

Project No: TM-2207000162P
Report No.: TMWK2207002820KR

FCC ID: IR5FD10

Page: 1 / 71
Rev.: 00

RADIO TEST REPORT

FCC 47 CFR PART 15 SUBPART E

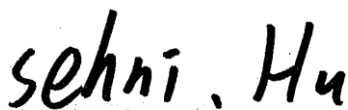
Test Standard	FCC Part 15.407
Product name	HANDHELD COMPUTER
Brand Name	MilDef
Model No.	DF10
Test Result	Pass
Statements of Conformity	Determination of compliance is based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

The test Result was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were given in ANSI C63.10: 2013 and compliance standards.

The test results of this report relate only to the tested sample (EUT) identified in this report.

The test Report of full or partial shall not copy. Without written approval of Compliance Certification Services Inc. (Wugu Laboratory)

Approved by:



Sehni Hu
Supervisor

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明，此報告結果僅對測試之樣品負責，同時此樣品僅保留90天。本報告未經本公司書面許可，不可部份複製。

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com.tw/Terms-and-Conditions> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com.tw/Terms-and-Conditions>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of client's instruction, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced, except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	October 11, 2022	Initial Issue	ALL	Allison Chen

Table of contents

1. GENERAL INFORMATION	4
1.1 EUT INFORMATION	4
1.2 EUT CHANNEL INFORMATION	5
1.3 ANTENNA INFORMATION	6
1.4 MEASUREMENT UNCERTAINTY	6
1.5 FACILITIES AND TEST LOCATION	7
1.6 INSTRUMENT CALIBRATION.....	7
1.7 SUPPORT AND EUT ACCESSORIES EQUIPMENT	9
1.8 TEST METHODOLOGY AND APPLIED STANDARDS	9
2. TEST SUMMARY	10
3. DESCRIPTION OF TEST MODES	11
3.1 THE EUT CHANNEL NUMBER OF OPERATING CONDITION.....	11
3.2 THE WORST MODE OF MEASUREMENT	12
3.3 EUT DUTY CYCLE	13
4. TEST RESULT	14
4.1 AC POWER LINE CONDUCTED EMISSION	14
4.2 26DB BANDWIDTH, 6DB BANDWIDTH AND OCCUPIED BANDWIDTH(99%)	17
4.3 OUTPUT POWER MEASUREMENT.....	26
4.4 POWER SPECTRAL DENSITY	30
4.5 RADIATION BANDEDGE AND SPURIOUS EMISSION	36
APPENDIX-A TEST PHOTO	A-1
APPENDIX 1 - PHOTOGRAPHS OF EUT	

1. GENERAL INFORMATION

1.1 EUT INFORMATION

Applicant	MilDef Crete Inc. 7F, No.250, Sec.3,Pei Shen Rd.,Shen Keng District,New Taipei City, Taiwan
Manufacturer	MilDef Crete Inc. 7F, No.250, Sec.3,Pei Shen Rd.,Shen Keng District,New Taipei City, Taiwan
Equipment	HANDHELD COMPUTER
Model No.	DF10
Model Discrepancy	N/A
Trade Name	MilDef
Received Date	July 13, 2022
Date of Test	August 10~September 5, 2022
Power Operation	1. Power from Adapter. ADAPTER TECH. / COP060A1-P200 I/P: 100-240Vac, 50-60Hz, 1.5MAX O/P: 5.0Vdc, 3.0A, 15.0W or 9.0Vdc, 3.0A, 27.0W or 12.0Vdc, 3.0A, 36.0W or 15.0Vdc, 3.0A, 45.0W or 20.0Vdc, 3.0A, 60.0W 2. Power from Battery. Rating: 3.6VDC, 4040mAh

Remark:

- For more details, please refer to the User's manual of the EUT.
- Disclaimer: Antenna information is provided by the applicant, test results of this report are applicable to the sample EUT received.

1.2 EUT CHANNEL INFORMATION

Frequency Range	UNII-1	
	IEEE 802.11a	5180 ~ 5240 MHz
	IEEE 802.11n HT20	5180 ~ 5240 MHz
	IEEE 802.11n HT40	5190 ~ 5230 MHz
	IEEE 802.11ac VHT20	5180 ~ 5240 MHz
	IEEE 802.11ac VHT40	5190 ~ 5230 MHz
	IEEE 802.11ac VHT80	5210 MHz
Modulation Type	1. IEEE 802.11a mode: OFDM 2. IEEE 802.11n HT20 mode: OFDM 3. IEEE 802.11n HT40 mode: OFDM 4. IEEE 802.11ac VHT20 mode: OFDM 5. IEEE 802.11ac VHT40 mode: OFDM 6. IEEE 802.11ac VHT80 mode: OFDM	

Remark:

Refer as ANSI C63.10: 2013 clause 5.6.1 Table 4 for test channels

Number of frequencies to be tested		
Frequency range in which device operates	Number of frequencies	Location in frequency range of operation
☐ 1 MHz or less	1	Middle
☐ 1 MHz to 10 MHz	2	1 near top and 1 near bottom
☒ More than 10 MHz	3	1 near top, 1 near middle, and 1 near bottom

1.3 ANTENNA INFORMATION

Antenna Specification	☒ PIFA ☐ PCB ☐ Dipole ☐ Chip ☐ Coils
Antenna Gain	Gain: 0.48 dBi
Brand / Model	MilDef Crete Inc. / G980210104

Notes:

1.The antenna(s) of the EUT are permanently attached and there are no provisions for connection to an external antenna. So the EUT complies with the requirements of §15.203.

1.4 MEASUREMENT UNCERTAINTY

PARAMETER	UNCERTAINTY
AC Powerline Conducted Emission	± 2.1183
Channel Bandwidth	± 2.1863
RF output power (Power Meter + Power sensor)	± 1.2688
Power Spectral density	± 2.1855
Conducted Bandedge	± 2.1866
Conducted Spurious Emission	± 2.1859
Radiated Emission_9kHz-30MHz	± 3.814
Radiated Emission_30MHz-200MHz	± 4.272
Radiated Emission_200MHz-1GHz	± 4.619
Radiated Emission_1GHz-6GHz	± 5.522
Radiated Emission_6GHz-18GHz	± 5.228
Radiated Emission_18GHz-26GHz	± 4.089
Radiated Emission_26GHz-40GHz	± 4.019

Remark:

- 1.This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2
2. ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report.

1.5 FACILITIES AND TEST LOCATION

All measurement facilities used to collect the measurement data are located at No.11, Wugong 6th Rd., Wugu Dist., New Taipei City, Taiwan. (R.O.C.)

CAB identifier: TW1309

Test site	Test Engineer	Remark
AC Conduction Room	Tony Chao	-
Radiation	Ray Li, Tony Chao	-
RF Conducted	David Li	-

Remark: The lab has been recognized as the FCC accredited lab. under the KDB 974614 D01 and is listed in the FCC public Access Link (PAL) database, FCC Registration No. :444940, the FCC Designation No.:TW1309

1.6 INSTRUMENT CALIBRATION

AC-line Conduction Test Room					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
CABLE	EMCI	CFD300-NL	CERF	06/27/2022	06/26/2023
EMI Test Receiver	R&S	ESCI	100064	06/17/2022	06/16/2023
LISN	SCHAFFNER	NNB 41	03/10013	02/15/2022	02/14/2023
Software	EZ-EMC(CCS-3A1-CE-wugu)				

RF Conducted Test Site					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Coaxial Cable	Woken	WC12	CC003	06/27/2022	06/26/2023
Power Meter	Anritsu	ML2496A	2136002	12/06/2021	12/05/2022
Power Seneor	Anritsu	MA2411B	1911386	08/08/2022	08/07/2023
Power Seneor	Anritsu	MA2411B	1911387	08/08/2022	08/07/2023
EXA Signal Analyzer	KEYSIGHT	N9010B	MY55460167	09/07/2021	09/06/2022
Software	Radio Test Software Ver. 21				

Remark:

- Each piece of equipment is scheduled for calibration once a year.
- N.C.R. = No Calibration Required.

3M 966A Chamber					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Bilog Antenna	Sunol Sciences	JB3	A030105	08/03/2022	08/02/2023
Coaxial Cable	HUBER SUHNER	SUCOFLEX 104PEA	20995	02/23/2022	02/22/2023
Coaxial Cable	EMCI&	EMC105	190914+33953	06/15/2022	06/14/2023
Coaxial Cable	Woken	J-1099	201709090004	12/23/2021	12/22/2022
Digital Thermo-Hygro Meter	WISEWIND	1206	D07	12/28/2021	12/27/2022
High Pass Filters	MICRO TRONICS	HPM13195	003	02/10/2022	02/09/2023
Horn Antenna	ETS LINDGREN	3116	00026370	11/30/2021	11/29/2022
Horn Antenna	MCTD	1209	DRH13M02003	01/25/2022	01/24/2023
K Type Cable	Huber+Suhner	SUCOFLEX 102	29406/2	12/05/2021	12/04/2022
Pre-Amplifier	EMEC	EM330	060609	02/23/2022	02/22/2023
Pre-Amplifier	HP	8449B	3008A00965	12/24/2021	12/23/2022
Pre-Amplifier	MITEQ	AMF-6F-18004000-37-8P	985646	09/08/2021	09/07/2022
PSA Series Spectrum Analyzer	Agilent	E4446A	MY46180323	12/06/2021	12/05/2022
Antenna Tower	CCS	CC-A-1F	N/A	N.C.R	N.C.R
Controller	CCS	CC-C-1F	N/A	N.C.R	N.C.R
Turn Table	CCS	CC-T-1F	N/A	N.C.R	N.C.R
Software	e3 210616				

Remark:

- Each piece of equipment is scheduled for calibration once a year.
- N.C.R. = No Calibration Required.

1.7 SUPPORT AND EUT ACCESSORIES EQUIPMENT

Support Equipment					
No.	Equipment	Brand	Model	Series No.	FCC ID
	N/A				

Support Equipment					
No.	Equipment	Brand	Model	Series No.	FCC ID
	N/A				

1.8 TEST METHODOLOGY AND APPLIED STANDARDS

The test methodology, setups and results comply with all requirements in accordance with ANSI C63.10:2013, FCC Part 2, FCC Part 15.407, KDB 789033 D02.

2. TEST SUMMARY

FCC Standard Sec.	Chapter	Test Item	Result
15.203	1.3	Antenna Requirement	Pass
15.207	4.1	AC Conducted Emission	Pass
15.403(i)	4.2	26dB Bandwidth	Pass
15.407(e)	4.2	6dB Bandwidth	Pass
2.1049	4.2	Occupied Bandwidth (99%)	Pass
15.407(a)	4.3	Output Power Measurement	Pass
15.407(a)	4.4	Power Spectral Density	Pass
15.407(b)	4.5	Radiation Band Edge	Pass
15.407(b)	4.5	Radiation Spurious Emission	Pass

3. DESCRIPTION OF TEST MODES

3.1 THE EUT CHANNEL NUMBER OF OPERATING CONDITION

Operation mode	1. IEEE 802.11a mode: 6Mbps 2. IEEE 802.11n HT20 mode: MCS0 3. IEEE 802.11n HT40 mode: MCS0 4. IEEE 802.11ac VHT20 mode: MCS0 5. IEEE 802.11ac VHT40 mode: MCS0 6. IEEE 802.11ac VHT80 mode: MCS0																
Operating Frequency	<table><tr><th></th><th>Mode</th><th>Frequency Range (MHz)</th></tr><tr><td rowspan="6">U-NII-1</td><td>IEEE 802.11a</td><td>5180, 5220, 5240</td></tr><tr><td>IEEE 802.11n HT20</td><td>5180, 5220, 5240</td></tr><tr><td>IEEE 802.11n HT40</td><td>5190, 5230</td></tr><tr><td>IEEE 802.11ac VHT20</td><td>5180, 5220, 5240</td></tr><tr><td>IEEE 802.11ac VHT40</td><td>5190, 5230</td></tr><tr><td>IEEE 802.11ac VHT80</td><td>5210</td></tr></table>		Mode	Frequency Range (MHz)	U-NII-1	IEEE 802.11a	5180, 5220, 5240	IEEE 802.11n HT20	5180, 5220, 5240	IEEE 802.11n HT40	5190, 5230	IEEE 802.11ac VHT20	5180, 5220, 5240	IEEE 802.11ac VHT40	5190, 5230	IEEE 802.11ac VHT80	5210
	Mode	Frequency Range (MHz)															
U-NII-1	IEEE 802.11a	5180, 5220, 5240															
	IEEE 802.11n HT20	5180, 5220, 5240															
	IEEE 802.11n HT40	5190, 5230															
	IEEE 802.11ac VHT20	5180, 5220, 5240															
	IEEE 802.11ac VHT40	5190, 5230															
	IEEE 802.11ac VHT80	5210															

Remark:

1. EUT pre-scanned data rate of output power for each mode, the worst data rate were recorded in this report.
2. The system support 802.11a/n ht20/n ht40/ac vht20/40/80, the vht20/vht40 were reduced since the identical parameters with 802.11n ht20 and ht40.

3.2 THE WORST MODE OF MEASUREMENT

AC Power Line Conducted Emission	
Test Condition	AC Power line conducted emission for line and neutral
Power supply Mode	Mode 1: EUT power by Adapter
Worst Mode	☒ Mode 1 ☐ Mode 2 ☐ Mode 3 ☐ Mode 4

Remark:

1. The worst mode was record in this test report.
2. AC power line conducted emission and for below 1G radiation emission were performed the EUT transmit at the highest output power channel as worse case.

