



FCC RF Test Report

APPLICANT : FairPhone B.V.
EQUIPMENT : Fairphone 4 5G
BRAND NAME : FAIRPHONE
MODEL NAME : FP4
FCC ID : 2AUWUFP4
STANDARD : FCC Part 15 Subpart E §15.407
CLASSIFICATION : (NII) Unlicensed National Information Infrastructure
TEST DATE(S) : Mar. 01, 2022 ~ Mar. 23, 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.

Reviewed by: Jason Jia / Supervisor

Approved by: Alex Wang / Manager



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People's Republic of China**



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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR152403-02D	Rev. 01	Initial issue of report	Apr. 08, 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)	6dB, 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 4.08 dB at 5150.00 MHz
3.5	15.207	AC Conducted Emission	15.207(a)	15.207(a)	Pass	Under limit 17.77 dB at 18.900 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

FairPhone B.V.

Van Diemenstraat 200, 1013 CP, Amsterdam, The Netherlands

1.2 Manufacturer

FairPhone B.V.

Van Diemenstraat 200, 1013 CP, Amsterdam, The Netherlands

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Fairphone 4 5G
Brand Name	FAIRPHONE
Model Name	FP4
FCC ID	2AUWUFP4
IMEI Code	Conducted: 355870090016855/355870090016863 Conduction: 355870090012011/355870090012029 Radiation: 355870090012078/355870090012086
HW Version	1.0
SW Version	FP4.FC1G.A.017-userdebug.20210804
EUT Stage	Identical Prototype

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

1.4 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx/Rx Frequency Range	5180 MHz ~ 5240 MHz 5260 MHz ~ 5320 MHz 5500 MHz ~ 5700 MHz 5745 MHz ~ 5825 MHz



<p>Maximum Output Power to Antenna</p>	<p><5180 MHz ~ 5240 MHz> 802.11a : 15.13 dBm / 0.0326 W 802.11n HT20 : 14.82 dBm / 0.0303 W 802.11n HT40 : 15.18 dBm / 0.0330 W 802.11ac VHT20: 15.00 dBm / 0.0316 W 802.11ac VHT40: 15.20 dBm / 0.0331 W 802.11ac VHT80: 14.89 dBm / 0.0308 W</p> <p><5260 MHz ~ 5320 MHz> 802.11a : 14.92 dBm / 0.0310 W 802.11n HT20 : 14.99 dBm / 0.0316 W 802.11n HT40 : 15.07 dBm / 0.0321 W 802.11ac VHT20: 15.00 dBm / 0.0316 W 802.11ac VHT40: 15.08 dBm / 0.0322 W 802.11ac VHT80: 14.98 dBm / 0.0315 W</p> <p><5500 MHz ~ 5700 MHz > 802.11a : 17.91 dBm / 0.0618 W 802.11n HT20 : 16.86 dBm / 0.0485 W 802.11n HT40 : 15.91 dBm / 0.0390 W 802.11ac VHT20: 16.89 dBm / 0.0489 W 802.11ac VHT40: 16.06 dBm / 0.0404 W 802.11ac VHT80: 15.99 dBm / 0.0397 W</p> <p><5745 MHz ~ 5825 MHz> 802.11a : 15.81 dBm / 0.0381 W 802.11n HT20 : 15.91 dBm / 0.0390 W 802.11n HT40 : 15.89 dBm / 0.0388 W 802.11ac VHT20: 15.89 dBm / 0.0388 W 802.11ac VHT40: 15.99 dBm / 0.0397 W 802.11ac VHT80: 16.22 dBm / 0.0419 W</p>
<p>99% Occupied Bandwidth</p>	<p><5180 MHz ~ 5240 MHz> 802.11a : 17.303 MHz 802.11ac HT20 : 18.382 MHz 802.11ac HT40 : 36.683 MHz 802.11ac VHT80 : 76.244 MHz</p> <p><5260 MHz ~ 5320 MHz> 802.11a : 17.303 MHz 802.11ac VHT20 : 18.382 MHz 802.11ac VHT40 : 36.603 MHz 802.11ac VHT80 : 76.244 MHz</p> <p><5500 MHz ~ 5700 MHz> 802.11a : 17.343 MHz 802.11ac VHT20 : 18.382 MHz 802.11ac VHT40 : 36.683 MHz 802.11ac VHT80 : 76.084 MHz</p> <p><5745 MHz ~ 5825 MHz> 802.11a : 17.303 MHz 802.11ac VHT20 : 18.462 MHz 802.11ac VHT40 : 36.603 MHz 802.11ac VHT80 : 76.084 MHz</p>
<p>Antenna Type / Gain</p>	<p><5180 MHz ~ 5240 MHz> PIFA Antenna with gain -3.45 dBi</p> <p><5260 MHz ~ 5320 MHz> PIFA Antenna with gain -3.93 dBi</p> <p><5500 MHz ~ 5700 MHz> PIFA Antenna with gain -4.04 dBi</p>



	<5745 MHz ~ 5825 MHz> PIFA Antenna with gain -4.59 dBi
Type of Modulation	802.11a/n: OFDM (BPSK / QPSK / 16QAM / 64QAM) 802.11ac: OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM)

Note:

- For 802.11n HT20 / ac VHT20 and 802.11n HT40 / ac VHT40 mode, the whole testing has assessed only 802.11ac VHT20/ VHT40 by referring to their higher conducted power.

1.5 Modification of EUT

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

1.6 Testing Location

<FCC>-KS

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 03CH06-KS TH01-KS	CN1257	314309

1.7 Test Software

Item	Site	Manufacturer	Name	Version
1.	03CH06-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.
- ♦ 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 (Z plane) were recorded in this report.
- b. AC power line Conducted Emission was tested under maximum output power.

2.1 Carrier Frequency and Channel

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

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

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

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



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

Note:

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



2.2 Test Mode

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

Single Mode

Modulation	Data Rate
802.11a	6 Mbps
802.11n HT20 (Covered by VHT20)	MCS0
802.11n HT40 (Covered by VHT40)	MCS0
802.11ac VHT20	MCS0
802.11ac VHT40	MCS0
802.11ac VHT80	MCS0

AC Conducted Emission	Mode 1 : GSM850 Idle + Bluetooth Link + WLAN(5G)Link + USB Cable 1(Charging from Adapter)
Remark:	
<ol style="list-style-type: none"> For Radiated Test Cases, The tests were performance with Adapter For Radiated Test Cases, the EUT with adapter configuration was determined to be worst-case configurations; therefore, all final tests were performed on the EUT with adapter. All the test modes of Radiated Spurious Emission (RSE) were tested at the worst data rate; only the worse data shown in report. 	

Simultaneous transmission
802.11a CH36(5180MHz)+PCS1900



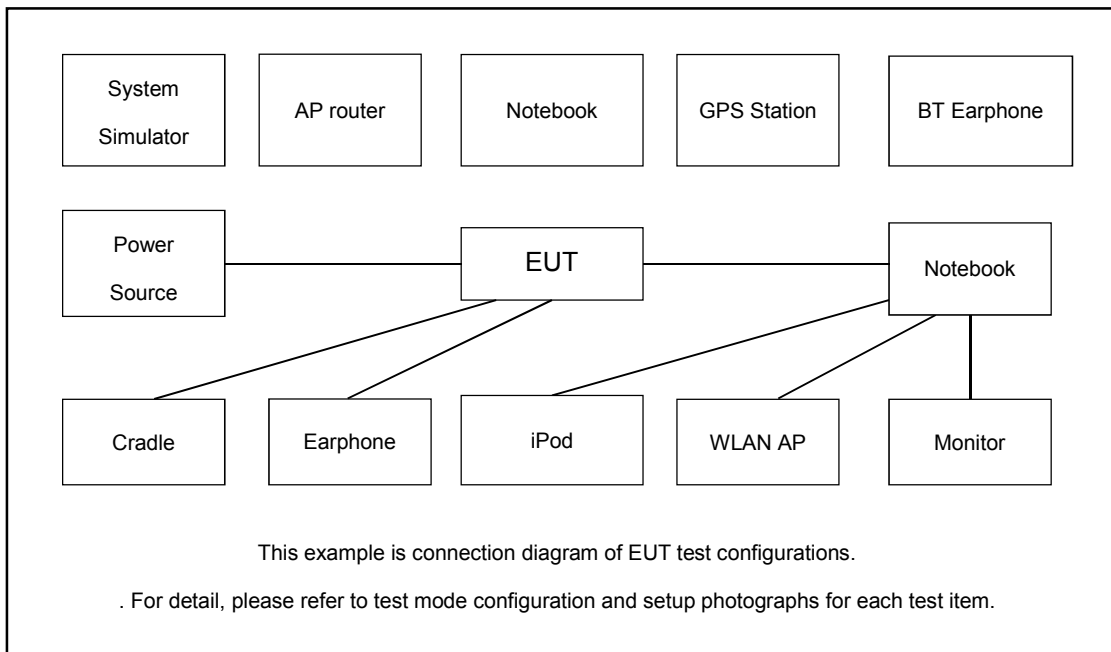
Ch. #		U-NII-1	U-NII-2A	U-NII-2C	U-NII-3
		5180-5240 MHz	5260-5320 MHz	5500-5700MHz	5745-5825 MHz
		802.11a	802.11a	802.11a	802.11a
L	Low	36	52	100	149
M	Middle	44	60	116	157
H	High	48	64	140	165

Ch. #		U-NII-1	U-NII-2A	U-NII-2C	U-NII-3
		5180-5240 MHz	5260-5320 MHz	5500-5700MHz	5745-5825 MHz
		802.11ac VHT20	802.11ac VHT20	802.11ac VHT20	802.11ac VHT20
L	Low	36	52	100	149
M	Middle	44	60	116	157
H	High	48	64	140	165

Ch. #		U-NII-1	U-NII-2A	U-NII-2C	U-NII-3
		5180-5240 MHz	5260-5320 MHz	5500-5700MHz	5745-5825 MHz
		802.11ac VHT40	802.11ac VHT40	802.11ac VHT40	802.11ac VHT40
L	Low	38	54	102	151
M	Middle	-	-	110	-
H	High	46	62	134	159

Ch. #		U-NII-1	U-NII-2A	U-NII-2C	U-NII-3
		5180-5240 MHz	5260-5320 MHz	5500-5700MHz	5745-5825 MHz
		802.11ac VHT80	802.11ac VHT80	802.11ac VHT80	802.11ac VHT80
L	Low	-	-	106	-
M	Middle	42	58	-	155
H	High	-	-	-	-

2.3 Connection Diagram of Test System



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	Lenovo	LBH308	N/A	N/A	N/A
5.	SD Card	Kingston	8GB	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/receive.

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 10dB attenuator.

$$\begin{aligned} \text{Offset(dB)} &= \text{RF cable loss(dB)} + \text{attenuator factor(dB)}. \\ &= 6.75 + 10 = 16.75 \text{ (dB)} \end{aligned}$$



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

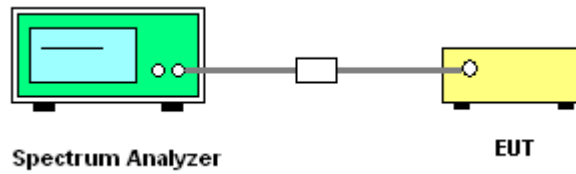
The measuring equipment is listed in the section 4 of this test report.

3.1.3 Test Procedures

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

<input checked="" type="checkbox"/>	Section C) Bandwidth Measurement 1. Emission Bandwidth (EBW)
	<ol style="list-style-type: none"> 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.
<input checked="" type="checkbox"/>	Section C) Bandwidth Measurement 2. Minimum Emission Bandwidth for the band 5.725 - 5.85 GHz
	<ol style="list-style-type: none"> 1. Set RBW = 100kHz. 2. Set the VBW ≥ 3 x RBW. 3. Detector = Peak. 4. Trace mode = max hold 5. Measure the maximum width of the emission that is 6 dB down from the peak of the emission. 6. Measure and record the results in the test report.

3.1.4 Test Setup



3.1.5 Test Result of 6dB Bandwidth

Please refer to Appendix A.



3.2 Maximum Conducted Output Power Measurement

3.2.1 Limit of Maximum Conducted Output Power

<FCC 14-30 CFR 15.407>

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

For the 5.25–5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, 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.

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.

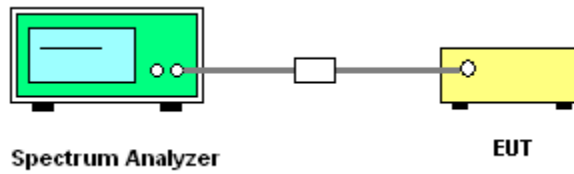
3.2.3 Test Procedures

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.

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.

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 \geq 3 MHz.
- Number of points in sweep \geq 2 Span / RBW.
- Sweep time = auto.
- Detector = RMS
- Trace average at least 100 traces in power averaging mode.

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

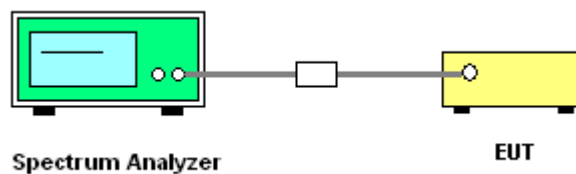
For devices operating in the band 5.725 - 5.85 GHz

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 \geq 1 MHz.
 - Number of points in sweep \geq 2 Span / RBW.
 - Sweep time = auto.
 - Detector = RMS
 - Trace average at least 100 traces in power averaging mode.
 - Add $10 \log(500\text{kHz}/\text{RBW})$ 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 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 Part 15.205.

3.4.1 Limit of Unwanted Emissions

- (1) For transmitters operating in the 5150-5250 MHz band: all emissions outside of the 5150-5350 MHz band shall not exceed an EIRP of -27dBm/MHz.

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

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

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



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

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

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

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

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

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

3.4.2 Measuring Instruments

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



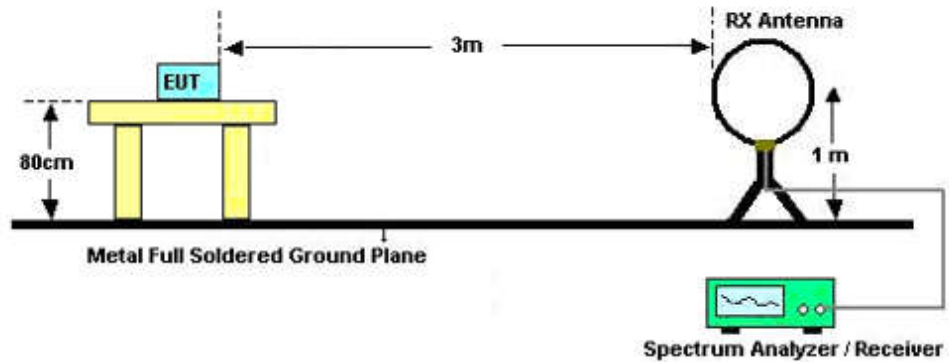
3.4.3 Test Procedures

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r04. Section G) Unwanted emissions measurement.
 - (1) Procedure for Unwanted Emissions Measurements Below 1000MHz
 - RBW = 120 kHz
 - VBW = 300 kHz
 - Detector = Peak
 - Trace mode = max hold
 - (2) Procedure for Peak Unwanted Emissions Measurements Above 1000 MHz
 - RBW = 1 MHz
 - VBW \geq 3 MHz
 - Detector = Peak
 - Sweep time = auto
 - Trace mode = max hold
 - (3) Procedures for Average Unwanted Emissions Measurements Above 1000MHz
 - RBW = 1 MHz
 - VBW = 10 Hz, when duty cycle is no less than 98 percent.
 - VBW \geq 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.
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

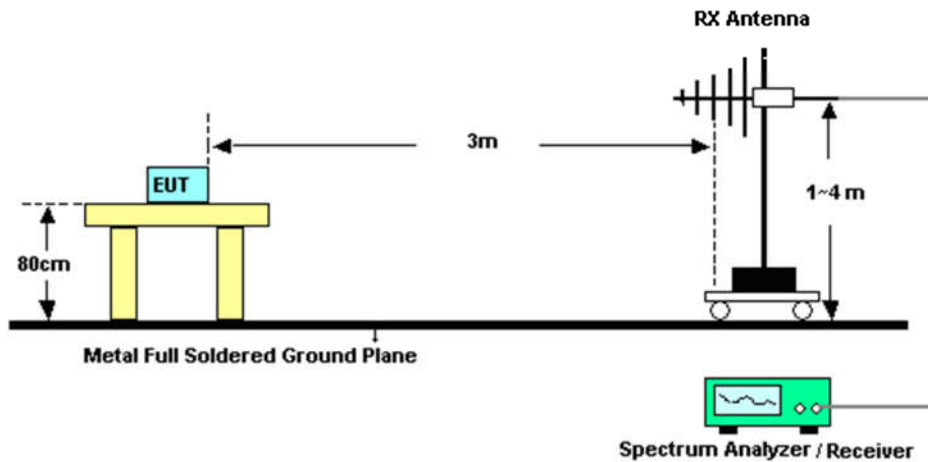
average limit (that means the emission level in average mode also complies with the limit in average mode), then peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

3.4.4 Test Setup

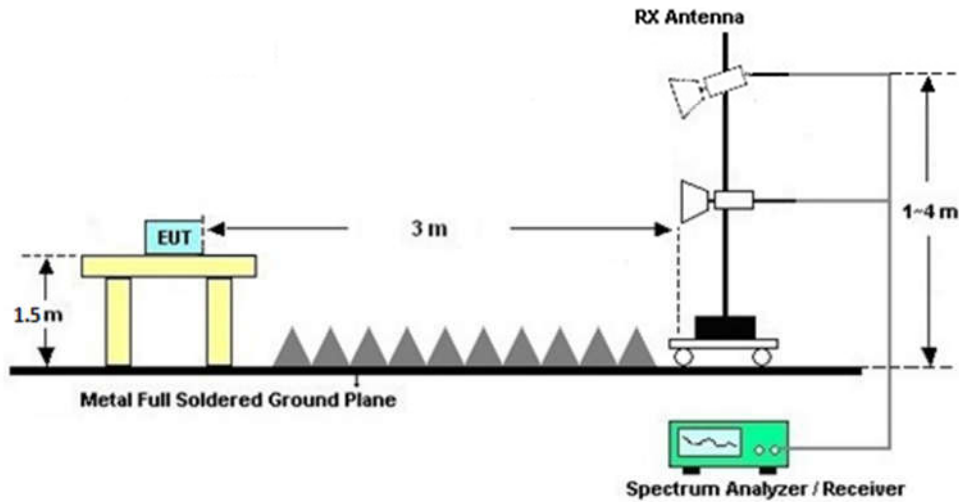
For radiated emissions below 30MHz



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&D.

