FCC RF Test Report

APPLICANT	:	Xiaomi Communications Co., Ltd.
EQUIPMENT	:	Mobile Phone
BRAND NAME	:	Redmi
MODEL NAME	:	24090RA29G
FCC ID	:	2AFZZRA29G
STANDARD	:	FCC Part 15 Subpart E §15.407
CLASSIFICATION	:	(NII) Unlicensed National Information Infrastructure
TEST DATE(S)	:	Jul. 18, 2024 ~ Aug. 06, 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

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR471506E	Rev. 01	Initial issue of report	Aug. 19, 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 3.14 dB at 5141.44 MHz
3.5	15.207	AC Conducted Emission	15.207(a)	15.207(a)	Pass	Under limit 17.50 dB at 1.289 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

Xiaomi Communications Co., Ltd.
#019, 9th Floor, Building 6, 33 Xi'erqi Middle Road, Haidian District, Beijing, China, 100085

1.2 Manufacturer

Xiaomi Communications Co., Ltd.
#019, 9th Floor, Building 6, 33 Xi'erqi Middle Road, Haidian District, Beijing, China, 100085

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Mobile Phone
Brand Name	Redmi
Model Name	24090RA29G
FCC ID	2AFZZRA29G
IMEI Code	Conducted: 861793070040843/861793070040850 Conduction: 861793070038664/861793070038672 Radiation: 861793070038607
HW Version	135300O16
SW Version	Xiaomi HyperOS 1.0
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 ~ 5720 MHz 5745 MHz ~ 5825 MHz
Maximum Output Power to Antenna	**<5180 MHz ~ 5240 MHz>** 802.11a : 16.98 dBm / 0.0499 W 802.11n HT20 : 16.02 dBm / 0.0400 W 802.11n HT40 : 15.06 dBm / 0.0321 W 802.11ac VHT20: 16.08 dBm / 0.0406 W 802.11ac VHT40: 15.80 dBm / 0.0380 W 802.11ac VHT80: 13.40 dBm / 0.0219 W 802.11ax HE20: 16.18 dBm / 0.0415 W 802.11ax HE40: 15.17 dBm / 0.0329 W 802.11ax HE80: 13.57 dBm / 0.0228 W **<5260 MHz ~ 5320 MHz>** 802.11a : 16.96 dBm / 0.0497 W 802.11n HT20 : 15.87 dBm / 0.0386 W 802.11n HT40 : 15.01 dBm / 0.0317 W 802.11ac VHT20: 15.90 dBm / 0.0389 W 802.11ac VHT40: 15.88 dBm / 0.0387 W 802.11ac VHT80: 12.70 dBm / 0.0186 W 802.11ax HE20: 16.00 dBm / 0.0398 W 802.11ax HE40: 15.12 dBm / 0.0325 W 802.11ax HE80: 12.84 dBm / 0.0192 W **<5500 MHz ~ 5720 MHz >** 802.11a : 17.28 dBm / 0.0535 W 802.11n HT20 : 16.23 dBm / 0.0420 W 802.11n HT40 : 15.30 dBm / 0.0339 W 802.11ac VHT20: 16.32 dBm / 0.0429 W 802.11ac VHT40: 16.14 dBm / 0.0411 W 802.11ac VHT80: 14.15 dBm / 0.0260 W 802.11ax HE20: 16.40 dBm / 0.0437 W 802.11ax HE40: 15.40 dBm / 0.0347 W 802.11ax HE80: 14.24 dBm / 0.0265 W **<5745 MHz ~ 5825 MHz>** 802.11a : 17.29 dBm / 0.0536 W 802.11n HT20 : 16.26 dBm / 0.0423 W 802.11n HT40 : 15.36 dBm / 0.0344 W 802.11ac VHT20: 16.33 dBm / 0.0430 W 802.11ac VHT40: 16.24 dBm / 0.0421 W 802.11ac VHT80: 14.21 dBm / 0.0264 W 802.11ax HE20: 16.41 dBm / 0.0438 W 802.11ax HE40: 15.47 dBm / 0.0352 W 802.11ax HE80: 14.33 dBm / 0.0271 W

99% Occupied Bandwidth	**<5180 MHz ~ 5240 MHz>** 802.11a : 17.257 MHz 802.11ac VHT40 : 36.610 MHz 802.11ax HE20: 19.162 MHz 802.11ax HE40: 37.905 MHz 802.11ax HE80: 77.410 MHz **<5260 MHz ~ 5320 MHz>** 802.11a : 17.295 MHz 802.11ac VHT40 : 36.648 MHz 802.11ax HE20: 19.181 MHz 802.11ax HE40: 37.981 MHz 802.11ax HE80: 77.562 MHz **<5500 MHz ~ 5720 MHz>** 802.11a : 17.410 MHz 802.11ac VHT40 : 36.914 MHz 802.11ax HE20: 19.200 MHz 802.11ax HE40: 37.943 MHz 802.11ax HE80: 77.562 MHz **<5745 MHz ~ 5825 MHz>** 802.11a : 17.333 MHz 802.11ac VHT40 : 36.914 MHz 802.11ax HE20: 19.181 MHz 802.11ax HE40: 37.981 MHz 802.11ax HE80: 77.333 MHz
Antenna Type / Gain	**<5180 MHz ~ 5240 MHz>**: PIFA Antenna with gain -1.60 dBi **<5260 MHz ~ 5320 MHz>**: PIFA Antenna with gain -2.70 dBi **<5500 MHz ~ 5720 MHz>**: PIFA Antenna with gain -2.60 dBi **<5745 MHz ~ 5825 MHz>**: PIFA Antenna with gain -2.70 dBi
Type of Modulation	802.11a/n : OFDM (BPSK / QPSK / 16QAM / 64QAM) 802.11ac/ax : OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM / 1024QAM)

Note:

1. For 802.11n/11ac/11ax mode, the whole testing have assessed only 802.11ac VHT40 & 11ax HE20/HE40/HE80 by referring to the higher output power.
2. 802.11ax support full RU tone and partial RU tone, both full RU and partial RU-left (for low CH) and partial RU-right (for high CH) are tested for conducted power/PSD/RSE, the full RU power > partial RU, therefore the full RU perform full test and Partial RU verified power/PSD/RSE.
3. The device does not support 802.11ax channel puncturing 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.**
	CO01-KS 03CH03-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.	03CH03-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.
- 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)
5500-5720MHz 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

Frequency Band	Channel	Freq.(MHz)	Channel	Freq. (MHz)
TDWR Channel	118*	5590	124	5620
	120	5600	126*	5630
	122#	5610	128	5640

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.
3. The above Frequency and Channel in "##" are 160MHz 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
802.11ac VHT40	MCS0
802.11ax HE20	MCS0
802.11ax HE40	MCS0
802.11ax HE80	MCS0

AC Conducted Emission	Mode 1 : WLAN 5G Link + Bluetooth Link + USB Cable 3 + AC Adapter 3
Remark: For Radiated Test Cases, The tests were performance with Adapter	

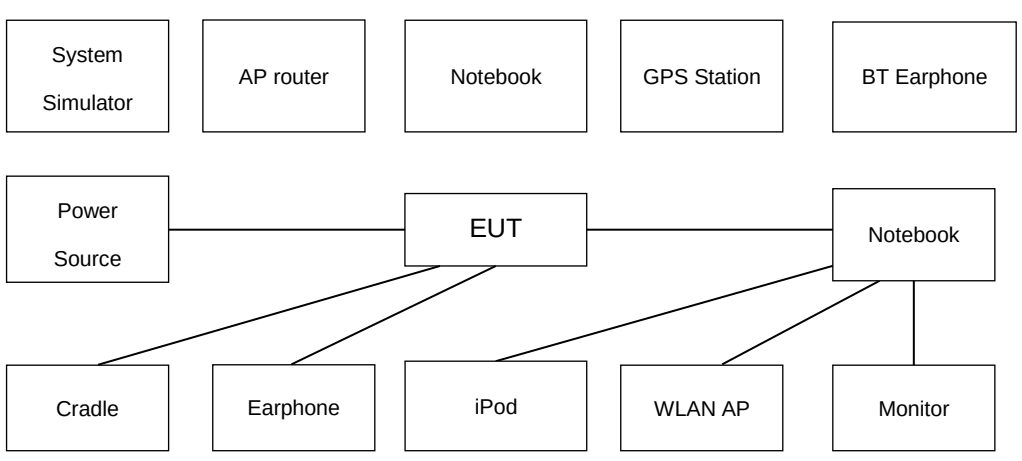
Simultaneous transmission
_802.11ax HE80_CH42_Full RU_TX + Bluetooth-LE_CH38_TX + LTE B48 Link

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
Straddle		-	-	144	-

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
Straddle		-	-	142	-

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	-	-	122	-
Straddle		-	-	138	-

2.3 Connection Diagram of Test System



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.	LTE Base Station	Anritus	MT8821C	N/A	N/A	Unshielded,1.8m
2.	WLAN AP	D-link	DIR-655	KA21R655B1	N/A	Unshielded,1.8m
3.	Notebook	Lenovo	G480	QDS-BRCM1050I	N/A	shielded cable DC O/P 1.8m , Unshielded AC I/P cable 1.8m

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 1.80 dB

Offset(dB) = RF cable loss(dB)

= 1.80 (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

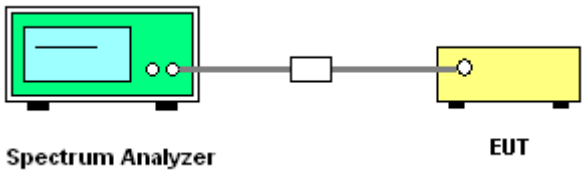
The measuring equipment is listed in the section 4 of this test report.

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.

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.

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

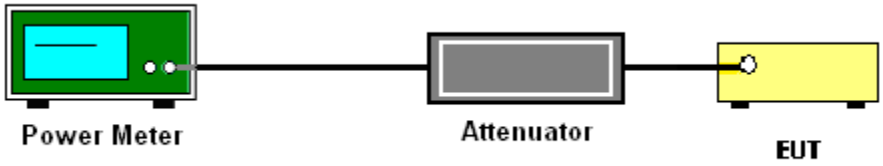
The testing follows Method PM of FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.

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.

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

Please refer to Appendix A.

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.

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.

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 #

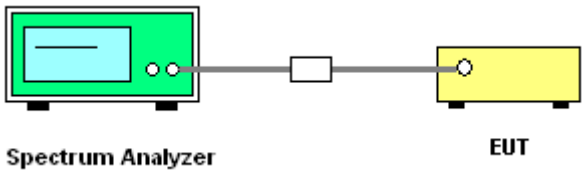
(trace averaging across on and off times of the EUT transmissions, followed by duty cycle correction).

- 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.

The RF output of EUT was connected to the spectrum analyzer by a low loss cable.

Each plot has already offset with cable loss, and attenuator loss. Measure the PSD and record it.

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

(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

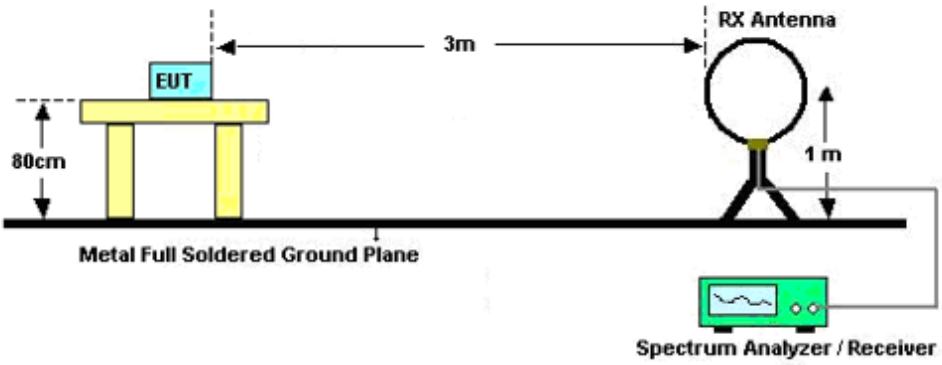
   - RBW = 1 MHz
   - VBW ≥ 3 MHz
   - Detector = Peak
   - Sweep time = auto
   - Trace mode = max hold

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

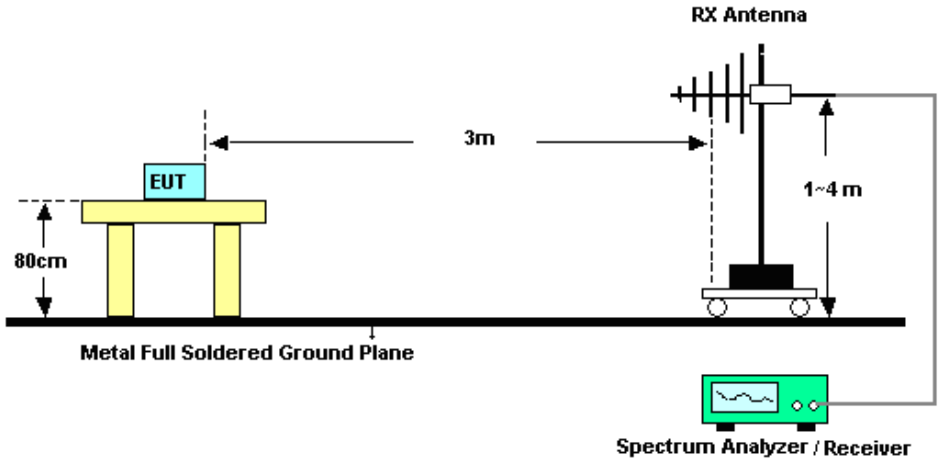
   - RBW = 1 MHz
   - VBW = 10 Hz, when duty cycle is no less than 98 percent.
   - VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on.
2. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter 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

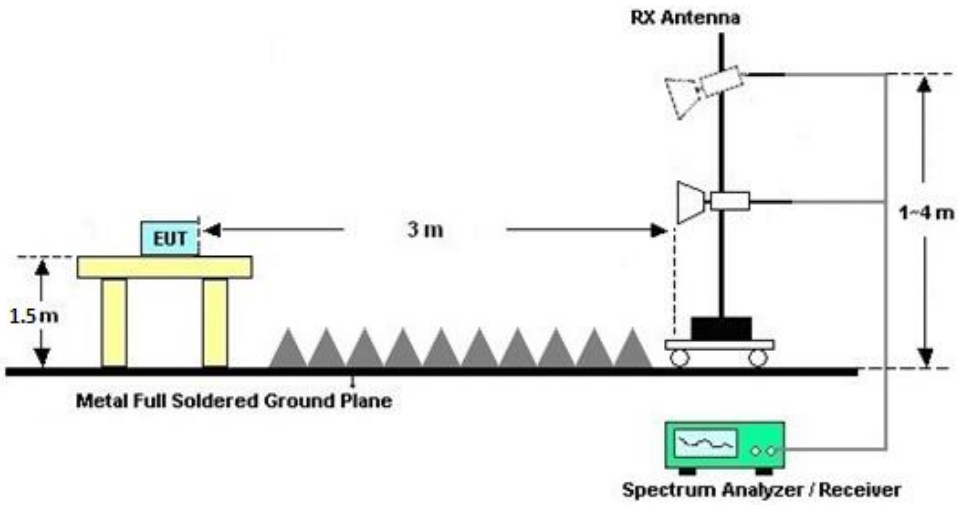
For radiated emissions below 30MHz



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.

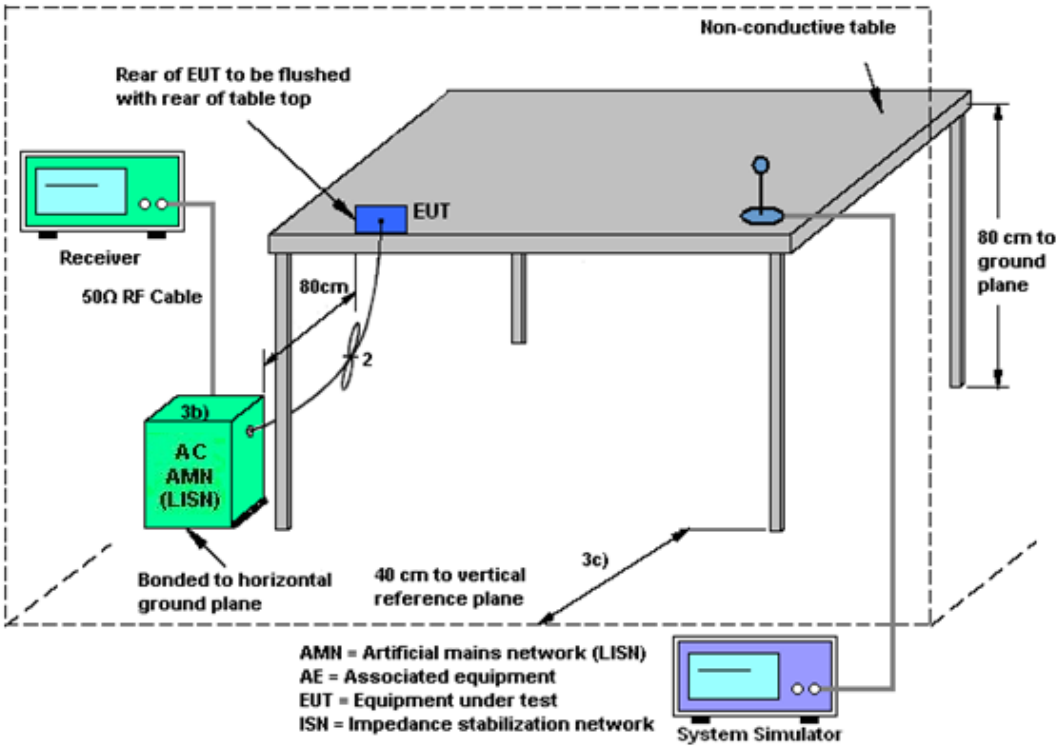
3.5.2 Measuring Instruments

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



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

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.

