



FCC RF Test Report

APPLICANT : Amazon.com Services LLC
EQUIPMENT : Wireless Tablet
MODEL NAME : TG425K
FCC ID : 2A4DH-4258
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : (DTS) Digital Transmission System
TEST DATE(S) : Feb. 13, 2023 ~ Mar. 07, 2023

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

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

Jason Jia

Approved by: Jason Jia



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
FR2N0304-01C	Rev. 01	Initial issue of report	Apr. 06, 2023
FR2N0304-01C	Rev. 02	1. Update Section 4. List of Measuring Equipment 2. Revise RSE test mode number in Appendix C. 3. Remove BLE duty cycle test plot in Appendix D	May 16, 2023
FR2N0304-01C	Rev. 03	Update Section 2.2 AC Conducted Emission test mode on Page 9	Sep. 07, 2023

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result
3.1	15.247(a)(2)	6dB Bandwidth	$\geq 0.5\text{MHz}$	Pass
3.1	-	99% Bandwidth	-	Report Only
3.2	15.247(b)	Power Output Measurement	$\leq 30\text{dBm}$	Pass
3.3	15.247(e)	Power Spectral Density	$\leq 8\text{dBm}/3\text{kHz}$	Pass
3.4	15.247(d)	Conducted Band Edges	$\leq 20\text{dBc}$	Pass
		Conducted Spurious Emission		Pass
3.5	15.247(d)	Radiated Band Edges and Radiated Spurious Emission	15.209(a) & 15.247(d)	Pass
3.6	15.207	AC Conducted Emission	15.207(a)	Pass
3.7	15.203 & 15.247(b)	Antenna Requirement	15.203 & 15.247(b)	Pass

Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits.

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

Amazon.com Services LLC

410 Terry Avenue N, Seattle, WA 98109-5210, United States

1.2 Product Feature of Equipment Under Test

Product Feature	
Equipment	Wireless Tablet
Model Name	TG425K
FCC ID	2A4DH-4258
SN	Conducted: PCC33E00304700M1 Conduction: GCC2HD003052001R Radiation: GCC2HD003052001W

Remark: There are three type of EUT, the differences between them are summary below:

	Sample1	Sample2	Sample3
Configuration	-	-	-
EMMC	64GB	64GB	64GB
DDR	4GB	4GB	3GB
Battery	ATL	SCUD	SCUD

According to the difference, for RF report, we chose sample 1 to perform full test.

1.3 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx/Rx Channel Frequency Range	2412 MHz ~ 2472 MHz
Maximum (Peak) Output Power to antenna	<Ant.1> 802.11b : 17.30 dBm (0.0537 W) 802.11g : 24.35 dBm (0.2723 W) 802.11n HT20 : 24.43 dBm (0.2773 W) < Ant.2> 802.11b : 17.63 dBm (0.0579 W) 802.11g : 24.84 dBm (0.3048 W) 802.11n HT20 : 24.56 dBm (0.2858 W)
99% Occupied Bandwidth	< Ant.1> 802.11b : 12.947MHz 802.11g : 17.223MHz 802.11n HT20 : 18.102MHz < Ant.2> 802.11b : 12.947MHz 802.11g : 17.423MHz 802.11n HT20 : 18.182MHz
Antenna Type / Gain	Ant 1: PIFA Antenna type with gain 1.5 dBi Ant 2: PIFA Antenna type with gain 2.5 dBi
Type of Modulation	802.11b : DSSS (DBPSK / DQPSK / CCK) 802.11g/n: OFDM (BPSK / QPSK / 16QAM / 64QAM)

Remark: WLAN supports SISO mode only.

1.4 Modification of EUT

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

1.5 Testing Location

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

Test Firm	Sporton International Inc. (Kunshan)		
Test Site Location	No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China TEL : +86-512-57900158		
Test Site No.	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.
	CO01-KS 03CH08-KS TH01-KS	CN1257	314309

1.6 Test Software

Item	Site	Manufacturer	Name	Version
1.	03CH08-KS	AUDIX	E3	6.2009-8-24
2.	CO01-KS	R&S	EMC32	10.60.20

1.7 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 C §15.247
- ♦ FCC KDB 558074 D01 15.247 Meas Guidance v05r02
- ♦ ANSI C63.10-2013

Remark: All test items were verified and recorded according to the standards and without any deviation during the test.



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)
2400-2483.5 MHz	1	2412	8	2447
	2	2417	9	2452
	3	2422	10	2457
	4	2427	11	2462
	5	2432	12	2467
	6	2437	13	2472
	7	2442		



2.2 Test Mode

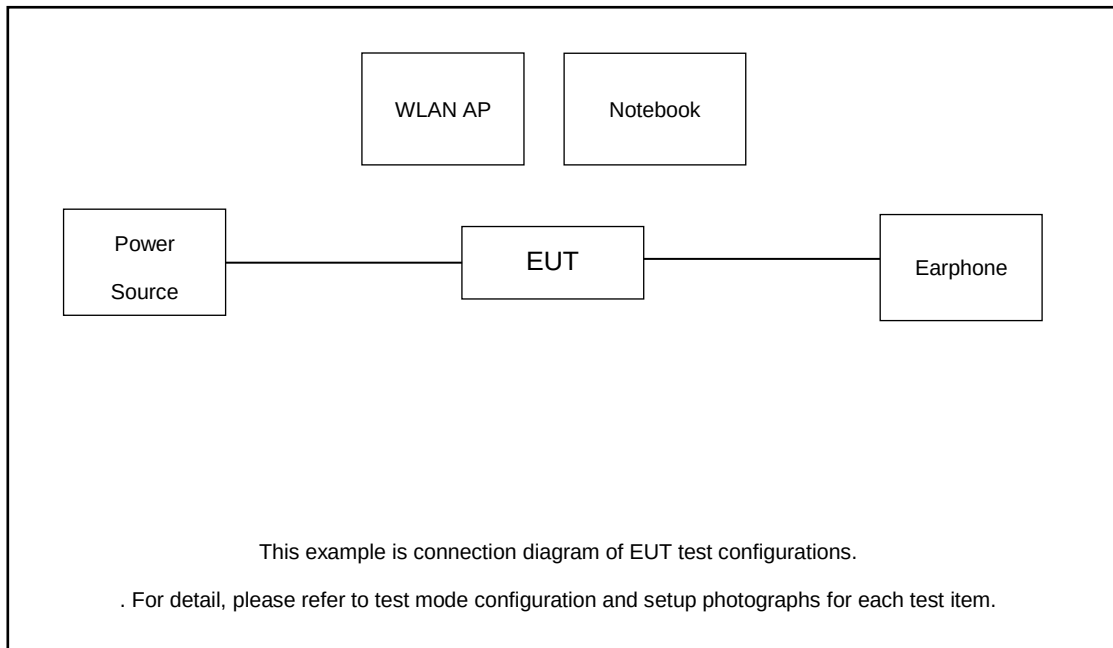
Final test modes are considering the modulation and worse data rates as below table.

Modulation	Data Rate
802.11b	1 Mbps
802.11g	6 Mbps
802.11n HT20	MCS0

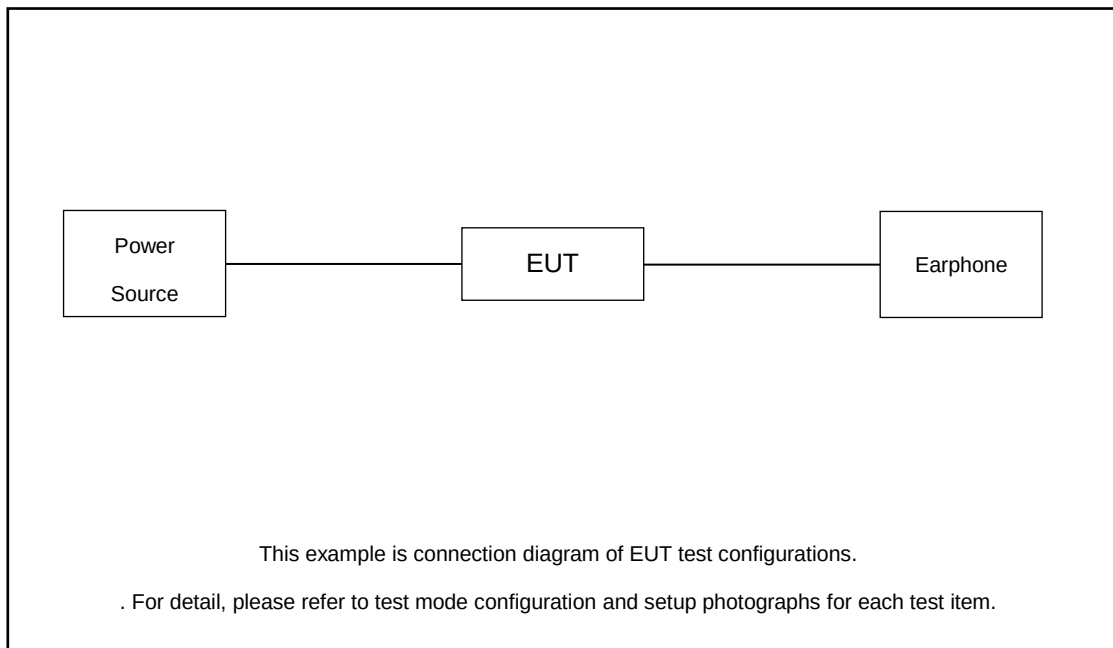
Test Cases	
AC Conducted Emission	Mode 1 :WLAN Link(2.4G) + USB Cable(Charging From Adapter(PS57CP)(US))+ Earphone
Remark: For Radiated Test Cases, The tests were performed with Adapter, Earphone and USB Cable.	

2.3 Connection Diagram of Test System

AC Conducted Emission:



Radiated Emission:



2.4 Support Unit used in test configuration and system

Item	Equipment	Model Name	FCC ID	Data Cable	Power Cord
1.	Earphone	P121	N/A	Unshielded,1.2m	N/A
2.	Notebook	G480	QDS-BRCM1050I	N/A	shielded cable DC O/P 1.8m , Unshielded AC I/P cable 1.8m
3.	WLAN AP	DIR-655	KA21R655B1	N/A	Unshielded,1.8m

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 which are included in RF test system.

$$\text{Offset(dB)} = 12.95 \text{ (dB)}$$

3 Test Result

3.1 6dB and 99% Bandwidth Measurement

3.1.1 Limit of 6dB and 99% Bandwidth

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

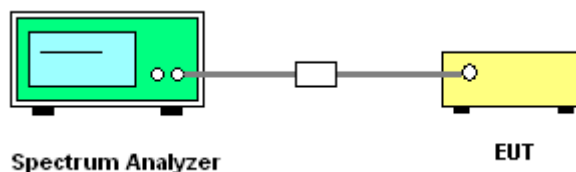
3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

1. The testing follows ANSI C63.10-2013 clause 11.8
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6 dB bandwidth must be greater than 500 kHz.
5. For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) = 1%~5% of OBW and set the Video bandwidth (VBW) $\geq 3 \times$ RBW.
6. Measure and record the results in the test report.

3.1.4 Test Setup



3.1.5 Test Result of 6dB and 99% Occupied Bandwidth

Please refer to Appendix A.

3.2 Output Power Measurement

3.2.1 Limit of Output Power

For systems using digital modulation in the 2400-2483.5MHz, the limit for peak output power is 30dBm. If transmitting antenna with directional gain greater than 6dBi is used, the peak output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the antenna exceeds 6 dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

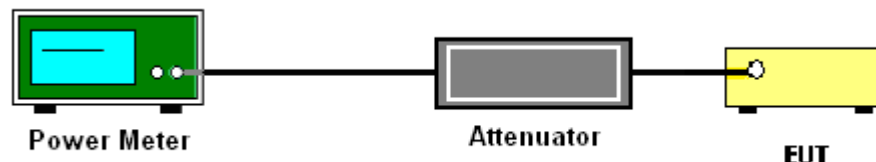
3.2.2 Measuring Instruments

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

3.2.3 Test Procedures

1. The testing follows the Measurement Procedure of ANSI C63.10-2013 clause 11.9.1.3 PKPM1 Peak power meter or ANSI C63.10-2013 clause 11.9.2.3.1 Method AVGPM method.
2. The RF output of EUT was connected to the power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Measure the conducted output power and record the results in the test report.

3.2.4 Test Setup



3.2.5 Test Result of Peak Output Power

Please refer to Appendix A.

3.2.6 Test Result of Average Output Power (Reporting Only)

Please refer to Appendix A.

3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

The peak power spectral density shall not be greater than 8dBm in any 3kHz band at any time interval of continuous transmission.

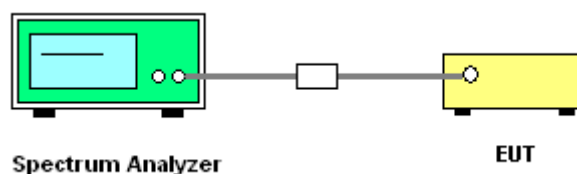
3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

1. The testing follows Measurement Procedure of ANSI C63.10-2013 clause 11.10.2 Method PKPSD.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 3 kHz. Video bandwidth VBW = 10 kHz In order to make an accurate measurement, set the span to 1.5 times DTS Channel Bandwidth. (6dB BW)
5. Detector = peak, Sweep time = auto couple, Trace mode = max hold, Allow trace to fully stabilize. Use the peak marker function to determine the maximum power level.
6. Measure and record the results in the test report.

3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.

3.4 Conducted Band Edges and Spurious Emission Measurement

3.4.1 Limit of Conducted Band Edges and Spurious Emission Measurement

In any 100 kHz bandwidth outside of the authorized frequency band, the emissions which fall in the non-restricted bands shall be attenuated at least 20 dB / 30dB relative to the maximum PSD level in 100 kHz by RF conducted measurement.

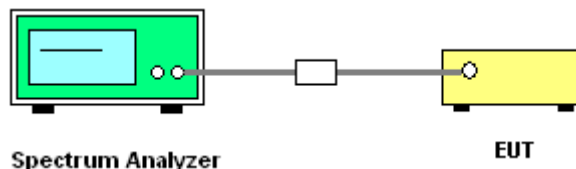
3.4.2 Measuring Instruments

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

3.4.3 Test Procedures

1. The testing follows ANSI C63.10-2013 clause 11.13
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Set RBW = 100 kHz, VBW=300 kHz, Peak Detector. Unwanted Emissions measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz when maximum peak conducted output power procedure is used. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB per 15.247(d).
5. Measure and record the results in the test report.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

3.4.4 Test Setup



3.4.5 Test Result of Conducted Band Edges and Spurious Emission

Please refer to Appendix A.

3.5 Radiated Band Edges and Spurious Emission Measurement

3.5.1 Limit of Radiated band edge and Spurious Emission Measurement

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. If the output power of this device was measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB. In addition, radiated emissions which fall in the restricted bands must also comply with the limits as below.

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

3.5.2 Measuring Instruments

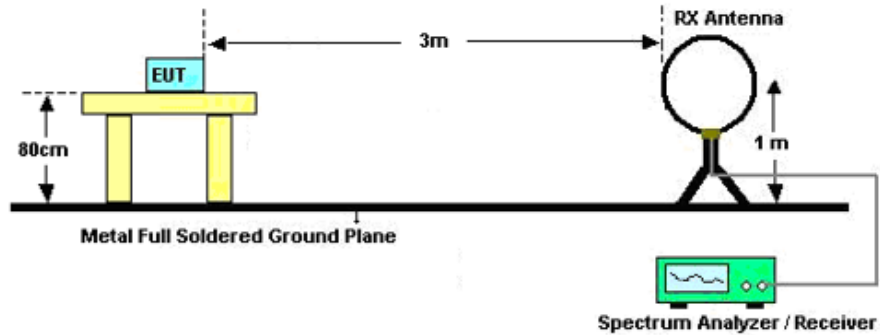
The measuring equipment is listed in the section 4 of this test report.

3.5.3 Test Procedures

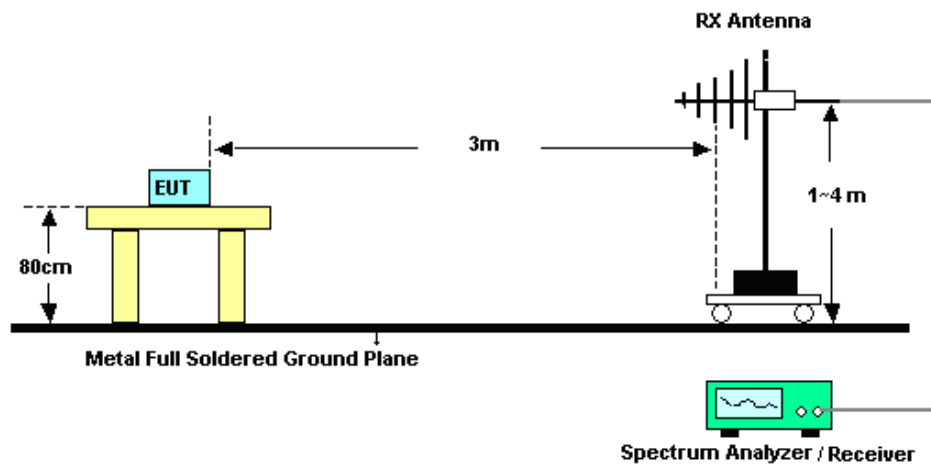
1. The testing follows ANSI C63.10-2013 clause 11.11 & 11.12
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
3. 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.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
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.
8. Use the following spectrum analyzer settings:
 - (1) Span shall wide enough to fully capture the emission being measured;
 - (2) Set RBW=100 kHz for $f < 1$ GHz; VBW $\geq$ RBW; Sweep = auto; Detector function = peak; Trace = max hold;
 - (3) Set RBW = 1 MHz, VBW= 3MHz for $f \geq 1$ GHz for peak measurement.
For average measurement:
 - 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.

