FCC CERTIFICATION TEST REPORT

Applicant:	RAINVI TECHNOLOGIES PRIVATE LIMITED
Address:	8-2-283/82/A/321/1 HBS CO OP JUBILEE HILLS HYDERABAD, TELANGANA, INDIA - 500034
Manufacturer:	Guangzhou Yuandong Smart Sports Technology Co., LTD
Address:	Room 518, 192 Kezhu Road, Huangpu District, Guangzhou
Product Description:	Portl UltraGym 70
Brand Name:	NA
Tested Model:	PUG-70
FCC ID:	2BKUS-PUG70
Report No.:	JCF240813051-003
Received Date:	Aug. 13, 2024
Tested Date:	Aug. 13, 2024 ~ Sep. 02, 2024
Issued Date:	Sep. 02, 2024
Test Standards:	FCC Rules and Regulations Part 15 Subpart C,
Test Procedure:	ANSI C63.10:2013
Test Result:	Pass

Prepared By:

Roger Li

Roger Li/Engineer **Date:** Sep. 02, 2024

Reviewed By:

Kennys Zhang

Kennys Zhang/Engineer **Date:** Sep. 02, 2024

Approved By:

Talent zhang

Talent Zhang/Engineer **Date:** Sep. 02, 2024

Note: The test results in this report apply exclusively to the tested model / sample. Without written approval of Guangzhou Jingce Testing Technology Co., Ltd. the test report shall not be reproduced except in full.

Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Sep. 02, 2024	Original Report	/

Table of Contents

1. Test Report Declare **5**
2. Summary of Test Results **6**
3. Test Laboratory **6**
4. Equipment Under Test **7**
4.1. Description of EUT 7
4.2. Channel List 7
4.3. Test Channel Configuration 7
4.4. Test environment conditions 8
4.5. Description of Available Antennas 8
4.6. Description of Available Antennas 8
5. Description of Test Setup **9**
5.1. Accessory 9
5.2. Support Equipment 9
5.3. Test Setup 9
5.4. Setup Diagram for Tests 9
6. Measurement Uncertainty **9**
7. Measuring Instrument and Software Used **9**
8. On Time and Duty Cycle **11**
8.1. Block diagram of test setup 11
8.2. Limits 11
8.3. Procedure 11
8.4. Results 11
8.5. Original test data 12
9. 6 dB DTS Bandwidth **16**
9.1. Block diagram of test setup 16
9.2. Limits 16
9.3. Test Procedure 16
9.4. Results 16
9.5. Original test data 17
10. Conducted Output Power **26**
10.1. Block diagram of test setup 26
10.2. Limits 26
10.3. Test Procedure 26
10.4. Results 26
11. Power Spectral Density **27**
11.1. Block diagram of test setup 27
11.2. Limits 27
11.3. Test Procedure 27
11.4. Results 27
11.5. Original test data 28
12. Conducted Band edge and Spurious Emissions **32**
12.1. Block diagram of test setup 32
12.2. Limits 32
12.3. Test Procedure 32
12.4. Test result 32
12.5. Original test data 33
13. Radiated Emission **49**
13.1. Block diagram of test setup 49
13.2. Limit 50
13.3. Test Procedure 51
13.4. Results 53
13.5. Original test data 53

14. AC Power Line Conducted Emissions 54
14.1. Block diagram of test setup 54
14.2. Limits 54
14.3. Test procedure 54
14.4. Test result 55
14.5. Original test data 55
15. Antenna Requirements 56
15.1. Applicable Requirements 56
15.2. Result 56
APPENDIX A – Radiated Emission Below 1GHz Test Data 57
APPENDIX B – Radiated Emission Above 1GHz Test Data 59
APPENDIX C – AC Power Line Conducted Emission Test Data 81

1. Test Report Declare

Applicant:	RAINVI TECHNOLOGIES PRIVATE LIMITED
Address:	8-2-283/82/A/321/1 HBS CO OP JUBILEE HILLS HYDERABAD, TELANGANA, INDIA - 500034
Manufacturer:	Guangzhou Yuandong Smart Sports Technology Co., LTD
Address:	Room 518, 192 Kezhu Road, Huangpu District, Guangzhou
Product Name:	Portl UltraGym 70
Brand Name:	NA
Model Name:	PUG-70
Difference Description:	NA

We Declare:

The equipment described above is tested by Guangzhou Jingce Testing Technology Co., Ltd. and in the configuration tested the equipment complied with the standards specified above. The test results are contained in this test report and Guangzhou Jingce Testing Technology Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these tests except as provided information by clients.

2. Summary of Test Results

Summary of Test Results			
Clause	**Test Items**	**FCC Rules**	**Test Results**
1	6dB Bandwidth	FCC Part 15.247 (a) (2)	Pass
2	Peak Conducted Output Power	FCC Part 15.247 (b) (3)	Pass
3	Power Spectral Density	FCC Part 15.247 (e)	Pass
4	Conducted Bandedge and Spurious Emission	FCC Part 15.247 (d)	Pass
5	Radiated Bandedge and Spurious Emission	FCC Part 15.247 (d) FCC Part 15.209 FCC Part 15.205	Pass
6	Conducted Emission Test For AC Power Port	FCC Part 15.207	Pass
7	Antenna Requirement	FCC Part 15.203	Pass

3. Test Laboratory

Guangzhou Jingce Testing Technology Co., Ltd.

Add.: No.10, Hefeng No.1 street, Huangpu District, Guangzhou, Guangdong, People's Republic of China

Association for Laboratory Accreditation(A2LA). Certificate Number: 6594.03

FCC Designation Number: CN1381. Test Firm Registration Number: 486550

IC Test Firm Registration Number: 31808

Conformity Assessment Body identifier: CN0173

4. Equipment Under Test

4.1. Description of EUT

EUT Name:	Portl UltraGym 70
Model Number:	PUG-70
EUT Function Description:	Please refer to user manual of this device
Power Supply:	AC 220V - 240V 50/60Hz 750W
Hardware Version:	NA
Software Version:	NA
Radio Specification:	IEEE802.11b/g/n
Operation Frequency:	IEEE 802.11b: 2412MHz—2462MHz IEEE 802.11g: 2412MHz—2462MHz IEEE 802.11n HT20: 2412MHz—2462MHz IEEE 802.11n HT40: 2422MHz—2452MHz
Modulation:	IEEE 802.11b: DSSS (CCK, DQPSK, DBPSK) IEEE 802.11g: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n (HT20/40): OFDM (64QAM, 16QAM, QPSK, BPSK)
Data Rate:	IEEE 802.11b: 1, 2, 5.5, 11 Mbps IEEE 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps IEEE 802.11n HT20: 7.2, 14.4, 21.7, 28.9, 43.3, 57.8, 65.0, 72.2 Mbps IEEE 802.11n HT40: 15, 30, 45, 60, 90, 120, 135, 150 Mbps
Antenna Type:	FPC Antenna, MAX. Gain: 2.71 dBi

Note 1: EUT is the ab. of equipment under test.

Note 2: The antenna gain is declared by the customer and the laboratory is not responsible for the accuracy of the antenna gain.

4.2. Channel List

Channel List for 802.11b/g/n (20 MHz)							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	4	2427	7	2442	10	2457
2	2417	5	2432	8	2447	11	2462
3	2422	6	2437	9	2452	/	/

Channel List for 802.11n (40 MHz)					
Channel	Frequency (MHz)	Channel	Frequency(MHz)	Channel	Frequency (MHz)
3	2422	6	2437	9	2452
4	2427	7	2442	/	/
5	2432	8	2447	/	/

4.3. Test Channel Configuration

Tested mode, channel and rand data rate information			
Mode	Data rate (Mbps) (see Note)	Channel	Frequency (MHz)
802.11b	1	Low: CH1	2412

	1	Middle: CH6	2437
	1	High: CH11	2462
802.11g	6	Low: CH1	2412
	6	Middle: CH6	2437
	6	High: CH11	2462
802.11n HT20	MCS 0	Low: CH1	2412
	MCS 0	Middle: CH6	2437
	MCS 0	High: CH11	2462
802.11n HT40	MCS 0	Low: CH3	2422
	MCS 0	Middle: CH6	2437
	MCS 0	High: CH9	2452
Note: According exploratory test, EUT will have maximum output power in those data rate, so those data rate were used for all test.			

4.4. Test environment conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature range:	21-25 ℃
Humidity range:	40-75%
Pressure range:	86-106 kPa

4.5. Description of Available Antennas

The Worse Case Power Setting Parameter under 2400 ~ 2483.5MHz Band			
Test Software		EspRFTestTool_v2.8_Manual	
Modulation Mode	Transmit Antenna Number	Test Software Setting Value	
		Channel	ANT1
802.11b	1	CH1	40
		CH6	40
		CH11	40
802.11g	1	CH1	30
		CH6	30
		CH11	30
802.11HT20	1	CH1	30
		CH6	30
		CH11	30
802.11n HT40	1	CH3	30
		CH6	30
		CH9	30

4.6. Description of Available Antennas

Test Mode	Transmit and Receive Mode	Description
IEEE 802.11b	☒ 1TX, 1RX	ANT 1 can be used as transmitting/receiving antenna.
IEEE 802.11g	☒ 1TX, 1RX	ANT 1 can be used as transmitting/receiving antenna.

IEEE 802.11n HT20	☒ 1TX, 1RX	ANT 1 can be used as transmitting/receiving antenna.
IEEE 802.11n HT40	☒ 1TX, 1RX	ANT 1 can be used as transmitting/receiving antenna.

5. Description of Test Setup

5.1. Accessory

Description of Accessories	Manufacturer	Model Number	Description	Remark
/	/	/	/	/

5.2. Support Equipment

Equipment	Brand Name	Model Name	P/N
PC	Lenovo	T480	/

5.3. Test Setup

The EUT can work in Fixed Frequency mode.

5.4. Setup Diagram for Tests

6. Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Test Item	Uncertainty
AC Power Conduction emission	1.37 dB
All Radiated emissions	5.4dB
Conducted emissions	3.09 dB
Occupied Channel Bandwidth	1.1%
Conducted Output power	0.82dB
Power Spectral Density	0.82dB
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95 % confidence level using a coverage factor of k = 2.	

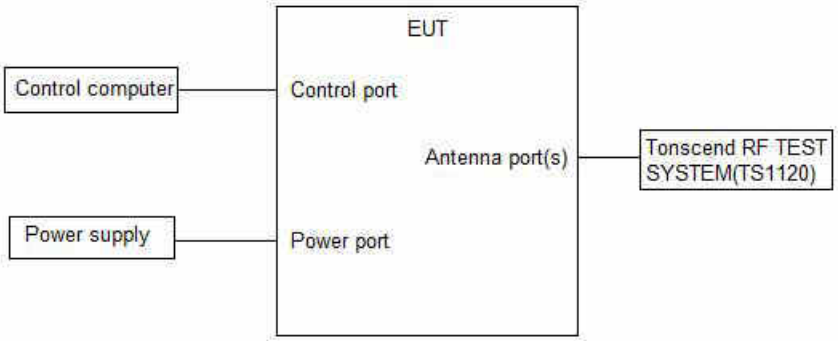
7. Measuring Instrument and Software Used

TS Test System						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due. Date
☑	Spectrum Analyzer	Keysight	N9030B	MY56320512	Sep. 12, 2023	Sep. 11, 2024
☑	Vector Signal Generator	Keysight	N5182B	MY57300334	Sep. 12, 2023	Sep. 11, 2024
☑	Signal Generator	Keysight	N5171B	MY57280639	Sep. 12, 2023	Sep. 11, 2024
☑	DC POWER	Keysight	E342A	MY59020356	Jun. 29, 2024	Jun. 28, 2025
☑	Incubator thermometer	GWS	EL-02JA	21107288	Sep. 12, 2023	Sep. 11, 2024

☑	Control unit(Power sensor)	Tonscend	JS0806-2	/	Sep. 12, 2023	Sep. 11, 2024
☑	Wideband radio communication tester	R&S	CMW500	163478	Jul. 03, 2024	Jul. 02, 2025
☑	Spectrum Analyzer	Keysight	N9020B	MY60112206	Sep. 12, 2023	Sep. 12, 2024
☑	Control unit(Power sensor)	Tonscend	JS0806-2	21H8060465	Sep. 12, 2023	Sep. 12, 2024
Software						
Used	Description	Manufacturer	Name		Version	
☑	Test software	Tonscend	JS1120-3		V3.3.10	
RSE Test System						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due. Date
☑	EMI Receiver	R&S	ESW	101685	Sep. 12, 2023	Sep. 11, 2024
☑	Bilog Antenna	Schwarzbeck	VULB 9163	01416	May. 22, 2024	May. 21, 2025
☑	Horn Antenna 1	Schwarzbeck	BBHA 9120 D	02910	Sep. 26, 2023	Sep. 25, 2024
☑	Horn Antenna 2	ETS	BBHA 9170	1090	Sep. 04, 2023	Sep. 03, 2024
☑	loop-antenna	Schwarzbeck	FMZB 1513-60	00030	Jan. 14, 2024	Jan. 13, 2025
☑	Signal Pre-Amplifier	Tonscend	TAP01018050	AP23I8060293	Oct. 12, 2023	Oct. 11, 2024
☑	Signal Pre-Amplifier	ETS	3116C-PA	00217677	Sep. 02, 2024	Sep. 01, 2025
☑	3m Fully-anechoic Chamber	YIHENG	9m*6m*6m	001	Sep. 05, 2023	Sep. 04, 2026
Software						
Used	Description	Manufacturer	Name		Version	
☑	Test software	Tonscend	TS+		V3.0.0.4	
Conducted Emission Test For AC Power Port						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due. Date
☑	LISN	R&S	ENV216	102509	Sep. 11, 2024	Sep. 10, 2025
☑	EMI Receiver	R&S	ESR	102154	Sep. 11, 2024	Sep. 10, 2025
Software						
Used	Description	Manufacturer	Name		Version	
☑	Test software	EZ	EZ-EMC		EMEC-3A1	
Other Instrument						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due. Date
☑	Temperature & Humidity	Temperature	HTC-1	/	Nov. 02, 2023	Nov. 01, 2024

8. On Time and Duty Cycle

8.1. Block diagram of test setup



8.2. Limits

None; for reporting purposes only

8.3. Procedure

KDB 558074 Zero-Span Spectrum Analyzer Method

8.4. Results

Test Mode	Ant.	Freq. (MHz)	Transmission Duration (ms)	Transmission Period (ms)	Duty Cycle (%)
11B	Ant1	2412	20.00	20.00	100.00
		2437	20.00	20.00	100.00
		2462	20.00	20.00	100.00
11G	Ant1	2412	20.00	20.00	100.00
		2437	20.00	20.00	100.00
		2462	20.00	20.00	100.00
11N20SISO	Ant1	2412	20.00	20.00	100.00
		2437	20.00	20.00	100.00
		2462	20.00	20.00	100.00
11N40SISO	Ant1	2422	20.00	20.00	100.00
		2437	20.00	20.00	100.00
		2452	20.00	20.00	100.00

Note: Duty Cycle Correction Factor = 10log (1/x).
Where: x is Duty Cycle (Linear)
Where: T is On Time
If that calculated VBW is not available on the analyzer, then the next higher value should be used.
For mode 11b, the duty cycle is greater than 98 %, so it can set VBW to 10 Hz.

8.5. Original test data

11B_Ant1_2412

11B_Ant1_2437

11B_Ant1_2462

11G_Ant1_2412

11G_Ant1_2437

11G_Ant1_2462

11N20SISO_Ant1_2412

11N20SISO_Ant1_2437

11N20SISO_Ant1_2462

11N40SISO_Ant1_2422

11N40SISO_Ant1_2437

11N40SISO_Ant1_2452

9. 6 dB DTS Bandwidth

9.1. Block diagram of test setup

Same as section 8.1

9.2. Limits

CFR 47 FCC Part15 (15.247) Subpart C			
Section	Test Item	Limit	Frequency Range (MHz)
CFR 47 FCC 15.247(a)(2)	6 dB Bandwidth	≥ 500 kHz	2400-2483.5

9.3. Test Procedure

Connect the UUT to the spectrum analyzer and use the following settings:

Center Frequency	The center frequency of the channel under test
Detector	Peak
RBW	For 6 dB Bandwidth :100 kHz For 99 % Occupied Bandwidth :1 % to 5 % of the occupied bandwidth
VBW	For 6 dB Bandwidth: ≥ 3 × RBW For 99 % Occupied Bandwidth : ≥ 3×RBW
Trace	Max hold
Sweep	Auto couple

Allow the trace to stabilize and measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB and 99 % relative to the maximum level measured in the fundamental emission.

9.4. Results

6dB bandwidth:

Test Mode	Ant.	Freq. (MHz)	DTS BW (MHz)	FL (MHz)	FH (MHz)	Limit (MHz)	Verdict
11B	Ant1	2412	9.560	2406.960	2416.520	0.5	PASS
		2437	9.160	2432.360	2441.520	0.5	PASS
		2462	9.040	2456.960	2466.000	0.5	PASS
11G	Ant1	2412	16.360	2403.760	2420.120	0.5	PASS
		2437	16.320	2428.800	2445.120	0.5	PASS
		2462	16.360	2453.760	2470.120	0.5	PASS
11N20SISO	Ant1	2412	16.840	2403.520	2420.360	0.5	PASS
		2437	17.000	2428.440	2445.440	0.5	PASS
		2462	16.840	2453.520	2470.360	0.5	PASS
11N40SISO	Ant1	2422	32.160	2406.080	2438.240	0.5	PASS
		2437	31.760	2421.080	2452.840	0.5	PASS
		2452	31.680	2436.240	2467.920	0.5	PASS

99 % bandwidth：

Test Mode	Ant.	Channel Freq. (MHz)	OCB (MHz)	FL (MHz)	FH (MHz)	Limit (MHz)	Verdict
11B	Ant1	2412	13.010	2405.3582	2418.3682	---	---
		2437	13.817	2429.9924	2443.8094	---	---
		2462	14.100	2454.7783	2468.8783	---	---
11G	Ant1	2412	16.548	2403.6920	2420.2400	---	---
		2437	16.444	2428.7589	2445.2029	---	---
		2462	16.550	2453.6697	2470.2197	---	---

11N20SISO	Ant1	2412	17.286	2403.3142	2420.6002	---	---
		2437	17.187	2428.3905	2445.5775	---	---
		2462	17.255	2453.2985	2470.5535	---	---
11N40SISO	Ant1	2422	34.063	2404.9912	2439.0542	---	---
		2437	33.886	2420.0854	2453.9714	---	---
		2452	33.875	2435.0511	2468.9261	---	---

9.5. Original test data

6dB bandwidth:

11B_Ant1_2412

11B_Ant1_2437

11B_Ant1_2462

11G_Ant1_2412

11G_Ant1_2437

11G_Ant1_2462

11N20SISO_Ant1_2412

11N20SISO_Ant1_2437

11N20SISO_Ant1_2462

11N40SISO_Ant1_2422

11N40SISO_Ant1_2437

11N40SISO_Ant1_2452

99 % bandwidth：

11B_Ant1_2412

11B_Ant1_2437

11B_Ant1_2462

11G_Ant1_2412

11G_Ant1_2437

11G_Ant1_2462

11N20SISO_Ant1_2412

11N20SISO_Ant1_2437

11N20SISO_Ant1_2462

11N40SISO_Ant1_2422

11N40SISO_Ant1_2437

11N40SISO_Ant1_2452

Spectrum Analyzer 1
Occupied BW
KEYSIGHT
Input: RF
Coupling: DC
Align: Auto
Input Z: 50 Ω
Corr CCorr
Freq Ref: Int (S)
Atten: 30 dB
Preamp: Off
µW Path: Standard
Trig: Free Run
Gate: Off
#IF Gain: Low
Center Freq: 2.452000000 GHz
Avg|Hold: 100/100
Radio Std: None
Frequency
Center Frequency
2.452000000 GHz
Settings
Span
80.000 MHz
CF Step
8.000000 MHz
Auto
Man
Freq Offset
0 Hz
1 Graph
Ref Lvl Offset 13.23 dB
Ref Value 20.00 dBm
Mkr1 2.443360000 GHz
9.19 dBm
Scale/Div 10.0 dB
Log
Center 2.45200 GHz
#Res BW 820.00 kHz
#Video BW 2.7000 MHz
Span 80 MHz
Sweep 1.00 ms (1001 pts)
2 Metrics
Measure Trace
Trace 1
Occupied Bandwidth
33.875 MHz
Total Power
22.0 dBm
Transmit Freq Error
-11.401 kHz
x dB Bandwidth
38.00 MHz
% of OBW Power
99.00 %
x dB
-26.00 dB
Local
Aug 16, 2024
3:59:49 PM

10. Conducted Output Power

10.1. Block diagram of test setup

Same as section 8.1

10.2. Limits

CFR 47 FCC Part15 (15.247) Subpart C			
Section	Test Item	Limit	Frequency Range (MHz)
CFR 47 FCC 15.247(b)(3)	Peak Output Power	1 watt or 30 dBm	2400-2483.5

10.3. Test Procedure

Place the EUT on the table and set it in the transmitting mode.

Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the Power sensor.

Measure peak power each channel.

Peak Detector use for Peak result.

AVG Detector use for AVG result.

10.4. Results

Test Mode	Ant.	Freq. (MHz)	Peak Power (dBm)	Conducted Limit (dBm)	Verdict
11B	Ant1	2412	15.78	≤30.00	PASS
		2437	14.91	≤30.00	PASS
		2462	15.08	≤30.00	PASS
11G	Ant1	2412	10.46	≤30.00	PASS
		2437	9.39	≤30.00	PASS
		2462	9.57	≤30.00	PASS
11N20SISO	Ant1	2412	10.32	≤30.00	PASS
		2437	9.41	≤30.00	PASS
		2462	9.45	≤30.00	PASS
11N40SISO	Ant1	2422	9.26	≤30.00	PASS
		2437	8.71	≤30.00	PASS
		2452	8.85	≤30.00	PASS

11. Power Spectral Density

11.1. Block diagram of test setup

Same as section 8.1

11.2. Limits

CFR 47 FCC Part15 (15.247) Subpart C			
Section	Test Item	Limit	Frequency Range (MHz)
CFR 47 FCC §15.247 (e)	Power Spectral Density	8 dBm/3 kHz	2400-2483.5

11.3. Test Procedure

Connect the UUT to the spectrum analyzer and use the following settings:

Center Frequency	The centre frequency of the channel under test
Detector	Peak
RBW	3 kHz ≤ RBW ≤100 kHz
VBW	≥3 × RBW
Span	1.5 x DTS bandwidth
Trace	Max hold
Sweep time	Auto couple.

Allow trace to fully stabilize and use the peak marker function to determine the maximum amplitude level within the RBW.

If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

11.4. Results

Test Mode	Ant.	Freq. (MHz)	Result (dBm/3-100kHz)	Limit (dBm/3kHz)	Verdict
11B	Ant1	2412	-9.62	≤8.00	PASS
		2437	-5.92	≤8.00	PASS
		2462	-5.65	≤8.00	PASS
11G	Ant1	2412	-11.52	≤8.00	PASS
		2437	-11.98	≤8.00	PASS
		2462	-11.74	≤8.00	PASS
11N20SISO	Ant1	2412	-10.84	≤8.00	PASS
		2437	-11.77	≤8.00	PASS
		2462	-11.05	≤8.00	PASS
11N40SISO	Ant1	2422	-12.59	≤8.00	PASS
		2437	-12.66	≤8.00	PASS
		2452	-12.78	≤8.00	PASS

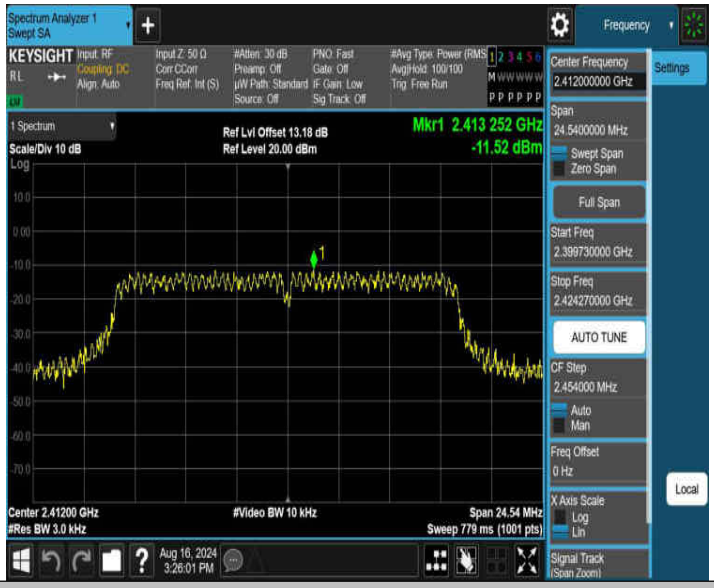
11.5. Original test data

11B_Ant1_2412

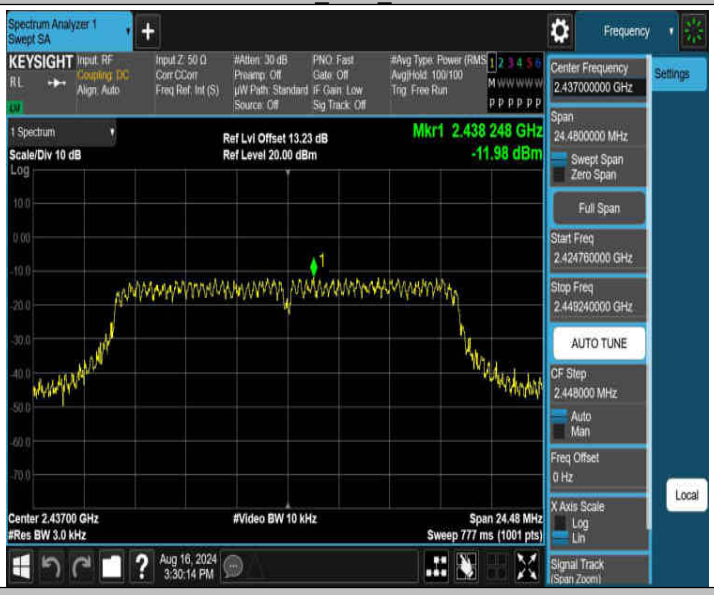
11B_Ant1_2437

11B_Ant1_2462

11G_Ant1_2412

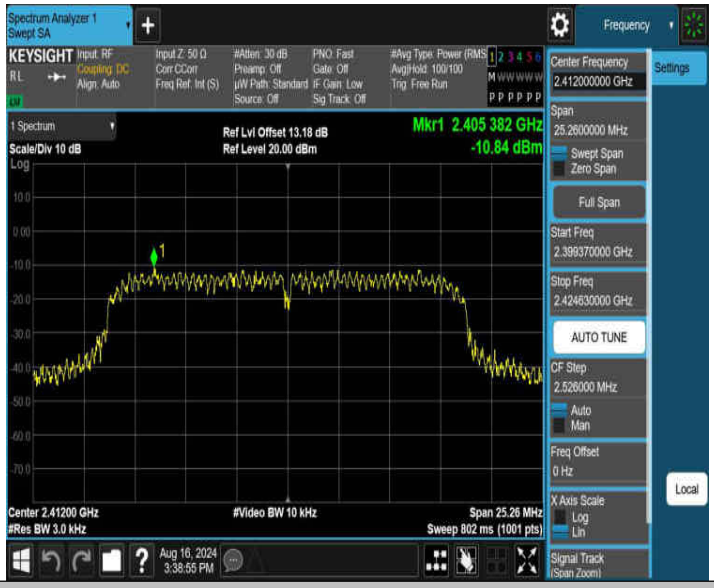


11G_Ant1_2437

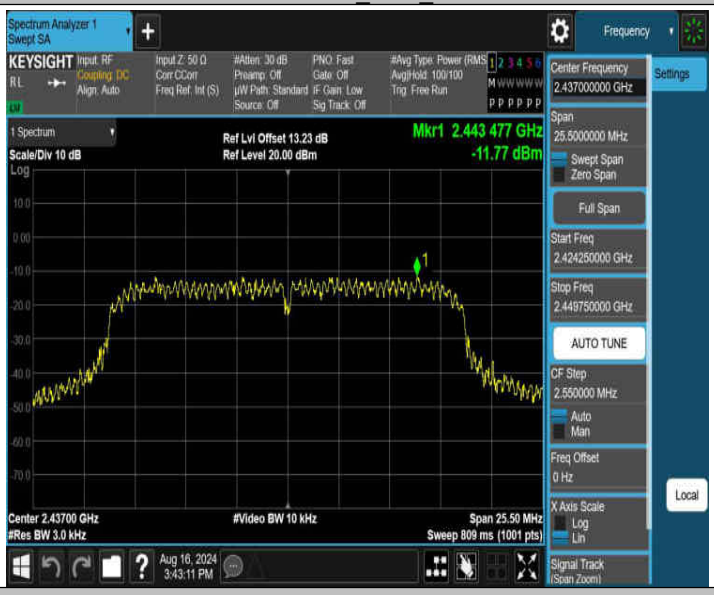


11G_Ant1_2462

11N20SISO_Ant1_2412

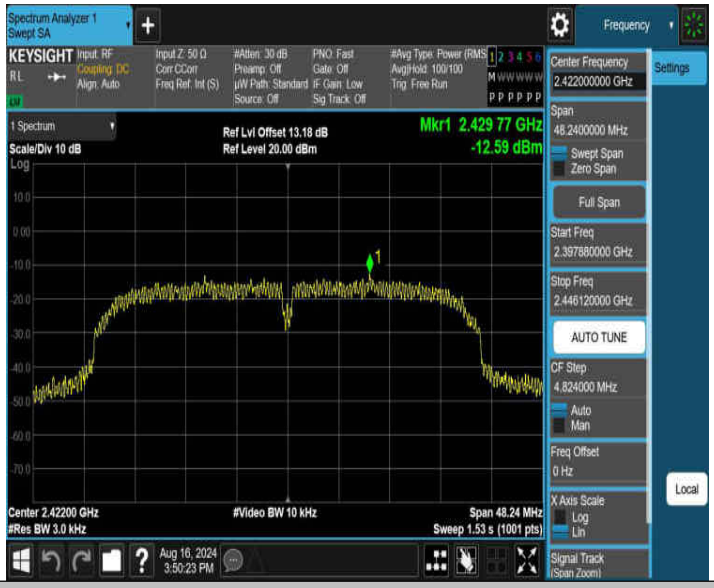


11N20SISO_Ant1_2437

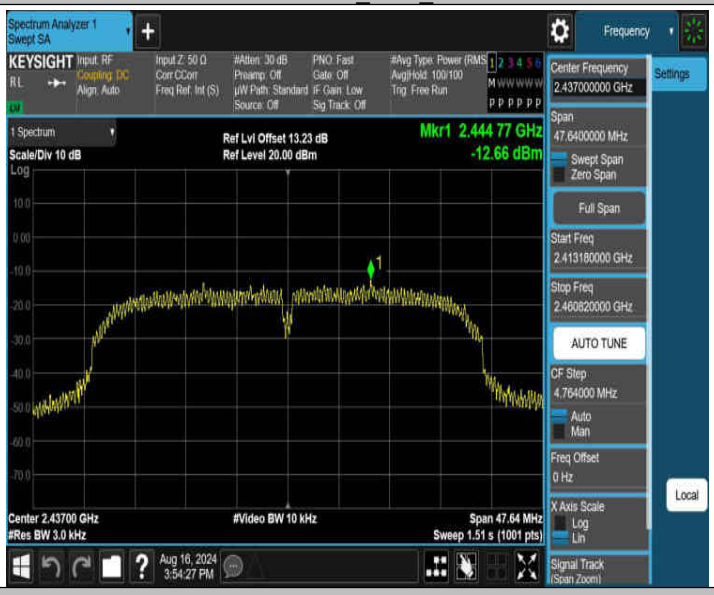


11N20SISO_Ant1_2462

11N40SISO_Ant1_2422



11N40SISO_Ant1_2437



11N40SISO_Ant1_2452

12. Conducted Band edge and Spurious Emissions

12.1. Block diagram of test setup

Same as section 8.1

12.2. Limits

CFR 47 FCC Part15 (15.247) Subpart C		
Section	Test Item	Limit
CFR 47 FCC §15.247 (d)	Conducted Bandedge and Spurious Emissions	at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power

12.3. Test Procedure

Center Frequency	The centre frequency of the channel under test
Detector	Peak
RBW	100 kHz
VBW	≥3 × RBW
Span	1.5 x DTS bandwidth
Trace	Max hold
Sweep time	Auto couple.

Connect the UUT to the spectrum analyzer and use the following settings:
Use the peak marker function to determine the maximum PSD level.

Span	Set the center frequency and span to encompass frequency range to be measured
Detector	Peak
RBW	100 kHz
VBW	≥ 3 × RBW
measurement points	≥ span/RBW
Trace	Max hold
Sweep time	Auto couple.

Use the peak marker function to determine the maximum amplitude level.

12.4. Test result

Test Mode	Ant.	Ch Name	Freq. (MHz)	Ref Level (dBm)	Result (dBm)	Limit (dBm)	Verdict
11B	Ant1	Low	2412	5.20	-45.85	≤-14.8	PASS
		High	2462	9.23	-36.77	≤-10.77	PASS
11G	Ant1	Low	2412	3.70	-23.55	≤-16.3	PASS
		High	2462	2.93	-34.29	≤-17.07	PASS
11N20SISO	Ant1	Low	2412	3.08	-24.78	≤-16.92	PASS
		High	2462	3.55	-34.61	≤-16.45	PASS
11N40SISO	Ant1	Low	2422	-0.62	-30.19	≤-20.62	PASS
		High	2452	-0.43	-32.17	≤-20.43	PASS

Test Mode	Ant.	Freq. (MHz)	Freq Range (Mhz)	Ref Level (dBm)	Result (dBm)	Limit (dBm)	Verdict

11B	Ant1	2412	30~1000	5.20	-51.25	≤-14.8	PASS
			1000~26500	5.20	-49.53	≤-14.8	PASS
		2437	30~1000	8.70	-51.87	≤-11.3	PASS
			1000~26500	8.70	-50	≤-11.3	PASS
		2462	30~1000	9.23	-51.92	≤-10.77	PASS
			1000~26500	9.23	-49.9	≤-10.77	PASS
11G	Ant1	2412	30~1000	3.70	-53.95	≤-16.3	PASS
			1000~26500	3.70	-49.11	≤-16.3	PASS
		2437	30~1000	3.09	-53.27	≤-16.91	PASS
			1000~26500	3.09	-49.13	≤-16.91	PASS
		2462	30~1000	2.93	-53.58	≤-17.07	PASS
			1000~26500	2.93	-49.28	≤-17.07	PASS
11N20SISO	Ant1	2412	30~1000	3.08	-53.95	≤-16.92	PASS
			1000~26500	3.08	-49.62	≤-16.92	PASS
		2437	30~1000	2.52	-53.68	≤-17.48	PASS
			1000~26500	2.52	-49.59	≤-17.48	PASS
		2462	30~1000	3.55	-54.08	≤-16.45	PASS
			1000~26500	3.55	-49.56	≤-16.45	PASS
11N40SISO	Ant1	2422	30~1000	-0.62	-41.86	≤-20.62	PASS
			1000~26500	-0.62	-49.44	≤-20.62	PASS
		2437	30~1000	-0.56	-42.45	≤-20.56	PASS
			1000~26500	-0.56	-50.14	≤-20.56	PASS
		2452	30~1000	-0.43	-42.04	≤-20.43	PASS
			1000~26500	-0.43	-47.9	≤-20.43	PASS

