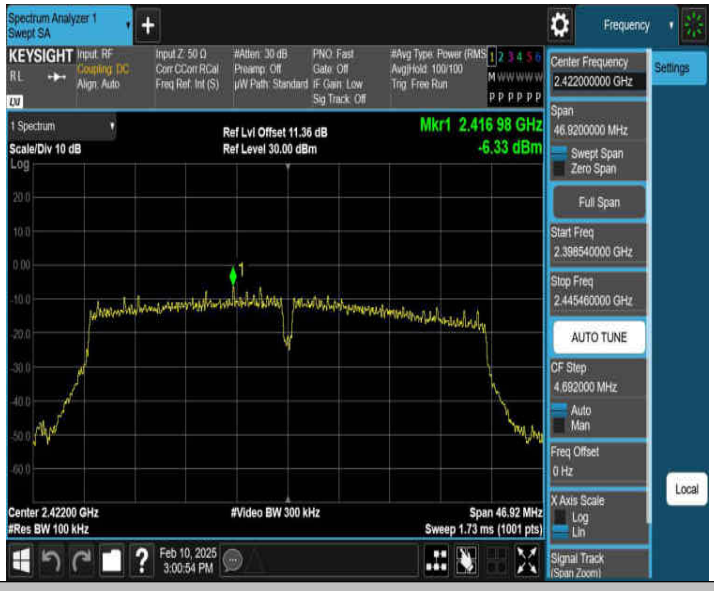
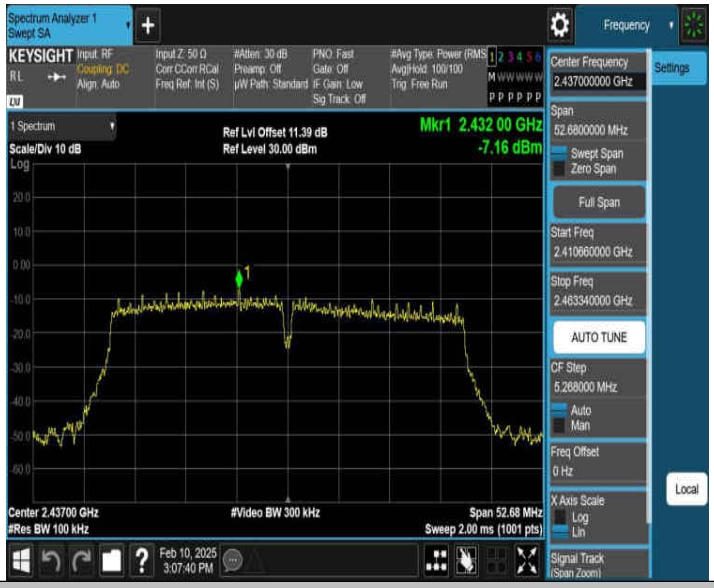
11N40MIMO_Ant2_2422



11N40MIMO_Ant1_2437

11N40MIMO_Ant2_2437



11N40MIMO_Ant1_2452

11N40MIMO_Ant2_2452

Band edge:

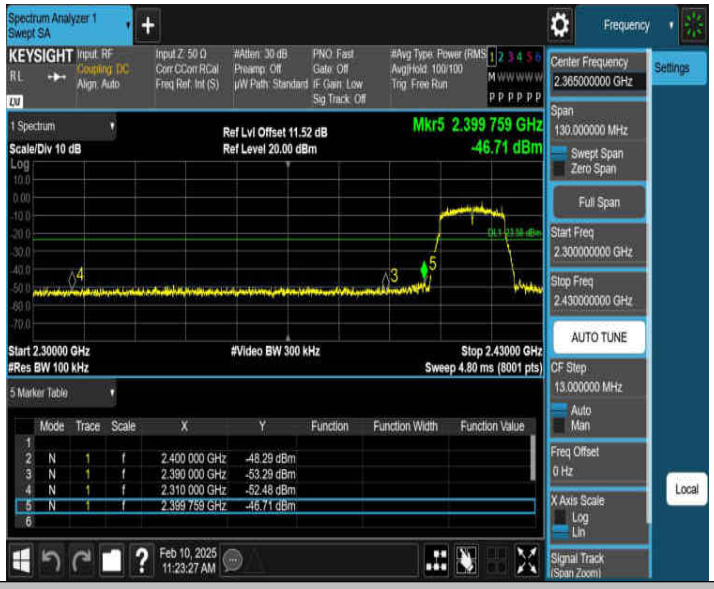
11B_Ant1_Low_2412

11B_Ant2_Low_2412

11B_Ant1_High_2462

11B_Ant2_High_2462

11G_Ant1_Low_2412



11G_Ant2_Low_2412

11G_Ant1_High_2462

11G_Ant2_High_2462

11N20MIMO_Ant1_Low_2412

11N20MIMO_Ant2_Low_2412

11N20MIMO_Ant1_High_2462

11N20MIMO_Ant2_High_2462

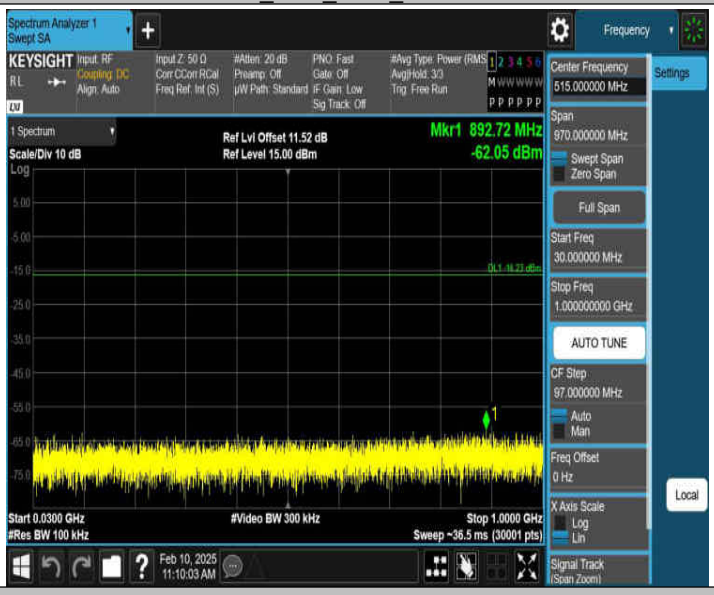
11N40MIMO_Ant1_Low_2422

11N40MIMO_Ant2_Low_2422

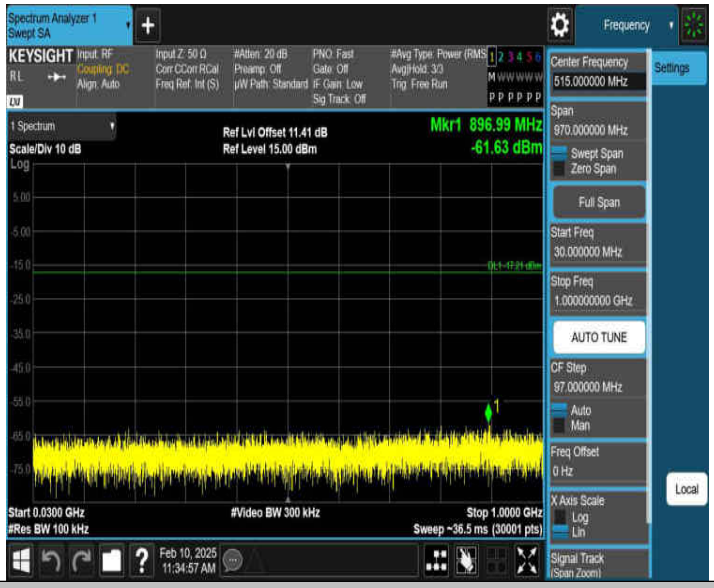
11N40MIMO_Ant1_High_2452

11N40MIMO_Ant2_High_2452

Spurious Emission:

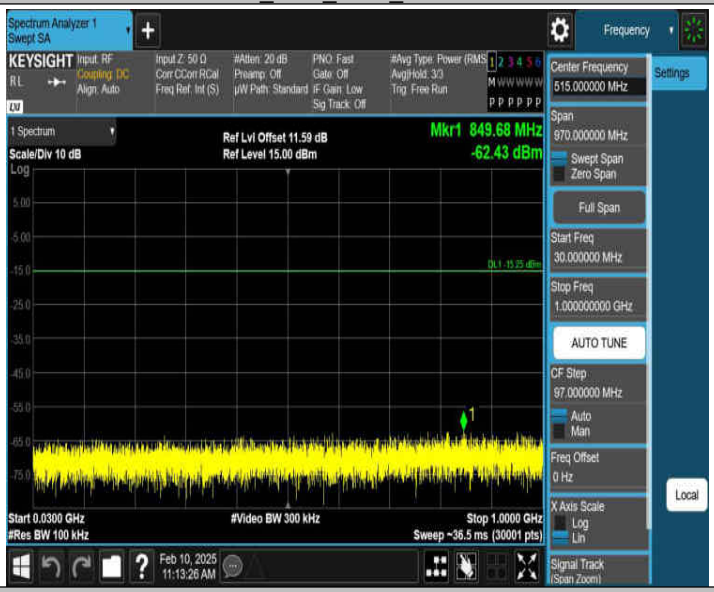
11B_Ant1_2412_30~1000

11B_Ant1_2412_1000~26500

11B_Ant2_2412_30~1000



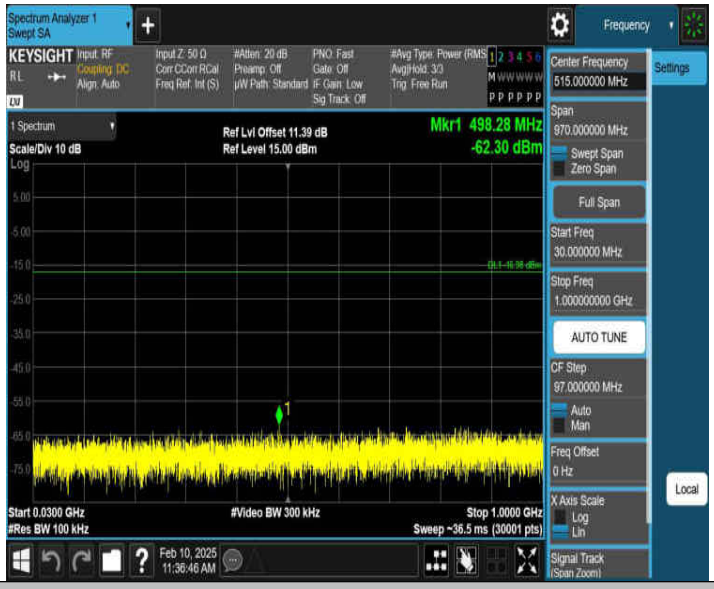
11B_Ant2_2412_1000~26500

11B_Ant1_2437_30~1000



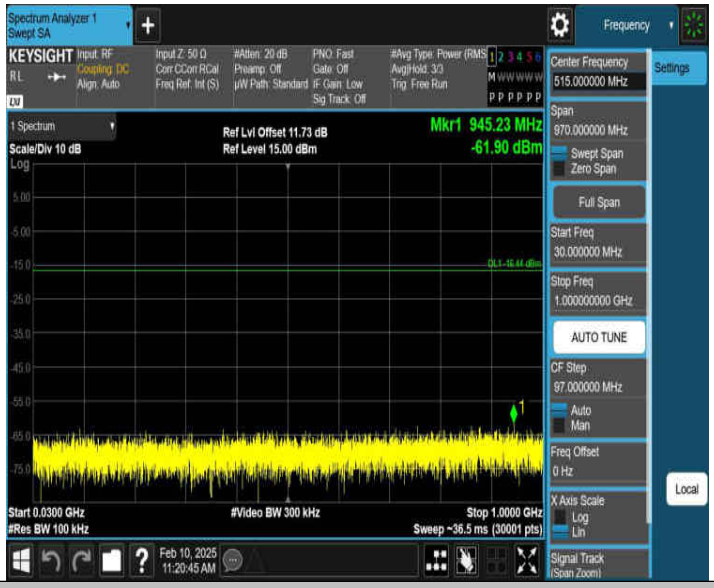
11B_Ant1_2437_1000~26500

11B_Ant2_2437_30~1000



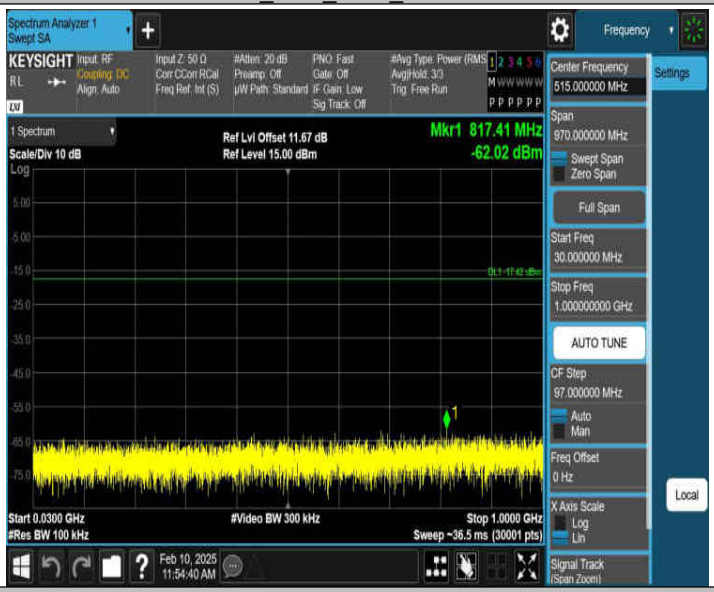
11B_Ant2_2437_1000~26500

11B_Ant1_2462_30~1000



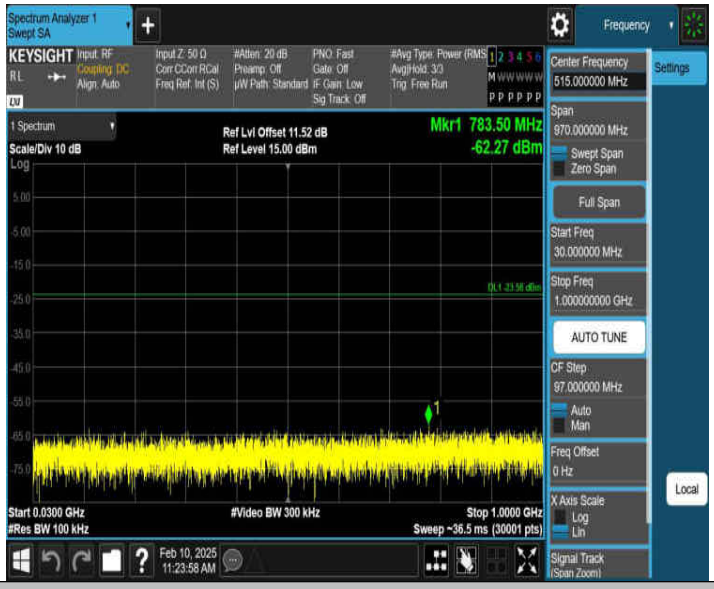
11B_Ant1_2462_1000~26500

11B_Ant2_2462_30~1000



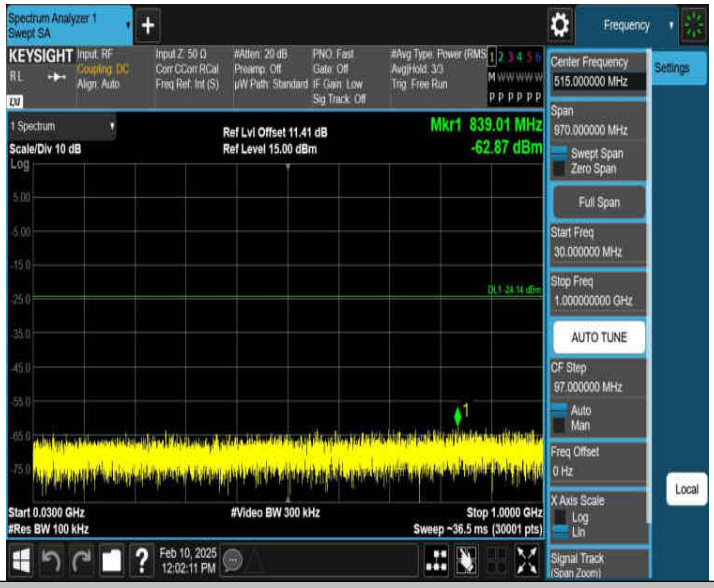
11B_Ant2_2462_1000~26500

11G_Ant1_2412_30~1000



11G_Ant1_2412_1000~26500

11G_Ant2_2412_30~1000

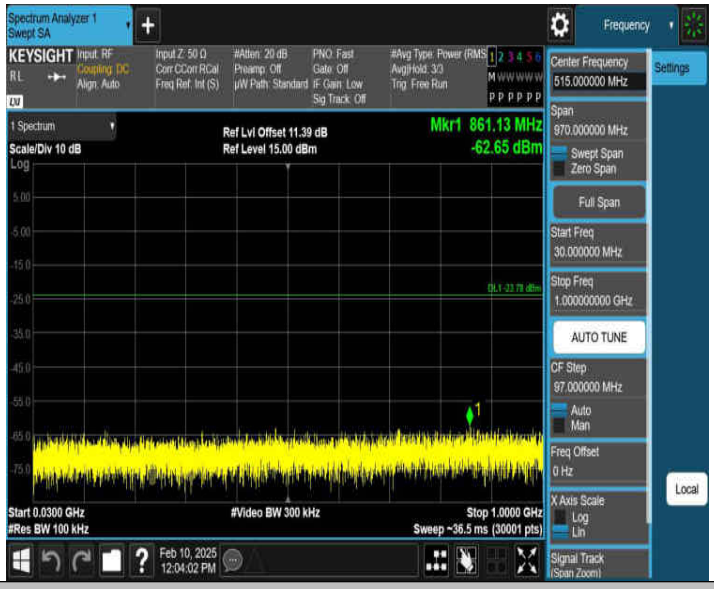


11G_Ant2_2412_1000~26500

11G_Ant1_2437_30~1000

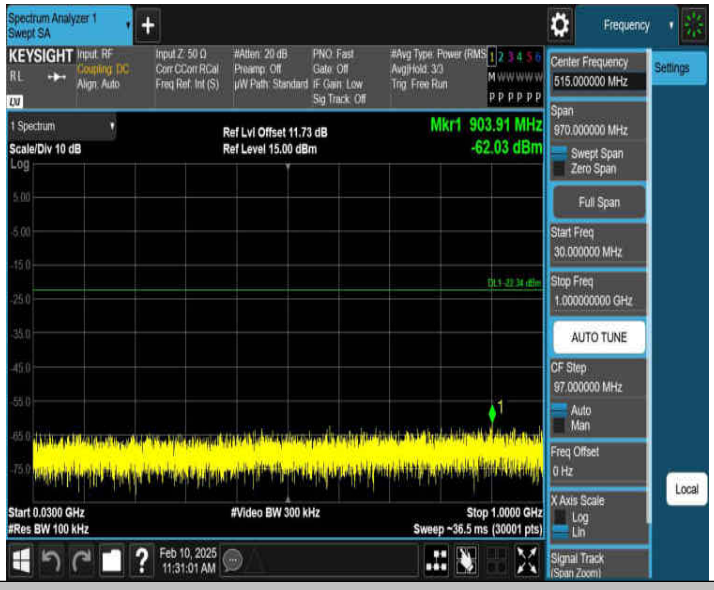
11G_Ant1_2437_1000~26500

11G_Ant2_2437_30~1000



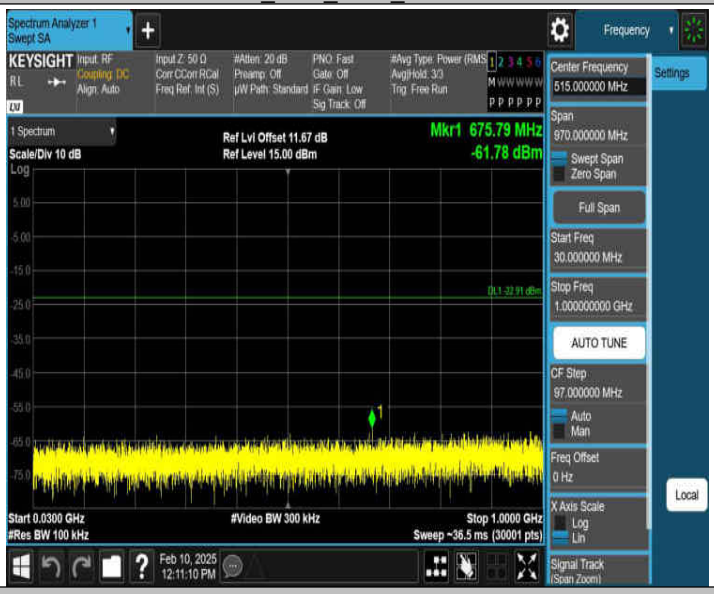
11G_Ant2_2437_1000~26500

11G_Ant1_2462_30~1000



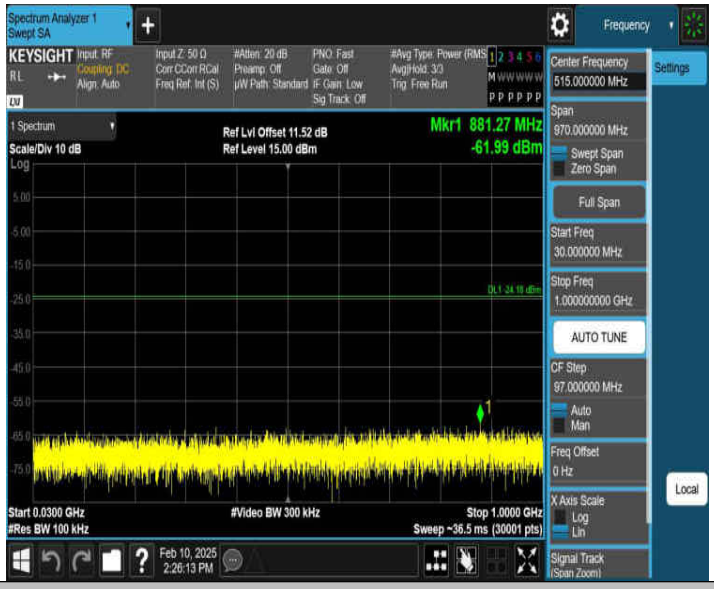
11G_Ant1_2462_1000~26500

11G_Ant2_2462_30~1000



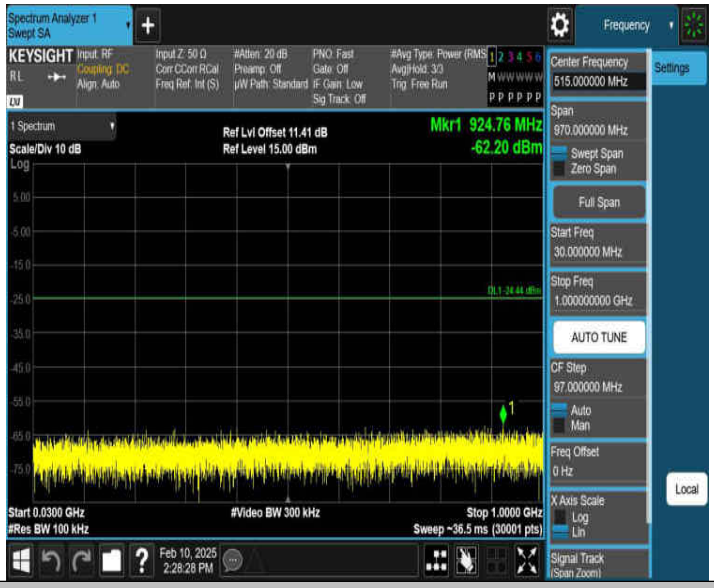
11G_Ant2_2462_1000~26500

11N20MIMO_Ant1_2412_30~1000



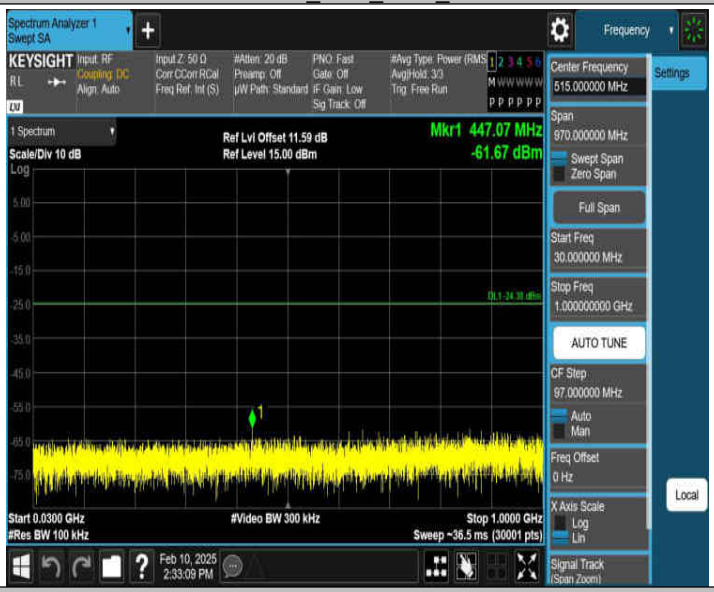
11N20MIMO_Ant1_2412_1000~26500

11N20MIMO_Ant2_2412_30~1000



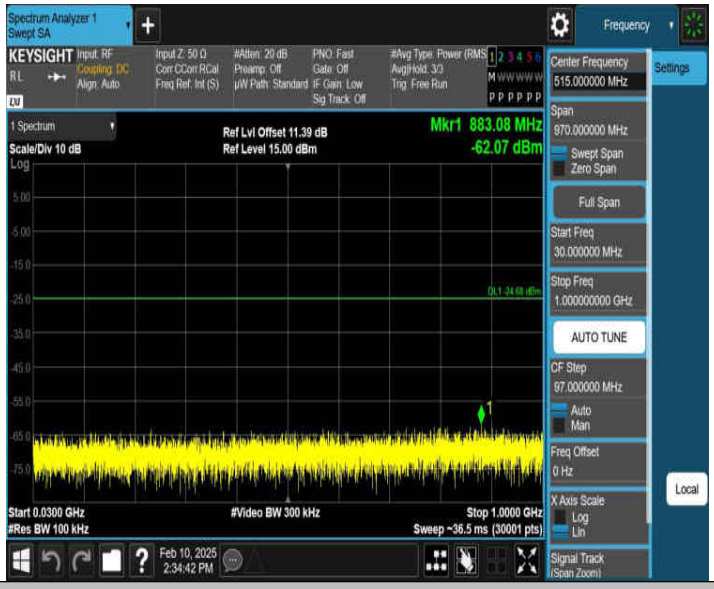
11N20MIMO_Ant2_2412_1000~26500

11N20MIMO_Ant1_2437_30~1000



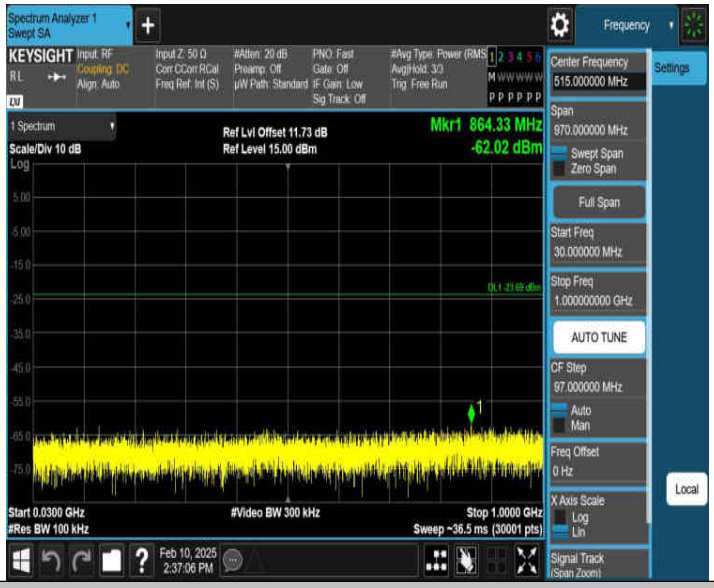
11N20MIMO_Ant1_2437_1000~26500

11N20MIMO_Ant2_2437_30~1000



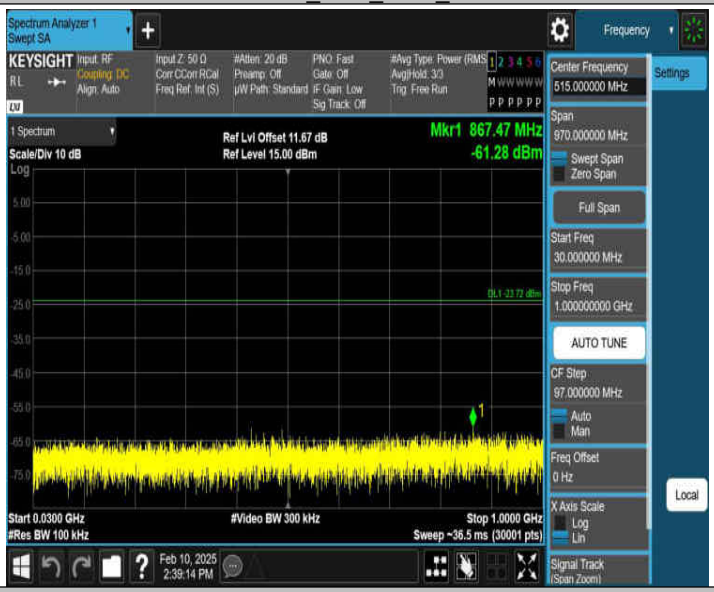
11N20MIMO_Ant2_2437_1000~26500

11N20MIMO_Ant1_2462_30~1000



11N20MIMO_Ant1_2462_1000~26500

11N20MIMO_Ant2_2462_30~1000

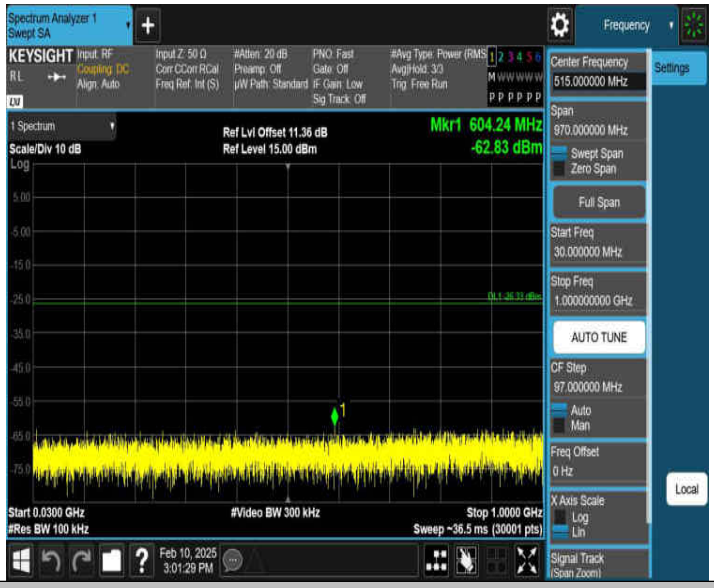


11N20MIMO_Ant2_2462_1000~26500

11N40MIMO_Ant1_2422_30~1000

11N40MIMO_Ant1_2422_1000~26500

11N40MIMO_Ant2_2422_30~1000



11N40MIMO_Ant2_2422_1000~26500

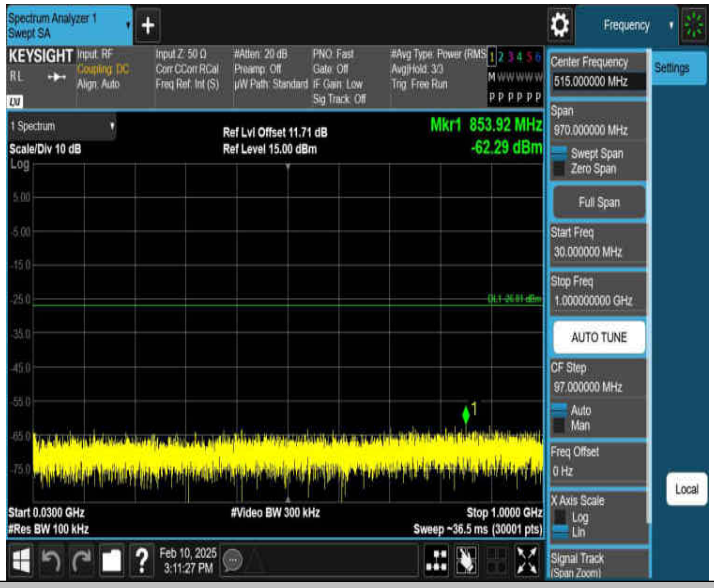
11N40MIMO_Ant1_2437_30~1000

11N40MIMO_Ant1_2437_1000~26500

11N40MIMO_Ant2_2437_30~1000

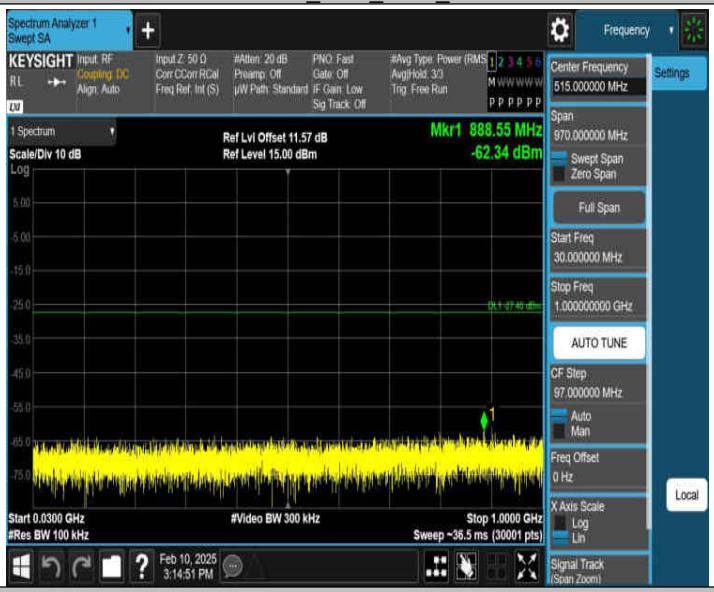
11N40MIMO_Ant2_2437_1000~26500

11N40MIMO_Ant1_2452_30~1000



11N40MIMO_Ant1_2452_1000~26500

11N40MIMO_Ant2_2452_30~1000



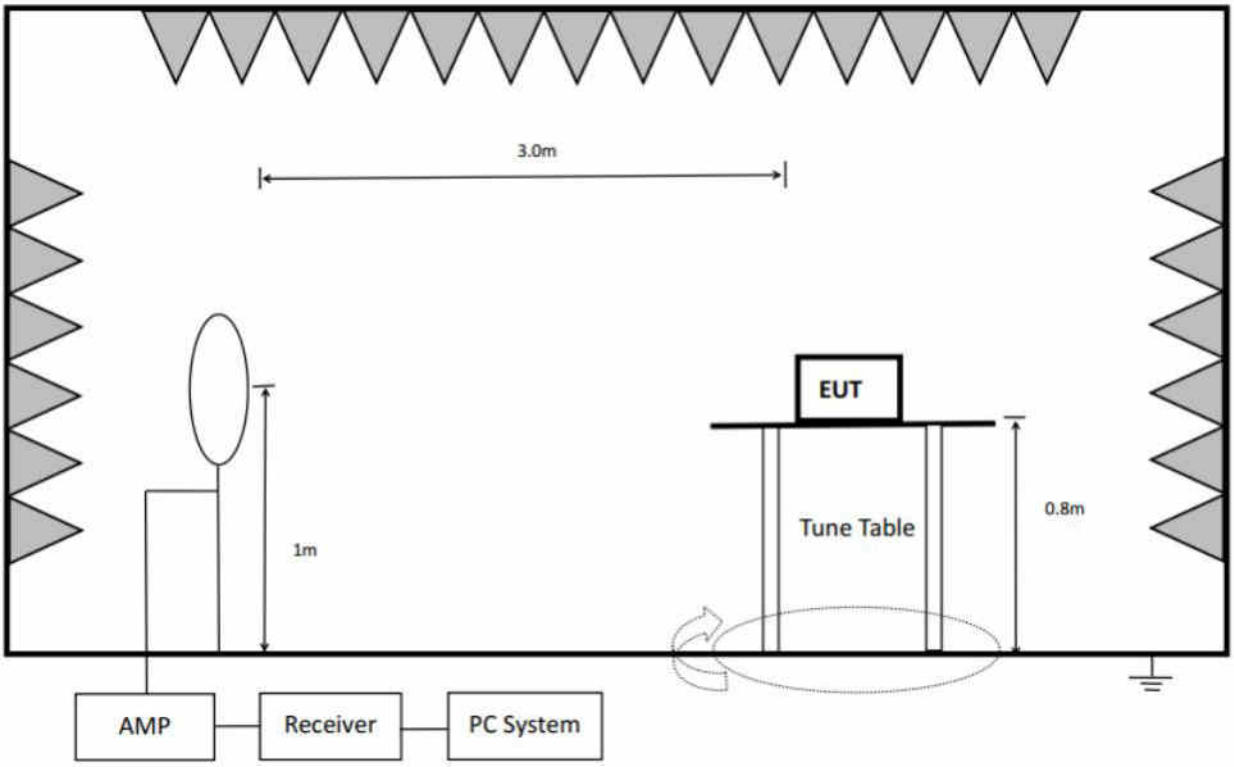
11N40MIMO_Ant2_2452_1000~26500


Spectrum Analyzer 1
Swept SA
KEYSIGHT
Frequency
Center Frequency
13.750000000 GHz
Settings
Span
25.5000000 GHz
Swept Span
Zero Span
Full Span
Start Freq
1.000000000 GHz
Stop Freq
26.500000000 GHz
AUTO TUNE
CF Step
2.550000000 GHz
Auto
Man
Freq Offset
0 Hz
X Axis Scale
Log
Lin
Signal Track
(Span Zoom)
Local
1 Spectrum
Ref Lvl Offset 11.57 dB
Ref Level 15.00 dBm
Mkr2 26.222 05 GHz
-50.40 dBm
Scale/Div 10 dB
Log
Start 1.00 GHz
#Res BW 100 kHz
#Video BW 300 kHz
Stop 26.50 GHz
Sweep ~943 ms (30001 pts)
5 Marker Table
Mode Trace Scale X Y Function Function Width Function Value
1 N 1 f 2.444 15 GHz -10.21 dBm
2 N 1 f 26.222 05 GHz -50.40 dBm
Feb 10, 2025
3:15:07 PM

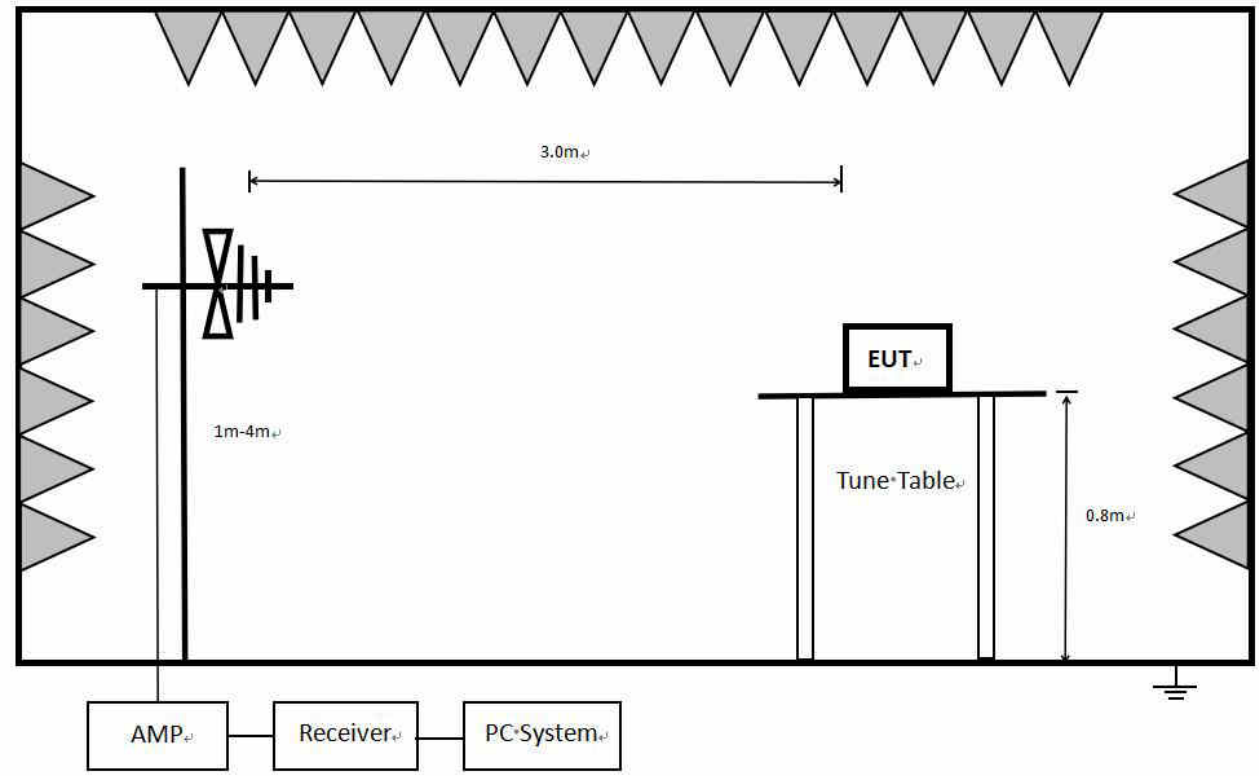
13. Radiated Emission

13.1. Block diagram of test setup

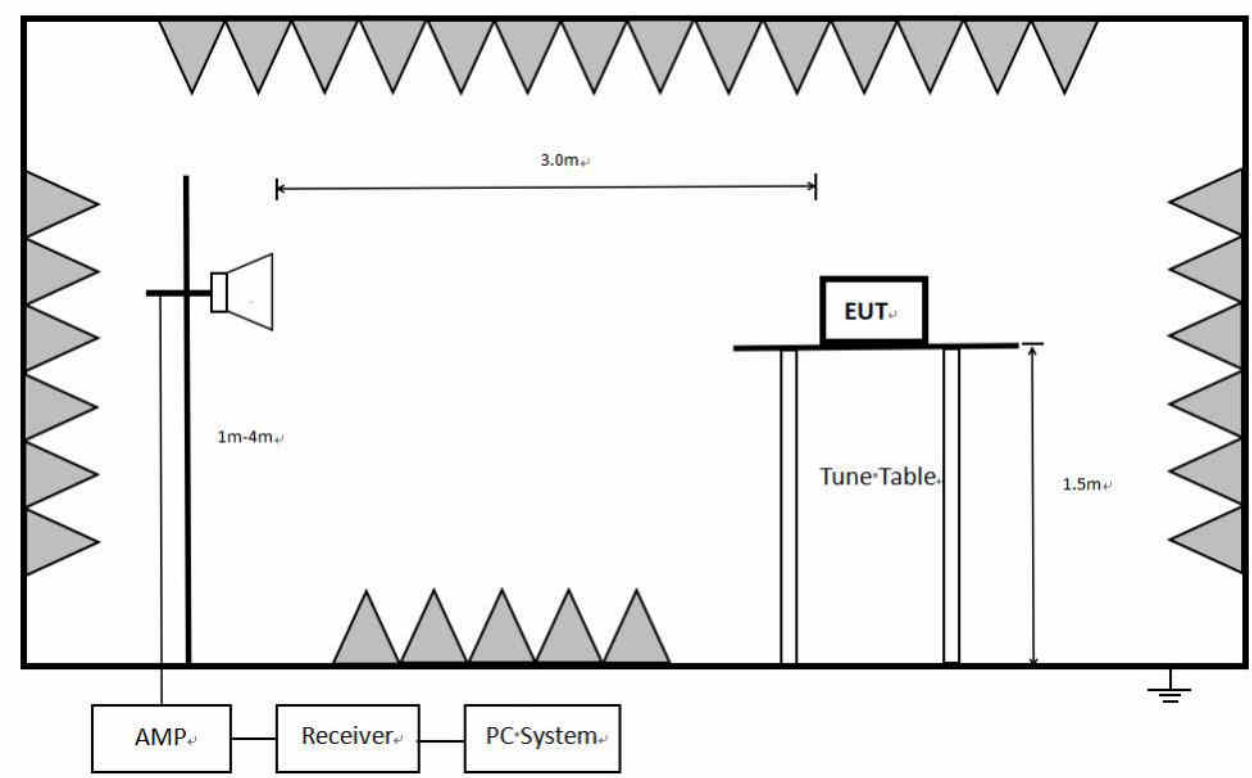
In 3 m Anechoic Chamber, test setup diagram for 9 kHz - 30 MHz:



In 3 m Anechoic Chamber, test setup diagram for 30 MHz - 1 GHz:



In 3 m Anechoic Chamber, test setup diagram for frequency above 1 GHz:



Note: For harmonic emissions test an appropriate high pass filter was inserted in the input port of AMP.

13.2. Limit

(1) FCC 15.205 Restricted frequency band

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
[1]0.495-0.505	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
4.1772&4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.2072&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	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	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			

[1]Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

[2]Above 38.6

(2) FCC 15.209 Limit.

Frequency MHz	Distance Meters	Field Strengths Limit	
		μV/m	dB(μV)/m
0.009 ~ 0.490	300	2400/F(kHz)	67.6-20log(F)
0.490 ~ 1.705	30	24000/F(kHz)	87.6-20log(F)
1.705 ~ 30.0	30	30	29.54
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216~960	3	200	46.0
960~1000	3	500	54.0
Above 1000	3	74.0 dB(μV)/m (Peak) 54.0 dB(μV)/m (Average)	

Note: (1) At frequencies at or above 30 MHz, measurements may be performed at a distance other than what is specified provided: measurements are not made in the near field except where it can be shown that near field measurements are appropriate due to the characteristics of the device; and it can be demonstrated that the signal levels needed to be measured at the distance employed can be detected by the measurement equipment. Measurements shall not be performed at a distance greater than 30 meters unless it can be further demonstrated that measurements at a distance of 30 meters or less are impractical. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse linear-distance for field strength measurements; inverse-linear-distance-squared for power density measurements).