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. 11, 2023	Jul. 18, 2024 ~Aug. 05, 2024	Oct. 10, 2024	Conducted (TH01-KS)
Power Meter	Anritsu	ML2495A	1005002	50MHz Bandwidth	Jan. 02, 2024	Jul. 18, 2024 ~Aug. 05, 2024	Jan. 01, 2025	Conducted (TH01-KS)
Pulse Power Senor	Anritsu	MA2411B	0917070	300MHz~40GHz	Jan. 02, 2024	Jul. 18, 2024 ~Aug. 05, 2024	Jan. 01, 2025	Conducted (TH01-KS)
EMI Test Receiver	Keysight	N9038A	MY56400004	3Hz~8.5GHz;Max 30dBm	Oct. 11, 2023	Jul. 18, 2024 ~Aug. 06, 2024	Oct. 10, 2024	Radiation (03CH03-KS)
EXA Spectrum Analyzer	Keysight	N9010A	MY55370528	10Hz-44GHz	Oct. 11, 2023	Jul. 18, 2024 ~Aug. 06, 2024	Oct. 10, 2024	Radiation (03CH03-KS)
Loop Antenna	R&S	HFH2-Z2E	101125	9kHz~30MHz	Sep. 11, 2023	Jul. 18, 2024 ~Aug. 06, 2024	Sep. 10, 2024	Radiation (03CH03-KS)
Bilog Antenna	TeseQ	CBL6112D	23182	30MHz-1GHz	Dec. 06, 2023	Jul. 18, 2024 ~Aug. 06, 2024	Dec. 05, 2024	Radiation (03CH03-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	75957	1GHz~18GHz	Oct. 23, 2023	Jul. 18, 2024 ~Aug. 06, 2024	Oct. 22, 2024	Radiation (03CH03-KS)
SHF-EHF Horn	com-power	AH-840	101115	18GHz~40GHz	Oct. 15, 2023	Jul. 18, 2024 ~Aug. 06, 2024	Oct. 14, 2024	Radiation (03CH03-KS)
Amplifier	SONOMA	310N	413740	30MHz ~1000MHz	Jan. 03, 2024	Jul. 18, 2024 ~Aug. 06, 2024	Jan. 02, 2025	Radiation (03CH03-KS)
Amplifier	EM	EM18G40GA	060851	18~40GHz	Jan. 03, 2024	Jul. 18, 2024 ~Aug. 06, 2024	Jan. 02, 2025	Radiation (03CH03-KS)
high gain Amplifier	MITEQ	AMF-7D-0010 1800-30-10P	2082394	1Ghz-18Ghz	Jan. 03, 2024	Jul. 18, 2024 ~Aug. 06, 2024	Jan. 02, 2025	Radiation (03CH03-KS)
Amplifier	Keysight	83017A	MY53270319	1GHz~26.5GHz	Oct. 11, 2023	Jul. 18, 2024 ~Aug. 06, 2024	Oct. 10, 2024	Radiation (03CH03-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Jul. 18, 2024 ~Aug. 06, 2024	NCR	Radiation (03CH03-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Jul. 18, 2024 ~Aug. 06, 2024	NCR	Radiation (03CH03-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Jul. 18, 2024 ~Aug. 06, 2024	NCR	Radiation (03CH03-KS)
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz;	Apr 18, 2024	Jul. 26, 2024 ~Jul. 28,, 2024	Apr 17, 2025	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060103	9kHz~30MHz	Oct. 11, 2023	Jul. 26, 2024 ~Jul. 28,, 2024	Oct. 10, 2024	Conduction (CO01-KS)
AC LISN	MessTec	AN3016	060105	9kHz~30MHz	Apr 18, 2024	Jul. 26, 2024 ~Jul. 28,, 2024	Apr 17, 2025	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP000000811	AC 0V~300V, 45Hz~1000Hz	Oct. 11, 2023	Jul. 26, 2024 ~Jul. 28,, 2024	Oct. 10, 2024	Conduction (CO01-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))	**2.84dB**

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

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

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**6.08dB**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**5.18dB**

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

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

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

Appendix A. Conducted Test Results

A1. Conducted Test Results

Test Engineer:	Jiang Jun	Temperature:	21~25	°C
Test Date:	2024.7.18~2024.8.5	Relative Humidity:	51~54	%

TEST RESULTS DATA
Average Power Table

FCC U-NII-1 single antenna									
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power with duty factor (dBm)	FCC Conducted Power Limit (dBm)	DG (dBi)	Pass/Fail
11a	6Mbps	1	36	5180	0.13	16.98	24.00	-1.60	Pass
11a	6Mbps	1	44	5220	0.13	16.91	24.00	-1.60	Pass
11a	6Mbps	1	48	5240	0.13	16.89	24.00	-1.60	Pass
HT20	MCS0	1	36	5180	0.14	16.02	24.00	-1.60	Pass
HT20	MCS0	1	44	5220	0.14	16.00	24.00	-1.60	Pass
HT20	MCS0	1	48	5240	0.14	15.79	24.00	-1.60	Pass
HT40	MCS0	1	38	5190	0.28	14.11	24.00	-1.60	Pass
HT40	MCS0	1	46	5230	0.28	15.06	24.00	-1.60	Pass
VHT20	MCS0	1	36	5180	0.14	16.08	24.00	-1.60	Pass
VHT20	MCS0	1	44	5220	0.14	16.06	24.00	-1.60	Pass
VHT20	MCS0	1	48	5240	0.14	15.85	24.00	-1.60	Pass
VHT40	MCS0	1	38	5190	0.28	14.34	24.00	-1.60	Pass
VHT40	MCS0	1	46	5230	0.28	15.80	24.00	-1.60	Pass
VHT80	MCS0	1	42	5210	0.55	13.40	24.00	-1.60	Pass

TEST RESULTS DATA
Average Power Table

FCC U-NII-2A single antenna										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power with duty factor (dBm)	FCC Conducted Power Limit (dBm)	DG (dBi)	EIRP Power Limit (dBm)	Pass /Fail
11a	6Mbps	1	52	5260	0.13	16.88	23.98	-2.70	30	Pass
11a	6Mbps	1	60	5300	0.13	16.96	23.98	-2.70	30	Pass
11a	6Mbps	1	64	5320	0.13	16.82	23.98	-2.70	30	Pass
HT20	MCS0	1	52	5260	0.14	15.72	23.98	-2.70	30	Pass
HT20	MCS0	1	60	5300	0.14	15.87	23.98	-2.70	30	Pass
HT20	MCS0	1	64	5320	0.14	15.84	23.98	-2.70	30	Pass
HT40	MCS0	1	54	5270	0.28	15.01	23.98	-2.70	30	Pass
HT40	MCS0	1	62	5310	0.28	14.52	23.98	-2.70	30	Pass
VHT20	MCS0	1	52	5260	0.14	15.79	23.98	-2.70	30	Pass
VHT20	MCS0	1	60	5300	0.14	15.90	23.98	-2.70	30	Pass
VHT20	MCS0	1	64	5320	0.14	15.87	23.98	-2.70	30	Pass
VHT40	MCS0	1	54	5270	0.28	15.88	23.98	-2.70	30	Pass
VHT40	MCS0	1	62	5310	0.28	14.44	23.98	-2.70	30	Pass
VHT80	MCS0	1	58	5290	0.55	12.70	23.98	-2.70	30	Pass

TEST RESULTS DATA
Average Power Table

FCC U-NII-2C single antenna										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power with duty factor (dBm)	FCC Conducted Power Limit (dBm)	DG (dBi)	EIRP Power Limit (dBm)	Pass /Fail
11a	6Mbps	1	100	5500	0.13	16.85	23.98	-2.60	30	Pass
11a	6Mbps	1	116	5580	0.13	17.06	23.98	-2.60	30	Pass
11a	6Mbps	1	132	5660	0.13	17.09	23.98	-2.60	30	Pass
11a	6Mbps	1	136	5680	0.13	17.28	23.98	-2.60	30	Pass
11a	6Mbps	1	140	5700	0.13	12.49	23.98	-2.60	30	Pass
HT20	MCS0	1	100	5500	0.14	15.89	23.98	-2.60	30	Pass
HT20	MCS0	1	116	5580	0.14	16.13	23.98	-2.60	30	Pass
HT20	MCS0	1	132	5660	0.14	16.01	23.98	-2.60	30	Pass
HT20	MCS0	1	136	5680	0.14	16.23	23.98	-2.60	30	Pass
HT20	MCS0	1	140	5700	0.14	11.50	23.98	-2.60	30	Pass
HT40	MCS0	1	102	5510	0.28	13.80	23.98	-2.60	30	Pass
HT40	MCS0	1	110	5550	0.28	14.77	23.98	-2.60	30	Pass
HT40	MCS0	1	134	5670	0.28	15.23	23.98	-2.60	30	Pass
VHT20	MCS0	1	100	5500	0.14	15.94	23.98	-2.60	30	Pass
VHT20	MCS0	1	116	5580	0.14	16.17	23.98	-2.60	30	Pass
VHT20	MCS0	1	132	5660	0.14	16.06	23.98	-2.60	30	Pass
VHT20	MCS0	1	136	5680	0.14	16.32	23.98	-2.60	30	Pass
VHT20	MCS0	1	140	5700	0.14	11.58	23.98	-2.60	30	Pass
VHT40	MCS0	1	102	5510	0.28	13.72	23.98	-2.60	30	Pass
VHT40	MCS0	1	110	5550	0.28	15.76	23.98	-2.60	30	Pass
VHT40	MCS0	1	134	5670	0.28	15.51	23.98	-2.60	30	Pass
VHT80	MCS0	1	106	5530	0.55	13.30	23.98	-2.60	30	Pass
VHT80	MCS0	1	122	5610	0.55	14.15	23.98	-2.60	30	Pass

FCC U-NII-2C straddle channel single antenna										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power with duty factor (dBm)	FCC Conducted Power Limit (dBm)	DG (dBi)	EIRP Power Limit (dBm)	Pass /Fail
11a	6Mbps	1	144	5720	0.13	17.22	23.98	-2.60	30	Pass
HT20	MCS0	1	144	5720	0.14	16.19	23.98	-2.60	30	Pass
HT40	MCS0	1	142	5710	0.28	15.30	23.98	-2.60	30	Pass
VHT20	MCS0	1	144	5720	0.14	16.22	23.98	-2.60	30	Pass
VHT40	MCS0	1	142	5710	0.28	16.14	23.98	-2.60	30	Pass
VHT80	MCS0	1	138	5690	0.55	14.01	23.98	-2.60	30	Pass

TEST RESULTS DATA
Average Power Table

FCC U-NII-1 single antenna										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	RU Config.	Duty Factor (dB)	Average Conducted Power with duty factor (dBm)	FCC Conducted Power Limit (dBm)	DG (dBi)	Pass/Fail
HE20	MCS0	1	36	5180	Full	0.18	16.18	24.00	-1.60	Pass
HE20	MCS0	1	36	5180	26/0	0.04	7.91	24.00	-1.60	Pass
HE20	MCS0	1	36	5180	52/37	0.04	11.02	24.00	-1.60	Pass
HE20	MCS0	1	36	5180	106/53	0.05	13.41	24.00	-1.60	Pass
HE20	MCS0	1	44	5220	Full	0.18	16.14	24.00	-1.60	Pass
HE20	MCS0	1	44	5220	26/0	0.04	7.45	24.00	-1.60	Pass
HE20	MCS0	1	44	5220	52/37	0.04	10.55	24.00	-1.60	Pass
HE20	MCS0	1	44	5220	106/53	0.05	13.57	24.00	-1.60	Pass
HE20	MCS0	1	48	5240	Full	0.18	15.94	24.00	-1.60	Pass
HE20	MCS0	1	48	5240	26/8	0.04	8.02	24.00	-1.60	Pass
HE20	MCS0	1	48	5240	52/40	0.04	10.46	24.00	-1.60	Pass
HE20	MCS0	1	48	5240	106/54	0.05	13.37	24.00	-1.60	Pass
HE40	MCS0	1	38	5190	Full	0.34	14.24	24.00	-1.60	Pass
HE40	MCS0	1	46	5230	Full	0.34	15.17	24.00	-1.60	Pass
HE80	MCS0	1	42	5210	Full	0.61	13.57	24.00	-1.60	Pass

TEST RESULTS DATA
Average Power Table

FCC U-NII-2A single antenna											
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	RU Config.	Duty Factor (dB)	Average Conducted Power with duty factor (dBm)	FCC Conducted Power Limit (dBm)	DG (dBi)	EIRP Power Limit (dBm)	Pass /Fail
HE20	MCS0	1	52	5260	Full	0.18	15.86	23.98	-2.70	30	Pass
HE20	MCS0	1	52	5260	26/0	0.04	8.15	23.98	-2.70	30	Pass
HE20	MCS0	1	52	5260	52/37	0.04	10.88	23.98	-2.70	30	Pass
HE20	MCS0	1	52	5260	106/53	0.05	13.88	23.98	-2.70	30	Pass
HE20	MCS0	1	60	5300	Full	0.18	16.00	23.98	-2.70	30	Pass
HE20	MCS0	1	60	5300	26/0	0.04	7.68	23.98	-2.70	30	Pass
HE20	MCS0	1	60	5300	52/37	0.04	10.82	23.98	-2.70	30	Pass
HE20	MCS0	1	60	5300	106/53	0.05	13.40	23.98	-2.70	30	Pass
HE20	MCS0	1	64	5320	Full	0.18	15.97	23.98	-2.70	30	Pass
HE20	MCS0	1	64	5320	26/8	0.04	7.31	23.98	-2.70	30	Pass
HE20	MCS0	1	64	5320	52/40	0.04	10.32	23.98	-2.70	30	Pass
HE20	MCS0	1	64	5320	106/54	0.05	13.31	23.98	-2.70	30	Pass
HE40	MCS0	1	54	5270	Full	0.34	15.12	23.98	-2.70	30	Pass
HE40	MCS0	1	62	5310	Full	0.34	14.65	23.98	-2.70	30	Pass
HE80	MCS0	1	58	5290	Full	0.61	12.84	23.98	-2.70	30	Pass

TEST RESULTS DATA
Average Power Table

FCC U-NII-2C single antenna											
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	RU Config.	Duty Factor (dB)	Average Conducted Power with duty factor (dBm)	FCC Conducted Power Limit (dBm)	DG (dBi)	EIRP Power Limit (dBm)	Pass/Fail
HE20	MCS0	1	100	5500	Full	0.18	16.06	23.98	-2.60	30	Pass
HE20	MCS0	1	100	5500	26/0	0.04	7.58	23.98	-2.60	30	Pass
HE20	MCS0	1	100	5500	52/37	0.04	10.78	23.98	-2.60	30	Pass
HE20	MCS0	1	100	5500	106/53	0.05	13.43	23.98	-2.60	30	Pass
HE20	MCS0	1	116	5580	Full	0.18	16.24	23.98	-2.60	30	Pass
HE20	MCS0	1	116	5580	26/0	0.04	8.68	23.98	-2.60	30	Pass
HE20	MCS0	1	116	5580	52/37	0.04	11.15	23.98	-2.60	30	Pass
HE20	MCS0	1	116	5580	106/53	0.05	14.08	23.98	-2.60	30	Pass
HE20	MCS0	1	136	5660	Full	0.18	16.18	23.98	-2.60	30	Pass
HE20	MCS0	1	138	5680	Full	0.18	16.40	23.98	-2.60	30	Pass
HE20	MCS0	1	140	5700	Full	0.18	11.64	23.98	-2.60	30	Pass
HE20	MCS0	1	140	5700	26/8	0.04	3.60	23.98	-2.60	30	Pass
HE20	MCS0	1	140	5700	52/40	0.04	6.81	23.98	-2.60	30	Pass
HE20	MCS0	1	140	5700	106/54	0.05	9.72	23.98	-2.60	30	Pass
HE40	MCS0	1	102	5510	Full	0.34	13.94	23.98	-2.60	30	Pass
HE40	MCS0	1	110	5550	Full	0.34	14.88	23.98	-2.60	30	Pass
HE40	MCS0	1	134	5670	Full	0.34	15.35	23.98	-2.60	30	Pass
HE80	MCS0	1	106	5530	Full	0.61	13.43	23.98	-2.60	30	Pass
HE80	MCS0	1	122	5610	Full	0.61	14.24	23.98	-2.60	30	Pass

FCC U-NII-2C straddle channel single antenna											
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	RU Config.	Duty Factor (dB)	Average Conducted Power with duty factor (dBm)	FCC Conducted Power Limit (dBm)	DG (dBi)	EIRP Power Limit (dBm)	Pass/Fail
HE20	MCS0	1	144	5720	Full	0.18	16.29	23.98	-2.60	30	Pass
HE20	MCS0	1	144	5720	26/8	0.04	7.76	23.98	-2.60	30	Pass
HE20	MCS0	1	144	5720	52/40	0.04	10.98	23.98	-2.60	30	Pass
HE20	MCS0	1	144	5720	106/54	0.05	13.96	23.98	-2.60	30	Pass
HE40	MCS0	1	142	5710	Full	0.34	15.40	23.98	-2.60	30	Pass
HE80	MCS0	1	138	5690	Full	0.61	14.13	23.98	-2.60	30	Pass

