FCC RF Test Report

APPLICANT	:	Quectel Wireless Solutions Co., Ltd.
EQUIPMENT	:	Wi-Fi & Bluetooth Module
BRAND NAME	:	Quectel
MODEL NAME	:	FCS960K
FCC ID	:	XMR2023FCS960K
STANDARD	:	FCC Part 15 Subpart E §15.407
CLASSIFICATION	:	(NII) Unlicensed National Information Infrastructure
TEST DATE(S)	:	Jul. 20, 2023 ~ Aug. 24, 2023

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

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

Jason Jia

Approved by: Jason Jia

ACCREDITED Cert #5145.02

Sporton International Inc. (Kunshan)
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People's Republic of China

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR351903D	Rev. 01	Initial issue of report	Aug. 30, 2023

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 3.11 dB at 5465.840 MHz
3.5	15.207	AC Conducted Emission	15.207(a)	15.207(a)	Pass	Under limit 12.94 dB at 0.404 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	FCS960K
FCC ID	XMR2023FCS960K
SN Code	Conducted: E1N23EF1B000037 Conduction/ Radiation: E1N23EH14000007
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 ~ 5720 MHz 5745 MHz ~ 5825 MHz
Maximum Output Power to Antenna	**<5180 MHz ~ 5240 MHz>** 802.11a : 18.29 dBm / 0.0675 W 802.11n HT20 : 17.72 dBm / 0.0592W 802.11n HT40 : 15.32 dBm / 0.0340W 802.11ac VHT20: 17.81 dBm / 0.0604W 802.11ac VHT40: 15.36 dBm / 0.0344W 802.11ac VHT80: 12.86 dBm / 0.0193W 802.11ax HE20 : 18.19 dBm (0.0659 W) 802.11ax HE40 : 15.47 dBm (0.0352 W) 802.11ax HE80 : 13.05 dBm (0.0202 W) **<5260 MHz ~ 5320 MHz>** 802.11a : 18.39 dBm / 0.0690 W 802.11n HT20 : 17.66 dBm / 0.0583W 802.11n HT40 : 16.41 dBm / 0.0438W 802.11ac VHT20: 17.77 dBm / 0.0598W 802.11ac VHT40: 16.48 dBm / 0.0445W 802.11ac VHT80: 12.83 dBm / 0.0192W 802.11ax HE20 : 18.15 dBm (0.0653 W) 802.11ax HE40 : 16.57 dBm (0.0454 W) 802.11ax HE80 : 12.99 dBm (0.0199 W) **<5500 MHz ~ 5720 MHz >** 802.11a : 18.32 dBm / 0.0679 W 802.11n HT20 : 17.87 dBm / 0.0612W 802.11n HT40 : 18.31 dBm / 0.0678W 802.11ac VHT20: 18.00 dBm / 0.0631W 802.11ac VHT40: 18.33 dBm / 0.0681W 802.11ac VHT80: 16.37 dBm / 0.0434W 802.11ax HE20 : 18.34 dBm (0.0682 W) 802.11ax HE40 : 18.48 dBm (0.0705 W) 802.11ax HE80 : 16.63 dBm (0.0460 W) **<5745 MHz ~ 5825 MHz>** 802.11a : 18.70 dBm / 0.0741 W 802.11n HT20 : 18.26 dBm / 0.0670W 802.11n HT40 : 17.91 dBm / 0.0618W 802.11ac VHT20: 18.38 dBm / 0.0689W 802.11ac VHT40: 17.95 dBm / 0.0624W 802.11ac VHT80: 14.53 dBm / 0.0284W 802.11ax HE20 : 18.76 dBm (0.0752 W) 802.11ax HE40 : 18.21 dBm (0.0662 W) 802.11ax HE80 : 14.73 dBm (0.0297 W)
99% Occupied Bandwidth	**<5180 MHz ~ 5240 MHz>** 802.11a : 18.462 MHz 802.11ax HE20 : 19.700MHz 802.11ax HE40 : 38.681MHz 802.11ax HE80 : 78.002MHz **<5260 MHz ~ 5320 MHz>** 802.11a : 18.222 MHz

	802.11ax HE20 : 19.620MHz 802.11ax HE40 : 38.601MHz 802.11ax HE80 : 78.002MHz **<5500 MHz ~ 5720 MHz>** 802.11a : 19.181 MHz 802.11ax HE20 : 20.020MHz 802.11ax HE40 : 39.241MHz 802.11ax HE80 : 78.641MHz **<5745 MHz ~ 5825 MHz>** 802.11a : 19.580 MHz 802.11ax HE20 : 20.140MHz 802.11ax HE40 : 39.321MHz 802.11ax HE80 : 78.641MHz
Antenna Type / Gain	**<5180 MHz ~ 5240 MHz> :** Dipole Antenna with gain 1.14 dBi **<5260 MHz ~ 5320 MHz> :** Dipole Antenna with gain 1.00 dBi **<5500 MHz ~ 5720 MHz> :** Dipole Antenna with gain 0.60 dBi **<5745 MHz ~ 5825 MHz> :** 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) 802.11ax : OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM / 1024QAM)

Remark:

1. For 802.11n HT20 / ax HE20, 802.11n HT40 / ax HE40 and 802.11n HT80 / ax HE80 mode, the whole testing has assessed only 802.11ax HE20/HE40/HE80 by referring to their maximum conducted 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, all the other test case were performed with full RU with its maximum power/PSD.

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 "*" were 802.11n HT40 and 802.11ac VHT40 and 802.11ax HE40.
2. The above Frequency and Channel in "#" were 802.11ac VHT80 and 802.11ax HE80.

2.2 Test Mode

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

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

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

Ch. #		U-NII-1	U-NII-2A	U-NII-2C	U-NII-3
		802.11a	802.11a	802.11a	802.11a
L	Low	36	52	100	149
M	Middle	44	60	116	157
H	High	48	64	140	165
Straddle		-	-	144	-

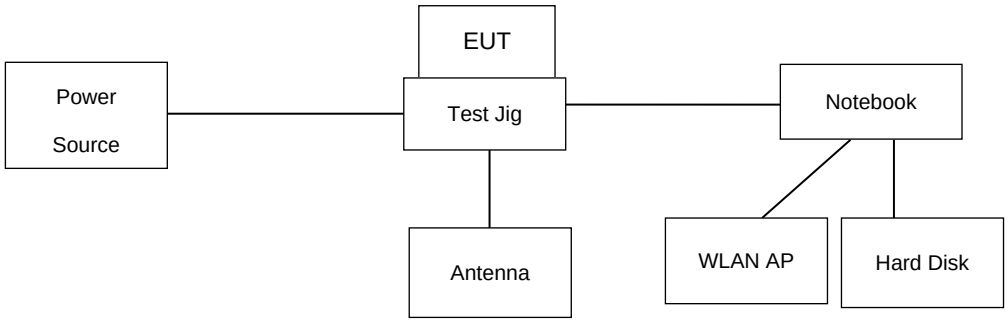
Ch. #		U-NII-1	U-NII-2A	U-NII-2C	U-NII-3
		802.11ax HE20	802.11ax HE20	802.11ax HE20	802.11ax HE20
L	Low	36	52	100	149
M	Middle	44	60	116	157
H	High	48	64	140	165
Straddle		-	-	144	-

Ch. #		U-NII-1	U-NII-2A	U-NII-2C	U-NII-3
		802.11ax HE40	802.11ax HE40	802.11ax HE40	802.11ax HE40
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
		802.11ax HE80	802.11ax HE80	802.11ax HE80	802.11ax HE80
L	Low	-	-	106	-
M	Middle	42	58	-	155
H	High	-	-	-	-
Straddle		-	-	138	-

2.3 Connection Diagram of Test System

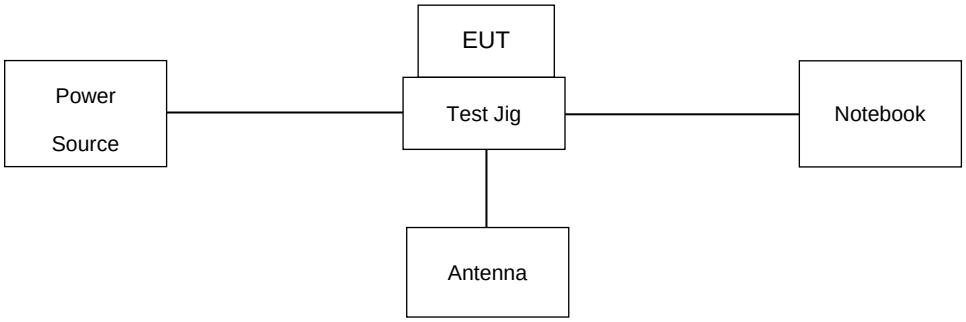
AC Conducted Emission:



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.	WLAN AP	D-link	DIR-655	KA21R655B1	N/A	Unshielded,1.8m
2.	Notebook	Lenovo	G480	QDS-BRCM1050I	N/A	AC I/P: Unshielded, 1.8 m DC O/P: Shielded, 1.8 m
3.	Hard Disk	Lenovo	F310	DoC	Shielded, 1.2m	N/A
4.	Test Jig	N/A	N/A	N/A	N/A	N/A
5.	EVB Adapter	N/A	N/A	N/A	N/A	N/A
6.	Antenna	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 5.75 dB and 10dB attenuator.

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

= 5.75 + 10 = 15.75 (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

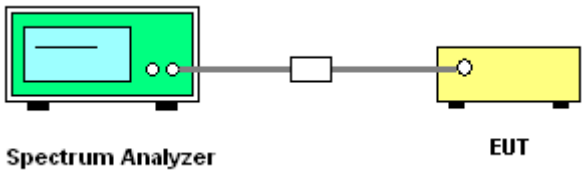
The measuring equipment is listed in the section 4 of this test report.

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

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 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

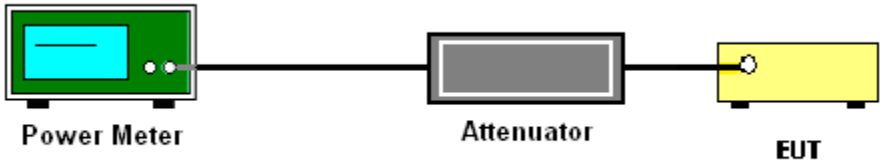
The testing follows Method PM of FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.

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 5.15 - 5.25 GHz, 5.25 - 5.35 GHz, and 5.47 - 5.725 GHz

 # 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.

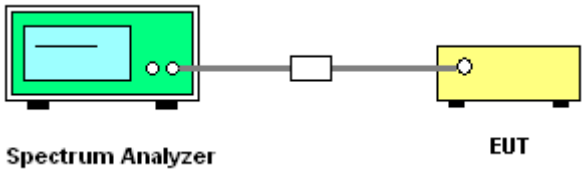
For devices operating in the band 5.725 - 5.85 GHz

 # 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.

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

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

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

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

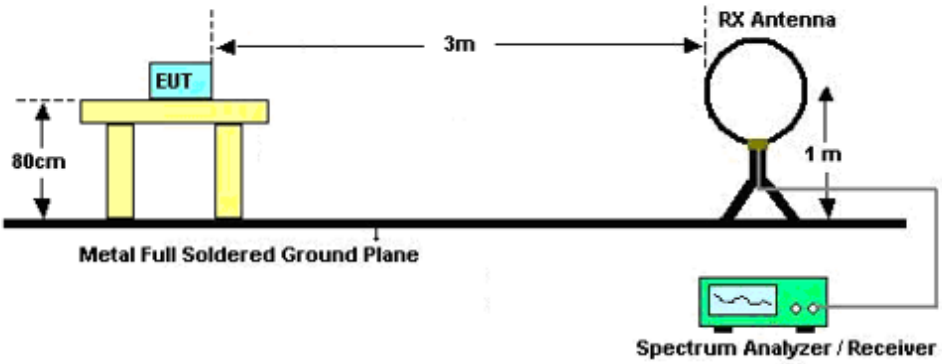
   (3) Procedures for Average Unwanted Emissions Measurements Above 1000MHz

   - 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.

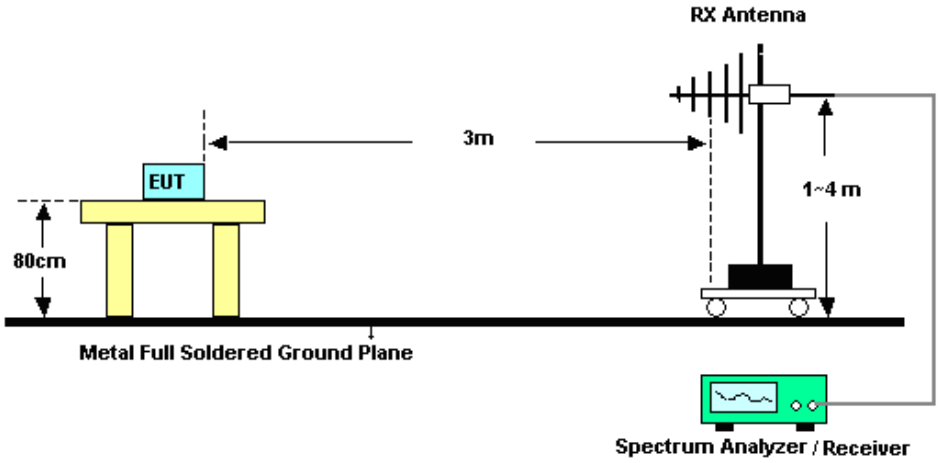
2. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
3. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
4. The antenna is a broadband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

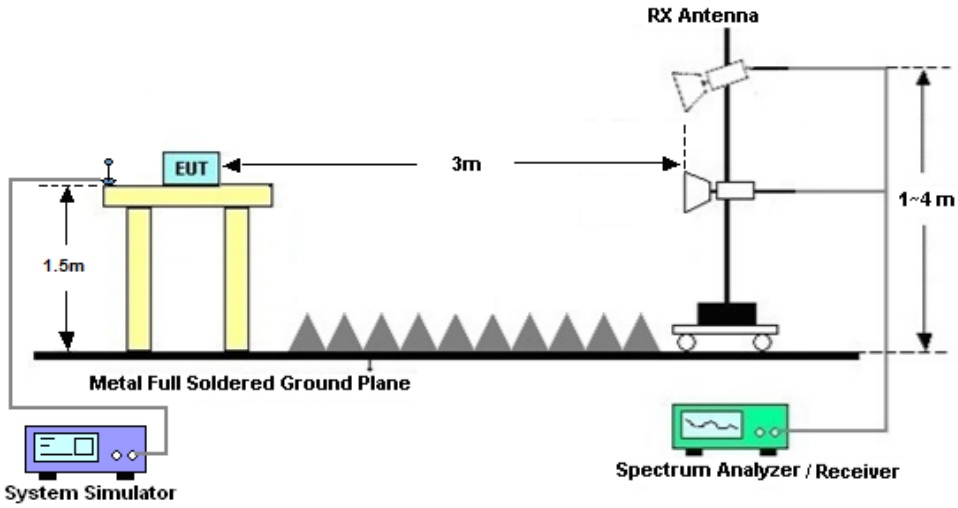
For radiated emissions below 30MHz



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.