(2) At frequencies below 30 MHz, measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field. Pending the development of an appropriate measurement procedure for measurements performed below 30 MHz, when performing measurements at a closer distance than specified, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade). This paragraph (f) shall not apply to Access BPL devices operating below 30 MHz.

About Restricted bands of operation please refer to RSS-Gen section 8.10 and FCC § 15.205(a).

13.3. Test Procedure

Below 30 MHz：

The setting of the spectrum Analyzer

RBW	300 Hz (From 9 kHz to 0.15 MHz)/ 10 kHz (From 0.15 MHz to 30 MHz)
VBW	1 kHz (From 9 kHz to 0.15 MHz)/ 30 kHz (From 0.15 MHz to 30 MHz)
Sweep	Auto
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.10-2013

2. The EUT was arranged to its worst case and then 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. Both Horizontal, Face-on and Face-off polarizations of the antenna are set to make the measurement.

3. The EUT was placed on a turntable with 80 cm meter above ground.

4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of 1 meter height antenna tower.

5. The radiated emission limits are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

6. For measurement below 1 GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. If the emission level of the EUT

measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

7. Although these tests were performed other than open field site, adequate comparison measurements were confirmed against 30m open field site. Therefore, sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field site based on KDB 414788.

Below 1 GHz and above 30 MHz：

The setting of the spectrum Analyzer

RBW	100 kHz
VBW	300 kHz
Sweep	Auto
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.10-2013.

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. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

3. The EUT was placed on a turntable with 80 cm 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. For measurement below 1GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

Above 1 GHz：

RBW	1 MHz
VBW	PEAK: 3 MHz AVG: see note 6
Sweep	Auto
Detector	Peak
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.10-2013.

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. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

3. The EUT was placed on a turntable with 1.5m 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. For measurement above 1GHz, the emission measurement will be measured by the peak detector. This peak level, once corrected, must comply with the limit specified in Section 15.209.

6. For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements and 1 MHz resolution bandwidth with 1/T video bandwidth with peak detector for AVG measurements. For the Duty Cycle please refer to clause 8.1.ON TIME AND DUTY CYCLE.

7. Restriction band: Investigated frequency range from 2310 MHz to 2430 MHz and 2445 MHz to 2500 MHz, 2310 MHz to 2450 MHz and 2425 MHz to 2500MHz.

All restriction band should comply with 15.209, other emission should be at least 20 dB below the fundamental.

Note 1: For all radiated test, EUT in each of three orthogonal axis emissions had been tested, but only the worst case (X axis) data recorded in the report.

Note 2: The EUT does not support simultaneous transmission.

Note 3: The EUT was fully exercised with external accessories during the test. In the case of multiple accessory external ports, an external accessory shall be connected to one of each type of port.

13.4. Results

Pass. (See below detailed test result)

All the emissions except fundamental emission from 9 kHz to 25 GHz were comply with 15.209 limits.

Note1: According exploratory test, the emission levels are 20 dB below the limit detected from 9 kHz to 30 MHz, so the final test was performed with frequency range from 30 MHz to 26 GHz and recorded in below.

Note2: For emissions below 1 GHz, according exploratory explorer test, when change Tx mode and channel, have no distinct influence on emissions level, so for emissions below 1 GHz, the final test was only performed with EUT working in ANT1+ ANT2, 11n HT40, Tx CH9 mode.

Note3: For emissions above 1 GHz. If peak results comply with AV limit, AV Result is deemed to comply with AV limit.

