FCC TEST REPORT

FCC ID: 2A9V8-STARRYHUB

Product	:	Business Conference System
Model Name	:	StarryHub Q1 Pro、StarryHub Q1、StarryHub Q1S、StarryHub Q1S Max、StarryHub Q1S Plus、StarryHub Q1S Pro
Brand	:	CZUR
Report No.	:	PTC22091504702E-FC03
Sample ID	:	PTC22091504702E-01#

Prepared for

CZUR TECH CO., LTD

RM722, Block B, Podium of Buiding No. 12, Shenzhen Bay Eco-Technology Park, No. 10 Gaoxin South RD., Nanshan District, Shenzhen, China

Prepared by

Precise Testing & Certification Co., Ltd.

Building 1, No. 6, Tongxin Road, Dongcheng Street, Dongguan, Guangdong, China

1 TEST RESULT CERTIFICATION

Applicant's name	:	CZUR TECH CO., LTD
Address	:	RM722, Block B, Podium of Buiding No. 12, Shenzhen Bay Eco-Technology Park, No. 10 Gaoxin South RD., Nanshan District, Shenzhen, China
Manufacture's name	:	CZUR TECH CO., LTD
Address	:	RM722, Block B, Podium of Buiding No. 12, Shenzhen Bay Eco-Technology Park, No. 10 Gaoxin South RD., Nanshan District, Shenzhen, China
Product name	:	Business Conference System
Model name	:	StarryHub Q1 Pro、StarryHub Q1、StarryHub Q1S、StarryHub Q1S Max、StarryHub Q1S Plus、StarryHub Q1S Pro
Standards	:	FCC CFR47 Part 15 Section 15.247
Test procedure	:	ANSI C63.10:2013
Test Date	:	Oct. 28, 2022 to Dec. 08, 2022
Date of Issue	:	Dec. 08, 2022
Test Result	:	Pass

This device described above has been tested by PTC, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.
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Test Engineer:

Simon Pu / Engineer

Technical Manager:

Ronnie Liu / Manager

Contents

Page

1 TEST RESULT CERTIFICATION 2

2 TEST SUMMARY 5

2.1 TEST SITE 5

3 GENERAL INFORMATION 6

3.1 GENERAL DESCRIPTION OF E.U.T. 6

3.2 CHANNEL LIST 7

4 EQUIPMENT DURING TEST 18

4.1 EQUIPMENTS LIST 18

4.2 MEASUREMENT UNCERTAINTY 20

4.3 DESCRIPTION OF SUPPORT UNITS 21

5 CONDUCTED EMISSION 22

5.1 E.U.T. OPERATION 22

5.2 EUT SETUP 22

5.3 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION) 23

5.4 MEASUREMENT PROCEDURE 23

5.5 CONDUCTED EMISSION LIMIT 23

5.6 MEASUREMENT DESCRIPTION 23

5.7 CONDUCTED EMISSION TEST RESULT 23

6 RADIATED SPURIOUS EMISSIONS 26

6.1 EUT OPERATION 26

6.2 TEST SETUP 27

6.3 SPECTRUM ANALYZER SETUP 28

6.4 TEST PROCEDURE 29

6.5 SUMMARY OF TEST RESULTS 30

7 CONDUCTED SPURIOUS EMISSION 36

7.1 TEST PROCEDURE 36

7.2 TEST RESULT 36

8 BAND EDGE MEASUREMENT 72

8.1 TEST PROCEDURE 72
8.2 TEST RESULT 73
9 6DB BANDWIDTH MEASUREMENT 80
9.1 TEST PROCEDURE 80
9.2 TEST RESULT 80
10 MAXIMUM PEAK OUTPUT POWER 91
10.1 TEST PROCEDURE 91
10.2 TEST RESULT 91
11 POWER SPECTRAL DENSITY 93
11.1 TEST PROCEDURE 93
11.2 TEST RESULT 93
12 ANTENNA APPLICATION 104
12.1 ANTENNA REQUIREMENT 104
12.2 RESULT 104
13 TEST SETUP 105
14 EUT PHOTOS 107

2 Test Summary

Test Items	Test Requirement	Result
Conduct Emission	15.207	PASS
Radiated Spurious Emissions	15.205(a) 15.209 15.247(d)	PASS
Conducted Spurious Emission	15.247(d)	PASS
Band edge	15.247(d) 15.205(a)	PASS
6dB Bandwidth	15.247(a)(2)	PASS
Maximum Peak Output Power	15.247(b)(3)	PASS
Power Spectral Density	15.247(e)	PASS
Antenna Requirement	15.203	PASS
Remark: N/A: Not Applicable		

2.1 Test Site

Precise Testing & Certification Co., Ltd.

Address: Building 1, No.6 Tongxin Road, Dongcheng Street, Dongguan,China

FCC Registration Number: 790290

Designation Number：CN1219

A2LA Certificate No.: 4408.01

IC Registration Number: 12191A

CAB identifier: CN0080

3 General Information

3.1 General Description of E.U.T.

Product Name	:	Business Conference System
Model Name	:	StarryHub Q1 Pro、StarryHub Q1、StarryHub Q1S、StarryHub Q1S Max、StarryHub Q1S Plus、StarryHub Q1S Pro
Specification	:	802.11b/g/n HT20/HT40
Operation Frequency	:	2412-2462MHz for 802.11b/g/ n(HT20) 2422-2452MHz for 802.11n(HT40)
Number of Channel	:	11 channels for 802.11b/g/ n(HT20) 7 channels for 802.11 n(HT40)
Type of Modulation	:	DSSS with DBPSK/DQPSK/CCK for 802.11b; OFDM with BPSK/QPSK/16QAM/64QAM for 802.11g/n;
Antenna installation	:	Fpcb Antenna
Antenna Gain	:	1.61 dBi
Power supply	:	DC 19V adaptor input AC120V 60Hz （Model：SH-AF150W）
Hardware Version	:	T.3399V01
Software Version	:	Starry-CPH22A-V1.2.11

3.2 Channel List

The EUT has been tested under its typical operating condition.

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

Test of channel included the lowest and middle and highest frequency to perform the test, then record on this report.

Those data rates (802.11b: 1 Mbps; 802.11g: 6 Mbps; 802.11n (HT20/HT40): MCS0;) were used for all test.

Pre-defined engineering program for regulatory testing used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

Frequency and Channel list for 802.11 b/g/n (HT20)

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	5	2432	9	2452
2	2417	6	2437	10	2457
3	2422	7	2442	11	2462
4	2427	8	2447		

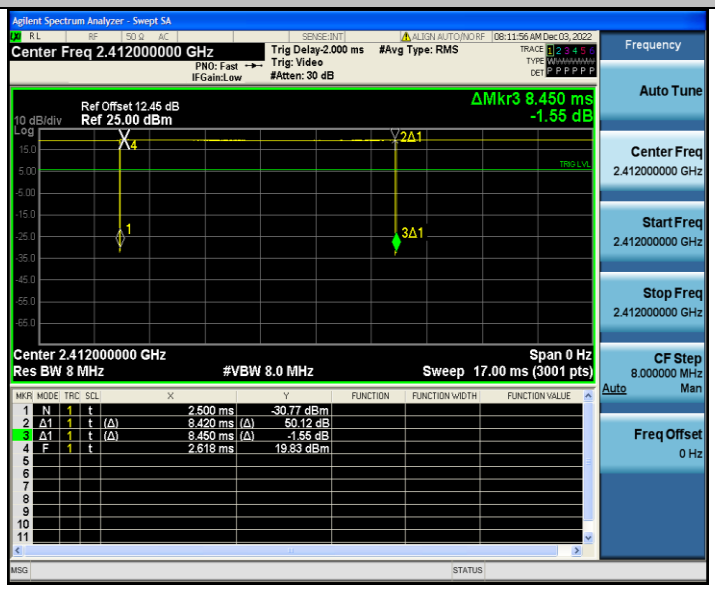
Test Frequency and Channel for 802.11 b/g/n (HT20/HT40):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	6	2437	11	2462
3	2422	6	2437	9	2452

The maximum duty cycle as following table:

TestMode	Antenna	Frequency[MHz]	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	Factor
11B	Ant1	2412	8.42	8.45	99.64	0.02
	Ant2	2412	8.42	8.45	99.64	0.02
	Ant1	2437	8.41	8.45	99.53	0.02
	Ant2	2437	8.41	8.45	99.53	0.02
	Ant1	2462	8.42	8.46	99.53	0.02
	Ant2	2462	8.42	8.45	99.64	0.02
11G	Ant1	2412	1.40	1.44	97.22	0.12
	Ant2	2412	1.40	1.44	97.22	0.12
	Ant1	2437	1.40	1.44	97.22	0.12
	Ant2	2437	1.39	1.44	96.53	0.15
	Ant1	2462	1.40	1.44	97.22	0.12
	Ant2	2462	1.39	1.44	96.53	0.15
11N20SISO	Ant1	2412	1.31	1.35	97.04	0.13
	Ant2	2412	1.30	1.35	96.30	0.16
	Ant1	2437	1.31	1.35	97.04	0.13
	Ant2	2437	1.31	1.35	97.04	0.13
	Ant1	2462	1.30	1.35	96.30	0.16
	Ant2	2462	1.31	1.35	97.04	0.13
11N40SISO	Ant1	2422	5.43	5.44	99.82	0.01
	Ant2	2422	5.43	5.45	99.63	0.02
	Ant1	2437	5.43	5.44	99.82	0.01
	Ant2	2437	5.43	5.44	99.82	0.01
	Ant1	2452	5.43	5.44	99.82	0.01
	Ant2	2452	5.43	5.44	99.82	0.01

11B_Ant1_2412



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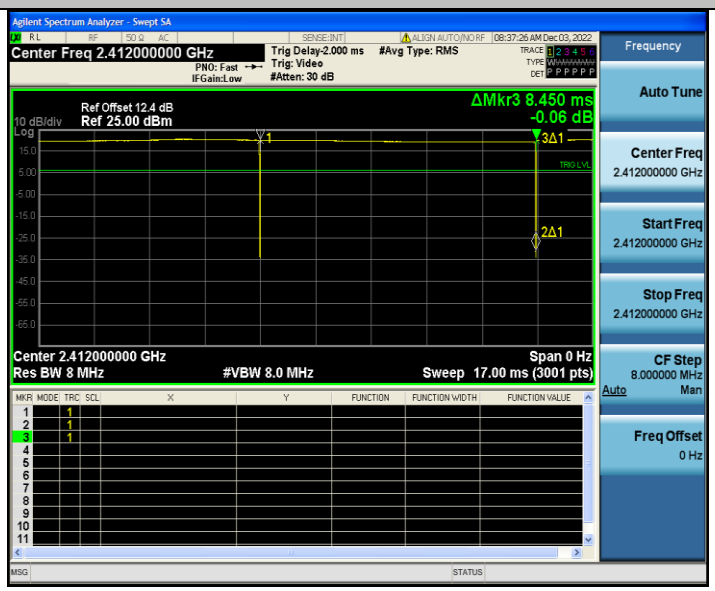

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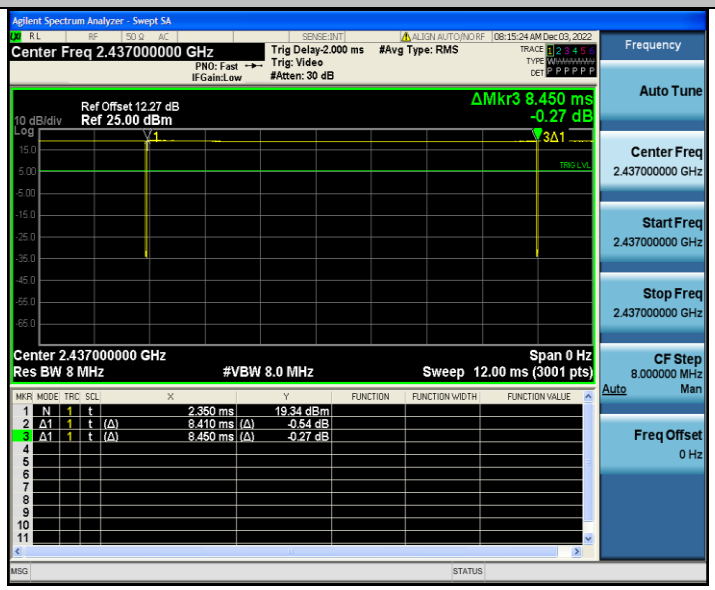

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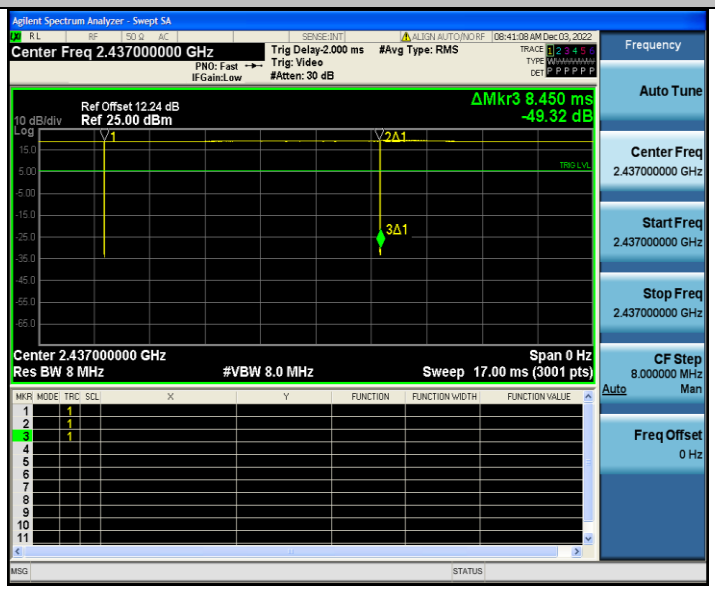

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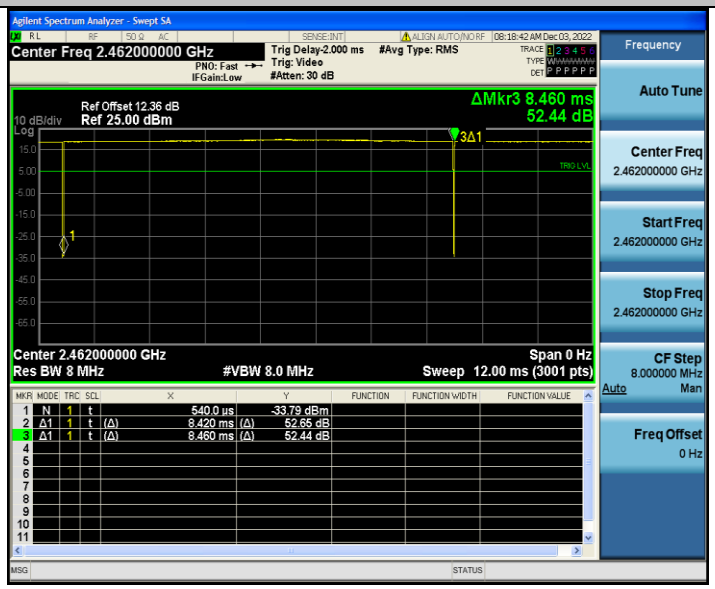

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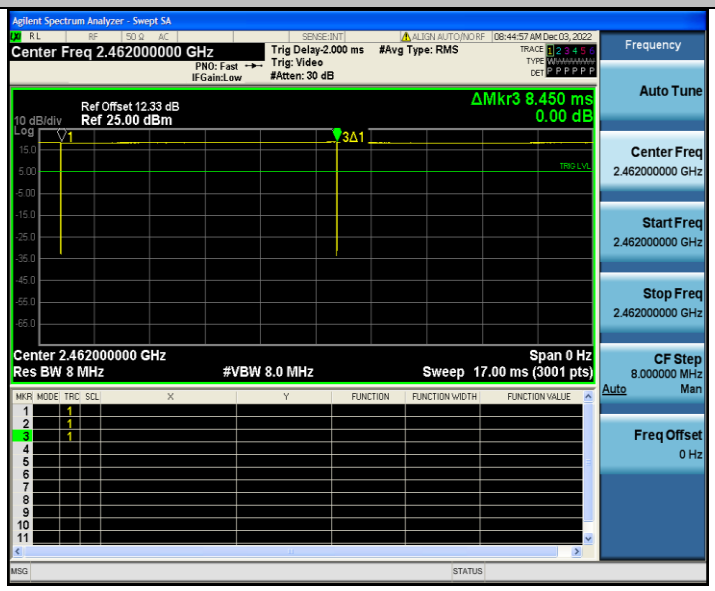

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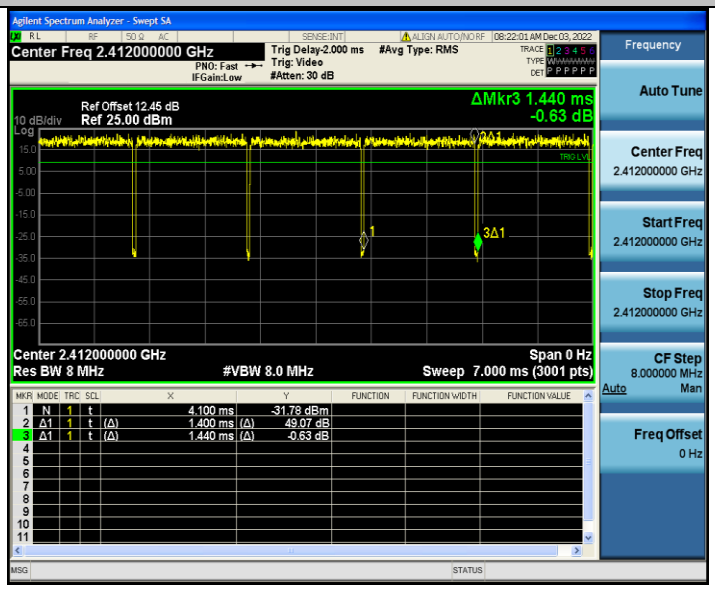

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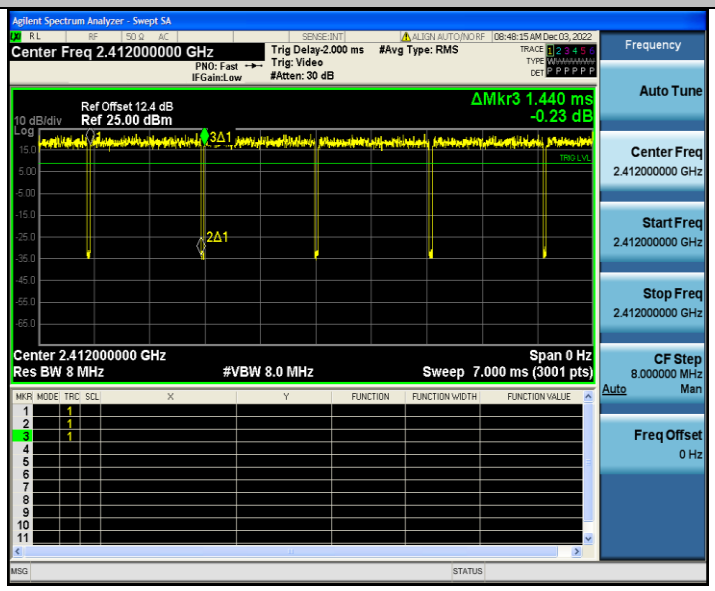

