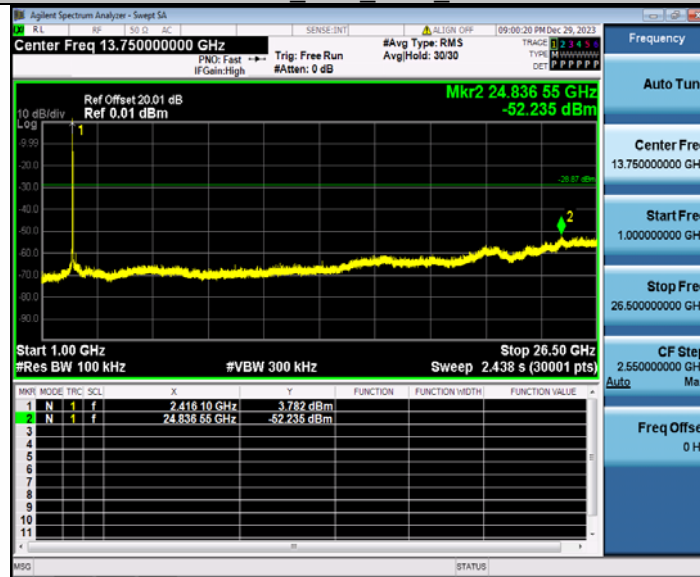
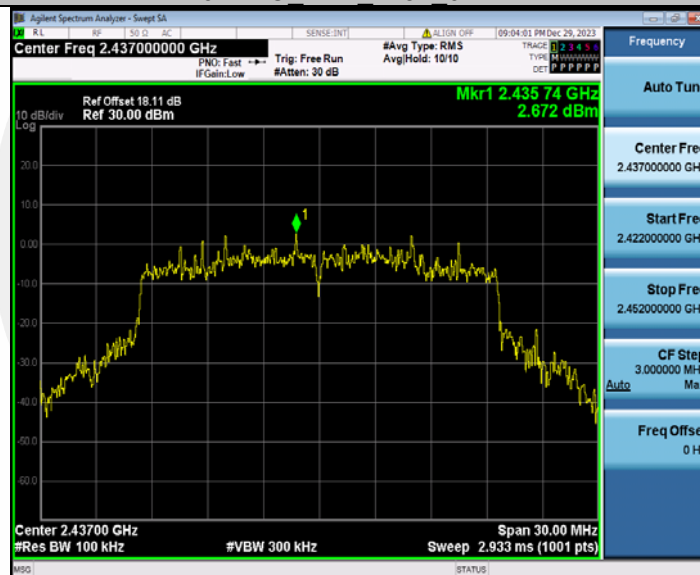