Radiated Emission Measurement Above 1G	
Test Condition	Radiated Emission Above 1G
Power supply Mode	Mode 1: EUT power by Adapter
Worst Mode	☒ Mode 1 ☐ Mode 2 ☐ Mode 3 ☐ Mode 4
Worst Position	☐ Placed in fixed position. ☒ Placed in fixed position at X-Plane (E2-Plane) ☐ Placed in fixed position at Y-Plane (E1-Plane) ☐ Placed in fixed position at Z-Plane (H-Plane)

Radiated Emission Measurement Below 1G	
Test Condition	Radiated Emission Below 1G
Power supply Mode	Mode 1: EUT power by Adapter
Worst Mode	☒ Mode 1 ☐ Mode 2 ☐ Mode 3 ☐ Mode 4

Remark:

1. The worst mode was record in this test report.
2. EUT pre-scanned in three axis ,X,Y, Z and two polarity, for radiated measurement. The worst case(X-Plane) were recorded in this report



Report No.: TMWK2207002820KR

Page: 13 / 71
Rev.: 00

3.3 EUT DUTY CYCLE

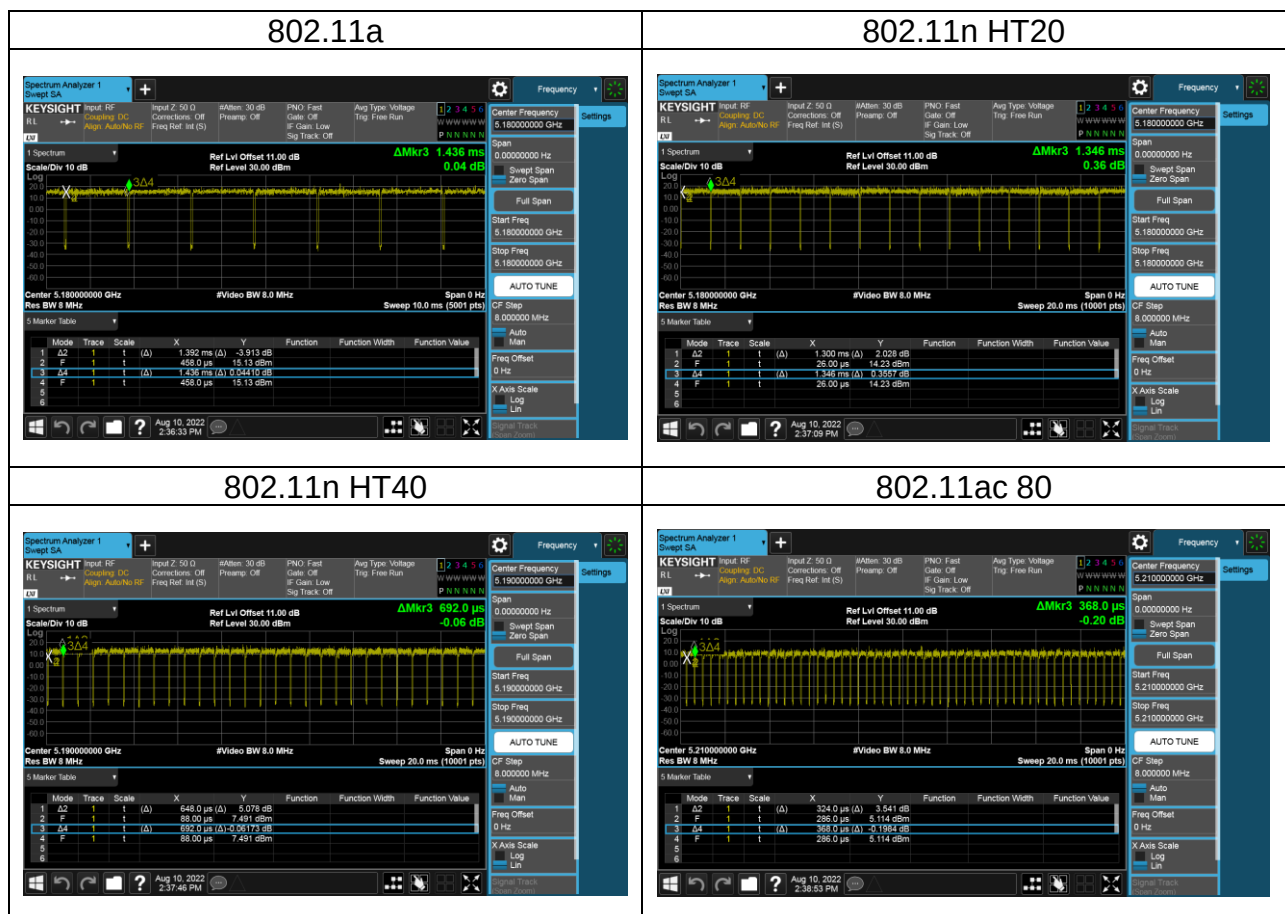
Temperature: 25.6°C

Test date: August 10, 2022

Humidity: 46% RH

Tested by: David Li

Duty Cycle				
Configuration	Duty Cycle (%)	Duty Factor (dB) $=10 \cdot \log(1/\text{Duty Cycle})$	1/T (kHz)	VBW setting (kHz)
802.11a	96.94	0.13	0.72	1.00
802.11n_20	96.58	0.15	0.77	1.00
802.11n_40	93.64	0.29	1.54	2.00
802.11ac_80	88.04	0.55	3.09	4.00



4. TEST RESULT

4.1 AC POWER LINE CONDUCTED EMISSION

4.1.1 Test Limit

According to §15.207(a),

Frequency Range (MHz)	Limits(dBμV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56*	56 to 46*
0.50 to 5	56	46
5 to 30	60	50

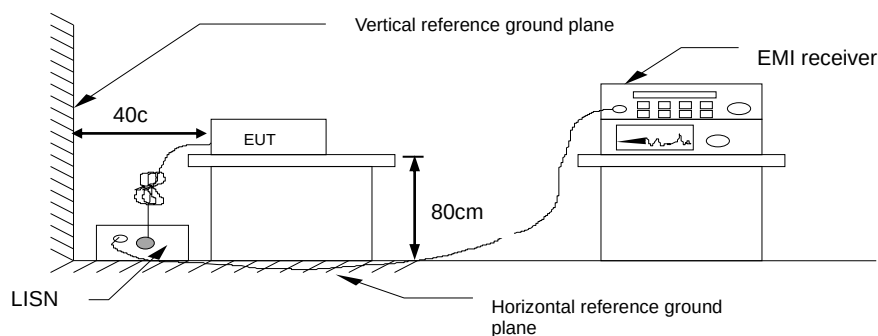
* Decreases with the logarithm of the frequency.

4.1.2 Test Procedure

Test method Refer as ANSI C63.10: 2013 clause 6.2,

1. The EUT was placed on a non-conducted table, which is 0.8m above horizontal ground plane and 0.4m above vertical ground plane.
2. EUT connected to the line impedance stabilization network (LISN)
3. Receiver set RBW of 9kHz and Detector Peak, and note as quasi-peak and average.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. Recorded Line for Neutral and Line.

4.1.3 Test Setup

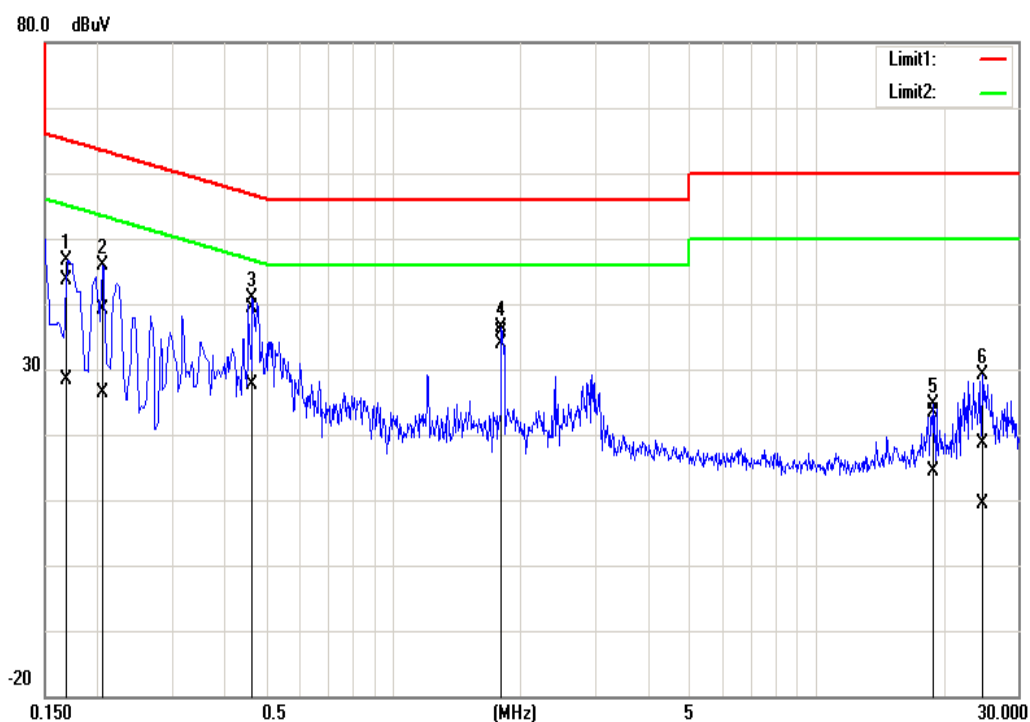


4.1.4 Test Result

Pass.

Test Data

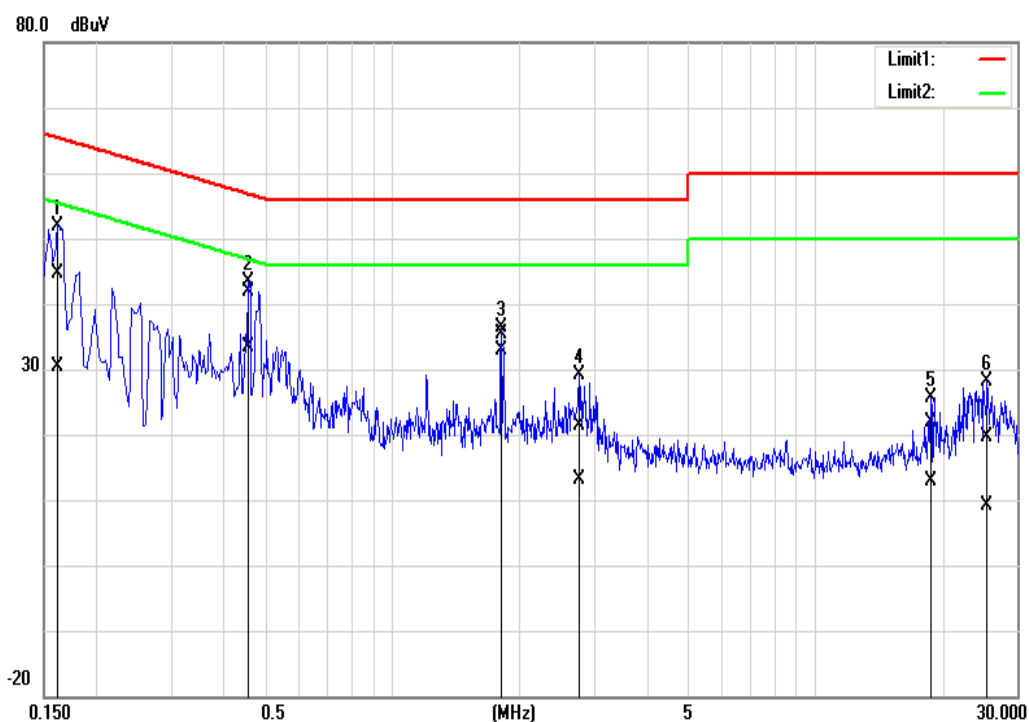
Test Mode:	Mode 1	Temp/Hum	24.9(°C)/ 51%RH
Phase:	Line	Test Date	August 17, 2022
Test Voltage:	120Vac, 60Hz	Test Engineer	Tony Chao



Frequency (MHz)	Quasi Peak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	Quasi Peak result (dBuV)	Average result (dBuV)	Quasi Peak limit (dBuV)	Average limit (dBuV)	Quasi Peak margin (dB)	Average margin (dB)	Remark
0.1700	33.58	18.27	10.17	43.75	28.44	64.96	54.96	-21.21	-26.52	Pass
0.2060	29.01	16.16	10.18	39.19	26.34	63.37	53.37	-24.18	-27.03	Pass
0.4660	29.30	17.39	10.19	39.49	27.58	56.58	46.58	-17.09	-19.00	Pass
1.8060	25.36	23.67	10.25	35.61	33.92	56.00	46.00	-20.39	-12.08	Pass
18.9740	13.03	3.99	10.37	23.40	14.36	60.00	50.00	-36.60	-35.64	Pass
24.6980	8.40	-0.73	10.23	18.63	9.50	60.00	50.00	-41.37	-40.50	Pass

Note: Correction factor = LISN loss + Cable loss.

Test Mode:	Mode 1	Temp/Hum	24.9(°C)/ 51%RH
Phase:	Neutral	Test Date	August 17, 2022
Test Voltage:	120Vac, 60Hz	Test Engineer	Tony Chao



Frequency (MHz)	Quasi Peak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	Quasi Peak result (dBuV)	Average result (dBuV)	Quasi Peak limit (dBuV)	Average limit (dBuV)	Quasi Peak margin (dB)	Average margin (dB)	Remark
0.1640	34.49	20.26	10.17	44.66	30.43	65.25	55.26	-20.59	-24.83	Pass
0.4580	31.73	23.18	10.18	41.91	33.36	56.73	46.73	-14.82	-13.37	Pass
1.8100	25.20	22.75	10.23	35.43	32.98	56.00	46.00	-20.57	-13.02	Pass
2.7660	11.19	2.89	10.26	21.45	13.15	56.00	46.00	-34.55	-32.85	Pass
18.8100	11.52	2.38	10.40	21.92	12.78	60.00	50.00	-38.08	-37.22	Pass
25.5700	9.04	-1.44	10.51	19.55	9.07	60.00	50.00	-40.45	-40.93	Pass

Note: Correction factor = LISN loss + Cable loss.

4.2 26dB BANDWIDTH, 6dB BANDWIDTH AND OCCUPIED BANDWIDTH(99%)

4.2.1 Test Limit

26 dB Bandwidth : For reporting purposes only.

Occupied Bandwidth(99%) : For reporting purposes only.

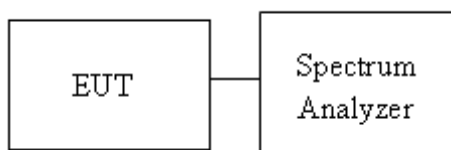
4.2.2 Test Procedure

26dB

1. This measurement setting are specified in section D of KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
2. Set RBW: approximately 1% of the emission bandwidth.
3. Set the VBW>RBW.
4. Detector = Peak.
5. Trace mode = max hold.
6. Measure the maximum width of the emission that is 26dB down from the peak of the emission. Compare this with the RBW setting of the analyser. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

99%

1. This measurement setting are specified in section D of KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
2. Set center frequency to the nominal EUT channel center frequency.
3. Set span = 1.5 times to 5.0 times the OBW.
4. Set RBW = 1 % to 5% of the OBW.
5. Set VBW $\geq 3 \times \text{RBW}$
6. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
7. Use the 99% power bandwidth function of the instrument (if available).