TEST RESULTS DATA
Average Power Table

U-NII-3 single antenna									
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power with duty factor (dBm)	FCC Conducted Power Limit (dBm)	DG (dBi)	Pass/Fail
11a	6Mbps	1	149	5745	0.13	17.17	30.00	-2.70	Pass
11a	6Mbps	1	157	5785	0.13	17.29	30.00	-2.70	Pass
11a	6Mbps	1	165	5825	0.13	17.21	30.00	-2.70	Pass
HT20	MCS0	1	149	5745	0.14	16.06	30.00	-2.70	Pass
HT20	MCS0	1	157	5785	0.14	16.26	30.00	-2.70	Pass
HT20	MCS0	1	165	5825	0.14	16.20	30.00	-2.70	Pass
HT40	MCS0	1	151	5755	0.28	15.32	30.00	-2.70	Pass
HT40	MCS0	1	159	5795	0.28	15.36	30.00	-2.70	Pass
VHT20	MCS0	1	149	5745	0.14	16.12	30.00	-2.70	Pass
VHT20	MCS0	1	157	5785	0.14	16.33	30.00	-2.70	Pass
VHT20	MCS0	1	165	5825	0.14	16.24	30.00	-2.70	Pass
VHT40	MCS0	1	151	5755	0.28	16.10	30.00	-2.70	Pass
VHT40	MCS0	1	159	5795	0.28	16.24	30.00	-2.70	Pass
VHT80	MCS0	1	155	5775	0.55	14.21	30.00	-2.70	Pass

TEST RESULTS DATA
Average Power Table

U-NII-3 single antenna										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	RU Config.	Duty Factor (dB)	Average Conducted Power with duty factor (dBm)	FCC Conducted Power Limit (dBm)	DG (dBi)	Pass/Fail
HE20	MCS0	1	149	5745	Full	0.18	16.24	30.00	-2.70	Pass
HE20	MCS0	1	149	5745	26/0	0.04	8.23	30.00	-2.70	Pass
HE20	MCS0	1	149	5745	52/37	0.04	11.41	30.00	-2.70	Pass
HE20	MCS0	1	149	5745	106/53	0.05	13.91	30.00	-2.70	Pass
HE20	MCS0	1	157	5785	Full	0.18	16.41	30.00	-2.70	Pass
HE20	MCS0	1	157	5785	26/0	0.04	8.18	30.00	-2.70	Pass
HE20	MCS0	1	157	5785	52/37	0.04	11.45	30.00	-2.70	Pass
HE20	MCS0	1	157	5785	106/53	0.05	13.94	30.00	-2.70	Pass
HE20	MCS0	1	165	5825	Full	0.18	16.35	30.00	-2.70	Pass
HE20	MCS0	1	165	5825	26/8	0.04	7.69	30.00	-2.70	Pass
HE20	MCS0	1	165	5825	52/40	0.04	10.98	30.00	-2.70	Pass
HE20	MCS0	1	165	5825	106/54	0.05	13.96	30.00	-2.70	Pass
HE40	MCS0	1	151	5755	Full	0.34	15.41	30.00	-2.70	Pass
HE40	MCS0	1	159	5795	Full	0.34	15.47	30.00	-2.70	Pass
HE80	MCS0	1	155	5775	Full	0.61	14.33	30.00	-2.70	Pass

Emission Bandwidth

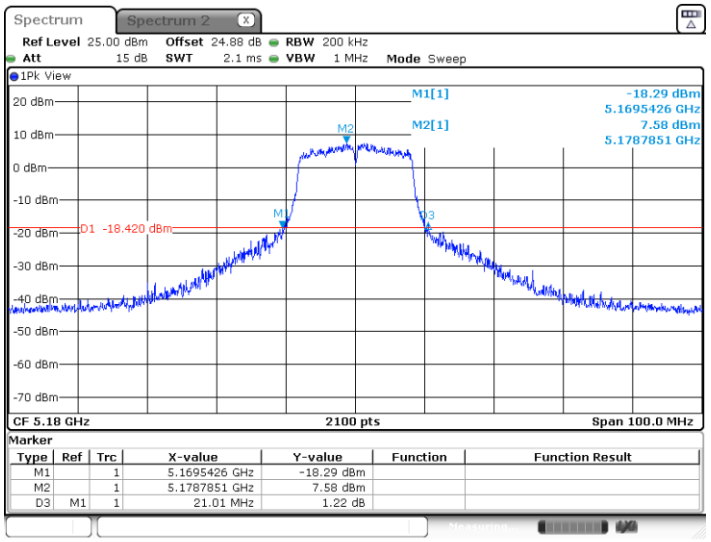
Test Result

TestMode	Antenna	Freq(MHz)	26dB EBW [MHz]	FL[MHz]	FH[MHz]
11A	Ant6	5180	21.01	5169.54	5190.55
		5220	20.25	5209.92	5230.17
		5240	20.96	5229.64	5250.60
		5260	22.34	5249.21	5271.55
		5300	21.01	5289.49	5310.51
		5320	21.92	5309.83	5331.74
		5500	23.20	5488.73	5511.93
		5580	23.73	5568.35	5592.08
		5660	22.34	5648.92	5671.27
		5680	21.77	5668.92	5690.70
		5700	22.25	5689.16	5711.41
		5720	23.73	5707.92	5731.65
		5745	23.87	5733.40	5757.27
		5785	23.15	5773.26	5796.41
		5825	22.63	5813.73	5836.36
11AC40SISO	Ant6	5190	40.88	5169.66	5210.53
		5230	44.88	5209.37	5254.25
		5270	41.16	5249.47	5290.63
		5310	40.97	5289.56	5330.53
		5510	41.26	5489.37	5530.63
		5550	44.21	5526.51	5570.72
		5670	41.07	5649.47	5690.53
		5710	48.31	5687.08	5735.39
		5755	48.02	5730.56	5778.58
		5795	44.21	5774.18	5818.39
11AX20SISO	Ant6	5180	21.87	5169.26	5191.12
		5220	21.77	5209.26	5231.03
		5240	21.30	5229.40	5250.70
		5260	21.68	5249.02	5270.70
		5300	21.82	5289.11	5310.93
		5320	22.11	5309.11	5331.22
		5500	21.92	5489.11	5511.03
		5580	22.20	5568.92	5591.12
		5660	21.11	5649.45	5670.55

		5680	22.01	5668.97	5690.98
		5700	21.96	5688.92	5710.89
		5720	21.72	5709.11	5730.84
		5745	22.25	5733.83	5756.08
		5785	22.15	5773.88	5796.03
		5825	22.44	5813.59	5836.03
11AX40SISO	Ant6	5190	39.64	5170.23	5209.87
		5230	39.73	5210.13	5249.87
		5270	39.83	5250.13	5289.96
		5310	39.73	5290.23	5329.96
		5510	39.73	5490.23	5529.96
		5550	39.64	5530.23	5569.87
		5670	39.83	5650.13	5689.96
		5710	39.64	5690.23	5729.87
		5755	39.54	5735.32	5774.87
		5795	39.73	5775.23	5814.96
11AX80SISO	Ant6	5210	80.42	5169.89	5250.30
		5290	80.42	5249.89	5330.30
		5530	80.42	5489.89	5570.30
		5610	80.23	5570.08	5650.30
		5690	80.42	5649.89	5730.30
		5775	80.42	5734.89	5815.30

Test Graphs

11A_Ant6_5180



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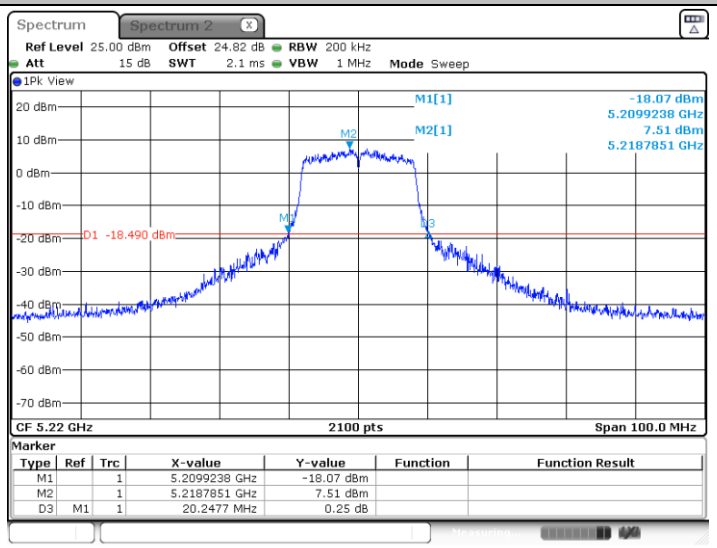

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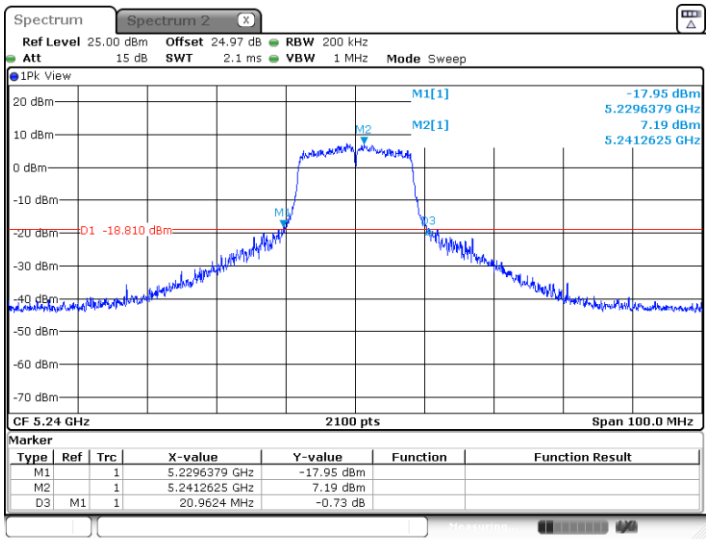

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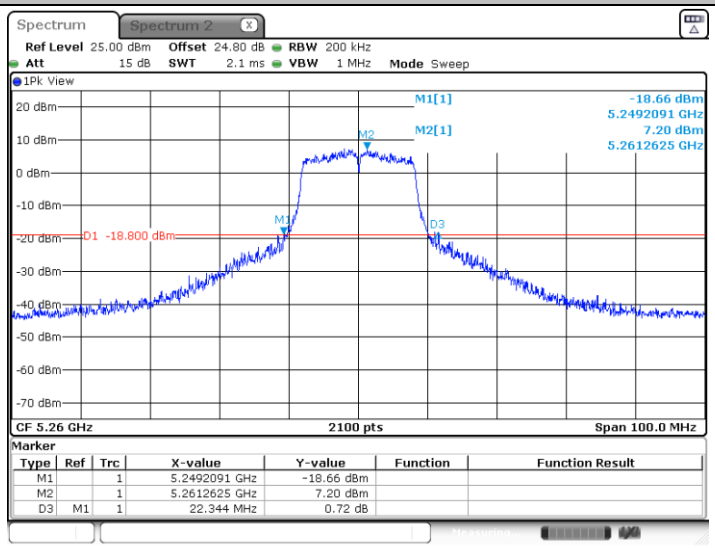
11A_Ant6_5260



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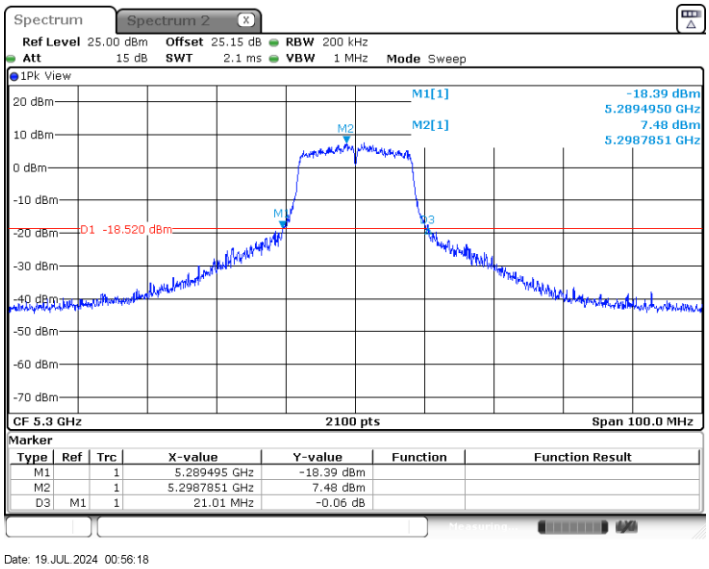

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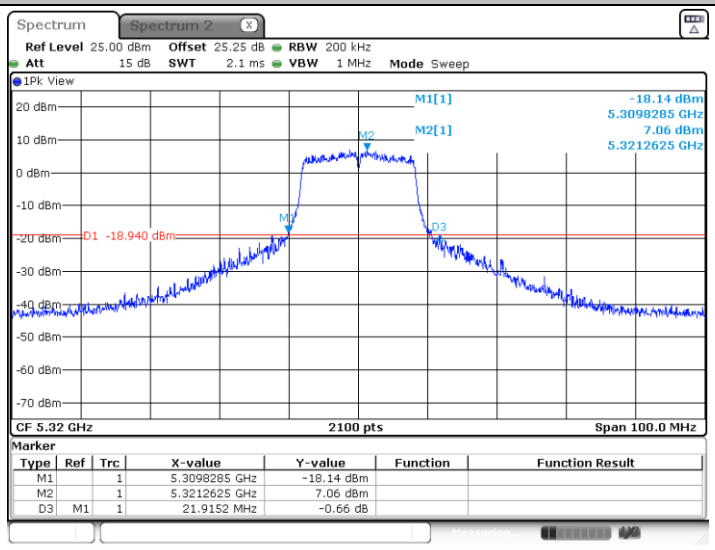

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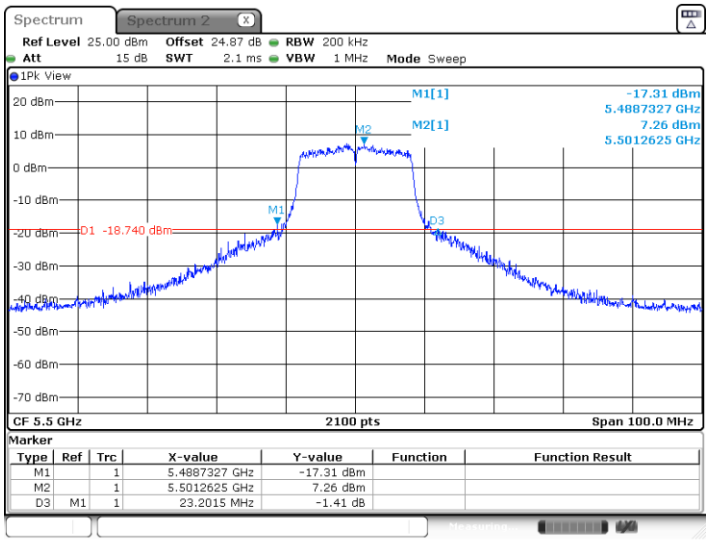

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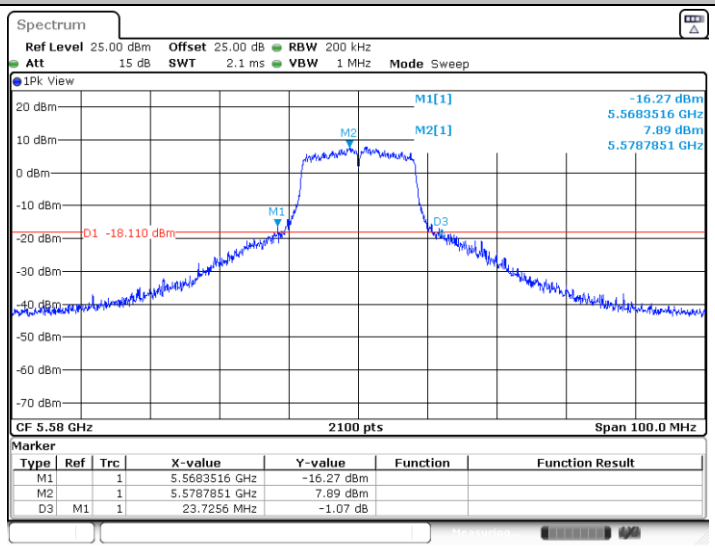

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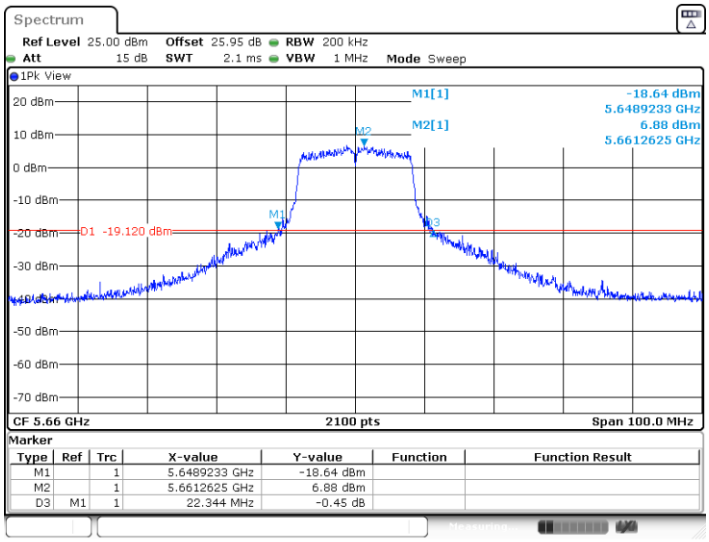