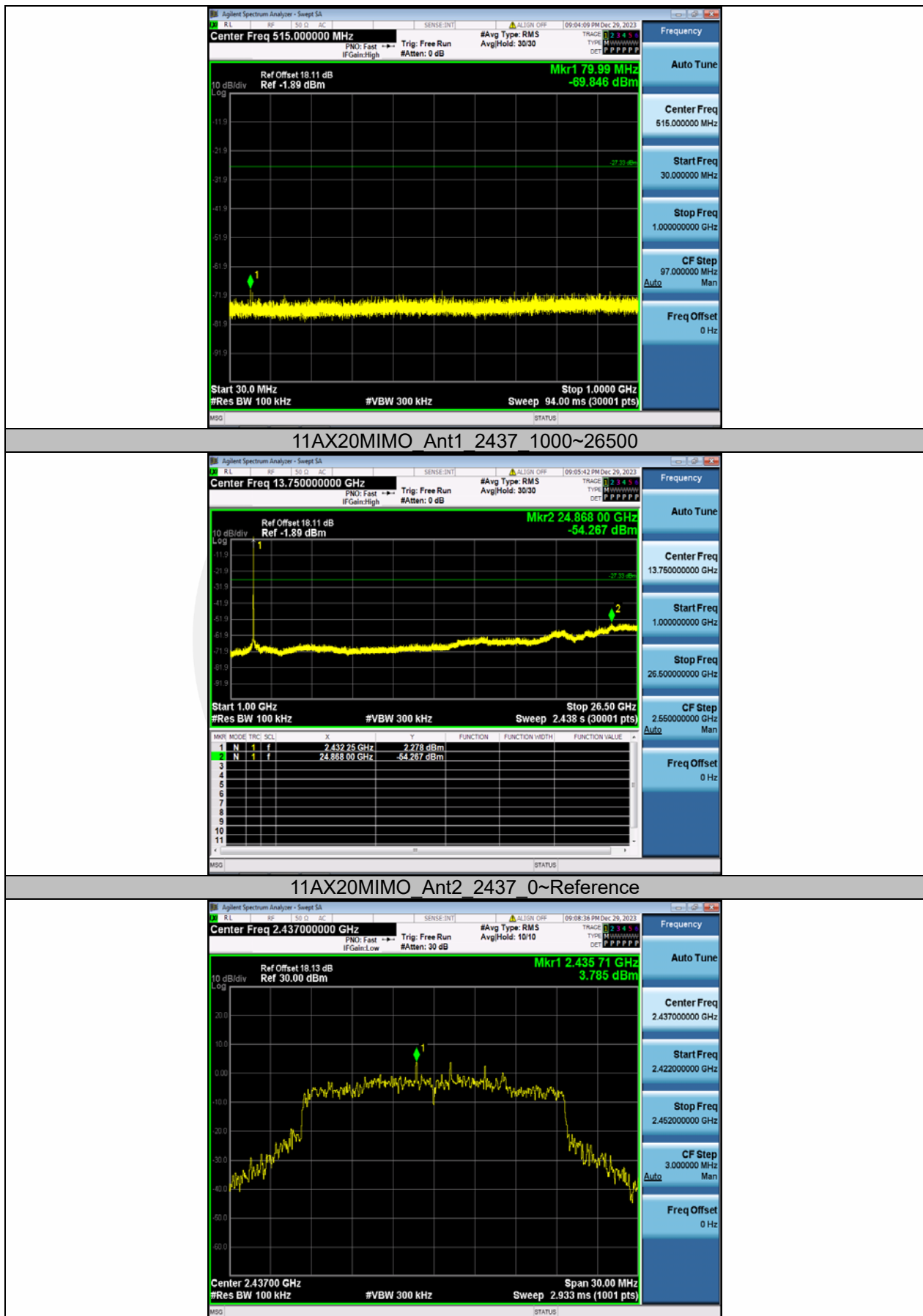
11AX20MIMO_Ant2_2412_1000~26500



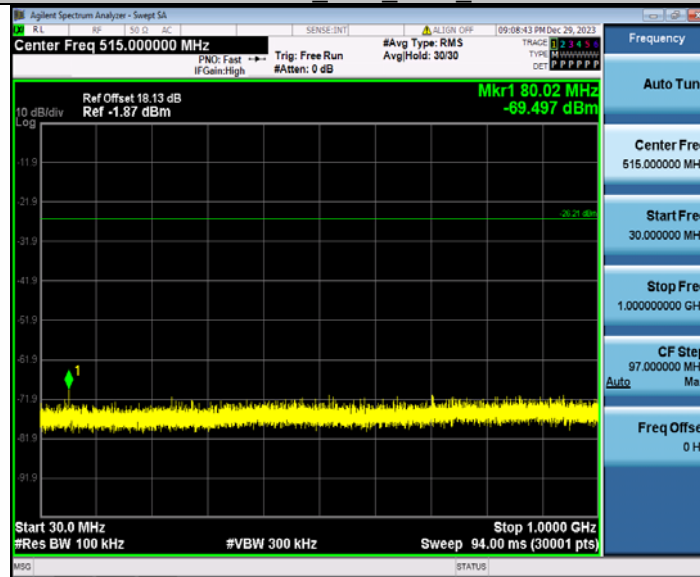
11AX20MIMO_Ant1_2437_0~Reference



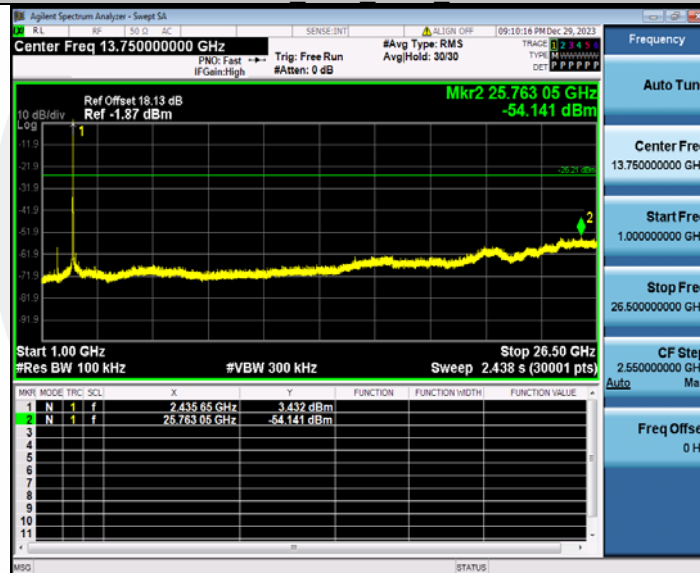
11AX20MIMO_Ant1_2437_30~1000



11AX20MIMO_Ant2_2437_30~1000



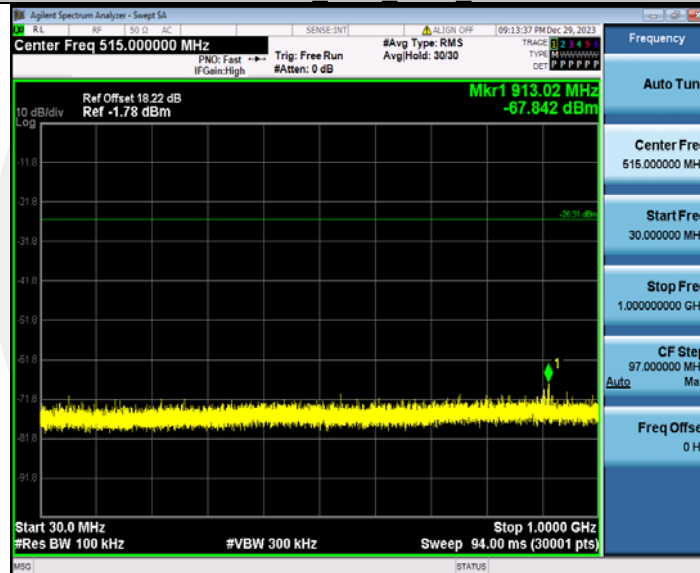
11AX20MIMO_Ant2_2437_1000~26500



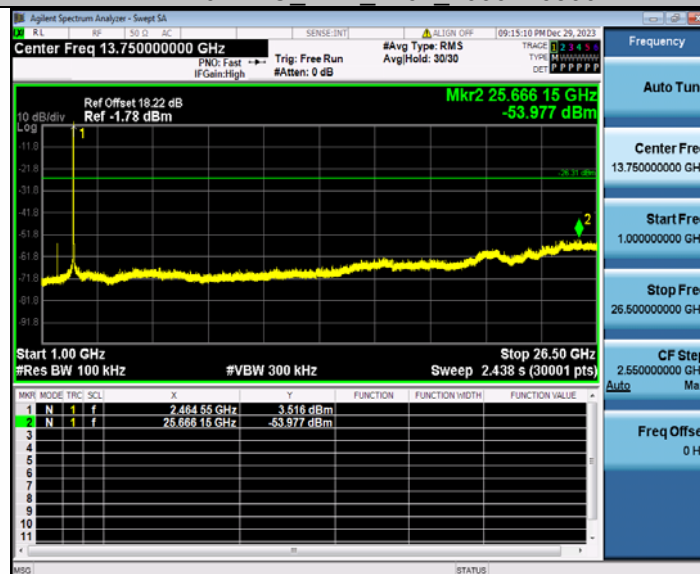
11AX20MIMO_Ant1_2462_0~Reference



11AX20MIMO Ant1 2462 30~1000



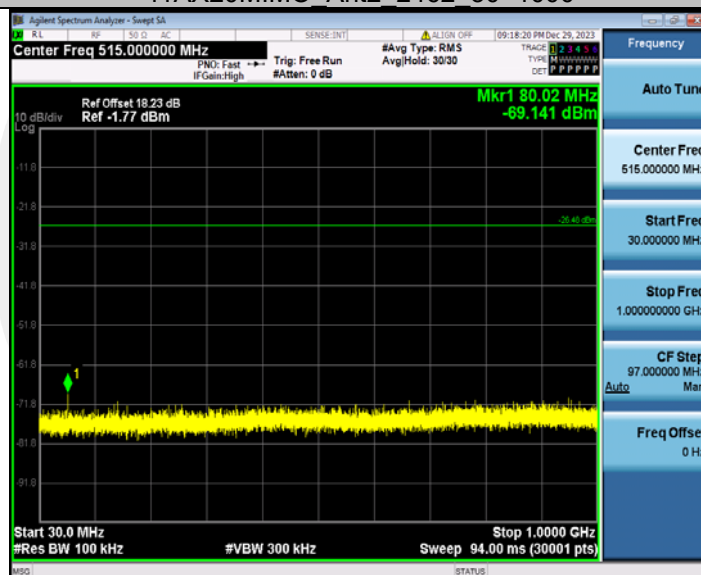
11AX20MIMO_Ant1 2462 1000~26500



11AX20MIMO_Ant2_2462_0~Reference



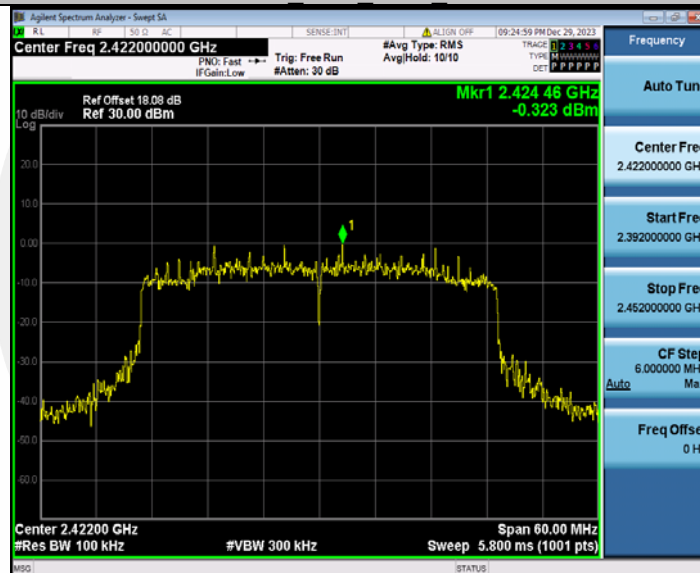
11AX20MIMO_Ant2_2462_30~1000



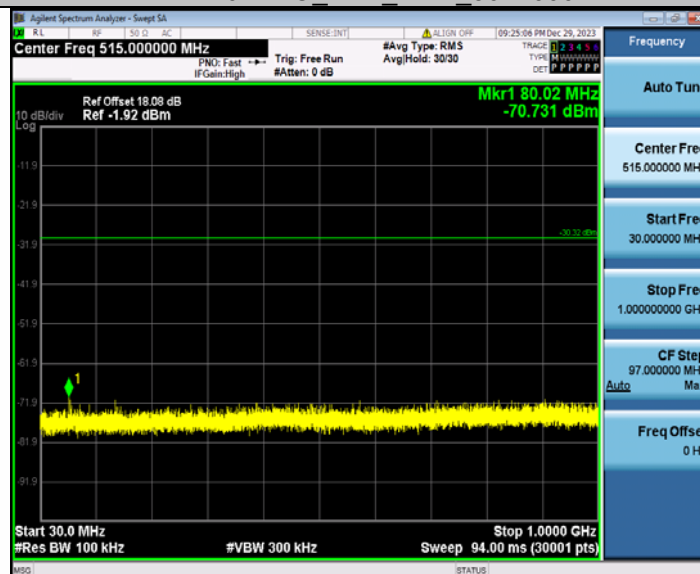
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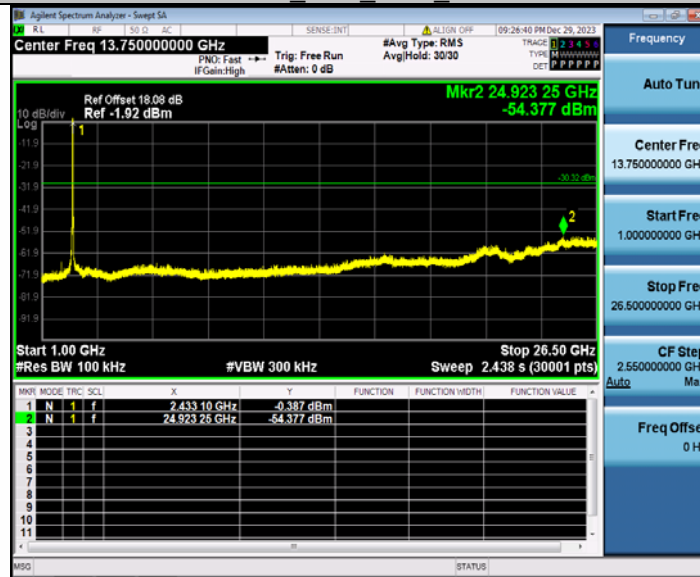
11AX40MIMO Ant1 2422 0~Reference



