FCC RF Test Report

APPLICANT	:	Xiaomi Communications Co., Ltd.
EQUIPMENT	:	Mobile Phone
BRAND NAME	:	POCO
MODEL NAME	:	22041216UG
FCC ID	:	2AFZZ1216U
STANDARD	:	FCC Part 15 Subpart E §15.407
CLASSIFICATION	:	(NII) Unlicensed National Information Infrastructure
TEST DATE(S)	:	Mar. 29, 2022 ~ Apr. 21, 2022

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
FR231203E	Rev. 01	Initial issue of report	May 06, 2022

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit for U-NII-1 ~ U-NII-2C	Limit for U-NII-3	Result	Remark
3.1	2.1049 & 15.403(i)	26dB & 99% 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	≤ 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 3.17 dB at 5145.600 MHz
3.5	15.207	AC Conducted Emission	15.207(a)	15.207(a)	Pass	Under limit 8.77 dB at 0.151 MHz
3.6	15.203 & 15.407(a)	Antenna Requirement	N/A	N/A	Pass	-

Declaration of Conformity:
The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.
Comments and Explanations:
The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

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	POCO
Model Name	22041216UG
FCC ID	2AFZZ1216U
IMEI Code	Conducted: 867032060031692/867032060031678 Conduction: 867032060031072/867032060031080 Radiation: 867032060032773
HW Version	P2
SW Version	MIUI13
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 : 16.46 dBm / 0.0443 W 802.11n HT20 : 16.53 dBm / 0.0450 W 802.11n HT40 : 16.10 dBm / 0.0407 W 802.11ac VHT20 : 16.53 dBm / 0.0450 W 802.11ac VHT40 : 16.20 dBm / 0.0417 W 802.11ac VHT80 : 12.31 dBm / 0.0170 W 802.11ax HE20 : 16.69 dBm / 0.0467 W 802.11ax HE40 : 16.33 dBm / 0.0430 W 802.11ax HE80 : 12.57 dBm / 0.0181 W **<5260 MHz ~ 5320 MHz>** 802.11a : 18.51 dBm / 0.0710 W 802.11n HT20 : 18.41 dBm / 0.0693 W 802.11n HT40 : 18.00 dBm / 0.0631 W

	802.11ac VHT20 : 18.44 dBm / 0.0698 W 802.11ac VHT40 : 18.00 dBm / 0.0631 W 802.11ac VHT80 : 13.81 dBm / 0.0240 W 802.11ax HE20 : 18.68 dBm / 0.0738 W 802.11ax HE40 : 18.24 dBm / 0.0667 W 802.11ax HE80 : 14.11 dBm / 0.0258 W **<5500 MHz ~ 5720 MHz >** 802.11a : 18.09 dBm / 0.0644 W 802.11n HT20 : 18.02 dBm / 0.0634 W 802.11n HT40 : 17.58 dBm / 0.0573 W 802.11ac VHT20 : 17.94 dBm / 0.0622 W 802.11ac VHT40 : 17.66 dBm / 0.0583 W 802.11ac VHT80 : 17.47 dBm / 0.0558 W 802.11ax HE20 : 18.17 dBm / 0.0656 W 802.11ax HE40 : 17.90 dBm / 0.0617 W 802.11ax HE80 : 17.67 dBm / 0.0585 W **<5745 MHz ~ 5825 MHz>** 802.11a : 17.80 dBm / 0.0603 W 802.11n HT20 : 17.34 dBm / 0.0542 W 802.11n HT40 : 17.56 dBm / 0.0570 W 802.11ac VHT20 : 17.41 dBm / 0.0551 W 802.11ac VHT40 : 17.63 dBm / 0.0579 W 802.11ac VHT80 : 18.01 dBm / 0.0632 W 802.11ax HE20 : 17.77 dBm / 0.0598 W 802.11ax HE40 : 17.74 dBm / 0.0594 W 802.11ax HE80 : 18.11 dBm / 0.0647 W
99% Occupied Bandwidth	**<5180 MHz ~ 5240 MHz>** 802.11a : 17.06 MHz 802.11ax HE20 : 19.06 MHz 802.11ax HE40 : 37.96 MHz 802.11ax HE80 : 77.84 MHz **<5260 MHz ~ 5320 MHz>** 802.11a : 17.10 MHz 802.11ax HE20 : 19.06 MHz 802.11ax HE40 : 37.80 MHz 802.11ax HE80 : 78.16 MHz **<5500 MHz ~ 5720 MHz >** 802.11a : 17.14 MHz 802.11ax HE20 : 19.06 MHz 802.11ax HE40 : 37.96 MHz 802.11ax HE80 : 78.16 MHz **<5745 MHz ~ 5825 MHz>** 802.11a : 18.06 MHz 802.11ax HE20 : 19.22 MHz 802.11ax HE40 : 38.04 MHz 802.11ax HE80 : 78.32 MHz
Antenna Type / Gain	**<5180 MHz ~ 5240 MHz>** <Ant. 8> : PIFA Antenna with gain 0.80 dBi <Ant. 9> : PIFA Antenna with gain -0.80 dBi **<5260 MHz ~ 5320 MHz>** <Ant. 8> : PIFA Antenna with gain 1.40 dBi <Ant. 9> : PIFA Antenna with gain -0.20 dBi **<5500 MHz ~ 5720 MHz>** <Ant. 8> : PIFA Antenna with gain 2.30 dBi

	<Ant. 9> : PIFA Antenna with gain 0.00 dBi **<5745 MHz ~ 5825 MHz>** <Ant. 8> : PIFA Antenna with gain 1.00 dBi <Ant. 9> : PIFA Antenna with gain -0.10 dBi
Type of Modulation	802.11a/n : OFDM (BPSK / QPSK / 16QAM / 64QAM) 802.11ac/ax : OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM / 1024QAM)
Antenna Function Description	<table><tr><td></td><td>Ant. 8</td><td>Ant. 9</td></tr><tr><td>802.11 a/n/ac/ax SISO/MIMO</td><td>V</td><td>V</td></tr></table>

Note:

1. For SISO&MIMO (CDD) mode, the whole testing has assessed only MIMO mode by referring to their higher conducted power
2. For 802.11n/ac/ax 20/40/80 mode, the whole testing have assessed only 802.11ax HE20/HE40/HE80 by referring to their maximum conducted power.
3. WLAN 5GHz support partial RU for 802.11ax mode.
4. The PSD of partial RU is smaller than full RU, so only tests 802.11ax HE20 RU26/52/106 for RSE.

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 FAX : +86-512-57900958		
Test Site No.	**Sporton Site No.**	**FCC Designation No.**	**FCC Test Firm Registration No.**
	CO01-KS 03CH07-KS TH01-KS	CN1257	314309

1.7 Test Software

Item	Site	Manufacturer	Name	Version
1.	03CH07-KS	AUDIX	E3	6.2009-8-24al
2.	CO01-KS	AUDIX	E3	6.2009-8-24

1.8 Applicable Standards

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

- 47 CFR Part 15 Subpart E
- FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
- FCC KDB 662911 D01 Multiple Transmitter Output v02r01.
- ANSI C63.10-2013

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

2 Test Configuration of Equipment Under Test

a. The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conduction emission (150 kHz to 30 MHz), radiation emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (X plane) were recorded in this report.

b. AC power line Conducted Emission was tested under maximum output power.

2.1 Carrier Frequency and Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5180-5240 MHz U-NII-1	36	5180	44	5220
	38	5190	46	5230
	40	5200	48	5240
	42	5210		

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

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5500- 5720 MHz MHz 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)
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		

2.2 Test Mode

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

MIMO Mode

Modulation	Data Rate
802.11a	**6 Mbps**
802.11ac VHT20 (Covered by HT20)	**MCS0**
802.11ac VHT40 (Covered by HT40)	**MCS0**
802.11ac VHT80(Covered by HT80)	**MCS0**
802.11ax HE20	**MCS0**
802.11ax HE40	**MCS0**
802.11ax HE80	**MCS0**
802.11ax HE20 RU 26/52/106	**MCS0**

Test Cases	
AC Conducted Emission	Mode 1 : GSM 850 Idle + Bluetooth Link + WLAN Link(5G) + USB Cable(Charging From Adaptor)

Remark:

1. For Radiated Test Cases, The tests were performance with Adapter and Earphone. Only the worst test data show in the report.

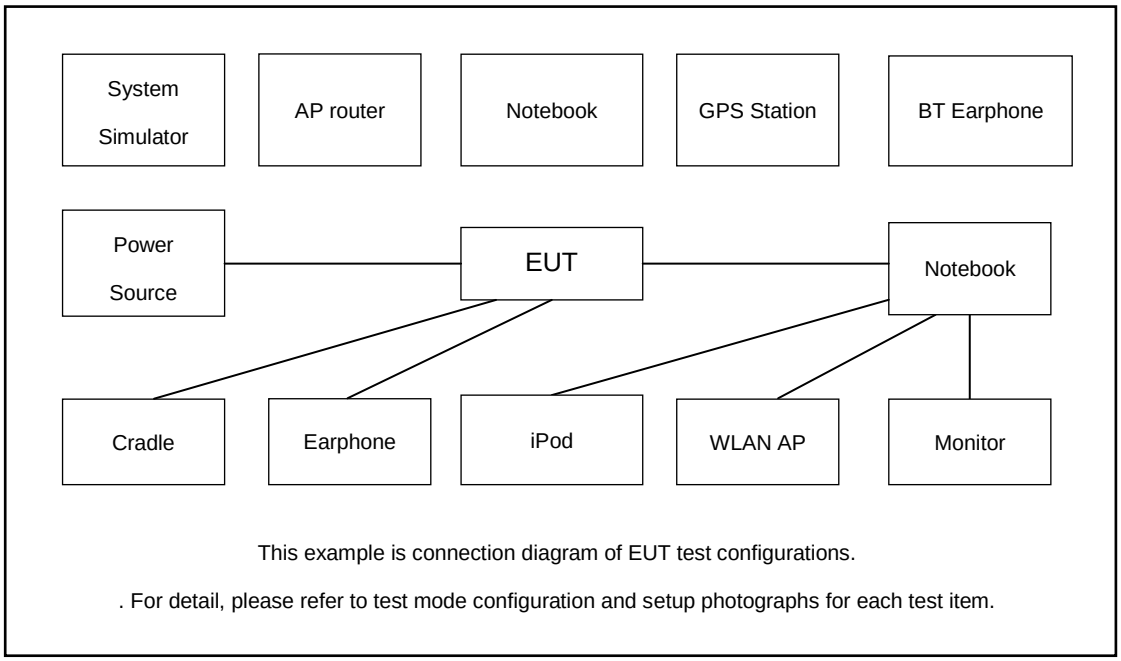
Ch. #		U-NII-1：5180-5240 MHz	U-NII-2A：5260-5320 MHz	U-NII-2C：5500- 5720 MHz
		802.11a	802.11a	802.11a
L	Low	36	52	100
M	Middle	44	60	116
H	High	48	64	140
Straddle		-	-	144

Ch. #		U-NII-1：5180-5240 MHz	U-NII-2A：5260-5320 MHz	U-NII-2C：5500- 5720 MHz
		11ac/ax VHT20/HE20	11ac/ax VHT20/HE20	11ac/ax VHT20/HE20
L	Low	36	52	100
M	Middle	44	60	116
H	High	48	64	140
Straddle		-	-	144

Ch. #		U-NII-1：5180-5240 MHz	U-NII-2A：5260-5320 MHz	U-NII-2C：5500- 5720 MHz
		11ac/ax VHT40/HE40	11ac/ax VHT40/HE40	11ac/ax VHT40/HE40
L	Low	38	54	102
M	Middle	-	-	110
H	High	46	62	134
Straddle		-	-	142

Ch. #		U-NII-1：5180-5240 MHz	U-NII-2A：5260-5320 MHz	U-NII-2C：5500- 5720 MHz
		11ac/ax VHT80/HE80	11ac/ax VHT80/HE80	11ac/ax VHT80/HE80
L	Low	-	-	106
M	Middle	42	58	-
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	AC I/P: Unshielded, 1.8 m DC O/P: Shielded, 1.8 m
4.	Bluetooth Earphone	Xiaomi	LYEJ02LM	N/A	N/A	N/A
5.	SD Card	Kingston	8GB	N/A	N/A	N/A
6.	Earphone	Xiaomi	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 continuous 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 6.75 dB and 10 dB attenuator.

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

= 6.75 + 10 = 16.75(dB)

3 Test Result

3.1 26dB & 99% Occupied Bandwidth Measurement

3.1.1 Description of 26dB & 99% Occupied Bandwidth

This section is for reporting purpose only.

There is no restriction limits for bandwidth.

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

3.1.2 Measuring Instruments

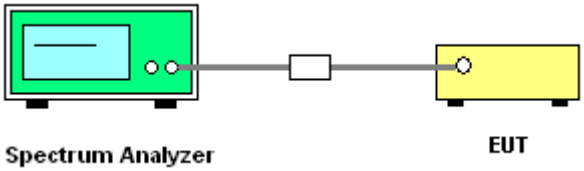
The measuring equipment is listed in the section 4 of this test report.

3.1.3 Test Procedures

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

☒	Section C) Bandwidth Measurement 1. Emission Bandwidth (EBW)
	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 1MHz 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 26dB & 99% Occupied Bandwidth

Please refer to Appendix A.

3.2 Maximum Conducted Output Power Measurement

3.2.1 Limit of Maximum Conducted Output Power

<FCC 14-30 CFR 15.407>

For 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.

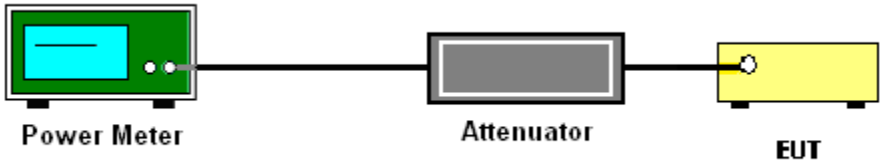
3.2.3 Test Procedures

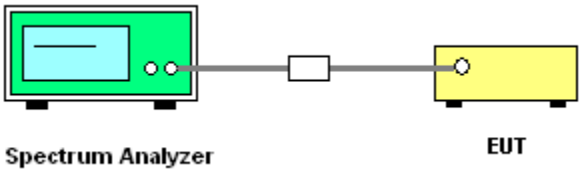
The testing follows Method PM of FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.

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.
4. For MIMO mode, the measure-and-sum technique should be used for measuring the in-band transmit power of a device.

3.2.4 Test Setup





3.2.5 Test Result of Maximum Conducted Output Power

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 v02r01. 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 GH

 # 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

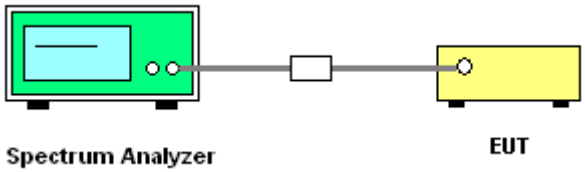
 # Method SA-2 #

(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 = 300 kHz.
- 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.
- Add 10 log(500kHz/RBW) to the test result.
- Add 10 log(1/x), where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times. For example, add 10 log(1/0.25) = 6 dB if the duty cycle is 25 percent.

1. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
2. Each plot has already offset with cable loss, and attenuator loss. Measure the PPSD and record it.

3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.

3.4 Unwanted Emissions Measurement

This section is to measure unwanted emissions through radiated measurement for band edge spurious emissions and out of band emissions measurement.

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

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

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

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

where

EIRP is the equivalent isotropically radiated power, in dBm

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

d_{Meas} is the measurement distance, in m

3.4.2 Measuring Instruments

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

3.4.3 Test Procedures

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01. 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 and is transmitting at its maximum power control level for the tested mode of operation.