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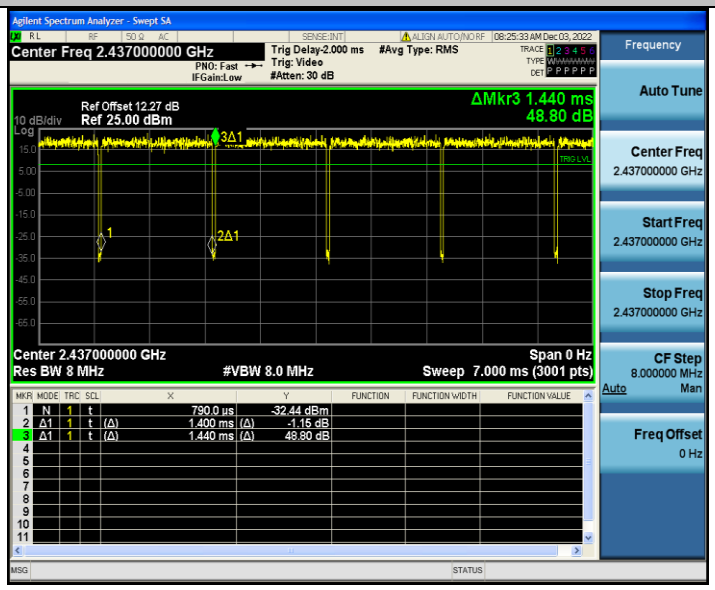

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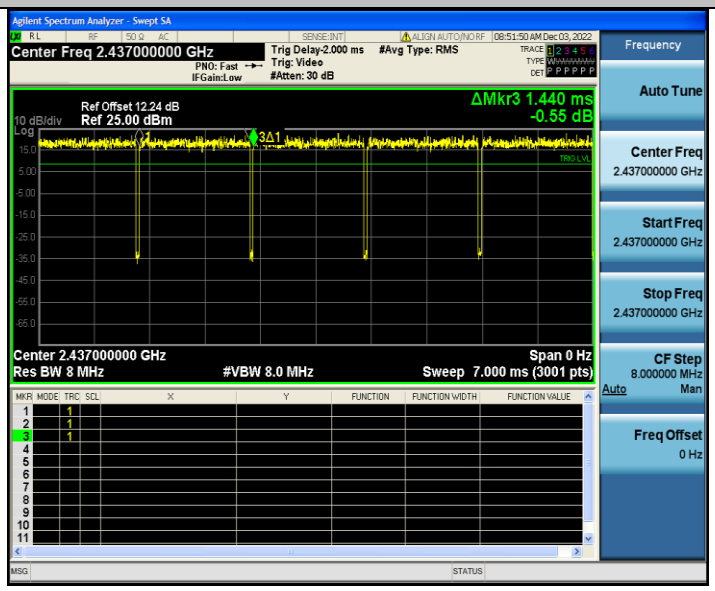

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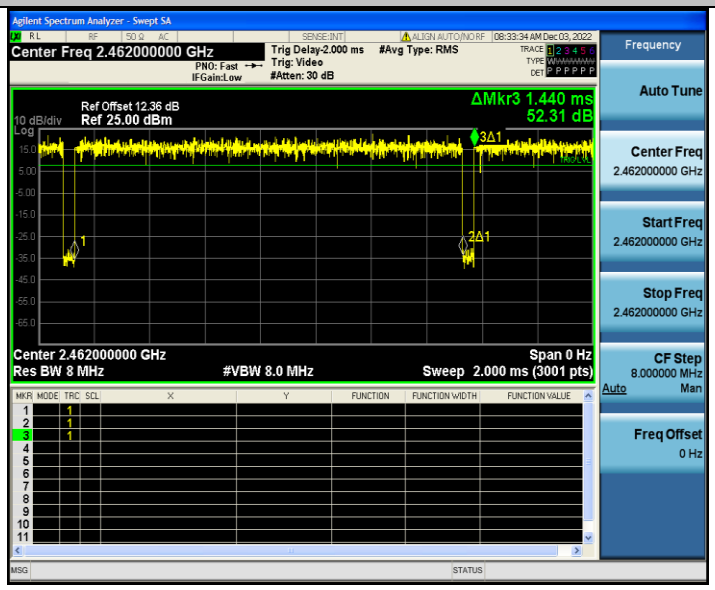

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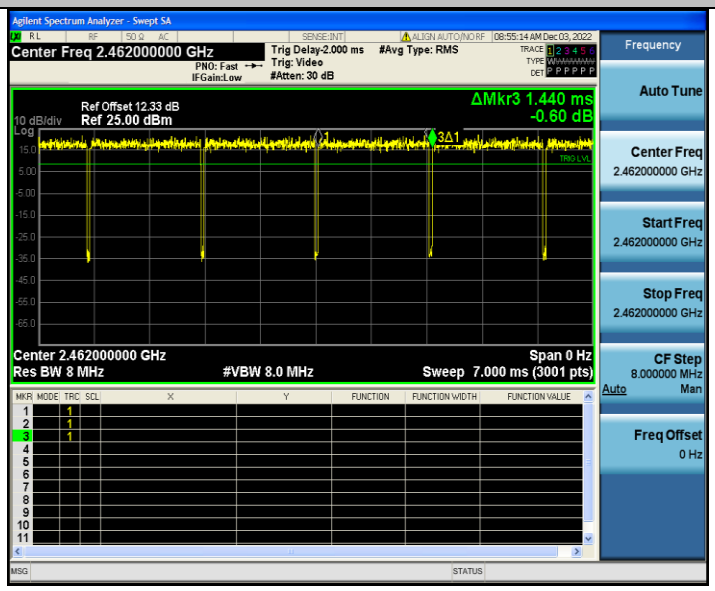

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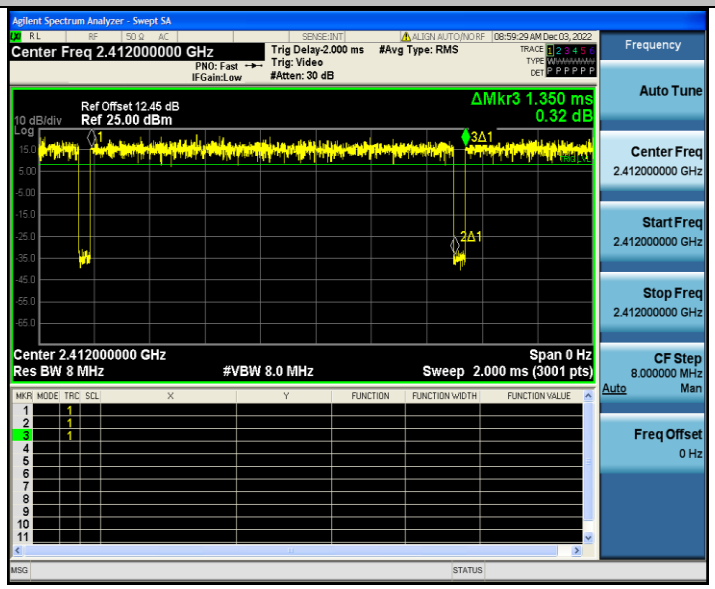

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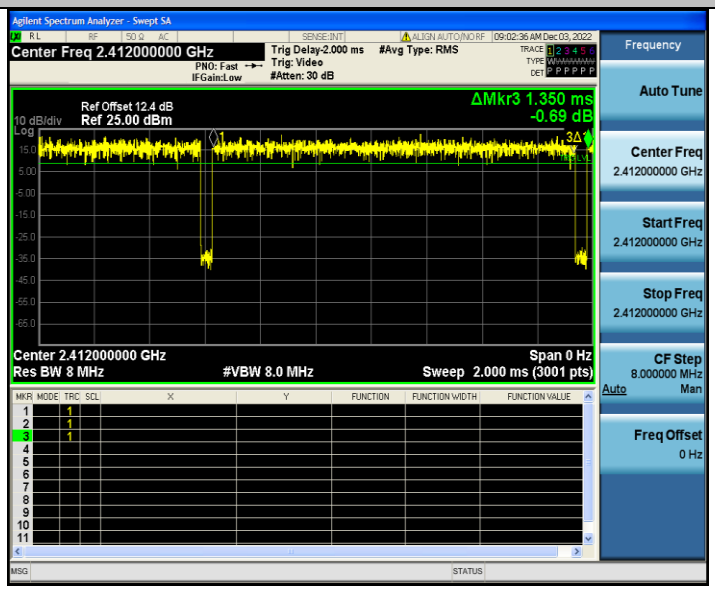

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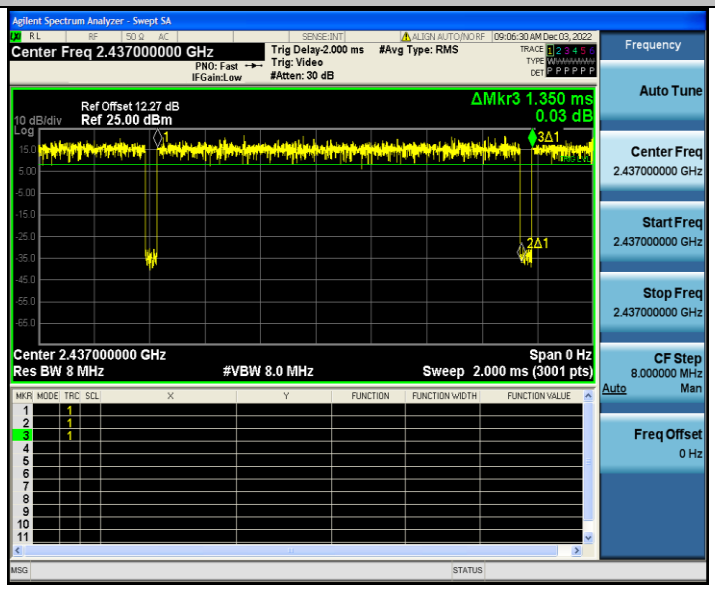

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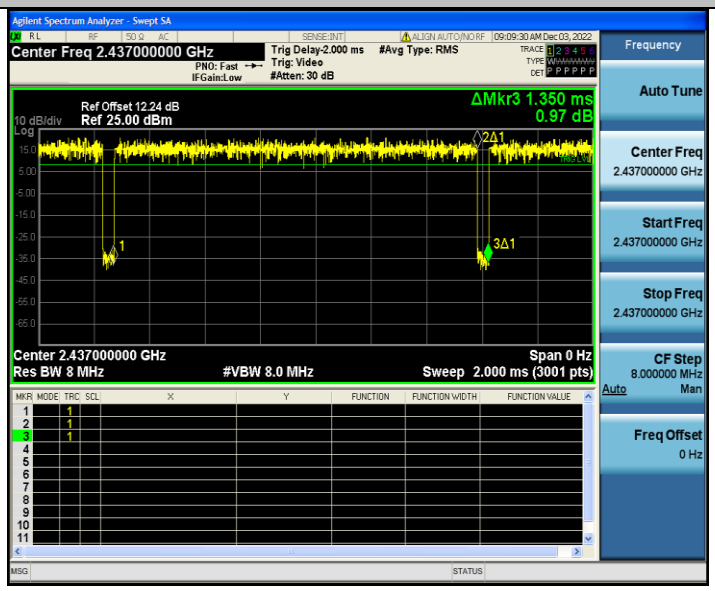

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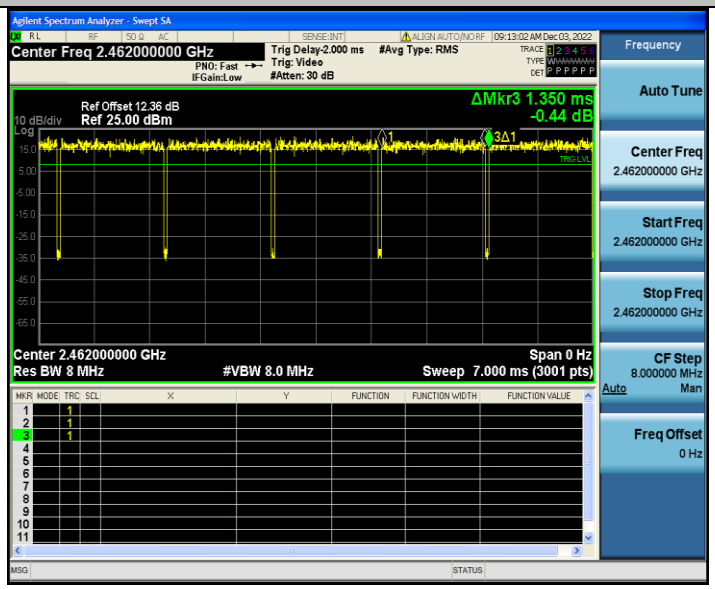

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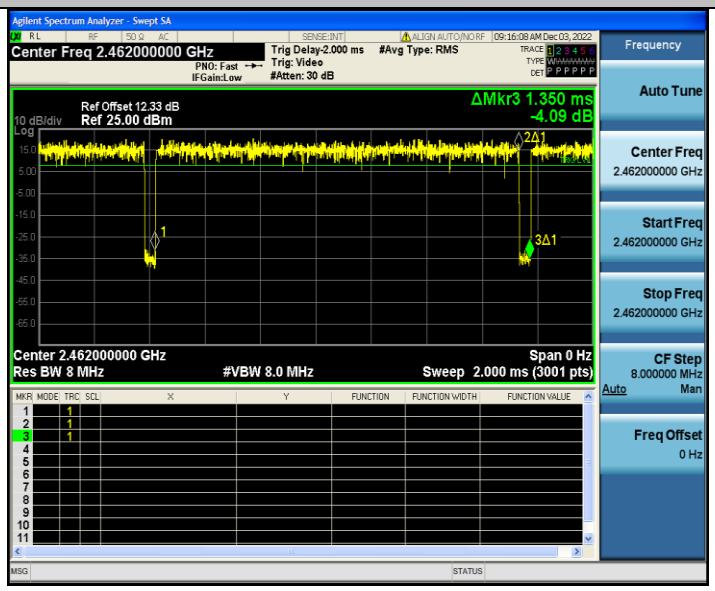


4 Equipment During Test

4.1 Equipments List

RF Conducted Test

Name of Equipment	Manufacturer	Model	Serial No.	Characteristics	Calibration Due
MXG Signal Analyzer	Agilent	N9020A	MY56070279	10Hz-30GHz	Aug21,2023
Coaxial Cable	CDS	79254	46107086	10Hz-30GHz	Aug21,2023
Antenna Connector	Florida RF Labs	N/A	RF01#	N/A	Aug21,2023
Scope	Tektronix	TDS3032B	B014131	300MHz BW; 2 way scope	Aug21,2023
DC power	eTOMENS	eTM-1560	--	15V 60A	Aug21,2023
Power Meter	Anritsu	ML2495A	0949003	300MHz-40GHz	Aug21,2023
Power Sensor	Anritsu	MA2411B	0917017	300MHz-40GHz	Aug21,2023

Remark: The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.

Radiated Emissions

Name of Equipment	Manufacturer	Model	Serial No.	Characteristics	Calibration Due
EMI Test Receiver	Rohde&Schwarz	ESCI	101417	9KHz-3GHz	Aug21,2023
Loop Antenna	Schwarzbeck	FMZB 1519	012	9 KHz -30MHz	Aug21,2023
Bilog Antenna	SCHWARZBECK	VULB9160	9160-3355	25MHz-2GHz	Aug21,2023
Preamplifier (low frequency)	SCHWARZBECK	BBV 9475	9745-0013	1MHz-1GHz	Aug21,2023
Cable	Schwarzbeck	PLF-100	549489	9KHz-3GHz	Aug21,2023
Spectrum Analyzer	Agilent	E4407B	MY45109572	9KHz-26.5GHz	Aug21,2023
Horn Antenna	SCHWARZBECK	9120D	9120D-1246	1GHz-18GHz	Aug21,2023
High NOISE AMPLIFIER	ZHINAN	ZN3380C	15002	10KHz-18GHz	Aug21,2023
Cable	H+S	CBL-26	N/A	1GHz-26.5GHz	Aug21,2023
Spectrum Analyzer	Rohde&Schwarz	FSVR40	101003	10Hz-40GHz	Aug21,2023
Horn Antenna	SCHWARZBECK	BBHA9170	01066	15GHZ-40GHZ	Aug21,2023
Preamplifier	SCHWARZBECK	BBV-9721	81	18GHZ-40GHZ	Aug21,2023

Test S/W	Tonscend	JS32-RE/4.0.0.0

Conducted Emissions

Name of Equipment	Manufacturer	Model	Serial No.	Characteristics	Calibration Due
EMI Test Receiver	Rohde&Schwarz	ESCI	101417	9KHz-3GHz	Aug21,2023
Artificial Mains Network	Rohde&Schwarz	BS ENV216	102453	9KHz-300MHz	Aug21,2023
Artificial Mains Network	Rohde&Schwarz	L2-16B	000WX31025	9KHz-300MHz	Aug21,2023
Test S/W	Tonscend	JS32-CE/4.0.0.3			

4.2 Measurement Uncertainty

Parameter	Uncertainty
RF output power, conducted	±1.0dB
Power Spectral Density, conducted	±2.2dB
Radio Frequency	± 1 x 10^{-6}
Bandwidth	± 1.5 x 10^{-6}
Time	±2%
Duty Cycle	±2%
Temperature	±1°C
Humidity	±5%
DC and low frequency voltages	±3%
Conducted Emissions (150kHz~30MHz)	±3.64dB
Radiated Emission(9KHz~30MHz)	±2.54dB
Radiated Emission(30MHz~1GHz)	±5.03dB
Radiated Emission(1GHz~25GHz)	±4.74dB
Remark: The coverage Factor (k=2), and measurement Uncertainty for a level of Confidence of 95%	

4.3 Description of Support Units

Equipment	Model No.	Series No.
Notebook	NbDE-WDH9	WCTPM22527002929

5 Conducted Emission

Test Requirement:	:	FCC CFR 47 Part 15 Section 15.207
Test Method	:	ANSI C63.10: 2013
Test Result	:	PASS
Frequency Range	:	150kHz to 30MHz
Class/Severity	:	Class B

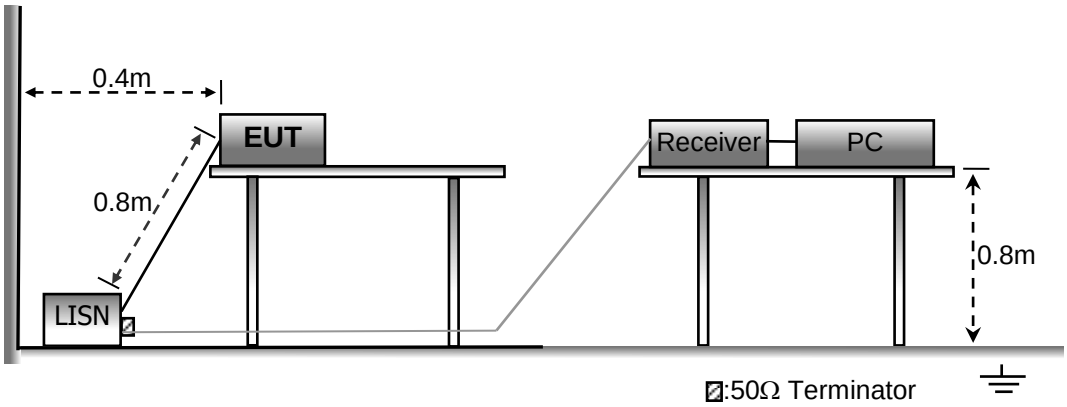
5.1 E.U.T. Operation

Operating Environment :

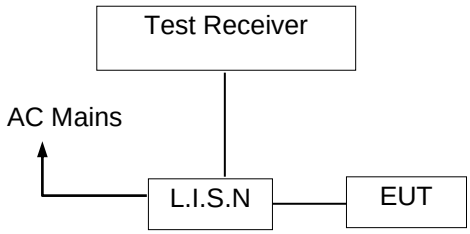
Temperature	:	23.9 °C
Humidity	:	51.4 % RH
Atmospheric Pressure	:	101.21kPa

5.2 EUT Setup

The conducted emission tests were performed using the setup accordance with the ANSI C63.10:2013.