4.2.3 Test Setup

Report No.: TMWK2207002820KR

4.2.4 Test Result

Temperature: 20~25.6℃ **Test date:** August 10~September 5, 2022
Humidity: 40~58% RH **Tested by:** David Li

UNII-1 5150-5250 MHz

Test mode: IEEE 802.11a mode

Channel	Frequency (MHz)	Chain 0 OBW(99%) (MHz)	Chain 1 OBW(99%) (MHz)	Chain 0 26dB BW (MHz)	Chain 1 26dB BW (MHz)
Low	5180	16.423	-	20.82	-
Mid	5220	16.443	-	19.63	-
High	5240	16.419	-	19.70	-

Test mode: IEEE 802.11n HT20 mode

Channel	Frequency (MHz)	Chain 0 OBW(99%) (MHz)	Chain 1 OBW(99%) (MHz)	Chain 0 26dB BW (MHz)	Chain 1 26dB BW (MHz)
Low	5180	17.574	-	20.03	-
Mid	5220	17.549	-	20.62	-
High	5240	17.527	-	20.33	-

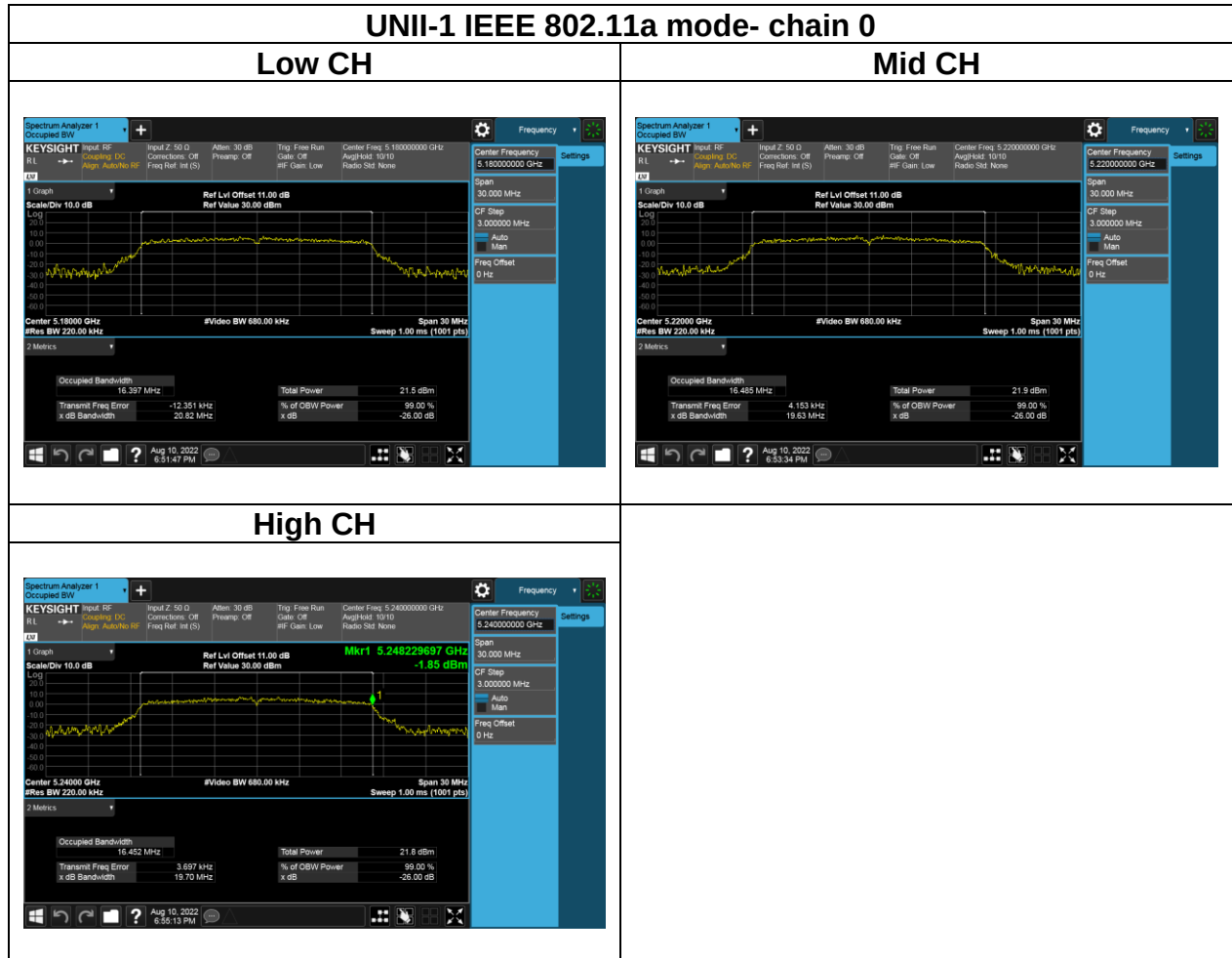
Test mode: IEEE 802.11n HT40 mode

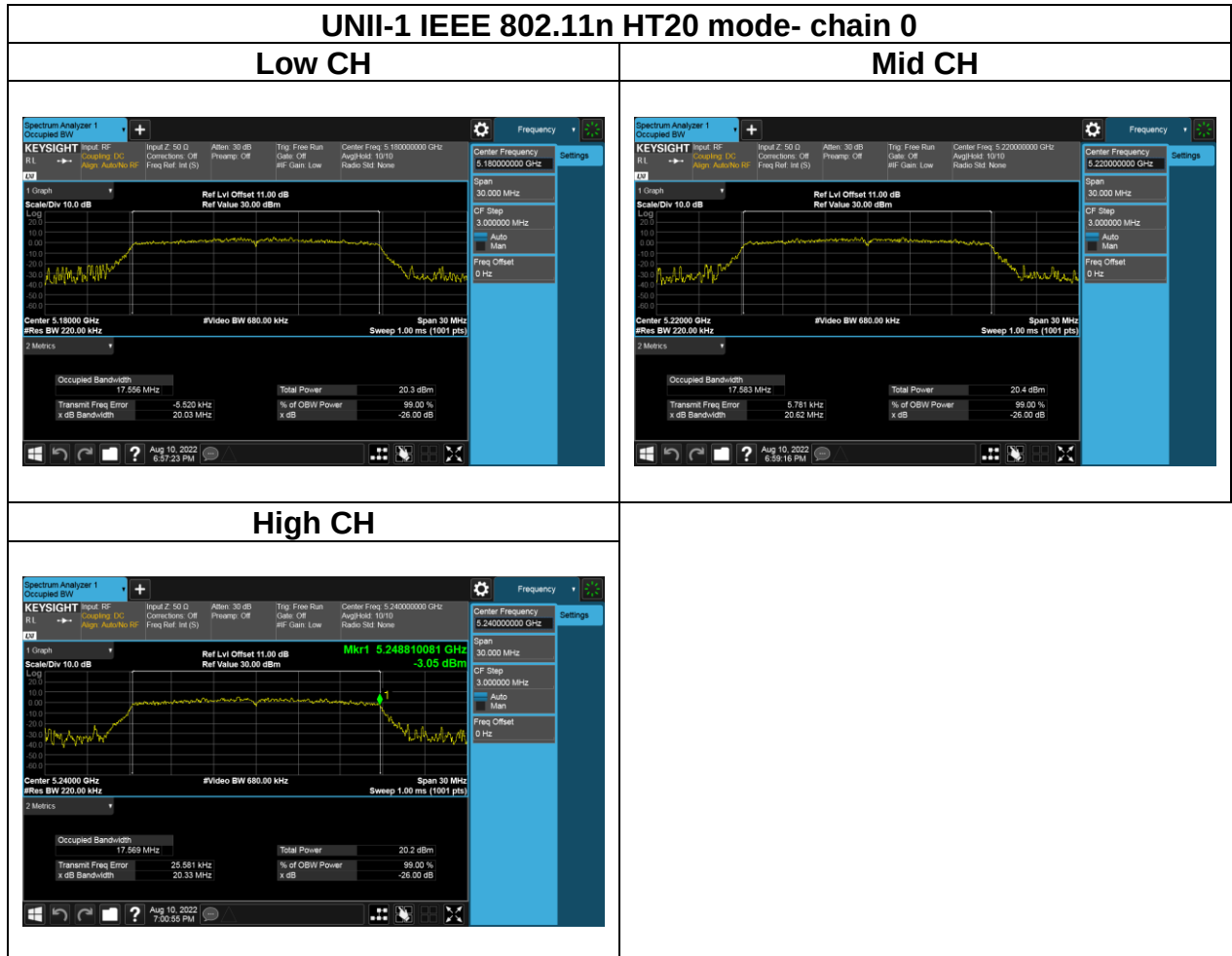
Channel	Frequency (MHz)	Chain 0 OBW(99%) (MHz)	Chain 1 OBW(99%) (MHz)	Chain 0 26dB BW (MHz)	Chain 1 26dB BW (MHz)
Low	5190	35.912	-	40.51	-
High	5230	35.949	-	40.22	-

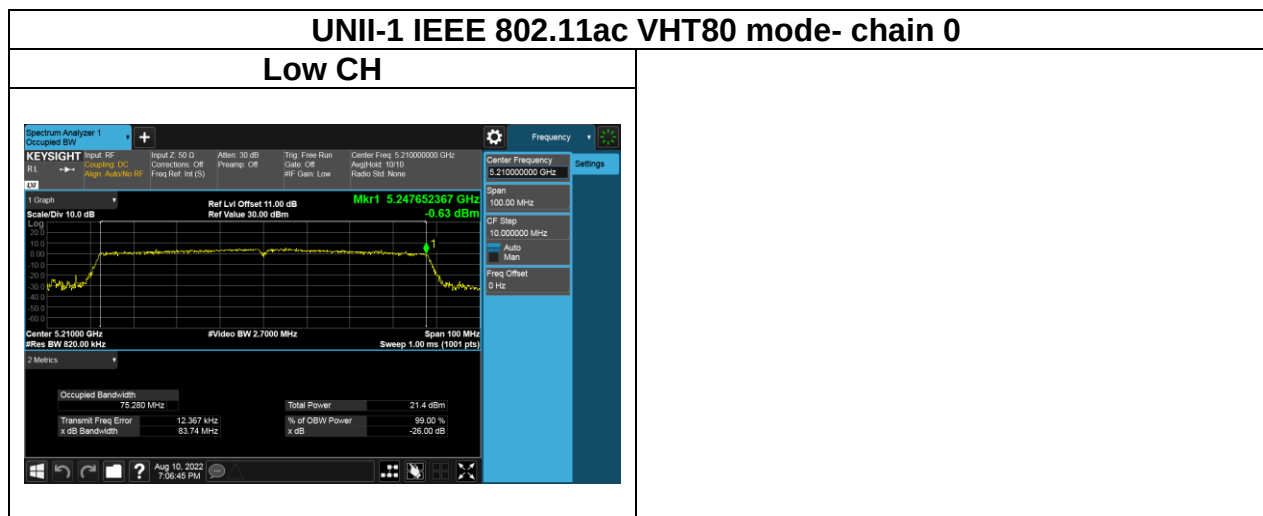
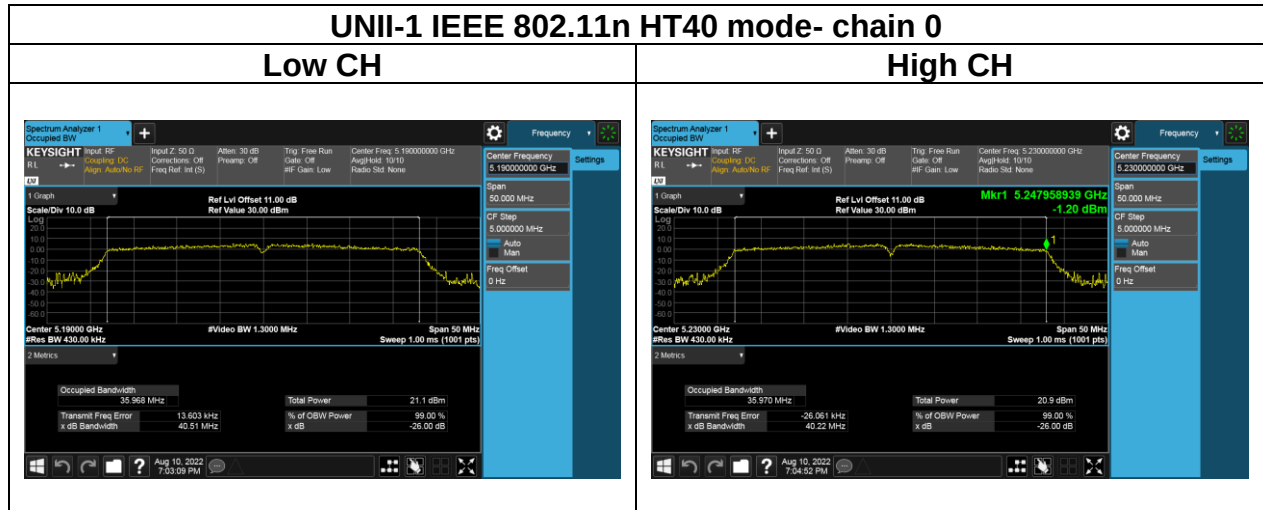
Test mode: IEEE 802.11ac VHT80 mode

Channel	Frequency (MHz)	Chain 0 OBW(99%) (MHz)	Chain 1 OBW(99%) (MHz)	Chain 0 26dB BW (MHz)	Chain 1 26dB BW (MHz)
Low	5210	75.096	-	83.74	-