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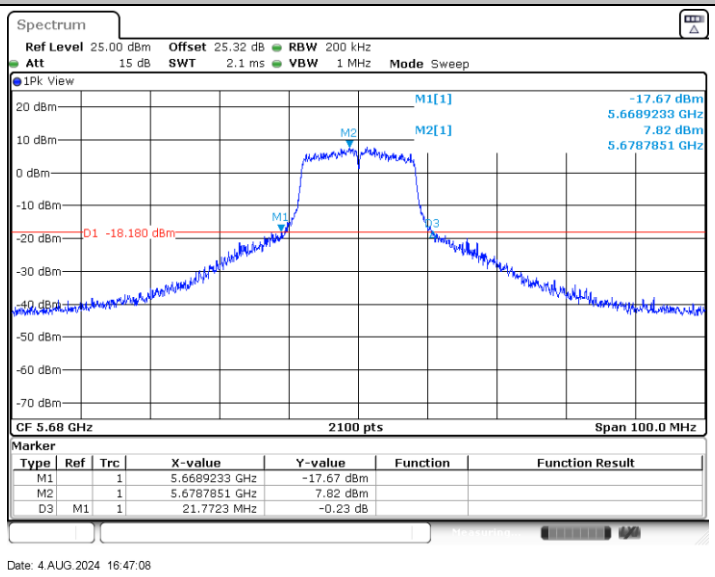

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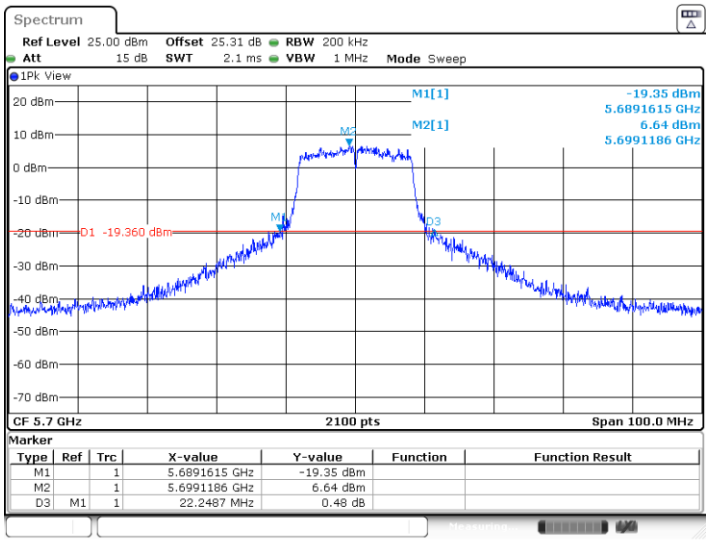

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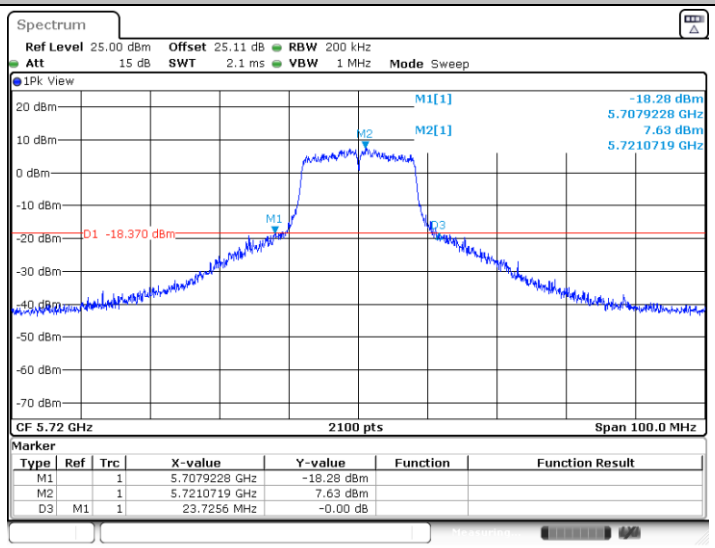

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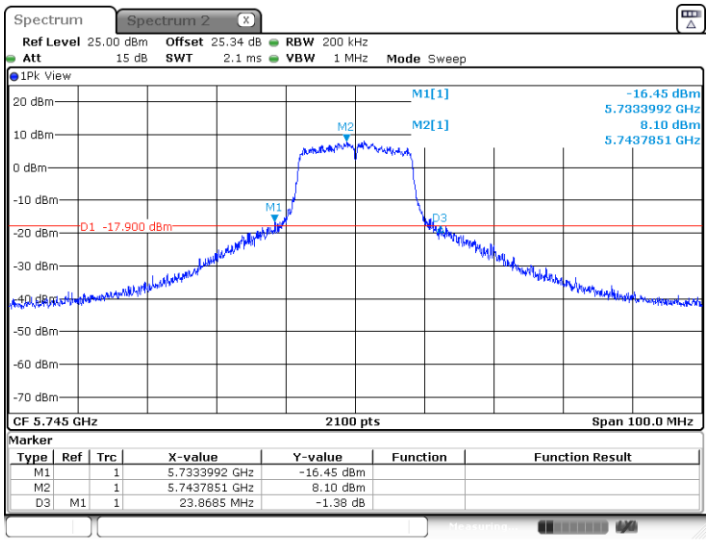

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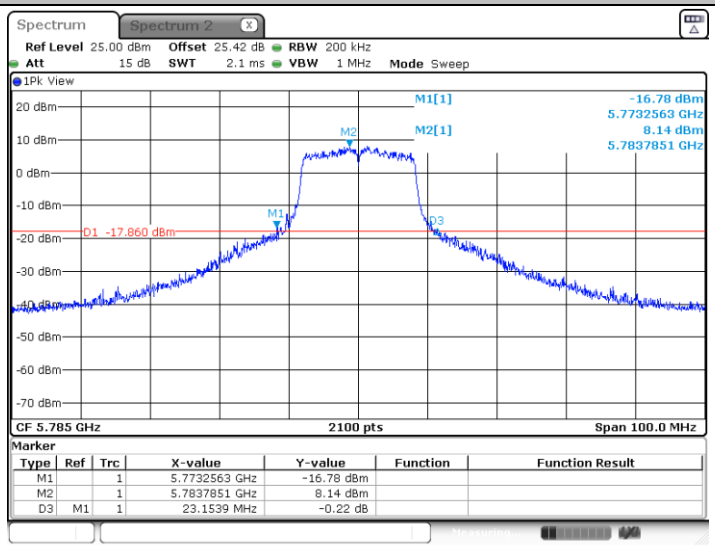

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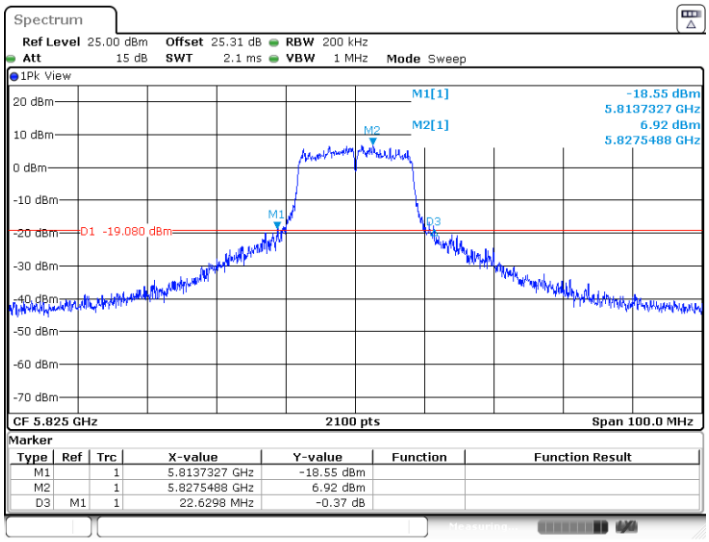

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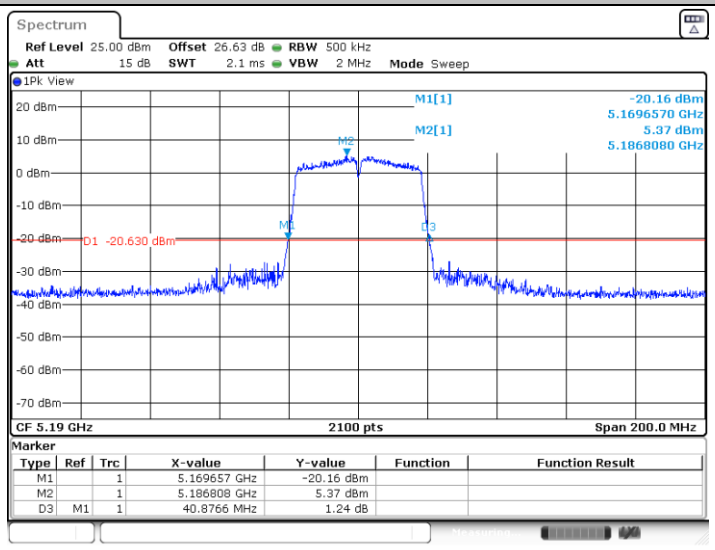

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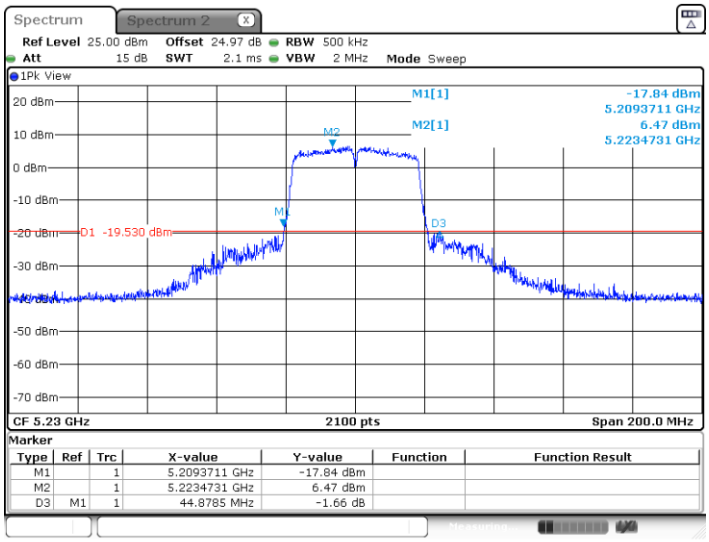

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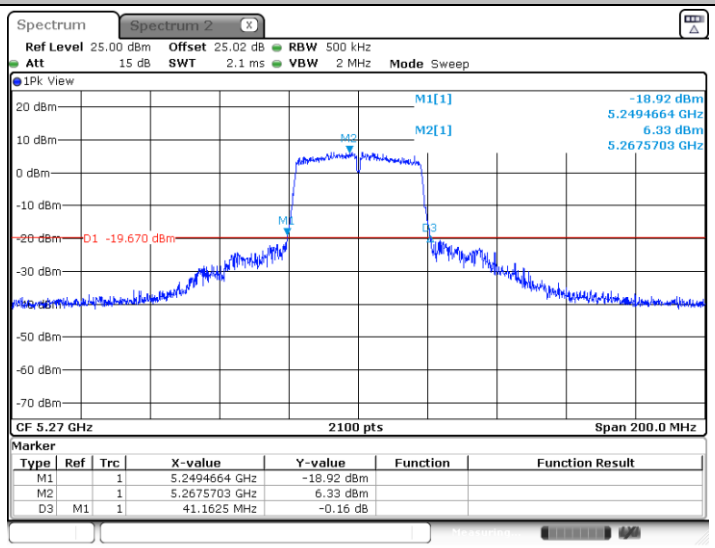

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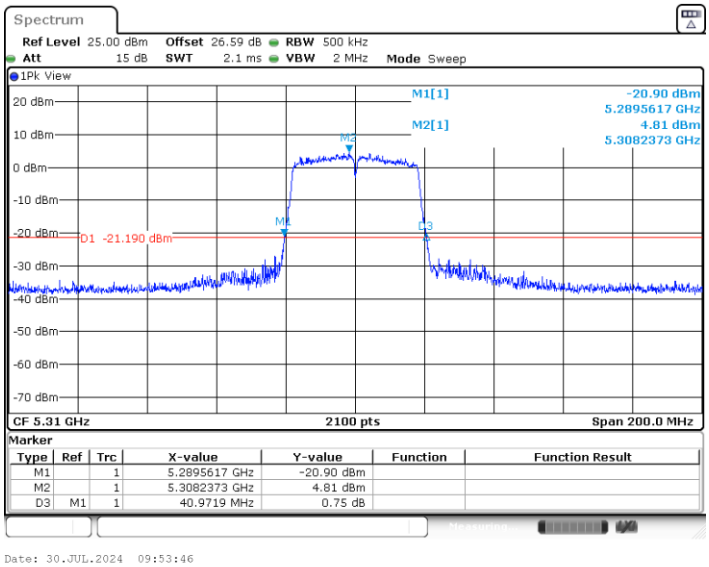

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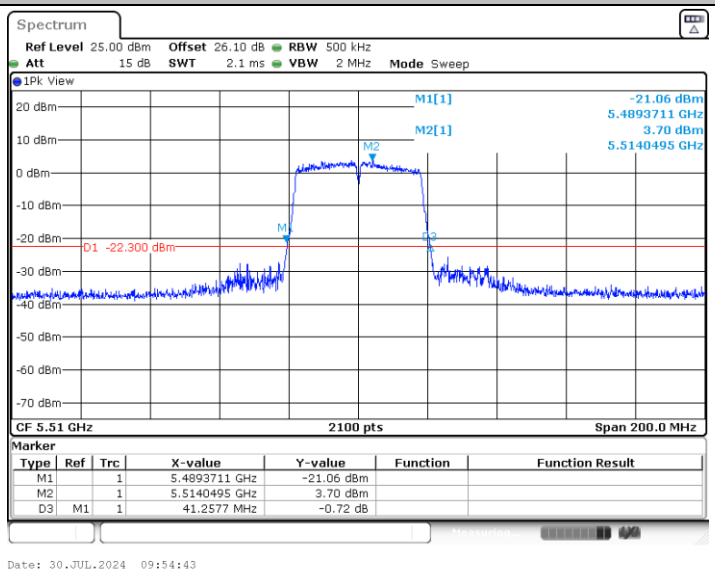

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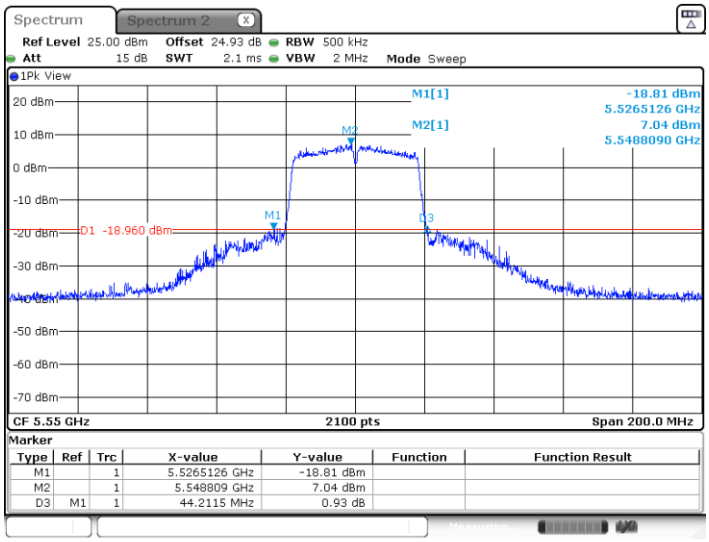

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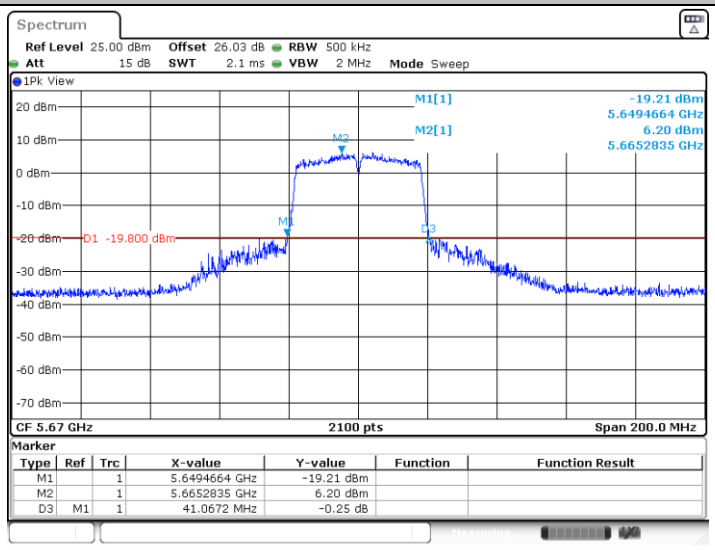

