FCC RF Test Report

APPLICANT	:	Quectel Wireless Solutions Co., Ltd.
EQUIPMENT	:	Wi-Fi & Bluetooth Module
BRAND NAME	:	QUECTEL
MODEL NAME	:	FCS851U
FCC ID	:	XMR2023FCS851U
STANDARD	:	FCC Part 15 Subpart E §15.407
CLASSIFICATION	:	(NII) Unlicensed National Information Infrastructure
TEST DATE(S)	:	Aug. 10, 2023 ~ Apr. 04, 2024

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

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

Jason Jia

Approved by: Jason Jia

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

TABLE OF CONTENTS

REVISION HISTORY **3**

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 7
1.6 Testing Location 8
1.7 Test Software 8
1.8 Applicable Standards 8

2 TEST CONFIGURATION OF EQUIPMENT UNDER TEST **9**

2.1 Carrier Frequency and Channel 9
2.2 Test Mode 10
2.3 Connection Diagram of Test System 11
2.4 Support Unit used in test configuration and system 12
2.5 EUT Operation Test Setup 12
2.6 Measurement Results Explanation Example 12

3 TEST RESULT **13**

3.1 6dB and 26dB and 99% Occupied Bandwidth Measurement 13
3.2 Maximum Conducted Output Power Measurement 15
3.3 Power Spectral Density Measurement 20
3.4 Unwanted Emissions Measurement 22
3.5 AC Conducted Emission Measurement 27
3.6 Antenna Requirements 29

4 LIST OF MEASURING EQUIPMENT **30**

5 MEASUREMENT UNCERTAINTY **31**

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
FR371207D	Rev. 01	Initial issue of report	May 23, 2024

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit for U-NII-1/2A/2C	Limit for U-NII-3	Result	Remark
3.1	2.1049 & 15.403(i)	6dB, 26dB & 99% Bandwidth	-	6dB Bandwidth > 500kHz	Pass	-
3.2	15.407(a)	Maximum Conducted Output Power	≤ 24 dBm	≤ 30 dBm	Pass	-
3.3	15.407(a)	Power Spectral Density	≤ 11 dBm/MHz	≤ 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 0.57 dB at 4660.00 MHz
3.5	15.207	AC Conducted Emission	15.207(a)	15.207(a)	Pass	Under limit 5.78 dB at 0.573 MHz
3.6	15.203 & 15.407(a)	Antenna Requirement	15.203 & 15.407(a)	15.203 & 15.407(a)	Pass	-

Conformity Assessment Condition:

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

Disclaimer:

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

1 General Description

1.1 Applicant

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	Wi-Fi & Bluetooth Module
Brand Name	QUECTEL
Model Name	FCS851U
FCC ID	XMR2023FCS851U
SN Code	Conducted: MPY23E033000030 Conduction: E1N23FH06000133 Radiation: E1N23FH06000076
HW Version	R1.0
SW Version	NA
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	5180 MHz ~ 5240 MHz; 5260 MHz ~ 5320 MHz 5500 MHz ~ 5700 MHz; 5745 MHz ~ 5825 MHz
Maximum Output Power to Antenna	**<5180 MHz ~ 5240 MHz>** 802.11a : 19.47 dBm / 0.0885 W 802.11n HT20 : 19.63 dBm / 0.0918 W 802.11n HT40 : 19.78 dBm / 0.0951 W 802.11ac VHT20: 19.71 dBm / 0.0935 W 802.11ac VHT40: 19.85 dBm / 0.0966 W 802.11ac VHT80: 14.53 dBm / 0.0284 W **<5260 MHz ~ 5320 MHz>** 802.11a : 19.58 dBm / 0.0908 W 802.11n HT20 : 18.03 dBm / 0.0635 W 802.11n HT40 : 19.57 dBm / 0.0906 W 802.11ac VHT20: 18.10 dBm / 0.0646 W 802.11ac VHT40: 19.66 dBm / 0.0925 W 802.11ac VHT80: 13.66 dBm / 0.0232 W **<5500 MHz ~ 5700 MHz >** 802.11a : 19.57 dBm / 0.0906 W 802.11n HT20 : 21.95 dBm / 0.1567 W 802.11n HT40 : 22.07 dBm / 0.1611 W 802.11ac VHT20: 22.00 dBm / 0.1585 W 802.11ac VHT40: 22.21 dBm / 0.1663 W 802.11ac VHT80: 14.05 dBm / 0.0254 W **<5745 MHz ~ 5825 MHz>** 802.11a : 15.52 dBm / 0.0356 W 802.11n HT20 : 18.35 dBm / 0.0684 W 802.11n HT40 : 18.60 dBm / 0.0724 W 802.11ac VHT20: 18.40 dBm / 0.0692 W 802.11ac VHT40: 18.70 dBm / 0.0741 W 802.11ac VHT80: 17.89 dBm / 0.0615 W
99% Occupied Bandwidth	**<5180 MHz ~ 5240 MHz>** 802.11a : 18.262 MHz 802.11ac VHT20 : 18.741 MHz 802.11ac VHT40 : 36.923 MHz 802.11ac VHT80 : 77.203 MHz **<5260 MHz ~ 5320 MHz>** 802.11a : 17.982 MHz 802.11ac VHT20 : 19.301 MHz 802.11ac VHT40 : 37.003 MHz 802.11ac VHT80 : 76.883 MHz **<5500 MHz ~ 5700 MHz>** 802.11a : 17.702 MHz 802.11ac VHT20 : 18.462 MHz 802.11ac VHT40 : 36.763 MHz 802.11ac VHT80 : 76.563 MHz **<5745 MHz ~ 5825 MHz>** 802.11a : 17.582 MHz 802.11ac VHT20 : 18.501 MHz 802.11ac VHT40 : 36.763 MHz 802.11ac VHT80 : 76.563 MHz

Antenna Type / Gain	**<5180 MHz ~ 5240 MHz>** <Ant. 0> : Dipole Antenna with gain 1.14 dBi <Ant. 1> : Dipole Antenna with gain 1.14 dBi **<5260 MHz ~ 5320 MHz>** <Ant. 0> : Dipole Antenna with gain 1.00 dBi <Ant. 1> : Dipole Antenna with gain 1.00 dBi **<5500 MHz ~ 5700 MHz>** <Ant. 0> : Dipole Antenna with gain 0.6 dBi <Ant. 1> : Dipole Antenna with gain 0.6 dBi **<5745 MHz ~ 5825 MHz>** <Ant. 0> : Dipole Antenna with gain 0.95 dBi <Ant. 1> : Dipole Antenna with gain 0.95 dBi
Type of Modulation	802.11a/n : OFDM (BPSK / QPSK / 16QAM / 64QAM) 802.11ac : OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM)

Note:

1. WLAN 802.11a support SISO Ant.0, 11n/11ac support MIMO Ant.0+1 CDD mode.
2. For 802.11n HT20 / ac VHT20 and 802.11n HT40 / ac VHT40 mode, the whole testing has assessed only 802.11ac VHT20/ VHT40 by referring to the higher output power.
3. WLAN operation in 5600 MHz ~ 5650 MHz is notched.

1.5 Modification of EUT

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

1.6 Testing Location

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

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

1.7 Test Software

Item	Site	Manufacturer	Name	Version
1.	TH01-KS	Tonscend	JS1120-3 test system China_210602	3.3.10
2.	03CH05-KS	AUDIX	E3	210616
3.	CO01-KS	AUDIX	E3	6.2009-8-24

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 (X 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)
5180-5240 MHz U-NII-1	36	5180	44	5220
	38*	5190	46*	5230
	40	5200	48	5240
	42#	5210	-	-

Frequency Band	Channel	Freq.(MHz)	Channel	Freq. (MHz)
5260-5320 MHz U-NII-2A	52	5260	60	5300
	54*	5270	62*	5310
	56	5280	64	5320
	58#	5290	-	-

Frequency Band	Channel	Freq.(MHz)	Channel	Freq. (MHz)
5500-5700MHz U-NII-2C	100	5500	112	5560
	102*	5510	116	5580
	104	5520	132	5660
	106#	5530	134*	5670
	108	5540	136	5680
	110*	5550	140	5700

Frequency Band	Channel	Freq.(MHz)	Channel	Freq. (MHz)
5745-5825 MHz U-NII-3	149	5745	157	5785
	151*	5755	159*	5795
	153	5765	161	5805
	155#	5775	165	5825

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

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

SISO Mode

Modulation	Data Rate
802.11a	6 Mbps

MIMO Mode

Modulation	Data Rate
802.11ac VHT20	MCS0
802.11ac VHT40	MCS0
802.11ac VHT80	MCS0

AC Conducted Emission	Mode 1 : WLAN Link(5G) + Powered From Test Jig

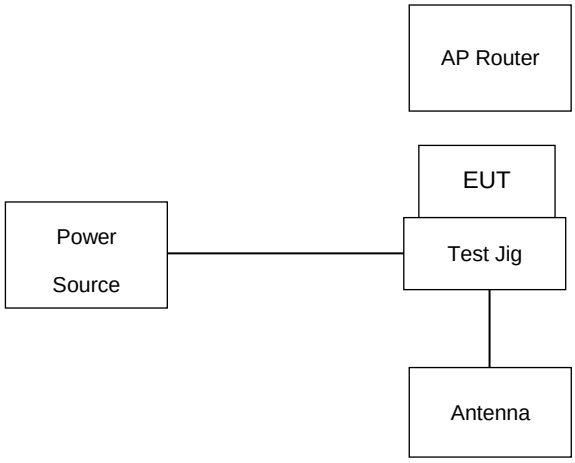
Ch. #		U-NII-1	U-NII-2A	U-NII-2C	U-NII-3
		20M BW	20M BW	20M BW	20M BW
L	Low	36	52	100	149
M	Middle	44	60	116	157
H	High	48	64	140	165

Ch. #		U-NII-1	U-NII-2A	U-NII-2C	U-NII-3
		40M BW	40M BW	40M BW	40M BW
L	Low	38	54	102	151
M	Middle	-	-	110	-
H	High	46	62	134	159

Ch. #		U-NII-1	U-NII-2A	U-NII-2C	U-NII-3
		80M BW	80M BW	80M BW	80M BW
L	Low	-	-	106	-
M	Middle	42	58	-	155
H	High	-	-	-	-

2.3 Connection Diagram of Test System

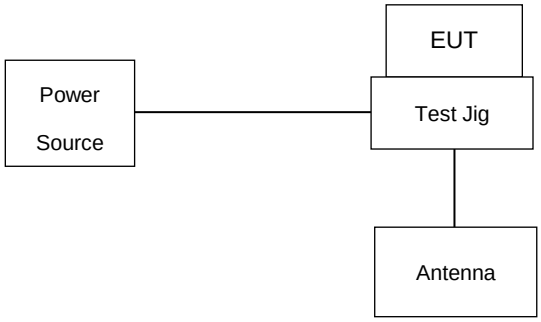
AC Conducted Emission:



This example is connection diagram of EUT test configurations.

. For detail, please refer to test mode configuration and setup photographs for each test item.

Radiated Emission:



This example is connection diagram of EUT test configurations.

. For detail, please refer to test mode configuration and setup photographs for each test item.

2.4 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Notebook	Lenovo	G480	QDS-BRCM1050I	N/A	shielded cable DC O/P 1.8m , Unshielded AC I/P cable 1.8m
2.	WLAN AP	D-link	DIR-655	KA21R655B1	N/A	Unshielded,1.8m
3.	Antenna	Quectel	N/A	N/A	N/A	N/A
4.	Test Jig	Quectel	N/A	N/A	N/A	N/A
5.	Adapter	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.

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

2.6 Measurement Results Explanation Example

For all conducted test items:

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

Example :

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

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with cable loss 4.08 dB and 10dB attenuator.

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

= 4.08 + 10 = 14.08 (dB)

3 Test Result

3.1 6dB and 26dB and 99% Occupied Bandwidth Measurement

3.1.1 Description of 6dB and 26dB and 99% Occupied Bandwidth

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

26dB and 99% Occupied bandwidth are reporting only.

3.1.2 Measuring Instruments

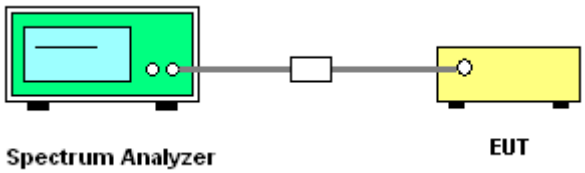
The measuring equipment is listed in the section 4 of this test report.

3.1.3 Test Procedures

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

☒	Section C) Bandwidth Measurement 1. Emission Bandwidth (EBW) and 99% OBW
	1. Set RBW = approximately 1% of the emission bandwidth. **2.** Set the VBW > RBW. **3.** Detector = Peak. **4.** Trace mode = max hold **5.** 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%. **6.** For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) is set to 1%~5% of the OBW and set the Video bandwidth (VBW) ≥ 3 * RBW. **7.** Measure and record the results in the test report.
☒	Section C) Bandwidth Measurement 2. Minimum Emission Bandwidth for the band 5.725 - 5.85 GHz
	1. Set RBW = 100kHz. **2.** Set the VBW ≥ 3 x RBW. **3.** Detector = Peak. **4.** Trace mode = max hold **5.** Measure the maximum width of the emission that is 6 dB down from the peak of the emission. **6.** Measure and record the results in the test report.

3.1.4 Test Setup



3.1.5 Test Result of 6dB 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 mobile and portable client devices in the 5.15–5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW.

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 $\log_{10}$ 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.

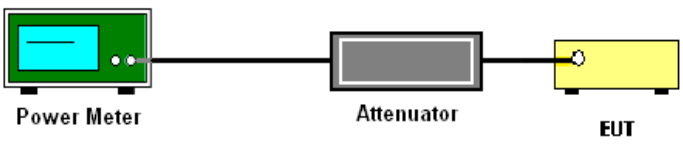
3.2.3 Test Procedures

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.

3.2.4 Test Setup



3.2.5 Test Result of Maximum Conducted Output Power

FCC <5180 MHz ~ 5240 MHz> single antenna														
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power with duty factor (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		Pass /Fail	Setting	
					Ant 0	Ant 1	SUM	Ant 0	Ant 1	Ant 0	Ant 1		Ant 0	Ant 1
11a	6Mbps	1	36	5180	17.56	-	-	24.00	-	1.14	-	Pass	25	-
11a	6Mbps	1	44	5220	19.47	-		24.00	-	1.14	-	Pass	5	-
11a	6Mbps	1	48	5240	19.36	-		24.00	-	1.14	-	Pass	5	-

FCC <5180 MHz ~ 5240 MHz> MIMO													
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power with duty factor (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		Pass/Fail	Setting	
					Ant 0	Ant 1	SUM	Ant 0	Ant 1	Ant 0	Ant 1		Ant 0	Ant 1
HT20	MCS0	2	36	5180	14.67	14.63	17.66	24.00		1.14		Pass	55	
HT20	MCS0	2	44	5220	16.59	16.65	19.63	24.00		1.14		Pass	33	
HT20	MCS0	2	48	5240	15.92	16.44	19.20	24.00		1.14		Pass	35	
HT40	MCS0	2	38	5190	16.54	16.98	19.78	24.00		1.14		Pass	68	
HT40	MCS0	2	46	5230	16.50	16.74	19.63	24.00		1.14		Pass	30	
VHT20	MCS0	2	36	5180	14.72	14.70	17.72	24.00		1.14		Pass	55	
VHT20	MCS0	2	44	5220	16.67	16.74	19.71	24.00		1.14		Pass	33	
VHT20	MCS0	2	48	5240	15.96	16.51	19.25	24.00		1.14		Pass	35	
VHT40	MCS0	2	38	5190	16.64	17.03	19.85	24.00		1.14		Pass	68	
VHT40	MCS0	2	46	5230	16.59	16.82	19.72	24.00		1.14		Pass	30	
VHT80	MCS0	2	42	5210	11.66	11.37	14.53	24.00		1.14		Pass	72	

FCC <5260 MHz ~ 5320 MHz> single antenna															
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power with duty factor (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		EIRP Power Limit (dBm)	Pass/Fail	Setting	
					Ant 0	Ant 1	SUM	Ant 0	Ant 1	Ant 0	Ant 1			Ant 0	Ant 1
11a	6Mbps	1	52	5260	19.58	-	-	23.98	-	1.00	-	26.99	Pass	10	-
11a	6Mbps	1	60	5300	19.35	-		23.98	-	1.00	-	26.99	Pass	10	-
11a	6Mbps	1	64	5320	17.45	-		23.98	-	1.00	-	26.99	Pass	22	-

FCC <5260 MHz ~ 5320 MHz> MIMO														
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power with duty factor (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		EIRP Power Limit (dBm)	Pass/Fail	Setting	
					Ant 0	Ant 1	SUM	Ant 0	Ant 1	Ant 0	Ant 1			Ant 0	Ant 1
HT20	MCS0	2	52	5260	14.96	15.07	18.03	23.98		1.00		26.99	Pass	45	
HT20	MCS0	2	60	5300	14.83	14.94	17.90	23.98		1.00		26.99	Pass	43	
HT20	MCS0	2	64	5320	14.48	14.59	17.55	23.98		1.00		26.99	Pass	50	
HT40	MCS0	2	54	5270	16.34	16.32	19.34	23.98		1.00		26.99	Pass	31	
HT40	MCS0	2	62	5310	16.53	16.58	19.57	23.98		1.00		26.99	Pass	83	
VHT20	MCS0	2	52	5260	15.02	15.16	18.10	23.98		1.00		26.99	Pass	45	
VHT20	MCS0	2	60	5300	14.87	15.02	17.96	23.98		1.00		26.99	Pass	43	
VHT20	MCS0	2	64	5320	14.55	14.64	17.60	23.98		1.00		26.99	Pass	50	
VHT40	MCS0	2	54	5270	16.40	16.36	19.39	23.98		1.00		26.99	Pass	31	
VHT40	MCS0	2	62	5310	16.62	16.67	19.66	23.98		1.00		26.99	Pass	83	
VHT80	MCS0	2	58	5290	10.77	10.52	13.66	23.98		1.00		26.99	Pass	80	

FCC <5500 MHz ~ 5700 MHz single antenna															
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power with duty factor (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		EIRP Power Limit (dBm)	Pass/Fail	Setting	
					Ant 0	Ant 1	SUM	Ant 0	Ant 1	Ant 0	Ant 1			Ant 0	Ant 1
11a	6Mbps	1	100	5500	19.45	-	-	23.98	-	0.60	-	26.99	Pass	10	-
11a	6Mbps	1	116	5580	19.57	-		23.98	-	0.60	-	26.99	Pass	10	-
11a	6Mbps	1	140	5700	18.06	-		23.98	-	0.60	-	26.99	Pass	15	-