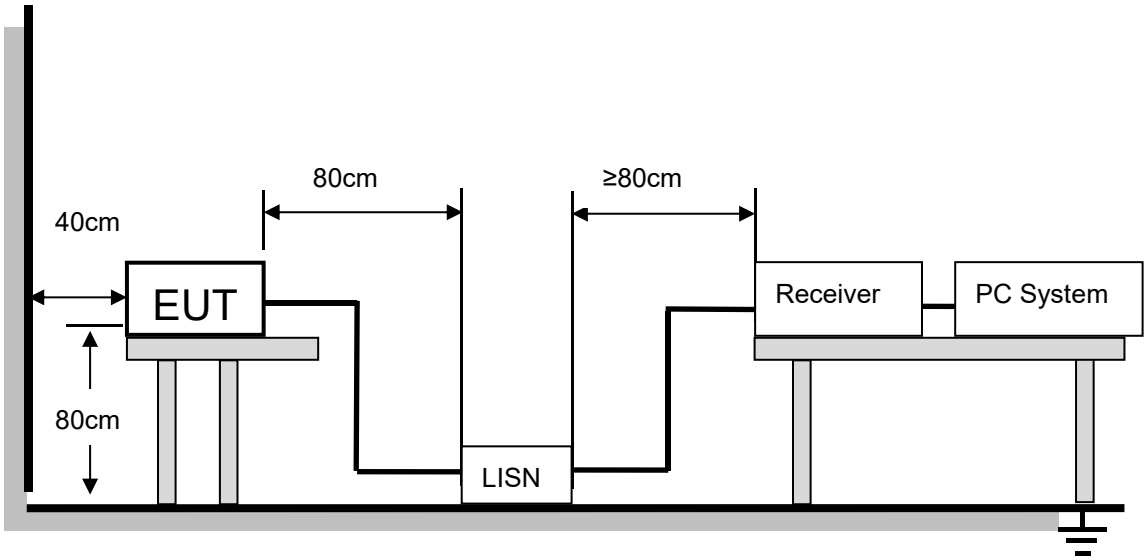
13.5. Original test data

Below 1 GHz and above 30 MHz test data Refer to appendix A

Above 1 GHz test data Refer to appendix B

14. AC Power Line Conducted Emissions

14.1. Block diagram of test setup



The EUT is put on a table of non-conducting material that is 80 cm high. The vertical conducting wall of shielding is located 40 cm to the rear of the EUT. The power line of the EUT is connected to the AC mains through an Artificial Mains Network (A.M.N.). A EMI Measurement Receiver (R&S Test Receiver ESR3) is used to test the emissions from both sides of AC line. According to the requirements in Section 6.2 of ANSI C63.10-2013.Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and average detector mode. The bandwidth of EMI test receiver is set at 9 kHz.

The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application.

14.2. Limits

Please refer to CFR 47 FCC § 15.207 (a) and ISED RSS-Gen Clause 8.8.

Frequency (MHz)	Quasi-peak	Average
0.15 -0.5	66 - 56 *	56 - 46 *
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00

Note 1: * Decreasing linearly with logarithm of frequency.

Note 2: The lower limit shall apply at the transition frequencies.

14.3. Test procedure

The EUT and Support equipment, if needed, were put placed on a non-metallic table, 80cm above the ground plane.

Configuration EUT to simulate typical usage as described in clause 2.4 and test equipment as described in clause 10.2 of this report.

All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.

All support equipment power received from a second LISN.

Emissions were measured on each current carrying line of the EUT using an EMI Test Receiver connected to the LISN powering the EUT.

The Receiver scanned from 150 kHz to 30 MHz for emissions in each of the test modes.

During the above scans, the emissions were maximized by cable manipulation.

The test mode(s) described in clause 2.4 were scanned during the preliminary test.

After the preliminary scan, we found the test mode producing the highest emission level.

The EUT configuration and worse cable configuration of the above highest emission levels were recorded for reference of the final test.

EUT and support equipment were set up on the test bench as per the configuration with highest emission level in the preliminary test.

A scan was taken on both power lines, Neutral and Line, recording at least the six highest emissions.

Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit.

The test data of the worst-case condition(s) was recorded.

The bandwidth of test receiver is set at 9 kHz.

14.4. Test result

Pass. (See below detailed test result)

Note1: All emissions not reported below are too low against the prescribed limits.

Note2: Pre-test AC conducted emission at both voltage AC 120V/60Hz and AC 240V/50Hz, recorded worse case.

14.5. Original test data

AC Power Line Conducted Emission Test Data Refer to appendix C.

15. Antenna Requirements

15.1. Applicable Requirements

Please refer to FCC §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. 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.

Please refer to FCC §15.247(b)(4)

The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

15.2. Result

The device support 2T2R MIMO, the antennas both used for this product are dedicated PCB antennas and other than that furnished by the responsible party shall be used with the device, maximum antenna gain is 2.75 dBi for antenna 1, 2.67 dBi for antenna 2.

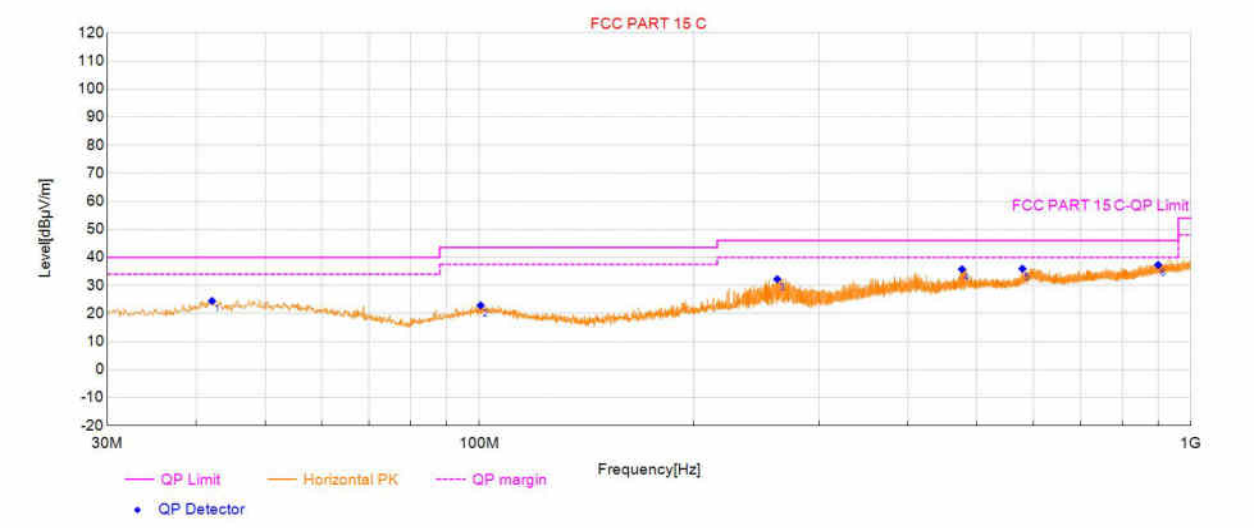
APPENDIX A – Radiated Emission Below 1GHz Test Data

Test Report

Project Information			
EUT:	IEEE 802.11b/g/n/a/ac 2T2R USB WiFi Module Integrated BT 2.1+EDR/4.2/5.1		
Customer:			
Model:	SKO.WB663U.16	SN:	
Mode:	11N40_2452	Voltage:	DC 5V
Environment:	Temp: 25℃; Humi:60%	Engineer:	Soho Liu
Remark:	Power Set:0C		
Test Standard: FCC PART 15 C			

Start of Test:2025-02-12 19:03:18

Test Graph



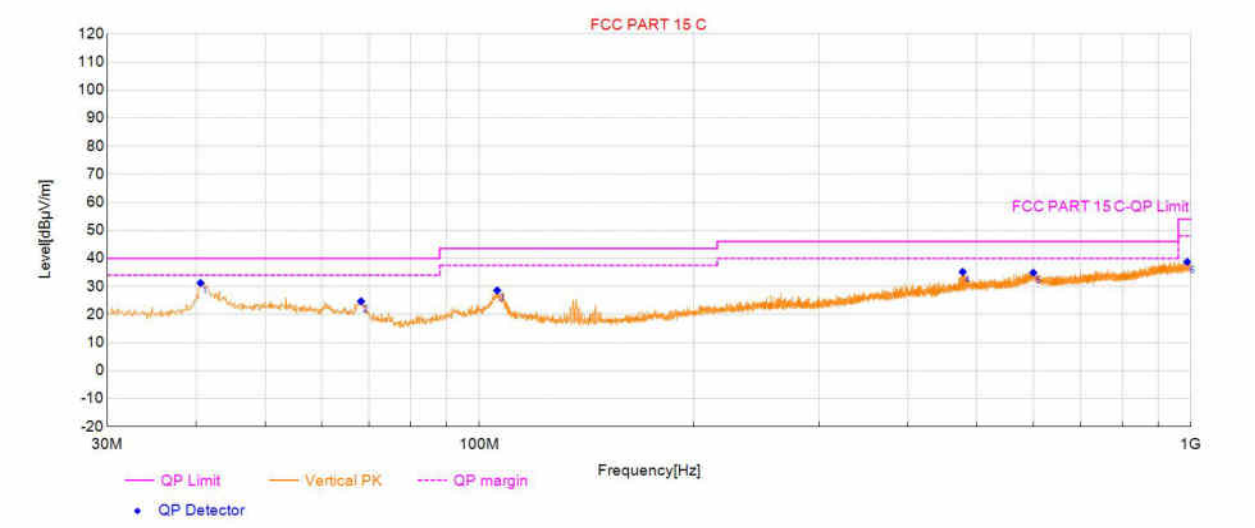
Final Data List								
NO.	Frequency (MHz)	QP Value (dBµV/m)	QP Limit (dBµV/m)	QP Margin (dB)	Height (cm)	Angle (°)	Polarity	Verdict
1	42.1262	24.46	40.00	15.54	100	333	Horizontal	PASS
2	100.4290	22.86	43.50	20.64	100	0	Horizontal	PASS
3	262.1442	32.24	46.00	13.76	100	245	Horizontal	PASS
4	476.7297	35.76	46.00	10.24	100	333	Horizontal	PASS
5	579.5600	35.96	46.00	10.04	100	180	Horizontal	PASS
6	899.0129	37.29	46.00	8.71	100	255	Horizontal	PASS

Test Report

Project Information			
EUT:	IEEE 802.11b/g/n/a/ac 2T2R USB WiFi Module Integrated BT 2.1+EDR/4.2/5.1		
Customer:			
Model:	SKO.WB663U.16	SN:	
Mode:	11N40_2452	Voltage:	DC 5V
Environment:	Temp: 25℃; Humi:60%	Engineer:	Soho Liu
Remark:	Power Set:0C		
Test Standard: FCC PART 15 C			

Start of Test:2025-02-12 19:04:00

Test Graph



Final Data List								
NO.	Frequency (MHz)	QP Value (dBµV/m)	QP Limit (dBµV/m)	QP Margin (dB)	Height (cm)	Angle (°)	Polarity	Verdict
1	40.5741	31.23	40.00	8.77	100	36	Vertical	PASS
2	68.2218	24.70	40.00	15.30	100	294	Vertical	PASS
3	105.9586	28.59	43.50	14.91	100	154	Vertical	PASS
4	477.7968	35.18	46.00	10.82	100	26	Vertical	PASS
5	600.3200	34.89	46.00	11.11	100	201	Vertical	PASS
6	987.6798	38.73	54.00	15.27	100	26	Vertical	PASS

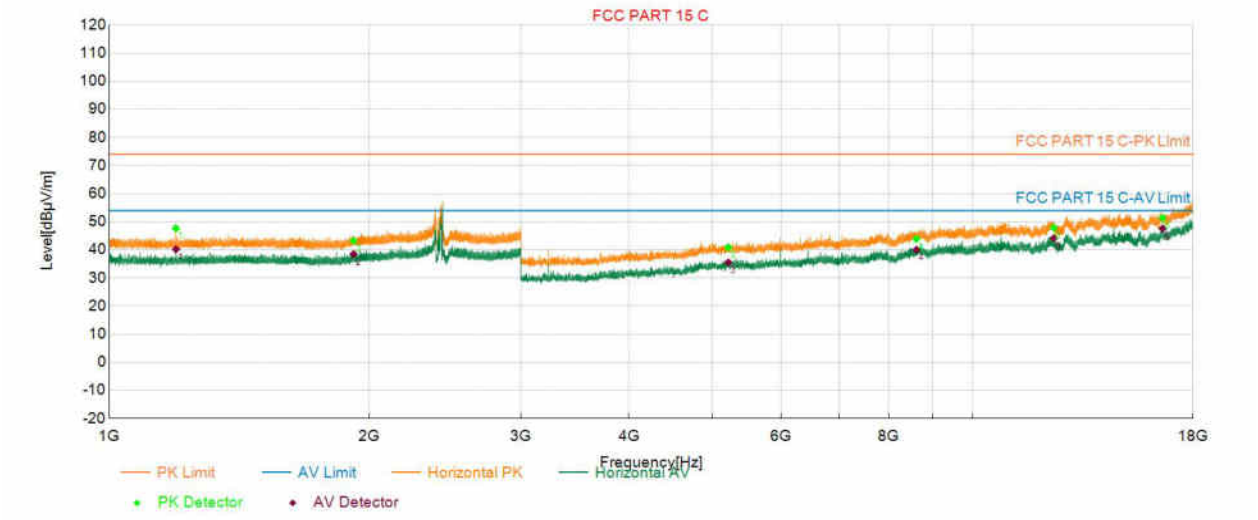
APPENDIX B – Radiated Emission Above 1GHz Test Data

Test Report

Project Information			
Customer:			
EUT:	IEEE 802.11b/g/n/a/ac 2T2R USB WiFi Module Integrated BT 2.1+EDR/4.2/5.1		
Model:	SKO.WB663U.16	SN:	
Mode:	11N40_2422	Voltage:	DC 5V
Environment:	Temp: 25℃; Humi:60%	Engineer:	Soho Liu
Remark:	Power Set:0C		
Test Standard: FCC PART 15 C			

Start of Test:2025-02-12 09:28:37

Test Graph



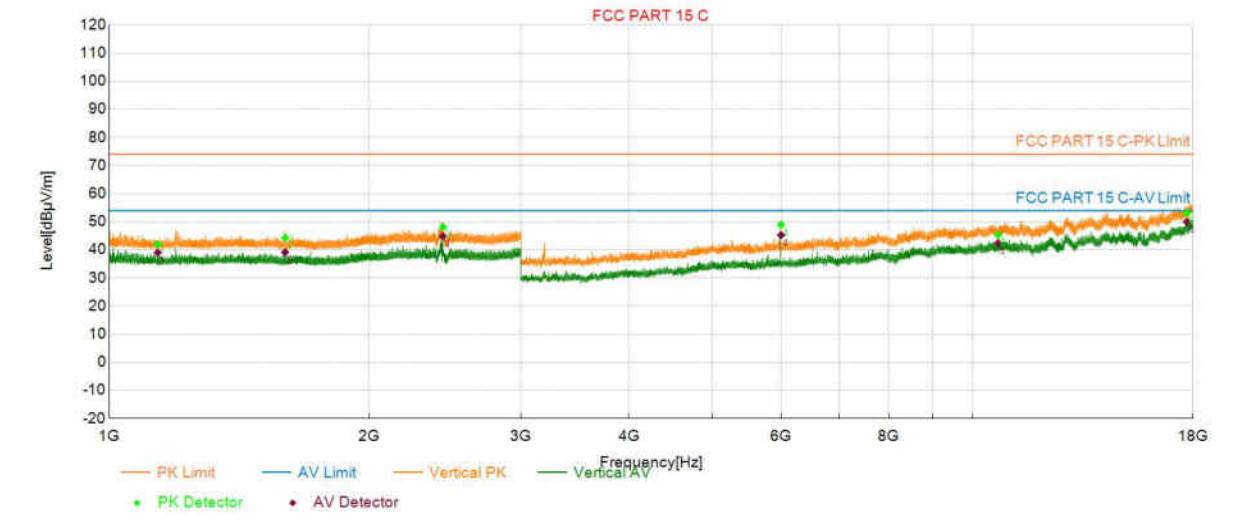
PK Final Data List										
NO.	Frequency (MHz)	PK Value (dBµV/m)	PK Limit (dBµV/m)	PK Margin (dB)	AV Value (dBµV/m)	AV Limit (dBµV/m)	AV Margin (dB)	Height (cm)	Angle (°)	Polarity
1	1195.1098	47.66	74.00	26.34	40.21	54.00	13.79	150	164	Horizontal
2	1919.2460	43.19	74.00	30.81	38.48	54.00	15.52	150	49	Horizontal
3	5213.3607	40.89	74.00	33.11	35.51	54.00	18.49	150	5	Horizontal
4	8610.2805	43.89	74.00	30.11	40.00	54.00	14.00	150	354	Horizontal
5	12416.7208	47.88	74.00	26.12	44.17	54.00	9.83	150	156	Horizontal
6	16595.1798	51.37	74.00	22.63	47.61	54.00	6.39	150	2	Horizontal

Test Report

Project Information			
Customer:			
EUT:	IEEE 802.11b/g/n/a/ac 2T2R USB WiFi Module Integrated BT 2.1+EDR/4.2/5.1		
Model:	SKO.WB663U.16	SN:	
Mode:	11N40_2422	Voltage:	DC 5V
Environment:	Temp: 25℃; Humi:60%	Engineer:	Soho Liu
Remark:	Power Set:0C		
Test Standard: FCC PART 15 C			