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

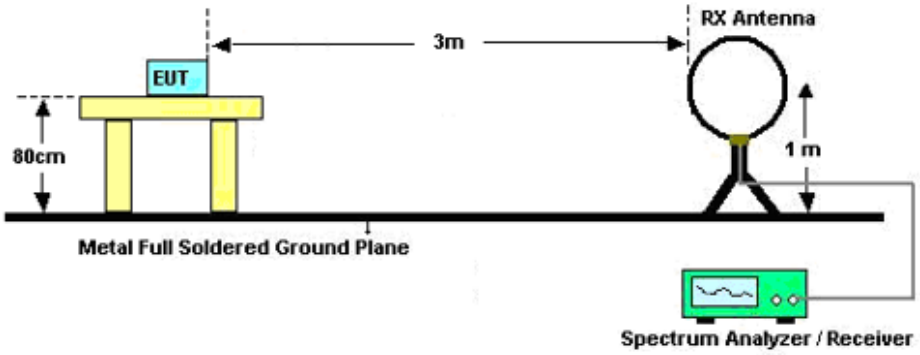
   - RBW = 1 MHz
   - VBW = 3 MHz
   - Detector = power averaging (rms), set span/(# of points in sweep) ≥ RBW/2.
   - Averaging type = power averaging(RMS)
   - The correction factor shall be offset is 10 log (1/x), where x is the duty cycle.
   -

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 peak 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.

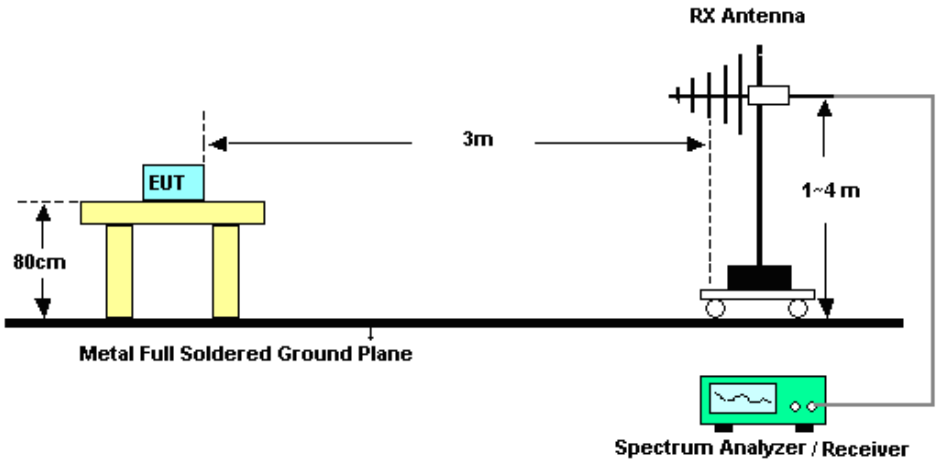
3.4.4 Test Setup

For radiated emissions below 30MHz



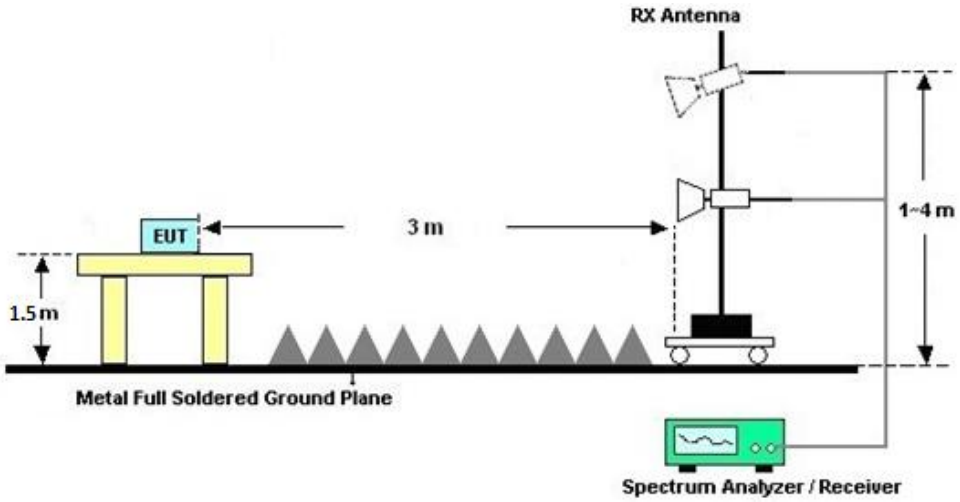
For radiated emissions from 30MHz to 1GHz

<CDD Mode>



For radiated emissions above 1GHz

<CDD Mode>



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 or 40GHz, whichever is lower)

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.

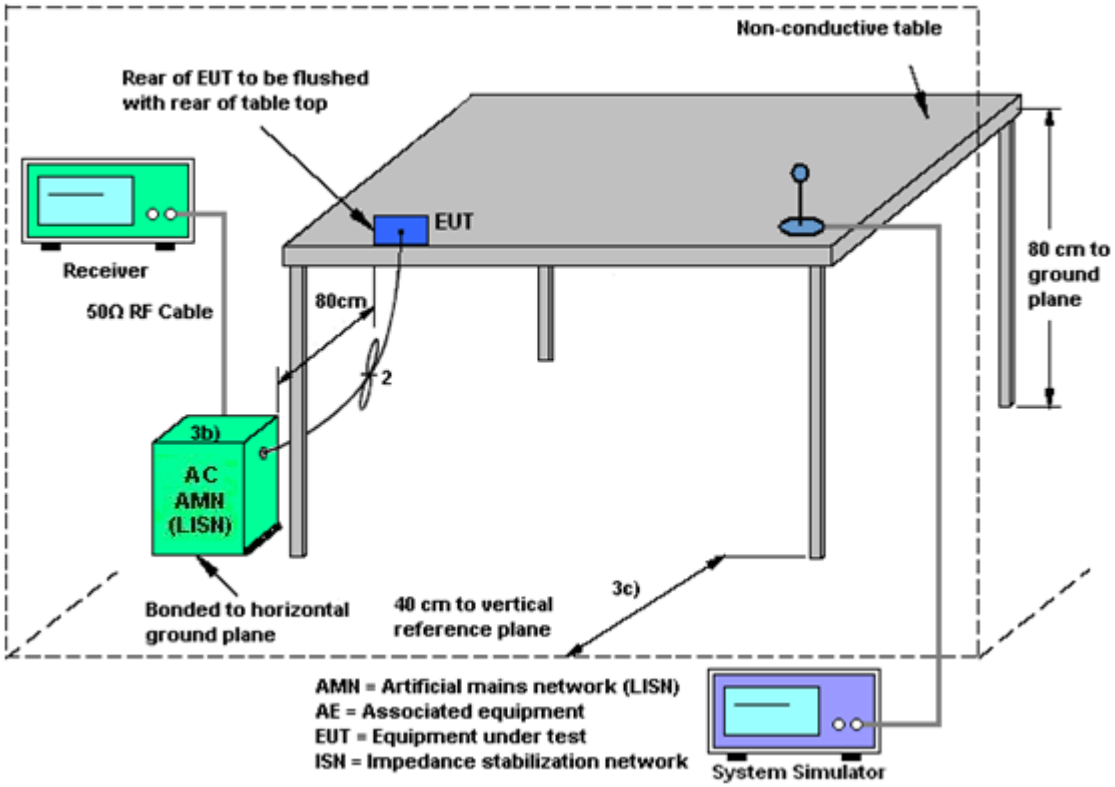
3.5.2 Measuring Instruments

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

If transmitting antenna directional gain is greater than 6 dBi, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

3.6.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.6.3 Antenna Gain

<CDD Modes >

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

For CDD transmissions, directional gain is calculated as

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

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

Array Gain = 10 log(NANT/NSS=1) dB.

For power measurements on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for NANT ≤ 4.

Directional gain may be calculated by using the formulas applicable to equal gain antennas with GANT set equal to the gain of the antenna having the highest gain;

The EUT supports CDD mode.

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

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

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

The directional gain “DG” is calculated as following table.

<CDD Modes>

	Ant. 1 (dBi)	Ant. 2 (dBi)	DG for Power (dBi)	DG for PSD (dBi)	Power Limit Reduction (dB)	PSD Limit Reduction (dB)
Band I	0.80	-0.80	0.80	3.05	0.00	0.00
Band II	1.40	-0.20	1.40	3.65	0.00	0.00
Band III	2.30	0.00	2.30	4.24	0.00	0.00
Band IV	1.00	-0.10	1.00	3.48	0.00	0.00

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

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

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101040	10Hz~40GHz	Oct. 14, 2021	Mar. 29, 2022~ Mar. 30, 2022	Oct. 13, 2022	Conducted (TH01-KS)
Pulse Power Senor	Anritsu	MA2411B	0917070	300MHz~40GHz	Jan. 05, 2022	Mar. 29, 2022~ Mar. 30, 2022	Jan. 04, 2023	Conducted (TH01-KS)
Power Meter	Anritsu	ML2495A	1005002	50MHz Bandwidth	Jan. 05, 2022	Mar. 29, 2022~ Mar. 30, 2022	Jan. 04, 2023	Conducted (TH01-KS)
Temperature &humidity chamber	Hongzhan	LP-150U	H2014011440	-40~+150°C 20%~95%RH	Jul. 12, 2021	Mar. 29, 2022~ Mar. 30, 2022	Jul. 11, 2022	Conducted (TH01-KS)
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz;	Apr. 21, 2021	Apr. 01, 2022	Apr. 20, 2022	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060103	9kHz~30MHz	Oct. 14, 2021	Apr. 01, 2022	Oct. 13, 2022	Conduction (CO01-KS)
AC LISN	R&S	ENV216	100334	9kHz~30MHz	Oct. 14, 2021	Apr. 01, 2022	Oct. 13, 2022	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP000000811	AC 0V~300V, 45Hz~1000Hz	Oct. 14, 2021	Apr. 01, 2022	Oct. 13, 2022	Conduction (CO01-KS)
EMI Test Receiver	R&S	ESR7	101403	9kHz~7GHz;Max 30dBm	Oct, 16, 2021	Apr. 21, 2022	Oct, 15,2022	Radiation (03CH07-KS)
EXA Spectrum Analyzer	Keysight	N9010A	MY55370528	10Hz-44G,MAX 30dB	Oct. 16, 2021	Apr. 21, 2022	Oct. 15,2022	Radiation (03CH07-KS)
Loop Antenna	R&S	HFH2-Z2	100321	9kHz~30MHz	Oct. 30, 2021	Apr. 21, 2022	Oct. 29, 2022	Radiation (03CH07-KS)
Bilog Antenna	TeseQ	CBL6111D	44483	30MHz-1GHz	Dec. 22, 2021	Apr. 21, 2022	Dec. 21, 2022	Radiation (03CH07-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	75957	1GHz~18GHz	Oct. 30, 2021	Apr. 21, 2022	Oct. 29, 2022	Radiation (03CH07-KS)
high gain Amplifier	MITEQ	AMF-7D-00101800-30-10P	2025788	1Ghz-18Ghz	Jul. 30, 2021	Apr. 21, 2022	Jul. 29, 2023	Radiation (03CH07-KS)
SHF-EHF Horn	Com-power	AH-840	101070	18GHz~40GHz	Jan. 05, 2022	Apr. 21, 2022	Jan. 04, 2023	Radiation (03CH07-KS)
Amplifier	Keysight	83017A	MY53270316	500MHz~26.5GHz	Oct, 16, 2021	Apr. 21, 2022	Oct, 15,2022	Radiation (03CH07-KS)
Amplifier	MITEQ	EM18G40GGA	060728	18~40GHz	Jan. 05, 2022	Apr. 21, 2022	Jan. 04, 2023	Radiation (03CH07-KS)
AC Power Source	Chroma	61601	616010002473	N/A	NCR	Apr. 21, 2022	NCR	Radiation (03CH07-KS)
Turn Table	MF	MF7802	N/A	0~360 degree	NCR	Apr. 21, 2022	NCR	Radiation (03CH07-KS)
Antenna Mast	MF	MF7802	N/A	1 m~4 m	NCR	Apr. 21, 2022	NCR	Radiation (03CH07-KS)

NCR: No Calibration Required

5 Uncertainty of Evaluation

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 Emission Measurement (150kHz ~ 30MHz)

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

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

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

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

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

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

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

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

Appendix A. Conducted Test Results

A1. Conducted Test Results

Test Engineer:	Jacob Zhang	Temperature:	21~25	°C
Test Date:	2022/3/29~2022/03/30	Relative Humidity:	51~54	%

TEST RESULTS DATA
Average Power Table

FCC U-NII-1 MIMO													
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power with duty factor (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)			Pass/Fail
					Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2		
11a	6Mbps	2	36	5180	11.67	11.19	14.45	24.00		0.80			Pass
11a	6Mbps	2	44	5220	13.63	13.26	16.46	24.00		0.80			Pass
11a	6Mbps	2	48	5240	13.51	13.38	16.46	24.00		0.80			Pass
HT20	MCS0	2	36	5180	13.74	13.29	16.53	24.00		0.80			Pass
HT20	MCS0	2	44	5220	13.64	13.28	16.48	24.00		0.80			Pass
HT20	MCS0	2	48	5240	13.61	13.33	16.48	24.00		0.80			Pass
HT40	MCS0	2	38	5190	12.26	11.69	15.00	24.00		0.80			Pass
HT40	MCS0	2	46	5230	13.19	12.98	16.10	24.00		0.80			Pass
VHT20	MCS0	2	36	5180	13.86	13.03	16.48	24.00		0.80			Pass
VHT20	MCS0	2	44	5220	13.69	13.29	16.51	24.00		0.80			Pass
VHT20	MCS0	2	48	5240	13.67	13.36	16.53	24.00		0.80			Pass
VHT40	MCS0	2	38	5190	12.33	11.78	15.08	24.00		0.80			Pass
VHT40	MCS0	2	46	5230	13.37	12.99	16.20	24.00		0.80			Pass
VHT80	MCS0	2	42	5210	9.59	9.00	12.31	24.00		0.80			Pass

TEST RESULTS DATA
Average Power Table

FCC U-NII-2A MIMO													
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power with duty factor (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		EIRP Power Limit (dBm)	Pass/Fail
					Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2		
11a	6Mbps	2	52	5260	15.61	15.39	18.51	23.98		1.40		26.99	Pass
11a	6Mbps	2	60	5300	15.52	15.44	18.49	23.98		1.40		26.99	Pass
11a	6Mbps	2	64	5320	14.44	14.34	17.40	23.98		1.40		26.99	Pass
HT20	MCS0	2	52	5260	15.50	15.29	18.41	23.98		1.40		26.99	Pass
HT20	MCS0	2	60	5300	15.40	15.40	18.41	23.98		1.40		26.99	Pass
HT20	MCS0	2	64	5320	13.54	13.47	16.52	23.98		1.40		26.99	Pass
HT40	MCS0	2	54	5270	15.11	14.85	18.00	23.98		1.40		26.99	Pass
HT40	MCS0	2	62	5310	12.66	12.79	15.74	23.98		1.40		26.99	Pass
VHT20	MCS0	2	52	5260	15.56	15.17	18.38	23.98		1.40		26.99	Pass
VHT20	MCS0	2	60	5300	15.52	15.34	18.44	23.98		1.40		26.99	Pass
VHT20	MCS0	2	64	5320	13.57	13.50	16.55	23.98		1.40		26.99	Pass
VHT40	MCS0	2	54	5270	15.14	14.84	18.00	23.98		1.40		26.99	Pass
VHT40	MCS0	2	62	5310	12.77	12.82	15.81	23.98		1.40		26.99	Pass
VHT80	MCS0	2	58	5290	10.81	10.80	13.81	23.98		1.40		26.99	Pass