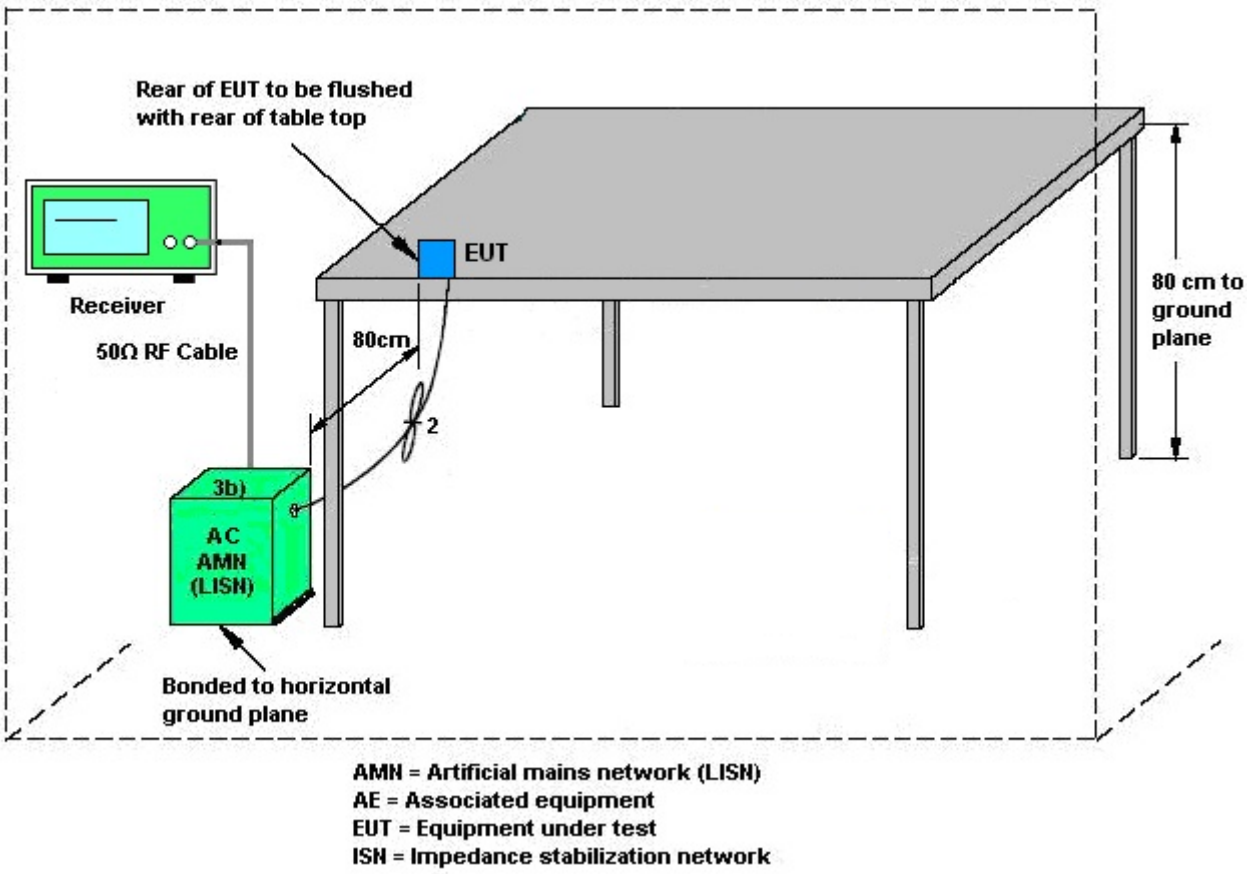
3.5.2 Measuring Instruments

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

Non-standard antenna connector 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. 12, 2022	Jul. 27, 2023~ Aug. 08, 2023	Oct. 11, 2023	Conducted (TH01-KS)
Pulse Power Senor	Anritsu	MA2411B	0917070	300MHz~40GHz	Jan. 05, 2023	Jul. 27, 2023~ Aug. 08, 2023	Jan. 04, 2024	Conducted (TH01-KS)
Power Meter	Anritsu	ML2495A	1005002	50MHz Bandwidth	Jan. 05, 2023	Jul. 27, 2023~ Aug. 08, 2023	Jan. 04, 2024	Conducted (TH01-KS)
EMI Test Receiver	Keysight	N9038A	MY56400004	3Hz~8.5GHz;Max 30dBm	Oct. 13, 2022	Jul. 20, 2023~ Aug. 24, 2023	Oct. 12, 2023	Radiation (03CH03-KS)
EXA Spectrum Analyzer	Keysight	N9010A	MY55150244	10Hz-44GHz	May 15, 2023	Jul. 20, 2023~ Aug. 24, 2023	May 14, 2024	Radiation (03CH03-KS)
Loop Antenna	R&S	HFH2-Z2	100321	9kHz~30MHz	Oct. 16, 2022	Jul. 20, 2023~ Aug. 24, 2023	Oct. 15, 2023	Radiation (03CH03-KS)
Bilog Antenna	TeseQ	CBL6112D	23182	30MHz-1GHz	Dec. 23, 2022	Jul. 20, 2023~ Aug. 24, 2023	Dec. 22, 2023	Radiation (03CH03-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	75957	1GHz~18GHz	Nov. 15, 2022	Jul. 20, 2023~ Aug. 24, 2023	Nov. 14, 2023	Radiation (03CH03-KS)
SHF-EHF Horn	com-power	AH-840	101116	18GHz~40GHz	Oct. 17, 2022	Jul. 20, 2023~ Aug. 24, 2023	Oct. 16, 2023	Radiation (03CH03-KS)
Amplifier	SONOMA	310N	413740	30MHz ~1000MHz	Jan. 05, 2023	Jul. 20, 2023~ Aug. 24, 2023	Jan. 04, 2024	Radiation (03CH03-KS)
Amplifier	EM	EM18G40GA	060851	18~40GHz	Jan. 05, 2023	Jul. 20, 2023~ Aug. 24, 2023	Jan. 04, 2024	Radiation (03CH03-KS)
high gain Amplifier	MITEQ	AMF-7D-00101800-30-10P	2082394	1Ghz-18Ghz	Jan. 05, 2023	Jul. 20, 2023~ Aug. 24, 2023	Jan. 04, 2024	Radiation (03CH03-KS)
Amplifier	Keysight	83017A	MY53270319	1GHz~26.5GHz	Oct. 12, 2022	Jul. 20, 2023~ Aug. 24, 2023	Oct. 11, 2023	Radiation (03CH03-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Jul. 20, 2023~ Aug. 24, 2023	NCR	Radiation (03CH03-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Jul. 20, 2023~ Aug. 24, 2023	NCR	Radiation (03CH03-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Jul. 20, 2023~ Aug. 24, 2023	NCR	Radiation (03CH03-KS)
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz;	May 16, 2023	Aug. 03, 2023	May 15, 2024	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060103	9kHz~30MHz	Oct. 13, 2022	Aug. 03, 2023	Oct. 12, 2023	Conduction (CO01-KS)
AC LISN	MessTec	AN3016	060105	9kHz~30MHz	May 16, 2023	Aug. 03, 2023	May 15, 2024	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP000000811	AC 0V~300V, 45Hz~1000Hz	Oct. 12, 2022	Aug. 03, 2023	Oct. 11, 2023	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

Test Item	Uncertainty
Conducted Power	±0.46 dB
Conducted Emissions	±2.26 dB
Occupied Channel Bandwidth	±0.1 %
Conducted Power Spectral Density	±0.88 dB

Uncertainty of Conducted Emission Measurement (150 kHz ~ 30 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.94dB

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	4.0dB

Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	5.0dB

Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	5.0dB

Appendix A. Conducted Test Results

A1. Conducted Test Results

Test Engineer:	Jiang Jun	Temperature:	21~25	°C
Test Date:	2023.07.27~2023.08.08	Relative Humidity:	51~54	%

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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	Power Setting	Restriction
					Ant 1	Ant 1	Ant 1	Ant 1			Ant 1	
11a	6Mbps	1	36	5180	2.36	15.55	24.00	1.14		Pass	16.5	Target
11a	6Mbps	1	44	5220	2.36	18.18	24.00	1.14		Pass	19	Target
11a	6Mbps	1	48	5240	2.36	18.29	24.00	1.14		Pass	19	Target
HT20	MCS0	1	36	5180	1.50	17.67	24.00	1.14		Pass	19	Target
HT20	MCS0	1	44	5220	1.50	17.72	24.00	1.14		Pass	19	Target
HT20	MCS0	1	48	5240	1.50	17.67	24.00	1.14		Pass	19	Target
HT40	MCS0	1	38	5190	1.67	13.02	24.00	1.14		Pass	14.5	Target
HT40	MCS0	1	46	5230	1.67	15.32	24.00	1.14		Pass	17.5	Target
VHT20	MCS0	1	36	5180	1.50	17.77	24.00	1.14		Pass	19	Target
VHT20	MCS0	1	44	5220	1.50	17.81	24.00	1.14		Pass	19	Target
VHT20	MCS0	1	48	5240	1.50	17.80	24.00	1.14		Pass	19	Target
VHT40	MCS0	1	38	5190	1.65	13.06	24.00	1.14		Pass	14.5	Target
VHT40	MCS0	1	46	5230	1.65	15.36	24.00	1.14		Pass	17.5	Target
VHT80	MCS0	1	42	5210	0.91	12.86	24.00	1.14		Pass	14.5	Target

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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	Power Setting	Restriction
						Ant 1	Ant 1	Ant 1	Ant 1			Ant 1	
HE20	MCS0	1	36	5180	Full	1.02	18.12	24.00	1.14		Pass	19	Target
HE20	MCS0	1	36	5180	26/0	8.18	9.34	24.00	1.14		Pass	-15	Target
HE20	MCS0	1	36	5180	52/37	8.18	11.71	24.00	1.14		Pass	-10	Target
HE20	MCS0	1	36	5180	106/53	8.18	14.40	24.00	1.14		Pass	-7	Target
HE20	MCS0	1	44	5220	Full	1.02	18.19	24.00	1.14		Pass	19	Target
HE20	MCS0	1	44	5220	26/0	8.18	8.98	24.00	1.14		Pass	-17	Target
HE20	MCS0	1	44	5220	52/37	8.18	11.18	24.00	1.14		Pass	-12	Target
HE20	MCS0	1	44	5220	106/53	8.18	13.83	24.00	1.14		Pass	-8	Target
HE20	MCS0	1	48	5240	Full	1.02	18.16	24.00	1.14		Pass	19	Target
HE20	MCS0	1	48	5240	26/8	8.18	9.07	24.00	1.14		Pass	-17	Target
HE20	MCS0	1	48	5240	52/40	8.18	11.21	24.00	1.14		Pass	-12	Target
HE20	MCS0	1	48	5240	106/54	8.18	13.60	24.00	1.14		Pass	-9	Target
HE40	MCS0	1	38	5190	Full	1.05	13.17	24.00	1.14		Pass	14.5	Target
HE40	MCS0	1	46	5230	Full	1.05	15.47	24.00	1.14		Pass	17.5	Target
HE80	MCS0	1	42	5210	Full	1.06	13.05	24.00	1.14		Pass	14.5	Target

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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	Power Setting	Restriction
					Ant 1	Ant 1	Ant 1	Ant 1			Ant 1	
11a	6Mbps	1	52	5260	2.36	18.39	23.98	1.00	26.9897	Pass	19	Target
11a	6Mbps	1	60	5300	2.36	18.34	23.98	1.00	26.9897	Pass	19	Target
11a	6Mbps	1	64	5320	2.36	14.27	23.98	1.00	26.9897	Pass	14	Target
HT20	MCS0	1	52	5260	1.50	17.64	23.98	1.00	26.9897	Pass	19	Target
HT20	MCS0	1	60	5300	1.50	17.66	23.98	1.00	26.9897	Pass	19	Target
HT20	MCS0	1	64	5320	1.50	13.41	23.98	1.00	26.9897	Pass	14.5	Target
HT40	MCS0	1	54	5270	1.67	16.41	23.98	1.00	26.9897	Pass	18.5	Target
HT40	MCS0	1	62	5310	1.67	13.02	23.98	1.00	26.9897	Pass	14.5	Target
VHT20	MCS0	1	52	5260	1.50	17.76	23.98	1.00	26.9897	Pass	19	Target
VHT20	MCS0	1	60	5300	1.50	17.77	23.98	1.00	26.9897	Pass	19	Target
VHT20	MCS0	1	64	5320	1.50	13.44	23.98	1.00	26.9897	Pass	14.5	Target
VHT40	MCS0	1	54	5270	1.65	16.48	23.98	1.00	26.9897	Pass	18.5	Target
VHT40	MCS0	1	62	5310	1.65	13.04	23.98	1.00	26.9897	Pass	14.5	Target
VHT80	MCS0	1	58	5290	0.91	12.83	23.98	1.00	26.9897	Pass	14.5	Target

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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	Power Setting	Restriction
						Ant 1	Ant 1	Ant 1	Ant 1			Ant 1	
HE20	MCS0	1	52	5260	Full	1.02	18.08	23.98	1.00	26.9897	Pass	19	Target
HE20	MCS0	1	52	5260	26/0	8.18	8.89	23.98	1.00	26.9897	Pass	-15	Target
HE20	MCS0	1	52	5260	52/37	8.18	11.75	23.98	1.00	26.9897	Pass	-10	Target
HE20	MCS0	1	52	5260	106/53	8.18	14.47	23.98	1.00	26.9897	Pass	-7	Target
HE20	MCS0	1	60	5300	Full	1.02	18.15	23.98	1.00	26.9897	Pass	19	Target
HE20	MCS0	1	60	5300	26/0	8.18	8.96	23.98	1.00	26.9897	Pass	-17	Target
HE20	MCS0	1	60	5300	52/37	8.18	11.20	23.98	1.00	26.9897	Pass	-11	Target
HE20	MCS0	1	60	5300	106/53	8.18	13.89	23.98	1.00	26.9897	Pass	-8	Target
HE20	MCS0	1	64	5320	Full	1.02	13.60	23.98	1.00	26.9897	Pass	14.5	Target
HE20	MCS0	1	64	5320	26/8	8.18	3.47	23.98	1.00	26.9897	Pass	-28	Target
HE20	MCS0	1	64	5320	52/40	8.18	5.90	23.98	1.00	26.9897	Pass	-23	Target
HE20	MCS0	1	64	5320	106/54	8.18	9.05	23.98	1.00	26.9897	Pass	-18	Target
HE40	MCS0	1	54	5270	Full	1.05	16.57	23.98	1.00	26.9897	Pass	18.5	Target
HE40	MCS0	1	62	5310	Full	1.05	13.16	23.98	1.00	26.9897	Pass	14.5	Target
HE80	MCS0	1	58	5290	Full	1.06	12.99	23.98	1.00	26.9897	Pass	14.5	Target

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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	Power Setting	Restriction
					Ant 1	Ant 1	Ant 1	Ant 1			Ant 1	
11a	6Mbps	1	100	5500	2.36	18.03	23.98	0.60	26.9897	Pass	19	Target
11a	6Mbps	1	116	5580	2.36	18.07	23.98	0.60	26.9897	Pass	20	Target
11a	6Mbps	1	136	5680	2.36	14.97	23.98	0.60	26.9897	Pass	16	Target
11a	6Mbps	1	140	5700	2.36	14.21	23.98	0.60	26.9897	Pass	15	Target
HT20	MCS0	1	100	5500	1.50	17.72	23.98	0.60	26.9897	Pass	19	Target
HT20	MCS0	1	116	5580	1.50	17.50	23.98	0.60	26.9897	Pass	20	Target
HT20	MCS0	1	136	5680	1.50	14.72	23.98	0.60	26.9897	Pass	16	Target
HT20	MCS0	1	140	5700	1.50	12.05	23.98	0.60	26.9897	Pass	14	Target
HT40	MCS0	1	102	5510	1.67	17.63	23.98	0.60	26.9897	Pass	19	Target
HT40	MCS0	1	110	5550	1.67	17.95	23.98	0.60	26.9897	Pass	19	Target
HT40	MCS0	1	134	5670	1.67	13.86	23.98	0.60	26.9897	Pass	15.5	Target
VHT20	MCS0	1	100	5500	1.50	17.85	23.98	0.60	26.9897	Pass	19	Target
VHT20	MCS0	1	116	5580	1.50	17.62	23.98	0.60	26.9897	Pass	20	Target
VHT20	MCS0	1	136	5680	1.50	14.76	23.98	0.60	26.9897	Pass	16	Target
VHT20	MCS0	1	140	5700	1.50	12.11	23.98	0.60	26.9897	Pass	14	Target
VHT40	MCS0	1	102	5510	1.65	17.65	23.98	0.60	26.9897	Pass	19	Target
VHT40	MCS0	1	110	5550	1.65	17.95	23.98	0.60	26.9897	Pass	19	Target
VHT40	MCS0	1	134	5670	1.65	13.90	23.98	0.60	26.9897	Pass	15.5	Target
VHT80	MCS0	1	106	5530	0.91	15.97	23.98	0.60	26.9897	Pass	18	Target
VHT80	MCS0	1	122	5610	0.91	16.13	23.98	0.60	26.9897	Pass	17	Target

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	Power Setting	Restriction
					Ant 1	Ant 1	Ant 1	Ant 1			Ant 1	
11a	6Mbps	1	144	5720	2.36	18.32	23.98	0.60	26.9897	Pass	19	Target
HT20	MCS0	1	144	5720	1.50	17.87	23.98	0.60	26.9897	Pass	19	Target
HT40	MCS0	1	142	5710	1.67	18.31	23.98	0.60	26.9897	Pass	19	Target
VHT20	MCS0	1	144	5720	1.50	18.00	23.98	0.60	26.9897	Pass	19	Target
VHT40	MCS0	1	142	5710	1.65	18.33	23.98	0.60	26.9897	Pass	19	Target
VHT80	MCS0	1	138	5690	0.91	16.37	23.98	0.60	26.9897	Pass	18	Target

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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	Power Setting	Restriction
						Ant 1	Ant 1	Ant 1	Ant 1			Ant 1	
HE20	MCS0	1	100	5500	Full	1.02	18.17	23.98	0.60	26.99	Pass	19	Target
HE20	MCS0	1	100	5500	26/0	8.18	8.84	23.98	0.60	26.99	Pass	-15	Target
HE20	MCS0	1	100	5500	52/37	8.18	11.61	23.98	0.60	26.99	Pass	-9	Target
HE20	MCS0	1	100	5500	106/53	8.18	14.34	23.98	0.60	26.99	Pass	-4	Target
HE20	MCS0	1	116	5580	Full	1.02	17.96	23.98	0.60	26.99	Pass	20	Target
HE20	MCS0	1	116	5580	26/0	8.18	8.04	23.98	0.60	26.99	Pass	-14	Target
HE20	MCS0	1	116	5580	52/37	8.18	11.06	23.98	0.60	26.99	Pass	-9	Target
HE20	MCS0	1	116	5580	106/53	8.18	13.75	23.98	0.60	26.99	Pass	-4	Target
HE20	MCS0	1	136	5680	Full	1.02	14.83	23.98	0.60	26.99	Pass	16	Target
HE20	MCS0	1	140	5700	Full	1.02	12.32	23.98	0.60	26.99	Pass	14	Target
HE20	MCS0	1	140	5700	26/8	8.18	3.48	23.98	0.60	26.99	Pass	-21	Target
HE20	MCS0	1	140	5700	52/40	8.18	6.10	23.98	0.60	26.99	Pass	-15	Target
HE20	MCS0	1	140	5700	106/54	8.18	9.40	23.98	0.60	26.99	Pass	-10	Target
HE40	MCS0	1	102	5510	Full	1.05	17.91	23.98	0.60	26.99	Pass	19	Target
HE40	MCS0	1	110	5550	Full	1.05	18.10	23.98	0.60	26.99	Pass	19	Target
HE40	MCS0	1	134	5670	Full	1.05	14.02	23.98	0.60	26.99	Pass	15.5	Target
HE80	MCS0	1	106	5530	Full	1.06	16.24	23.98	0.60	26.99	Pass	18	Target
HE80	MCS0	1	122	5610	Full	1.06	16.42	23.98	0.60	26.99	Pass	17	Target

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	Power Setting	Restriction
						Ant 1	Ant 1	Ant 1	Ant 1			Ant 1	
HE20	MCS0	1	144	5720	Full	1.02	18.34	23.98	0.60	26.99	Pass	19	Target
HE20	MCS0	1	144	5720	26/8	8.18	8.69	23.98	0.60	26.99	Pass	-10	Target
HE20	MCS0	1	144	5720	52/40	8.18	9.38	23.98	0.60	26.99	Pass	-5	Target
HE20	MCS0	1	144	5720	106/54	8.18	14.35	23.98	0.60	26.99	Pass	0	Target
HE40	MCS0	1	142	5710	Full	1.05	18.48	23.98	0.60	26.99	Pass	19	Target
HE80	MCS0	1	138	5690	Full	1.06	16.63	23.98	0.60	26.99	Pass	18	Target