Start of Test:2025-02-12 09:29:56

Test Graph



PK Final Data List

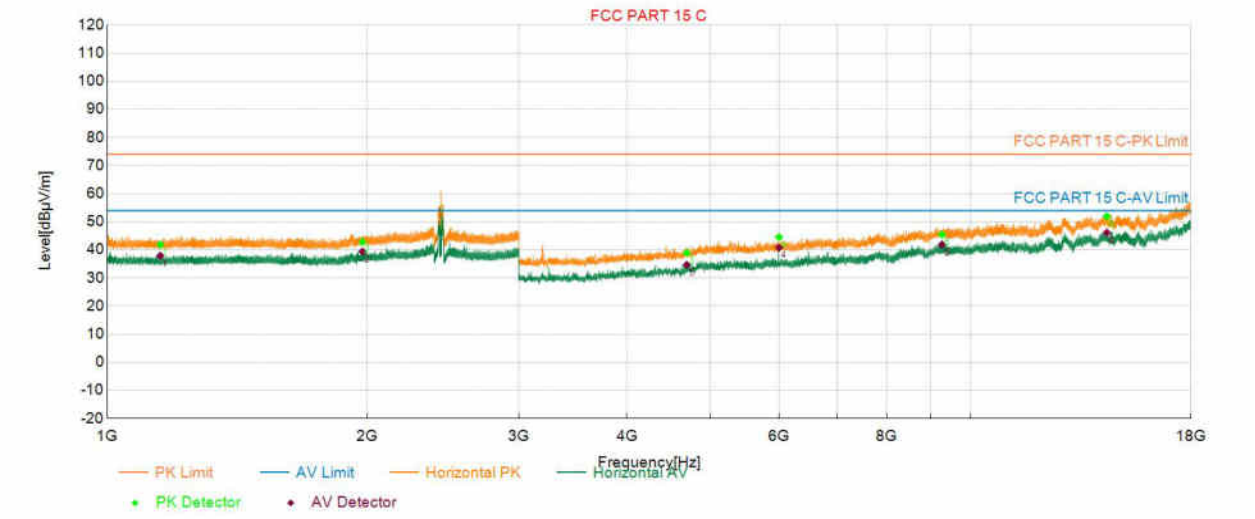
NO.	Frequency (MHz)	PK Value (dBµV/m)	PK Limit (dBµV/m)	PK Margin (dB)	AV Value (dBµV/m)	AV Limit (dBµV/m)	AV Margin (dB)	Height (cm)	Angle (°)	Polarity
1	1138.2069	41.98	74.00	32.02	39.04	54.00	14.96	150	90	Vertical
2	1598.6299	44.33	74.00	29.67	39.20	54.00	14.80	150	140	Vertical
3	2435.7718	48.14	74.00	25.86	44.84	54.00	9.16	150	82	Vertical
4	6000.1500	48.95	74.00	25.05	45.26	54.00	8.74	150	67	Vertical
5	10703.6352	45.24	74.00	28.76	42.39	54.00	11.61	150	126	Vertical
6	17707.4854	53.10	74.00	20.90	49.99	54.00	4.01	150	23	Vertical

Test Report

Project Information			
Customer:			
EUT:	IEEE 802.11b/g/n/a/ac 2T2R USB WiFi Module Integrated BT 2.1+EDR/4.2/5.1		
Model:	SKO.WB663U.16	SN:	
Mode:	11N40_2437	Voltage:	DC 5V
Environment:	Temp: 25℃; Humi:60%	Engineer:	Soho Liu
Remark:	Power Set:0C		
Test Standard: FCC PART 15 C			

Start of Test:2025-02-12 09:33:33

Test Graph



PK Final Data List

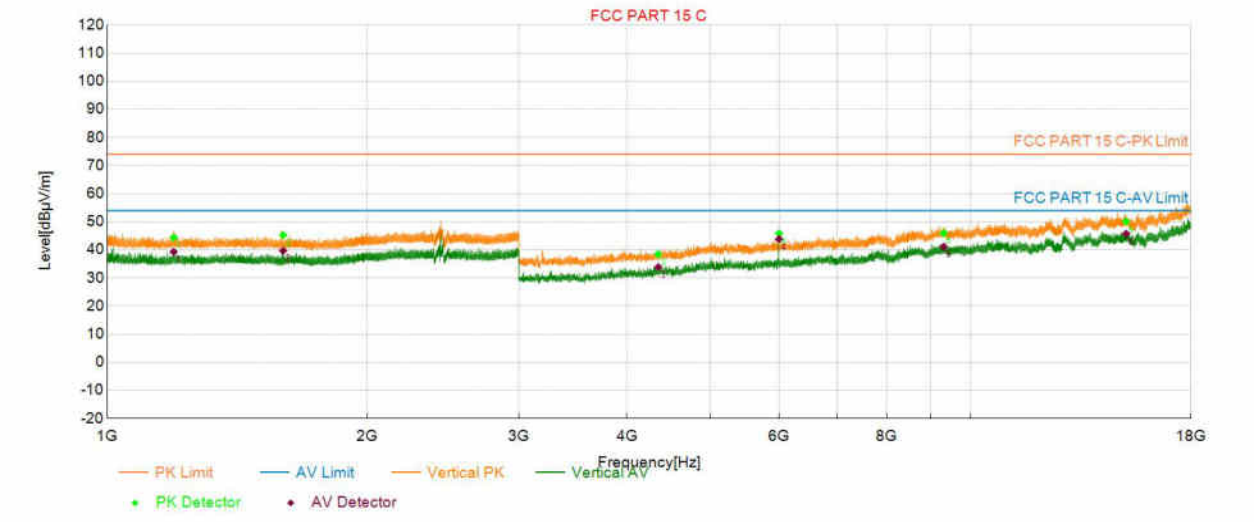
NO.	Frequency (MHz)	PK Value (dBµV/m)	PK Limit (dBµV/m)	PK Margin (dB)	AV Value (dBµV/m)	AV Limit (dBµV/m)	AV Margin (dB)	Height (cm)	Angle (°)	Polarity
1	1152.4076	41.85	74.00	32.15	37.90	54.00	16.10	150	0	Horizontal
2	1975.5488	42.82	74.00	31.18	39.41	54.00	14.59	150	268	Horizontal
3	4690.5845	38.92	74.00	35.08	34.67	54.00	19.33	150	143	Horizontal
4	6000.1500	44.53	74.00	29.47	40.81	54.00	13.19	150	48	Horizontal
5	9265.0633	45.43	74.00	28.57	41.89	54.00	12.11	150	76	Horizontal
6	14379.5690	51.91	74.00	22.09	46.12	54.00	7.88	150	6	Horizontal

Test Report

Project Information			
Customer:			
EUT:	IEEE 802.11b/g/n/a/ac 2T2R USB WiFi Module Integrated BT 2.1+EDR/4.2/5.1		
Model:	SKO.WB663U.16	SN:	
Mode:	11N40_2437	Voltage:	DC 5V
Environment:	Temp: 25℃; Humi:60%	Engineer:	Soho Liu
Remark:	Power Set:0C		
Test Standard: FCC PART 15 C			

Start of Test:2025-02-12 09:34:54

Test Graph



PK Final Data List

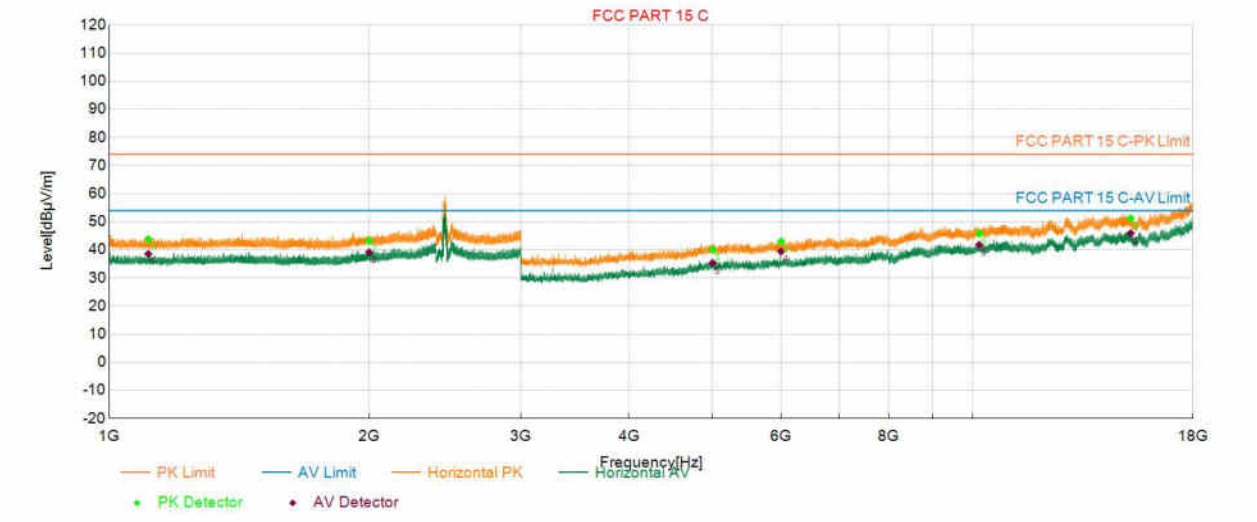
NO.	Frequency (MHz)	PK Value (dBµV/m)	PK Limit (dBµV/m)	PK Margin (dB)	AV Value (dBµV/m)	AV Limit (dBµV/m)	AV Margin (dB)	Height (cm)	Angle (°)	Polarity
1	1194.1097	44.40	74.00	29.60	39.33	54.00	14.67	150	66	Vertical
2	1598.7299	45.26	74.00	28.74	39.69	54.00	14.31	150	118	Vertical
3	4347.0674	38.48	74.00	35.52	33.86	54.00	20.14	150	166	Vertical
4	6000.1500	45.87	74.00	28.13	43.83	54.00	10.17	150	68	Vertical
5	9308.5654	45.98	74.00	28.02	41.12	54.00	12.88	150	219	Vertical
6	15138.6069	50.13	74.00	23.87	45.73	54.00	8.27	150	59	Vertical

Test Report

Project Information			
Customer:			
EUT:	IEEE 802.11b/g/n/a/ac 2T2R USB WiFi Module Integrated BT 2.1+EDR/4.2/5.1		
Model:	SKO.WB663U.16	SN:	
Mode:	11N40_2452	Voltage:	DC 5V
Environment:	Temp: 25℃; Humi:60%	Engineer:	Soho Liu
Remark:	Power Set:0C		
Test Standard: FCC PART 15 C			

Start of Test:2025-02-12 09:37:15

Test Graph



PK Final Data List

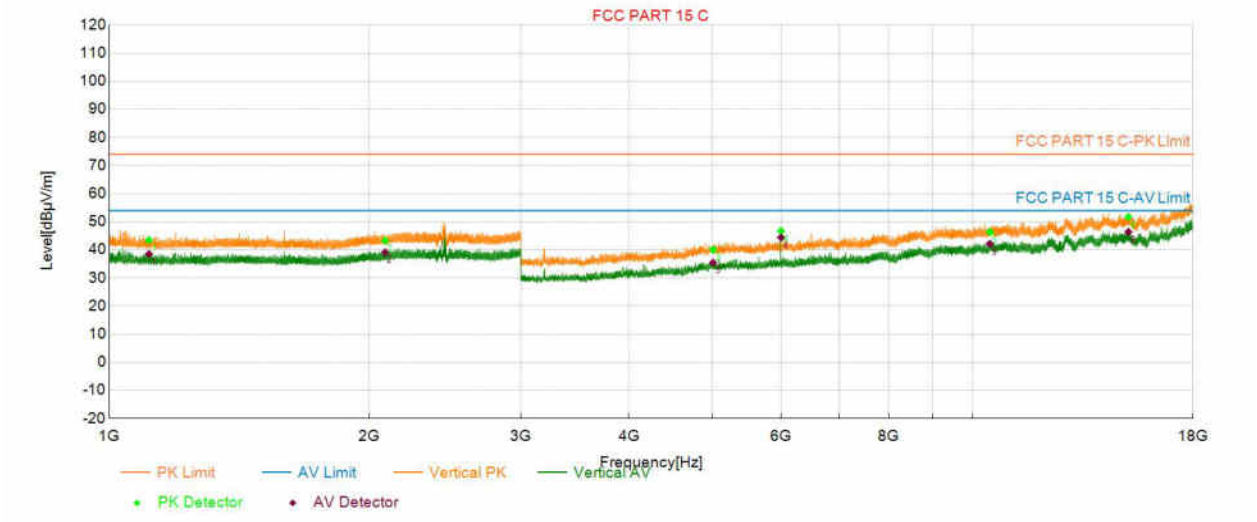
NO.	Frequency (MHz)	PK Value (dBµV/m)	PK Limit (dBµV/m)	PK Margin (dB)	AV Value (dBµV/m)	AV Limit (dBµV/m)	AV Margin (dB)	Height (cm)	Angle (°)	Polarity
1	1110.2055	43.82	74.00	30.18	38.53	54.00	15.47	150	146	Horizontal
2	2000.3500	43.23	74.00	30.77	39.11	54.00	14.89	150	18	Horizontal
3	4998.0999	40.11	74.00	33.89	35.32	54.00	18.68	150	122	Horizontal
4	6000.1500	42.95	74.00	31.05	39.45	54.00	14.55	150	114	Horizontal
5	10177.8589	45.77	74.00	28.23	41.80	54.00	12.20	150	207	Horizontal
6	15242.1121	51.21	74.00	22.79	45.95	54.00	8.05	150	207	Horizontal

Test Report

Project Information			
Customer:			
EUT:	IEEE 802.11b/g/n/a/ac 2T2R USB WiFi Module Integrated BT 2.1+EDR/4.2/5.1		
Model:	SKO.WB663U.16	SN:	
Mode:	11N40_2452	Voltage:	DC 5V
Environment:	Temp: 25℃; Humi:60%	Engineer:	Soho Liu
Remark:	Power Set:0C		
Test Standard: FCC PART 15 C			

Start of Test:2025-02-12 09:38:36

Test Graph



PK Final Data List

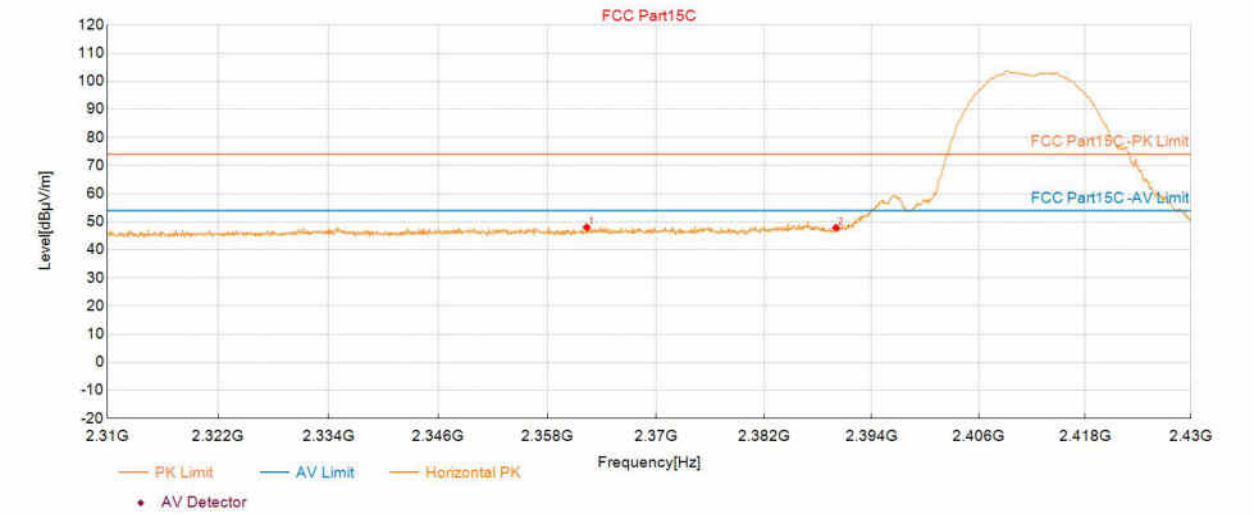
NO.	Frequency (MHz)	PK Value (dBµV/m)	PK Limit (dBµV/m)	PK Margin (dB)	AV Value (dBµV/m)	AV Limit (dBµV/m)	AV Margin (dB)	Height (cm)	Angle (°)	Polarity
1	1112.1056	43.42	74.00	30.58	38.50	54.00	15.50	150	140	Vertical
2	2087.8544	43.27	74.00	30.73	39.12	54.00	14.88	150	114	Vertical
3	5004.8502	40.10	74.00	33.90	35.44	54.00	18.56	150	48	Vertical
4	6000.1500	46.69	74.00	27.31	44.39	54.00	9.61	150	65	Vertical
5	10471.8736	46.33	74.00	27.67	42.14	54.00	11.86	150	274	Vertical
6	15151.3576	51.72	74.00	22.28	46.38	54.00	7.62	150	30	Vertical

Test Report

Project Information			
Customer:			
EUT:	IEEE 802.11b/g/n/a/ac 2T2R USB WiFi Module Integrated BT 2.1+EDR/4.2/5.1		
Model:	SKO.WB663U.16	SN:	
Mode:	11B_2412	Voltage:	DC 5V
Environment:	Temp: 25℃; Humi:60%	Engineer:	Soho Liu
Remark:	Power Set:16		
Test Standard: FCC Part15C			