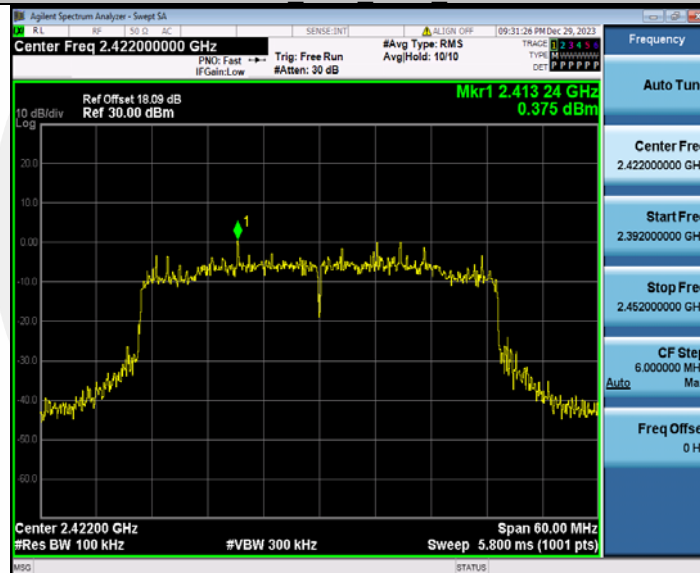
11AX40MIMO Ant1_2422_30~1000



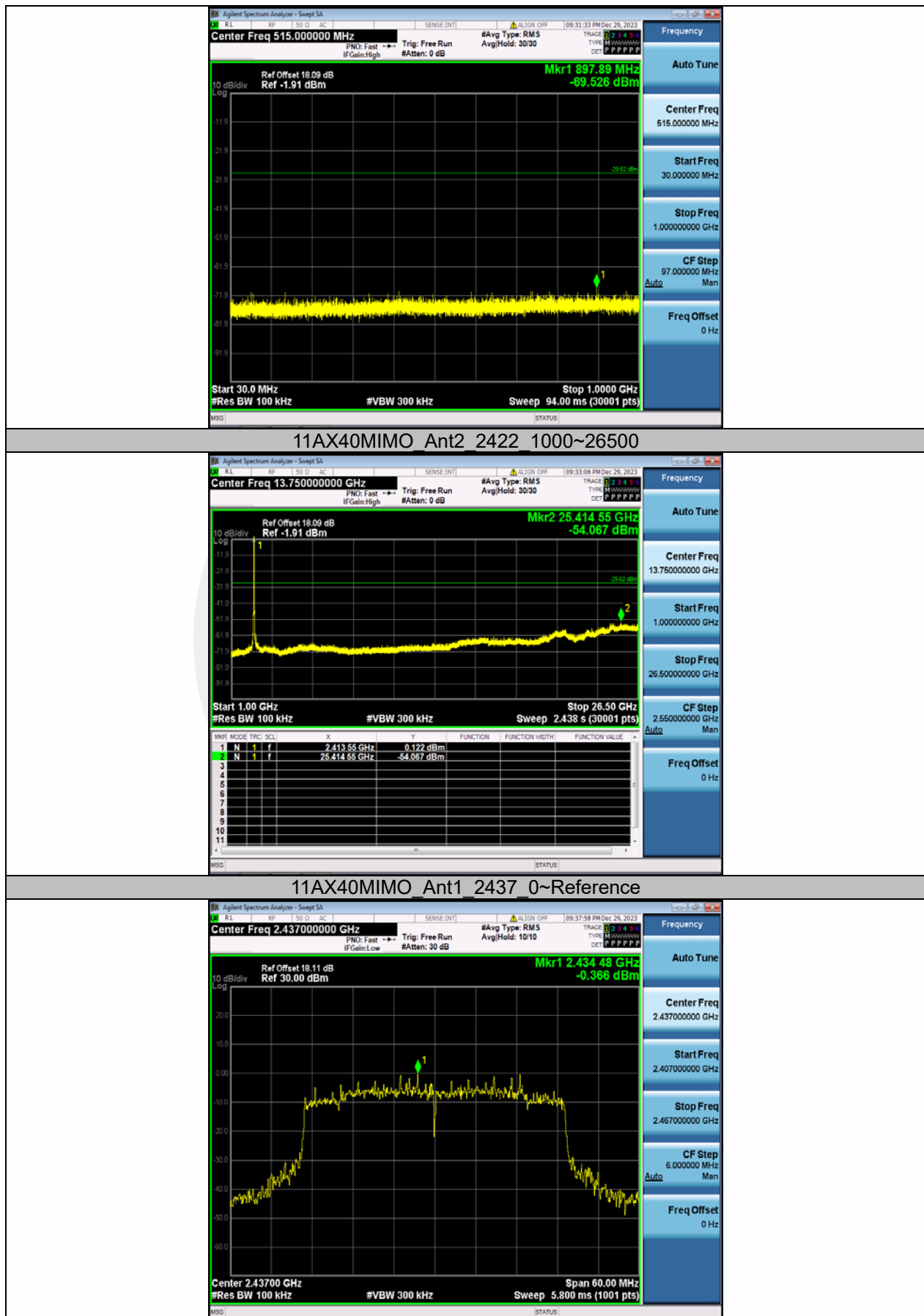
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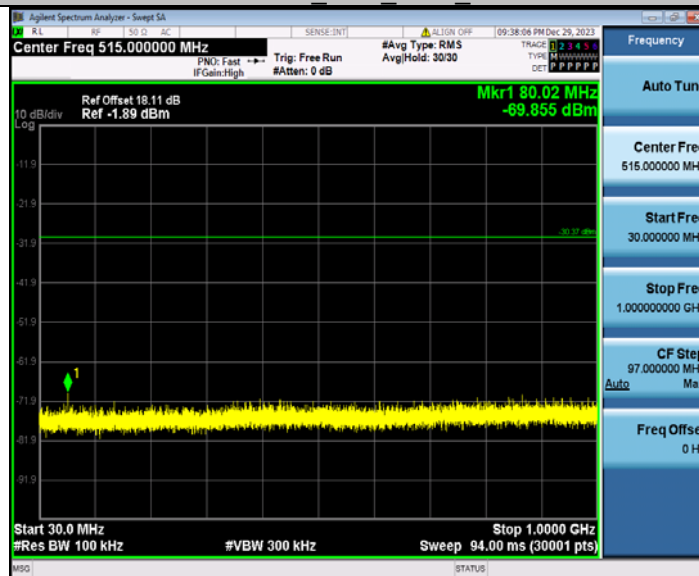
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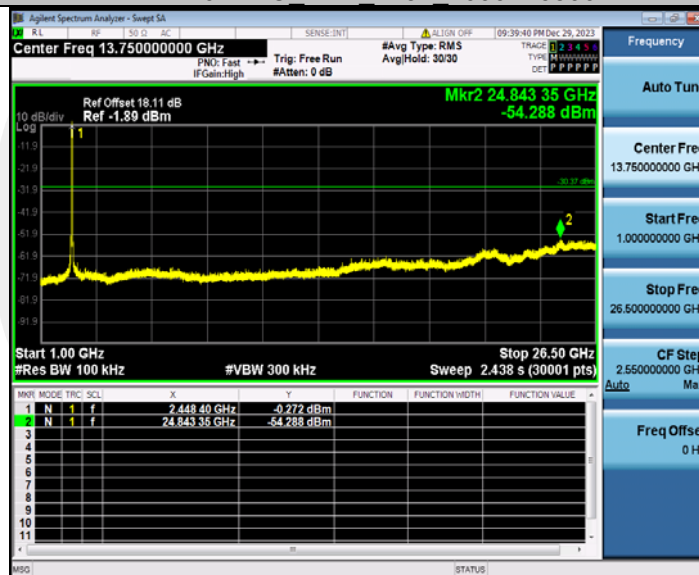
11AX40MIMO_Ant2_2422_30~1000