Report Number : FR231203E

TEST RESULTS DATA
Average Power Table

FCC U-NII-2C MIMO													
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power with duty factor (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		EIRP Power Limit (dBm)	Pass/Fail
					Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2		
11a	6Mbps	2	100	5500	14.42	14.31	17.38	23.98		2.30		26.99	Pass
11a	6Mbps	2	116	5580	14.85	15.03	17.95	23.98		2.30		26.99	Pass
11a	6Mbps	2	140	5700	15.12	14.93	18.04	23.98		2.30		26.99	Pass
HT20	MCS0	2	100	5500	13.82	13.94	16.89	23.98		2.30		26.99	Pass
HT20	MCS0	2	116	5580	14.80	15.01	17.92	23.98		2.30		26.99	Pass
HT20	MCS0	2	140	5700	15.13	14.82	17.99	23.98		2.30		26.99	Pass
HT40	MCS0	2	102	5510	12.48	12.33	15.42	23.98		2.30		26.99	Pass
HT40	MCS0	2	110	5550	14.48	14.39	17.45	23.98		2.30		26.99	Pass
HT40	MCS0	2	134	5670	14.53	14.35	17.45	23.98		2.30		26.99	Pass
VHT20	MCS0	2	100	5500	13.84	13.97	16.92	23.98		2.30		26.99	Pass
VHT20	MCS0	2	116	5580	14.78	14.99	17.90	23.98		2.30		26.99	Pass
VHT20	MCS0	2	140	5700	15.04	14.82	17.94	23.98		2.30		26.99	Pass
VHT40	MCS0	2	102	5510	12.51	12.36	15.45	23.98		2.30		26.99	Pass
VHT40	MCS0	2	110	5550	14.43	14.26	17.36	23.98		2.30		26.99	Pass
VHT40	MCS0	2	134	5670	14.50	14.38	17.45	23.98		2.30		26.99	Pass
VHT80	MCS0	2	106	5530	8.24	8.17	11.21	23.98		2.30		26.99	Pass
VHT80	MCS0	2	122	5610	14.23	14.31	17.278	23.98		2.30		26.99	Pass
VHT160		2	114	5570	-	-	-	23.98		2.30		26.99	Pass

FCC U-NII-2C straddle channel MIMO													
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power with duty factor (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		EIRP Power Limit (dBm)	Pass/Fail
					Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2		
11a	6Mbps	2	144	5720	15.21	14.95	18.09	23.98		2.30		26.99	Pass
HT20	MCS0	2	144	5720	15.08	14.94	18.02	23.98		2.30		26.99	Pass
HT40	MCS0	2	142	5710	14.65	14.48	17.58	23.98		2.30		26.99	Pass
VHT20	MCS0	2	144	5720	15.15	13.79	17.54	23.98		2.30		26.99	Pass
VHT40	MCS0	2	142	5710	14.82	14.47	17.66	23.98		2.30		26.99	Pass
VHT80	MCS0	2	138	5690	14.56	14.37	17.47	23.98		2.30		26.99	Pass

TEST RESULTS DATA
Average Power Table

FCC U-NII-1 MIMO														
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	RU Config.	Average Conducted Power with duty factor (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)			Pass/Fail
						Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2		
HE20	MCS0	2	36	5180	Full	13.98	13.34	16.69	24.00		0.80			Pass
HE20	MCS0	2	36	5180	26/0	6.70	5.54	9.17	24.00		0.80			Pass
HE20	MCS0	2	36	5180	52/37	9.13	8.14	11.67	24.00		0.80			Pass
HE20	MCS0	2	36	5180	106/53	12.12	11.15	14.67	24.00		0.80			Pass
HE20	MCS0	2	44	5220	Full	13.74	13.39	16.58	24.00		0.80			Pass
HE20	MCS0	2	44	5220	26/4	7.28	6.19	9.78	24.00		0.80			Pass
HE20	MCS0	2	44	5220	52/39	9.22	8.27	11.78	24.00		0.80			Pass
HE20	MCS0	2	44	5220	106/53	12.01	11.32	14.69	24.00		0.80			Pass
HE20	MCS0	2	48	5240	Full	13.81	13.51	16.68	24.00		0.80			Pass
HE20	MCS0	2	48	5240	26/8	6.49	5.71	9.13	24.00		0.80			Pass
HE20	MCS0	2	48	5240	52/40	9.07	8.38	11.75	24.00		0.80			Pass
HE20	MCS0	2	48	5240	106/54	11.94	11.34	14.66	24.00		0.80			Pass
HE40	MCS0	2	38	5190	Full	12.57	11.94	15.28	24.00		0.80			Pass
HE40	MCS0	2	46	5230	Full	13.57	13.06	16.33	24.00		0.80			Pass
HE80	MCS0	2	42	5210	Full	9.83	9.26	12.57	24.00		0.80			Pass

TEST RESULTS DATA
Average Power Table

FCC U-NII-2A MIMO														
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	RU Config.	Average Conducted Power with duty factor (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		EIRP Power Limit (dBm)	Pass/Fail
						Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2		
HE20	MCS0	2	52	5260	Full	15.80	15.53	18.68	23.98		1.40		26.99	Pass
HE20	MCS0	2	52	5260	26/0	7.74	7.48	10.62	23.98		1.40		26.99	Pass
HE20	MCS0	2	52	5260	52/37	10.37	10.02	13.21	23.98		1.40		26.99	Pass
HE20	MCS0	2	52	5260	106/53	13.13	12.78	15.97	23.98		1.40		26.99	Pass
HE20	MCS0	2	60	5300	Full	15.63	15.46	18.56	23.98		1.40		26.99	Pass
HE20	MCS0	2	60	5300	26/4	9.04	8.40	11.74	23.98		1.40		26.99	Pass
HE20	MCS0	2	60	5300	52/39	10.71	10.37	13.55	23.98		1.40		26.99	Pass
HE20	MCS0	2	60	5300	106/54	13.62	13.45	16.54	23.98		1.40		26.99	Pass
HE20	MCS0	2	64	5320	Full	13.62	13.58	16.61	23.98		1.40		26.99	Pass
HE20	MCS0	2	64	5320	26/8	6.85	6.92	9.90	23.98		1.40		26.99	Pass
HE20	MCS0	2	64	5320	52/40	9.28	9.35	12.32	23.98		1.40		26.99	Pass
HE20	MCS0	2	64	5320	106/54	12.43	12.35	15.40	23.98		1.40		26.99	Pass
HE40	MCS0	2	54	5270	Full	15.32	15.13	18.24	23.98		1.40		26.99	Pass
HE40	MCS0	2	62	5310	Full	13.03	13.13	16.09	23.98		1.40		26.99	Pass
HE80	MCS0	2	58	5290	Full	11.25	10.93	14.11	23.98		1.40		26.99	Pass

TEST RESULTS DATA
Average Power Table

FCC U-NII-2C MIMO														
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	RU Config.	Average Conducted Power with duty factor (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		EIRP Power Limit (dBm)	Pass/Fail
						Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2		
HE20	MCS0	2	100	5500	Full	13.97	14.07	17.03	23.98		2.30		26.99	Pass
HE20	MCS0	2	100	5500	26/0	7.28	6.86	10.09	23.98		2.30		26.99	Pass
HE20	MCS0	2	100	5500	52/37	10.24	10.10	13.18	23.98		2.30		26.99	Pass
HE20	MCS0	2	100	5500	106/53	13.12	12.94	16.04	23.98		2.30		26.99	Pass
HE20	MCS0	2	116	5580	Full	14.92	15.29	18.12	23.98		2.30		26.99	Pass
HE20	MCS0	2	116	5580	26/4	7.92	8.13	11.04	23.98		2.30		26.99	Pass
HE20	MCS0	2	116	5580	52/38	10.07	10.32	13.21	23.98		2.30		26.99	Pass
HE20	MCS0	2	116	5580	106/53	13.06	13.21	16.14	23.98		2.30		26.99	Pass
HE20	MCS0	2	140	5700	Full	15.25	15.06	18.17	23.98		2.30		26.99	Pass
HE20	MCS0	2	140	5700	26/8	7.71	6.95	10.36	23.98		2.30		26.99	Pass
HE20	MCS0	2	140	5700	52/40	10.69	10.03	13.38	23.98		2.30		26.99	Pass
HE20	MCS0	2	140	5700	106/54	13.39	12.96	16.19	23.98		2.30		26.99	Pass
HE40	MCS0	2	102	5510	Full	12.72	12.84	15.79	23.98		2.30		26.99	Pass
HE40	MCS0	2	110	5550	Full	14.69	14.68	17.70	23.98		2.30		26.99	Pass
HE40	MCS0	2	134	5670	Full	14.84	14.65	17.76	23.98		2.30		26.99	Pass
HE80	MCS0	2	106	5530	Full	8.54	8.37	11.47	23.98		2.30		26.99	Pass
HE80	MCS0	2	122	5610	Full	14.39	14.67	17.54	23.98		2.30		26.99	Pass

FCC U-NII-2C straddle channel MIMO														
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	RU Config.	Average Conducted Power with duty factor (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		EIRP Power Limit (dBm)	Pass/Fail
						Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2		
HE20	MCS0	2	144	5720	Full	15.22	15.04	18.15	23.98		2.30		26.99	Pass
HE40	MCS0	2	142	5710	Full	15.01	14.77	17.90	23.98		2.30		26.99	Pass
HE80	MCS0	2	138	5690	Full	14.78	14.53	17.67	23.98		2.30		26.99	Pass

TEST RESULTS DATA
Average Power Table

U-NII-3 MIMO												
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power with duty factor (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		Pass/Fail
					Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2	
11a	6Mbps	2	149	5745	14.48	14.70	17.60	30.00		1.00		Pass
11a	6Mbps	2	157	5785	14.53	14.75	17.65	30.00		1.00		Pass
11a	6Mbps	2	165	5825	14.63	14.93	17.80	30.00		1.00		Pass
HT20	MCS0	2	149	5745	14.19	14.01	17.11	30.00		1.00		Pass
HT20	MCS0	2	157	5785	14.27	14.13	17.21	30.00		1.00		Pass
HT20	MCS0	2	165	5825	14.40	14.26	17.34	30.00		1.00		Pass
HT40	MCS0	2	151	5755	14.42	14.66	17.56	30.00		1.00		Pass
HT40	MCS0	2	159	5795	14.26	14.72	17.51	30.00		1.00		Pass
VHT20	MCS0	2	149	5745	14.21	14.30	17.27	30.00		1.00		Pass
VHT20	MCS0	2	157	5785	14.40	14.34	17.38	30.00		1.00		Pass
VHT20	MCS0	2	165	5825	14.44	14.36	17.41	30.00		1.00		Pass
VHT40	MCS0	2	151	5755	14.46	14.78	17.63	30.00		1.00		Pass
VHT40	MCS0	2	159	5795	14.37	14.74	17.57	30.00		1.00		Pass
VHT80	MCS0	2	155	5775	14.85	15.15	18.01	30.00		1.00		Pass

TEST RESULTS DATA
Average Power Table

U-NII-3 MIMO													
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	RU Config.	Average Conducted Power with duty factor (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		Pass/Fail
						Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2	
HE20	MCS0	2	149	5745	Full	14.49	14.94	17.74	30.00		1.00		Pass
HE20	MCS0	2	149	5745	26/0	7.99	7.90	10.96	30.00		1.00		Pass
HE20	MCS0	2	149	5745	52/37	10.52	10.88	13.71	30.00		1.00		Pass
HE20	MCS0	2	149	5745	106/53	13.40	13.74	16.58	30.00		1.00		Pass
HE20	MCS0	2	157	5785	Full	14.55	14.92	17.75	30.00		1.00		Pass
HE20	MCS0	2	157	5785	26/4	7.93	8.14	11.05	30.00		1.00		Pass
HE20	MCS0	2	157	5785	52/38	10.47	10.67	13.58	30.00		1.00		Pass
HE20	MCS0	2	157	5785	106/53	13.56	13.77	16.67	30.00		1.00		Pass
HE20	MCS0	2	165	5825	Full	14.60	14.91	17.77	30.00		1.00		Pass
HE20	MCS0	2	165	5825	26/8	8.14	8.76	11.47	30.00		1.00		Pass
HE20	MCS0	2	165	5825	52/40	10.95	11.64	14.32	30.00		1.00		Pass
HE20	MCS0	2	165	5825	106/54	13.77	14.66	17.25	30.00		1.00		Pass
HE40	MCS0	2	151	5755	Full	14.59	14.80	17.71	30.00		1.00		Pass
HE40	MCS0	2	159	5795	Full	14.53	14.93	17.74	30.00		1.00		Pass
HE80	MCS0	2	155	5775	Full	15.05	15.14	18.11	30.00		1.00		Pass

Emission Bandwidth

Test Result

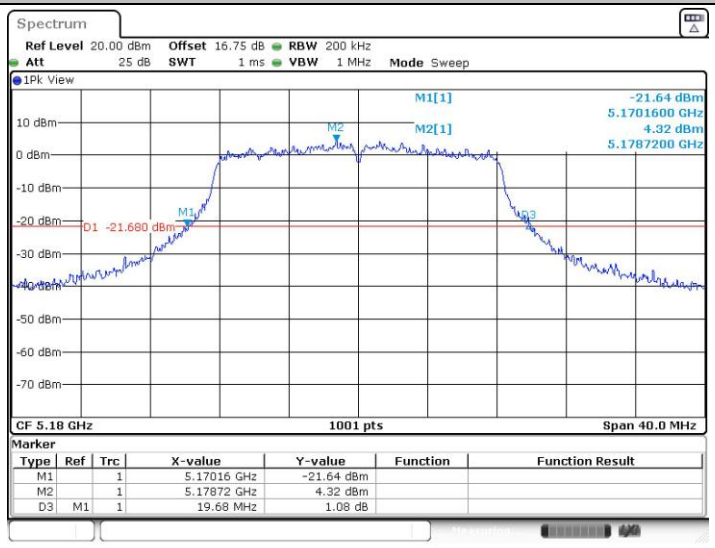
TestMode	Antenna	Frequency[MHz]	26db EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A-CDD	Ant8	5180	19.68	5170.16	5189.84	---	---
	Ant9	5180	19.48	5170.44	5189.92	---	---
	Ant8	5220	20.08	5209.80	5229.88	---	---
	Ant9	5220	19.84	5209.80	5229.64	---	---
	Ant8	5240	20.04	5230.16	5250.20	---	---
	Ant9	5240	19.16	5230.48	5249.64	---	---
	Ant8	5260	19.84	5250.16	5270.00	---	---
	Ant9	5260	19.36	5250.48	5269.84	---	---
	Ant8	5300	19.76	5290.24	5310.00	---	---
	Ant9	5300	19.40	5290.04	5309.44	---	---
	Ant8	5320	19.80	5310.00	5329.80	---	---
	Ant9	5320	19.96	5309.76	5329.72	---	---
	Ant8	5500	19.52	5490.28	5509.80	---	---
	Ant9	5500	19.40	5490.20	5509.60	---	---
	Ant8	5580	19.88	5569.92	5589.80	---	---
	Ant9	5580	19.28	5570.16	5589.44	---	---
	Ant8	5700	19.92	5690.16	5710.08	---	---
	Ant9	5700	19.56	5690.44	5710.00	---	---
	Ant8	5720	19.80	5710.04	5729.84	---	---
	Ant9	5720	19.60	5710.28	5729.88	---	---
	Ant8	5720_UNII-2C	14.96	5710.04	5725	---	---
	Ant9	5720_UNII-2C	14.72	5710.28	5725	---	---
	Ant8	5720_UNII-3	4.84	5725	5729.84	---	---
	Ant9	5720_UNII-3	4.88	5725	5729.88	---	---
	Ant8	5745	25.16	5732.64	5757.80	---	---
	Ant9	5745	22.92	5733.68	5756.60	---	---
	Ant8	5785	21.92	5773.56	5795.48	---	---
	Ant9	5785	21.80	5774.08	5795.88	---	---
	Ant8	5825	24.32	5812.84	5837.16	---	---
	Ant9	5825	28.16	5810.64	5838.80	---	---