12.5. Original test data

Reference level

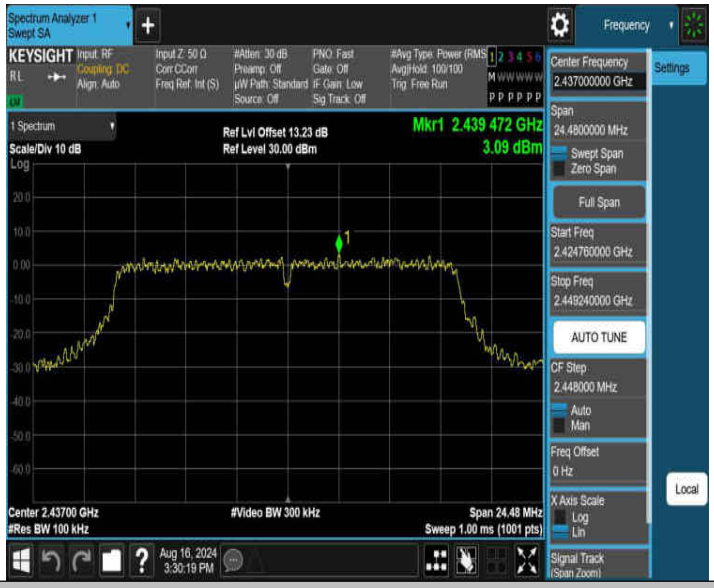
11B_Ant1_2412

11B_Ant1_2437

11B_Ant1_2462

11G_Ant1_2412

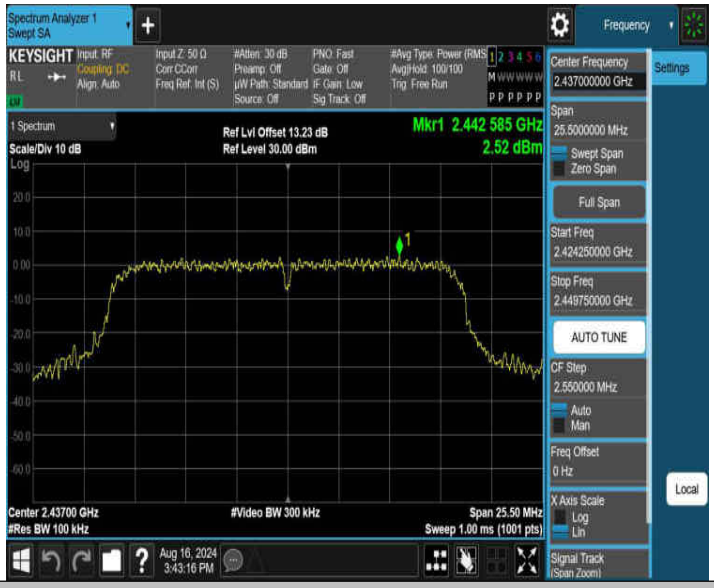
11G_Ant1_2437



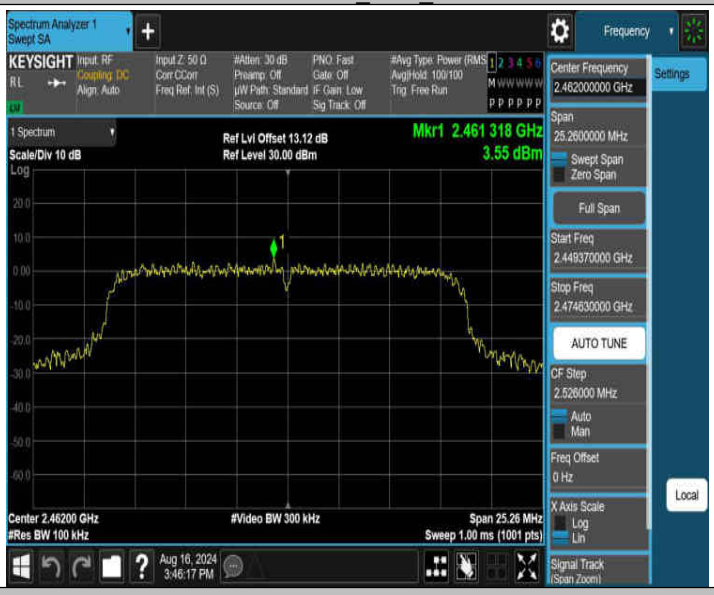
11G_Ant1_2462

11N20SISO_Ant1_2412

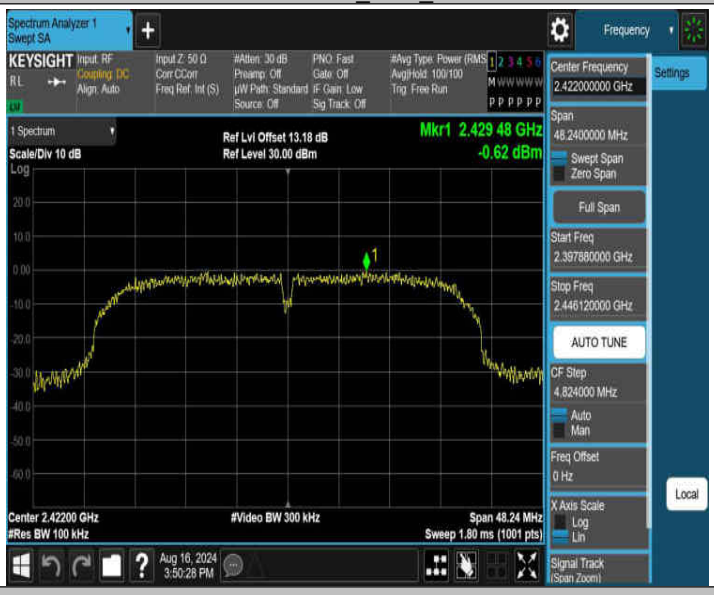
11N20SISO_Ant1_2437



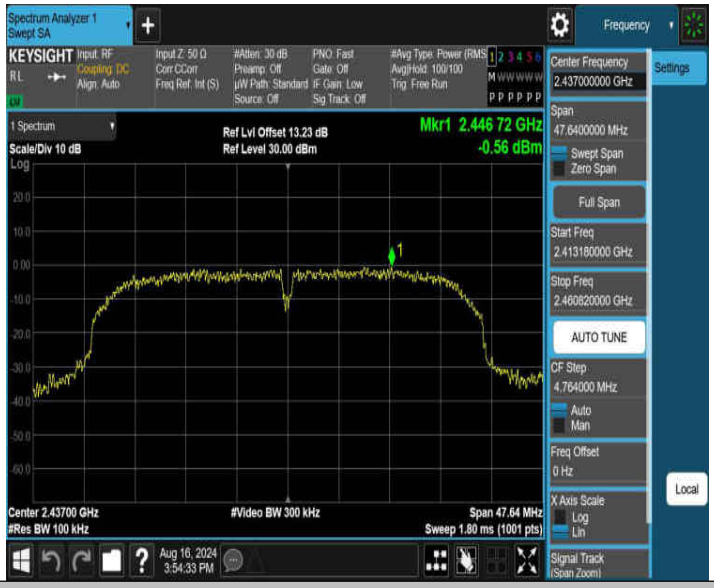
11N20SISO_Ant1_2462



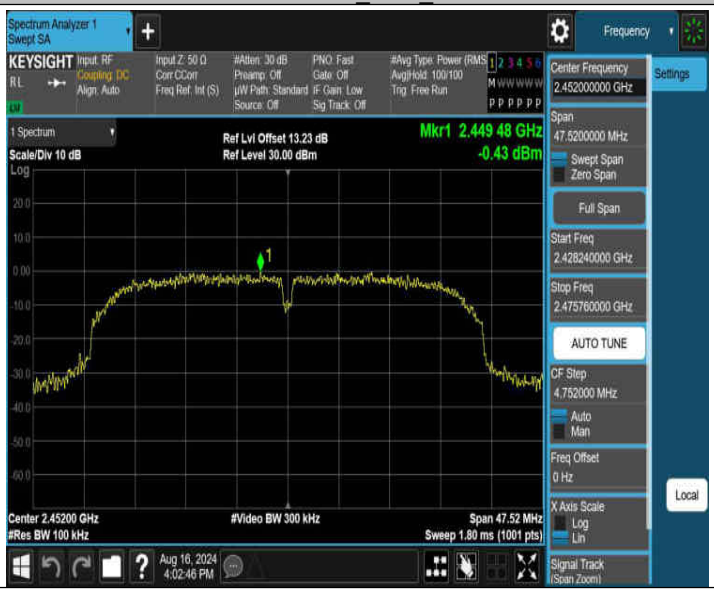
11N40SISO_Ant1_2422



11N40SISO_Ant1_2437



11N40SISO_Ant1_2452



Band edge:

11B_Ant1_Low_2412

11B_Ant1_High_2462

11G_Ant1_Low_2412

11G_Ant1_High_2462

11N20SISO_Ant1_Low_2412

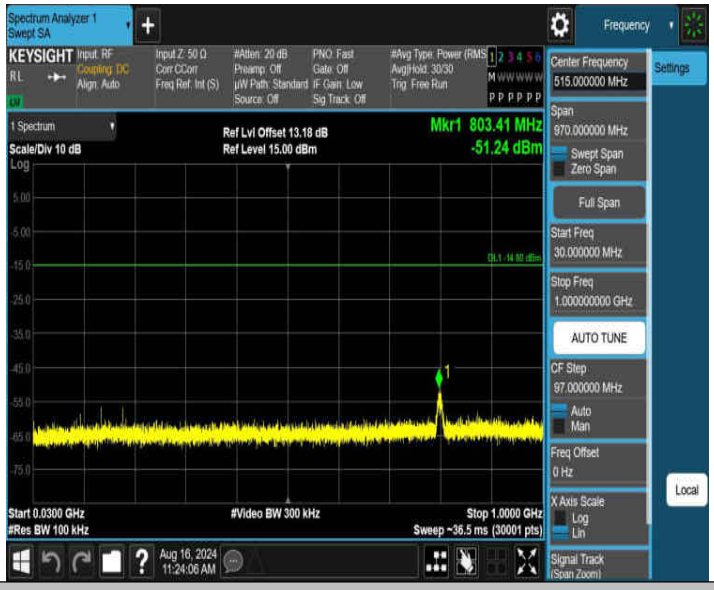
11N20SISO_Ant1_High_2462

11N40SISO_Ant1_Low_2422

11N40SISO_Ant1_High_2452

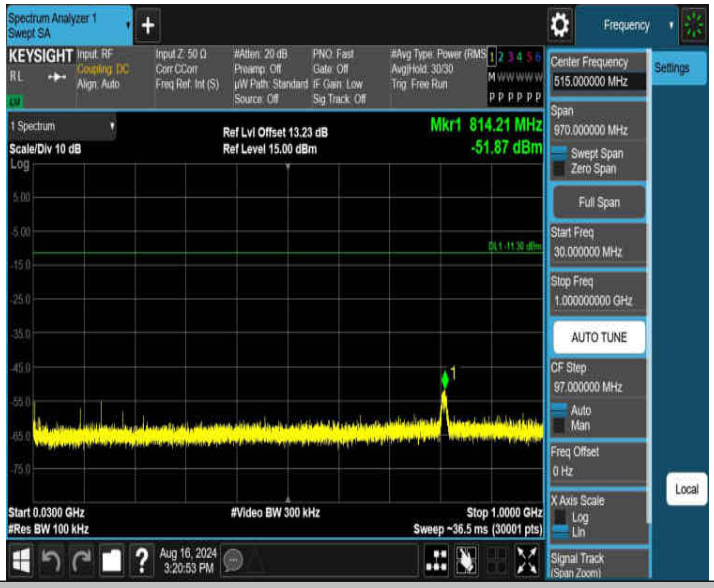
Spurious Emission:

11B_Ant1_2412_30~1000



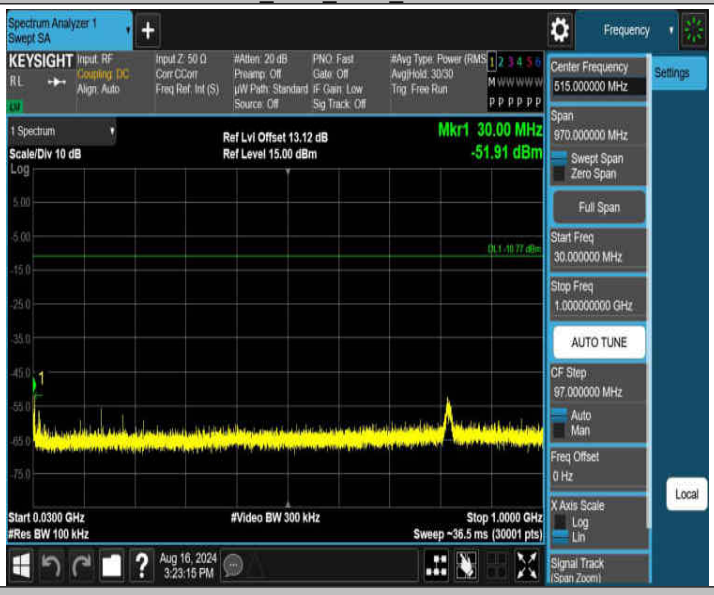
11B_Ant1_2412_1000~26500

11B_Ant1_2437_30~1000



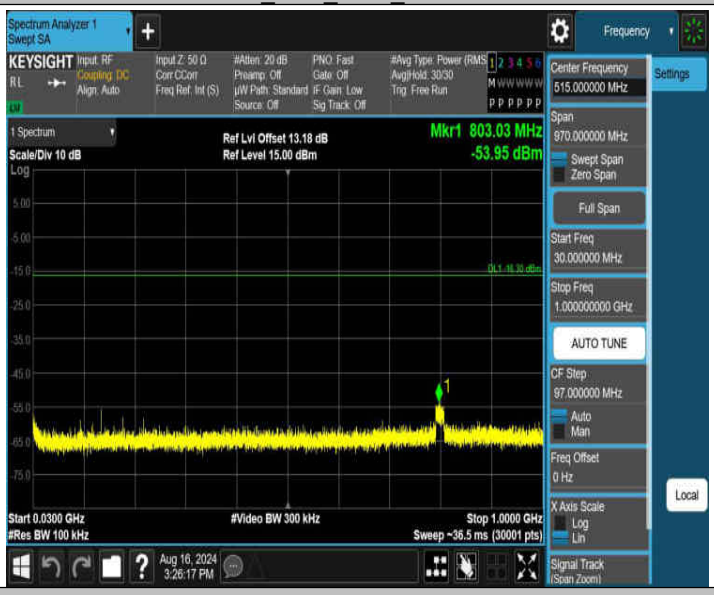
11B_Ant1_2437_1000~26500

11B_Ant1_2462_30~1000



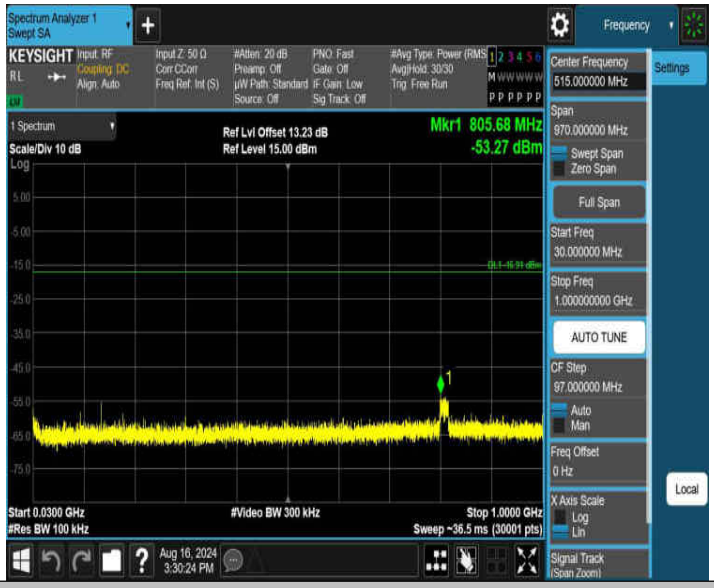
11B_Ant1_2462_1000~26500

11G_Ant1_2412_30~1000



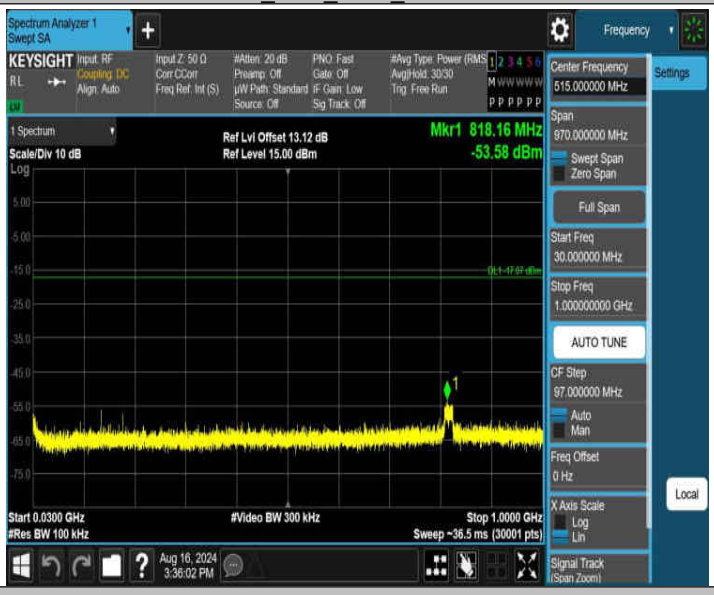
11G_Ant1_2412_1000~26500

11G_Ant1_2437_30~1000



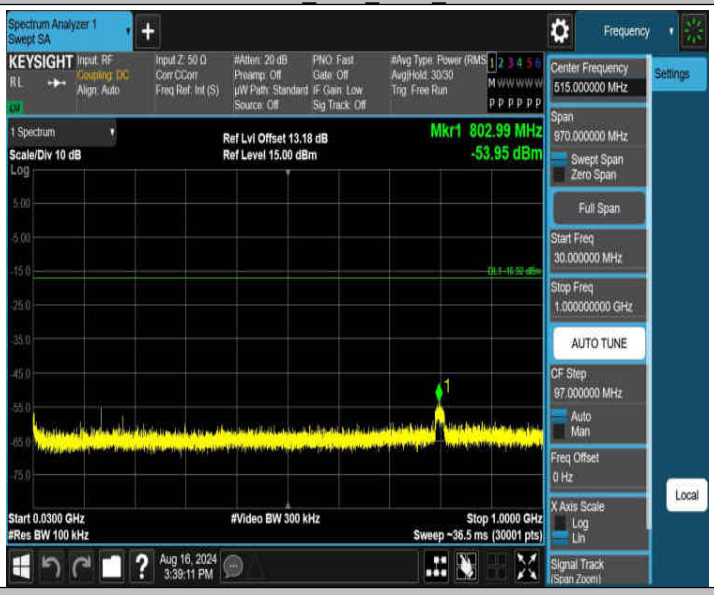
11G_Ant1_2437_1000~26500

11G_Ant1_2462_30~1000



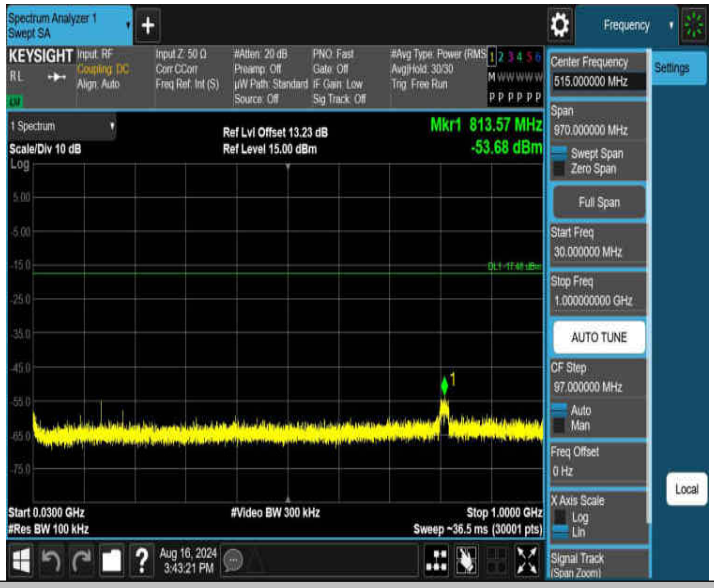
11G_Ant1_2462_1000~26500

11N20SISO_Ant1_2412_30~1000



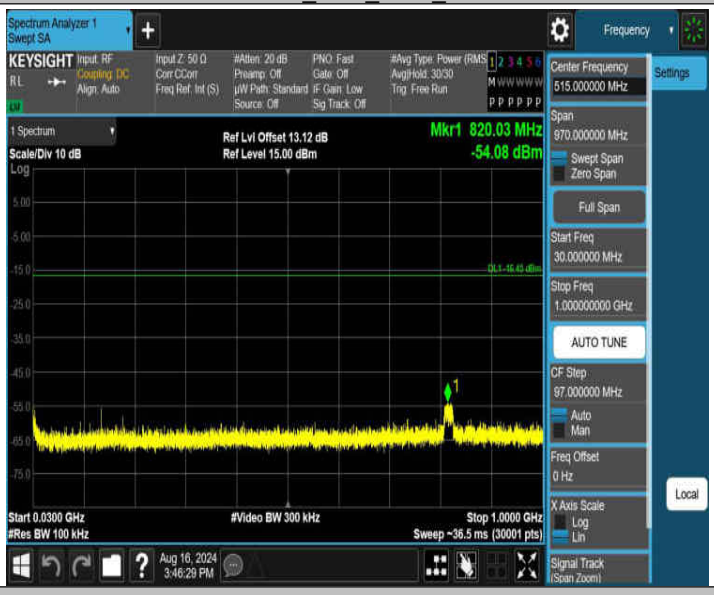
11N20SISO_Ant1_2412_1000~26500

11N20SISO_Ant1_2437_30~1000



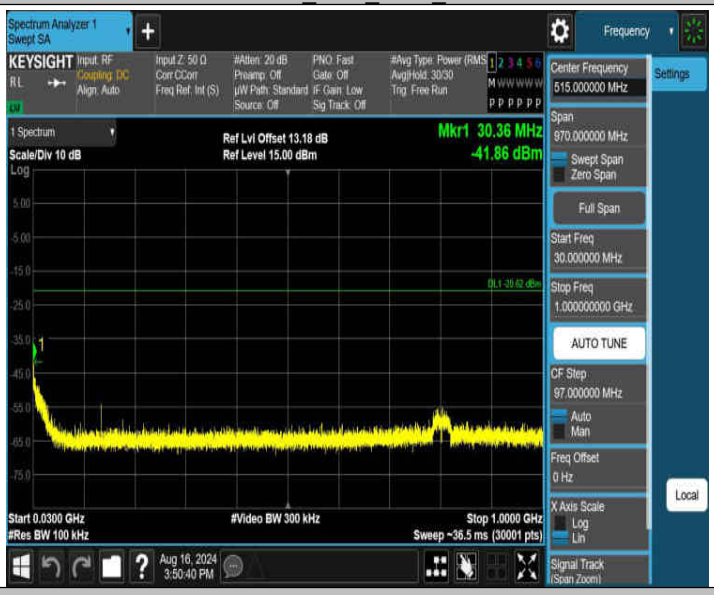
11N20SISO_Ant1_2437_1000~26500

11N20SISO_Ant1_2462_30~1000



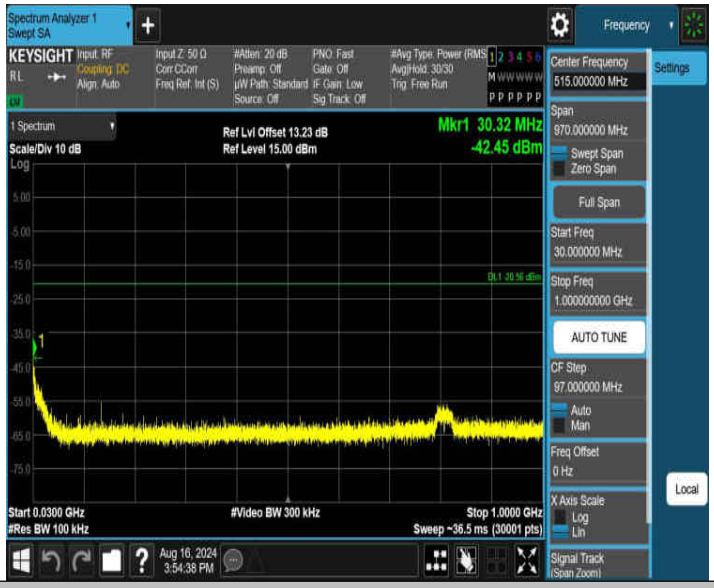
11N20SISO_Ant1_2462_1000~26500

11N40SISO_Ant1_2422_30~1000



11N40SISO_Ant1_2422_1000~26500

11N40SISO_Ant1_2437_30~1000



11N40SISO_Ant1_2437_1000~26500

11N40SISO_Ant1_2452_30~1000

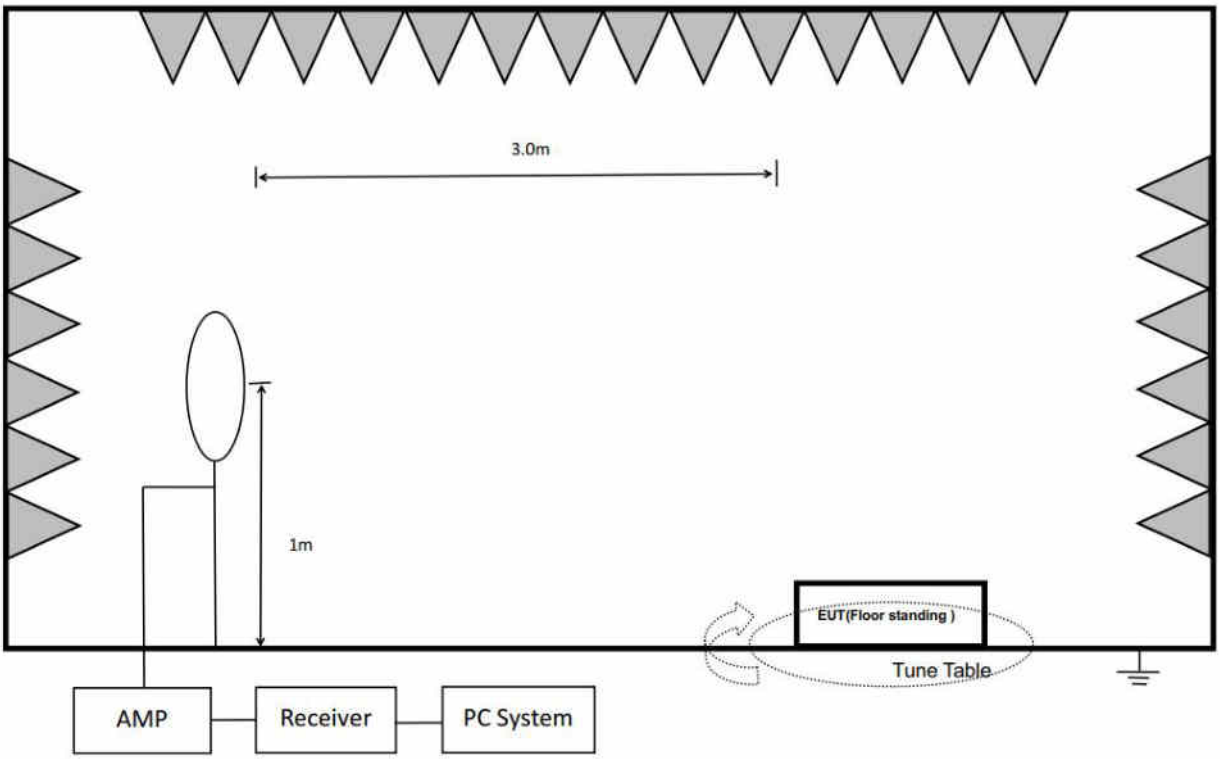
11N40SISO_Ant1_2452_1000~26500

Spectrum Analyzer 1
Swept SA
KEYSIGHT
Input: RF
Coupling: DC
Align: Auto
Input Z: 50 Ω
Corr CCorr
Freq Ref: Int (S)
#Atten: 20 dB
Preamp: Off
µW Path: Standard
Source: Off
PNO: Fast
Gate: Off
IF Gain: Low
Sig Track: Off
#Avg Type: Power (RMS)
Avg|Hold: 5/5
Trig: Free Run
Frequency
Settings
Center Frequency
13.750000000 GHz
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
Scale/Div 10 dB
Ref Lvl Offset 13.23 dB
Ref Level 15.00 dBm
Mkr2 26.388 65 GHz
-47.90 dBm
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 -1.014 dBm
2 N 1 f 26.388 65 GHz -47.90 dBm
Aug 16, 2024
4:03:09 PM

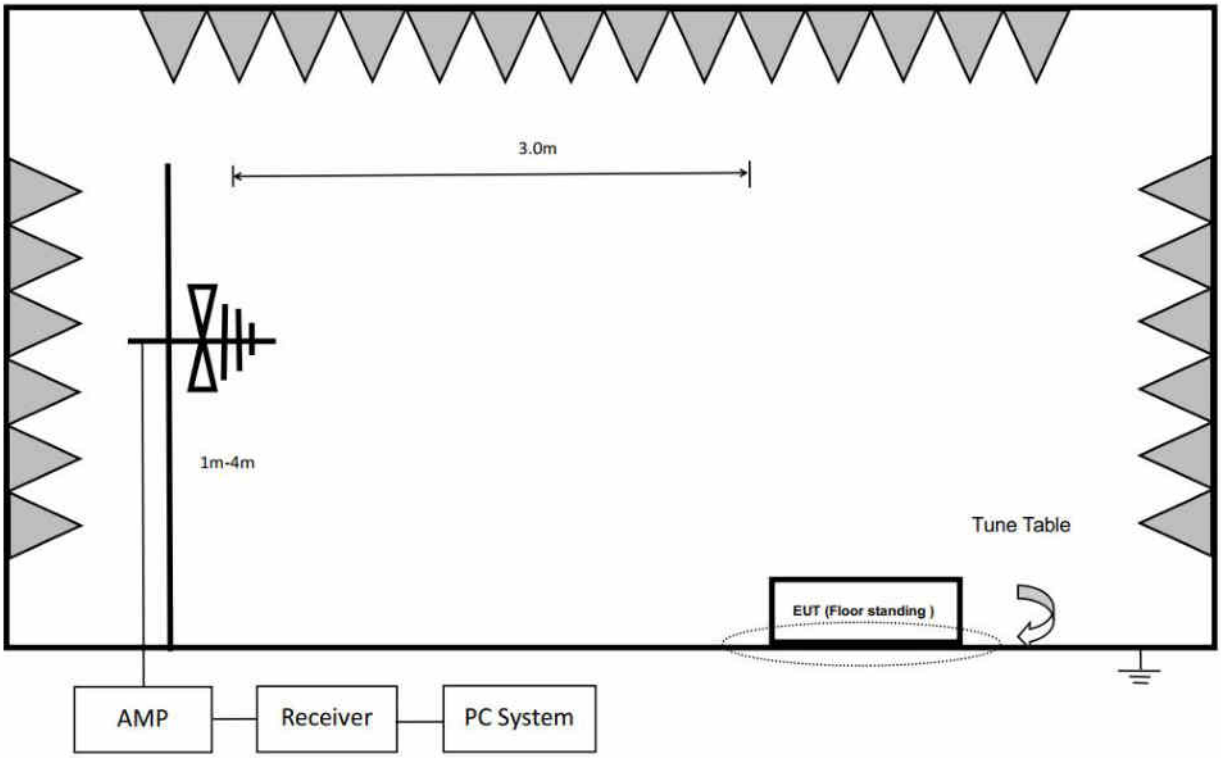
13. Radiated Emission

13.1. Block diagram of test setup

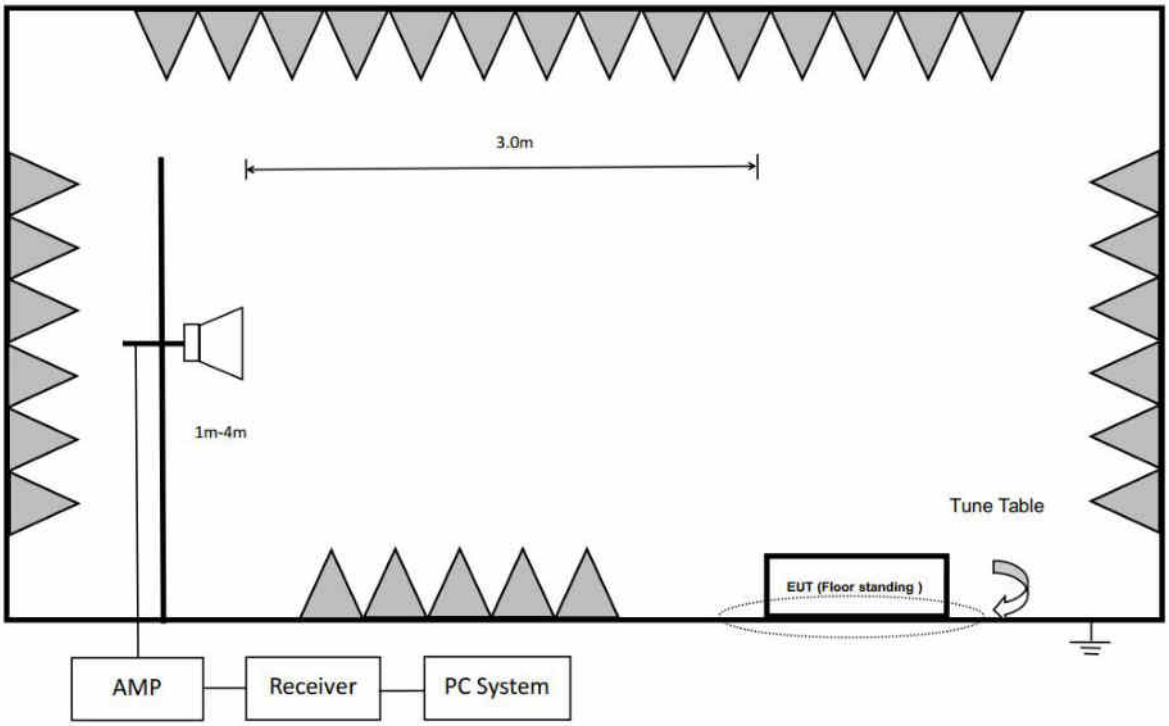
In 3 m Anechoic Chamber, test setup diagram for 9 kHz - 30 MHz:



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 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 and all cables shall be insulated, if required, from the ground plane by up to 12mm of insulating meterial.

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 and all cables shall be insulated, if required, from the ground plane by up to 12mm of insulating meterial.

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 and all cables shall be insulated, if required, from the ground plane by up to 12mm of insulating meterial.

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 11B mode.

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

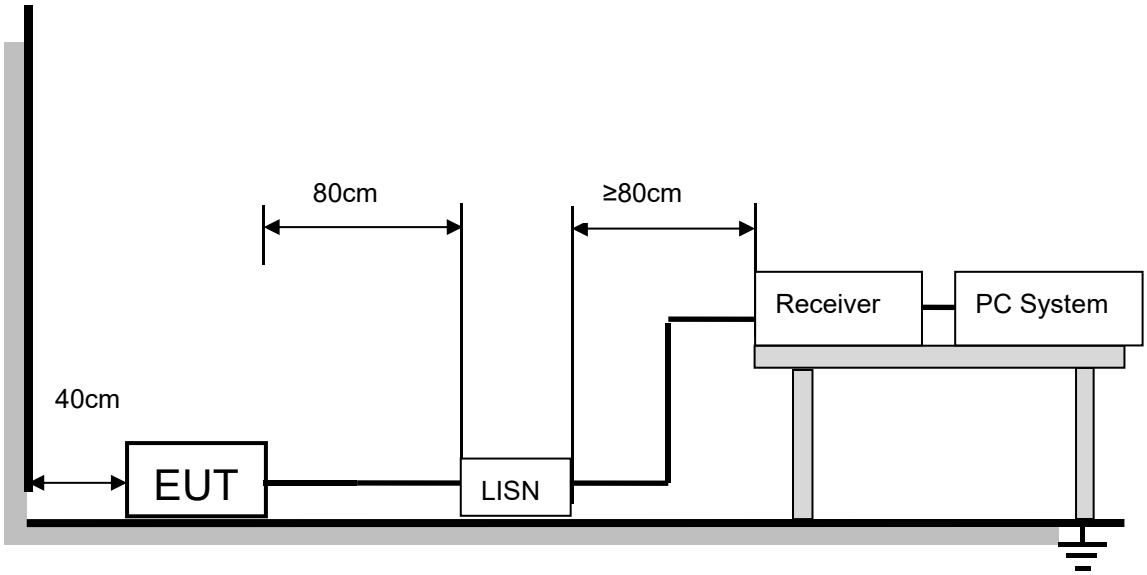
13.5. Original test data

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 and all cables shall be insulated, if required, from the ground plane by up to 12mm of insulating meterial. 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).

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 insulating meterial, 12mm 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.