3.5.4 Test Setup

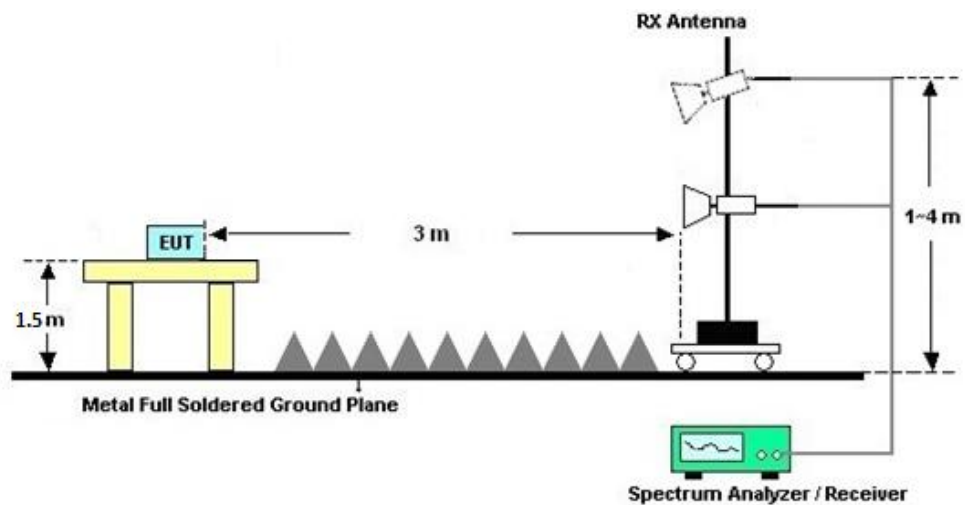
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



**3.5.5 Test Results of Radiated Spurious Emissions (9kHz ~ 30MHz)**

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.

3.5.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix C.

3.5.7 Duty Cycle

Please refer to Appendix D.

3.5.8 Test Result of Radiated Spurious Emission (30MHz ~ 10th Harmonic or 40GHz, whichever is lower)

Please refer to Appendix C.

3.6 AC Conducted Emission Measurement

3.6.1 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 (dB μ V)	
	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.

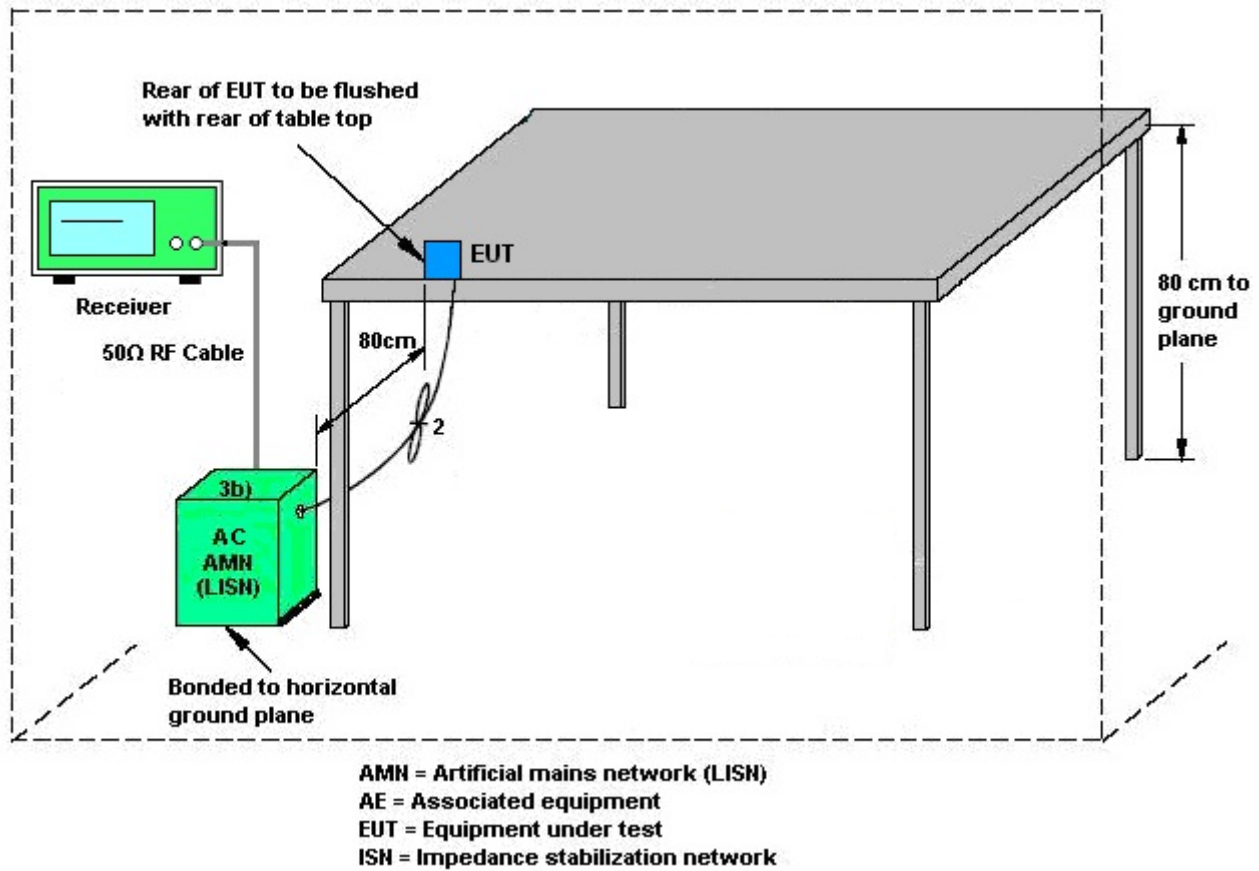
3.6.2 Measuring Instruments

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

3.6.3 Test Procedures

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it 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 (IF bandwidth = 9kHz) with Maximum Hold Mode.

3.6.4 Test Setup



3.6.5 Test Result of AC Conducted Emission

Please refer to Appendix B.



3.7 Antenna Requirements

3.7.1 Standard Applicable

If directional gain of transmitting Antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi. The use of a permanently attached Antenna or of an Antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the rule.

3.7.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.7.3 Antenna Gain

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



4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101040	10Hz~40GHz	Oct. 12, 2022	Feb. 13, 2023	Oct. 11, 2023	Conducted (TH01-KS)
Pulse Power Sensor	Anritsu	MA2411B	0917070	300MHz~40GHz	Jan. 05, 2023	Feb. 13, 2023	Jan. 04, 2024	Conducted (TH01-KS)
Power Meter	Anritsu	ML2495A	1005002	50MHz Bandwidth	Jan. 05, 2023	Feb. 13, 2023	Jan. 04, 2024	Conducted (TH01-KS)
RF Test System	Tonscend	TS1120-3	N/A	N/A	NCR	Feb. 13, 2023	NCR	Conducted (TH01-KS)
automation control unit	Tonscend	JS0806-2	21H8060473	N/A	NCR	Feb. 13, 2023	NCR	Conducted (TH01-KS)
power control unit	Tonscend	JS0806-4ADC	21J8060495	N/A	NCR	Feb. 13, 2023	NCR	Conducted (TH01-KS)
EMI Test Receiver	Keysight	N9038A	MY57290151	3Hz~8.5GHz; Max 30dBm	Jul. 11, 2022	Mar. 02, 2023	Jul. 10, 2023	Radiation (03CH08-KS)
Spectrum Analyzer	R&S	FSV40	101932	10kHz~40GHz; Max 30dBm	Oct. 12, 2022	Mar. 02, 2023	Oct. 11, 2023	Radiation (03CH08-KS)
Loop Antenna	R&S	HFH2-Z2	100321	9kHz~30MHz	Oct. 16, 2022	Mar. 02, 2023	Oct. 15, 2023	Radiation (03CH08-KS)
Bilog Antenna	TESEQ& VGT	CBL 61110	59915	30MHz~1GHz	Aug. 26, 2022	Mar. 02, 2023	Aug. 25, 2023	Radiation (03CH08-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	00240138	1GHz~18GHz	Jul. 08, 2022	Mar. 02, 2023	Jul. 07, 2023	Radiation (03CH08-KS)
high gain Amplifier	EM	EM01G18GA	060845	1Ghz~18Ghz	Jan. 05, 2023	Mar. 02, 2023	Jan. 04, 2024	Radiation (03CH08-KS)
SHF-EHF Horn	Com-power	AH-840	101070	18GHz~40GHz	Jan. 08, 2023	Mar. 02, 2023	Jan. 07, 2024	Radiation (03CH08-KS)
Amplifier	SONOMA	310N	413741	9KHz~1GHz	Jan. 05, 2023	Mar. 02, 2023	Jan. 04, 2024	Radiation (03CH08-KS)
Amplifier	EM	EM01G18GA	060834	1Ghz~18Ghz	Oct. 12, 2022	Mar. 02, 2023	Oct. 11, 2023	Radiation (03CH08-KS)
Amplifier	MITEQ	EM18G40GGA	060728	18~40GHz	Jan. 05, 2023	Mar. 02, 2023	Jan. 04, 2024	Radiation (03CH08-KS)
AC Power Source	Chroma	61601	616010002473	N/A	NCR	Mar. 02, 2023	NCR	Radiation (03CH08-KS)
Turn Table	EM	EM 1000-T	N/A	0~360 degree	NCR	Mar. 02, 2023	NCR	Radiation (03CH08-KS)
Antenna Mast	EM	EM 1000-A	N/A	1 m~4 m	NCR	Mar. 02, 2023	NCR	Radiation (03CH08-KS)
6db attenuator	TOJOIN	SMA(JK)	EMC01	2W/DC-18G	Jan. 10, 2023	Mar. 02, 2023	Jan. 09, 2024	Radiation (03CH08-KS)
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz;	May 24, 2022	Mar. 07, 2023	May 23, 2023	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060103	9kHz~30MHz	Oct. 13, 2022	Mar. 07, 2023	Oct. 12, 2023	Conduction (CO01-KS)
AC LISN	R&S	ENV216	100334	9kHz~30MHz	Oct. 13, 2022	Mar. 07, 2023	Oct. 12, 2023	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP000000811	AC 0V~300V, 45Hz~1000Hz	Oct. 12, 2022	Mar. 07, 2023	Oct. 11, 2023	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 Measurement

Test Item	Uncertainty
Conducted Power	± 0.46 dB
Conducted Emissions	± 0.48 dB
Occupied Channel Bandwidth	± 0.1 %
Conducted Power Spectral Density	± 0.40 dB

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.78dB
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Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	5.0dB
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Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	5.0dB
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Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

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



Appendix A. Conducted Test Results

A1. Conducted Test Results

Test Engineer:	Jiang Jun	Temperature:	21~25	°C
Test Date:	2023.2.13	Relative Humidity:	51~54	%

TEST RESULTS DATA
Peak Output Power

2.4GHz Band Single Antenna																
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak Conducted Power (dBm)			Conducted Power Limit (dBm)		DG (dBi)		EIRP Power (dBm)		EIRP Power Limit (dBm)		Pass /Fail
					Ant1	Ant2	SUM	Ant1	Ant2	Ant1	Ant2	Ant1	Ant2	Ant1	Ant2	
11b	1Mbps	1	1	2412	17.30	17.63		30.00	30.00	1.50	2.50	18.80	20.13	36.00	36.00	Pass
11b	1Mbps	1	6	2437	16.78	17.04		30.00	30.00	1.50	2.50	18.28	19.54	36.00	36.00	Pass
11b	1Mbps	1	11	2462	16.66	16.96		30.00	30.00	1.50	2.50	18.16	19.46	36.00	36.00	Pass
11b	1Mbps	1	12	2467	16.21	16.42		30.00	30.00	1.50	2.50	17.71	18.92	36.00	36.00	Pass
11b	1Mbps	1	13	2472	14.67	17.09		30.00	30.00	1.50	2.50	16.17	19.59	36.00	36.00	Pass
11g	6Mbps	1	1	2412	23.75	24.84		30.00	30.00	1.50	2.50	25.25	27.34	36.00	36.00	Pass
11g	6Mbps	1	6	2437	24.35	24.41		30.00	30.00	1.50	2.50	25.85	26.91	36.00	36.00	Pass
11g	6Mbps	1	11	2462	24.01	23.85		30.00	30.00	1.50	2.50	25.51	26.35	36.00	36.00	Pass
11g	6Mbps	1	12	2467	20.10	21.02		30.00	30.00	1.50	2.50	21.60	23.52	36.00	36.00	Pass
11g	6Mbps	1	13	2472	18.28	19.51		30.00	30.00	1.50	2.50	19.78	22.01	36.00	36.00	Pass
HT20	MCS0	1	1	2412	24.00	24.56		30.00	30.00	1.50	2.50	25.50	27.06	36.00	36.00	Pass
HT20	MCS0	1	6	2437	24.43	24.36		30.00	30.00	1.50	2.50	25.93	26.86	36.00	36.00	Pass
HT20	MCS0	1	11	2462	23.87	23.19		30.00	30.00	1.50	2.50	25.37	25.69	36.00	36.00	Pass
HT20	MCS0	1	12	2467	22.02	22.03		30.00	30.00	1.50	2.50	23.52	24.53	36.00	36.00	Pass
HT20	MCS0	1	13	2472	17.42	19.84		30.00	30.00	1.50	2.50	18.92	22.34	36.00	36.00	Pass

TEST RESULTS DATA
Average Output Power

2.4GHz Band Single Antenna																
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power with duty factor (dBm)			Conducted Power Limit (dBm)		DG (dBi)		EIRP Power (dBm)		EIRP Power Limit (dBm)		Pass /Fail
					Ant1	Ant2	SUM	Ant1	Ant2	Ant1	Ant2	Ant1	Ant2	Ant1	Ant2	
11b	1Mbps	1	1	2412	14.92	15.19		30.00	30.00	1.50	2.50	16.42	17.69	36.00	36.00	Pass
11b	1Mbps	1	6	2437	14.29	14.67		30.00	30.00	1.50	2.50	15.79	17.17	36.00	36.00	Pass
11b	1Mbps	1	11	2462	14.34	14.52		30.00	30.00	1.50	2.50	15.84	17.02	36.00	36.00	Pass
11b	1Mbps	1	12	2467	13.48	14.03		30.00	30.00	1.50	2.50	14.98	16.53	36.00	36.00	Pass
11b	1Mbps	1	13	2472	12.13	14.69		30.00	30.00	1.50	2.50	13.63	17.19	36.00	36.00	Pass
11g	6Mbps	1	1	2412	13.52	15.23		30.00	30.00	1.50	2.50	15.02	17.73	36.00	36.00	Pass
11g	6Mbps	1	6	2437	13.99	14.67		30.00	30.00	1.50	2.50	15.49	17.17	36.00	36.00	Pass
11g	6Mbps	1	11	2462	13.88	14.59		30.00	30.00	1.50	2.50	15.38	17.09	36.00	36.00	Pass
11g	6Mbps	1	12	2467	9.70	10.98		30.00	30.00	1.50	2.50	11.20	13.48	36.00	36.00	Pass
11g	6Mbps	1	13	2472	7.48	8.60		30.00	30.00	1.50	2.50	8.98	11.10	36.00	36.00	Pass
HT20	MCS0	1	1	2412	12.77	13.88		30.00	30.00	1.50	2.50	14.27	16.38	36.00	36.00	Pass
HT20	MCS0	1	6	2437	14.23	14.56		30.00	30.00	1.50	2.50	15.73	17.06	36.00	36.00	Pass
HT20	MCS0	1	11	2462	12.88	13.27	30.00	30.00	1.50	2.50	14.38	15.77	36.00	36.00	Pass	
HT20	MCS0	1	12	2467	10.44	10.89	30.00	30.00	1.50	2.50	11.94	13.39	36.00	36.00	Pass	
HT20	MCS0	1	13	2472	5.47	7.63	30.00	30.00	1.50	2.50	6.97	10.13	36.00	36.00	Pass	

Setting		Restriction
Ant 1	Ant 2	
16.00	16.00	Target
16.00	16.00	Target
16.00	16.00	Target
15.00	15.00	Target
14.00	16.00	Target
15.50	16.00	Target
16.00	16.00	Target
16.00	16.00	Target
11.00	12.50	Target
9.00	10.00	Target
14.00	15.00	Target
16.00	16.00	Target
15.00	15.50	Target
12.00	12.00	Target
7.00	9.00	Target

Note: Measured power (dBm) has offset with cable loss.