TestMode	Antenna	Frequency[MHz]	26db EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11AX20MIMO	Ant8	5180	21.32	5169.28	5190.60	---	---
	Ant9	5180	20.76	5169.60	5190.36	---	---
	Ant8	5220	21.04	5209.44	5230.48	---	---
	Ant9	5220	21.12	5209.16	5230.28	---	---
	Ant8	5240	20.88	5229.60	5250.48	---	---
	Ant9	5240	21.24	5229.52	5250.76	---	---
	Ant8	5260	21.28	5249.16	5270.44	---	---
	Ant9	5260	21.00	5249.80	5270.80	---	---
	Ant8	5300	21.08	5289.44	5310.52	---	---
	Ant9	5300	21.16	5289.28	5310.44	---	---
	Ant8	5320	21.32	5309.48	5330.80	---	---
	Ant9	5320	21.08	5309.36	5330.44	---	---
	Ant8	5500	20.88	5489.52	5510.40	---	---
	Ant9	5500	21.08	5489.56	5510.64	---	---
	Ant8	5580	21.36	5569.24	5590.60	---	---
	Ant9	5580	20.96	5569.40	5590.36	---	---
	Ant8	5700	21.48	5689.16	5710.64	---	---
	Ant9	5700	21.40	5689.24	5710.64	---	---
	Ant8	5720	21.48	5709.24	5730.72	---	---
	Ant9	5720	21.04	5709.52	5730.56	---	---
	Ant8	5720_UNII-2C	15.76	5709.24	5725	---	---
	Ant9	5720_UNII-2C	15.48	5709.52	5725	---	---
	Ant8	5720_UNII-3	5.72	5725	5730.72	---	---
	Ant9	5720_UNII-3	5.56	5725	5730.56	---	---
	Ant8	5745	22.44	5733.68	5756.12	---	---
	Ant9	5745	21.80	5734.08	5755.88	---	---
	Ant8	5785	21.04	5774.48	5795.52	---	---
	Ant9	5785	21.52	5774.28	5795.80	---	---
	Ant8	5825	27.92	5811.92	5839.84	---	---
	Ant9	5825	27.88	5810.68	5838.56	---	---

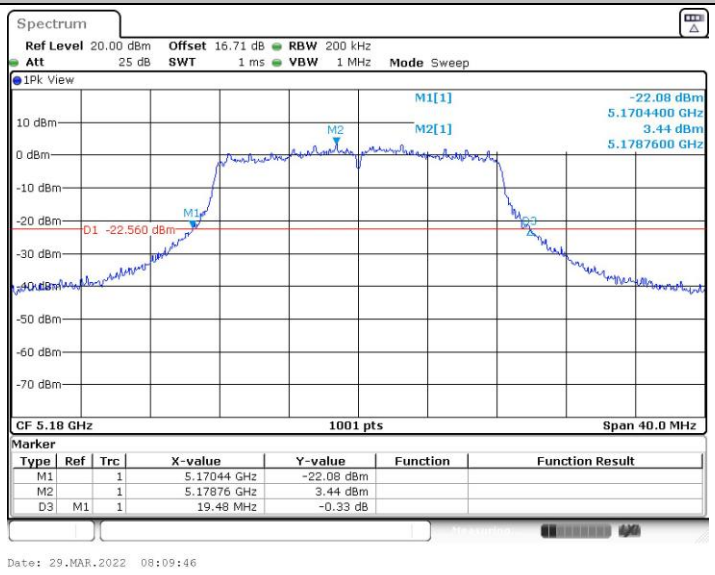
TestMode	Antenna	Frequency[MHz]	26db EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11AX40MIMO	Ant8	5190	39.84	5170.16	5210.00	---	---
	Ant9	5190	39.60	5170.24	5209.84	---	---
	Ant8	5230	39.68	5210.16	5249.84	---	---
	Ant9	5230	39.68	5210.16	5249.84	---	---
	Ant8	5270	39.68	5250.24	5289.92	---	---
	Ant9	5270	39.68	5250.24	5289.92	---	---
	Ant8	5310	39.68	5290.16	5329.84	---	---
	Ant9	5310	39.68	5290.08	5329.76	---	---
	Ant8	5510	39.68	5490.16	5529.84	---	---
	Ant9	5510	39.92	5490.08	5530.00	---	---
	Ant8	5550	39.68	5530.16	5569.84	---	---
	Ant9	5550	39.60	5530.24	5569.84	---	---
	Ant8	5670	39.68	5650.16	5689.84	---	---
	Ant9	5670	39.76	5650.08	5689.84	---	---
	Ant8	5710	39.76	5690.16	5729.92	---	---
	Ant9	5710	39.68	5690.24	5729.92	---	---
	Ant8	5710_UNII-2C	34.84	5690.16	5725	---	---
	Ant9	5710_UNII-2C	34.76	5690.24	5725	---	---
	Ant8	5710_UNII-3	4.92	5725	5729.92	---	---
	Ant9	5710_UNII-3	4.92	5725	5729.92	---	---
	Ant8	5755	42.48	5732.44	5774.92	---	---
	Ant9	5755	40.96	5733.88	5774.84	---	---
	Ant8	5795	39.84	5775.16	5815.00	---	---
	Ant9	5795	42.32	5773.40	5815.72	---	---
11AX80MIMO	Ant8	5210	80.80	5169.68	5250.48	---	---
	Ant9	5210	80.32	5169.84	5250.16	---	---
	Ant8	5290	80.80	5249.68	5330.48	---	---
	Ant9	5290	80.32	5249.84	5330.16	---	---
	Ant8	5530	80.64	5489.68	5570.32	---	---
	Ant9	5530	80.80	5489.68	5570.48	---	---
	Ant8	5610	80.48	5569.84	5650.32	---	---
	Ant9	5610	80.80	5569.68	5650.48	---	---
	Ant8	5690	80.80	5649.68	5730.48	---	---
	Ant9	5690	80.96	5649.68	5730.64	---	---
	Ant8	5690_UNII-2C	75.32	5649.68	5725	---	---
	Ant9	5690_UNII-2C	75.32	5649.68	5725	---	---
	Ant8	5690_UNII-3	5.48	5725	5730.48	---	---
	Ant9	5690_UNII-3	5.64	5725	5730.64	---	---
	Ant8	5775	90.08	5728.60	5818.68	---	---
	Ant9	5775	80.80	5734.68	5815.48	---	---

Test Graphs

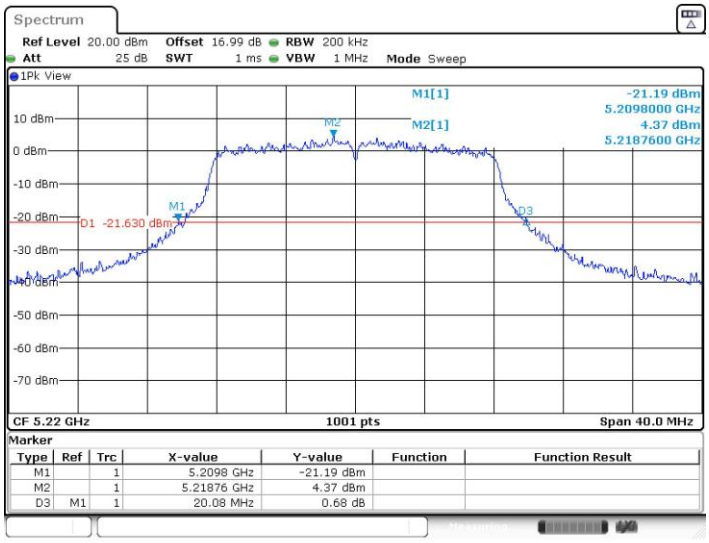
11A-CDD_Ant8_5180



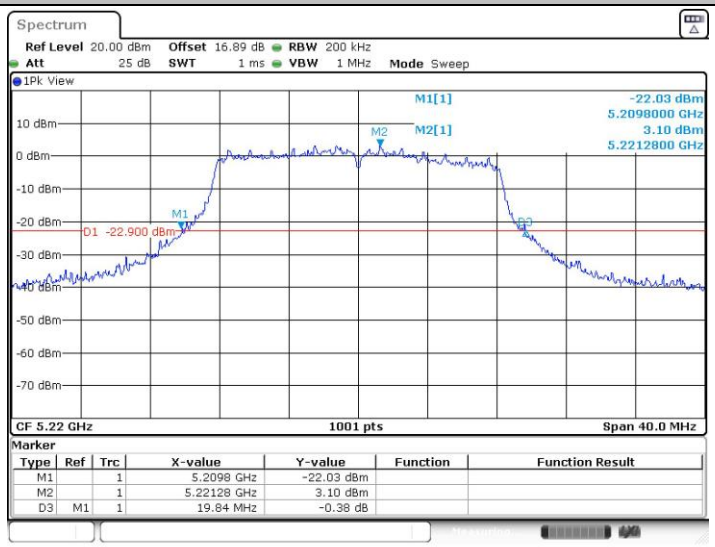
11A-CDD_Ant9_5180

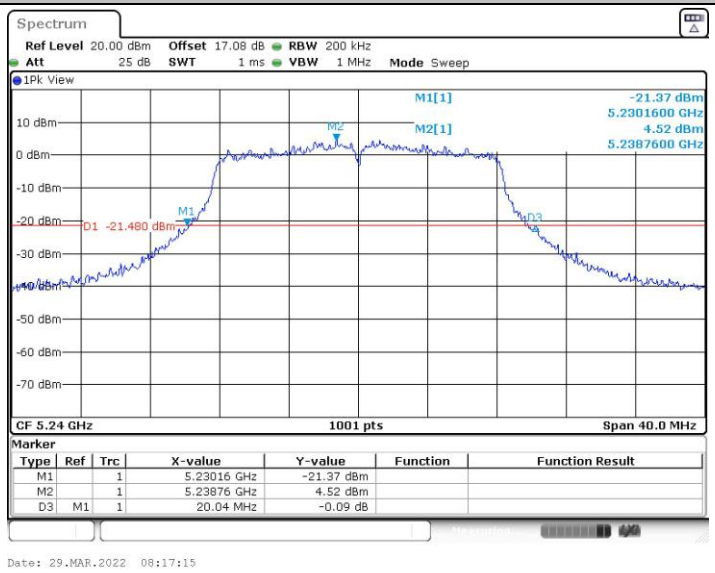


11A-CDD_Ant8_5220



11A-CDD_Ant9_5220



11A-CDD_Ant8_5240


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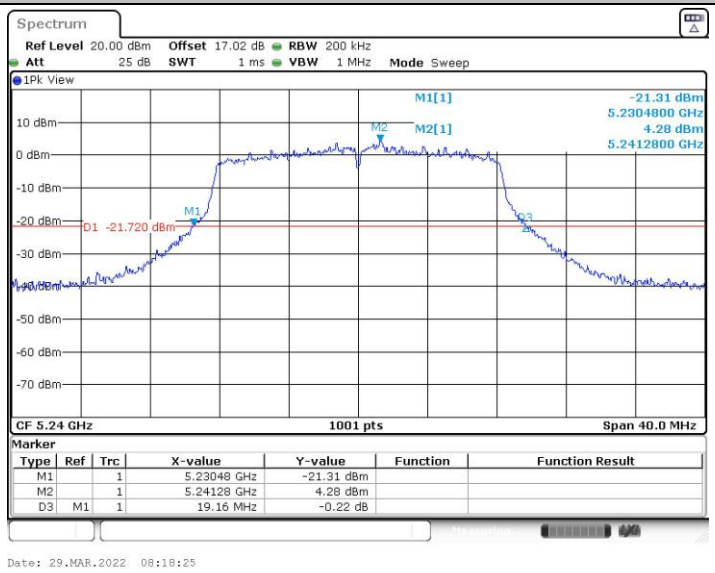

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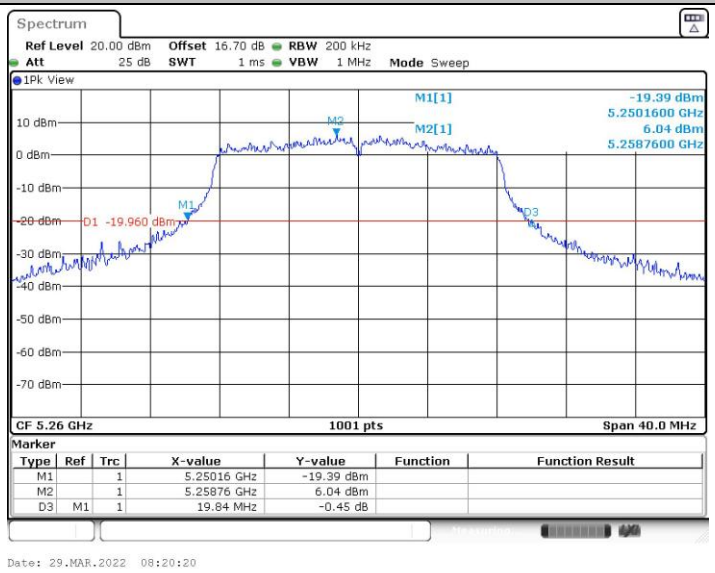

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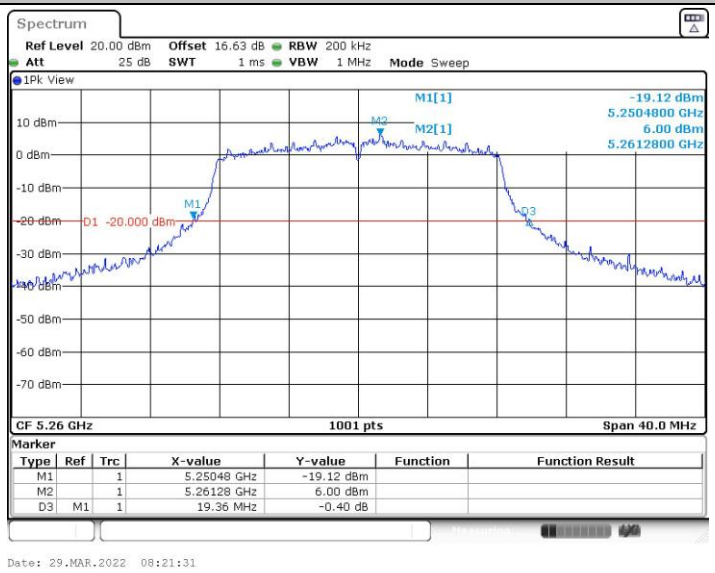

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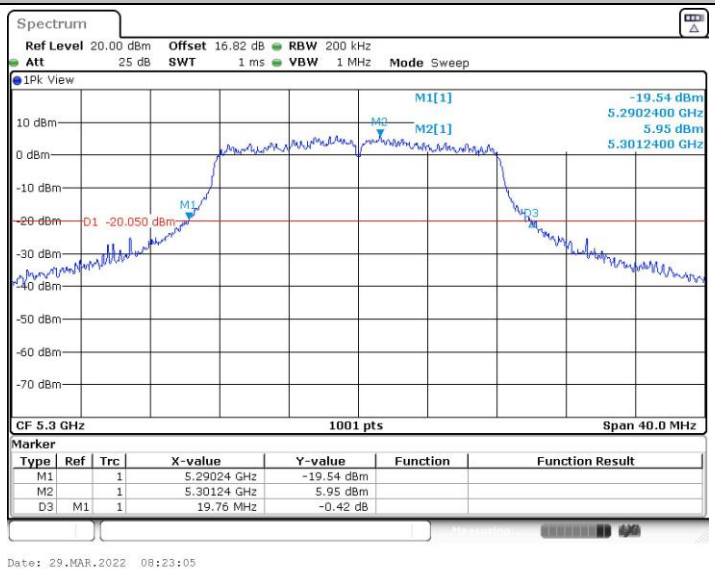