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	Power Setting	Restriction
					Ant 1	Ant 1	Ant 1	Ant 1		Ant 1	
11a	6Mbps	1	149	5745	2.36	18.70	30.00	0.95	Pass	19	Target
11a	6Mbps	1	157	5785	2.36	18.35	30.00	0.95	Pass	19	Target
11a	6Mbps	1	165	5825	2.36	15.75	30.00	0.95	Pass	17.5	Target
HT20	MCS0	1	149	5745	1.50	18.26	30.00	0.95	Pass	19	Power
HT20	MCS0	1	157	5785	1.50	17.97	30.00	0.95	Pass	19	Target
HT20	MCS0	1	165	5825	1.50	17.45	30.00	0.95	Pass	19	Target
HT40	MCS0	1	151	5755	1.67	17.55	30.00	0.95	Pass	18.5	Target
HT40	MCS0	1	159	5795	1.67	17.91	30.00	0.95	Pass	19	Target
VHT20	MCS0	1	149	5745	1.50	18.38	30.00	0.95	Pass	19	Target
VHT20	MCS0	1	157	5785	1.50	18.04	30.00	0.95	Pass	19	Target
VHT20	MCS0	1	165	5825	1.50	17.59	30.00	0.95	Pass	19	Target
VHT40	MCS0	1	151	5755	1.65	17.59	30.00	0.95	Pass	18.5	Target
VHT40	MCS0	1	159	5795	1.65	17.95	30.00	0.95		19	Target
VHT80	MCS0	1	155	5775	0.91	14.53	30.00	0.95	Pass	16.5	Target

Report Number : FR351903D

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	Power Setting	Restriction
						Ant 1	Ant 1	Ant 1	Ant 1		Ant 1	
HE20	MCS0	1	149	5745	Full	1.02	18.76	30.00	0.95	Pass	19	Target
HE20	MCS0	1	149	5745	26/0	8.18	9.73	30.00	0.95	Pass	-8	Target
HE20	MCS0	1	149	5745	52/37	8.18	12.44	30.00	0.95	Pass	-2	Target
HE20	MCS0	1	149	5745	106/53	8.18	15.10	30.00	0.95	Pass	3	Target
HE20	MCS0	1	157	5785	Full	1.02	18.40	30.00	0.95	Pass	19	Target
HE20	MCS0	1	157	5785	26/0	8.18	9.34	30.00	0.95	Pass	-8	Target
HE20	MCS0	1	157	5785	52/37	8.18	12.16	30.00	0.95	Pass	-2	Target
HE20	MCS0	1	157	5785	106/53	8.18	14.91	30.00	0.95	Pass	3	Target
HE20	MCS0	1	165	5825	Full	1.02	18.00	30.00	0.95	Pass	19	Target
HE20	MCS0	1	165	5825	26/8	8.18	7.97	30.00	0.95	Pass	-8	Target
HE20	MCS0	1	165	5825	52/40	8.18	10.69	30.00	0.95	Pass	-2	Target
HE20	MCS0	1	165	5825	106/54	8.18	13.78	30.00	0.95	Pass	3	Target
HE40	MCS0	1	151	5755	Full	1.05	17.68	30.00	0.95	Pass	18.5	Target
HE40	MCS0	1	159	5795	Full	1.05	18.21	30.00	0.95	Pass	19	Target
HE80	MCS0	1	155	5775	Full	1.06	14.73	30.00	0.95	Pass	16.5	Target

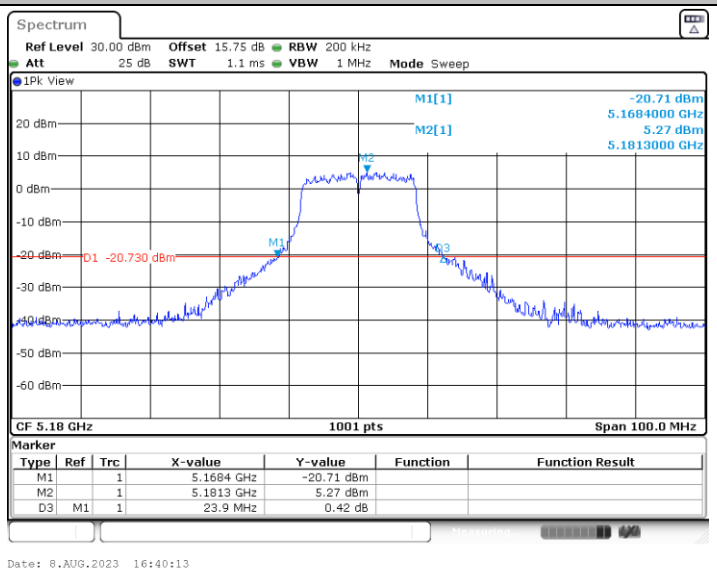
Emission Bandwidth

Test Result

TestMode	Antenna	Freq(MHz)	26dB EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A	Ant1	5180	23.90	5168.40	5192.30	---	---
		5220	33.50	5203.80	5237.30	---	---
		5240	32.90	5224.10	5257.00	---	---
		5260	32.50	5244.10	5276.60	---	---
		5300	34.40	5283.30	5317.70	---	---
		5320	25.20	5307.40	5332.60	---	---
		5500	27.20	5486.60	5513.80	---	---
		5580	33.40	5564.60	5598.00	---	---
		5680	25.70	5667.00	5692.70	---	---
		5700	25.60	5687.60	5713.20	---	---
		5720	26.10	5707.00	5733.10	---	---
		5745	26.80	5732.00	5758.80	---	---
		5785	26.50	5771.70	5798.20	---	---
		5825	26.30	5812.00	5838.30	---	---
11AX20SISO	Ant1	5180	32.70	5165.80	5198.50	---	---
		5220	34.70	5204.70	5239.40	---	---
		5240	36.50	5222.10	5258.60	---	---
		5260	34.00	5242.80	5276.80	---	---
		5300	35.90	5282.90	5318.80	---	---
		5320	25.50	5307.40	5332.90	---	---
		5500	27.20	5486.70	5513.90	---	---
		5580	31.00	5564.30	5595.30	---	---
		5680	26.30	5667.30	5693.60	---	---
		5700	25.90	5687.40	5713.30	---	---
		5720	26.60	5706.80	5733.40	---	---
		5745	31.70	5728.60	5760.30	---	---
		5785	27.00	5771.60	5798.60	---	---
		5825	26.80	5811.80	5838.60	---	---
11AX40SISO	Ant1	5190	44.60	5168.20	5212.80	---	---
		5230	49.60	5205.80	5255.40	---	---
		5270	69.00	5240.20	5309.20	---	---
		5310	45.00	5287.60	5332.60	---	---
		5510	50.00	5486.60	5536.60	---	---
		5550	53.40	5526.40	5579.80	---	---
		5670	46.40	5646.80	5693.20	---	---
		5710	49.40	5687.00	5736.40	---	---
		5755	46.60	5731.60	5778.20	---	---
		5795	46.20	5772.20	5818.40	---	---
11AX80SISO	Ant1	5210	87.20	5167.20	5254.40	---	---
		5290	84.40	5248.40	5332.80	---	---
		5530	88.00	5486.80	5574.80	---	---
		5610	88.00	5566.00	5654.00	---	---
		5690	87.20	5646.80	5734.00	---	---
		5775	89.20	5729.80	5819.00	---	---

Test Graphs

11A_Ant1_5180



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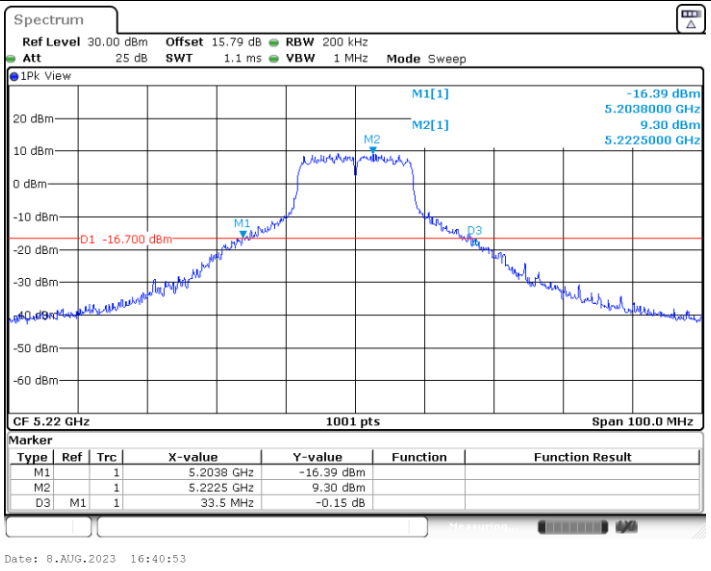

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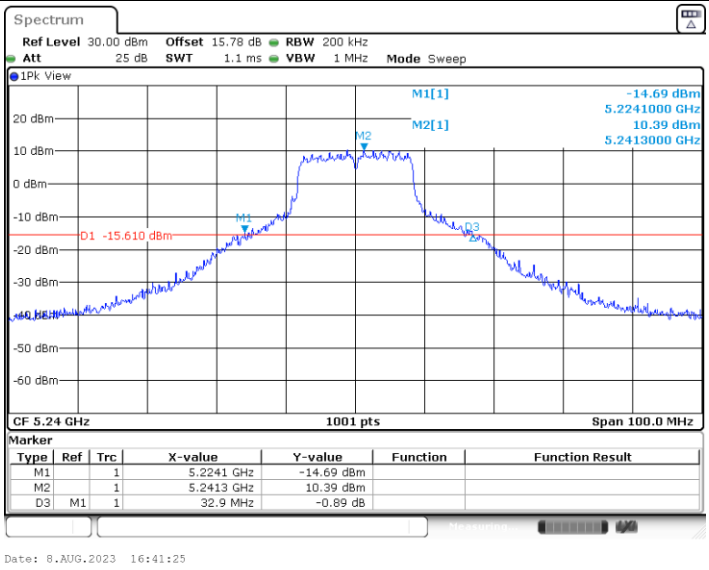

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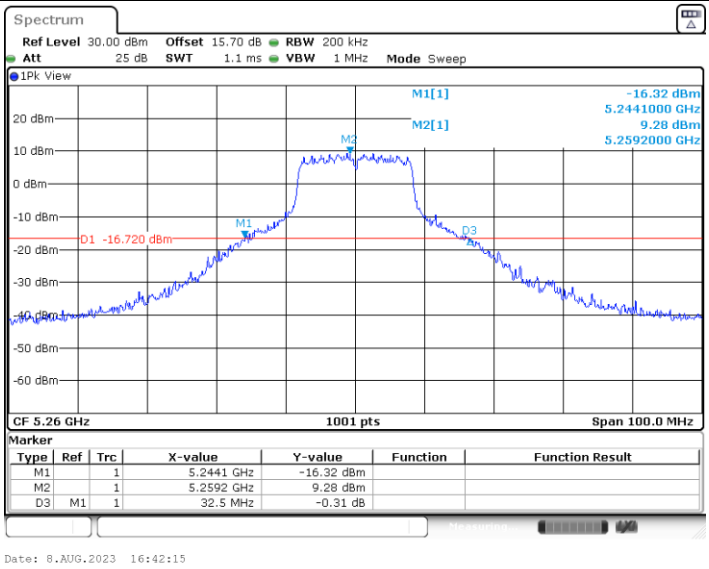

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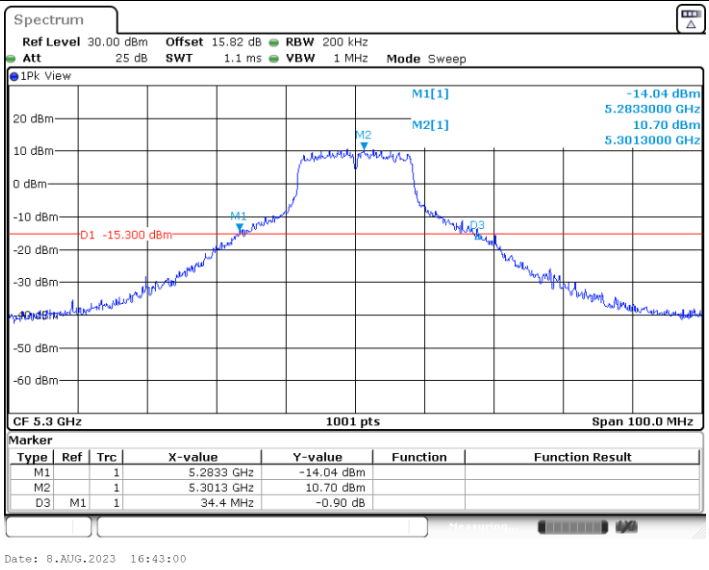

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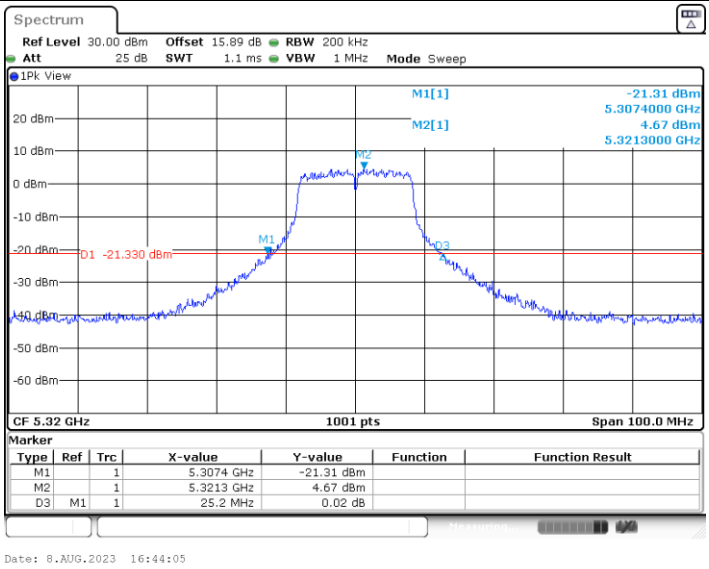

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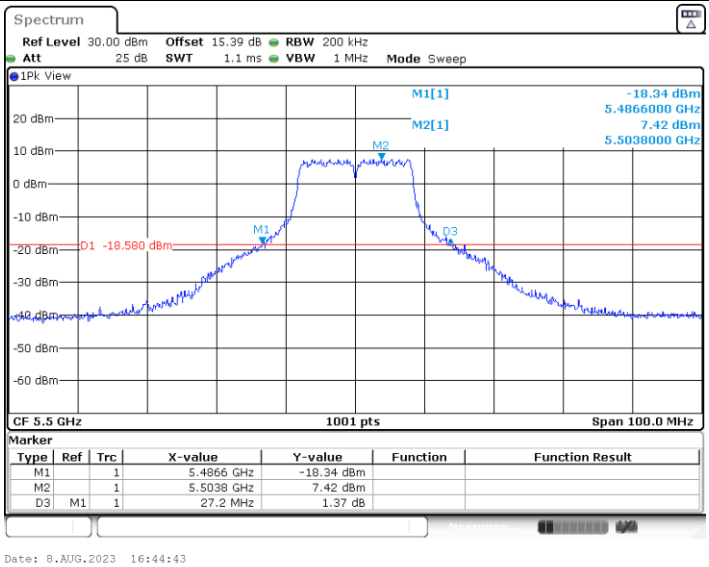

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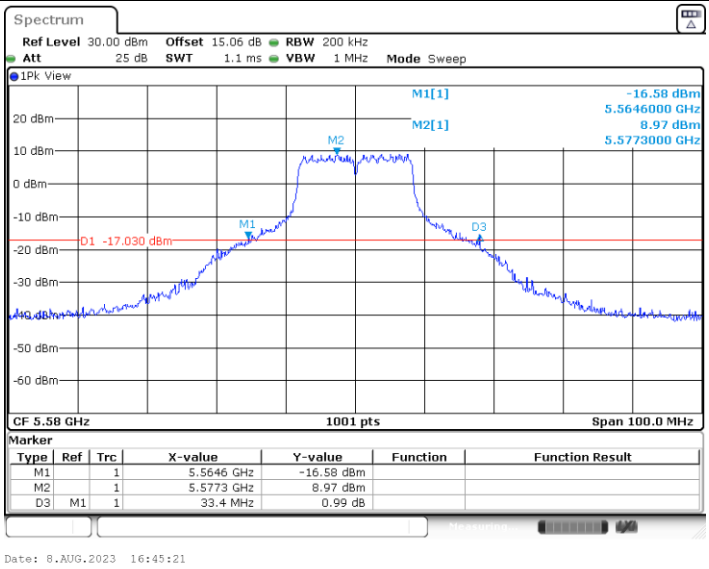

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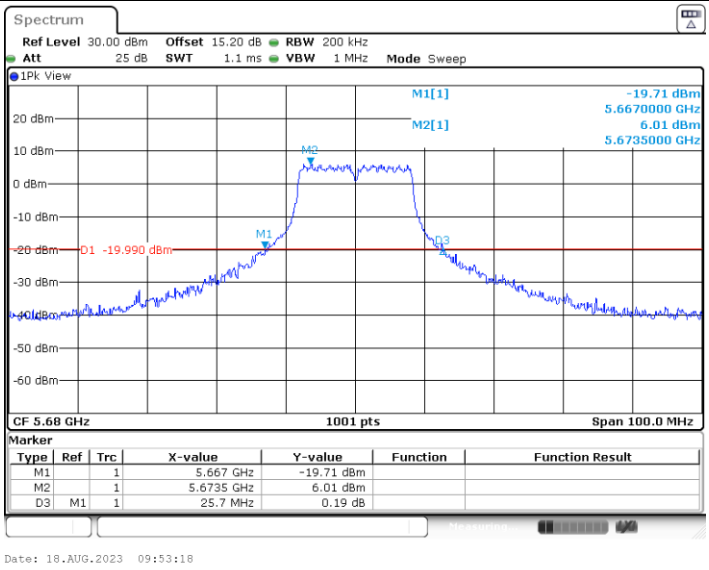