5.3 Test SET-UP (Block Diagram of Configuration)



5.4 Measurement Procedure

1. The EUT was placed on a table, which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured was complete.

5.5 Conducted Emission Limit

Conducted Emission

Frequency(MHz)	Quasi-peak	Average
0.15-0.5	66-56	56-46
0.5-5.0	56	46
5.0-30.0	60	50

Note:
1. The lower limit shall apply at the transition frequencies
2.The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

5.6 Measurement Description

The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines with AC 120V 60Hz and AC 240V 50Hz, the worst case is AC 120V 60Hz. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

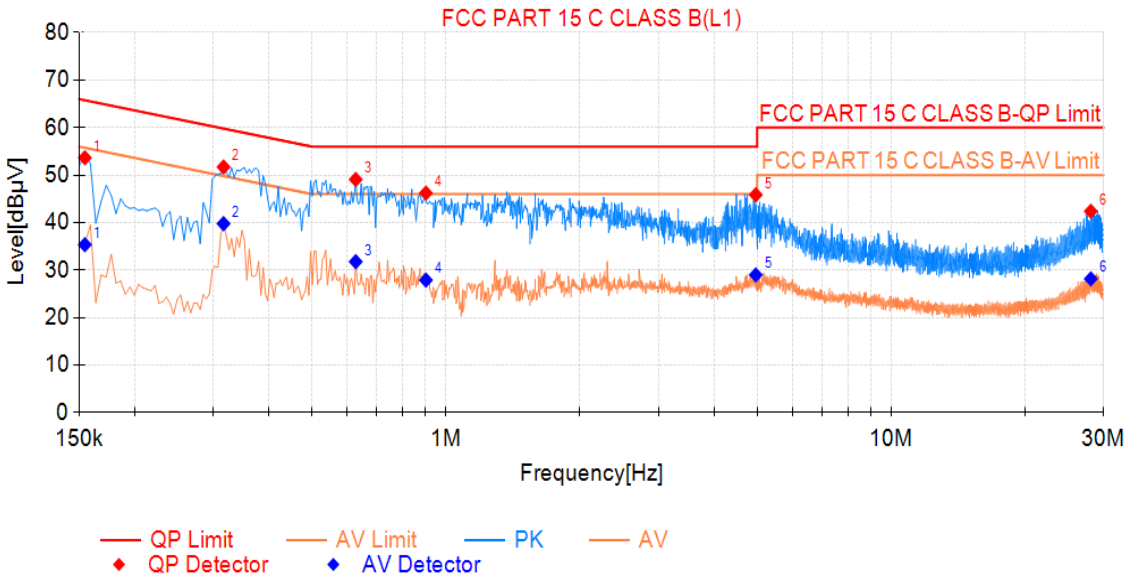
5.7 Conducted Emission Test Result

Pass.

The adapters and all modulation modes of have been tested. The data of the worst mode (TX 802.11b low channel) is recorded on the following page, and other modulation methods have not exceeded the limit.

Please refer to the following pages.

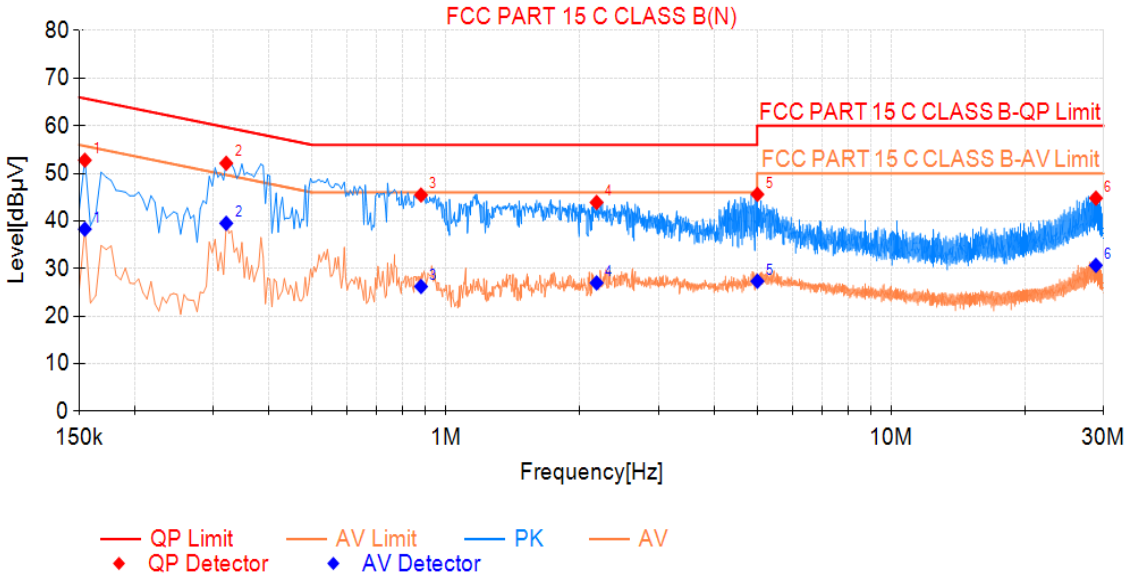
Line- AC 120V/60Hz



Final Data List								
NO.	Freq. [MHz]	QP Value	QP Limit	QP Margin	AV Value	AV Limit	AV Margin	Verdict
1	0.155	53.65	65.75	12.10	35.36	55.75	20.39	PASS
2	0.317	51.70	59.80	8.10	39.78	49.80	10.02	PASS
3	0.627	49.09	56.00	6.91	31.78	46.00	14.22	PASS
4	0.902	46.22	56.00	9.78	27.90	46.00	18.10	PASS
5	4.965	45.86	56.00	10.14	28.99	46.00	17.01	PASS
6	28.086	42.40	60.00	17.60	28.17	50.00	21.83	PASS

Note: Level= Reading + Cable Loss + Factor

Neutral-AC 120V/60Hz



Final Data List								
NO.	Freq. [MHz]	QP Value	QP Limit	QP Margin	AV Value	AV Limit	AV Margin	Verdict
1	0.155	52.77	65.75	12.98	38.29	55.75	17.46	PASS
2	0.321	52.13	59.68	7.55	39.52	49.68	10.16	PASS
3	0.879	45.46	56.00	10.54	26.23	46.00	19.77	PASS
4	2.180	43.90	56.00	12.10	26.99	46.00	19.01	PASS
5	5.006	45.60	60.00	14.40	27.34	50.00	22.66	PASS
6	28.833	44.79	60.00	15.21	30.68	50.00	19.32	PASS

Note: Level= Reading + Cable Loss + Factor

6 Radiated Spurious Emissions

Test Requirement : FCC CFR47 Part 15 Section 15.209 & 15.247

Test Method : ANSI C63.10:2013

Test Result : PASS

Measurement Distance : 3m

Limit : See the follow table

Frequency (MHz)	Field Strength		Field Strength Limit at 3m Measurement Dist	
	uV/m	Distance (m)	uV/m	dBuV/m
0.009 ~ 0.490	2400/F(kHz)	300	10000 * 2400/F(kHz)	$20\log^{(2400/F(kHz))} + 80$
0.490 ~ 1.705	24000/F(kHz)	30	100 * 24000/F(kHz)	$20\log^{(24000/F(kHz))} + 40$
1.705 ~ 30	30	30	100 * 30	$20\log^{(30)} + 40$
30 ~ 88	100	3	100	$20\log^{(100)}$
88 ~ 216	150	3	150	$20\log^{(150)}$
216 ~ 960	200	3	200	$20\log^{(200)}$
Above 960	500	3	500	$20\log^{(500)}$

6.1 EUT Operation

Operating Environment :

Temperature: : 24.5 °C

Humidity: : 52 % RH

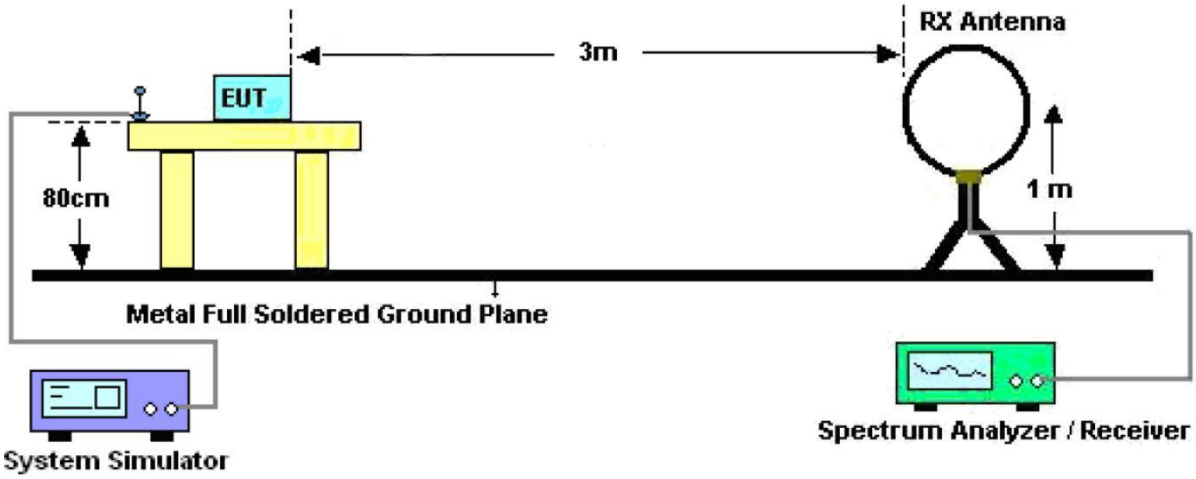
Atmospheric Pressure: : 101.3kPa

Test Voltage : AC 120V 60Hz

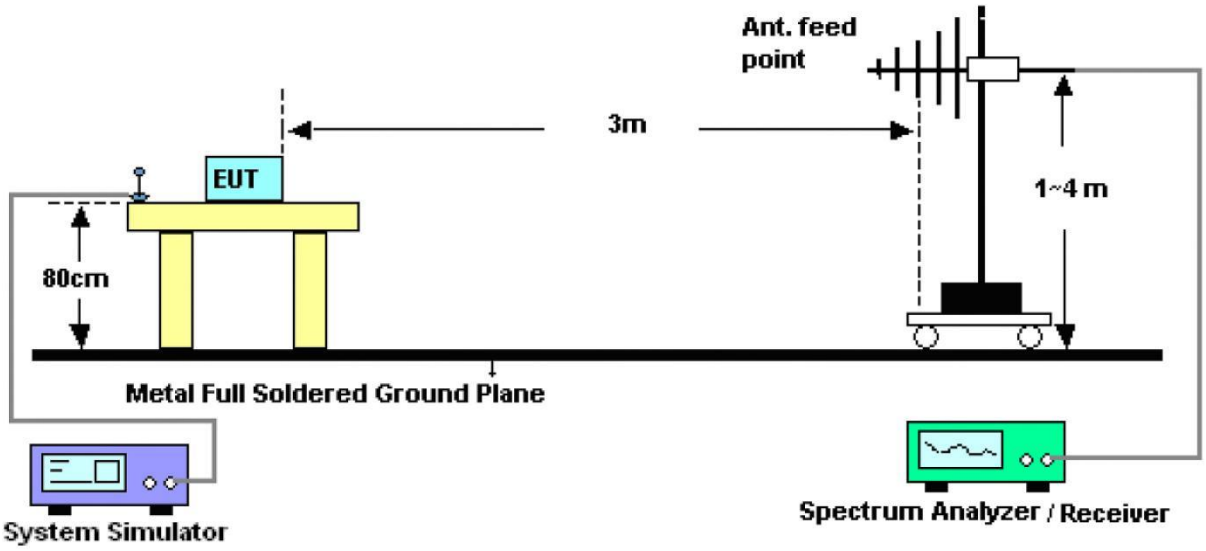
6.2 Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site

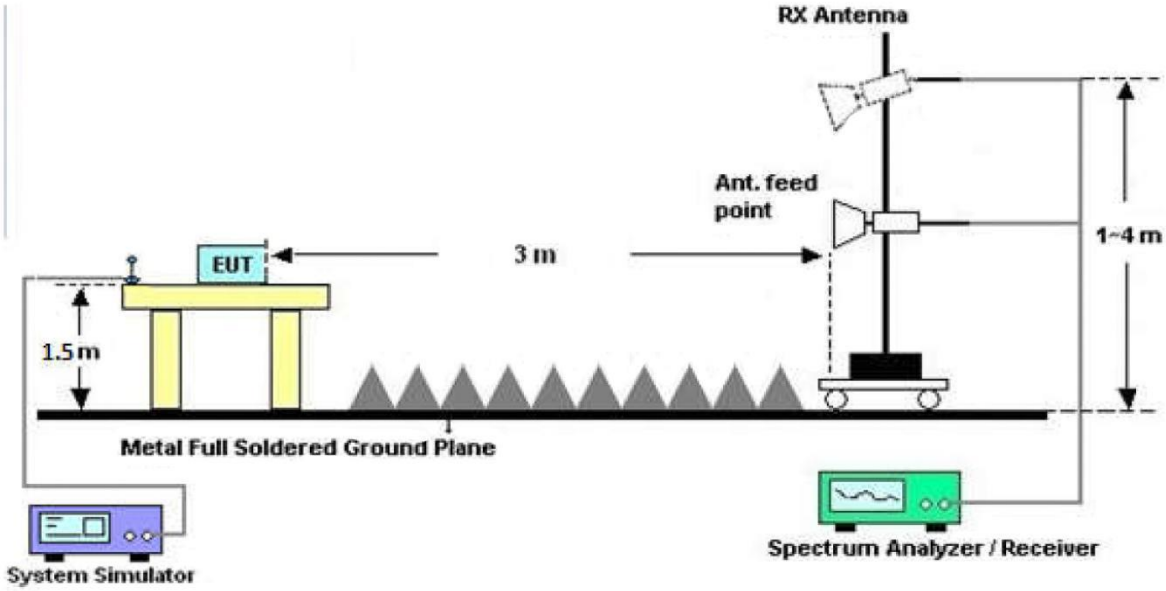
The test setup for emission measurement below 30MHz



The test setup for emission measurement from 30 MHz to 1 GHz.



The test setup for emission measurement above 1 GHz



6.3 Spectrum Analyzer Setup

	Frequency	Detector	RBW	VBW	Remark
Receiver Setup	Below 30MHz	--	10kHz	10kHz	--
	30MHz ~ 1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak Value
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
		RMS	1MHz	3MHz	Average Value

6.4 Test Procedure

1. Below 1000MHz, The EUT was placed on a turn table which is 0.8m above ground plane, And above 1000MHz, The EUT was placed on a styrofoam table which is 1.5m above ground plane.

2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.

3. EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions. The spectrum was investigated from the lowest radio frequency signal generated in the device, without going below 9 kHz, up to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.

5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.

6. Repeat above procedures until the measurements for all frequencies are complete.

7. The radiation measurements are tested under 3-axes(X,Y,Z) position(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand), After pre-test, It was found that the worse radiation emission was get at the X position. So the data shown was the X position only.

8. The test above 1GHz must be use the fully anechoic room, and the test below 1GHz use the half anechoic room

6.5 Summary of Test Results

Test Frequency: 9KHz-30MHz

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV/m)	Limit 3m (dBuV/m)	Over (dB)
--	--	--	--	>20

Note:

The amplitude of spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.

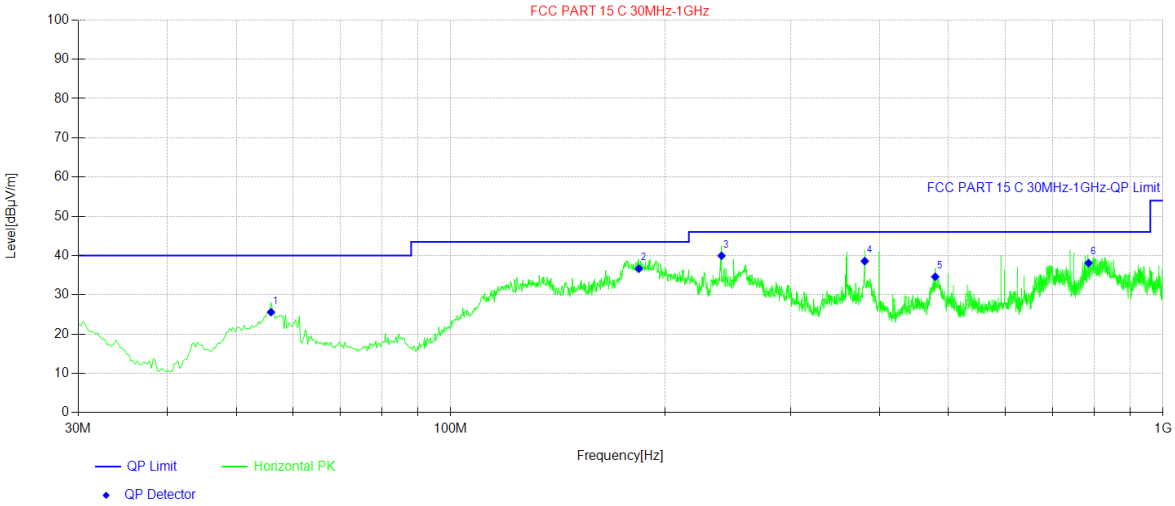
Distance extrapolation factor =40log(Specific distance/ test distance)(dB);
Limit line=Specific limits(dBuV) + distance extrapolation factor.

Test Frequency: 30MHz ~ 1GHz

All the modulation modes were tested the data of the worst mode (TX 802.11b Low Channel) are recorded in the following pages and the others modulation methods do not exceed the limits.