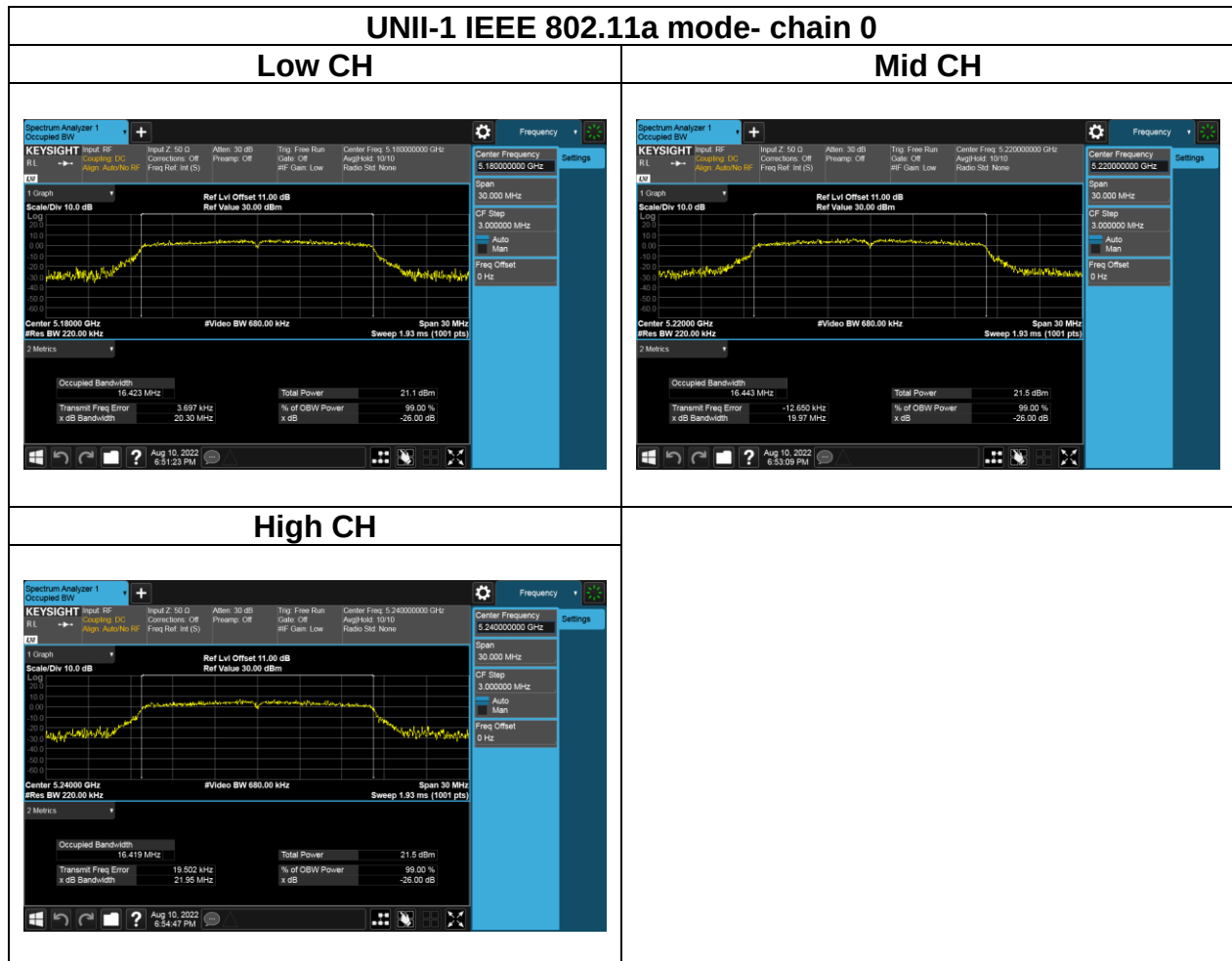
Test Plots (26dB BANDWIDTH)

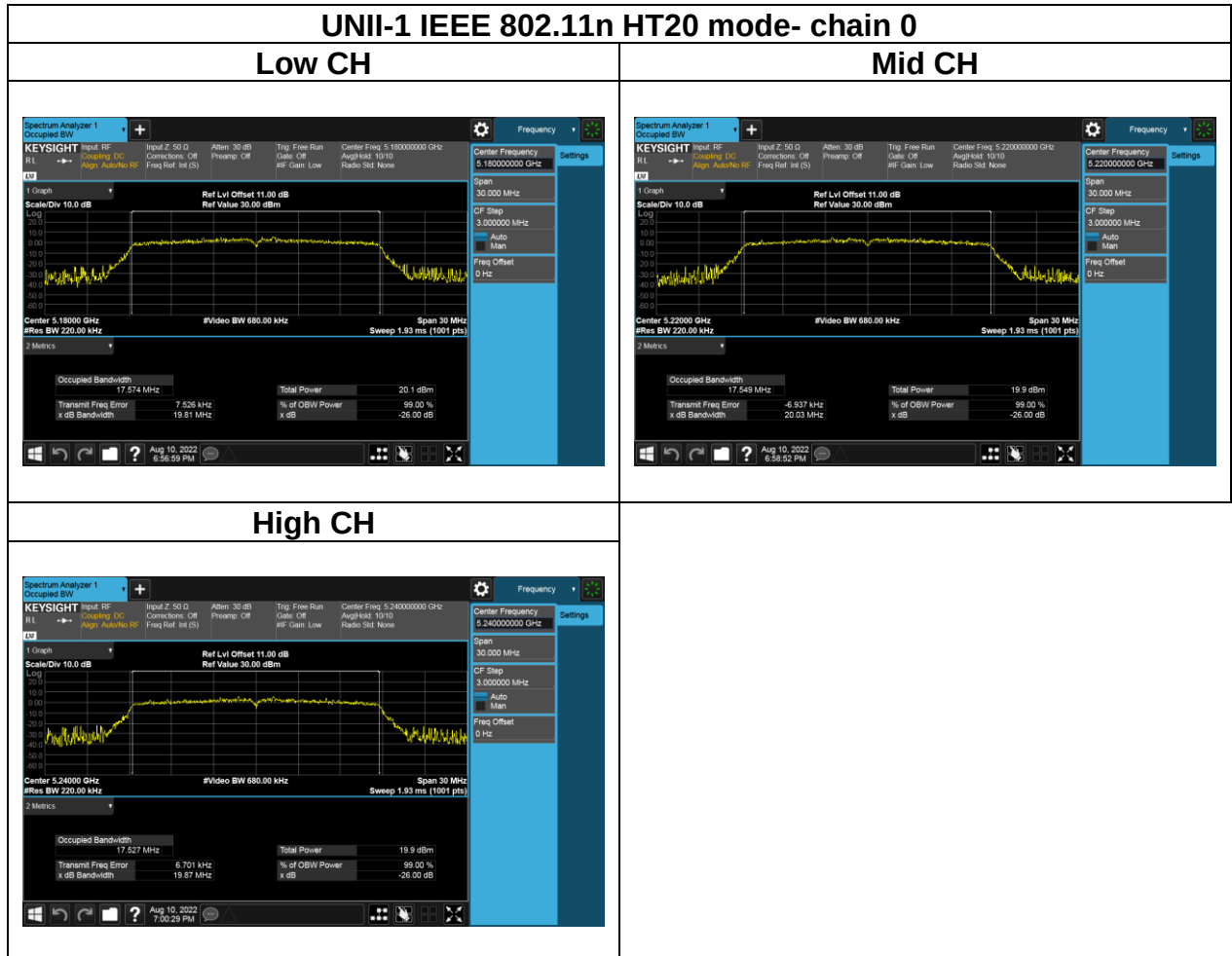


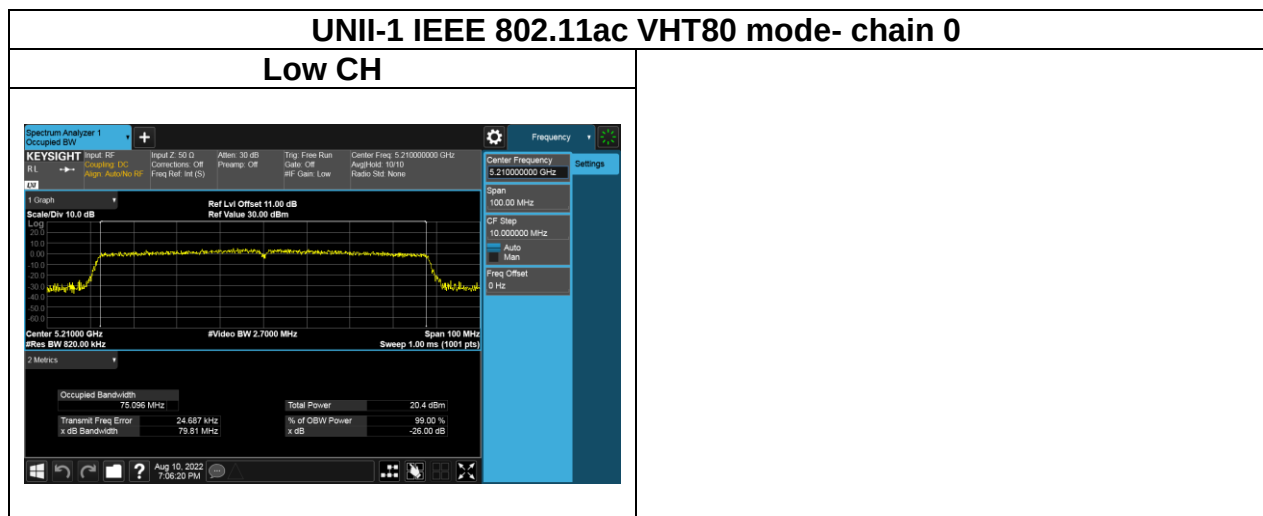
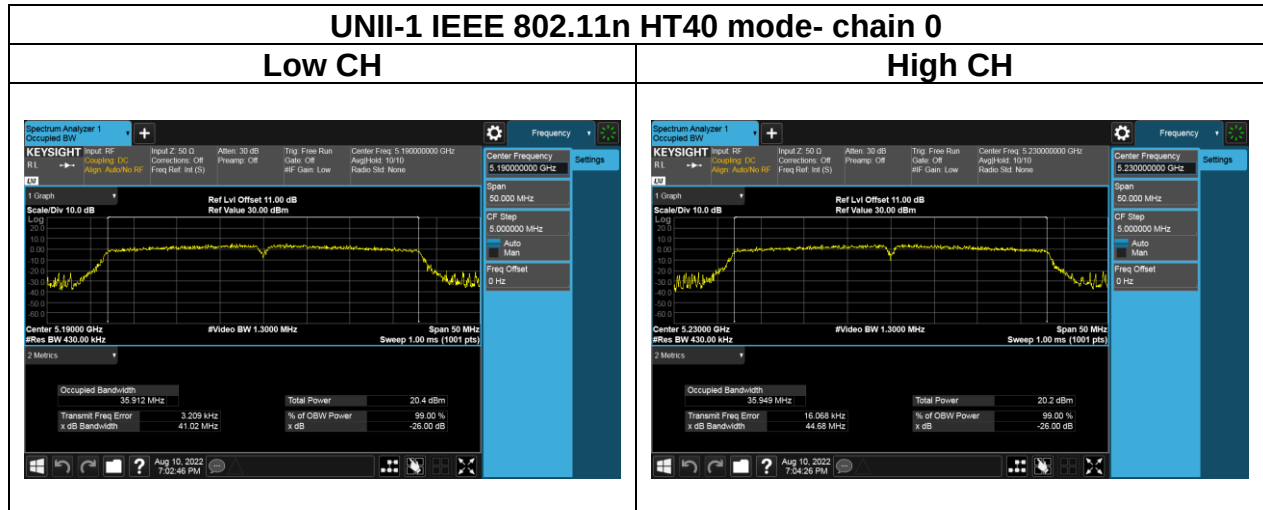




Test Plots (OBW 99%)







4.3 OUTPUT POWER MEASUREMENT

4.3.1 Test Limit

According to §15.407 (a)(1),

UNII-1 :

For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW (24 dBm), whichever power is less. B is the 99% emission bandwidth in megahertz, provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

UNII-1 Limit	☐ Antenna not exceed 6 dBi : 24dBm ☒ Antenna with DG greater than 6 dBi : [Limit = 24 – (DG – 6)]
--------------	--

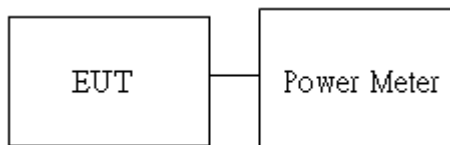
4.3.2 Test Procedure

Test method Refer as KDB 789033 D02, Section E.3.b for BW 20MHz and 40MHz, E.2.b for BW 80MHz.

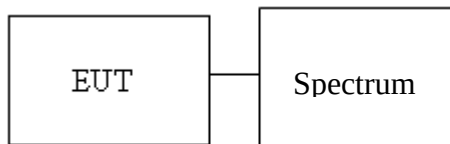
1. The EUT RF output connected to the power meter or spectrum by RF cable.
2. Setting maximum power transmit of EUT.
3. The path loss was compensated to the results for each measurement.
4. Measure and record the result of Average output power contains (Duty factor) in the test report.