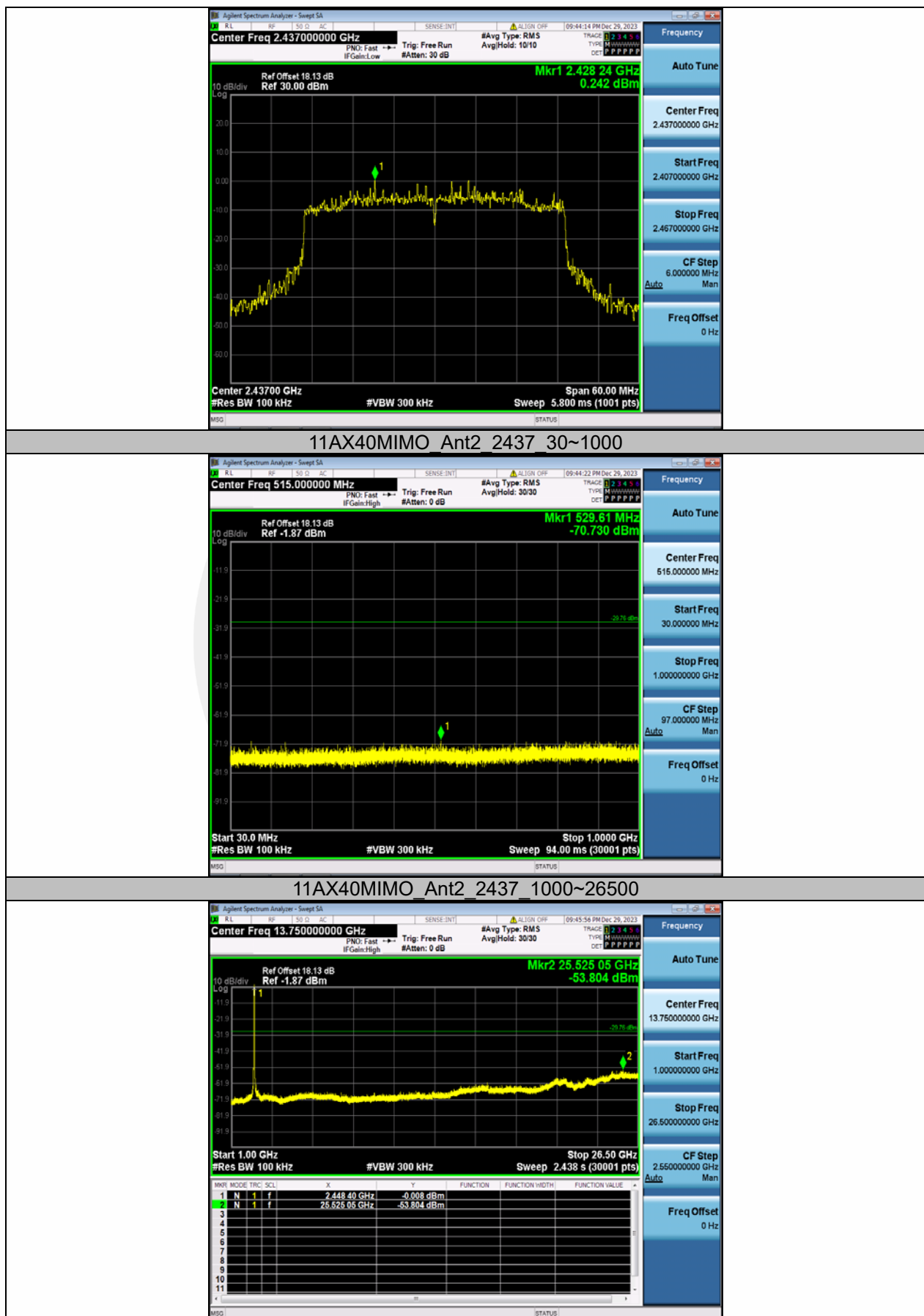
11AX40MIMO_Ant1_2437_30~1000



11AX40MIMO_Ant1_2437_1000~26500



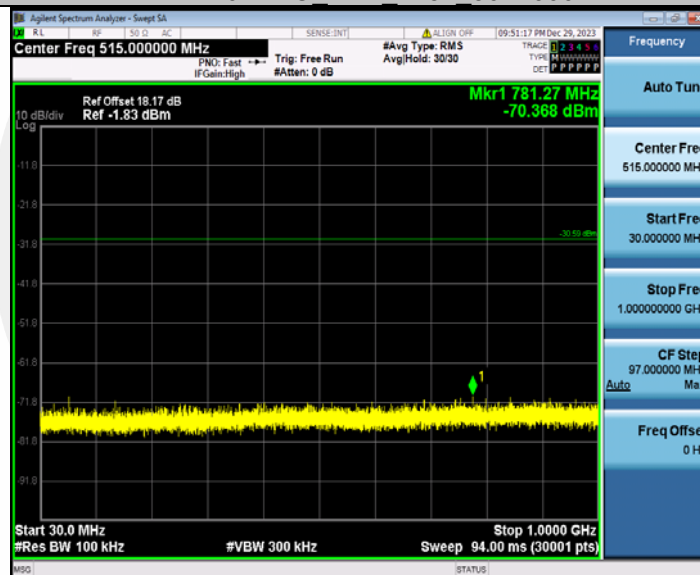
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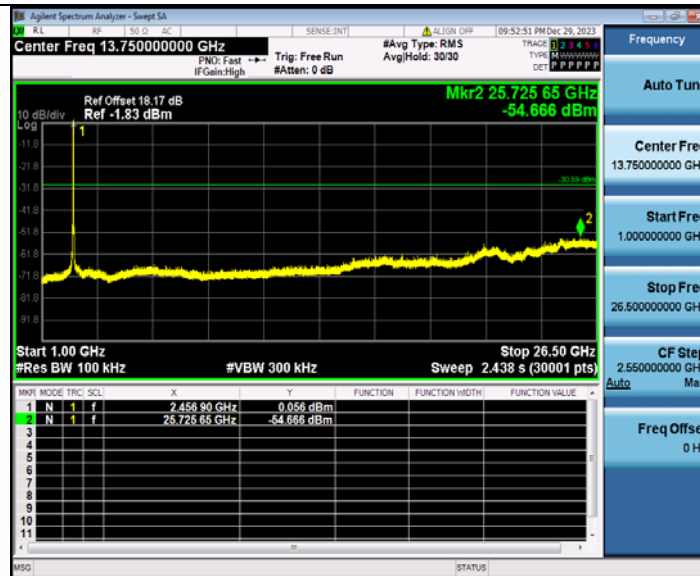
11AX40MIMO_Ant1_2452_0~Reference



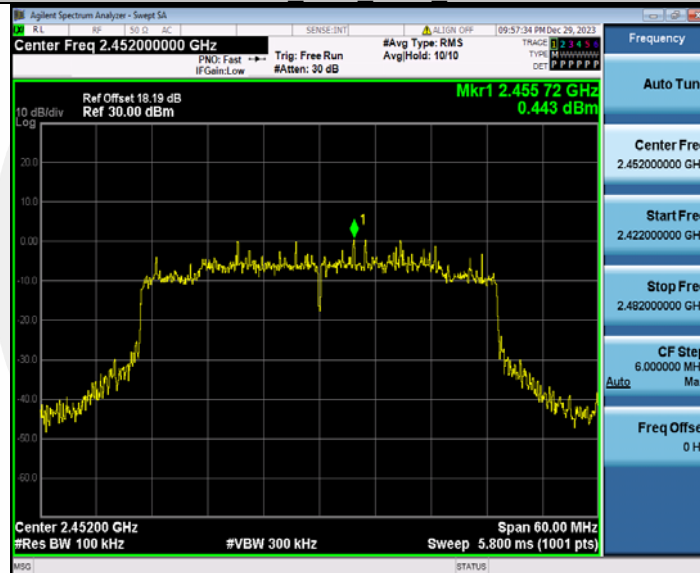
11AX40MIMO_Ant1_2452_30~1000



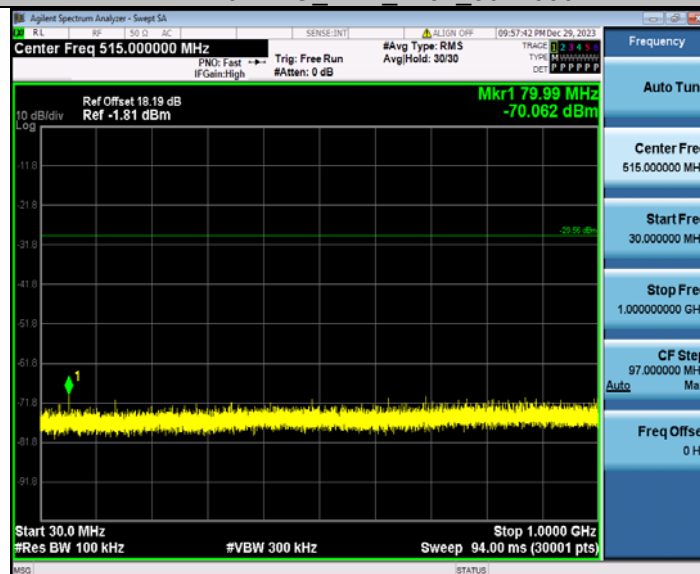
11AX40MIMO_Ant1_2452_1000~26500

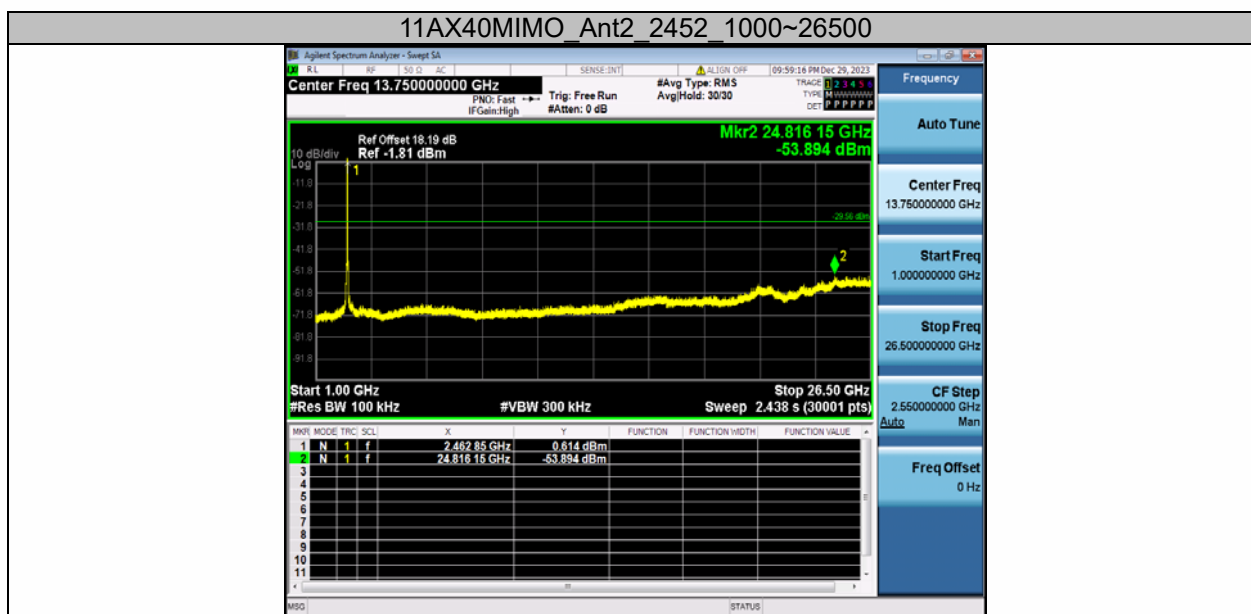


11AX40MIMO Ant2 2452 0~Reference



11AX40MIMO Ant2_2452_30~1000





7.5 RADIATED EMISSION

7.5.1 Applicable Standard

According to FCC Part 15.247(d) and 15.209 and KDB 558074 D01 15.247 Meas Guidance v05r02.

7.5.2 Conformance Limit

According to FCC Part 15.247(d): 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)).

According to FCC Part 15.205, Restricted bands:

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
10.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(2)
13.36-13.41			

According to FCC Part 15.205 the level of any transmitter spurious emission in Restricted bands shall not exceed the level of the emission specified in the following table.

Restricted Frequency(MHz)	Field Strength (μV/m)	Field Strength (dBμV/m)	Measurement Distance
0.009-0.490	2400/F(KHz)	20 log (uV/m)	300
0.490-1.705	24000/F(KHz)	20 log (uV/m)	30
1.705-30	30	29.5	30
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

7.5.3 Test Configuration

Test according to clause 6.2 radio frequency test setup 2.

7.5.4 Test Procedure

This test is required for any spurious emission that falls in a Restricted Band, as defined in Section 15.205. It must be performed with the highest gain of each type of antenna proposed for use with the EUT. Use the following spectrum analyzer settings:

For Above 1GHz:

The EUT was placed on a turn table which is 1.5m above ground plane.

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

Span = wide enough to fully capture the emission being measured.

RBW = 1 MHz.

VBW ≥ RBW.

Sweep = auto.

Detector function = peak.
Trace = max hold.

For Below 1GHz:

The EUT was placed on a turn table which is 0.8m above ground plane.
Maximum procedure was performed on the highest emissions to ensure EUT compliance.
Span = wide enough to fully capture the emission being measured.
RBW = 100 kHz.
VBW $\geq$ RBW.
Sweep = auto.
Detector function = peak.
Trace = max hold.