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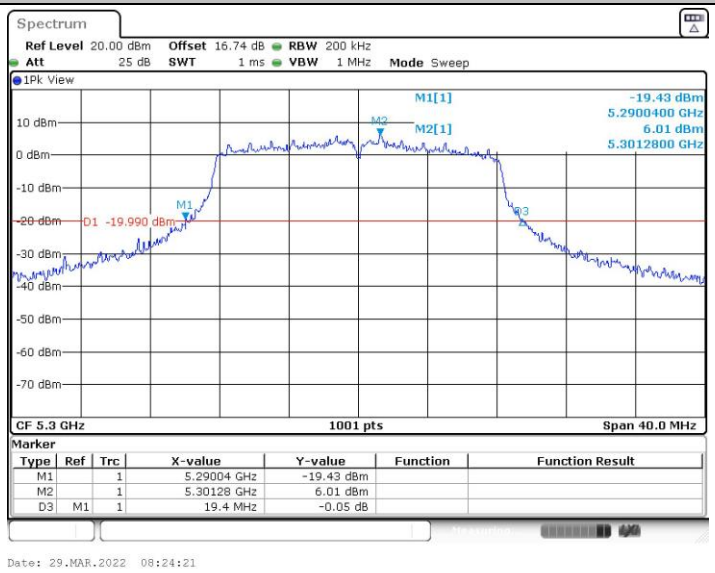

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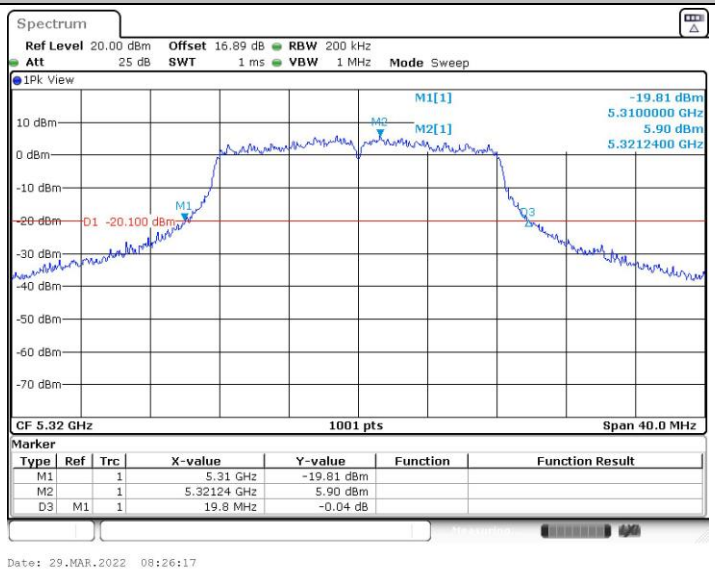

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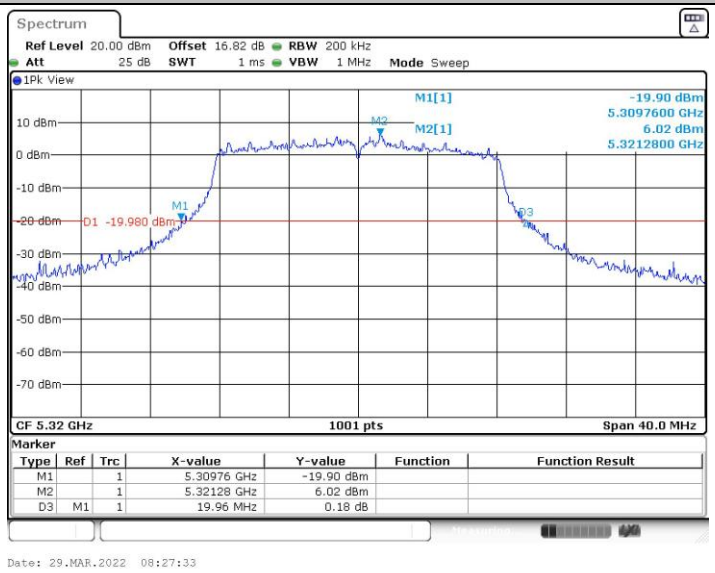

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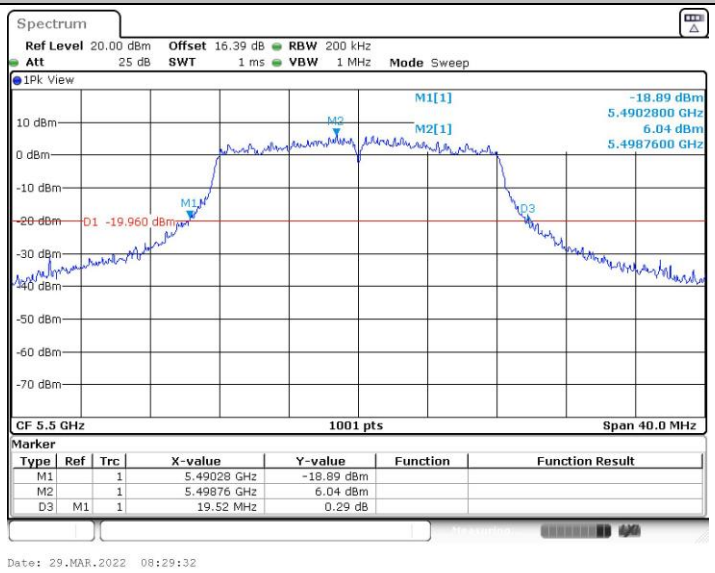
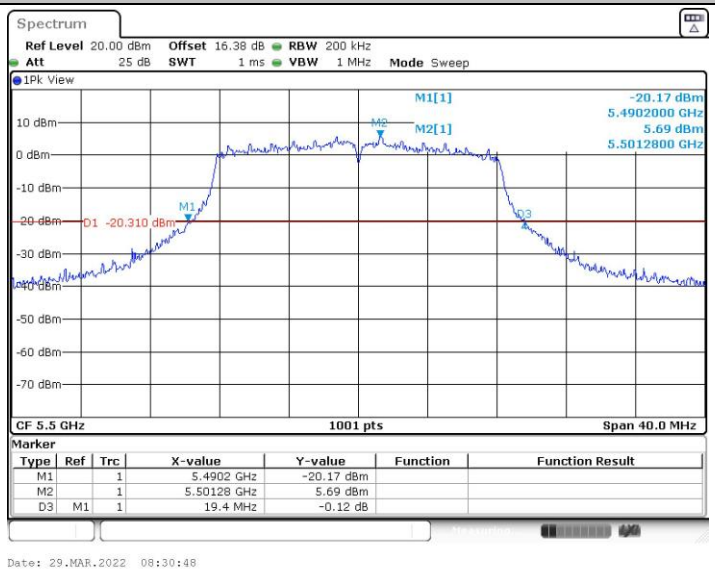
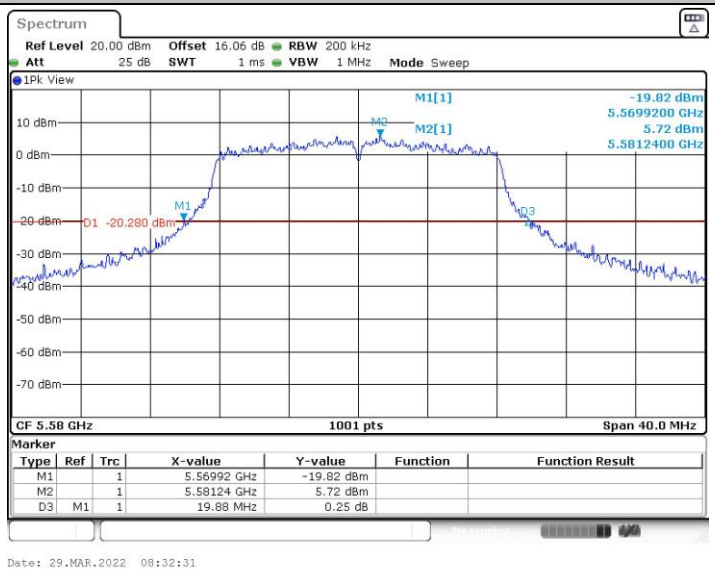
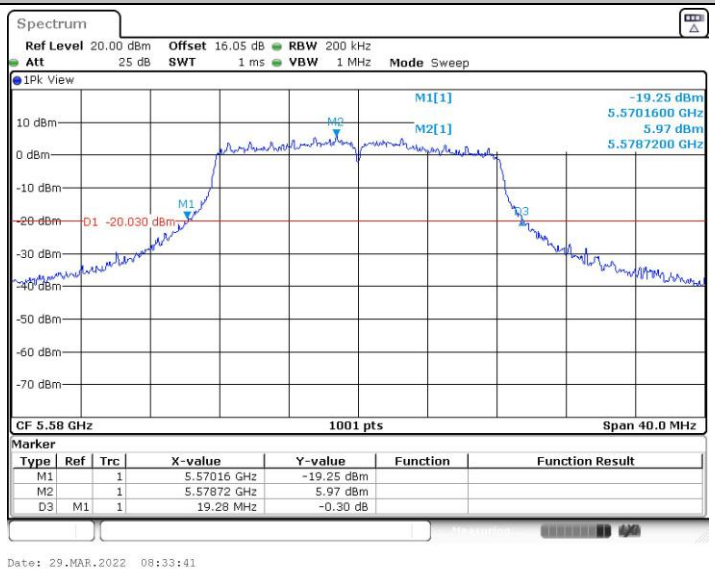


11A-CDD_Ant9_5500


11A-CDD_Ant8_5580


11A-CDD_Ant9_5580


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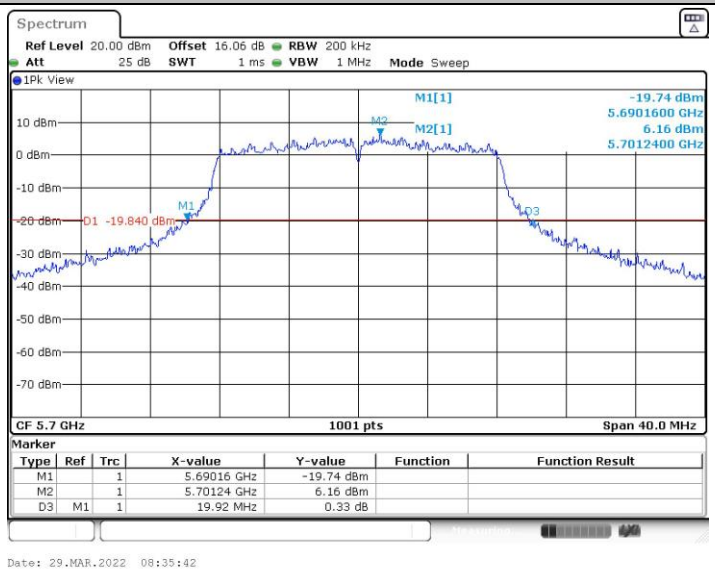

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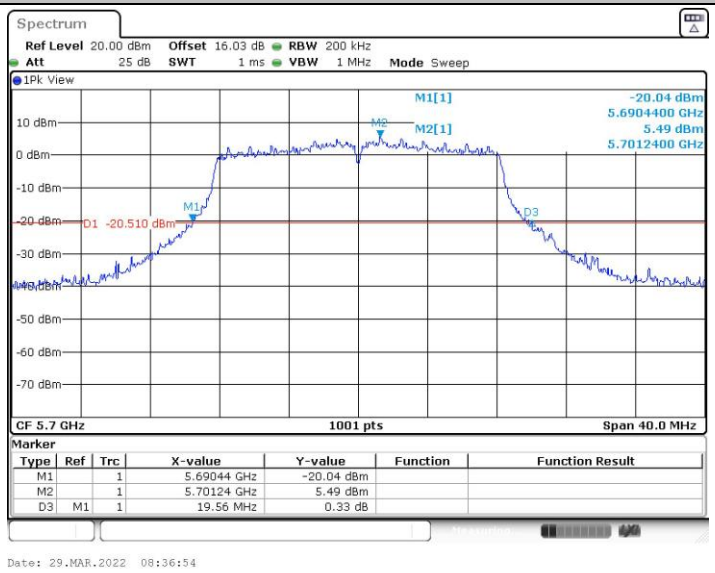

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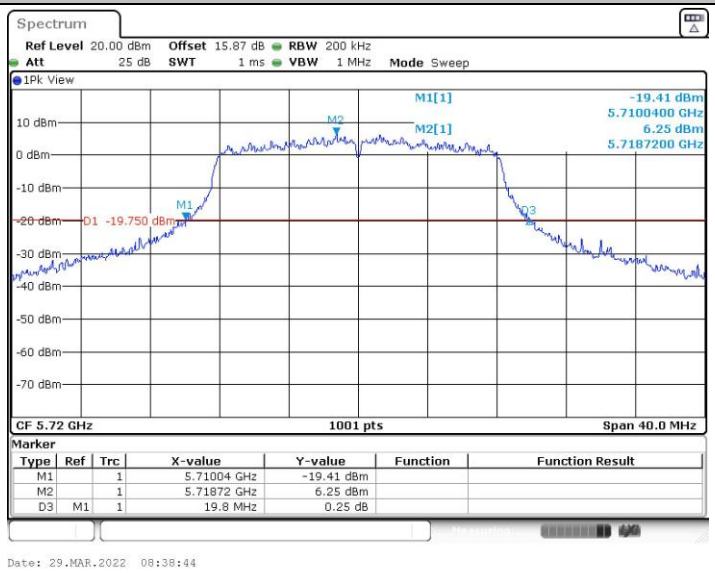

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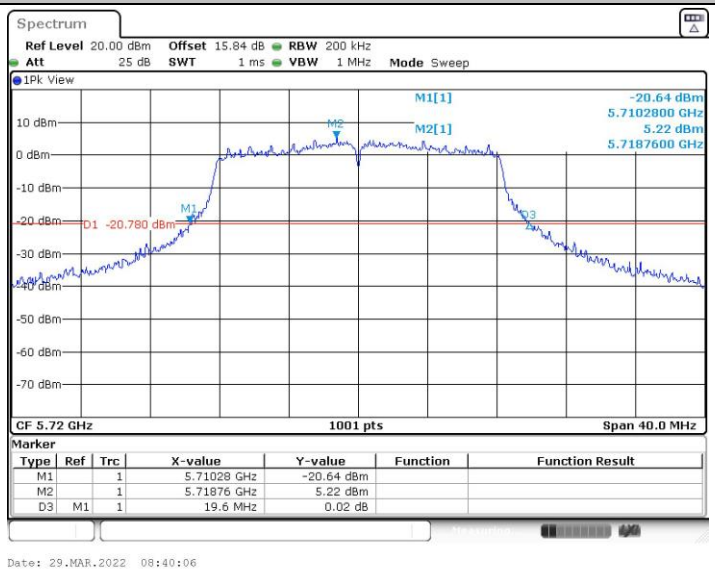