3.4.7 Duty Cycle

Please refer to Appendix E.

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

Please refer to Appendix C&D.



3.5 AC Conducted Emission Measurement

3.5.1 Limit of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

Frequency of emission (MHz)	Conducted limit (dBµV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

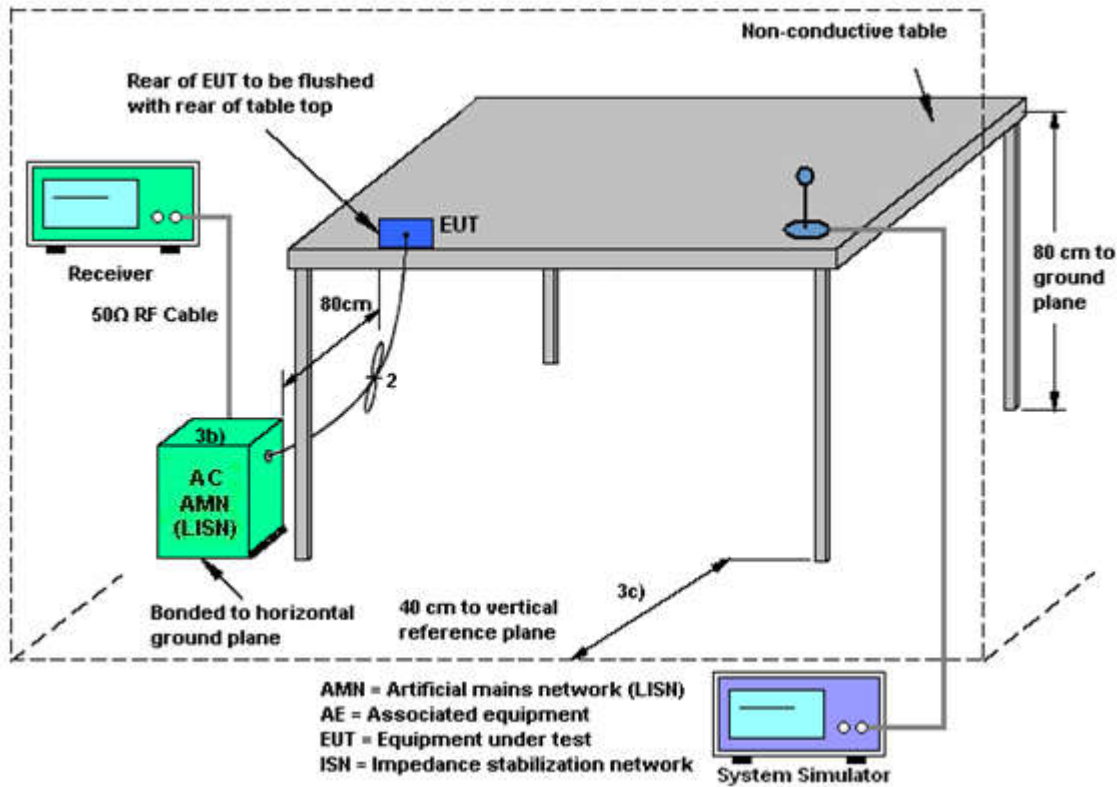
3.5.2 Measuring Instruments

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

3.5.3 Test Procedures

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

3.5.4 Test Setup



3.5.5 Test Result of AC Conducted Emission

Please refer to Appendix B.



3.6 Antenna Requirements

3.6.1 Standard Applicable

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

3.6.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.6.3 Antenna Gain

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



4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101040	10Hz~40GHz	Oct. 14, 2021	Mar. 02, 2022~ Mar. 23, 2022	Oct. 13, 2022	Conducted (TH01-KS)
Pulse Power Sensor	Anritsu	MA2411B	0917070	300MHz~40GHz	Jan. 05, 2022	Mar. 02, 2022~ Mar. 23, 2022	Jan. 04, 2023	Conducted (TH01-KS)
Power Meter	Anritsu	ML2495A	1005002	50MHz Bandwidth	Jan. 05, 2022	Mar. 02, 2022~ Mar. 23, 2022	Jan. 04, 2023	Conducted (TH01-KS)
Temperature & humidity chamber	Hongzhan	LP-150U	H2014011440	-40~+150°C 20%~95%RH	Jul. 12, 2021	Mar. 02, 2022~ Mar. 23, 2022	Jul. 11, 2022	Conducted (TH01-KS)
EMI Test Receiver	Keysight	N9038A	MY56400004	3Hz~8.5GHz; Max 30dBm	Oct. 16, 2021	Mar. 01, 2022	Oct. 15, 2022	Radiation (03CH06-KS)
EXA Spectrum Analyzer	Keysight	N9010A	MY55150208	10Hz-44GHz	Apr. 12, 2021	Mar. 01, 2022	Apr. 11, 2022	Radiation (03CH06-KS)
Loop Antenna	R&S	HFH2-Z2	100321	9kHz~30MHz	Oct. 30, 2021	Mar. 01, 2022	Oct. 29, 2022	Radiation (03CH06-KS)
Bilog Antenna	TeseQ	CBL6111D	49921	30MHz-1GHz	May 27, 2021	Mar. 01, 2022	May 26, 2022	Radiation (03CH06-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	00218652	1GHz~18GHz	Apr. 25, 2021	Mar. 01, 2022	Apr. 24, 2022	Radiation (03CH06-KS)
SHF-EHF Horn	Com-power	AH-840	101093	18GHz~40GHz	Jan. 05, 2022	Mar. 01, 2022	Jan. 04, 2023	Radiation (03CH06-KS)
Amplifier	SONOMA	310N	187289	9KHz ~1GHZ	Apr. 12, 2021	Mar. 01, 2022	Apr. 11, 2022	Radiation (03CH06-KS)
Amplifier	MITEQ	EM18G40GGA	060728	18~40GHz	Jan. 05, 2022	Mar. 01, 2022	Jan. 04, 2023	Radiation (03CH06-KS)
high gain Amplifier	MITEQ	AMF-7D-00101800-30-10P	2025788	1Ghz-18Ghz	Jul. 30, 2021	Mar. 01, 2022	Jul. 29, 2022	Radiation (03CH06-KS)
Amplifier	Keysight	83017A	MY53270203	500MHz~26.5GHz	Apr. 13, 2021	Mar. 01, 2022	Apr. 12, 2022	Radiation (03CH06-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Mar. 01, 2022	NCR	Radiation (03CH06-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Mar. 01, 2022	NCR	Radiation (03CH06-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Mar. 01, 2022	NCR	Radiation (03CH06-KS)
EMI Receiver	R&S	ESC17	100768	9kHz~7GHz;	Apr. 21, 2021	Mar. 09, 2022	Apr. 20, 2022	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060103	9kHz~30MHz	Oct. 14, 2021	Mar. 09, 2022	Oct. 13, 2022	Conduction (CO01-KS)
AC LISN	R&S	ENV216	100334	9kHz~30MHz	Oct. 14, 2021	Mar. 09, 2022	Oct. 13, 2022	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP000000811	AC 0V~300V, 45Hz~1000Hz	Oct. 14, 2021	Mar. 09, 2022	Oct. 13, 2022	Conduction (CO01-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))	2.94dB
---	--------

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

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

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

Test Engineer:	Jiang Jun	Temperature:	21~25	°C
Test Date:	2022/3/3	Relative Humidity:	51~54	%

TEST RESULTS DATA
Average Power Table

U-NII-1										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)	FCC Conducted Power Limit (dBm)	DG (dBi)		Pass/Fail
11a	6Mbps	1	36	5180	0.08	15.10	24.00	-3.45		Pass
11a	6Mbps	1	44	5220	0.08	15.03	24.00	-3.45		Pass
11a	6Mbps	1	48	5240	0.08	15.13	24.00	-3.45		Pass
HT20	MCS0	1	36	5180	0.10	14.82	24.00	-3.45		Pass
HT20	MCS0	1	44	5220	0.10	14.65	24.00	-3.45		Pass
HT20	MCS0	1	48	5240	0.10	14.77	24.00	-3.45		Pass
HT40	MCS0	1	38	5190	0.16	15.18	24.00	-3.45		Pass
HT40	MCS0	1	46	5230	0.16	15.02	24.00	-3.45		Pass
VHT20	MCS0	1	36	5180	0.08	14.84	24.00	-3.45		Pass
VHT20	MCS0	1	44	5220	0.08	14.75	24.00	-3.45		Pass
VHT20	MCS0	1	48	5240	0.08	15.00	24.00	-3.45		Pass
VHT40	MCS0	1	38	5190	0.16	15.20	24.00	-3.45		Pass
VHT40	MCS0	1	46	5230	0.16	15.03	24.00	-3.45		Pass
VHT80	MCS0	1	42	5210	0.34	14.89	24.00	-3.45		Pass

TEST RESULTS DATA
Average Power Table

FCC U-NII-2A										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)	FCC Conducted Power Limit (dBm)	DG (dBi)	EIRP Power Limit (dBm)	Pass/Fail
11a	6M bps	1	52	5260	0.08	14.84	23.98	-3.93	26.99	Pass
11a	6M bps	1	60	5300	0.08	14.92	23.98	-3.93	26.99	Pass
11a	6M bps	1	64	5320	0.08	14.87	23.98	-3.93	26.99	Pass
HT20	MCS 0	1	52	5260	0.10	14.95	23.98	-3.93	26.99	Pass
HT20	MCS 0	1	60	5300	0.10	14.99	23.98	-3.93	26.99	Pass
HT20	MCS 0	1	64	5320	0.10	14.85	23.98	-3.93	26.99	Pass
HT40	MCS 0	1	54	5270	0.16	15.07	23.98	-3.93	26.99	Pass
HT40	MCS 0	1	62	5310	0.16	14.94	23.98	-3.93	26.99	Pass
VHT20	MCS 0	1	52	5260	0.08	15.00	23.98	-3.93	26.99	Pass
VHT20	MCS 0	1	60	5300	0.08	14.72	23.98	-3.93	26.99	Pass
VHT20	MCS 0	1	64	5320	0.08	14.85	23.98	-3.93	26.99	Pass
VHT40	MCS 0	1	54	5270	0.16	15.08	23.98	-3.93	26.99	Pass
VHT40	MCS 0	1	62	5310	0.16	14.96	23.98	-3.93	26.99	Pass
VHT80	MCS 0	1	58	5290	0.34	14.98	23.98	-3.93	26.99	Pass

TEST RESULTS DATA
Average Power Table

FCC U-NII-2C										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)	FCC Conducted Power Limit (dBm)	DG (dBi)	EIRP Power Limit (dBm)	Pass/Fail
11a	6M bps	1	100	5500	0.08	17.90	23.98	-4.04	26.99	Pass
11a	6M bps	1	116	5580	0.08	17.70	23.98	-4.04	26.99	Pass
11a	6M bps	1	140	5700	0.08	17.91	23.98	-4.04	26.99	Pass
HT20	MCS 0	1	100	5500	0.10	16.86	23.98	-4.04	26.99	Pass
HT20	MCS 0	1	116	5580	0.10	16.80	23.98	-4.04	26.99	Pass
HT20	MCS 0	1	140	5700	0.10	16.80	23.98	-4.04	26.99	Pass
HT40	MCS 0	1	102	5510	0.16	15.91	23.98	-4.04	26.99	Pass
HT40	MCS 0	1	110	5550	0.16	15.87	23.98	-4.04	26.99	Pass
HT40	MCS 0	1	134	5670	0.16	15.88	23.98	-4.04	26.99	Pass
VHT20	MCS 0	1	100	5500	0.08	16.89	23.98	-4.04	26.99	Pass
VHT20	MCS 0	1	116	5580	0.08	16.76	23.98	-4.04	26.99	Pass
VHT20	MCS 0	1	140	5700	0.08	16.86	23.98	-4.04	26.99	Pass
VHT40	MCS 0	1	102	5510	0.16	15.83	23.98	-4.04	26.99	Pass
VHT40	MCS 0	1	110	5550	0.16	15.90	23.98	-4.04	26.99	Pass
VHT40	MCS 0	1	134	5670	0.16	16.06	23.98	-4.04	26.99	Pass
VHT80	MCS 0	1	106	5530	0.34	16.03	23.98	-4.04	26.99	Pass
VHT80	MCS 0	1	122	5610	0.34	15.99	23.98	-4.04	26.99	Pass

Test Engineer:	Jacob Zhang	Temperature:	21~25	°C
Test Date:	2022/3/2	Relative Humidity:	51~54	%

TEST RESULTS DATA
Average Power Table

U-NII-3										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)	FCC Conducted Power Limit (dBm)	DG (dBi)		Pass/Fail
11a	6M bps	1	149	5745	0.08	15.63	30.00	-4.59		Pass
11a	6Mbps	1	157	5785	0.08	15.69	30.00	-4.59		Pass
11a	6Mbps	1	165	5825	0.08	15.81	30.00	-4.59		Pass
HT20	MCS 0	1	149	5745	0.10	15.77	30.00	-4.59		Pass
HT20	MCS 0	1	157	5785	0.10	15.82	30.00	-4.59		Pass
HT20	MCS 0	1	165	5825	0.10	15.91	30.00	-4.59		Pass
HT40	MCS 0	1	151	5755	0.16	15.89	30.00	-4.59		Pass
HT40	MCS 0	1	159	5795	0.16	15.86	30.00	-4.59		Pass
VHT20	MCS 0	1	149	5745	0.08	15.77	30.00	-4.59		Pass
VHT20	MCS 0	1	157	5785	0.08	15.81	30.00	-4.59		Pass
VHT20	MCS 0	1	165	5825	0.08	15.89	30.00	-4.59		Pass
VHT40	MCS 0	1	151	5755	0.16	15.99	30.00	-4.59		Pass
VHT40	MCS 0	1	159	5795	0.16	15.91	30.00	-4.59		Pass
VHT80	MCS 0	1	155	5775	0.34	16.22	30.00	-4.59		Pass



Case No. :FR152403-02D
Ambient Condition: 25 °C, 45 %RH,
Test Date: 2022.3.02~2022.3.23
Test Engineer: Jack Fan