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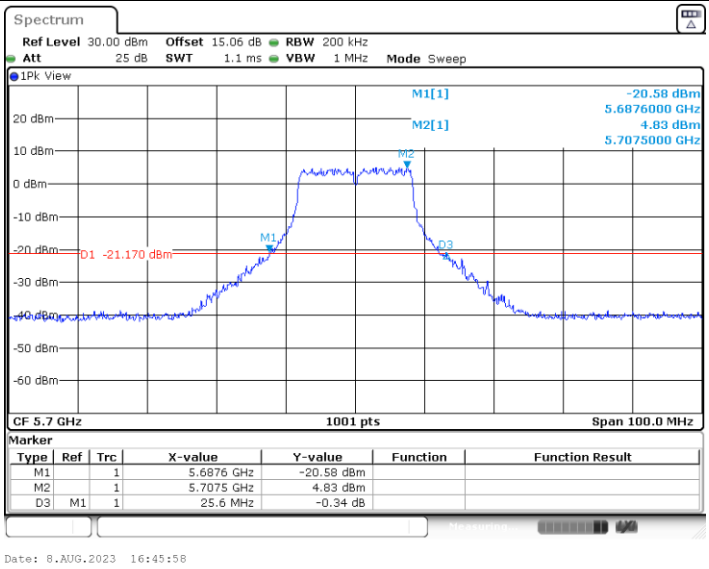

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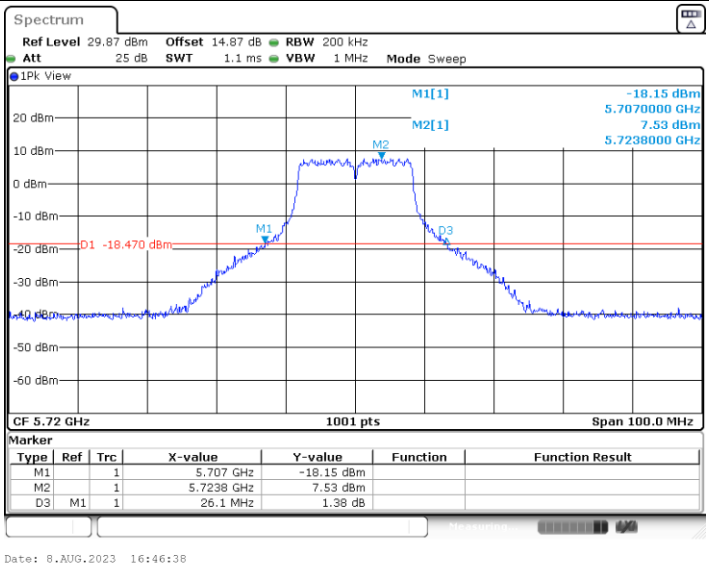

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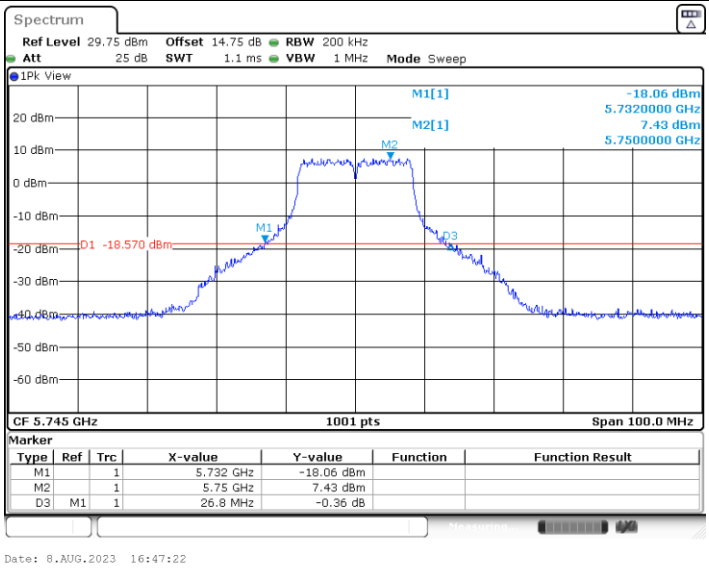

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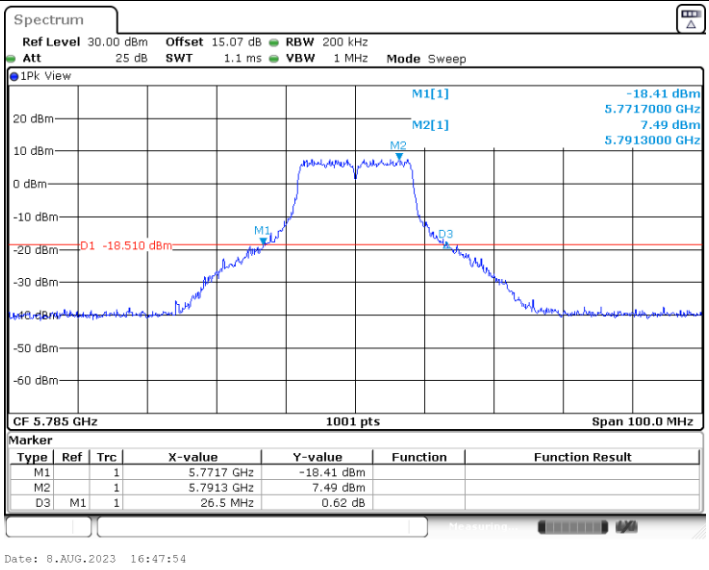

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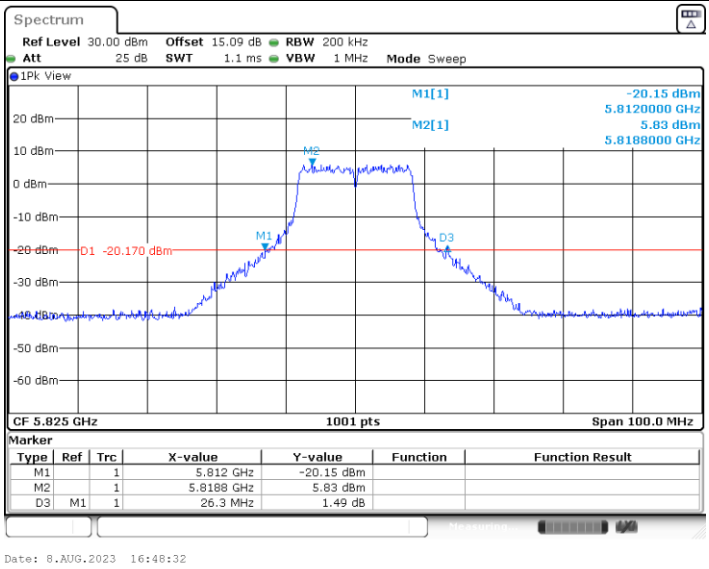

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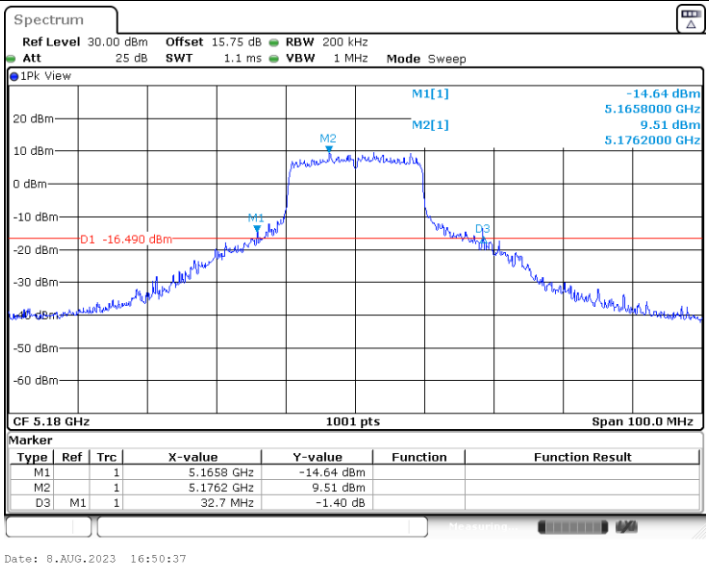

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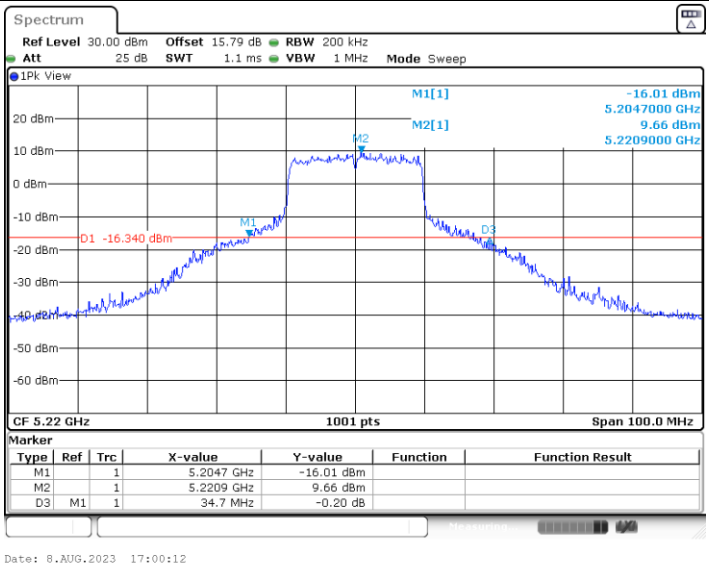

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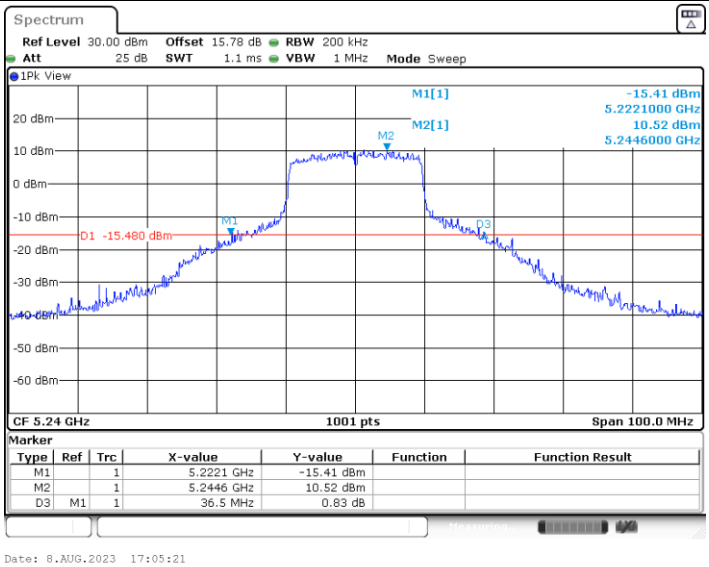

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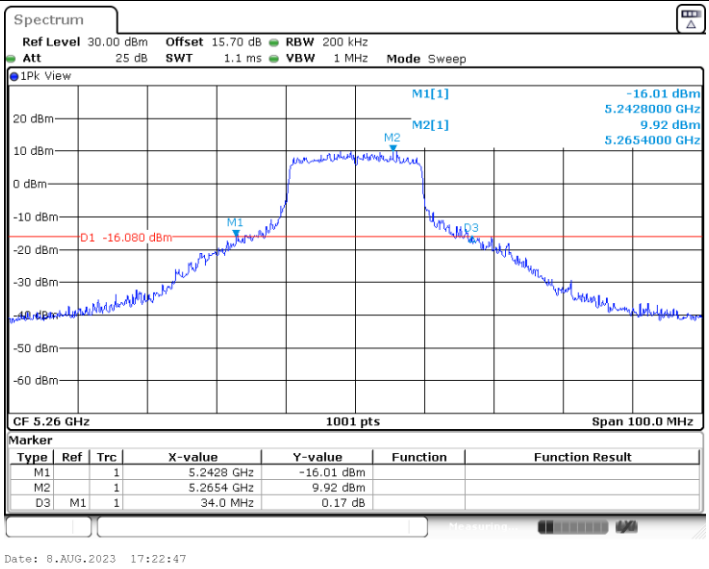

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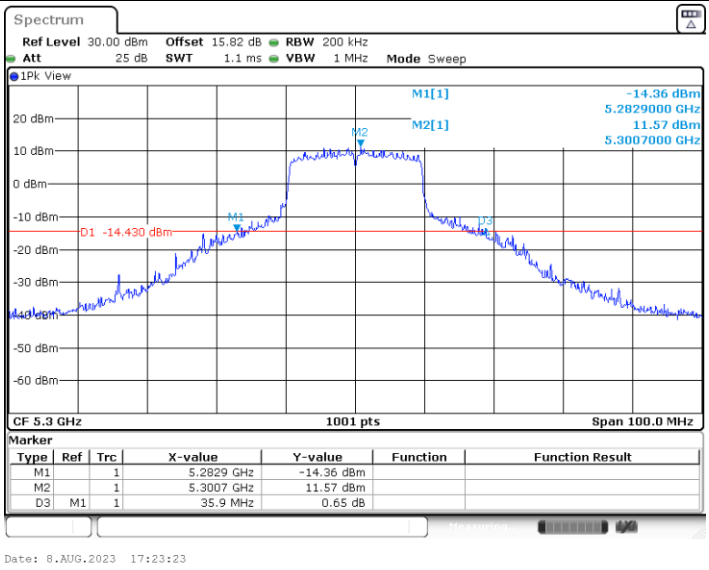

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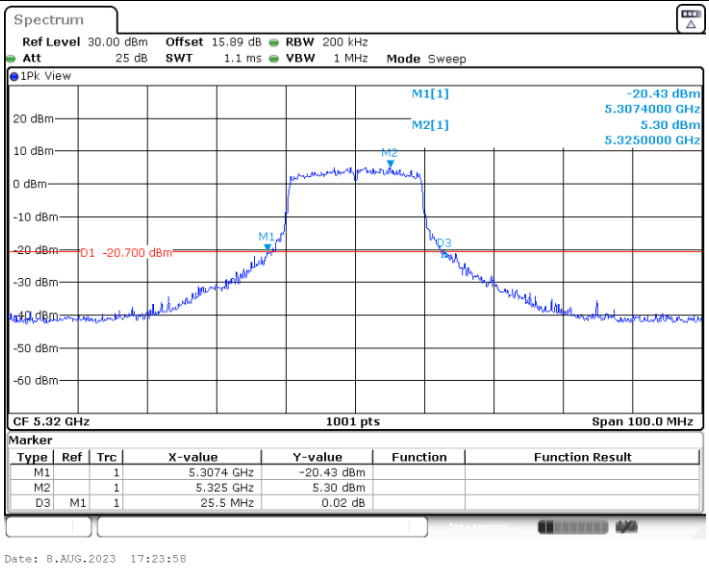

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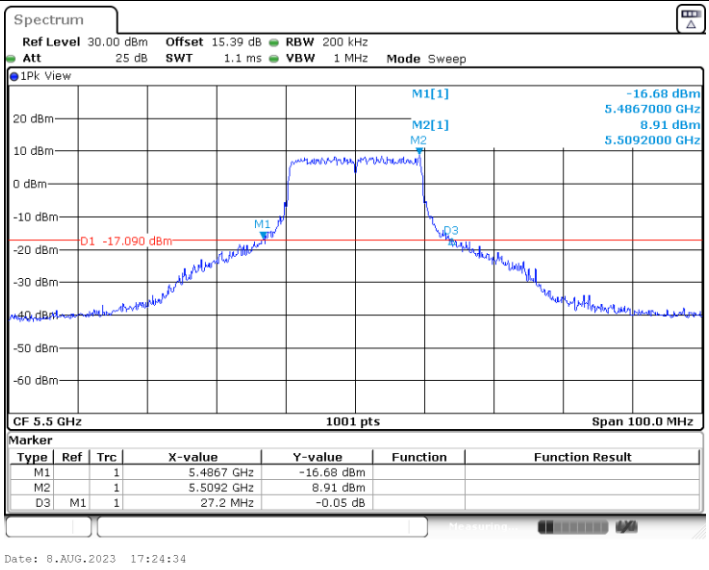

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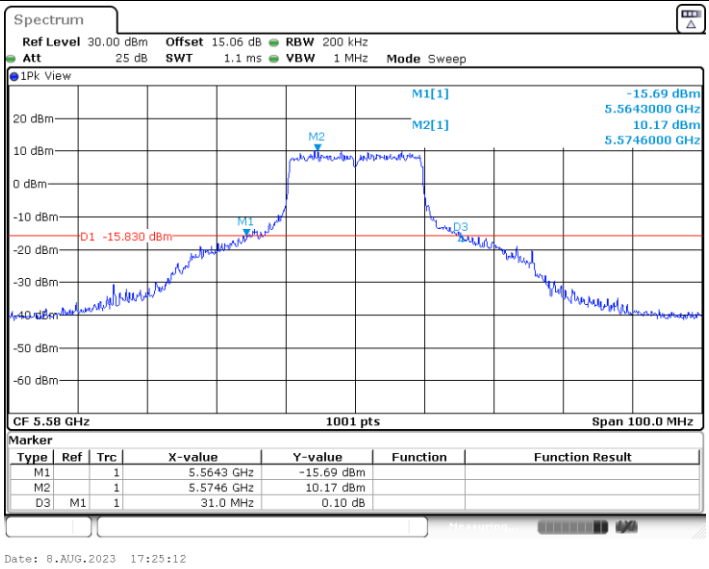

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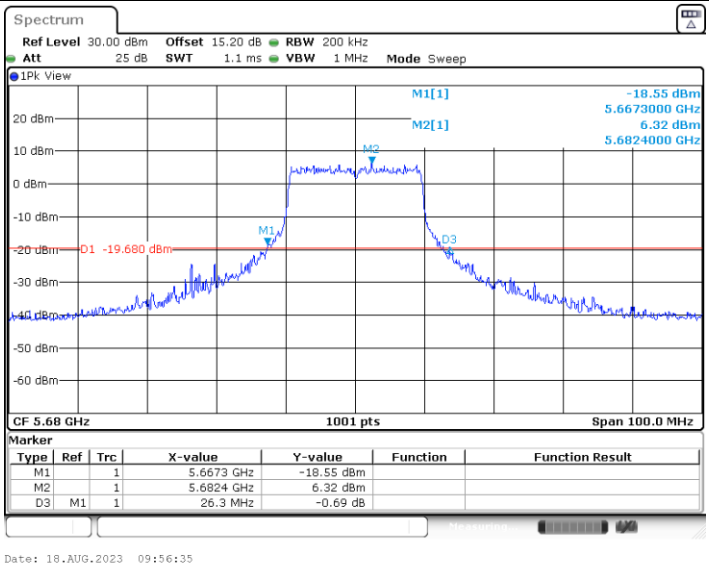