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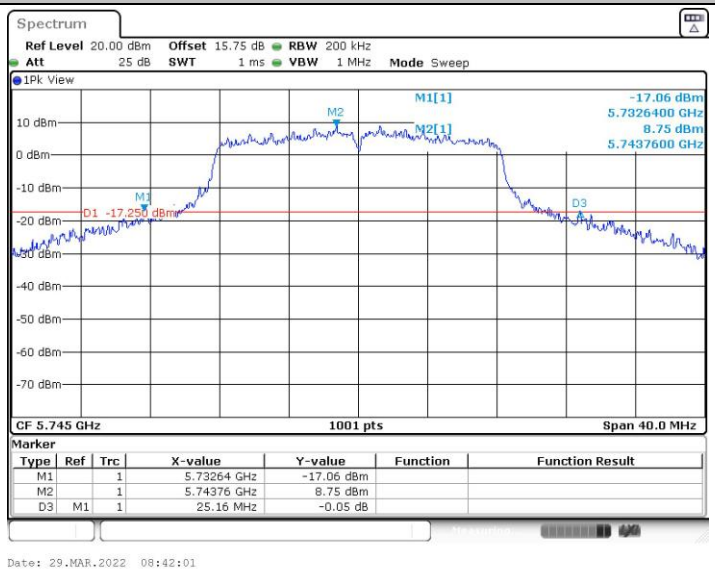
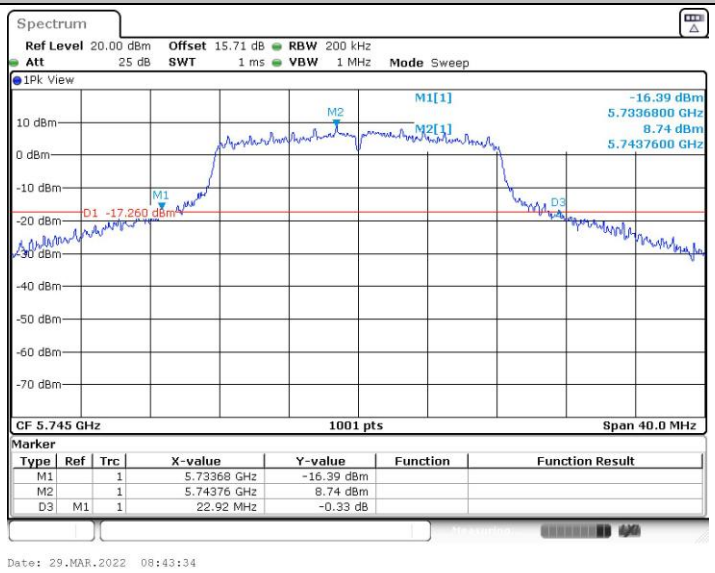


11A-CDD_Ant9_5745


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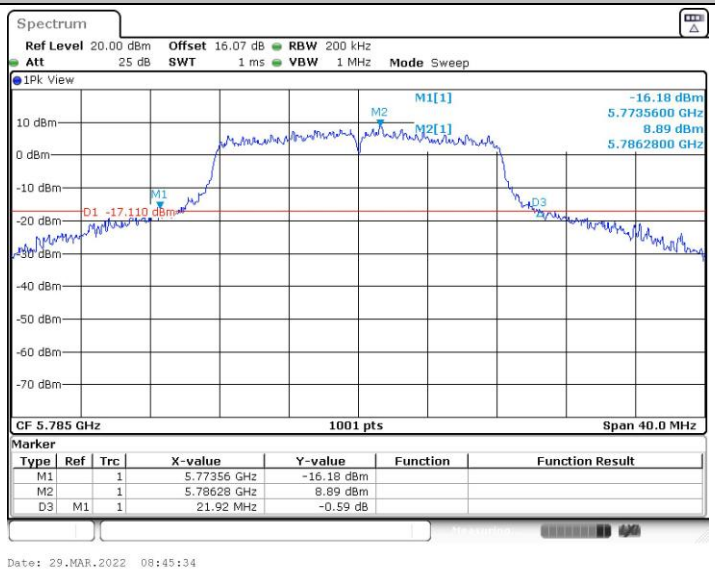

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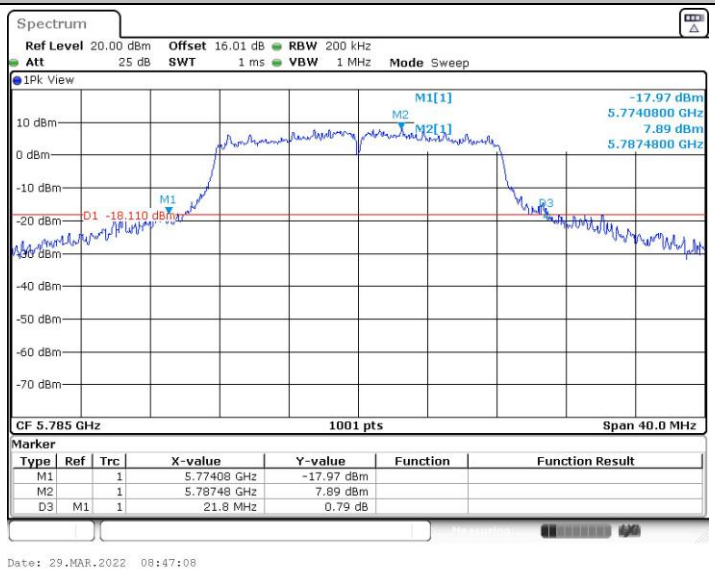

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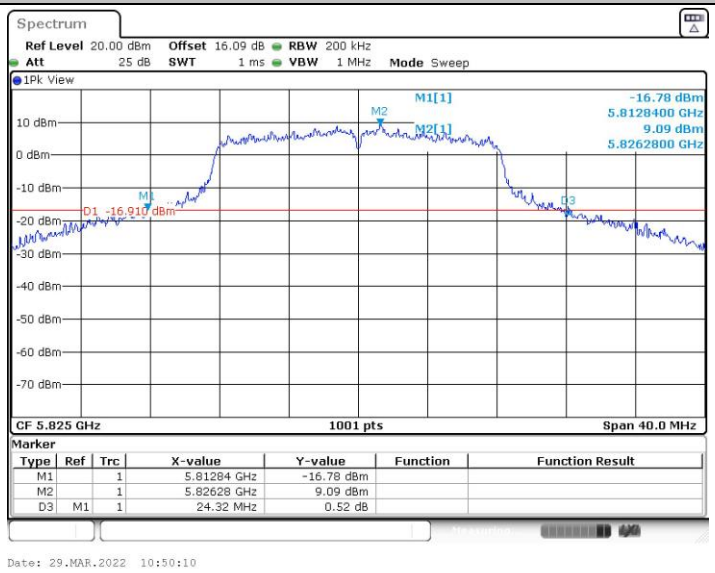

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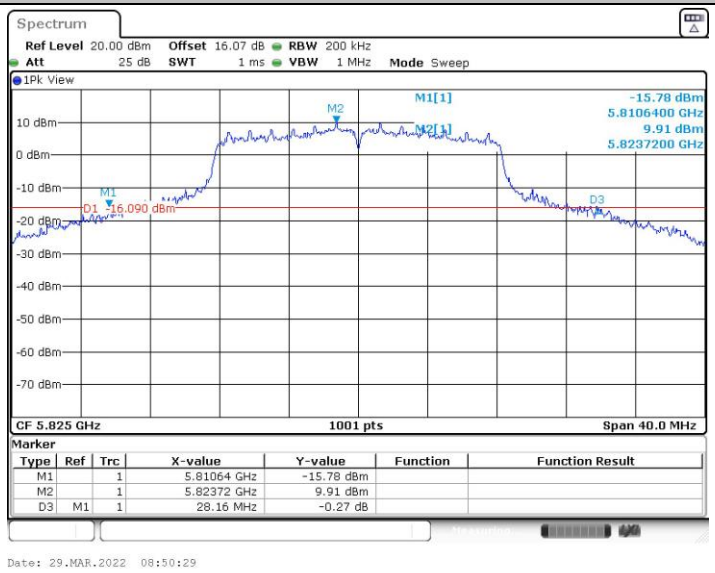

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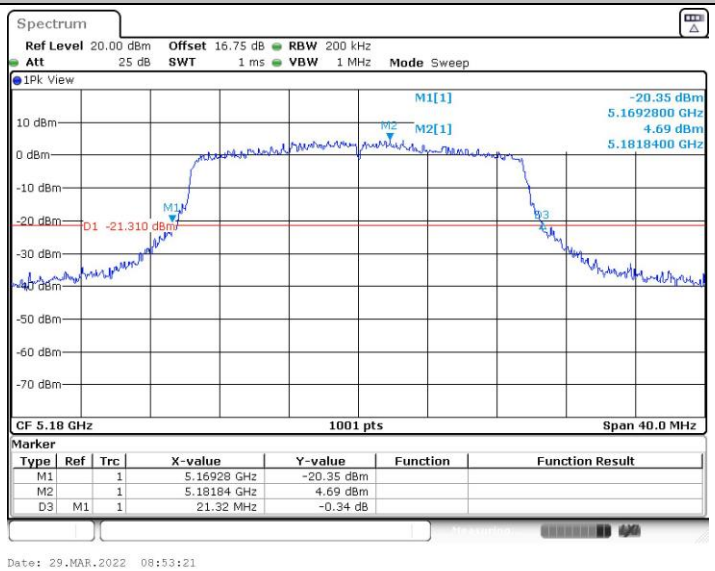

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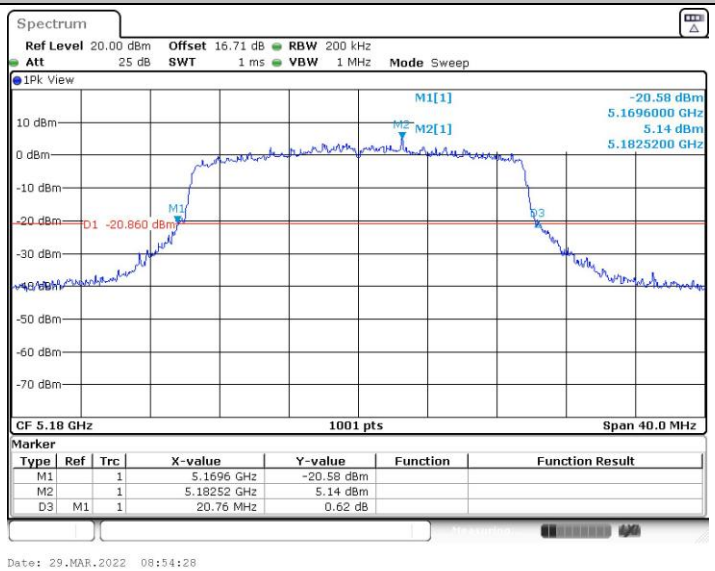

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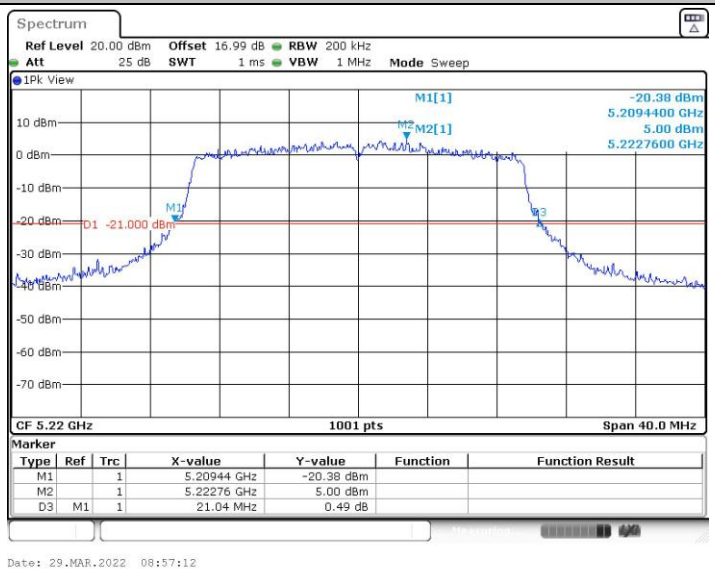

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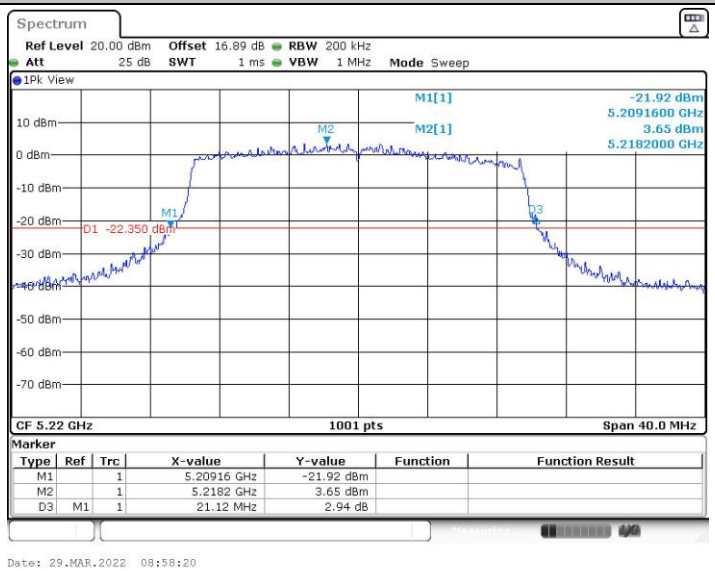

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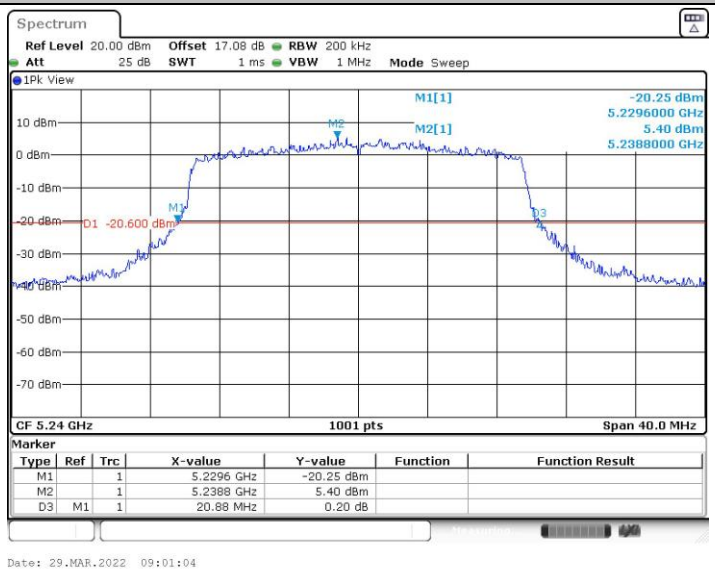

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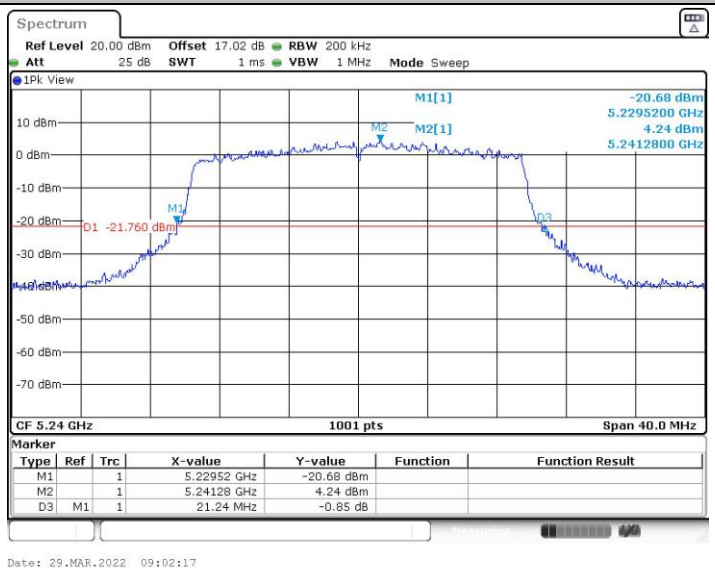

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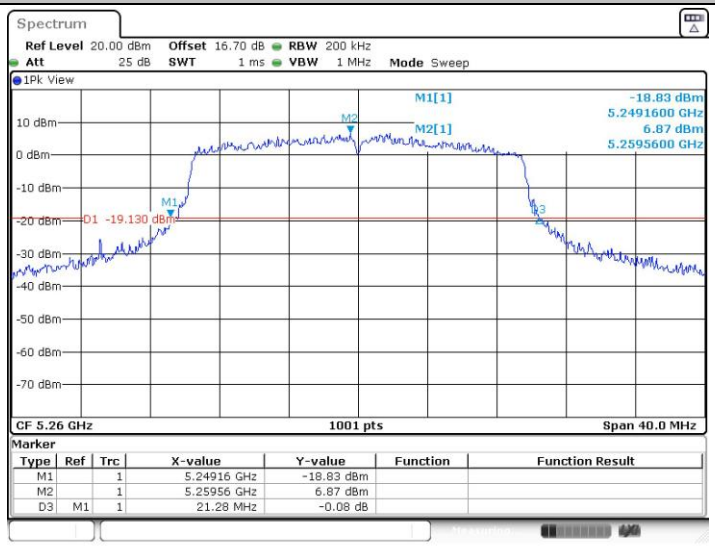