Case No. : <u>FR2N0304-01C</u>
Ambient Condition: <u>25</u> °C, <u>45</u> %RH
According Standard: <u>■Part15C</u>
Test Date: <u>2023.2.13</u> Test Engineer: <u>Jiang Jun</u>

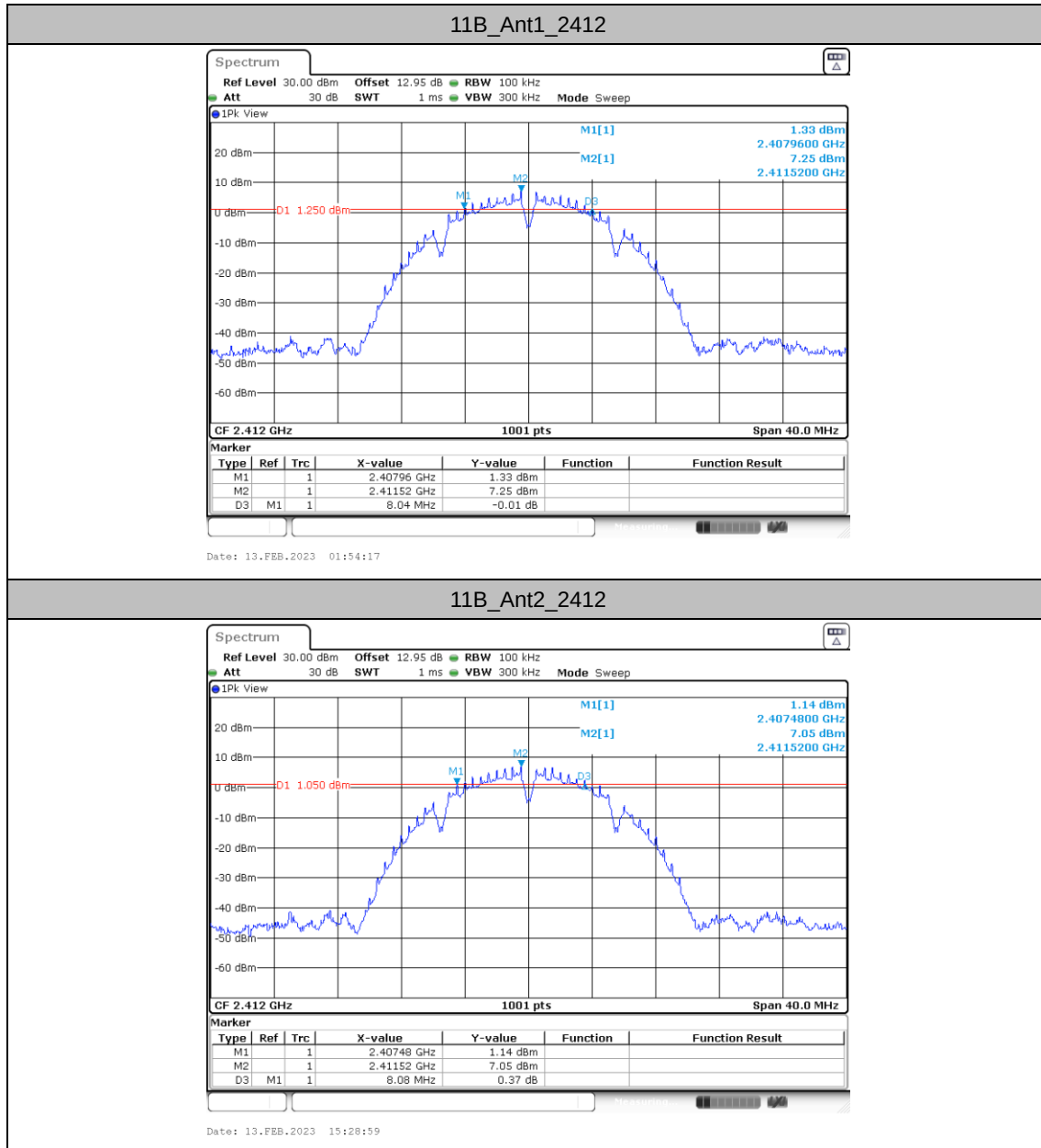
DTS Bandwidth

Test Result

TestMode	Antenna	Freq(MHz)	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	8.04	2407.96	2416.00	0.5	PASS
	Ant2	2412	8.08	2407.48	2415.56	0.5	PASS
	Ant1	2437	7.60	2433.44	2441.04	0.5	PASS
	Ant2	2437	8.52	2433.00	2441.52	0.5	PASS
	Ant1	2462	7.60	2457.96	2465.56	0.5	PASS
	Ant2	2462	8.08	2457.96	2466.04	0.5	PASS
	Ant1	2467	8.04	2463.00	2471.04	0.5	PASS
	Ant2	2467	8.00	2463.00	2471.00	0.5	PASS
	Ant1	2472	8.04	2468.00	2476.04	0.5	PASS
	Ant2	2472	8.04	2468.00	2476.04	0.5	PASS
11G	Ant1	2412	15.08	2404.44	2419.52	0.5	PASS
	Ant2	2412	15.48	2404.08	2419.56	0.5	PASS
	Ant1	2437	14.84	2429.44	2444.28	0.5	PASS
	Ant2	2437	15.08	2429.48	2444.56	0.5	PASS
	Ant1	2462	15.12	2454.44	2469.56	0.5	PASS
	Ant2	2462	16.04	2453.84	2469.88	0.5	PASS
	Ant1	2467	15.48	2459.08	2474.56	0.5	PASS
	Ant2	2467	15.48	2459.08	2474.56	0.5	PASS
	Ant1	2472	15.12	2464.44	2479.56	0.5	PASS
	Ant2	2472	15.08	2464.48	2479.56	0.5	PASS
11N20SISO	Ant1	2412	15.08	2404.48	2419.56	0.5	PASS
	Ant2	2412	15.88	2403.60	2419.48	0.5	PASS
	Ant1	2437	14.08	2430.48	2444.56	0.5	PASS
	Ant2	2437	15.44	2429.44	2444.88	0.5	PASS
	Ant1	2462	15.12	2454.44	2469.56	0.5	PASS
	Ant2	2462	16.64	2453.48	2470.12	0.5	PASS
	Ant1	2467	15.12	2459.44	2474.56	0.5	PASS
	Ant2	2467	15.12	2459.44	2474.56	0.5	PASS
	Ant1	2472	16.08	2463.48	2479.56	0.5	PASS
	Ant2	2472	16.12	2464.24	2480.36	0.5	PASS

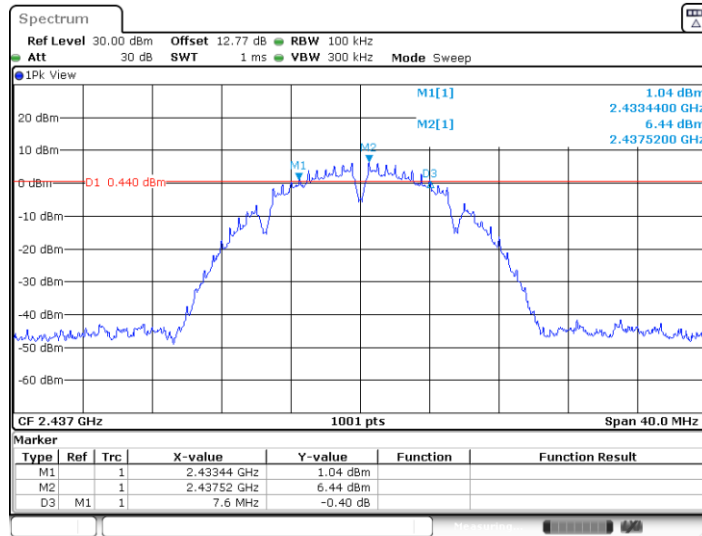


Test Graphs



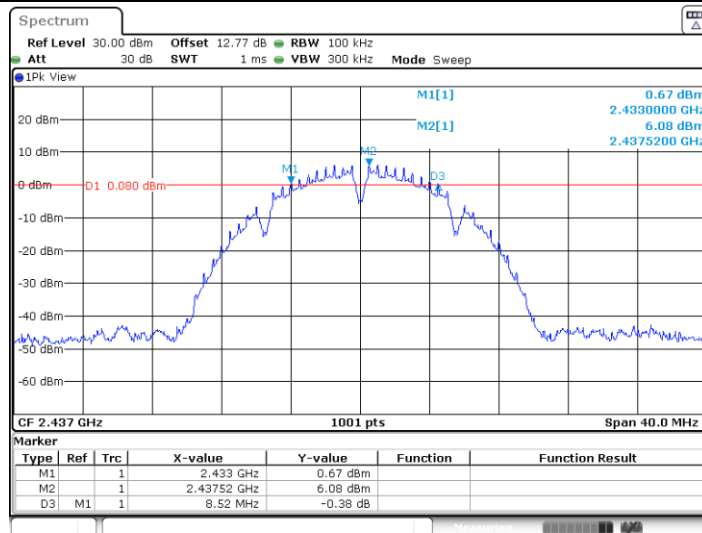


11B_Ant1_2437



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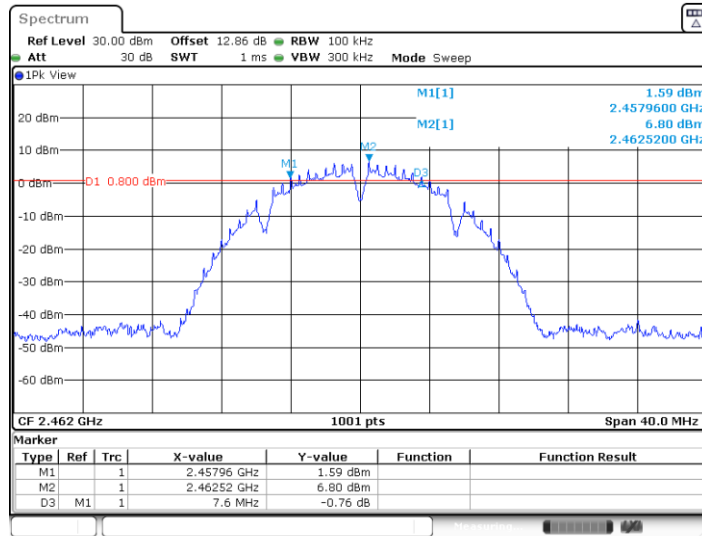
11B_Ant2_2437



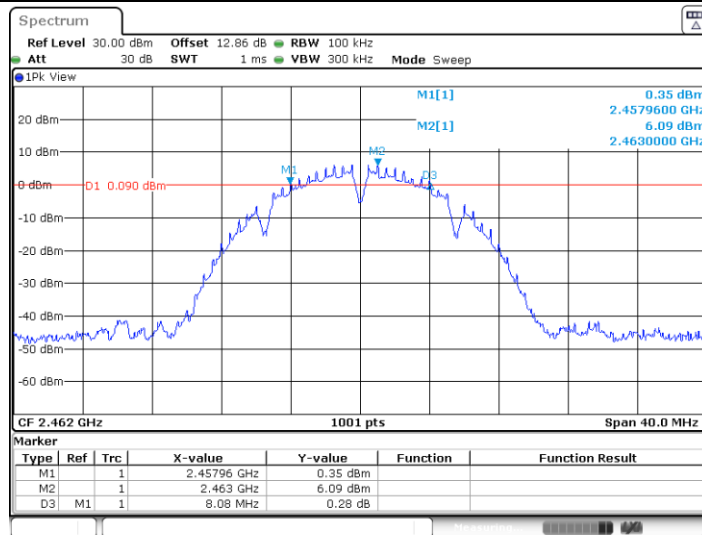
Date: 13.FEB.2023 15:30:45



11B_Ant1_2462

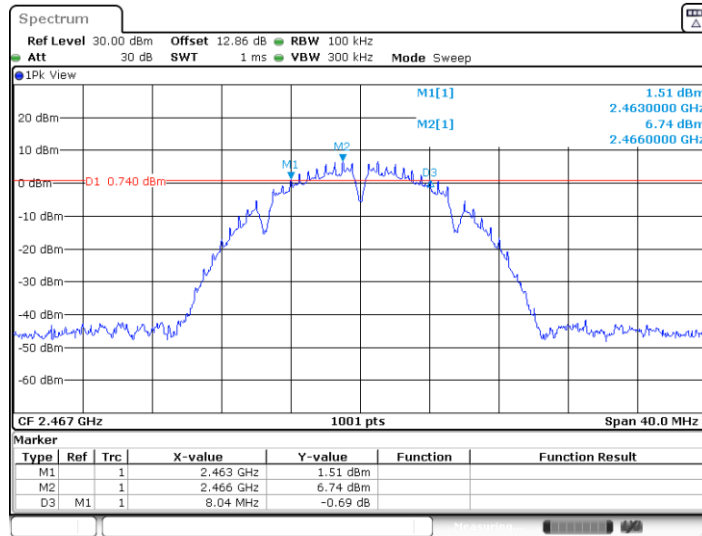


11B_Ant2_2462



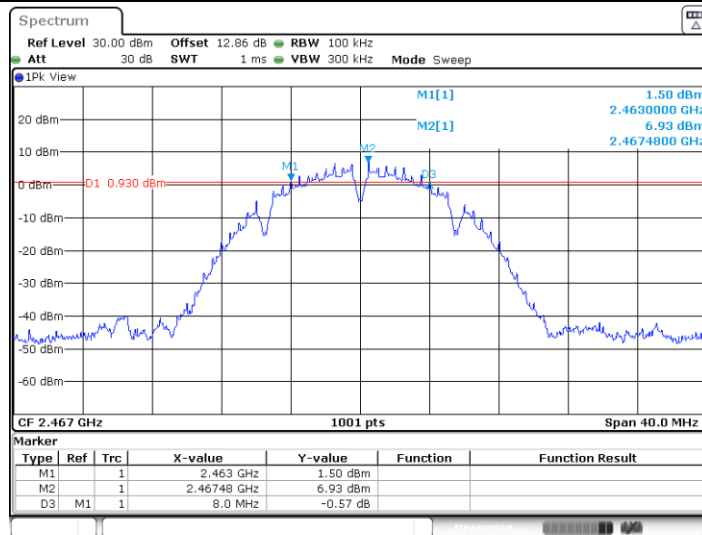


11B_Ant1_2467



Date: 13.FEB.2023 02:08:29

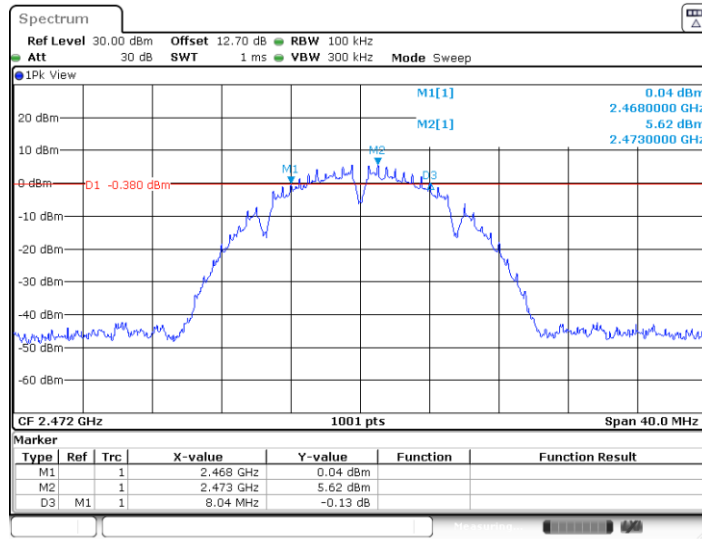
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Date: 13.FEB.2023 15:34:08

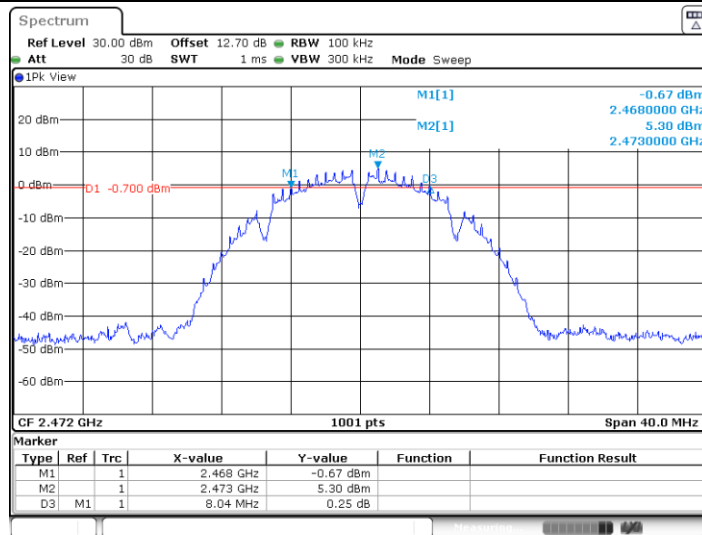


11B_Ant1_2472



Date: 13.FEB.2023 14:30:12

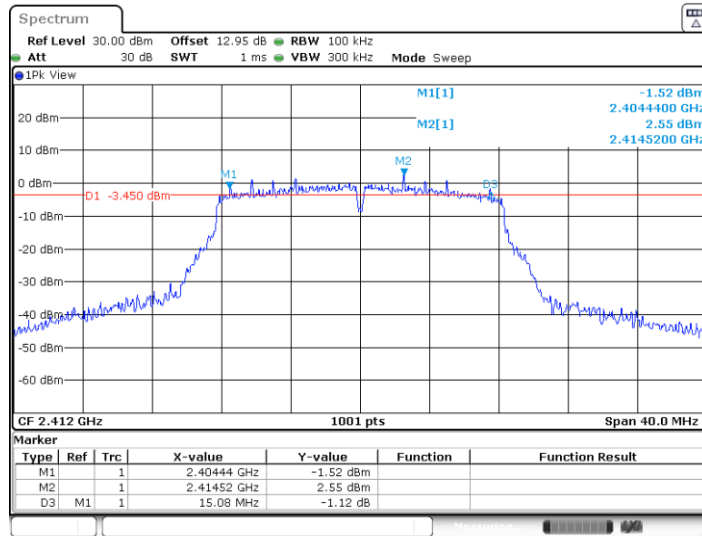
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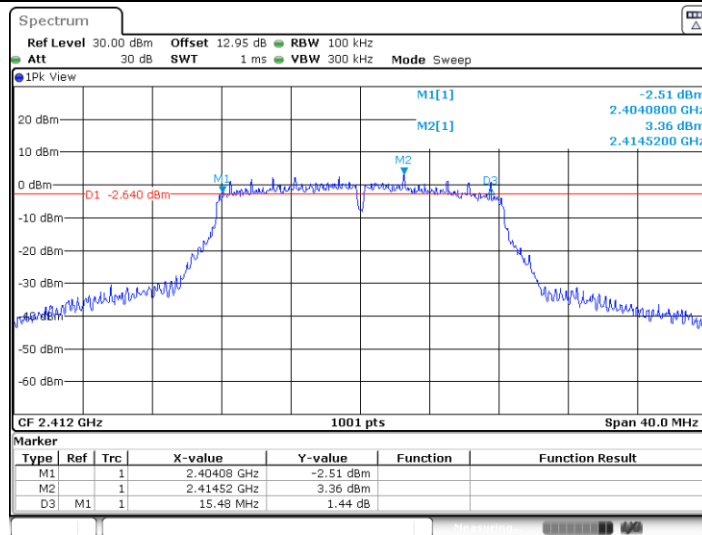