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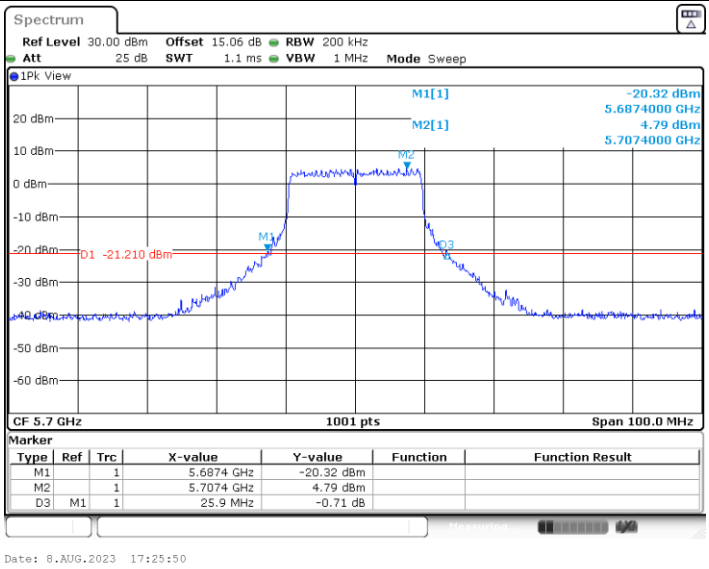

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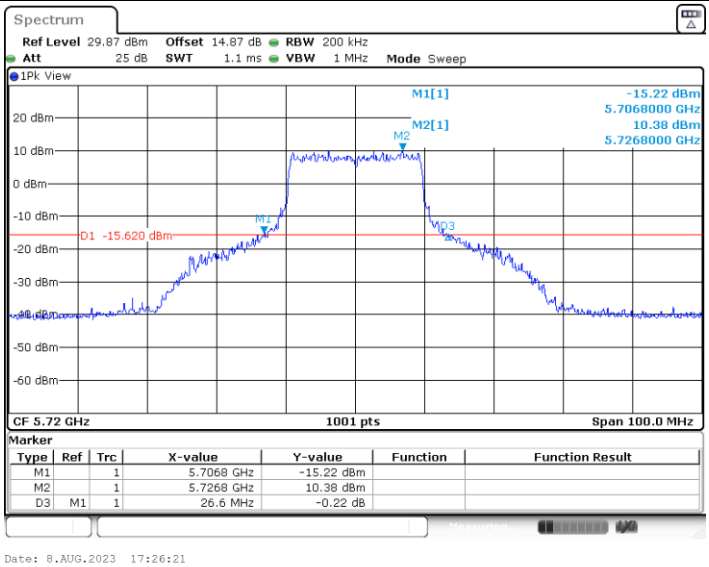

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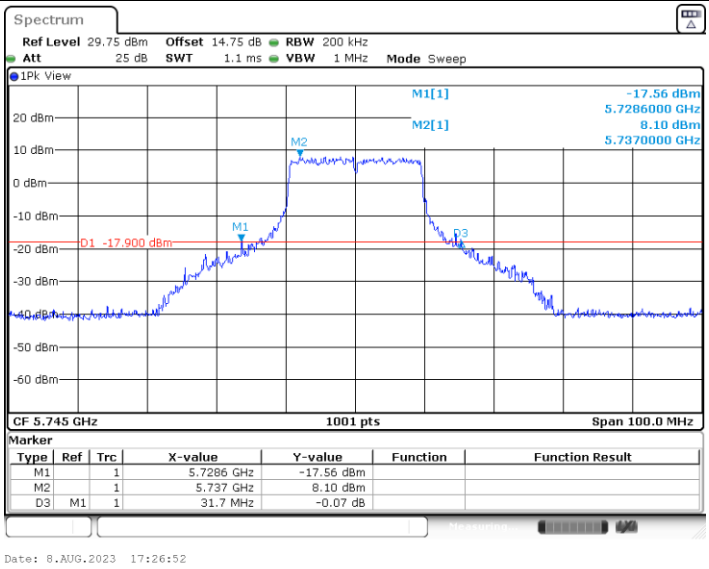

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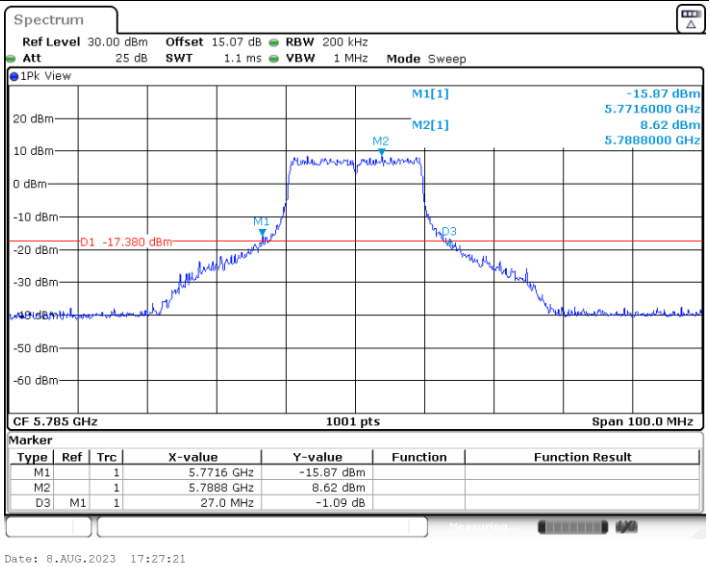

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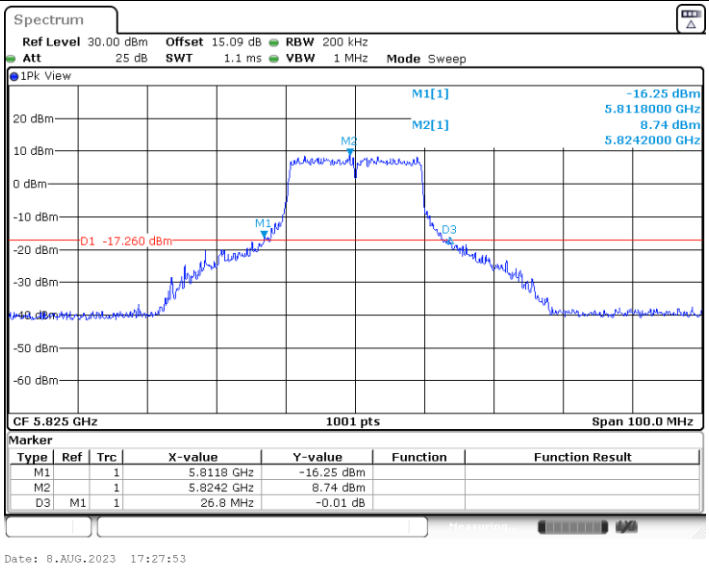

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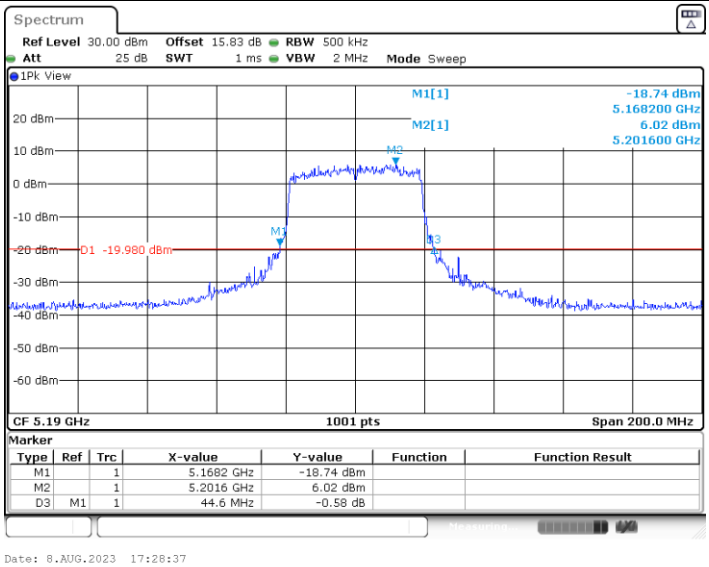

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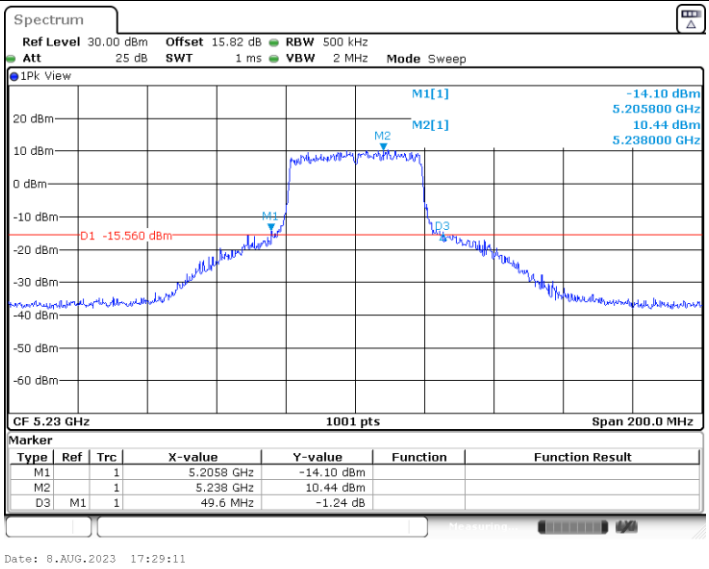

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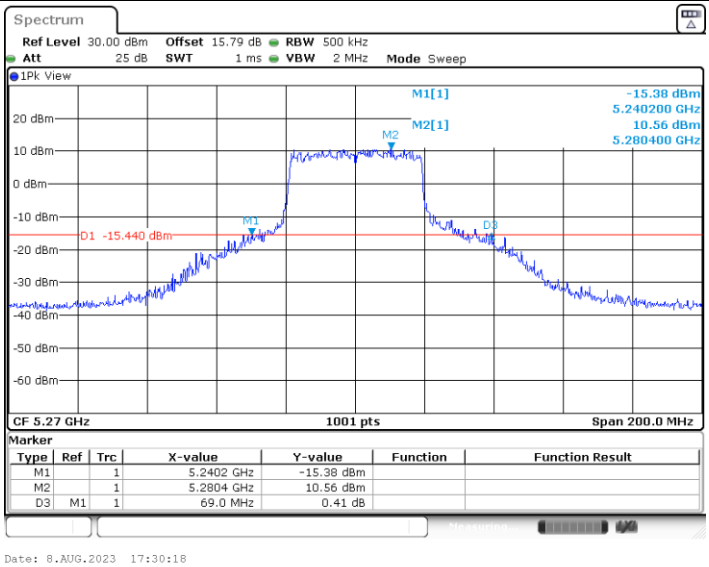

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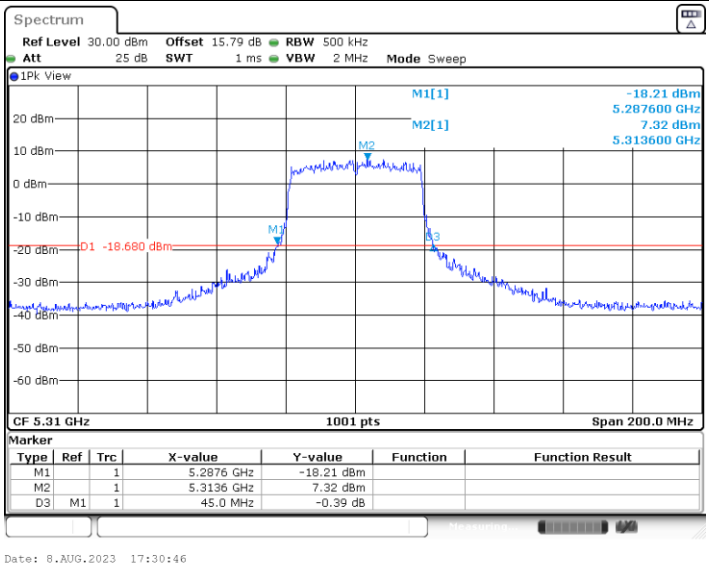

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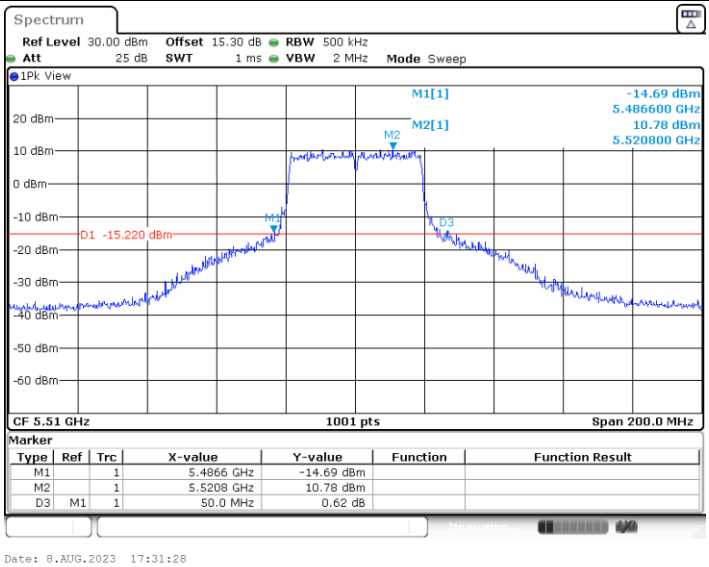

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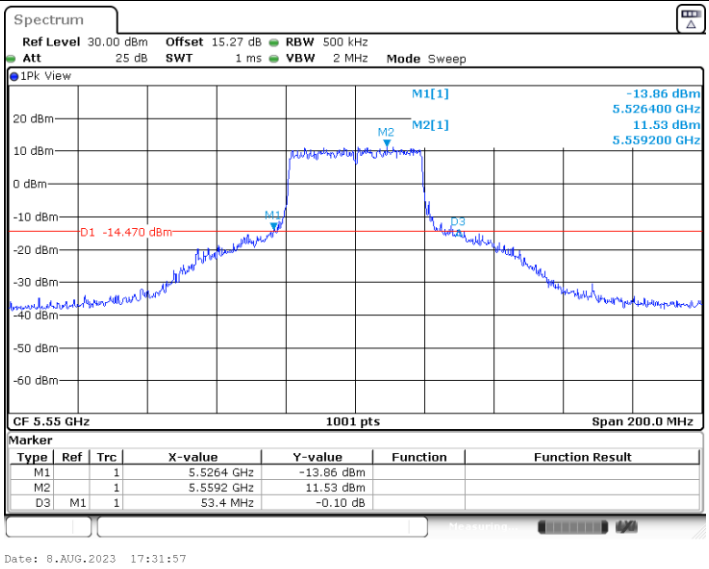

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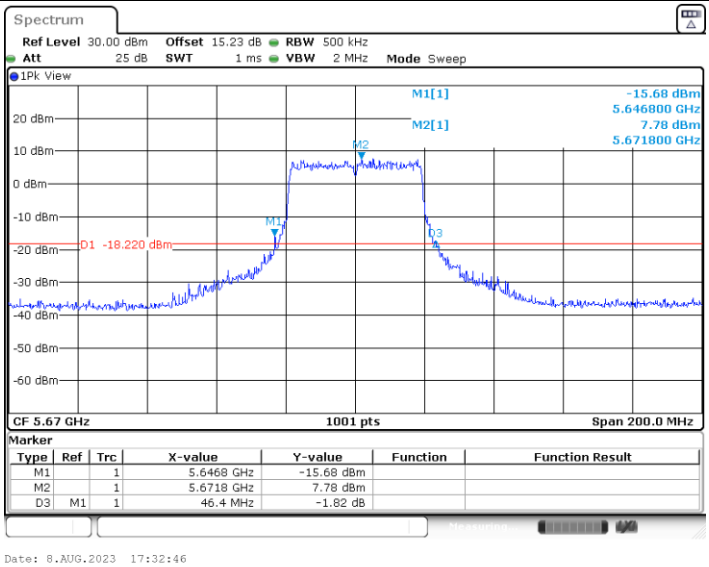

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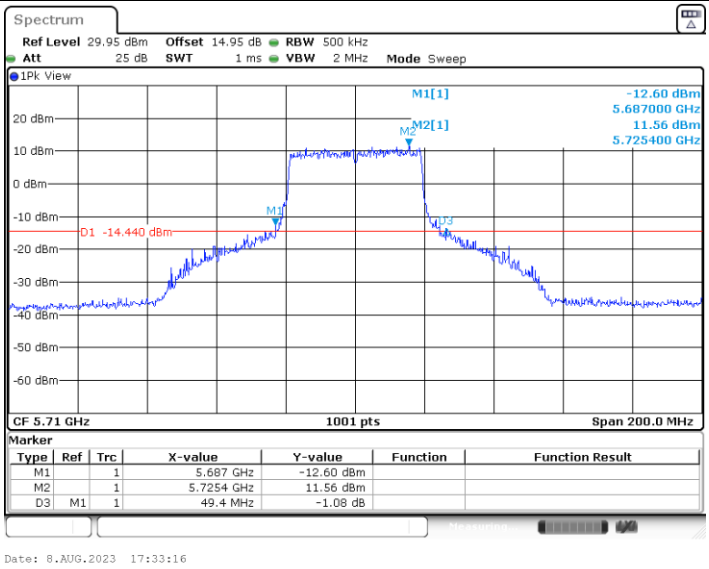
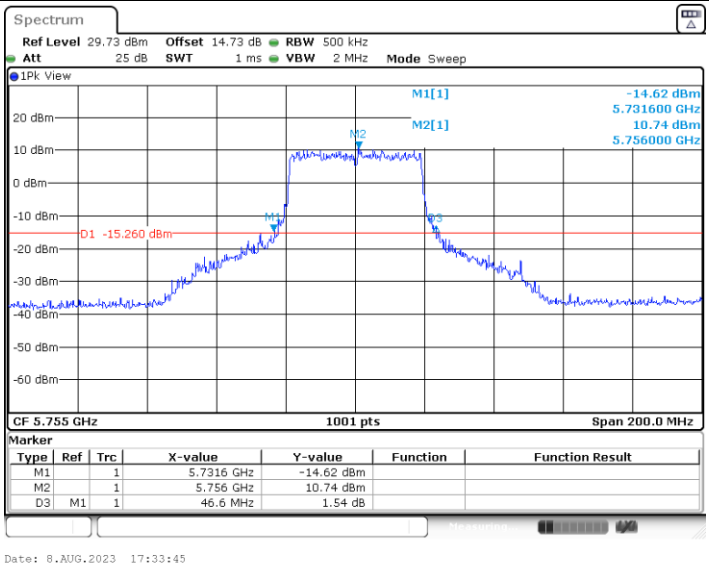