Please refer to the following test plots:

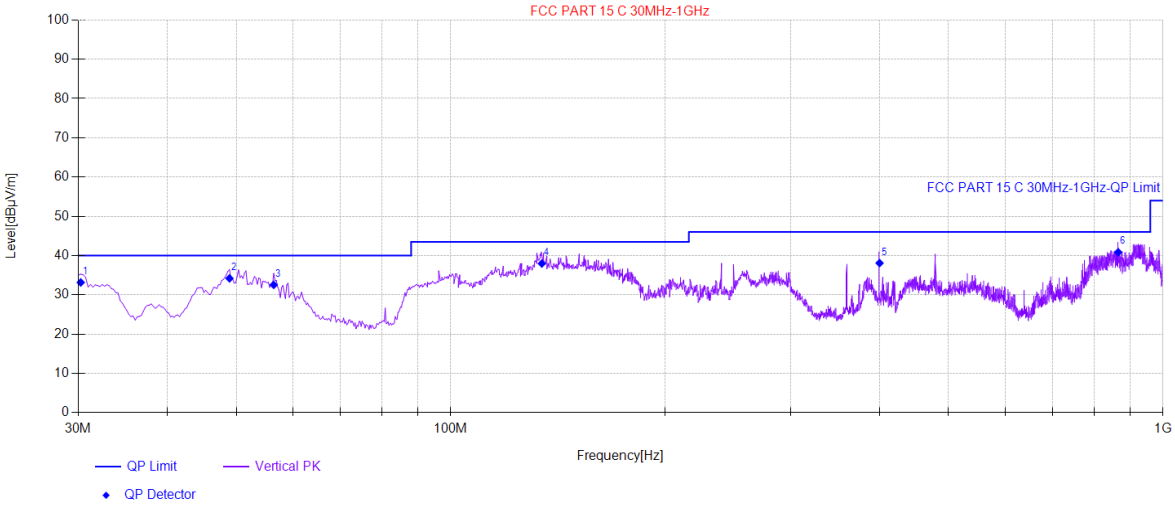
Antenna Polarization: Horizontal



Final Data List[QP]							
NO.	Freq. [MHz]	QP Reading [dBμV/m]	Factor [dB]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]	Polarity
1	55.95	43.52	-17.93	25.59	40.00	14.41	Horizontal
2	183.75	54.26	-17.58	36.68	43.50	6.82	Horizontal
3	240.01	57.58	-17.62	39.96	46.00	6.04	Horizontal
4	381.38	52.26	-13.67	38.59	46.00	7.41	Horizontal
5	478.87	46	-11.39	34.61	46.00	11.39	Horizontal
6	786.12	42.83	-4.73	38.10	46.00	7.90	Horizontal

Remark:Emission Level=Reading+Cable Loss+ANT Factor-AMP Factor

Antenna Polarization: Vertical



Final Data List[QP]							
NO.	Freq. [MHz]	QP Reading [dBμV/m]	Factor [dB]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]	Polarity
1	30.24	51.49	-18.33	33.16	40.00	6.84	Vertical
2	48.92	51.94	-17.74	34.20	40.00	5.80	Vertical
3	56.43	50.48	-17.93	32.55	40.00	7.45	Vertical
4	134.28	54.91	-16.93	37.98	43.50	5.52	Vertical
5	400.06	51.2	-13.11	38.09	46.00	7.91	Vertical
6	865.17	44.3	-3.44	40.86	46.00	5.14	Vertical

Remark:Emission Level=Reading+Cable Loss+ANT Factor-AMP Factor

Test Frequency: From 1GHz to 25GHz

Worst case 802.11b

Test Mode: 2412					Test channel: Lowest			
Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.
4824.00	40.73	32.29	4.10	28.45	48.67	74.00	-25.33	V
7236.00	34.50	35.99	6.22	27.83	48.88	74.00	-25.12	V
9648.00	32.91	38.11	7.83	25.10	53.75	74.00	-20.25	V
4824.00	39.33	32.29	4.10	28.45	47.27	74.00	-26.73	H
7236.00	34.21	35.99	6.22	27.83	48.59	74.00	-25.41	H
9648.00	32.48	38.11	7.83	25.10	53.32	74.00	-20.68	H
Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.
4824.00	29.78	32.29	4.10	28.45	37.72	54.00	-16.28	V
7236.00	23.35	35.99	6.22	27.83	37.73	54.00	-16.27	V
9648.00	23.25	38.11	7.83	25.10	44.09	54.00	-9.91	V
4824.00	28.85	32.29	4.10	28.45	36.79	54.00	-17.21	H
7236.00	22.79	35.99	6.22	27.83	37.17	54.00	-16.83	H
9648.00	22.22	38.11	7.83	25.10	43.06	54.00	-10.94	H

Worst case 802.11b

Test Mode: 2437					Test channel: Middle			
Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.
4874.00	39.71	32.35	4.12	28.44	47.74	74.00	-26.26	V
7311.00	34.52	36.08	6.30	27.74	49.16	74.00	-24.84	V
9748.00	33.90	38.25	7.91	24.65	55.41	74.00	-18.59	V
4874.00	40.14	32.35	4.12	28.44	48.17	74.00	-25.83	H
7311.00	33.13	36.08	6.30	27.74	47.77	74.00	-26.23	H
9748.00	33.77	38.25	7.91	24.65	55.28	74.00	-18.72	H
Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.
4874.00	30.54	32.35	4.12	28.44	38.57	54.00	-15.43	V
7311.00	22.83	36.08	6.30	27.74	37.47	54.00	-16.53	V
9748.00	23.14	38.25	7.91	24.65	44.65	54.00	-9.35	V
4874.00	30.23	32.35	4.12	28.44	38.26	54.00	-15.74	H
7311.00	22.21	36.08	6.30	27.74	36.85	54.00	-17.15	H
9748.00	23.48	38.25	7.91	24.65	44.99	54.00	-9.01	H

Worst case 802.11b

Test Mode: 2462					Test channel: High			
Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.
4924.00	45.51	32.41	4.14	28.42	53.64	74.00	-20.36	V
7386.00	35.36	36.15	6.36	27.68	50.19	74.00	-23.81	V
9848.00	37.31	38.35	7.97	24.33	59.30	74.00	-14.70	V
4924.00	44.72	32.41	4.14	28.42	52.85	74.00	-21.15	H
7386.00	34.21	36.15	6.36	27.68	49.04	74.00	-24.96	H
9848.00	33.46	38.35	7.97	24.33	55.45	74.00	-18.55	H
Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.
4924.00	36.37	32.41	4.14	28.42	44.50	54.00	-9.50	V
7386.00	25.26	36.15	6.36	27.68	40.09	54.00	-13.91	V
9848.00	25.80	38.35	7.97	24.33	47.79	54.00	-6.21	V
4924.00	35.05	32.41	4.14	28.42	43.18	54.00	-10.82	H
7386.00	23.59	36.15	6.36	27.68	38.42	54.00	-15.58	H
9848.00	22.71	38.35	7.97	24.33	44.70	54.00	-9.30	H

Note:

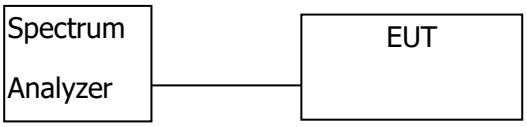
1. The testing has been conformed to 10*2462MHz=24620MHz.
2. All other emissions more than 30dB below the limit.
3. Factor = Antenna Factor + Cable Loss – Pre-amplifier.
   Emission Level = Reading + Factor
   Margin=Emission Level-Limit
4. X-Axis, Y-Axis and Z-Axis were investigated. The results above show only the worst case.

7 Conducted Spurious Emission

Test Requirement : FCC CFR47 Part 15 Section 15.247
Test Method : ANSI C63.10:2013
Test Limit : Regulation 15.247 (d),In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

7.1 Test Procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: RBW = 100kHz, VBW = 300kHz, Sweep = auto
Detector function = peak, Trace = max hold
3.Set up:



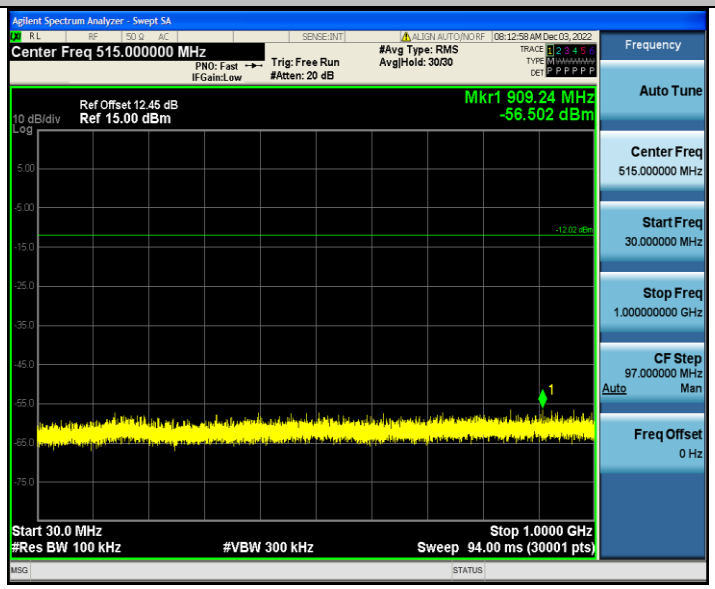
7.2 Test Result

TestMode	Antenna	Frequency[MHz]	FreqRange [Mhz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
11B	Ant1	2412	30~1000	7.98	-56.5	≤-12.02	PASS
			1000~26500	7.98	-41.47	≤-12.02	PASS
	Ant2	2412	30~1000	7.66	-56.58	≤-12.34	PASS
			1000~26500	7.66	-41.18	≤-12.34	PASS
	Ant1	2437	30~1000	7.27	-56.35	≤-12.73	PASS
			1000~26500	7.27	-41.47	≤-12.73	PASS
	Ant2	2437	30~1000	7.07	-56.73	≤-12.93	PASS
			1000~26500	7.07	-42.01	≤-12.93	PASS
	Ant1	2462	30~1000	6.77	-56.47	≤-13.23	PASS

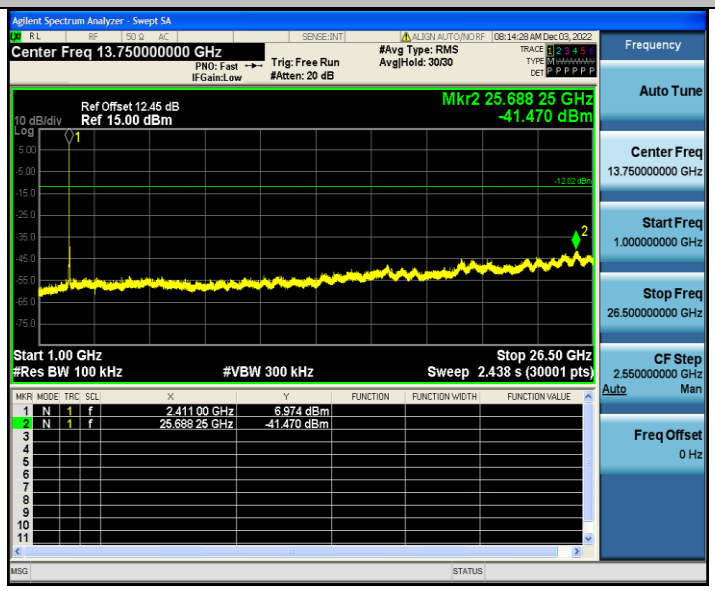
			1000~26500	6.77	-41.37	≤-13.23	PASS
	Ant2	2462	30~1000	6.75	-56.81	≤-13.25	PASS
			1000~26500	6.75	-41.84	≤-13.25	PASS
11G	Ant1	2412	30~1000	3.56	-56.58	≤-16.44	PASS
			1000~26500	3.56	-41.15	≤-16.44	PASS
	Ant2	2412	30~1000	3.59	-56.12	≤-16.41	PASS
			1000~26500	3.59	-40.99	≤-16.41	PASS
	Ant1	2437	30~1000	3.26	-56.71	≤-16.74	PASS
			1000~26500	3.26	-41.26	≤-16.74	PASS
	Ant2	2437	30~1000	2.89	-56.11	≤-17.11	PASS
			1000~26500	2.89	-41.66	≤-17.11	PASS
	Ant1	2462	30~1000	3.25	-57.12	≤-16.75	PASS
			1000~26500	3.25	-41.22	≤-16.75	PASS
	Ant2	2462	30~1000	2.53	-56.25	≤-17.47	PASS
			1000~26500	2.53	-40.83	≤-17.47	PASS
11N20SISO	Ant1	2412	30~1000	2.43	-56.23	≤-17.57	PASS
			1000~26500	2.43	-41.06	≤-17.57	PASS
	Ant2	2412	30~1000	3.05	-56.82	≤-16.95	PASS
			1000~26500	3.05	-41.5	≤-16.95	PASS
	Ant1	2437	30~1000	2.52	-56.83	≤-17.48	PASS
			1000~26500	2.52	-40.99	≤-17.48	PASS
	Ant2	2437	30~1000	2.02	-55.76	≤-17.98	PASS
			1000~26500	2.02	-40.32	≤-17.98	PASS
	Ant1	2462	30~1000	2.11	-56.36	≤-17.89	PASS
			1000~26500	2.11	-41.67	≤-17.89	PASS
	Ant2	2462	30~1000	2.43	-55.87	≤-17.57	PASS
			1000~26500	2.43	-41.89	≤-17.57	PASS
11N40SISO	Ant1	2422	Reference	-5.65	-5.65	---	PASS
			30~1000	-5.65	-56.45	≤-25.65	PASS

			1000~26500	-5.65	-40.34	≤-25.65	PASS
	Ant2	2422	Reference	-6.90	-6.90	---	PASS
			30~1000	-6.90	-57.44	≤-26.9	PASS
			1000~26500	-6.90	-41	≤-26.9	PASS
	Ant1	2437	Reference	-5.72	-5.72	---	PASS
			30~1000	-5.72	-55.94	≤-25.72	PASS
			1000~26500	-5.72	-41.79	≤-25.72	PASS
	Ant2	2437	Reference	-6.99	-6.99	---	PASS
			30~1000	-6.99	-58.25	≤-26.99	PASS
			1000~26500	-6.99	-40.98	≤-26.99	PASS
	Ant1	2452	Reference	-4.91	-4.91	---	PASS
			30~1000	-4.91	-56.68	≤-24.91	PASS
			1000~26500	-4.91	-41.26	≤-24.91	PASS
	Ant2	2452	Reference	-6.29	-6.29	---	PASS
			30~1000	-6.29	-57.81	≤-26.29	PASS
			1000~26500	-6.29	-41.22	≤-26.29	PASS