Emission Bandwidth

Test Result

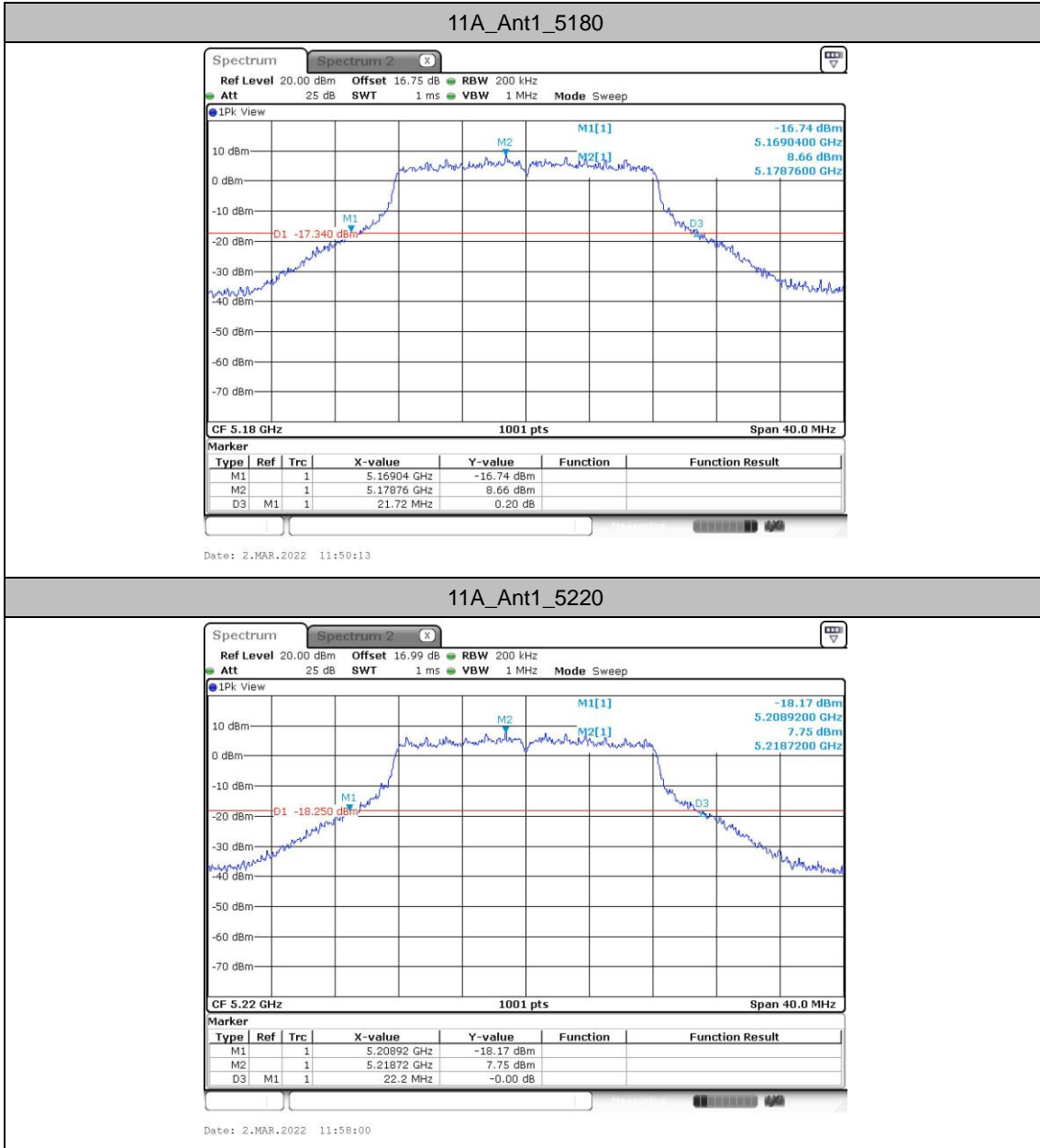
TestMode	Antenna	Frequency[MHz]	26db EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A	Ant1	5180	21.72	5169.04	5190.76	---	---
		5220	22.20	5208.92	5231.12	---	---
		5240	21.72	5229.04	5250.76	---	---
		5260	21.44	5249.12	5270.56	---	---
		5300	21.24	5289.20	5310.44	---	---
		5320	22.28	5308.96	5331.24	---	---
		5500	22.56	5488.72	5511.28	---	---
		5580	22.36	5568.96	5591.32	---	---
		5700	22.36	5688.68	5711.04	---	---
		5745	22.36	5733.64	5756.00	---	---
		5785	22.12	5773.72	5795.84	---	---
11AC20SISO	Ant1	5180	22.92	5168.48	5191.40	---	---
		5220	23.28	5208.40	5231.68	---	---
		5240	22.76	5228.76	5251.52	---	---
		5260	22.28	5248.76	5271.04	---	---
		5300	23.00	5288.12	5311.12	---	---
		5320	22.76	5308.72	5331.48	---	---
		5500	22.60	5488.64	5511.24	---	---
		5580	22.92	5568.36	5591.28	---	---
		5700	22.68	5688.84	5711.52	---	---
		5745	23.76	5732.72	5756.48	---	---
		5785	23.00	5773.32	5796.32	---	---
11AC40SISO	Ant1	5190	41.76	5169.04	5210.80	---	---
		5230	42.00	5209.12	5251.12	---	---
		5270	42.00	5248.88	5290.88	---	---
		5310	42.00	5288.88	5330.88	---	---
		5510	42.00	5489.12	5531.12	---	---
		5550	41.60	5529.12	5570.72	---	---
		5670	41.84	5648.96	5690.80	---	---
		5755	42.00	5733.80	5775.80	---	---
		5795	41.76	5774.04	5815.80	---	---

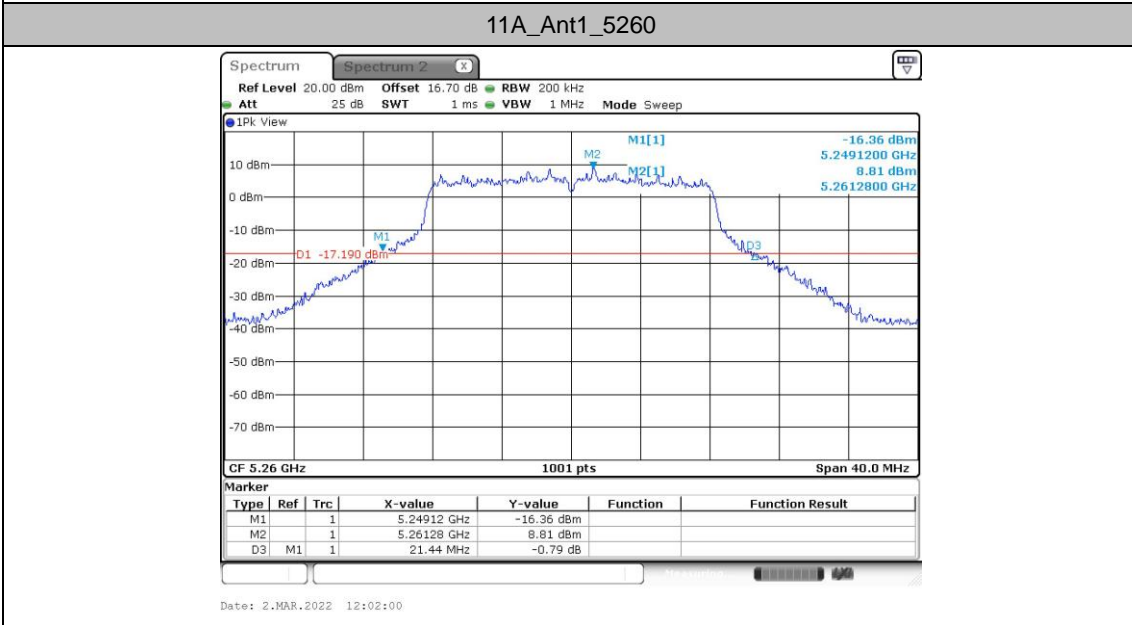
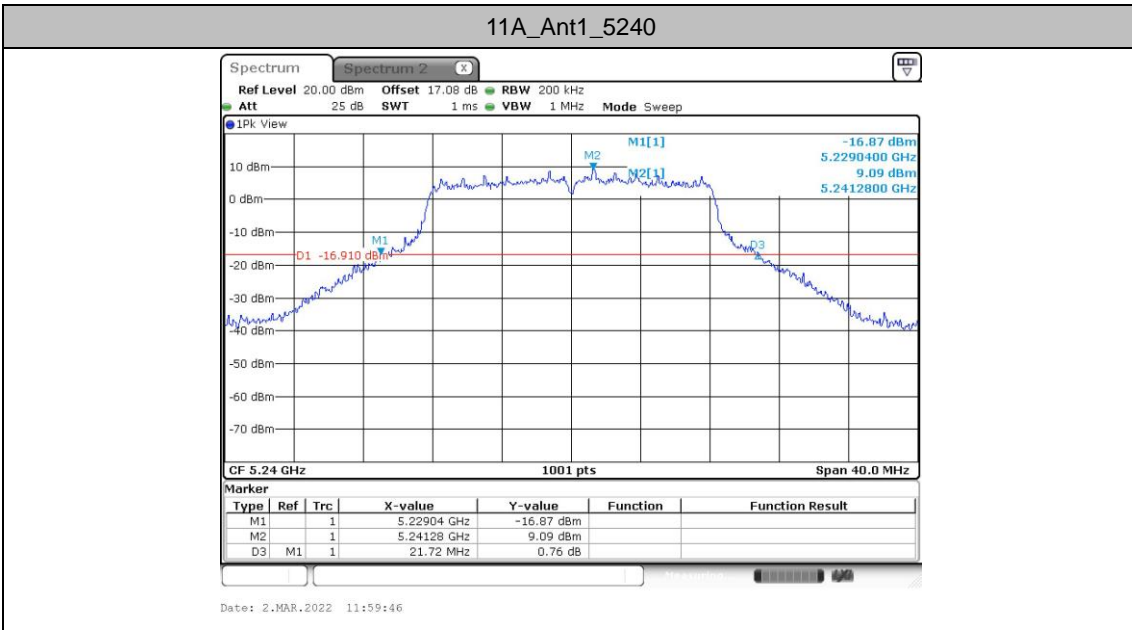


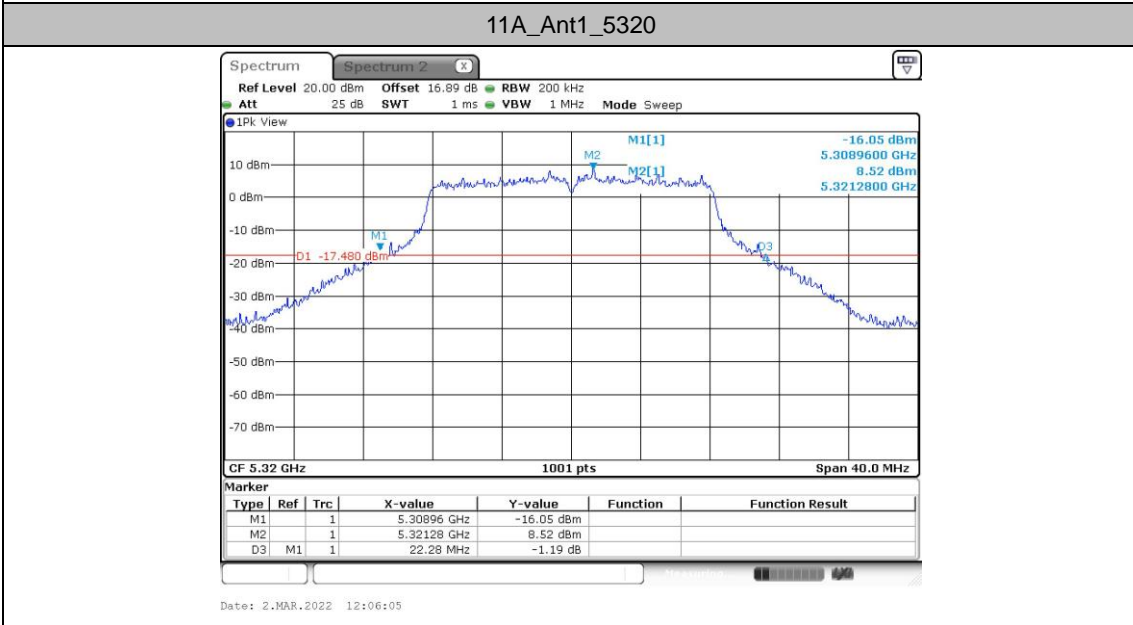
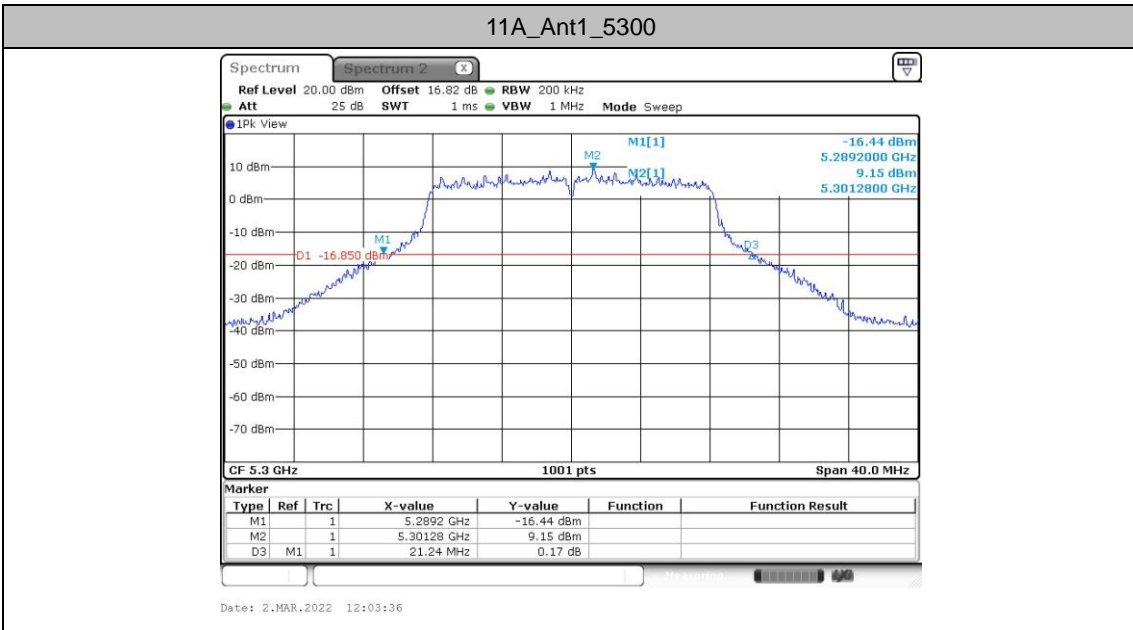
11AC80SISO	Ant1	5210	84.32	5168.08	5252.40	---	---
		5290	84.80	5247.76	5332.56	---	---
		5530	84.16	5487.92	5572.08	---	---
		5610	83.84	5568.08	5651.92	---	---
		5775	84.16	5733.08	5817.24	---	---