FCC <5500 MHz ~ 5700 MHz > MIMO														
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power with duty factor (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		EIRP Power Limit (dBm)	Pass/Fail	Setting	
					Ant 0	Ant 1	SUM	Ant 0	Ant 1	Ant 0	Ant 1			Ant 0	Ant 1
HT20	MCS0	2	100	5500	16.51	17.37	19.97	23.98		0.60		26.99	Pass	30	
HT20	MCS0	2	116	5580	18.59	19.26	21.95	23.98		0.60		26.99	Pass	8	
HT20	MCS0	2	140	5700	15.82	15.74	18.99	23.98		0.60		26.99	Pass	70	
HT40	MCS0	2	102	5510	14.69	15.30	18.02	23.98		0.60		26.99	Pass	48	
HT40	MCS0	2	110	5550	19.03	19.08	22.07	23.98		0.60		26.99	Pass	5	
HT40	MCS0	2	134	5670	16.94	16.83	19.90	23.98		0.60		26.99	Pass	23	
VHT20	MCS0	2	100	5500	16.56	17.46	20.04	23.98		0.60		26.99	Pass	30	
VHT20	MCS0	2	116	5580	18.63	19.32	22.00	23.98		0.60		26.99	Pass	8	
VHT20	MCS0	2	140	5700	15.86	15.83	19.05	23.98		0.60		26.99	Pass	70	
VHT40	MCS0	2	102	5510	14.72	15.39	18.08	23.98		0.60		26.99	Pass	48	
VHT40	MCS0	2	110	5550	19.19	19.20	22.21	23.98		0.60		26.99	Pass	5	
VHT40	MCS0	2	134	5670	17.06	16.92	20.00	23.98		0.60		26.99	Pass	23	
VHT80	MCS0	2	106	5530	10.83	11.24	14.05	23.98		0.60		26.99	Pass	71	

<5745 MHz ~ 5825 MHz>single antenna														
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power with duty factor (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		Pass/Fail	Setting	
					Ant 0	Ant 1	SUM	Ant 0	Ant 1	Ant 0	Ant 1		Ant 0	Ant 1
11a	6Mbps	1	149	5745	15.05	-	-	30.00	-	0.95	-	Pass	40	-
11a	6Mbps	1	157	5785	15.18	-		30.00	-	0.95	-	Pass	40	-
11a	6Mbps	1	165	5825	15.52	-		30.00	-	0.95	-	Pass	37	-

<5745 MHz ~ 5825 MHz> MIMO													
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power with duty factor (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		Pass/Fail	Setting	
					Ant 0	Ant 1	SUM	Ant 0	Ant 1	Ant 0	Ant 1		Ant 0	Ant 1
HT20	MCS0	2	149	5745	15.40	15.28	18.35	30.00		0.95		Pass	37	
HT20	MCS0	2	157	5785	14.22	14.00	17.12	30.00		0.95		Pass	48	
HT20	MCS0	2	165	5825	13.67	13.02	16.37	30.00		0.95		Pass	52	
HT40	MCS0	2	151	5755	15.20	14.71	17.97	30.00		0.95		Pass	40	
HT40	MCS0	2	159	5795	15.71	15.46	18.60	30.00		0.95		Pass	34	
VHT20	MCS0	2	149	5745	15.44	15.35	18.40	30.00		0.95		Pass	37	
VHT20	MCS0	2	157	5785	14.28	14.06	17.18	30.00		0.95		Pass	48	
VHT20	MCS0	2	165	5825	13.73	13.12	16.45	30.00		0.95		Pass	52	
VHT40	MCS0	2	151	5755	15.29	14.80	18.06	30.00		0.95		Pass	40	
VHT40	MCS0	2	159	5795	15.78	15.59	18.70	30.00		0.95		Pass	34	
VHT80	MCS0	2	155	5775	15.04	14.71	17.89	30.00		0.95		Pass	40	

3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

<FCC 14-30 CFR 15.407>

For mobile and portable client devices in the 5.15–5.25 GHz band, the maximum power spectral density shall not exceed 11dBm in any 1 megahertz band.

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 v01r04.
Section F) Maximum power spectral density.

For devices operating in the bands UNII-1/2A/2C

 # Method SA-2 #

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

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

For devices operating in the band UNII-3

 # Method SA-2 #

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

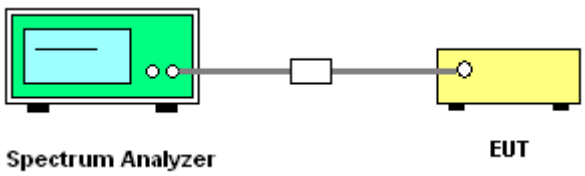
- Measure the duty cycle.
- Set span to encompass the entire emission bandwidth (EBW) of the signal.
- Set RBW = 500KHz (or 300 kHz if the SA can't set RBW=500KHz).
- Set VBW ≥ 1 MHz.
- Number of points in sweep ≥ 2 Span / RBW.
- Sweep time = auto.
- Detector = RMS
- Trace average at least 100 traces in power averaging mode.
- If the SA can't set RBW=500KHz, then add 10 log(500kHz/RBW) to the test result.
- 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 5150-5250 MHz band: all emissions outside of the 5150-5350 MHz band shall not exceed an EIRP of –27dBm/MHz.

For transmitters operating in the 5250-5350 MHz band: all emissions outside of the 5150-5350 MHz band shall not exceed an EIRP of -27 dBm/MHz. Devices operating in the 5250-5350 MHz band that generate emissions in the 5150-5250 MHz band must meet all applicable technical requirements for operation in the 5150-5250 MHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27 dBm/MHz in the 5150-5250 MHz band.

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) For transmitters operating in the 5.725-5.85 GHz band:
15.407(b)(4)(i) All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

(3) 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

(4) EIRP (dBm)	Field Strength at 3m (dBμV/m)
- 27	68.2

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

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

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

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

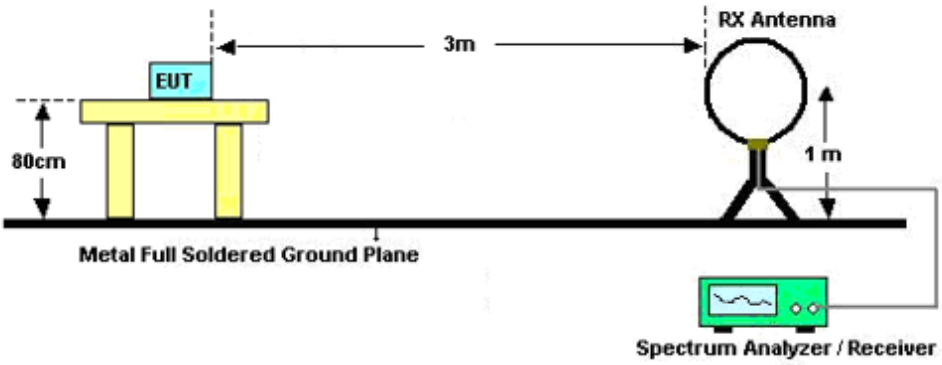
   (3) Procedures for Average Unwanted Emissions Measurements Above 1000MHz

   - RBW = 1 MHz
   - VBW = 10 Hz, when duty cycle is no less than 98 percent.
   - VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on.

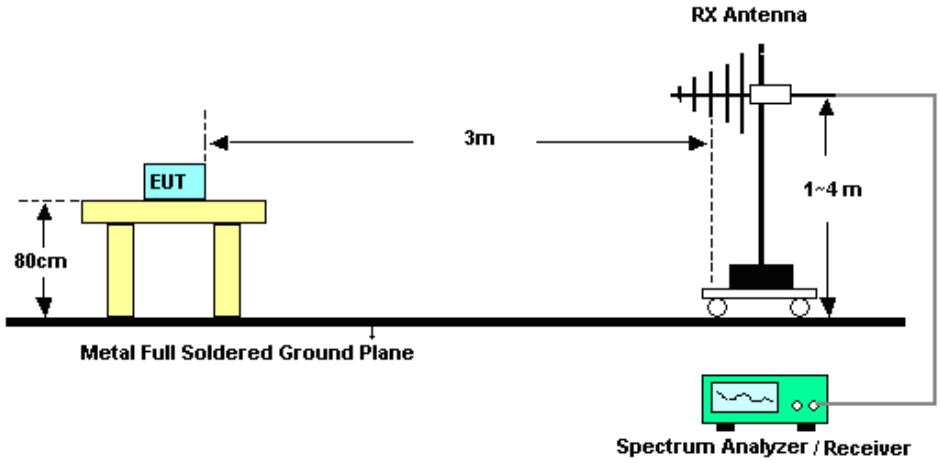
2. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
3. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
4. The antenna is a broadband 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

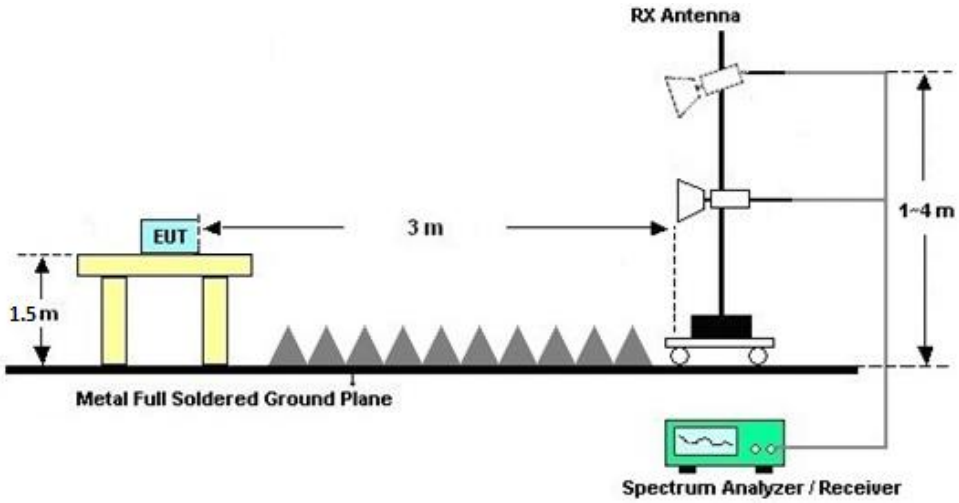
For radiated emissions below 30MHz



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 (dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

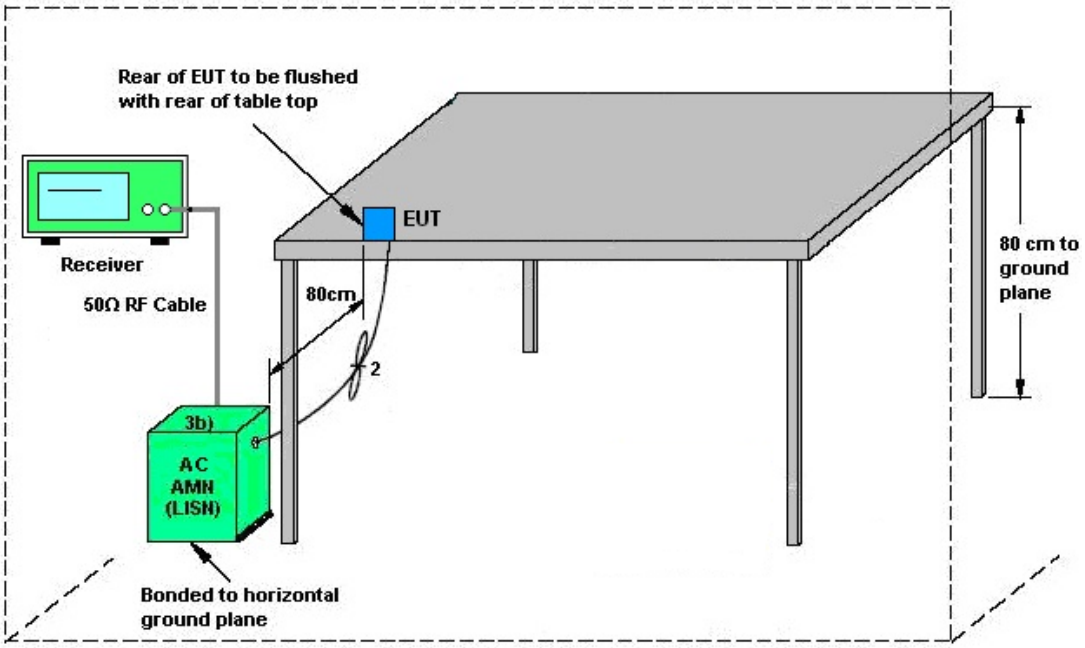
3.5.2 Measuring Instruments

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



AMN = Artificial mains network (LISN)
AE = Associated equipment
EUT = Equipment under test
ISN = Impedance stabilization network

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

Non-standard antenna connector 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(NANT/NSS=1) dB.

For power measurements on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for NANT ≤ 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>

	Ant. 0 (dBi)	Ant. 1 (dBi)	DG for Power (dBi)	DG for PSD (dBi)	Power Limit Reduction (dB)	PSD Limit Reduction (dB)
UNII-1	1.14	1.14	1.14	4.15	0.00	0.00
UNII-2A	1.00	1.00	1.00	4.01	0.00	0.00
UNII-2C	0.60	0.60	0.60	3.61	0.00	0.00
UNII-3	0.95	0.95	0.95	3.96	0.00	0.00

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
EMI Test Receiver	Keysight	N9038A	MY56400004	3Hz~8.5GHz;Max 30dBm	Oct. 10, 2023	Apr. 04, 2024	Oct. 09, 2024	Radiation (03CH05-KS)
EXA Spectrum Analyzer	Keysight	N9010A	MY55150244	10Hz-44G,MAX 30dB	Mar. 23, 2024	Apr. 04, 2024	Mar. 22, 2025	Radiation (03CH05-KS)
Loop Antenna	R&S	HFH2-Z2	100321	9kHz~30MHz	Oct. 10, 2023	Apr. 04, 2024	Oct. 09, 2024	Radiation (03CH05-KS)
Bilog Antenna	TeseQ	CBL6111D	49922	30MHz-1GHz	Apr. 09, 2023	Apr. 04, 2024	Apr. 08, 2024	Radiation (03CH05-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	00218642	1GHz~18GHz	Apr. 06, 2023	Apr. 04, 2024	Apr. 05, 2024	Radiation (03CH05-KS)
SHF-EHF Horn	Com-power	AH-840	101093	18GHz~40GHz	Jan. 05, 2024	Apr. 04, 2024	Jan. 04, 2025	Radiation (03CH05-KS)
Amplifier	SONOMA	310N	380826	9KHz-1GHz	Jul. 06, 2023	Apr. 04, 2024	Jul. 05, 2024	Radiation (03CH05-KS)
Amplifier	EM	EM18G40GA	060852	18~40GHz	Jan. 05, 2024	Apr. 04, 2024	Jan. 04, 2025	Radiation (03CH05-KS)
high gain Amplifier	EM	EM01G18GA	060839	1Ghz-18Ghz	Oct. 10, 2023	Apr. 04, 2024	Oct. 09, 2024	Radiation (03CH05-KS)
Amplifier	EM	EM01G18GA	060833	1Ghz-18Ghz	Jan. 03, 2024	Apr. 04, 2024	Jan. 02, 2025	Radiation (03CH05-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Apr. 04, 2024	NCR	Radiation (03CH05-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Apr. 04, 2024	NCR	Radiation (03CH05-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Apr. 04, 2024	NCR	Radiation (03CH05-KS)
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz;	May 16, 2023	Aug. 10, 2023	May 15, 2024	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060103	9kHz~30MHz	Oct. 13, 2022	Aug. 10, 2023	Oct. 12, 2023	Conduction (CO01-KS)
AC LISN	MessTec	AN3016	060105	9kHz~30MHz	May 16, 2023	Aug. 10, 2023	May 15, 2024	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP000000811	AC 0V~300V, 45Hz~1000Hz	Oct. 12, 2022	Aug. 10, 2023	Oct. 11, 2023	Conduction (CO01-KS)
Spectrum Analyzer	R&S	FSV40	101040	10Hz~40GHz	Oct. 12, 2022	Aug. 16, 2023	Oct. 11, 2023	Conducted (TH01-KS)
Pulse Power Senor	Anritsu	MA2411B	0917070	300MHz~40GHz	Jan. 03, 2023	Aug. 16, 2023	Jan. 02, 2024	Conducted (TH01-KS)
Power Meter	Anritsu	ML2495A	1005002	50MHz Bandwidth	Jan. 03, 2023	Aug. 16, 2023	Jan. 02, 2024	Conducted (TH01-KS)

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	**±2.26 dB**
Occupied Channel Bandwidth	**±0.1%**
Conducted Power	**±0.46 dB**
Conducted Power Spectral Density	**±0.88 dB**
Frequency	**±0.4 Hz**

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

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

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

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

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**6.28 dB**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**4.88 dB**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**5.26 dB**

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

Appendix A. Conducted Test Results

Ambient Condition: 25 ℃, 45 %RH	
Test Date: 2023.8.16	**Test Engineer:** Long Wu

Emission Bandwidth

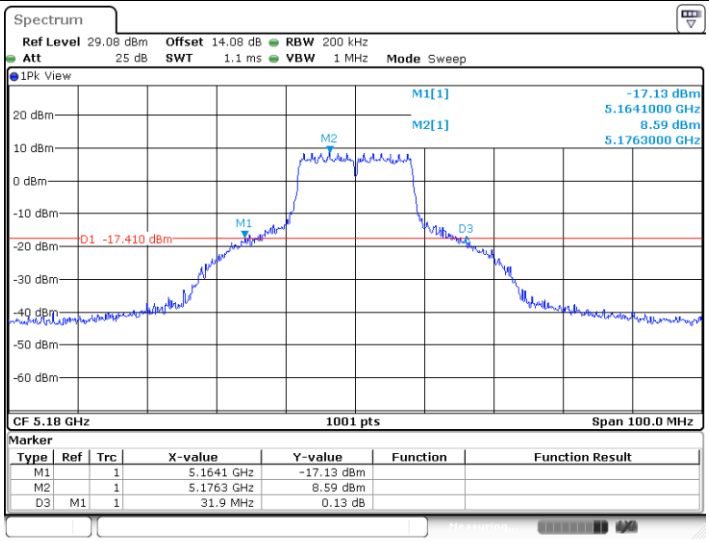
Test Result

TestMode	Antenna	Freq(MHz)	26dB EBW [MHz]	FL[MHz]	FH[MHz]
11A	Ant0	5180	31.90	5164.10	5196.00
	Ant0	5220	30.60	5204.60	5235.20
	Ant0	5240	31.80	5225.10	5256.90
	Ant0	5260	29.50	5244.90	5274.40
	Ant0	5300	29.00	5285.20	5314.20
	Ant0	5320	29.60	5304.70	5334.30
	Ant0	5500	30.00	5486.20	5516.20
	Ant0	5580	28.40	5566.60	5595.00
	Ant0	5700	29.00	5685.00	5714.00
	Ant0	5745	27.60	5732.20	5759.80
	Ant0	5785	28.50	5771.30	5799.80
	Ant0	5825	26.40	5811.80	5838.20
11AC20MIMO	Ant0	5180	31.50	5163.80	5195.30
	Ant1	5180	29.00	5166.70	5195.70
	Ant0	5220	31.10	5204.40	5235.50
	Ant1	5220	25.40	5207.20	5232.60
	Ant0	5240	31.60	5225.20	5256.80
	Ant1	5240	26.70	5227.20	5253.90
	Ant0	5260	31.70	5244.40	5276.10
	Ant1	5260	28.10	5245.40	5273.50
	Ant0	5300	33.30	5283.00	5316.30
	Ant1	5300	26.50	5286.80	5313.30
	Ant0	5320	33.80	5302.50	5336.30
	Ant1	5320	32.30	5303.40	5335.70
	Ant0	5500	29.00	5485.30	5514.30
	Ant1	5500	28.90	5486.50	5515.40
	Ant0	5580	27.40	5566.40	5593.80
	Ant1	5580	30.30	5565.40	5595.70
	Ant0	5700	30.30	5685.70	5716.00
	Ant1	5700	29.50	5684.80	5714.30
	Ant0	5745	28.60	5730.80	5759.40
	Ant1	5745	29.80	5731.30	5761.10
	Ant0	5785	28.90	5770.70	5799.60
	Ant1	5785	30.70	5770.30	5801.00
	Ant0	5825	29.80	5810.90	5840.70
	Ant1	5825	29.30	5810.30	5839.60
11AC40MIMO	Ant0	5190	68.00	5155.60	5223.60
	Ant1	5190	51.60	5164.20	5215.80
	Ant0	5230	77.40	5193.20	5270.60
	Ant1	5230	49.20	5204.40	5253.60