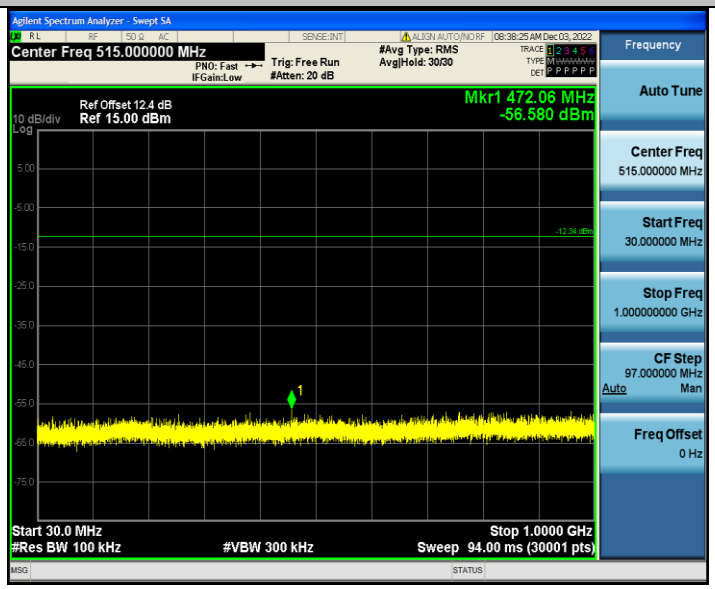
11B_Ant1_2412_30~1000



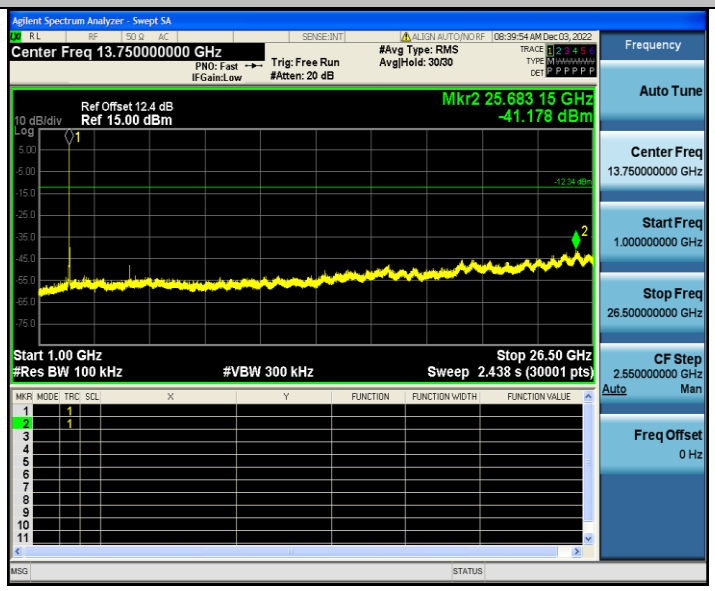
11B_Ant1_2412_1000~26500



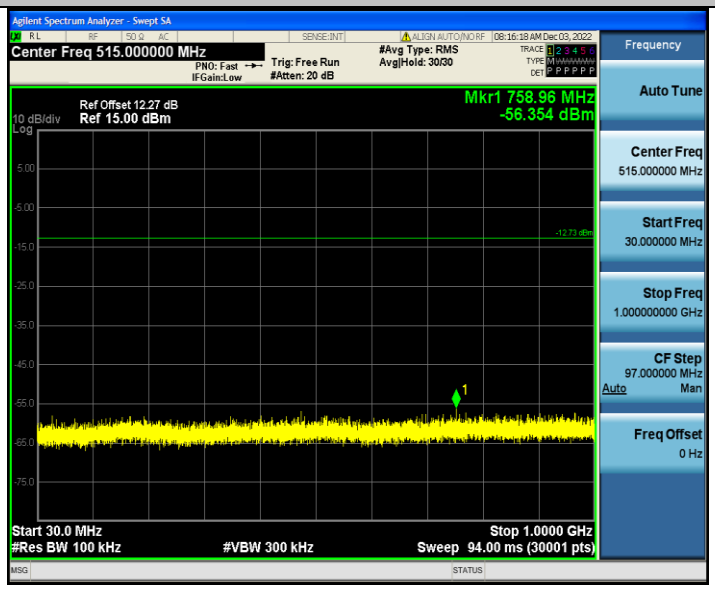
11B_Ant2_2412_30~1000



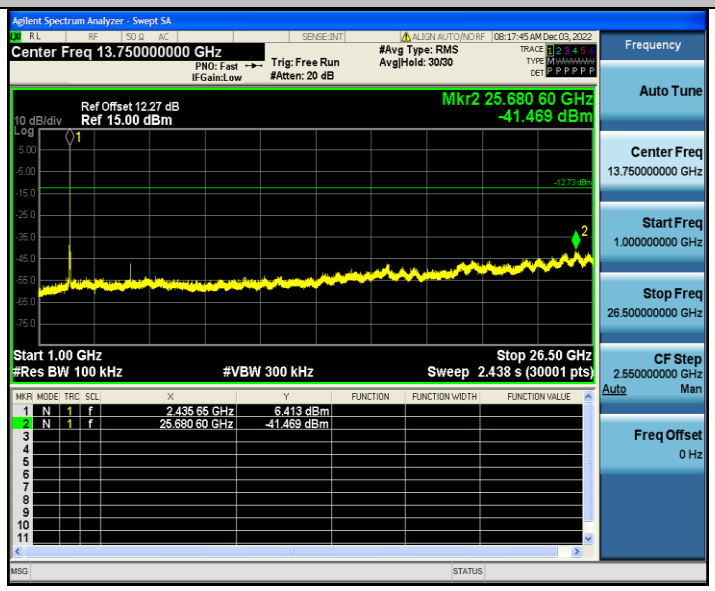
11B_Ant2_2412_1000~26500



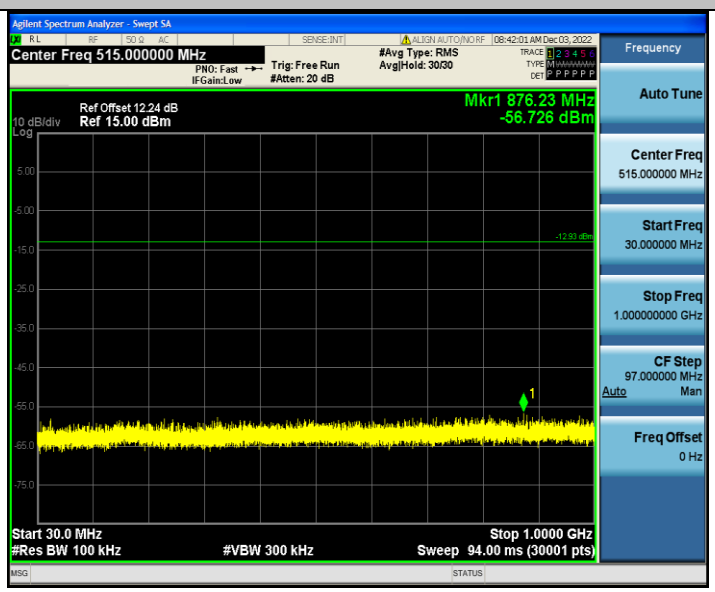
11B_Ant1_2437_30~1000



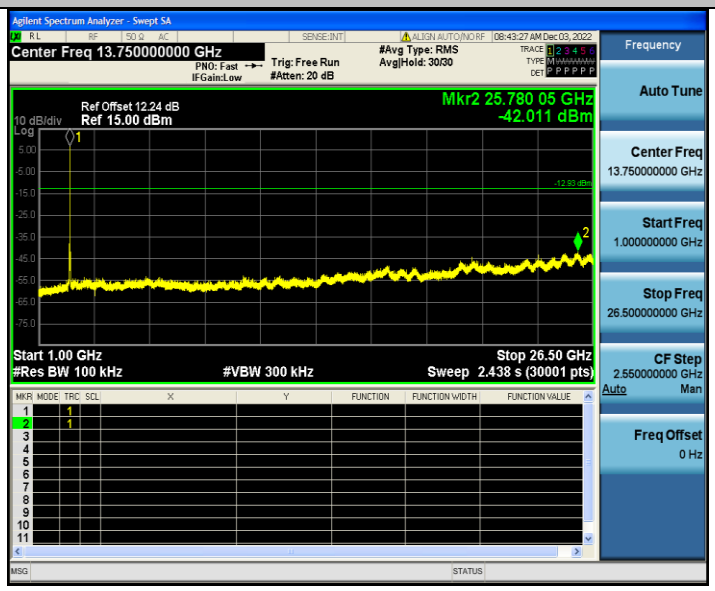
11B_Ant1_2437_1000~26500



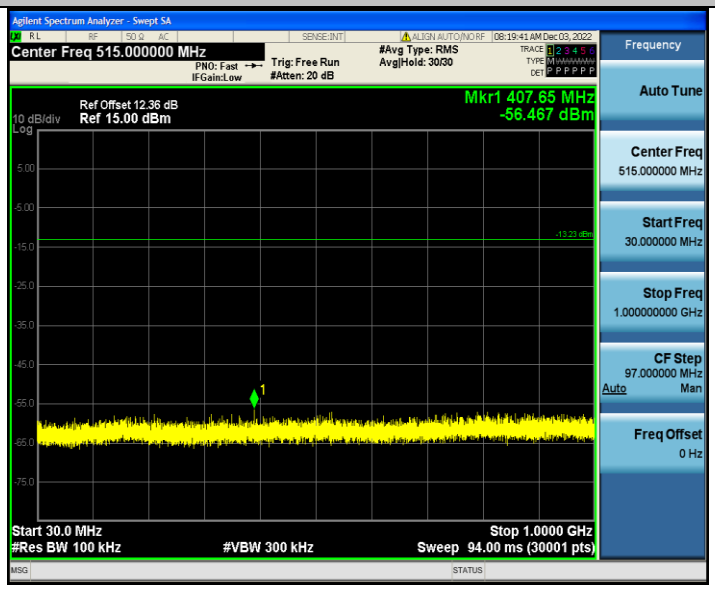
11B_Ant2_2437_30~1000



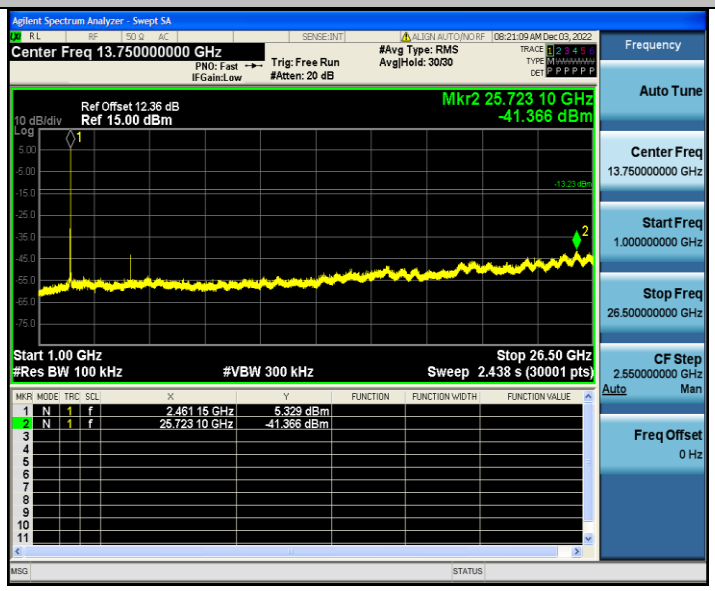
11B_Ant2_2437_1000~26500



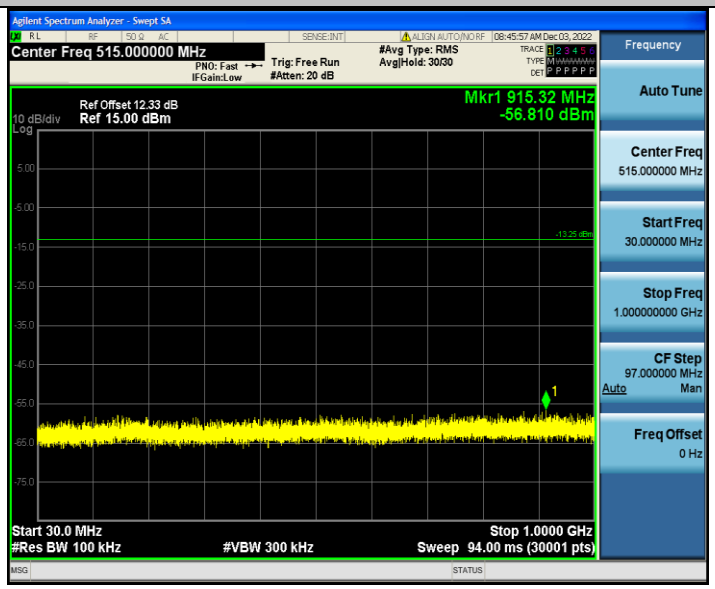
11B_Ant1_2462_30~1000



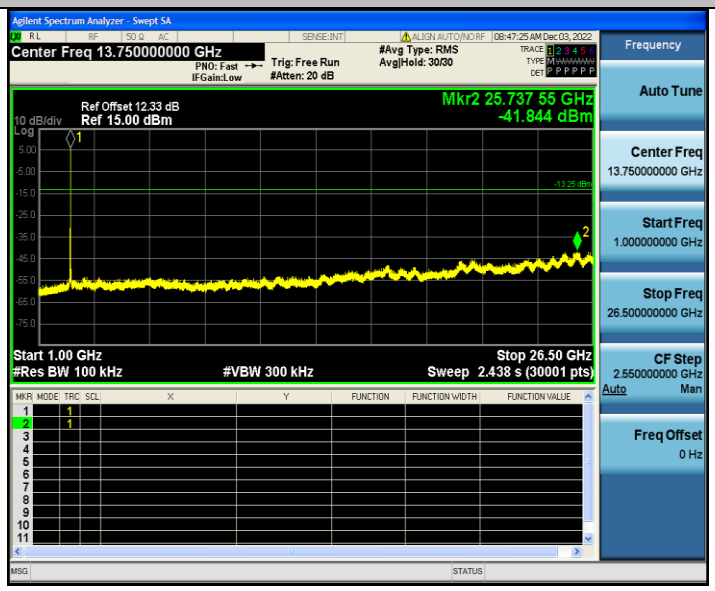
11B_Ant1_2462_1000~26500



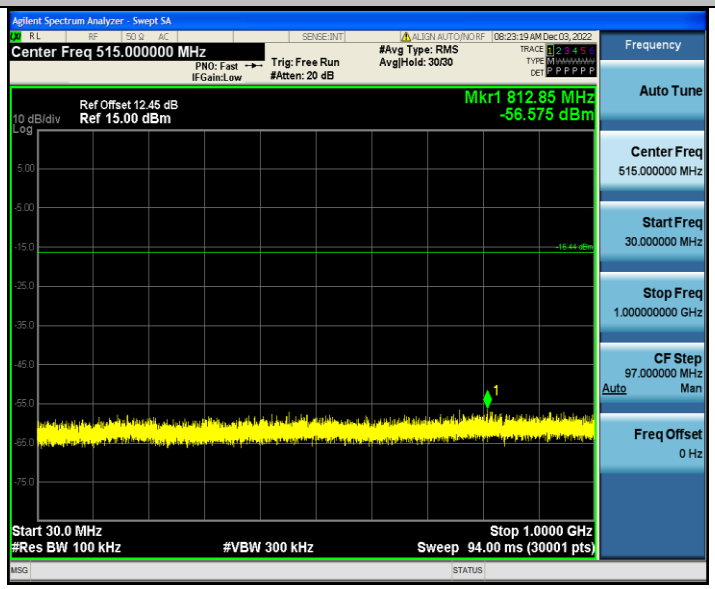
11B_Ant2_2462_30~1000



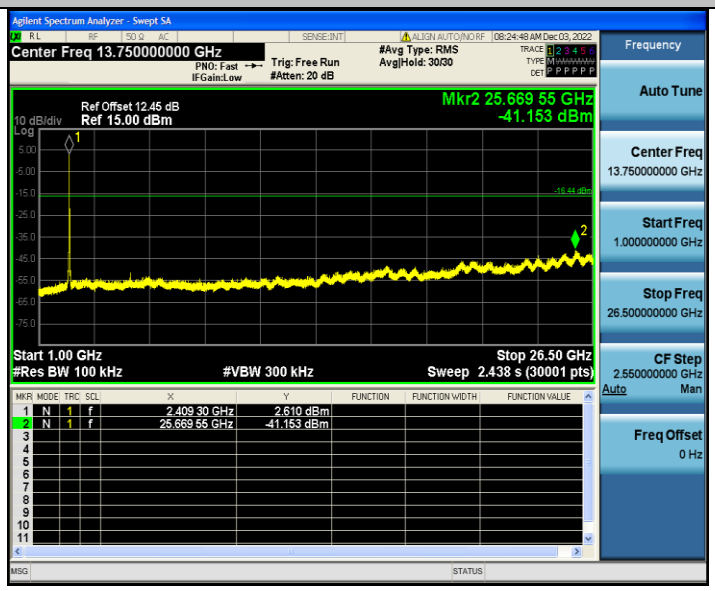
11B_Ant2_2462_1000~26500



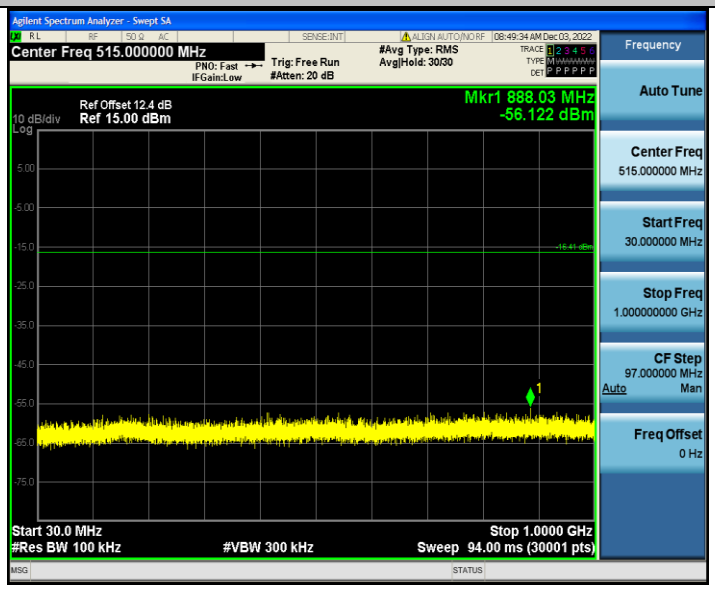
11G_Ant1_2412_30~1000



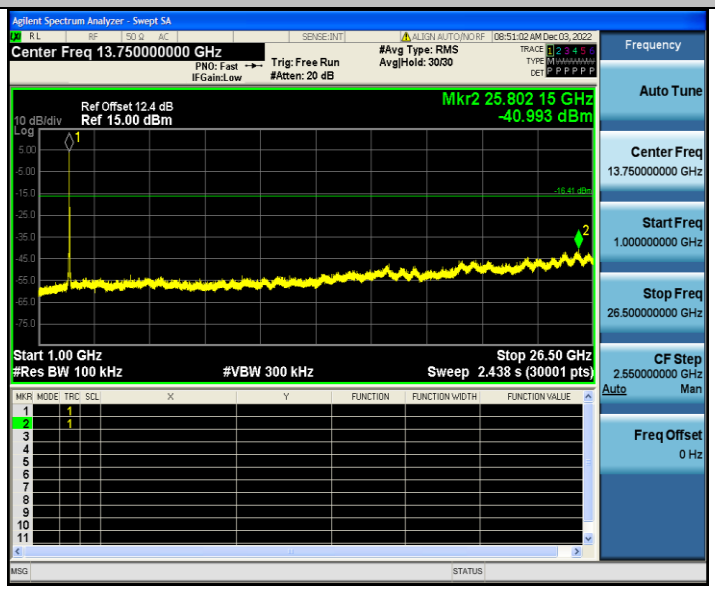
11G_Ant1_2412_1000~26500



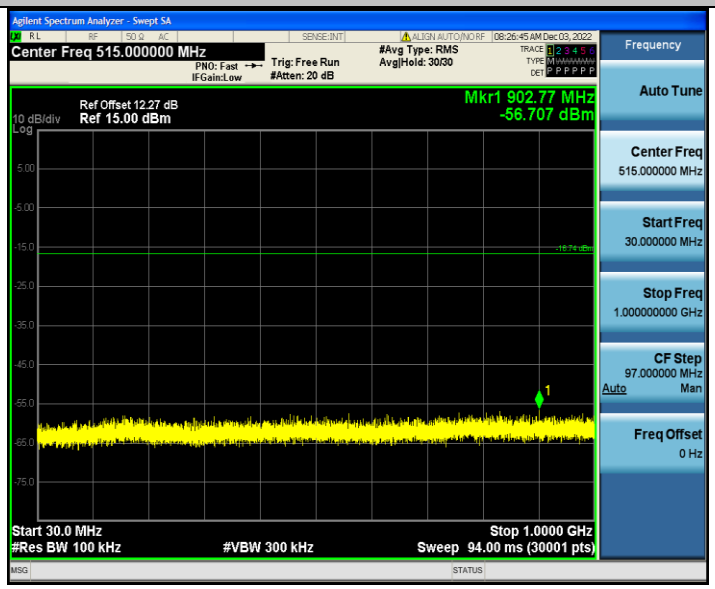
11G_Ant2_2412_30~1000



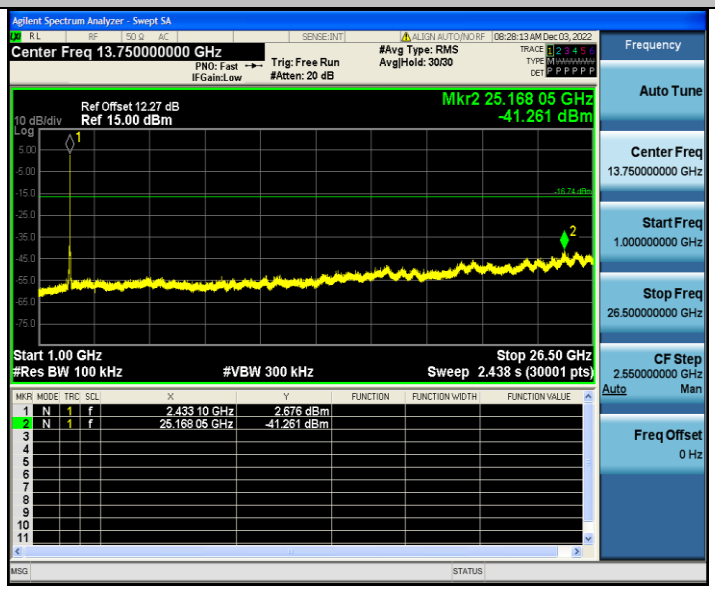
11G_Ant2_2412_1000~26500



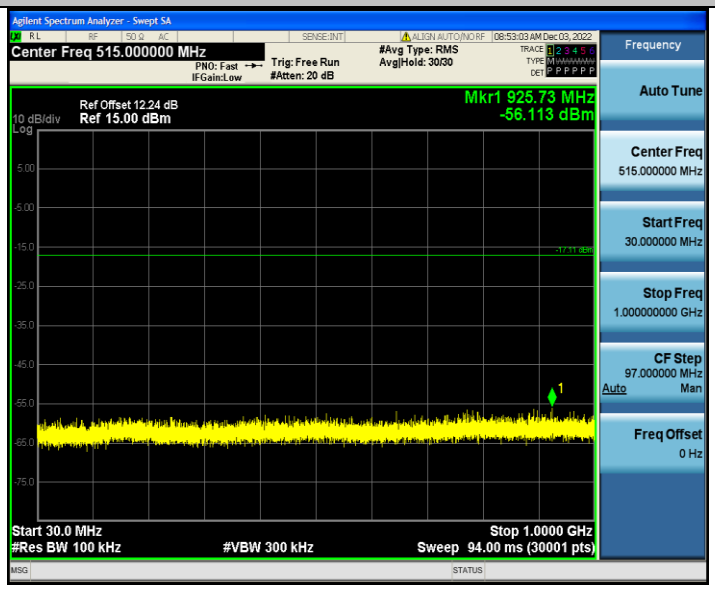
11G_Ant1_2437_30~1000



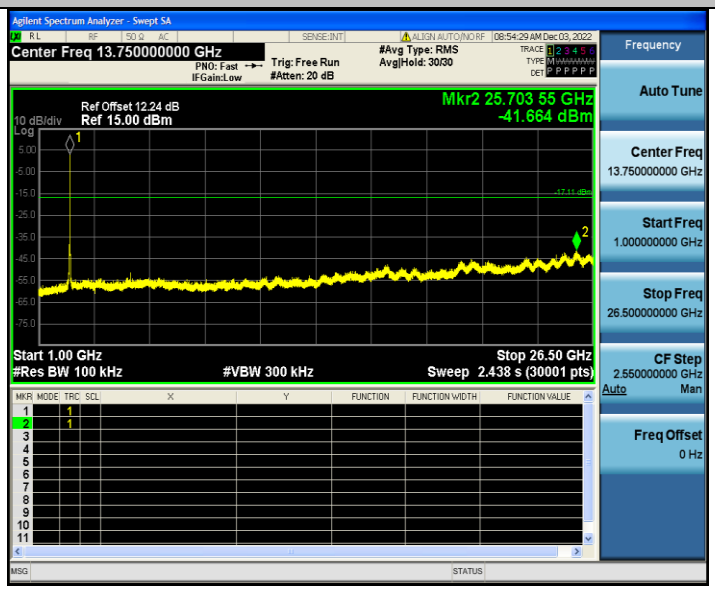
11G_Ant1_2437_1000~26500



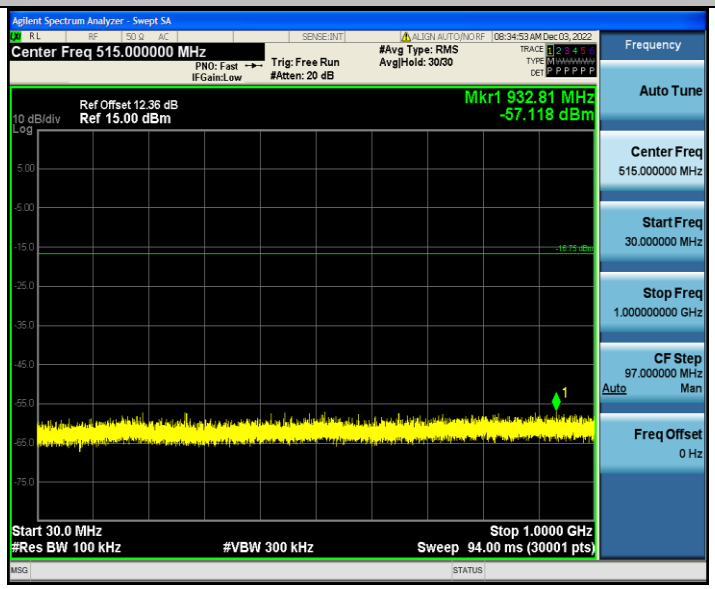
11G_Ant2_2437_30~1000



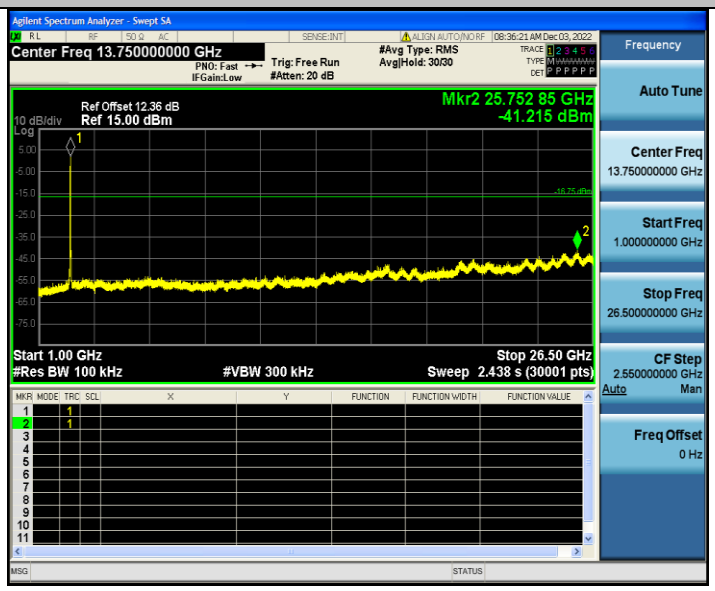
11G_Ant2_2437_1000~26500



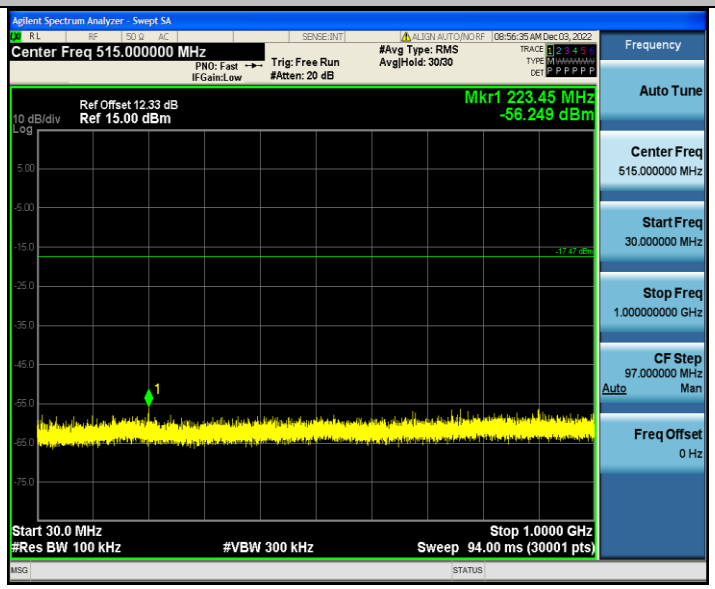
11G_Ant1_2462_30~1000



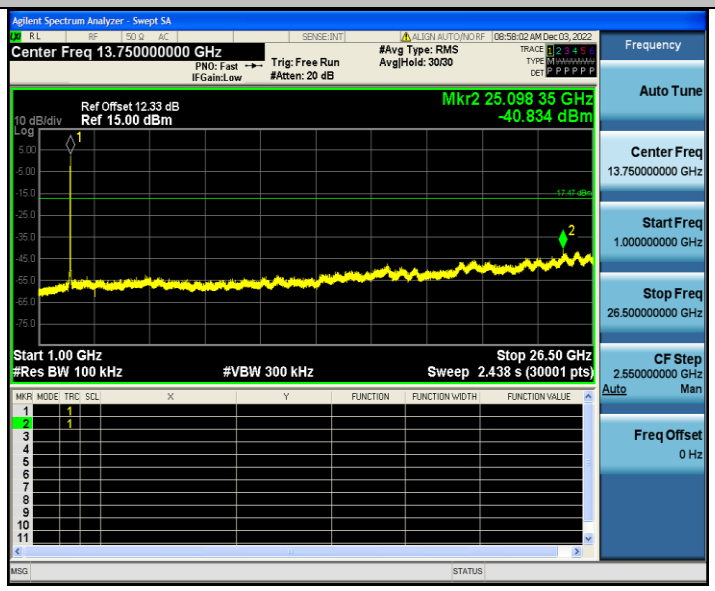
11G_Ant1_2462_1000~26500



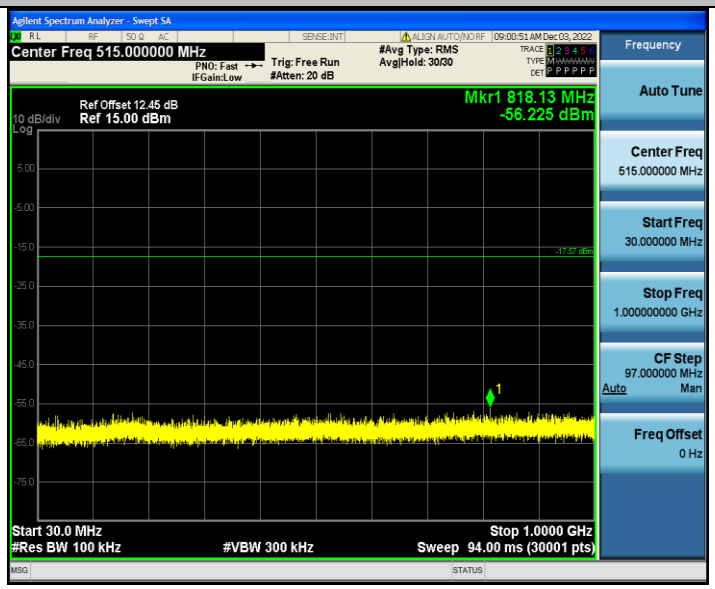
11G_Ant2_2462_30~1000



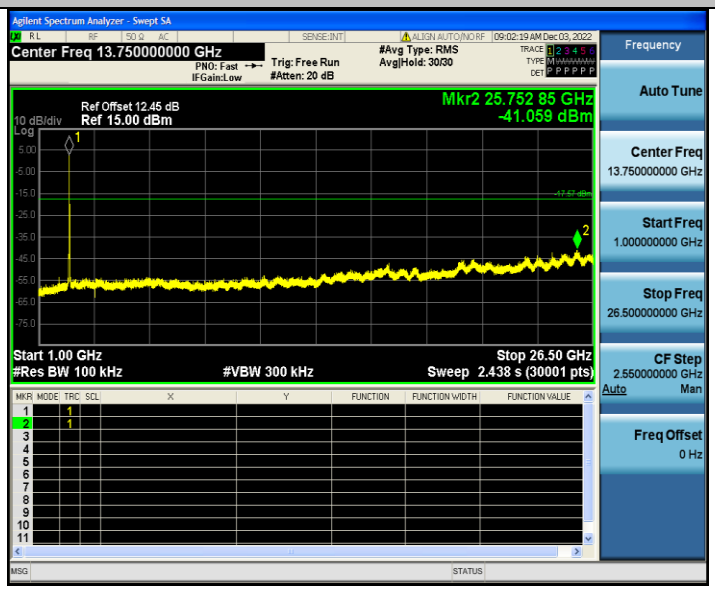
11G_Ant2_2462_1000~26500



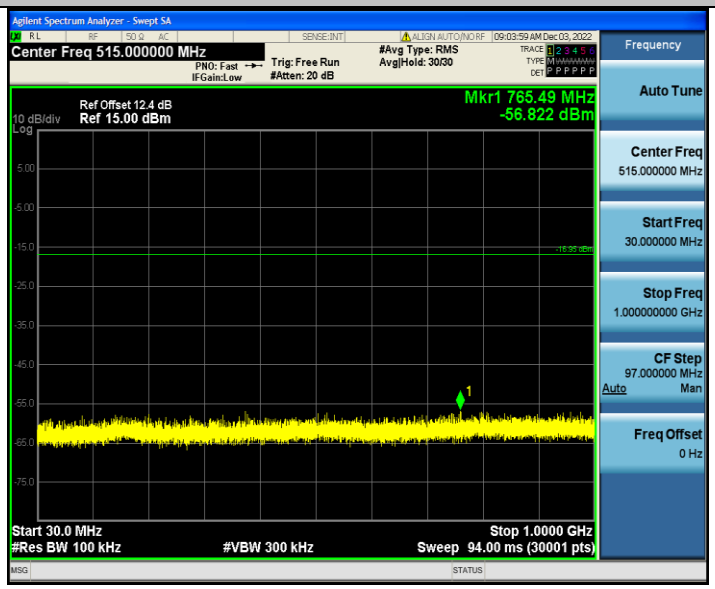
11N20SISO_Ant1_2412_30~1000



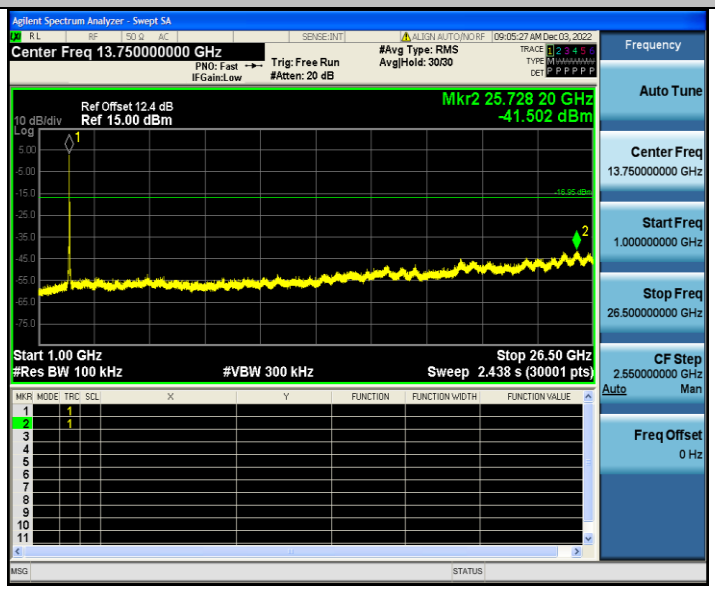
11N20SISO_Ant1_2412_1000~26500



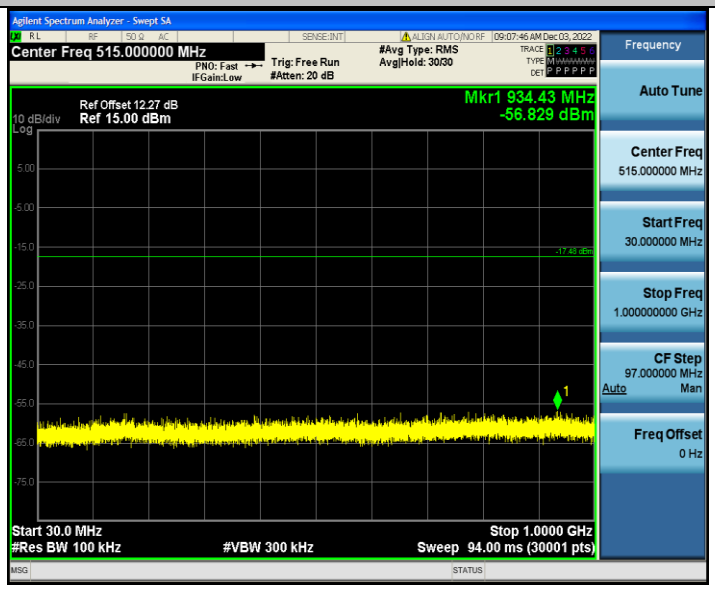
11N20SISO_Ant2_2412_30~1000



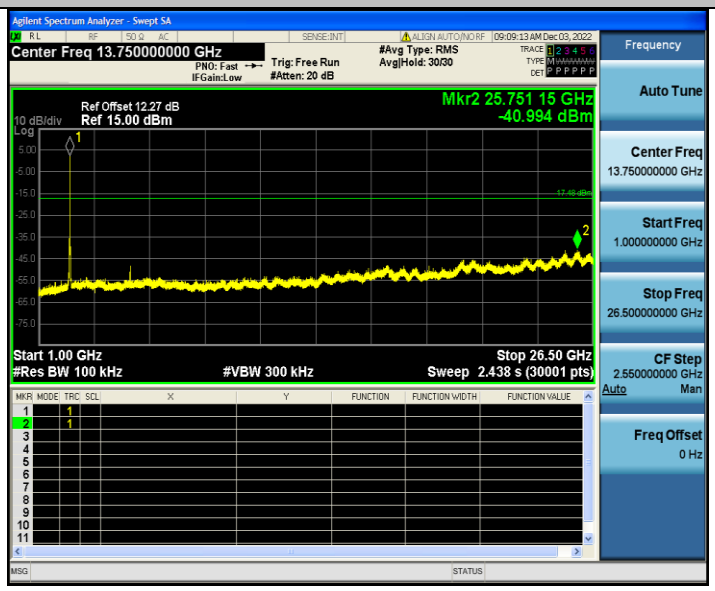
11N20SISO_Ant2_2412_1000~26500



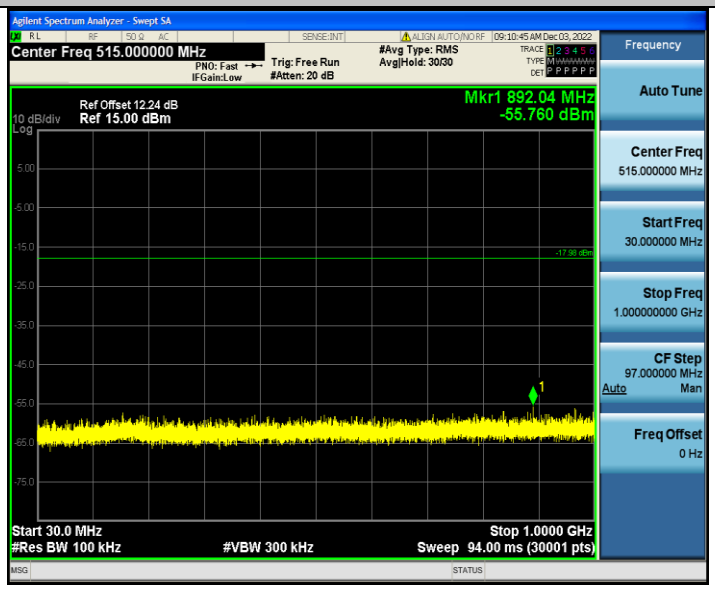
11N20SISO_Ant1_2437_30~1000



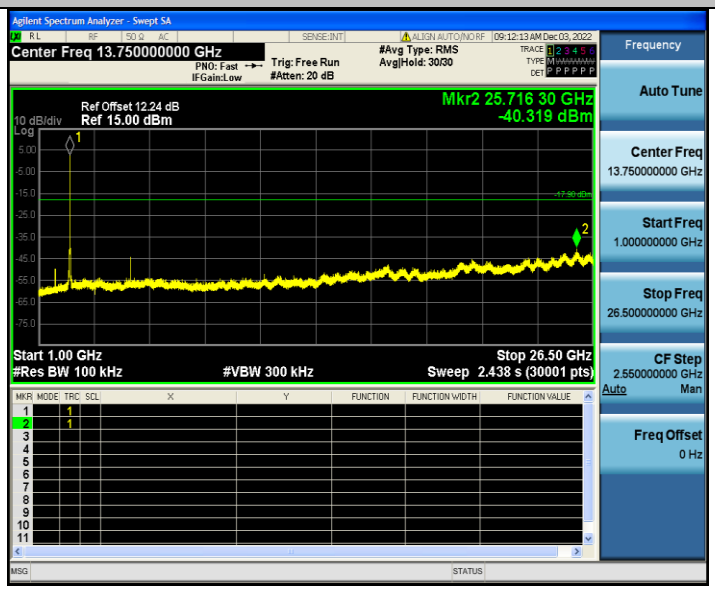
11N20SISO_Ant1_2437_1000~26500



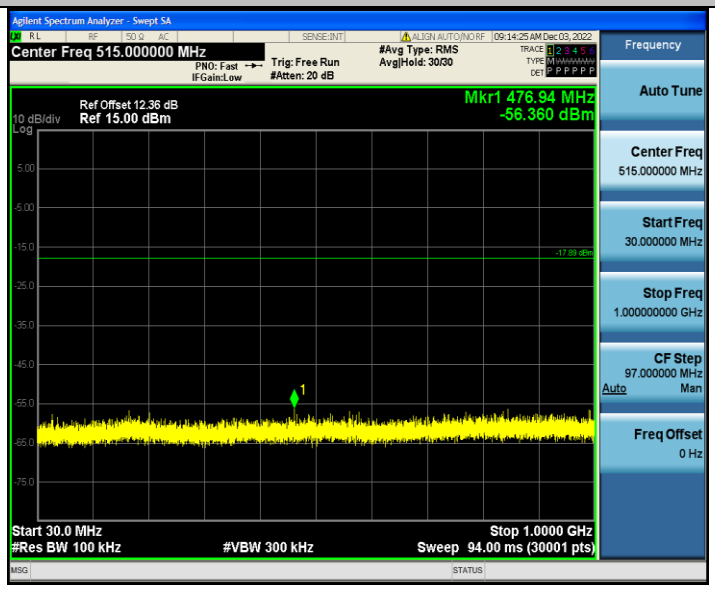
11N20SISO_Ant2_2437_30~1000



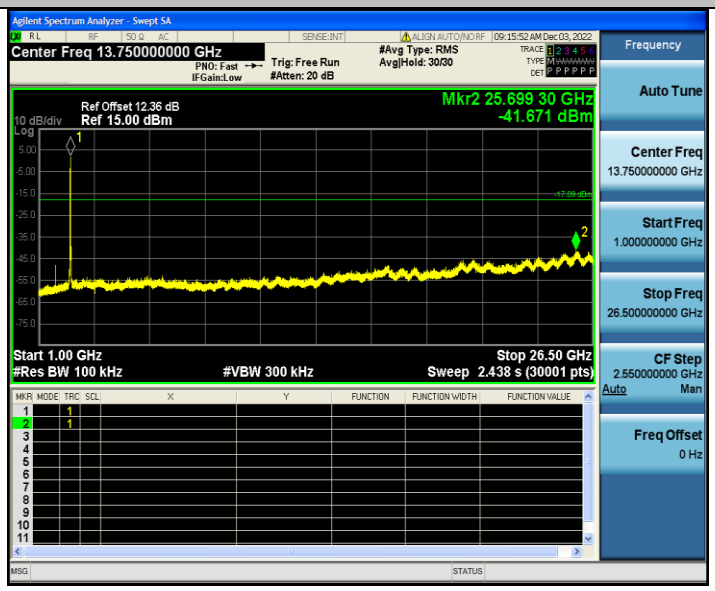
11N20SISO_Ant2_2437_1000~26500



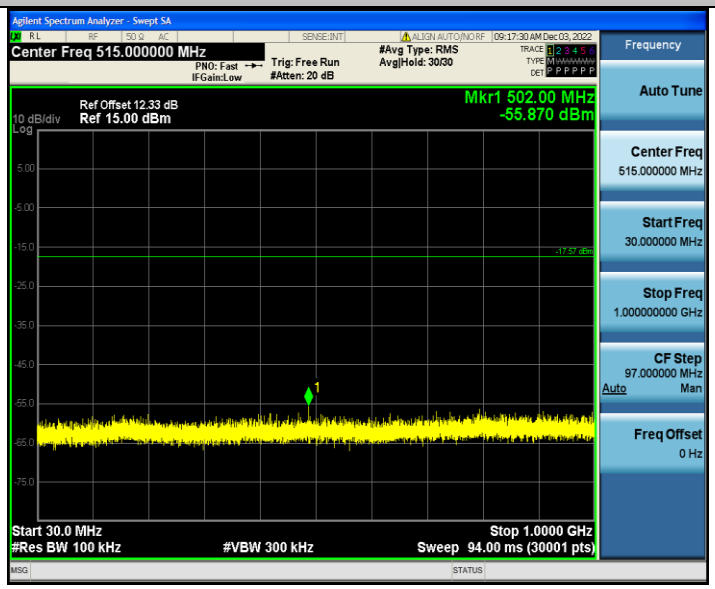
11N20SISO_Ant1_2462_30~1000



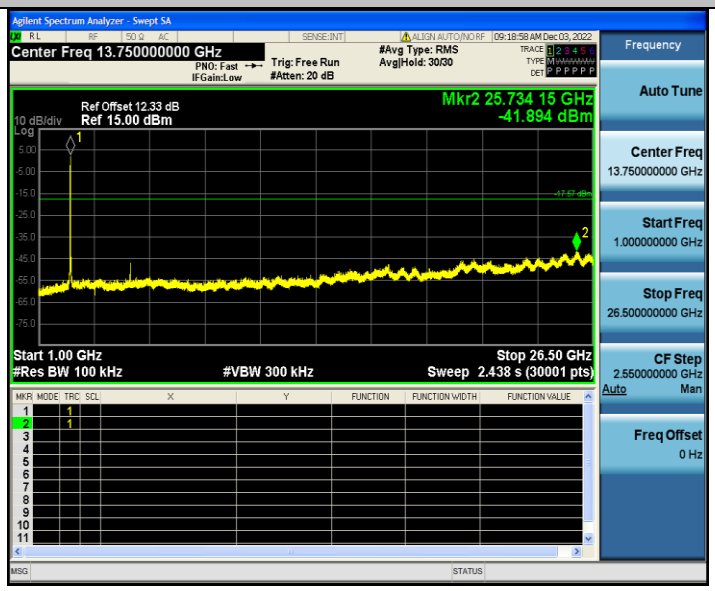
11N20SISO_Ant1_2462_1000~26500



11N20SISO_Ant2_2462_30~1000



11N20SISO_Ant2_2462_1000~26500



Emissions in Restricted Bands