11AX40SISO_Ant1_5755


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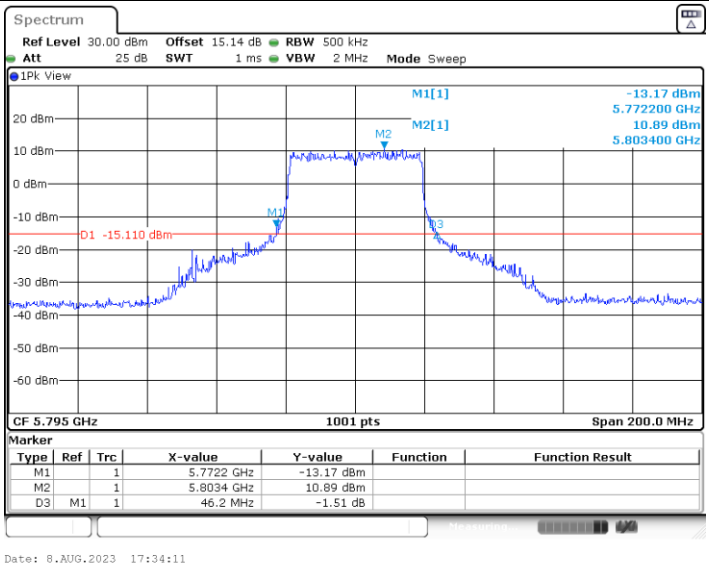
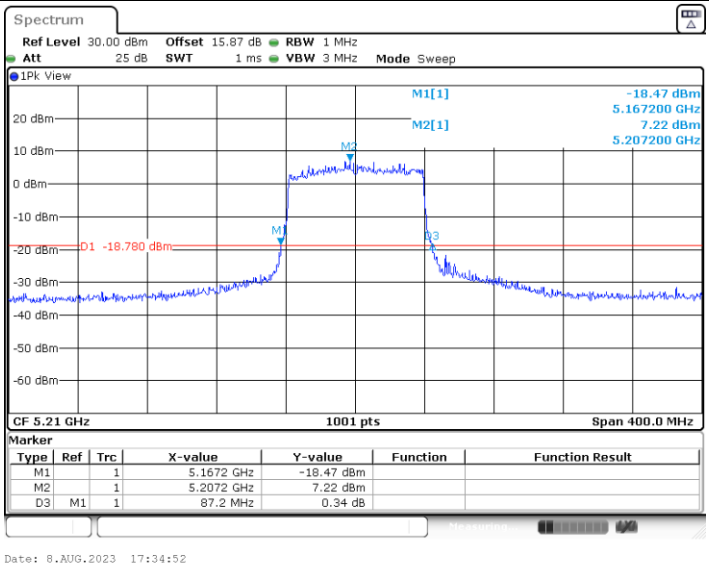


11AX80SISO_Ant1_5210



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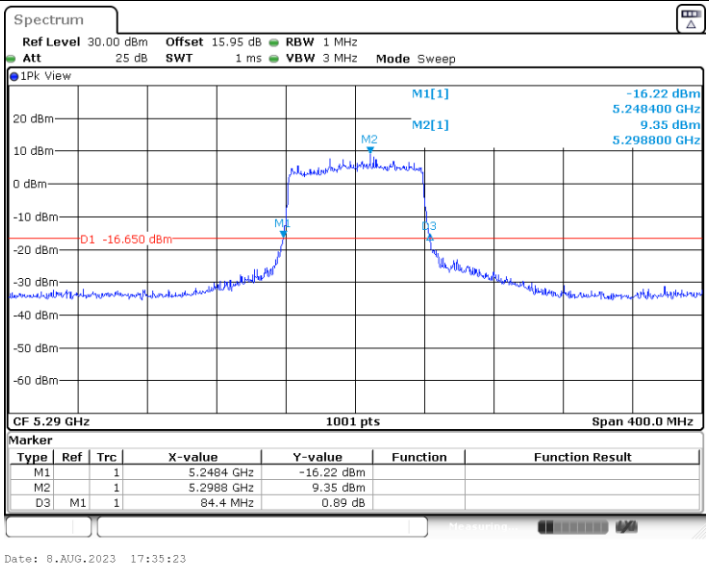

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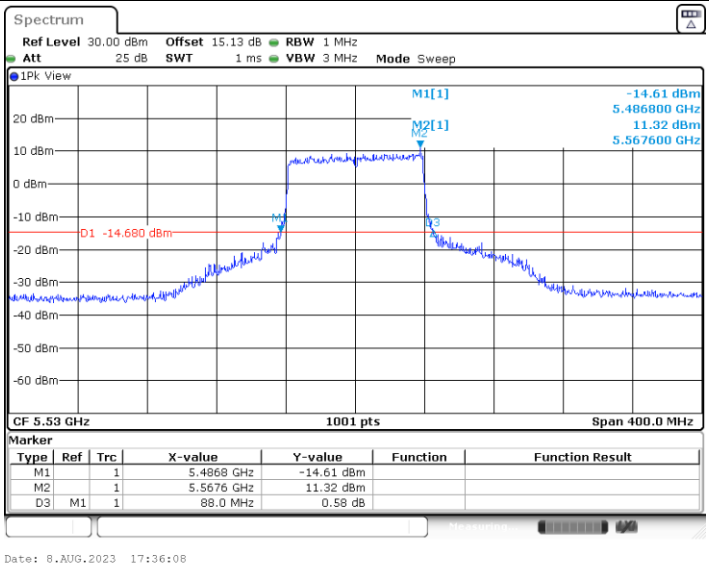

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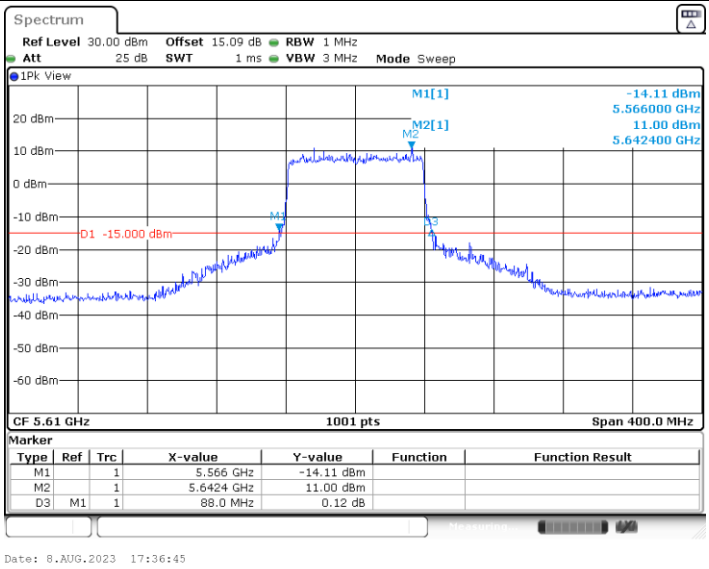
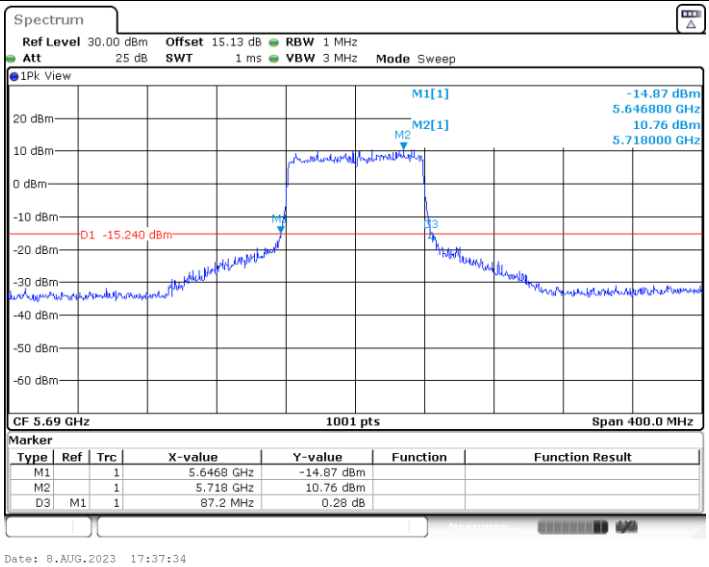
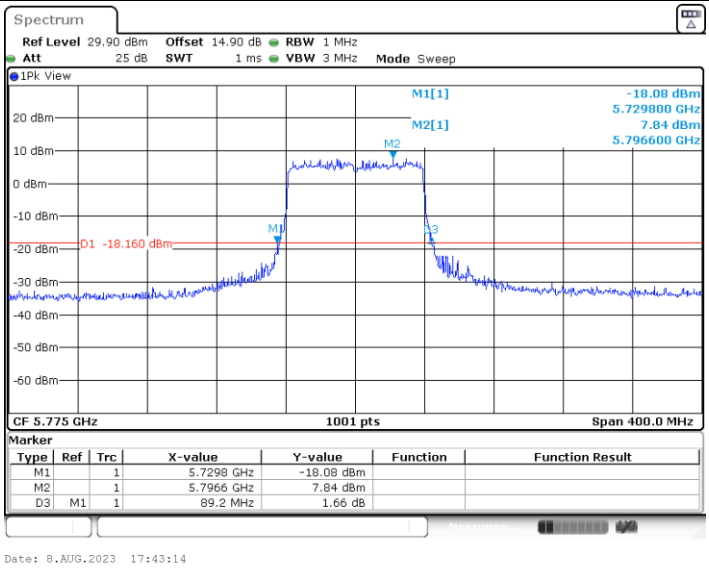


11AX80SISO_Ant1_5690


11AX80SISO_Ant1_5775


Occupied channel bandwidth

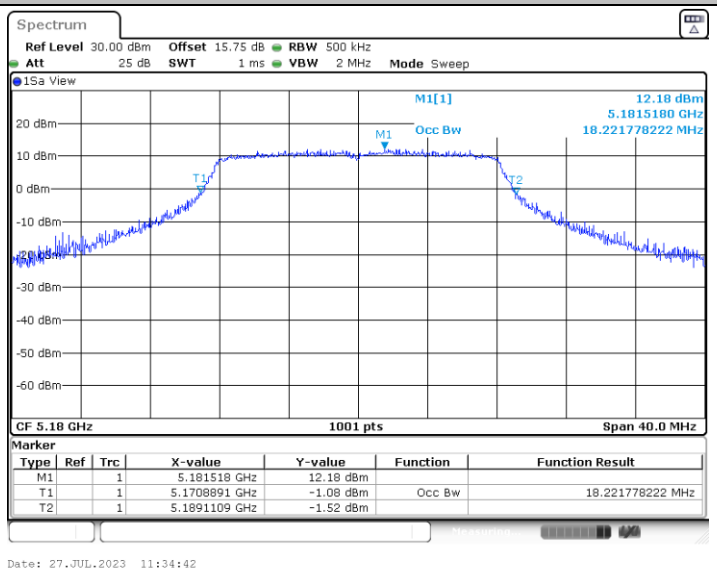
Test Result

TestMode	Antenna	Freq(MHz)	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A	Ant1	5180	18.222	5170.8891	5189.1109	---	---
		5220	18.462	5210.6094	5229.0709	---	---
		5240	18.182	5230.8492	5249.0310	---	---
		5260	18.182	5250.7692	5268.9510	---	---
		5300	18.062	5290.8891	5308.9510	---	---
		5320	18.222	5310.7692	5328.9910	---	---
		5500	18.501	5490.6494	5509.1508	---	---
		5580	18.422	5570.7293	5589.1508	---	---
		5680	18.382	5670.6893	5689.0709	---	---
		5700	18.541	5690.6494	5709.1908	---	---
		5720	19.181	5710.2897	5729.4705	---	---
		5745	19.461	5735.2498	5754.7103	---	---
		5785	19.58	5774.9301	5794.5105	---	---
		5825	19.061	5815.3696	5834.4306	---	---
11AX20SISO	Ant1	5180	19.66	5170.2098	5189.8701	---	---
		5220	19.7	5210.0899	5229.7902	---	---
		5240	19.62	5230.2098	5249.8302	---	---
		5260	19.54	5250.2098	5269.7502	---	---
		5300	19.62	5290.1698	5309.7902	---	---
		5320	19.58	5310.2098	5329.7902	---	---
		5500	19.86	5490.0500	5509.9101	---	---
		5580	19.86	5570.0899	5589.9500	---	---
		5680	19.78	5670.0899	5689.8701	---	---
		5700	19.94	5690.0100	5709.9500	---	---
		5720	20.02	5709.9700	5729.9900	---	---
		5745	20.14	5734.9301	5755.0699	---	---
		5785	20.14	5774.8501	5794.9900	---	---
		5825	20.06	5814.9301	5834.9900	---	---
11AX40SISO	Ant1	5190	38.362	5170.8192	5209.1808	---	---
		5230	38.681	5210.6593	5249.3407	---	---
		5270	38.601	5250.6593	5289.2607	---	---
		5310	38.521	5290.6593	5329.1808	---	---
		5510	38.601	5490.6593	5529.2607	---	---
		5550	38.841	5530.4995	5569.3407	---	---
		5670	39.001	5650.4995	5689.5005	---	---
		5710	39.241	5690.2597	5729.5005	---	---

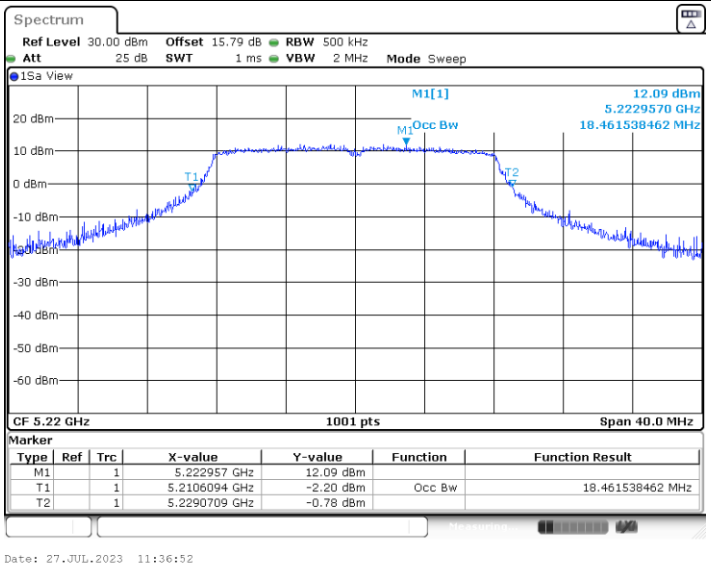
		5755	39.161	5735.3397	5774.5005	---	---
		5795	39.321	5775.1798	5814.5005	---	---
11AX80SISO	Ant1	5210	78.002	5170.9990	5249.0010	---	---
		5290	78.002	5250.9990	5329.0010	---	---
		5530	78.482	5490.6793	5569.1608	---	---
		5610	78.322	5570.6793	5649.0010	---	---
		5690	78.641	5650.5195	5729.1608	---	---
		5775	78.641	5735.5195	5814.1608	---	---