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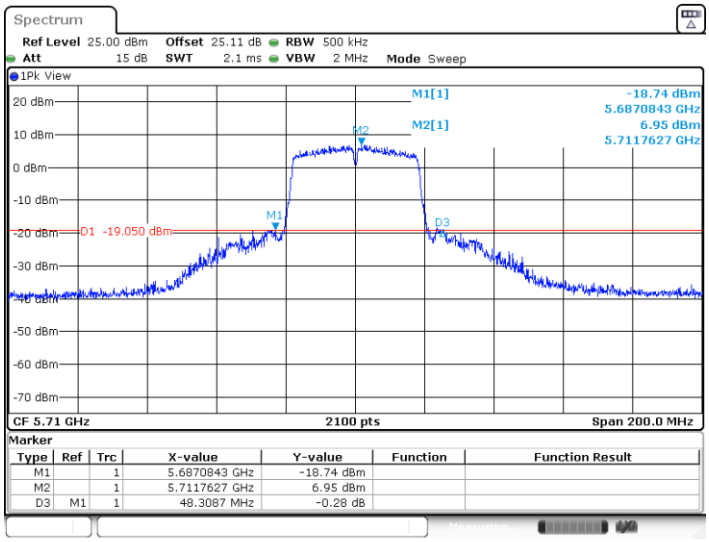

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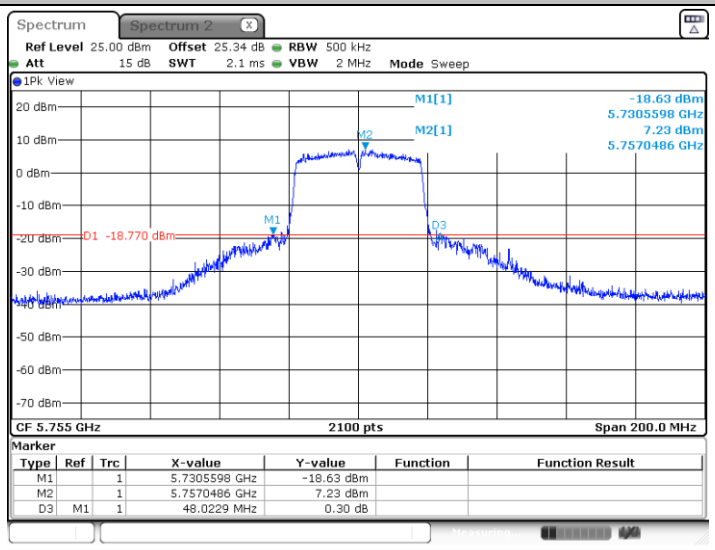

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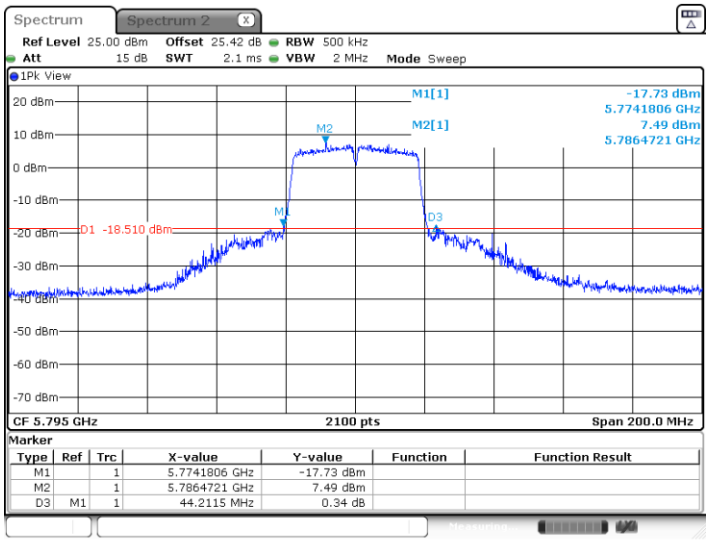

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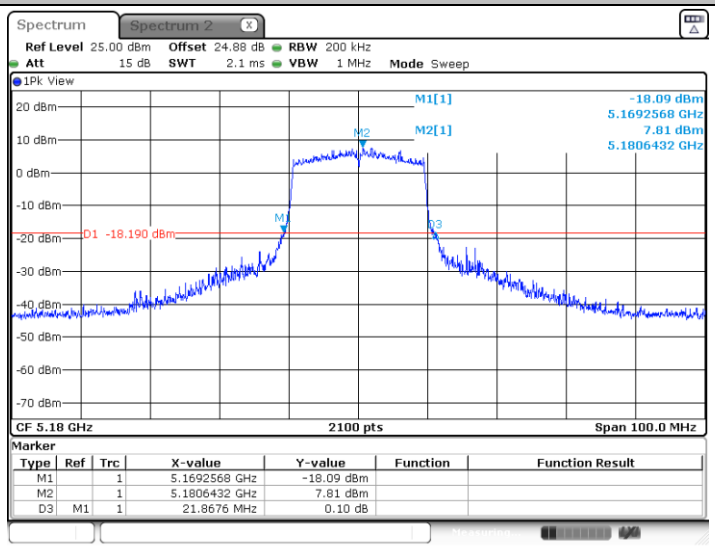

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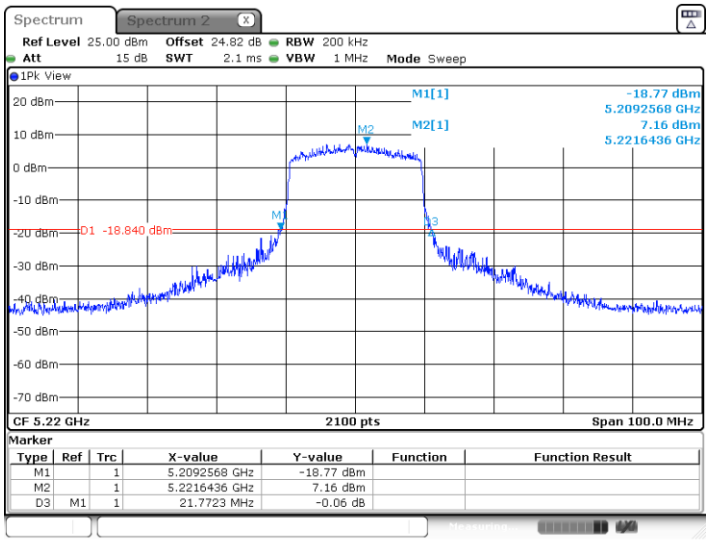

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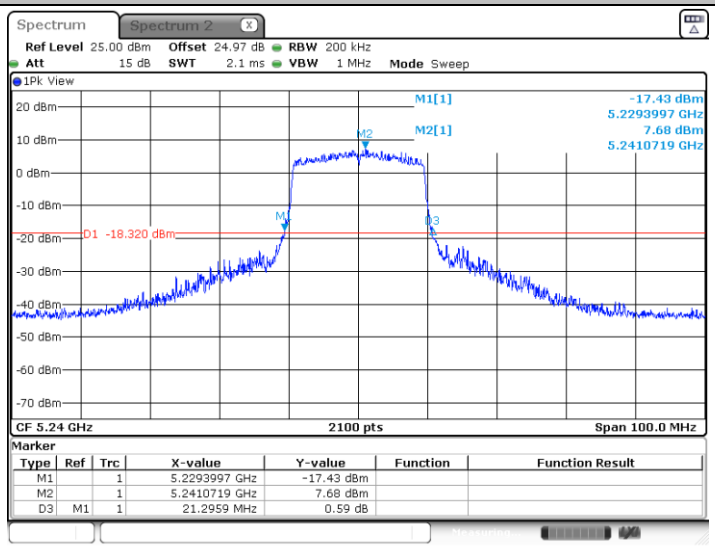

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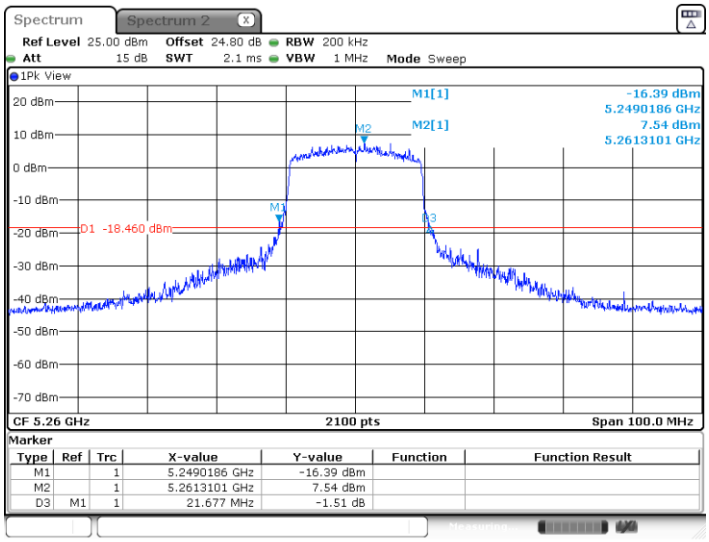

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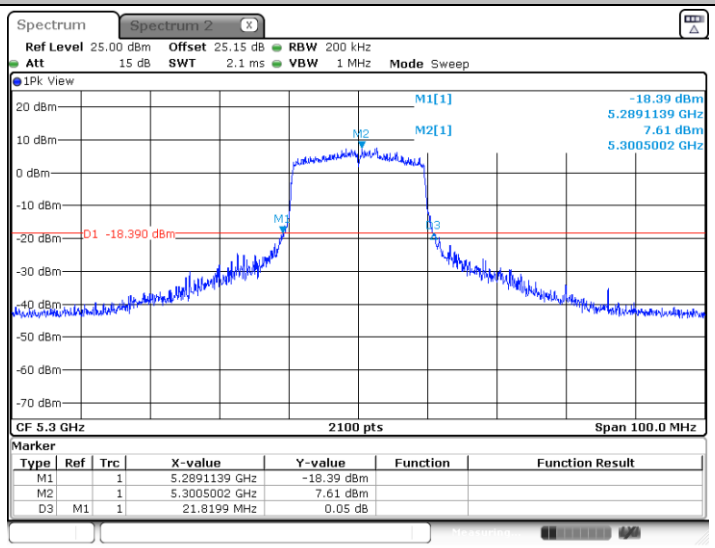

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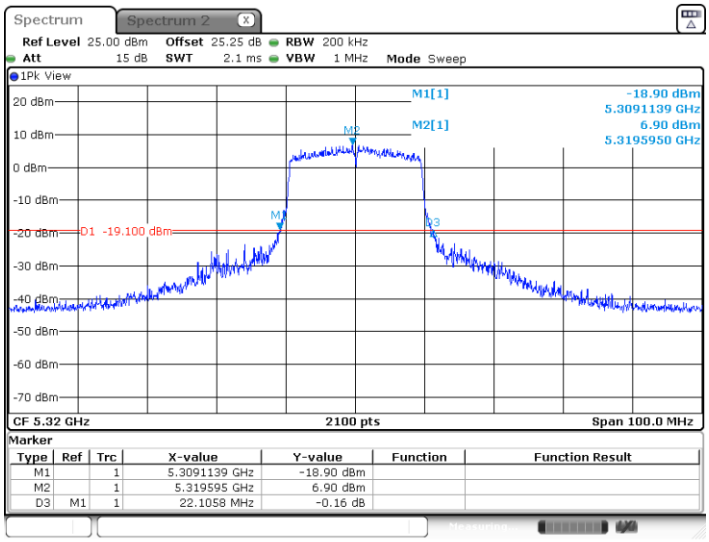

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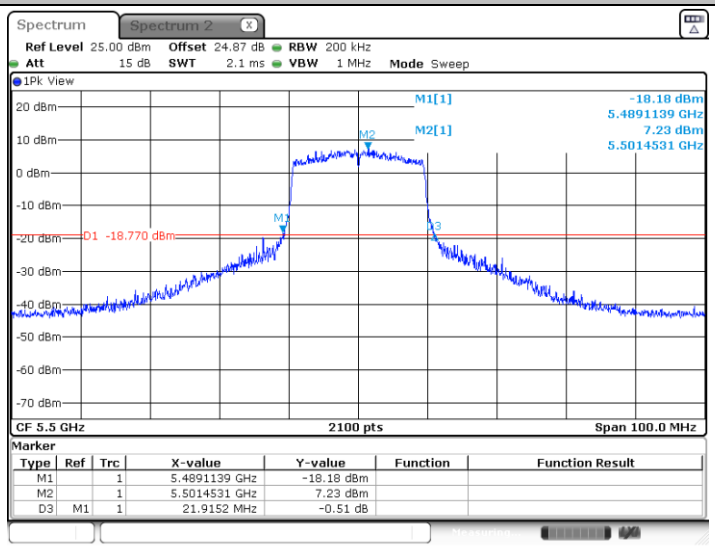

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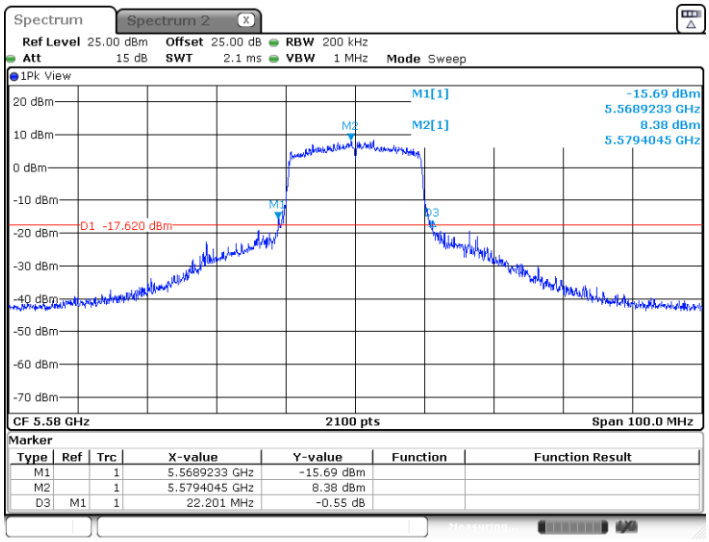

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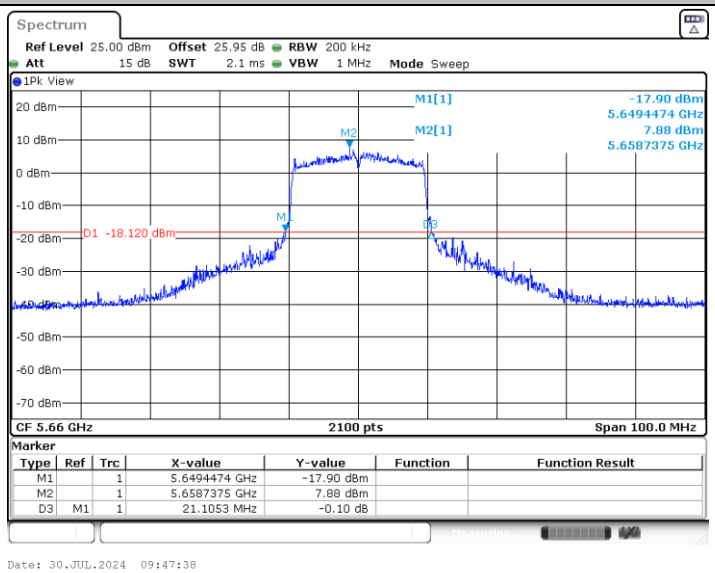

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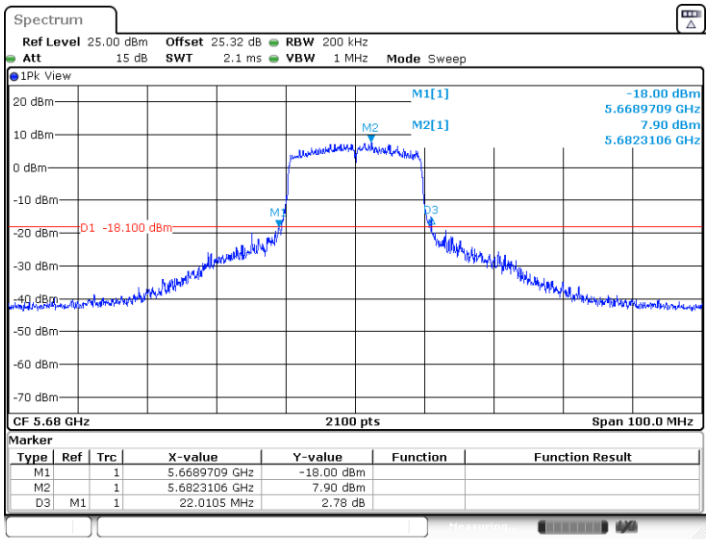

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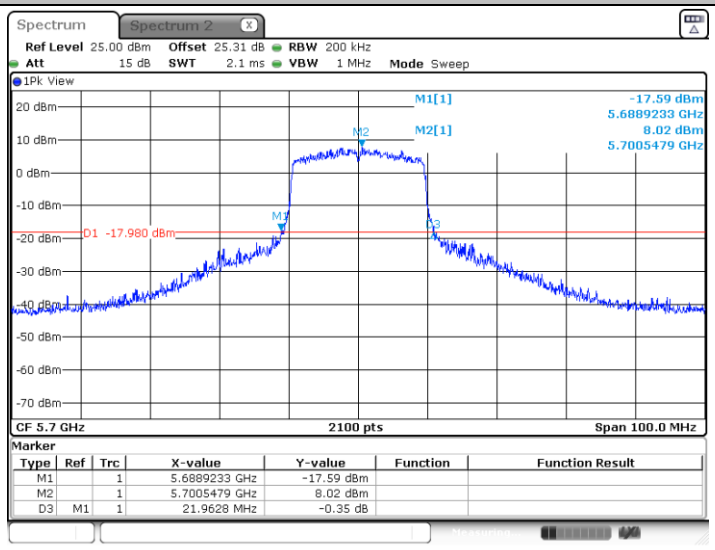