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 antenna used for this product is FPC antenna and that no antenna other than that furnished by the responsible party shall be used with the device, the maximum peak gain of the transmit antenna is 2.71 dBi

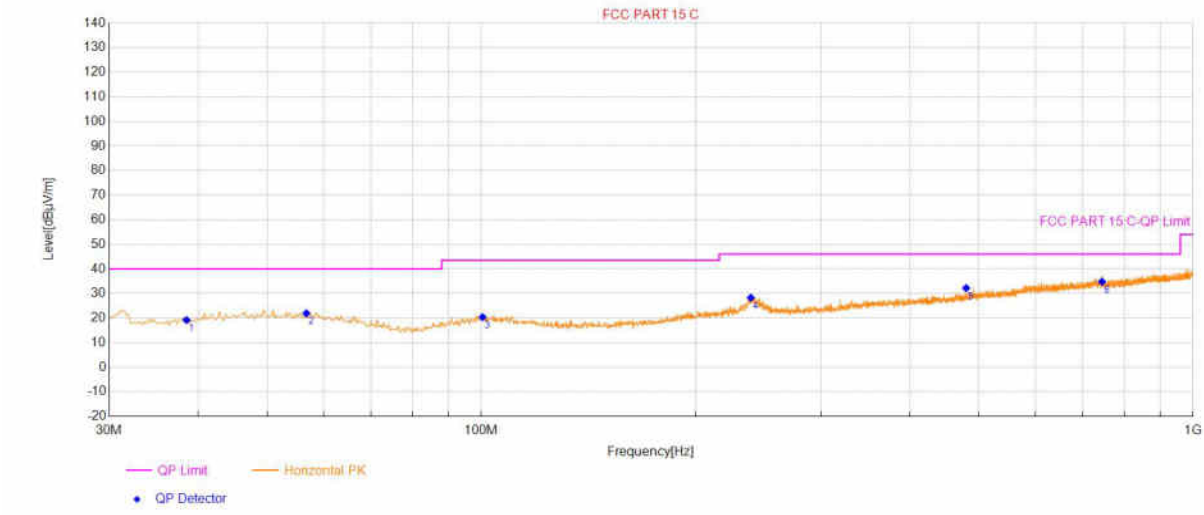
APPENDIX A – Radiated Emission Below 1GHz Test Data

Test Report

Project Information			
Customer:			
EUT:	Portl UltraGym 70		
Model:	PUG-70	SN:	
Mode:	11B_2412	Voltage:	AC220V/60Hz
Environment:	Temp: 25℃; Humi:60%	Engineer:	Soho Liu
Remark:			
Test Standard: FCC PART 15 C			

Start of Test:2024-08-20 18:32:23

Test Graph



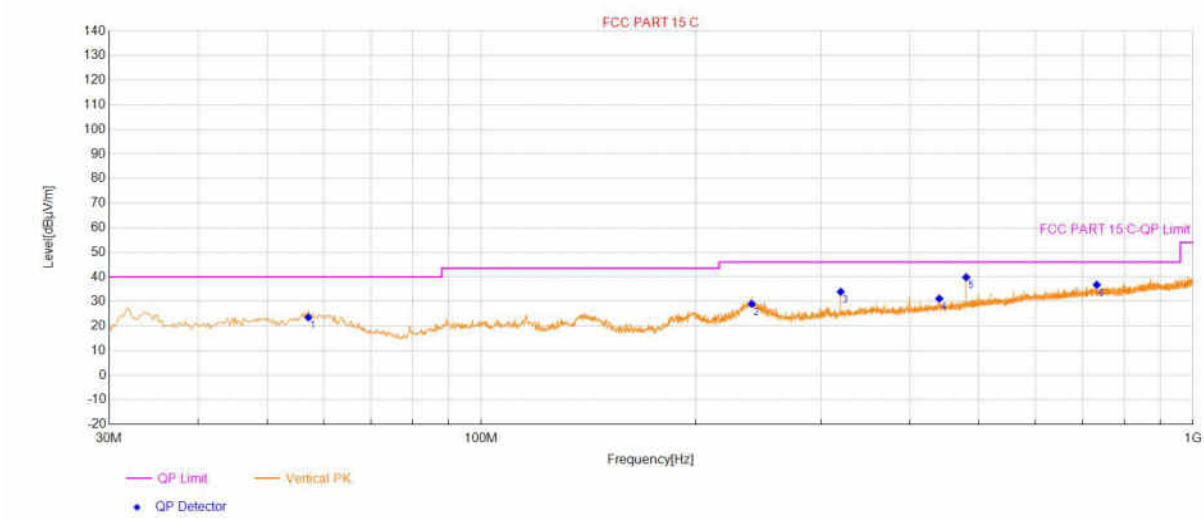
Final Data List									
NO.	Frequency (MHz)	Factor (dB/m)	QP Value (dBμV/m)	QP Limit (dBμV/m)	QP Margin (dB)	Height (cm)	Angle (°)	Polarity	Verdict
1	38.5377	19.06	19.20	40.00	20.80	100	342	Horizontal	PASS
2	56.7774	20.68	21.95	40.00	18.05	100	298	Horizontal	PASS
3	100.4361	19.93	20.39	43.50	23.11	100	32	Horizontal	PASS
4	239.1738	21.65	28.30	46.00	17.70	100	352	Horizontal	PASS
5	479.9760	27.35	32.20	46.00	13.80	100	359	Horizontal	PASS
6	744.8390	32.61	34.82	46.00	11.18	100	282	Horizontal	PASS

Test Report

Project Information			
Customer:			
EUT:	Portl UltraGym 70		
Model:	PUG-70	SN:	
Mode:	11B_2412	Voltage:	AC220V/60Hz
Environment:	Temp: 25℃; Humi:60%	Engineer:	Soho Liu
Remark:			
Test Standard: FCC PART 15 C			

Start of Test:2024-08-20 18:33:10

Test Graph



Final Data List									
NO.	Frequency (MHz)	Factor (dB/m)	QP Value (dBμV/m)	QP Limit (dBμV/m)	QP Margin (dB)	Height (cm)	Angle (°)	Polarity	Verdict
1	57.1654	20.63	23.55	40.00	16.45	100	35	Vertical	PASS
2	239.9500	21.67	29.02	46.00	16.98	100	321	Vertical	PASS
3	319.8940	23.84	33.93	46.00	12.07	100	13	Vertical	PASS
4	440.0040	26.39	31.17	46.00	14.83	100	328	Vertical	PASS
5	479.9760	27.35	39.83	46.00	6.17	100	52	Vertical	PASS
6	732.4205	32.28	36.77	46.00	9.23	100	150	Vertical	PASS

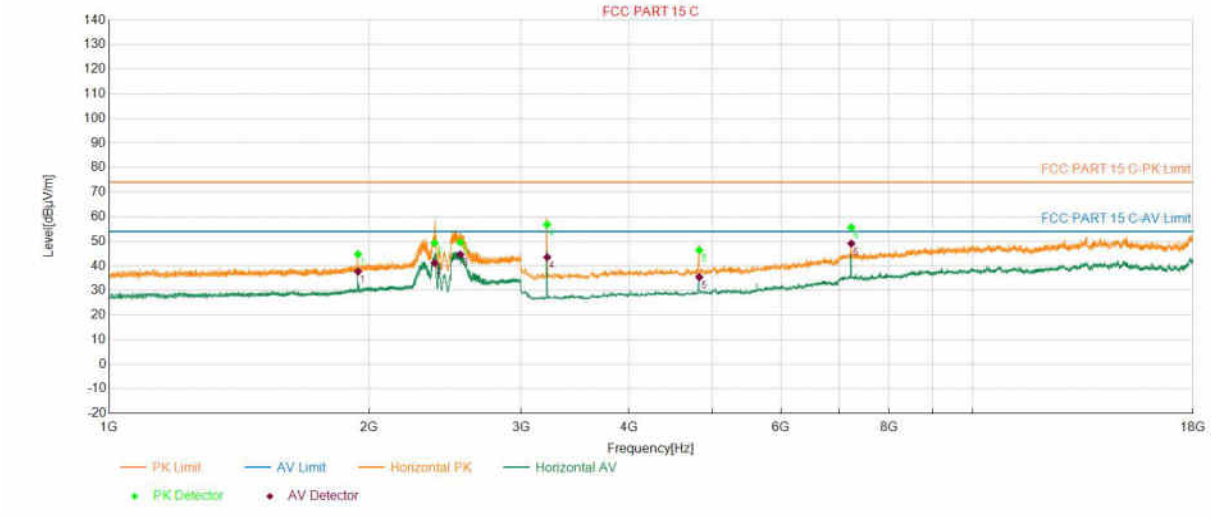
APPENDIX B – Radiated Emission Above 1GHz Test Data

Test Report

Project Information			
Customer:			
EUT:	Portl UltraGym 70		
Model:	PUG-70	SN:	
Mode:	11B_2412	Voltage:	AC220V/60Hz
Environment:	Temp: 25℃; Humi:60%	Engineer:	Soho Liu
Remark:	Power Set:40		
Test Standard: FCC PART 15 C			

Start of Test:2024-08-20 14:33:56

Test Graph



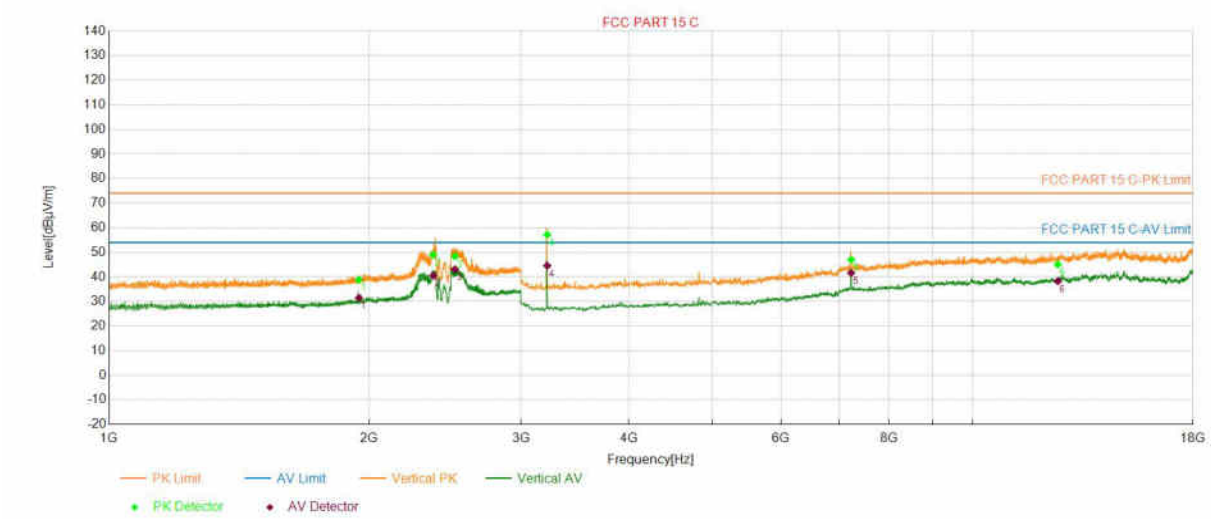
PK Final Data List											
NO.	Frequency (MHz)	Factor (dB/m)	PK Value (dBμV/m)	PK Limit (dBμV/m)	PK Margin (dB)	AV Value (dBμV/m)	AV Limit (dBμV/m)	AV Margin (dB)	Height (cm)	Angle (°)	Polarity
1	1941.7884	1.95	44.72	74.00	29.28	37.71	54.00	16.29	100	2	Horizontal
2	2382.2765	6.95	49.33	74.00	24.67	41.23	54.00	12.77	100	97	Horizontal
3	2551.5103	5.64	49.56	74.00	24.44	44.62	54.00	9.38	100	105	Horizontal
4	3216.0432	-10.47	56.84	74.00	17.16	43.54	54.00	10.46	100	9	Horizontal
5	4824.3649	-4.86	46.34	74.00	27.66	35.46	54.00	18.54	100	83	Horizontal
6	7236.6187	3.32	55.66	74.00	18.34	49.10	54.00	4.90	100	66	Horizontal

Test Report

Project Information			
Customer:			
EUT:	Portl UltraGym 70		
Model:	PUG-70	SN:	
Mode:	11B_2412	Voltage:	AC220V/60Hz
Environment:	Temp: 25℃; Humi:60%	Engineer:	Soho Liu
Remark:	Power Set:40		
Test Standard: FCC PART 15 C			

Start of Test:2024-08-20 14:35:35

Test Graph



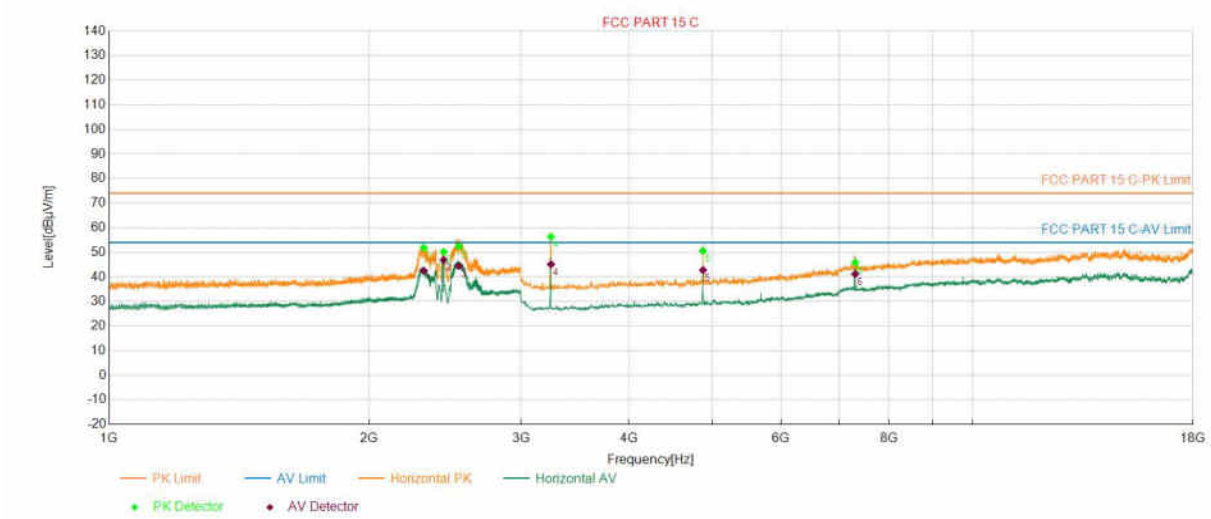
PK Final Data List											
NO.	Frequency (MHz)	Factor (dB/m)	PK Value (dBμV/m)	PK Limit (dBμV/m)	PK Margin (dB)	AV Value (dBμV/m)	AV Limit (dBμV/m)	AV Margin (dB)	Height (cm)	Angle (°)	Polarity
1	1946.1892	2.01	38.85	74.00	35.15	31.45	54.00	22.55	100	360	Vertical
2	2373.0746	7.05	49.04	74.00	24.96	40.48	54.00	13.52	100	115	Vertical
3	2514.7029	5.91	48.39	74.00	25.61	43.08	54.00	10.92	100	35	Vertical
4	3216.0432	-10.47	57.15	74.00	16.85	44.57	54.00	9.43	100	66	Vertical
5	7233.8468	3.33	47.00	74.00	27.00	41.65	54.00	12.35	100	209	Vertical
6	12550.9102	11.86	45.10	74.00	28.90	38.29	54.00	15.71	100	9	Vertical

Test Report

Project Information			
Customer:			
EUT:	Portl UltraGym 70		
Model:	PUG-70	SN:	
Mode:	11B_2437	Voltage:	AC220V/60Hz
Environment:	Temp: 25℃; Humi:60%	Engineer:	Soho Liu
Remark:	Power Set:40		
Test Standard: FCC PART 15 C			

Start of Test:2024-08-20 15:03:43

Test Graph



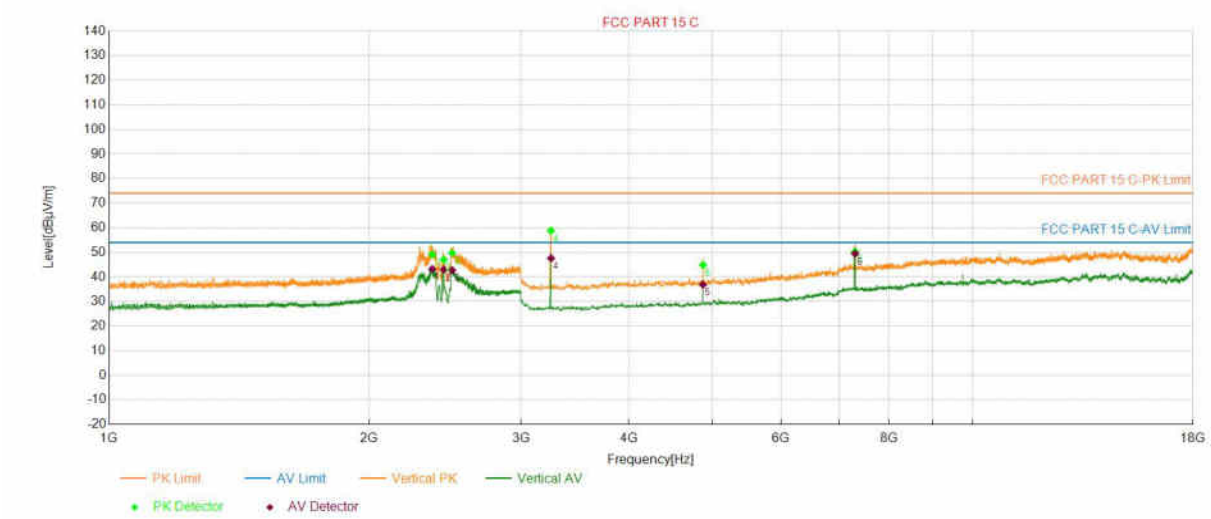
PK Final Data List											
NO.	Frequency (MHz)	Factor (dB/m)	PK Value (dBμV/m)	PK Limit (dBμV/m)	PK Margin (dB)	AV Value (dBμV/m)	AV Limit (dBμV/m)	AV Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2313.8628	3.91	51.85	74.00	22.15	42.50	54.00	11.50	100	106	Horizontal
2	2440.6881	6.45	50.16	74.00	23.84	46.89	54.00	7.11	100	106	Horizontal
3	2542.3085	5.71	52.34	74.00	21.66	44.46	54.00	9.54	100	98	Horizontal
4	3249.0498	-10.33	56.32	74.00	17.68	45.14	54.00	8.86	100	30	Horizontal
5	4872.3745	-4.50	50.61	74.00	23.39	42.75	54.00	11.25	100	94	Horizontal
6	7311.8624	3.21	45.89	74.00	28.11	41.16	54.00	12.84	100	129	Horizontal

Test Report

Project Information			
Customer:			
EUT:	Portl UltraGym 70		
Model:	PUG-70	SN:	
Mode:	11B_2437	Voltage:	AC220V/60Hz
Environment:	Temp: 25℃; Humi:60%	Engineer:	Soho Liu
Remark:	Power Set:40		
Test Standard: FCC PART 15 C			

Start of Test:2024-08-20 15:05:21

Test Graph



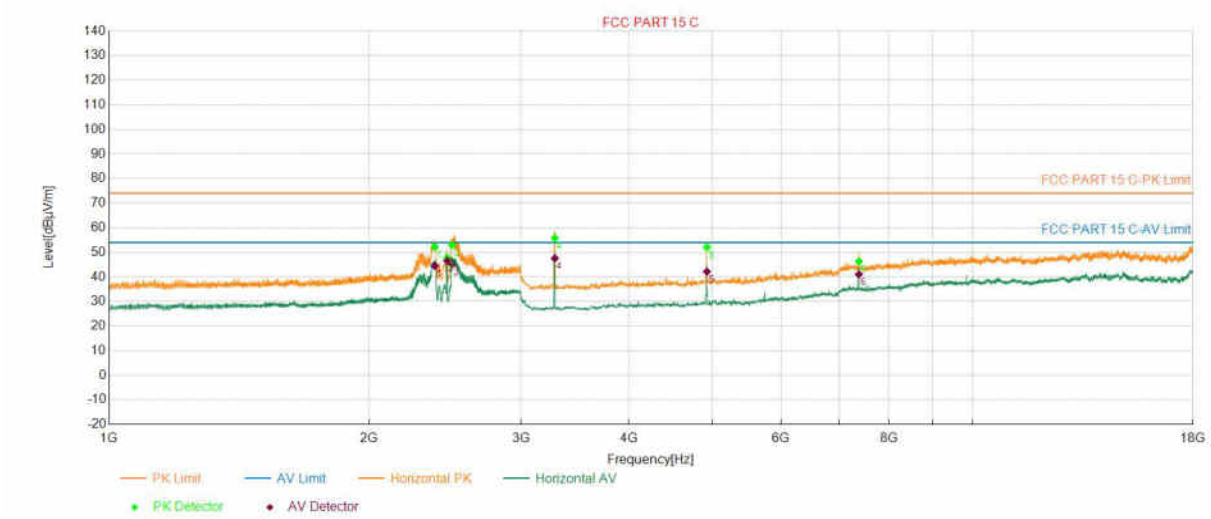
PK Final Data List											
NO.	Frequency (MHz)	Factor (dB/m)	PK Value (dBμV/m)	PK Limit (dBμV/m)	PK Margin (dB)	AV Value (dBμV/m)	AV Limit (dBμV/m)	AV Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2367.4735	7.12	49.11	74.00	24.89	43.23	54.00	10.77	100	46	Vertical
2	2440.6881	6.45	47.06	74.00	26.94	42.98	54.00	11.02	100	111	Vertical
3	2495.8992	6.04	49.70	74.00	24.30	42.69	54.00	11.31	100	46	Vertical
4	3249.0498	-10.33	58.81	74.00	15.19	47.57	54.00	6.43	100	40	Vertical
5	4872.3745	-4.50	44.84	74.00	29.16	36.85	54.00	17.15	100	103	Vertical
6	7308.8618	3.22	50.36	74.00	23.64	49.45	54.00	4.55	100	95	Vertical