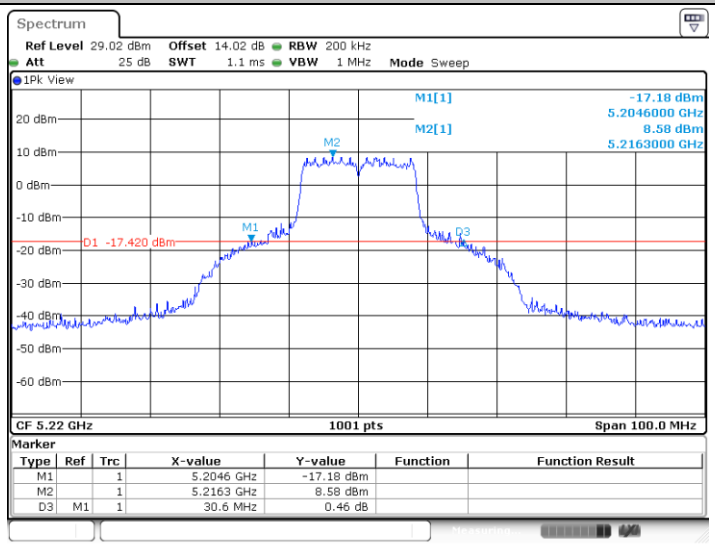
	Ant0	5270	72.00	5233.20	5305.20
	Ant1	5270	56.40	5241.20	5297.60
	Ant0	5310	70.20	5274.00	5344.20
	Ant1	5310	60.60	5278.00	5338.60
	Ant0	5510	60.00	5480.80	5540.80
	Ant1	5510	49.00	5485.40	5534.40
	Ant0	5550	57.40	5522.60	5580.00
	Ant1	5550	50.20	5524.60	5574.80
	Ant0	5670	60.20	5640.60	5700.80
	Ant1	5670	47.00	5648.40	5695.40
	Ant0	5755	50.00	5730.00	5780.00
	Ant1	5755	48.40	5731.00	5779.40
	Ant0	5795	63.60	5764.00	5827.60
	Ant1	5795	55.20	5765.80	5821.00
11AC80MIMO	Ant0	5210	171.20	5114.40	5285.60
	Ant1	5210	105.60	5154.80	5260.40
	Ant0	5290	163.60	5194.40	5358.00
	Ant1	5290	107.60	5234.00	5341.60
	Ant0	5530	116.40	5472.00	5588.40
	Ant1	5530	108.40	5474.40	5582.80
	Ant0	5775	123.20	5703.40	5826.60
	Ant1	5775	105.20	5715.40	5820.60