For Below 30MHz:

The EUT was placed on a turn table which is 0.8m above ground plane.
Maximum procedure was performed on the highest emissions to ensure EUT compliance.
Span = wide enough to fully capture the emission being measured.
RBW = 9kHz.
VBW $\geq$ RBW.
Sweep = auto.
Detector function = peak.
Trace = max hold.

For Below 150KHz:

The EUT was placed on a turn table which is 0.8m above ground plane.
Maximum procedure was performed on the highest emissions to ensure EUT compliance.
Span = wide enough to fully capture the emission being measured.
RBW = 200Hz.
VBW $\geq$ RBW.
Sweep = auto.
Detector function = peak.
Trace = max hold.

Follow the guidelines in ANSI C63.10 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization, etc. A pre-amp and a high pass filter are required for this test, in order to provide the measuring system with sufficient sensitivity. Allow the trace to stabilize. The peak reading of the emission, after being corrected by the antenna factor, cable loss, pre-amp gain, etc., is the peak field strength, which must comply with the limit. Submit this data. Now set the VBW to 10 Hz, while maintaining all of the other instrument settings. This peak level, once corrected, must comply with the limit. If the dwell time per channel of the hopping signal is less than 100 ms, then the reading obtained with the 10 Hz VBW may be further adjusted by a "duty cycle correction factor", derived from $20\log(\text{dwell time}/100 \text{ ms})$, in an effort to demonstrate compliance with the limit. Submit this data.
Repeat above procedures until all frequency measured was complete.

7.5.5 Test Results

Temperature:	28.1° C
Relative Humidity:	43%
ATM Pressure:	1011 mbar

■ Spurious Emission below 30MHz(9KHz to 30MHz)

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

Note: Data of measurement within this frequency range shown “ -- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

■ Spurious Emission Above 1GHz(1GHz to 25GHz)

All modes have been tested, and the worst result recorded was report as below:
Highest gain of each antenna and highest output power is ANT2 and MIMO as below:

Test mode: 802.11n(HT20) Frequency: Channel 1: 2412MHz

Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
11519.7599	V	59.73	74.00	14.27	peak
14496.2481	V	61.19	74.00	12.81	peak
17498.2491	V	66.47	74.00	7.53	peak
11519.7599	V	46.33	54.00	7.67	AVG
14496.2481	V	44.58	54.00	9.42	AVG
17498.2491	V	45.95	54.00	8.05	AVG
11375.1876	H	59.86	74.00	14.14	peak
15219.1096	H	62.30	74.00	11.70	peak
17481.2406	H	65.54	74.00	8.46	peak
11375.1876	H	45.96	54.00	8.04	AVG
15219.1096	H	43.66	54.00	10.34	AVG
17481.2406	H	43.99	54.00	10.01	AVG

Test mode: 802.11n(HT20) Frequency: Channel 6: 2437MHz

Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
11477.2386	V	59.51	74.00	14.49	peak
16783.8919	V	63.98	74.00	10.02	peak
17489.7449	V	65.80	74.00	8.20	peak
11477.2386	V	45.91	54.00	8.09	AVG
16783.8919	V	45.40	54.00	8.60	AVG
17489.7449	V	45.52	54.00	8.48	AVG
13144.072	H	59.95	74.00	14.05	peak
14861.931	H	61.99	74.00	12.01	peak
17489.7449	H	65.88	74.00	8.12	peak
13144.072	H	48.36	54.00	5.64	AVG
14861.931	H	43.35	54.00	10.65	AVG
17489.7449	H	46.43	54.00	7.57	AVG

Test mode: 802.11n(HT20) Frequency: Channel 11: 2462MHz

Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
11545.2726	V	59.73	74.00	14.27	peak
15559.2796	V	61.56	74.00	12.44	peak
17506.7534	V	65.87	74.00	8.13	peak
11545.2726	V	45.88	54.00	8.12	AVG
15559.2796	V	43.58	54.00	10.42	AVG
17506.7534	V	44.87	54.00	9.13	AVG
11545.2726	H	59.82	74.00	14.18	peak
15533.7669	H	61.81	74.00	12.19	peak
17498.2491	H	65.76	74.00	8.24	peak
11545.2726	H	46.19	54.00	7.81	AVG
15533.7669	H	44.47	54.00	9.53	AVG
17498.2491	H	45.19	54.00	8.81	AVG



■ Spurious Emission in Restricted Band 2310-2390MHz and 2483.5-2500MHz
All modes have been tested, and the worst result recorded was report as below:

Test mode: 802.11n(HT20) Frequency: Channel 1: 2412MHz

Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
2330.51	V	44.91	74.00	29.09	peak
2330.51	V	42.92	54.00	11.08	AVG
2329.71	H	45.90	74.00	28.10	peak
2329.71	H	42.82	54.00	11.18	AVG

Test mode: 802.11n(HT20) Frequency: Channel 11: 2462MHz

Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
2493.63	V	47.72	74.00	26.28	peak
2493.63	V	43.52	54.00	10.48	AVG
2488.42	H	45.77	74.00	28.23	peak
2488.42	H	43.51	54.00	10.49	AVG

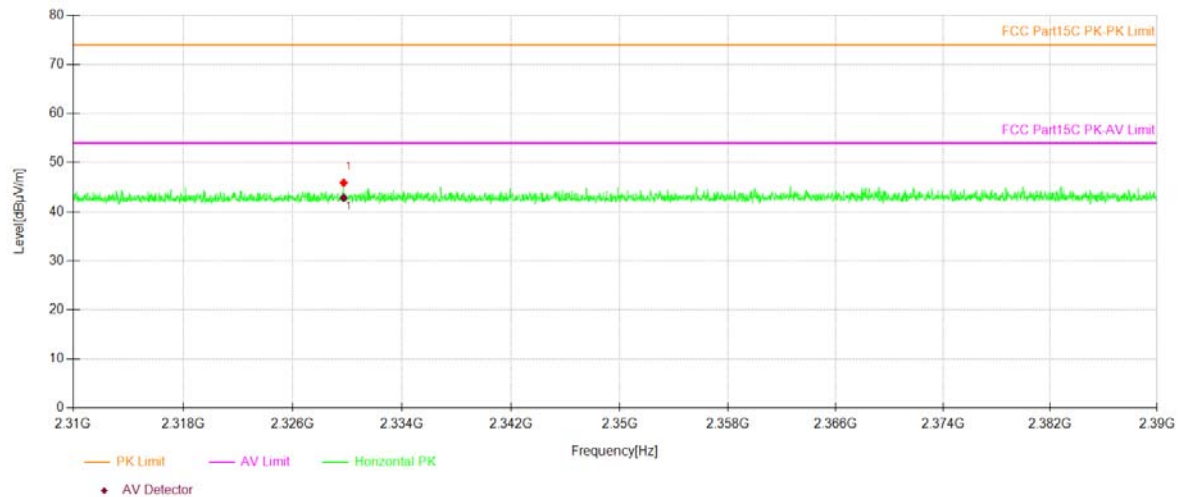
Note: (1) All Readings are Peak Value (VBW=3MHz) and Average Value (VBW=10Hz).
(2) Emission Level= Reading Level+Correct Factor.
(3) Correct Factor= Ant_F + Cab_L - Preamp
(4) The reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

Spurious Emission in Restricted Band 2310-2390MHz

Test Model ☐ 802.11b ☐ 802.11g ☒ 802.11n(HT20) ☐ 802.11n(HT40)

☒ Channel 1:2412MHz ☐ Channel 3: 2422MHz Polarity: H

VBW=3MHz

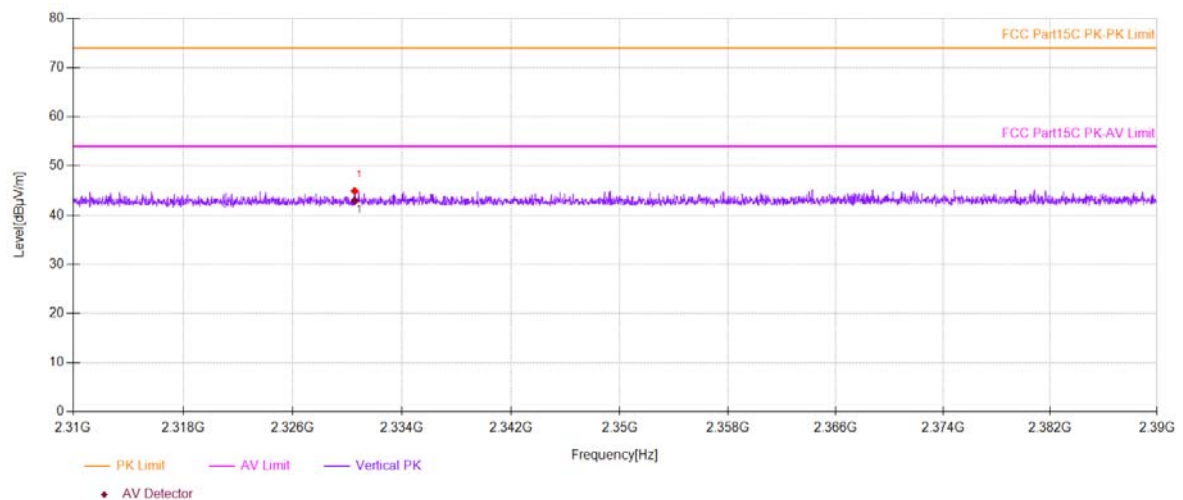


Spurious Emission in Restricted Band 2310-2390MHz

Test Model ☐ 802.11b ☐ 802.11g ☒ 802.11n(HT20) ☐ 802.11n(HT40)