Test Report

Project Information			
Customer:			
EUT:	Portl UltraGym 70		
Model:	PUG-70	SN:	
Mode:	11B_2462	Voltage:	AC220V/60Hz
Environment:	Temp: 25℃; Humi:60%	Engineer:	Soho Liu
Remark:	Power Set:40		
Test Standard: FCC PART 15 C			

Start of Test:2024-08-20 15:10:32

Test Graph



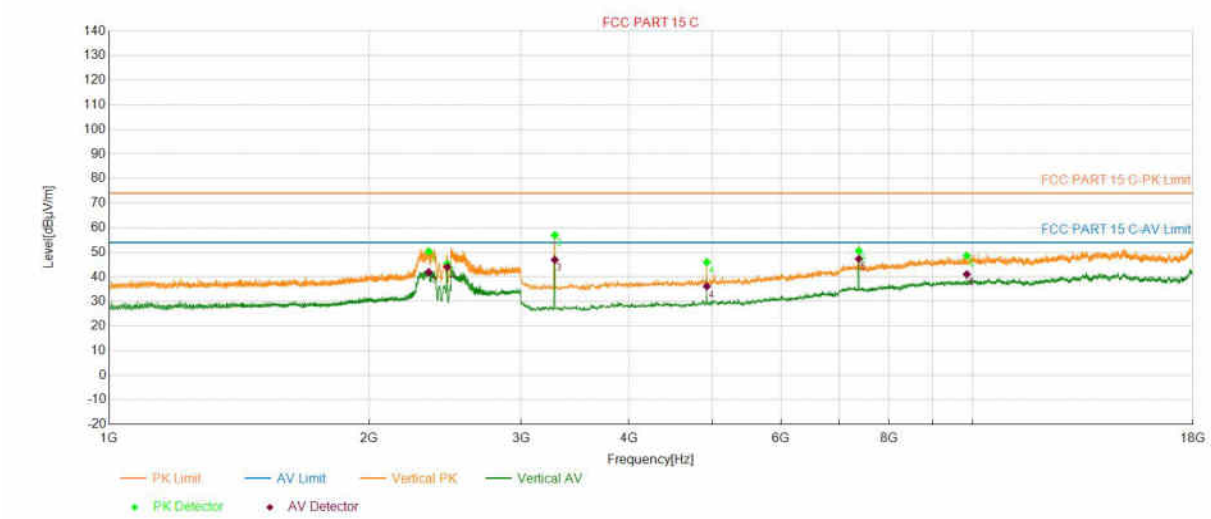
PK Final Data List											
NO.	Frequency (MHz)	Factor (dB/m)	PK Value (dBμV/m)	PK Limit (dBμV/m)	PK Margin (dB)	AV Value (dBμV/m)	AV Limit (dBμV/m)	AV Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2383.4767	6.94	52.20	74.00	21.80	44.47	54.00	9.53	100	98	Horizontal
2	2463.0926	6.29	47.84	74.00	26.16	46.58	54.00	7.42	100	90	Horizontal
3	2495.0990	6.05	52.97	74.00	21.03	45.12	54.00	8.88	100	98	Horizontal
4	3282.0564	-10.19	55.78	74.00	18.22	47.54	54.00	6.46	100	56	Horizontal
5	4923.3847	-4.24	52.06	74.00	21.94	42.15	54.00	11.85	100	91	Horizontal
6	7383.8768	3.20	46.28	74.00	27.72	41.04	54.00	12.96	100	30	Horizontal

Test Report

Project Information			
Customer:			
EUT:	Portl UltraGym 70		
Model:	PUG-70	SN:	
Mode:	11B_2462	Voltage:	AC220V/60Hz
Environment:	Temp: 25℃; Humi:60%	Engineer:	Soho Liu
Remark:	Power Set:40		
Test Standard: FCC PART 15 C			

Start of Test:2024-08-20 15:12:12

Test Graph



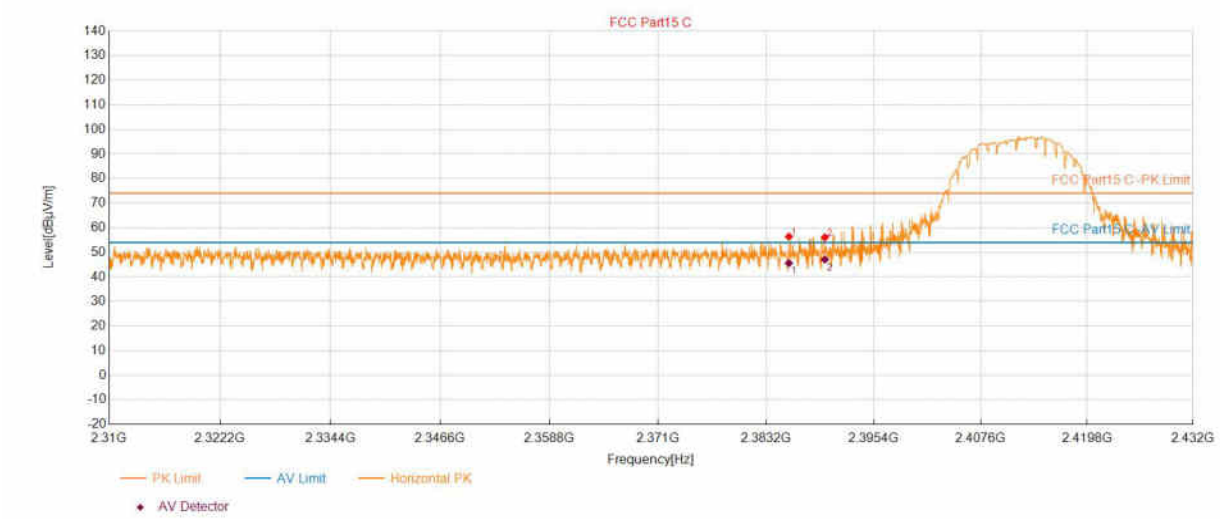
PK Final Data List											
NO.	Frequency (MHz)	Factor (dB/m)	PK Value (dBμV/m)	PK Limit (dBμV/m)	PK Margin (dB)	AV Value (dBμV/m)	AV Limit (dBμV/m)	AV Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2345.4691	4.09	50.35	74.00	23.65	41.95	54.00	12.05	100	44	Vertical
2	2464.2929	6.28	45.40	74.00	28.60	44.01	54.00	9.99	100	44	Vertical
3	3282.0564	-10.19	57.02	74.00	16.98	46.94	54.00	7.06	100	40	Vertical
4	4923.3847	-4.24	45.98	74.00	28.02	36.13	54.00	17.87	100	32	Vertical
5	7383.8768	3.20	50.56	74.00	23.44	47.33	54.00	6.67	100	130	Vertical
6	9847.3695	8.45	48.60	74.00	25.40	41.09	54.00	12.91	100	121	Vertical

Test Report

Project Information			
Customer:			
EUT:	Portl UltraGym 70		
Model:	PUG-70	SN:	
Mode:	11B_2412	Voltage:	AC220V/60Hz
Environment:	Temp: 25℃; Humi:60%	Engineer:	Soho Liu
Remark:	Power Set:40		
Test Standard: FCC Part15 C			

Start of Test:2024-08-20 14:56:09

Test Graph



Suspected Data List							
NO.	Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2385.78	56.41	74.00	17.59	100	96	Horizontal
2	2389.85	56.08	74.00	17.92	100	106	Horizontal

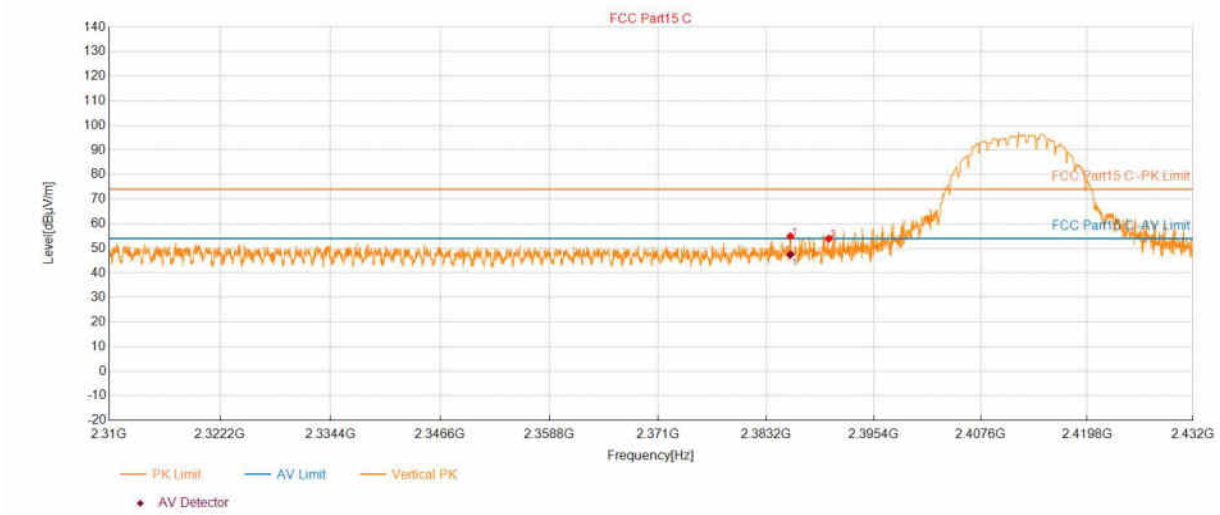
PK Final Data List								
NO.	Frequency (MHz)	Factor (dB/m)	AV Value (dBµV/m)	AV Limit (dBµV/m)	AV Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2385.7781	3.50	45.60	54.00	8.40	138.4	100	Horizontal
2	2389.8528	3.51	47.07	54.00	6.93	100	106	Horizontal

Test Report

Project Information			
Customer:			
EUT:	Portl UltraGym 70		
Model:	PUG-70	SN:	
Mode:	11B_2412	Voltage:	AC220V/60Hz
Environment:	Temp: 25℃; Humi:60%	Engineer:	Soho Liu
Remark:	Power Set:40		
Test Standard: FCC Part15 C			

Start of Test:2024-08-20 14:56:54

Test Graph



Suspected Data List							
NO.	Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2385.95	54.87	74.00	19.13	100	113	Vertical
2	2390.29	53.90	74.00	20.10	100	58	Vertical

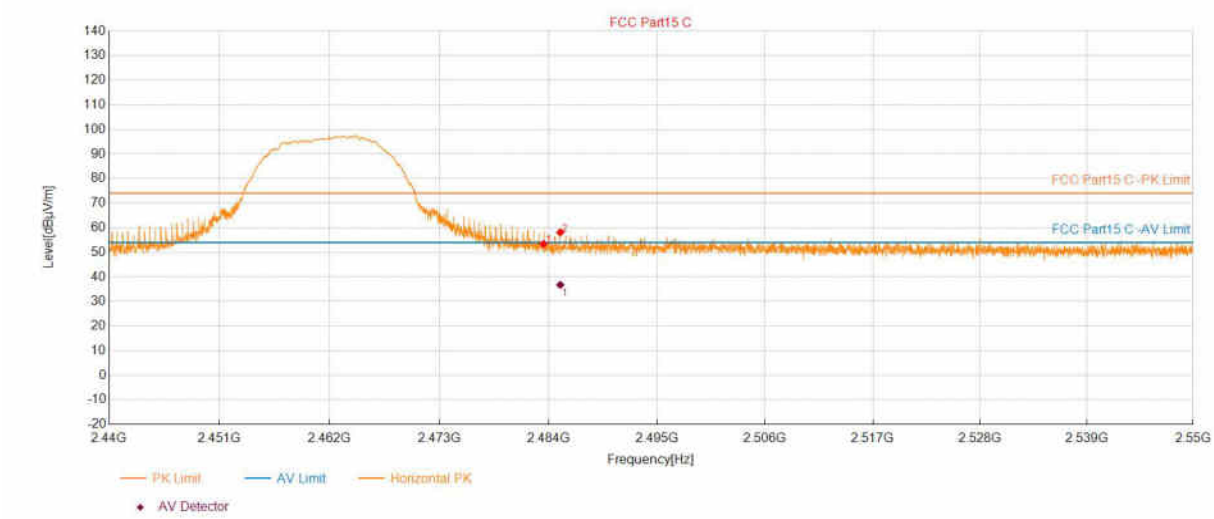
PK Final Data List								
NO.	Frequency (MHz)	Factor (dB/m)	AV Value (dBμV/m)	AV Limit (dBμV/m)	AV Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2385.9480	3.50	47.48	54.00	6.52	100	113	Vertical

Test Report

Project Information			
Customer:			
EUT:	Portl UltraGym 70		
Model:	PUG-70	SN:	
Mode:	11B_2462	Voltage:	AC220V/60Hz
Environment:	Temp: 25℃; Humi:60%	Engineer:	Soho Liu
Remark:	Power Set:40		
Test Standard: FCC Part15 C			

Start of Test:2024-08-20 15:16:47

Test Graph



Suspected Data List							
NO.	Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2483.50	53.42	74.00	20.58	100	95	Horizontal
2	2485.20	58.11	74.00	15.89	100	95	Horizontal

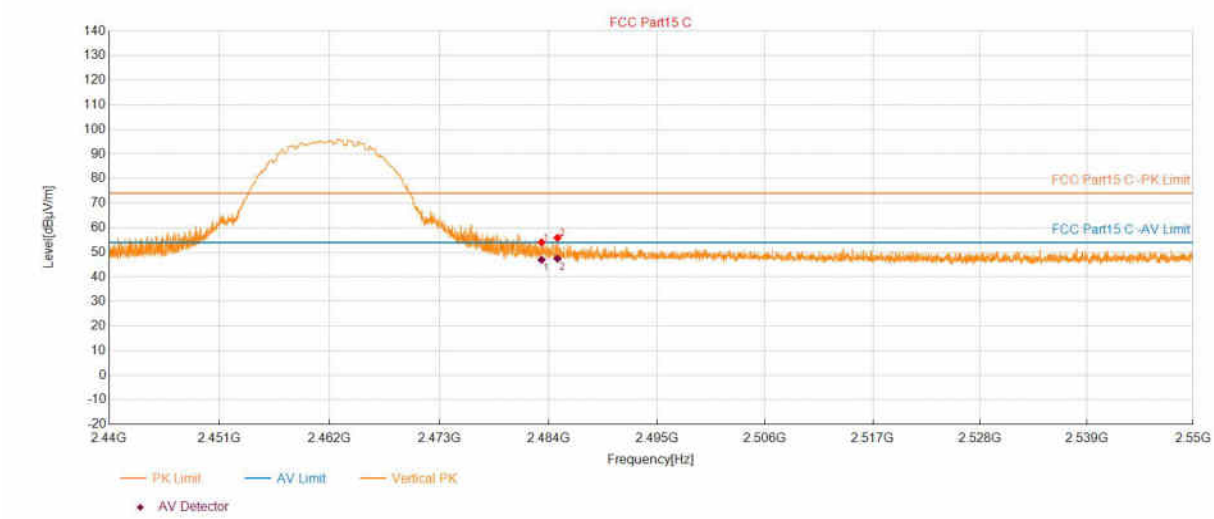
PK Final Data List								
NO.	Frequency (MHz)	Factor (dB/m)	AV Value (dBμV/m)	AV Limit (dBμV/m)	AV Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2485.1957	3.99	36.77	54.00	17.23	137.5	100	Horizontal

Test Report

Project Information			
Customer:			
EUT:	Portl UltraGym 70		
Model:	PUG-70	SN:	
Mode:	11B_2462	Voltage:	AC220V/60Hz
Environment:	Temp: 25℃; Humi:60%	Engineer:	Soho Liu
Remark:	Power Set:40		
Test Standard: FCC Part15 C			

Start of Test:2024-08-20 15:17:33

Test Graph



Suspected Data List							
NO.	Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2483.30	54.06	74.00	19.94	100	43	Vertical
2	2484.91	55.88	74.00	18.12	100	52	Vertical

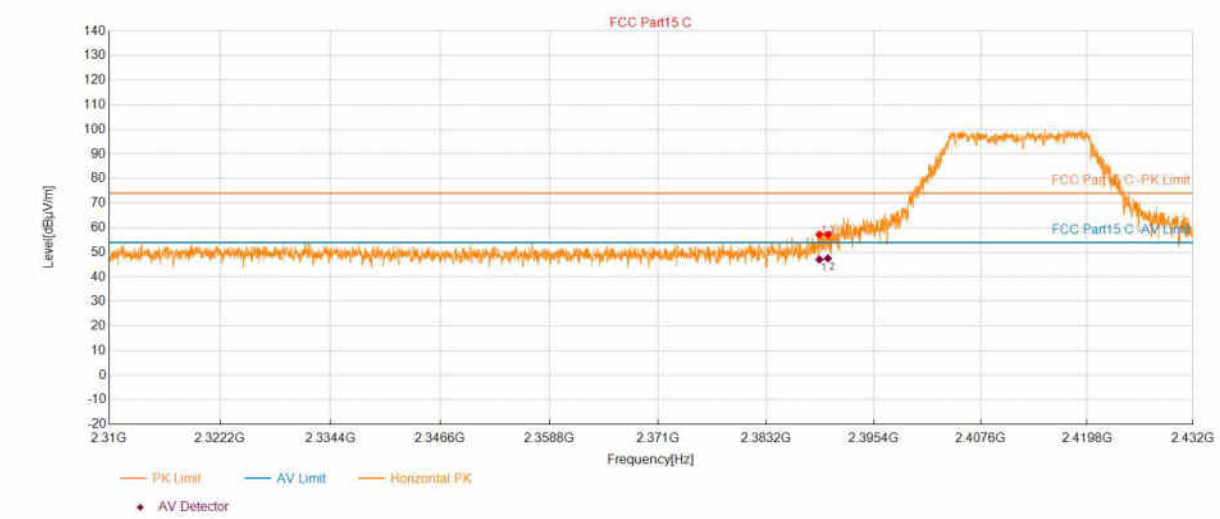
PK Final Data List								
NO.	Frequency (MHz)	Factor (dB/m)	AV Value (dBµV/m)	AV Limit (dBµV/m)	AV Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2483.3047	3.98	46.99	54.00	7.01	100	43	Vertical
2	2484.9110	3.99	47.41	54.00	6.59	100	52	Vertical

Test Report

Project Information			
Customer:			
EUT:	Portl UltraGym 70		
Model:	PUG-70	SN:	
Mode:	11G_2412	Voltage:	AC220V/60Hz
Environment:	Temp: 25℃; Humi:60%	Engineer:	Soho Liu
Remark:	Power Set:30		
Test Standard: FCC Part15 C			