11G_Ant1_2412



Date: 13.FEB.2023 14:51:25

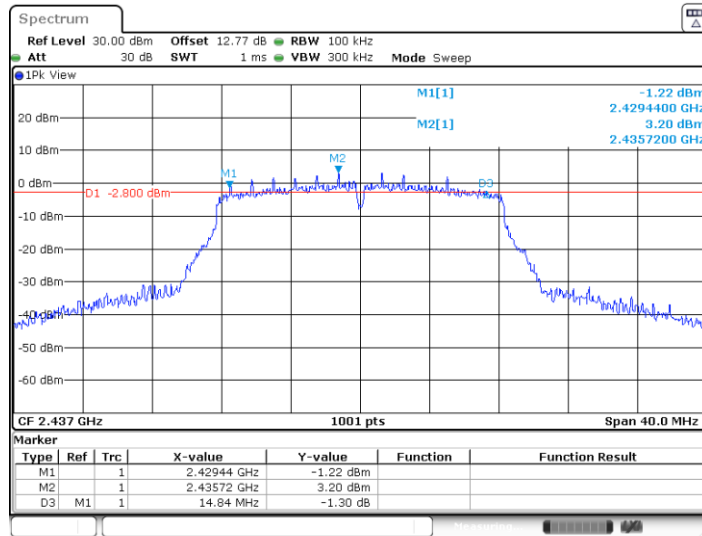
11G_Ant2_2412



Date: 13.FEB.2023 15:47:05

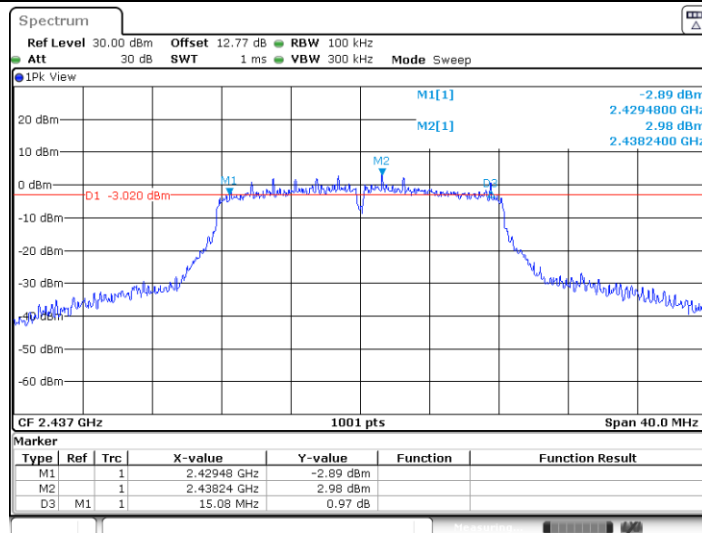


11G_Ant1_2437



Date: 13.FEB.2023 14:57:35

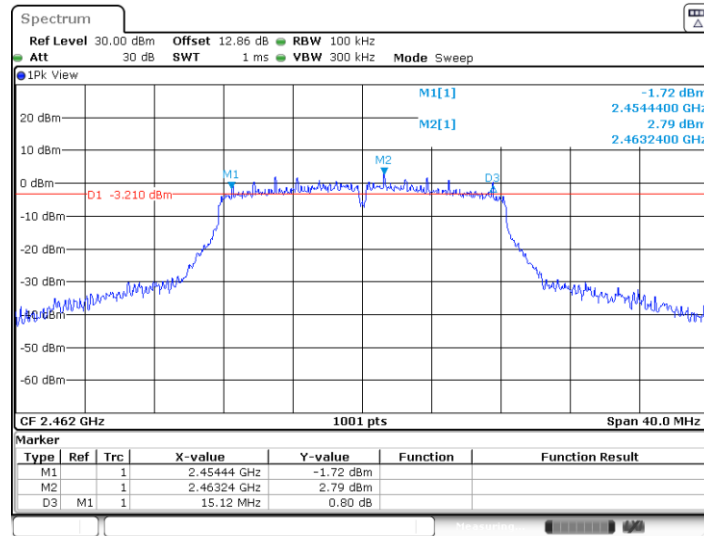
11G_Ant2_2437



Date: 13.FEB.2023 15:49:27

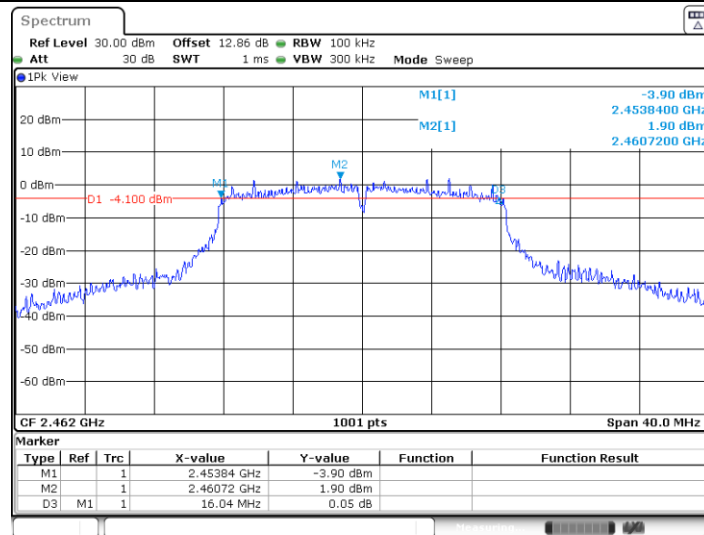


11G_Ant1_2462



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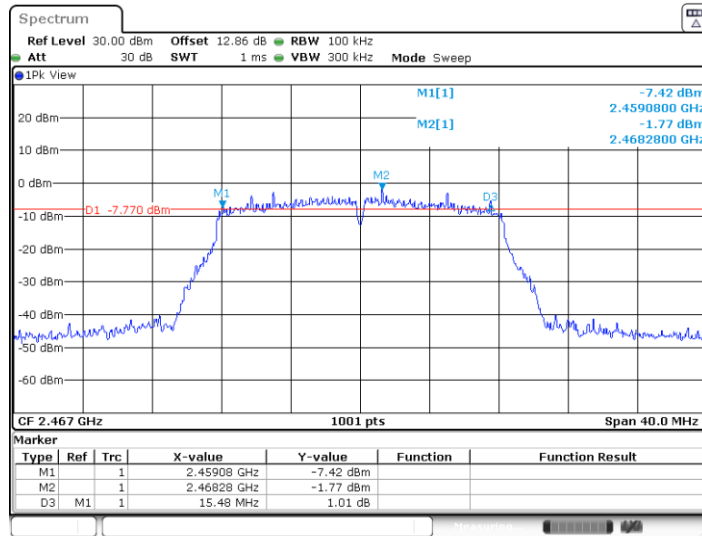
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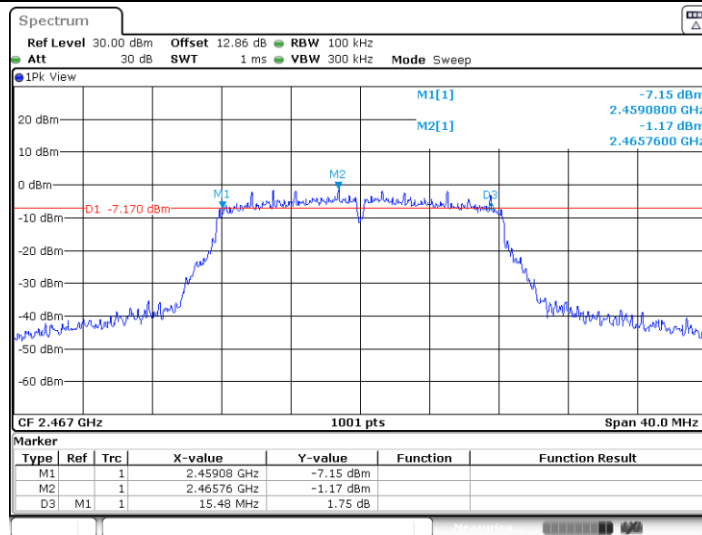


11G_Ant1_2467



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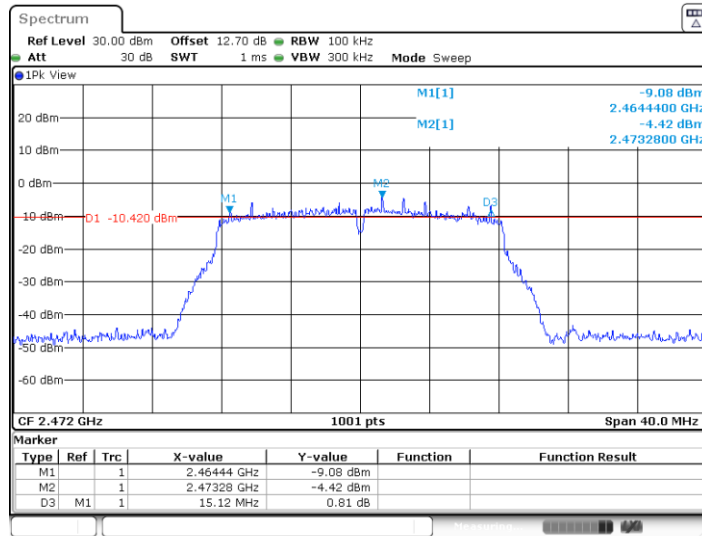
11G_Ant2_2467



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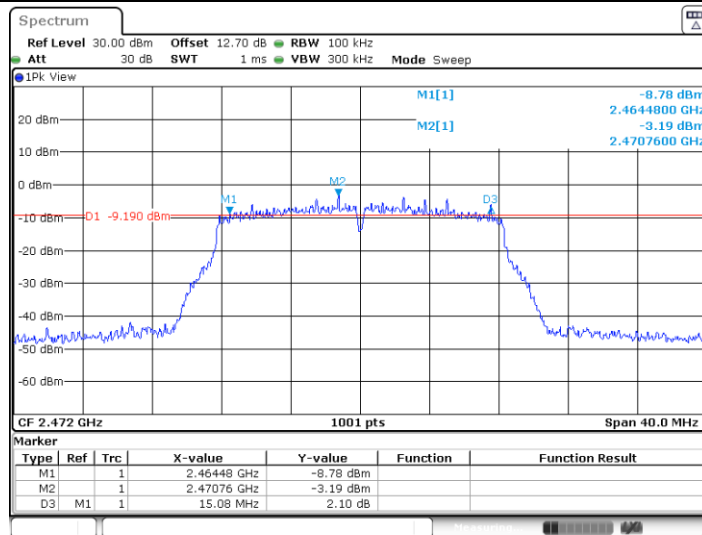


11G_Ant1_2472



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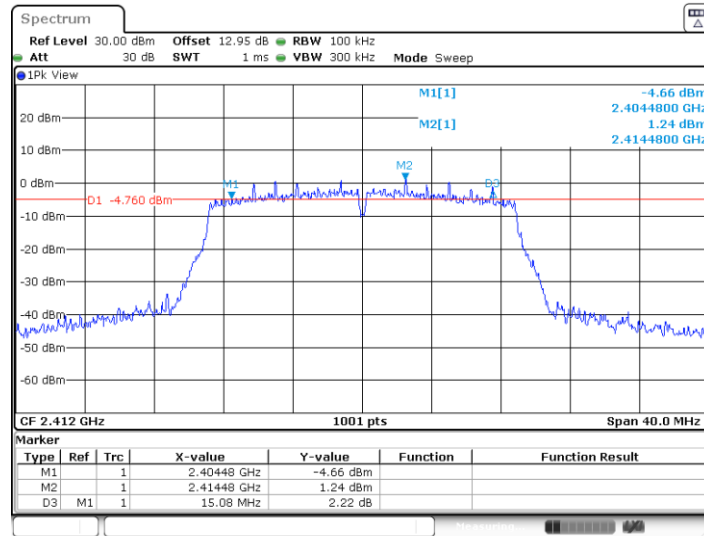
11G_Ant2_2472



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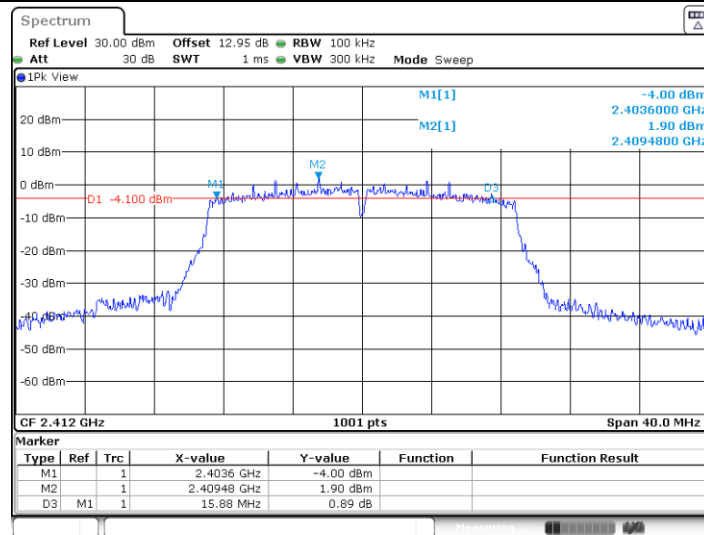


11N20SISO_Ant1_2412



Date: 13.FEB.2023 15:15:47

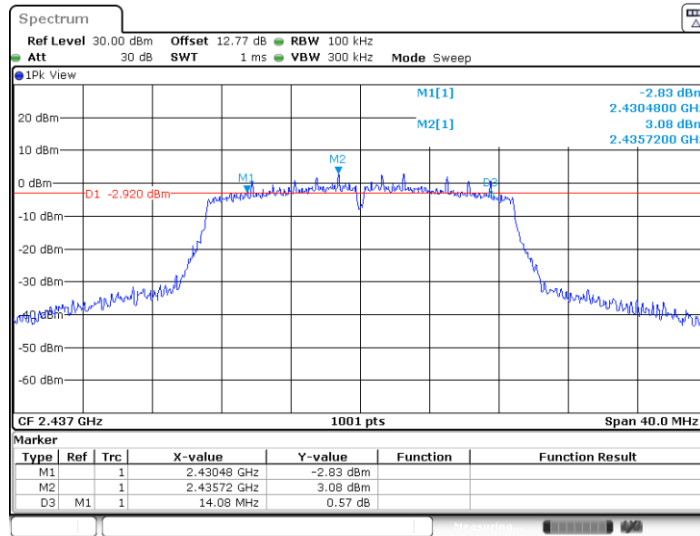
11N20SISO_Ant2_2412



Date: 13.FEB.2023 16:04:54

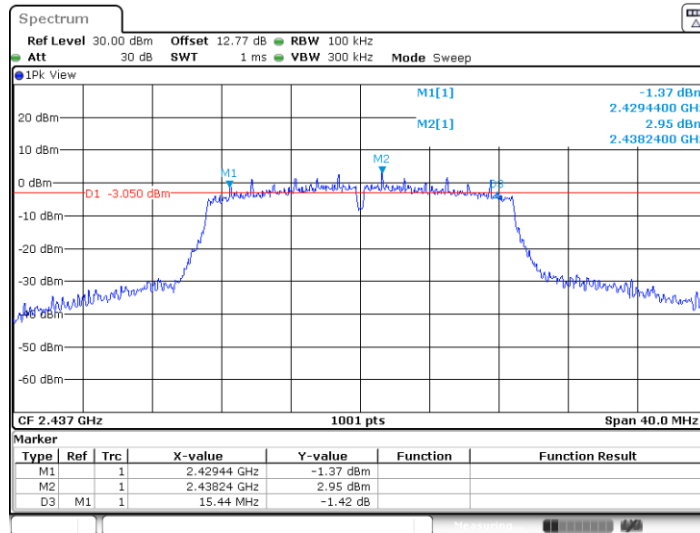


11N20SISO_Ant1_2437



Date: 13.FEB.2023 15:18:32

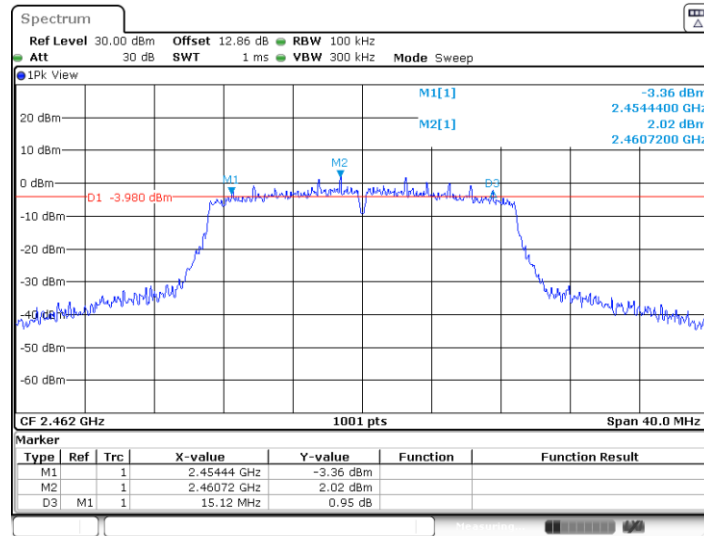
11N20SISO_Ant2_2437



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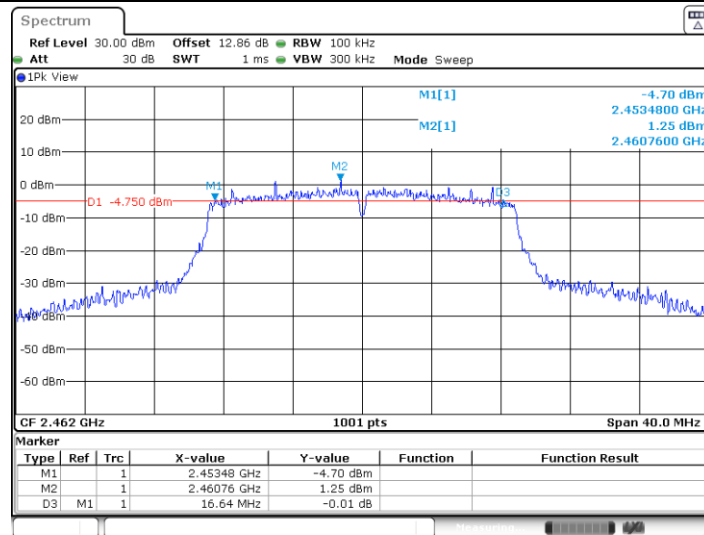