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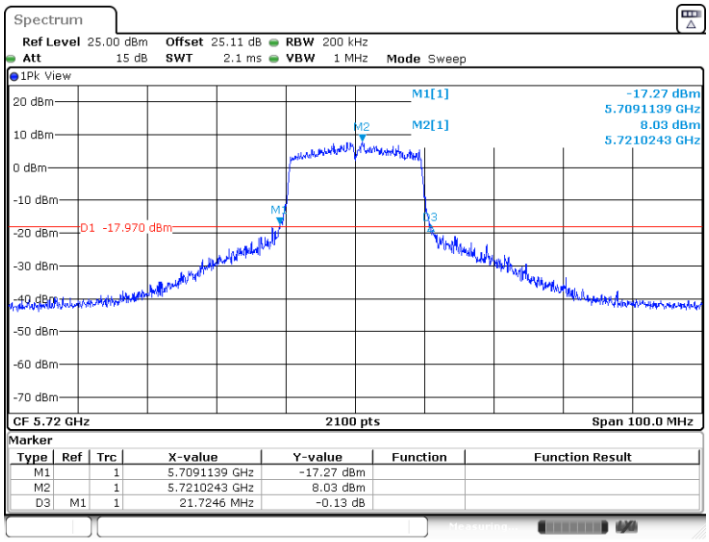

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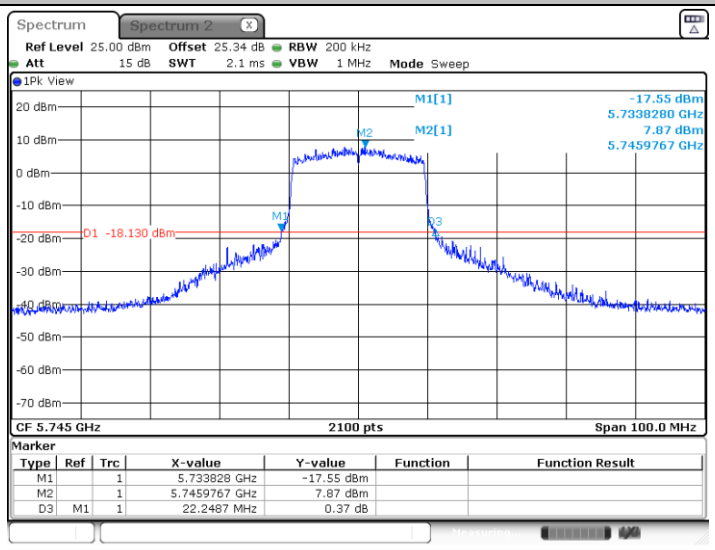

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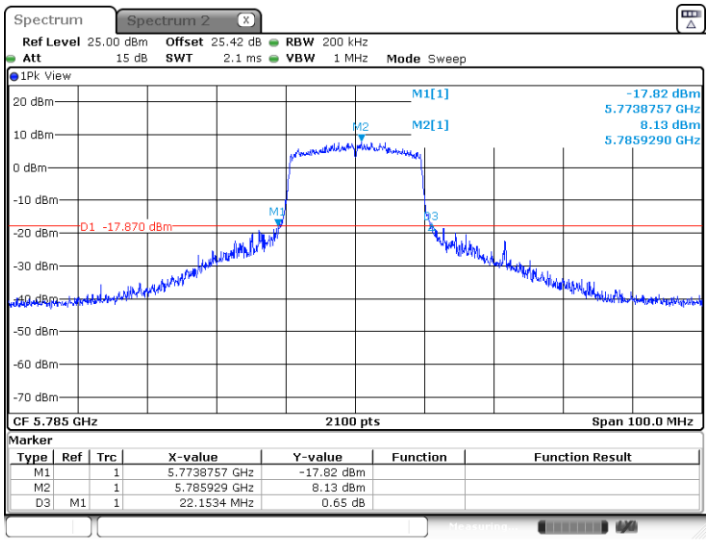
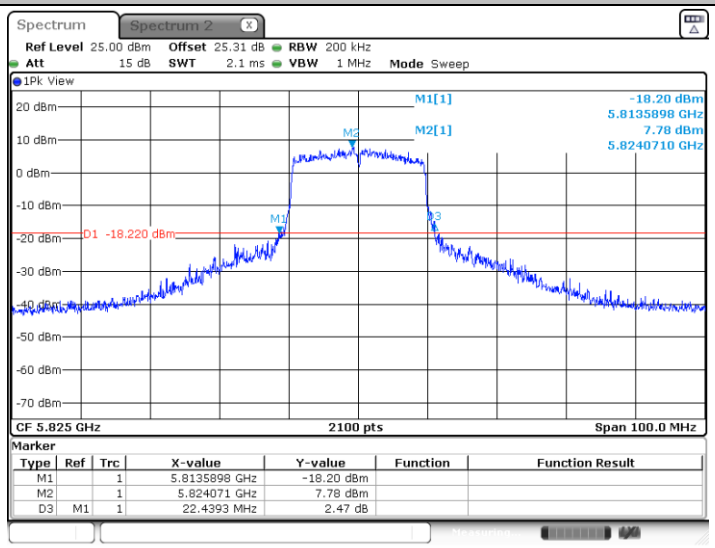


Date: 19.JUL.2024 01:24:42

11AX20SISO_Ant6_5825


Date: 19.JUL.2024 01:27:07

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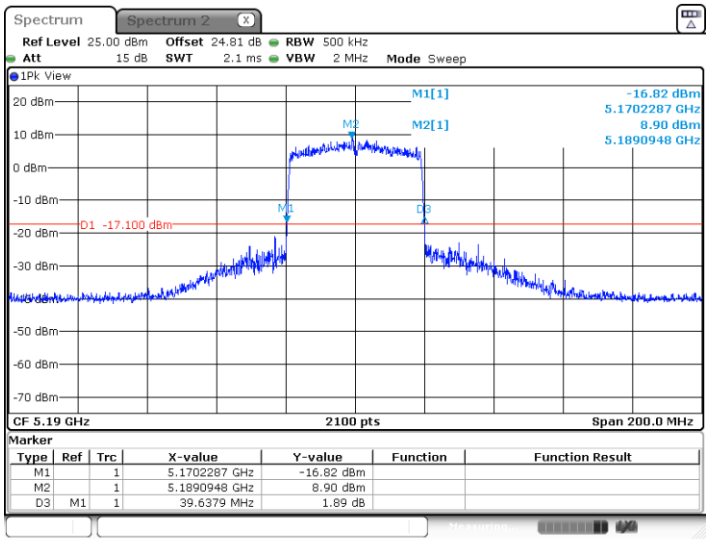

Date: 19.JUL.2024 01:28:05

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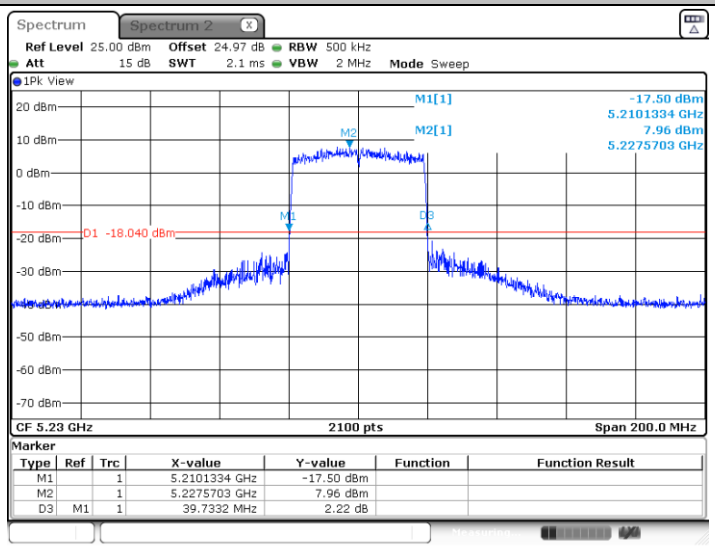

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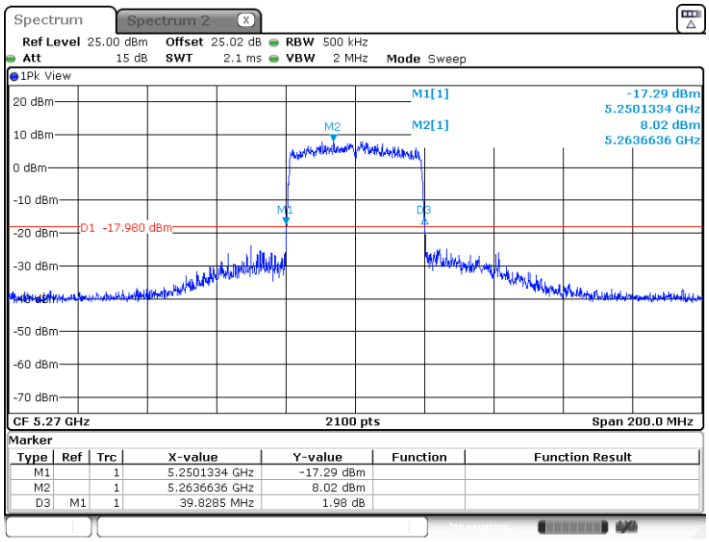

Date: 19.JUL.2024 01:29:34

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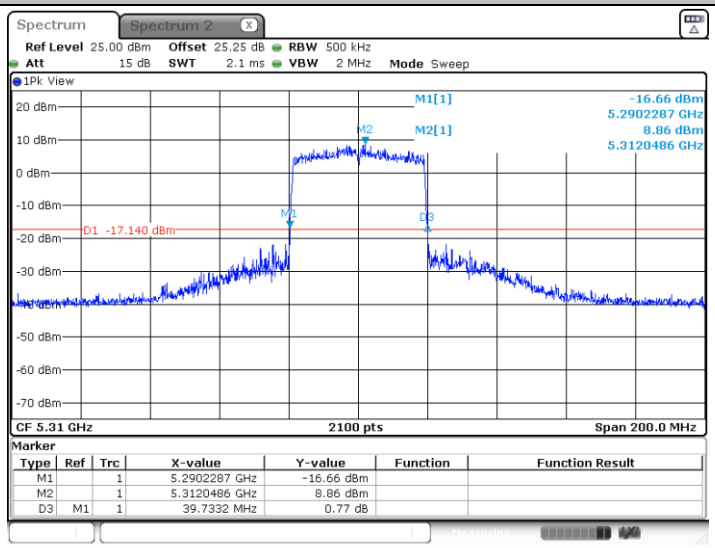

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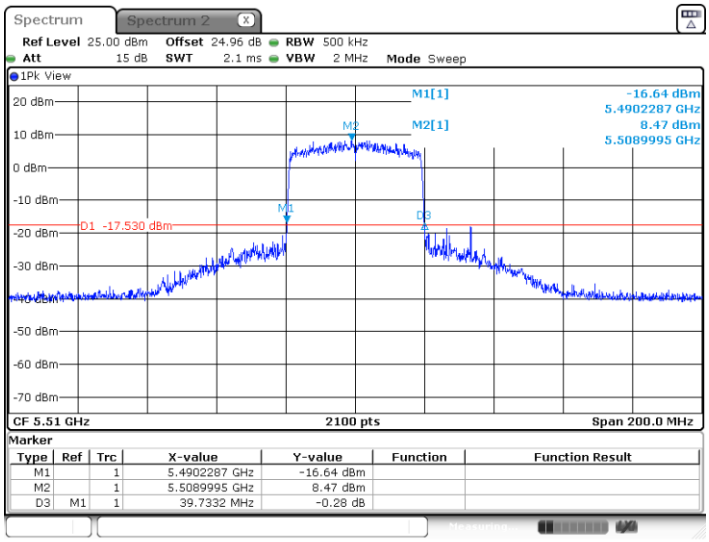

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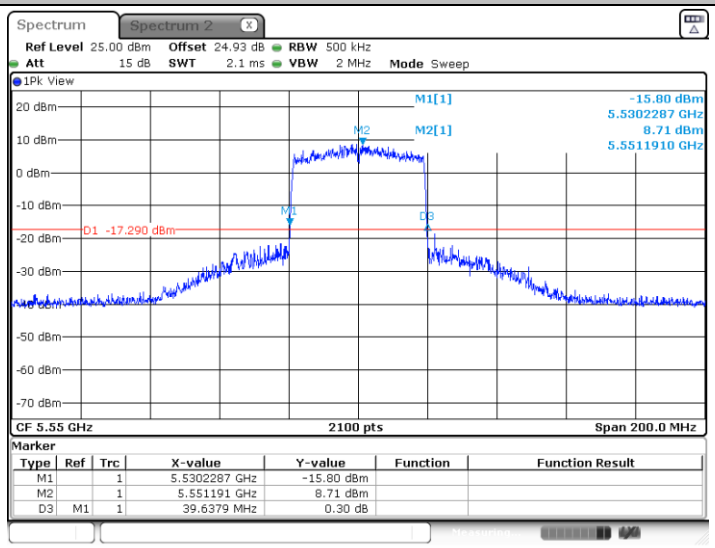

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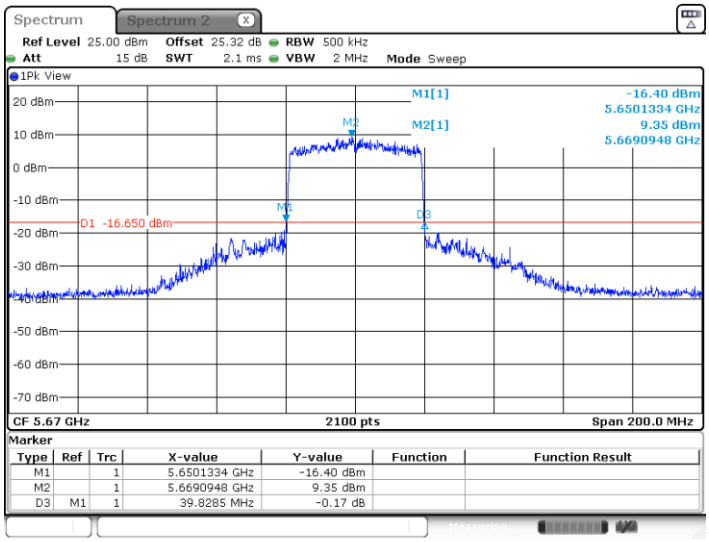

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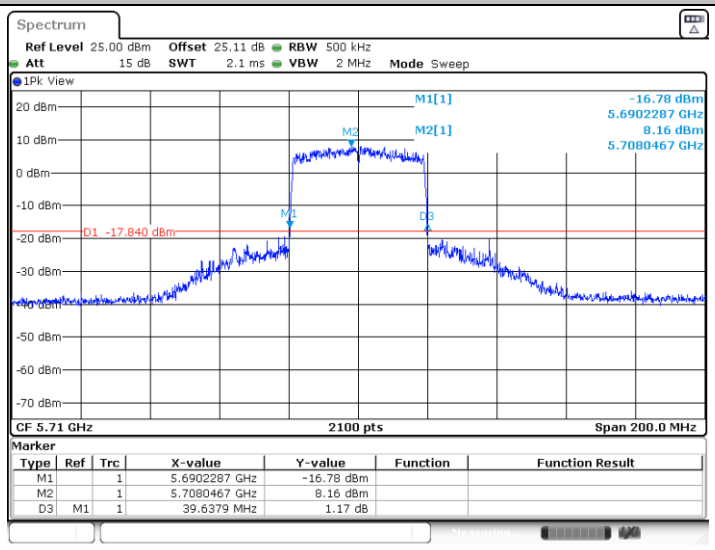

Date: 20.JUL.2024 04:25:16

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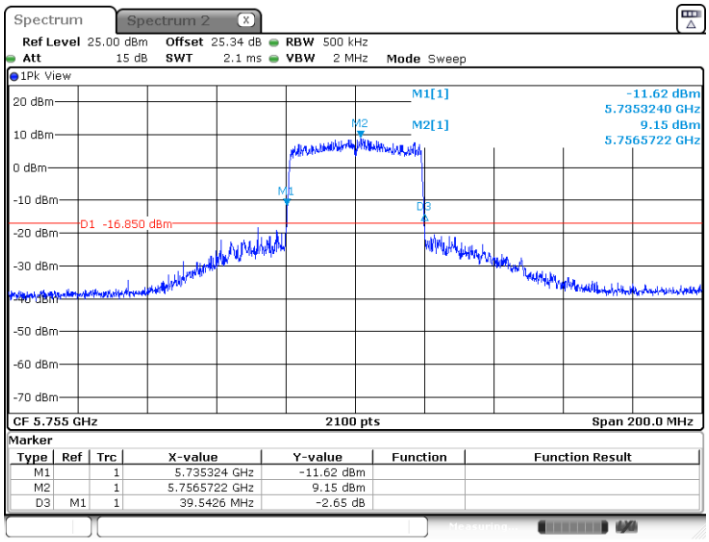