Test Graphs

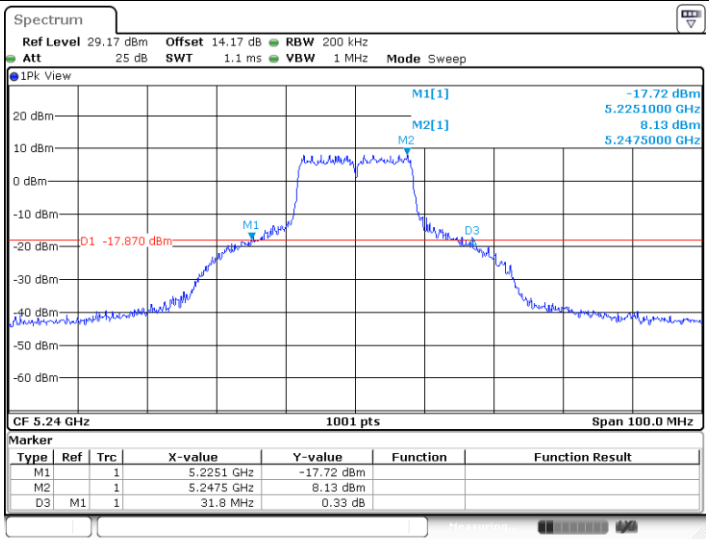
11A_Ant0_5180



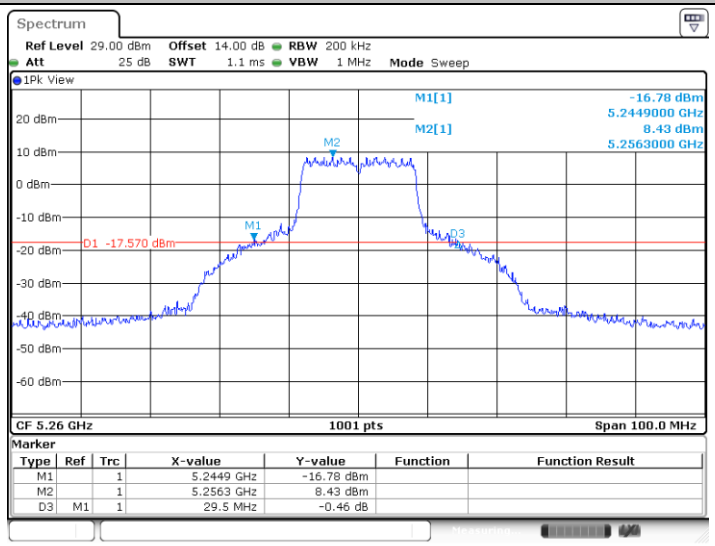
11A_Ant0_5220

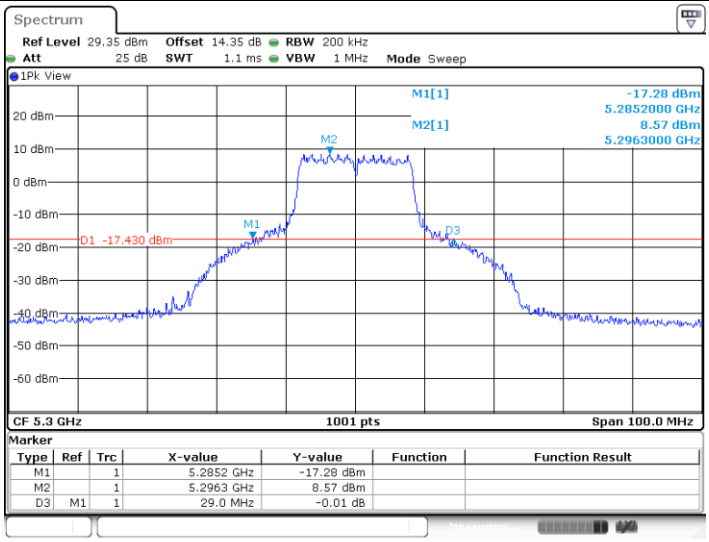


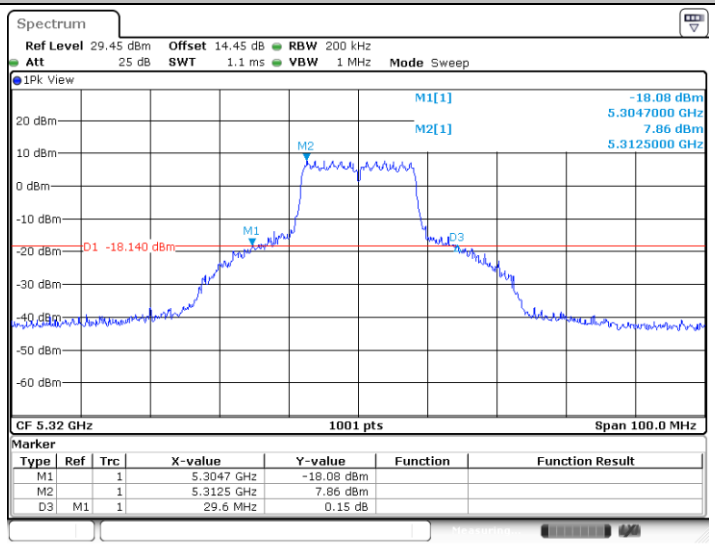
11A_Ant0_5240



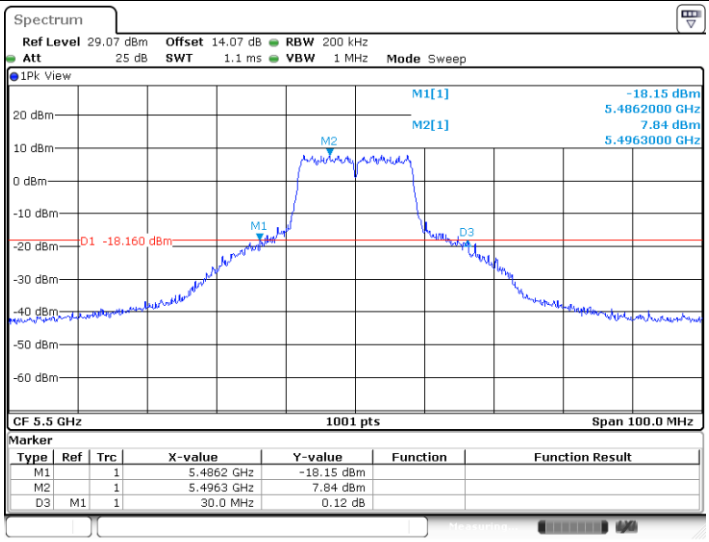
11A_Ant0_5260



11A_Ant0_5300


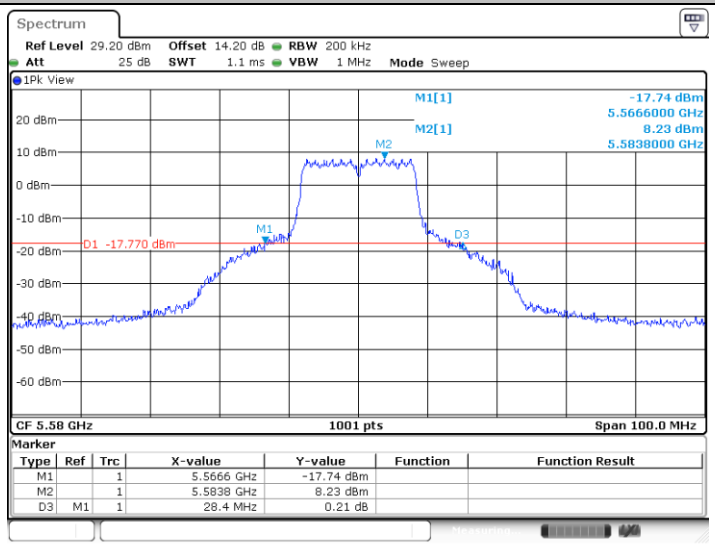
11A_Ant0_5320


11A_Ant0_5500

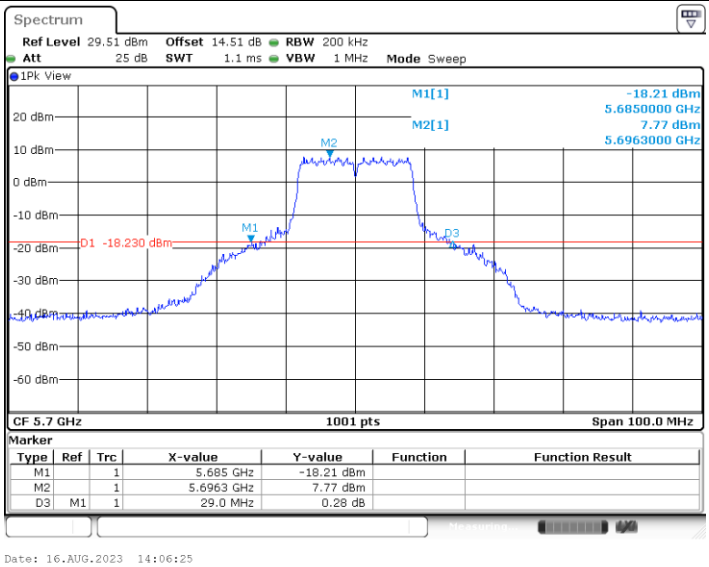


Date: 16.AUG.2023 14:05:10

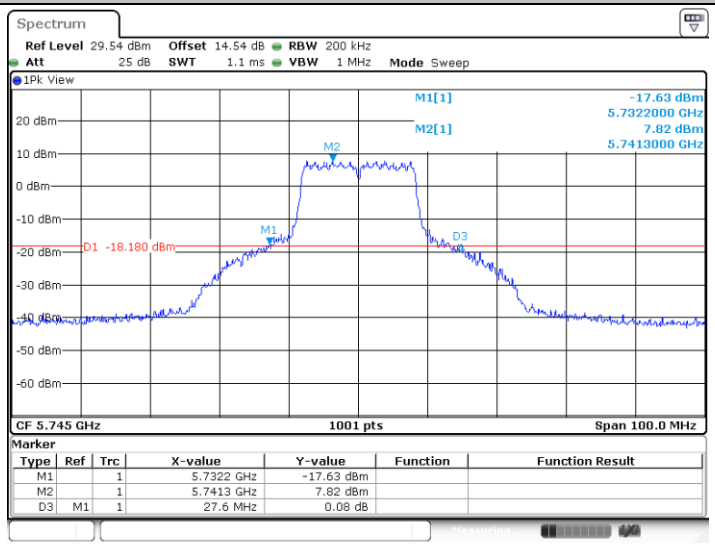
11A_Ant0_5580



Date: 16.AUG.2023 14:05:36

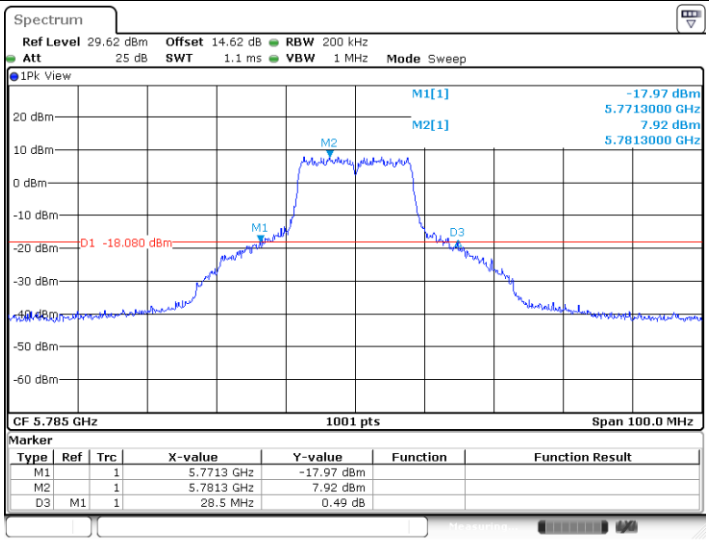
11A_Ant0_5700


Date: 16.AUG.2023 14:06:25

11A_Ant0_5745


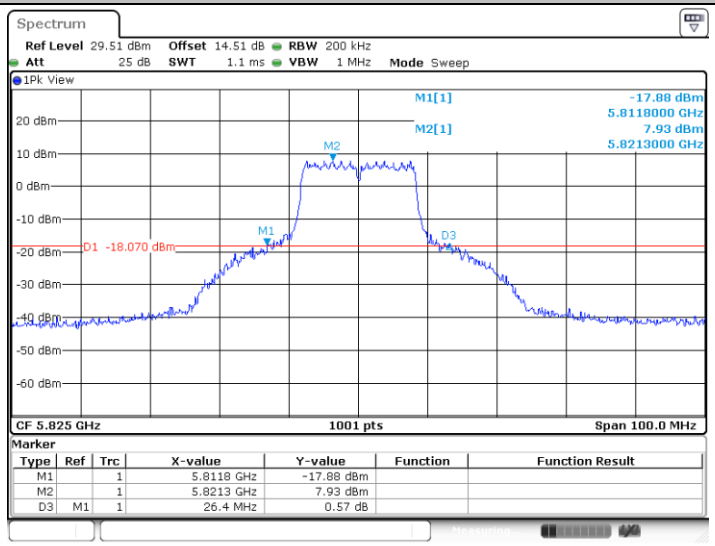
Date: 16.AUG.2023 14:06:51

11A_Ant0_5785

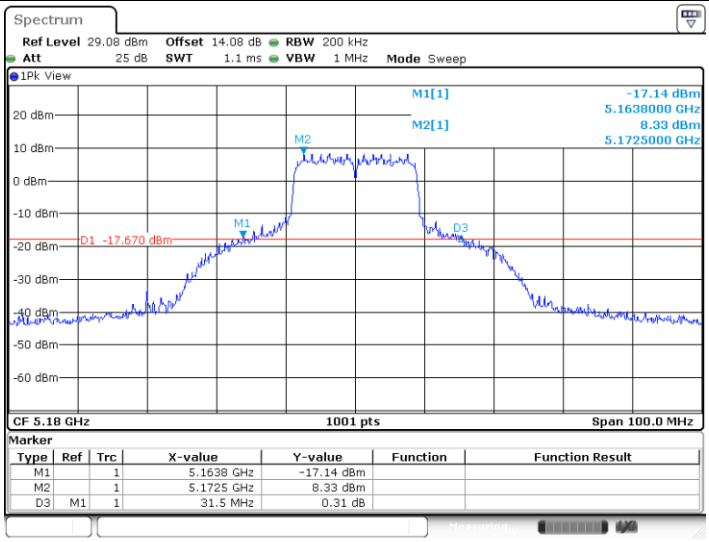


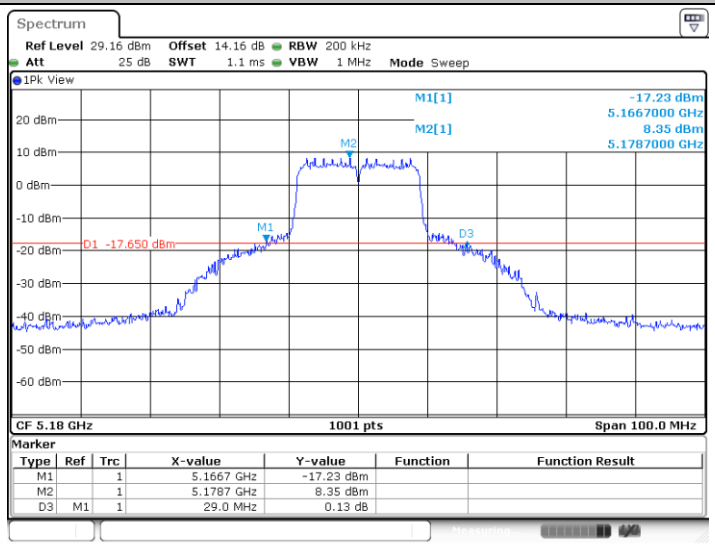
Date: 16.AUG.2023 14:07:27

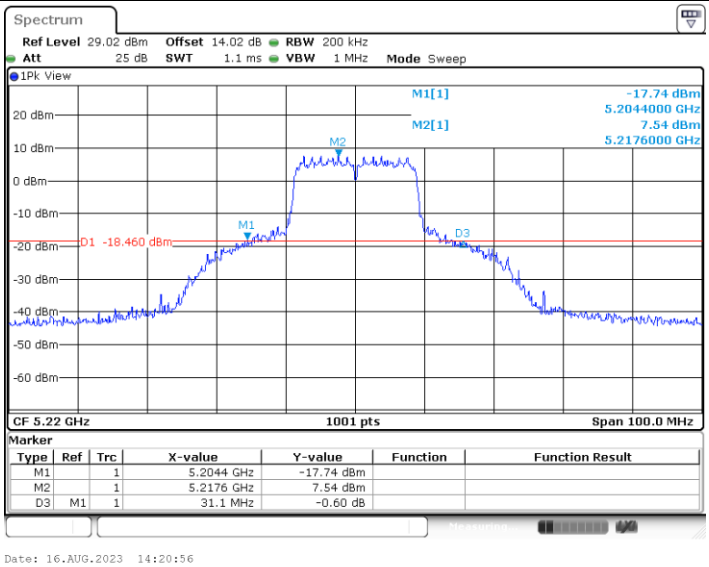
11A_Ant0_5825



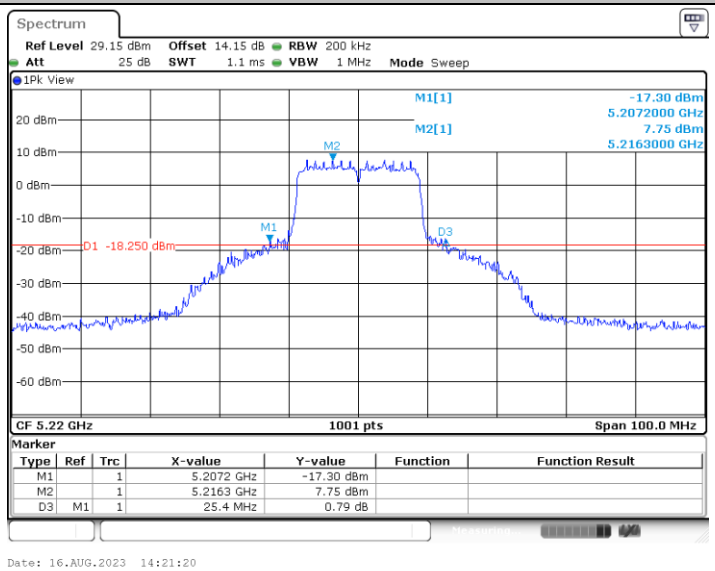
Date: 16.AUG.2023 14:08:05

11AC20MIMO_Ant0_5180


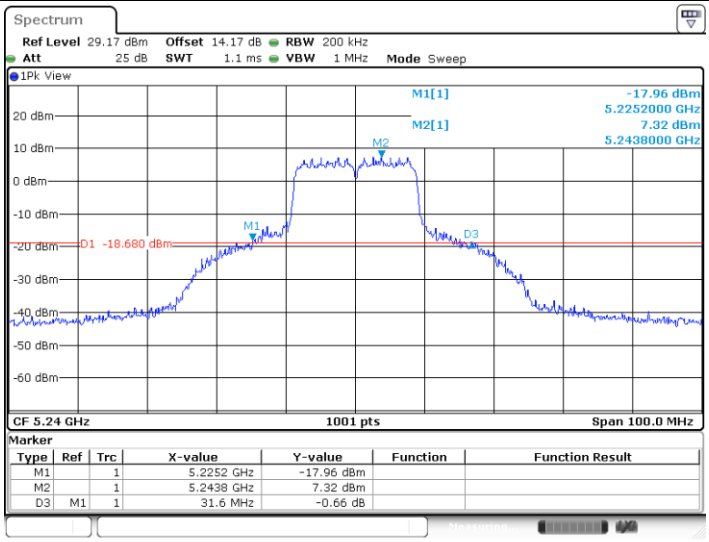
11AC20MIMO_Ant1_5180


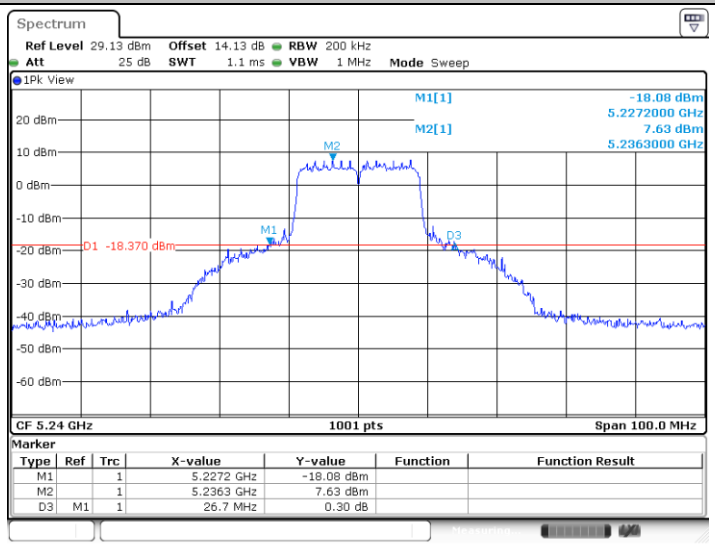
11AC20MIMO_Ant0_5220


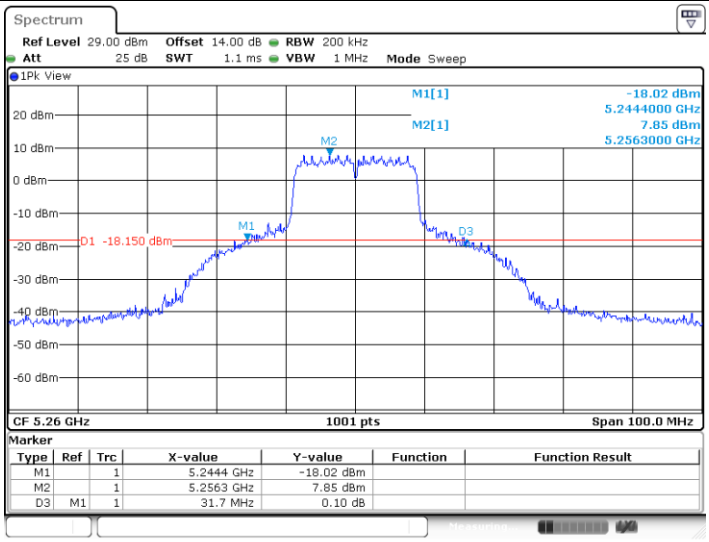
Date: 16.AUG.2023 14:20:56

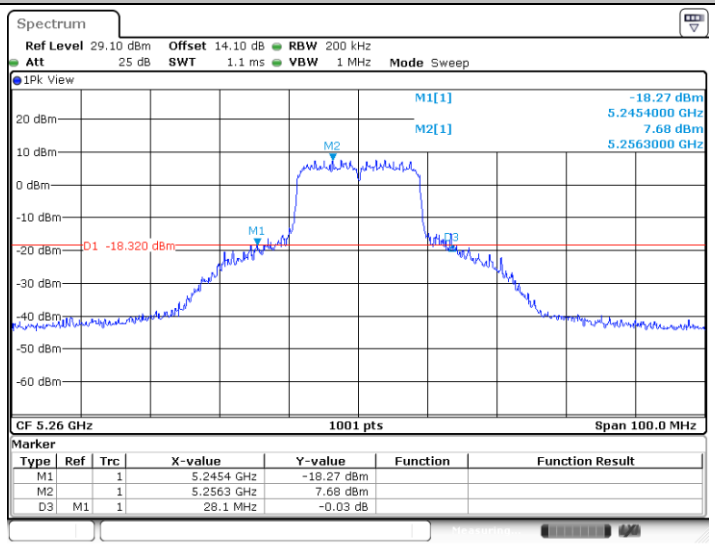
11AC20MIMO_Ant1_5220


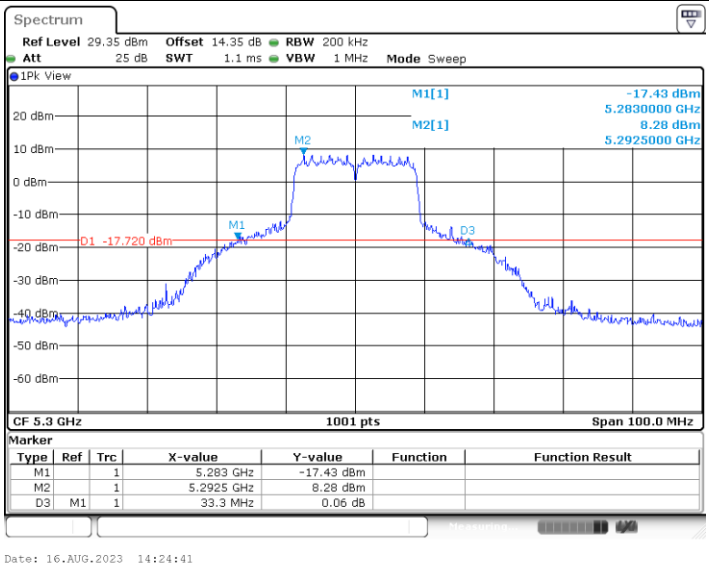
Date: 16.AUG.2023 14:21:20

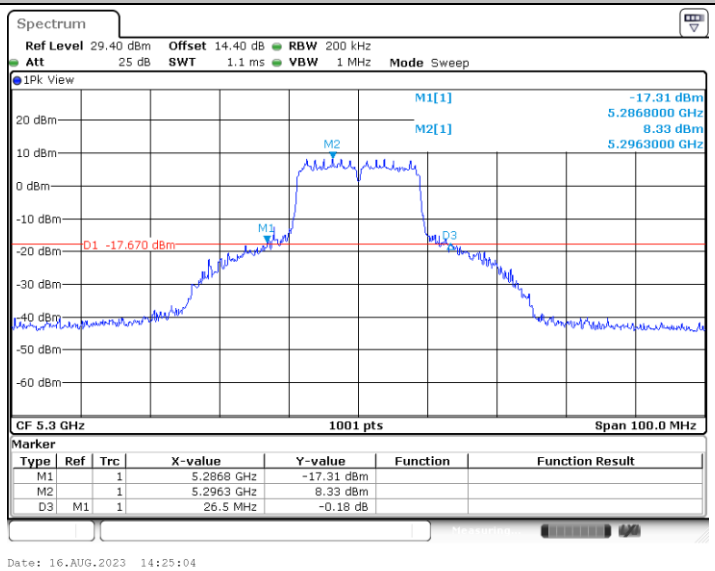
11AC20MIMO_Ant0_5240


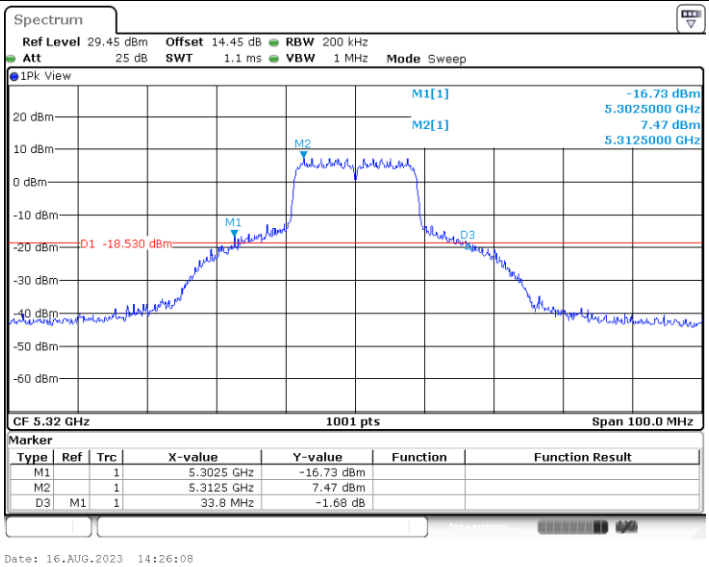
11AC20MIMO_Ant1_5240


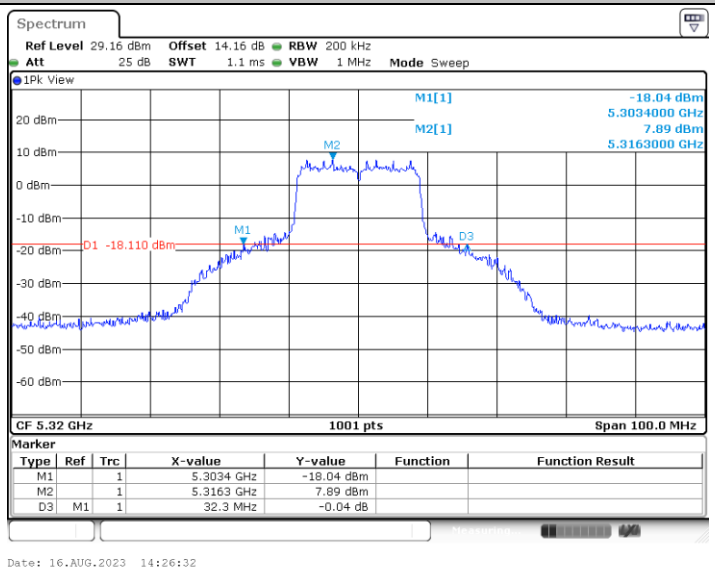
11AC20MIMO_Ant0_5260


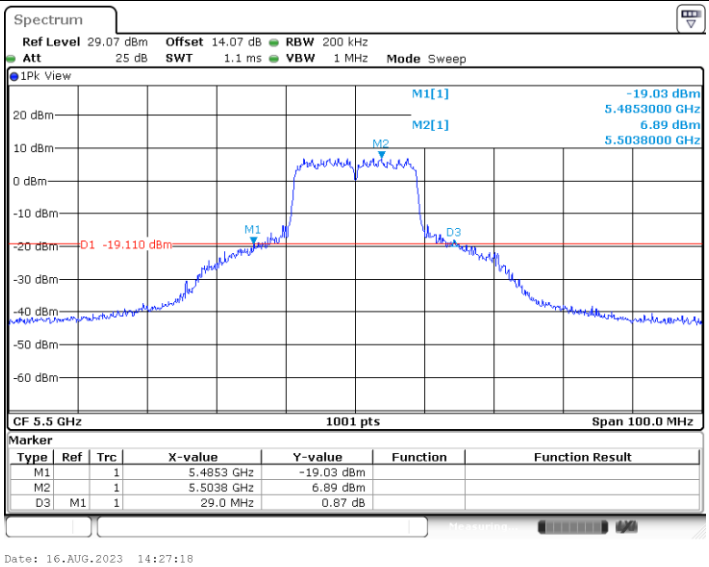
11AC20MIMO_Ant1_5260


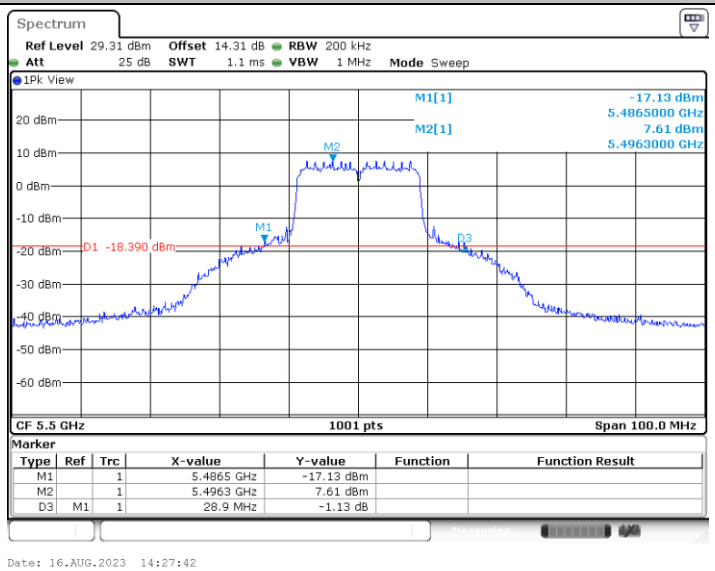
11AC20MIMO_Ant0_5300