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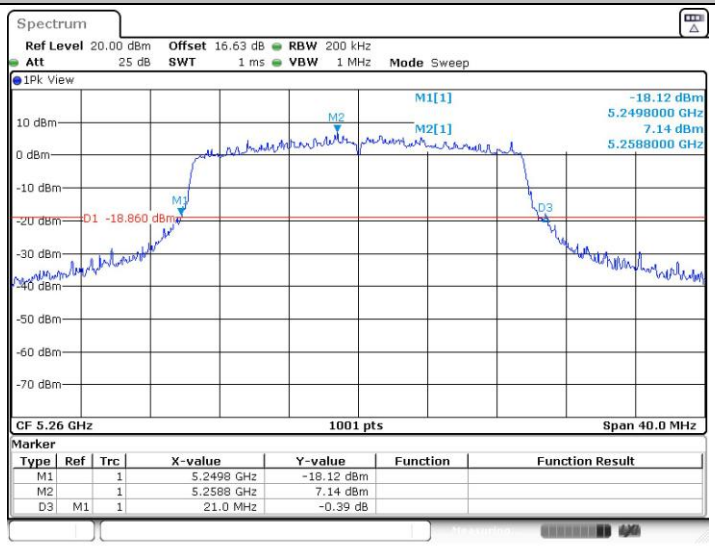

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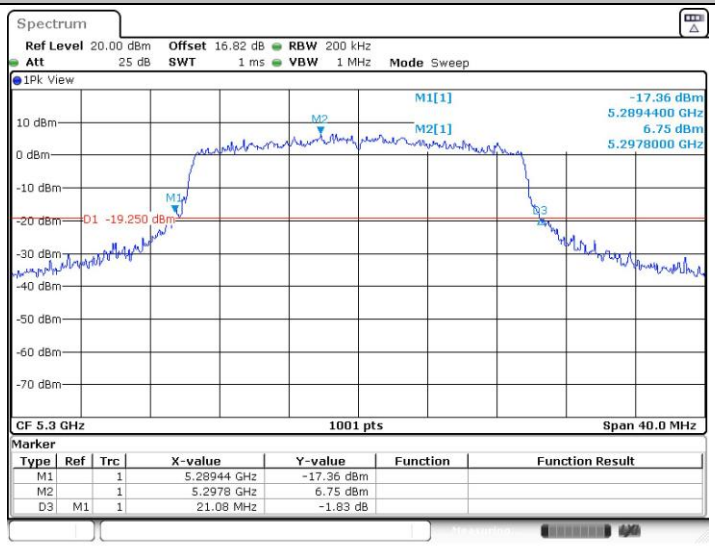

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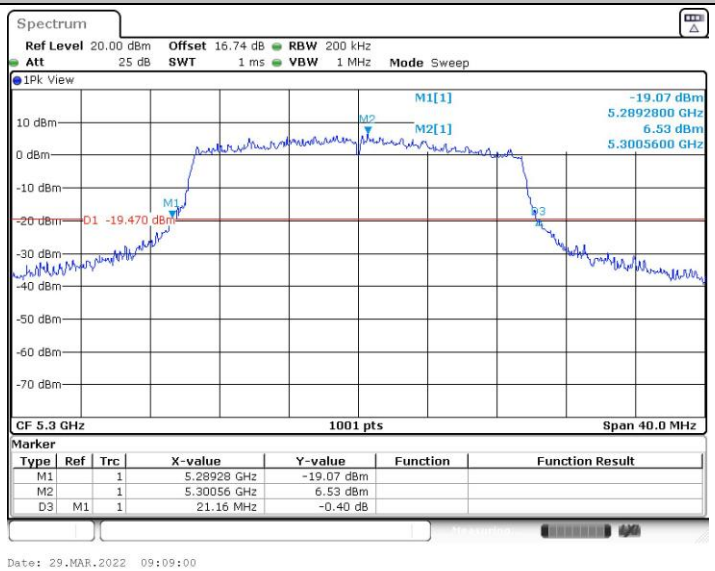

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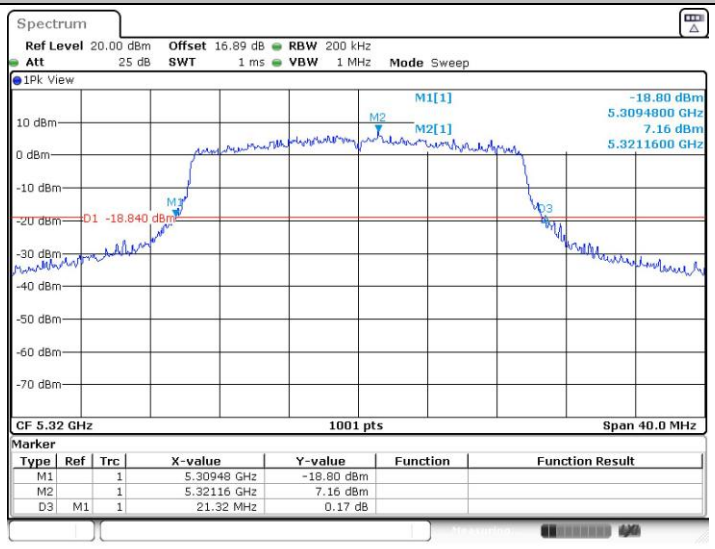

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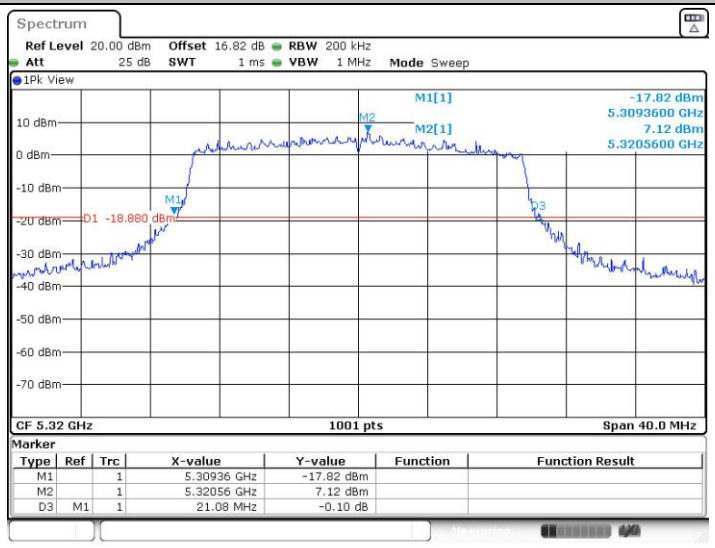

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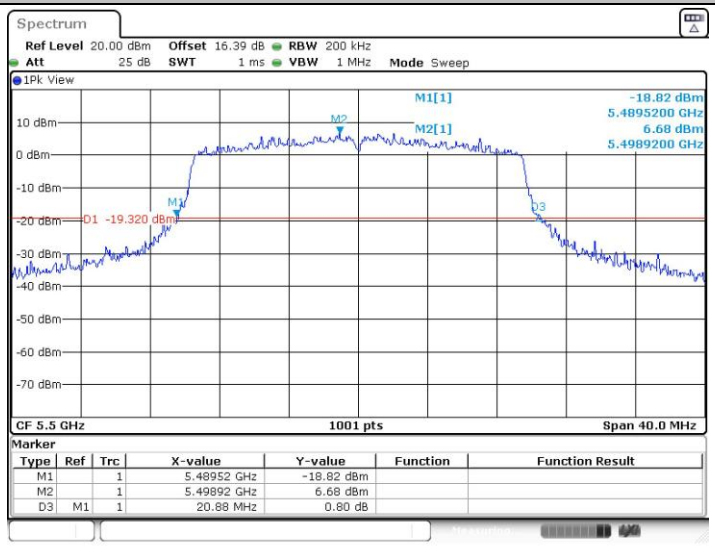

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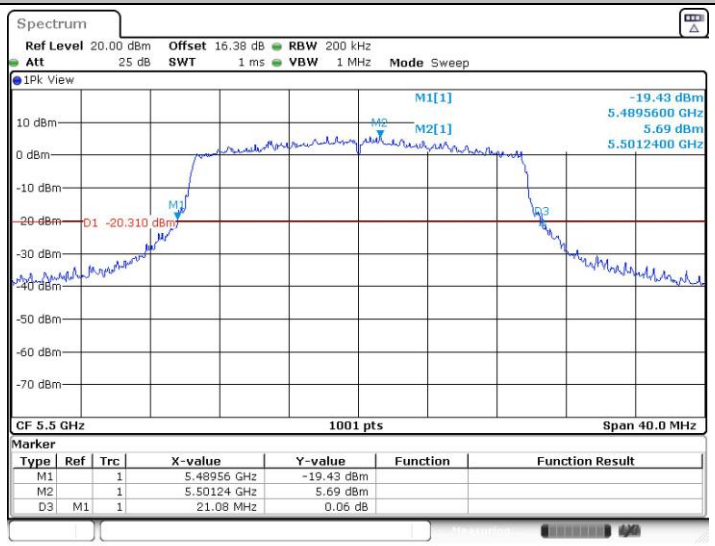

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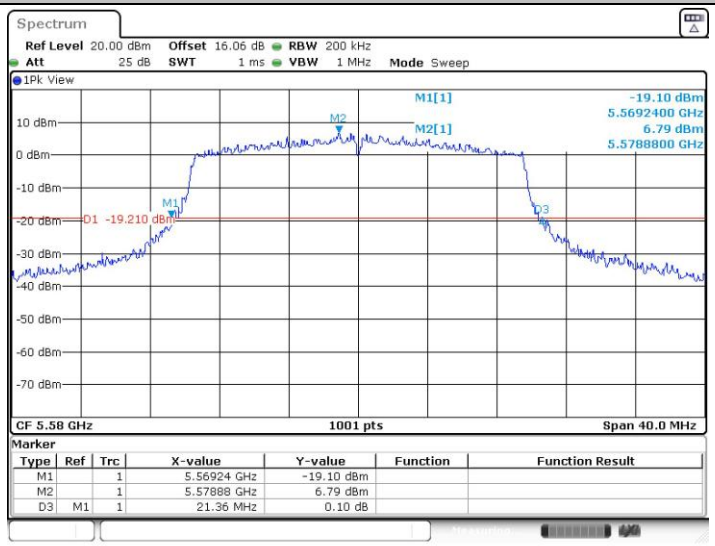

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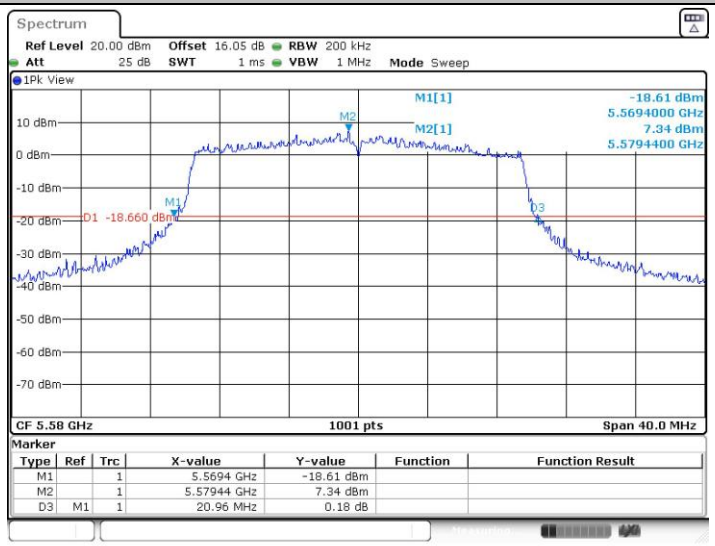

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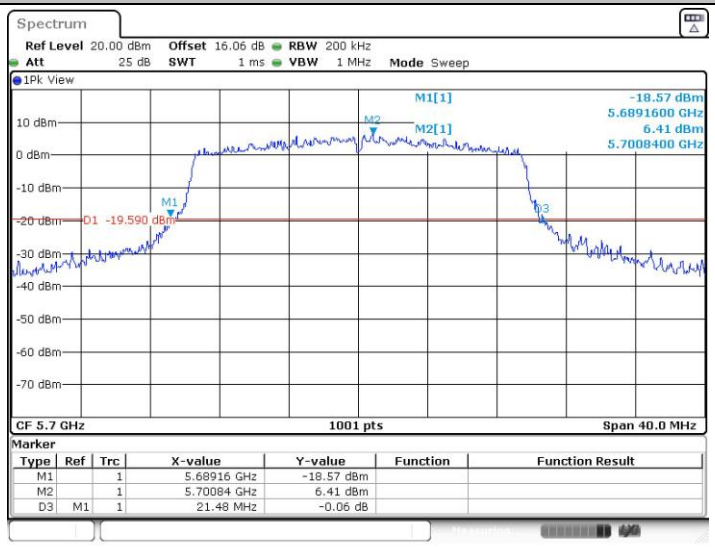

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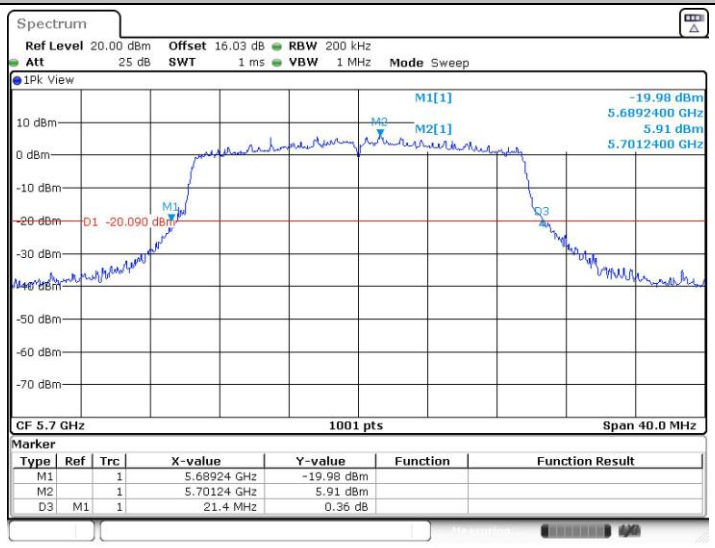

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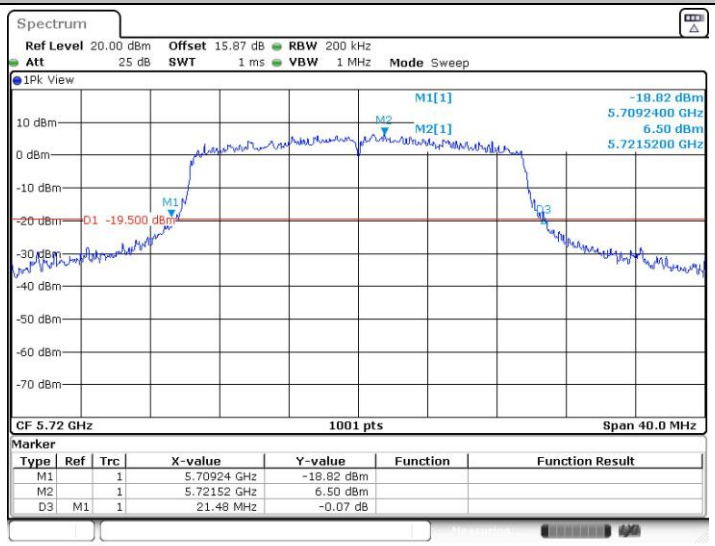