Start of Test:2025-02-12 11:18:07

Test Graph



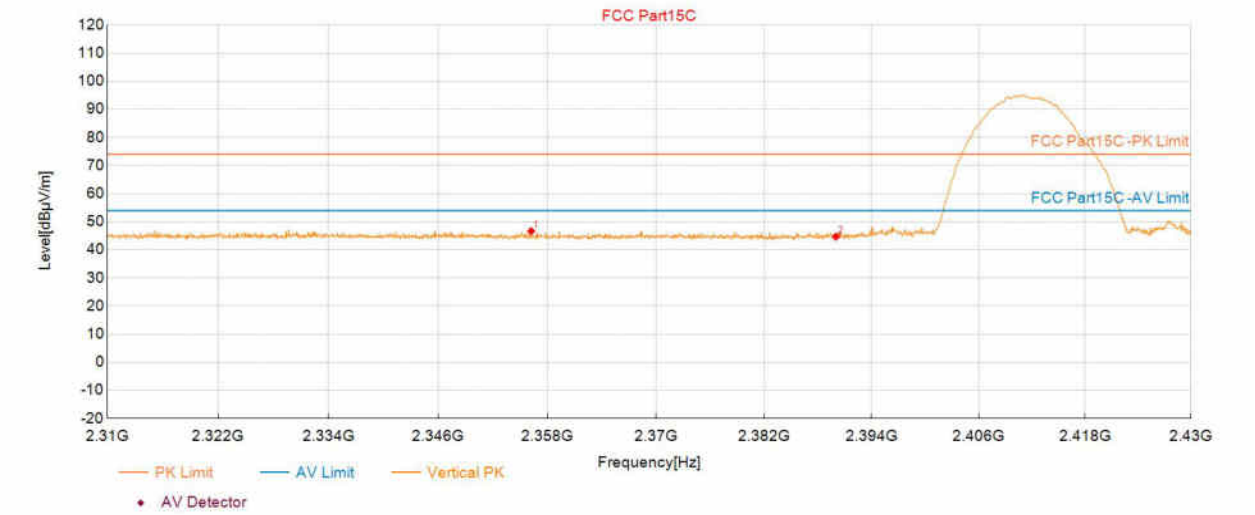
Suspected Data List								
NO.	Frequency (MHz)	Level (dBµV/m)	Factor (dB)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2362.3462	48.01	6.89	74.00	25.99	150	148	Horizontal
2	2390.0200	47.81	6.85	74.00	26.19	150	103	Horizontal

Test Report

Project Information			
Customer:			
EUT:	IEEE 802.11b/g/n/a/ac 2T2R USB WiFi Module Integrated BT 2.1+EDR/4.2/5.1		
Model:	SKO.WB663U.16	SN:	
Mode:	11B_2412	Voltage:	DC 5V
Environment:	Temp: 25℃; Humi:60%	Engineer:	Soho Liu
Remark:	Power Set:16		
Test Standard: FCC Part15C			

Start of Test:2025-02-12 11:18:49

Test Graph



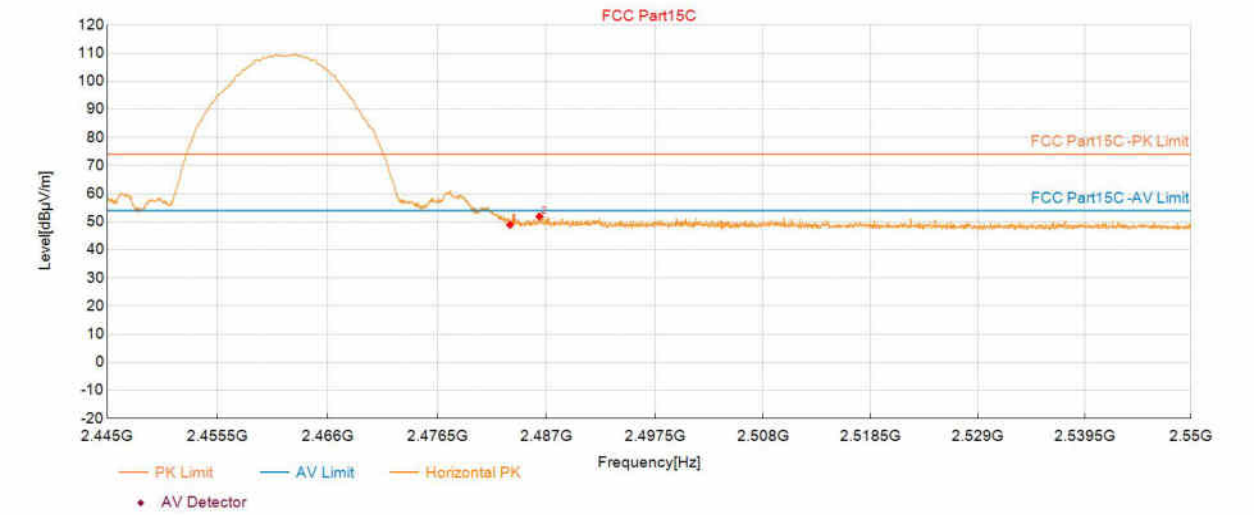
Suspected Data List								
NO.	Frequency (MHz)	Level (dBµV/m)	Factor (dB)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2356.2231	46.65	6.90	74.00	27.35	150	183	Vertical
2	2390.0200	44.70	6.85	74.00	29.30	150	128	Vertical

Test Report

Project Information			
Customer:			
EUT:	IEEE 802.11b/g/n/a/ac 2T2R USB WiFi Module Integrated BT 2.1+EDR/4.2/5.1		
Model:	SKO.WB663U.16	SN:	
Mode:	11B_2462	Voltage:	DC 5V
Environment:	Temp: 25℃; Humi:60%	Engineer:	Soho Liu
Remark:	Power Set:15		
Test Standard: FCC Part15C			

Start of Test:2025-02-12 11:22:49

Test Graph



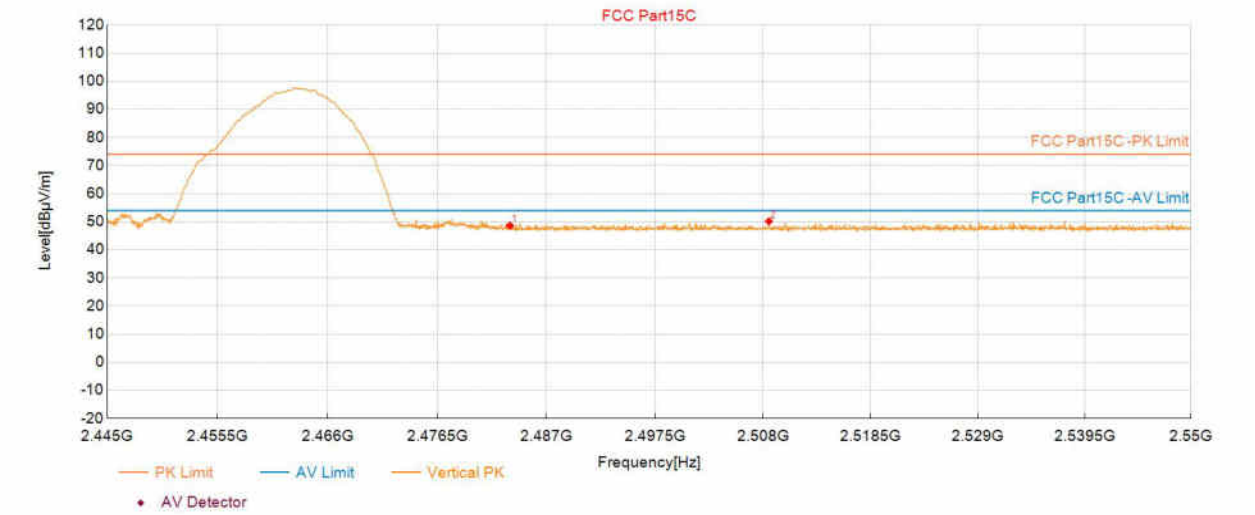
Suspected Data List								
NO.	Frequency (MHz)	Level (dBµV/m)	Factor (dB)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2483.5128	48.92	7.34	74.00	25.08	150	109	Horizontal
2	2486.3488	51.87	7.35	74.00	22.13	150	145	Horizontal

Test Report

Project Information			
Customer:			
EUT:	IEEE 802.11b/g/n/a/ac 2T2R USB WiFi Module Integrated BT 2.1+EDR/4.2/5.1		
Model:	SKO.WB663U.16	SN:	
Mode:	11B_2462	Voltage:	DC 5V
Environment:	Temp: 25℃; Humi:60%	Engineer:	Soho Liu
Remark:	Power Set:15		
Test Standard: FCC Part15C			

Start of Test:2025-02-12 11:23:32

Test Graph



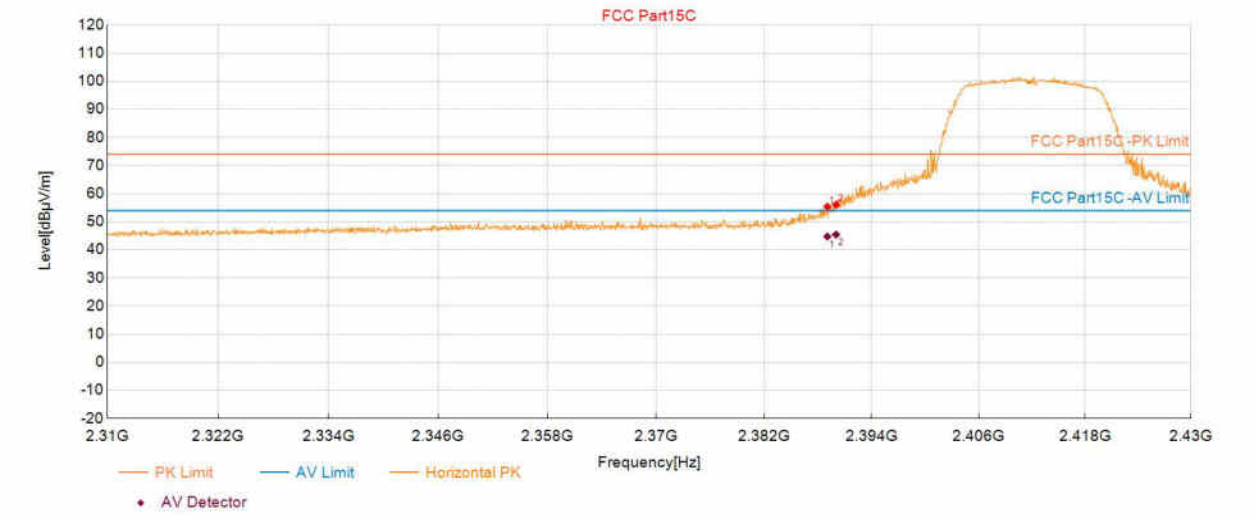
Suspected Data List								
NO.	Frequency (MHz)	Level (dBµV/m)	Factor (dB)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2483.5128	48.61	7.34	74.00	25.39	150	200	Vertical
2	2508.5812	50.13	7.48	74.00	23.87	150	75	Vertical

Test Report

Project Information			
Customer:			
EUT:	IEEE 802.11b/g/n/a/ac 2T2R USB WiFi Module Integrated BT 2.1+EDR/4.2/5.1		
Model:	SKO.WB663U.16	SN:	
Mode:	11G_2412	Voltage:	DC 5V
Environment:	Temp: 25℃; Humi:60%	Engineer:	Soho Liu
Remark:	Power Set:0D		
Test Standard: FCC Part15C			

Start of Test:2025-02-12 11:26:14

Test Graph



Suspected Data List								
NO.	Frequency (MHz)	Level (dBµV/m)	Factor (dB)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2389.0595	55.39	6.86	74.00	18.61	150	126	Horizontal
2	2390.0200	56.06	6.85	74.00	17.94	150	116	Horizontal

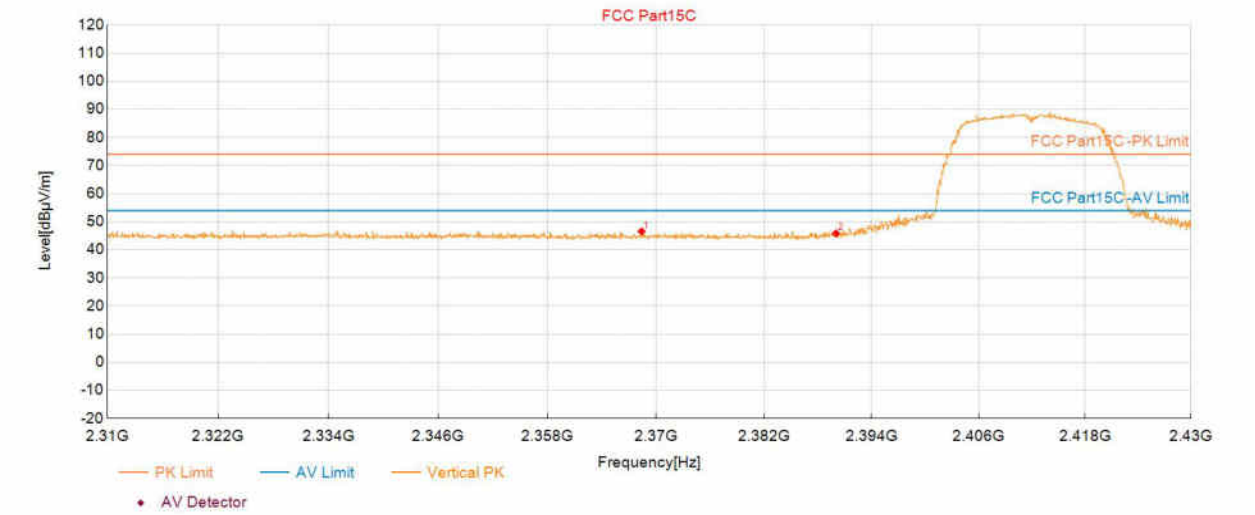
PK Final Data List							
NO.	Frequency (MHz)	AV Value (dBµV/m)	AV Limit (dBµV/m)	AV Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2389.0595	44.74	54.00	9.26	150	126	Horizontal
2	2390.0200	45.44	54.00	8.56	150	116	Horizontal

Test Report

Project Information			
Customer:			
EUT:	IEEE 802.11b/g/n/a/ac 2T2R USB WiFi Module Integrated BT 2.1+EDR/4.2/5.1		
Model:	SKO.WB663U.16	SN:	
Mode:	11G_2412	Voltage:	DC 5V
Environment:	Temp: 25℃; Humi:60%	Engineer:	Soho Liu
Remark:	Power Set:0D		
Test Standard: FCC Part15C			

Start of Test:2025-02-12 11:26:56

Test Graph



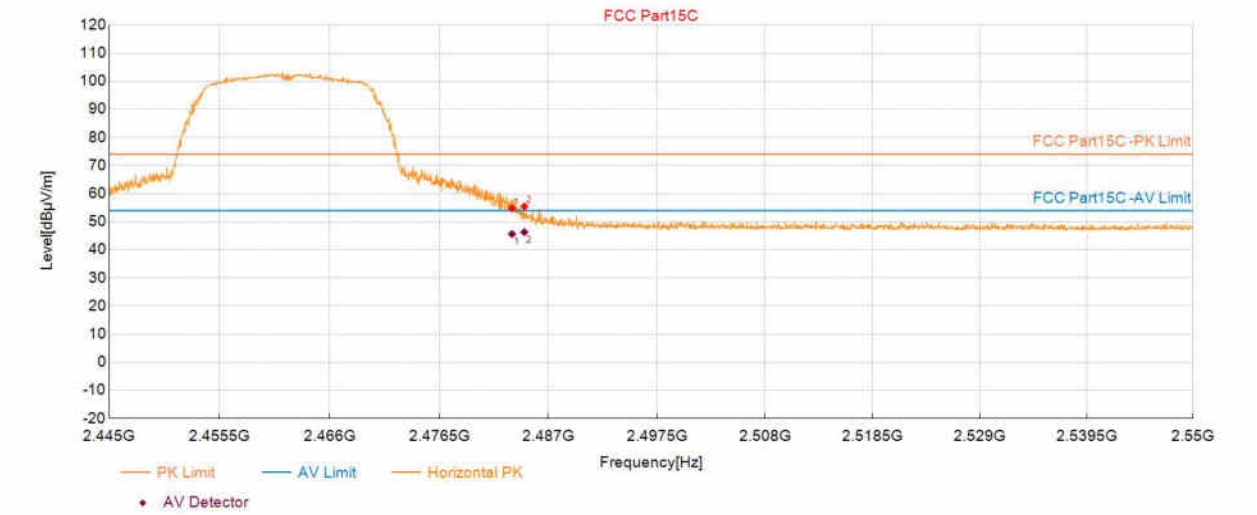
Suspected Data List								
NO.	Frequency (MHz)	Level (dBµV/m)	Factor (dB)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2368.4092	46.57	6.88	74.00	27.43	150	222	Vertical
2	2390.0200	45.88	6.85	74.00	28.12	150	96	Vertical

Test Report

Project Information			
Customer:			
EUT:	IEEE 802.11b/g/n/a/ac 2T2R USB WiFi Module Integrated BT 2.1+EDR/4.2/5.1		
Model:	SKO.WB663U.16	SN:	
Mode:	11G_2462	Voltage:	DC 5V
Environment:	Temp: 25℃; Humi:60%	Engineer:	Soho Liu
Remark:	Power Set:0D		
Test Standard: FCC Part15C			

Start of Test:2025-02-12 11:42:24

Test Graph



Suspected Data List								
NO.	Frequency (MHz)	Level (dBµV/m)	Factor (dB)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2483.5128	54.83	7.34	74.00	19.17	150	161	Horizontal
2	2484.7032	55.42	7.34	74.00	18.58	150	121	Horizontal