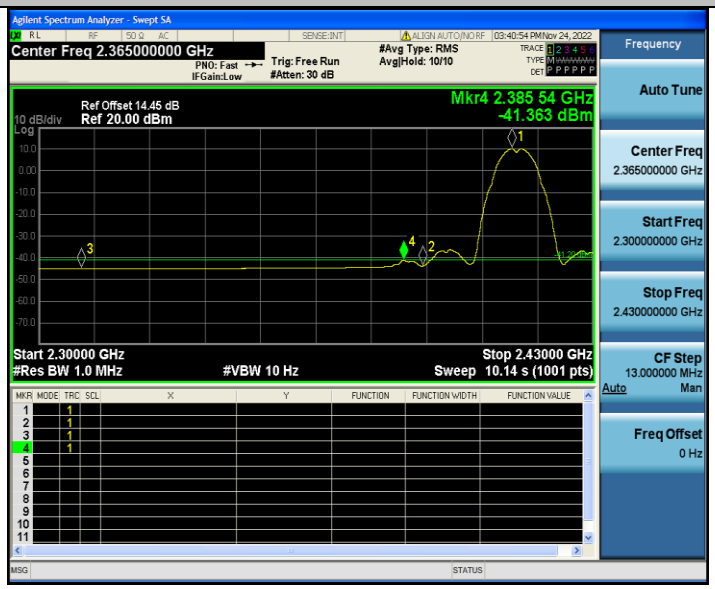
TestMode	Antenna	ChName	Frequency[MHz]	Detector	Freq [MHz]	Result [dBm]	Limit [dBm]	Result [dBuV/m]	Limit [dBuV/m]	Verdict
11B	Ant1	Low	2412	AV	2310.000	-45.06	≤-41.20	50.14	≤54	PASS
				AV	2385.540	-41.36	≤-41.20	53.84	≤54	PASS
				AV	2390.000	-43.92	≤-41.20	51.28	≤54	PASS
				Peak	2310.000	-44.44	≤-21.20	50.76	≤74	PASS
				Peak	2386.580	-36.09	≤-21.20	59.11	≤74	PASS
				Peak	2390.000	-44.9	≤-21.20	50.30	≤74	PASS
	Ant2	Low	2412	AV	2310.000	-45.15	≤-41.20	50.05	≤54	PASS
				AV	2385.540	-42.55	≤-41.20	52.65	≤54	PASS
				AV	2390.000	-44.32	≤-41.20	50.88	≤54	PASS
				Peak	2310.000	-38.78	≤-21.20	56.42	≤74	PASS
				Peak	2383.200	-35.86	≤-21.20	59.34	≤74	PASS
				Peak	2390.000	-39.69	≤-21.20	55.51	≤74	PASS

	Ant1	High	2462	AV	2483.500	-43.73	≤-41.20	51.47	≤54	PASS
				AV	2488.400	-42.39	≤-41.20	52.81	≤54	PASS
				AV	2500.000	-44.41	≤-41.20	50.79	≤54	PASS
				Peak	2483.500	-41.59	≤-21.20	53.61	≤74	PASS
				Peak	2488.070	-36.02	≤-21.20	59.18	≤74	PASS
				Peak	2500.000	-38.2	≤-21.20	57.00	≤74	PASS
	Ant2	High	2462	AV	2483.500	-44.16	≤-41.20	51.04	≤54	PASS
				AV	2486.640	-43.36	≤-41.20	51.84	≤54	PASS
				AV	2500.000	-44.58	≤-41.20	50.62	≤54	PASS
				Peak	2483.500	-40.97	≤-21.20	54.23	≤74	PASS
				Peak	2499.950	-36.21	≤-21.20	58.99	≤74	PASS
				Peak	2500.000	-36.21	≤-21.20	58.99	≤74	PASS
11G	Ant1	Low	2412	AV	2310.000	-44.64	≤-41.20	50.56	≤54	PASS
				AV	2389.960	-41.88	≤-41.20	53.32	≤54	PASS
				AV	2390.000	-41.88	≤-41.20	53.32	≤54	PASS
				Peak	2310.000	-45.6	≤-21.20	49.60	≤74	PASS
				Peak	2389.960	-34.64	≤-21.20	60.56	≤74	PASS
				Peak	2390.000	-34.64	≤-21.20	60.56	≤74	PASS
	Ant2	Low	2412	AV	2310.000	-44.65	≤-41.20	50.55	≤54	PASS
				AV	2389.960	-41.64	≤-41.20	53.56	≤54	PASS
				AV	2390.000	-41.64	≤-41.20	53.56	≤54	PASS
				Peak	2310.000	-47.04	≤-21.20	48.16	≤74	PASS
				Peak	2385.150	-32.4	≤-21.20	62.80	≤74	PASS
				Peak	2390.000	-44.04	≤-21.20	51.16	≤74	PASS
	Ant1	High	2462	AV	2483.500	-42.44	≤-41.20	52.76	≤54	PASS
				AV	2483.670	-42.43	≤-41.20	52.77	≤54	PASS
				AV	2500.000	-43.79	≤-41.20	51.41	≤54	PASS
				Peak	2483.500	-41.12	≤-21.20	54.08	≤74	PASS
				Peak	2489.280	-31.53	≤-21.20	63.67	≤74	PASS
				Peak	2500.000	-44.45	≤-21.20	50.75	≤74	PASS

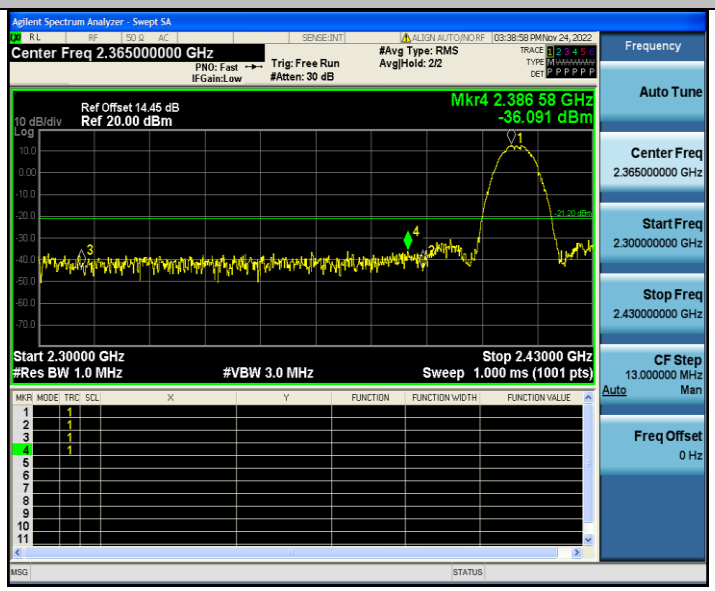
	Ant2	High	2462	AV	2483.500	-42.28	≤-41.20	52.92	≤54	PASS
				AV	2483.670	-42.38	≤-41.20	52.82	≤54	PASS
				AV	2500.000	-43.79	≤-41.20	51.41	≤54	PASS
				Peak	2483.500	-40.44	≤-21.20	54.76	≤74	PASS