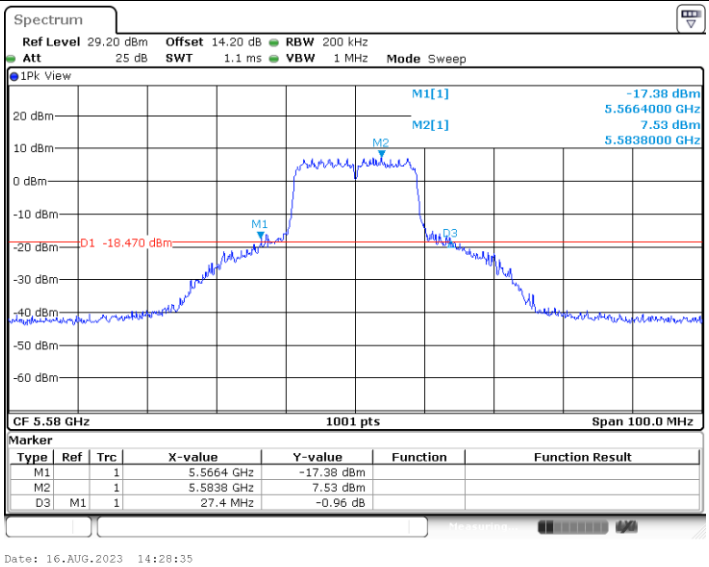
11AC20MIMO_Ant1_5300


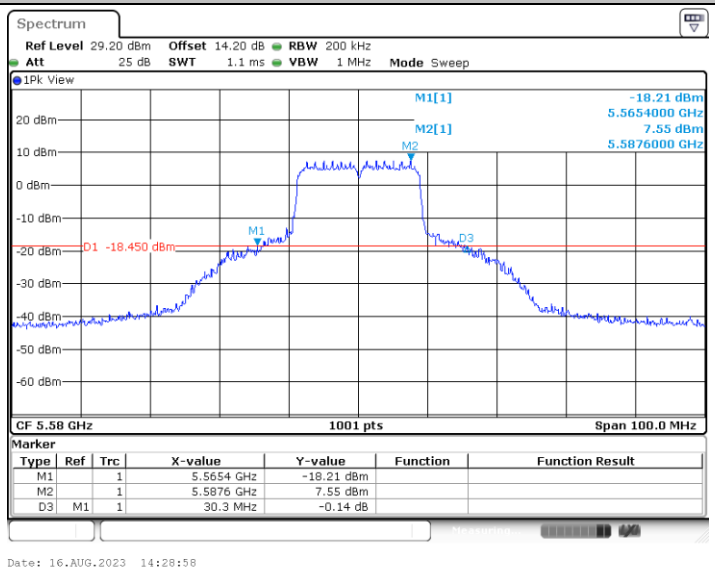
11AC20MIMO_Ant0_5320


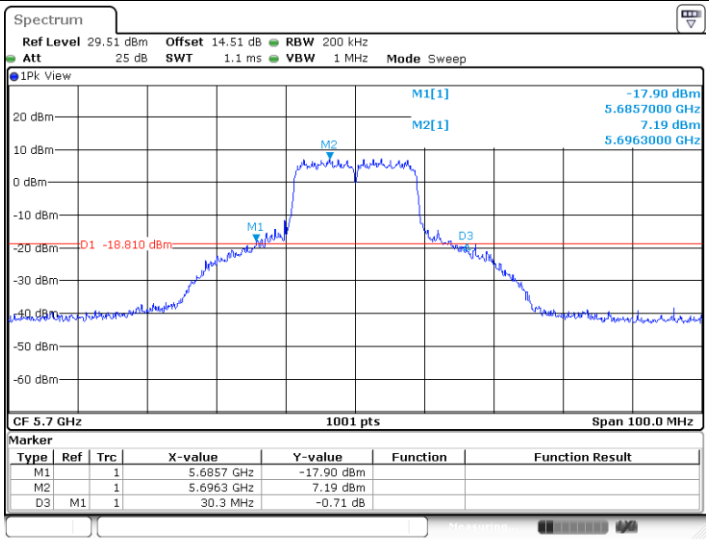
11AC20MIMO_Ant1_5320


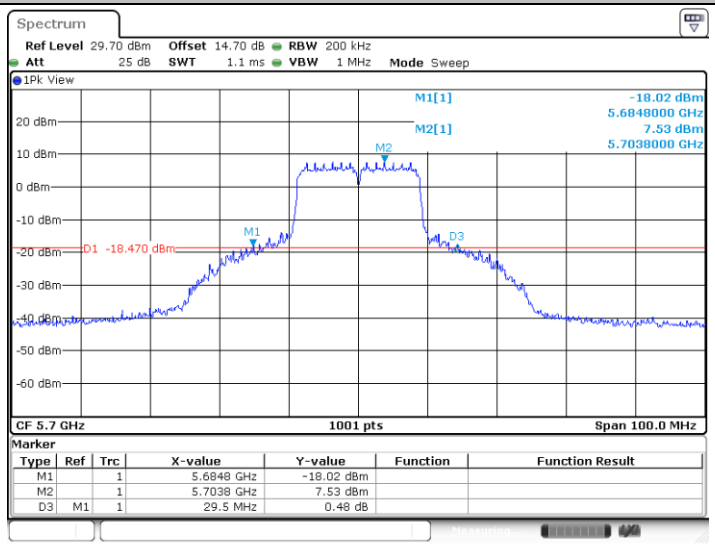
11AC20MIMO_Ant0_5500


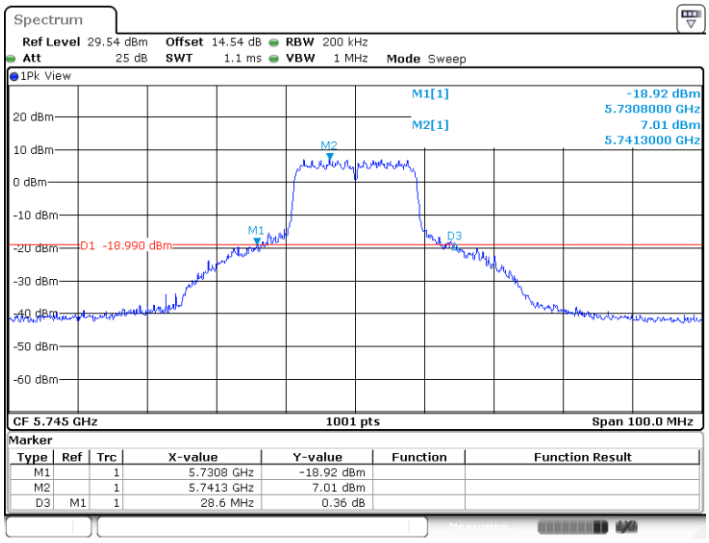
11AC20MIMO_Ant1_5500


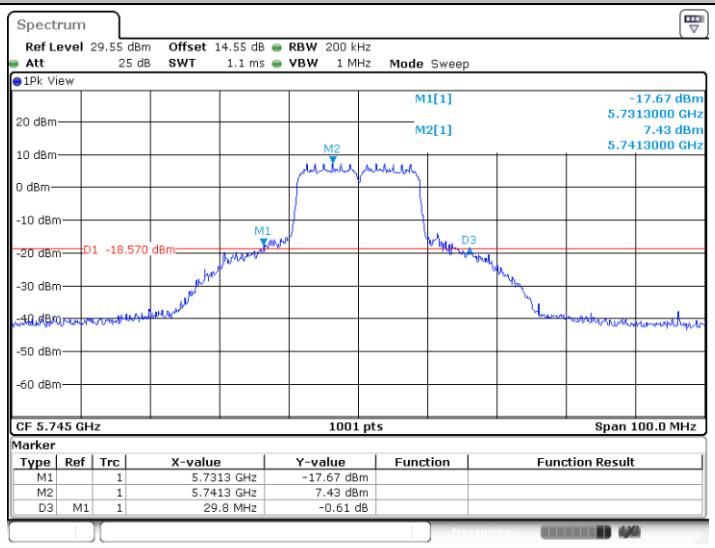
11AC20MIMO_Ant0_5580


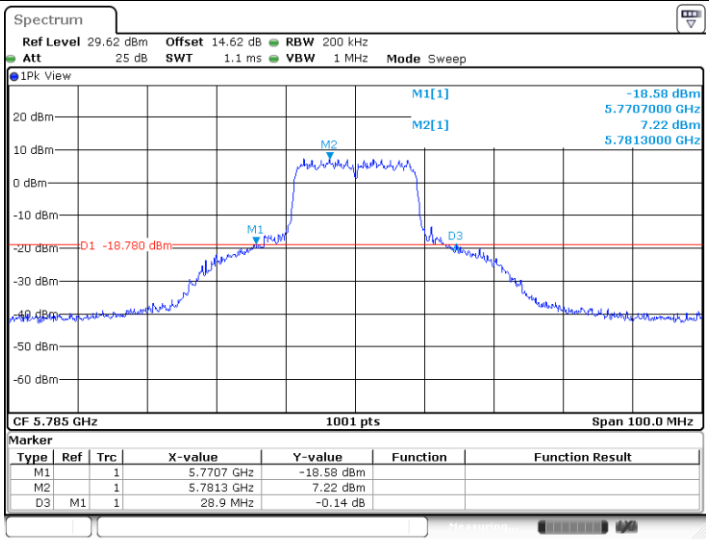
11AC20MIMO_Ant1_5580


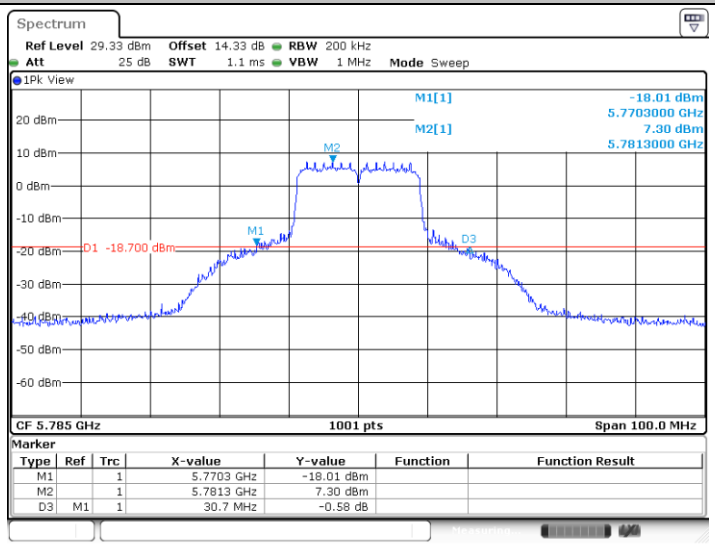
11AC20MIMO_Ant0_5700


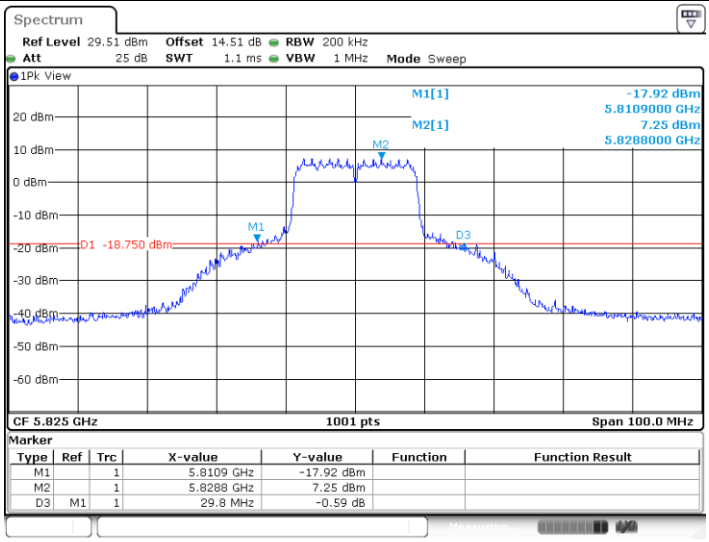
11AC20MIMO_Ant1_5700


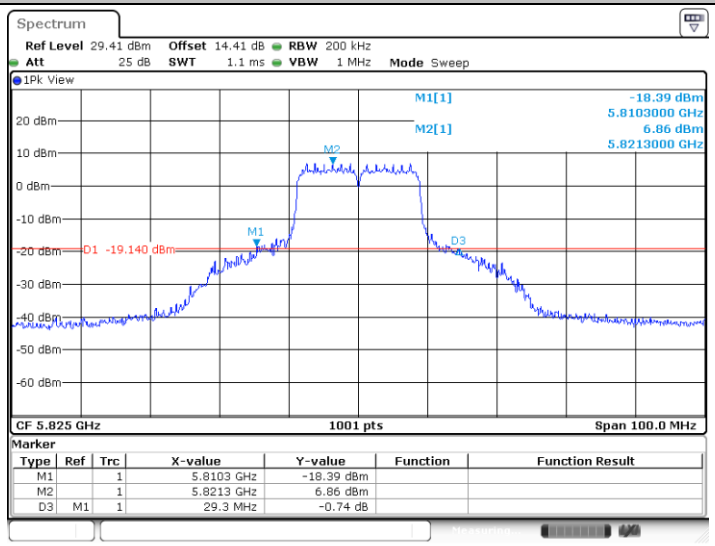
11AC20MIMO_Ant0_5745


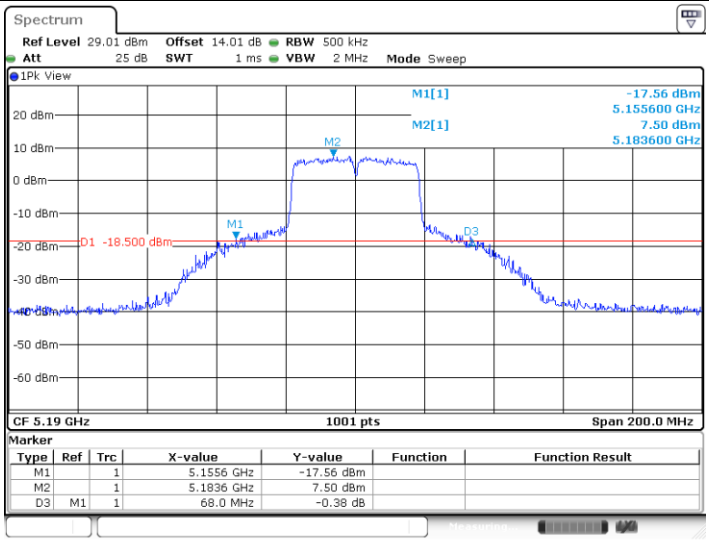
11AC20MIMO_Ant1_5745


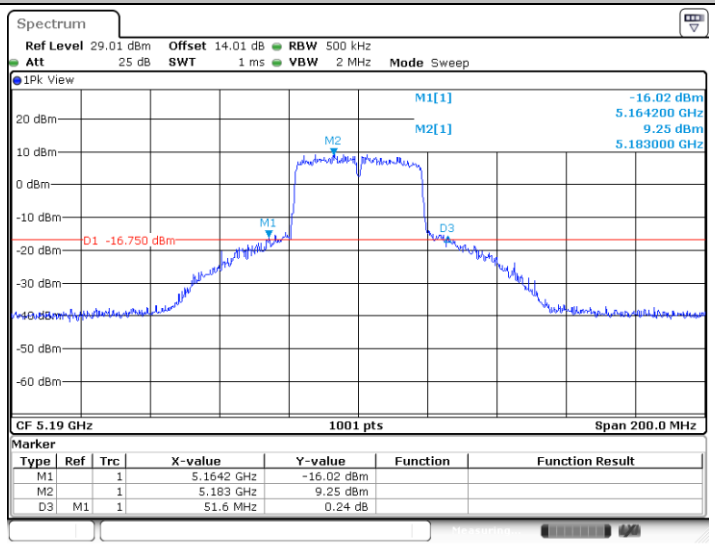
11AC20MIMO_Ant0_5785


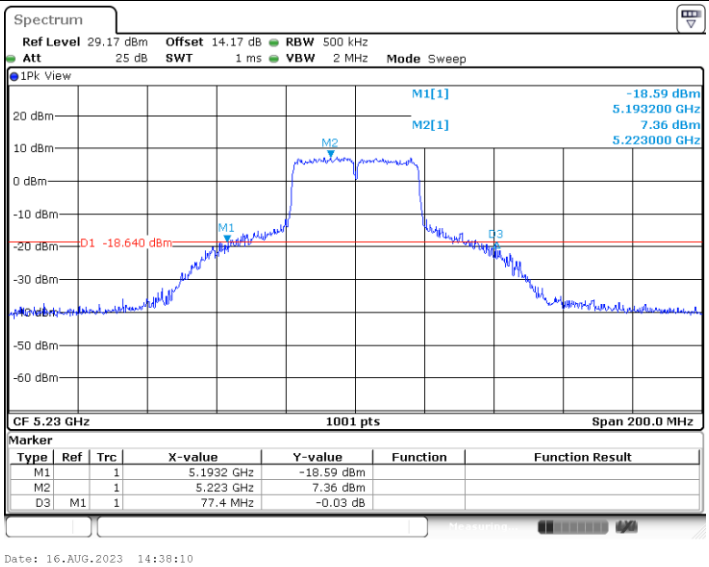
11AC20MIMO_Ant1_5785


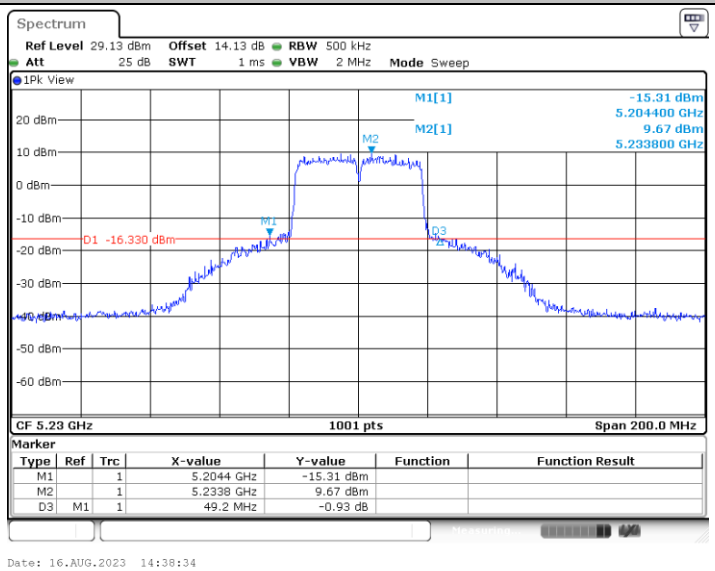
11AC20MIMO_Ant0_5825


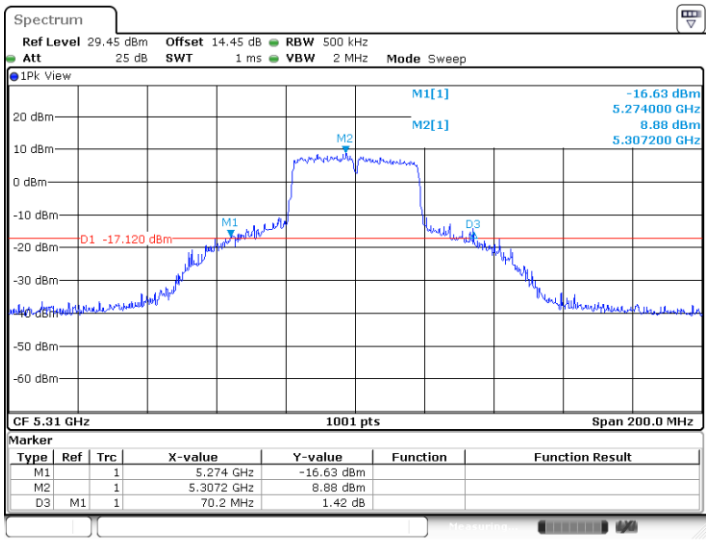
11AC20MIMO_Ant1_5825


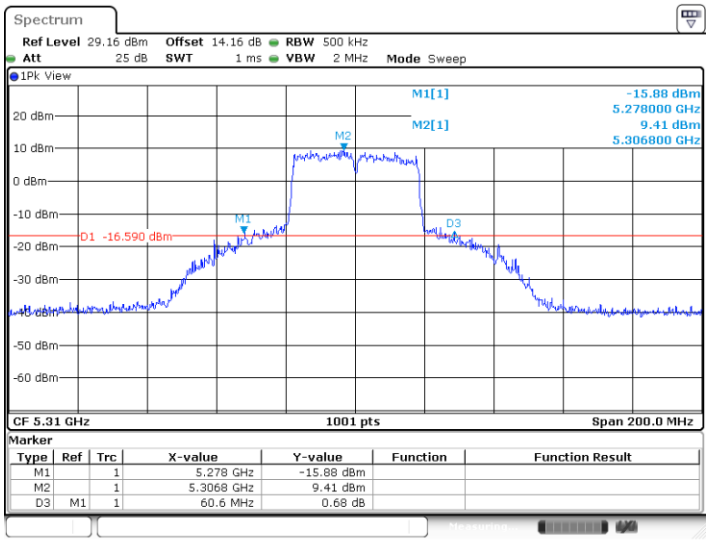
11AC40MIMO_Ant0_5190


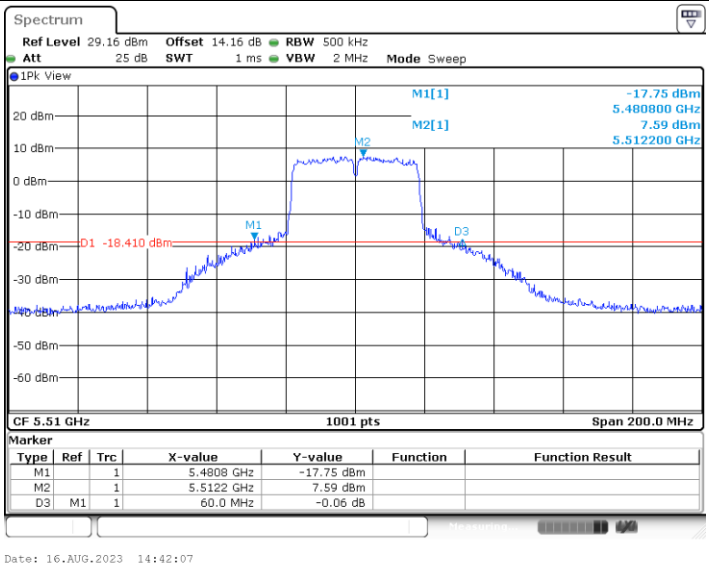
11AC40MIMO_Ant1_5190


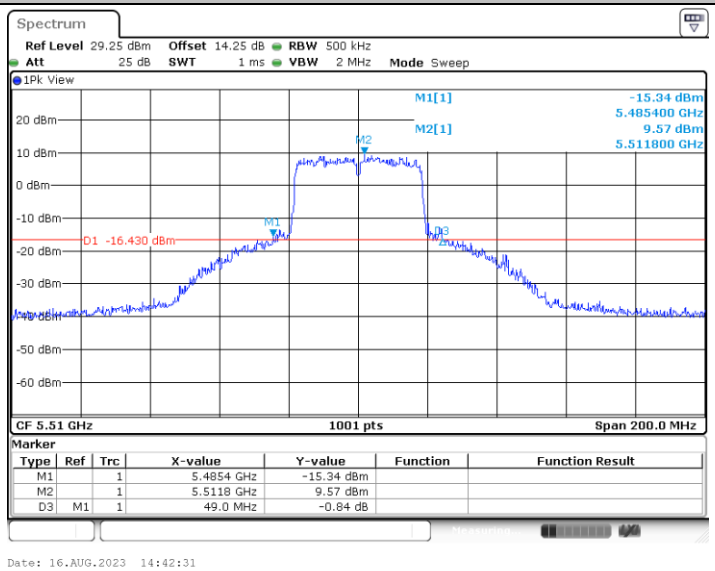
11AC40MIMO_Ant0_5230


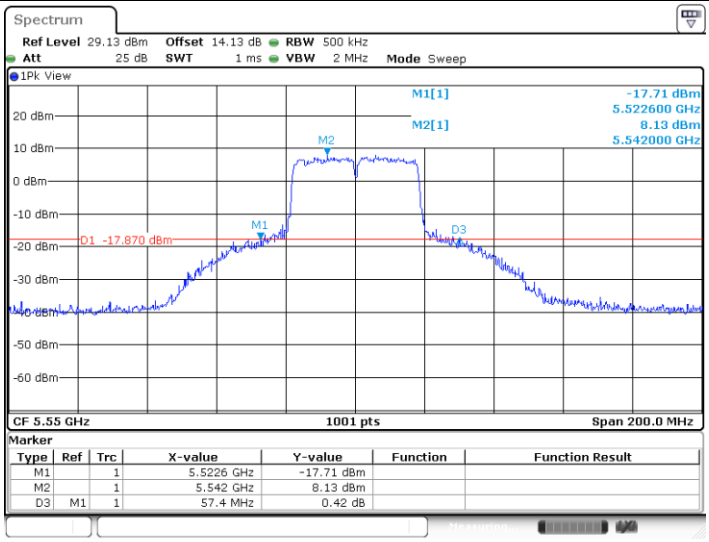
11AC40MIMO_Ant1_5230


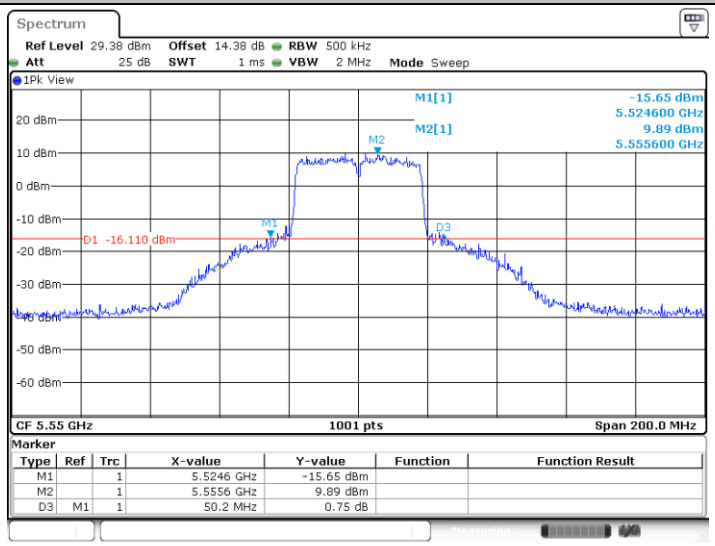
11AC40MIMO_Ant0_5310


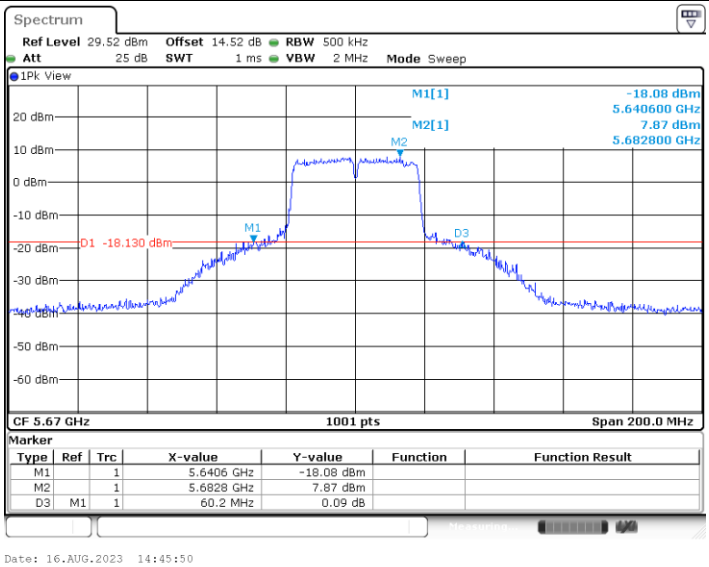
11AC40MIMO_Ant1_5310


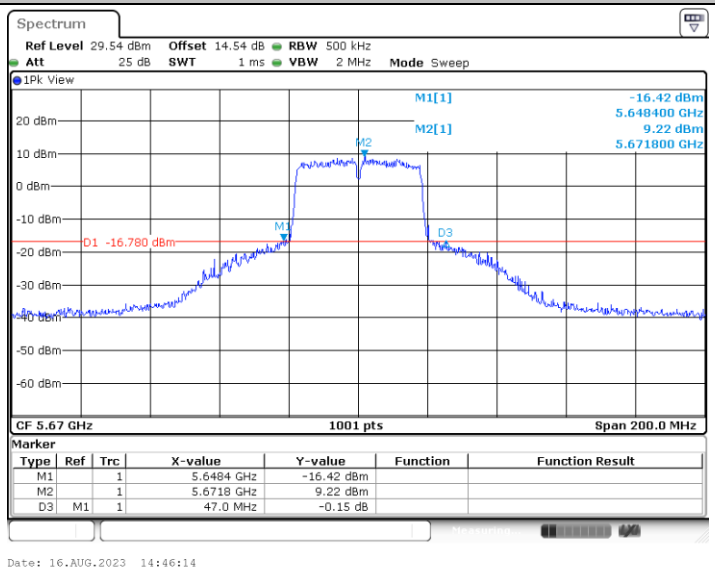
11AC40MIMO_Ant0_5510


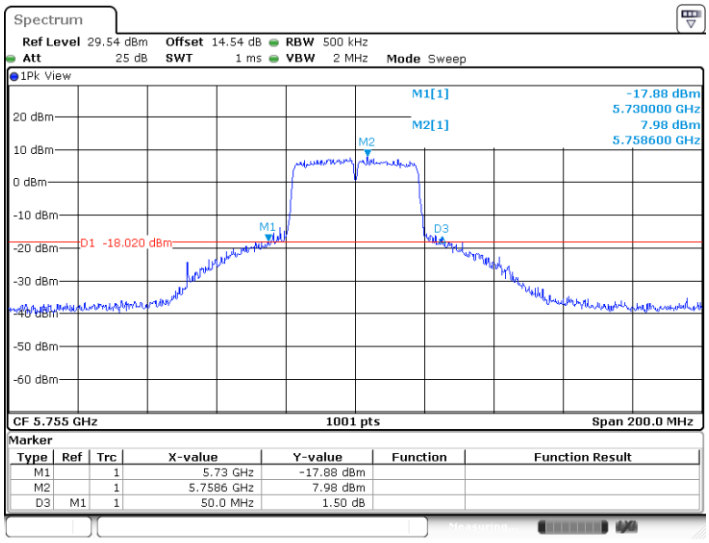
11AC40MIMO_Ant1_5510


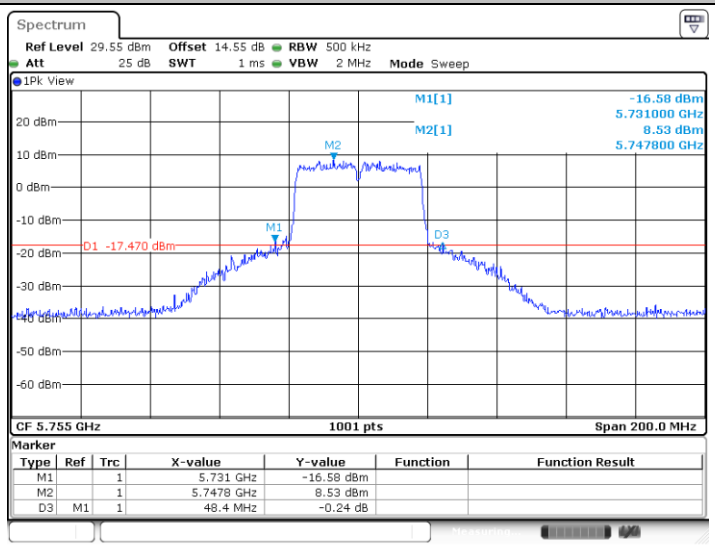
11AC40MIMO_Ant0_5550


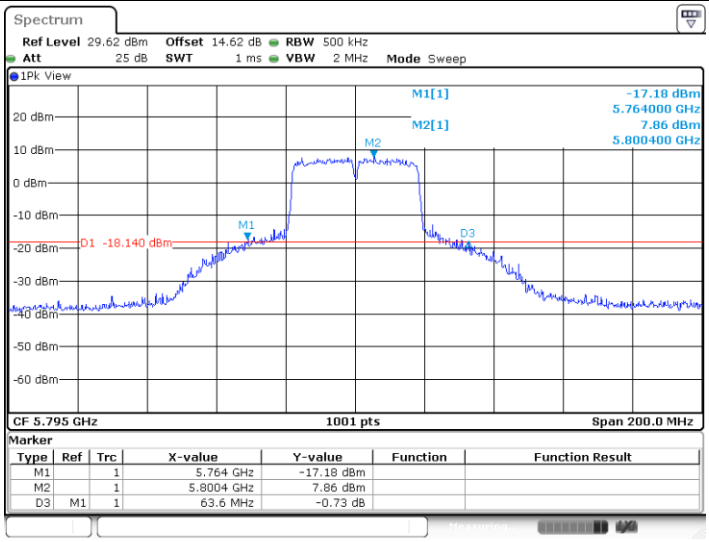
11AC40MIMO_Ant1_5550