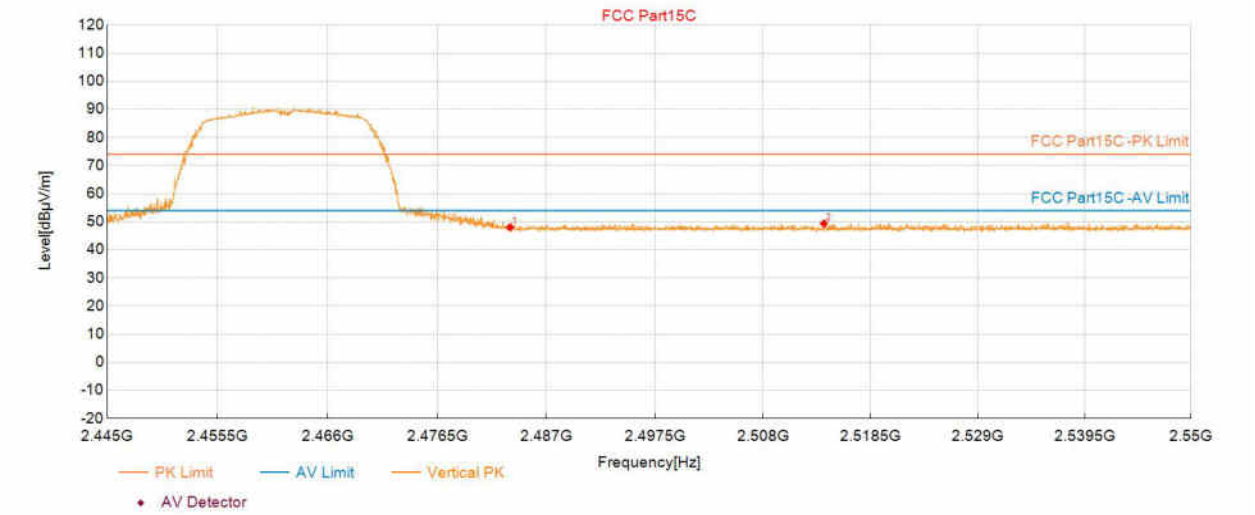
PK Final Data List							
NO.	Frequency (MHz)	AV Value (dBµV/m)	AV Limit (dBµV/m)	AV Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2483.5128	45.65	54.00	8.35	150	161	Horizontal
2	2484.7032	46.29	54.00	7.71	150	121	Horizontal

Test Report

Project Information			
Customer:			
EUT:	IEEE 802.11b/g/n/a/ac 2T2R USB WiFi Module Integrated BT 2.1+EDR/4.2/5.1		
Model:	SKO.WB663U.16	SN:	
Mode:	11G_2462	Voltage:	DC 5V
Environment:	Temp: 25℃; Humi:60%	Engineer:	Soho Liu
Remark:	Power Set:0D		
Test Standard: FCC Part15C			

Start of Test:2025-02-12 11:43:07

Test Graph



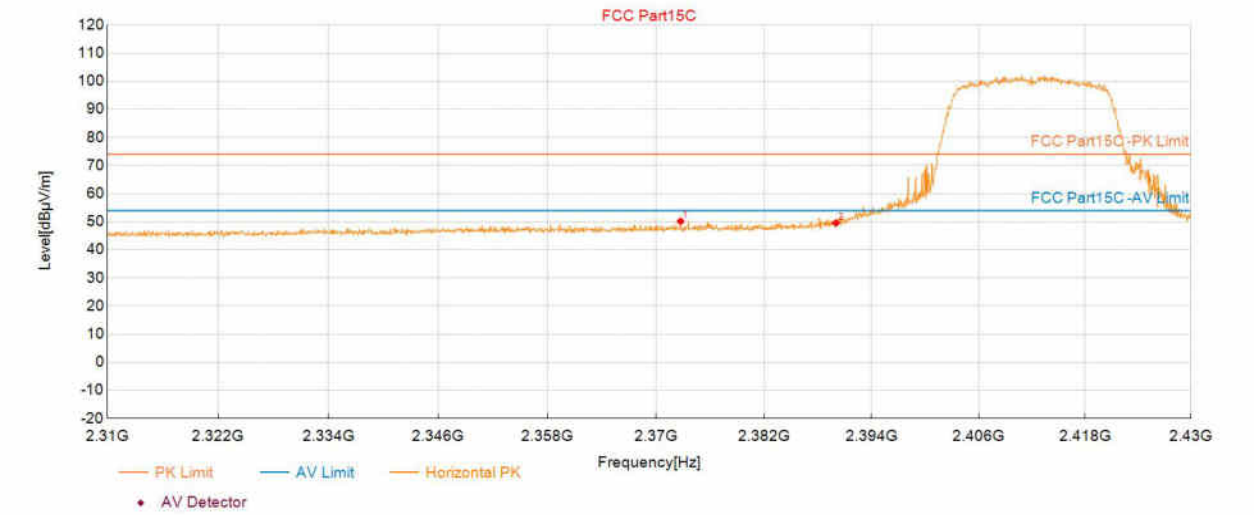
Suspected Data List								
NO.	Frequency (MHz)	Level (dBµV/m)	Factor (dB)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2483.5128	48.01	7.34	74.00	25.99	150	253	Vertical
2	2513.9380	49.39	7.50	74.00	24.61	150	117	Vertical

Test Report

Project Information			
Customer:			
EUT:	IEEE 802.11b/g/n/a/ac 2T2R USB WiFi Module Integrated BT 2.1+EDR/4.2/5.1		
Model:	SKO.WB663U.16	SN:	
Mode:	11N20_2412	Voltage:	DC 5V
Environment:	Temp: 25℃; Humi:60%	Engineer:	Soho Liu
Remark:	Power Set:0C		
Test Standard: FCC Part15C			

Start of Test:2025-02-12 11:47:08

Test Graph



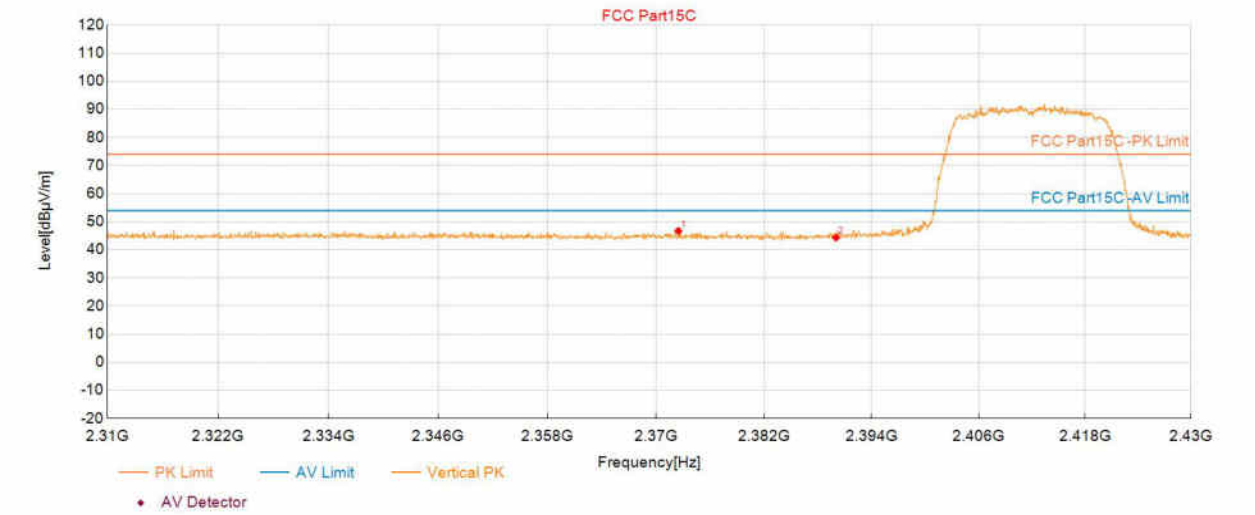
Suspected Data List								
NO.	Frequency (MHz)	Level (dBµV/m)	Factor (dB)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2372.7314	50.19	6.87	74.00	23.81	150	132	Horizontal
2	2390.0200	49.53	6.85	74.00	24.47	150	171	Horizontal

Test Report

Project Information			
Customer:			
EUT:	IEEE 802.11b/g/n/a/ac 2T2R USB WiFi Module Integrated BT 2.1+EDR/4.2/5.1		
Model:	SKO.WB663U.16	SN:	
Mode:	11N20_2412	Voltage:	DC 5V
Environment:	Temp: 25℃; Humi:60%	Engineer:	Soho Liu
Remark:	Power Set:0C		
Test Standard: FCC Part15C			

Start of Test:2025-02-12 11:47:50

Test Graph



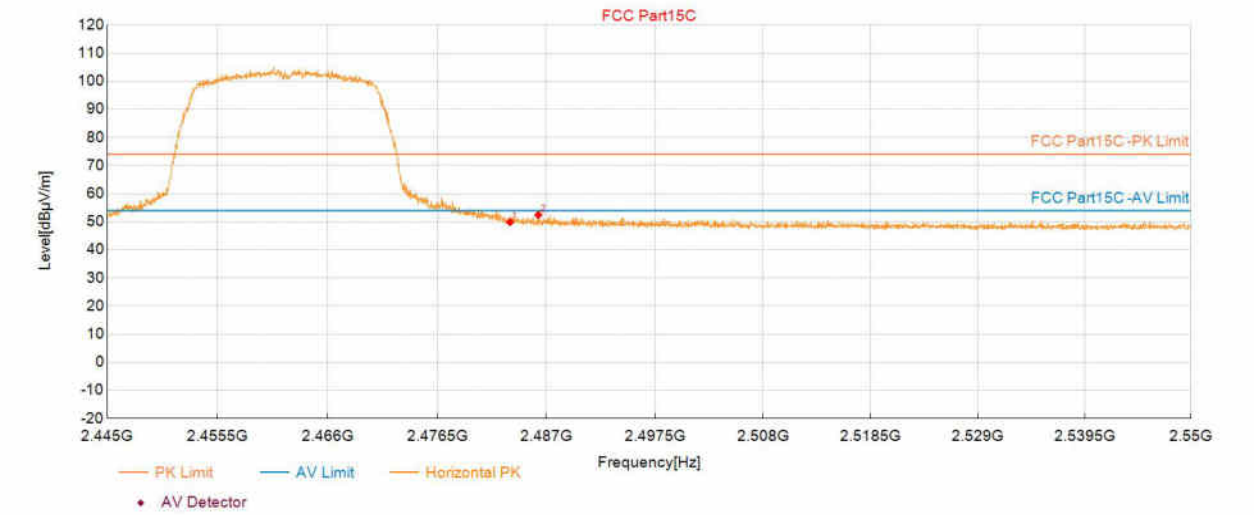
Suspected Data List								
NO.	Frequency (MHz)	Level (dBµV/m)	Factor (dB)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2372.4912	46.74	6.87	74.00	27.26	150	86	Vertical
2	2390.0200	44.35	6.85	74.00	29.65	150	351	Vertical

Test Report

Project Information			
Customer:			
EUT:	IEEE 802.11b/g/n/a/ac 2T2R USB WiFi Module Integrated BT 2.1+EDR/4.2/5.1		
Model:	SKO.WB663U.16	SN:	
Mode:	11N20_2462	Voltage:	DC 5V
Environment:	Temp: 25℃; Humi:60%	Engineer:	Soho Liu
Remark:	Power Set:0C		
Test Standard: FCC Part15C			

Start of Test:2025-02-12 11:49:59

Test Graph



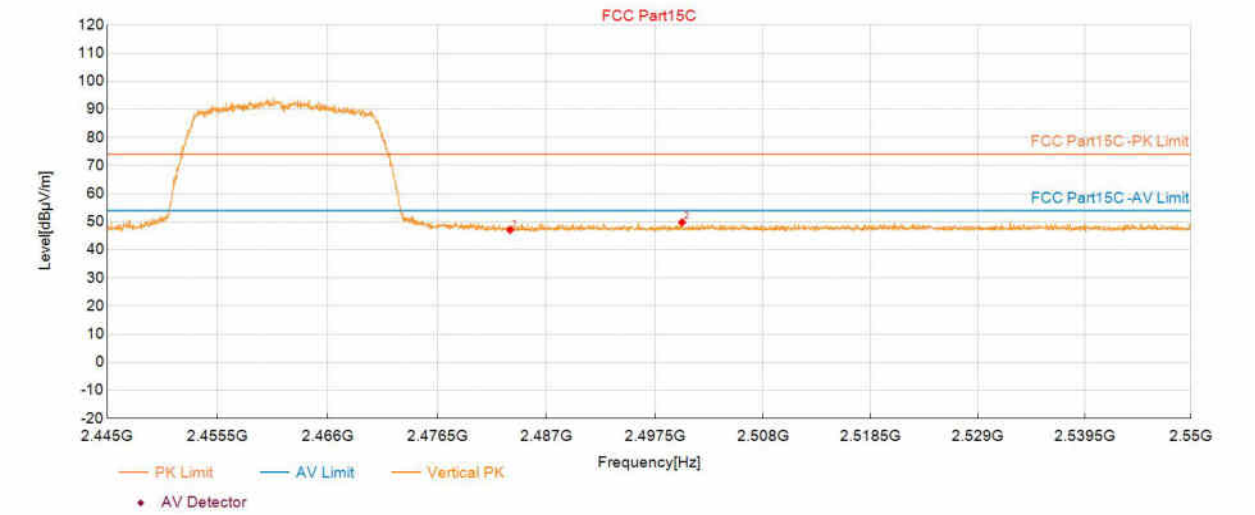
Suspected Data List								
NO.	Frequency (MHz)	Level (dBµV/m)	Factor (dB)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2483.5128	49.87	7.34	74.00	24.13	150	132	Horizontal
2	2486.2437	52.40	7.35	74.00	21.60	150	124	Horizontal

Test Report

Project Information			
Customer:			
EUT:	IEEE 802.11b/g/n/a/ac 2T2R USB WiFi Module Integrated BT 2.1+EDR/4.2/5.1		
Model:	SKO.WB663U.16	SN:	
Mode:	11N20_2462	Voltage:	DC 5V
Environment:	Temp: 25℃; Humi:60%	Engineer:	Soho Liu
Remark:	Power Set:0C		
Test Standard: FCC Part15C			

Start of Test:2025-02-12 11:50:42

Test Graph



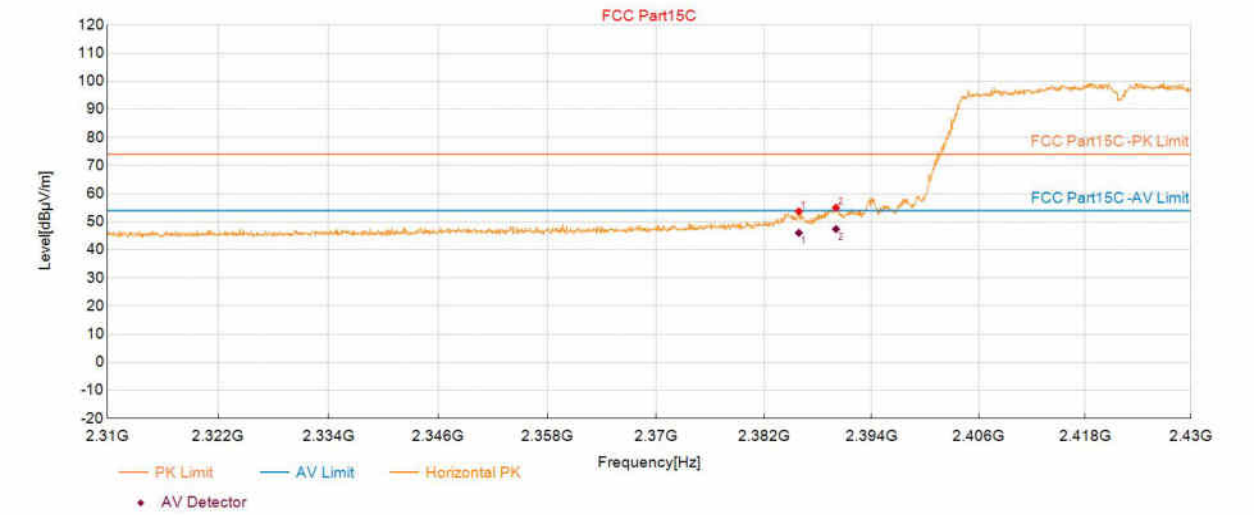
Suspected Data List								
NO.	Frequency (MHz)	Level (dBµV/m)	Factor (dB)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2483.5128	47.09	7.34	74.00	26.91	150	347	Vertical
2	2500.1434	49.78	7.43	74.00	24.22	150	95	Vertical

Test Report

Project Information			
Customer:			
EUT:	IEEE 802.11b/g/n/a/ac 2T2R USB WiFi Module Integrated BT 2.1+EDR/4.2/5.1		
Model:	SKO.WB663U.16	SN:	
Mode:	11N40_2422	Voltage:	DC 5V
Environment:	Temp: 25℃; Humi:60%	Engineer:	Soho Liu
Remark:	Power Set:0C		
Test Standard: FCC Part15C			