11N20SISO_Ant1_2462



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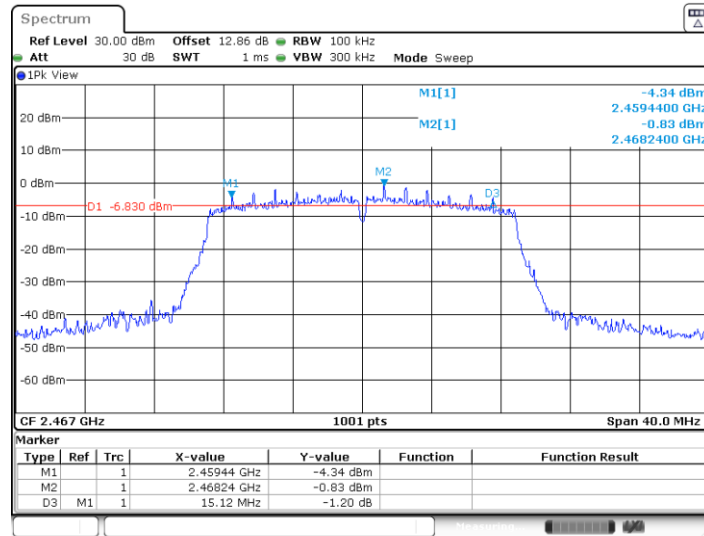
11N20SISO_Ant2_2462



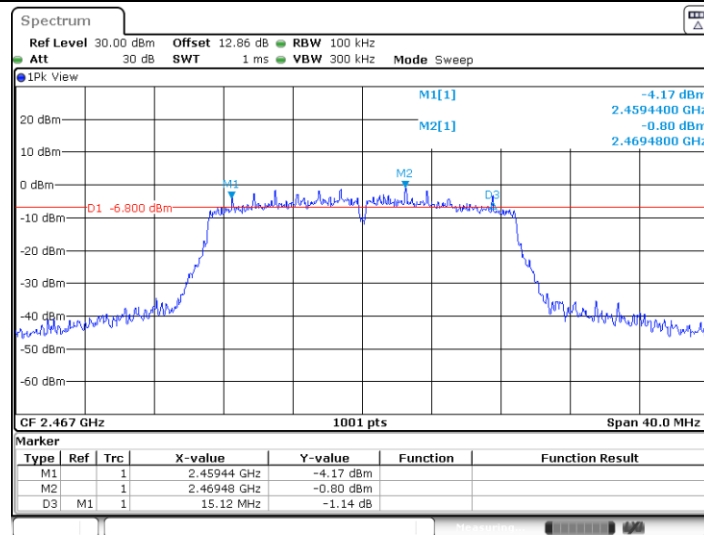
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11N20SISO_Ant1_2467

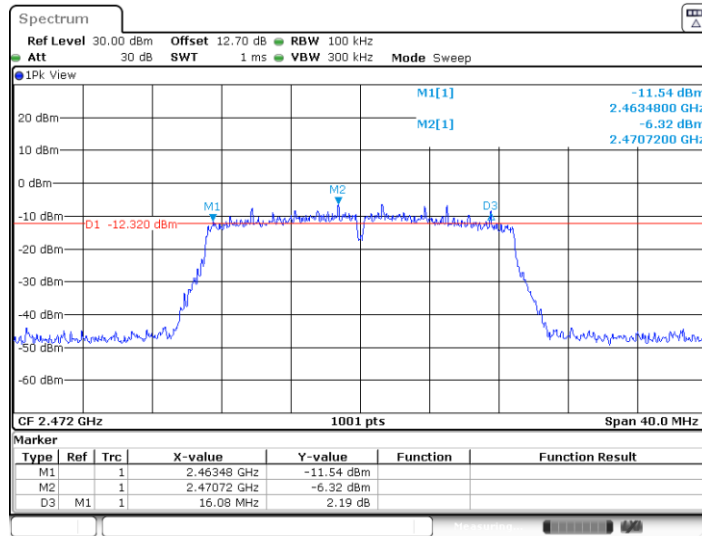


11N20SISO_Ant2_2467



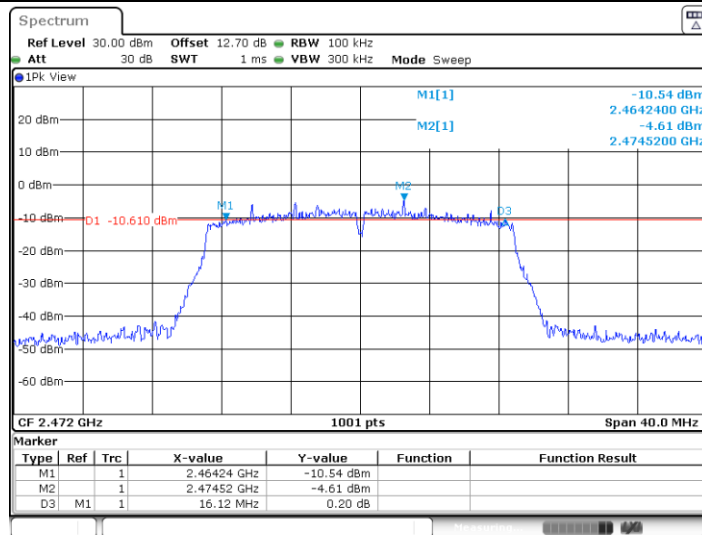


11N20SISO_Ant1_2472



Date: 13.FEB.2023 15:26:00

11N20SISO_Ant2_2472



Date: 13.FEB.2023 16:15:08



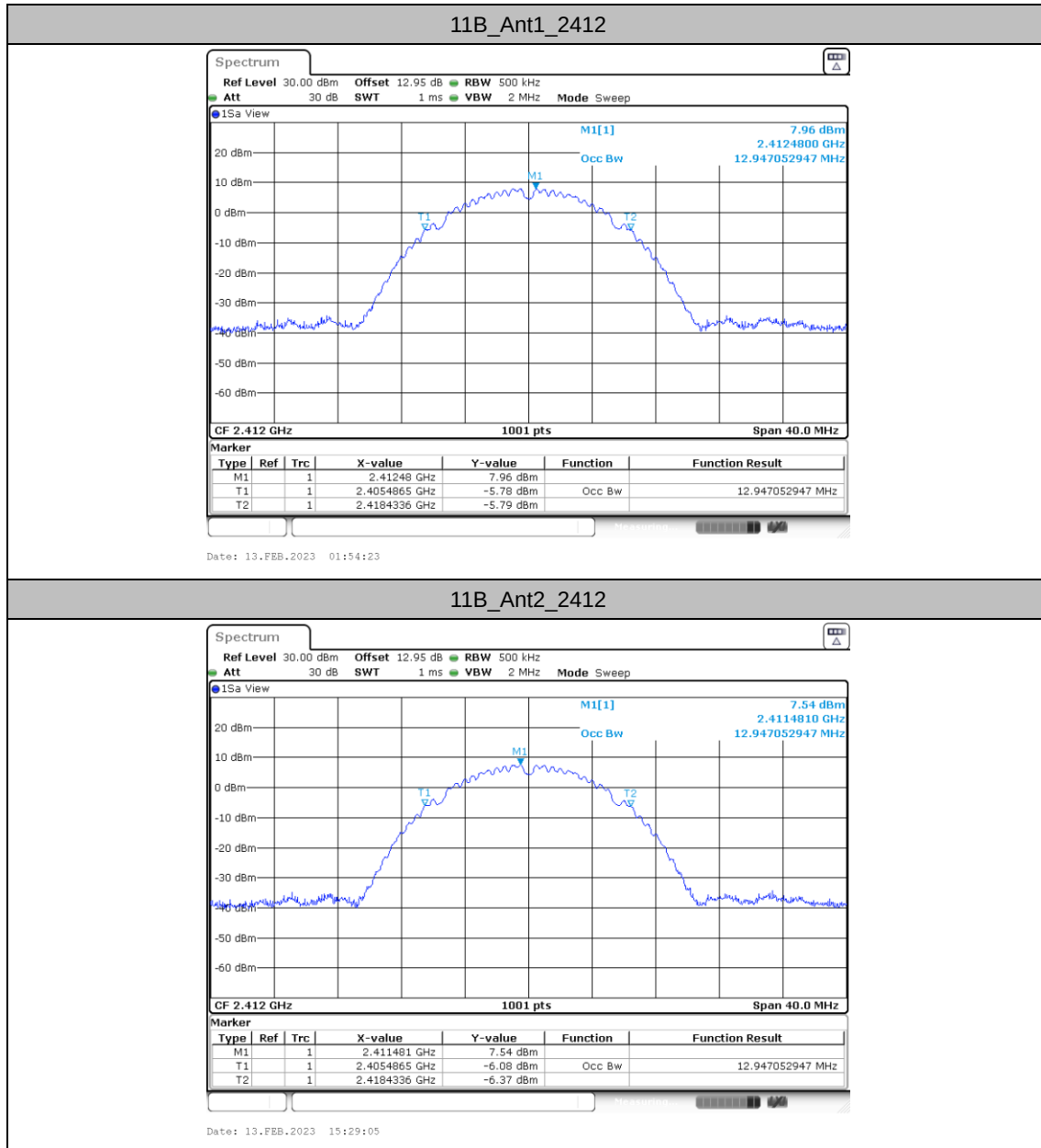
Occupied Channel Bandwidth

Test Result

TestMode	Antenna	Freq(MHz)	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	12.947	2405.4865	2418.4336	---	---
	Ant2	2412	12.947	2405.4865	2418.4336	---	---
	Ant1	2437	12.867	2430.6064	2443.4735	---	---
	Ant2	2437	12.787	2430.6464	2443.4336	---	---
	Ant1	2462	12.867	2455.5265	2468.3936	---	---
	Ant2	2462	12.787	2455.6064	2468.3936	---	---
	Ant1	2467	12.867	2460.5265	2473.3936	---	---
	Ant2	2467	12.787	2460.6064	2473.3936	---	---
	Ant1	2472	12.787	2465.6064	2478.3936	---	---
	Ant2	2472	12.747	2465.6464	2478.3936	---	---
11G	Ant1	2412	17.143	2403.3686	2420.5115	---	---
	Ant2	2412	17.143	2403.3686	2420.5115	---	---
	Ant1	2437	17.183	2428.4086	2445.5914	---	---
	Ant2	2437	17.303	2428.4086	2445.7113	---	---
	Ant1	2462	17.223	2453.3686	2470.5914	---	---
	Ant2	2462	17.423	2453.2887	2470.7113	---	---
	Ant1	2467	17.063	2458.4086	2475.4715	---	---
	Ant2	2467	17.183	2458.3686	2475.5514	---	---
	Ant1	2472	17.143	2463.3686	2480.5115	---	---
	Ant2	2472	17.143	2463.4086	2480.5514	---	---
11N20SISO	Ant1	2412	18.022	2403.0090	2421.0310	---	---
	Ant2	2412	18.142	2402.8891	2421.0310	---	---
	Ant1	2437	18.102	2427.9690	2446.0709	---	---
	Ant2	2437	18.182	2427.9291	2446.1109	---	---
	Ant1	2462	18.062	2452.9291	2470.9910	---	---
	Ant2	2462	18.182	2452.8891	2471.0709	---	---
	Ant1	2467	18.022	2457.9690	2475.9910	---	---
	Ant2	2467	18.102	2457.9291	2476.0310	---	---
	Ant1	2472	18.022	2462.9690	2480.9910	---	---
	Ant2	2472	18.022	2462.9690	2480.9910	---	---

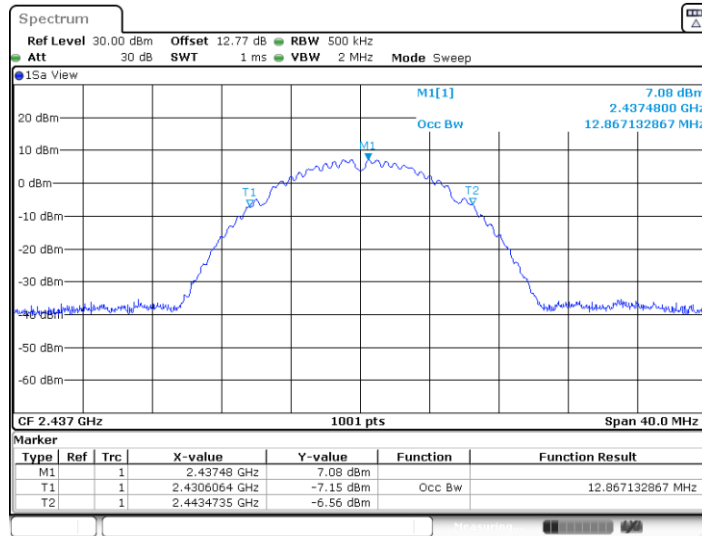


Test Graphs



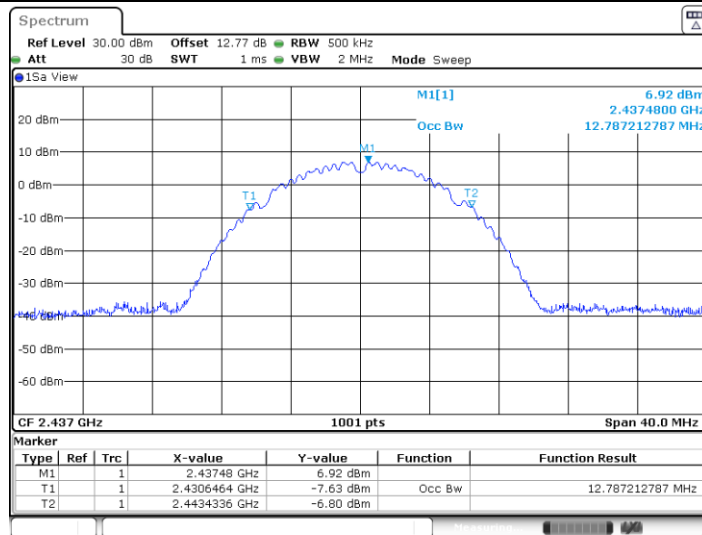


11B_Ant1_2437



Date: 13.FEB.2023 01:56:33

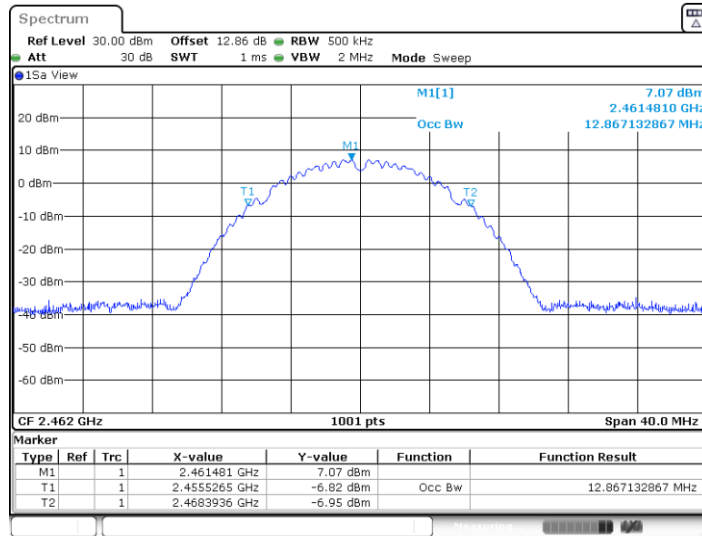
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Date: 13.FEB.2023 15:30:57

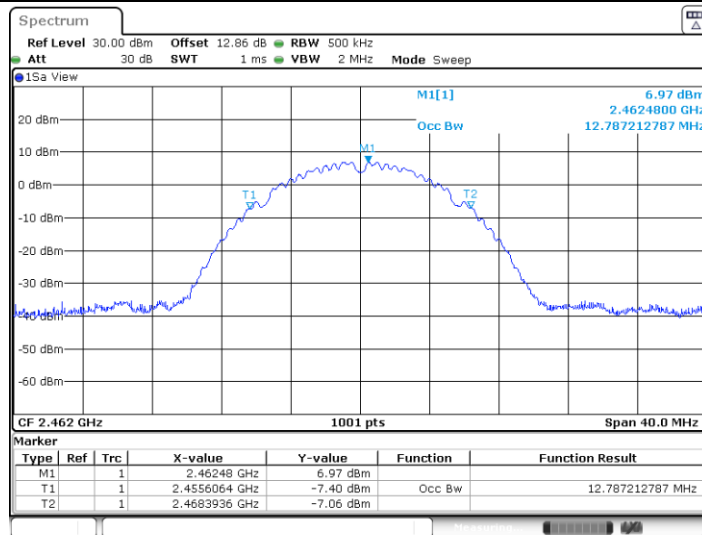


11B_Ant1_2462



Date: 13.FEB.2023 01:58:33

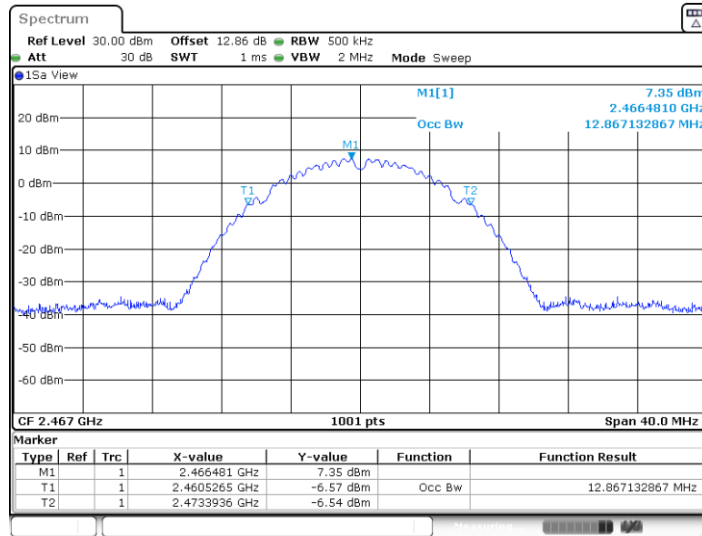
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Date: 13.FEB.2023 15:32:29