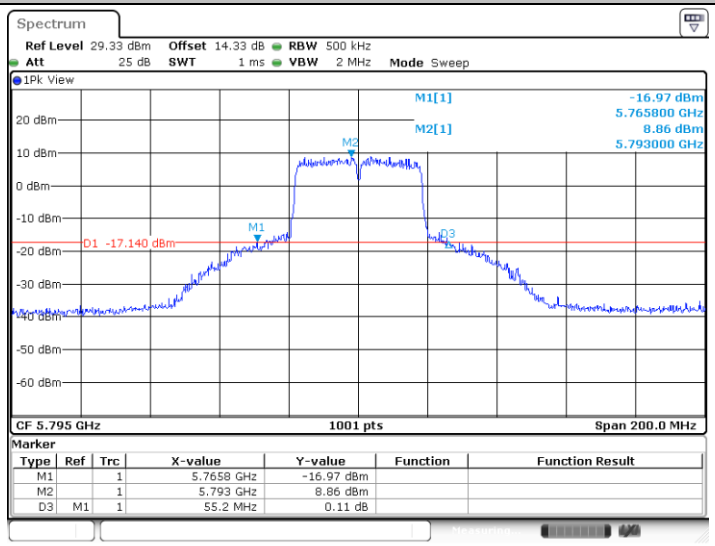
11AC40MIMO_Ant0_5670


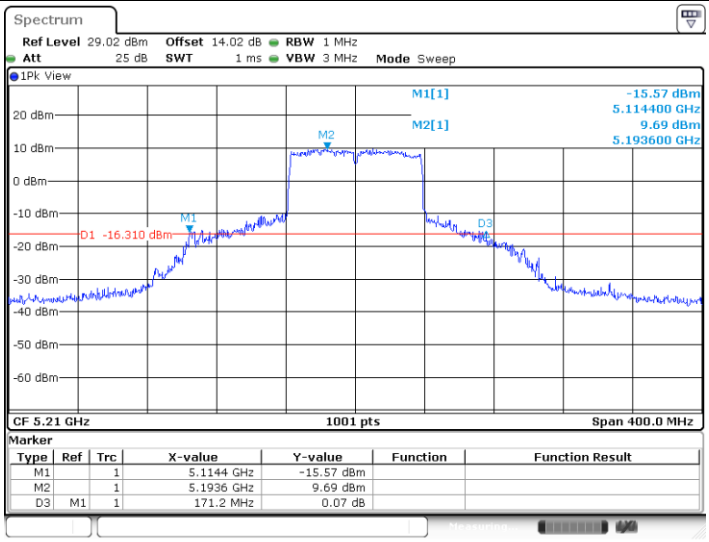
11AC40MIMO_Ant1_5670


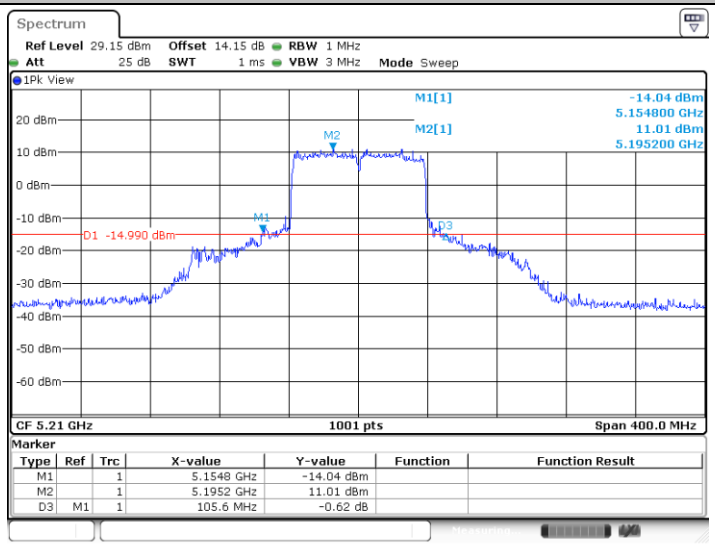
11AC40MIMO_Ant0_5755


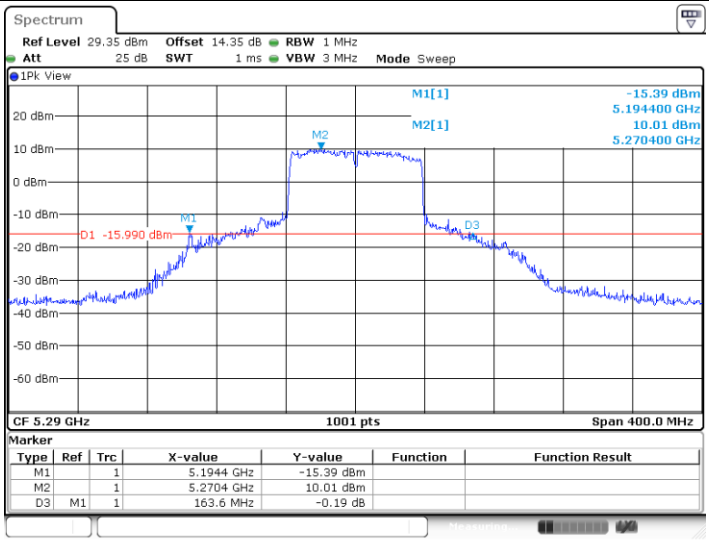
11AC40MIMO_Ant1_5755


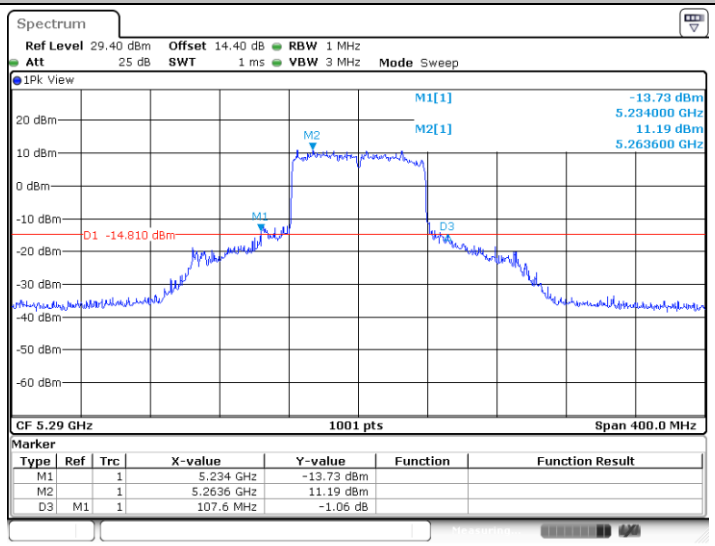
11AC40MIMO_Ant0_5795


11AC40MIMO_Ant1_5795


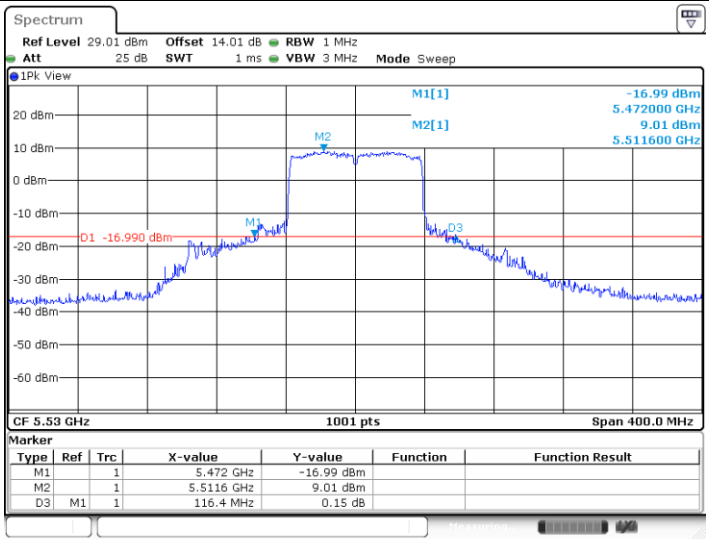
11AC80MIMO_Ant0_5210


11AC80MIMO_Ant1_5210


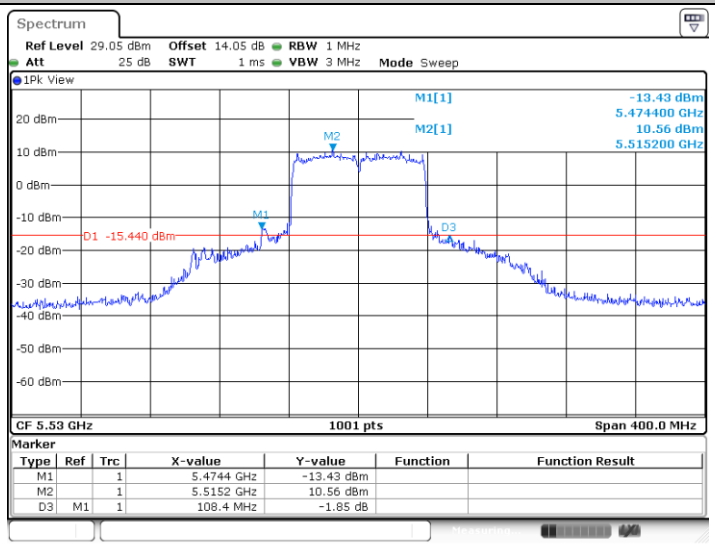
11AC80MIMO_Ant0_5290


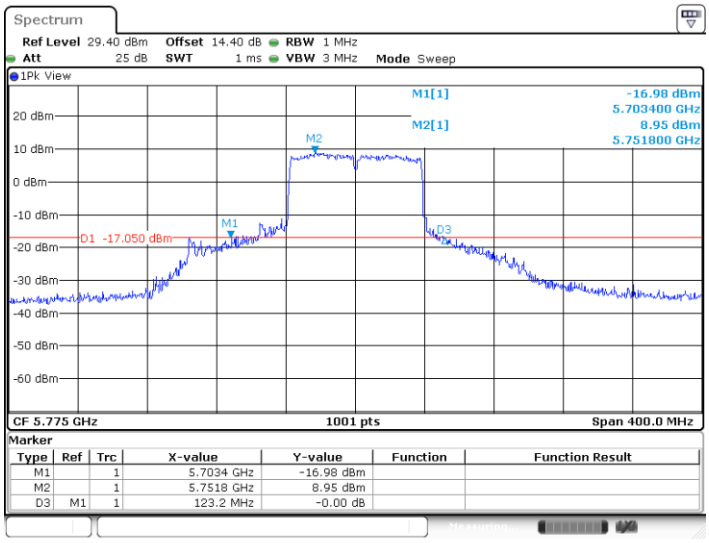
11AC80MIMO_Ant1_5290


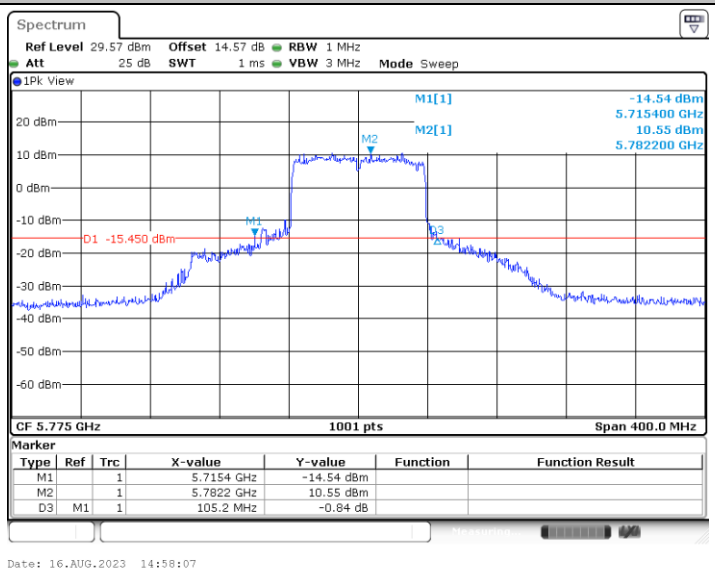
11AC80MIMO_Ant0_5530



11AC80MIMO_Ant1_5530



11AC80MIMO_Ant0_5775


11AC80MIMO_Ant1_5775


Occupied channel bandwidth

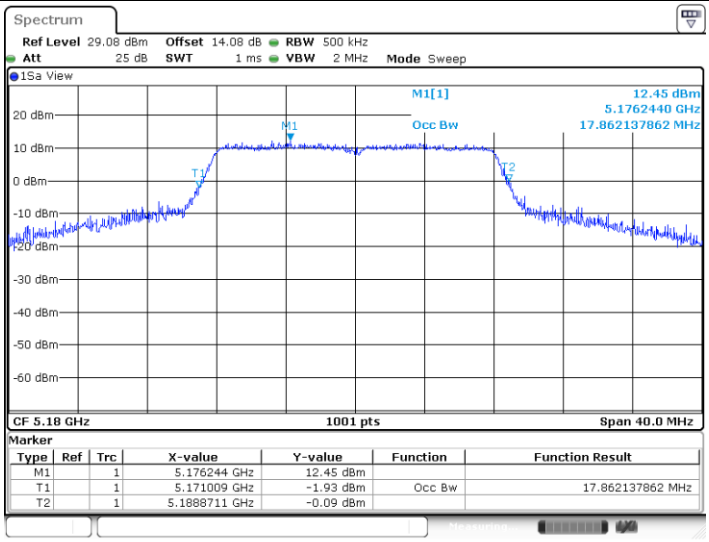
Test Result

TestMode	Antenna	Freq(MHz)	OCB [MHz]	FL[MHz]	FH[MHz]
11A	Ant0	5180	17.862	5171.0090	5188.8711
	Ant0	5220	18.022	5210.8891	5228.9111
	Ant0	5240	18.262	5230.8492	5249.1109
	Ant0	5260	17.942	5250.9690	5268.9111
	Ant0	5300	17.862	5290.9690	5308.8312
	Ant0	5320	17.982	5310.8891	5328.8711
	Ant0	5500	17.582	5491.2088	5508.7912
	Ant0	5580	17.582	5571.2488	5588.8312
	Ant0	5700	17.702	5691.1289	5708.8312
	Ant0	5745	17.542	5736.2088	5753.7512
	Ant0	5785	17.582	5776.1289	5793.7113
	Ant0	5825	17.582	5816.1688	5833.7512
11AC20MIMO	Ant0	5180	18.541	5170.6893	5189.2308
	Ant1	5180	18.142	5170.8891	5189.0310
	Ant0	5220	18.621	5210.6094	5229.2308
	Ant1	5220	18.062	5210.9291	5228.9910
	Ant0	5240	18.741	5230.6094	5249.3506
	Ant1	5240	18.182	5230.9291	5249.1109
	Ant0	5260	18.781	5250.5694	5269.3506
	Ant1	5260	18.102	5250.9291	5269.0310
	Ant0	5300	19.021	5290.3297	5309.3506