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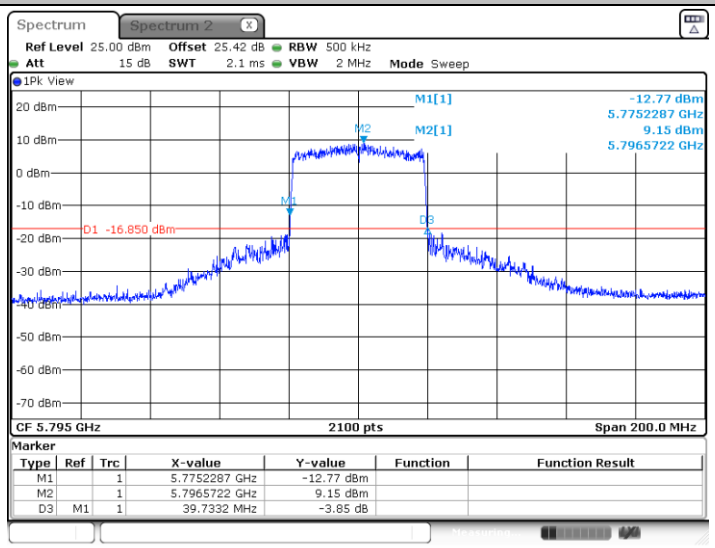
11AX40SISO_Ant6_5795


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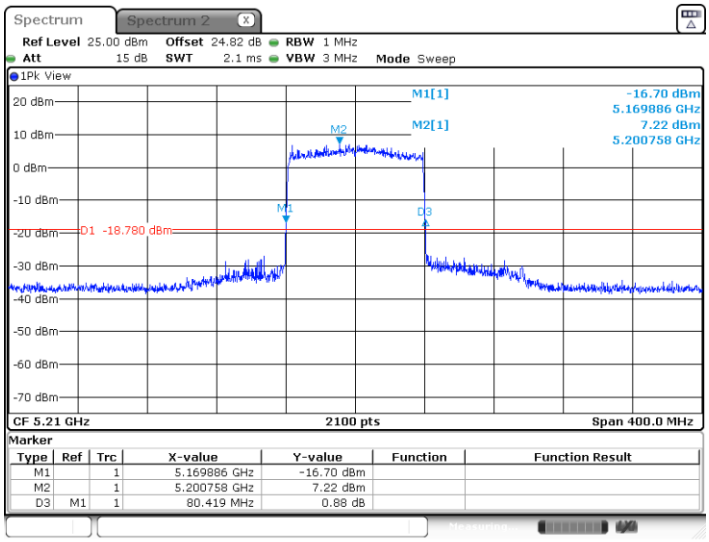
11AX80SISO_Ant6_5210


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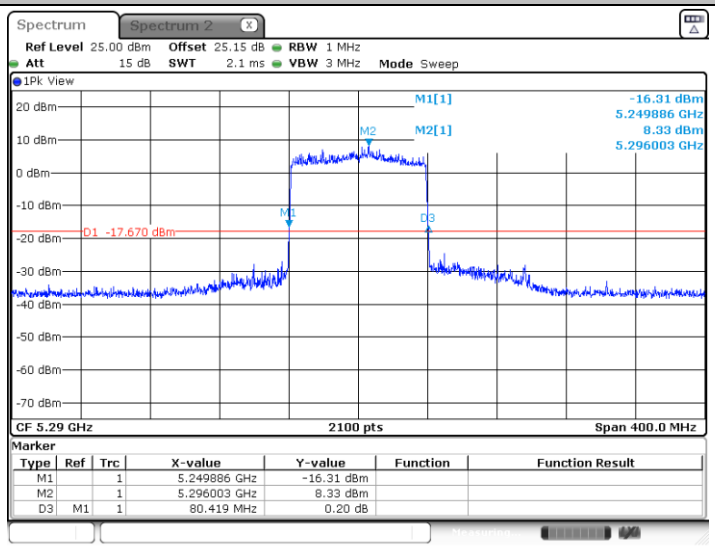

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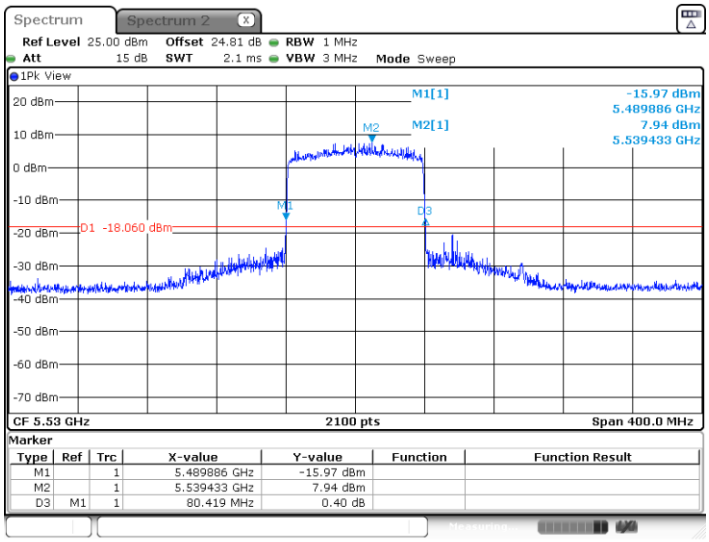

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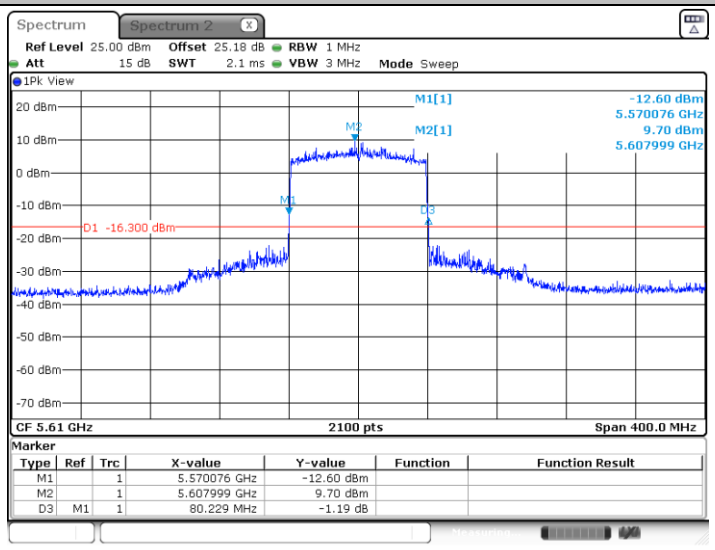

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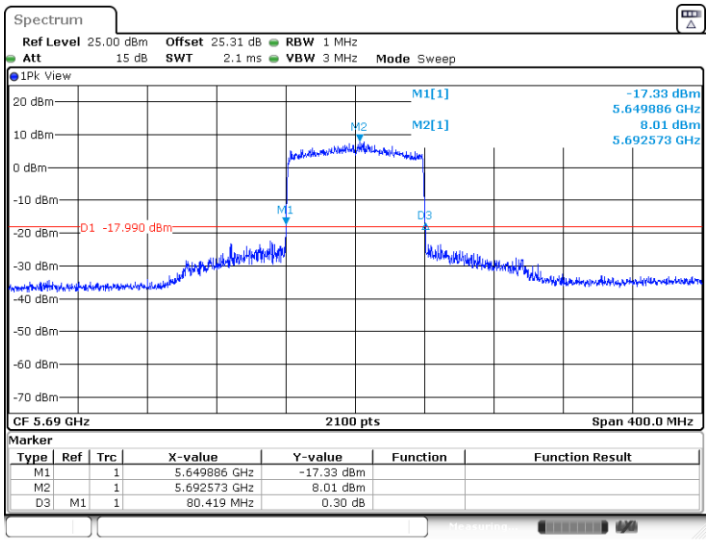

Date: 20.JUL.2024 04:26:13

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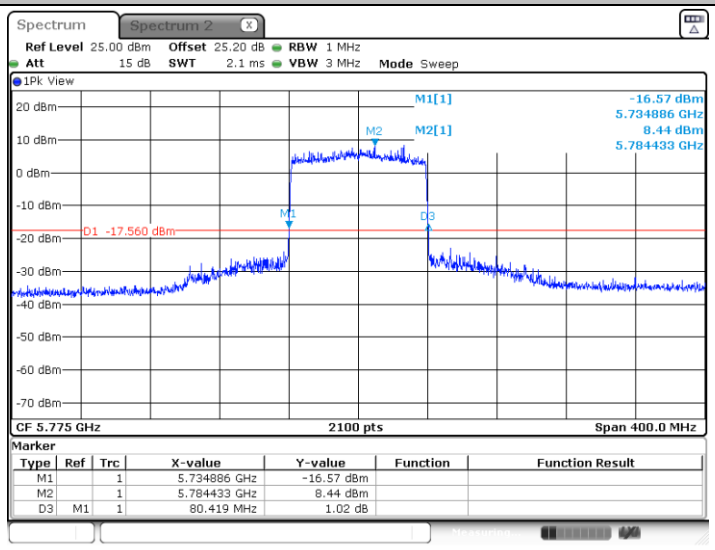


Date: 19.JUL.2024 01:40:12

Occupied channel bandwidth

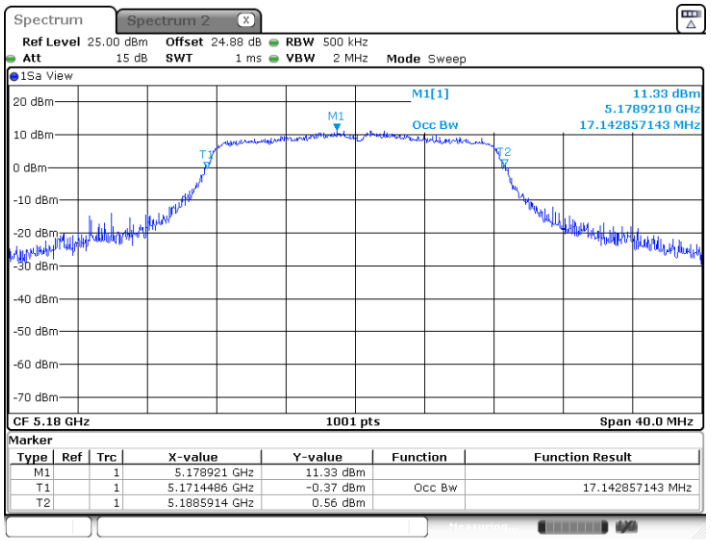
Test Result

TestMode	Antenna	Freq(MHz)	OCB [MHz]	FL[MHz]	FH[MHz]
11A	Ant6	5180	17.143	5171.4486	5188.5914
		5220	17.181	5211.4000	5228.5810
		5240	17.257	5231.3619	5248.6190
		5260	17.181	5251.3619	5268.5429
		5300	17.181	5291.4000	5308.5810
		5320	17.295	5311.3810	5328.6762
		5500	17.314	5491.3238	5508.6381
		5580	17.41	5571.3238	5588.7333
		5660	17.314	5651.3429	5668.6571
		5680	17.333	5671.3048	5688.6381
		5700	17.295	5691.3429	5708.6381
		5720	17.41	5711.3048	5728.7143
		5745	17.333	5736.3238	5753.6571
		5785	17.314	5776.3238	5793.6381
		5825	17.314	5816.3238	5833.6381
11AC40SISO	Ant6	5190	36.457	5171.7714	5208.2286
		5230	36.61	5211.6952	5248.3048
		5270	36.648	5251.6952	5288.3429
		5310	36.495	5291.7333	5328.2286
		5510	36.571	5491.6952	5528.2667
		5550	36.762	5531.6190	5568.3810
		5670	36.724	5651.6571	5688.3810
		5710	36.914	5691.5810	5728.4952
		5755	36.762	5736.6190	5773.3810
		5795	36.914	5776.5429	5813.4571
11AX20SISO	Ant6	5180	19.105	5170.4476	5189.5524
		5220	19.124	5210.4286	5229.5524
		5240	19.162	5230.4286	5249.5905
		5260	19.067	5250.4667	5269.5333
		5300	19.124	5290.4286	5309.5524
		5320	19.181	5310.4095	5329.5905
		5500	19.162	5490.4286	5509.5905
		5580	19.181	5570.4095	5589.5905
		5660	19.181	5650.4095	5669.5905

		5680	19.143	5670.4095	5689.5524
		5700	19.162	5690.4095	5709.5714
		5720	19.2	5710.4095	5729.6095
		5745	19.143	5735.4095	5754.5524
		5785	19.181	5775.3905	5794.5714
		5825	19.162	5815.4095	5834.5714
11AX40SISO	Ant6	5190	37.905	5171.0476	5208.9524
		5230	37.905	5211.0476	5248.9524
		5270	37.905	5251.0476	5288.9524
		5310	37.981	5291.0095	5328.9905
		5510	37.867	5491.0857	5528.9524
		5550	37.943	5531.0095	5568.9524
		5670	37.905	5651.0476	5688.9524
		5710	37.943	5691.0476	5728.9905
		5755	37.981	5736.0095	5773.9905
		5795	37.905	5776.0476	5813.9524
11AX80SISO	Ant6	5210	77.41	5171.3333	5248.7429
		5290	77.562	5251.2571	5328.8190
		5530	77.41	5491.3333	5568.7429
		5610	77.333	5571.3333	5648.6667
		5690	77.562	5651.2571	5728.8190
		5775	77.333	5736.3333	5813.6667

Test Graphs

11A_Ant6_5180



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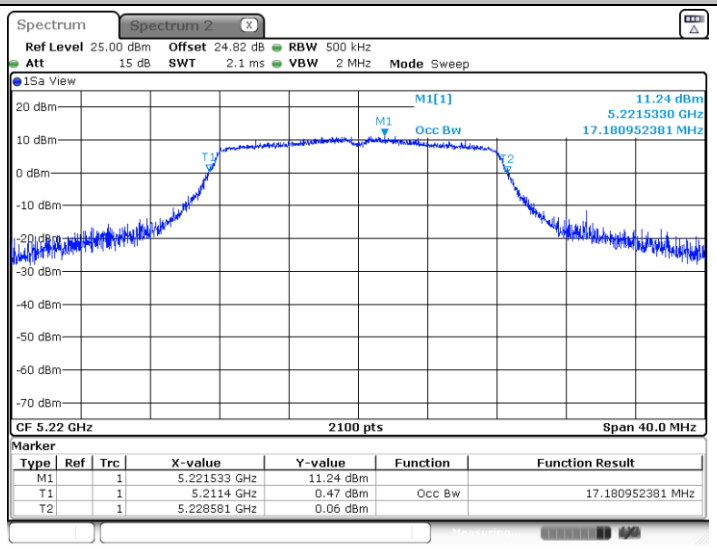

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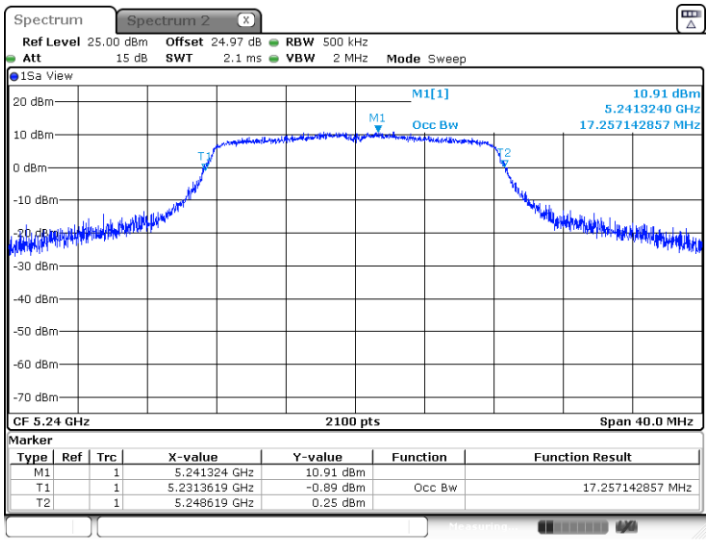

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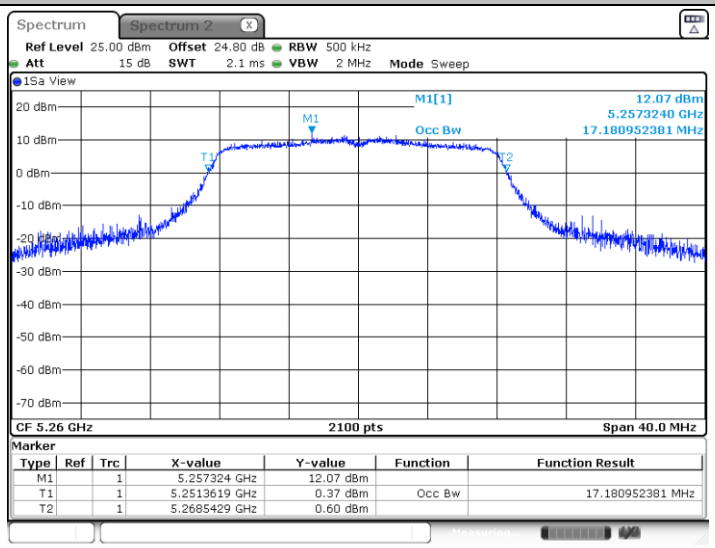