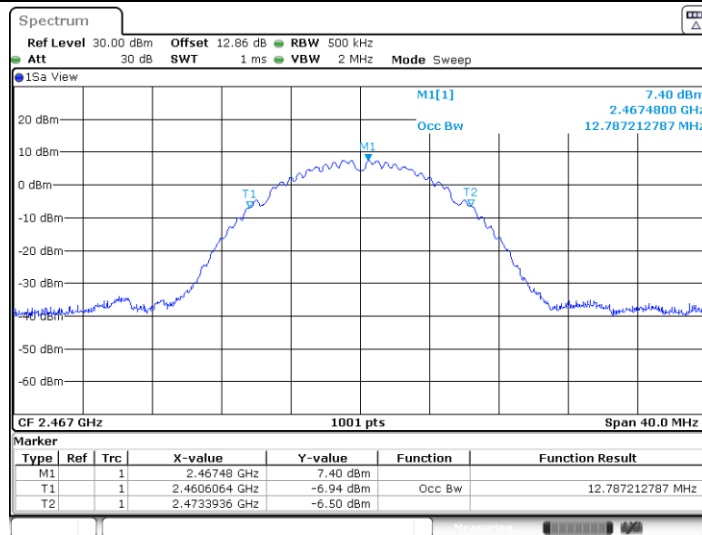


11B_Ant1_2467



Date: 13.FEB.2023 02:08:43

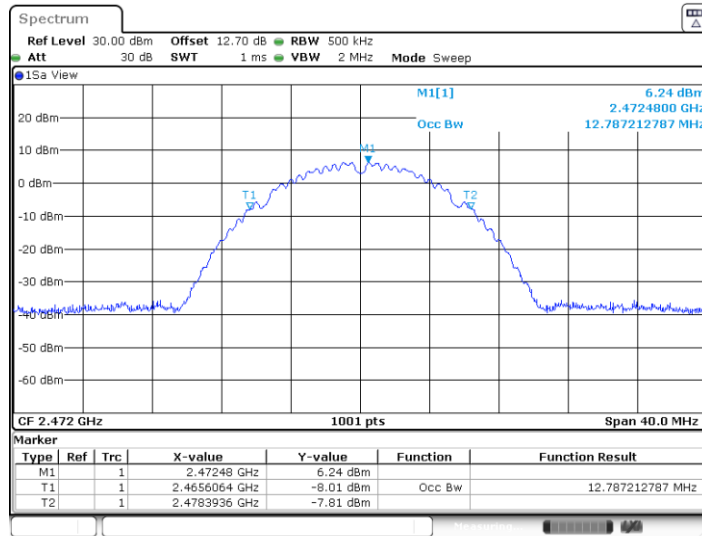
11B_Ant2_2467



Date: 13.FEB.2023 15:34:20

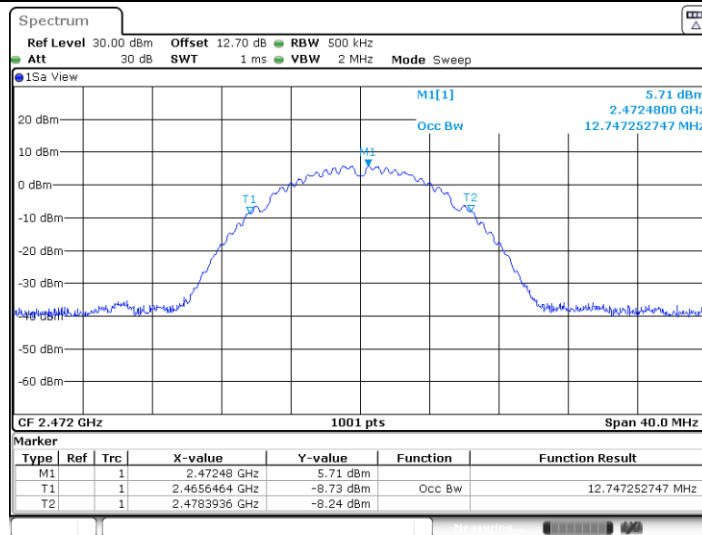


11B_Ant1_2472



Date: 13.FEB.2023 14:30:18

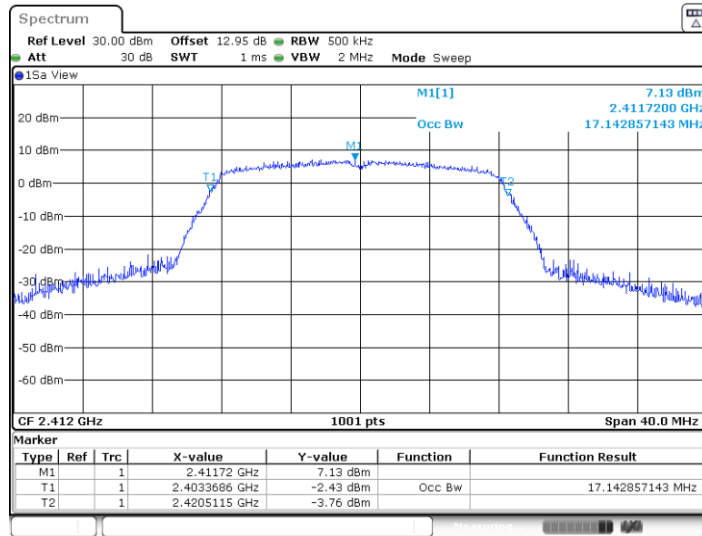
11B_Ant2_2472



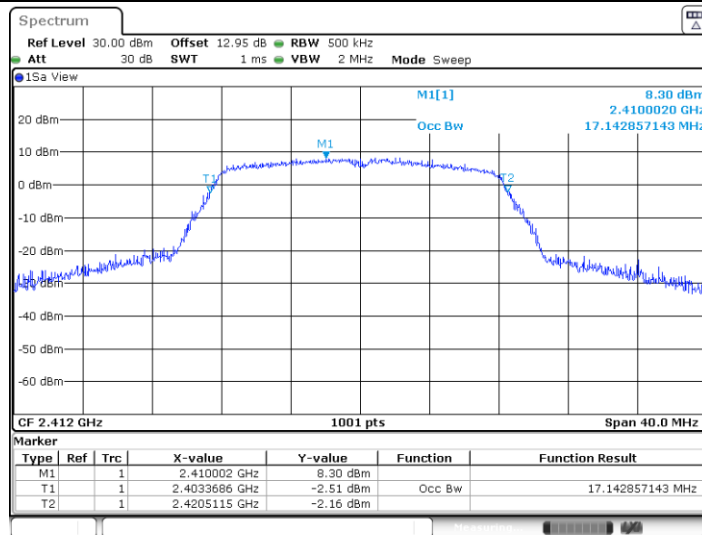
Date: 13.FEB.2023 15:36:48



11G_Ant1_2412

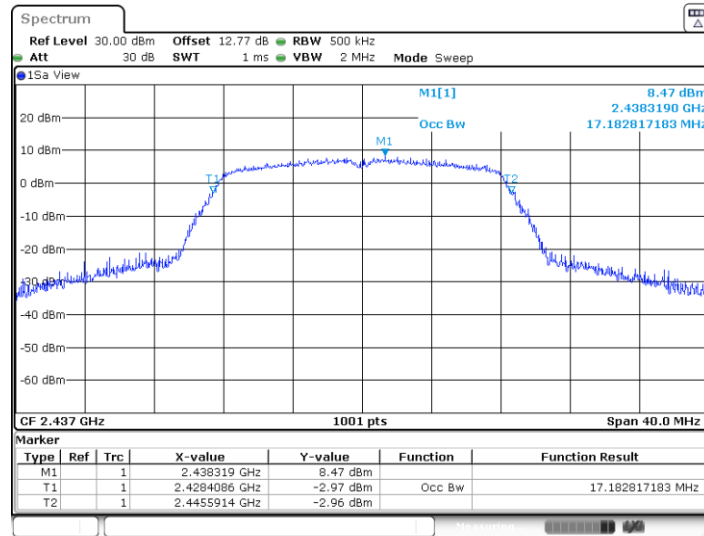


11G_Ant2_2412



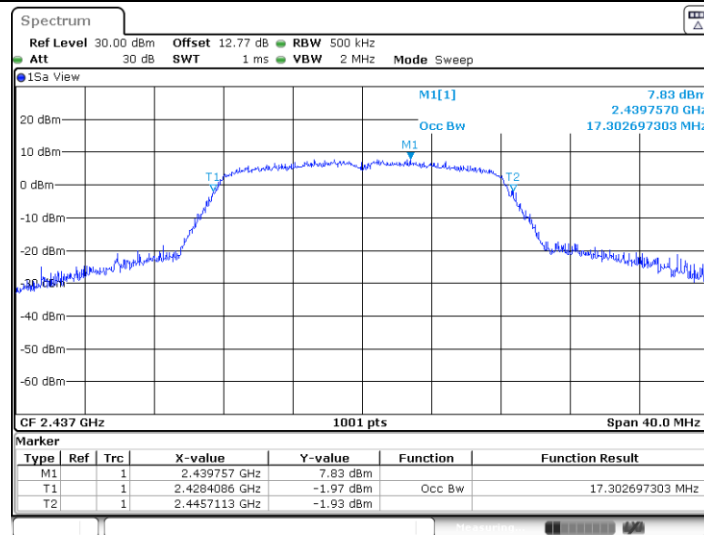


11G_Ant1_2437



Date: 13.FEB.2023 14:57:50

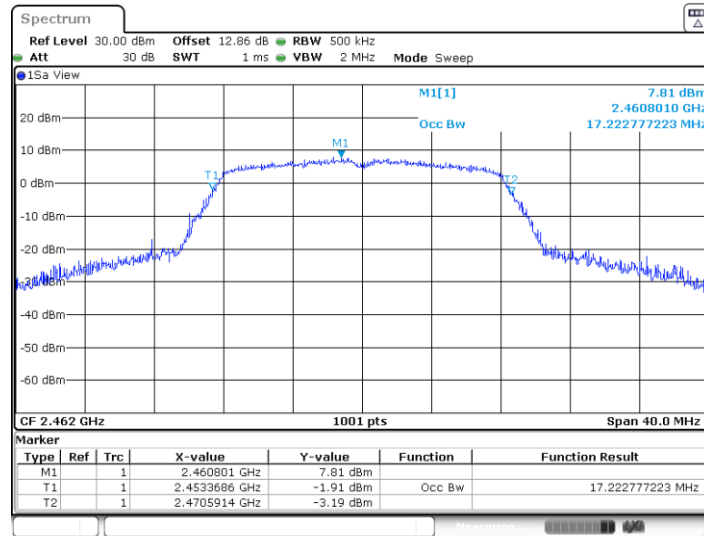
11G_Ant2_2437



Date: 13.FEB.2023 15:49:42

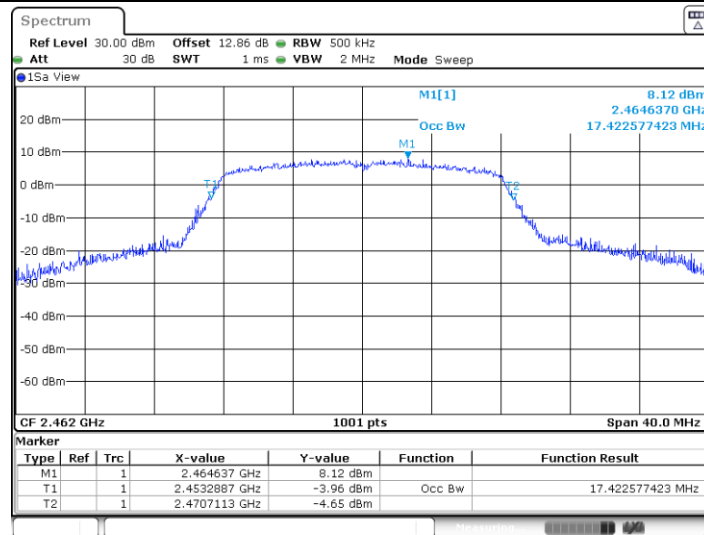


11G_Ant1_2462



Date: 13.FEB.2023 14:59:24

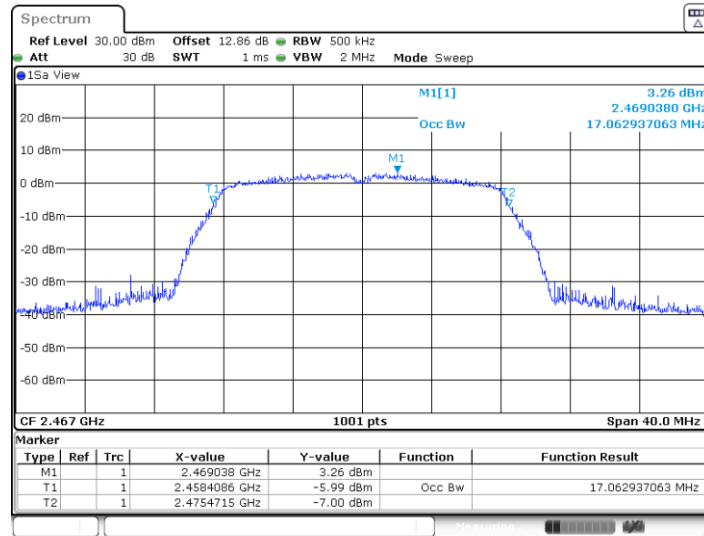
11G_Ant2_2462



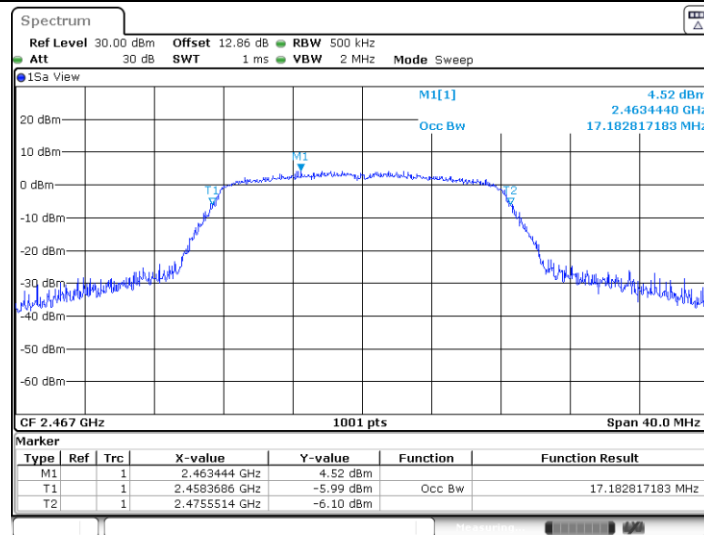
Date: 13.FEB.2023 15:51:54



11G_Ant1_2467

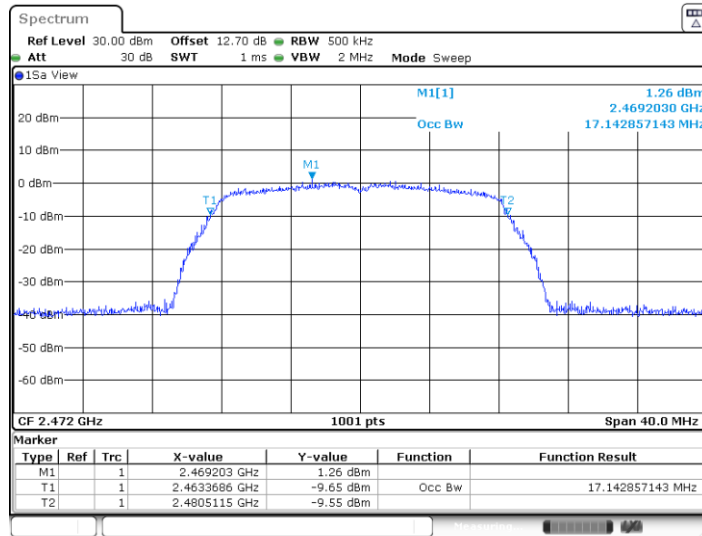


11G_Ant2_2467



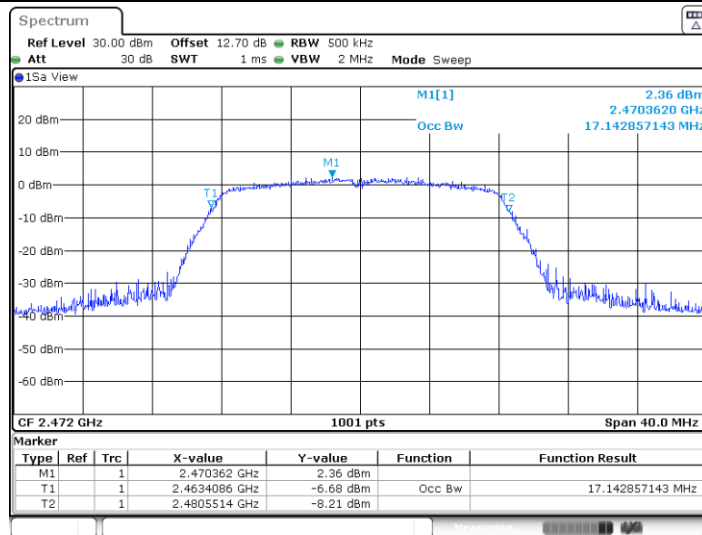


11G_Ant1_2472



Date: 13.FEB.2023 15:12:35

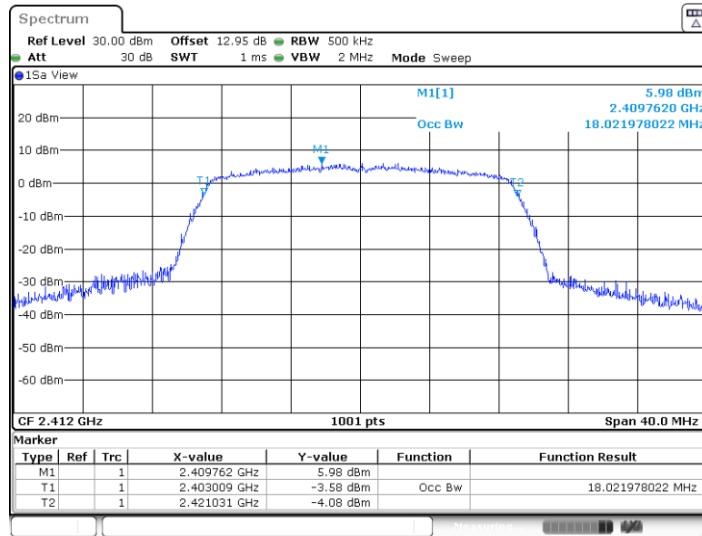
11G_Ant2_2472



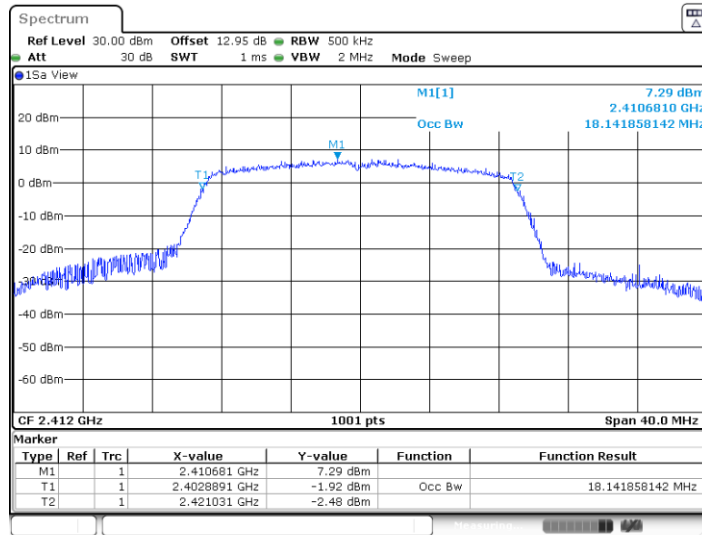
Date: 13.FEB.2023 16:02:20



11N20SISO_Ant1_2412

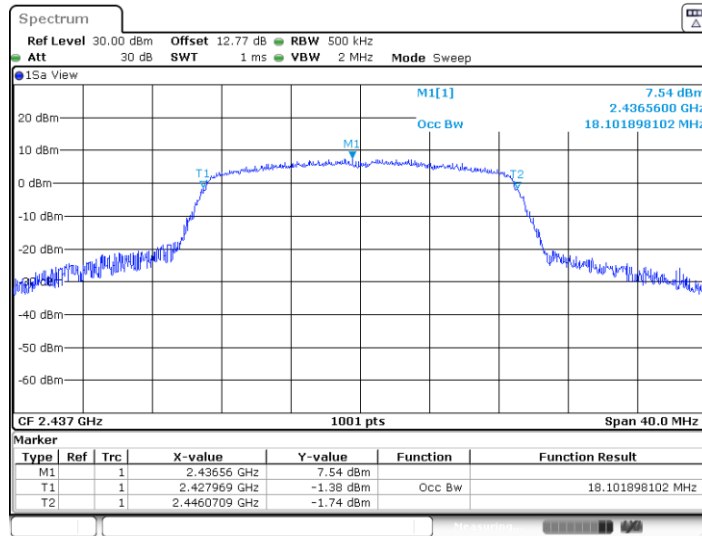


11N20SISO_Ant2_2412



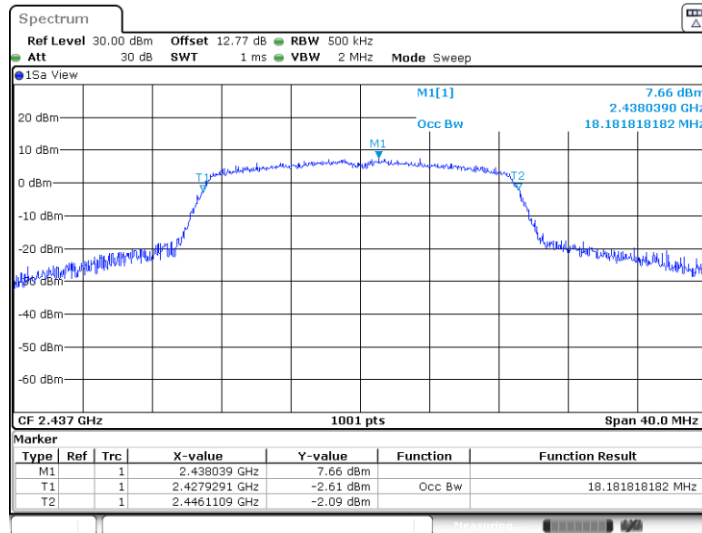


11N20SISO_Ant1_2437



Date: 13.FEB.2023 15:18:44

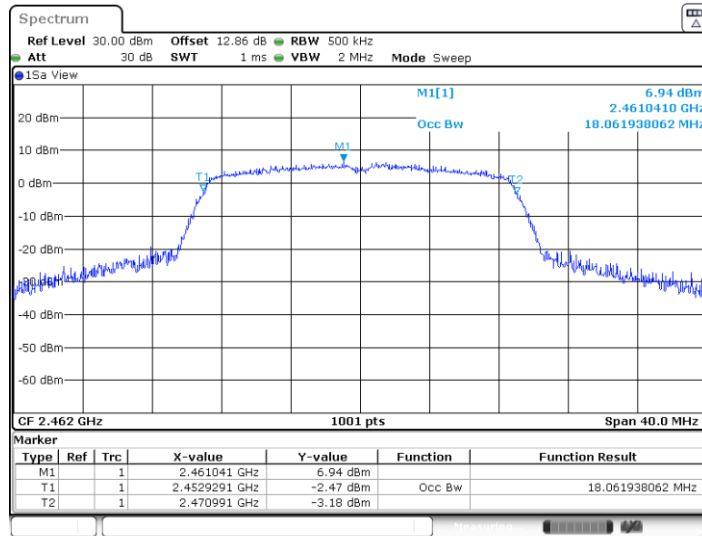
11N20SISO_Ant2_2437



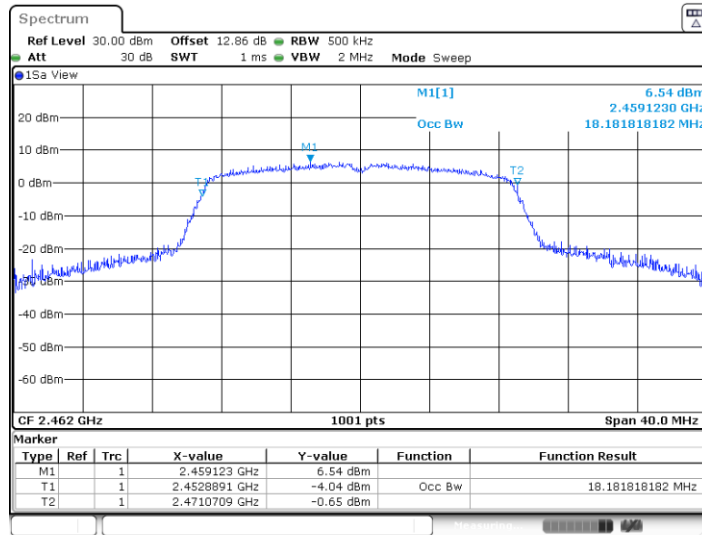