Test Graphs

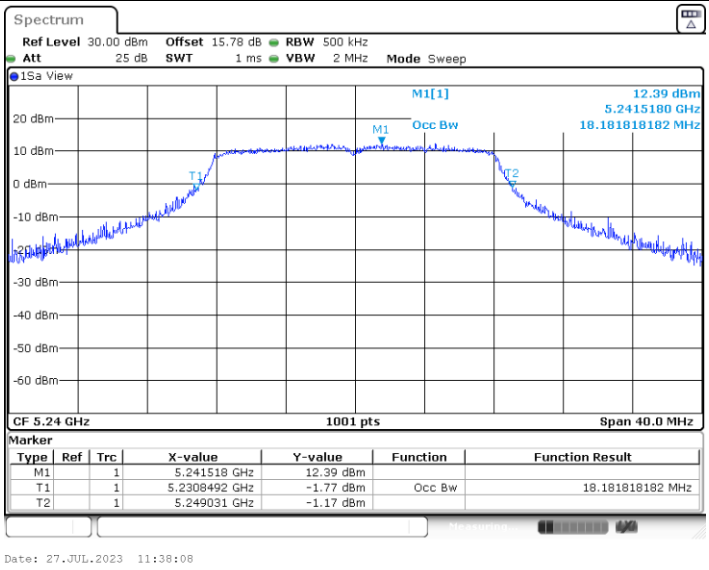
11A_Ant1_5180



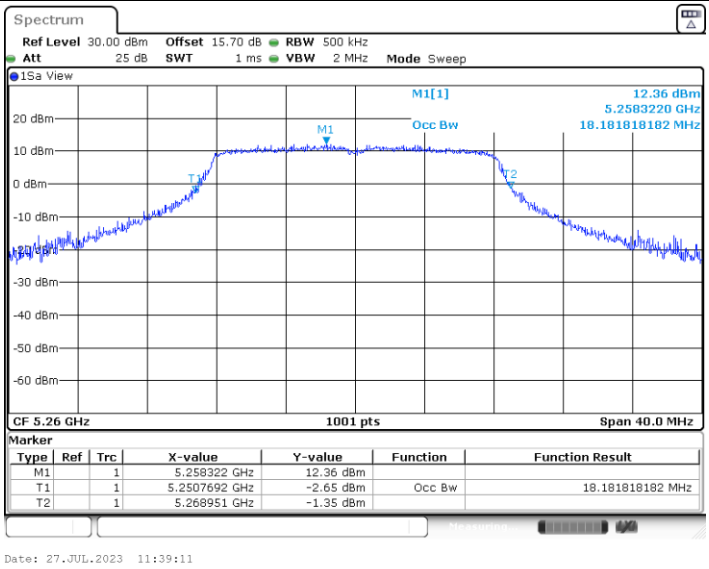
11A_Ant1_5220

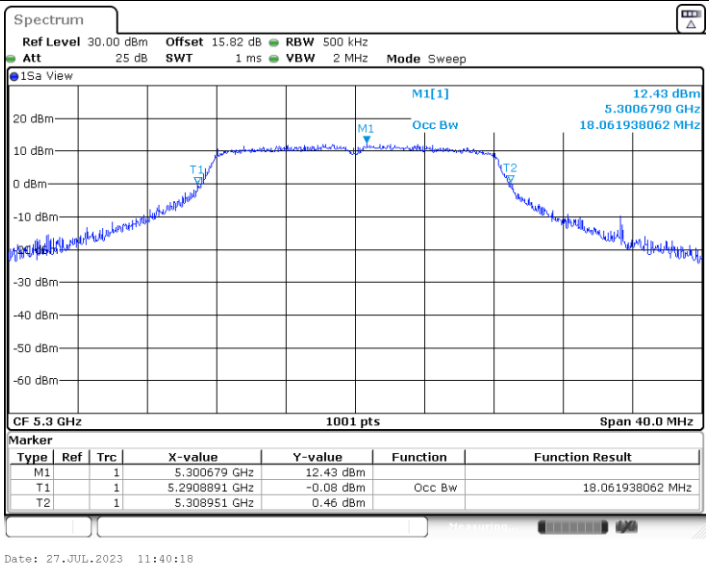


11A_Ant1_5240



11A_Ant1_5260



11A_Ant1_5300


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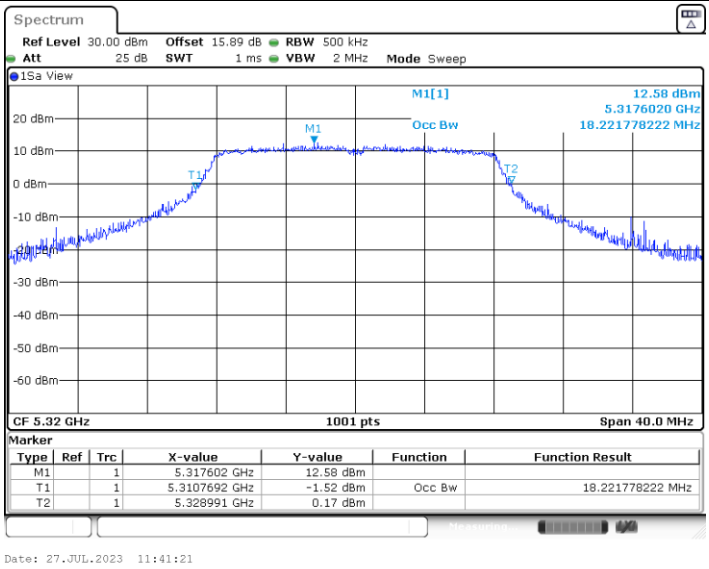
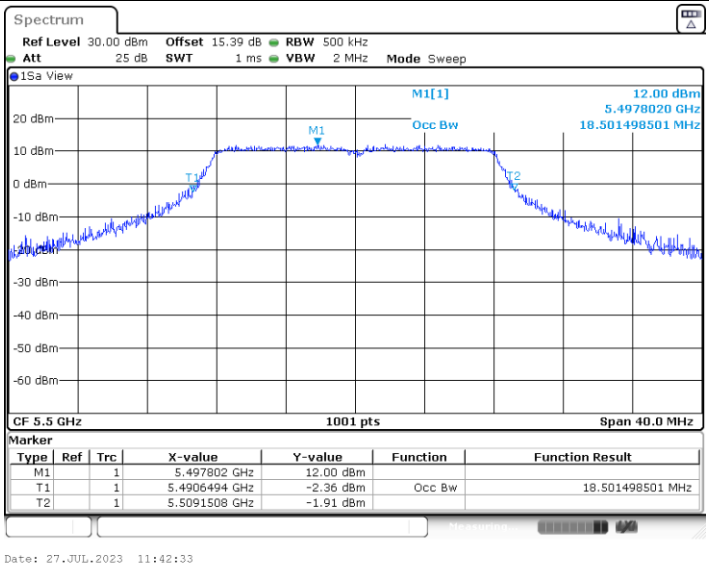
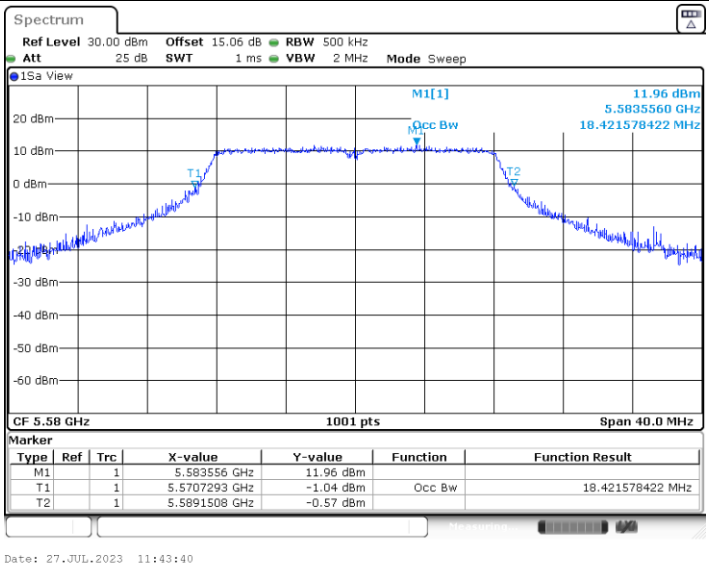


11A_Ant1_5500



11A_Ant1_5580



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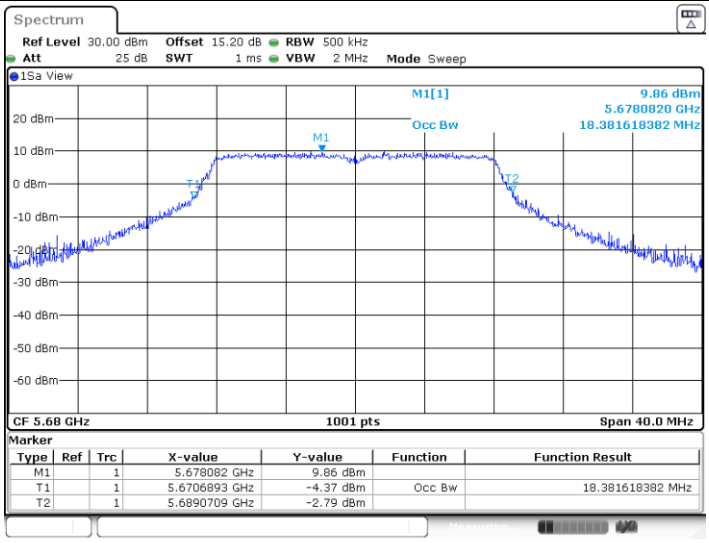

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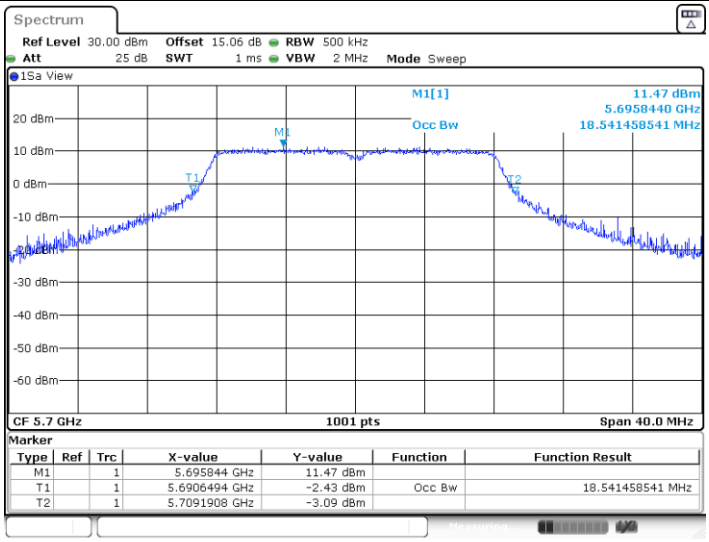

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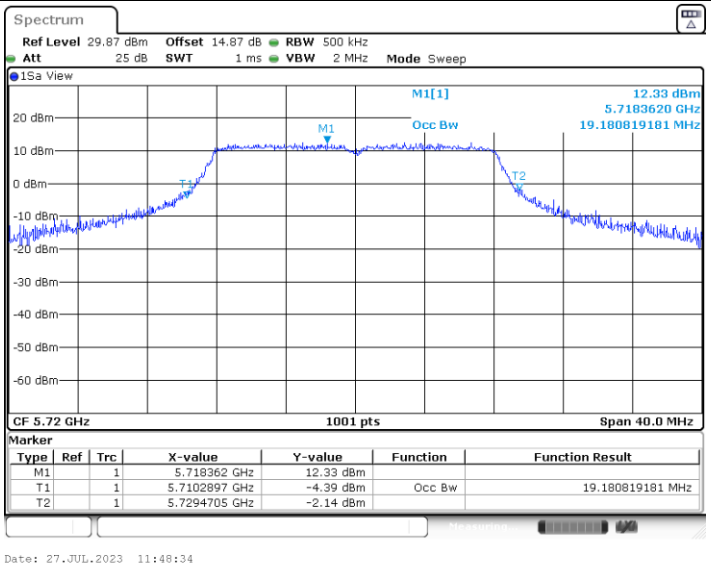

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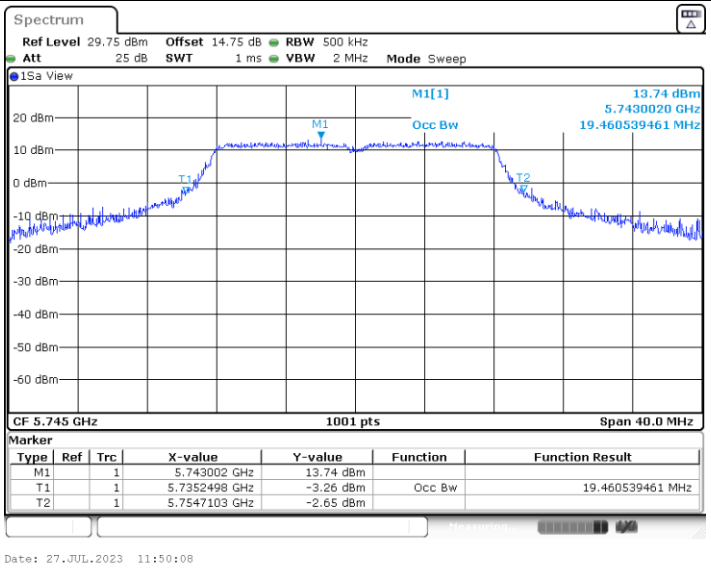

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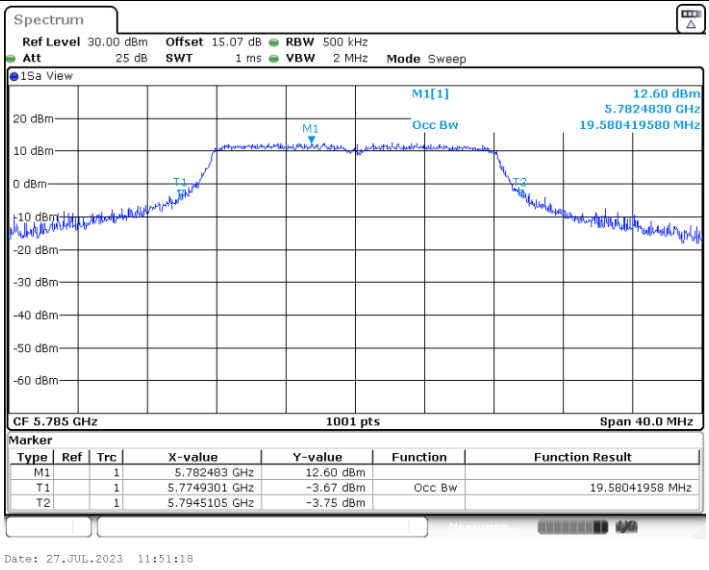
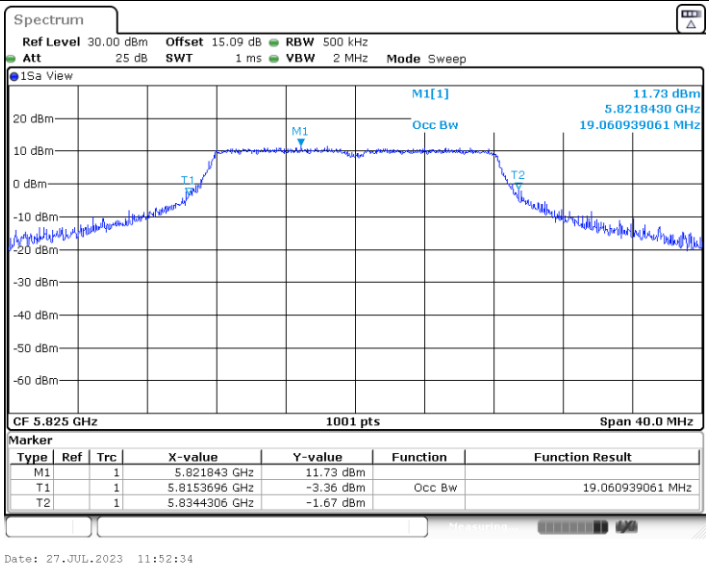


11A_Ant1_5825



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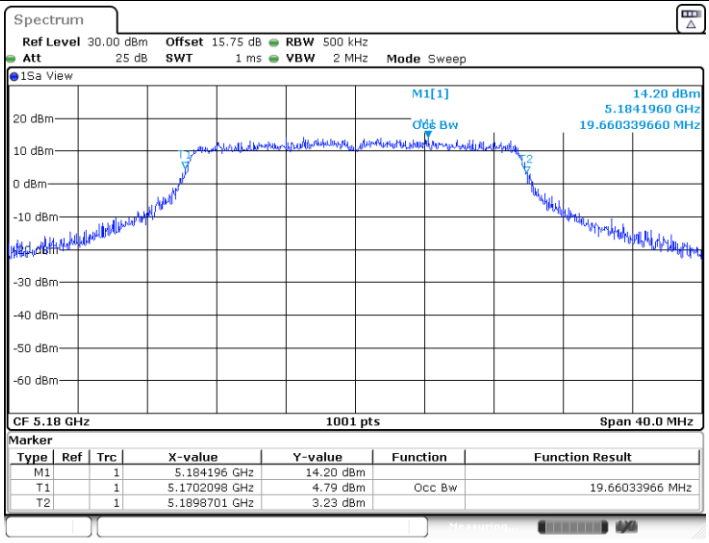

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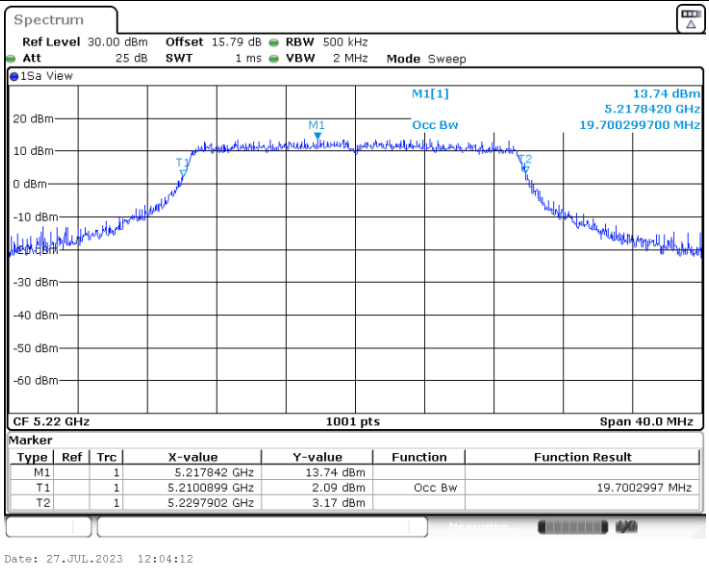

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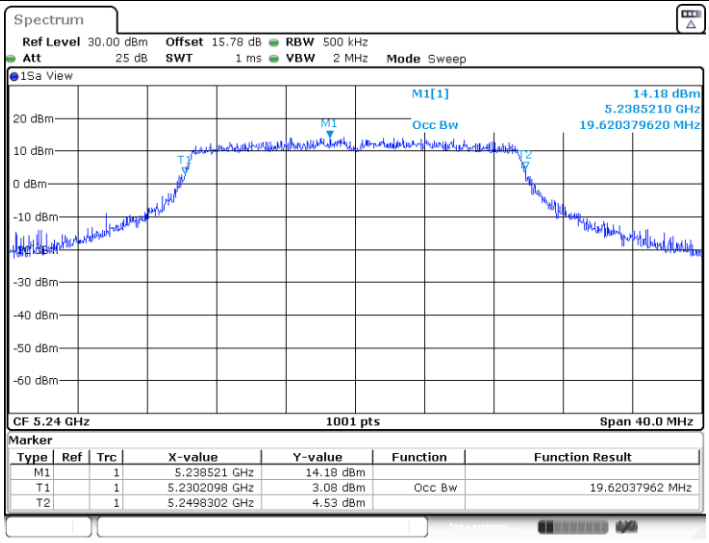