				Peak	2488.730	-33.96	≤-21.20	61.24	≤74	PASS
				Peak	2500.000	-45.44	≤-21.20	49.76	≤74	PASS
11N20SISO	Ant1	Low	2412	AV	2310.000	-44.63	≤-41.20	50.57	≤54	PASS
				AV	2389.700	-41.97	≤-41.20	53.23	≤54	PASS
				AV	2390.000	-42.16	≤-41.20	53.04	≤54	PASS
				Peak	2310.000	-43.89	≤-21.20	51.31	≤74	PASS
				Peak	2372.670	-35.39	≤-21.20	59.81	≤74	PASS
				Peak	2390.000	-41.45	≤-21.20	53.75	≤74	PASS
	Ant2	Low	2412	AV	2310.000	-44.63	≤-41.20	50.57	≤54	PASS
				AV	2389.700	-42.1	≤-41.20	53.10	≤54	PASS
				AV	2390.000	-42.32	≤-41.20	52.88	≤54	PASS
				Peak	2310.000	-40.9	≤-21.20	54.30	≤74	PASS
				Peak	2389.570	-35.05	≤-21.20	60.15	≤74	PASS
				Peak	2390.000	-40.74	≤-21.20	54.46	≤74	PASS
	Ant1	High	2462	AV	2483.500	-42.93	≤-41.20	52.27	≤54	PASS
				AV	2484.000	-42.49	≤-41.20	52.71	≤54	PASS
				AV	2500.000	-43.97	≤-41.20	51.23	≤54	PASS
				Peak	2483.500	-41.2	≤-21.20	54.00	≤74	PASS
				Peak	2485.210	-35.78	≤-21.20	59.42	≤74	PASS
				Peak	2500.000	-38.39	≤-21.20	56.81	≤74	PASS
	Ant2	High	2462	AV	2483.500	-42.95	≤-41.20	52.25	≤54	PASS
				AV	2484.660	-42.7	≤-41.20	52.50	≤54	PASS
				AV	2500.000	-43.88	≤-41.20	51.32	≤54	PASS
				Peak	2483.500	-39.17	≤-21.20	56.03	≤74	PASS
				Peak	2487.850	-35.2	≤-21.20	60.00	≤74	PASS
				Peak	2500.000	-44.56	≤-21.20	50.64	≤74	PASS
11N40SISO	Ant1	Low	2422	AV	2310.000	-45.53	≤-41.20	49.67	≤54	PASS

				AV	2389.960	-44.96	≤-41.20	50.24	≤54	PASS
				AV	2390.000	-44.96	≤-41.20	50.24	≤54	PASS
				Peak	2310.000	-41.84	≤-21.20	53.36	≤74	PASS
				Peak	2320.930	-35.18	≤-21.20	60.02	≤74	PASS
				Peak	2390.000	-39.68	≤-21.20	55.52	≤74	PASS
	Ant2	Low	2422	AV	2310.000	-45.51	≤-41.20	49.69	≤54	PASS
				AV	2389.830	-45.12	≤-41.20	50.08	≤54	PASS
				AV	2390.000	-45.12	≤-41.20	50.08	≤54	PASS
				Peak	2310.000	-39.45	≤-21.20	55.75	≤74	PASS
				Peak	2320.540	-35.36	≤-21.20	59.84	≤74	PASS
				Peak	2390.000	-37.49	≤-21.20	57.71	≤74	PASS
	Ant1	High	2452	AV	2483.500	-44.72	≤-41.20	50.48	≤54	PASS
				AV	2483.670	-44.71	≤-41.20	50.49	≤54	PASS
				AV	2500.000	-44.86	≤-41.20	50.34	≤54	PASS
				Peak	2483.500	-35.93	≤-21.20	59.27	≤74	PASS
				Peak	2488.180	-35.66	≤-21.20	59.54	≤74	PASS
				Peak	2500.000	-38.54	≤-21.20	56.66	≤74	PASS
	Ant2	High	2452	AV	2483.500	-44.63	≤-41.20	50.57	≤54	PASS
				AV	2483.560	-44.63	≤-41.20	50.57	≤54	PASS
				AV	2500.000	-44.87	≤-41.20	50.33	≤54	PASS
				Peak	2483.500	-40.27	≤-21.20	54.93	≤74	PASS
				Peak	2484.110	-36.29	≤-21.20	58.91	≤74	PASS
				Peak	2500.000	-40.88	≤-21.20	54.32	≤74	PASS