4.3.3 Test Setup

For BW 20MHz and 40MHz



For BW 80MHz



4.3.4 Test Result

Temperature: 20~25.6℃ **Test date:** August 10~September 5, 2022
Humidity: 40~58% RH **Tested by:** David Li

FCC Conducted output power :

Test Mode: IEEE 802.11a mode

CH	Frequency (MHz)	Data Rate	Power set	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
36	5180	6	19.5	16.57	45.446	23.98	PASS
44	5220	6	20	16.93	49.374	23.98	PASS
48	5240	6	20	16.91	49.147	23.98	PASS

Test Mode: IEEE 802.11n HT20 mode

CH	Frequency (MHz)	Data Rate	Power set	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
36	5180	MCS0	18.5	15.43	34.923	23.98	PASS
44	5220	MCS0	18.5	15.15	32.743	23.98	PASS
48	5240	MCS0	18.5	15.20	33.122	23.98	PASS

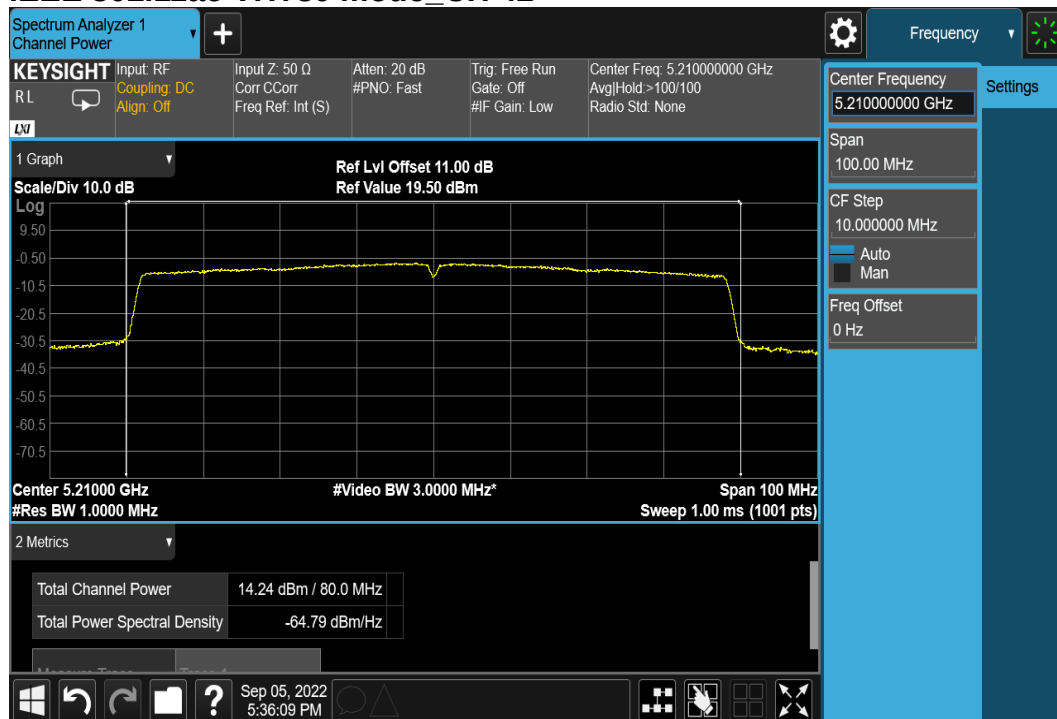
Test Mode: IEEE 802.11n HT40 mode

CH	Frequency (MHz)	Data Rate	Power set	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
38	5190	MCS0	18.5	15.34	34.162	23.98	PASS
46	5230	MCS0	18.5	15.19	33.002	23.98	PASS

Test Mode: IEEE 802.11ac VHT80 mode

CH	Frequency (MHz)	Data Rate	Power set	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
42	5210	MCS0	18	14.79	30.152	23.98	PASS

IEEE 802.11ac VHT80 mode_CH 42



4.4 POWER SPECTRAL DENSITY

4.4.1 Test Limit

According to §15.407 (a)(1),

UNII-1 :

For client devices, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.

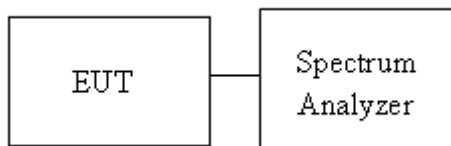
UNII-1 Limit	☒ Antenna not exceed 6 dBi : 11 dBm/MHz ☐ Antenna with DG greater than 6 dBi : [Limit = 11 – (DG – 6) dBm/MHz]
--------------	---

4.4.2 Test Procedure

Test method Refer as KDB 789033 D02

1. The EUT RF output connected to the spectrum analyzer by RF cable.
2. Setting maximum power transmit of EUT
3. UNII-1, SA set RBW = 1MHz, VBW = 3MHz and Detector = RMS, to measurement Power Density.
4. The path loss and Duty Factor were compensated to the results for each measurement by SA.
5. Mark the maximum level.
6. Measure and record the result of power spectral density. in the test report.

4.4.3 Test Setup



Report No.: TMWK2207002820KR

4.4.4 Test Result

Temperature: 20~25.6°C

Test date: August 10~September 5, 2022

Humidity: 40~58% RH

Tested by: David Li

UNII-1 5150-5250 MHz

Test Mode: IEEE 802.11a mode

Channel	Frequency (MHz)	Ch0 meas PSD (dBm/MHz)	Duty Factor (dB)	Maximum Corr'd PSD (dBm/MHz)	Limit (dBm/MHz)	Margin (dB)
Low	5180	6.667	0.13	6.80	11.00	-4.20
Mid	5220	6.769	0.13	6.90	11.00	-4.10
High	5240	6.523	0.13	6.65	11.00	-4.35

Test Mode: IEEE 802.11n HT20 mode

Channel	Frequency (MHz)	Ch0 meas PSD (dBm/MHz)	Duty Factor (dB)	Maximum Corr'd PSD (dBm/MHz)	Limit (dBm/MHz)	Margin (dB)
Low	5180	5.131	0.15	5.28	11.00	-5.72
Mid	5220	4.943	0.15	5.09	11.00	-5.91
High	5240	4.811	0.15	4.96	11.00	-6.04

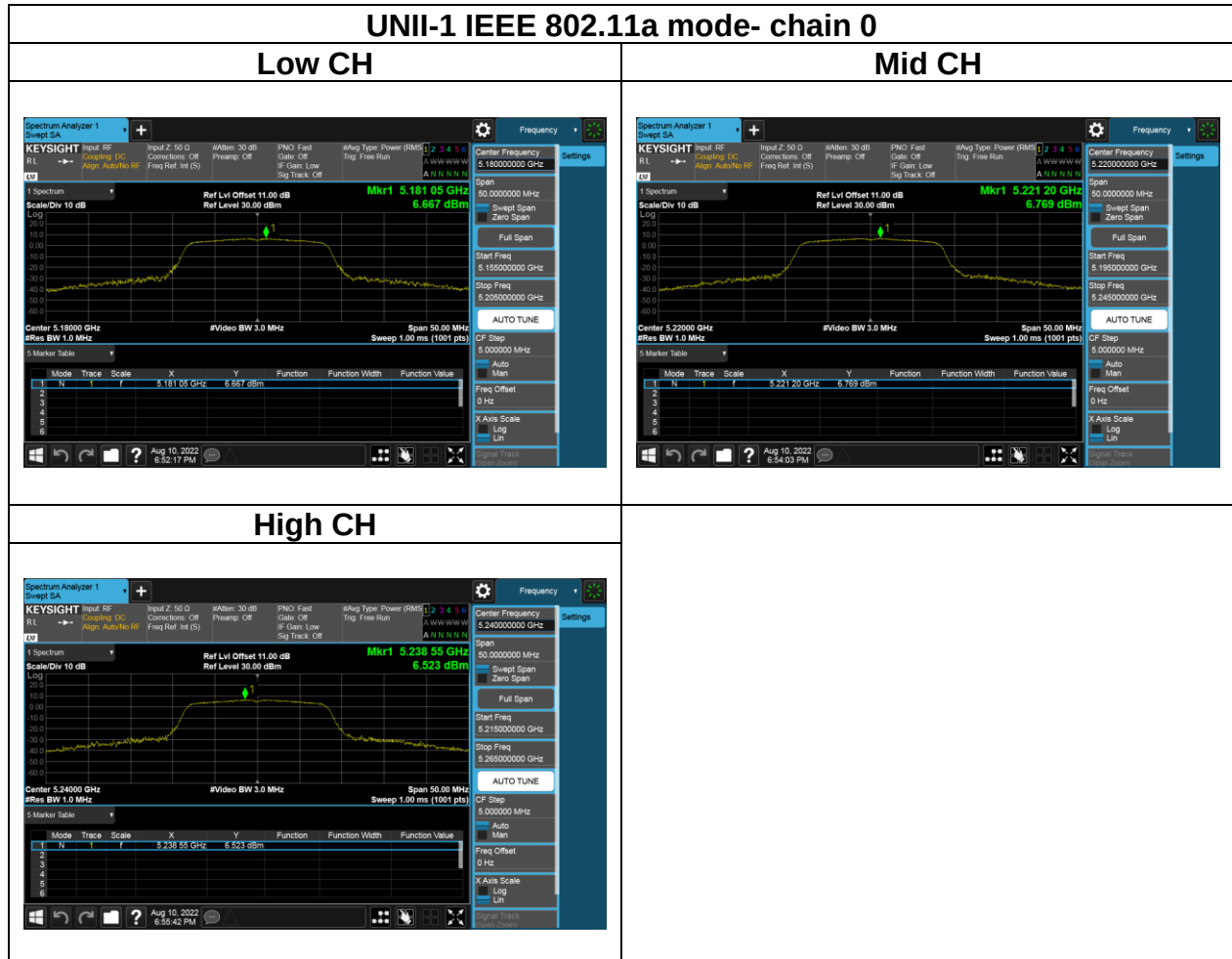
Test Mode: IEEE 802.11n HT40 mode

Channel	Frequency (MHz)	Ch0 meas PSD (dBm/MHz)	Duty Factor (dB)	Maximum Corr'd PSD (dBm/MHz)	Limit (dBm/MHz)	Margin (dB)
Low	5190	1.859	0.29	2.15	11.00	-8.85
High	5230	1.682	0.29	1.97	11.00	-9.03

Test Mode: IEEE 802.11ac VHT80 mode

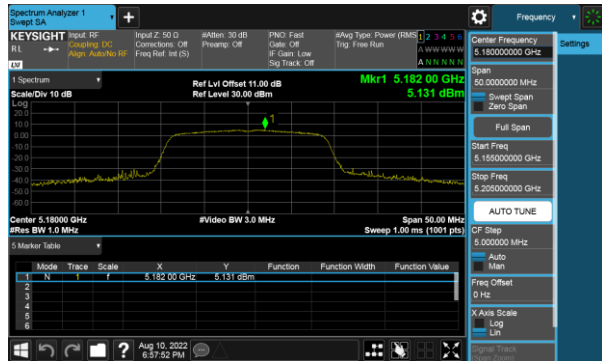
Channel	Frequency (MHz)	Ch0 meas PSD (dBm/MHz)	Duty Factor (dB)	Maximum Corr'd PSD (dBm/MHz)	Limit (dBm/MHz)	Margin (dB)
Low	5210	-2.014	0.55	-1.46	11.00	-12.46

Test Plots



UNII-1 IEEE 802.11n HT20 mode- chain 0

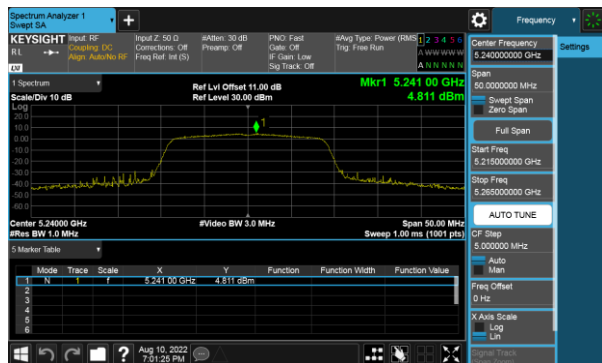
Low CH

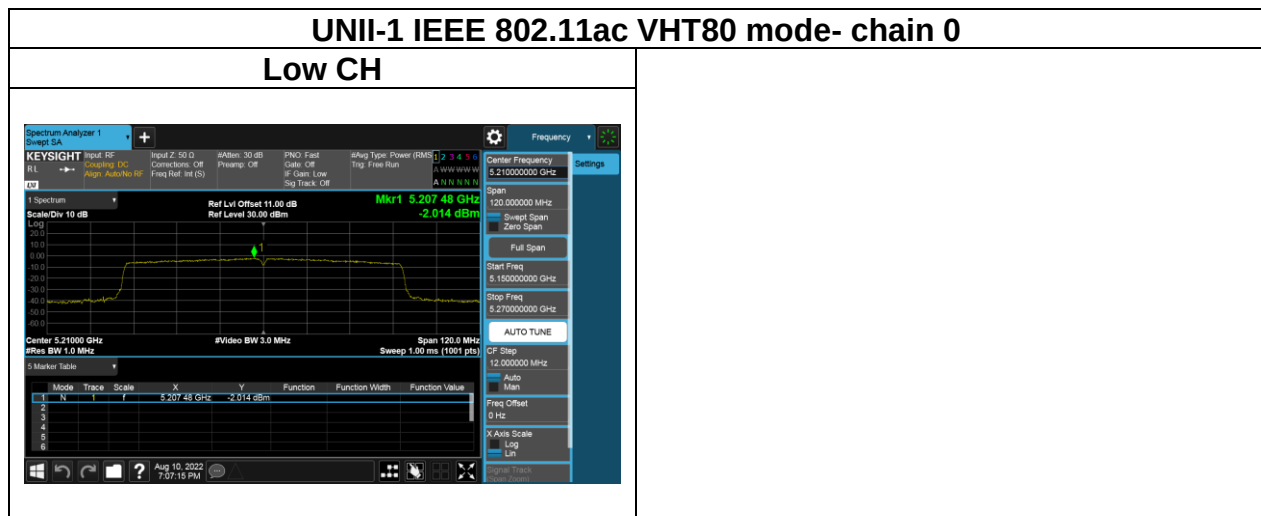
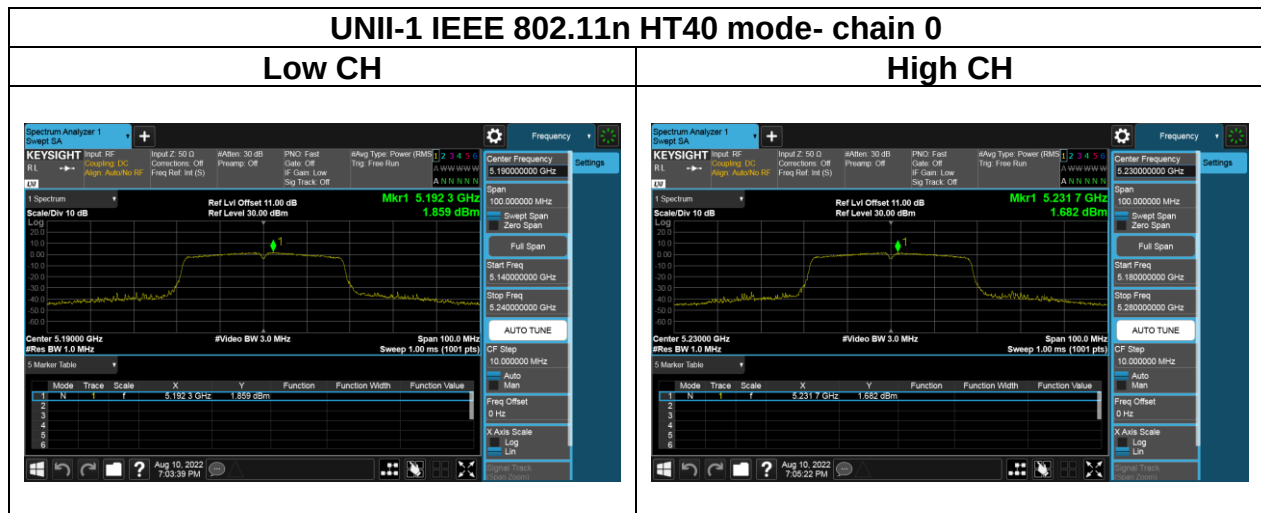