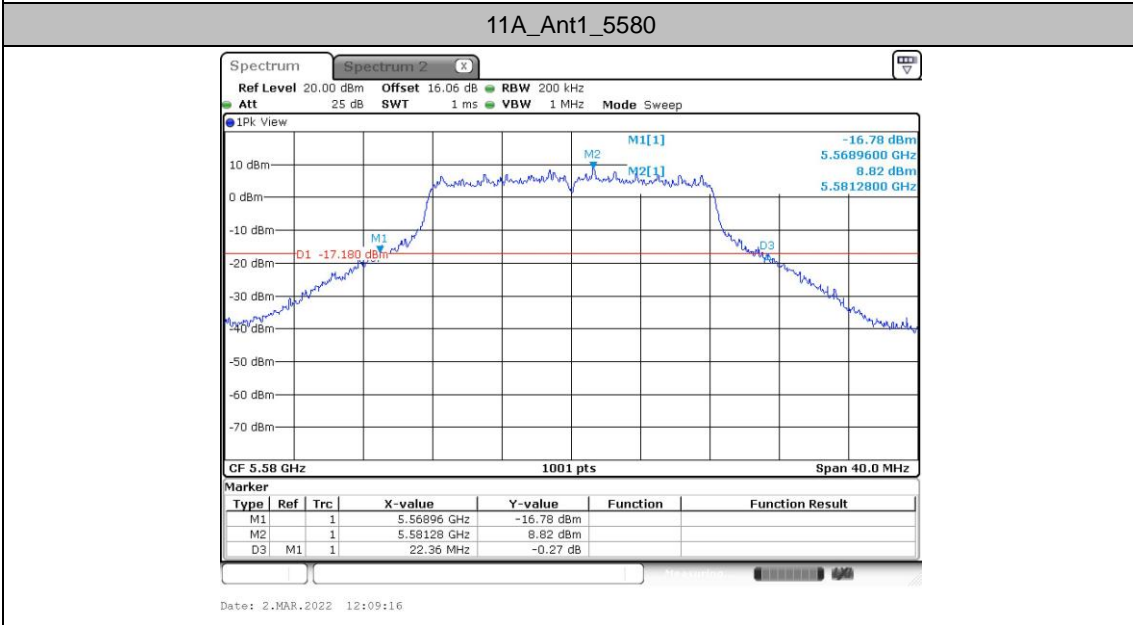
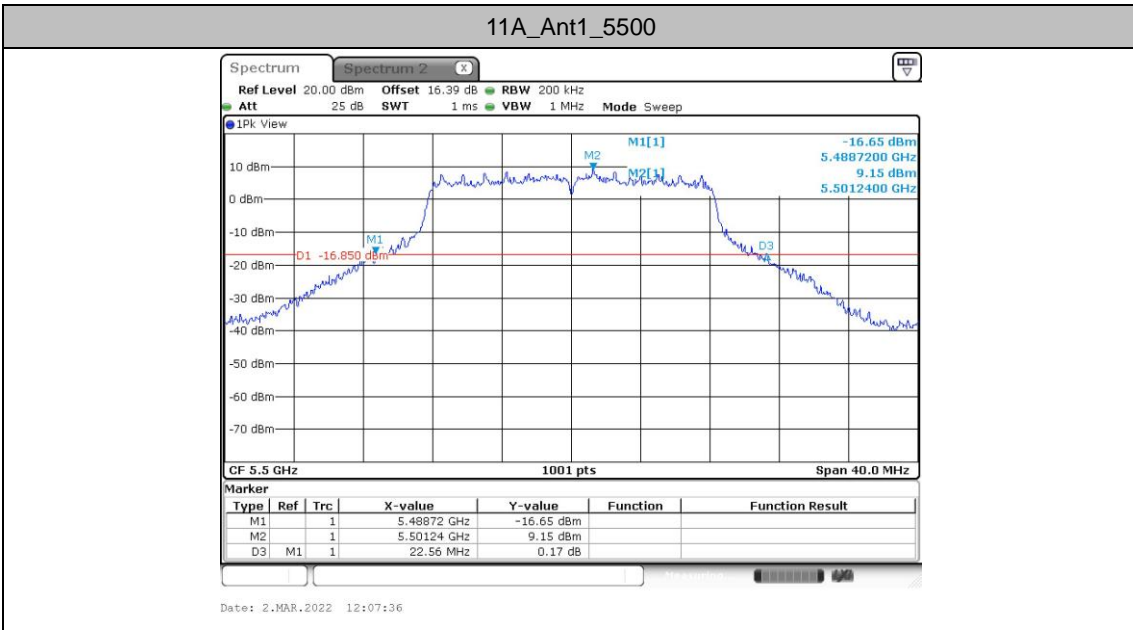


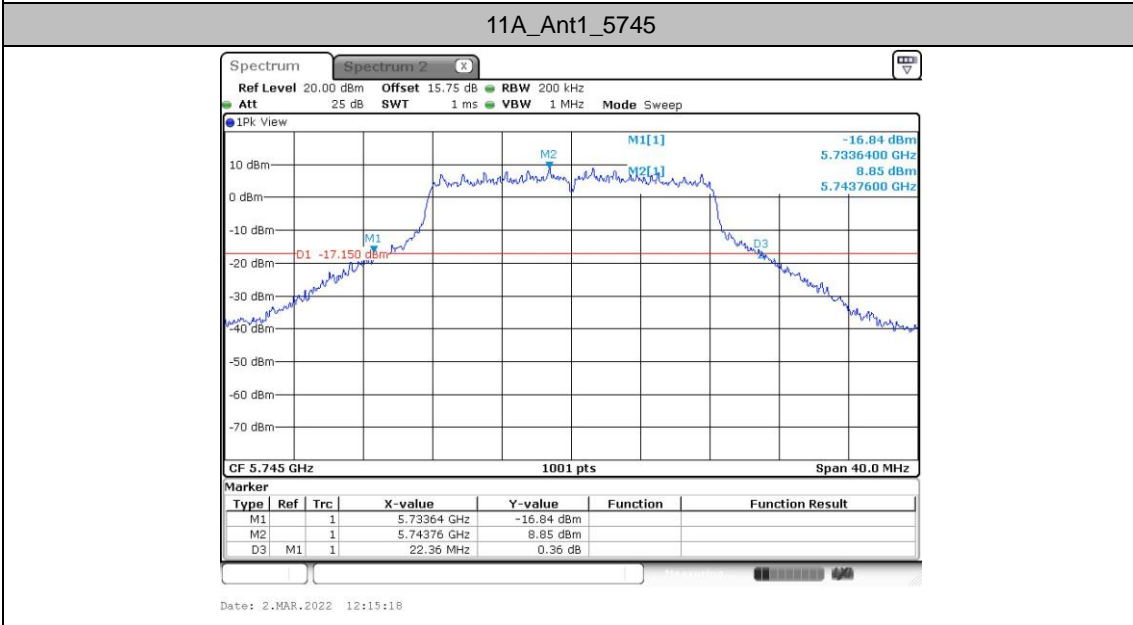
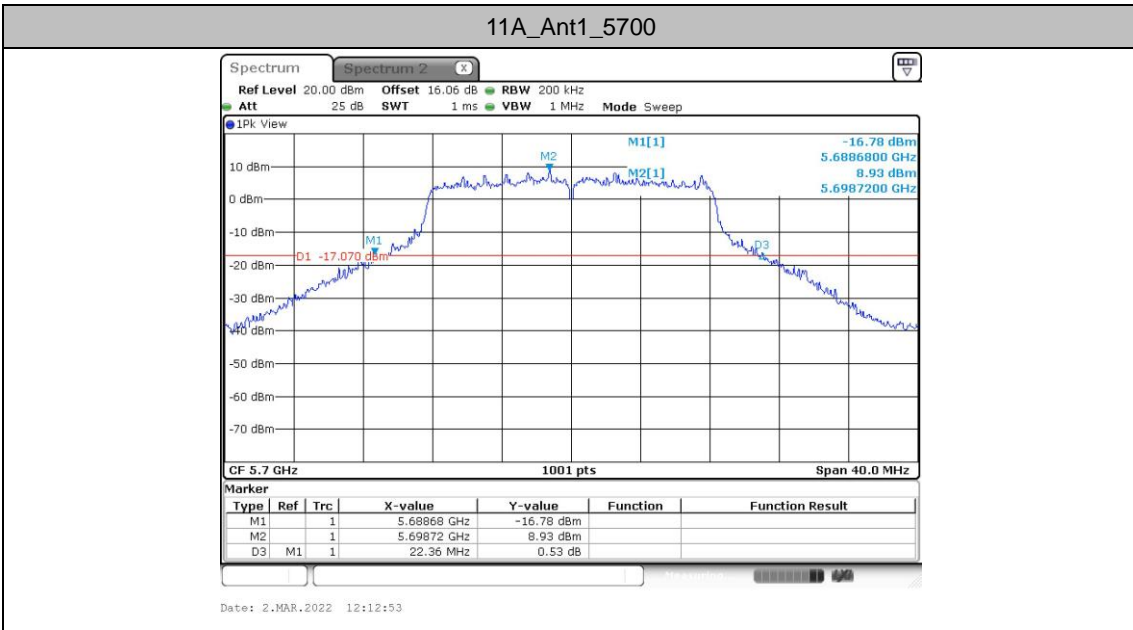
Test Graphs





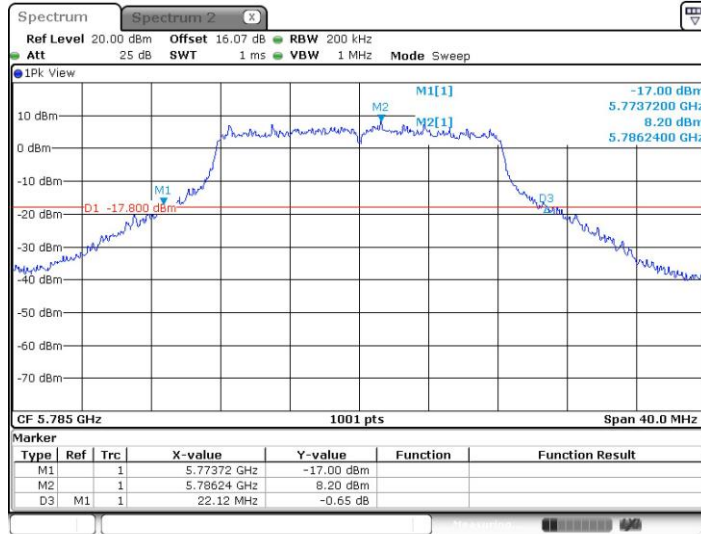




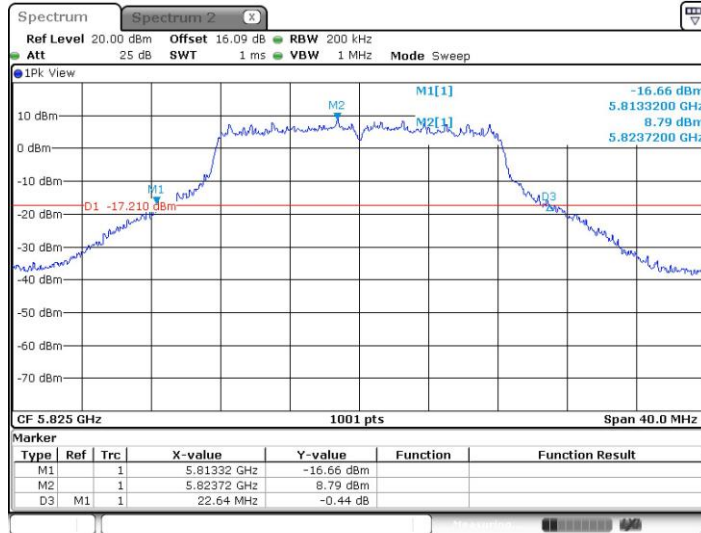




11A_Ant1_5785

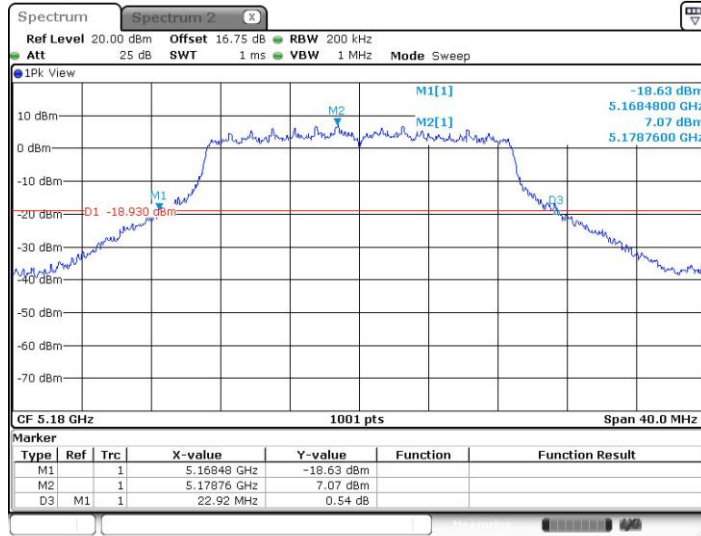


11A_Ant1_5825



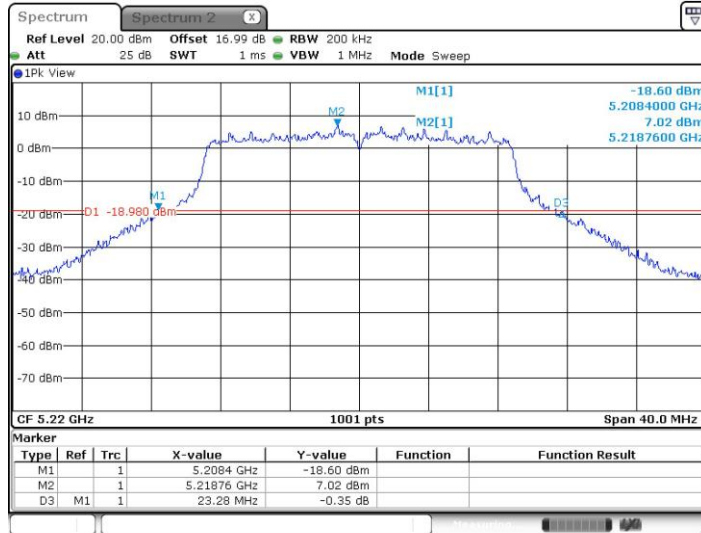


11AC20SISO_Ant1_5180

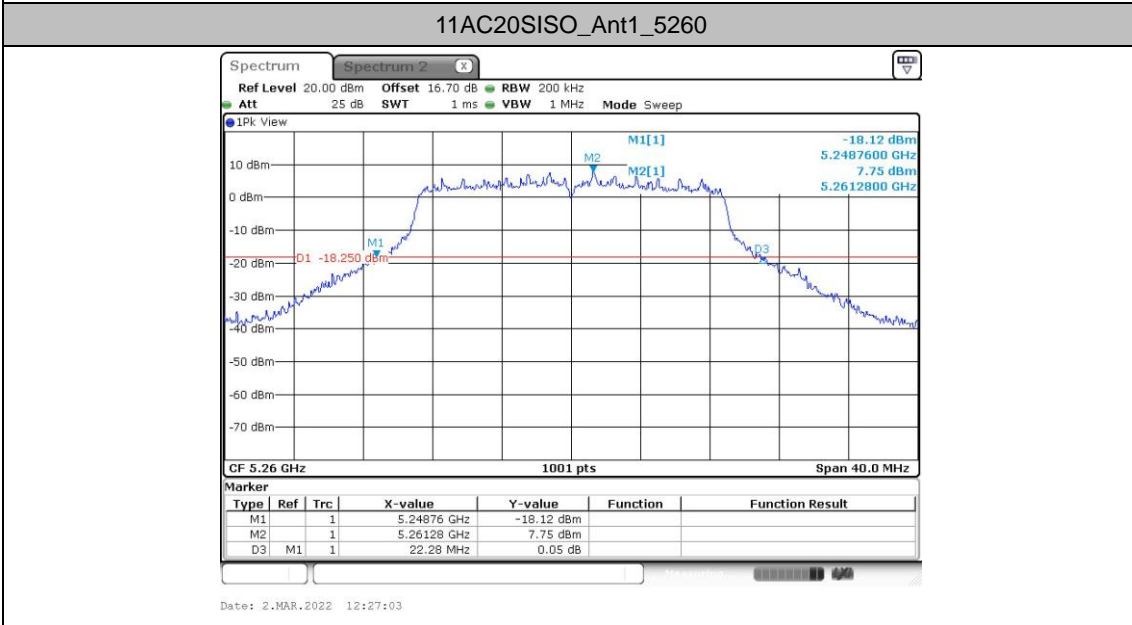
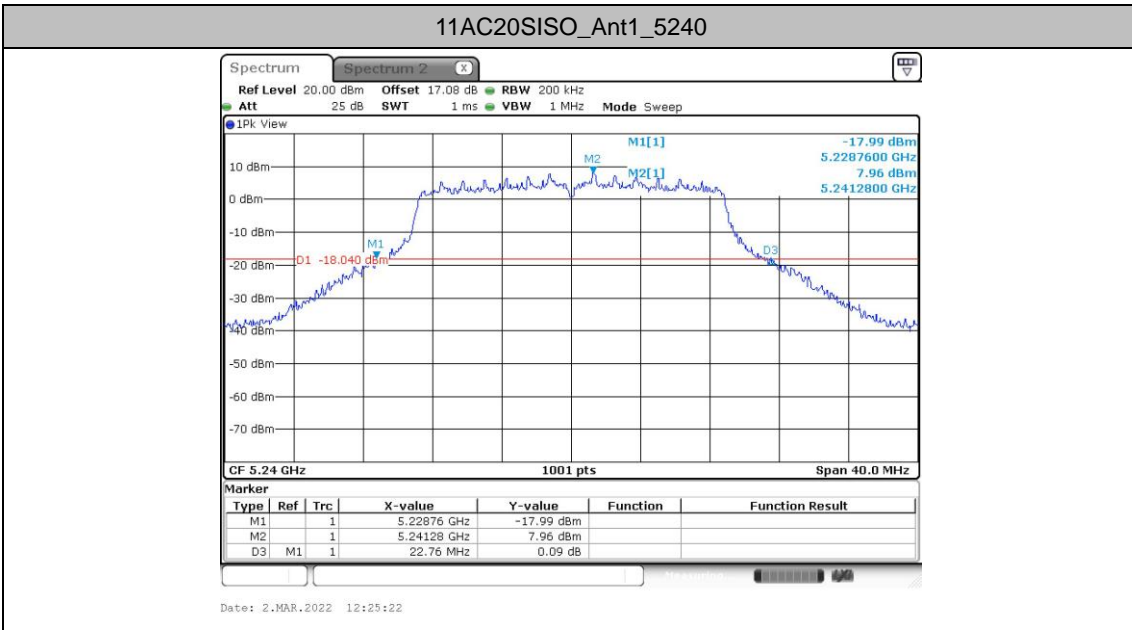