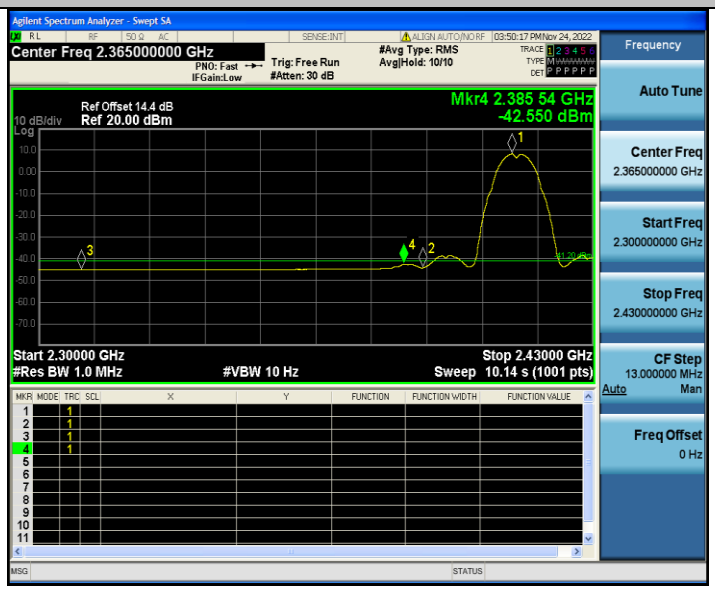
11B_Ant1_Low_2412_AV



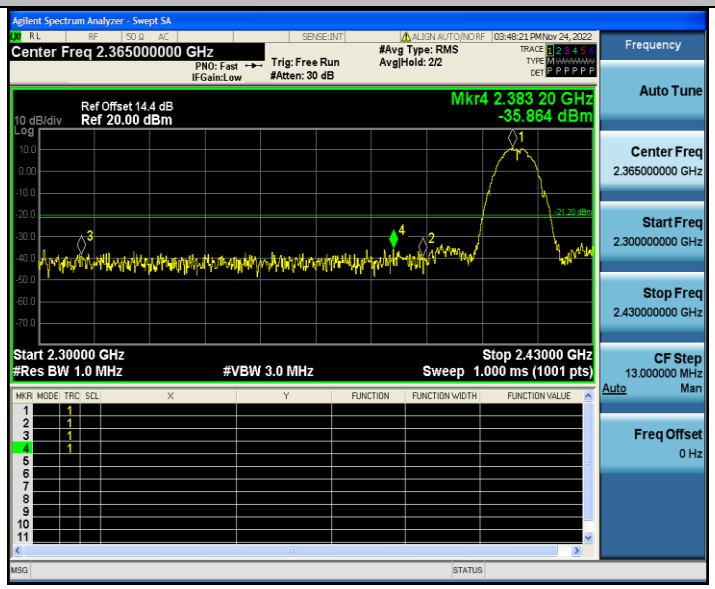
11B_Ant1_Low_2412_Peak



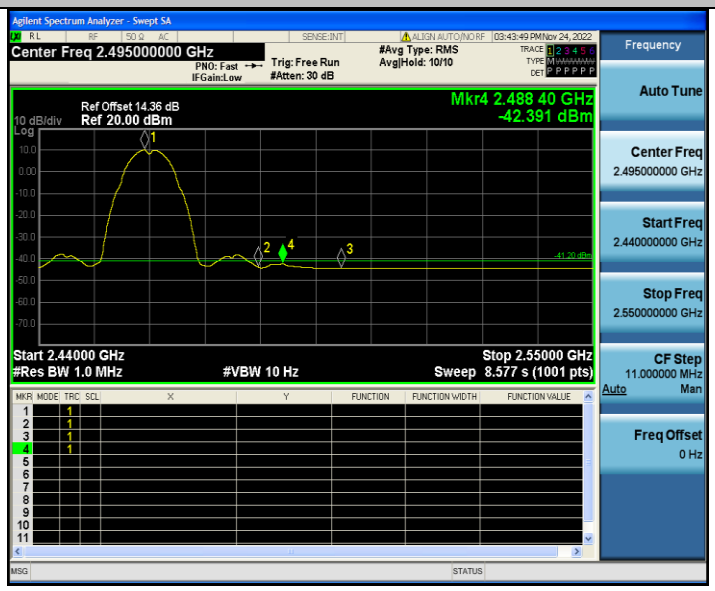
11B_Ant2_Low_2412_AV



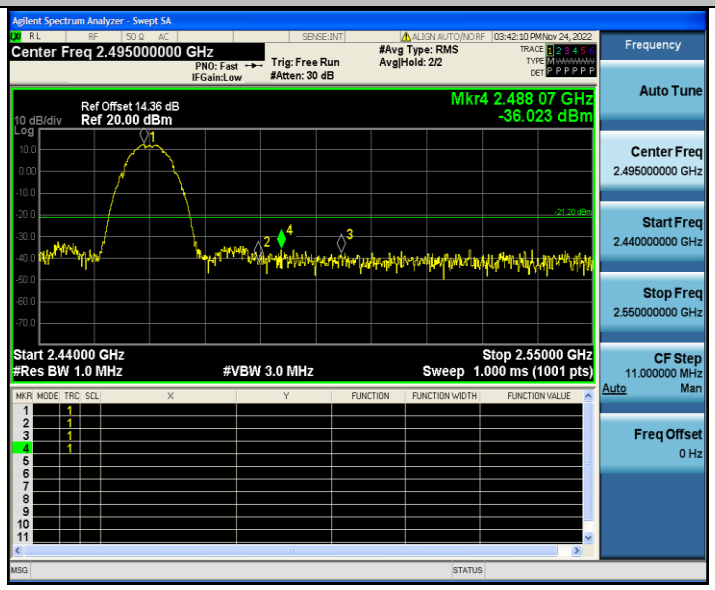
11B_Ant2_Low_2412_Peak



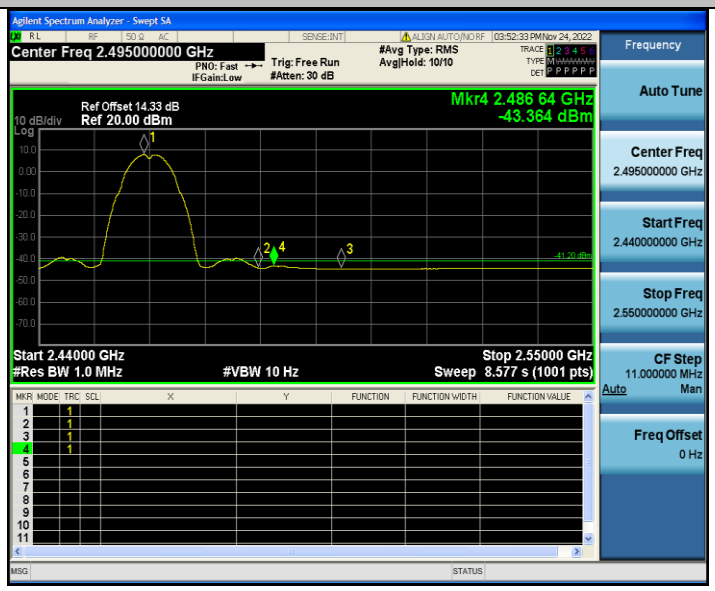
11B_Ant1_High_2462_AV



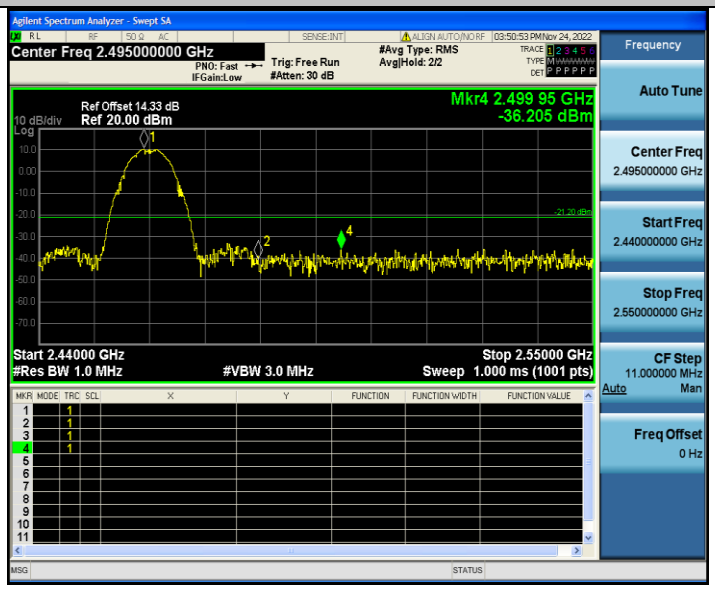
11B_Ant1_High_2462_Peak



11B_Ant2_High_2462_AV



11B_Ant2_High_2462_Peak



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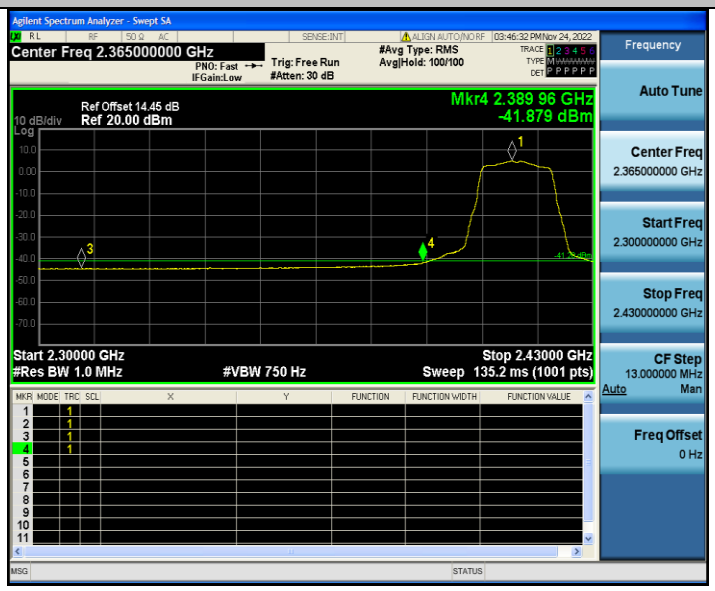

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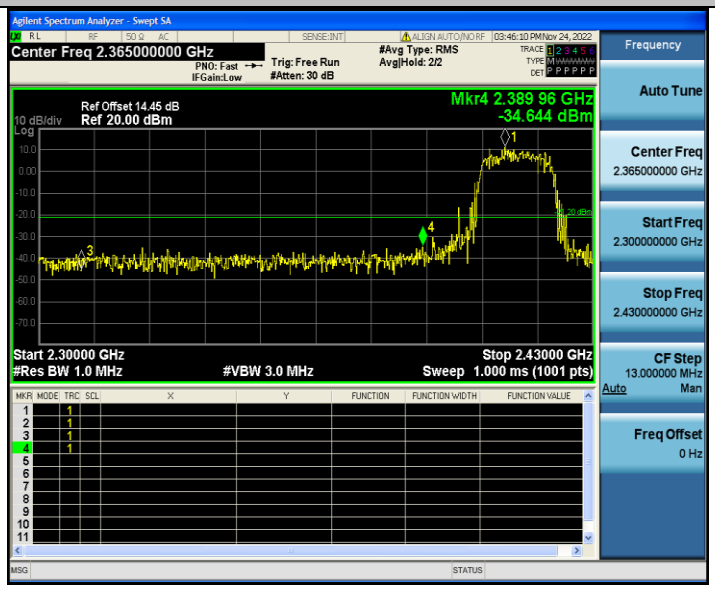

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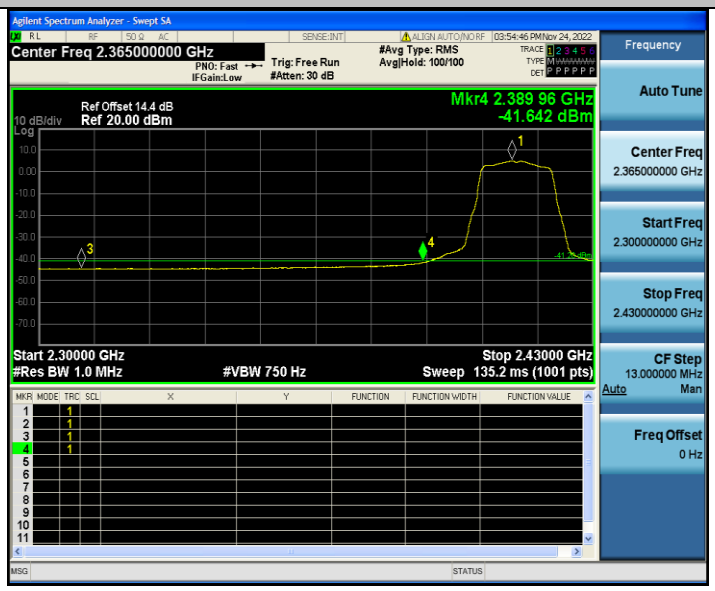

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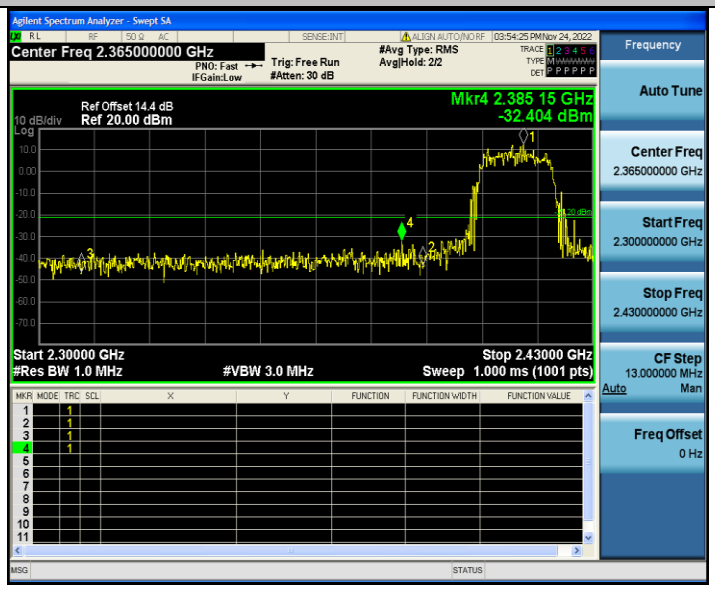

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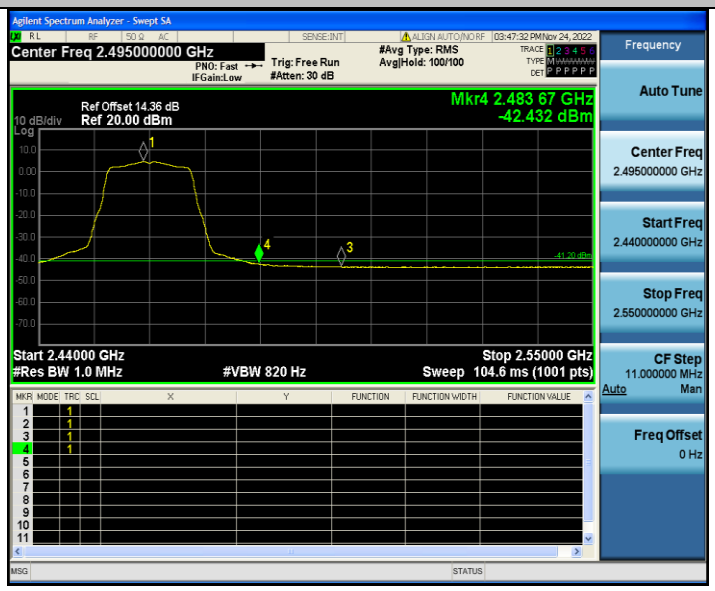

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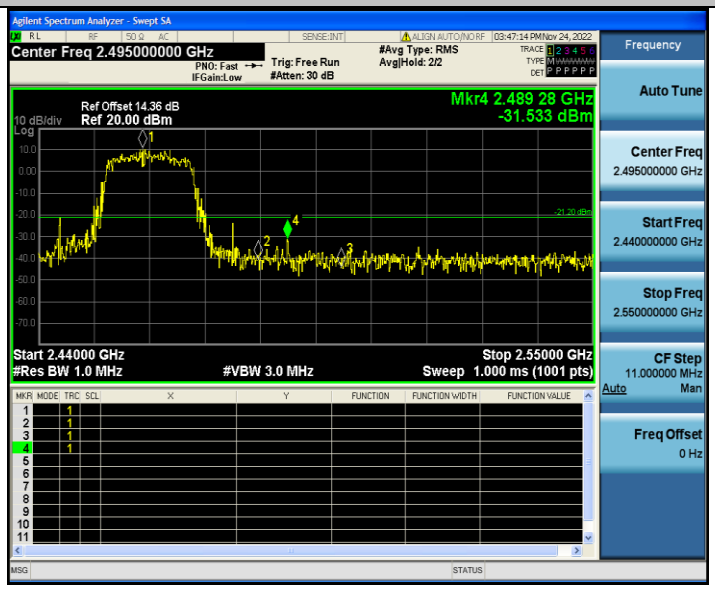

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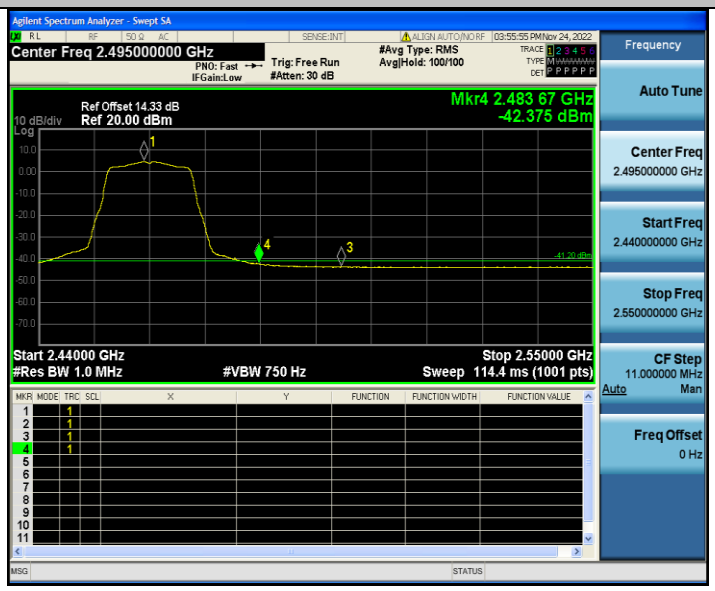

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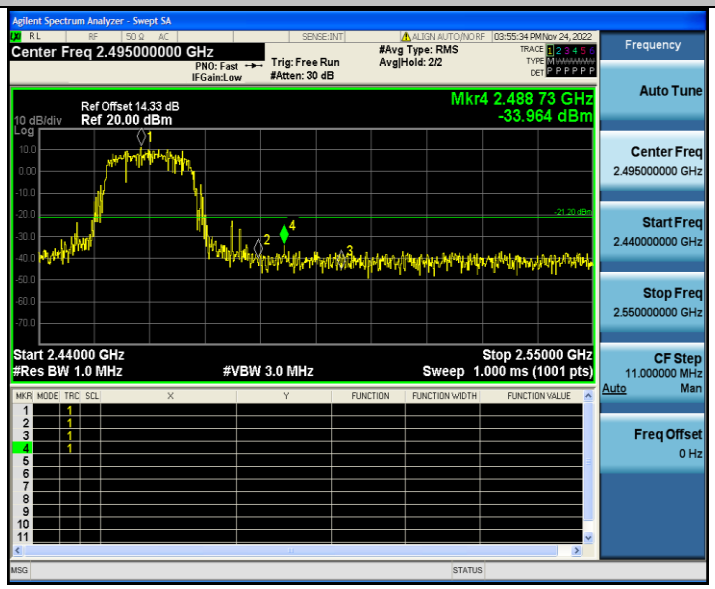
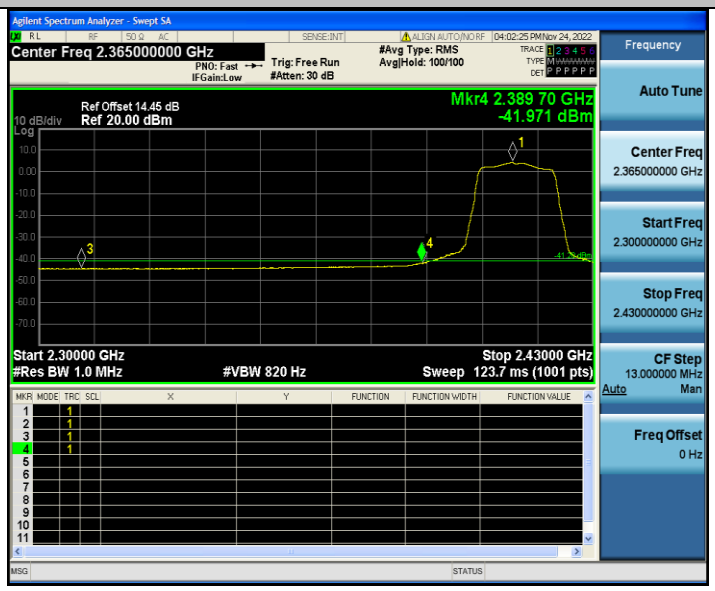
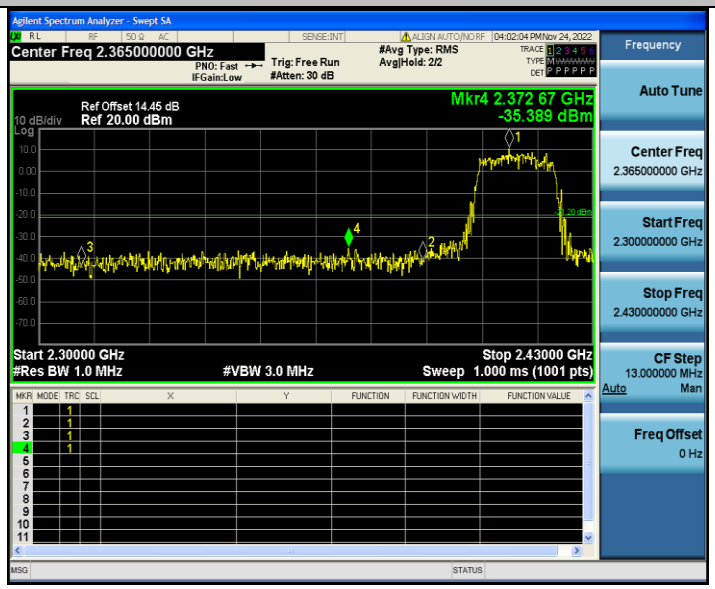


11N20SISO_Ant1_Low_2412_AV



11N20SISO_Ant1_Low_2412_Peak