Start of Test:2024-08-20 15:43:42

Test Graph



Suspected Data List							
NO.	Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2389.24	57.23	74.00	16.77	100	106	Horizontal
2	2390.19	57.25	74.00	16.75	100	106	Horizontal

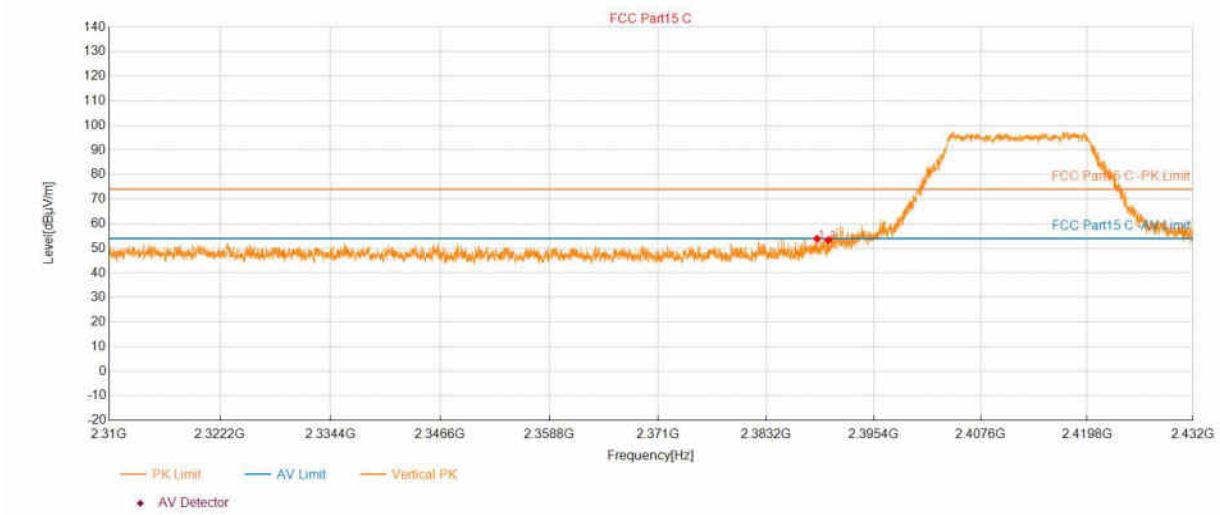
PK Final Data List								
NO.	Frequency (MHz)	Factor (dB/m)	AV Value (dBµV/m)	AV Limit (dBµV/m)	AV Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2389.2426	3.51	47.07	54.00	6.93	100	106	Horizontal
2	2390.1944	3.51	47.53	54.00	6.47	100	106	Horizontal

Test Report

Project Information			
Customer:			
EUT:	Portl UltraGym 70		
Model:	PUG-70	SN:	
Mode:	11G_2412	Voltage:	AC220V/60Hz
Environment:	Temp: 25℃; Humi:60%	Engineer:	Soho Liu
Remark:	Power Set:30		
Test Standard: FCC Part15 C			

Start of Test:2024-08-20 15:44:29

Test Graph



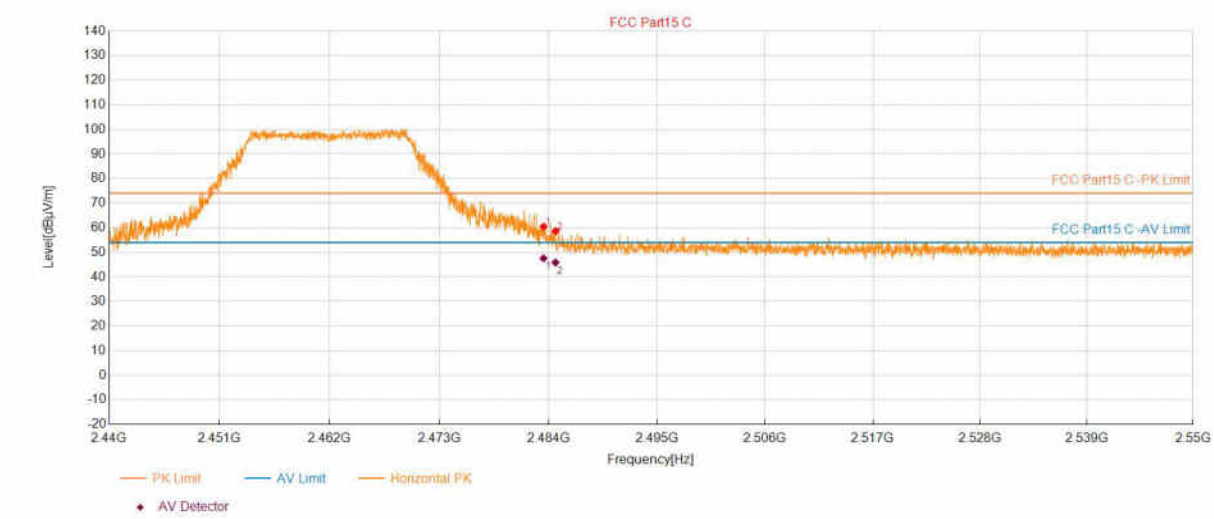
Suspected Data List							
NO.	Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2388.97	53.89	74.00	20.11	100	43	Vertical
2	2390.22	53.28	74.00	20.72	100	121	Vertical

Test Report

Project Information			
Customer:			
EUT:	Portl UltraGym 70		
Model:	PUG-70	SN:	
Mode:	11G_2462	Voltage:	AC220V/60Hz
Environment:	Temp: 25℃; Humi:60%	Engineer:	Soho Liu
Remark:	Power Set:30		
Test Standard: FCC Part15 C			

Start of Test:2024-08-20 15:49:00

Test Graph



Suspected Data List							
NO.	Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2483.50	60.43	74.00	13.57	100	95	Horizontal
2	2484.71	58.60	74.00	15.40	100	95	Horizontal

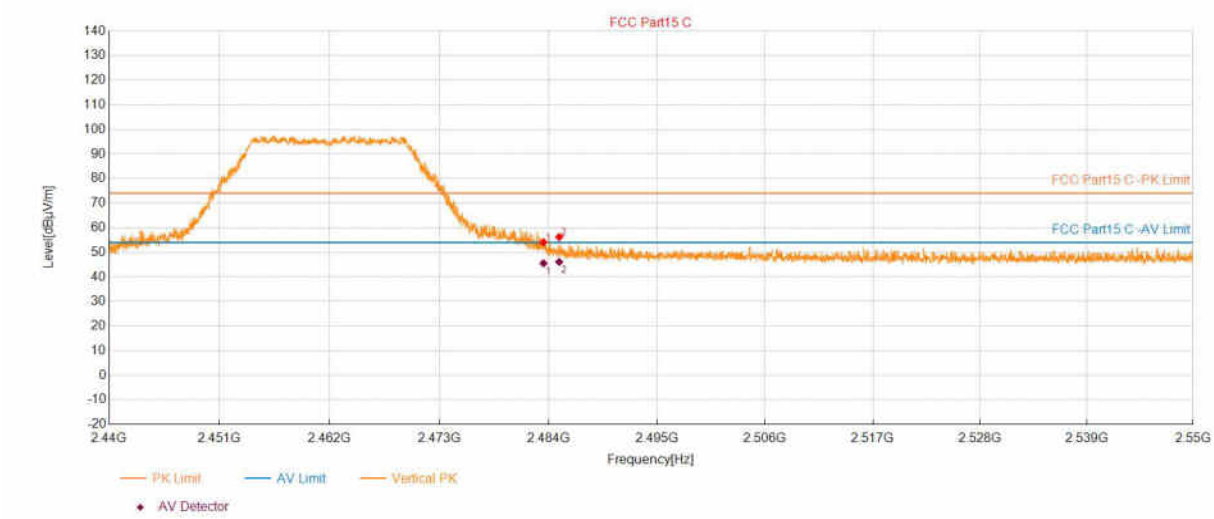
PK Final Data List								
NO.	Frequency (MHz)	Factor (dB/m)	AV Value (dBμV/m)	AV Limit (dBμV/m)	AV Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2483.5016	3.98	47.56	54.00	6.44	138.4	106	Horizontal
2	2484.7129	3.99	45.88	54.00	8.12	100	95	Horizontal

Test Report

Project Information			
Customer:			
EUT:	Portl UltraGym 70		
Model:	PUG-70	SN:	
Mode:	11G_2462	Voltage:	AC220V/60Hz
Environment:	Temp: 25℃; Humi:60%	Engineer:	Soho Liu
Remark:	Power Set:30		
Test Standard: FCC Part15 C			

Start of Test:2024-08-20 15:49:46

Test Graph



Suspected Data List							
NO.	Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2483.50	54.07	74.00	19.93	100	51	Vertical
2	2485.09	56.23	74.00	17.77	100	51	Vertical

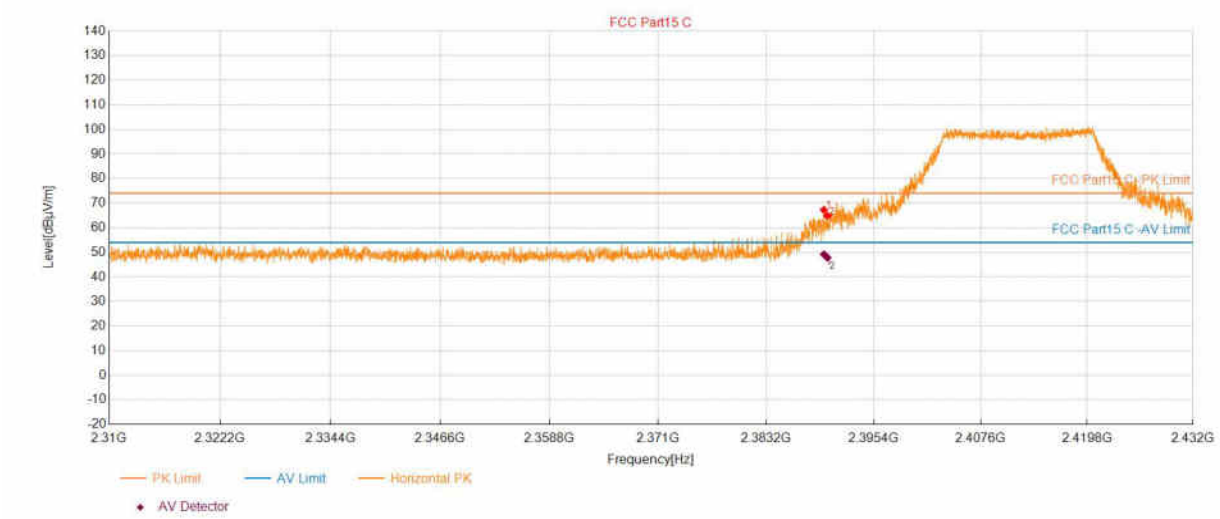
PK Final Data List								
NO.	Frequency (MHz)	Factor (dB/m)	AV Value (dBμV/m)	AV Limit (dBμV/m)	AV Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2483.5027	3.98	45.54	54.00	8.46	100	51	Vertical
2	2485.0870	3.99	46.11	54.00	7.89	100	51	Vertical

Test Report

Project Information			
Customer:			
EUT:	Portl UltraGym 70		
Model:	PUG-70	SN:	
Mode:	11N20_2412	Voltage:	AC220V/60Hz
Environment:	Temp: 25℃; Humi:60%	Engineer:	Soho Liu
Remark:	Power Set:20		
Test Standard: FCC Part15 C			

Start of Test:2024-08-20 16:06:16

Test Graph



Suspected Data List							
NO.	Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2389.76	67.25	74.00	6.75	100	96	Horizontal
2	2390.15	64.85	74.00	9.15	100	113	Horizontal

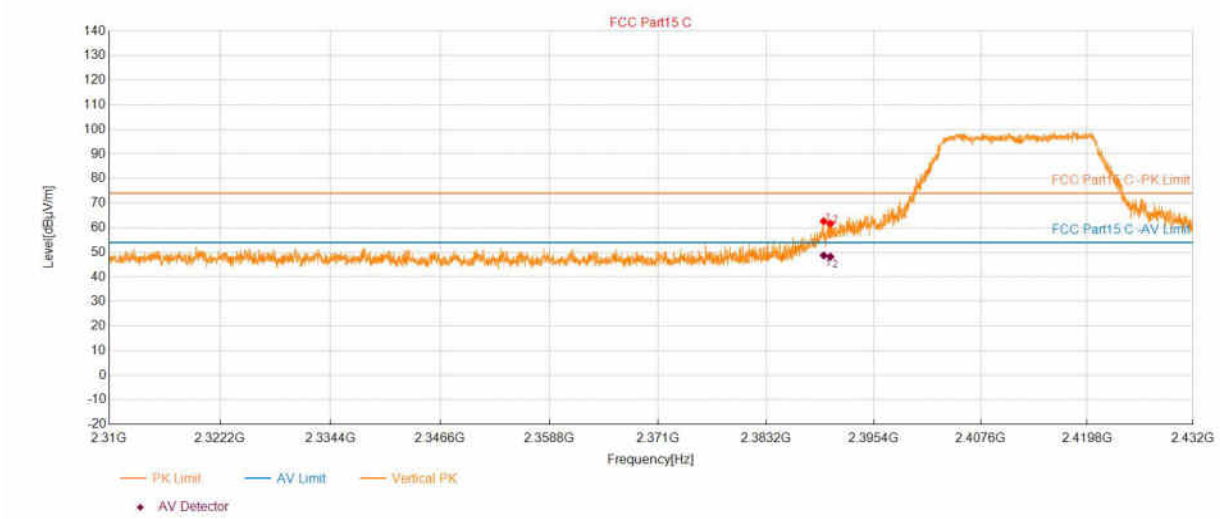
PK Final Data List								
NO.	Frequency (MHz)	Factor (dB/m)	AV Value (dBµV/m)	AV Limit (dBµV/m)	AV Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2389.7552	3.51	49.18	54.00	4.82	100	96	Horizontal
2	2390.1456	3.51	47.83	54.00	6.17	100	113	Horizontal

Test Report

Project Information			
Customer:			
EUT:	Portl UltraGym 70		
Model:	PUG-70	SN:	
Mode:	11N20_2412	Voltage:	AC220V/60Hz
Environment:	Temp: 25℃; Humi:60%	Engineer:	Soho Liu
Remark:	Power Set:20		
Test Standard: FCC Part15 C			

Start of Test:2024-08-20 16:07:02

Test Graph



Suspected Data List							
NO.	Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2389.73	62.63	74.00	11.37	100	43	Vertical
2	2390.49	61.63	74.00	12.37	100	43	Vertical

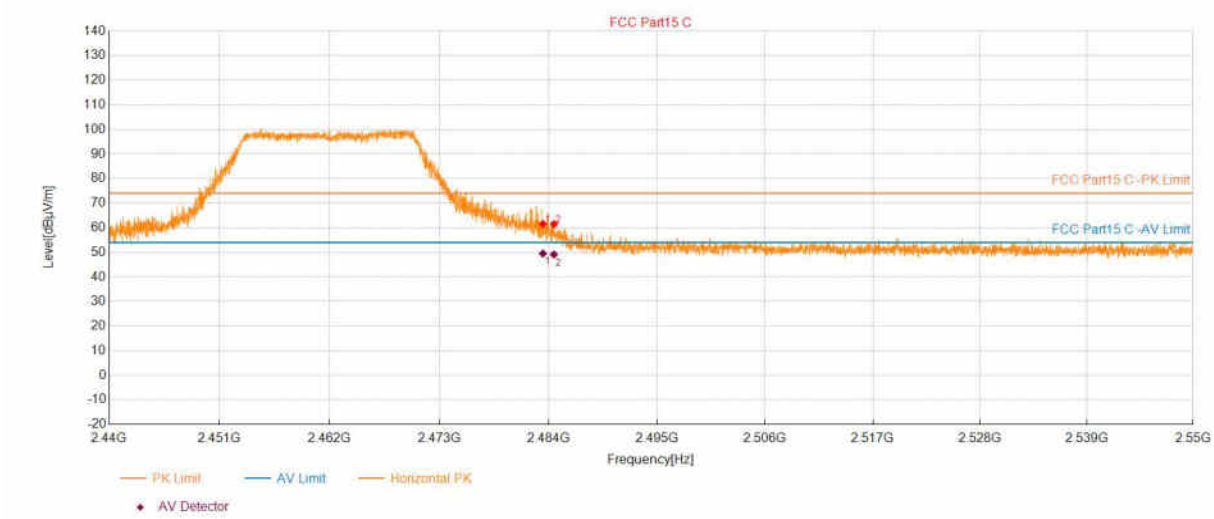
PK Final Data List								
NO.	Frequency (MHz)	Factor (dB/m)	AV Value (dBµV/m)	AV Limit (dBµV/m)	AV Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2389.7307	3.51	48.74	54.00	5.26	100	43	Vertical
2	2390.4873	3.52	48.19	54.00	5.81	100	43	Vertical

Test Report

Project Information			
Customer:			
EUT:	Portl UltraGym 70		
Model:	PUG-70	SN:	
Mode:	11N20_2462	Voltage:	AC220V/60Hz
Environment:	Temp: 25℃; Humi:60%	Engineer:	Soho Liu
Remark:	Power Set:20		
Test Standard: FCC Part15 C			

Start of Test:2024-08-20 16:18:53

Test Graph



Suspected Data List							
NO.	Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2483.44	61.54	74.00	12.46	100	95	Horizontal
2	2484.56	61.45	74.00	12.55	100	102	Horizontal

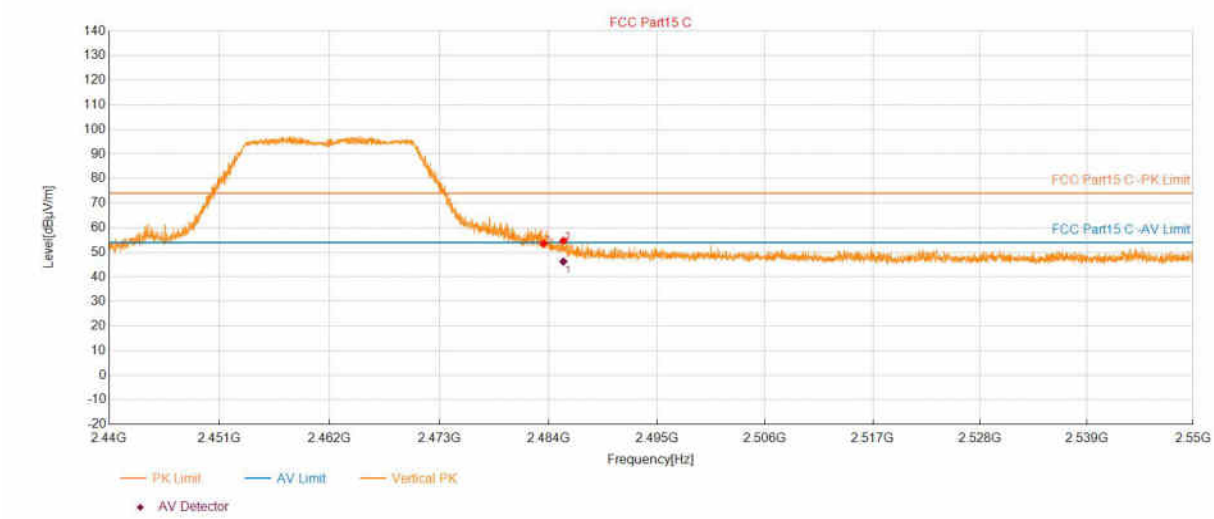
PK Final Data List								
NO.	Frequency (MHz)	Factor (dB/m)	AV Value (dBμV/m)	AV Limit (dBμV/m)	AV Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2483.4367	3.98	49.50	54.00	4.50	100	95	Horizontal
2	2484.5589	3.99	49.12	54.00	4.88	100	102	Horizontal