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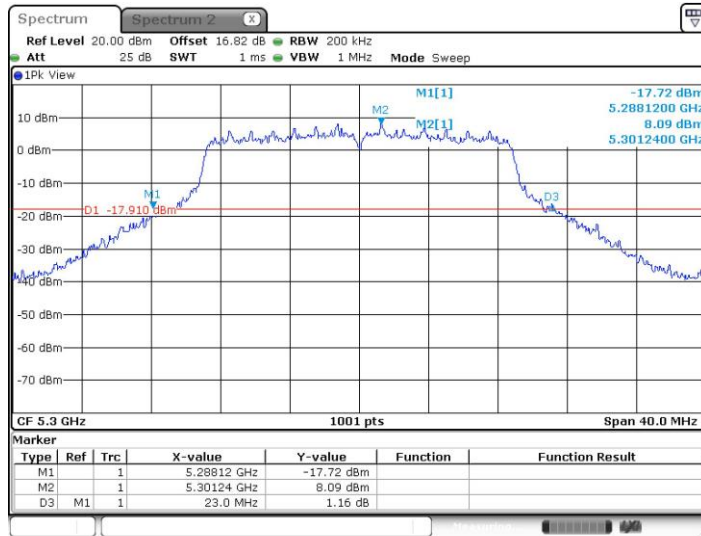


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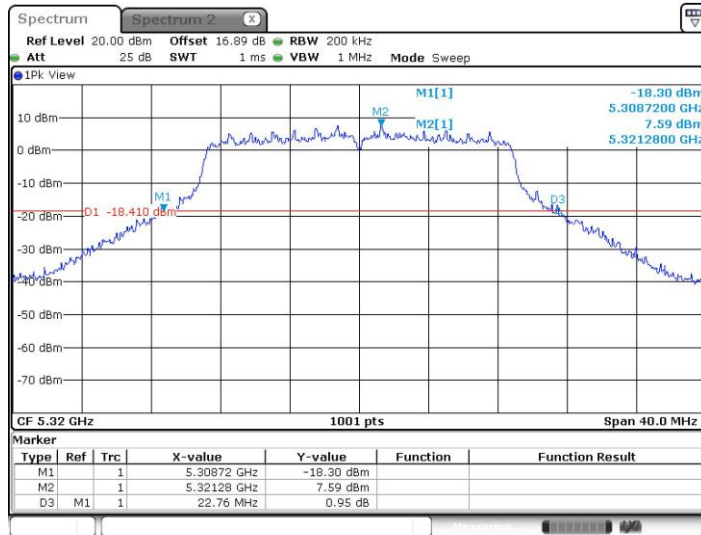


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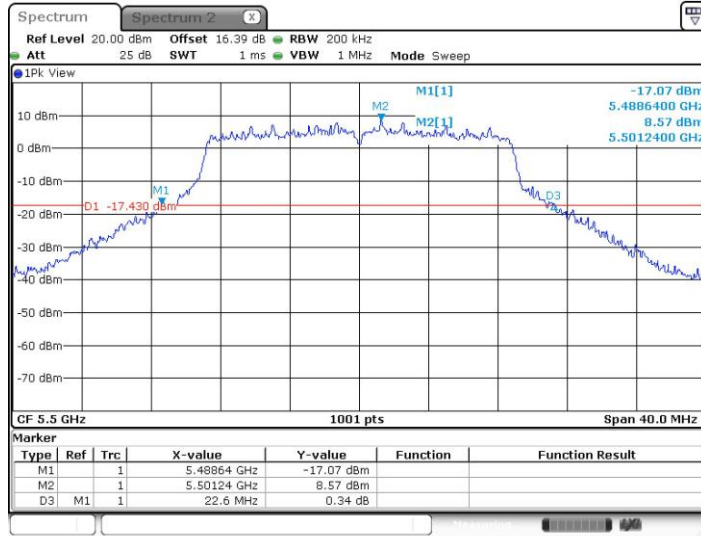
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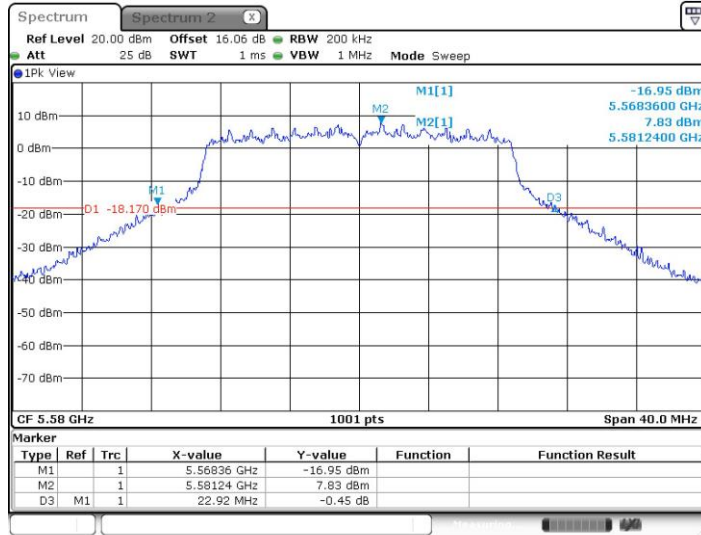
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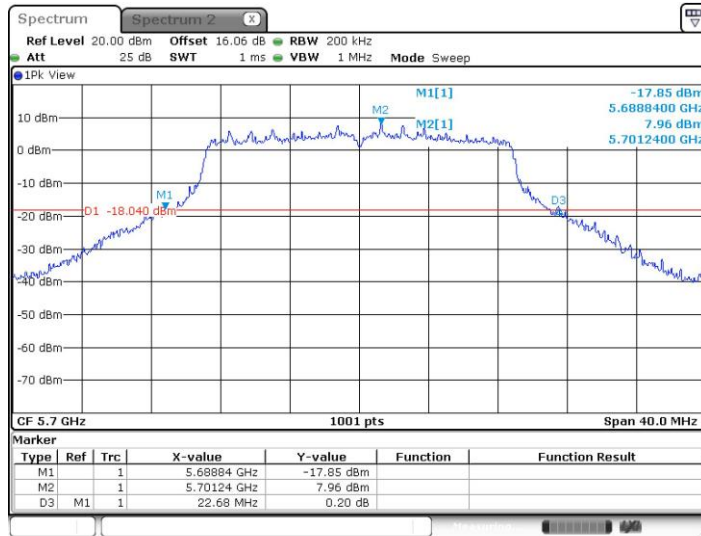