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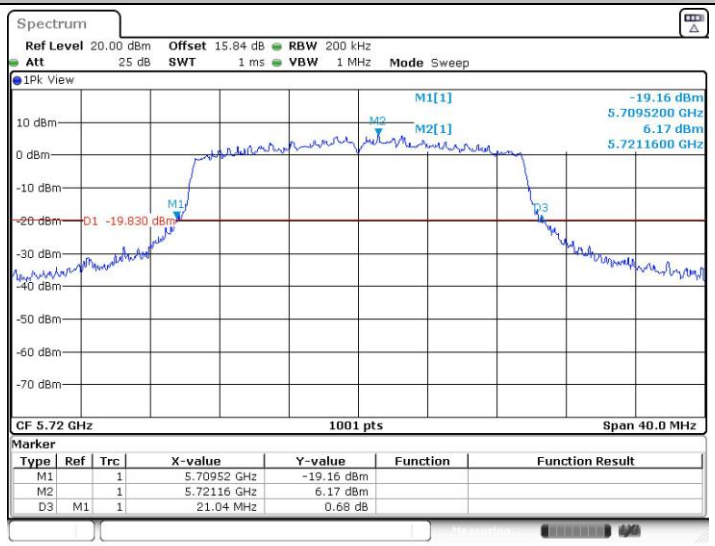

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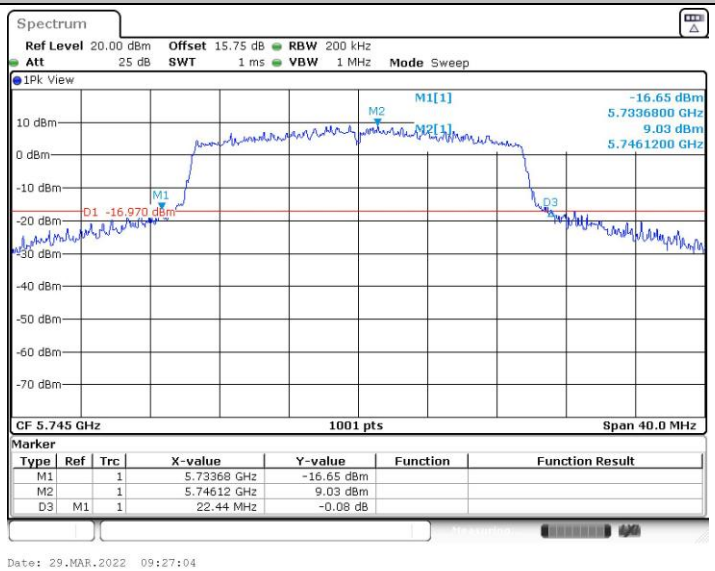

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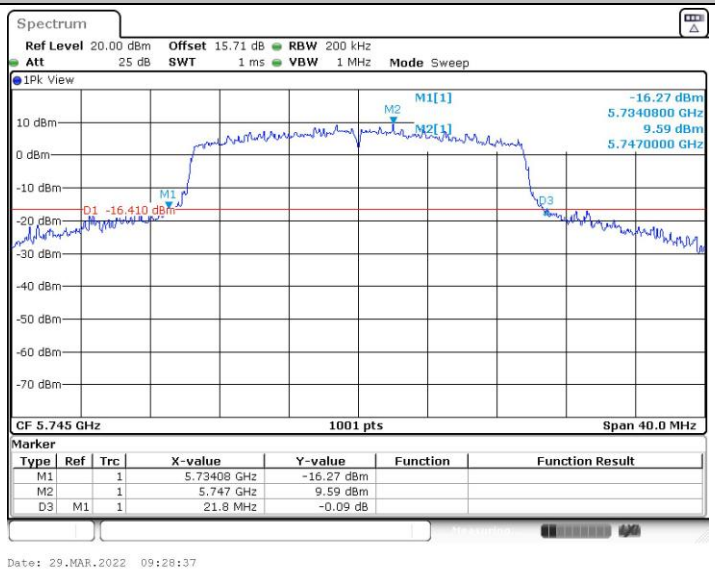

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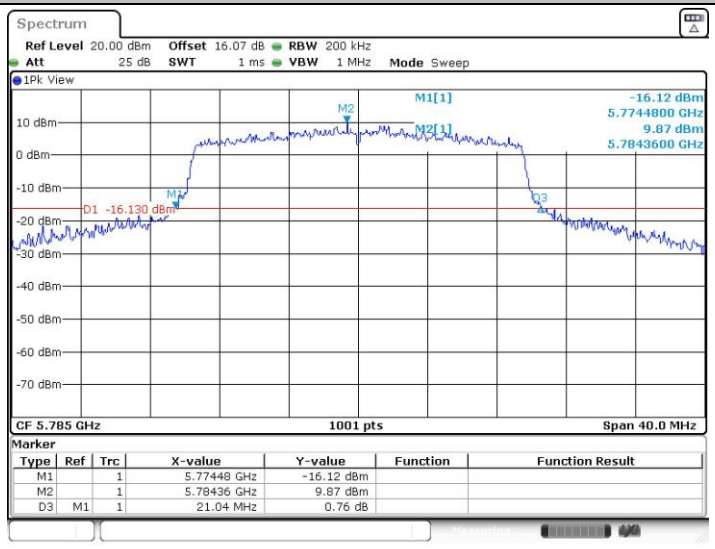

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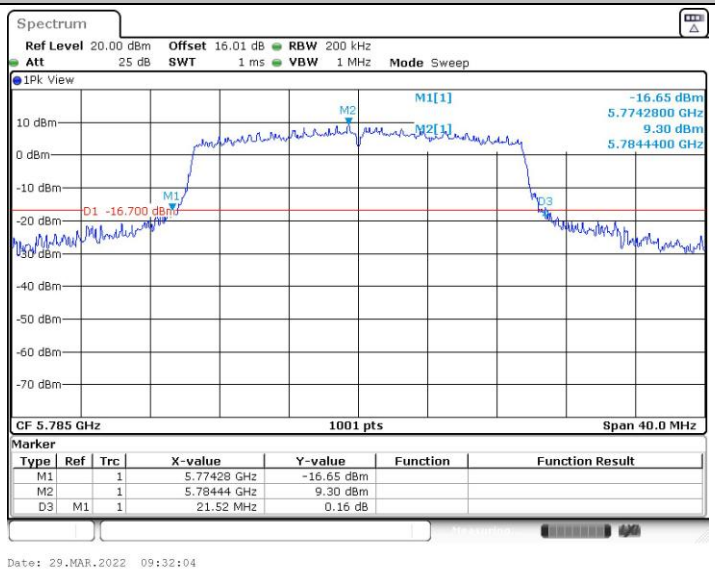

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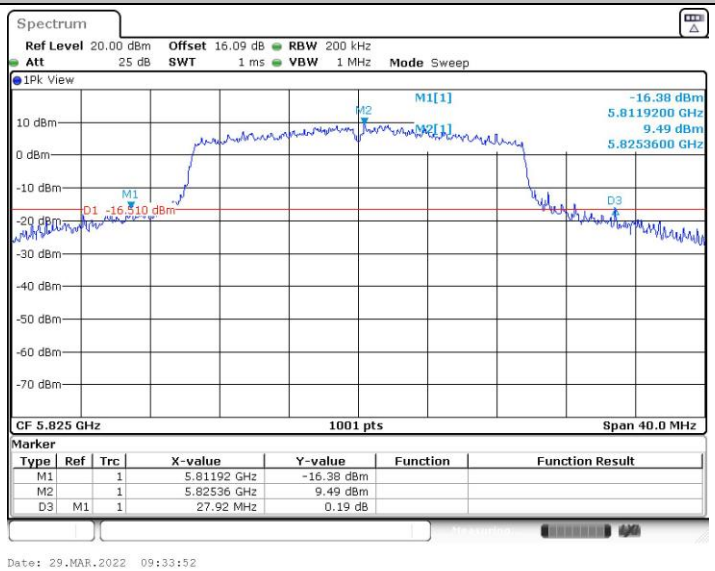

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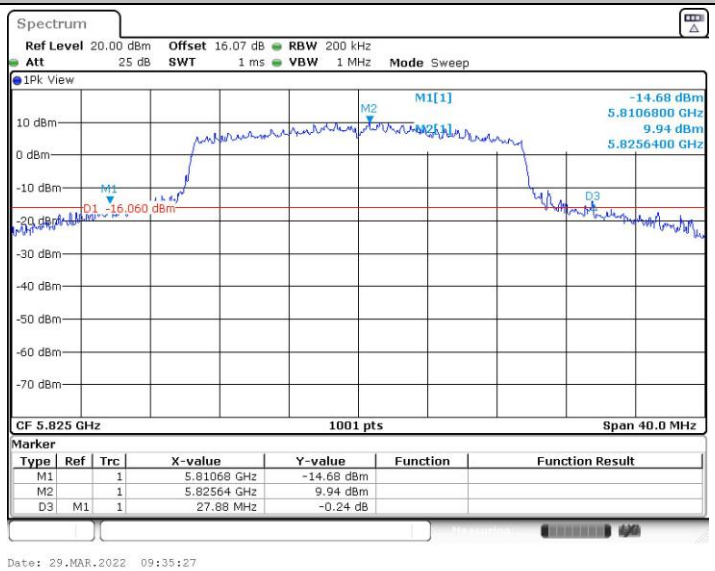

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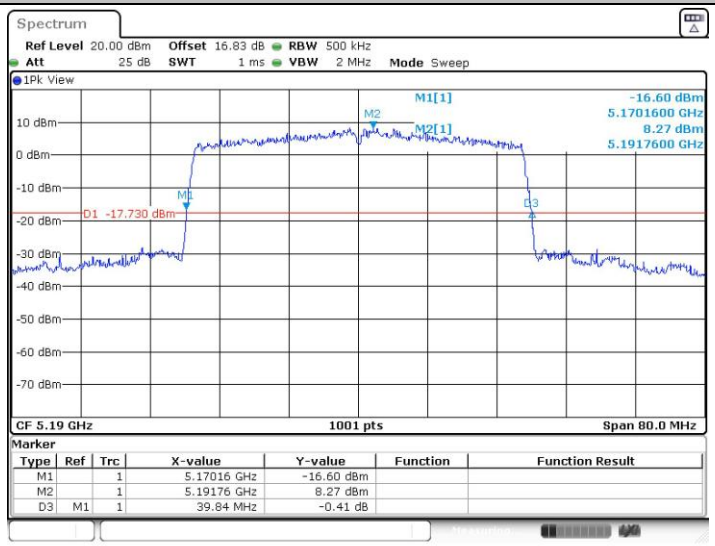

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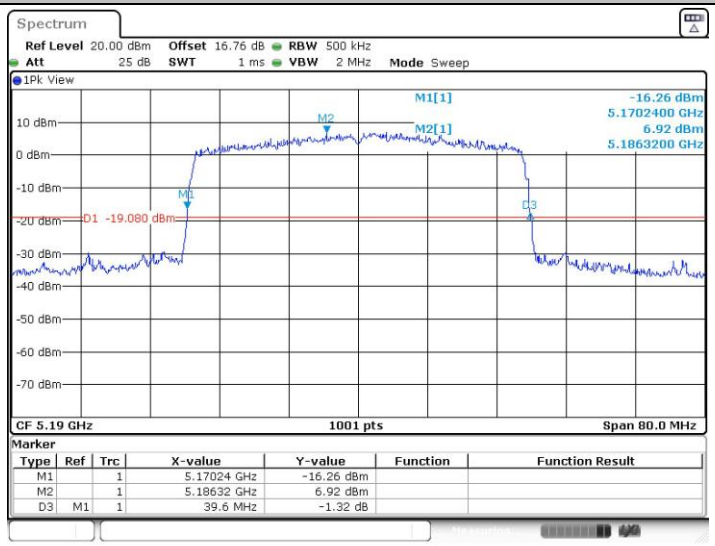

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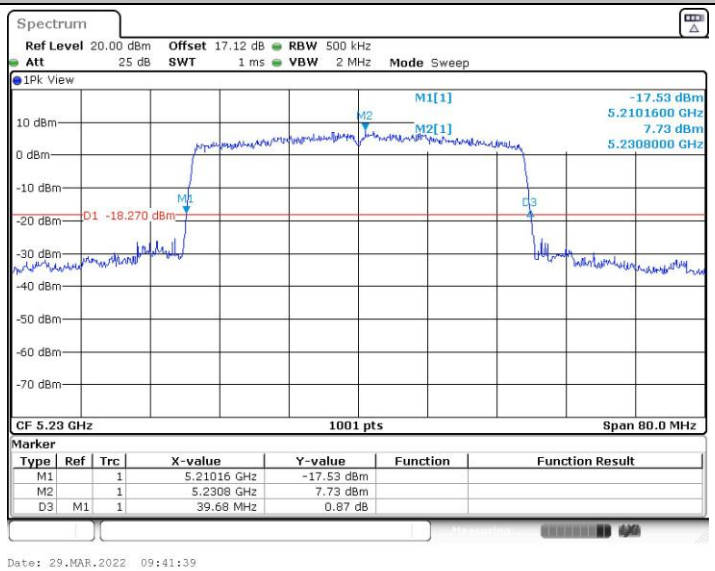

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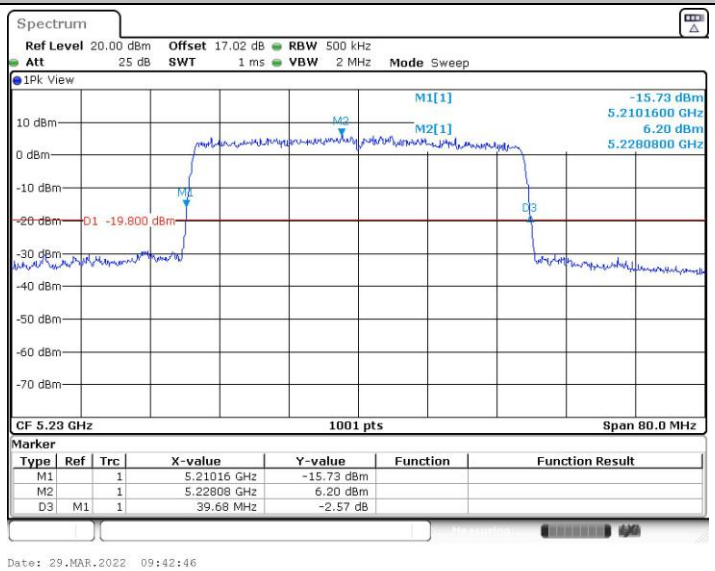

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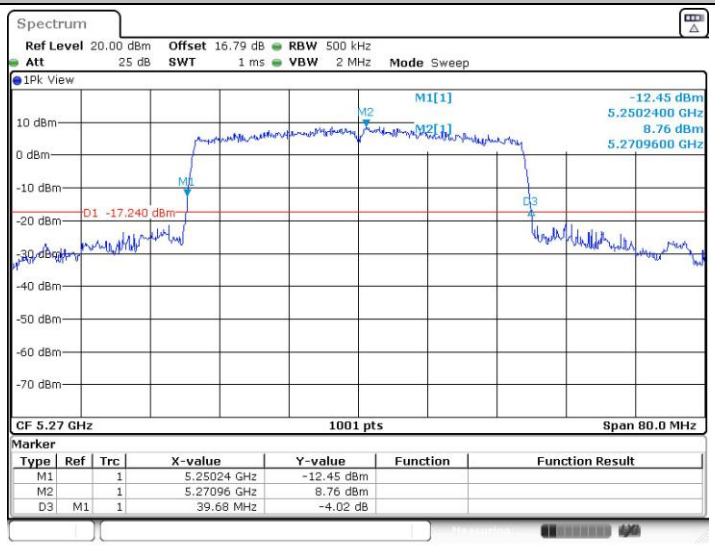

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