	Ant1	5300	18.182	5290.8492	5309.0310
	Ant0	5320	19.301	5310.0899	5329.3906
	Ant1	5320	18.302	5310.7692	5329.0709
	Ant0	5500	18.342	5490.8092	5509.1508
	Ant1	5500	18.262	5490.8492	5509.1109
	Ant0	5580	18.302	5570.8492	5589.1508
	Ant1	5580	18.222	5570.8891	5589.1109
	Ant0	5700	18.462	5690.7293	5709.1908
	Ant1	5700	18.182	5690.8891	5709.0709
	Ant0	5745	18.302	5735.8092	5754.1109
	Ant1	5745	18.182	5735.8492	5754.0310
	Ant0	5785	18.462	5775.7293	5794.1908
	Ant1	5785	18.142	5775.8891	5794.0310
	Ant0	5825	18.501	5815.7293	5834.2308
	Ant1	5825	18.182	5815.8891	5834.0709
11AC40MIMO	Ant0	5190	36.843	5171.5385	5208.3816
	Ant1	5190	36.763	5171.6184	5208.3816
	Ant0	5230	36.923	5211.4585	5248.3816
	Ant1	5230	36.603	5211.6983	5248.3017
	Ant0	5270	37.003	5251.4585	5288.4615

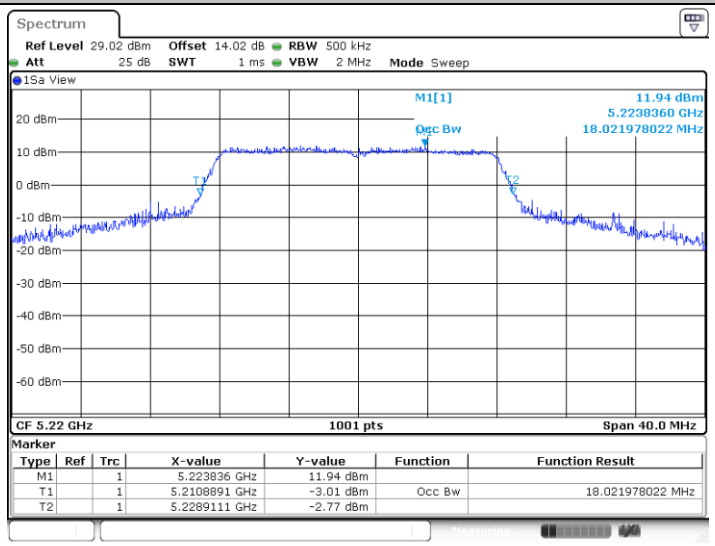
	Ant1	5270	36.683	5251.6184	5288.3017
	Ant0	5310	37.003	5291.2987	5328.3017
	Ant1	5310	36.763	5291.5385	5328.3017
	Ant0	5510	36.603	5491.6983	5528.3017
	Ant1	5510	36.763	5491.5385	5528.3017
	Ant0	5550	36.603	5531.6983	5568.3017
	Ant1	5550	36.603	5531.6983	5568.3017
	Ant0	5670	36.683	5651.6184	5688.3017
	Ant1	5670	36.603	5651.6983	5688.3017
	Ant0	5755	36.603	5736.6184	5773.2218
	Ant1	5755	36.523	5736.6983	5773.2218
	Ant0	5795	36.683	5776.6184	5813.3017
	Ant1	5795	36.763	5776.5385	5813.3017
11AC80MIMO	Ant0	5210	77.203	5171.1588	5248.3616
	Ant1	5210	76.563	5171.6384	5248.2018
	Ant0	5290	76.883	5251.3187	5328.2018
	Ant1	5290	76.404	5251.6384	5328.0420
	Ant0	5530	76.563	5491.6384	5568.2018
	Ant1	5530	76.244	5491.7982	5568.0420
	Ant0	5775	76.563	5736.6384	5813.2018
	Ant1	5775	76.404	5736.6384	5813.0420