11AC20SISO_Ant1_5580

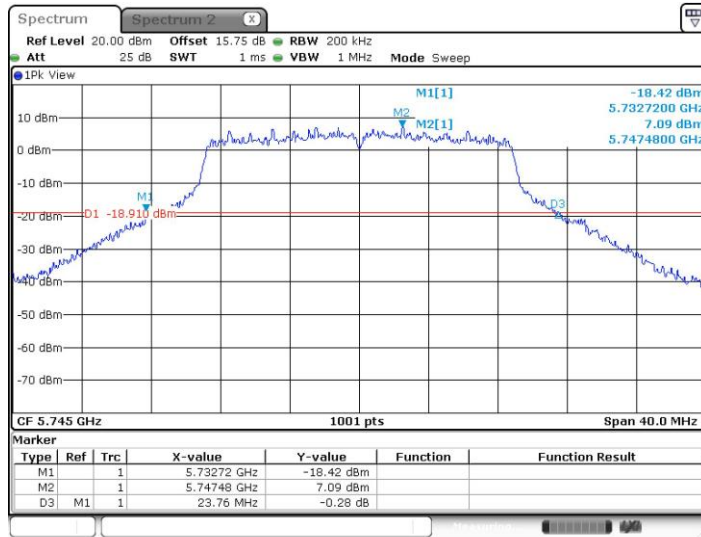




11AC20SISO_Ant1_5700

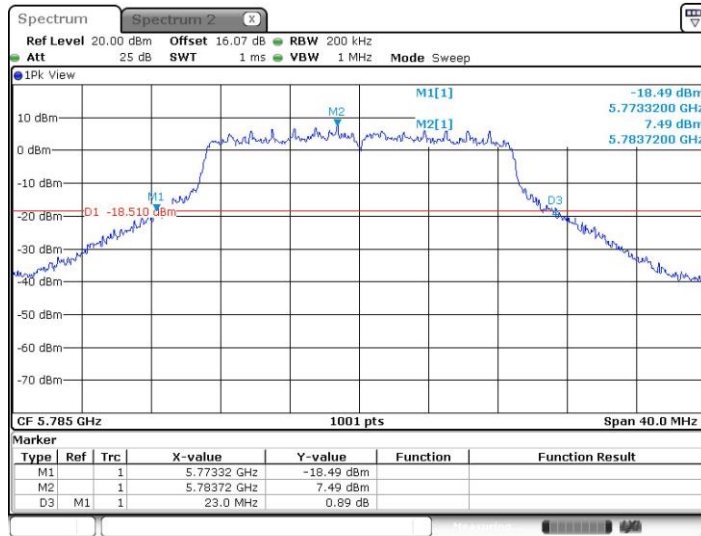


11AC20SISO_Ant1_5745



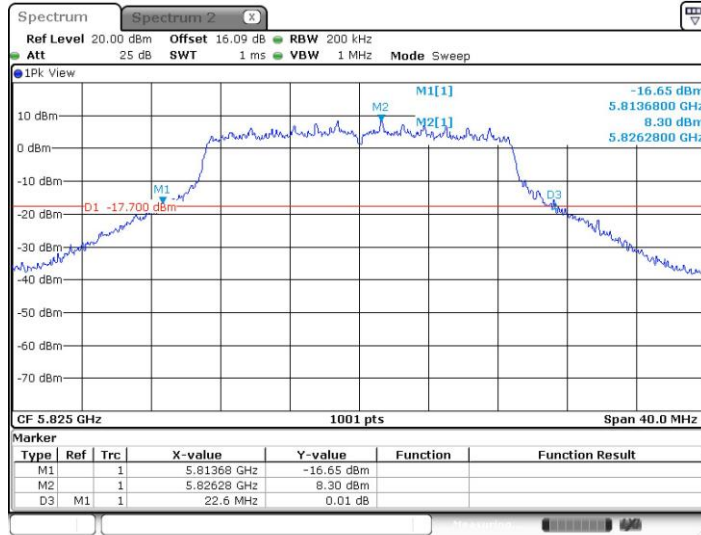


11AC20SISO_Ant1_5785



Date: 2.MAR.2022 12:43:16

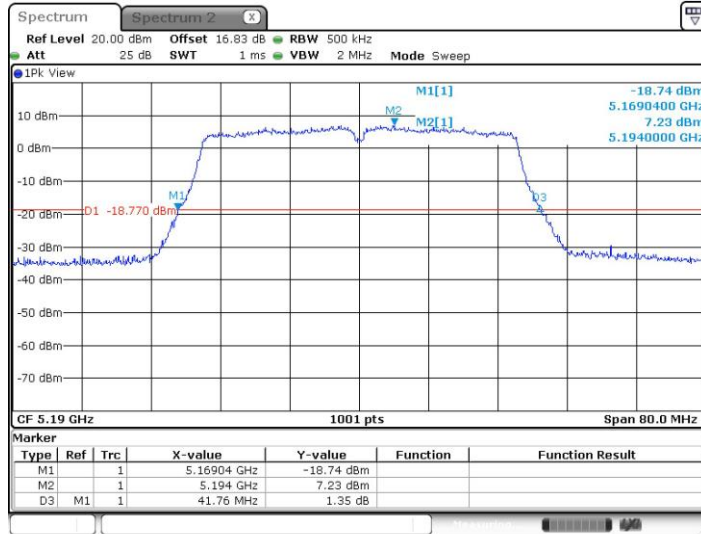
11AC20SISO_Ant1_5825



Date: 2.MAR.2022 12:45:04

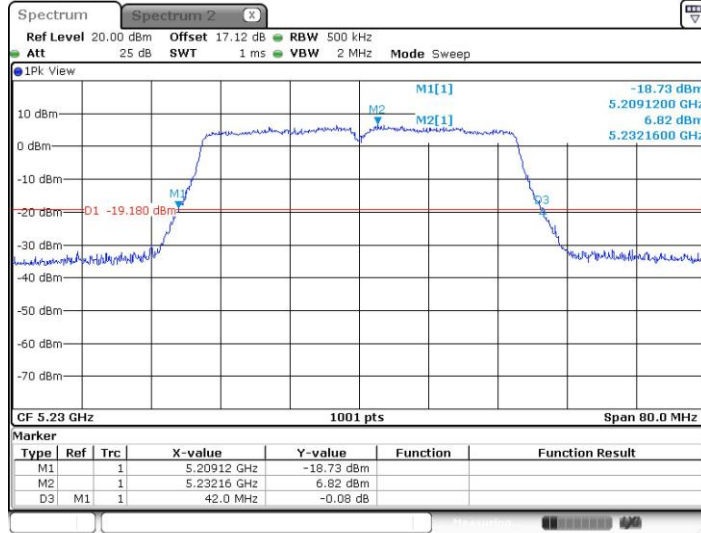


11AC40SISO_Ant1_5190



Date: 2.MAR.2022 12:47:26

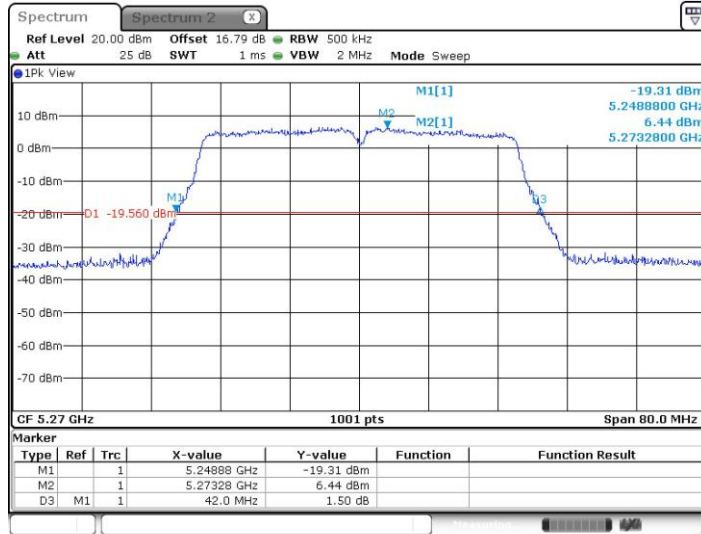
11AC40SISO_Ant1_5230



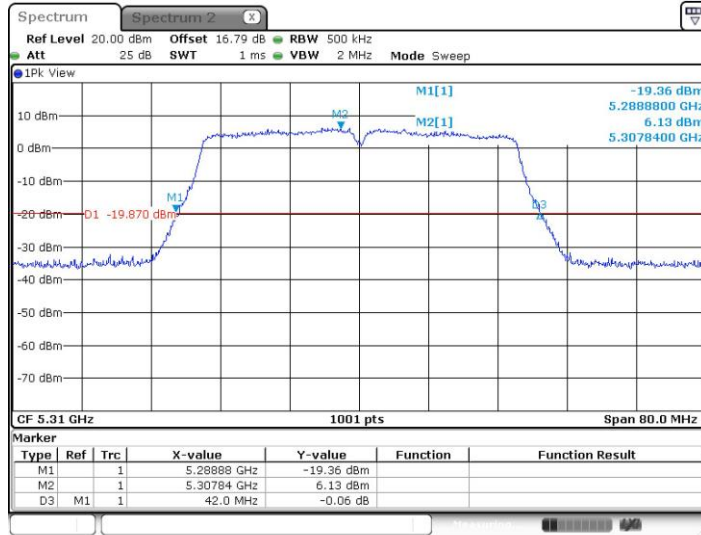
Date: 2.MAR.2022 12:49:23



11AC40SISO_Ant1_5270

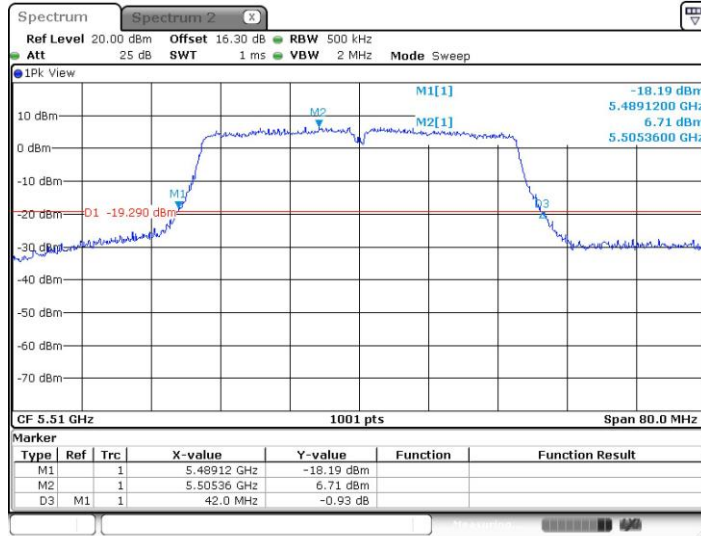


11AC40SISO_Ant1_5310



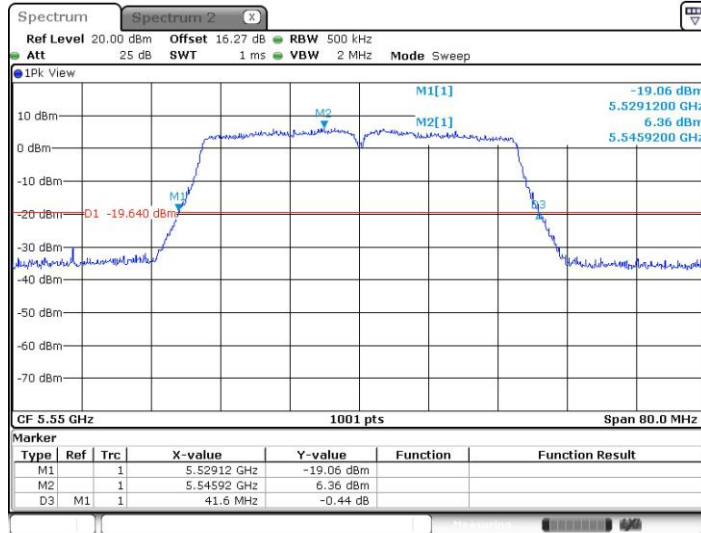


11AC40SISO_Ant1_5510



Date: 2.MAR.2022 12:54:34

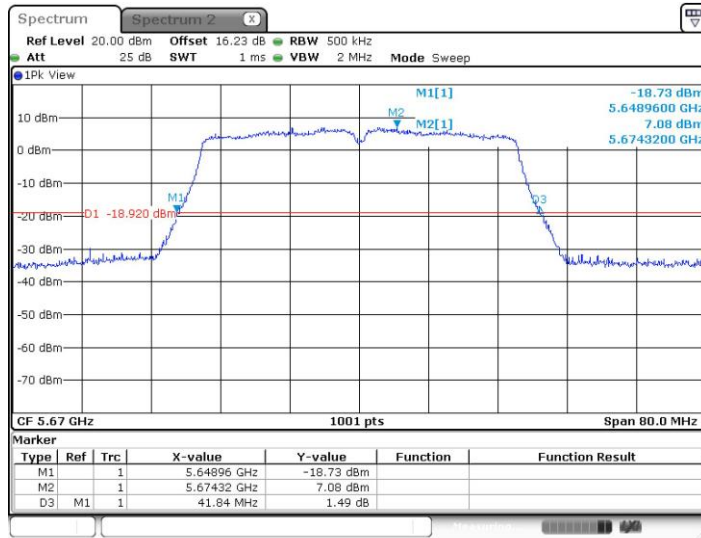
11AC40SISO_Ant1_5550



Date: 2.MAR.2022 12:56:47

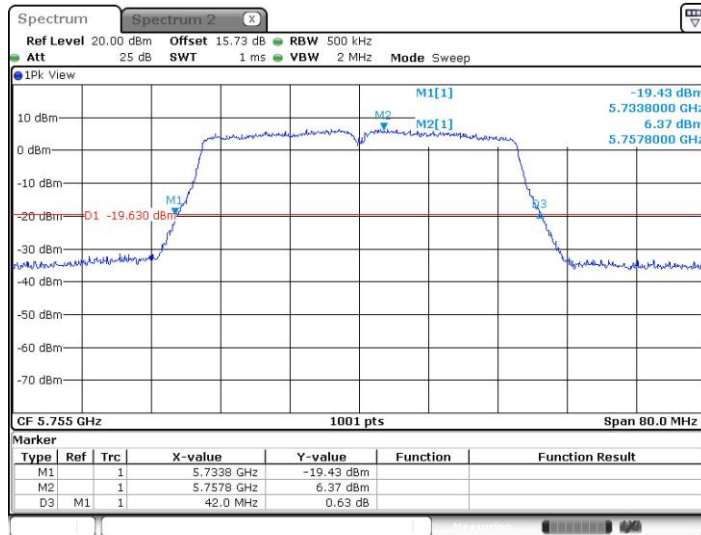


11AC40SISO_Ant1_5670



Date: 2.MAR.2022 13:00:08

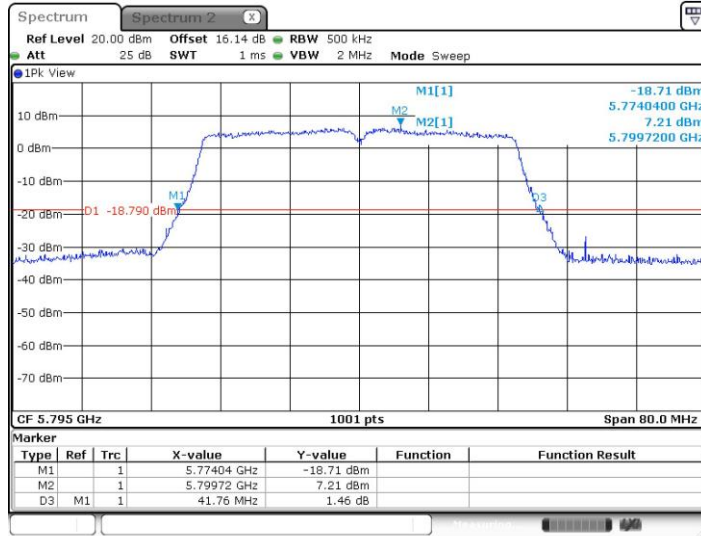
11AC40SISO_Ant1_5755



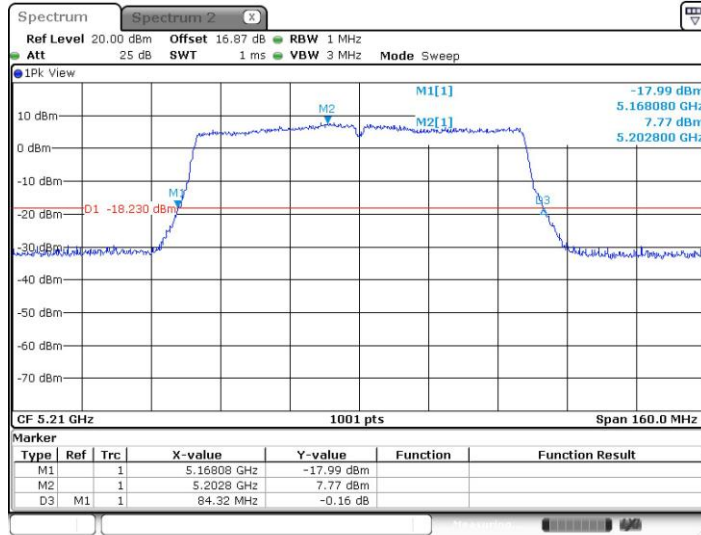
Date: 2.MAR.2022 13:02:09



11AC40SISO_Ant1_5795

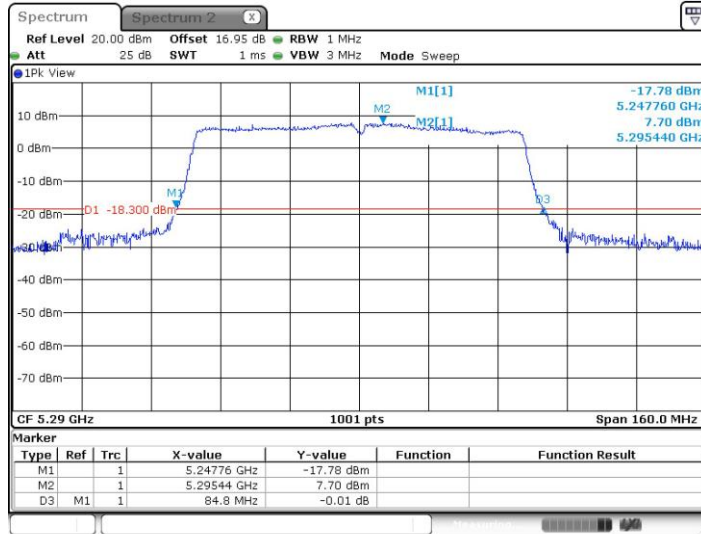


11AC80SISO_Ant1_5210



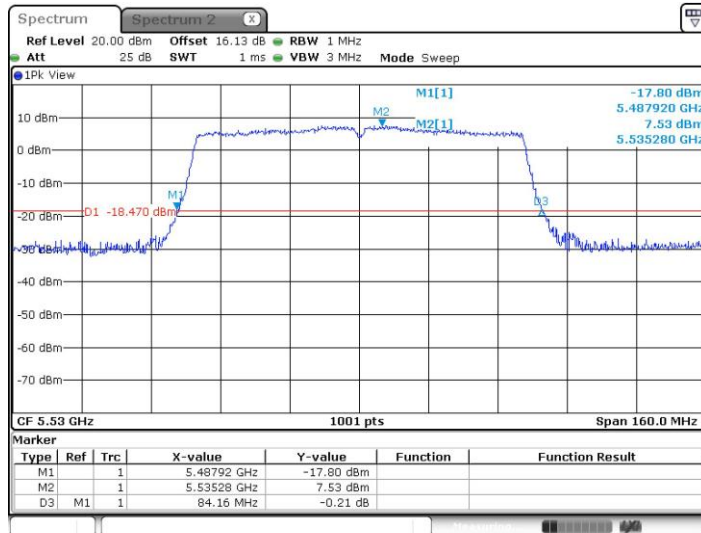


11AC80SISO_Ant1_5290



Date: 2.MAR.2022 13:08:30

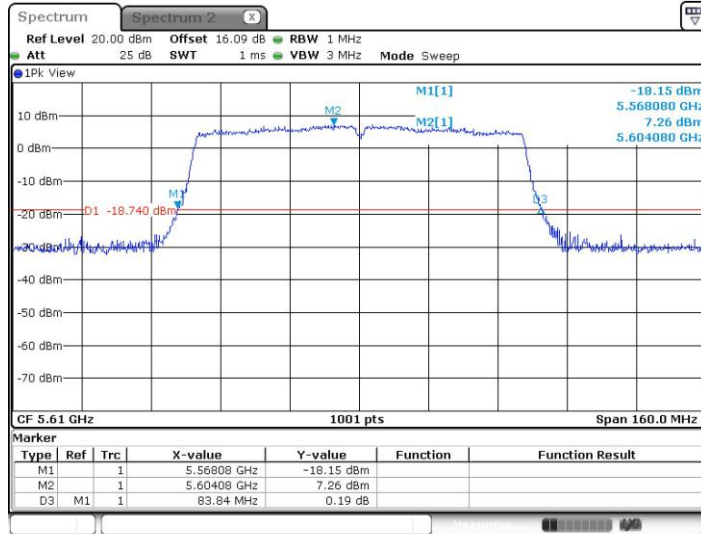
11AC80SISO_Ant1_5530



Date: 2.MAR.2022 13:10:46

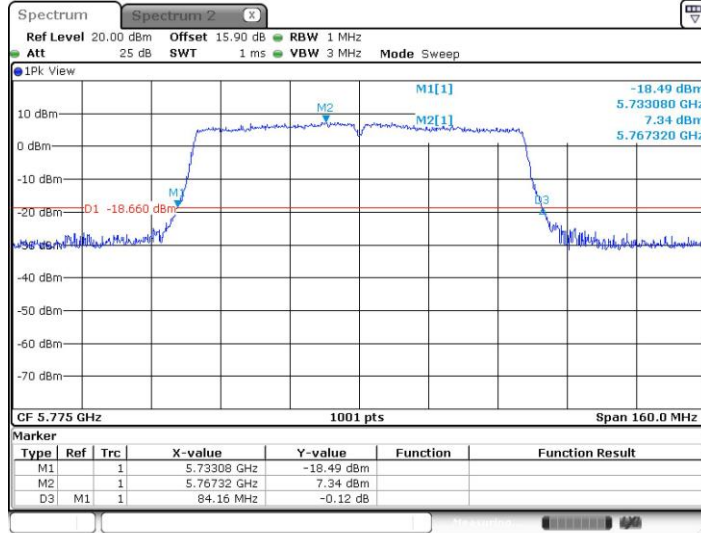


11AC80SISO_Ant1_5610



Date: 2.MAR.2022 13:12:38

11AC80SISO_Ant1_5775



Date: 2.MAR.2022 13:14:51



Occupied channel bandwidth

Test Result

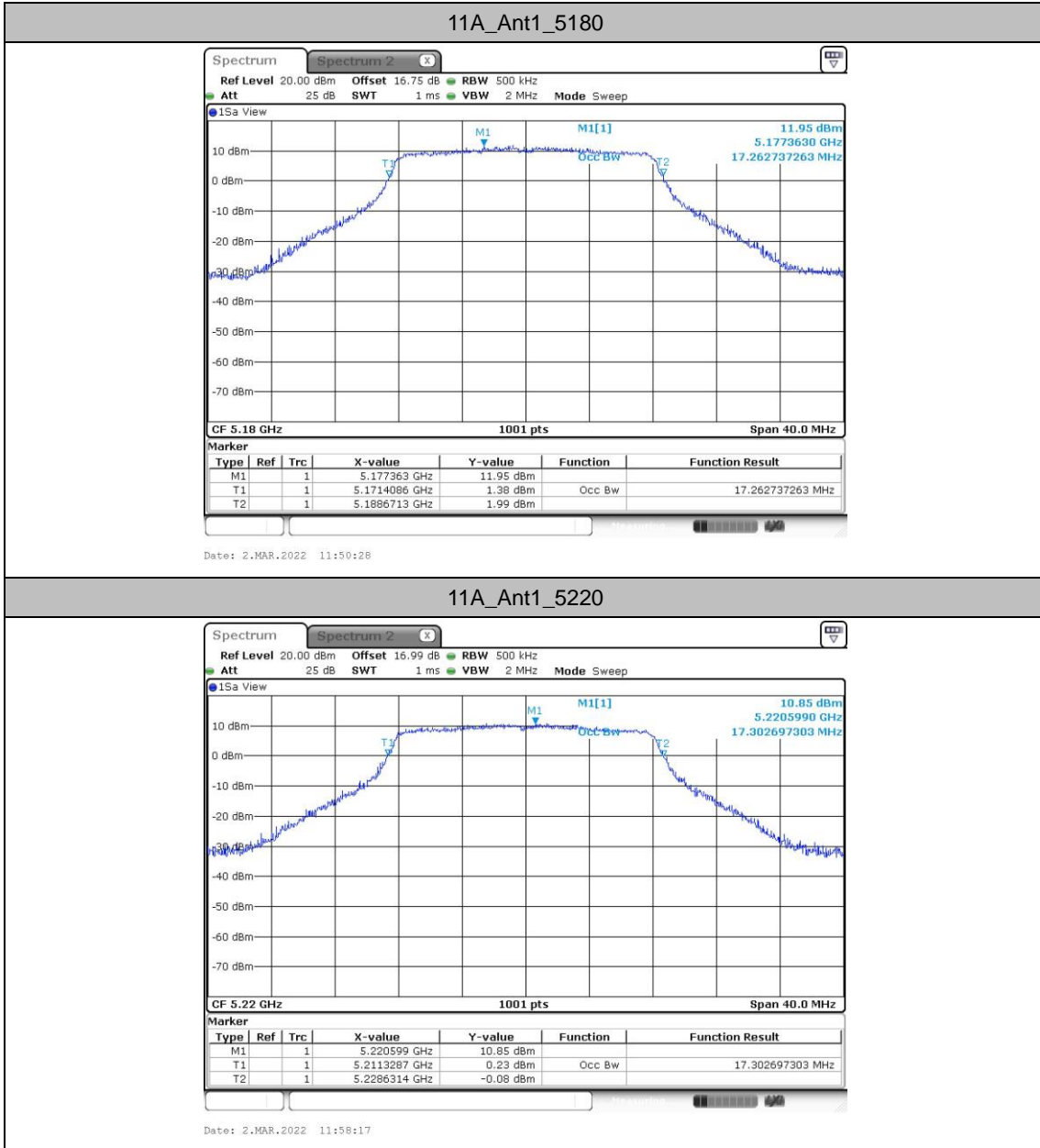
TestMode	Antenna	Frequency[MHz]	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A	Ant1	5180	17.263	5171.409	5188.671	---	---
		5220	17.303	5211.329	5228.631	---	---
		5240	17.223	5231.449	5248.671	---	---
		5260	17.263	5251.329	5268.591	---	---
		5300	17.183	5291.409	5308.591	---	---
		5320	17.303	5311.369	5328.671	---	---
		5500	17.263	5491.329	5508.591	---	---
		5580	17.263	5571.369	5588.631	---	---
		5700	17.343	5691.329	5708.671	---	---
		5745	17.263	5736.369	5753.631	---	---
		5785	17.303	5776.289	5793.591	---	---
		5825	17.263	5816.329	5833.591	---	---
11AC20SISO	Ant1	5180	18.382	5170.809	5189.191	---	---
		5220	18.382	5210.769	5229.151	---	---
		5240	18.382	5230.849	5249.231	---	---
		5260	18.342	5250.769	5269.111	---	---
		5300	18.302	5290.849	5309.151	---	---
		5320	18.382	5310.809	5329.191	---	---
		5500	18.302	5490.809	5509.111	---	---
		5580	18.382	5570.809	5589.191	---	---
		5700	18.382	5690.809	5709.191	---	---
		5745	18.342	5735.809	5754.151	---	---
		5785	18.342	5775.769	5794.111	---	---
		5825	18.462	5815.729	5834.191	---	---
11AC40SISO	Ant1	5190	36.523	5171.778	5208.302	---	---
		5230	36.683	5211.698	5248.382	---	---
		5270	36.603	5251.698	5288.302	---	---
		5310	36.603	5291.698	5328.302	---	---
		5510	36.683	5491.618	5528.302	---	---
		5550	36.523	5531.698	5568.222	---	---
		5670	36.603	5651.698	5688.302	---	---
		5755	36.523	5736.698	5773.222	---	---
		5795	36.603	5776.698	5813.302	---	---