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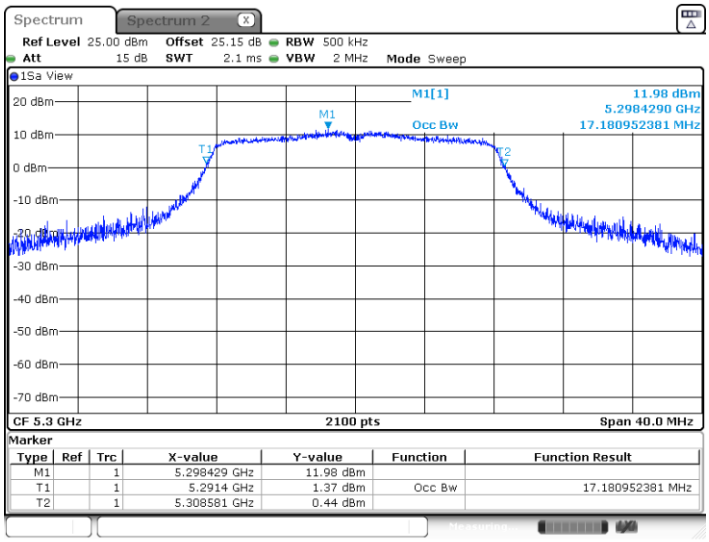

Date: 19.JUL.2024 00:56:26

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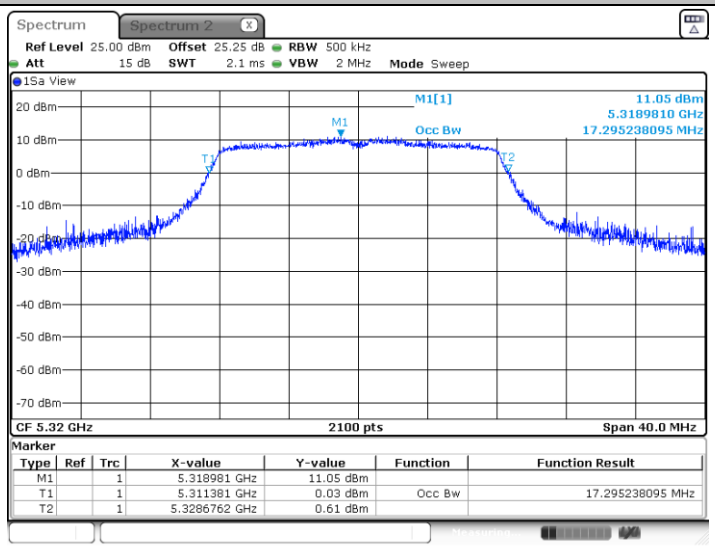

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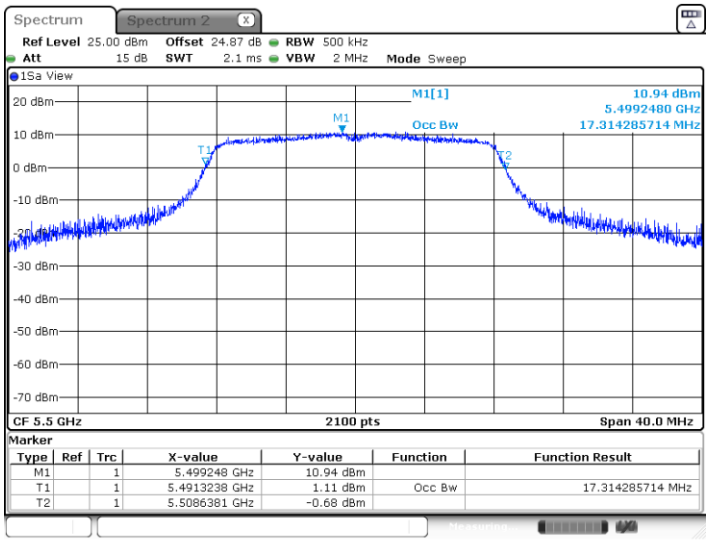

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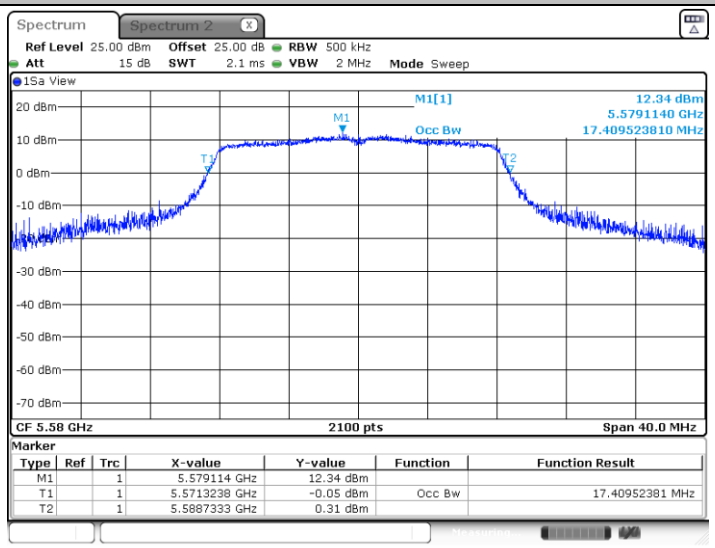

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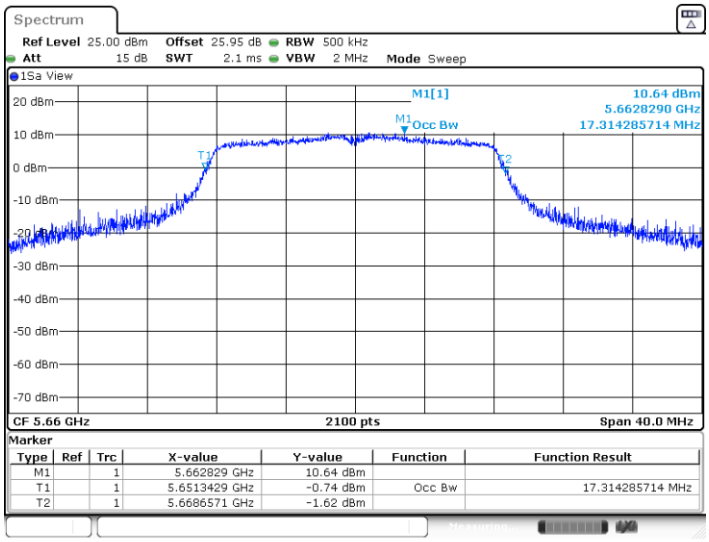

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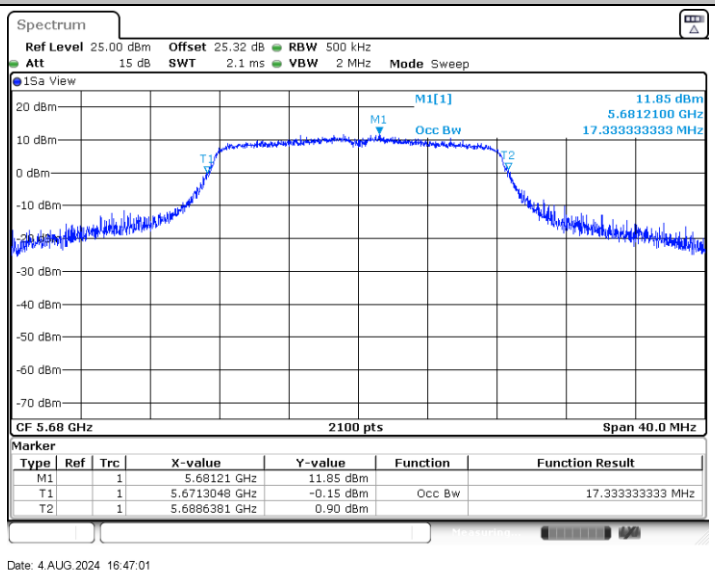

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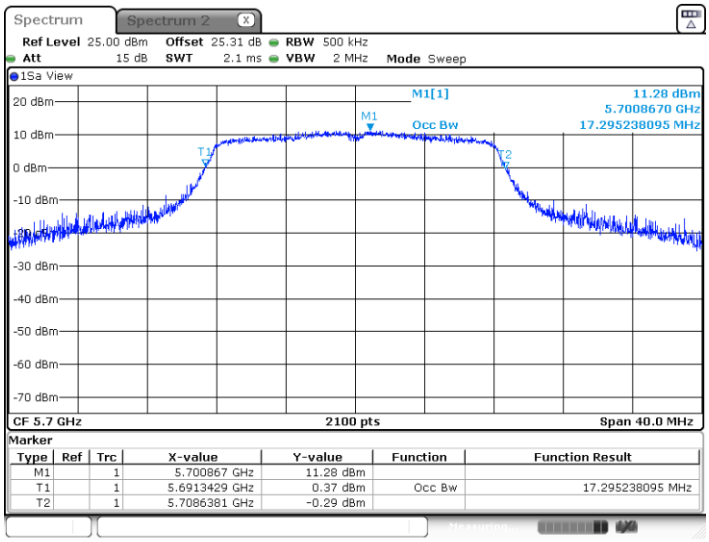

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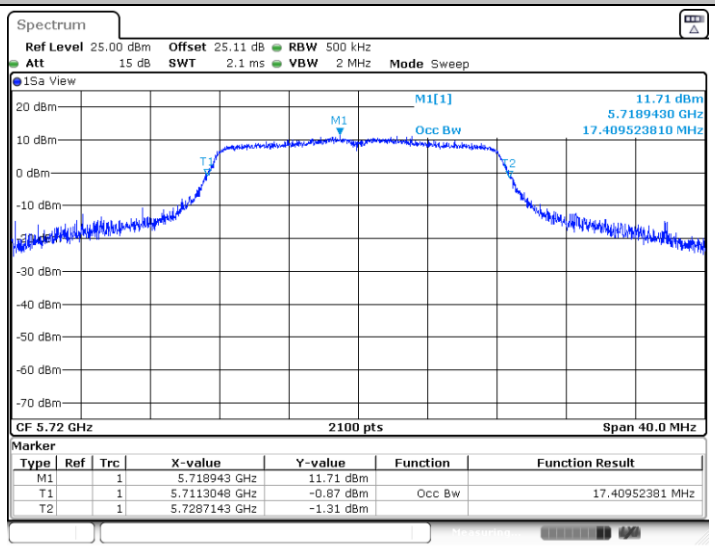
11A_Ant6_5720



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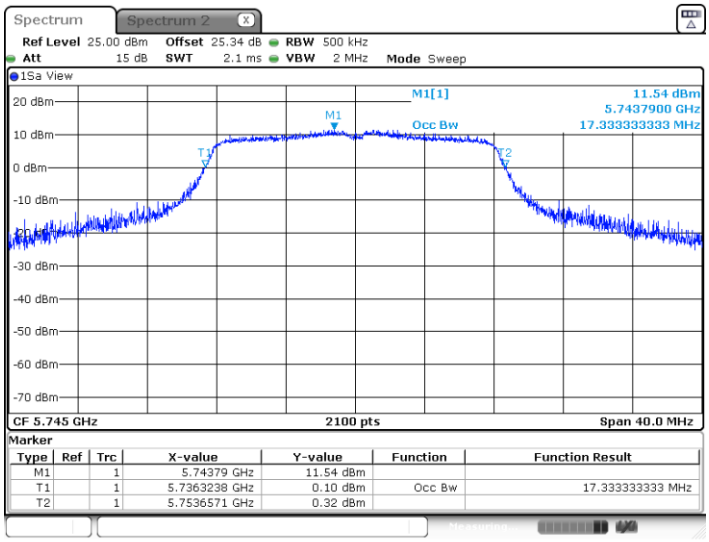

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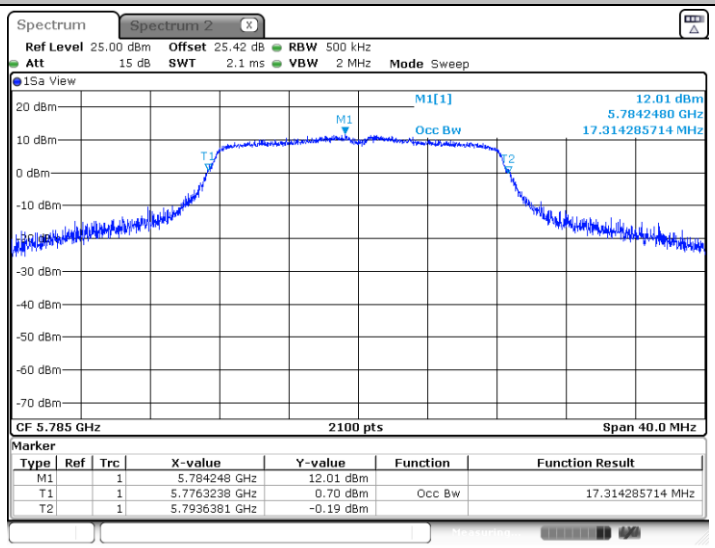

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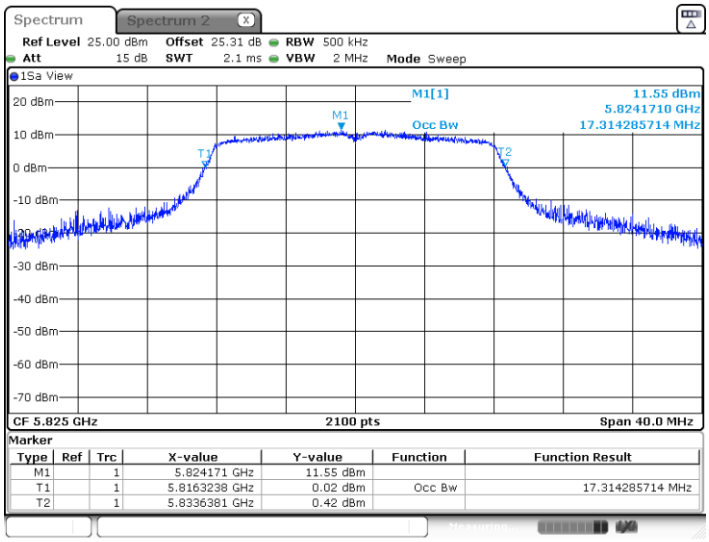

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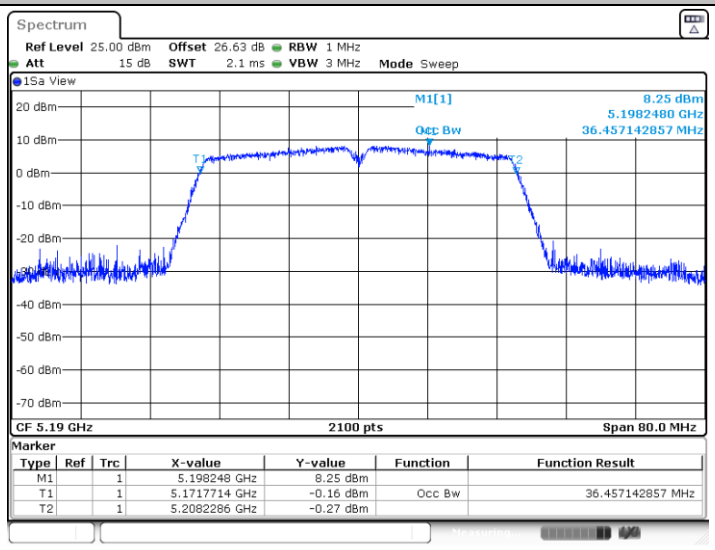

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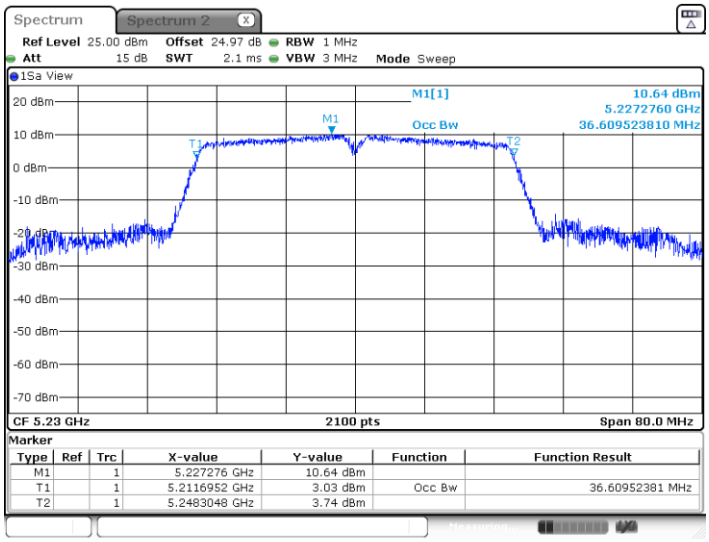

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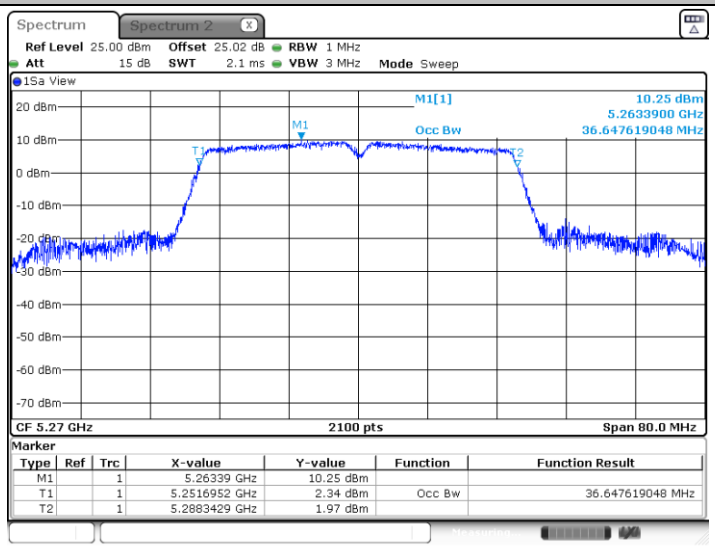

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