☒ Channel 1:2412MHz ☐ Channel 3: 2422MHz Polarity: V

VBW=3MHz

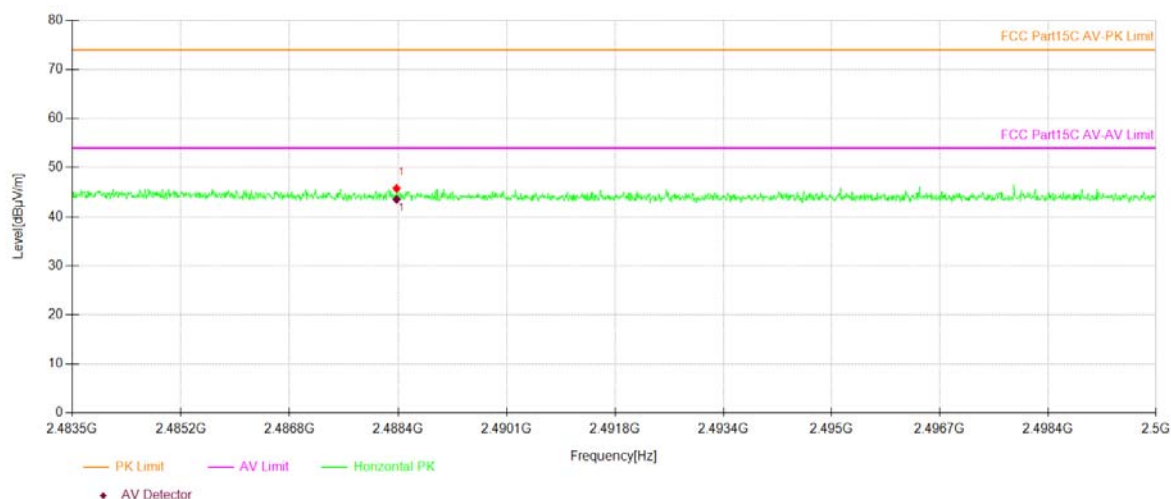


Spurious Emission in Restricted Band 2483.5-2500MHz

Test Model ☐ 802.11b ☐ 802.11g ☒ 802.11n(HT20) ☐ 802.11n(HT40)

☒ Channel 11: 2462MHz ☐ Channel 9: 2452MHz

VBW=3MHz Polarity: H

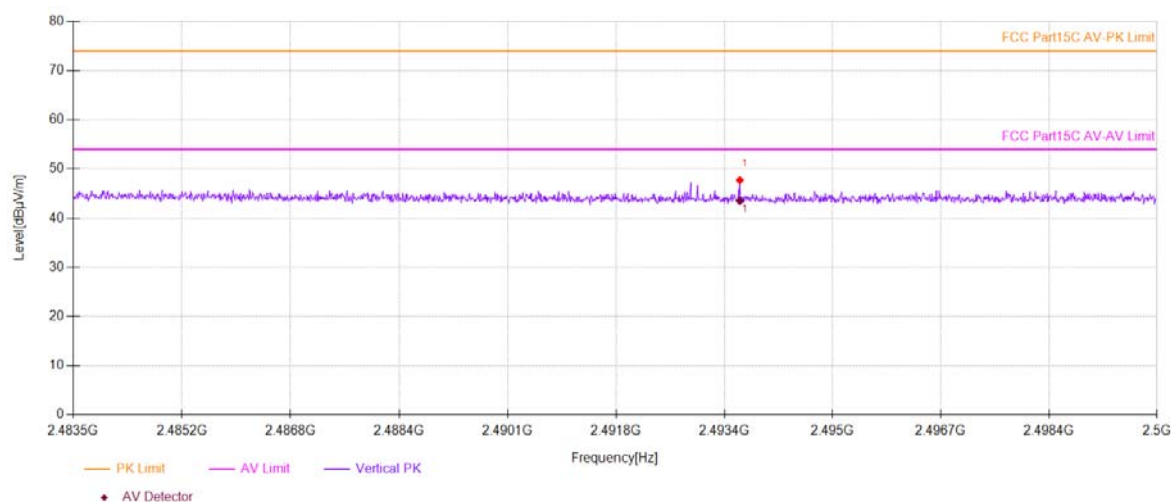


Spurious Emission in Restricted Band 2483.5-2500MHz

Test Model ☐ 802.11b ☐ 802.11g ☒ 802.11n(HT20) ☐ 802.11n(HT40)

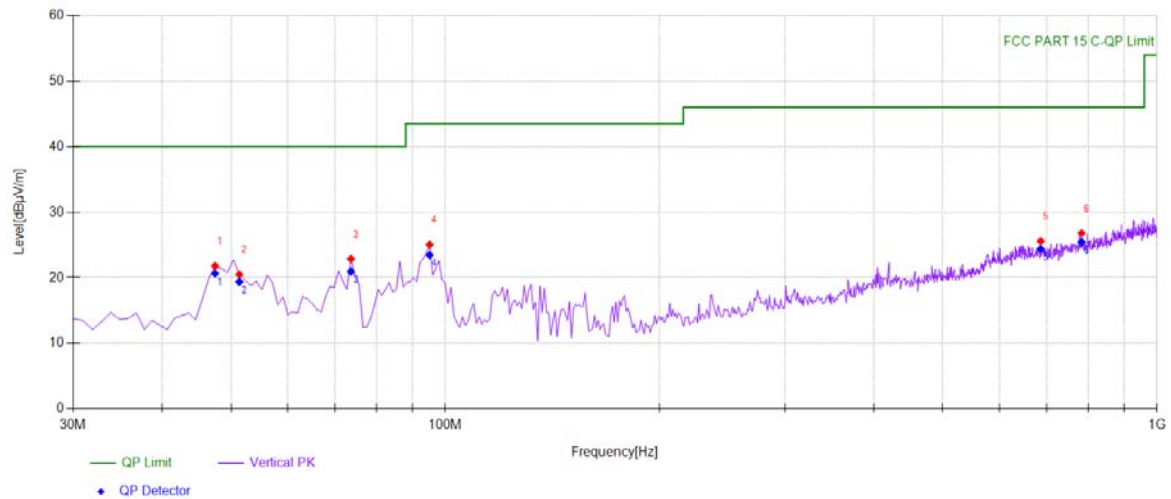
☒ Channel 11: 2462MHz ☐ Channel 9: 2452MHz

VBW=3MHz Polarity: V



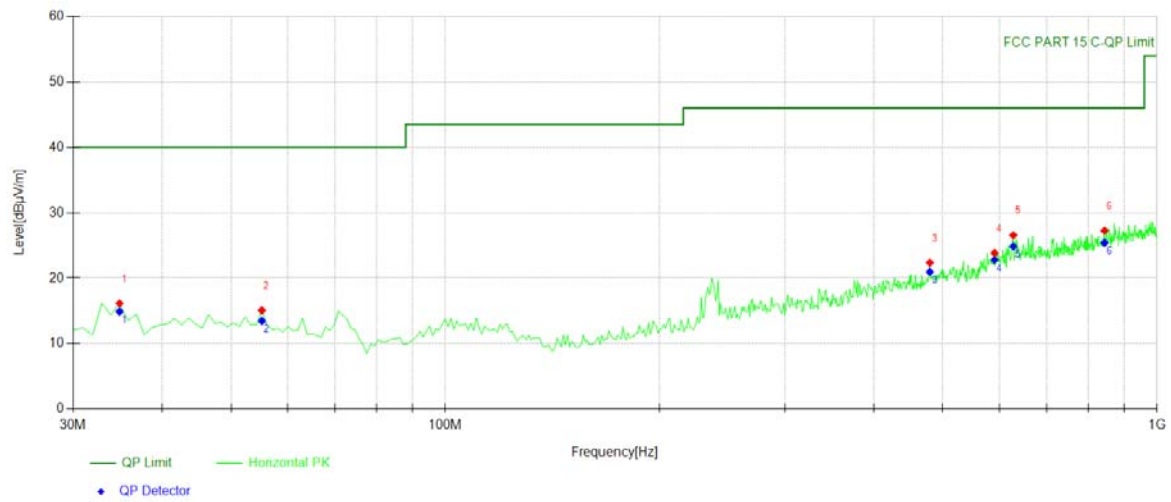
- Spurious Emission below 1GHz (30MHz to 1GHz)
All modes have been tested, and the worst result recorded was report as below:

Test mode: 802.11n(HT20) Frequency: Channel 1: 2412MHz



Suspected Data List

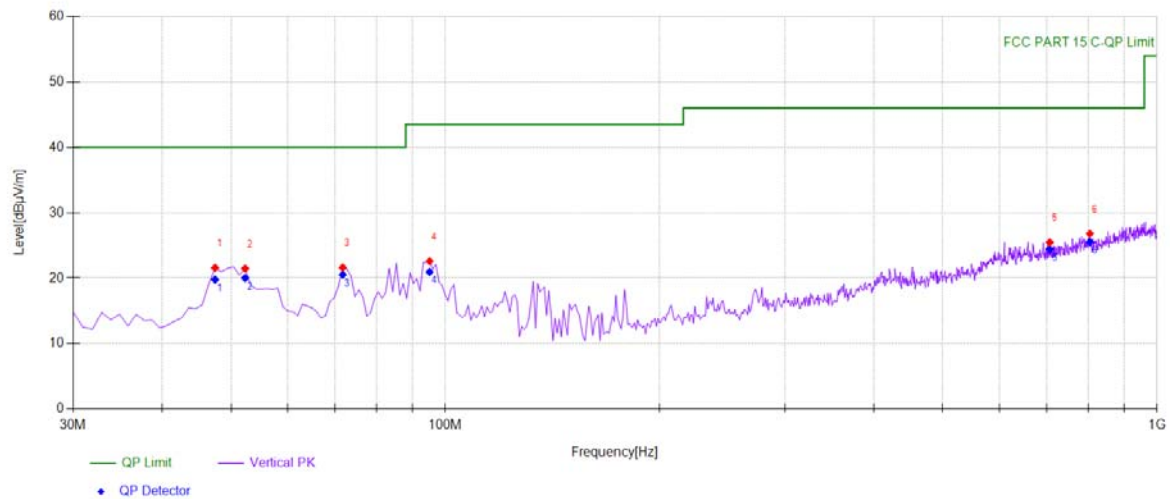
NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB/m]	Level [dBμV/m]	Detector	Limit [dBμV/m]	Margin [dB]	Polarity
1	47.4775	39.16	-17.39	21.77	PK	40.00	18.23	Vertical
2	51.3614	37.88	-17.39	20.49	PK	40.00	19.51	Vertical
3	73.6937	43.40	-20.53	22.87	PK	40.00	17.13	Vertical
4	95.0551	43.01	-17.97	25.04	PK	43.50	18.46	Vertical
5	686.376	31.65	-6.06	25.59	PK	46.00	20.41	Vertical
6	783.473	31.40	-4.59	26.81	PK	46.00	19.19	Vertical