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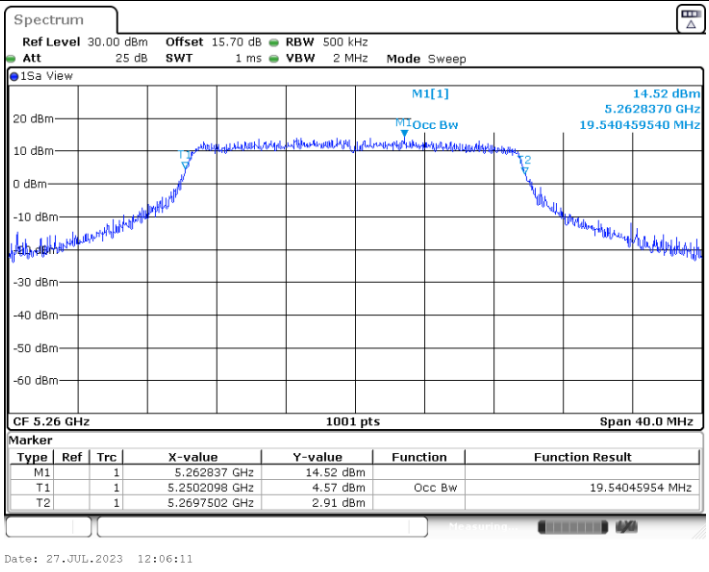

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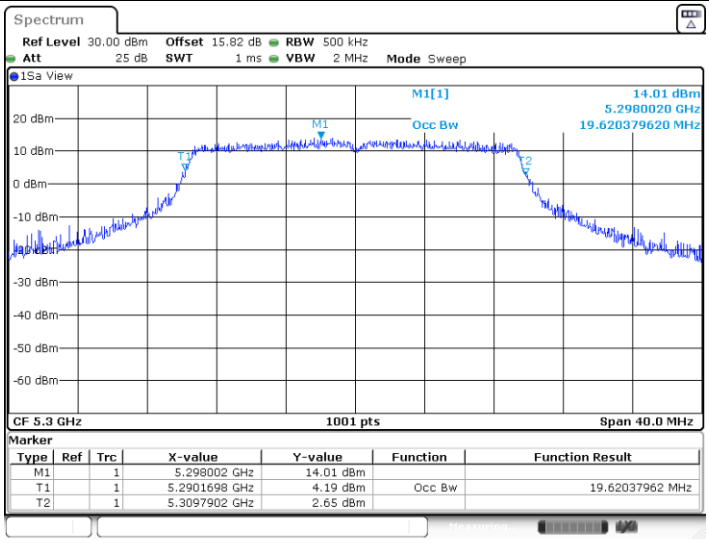

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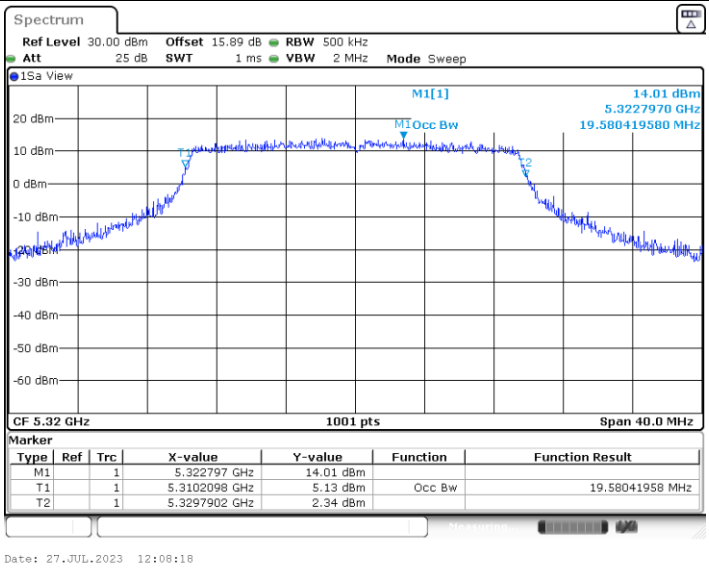

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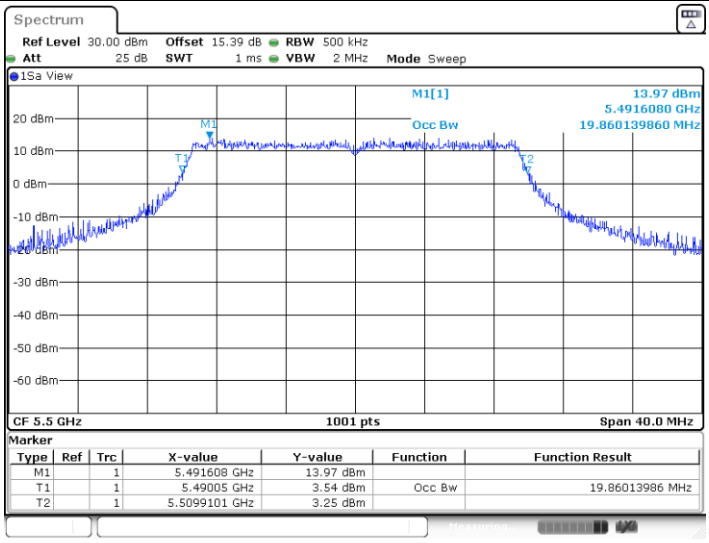

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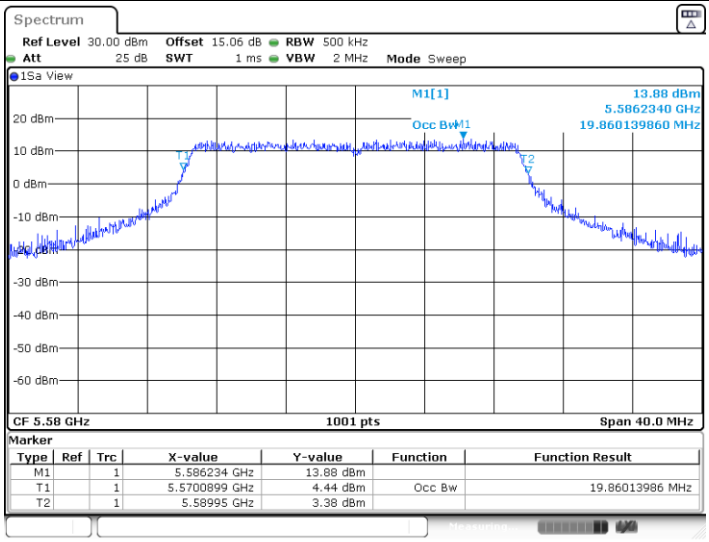

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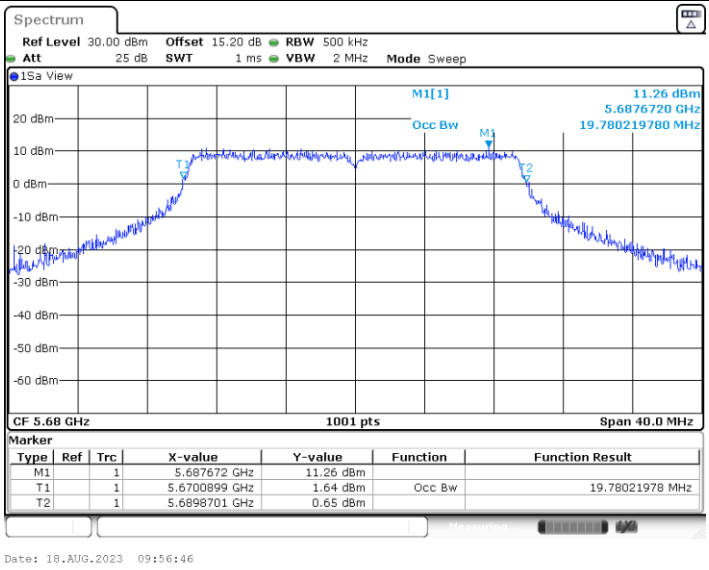

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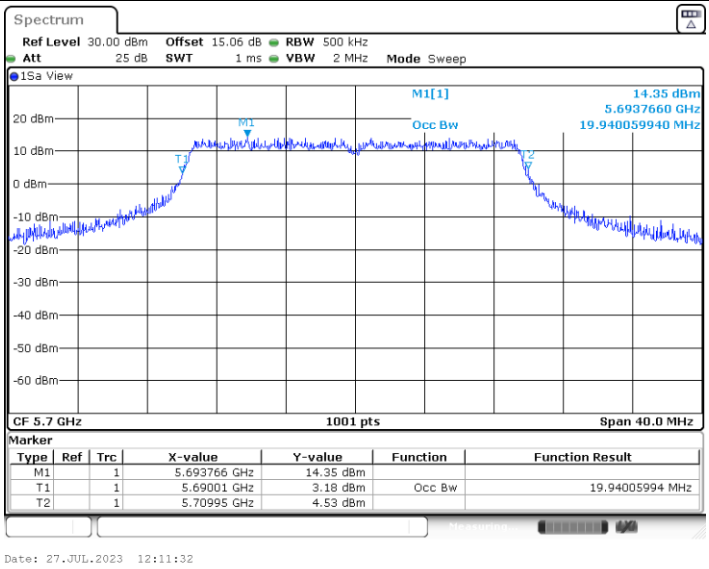

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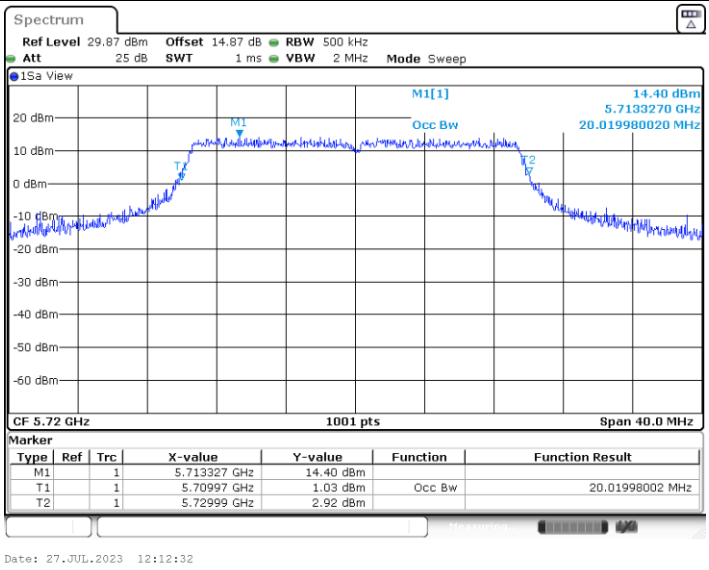

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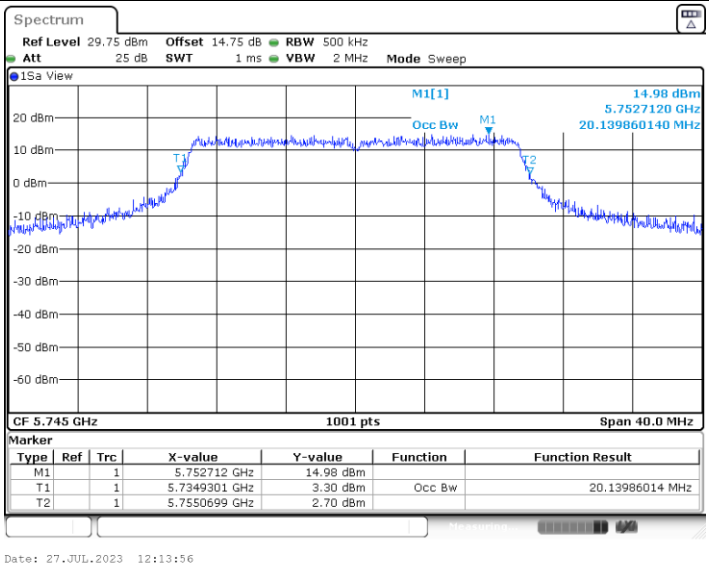

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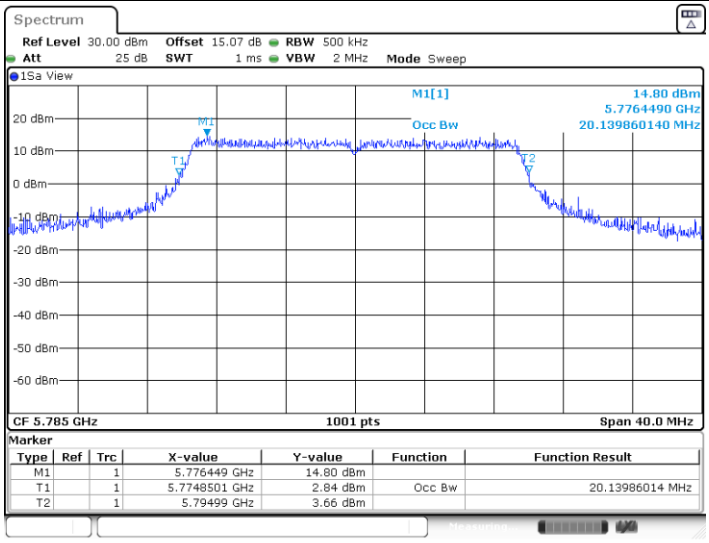

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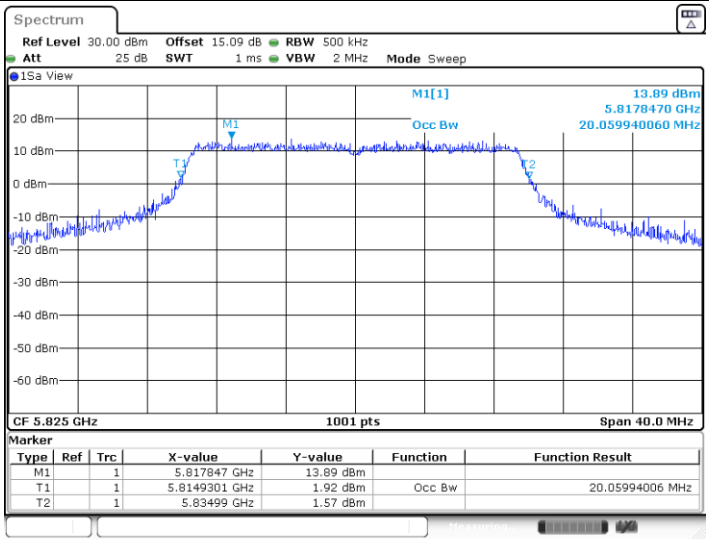

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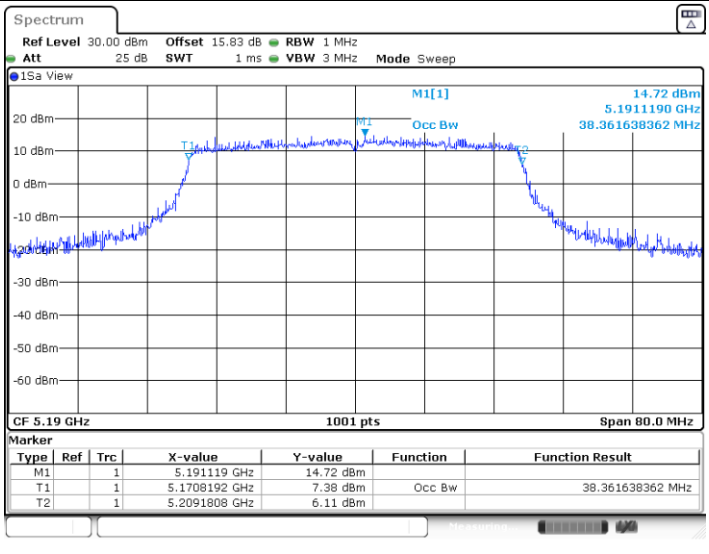

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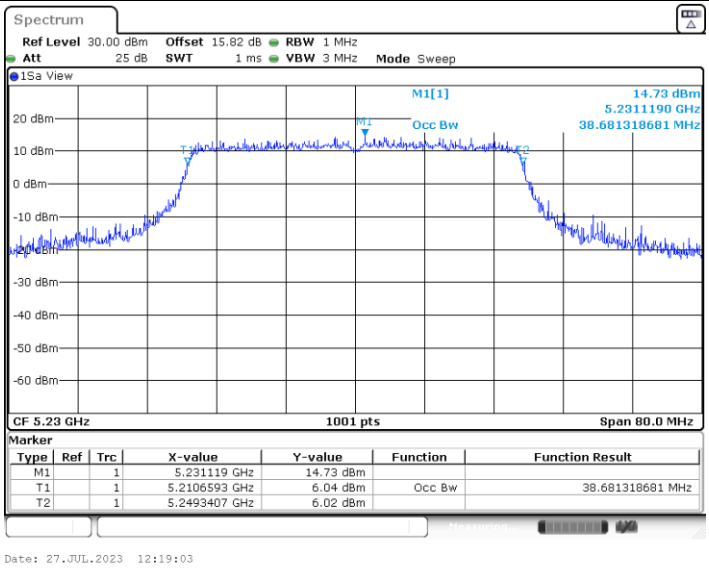

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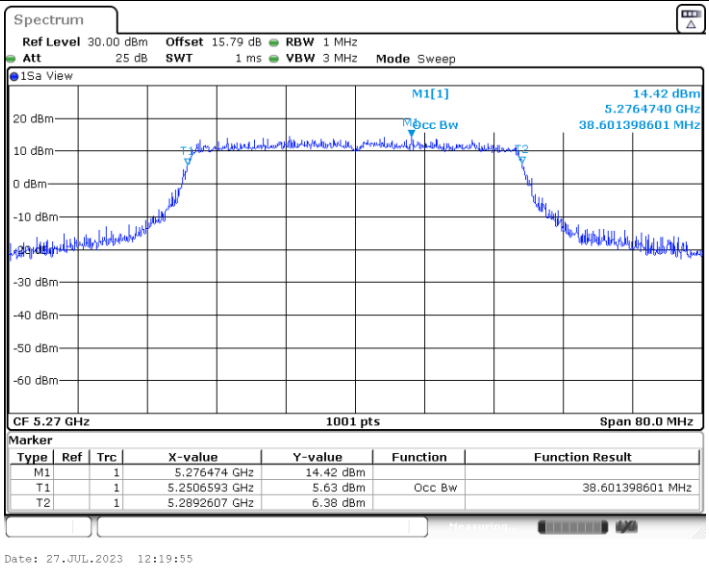

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