Mid CH



High CH





4.5 RADIATION Bandedge and Spurious Emission

4.5.1 Test Limit

FCC according to §15.407, §15.209 and §15.205,

Below 30 MHz

Frequency	Field Strength (microvolts/m)	Magnetic H-Field (microamperes/m)	Measurement Distance (metres)
9-490 kHz	2,400/F (F in kHz)	2,400/F (F in kHz)	300
490-1,705 kHz	24,000/F (F in kHz)	24,000/F (F in kHz)	30
1.705-30 MHz	30	N/A	30

Above 30 MHz

Frequency (MHz)	Field Strength microvolts/m at 3 metres (watts, e.i.r.p.)	
	Transmitters	Receivers
30-88	100 (3 nW)	100 (3 nW)
88-216	150 (6.8 nW)	150 (6.8 nW)
216-960	200 (12 nW)	200 (12 nW)
Above 960	500 (75 nW)	500 (75 nW)

UNII-1 :

For transmitters operating in the band 5150-5250 MHz, all emissions outside the band 5150-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p. However, any unwanted emissions that fall into the band 5250-5350 MHz must be 26 dBc, when measured using a resolution bandwidth between 1 and 5% of the occupied bandwidth, above 5.25 GHz. Otherwise, the transmission is considered as intentional and the devices shall implement dynamic frequency selection (DFS) and transmitter power control (TPC) as per the requirements for the band 5250-5350 MHz

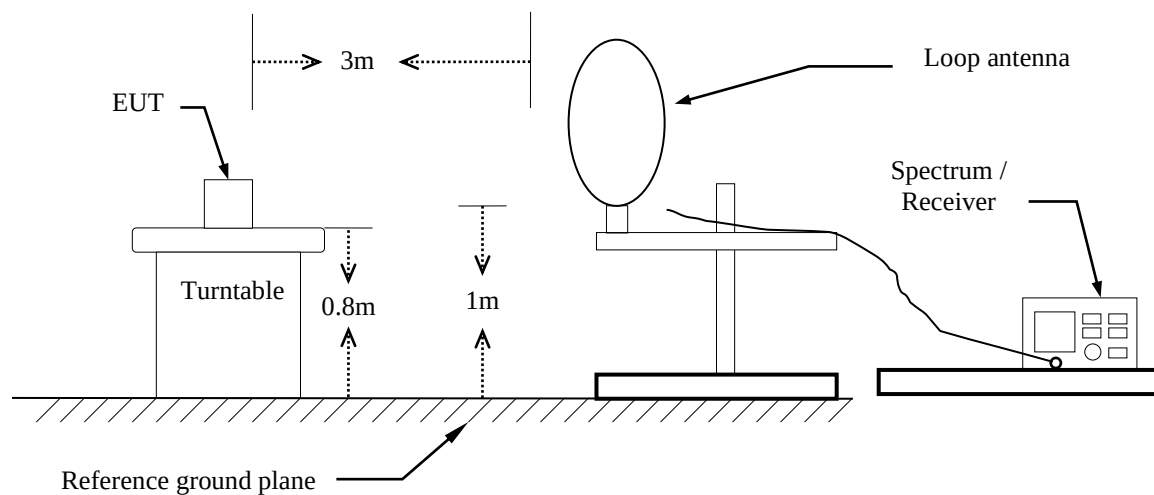
4.5.2 Test Procedure

Test method Refer as KDB 789033 D02.

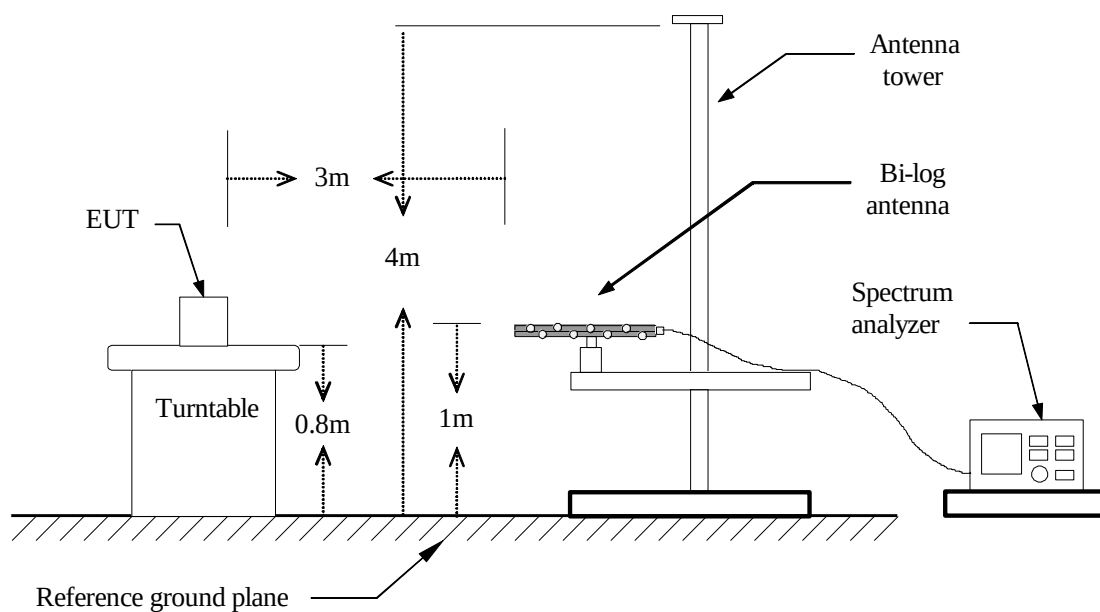
1. The EUT is placed on a turntable, Above 1 GHz is 1.5m and below 1 GHz is 0.8m above ground plane. The EUT Configured un accordance with ANSI C63.10: 2013, and the EUT set in a continuous mode.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level. And EUT is set 3m away from the receiving antenna, which is scanned from 1m to 4m above the ground plane to find out the highest emissions. Measurement are made polarized in both the vertical and the horizontal positions with antenna.
3. Span shall wide enough to full capture the emission measured. The SA from 9kHz to 40GHz set to the low, Mid and High channels with the EUT transmit.
4. No emission found between lowest internal used/generated frequency to 30MHz (9KHz~30MHz)
5. The SA setting following :
 - (1) Below 1G : RBW = 100kHz, VBW $\geq 3 \times$ RBW, Sweep = Auto, Detector = Peak, Trace = Max hold.
 - (2) Above 1G :
 - (2.1) For Peak measurement : RBW = 1MHz, VBW ≥ 3 RBW, Sweep = Auto, Detector = Peak, Trace = Max hold.
 - (2.2) For Average measurement : RBW = 1MHz, VBW
 - If Duty Cycle $\geq 98\%$, VBW=10Hz.
 - If Duty Cycle $< 98\%$, VBW=1/T.
- (3) Data result
 - Actual FS=Spectrum Reading Level + Factor
 - Margin=Actual FS- Limit

4.5.3 Test Setup

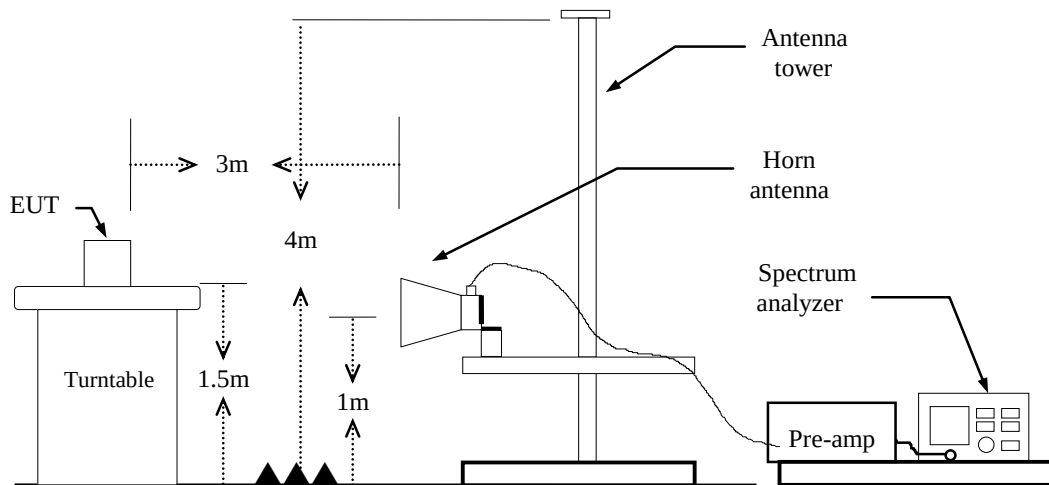
9kHz ~ 30MHz



30MHz ~ 1GHz



Above 1 GHz

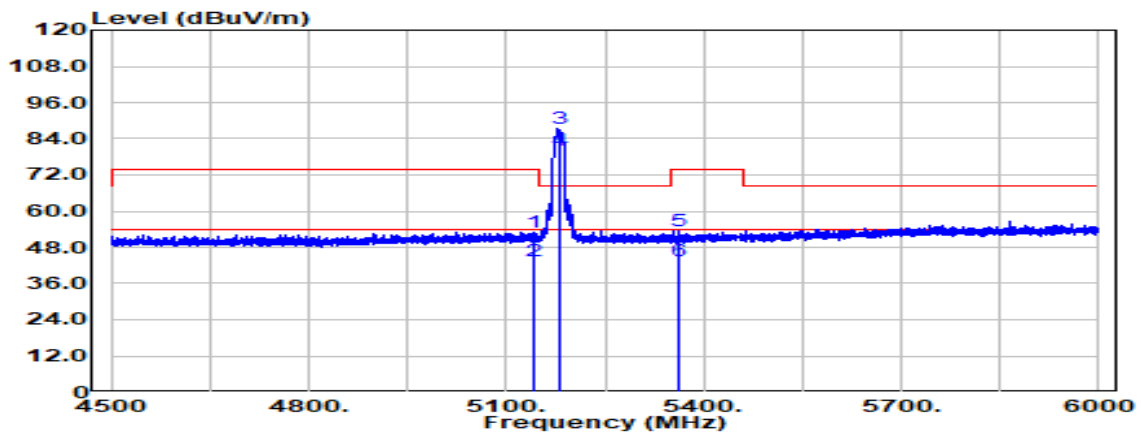


4.5.4 Test Result

Band Edge Test Data

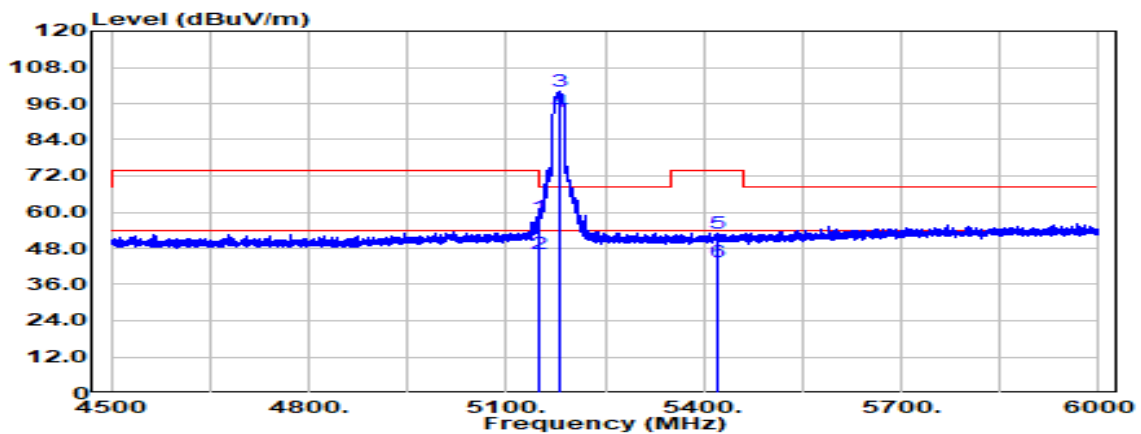
Test Data for UNII-1

Test Mode	IEEE 802.11a / 5180 MHz	Temp/Hum	24.5(°C)/ 63%RH
Test Item	Band Edge	Test Date	August 18, 2022
Polarize	Vertical	Test Engineer	Ray Li
Detector	Peak / Average		



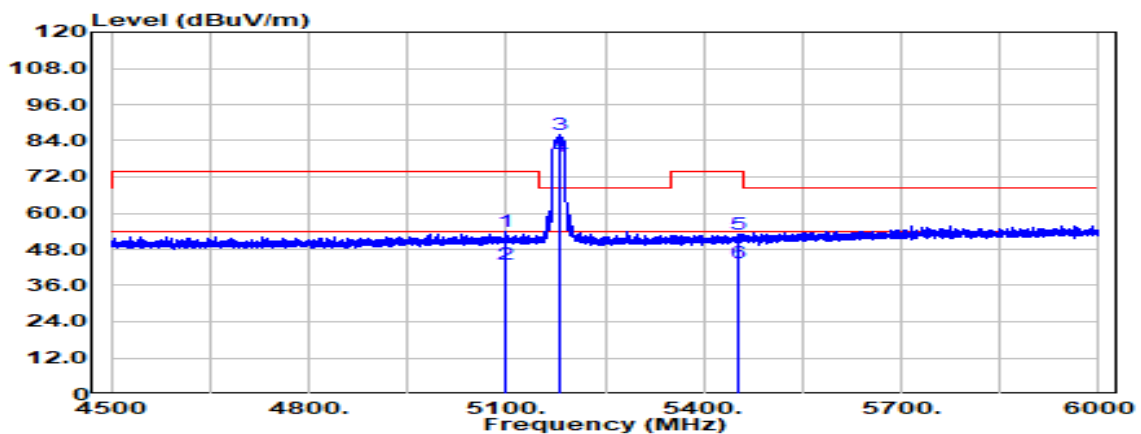
Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBμV)	Factor (dB)	Actual FS (dBμV/m)	Limit @3m (dBμV/m)	Margin (dB)
5142.900	Peak	36.22	16.91	53.13	74.00	-20.87
5142.900	Average	26.39	16.91	43.30	54.00	-10.70
5180.000	Peak	70.43	17.00	87.43	--	--
5180.000	Average	62.94	17.00	79.94	--	--
5360.700	Peak	36.05	17.25	53.30	74.00	-20.70
5360.700	Average	26.40	17.25	43.66	54.00	-10.34