Date: 13.FEB.2023 16:08:25



11N20SISO_Ant1_2462

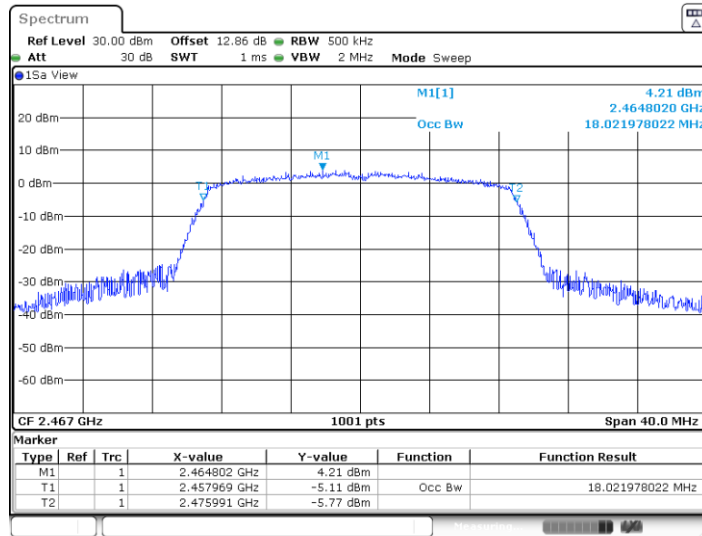


11N20SISO_Ant2_2462

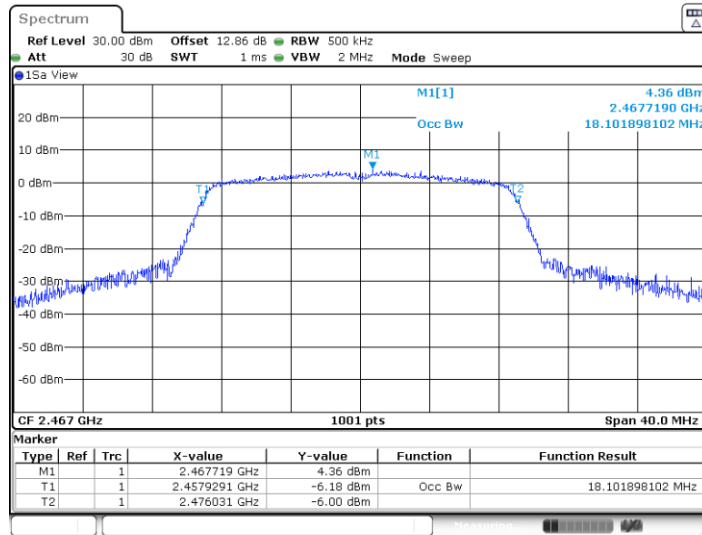




11N20SISO_Ant1_2467

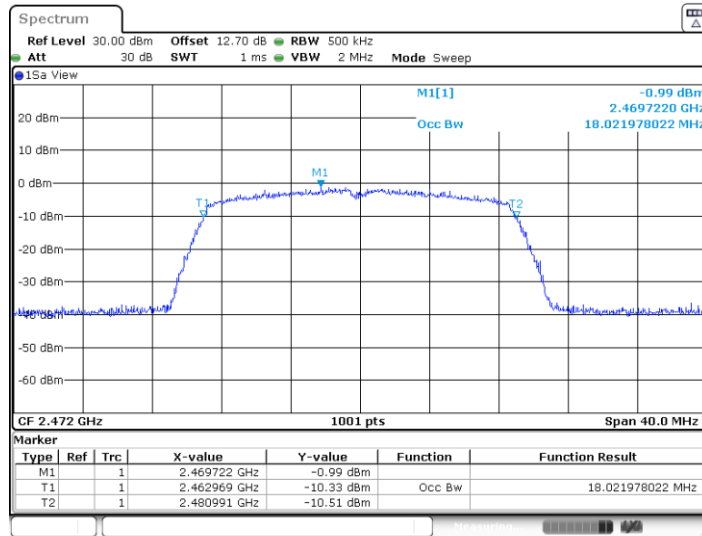


11N20SISO_Ant2_2467



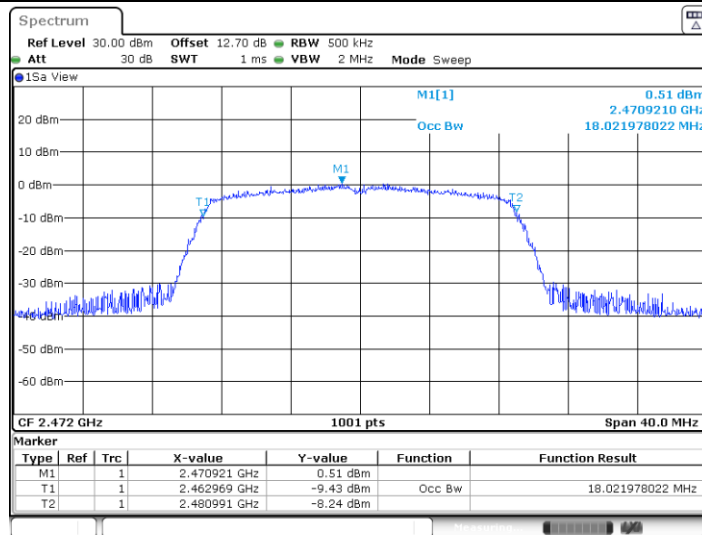


11N20SISO_Ant1_2472



Date: 13.FEB.2023 15:26:11

11N20SISO_Ant2_2472



Date: 13.FEB.2023 16:15:16

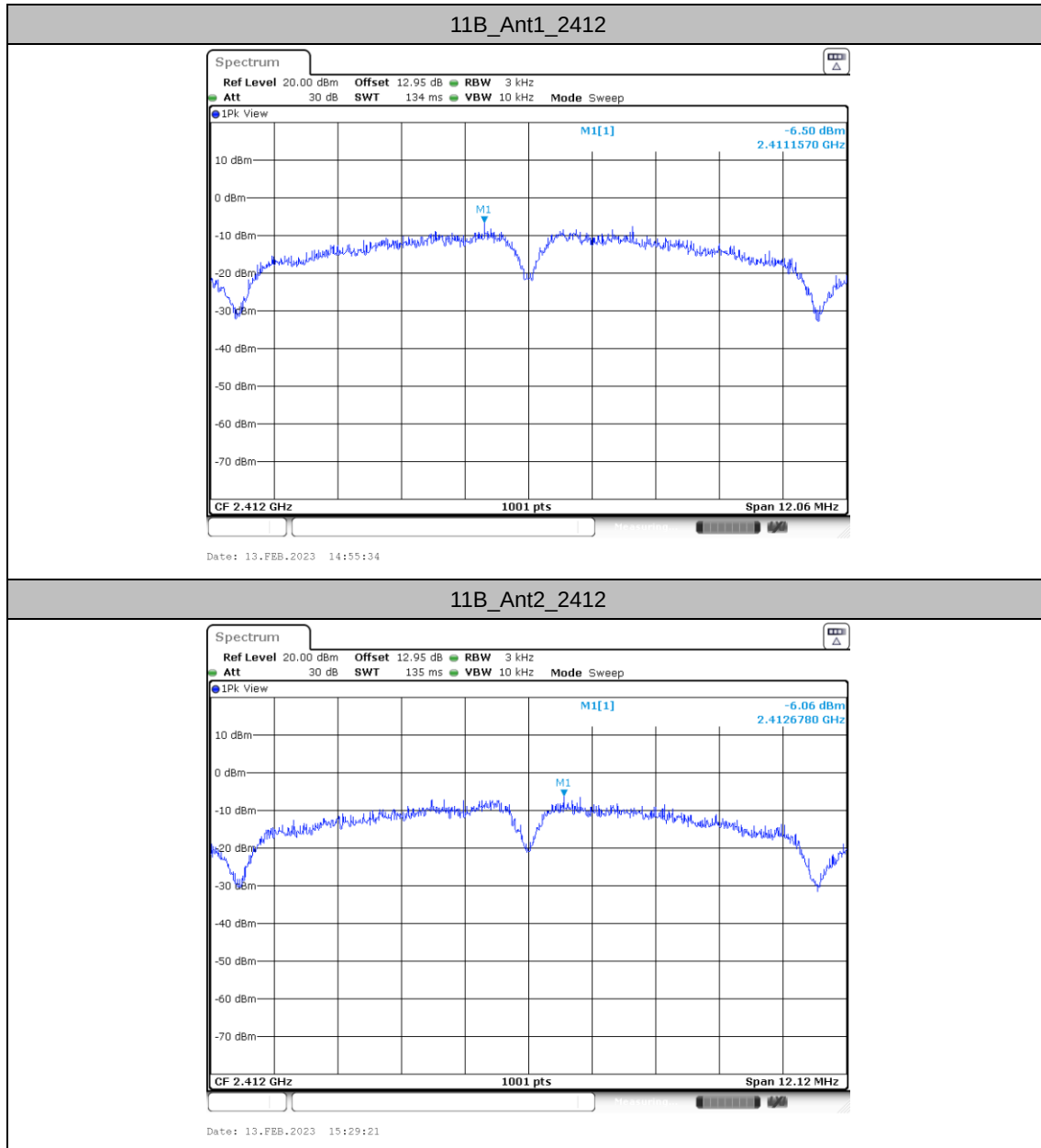
Power spectral density

Test Result

TestMode	Antenna	Freq(MHz)	Result [dBm/3kHz]	Limit [dBm/3kHz]	Verdict
11B	Ant1	2412	-6.5	≤8.00	PASS
	Ant2	2412	-6.06	≤8.00	PASS
	Ant1	2437	-6.23	≤8.00	PASS
	Ant2	2437	-7.62	≤8.00	PASS
	Ant1	2462	-7.43	≤8.00	PASS
	Ant2	2462	-7.4	≤8.00	PASS
	Ant1	2467	-7.25	≤8.00	PASS
	Ant2	2467	-7.24	≤8.00	PASS
	Ant1	2472	-10.23	≤8.00	PASS
	Ant2	2472	-8.08	≤8.00	PASS
11G	Ant1	2412	-10.19	≤8.00	PASS
	Ant2	2412	-10.46	≤8.00	PASS
	Ant1	2437	-11.15	≤8.00	PASS
	Ant2	2437	-10.77	≤8.00	PASS
	Ant1	2462	-10.98	≤8.00	PASS
	Ant2	2462	-11.29	≤8.00	PASS
	Ant1	2467	-14.92	≤8.00	PASS
	Ant2	2467	-14.73	≤8.00	PASS
	Ant1	2472	-17.41	≤8.00	PASS
	Ant2	2472	-16.22	≤8.00	PASS
11N20SISO	Ant1	2412	-11.88	≤8.00	PASS
	Ant2	2412	-10.62	≤8.00	PASS
	Ant1	2437	-11.59	≤8.00	PASS
	Ant2	2437	-10.54	≤8.00	PASS
	Ant1	2462	-12.01	≤8.00	PASS
	Ant2	2462	-13.01	≤8.00	PASS
	Ant1	2467	-15.07	≤8.00	PASS
	Ant2	2467	-14.07	≤8.00	PASS
	Ant1	2472	-19.44	≤8.00	PASS
	Ant2	2472	-18.21	≤8.00	PASS