11AC80SISO	Ant1	5210	76.244	5171.958	5248.202	---	---
		5290	76.244	5251.798	5328.042	---	---
		5530	76.084	5491.958	5568.042	---	---
		5610	75.924	5572.118	5648.042	---	---
		5775	76.084	5736.958	5813.042	---	---

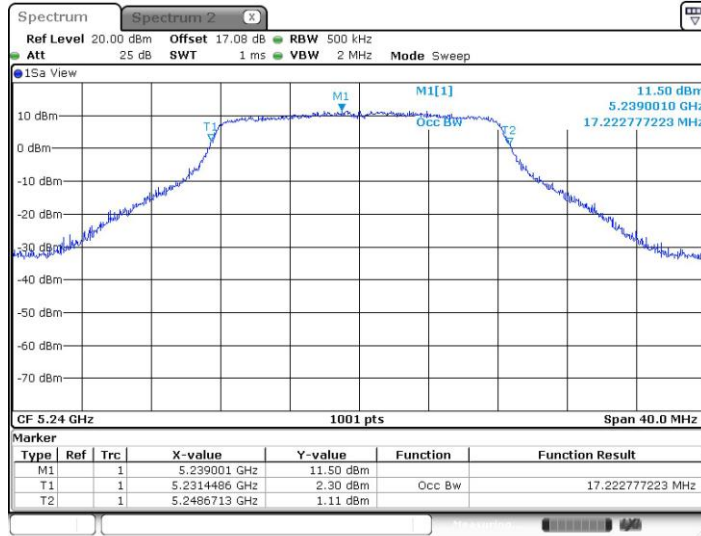


Test Graphs



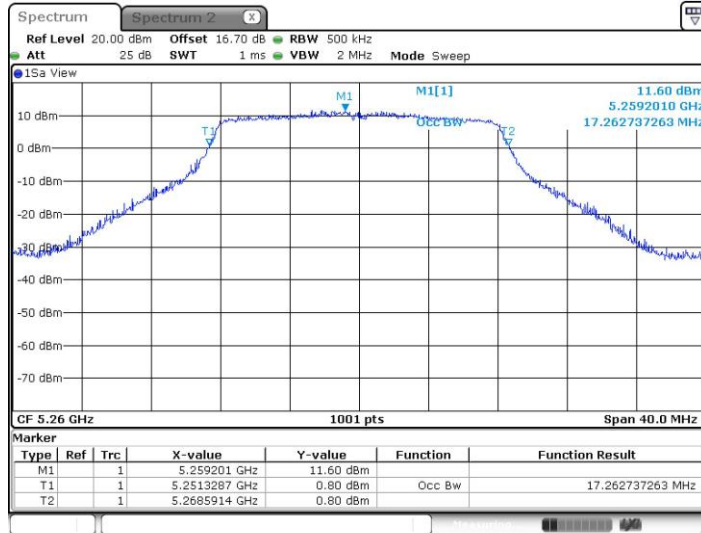


11A_Ant1_5240



Date: 2.MAR.2022 12:00:04

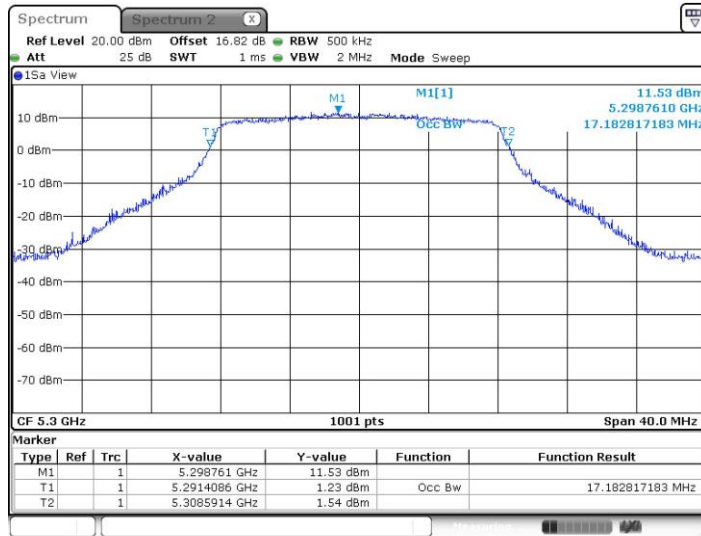
11A_Ant1_5260



Date: 2.MAR.2022 12:02:19

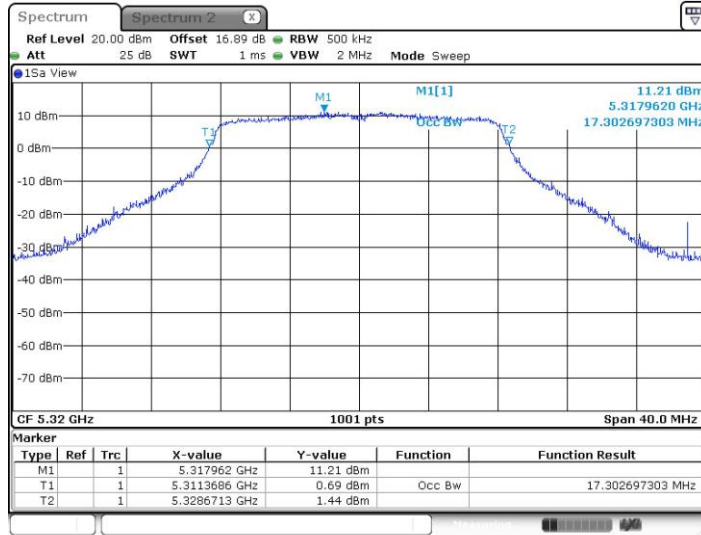


11A_Ant1_5300



Date: 2.MAR.2022 12:03:55

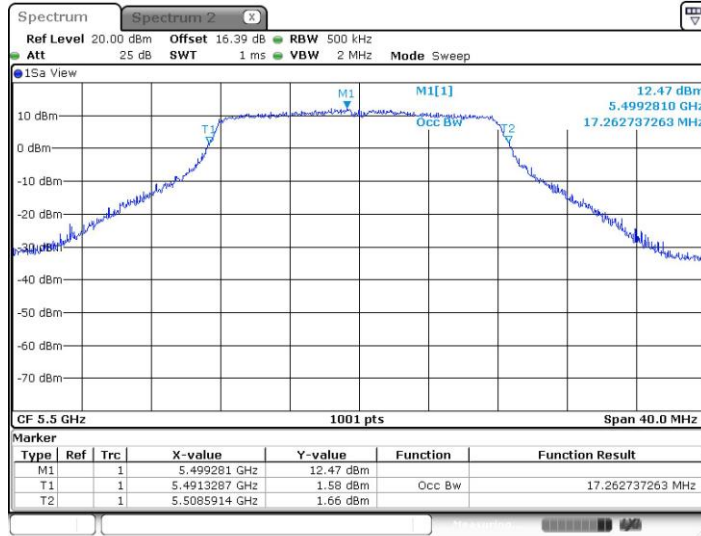
11A_Ant1_5320



Date: 2.MAR.2022 12:06:23

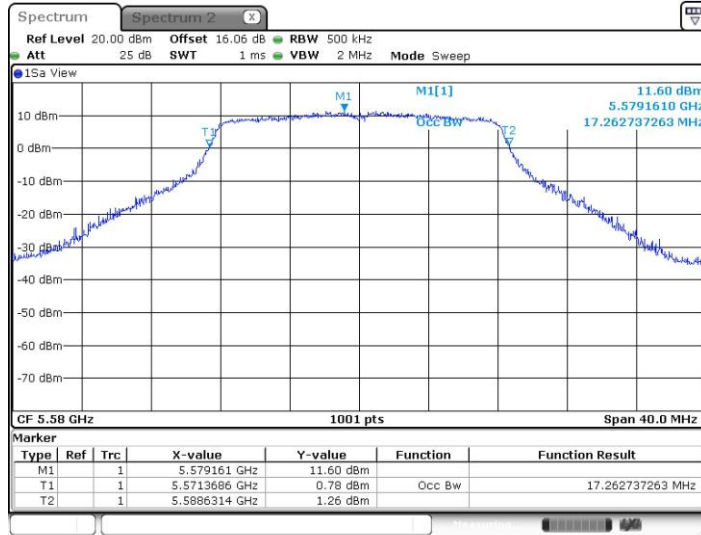


11A_Ant1_5500



Date: 2.MAR.2022 12:07:54

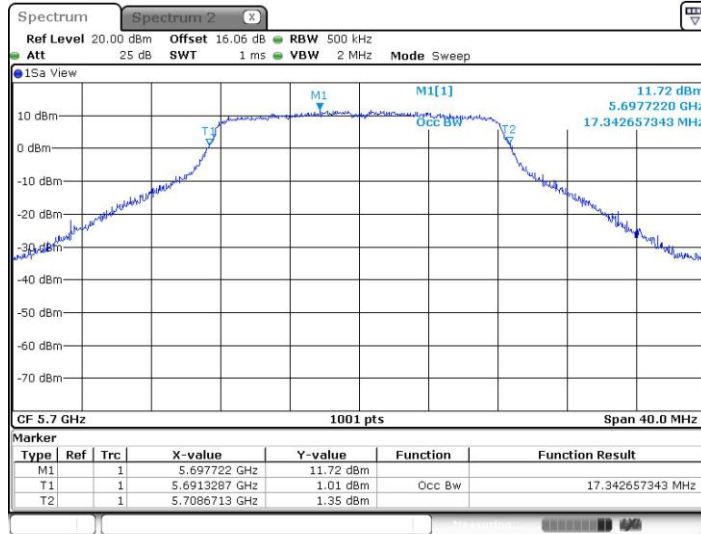
11A_Ant1_5580



Date: 2.MAR.2022 12:09:33

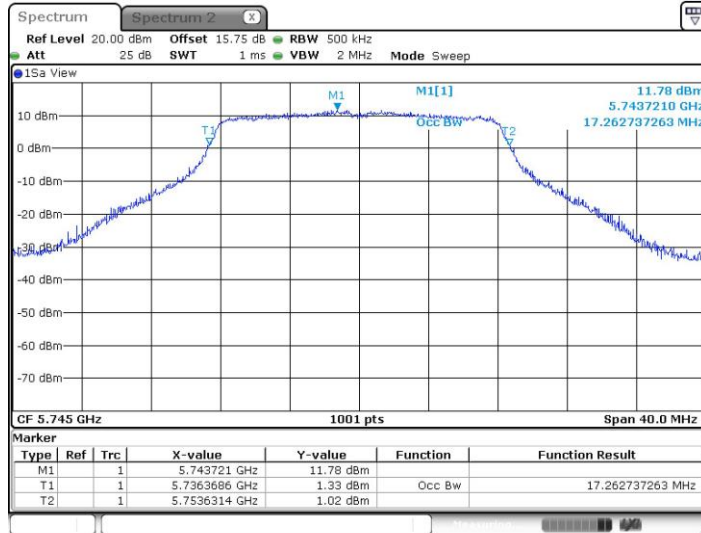


11A_Ant1_5700



Date: 2.MAR.2022 12:13:10

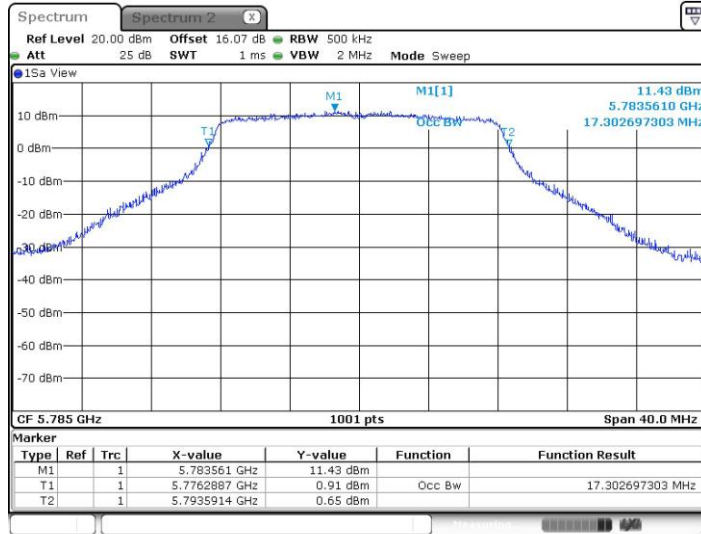
11A_Ant1_5745



Date: 2.MAR.2022 12:15:55

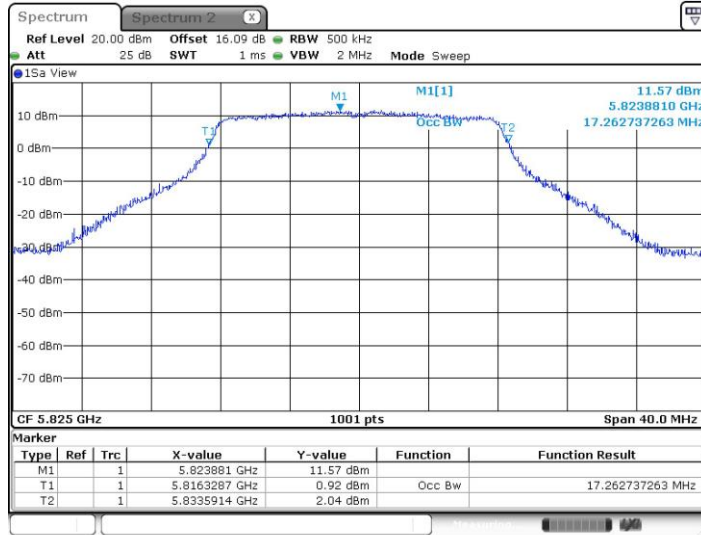


11A_Ant1_5785



Date: 2.MAR.2022 12:17:38

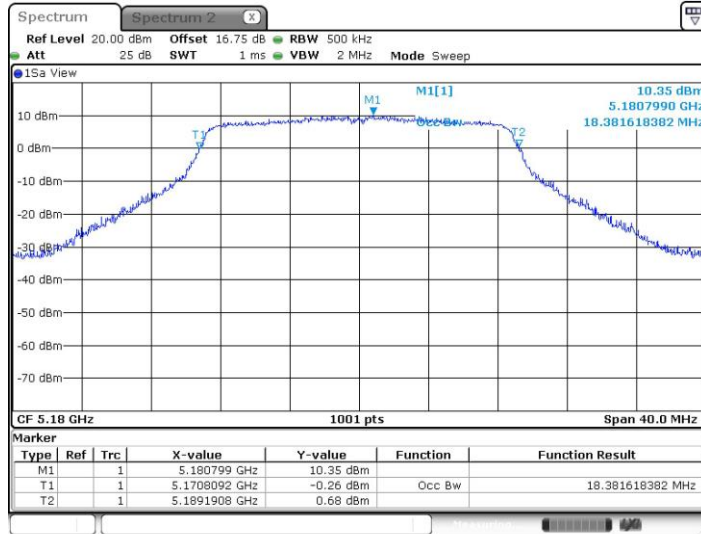
11A_Ant1_5825



Date: 2.MAR.2022 12:19:27

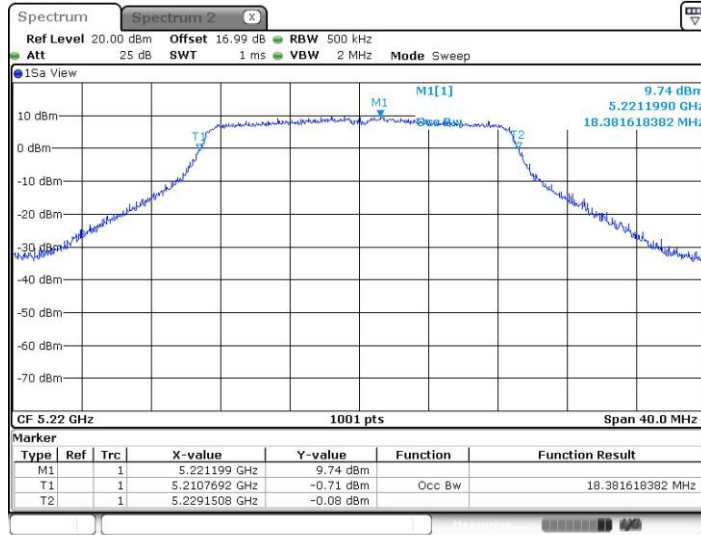