Start of Test:2025-02-12 11:52:55

Test Graph



Suspected Data List								
NO.	Frequency (MHz)	Level (dBµV/m)	Factor (dB)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2385.8779	53.68	6.86	74.00	20.32	150	87	Horizontal
2	2390.0200	54.98	6.85	74.00	19.02	150	87	Horizontal

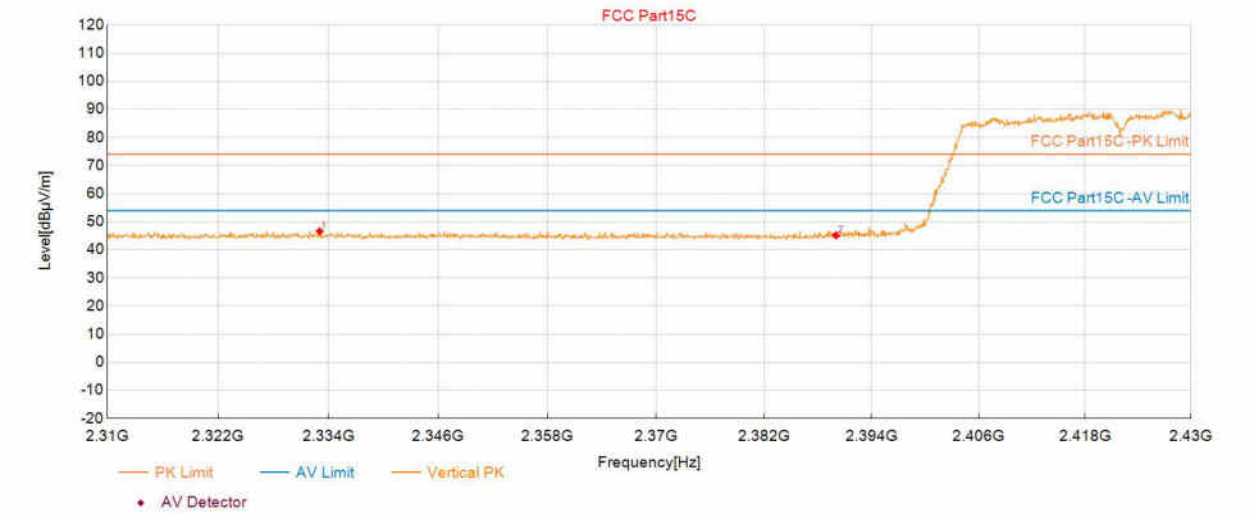
PK Final Data List							
NO.	Frequency (MHz)	AV Value (dBµV/m)	AV Limit (dBµV/m)	AV Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2385.8779	46.05	54.00	7.95	150	87	Horizontal
2	2390.0200	47.37	54.00	6.63	150	87	Horizontal

Test Report

Project Information			
Customer:			
EUT:	IEEE 802.11b/g/n/a/ac 2T2R USB WiFi Module Integrated BT 2.1+EDR/4.2/5.1		
Model:	SKO.WB663U.16	SN:	
Mode:	11N40_2422	Voltage:	DC 5V
Environment:	Temp: 25℃; Humi:60%	Engineer:	Soho Liu
Remark:	Power Set:0C		
Test Standard: FCC Part15C			

Start of Test:2025-02-12 11:53:37

Test Graph



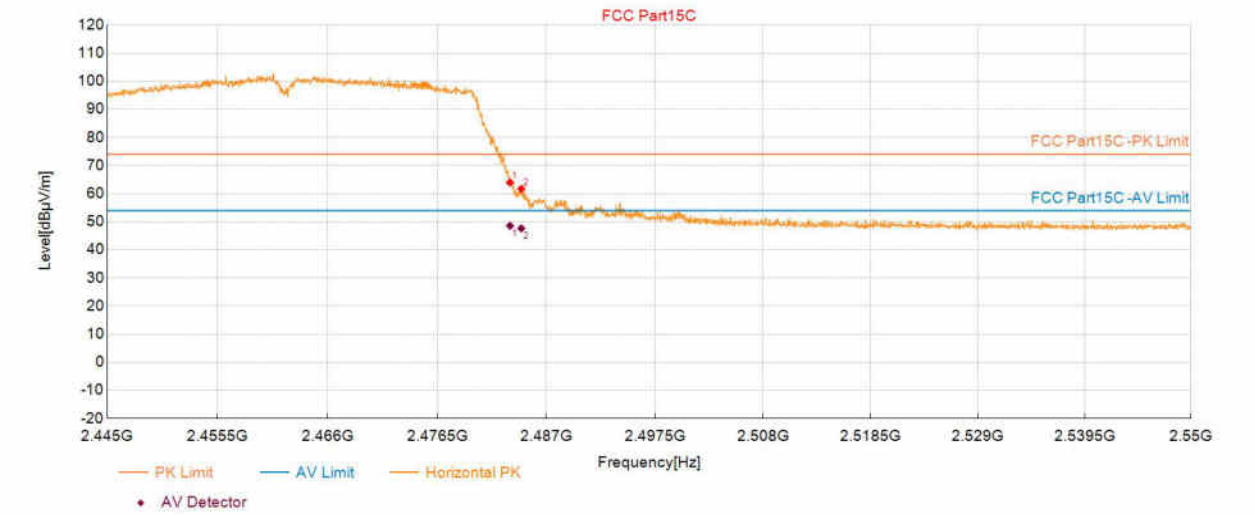
Suspected Data List								
NO.	Frequency (MHz)	Level (dBµV/m)	Factor (dB)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2333.0515	46.57	6.92	74.00	27.43	150	5	Vertical
2	2390.0200	45.14	6.85	74.00	28.86	150	273	Vertical

Test Report

Project Information			
Customer:			
EUT:	IEEE 802.11b/g/n/a/ac 2T2R USB WiFi Module Integrated BT 2.1+EDR/4.2/5.1		
Model:	SKO.WB663U.16	SN:	
Mode:	11N40_2462	Voltage:	DC 5V
Environment:	Temp: 25℃; Humi:60%	Engineer:	Soho Liu
Remark:	Power Set:0C		
Test Standard: FCC Part15C			

Start of Test:2025-02-12 11:56:47

Test Graph



Suspected Data List								
NO.	Frequency (MHz)	Level (dBµV/m)	Factor (dB)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2483.5128	63.98	7.34	74.00	10.02	150	131	Horizontal
2	2484.5982	61.70	7.34	74.00	12.30	150	121	Horizontal

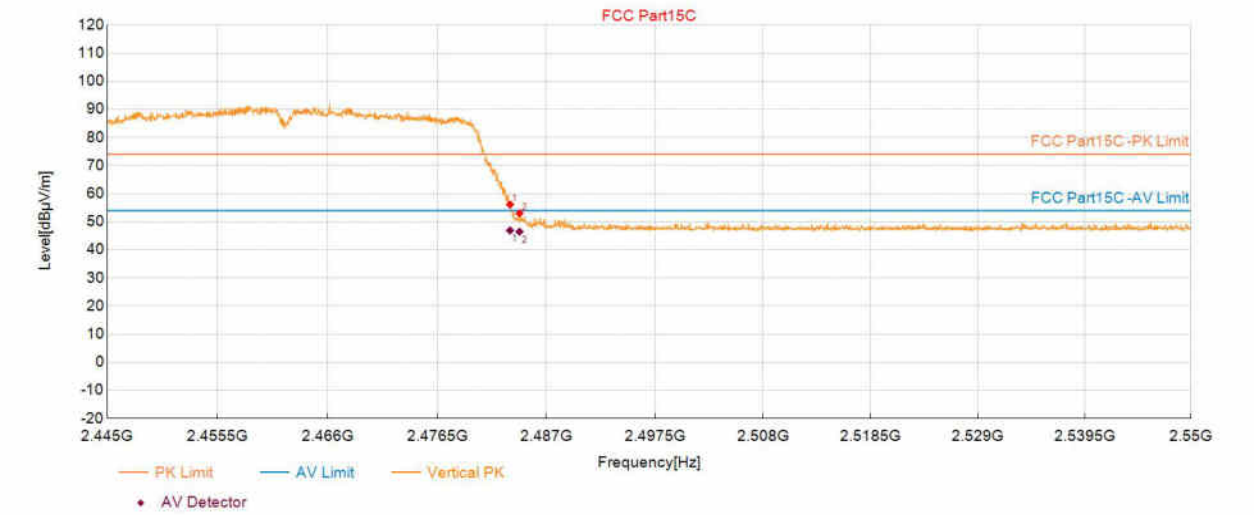
PK Final Data List							
NO.	Frequency (MHz)	AV Value (dBµV/m)	AV Limit (dBµV/m)	AV Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2483.5128	48.54	54.00	5.46	150	131	Horizontal
2	2484.5982	47.65	54.00	6.35	150	121	Horizontal

Test Report

Project Information			
Customer:			
EUT:	IEEE 802.11b/g/n/a/ac 2T2R USB WiFi Module Integrated BT 2.1+EDR/4.2/5.1		
Model:	SKO.WB663U.16	SN:	
Mode:	11N40_2462	Voltage:	DC 5V
Environment:	Temp: 25℃; Humi:60%	Engineer:	Soho Liu
Remark:	Power Set:0C		
Test Standard: FCC Part15C			

Start of Test:2025-02-12 11:57:29

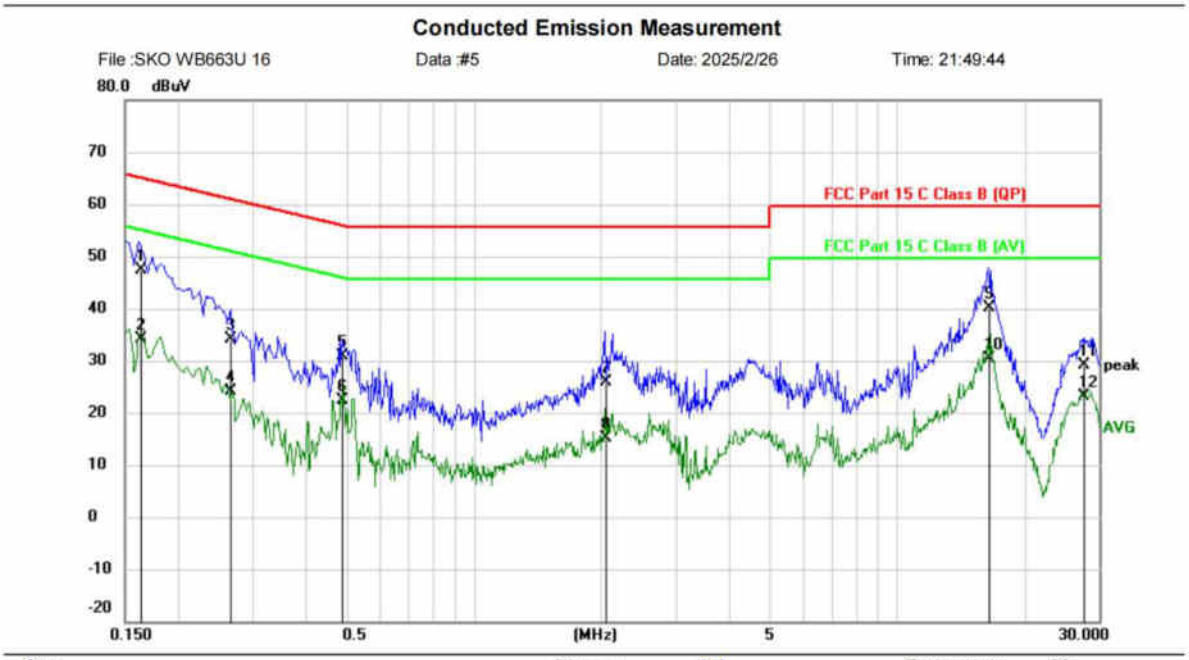
Test Graph



Suspected Data List								
NO.	Frequency (MHz)	Level (dBµV/m)	Factor (dB)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2483.5128	56.16	7.34	74.00	17.84	150	126	Vertical
2	2484.4231	53.00	7.34	74.00	21.00	150	120	Vertical

PK Final Data List							
NO.	Frequency (MHz)	AV Value (dBµV/m)	AV Limit (dBµV/m)	AV Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2483.5128	46.92	54.00	7.08	150	126	Vertical
2	2484.4231	46.45	54.00	7.55	150	120	Vertical

APPENDIX C – AC Power Line Conducted Emission Test Data

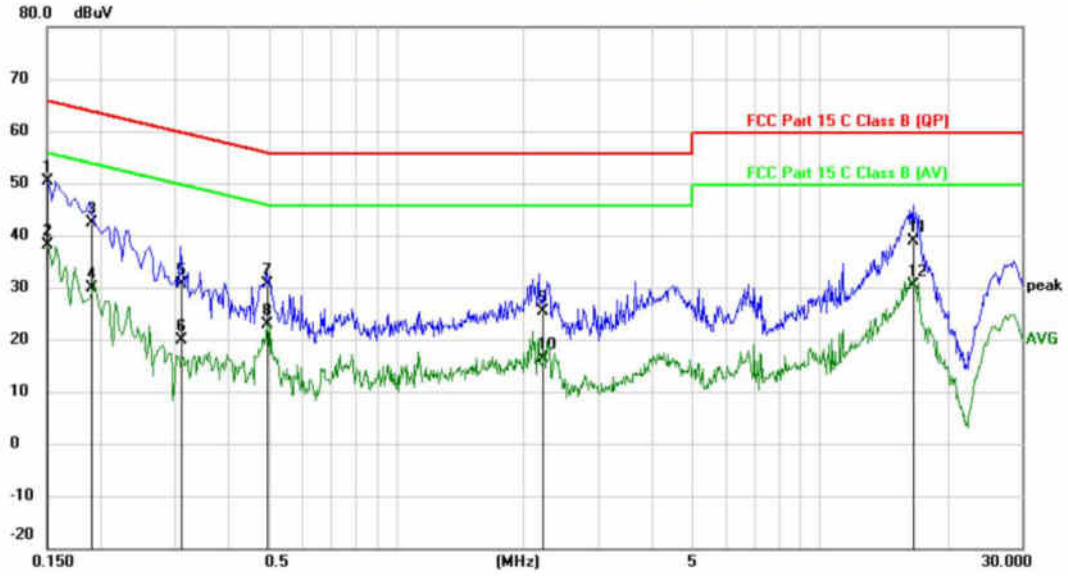


Site
Phase: *L1*
Temperature: 26
Limit: FCC Part 15 C Class B (QP)
Power: AC 120V/60Hz
Humidity: 60 %
EUT:
M/N: SKO.WB663U.16
Mode: 2.4G WIFI
Note: IEEE 802.11b/g/n/a/ac 2T2R USB WiFi Module Integrated BT 2.1+EDR/4.2/5.1

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1626	37.84	9.54	47.38	65.33	-17.95	QP	
2		0.1626	24.65	9.54	34.19	55.33	-21.14	AVG	
3		0.2659	24.59	9.57	34.16	61.25	-27.09	QP	
4		0.2659	14.46	9.57	24.03	51.25	-27.22	AVG	
5		0.4887	21.40	9.60	31.00	56.19	-25.19	QP	
6		0.4887	12.69	9.60	22.29	46.19	-23.90	AVG	
7		2.0515	16.28	9.66	25.94	56.00	-30.06	QP	
8		2.0515	5.56	9.66	15.22	46.00	-30.78	AVG	
9		16.4237	30.02	10.10	40.12	60.00	-19.88	QP	
10		16.4237	20.28	10.10	30.38	50.00	-19.62	AVG	
11		27.7070	19.12	10.13	29.25	60.00	-30.75	QP	
12		27.7070	13.10	10.13	23.23	50.00	-26.77	AVG	

Conducted Emission Measurement

File :SKO WB663U 16 Data :#6 Date: 2025/2/26 Time: 21:54:24



Site Phase: N Temperature: 26

Limit: FCC Part 15 C Class B (QP) Power: AC 120V/60Hz Humidity: 60 %

EUT:

M/N: SKO.WB663U.16

Mode: 2.4G WIFI

Note: IEEE 802.11b/g/n/a/ac 2T2R USB WiFi Module Integrated BT 2.1+EDR/4.2/5.1

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1501	40.75	9.53	50.28	65.99	-15.71	QP	
2		0.1501	28.48	9.53	38.01	55.99	-17.98	AVG	
3		0.1905	32.93	9.55	42.48	64.01	-21.53	QP	
4		0.1905	20.22	9.55	29.77	54.01	-24.24	AVG	
5		0.3105	21.11	9.57	30.68	59.96	-29.28	QP	
6		0.3105	10.30	9.57	19.87	49.96	-30.09	AVG	
7		0.4964	21.01	9.60	30.61	56.06	-25.45	QP	
8		0.4964	13.28	9.60	22.88	46.06	-23.18	AVG	
9		2.2096	15.76	9.66	25.42	56.00	-30.58	QP	
10		2.2096	6.69	9.66	16.35	46.00	-29.65	AVG	
11		16.5756	28.78	10.12	38.90	60.00	-21.10	QP	
12		16.5756	20.16	10.12	30.28	50.00	-19.72	AVG	

END OF REPORT