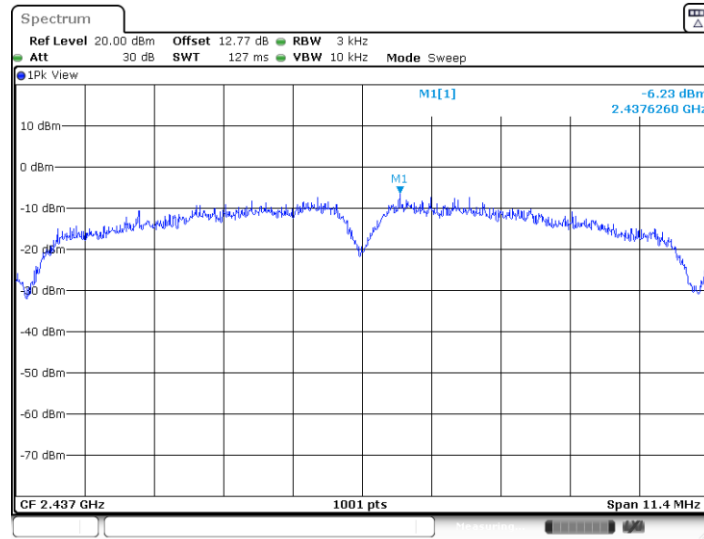


Test Graphs

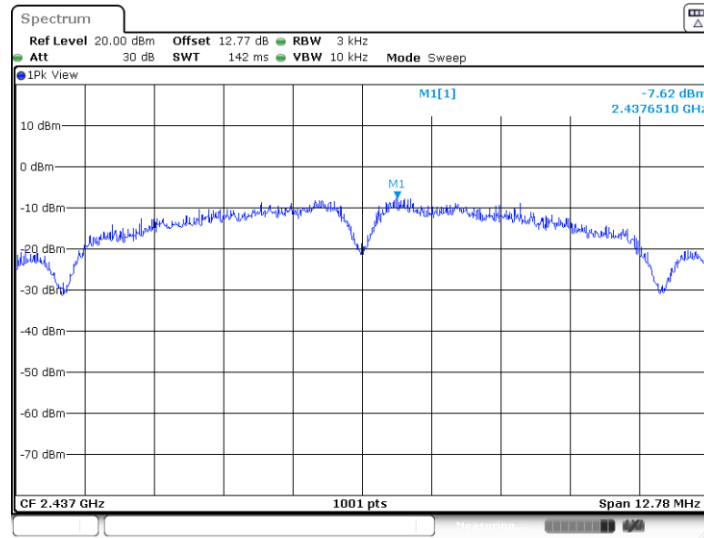




11B_Ant1_2437

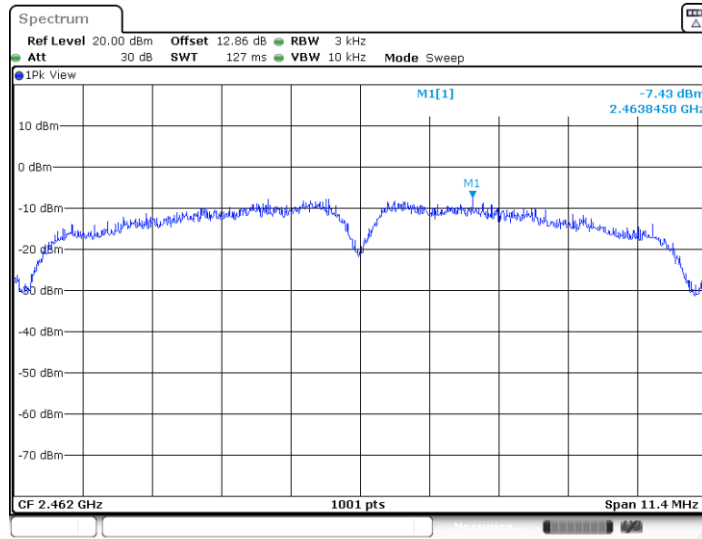


11B_Ant2_2437



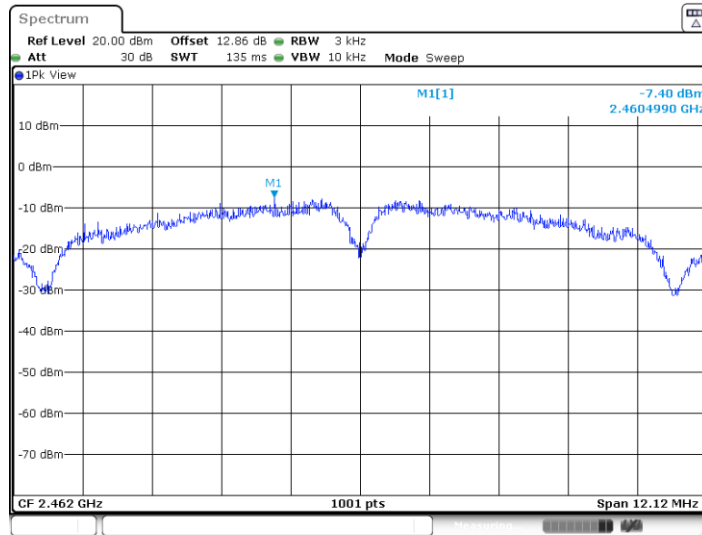


11B_Ant1_2462



Date: 13.FEB.2023 01:58:50

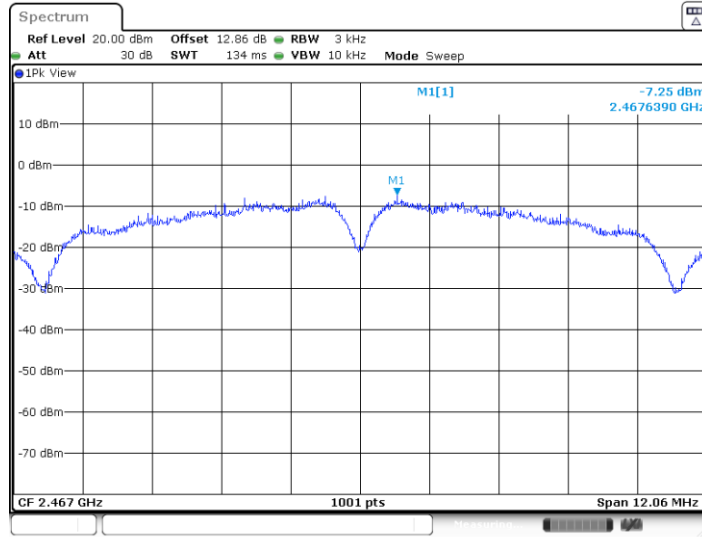
11B_Ant2_2462



Date: 13.FEB.2023 15:32:45

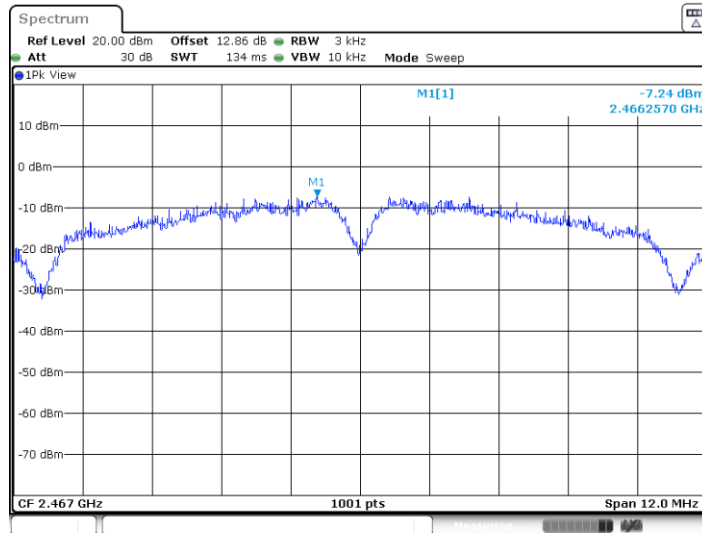


11B_Ant1_2467



Date: 13.FEB.2023 14:46:32

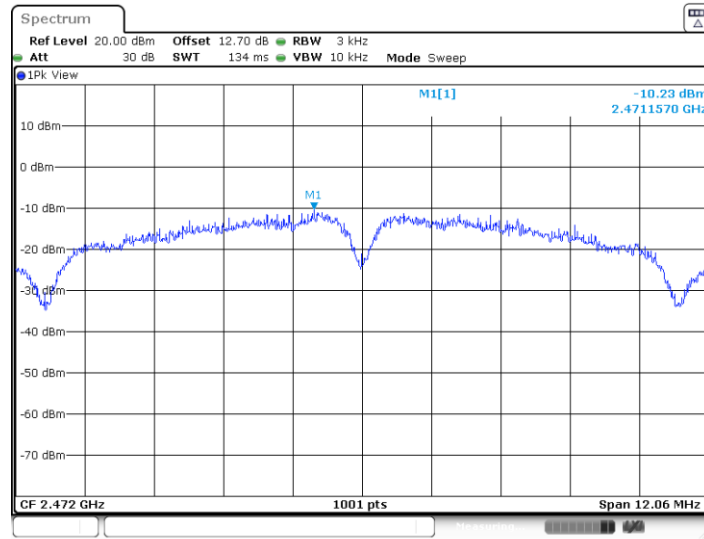
11B_Ant2_2467



Date: 13.FEB.2023 15:34:40

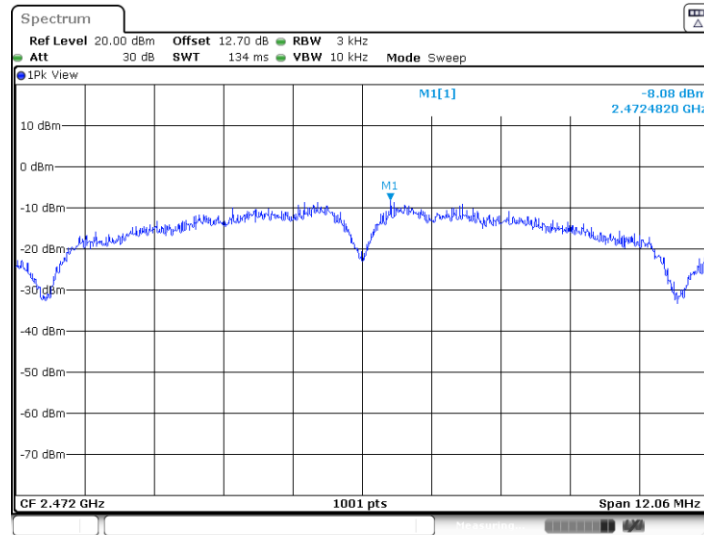


11B_Ant1_2472



Date: 13.FEB.2023 14:49:40

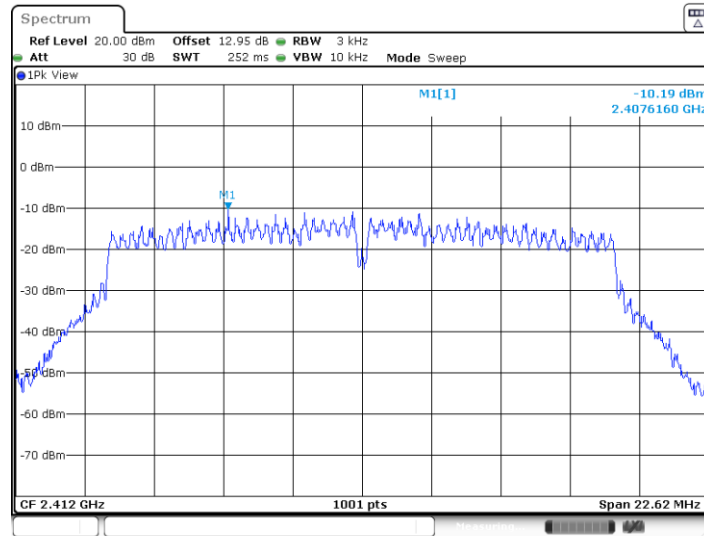
11B_Ant2_2472



Date: 13.FEB.2023 15:37:08

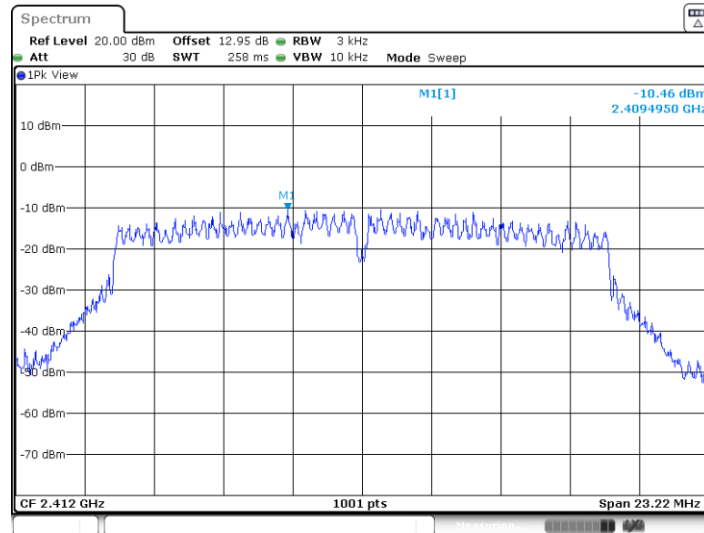


11G_Ant1_2412



Date: 13.FEB.2023 14:51:57

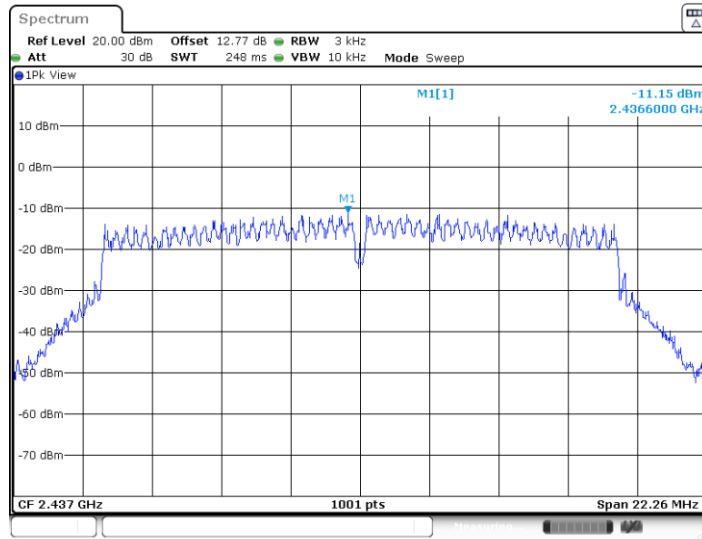
11G_Ant2_2412



Date: 13.FEB.2023 15:47:39

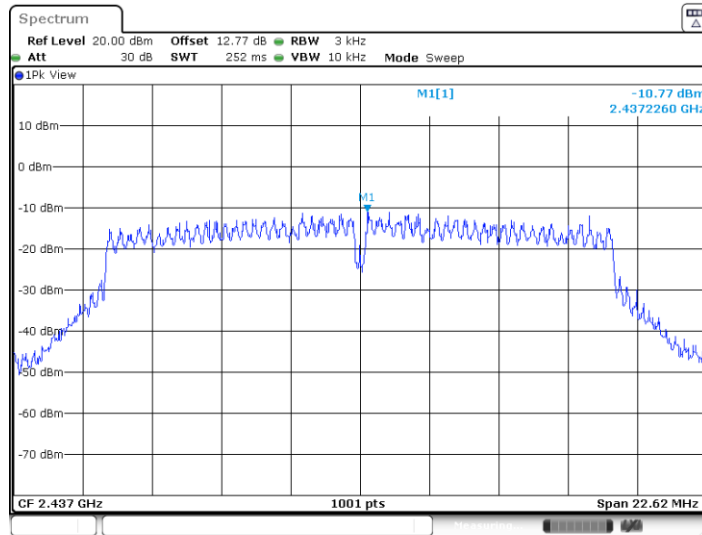


11G_Ant1_2437



Date: 13.FEB.2023 14:58:07

11G_Ant2_2437



Date: 13.FEB.2023 15:49:55