Test Graphs

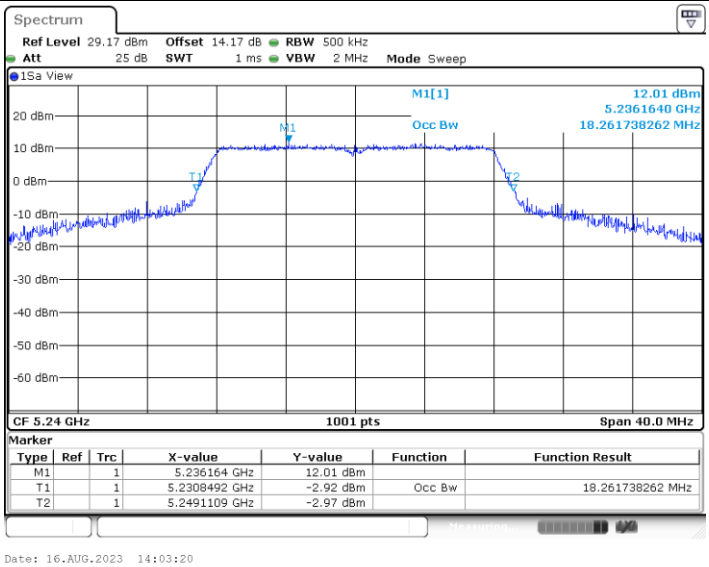
11A_Ant0_5180



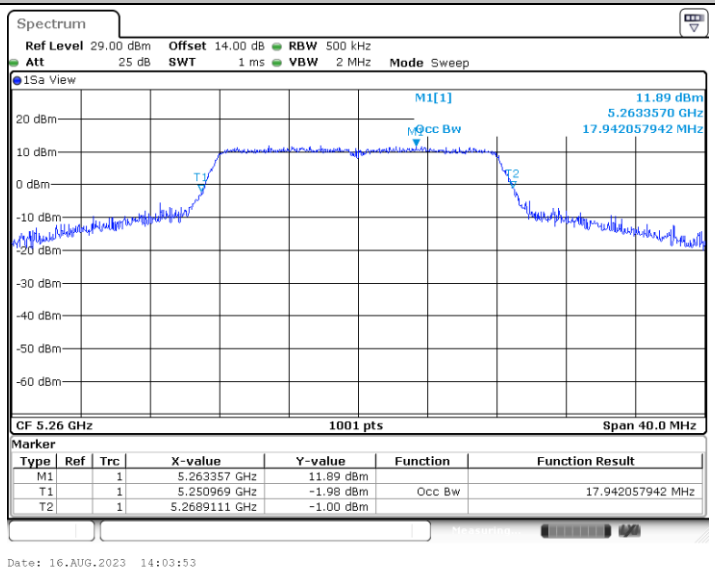
11A_Ant0_5220



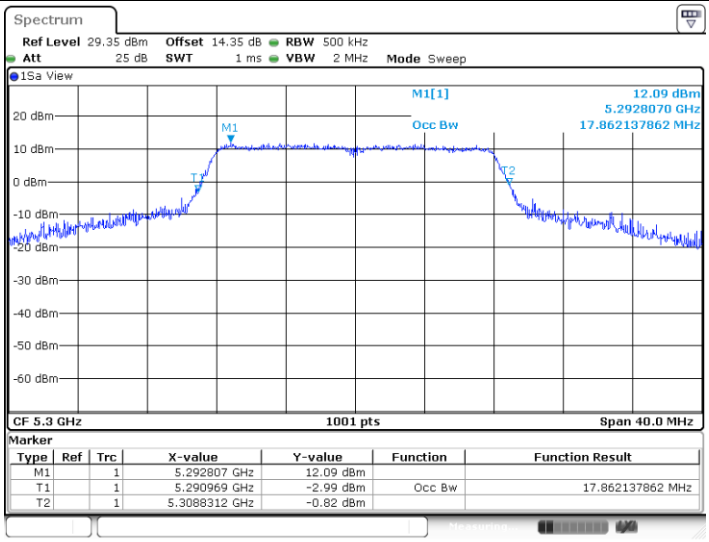
11A_Ant0_5240



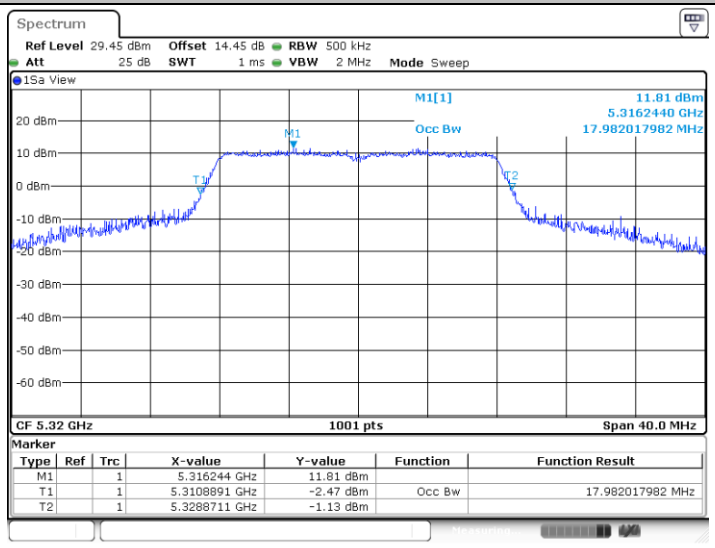
11A_Ant0_5260



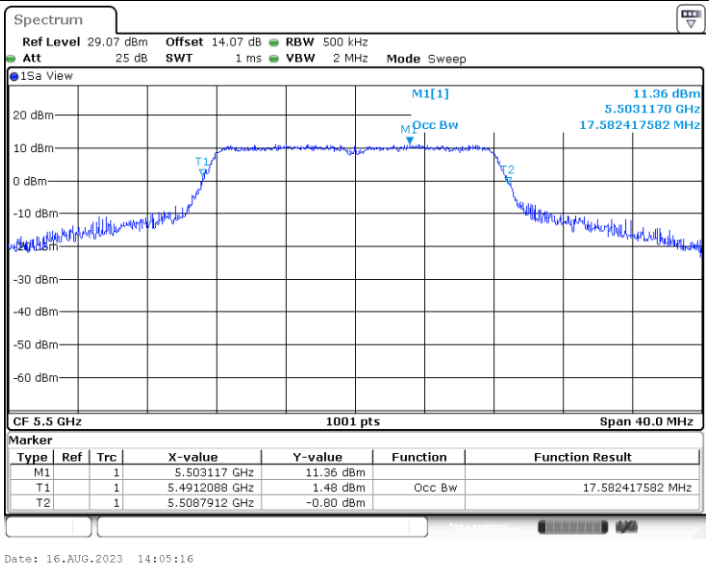
11A_Ant0_5300



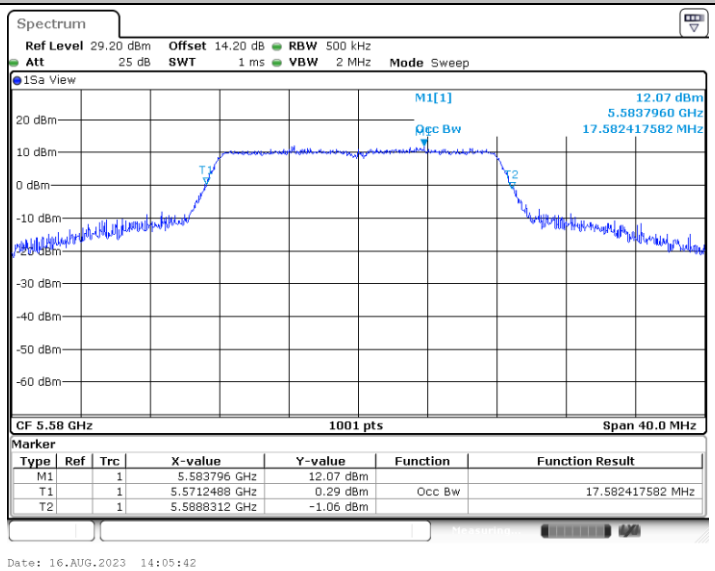
11A_Ant0_5320

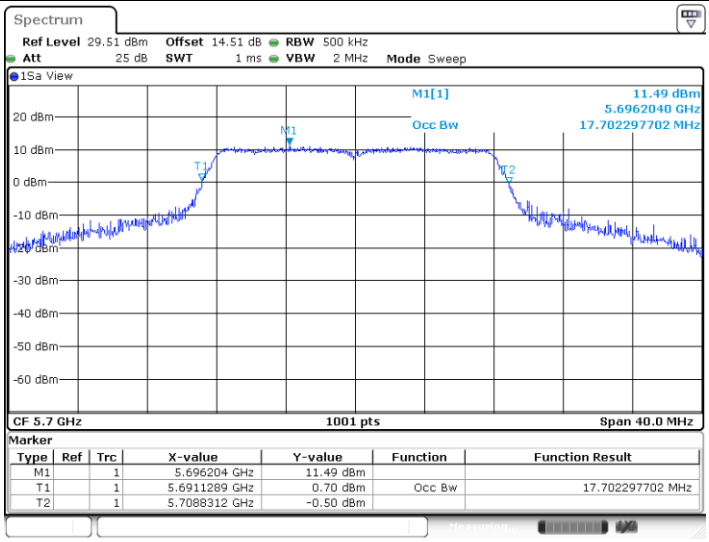


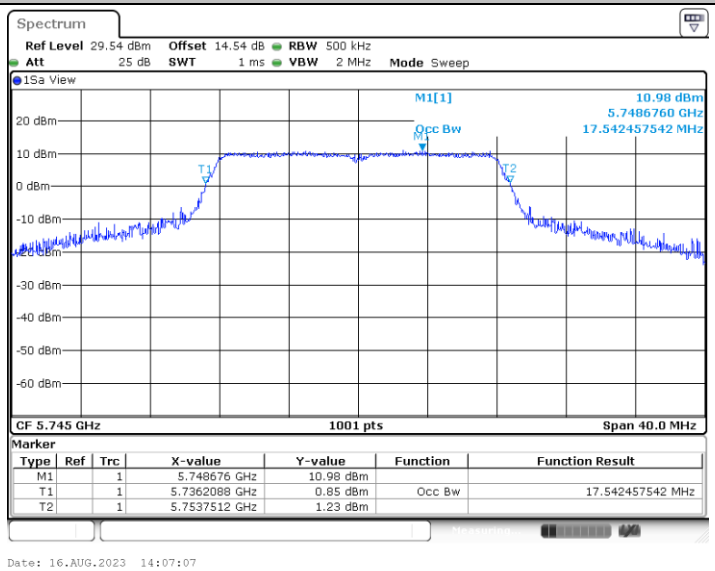
11A_Ant0_5500

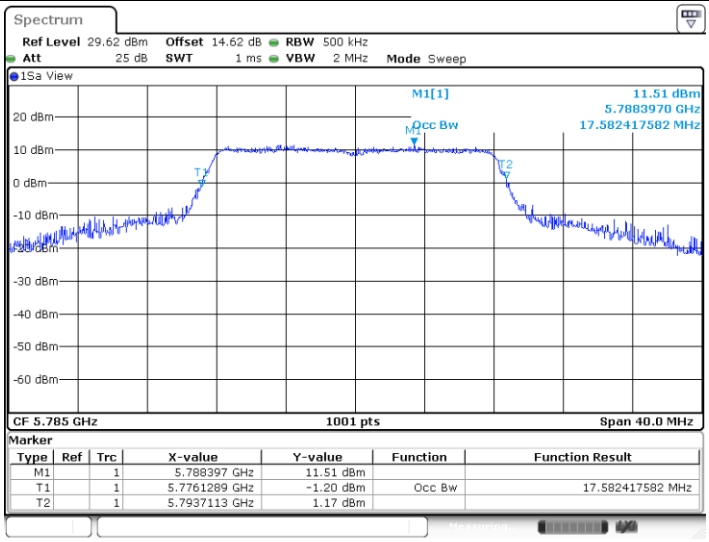


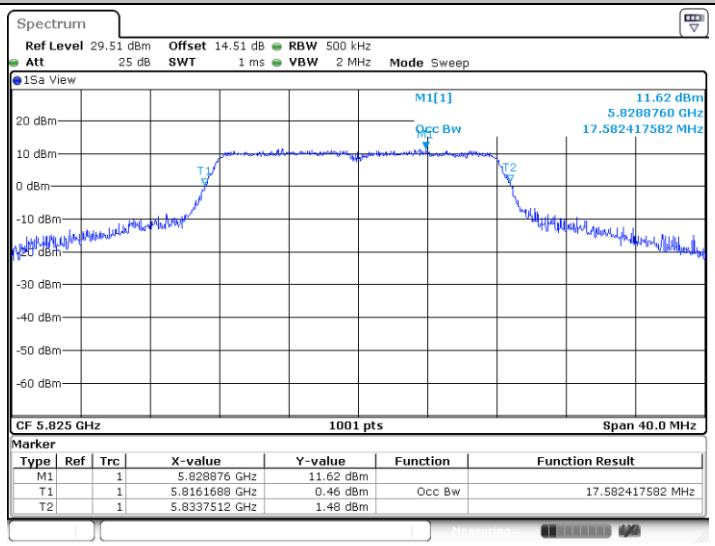
11A_Ant0_5580

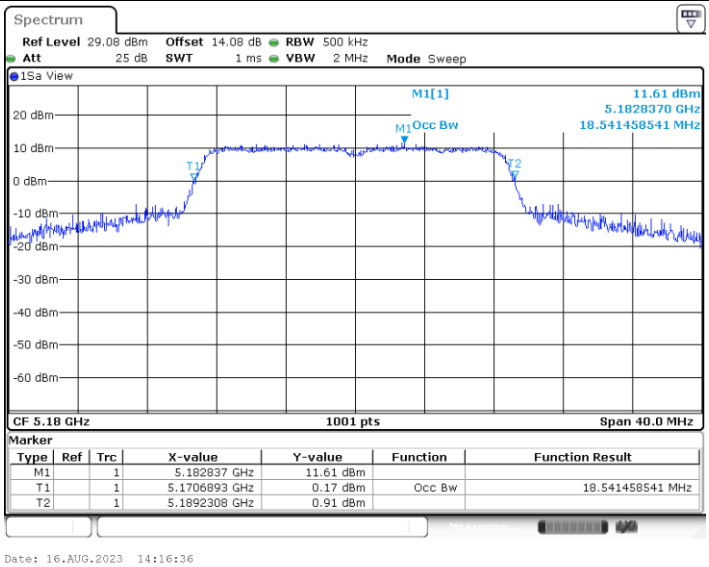


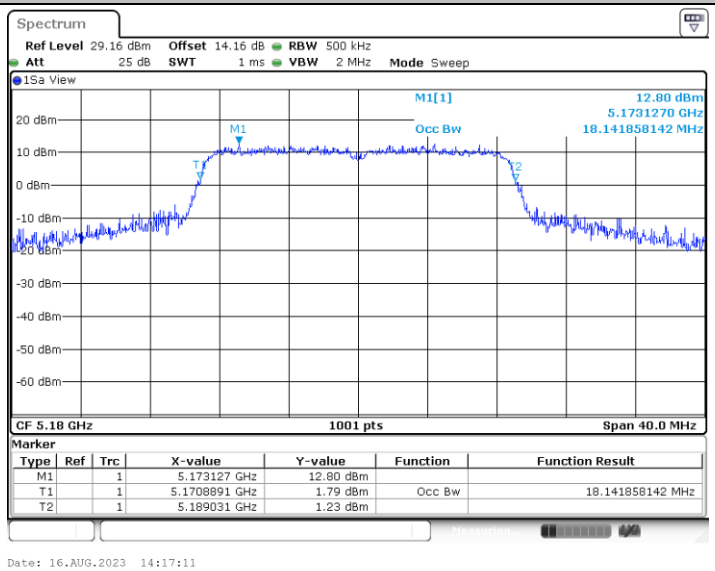
11A_Ant0_5700


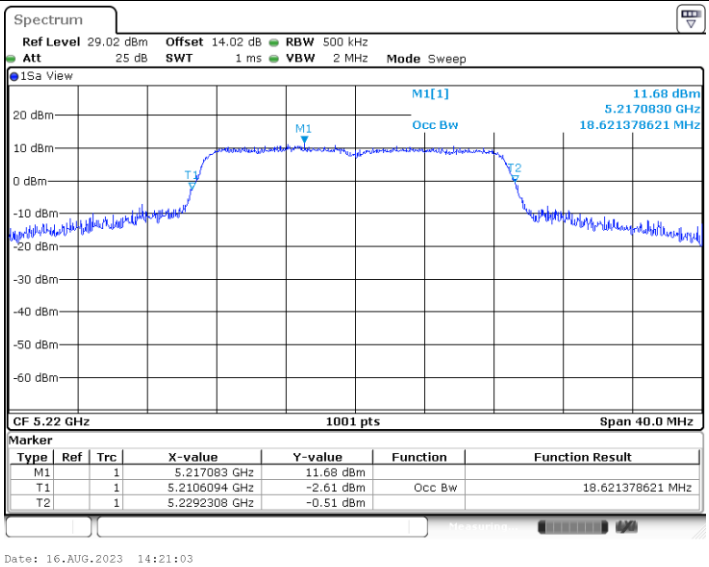
11A_Ant0_5745


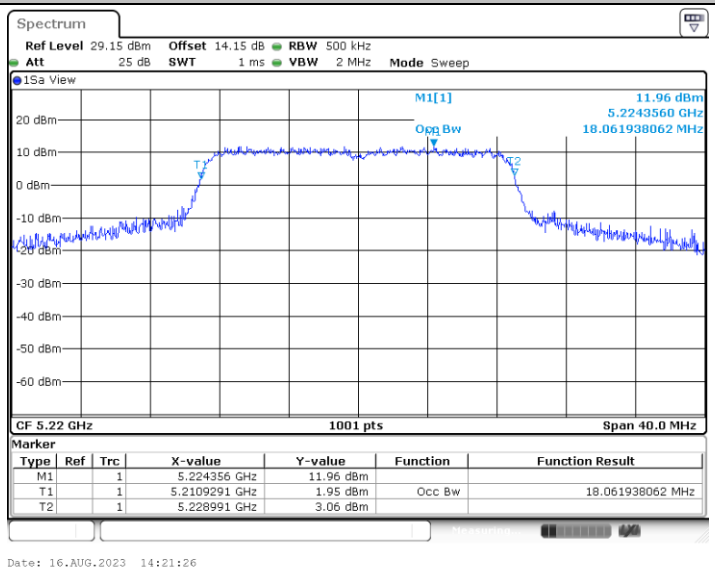
11A_Ant0_5785


11A_Ant0_5825


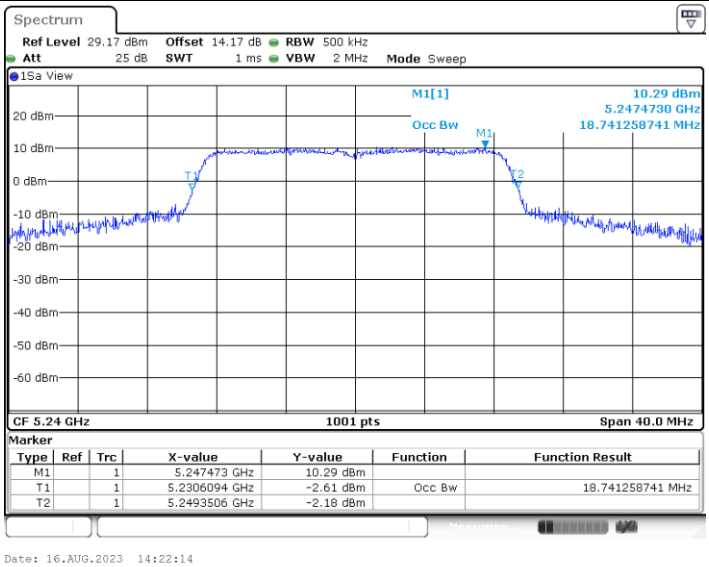
11AC20MIMO_Ant0_5180


11AC20MIMO_Ant1_5180


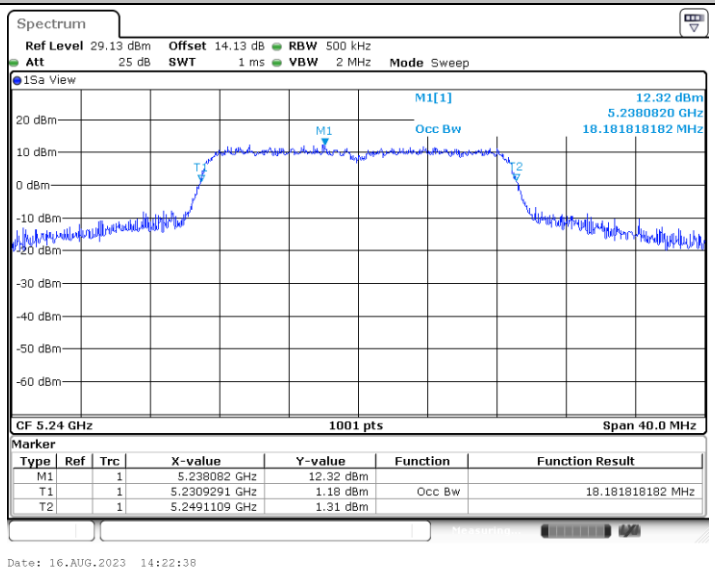
11AC20MIMO_Ant0_5220


11AC20MIMO_Ant1_5220


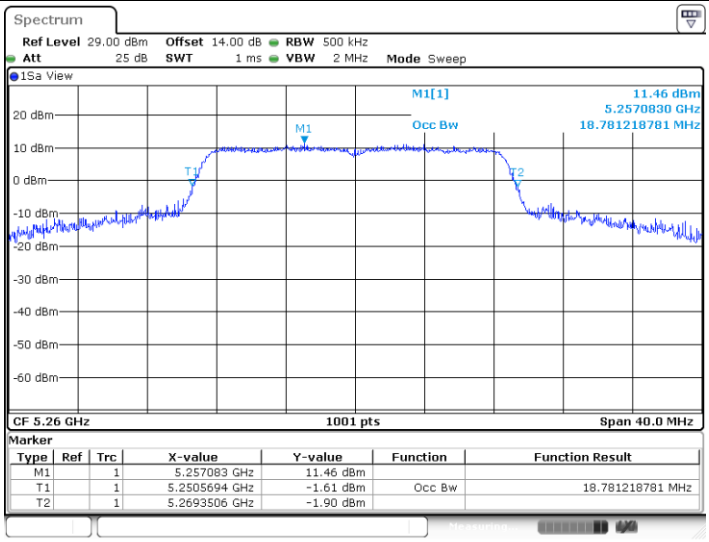
11AC20MIMO_Ant0_5240



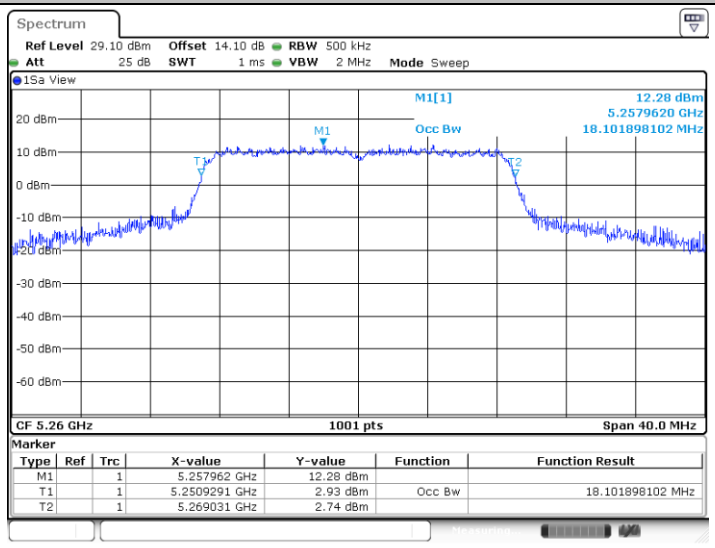
11AC20MIMO_Ant1_5240

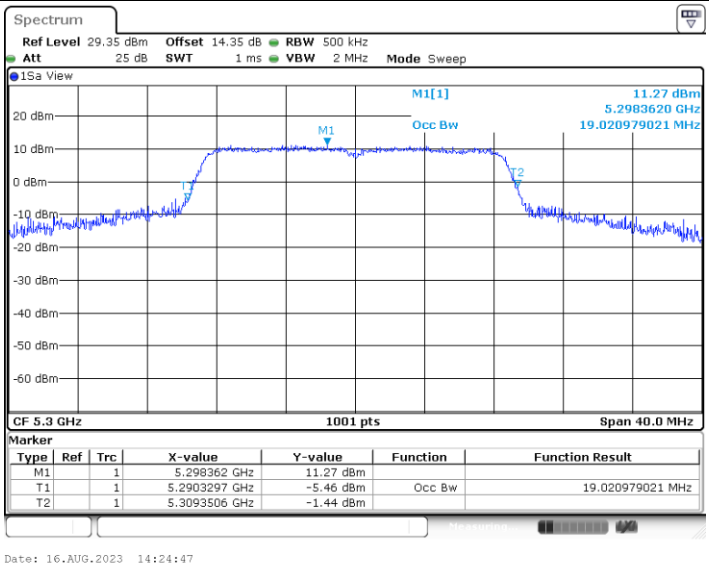


11AC20MIMO_Ant0_5260

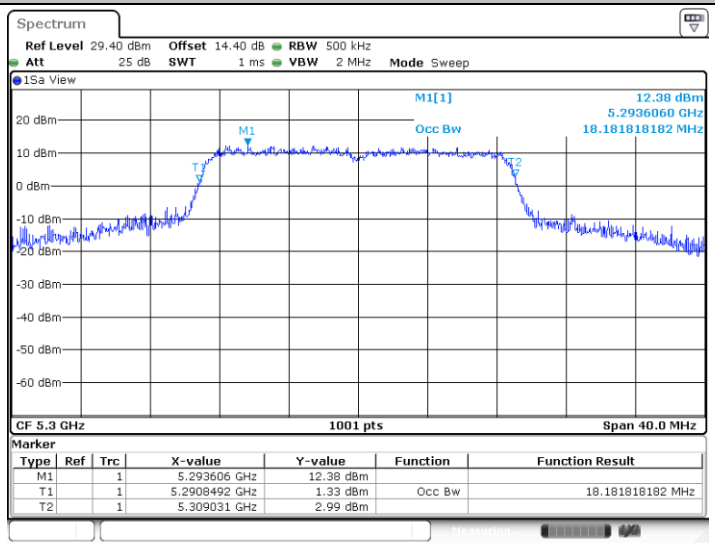


11AC20MIMO_Ant1_5260



11AC20MIMO_Ant0_5300


Date: 16.AUG.2023 14:24:47

11AC20MIMO_Ant1_5300


Date: 16.AUG.2023 14:25:10