Test Report

Project Information			
Customer:			
EUT:	Portl UltraGym 70		
Model:	PUG-70	SN:	
Mode:	11N20_2462	Voltage:	AC220V/60Hz
Environment:	Temp: 25℃; Humi:60%	Engineer:	Soho Liu
Remark:	Power Set:30		
Test Standard: FCC Part15 C			

Start of Test:2024-08-20 16:19:39

Test Graph



Suspected Data List							
NO.	Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2483.50	53.53	74.00	20.47	100	112	Vertical
2	2485.51	54.70	74.00	19.30	100	50	Vertical

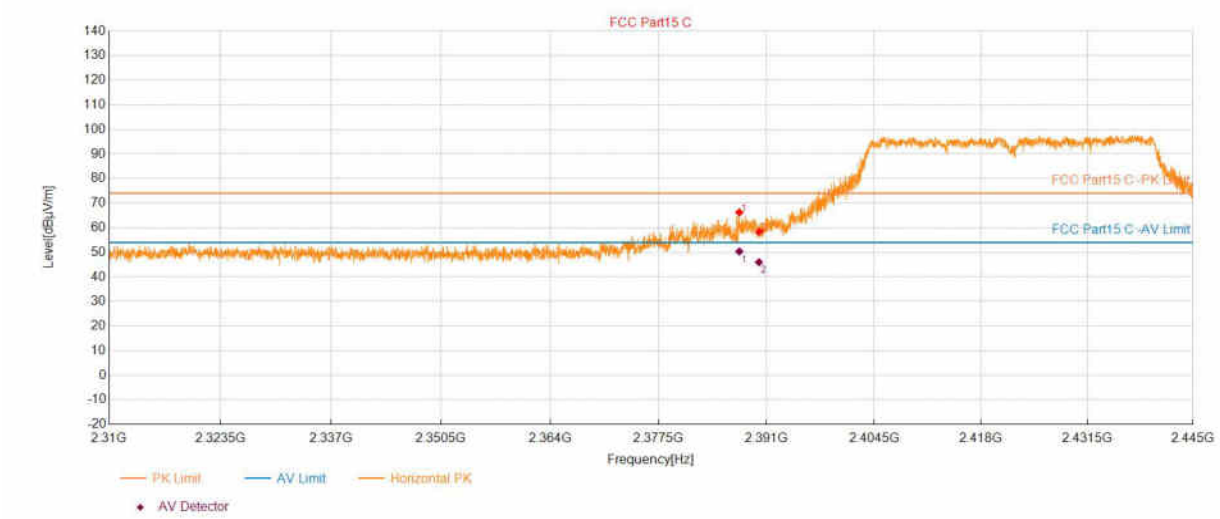
PK Final Data List								
NO.	Frequency (MHz)	Factor (dB/m)	AV Value (dBμV/m)	AV Limit (dBμV/m)	AV Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2485.5051	3.99	46.22	54.00	7.78	100	50	Vertical

Test Report

Project Information			
Customer:			
EUT:	Portl UltraGym 70		
Model:	PUG-70	SN:	
Mode:	11N40_2422	Voltage:	AC220V/60Hz
Environment:	Temp: 25℃; Humi:60%	Engineer:	Soho Liu
Remark:	Power Set:30		
Test Standard: FCC Part15 C			

Start of Test:2024-08-20 16:31:06

Test Graph



Suspected Data List							
NO.	Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2387.56	66.23	74.00	7.77	100	102	Horizontal
2	2390.02	58.28	74.00	15.72	100	112	Horizontal

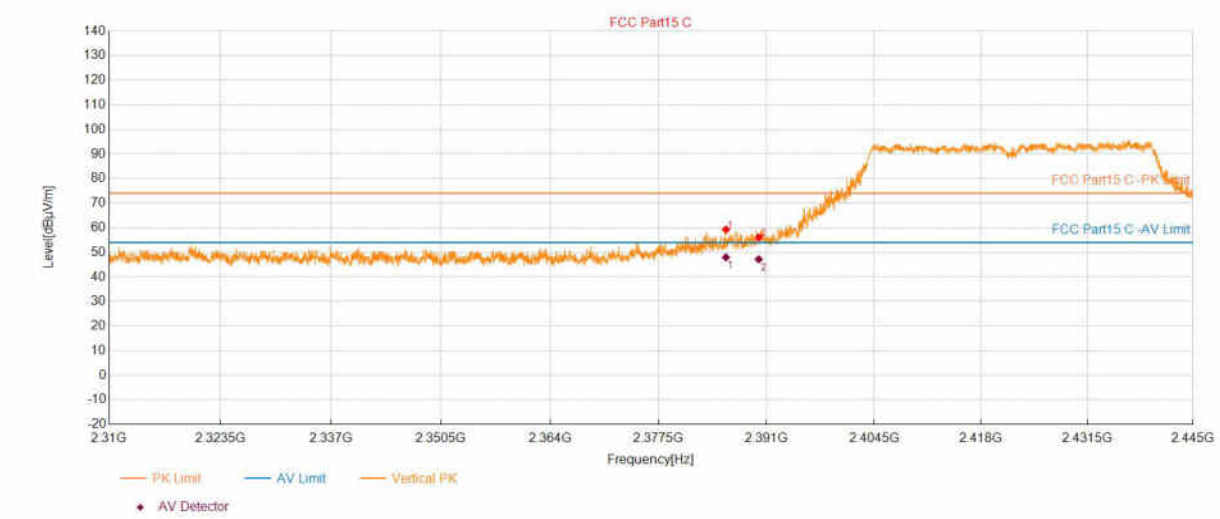
PK Final Data List								
NO.	Frequency (MHz)	Factor (dB/m)	AV Value (dBµV/m)	AV Limit (dBµV/m)	AV Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2387.5595	3.51	50.32	54.00	3.68	100	102	Horizontal
2	2390.0170	3.51	45.99	54.00	8.01	100	112	Horizontal

Test Report

Project Information			
Customer:			
EUT:	Portl UltraGym 70		
Model:	PUG-70	SN:	
Mode:	11N40_2422	Voltage:	AC220V/60Hz
Environment:	Temp: 25℃; Humi:60%	Engineer:	Soho Liu
Remark:	Power Set:30		
Test Standard: FCC Part15 C			

Start of Test:2024-08-20 16:31:52

Test Graph



Suspected Data List							
NO.	Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2385.89	59.28	74.00	14.72	100	43	Vertical
2	2389.99	56.02	74.00	17.98	100	43	Vertical

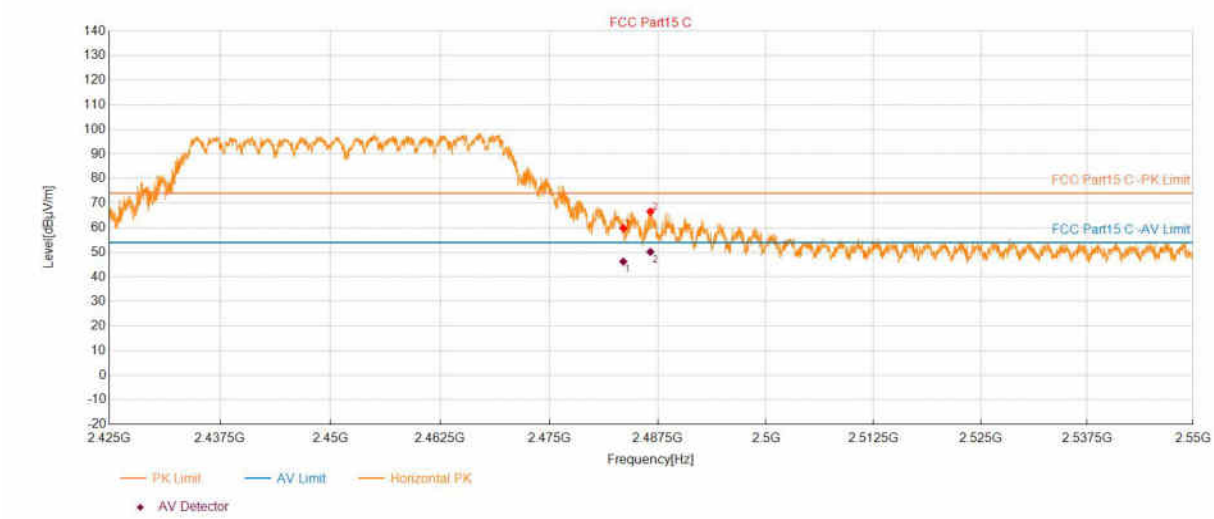
PK Final Data List								
NO.	Frequency (MHz)	Factor (dB/m)	AV Value (dBµV/m)	AV Limit (dBµV/m)	AV Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2385.8852	3.50	47.96	54.00	6.04	100	43	Vertical
2	2389.9900	3.51	47.18	54.00	6.82	100	43	Vertical

Test Report

Project Information			
Customer:			
EUT:	Portl UltraGym 70		
Model:	PUG-70	SN:	
Mode:	11N40_2452	Voltage:	AC220V/60Hz
Environment:	Temp: 25℃; Humi:60%	Engineer:	Soho Liu
Remark:	Power Set:35		
Test Standard: FCC Part15 C			

Start of Test:2024-08-20 16:37:24

Test Graph



Suspected Data List							
NO.	Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2483.51	59.83	74.00	14.17	100	88	Horizontal
2	2486.64	66.58	74.00	7.42	100	97	Horizontal

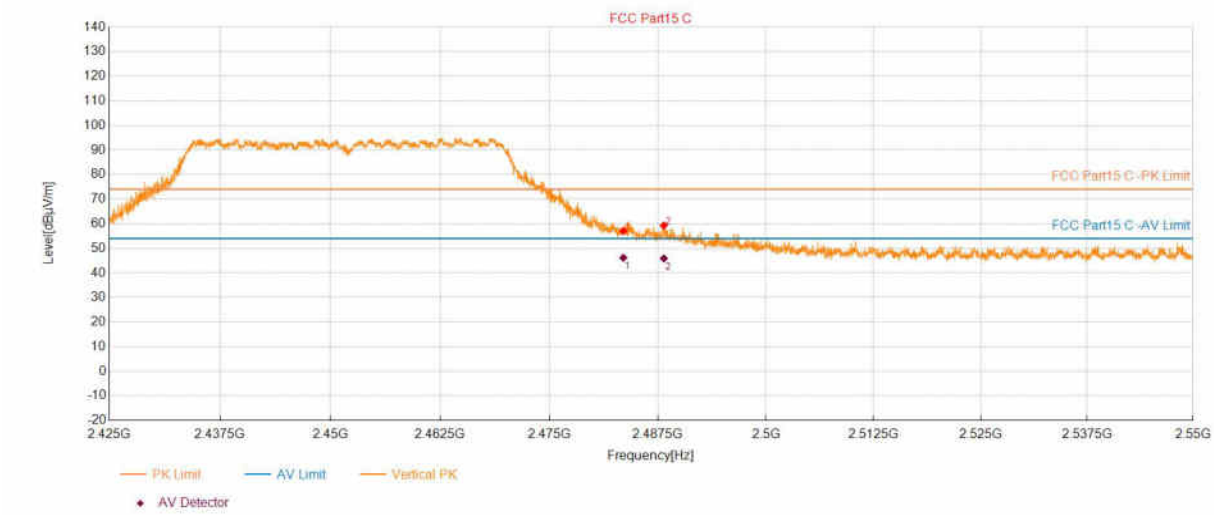
PK Final Data List								
NO.	Frequency (MHz)	Factor (dB/m)	AV Value (dBμV/m)	AV Limit (dBμV/m)	AV Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2483.5117	3.98	46.24	54.00	7.76	100	88	Horizontal
2	2486.6373	4.00	50.20	54.00	3.80	100	97	Horizontal

Test Report

Project Information			
Customer:			
EUT:	Portl UltraGym 70		
Model:	PUG-70	SN:	
Mode:	11N40_2452	Voltage:	AC220V/60Hz
Environment:	Temp: 25℃; Humi:60%	Engineer:	Soho Liu
Remark:	Power Set:35		
Test Standard: FCC Part15 C			

Start of Test:2024-08-20 16:38:10

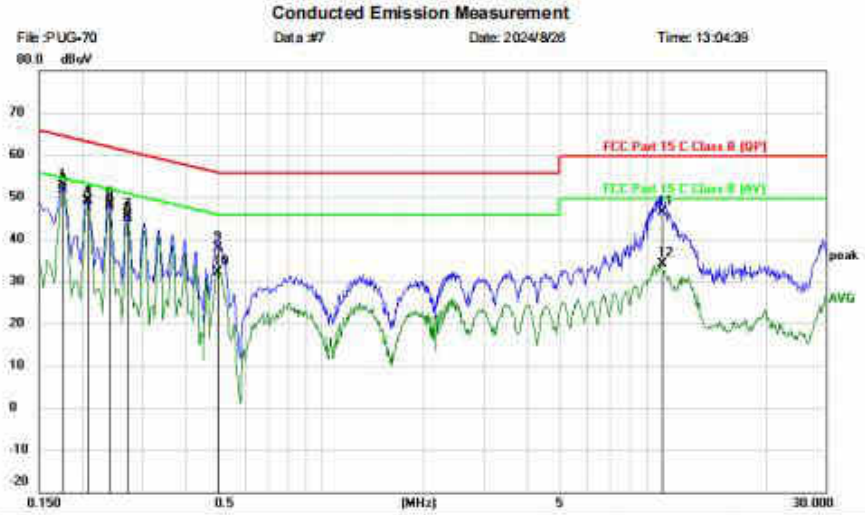
Test Graph



Suspected Data List							
NO.	Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2483.51	57.06	74.00	16.94	100	124	Vertical
2	2488.19	59.28	74.00	14.72	100	51	Vertical

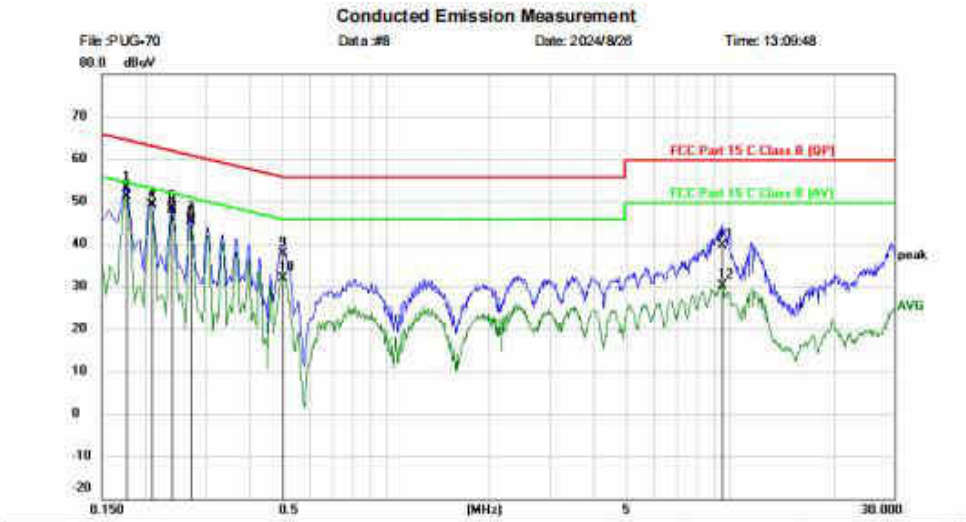
PK Final Data List								
NO.	Frequency (MHz)	Factor (dB/m)	AV Value (dBμV/m)	AV Limit (dBμV/m)	AV Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2483.5117	3.98	46.17	54.00	7.83	100	124	Vertical
2	2488.1876	4.00	45.89	54.00	8.11	100	51	Vertical

APPENDIX C – AC Power Line Conducted Emission Test Data



Site | Phase: N | Temperature: 26
Limit: FCC Part 15 C Class B (QP) | Power: AC 220V/50Hz | Humidity: 60 %
EUT: Portl UltraGym 70
M/N: PUG-70
Mode: WIFI 2.4G
Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1757	42.96	9.65	52.61	64.69	-12.08	QP	
2	*	0.1757	42.02	9.65	51.67	54.69	-3.02	AVG	
3		0.2083	39.61	9.65	49.26	63.27	-14.01	QP	
4		0.2083	39.30	9.65	48.95	53.27	-4.32	AVG	
5		0.2404	38.66	9.66	48.32	62.08	-13.76	QP	
6		0.2404	37.96	9.66	47.62	52.08	-4.46	AVG	
7		0.2720	36.06	9.66	45.72	61.06	-15.34	QP	
8		0.2720	35.33	9.66	44.99	51.06	-6.07	AVG	
9		0.4984	28.19	9.77	37.96	56.03	-18.07	QP	
10		0.4984	22.42	9.77	32.19	46.03	-13.84	AVG	
11		9.9350	36.55	9.95	46.50	60.00	-13.50	QP	
12		9.9350	24.30	9.95	34.25	50.00	-15.75	AVG	



Site

Phase: *L1*

Temperature: 26

Limit: FCC Part 15 C Class B (QP)

Power: AC 220V/50Hz

Humidity: 60 %

EUT: Portl UltraGym 70

M/N: PUG-70

Mode: WIFI 2.4G

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1763	43.37	9.65	53.02	64.66	-11.64	QP	
2	*	0.1763	41.49	9.65	51.14	54.66	-3.52	AVG	
3		0.2085	39.84	9.65	49.49	63.26	-13.77	QP	
4		0.2085	39.51	9.65	49.16	53.26	-4.10	AVG	
5		0.2402	38.87	9.66	48.53	62.09	-13.56	QP	
6		0.2402	38.16	9.66	47.82	52.09	-4.27	AVG	
7		0.2717	36.15	9.66	45.81	61.07	-15.26	QP	
8		0.2717	35.38	9.66	45.04	51.07	-6.03	AVG	
9		0.5008	27.80	9.77	37.57	56.00	-18.43	QP	
10		0.5008	22.07	9.77	31.84	46.00	-14.16	AVG	
11		9.4700	29.69	9.93	39.62	60.00	-20.38	QP	
12		9.4700	20.09	9.93	30.02	50.00	-19.98	AVG	

END OF REPORT