11AC20SISO_Ant1_5180



Date: 2.MAR.2022 12:22:14

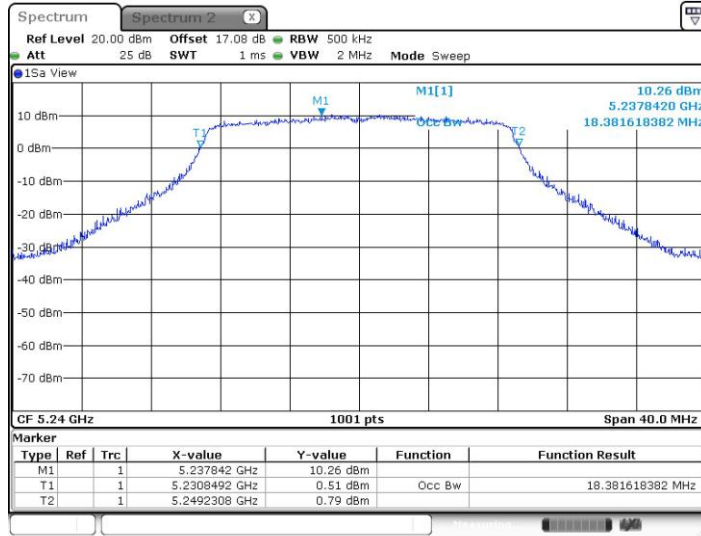
11AC20SISO_Ant1_5220



Date: 2.MAR.2022 12:24:01

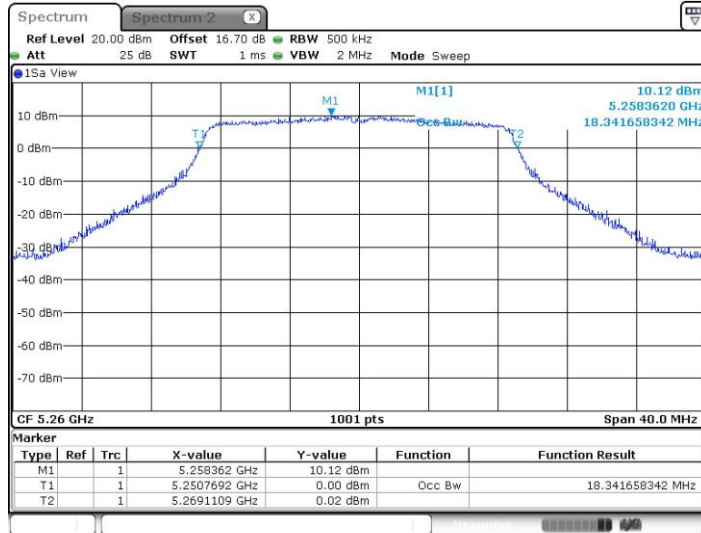


11AC20SISO_Ant1_5240



Date: 2.MAR.2022 12:25:40

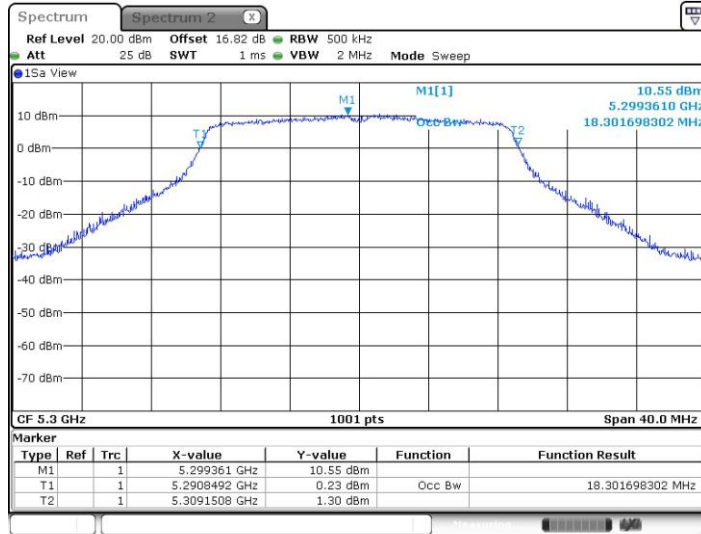
11AC20SISO_Ant1_5260



Date: 2.MAR.2022 12:27:20

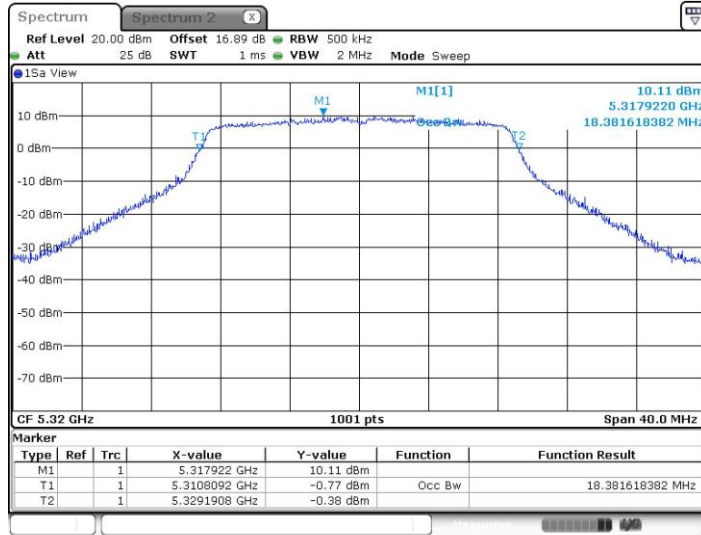


11AC20SISO_Ant1_5300



Date: 2.MAR.2022 12:28:50

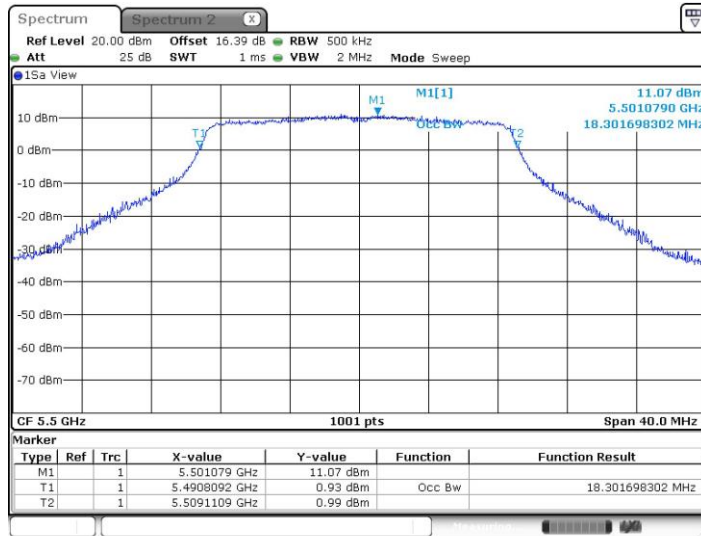
11AC20SISO_Ant1_5320



Date: 2.MAR.2022 12:30:23

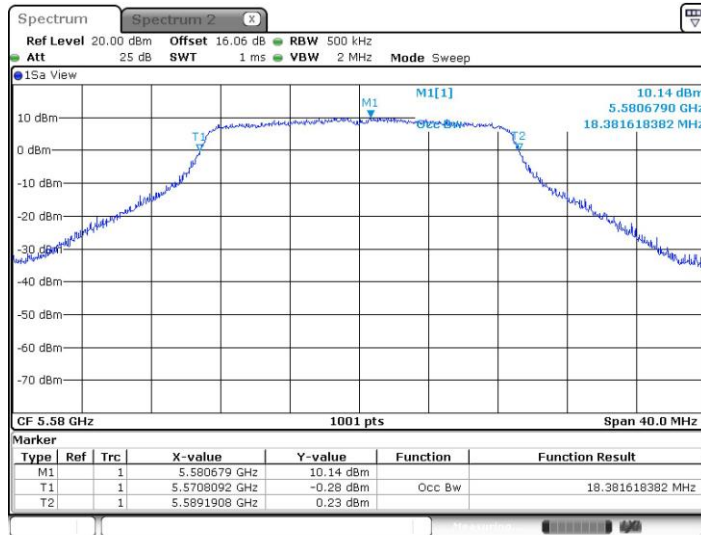


11AC20SISO_Ant1_5500



Date: 2.MAR.2022 12:31:55

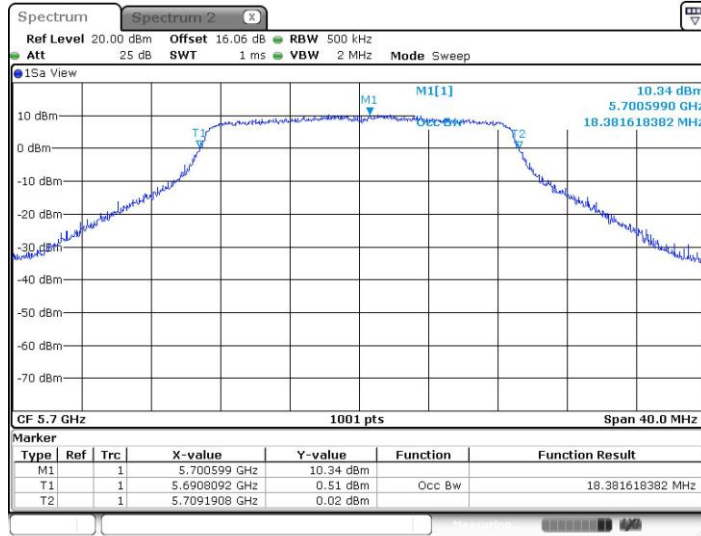
11AC20SISO_Ant1_5580



Date: 2.MAR.2022 12:33:24

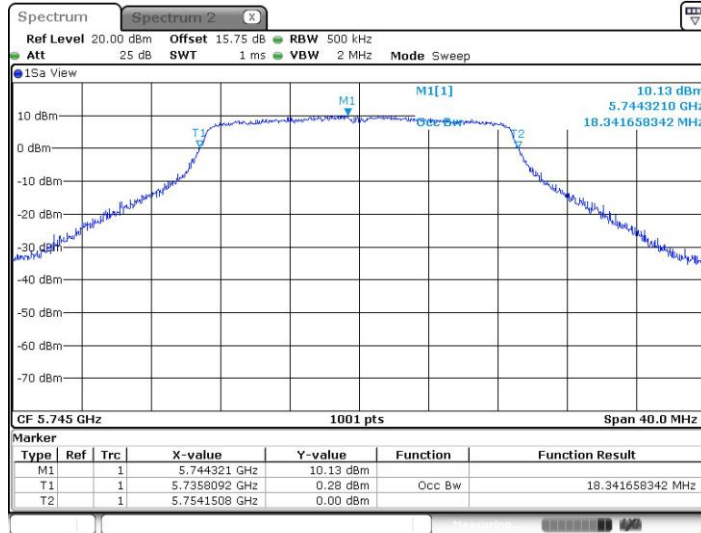


11AC20SISO_Ant1_5700



Date: 2.MAR.2022 12:36:29

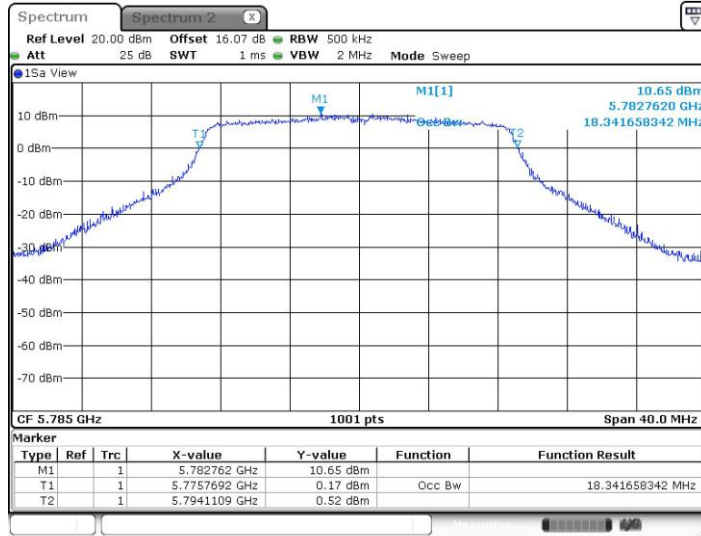
11AC20SISO_Ant1_5745



Date: 2.MAR.2022 12:38:19

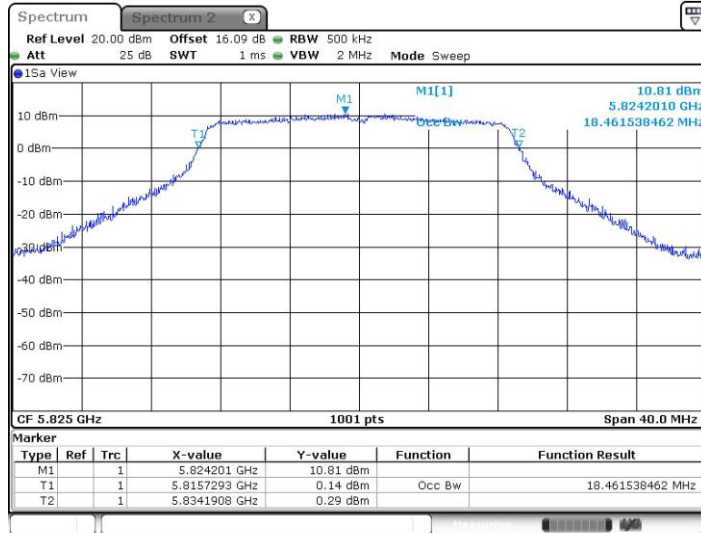


11AC20SISO_Ant1_5785



Date: 2.MAR.2022 12:43:52

11AC20SISO_Ant1_5825



Date: 2.MAR.2022 12:45:41

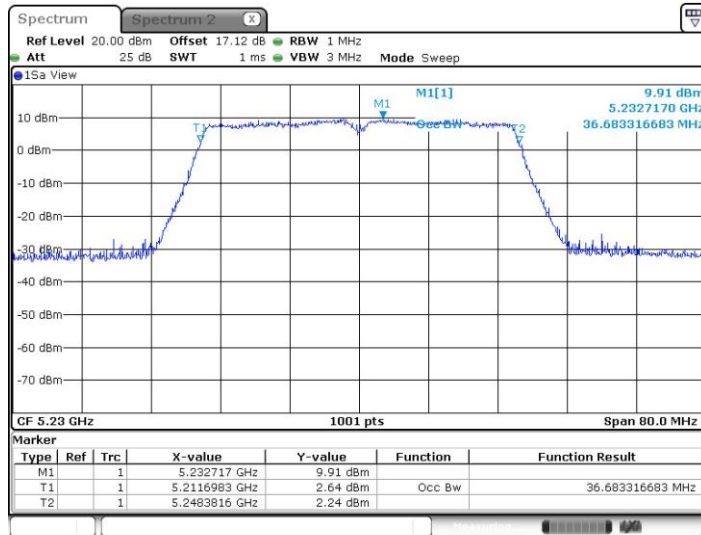


11AC40SISO_Ant1_5190



Date: 2.MAR.2022 12:47:45

11AC40SISO_Ant1_5230



Date: 2.MAR.2022 12:49:39