Suspected Data List

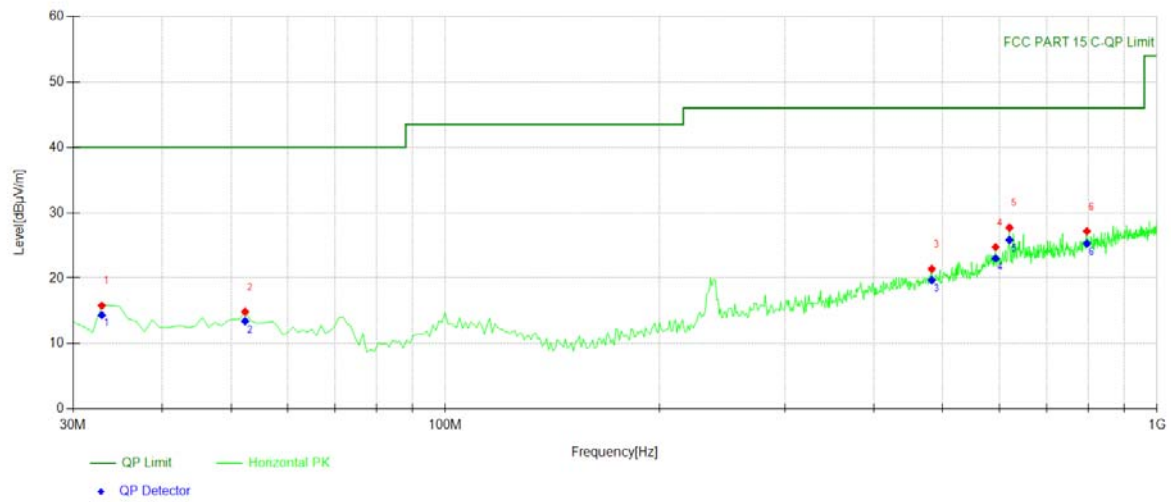
NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB/m]	Level [dBμV/m]	Detector	Limit [dBμV/m]	Margin [dB]	Polarity
1	34.8549	34.38	-18.23	16.15	PK	40.00	23.85	Horizontal
2	55.2452	32.98	-17.91	15.07	PK	40.00	24.93	Horizontal
3	479.559	32.18	-9.81	22.37	PK	46.00	23.63	Horizontal
4	591.221	30.98	-7.14	23.84	PK	46.00	22.16	Horizontal
5	628.118	33.37	-6.81	26.56	PK	46.00	19.44	Horizontal
6	843.673	31.11	-3.84	27.27	PK	46.00	18.73	Horizontal

Test mode: 802.11n(HT20) Frequency: Channel 6: 2437MHz



Suspected Data List

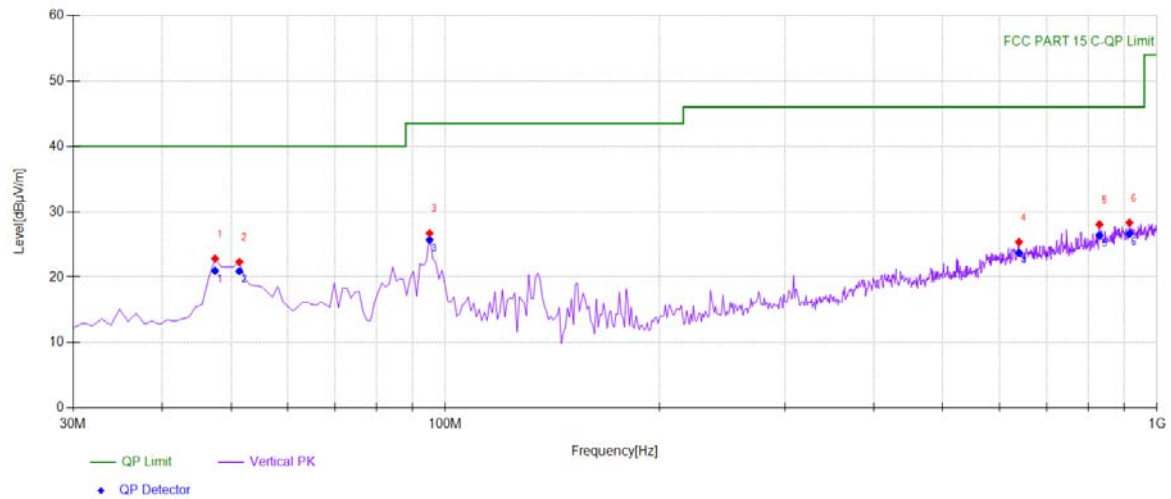
NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB/m]	Level [dBμV/m]	Detector	Limit [dBμV/m]	Margin [dB]	Polarity
1	47.4775	38.97	-17.39	21.58	PK	40.00	18.42	Vertical
2	52.3323	38.98	-17.52	21.46	PK	40.00	18.54	Vertical
3	71.7518	41.85	-20.23	21.62	PK	40.00	18.38	Vertical
4	95.0551	40.57	-17.97	22.60	PK	43.50	20.90	Vertical
5	706.766	31.35	-5.87	25.48	PK	46.00	20.52	Vertical
6	804.834	31.19	-4.38	26.81	PK	46.00	19.19	Vertical



Suspected Data List

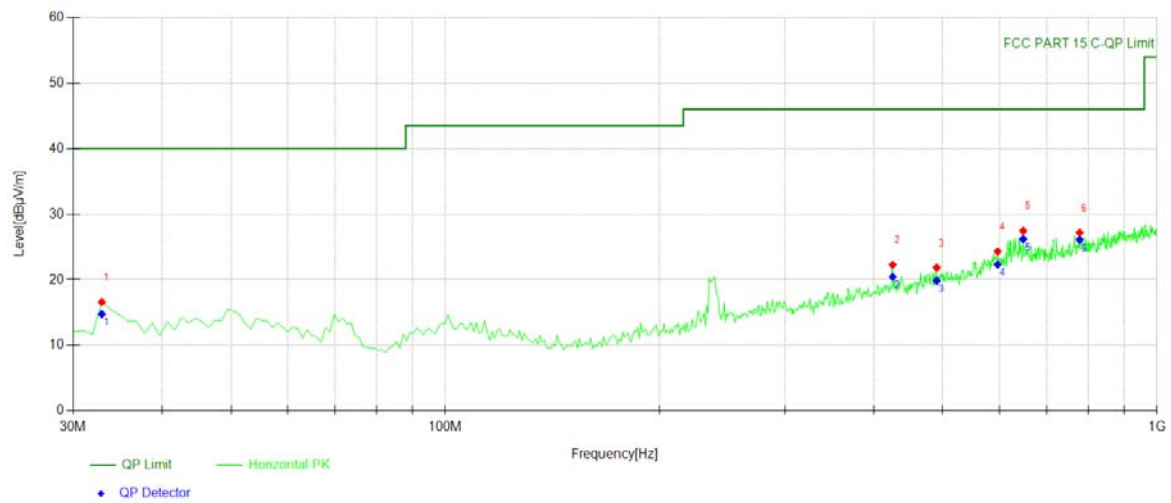
NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB/m]	Level [dBμV/m]	Detector	Limit [dBμV/m]	Margin [dB]	Polarity
1	32.9129	34.14	-18.35	15.79	PK	40.00	24.21	Horizontal
2	52.3323	32.38	-17.52	14.86	PK	40.00	25.14	Horizontal
3	482.472	31.18	-9.78	21.40	PK	46.00	24.60	Horizontal
4	593.163	31.89	-7.14	24.75	PK	46.00	21.25	Horizontal
5	620.350	34.84	-7.11	27.73	PK	46.00	18.27	Horizontal
6	797.067	31.63	-4.45	27.18	PK	46.00	18.82	Horizontal

Test mode: 802.11n(HT20) Frequency: Channel 11: 2462MHz



Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB/m]	Level [dBμV/m]	Detector	Limit [dBμV/m]	Margin [dB]	Polarity
1	47.4775	40.22	-17.39	22.83	PK	40.00	17.17	Vertical
2	51.3614	39.72	-17.39	22.33	PK	40.00	17.67	Vertical
3	95.0551	44.69	-17.97	26.72	PK	43.50	16.78	Vertical
4	639.769	31.64	-6.26	25.38	PK	46.00	20.62	Vertical
5	830.080	32.18	-4.12	28.06	PK	46.00	17.94	Vertical
6	914.554	31.16	-2.85	28.31	PK	46.00	17.69	Vertical



Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB/m]	Level [dBμV/m]	Detector	Limit [dBμV/m]	Margin [dB]	Polarity
1	32.9129	34.95	-18.35	16.60	PK	40.00	23.40	Horizontal
2	425.185	33.86	-11.59	22.27	PK	46.00	23.73	Horizontal
3	490.240	31.63	-9.80	21.83	PK	46.00	24.17	Horizontal
4	597.047	31.45	-7.14	24.31	PK	46.00	21.69	Horizontal
5	648.508	33.69	-6.22	27.47	PK	46.00	18.53	Horizontal
6	778.618	31.85	-4.67	27.18	PK	46.00	18.82	Horizontal

7.6 CONDUCTED EMISSION TEST

7.6.1 Applicable Standard

According to IC RSS-Gen 8.8

7.6.2 Conformance Limit

FCC Part 15, Subpart B, Class B

Conducted Emission Limit		
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.		

7.6.3 Test Configuration

Test according to clause 6.3 conducted emission test setup 3.

7.6.4 Test Procedure

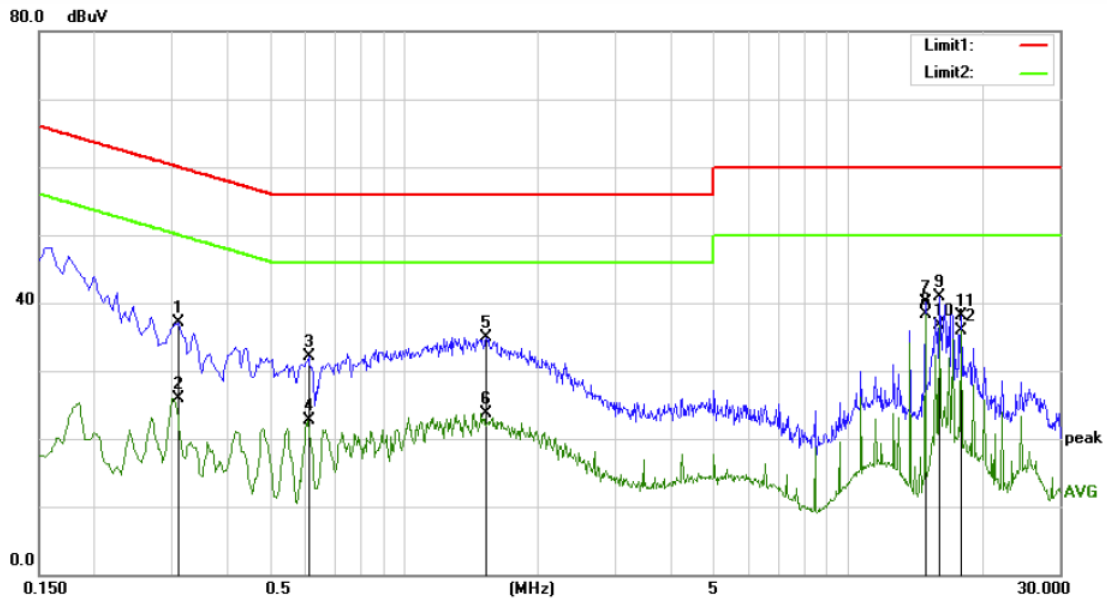
The EUT was placed on a table which is 0.8m above ground plane.

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

Repeat above procedures until all frequency measured were complete.

7.6.5 Test Results

Pass



Site Conduction #1

Phase: **L1**

Temperature: 21.9

Limit: (CE)FCC PART 15 CLASS B_QP

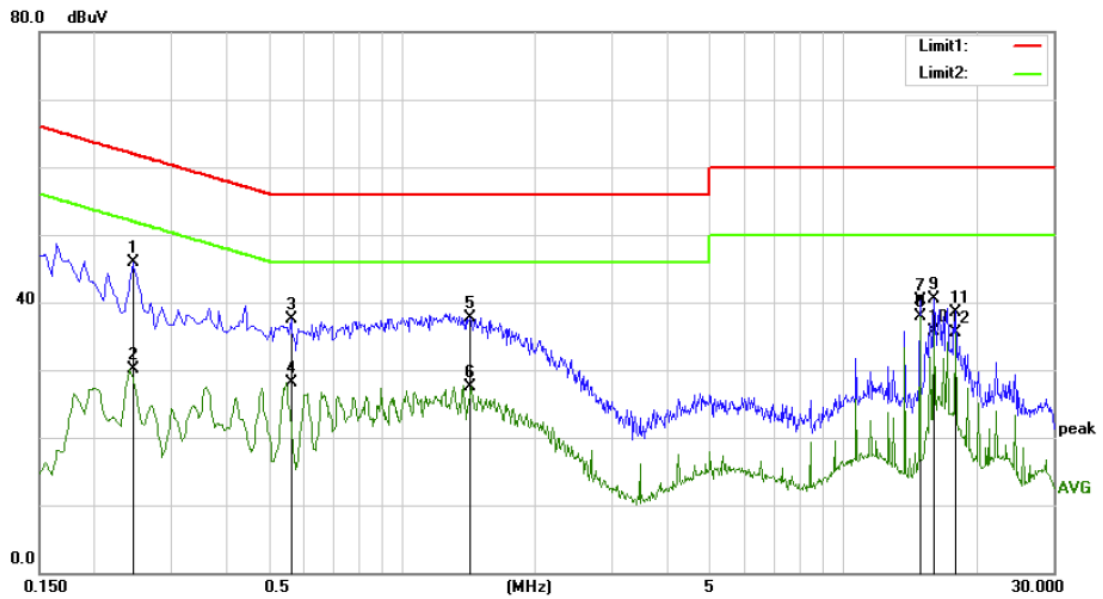
Power: AC 120V/60Hz

Humidity: 58 %

Mode: WIFI mode

Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.3100	27.02	10.00	37.02	59.97	-22.95	QP	
2		0.3100	15.85	10.00	25.85	49.97	-24.12	AVG	
3		0.6100	22.18	9.87	32.05	56.00	-23.95	QP	
4		0.6100	12.89	9.87	22.76	46.00	-23.24	AVG	
5		1.5350	24.97	9.86	34.83	56.00	-21.17	QP	
6		1.5350	13.86	9.86	23.72	46.00	-22.28	AVG	
7		14.9550	30.19	9.91	40.10	60.00	-19.90	QP	
8	*	14.9550	28.43	9.91	38.34	50.00	-11.66	AVG	
9		16.1050	31.00	9.99	40.99	60.00	-19.01	QP	
10		16.1050	26.65	9.99	36.64	50.00	-13.36	AVG	
11		18.0300	28.03	10.14	38.17	60.00	-21.83	QP	
12		18.0300	25.81	10.14	35.95	50.00	-14.05	AVG	



Site Conduction #1

Phase: **N**

Temperature: 21.9

Limit: (CE)FCC PART 15 CLASS B_QP

Power: AC 120V/60Hz

Humidity: 58 %

Mode: WIFI mode

Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.2450	35.82	10.01	45.83	61.92	-16.09	QP	
2		0.2450	20.05	10.01	30.06	51.92	-21.86	AVG	
3		0.5600	27.66	9.86	37.52	56.00	-18.48	QP	
4		0.5600	18.30	9.86	28.16	46.00	-17.84	AVG	
5		1.4300	27.88	9.87	37.75	56.00	-18.25	QP	
6		1.4300	17.70	9.87	27.57	46.00	-18.43	AVG	
7		14.9550	30.37	9.91	40.28	60.00	-19.72	QP	
8	*	14.9550	28.04	9.91	37.95	50.00	-12.05	AVG	
9		16.1050	30.53	9.99	40.52	60.00	-19.48	QP	
10		16.1050	25.68	9.99	35.67	50.00	-14.33	AVG	
11		18.0300	28.46	10.14	38.60	60.00	-21.40	QP	
12		18.0300	25.37	10.14	35.51	50.00	-14.49	AVG	

7.7 ANTENNA APPLICATION

7.7.1 Antenna Requirement

Standard	Requirement
FCC CRF Part15.203	An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. 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 provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi..

7.7.2 Result

PASS

The EUT use FPC Antenna, antenna1 gain is 1.90dBi, antenna2 gain is 1.90dBi.

- ☐ Antenna uses a permanently attached antenna which is not replaceable.
- ☒ Not using a standard antenna jack or electrical connector for antenna replacement.
- ☐ The antenna has to be professionally installed (please provide method of installation).

Which in accordance to section 15.203, please refer to the internal photos.

Detail of factor for radiated emission:

Frequency(MHz)	Ant_F(dB)	Cab_L(dB)	Preamp(dB)	Correct Factor(dB)
0.009	20.6	0.03	\	20.63
0.15	20.7	0.1	\	20.8
1	20.9	0.15	\	21.05
10	20.1	0.28	\	20.38
30	18.8	0.45	\	19.25
30	11.7	0.62	27.9	-15.58
100	12.5	1.02	27.8	-14.28
300	12.9	1.91	27.5	-12.69
600	19.2	2.92	27	-4.88
800	21.1	3.54	26.6	-1.96
1000	22.3	4.17	26.2	0.27
1000	25.6	1.76	41.4	-14.04
3000	28.9	3.27	43.2	-11.03
5000	31.1	4.2	44.6	-9.3
8000	36.2	5.95	44.7	-2.55
10000	38.4	6.3	43.9	0.8
12000	38.5	7.14	42.3	3.34
15000	40.2	8.15	41.4	6.95
18000	45.4	9.02	41.3	13.12
18000	37.9	1.81	47.9	-8.19
21000	37.9	1.95	48.7	-8.85
25000	39.3	2.01	42.8	-1.49
28000	39.6	2.16	46.0	-4.24
31000	41.2	2.24	44.5	-1.06
34000	41.5	2.29	46.6	-2.81
37000	43.8	2.30	46.4	-0.3
40000	43.2	2.50	42.2	3.5

--- End of Report ---