Test Mode	IEEE 802.11a / 5180 MHz	Temp/Hum	24.5(°C)/ 63%RH
Test Item	Band Edge	Test Date	August 18, 2022
Polarize	Horizontal	Test Engineer	Ray Li
Detector	Peak / Average		



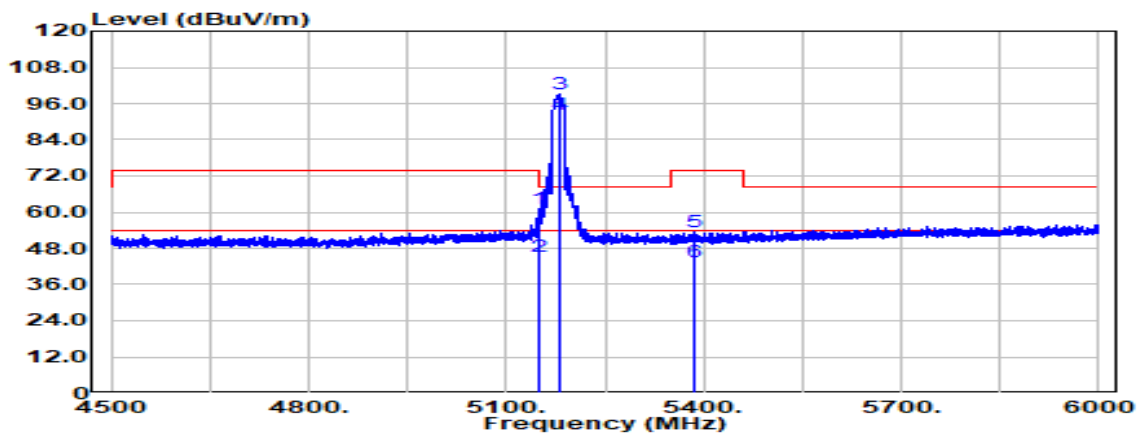
Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBμV)	Factor (dB)	Actual FS (dBμV/m)	Limit @3m (dBμV/m)	Margin (dB)
5149.500	Peak	41.42	16.91	58.33	74.00	-15.67
5149.500	Average	29.44	16.91	46.35	54.00	-7.65
5180.000	Peak	83.01	17.00	100.01	--	--
5180.000	Average	76.30	17.00	93.30	--	--
5422.200	Peak	35.75	17.40	53.15	74.00	-20.85
5422.200	Average	26.05	17.40	43.45	54.00	-10.55

Test Mode	IEEE 802.11n HT20 / 5180 MHz	Temp/Hum	24.5(°C)/ 63%RH
Test Item	Band Edge	Test Date	August 18, 2022
Polarize	Vertical	Test Engineer	Ray Li
Detector	Peak / Average		



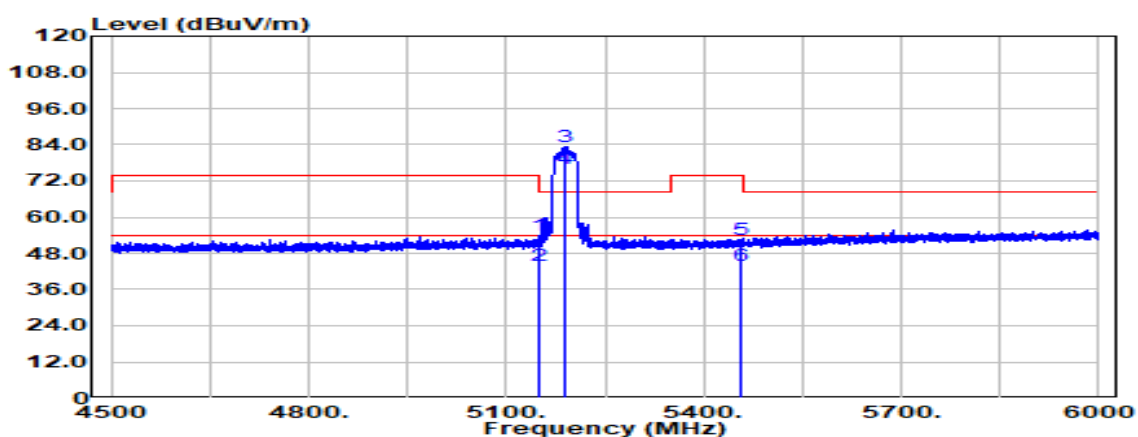
Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBUV)	Factor (dB)	Actual FS (dBUV/m)	Limit @3m (dBUV/m)	Margin (dB)
5099.100	Peak	36.92	16.87	53.80	74.00	-20.20
5099.100	Average	26.34	16.87	43.21	54.00	-10.79
5180.000	Peak	68.85	17.00	85.85	--	--
5180.000	Average	61.59	17.00	78.59	--	--
5453.100	Peak	35.62	17.49	53.11	74.00	-20.89
5453.100	Average	26.04	17.49	43.52	54.00	-10.48

Test Mode	IEEE 802.11n HT20 / 5180 MHz	Temp/Hum	24.5(°C)/ 63%RH
Test Item	Band Edge	Test Date	August 18, 2022
Polarize	Horizontal	Test Engineer	Ray Li
Detector	Peak / Average		



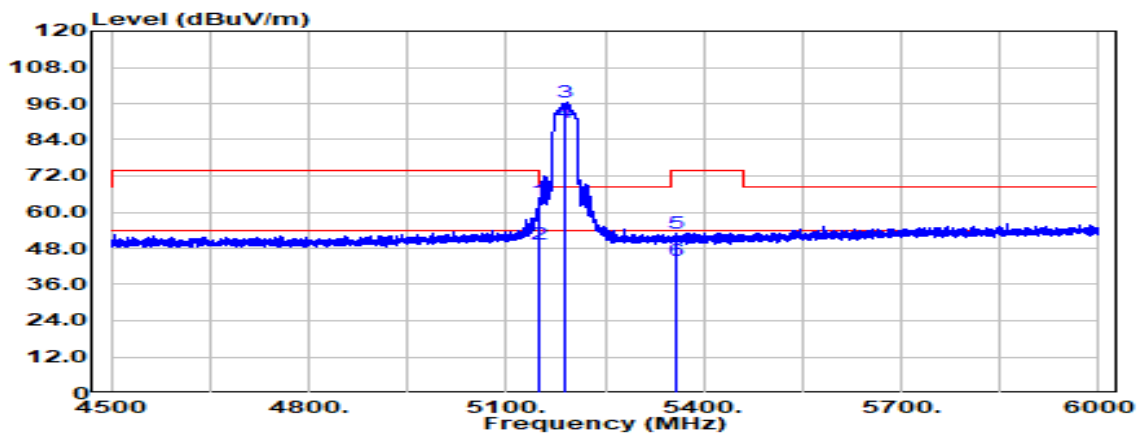
Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBμV)	Factor (dB)	Actual FS (dBμV/m)	Limit @3m (dBμV/m)	Margin (dB)
5149.200	Peak	44.20	16.91	61.11	74.00	-12.89
5149.200	Average	28.32	16.91	45.23	54.00	-8.77
5180.000	Peak	82.33	17.00	99.33	--	--
5180.000	Average	75.27	17.00	92.27	--	--
5384.100	Peak	35.94	17.30	53.24	74.00	-20.76
5384.100	Average	26.18	17.30	43.48	54.00	-10.52

Test Mode	IEEE 802.11n HT40 / 5190 MHz	Temp/Hum	24.5(°C)/ 63%RH
Test Item	Band Edge	Test Date	August 18, 2022
Polarize	Vertical	Test Engineer	Ray Li
Detector	Peak / Average		



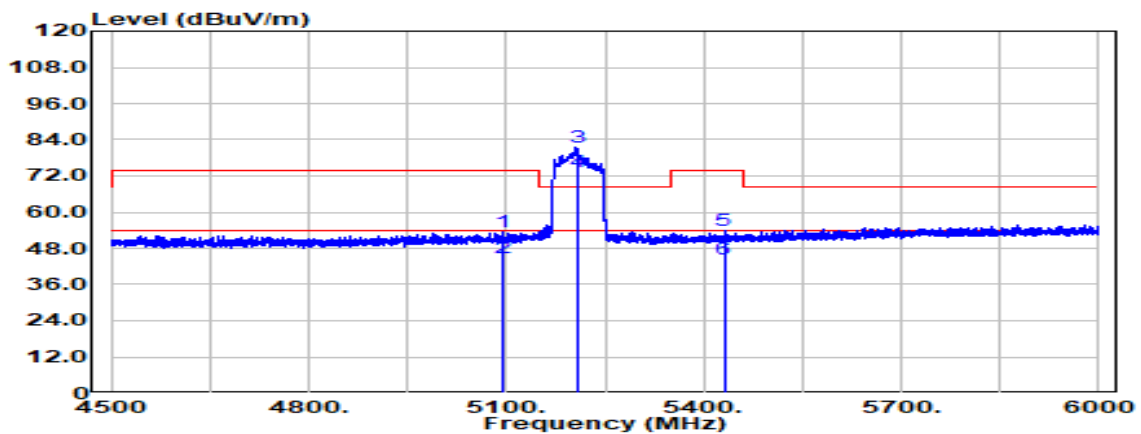
Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBμV)	Factor (dB)	Actual FS (dBμV/m)	Limit @3m (dBμV/m)	Margin (dB)
5149.200	Peak	36.95	16.91	53.86	74.00	-20.14
5149.200	Average	26.92	16.91	43.83	54.00	-10.17
5190.000	Peak	66.48	17.03	83.51	--	--
5190.000	Average	59.12	17.03	76.15	--	--
5457.000	Peak	35.08	17.48	52.56	74.00	-21.44
5457.000	Average	26.43	17.48	43.91	54.00	-10.09

Test Mode	IEEE 802.11n HT40 / 5190 MHz	Temp/Hum	24.5(°C)/ 63%RH
Test Item	Band Edge	Test Date	August 18, 2022
Polarize	Horizontal	Test Engineer	Ray Li
Detector	Peak / Average		



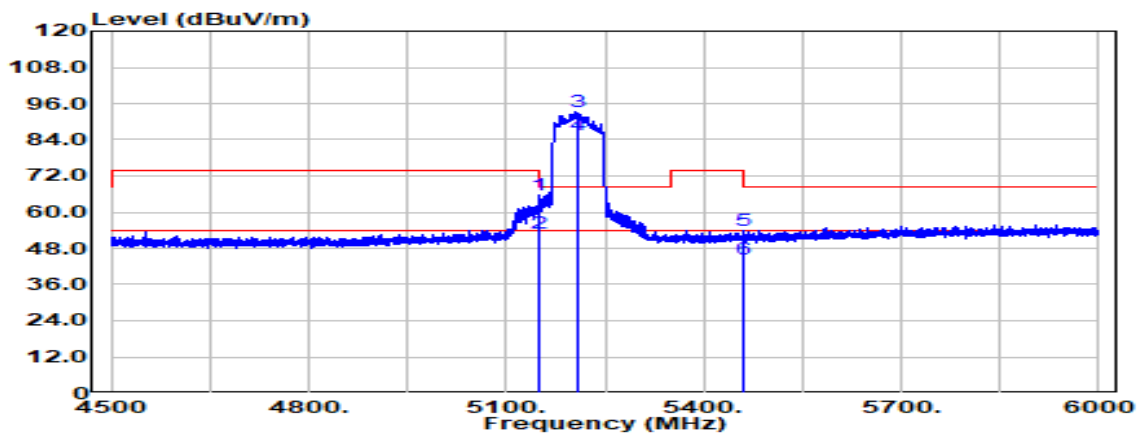
Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBμV)	Factor (dB)	Actual FS (dBμV/m)	Limit @3m (dBμV/m)	Margin (dB)
5149.800	Peak	46.84	16.91	63.75	74.00	-10.25
5149.800	Average	32.56	16.91	49.47	54.00	-4.53
5190.000	Peak	79.25	17.03	96.28	--	--
5190.000	Average	72.45	17.03	89.48	--	--
5359.500	Peak	35.89	17.25	53.14	74.00	-20.86
5359.500	Average	26.72	17.25	43.97	54.00	-10.03

Test Mode	IEEE 802.11ac VHT80 / 5210 MHz	Temp/Hum	24.4(°C)/ 64%RH
Test Item	Band Edge	Test Date	August 18, 2022
Polarize	Vertical	Test Engineer	Ray Li
Detector	Peak / Average		



Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBμV)	Factor (dB)	Actual FS (dBμV/m)	Limit @3m (dBμV/m)	Margin (dB)
5094.900	Peak	36.70	16.85	53.55	74.00	-20.45
5094.900	Average	27.91	16.85	44.76	54.00	-9.24
5210.000	Peak	64.55	17.07	81.61	--	--
5210.000	Average	56.11	17.07	73.18	--	--
5430.900	Peak	36.43	17.43	53.86	74.00	-20.14
5430.900	Average	27.07	17.43	44.49	54.00	-9.51

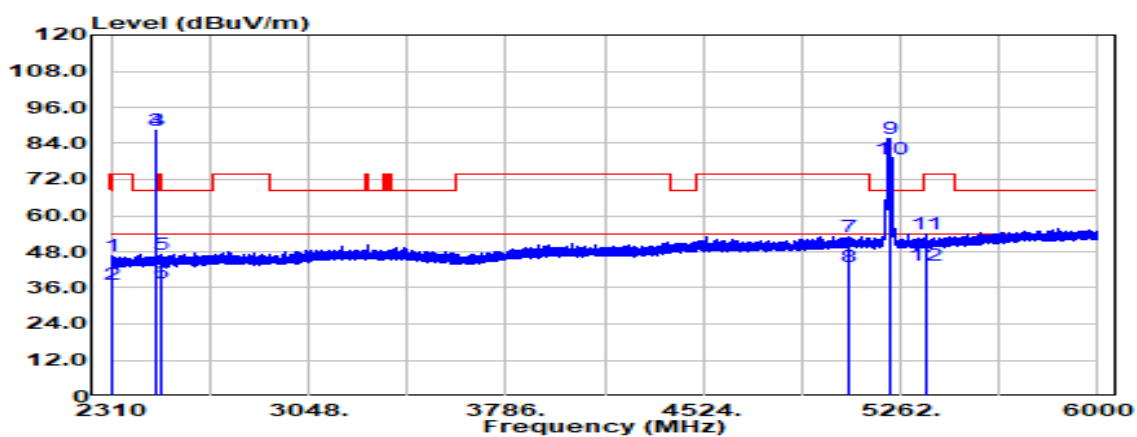
Test Mode	IEEE 802.11ac VHT80 / 5210 MHz	Temp/Hum	24.4(°C)/ 64%RH
Test Item	Band Edge	Test Date	August 18, 2022
Polarize	Horizontal	Test Engineer	Ray Li
Detector	Peak / Average		



Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBμV)	Factor (dB)	Actual FS (dBμV/m)	Limit @3m (dBμV/m)	Margin (dB)
5149.500	Peak	48.71	16.91	65.62	74.00	-8.38
5149.500	Average	36.02	16.91	52.93	54.00	-1.07
5210.000	Peak	76.17	17.07	93.24	--	--
5210.000	Average	68.50	17.07	85.56	--	--
5458.500	Peak	36.44	17.48	53.93	74.00	-20.07
5458.500	Average	26.84	17.48	44.32	54.00	-9.68

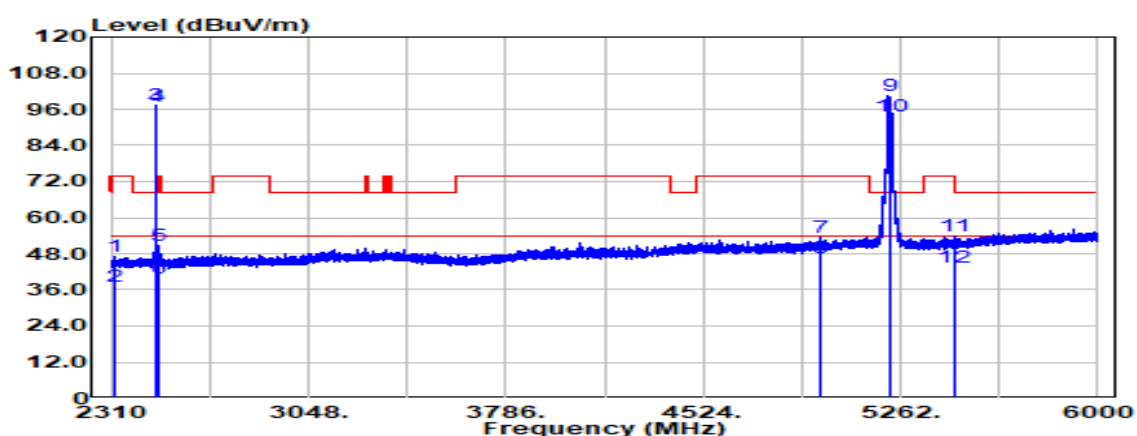
Simultaneously transmit system (WLAN+BT)

Test Mode	IEEE 802.11a(Band 1) /BT BR	Temp/Hum	24.6(°C)/ 64%RH
Test Item	Band Edge	Test Date	August 22, 2022
Polarize	Vertical	Test Engineer	Tony Chao
Detector	Peak / Average		



Frequency (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBUV)	Factor (dB)	Actual FS (dBUV/m)	Limit @3m (dBUV/m)	Margin (dB)
2315.347	Peak	38.89	7.58	46.47	74.00	-27.53
2315.347	Average	29.50	7.58	37.08	54.00	-16.92
2480.000	Peak	80.22	8.24	88.47	--	--
2480.000	Average	80.03	8.24	88.27	--	--
2499.563	Peak	38.90	8.34	47.23	74.00	-26.77
2499.563	Average	29.37	8.34	37.71	54.00	-16.29
5067.600	Peak	36.37	16.70	53.07	74.00	-20.93
5067.600	Average	26.48	16.70	43.18	54.00	-10.82
5220.000	Peak	68.62	17.08	85.70	--	--
5220.000	Average	61.72	17.08	78.79	--	--
5353.800	Peak	36.67	17.24	53.91	74.00	-20.09
5353.800	Average	26.19	17.24	43.43	54.00	-10.57

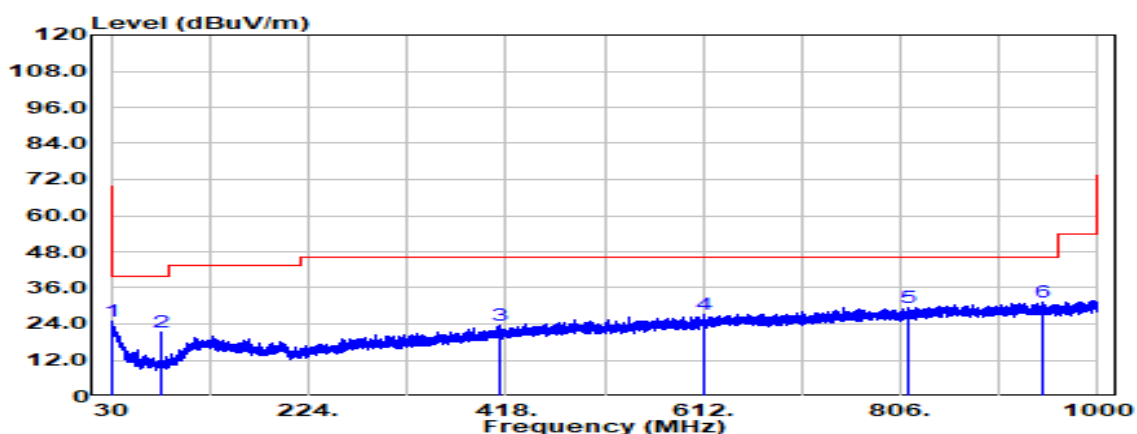
Test Mode	IEEE 802.11a(Band 1) /BT BR	Temp/Hum	24.6(°C)/ 64%RH
Test Item	Band Edge	Test Date	August 22, 2022
Polarize	Horizontal	Test Engineer	Tony Chao
Detector	Peak / Average		



Frequency (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBμV)	Factor (dB)	Actual FS (dBμV/m)	Limit @3m (dBμV/m)	Margin (dB)
2325.330	Peak	39.32	7.60	46.92	74.00	-27.08
2325.330	Average	29.51	7.60	37.11	54.00	-16.89
2480.000	Peak	88.95	8.24	97.19	--	--
2480.000	Average	88.75	8.24	97.00	--	--
2489.580	Peak	42.50	8.29	50.79	74.00	-23.21
2489.580	Average	31.63	8.29	39.92	54.00	-14.08
4959.600	Peak	37.74	15.91	53.65	74.00	-20.35
4959.600	Average	30.73	15.91	46.63	54.00	-7.37
5220.000	Peak	83.30	17.08	100.38	--	--
5220.000	Average	76.59	17.08	93.67	--	--
5460.000	Peak	36.53	17.48	54.01	68.20	-14.19
5460.000	Average	25.95	17.48	43.43	54.00	-10.57

Below 1G Test Data

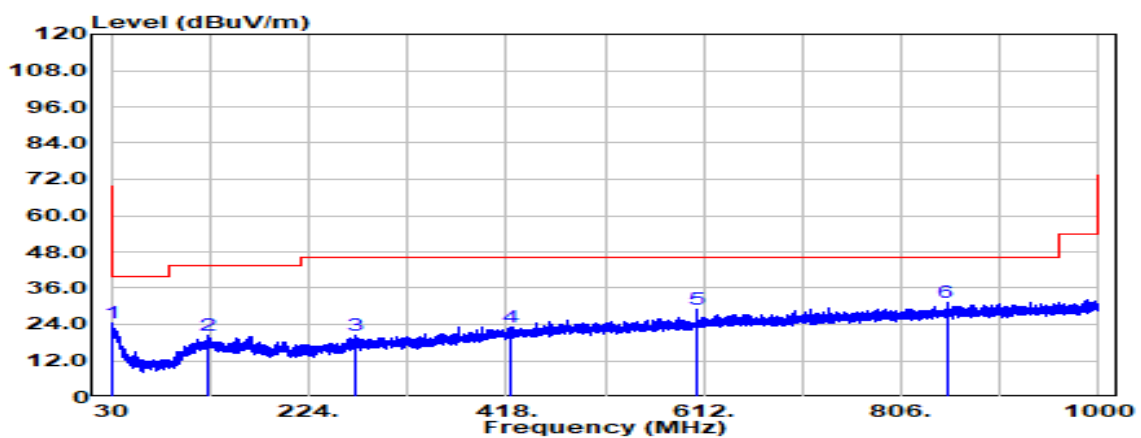
Test Mode	IEEE 802.11ac 80 / 5210 MHz	Temp/Hum	24.4(°C)/ 64%RH
Test Item	30MHz-1GHz	Test Date	August 22, 2022
Polarize	Vertical	Test Engineer	Ray Li
Detector	Peak		



Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBμV)	Factor (dB)	Actual FS (dBμV/m)	Limit @3m (dBμV/m)	Margin (dB)
30.728	Peak	28.71	-3.73	24.98	40.00	-15.02
78.500	Peak	37.28	-15.92	21.36	40.00	-18.64
411.938	Peak	29.03	-5.60	23.42	46.00	-22.58
612.849	Peak	29.24	-1.87	27.37	46.00	-18.63
812.790	Peak	27.99	1.34	29.33	46.00	-16.67
944.710	Peak	27.79	3.22	31.02	46.00	-14.98

Note: 1. No emission found between lowest internal used/generated frequency to 30MHz(9KHz~30MHz)
2. For below 1GHz, the EUT peak value was under average limit, therefore the Average value compliance with the average limit.

Test Mode	IEEE 802.11ac 80 / 5210 MHz	Temp/Hum	24.4(°C)/ 64%RH
Test Item	30MHz-1GHz	Test Date	August 22, 2022
Polarize	Horizontal	Test Engineer	Ray Li
Detector	Peak		



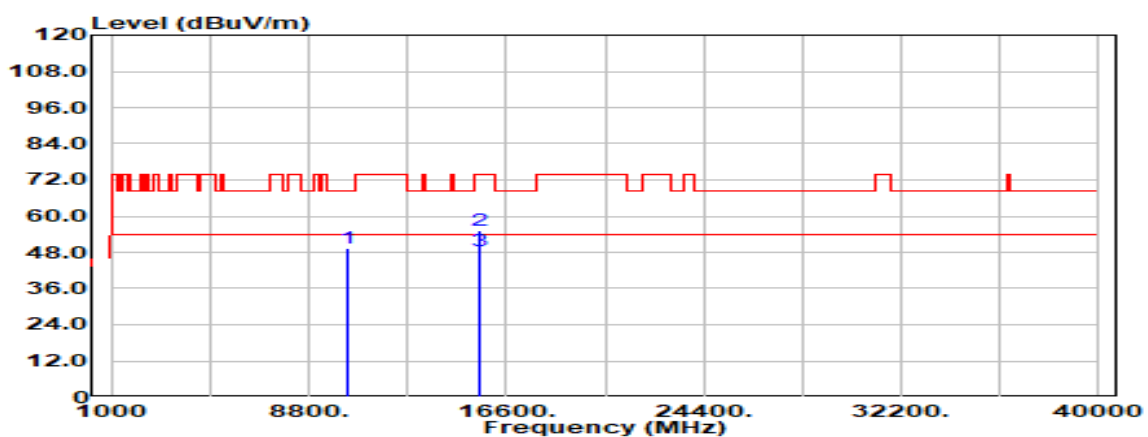
Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBUV)	Factor (dB)	Actual FS (dBUV/m)	Limit @3m (dBUV/m)	Margin (dB)
30.000	Peak	27.47	-3.22	24.25	40.00	-15.75
125.060	Peak	29.85	-9.29	20.56	43.50	-22.94
269.348	Peak	29.69	-9.12	20.57	46.00	-25.43
422.971	Peak	28.61	-5.32	23.29	46.00	-22.71
605.938	Peak	31.42	-2.30	29.11	46.00	-16.89
850.499	Peak	29.38	1.88	31.25	46.00	-14.75

Note: 1. No emission found between lowest internal used/generated frequency to 30MHz(9KHz~30MHz)
 2. For below 1GHz, the EUT peak value was under average limit, therefore the Average value compliance with the average limit.

Above 1G

Test Data for UNII-1

Test Mode	IEEE 802.11a / 5180 MHz	Temp/Hum	24.5(°C)/ 63%RH
Test Item	Harmonic	Test Date	August 18, 2022
Polarize	Vertical	Test Engineer	Ray Li
Detector	Peak / Average		

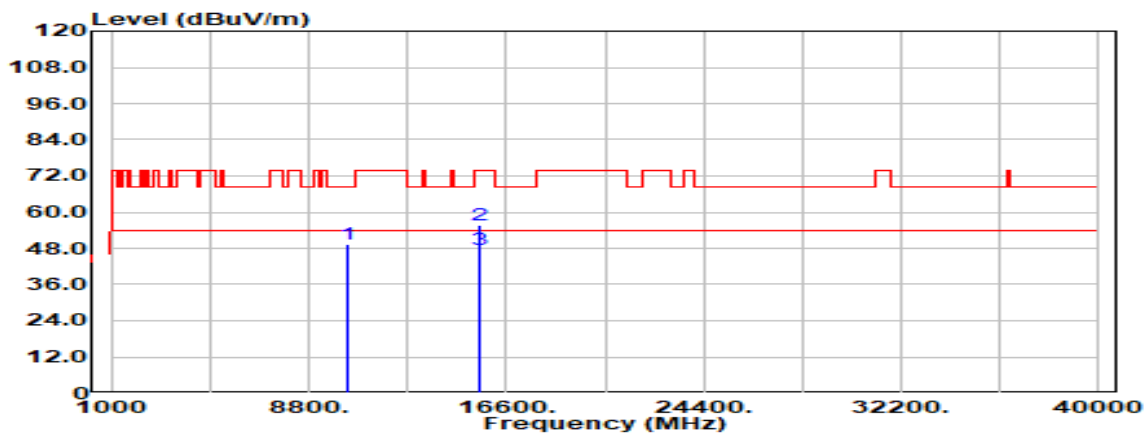


Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBμV)	Factor (dB)	Actual FS (dBμV/m)	Limit @3m (dBμV/m)	Margin (dB)
10360.000	Peak	31.17	18.27	49.43	68.20	-18.77
15540.000	Peak	32.81	22.34	55.15	74.00	-18.85
15540.000	Average	26.04	22.34	48.38	54.00	-5.62
N/A						

Remark:

- Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

Test Mode	IEEE 802.11a / 5180 MHz	Temp/Hum	24.5(°C)/ 63%RH
Test Item	Harmonic	Test Date	August 18, 2022
Polarize	Horizontal	Test Engineer	Ray Li
Detector	Peak / Average		

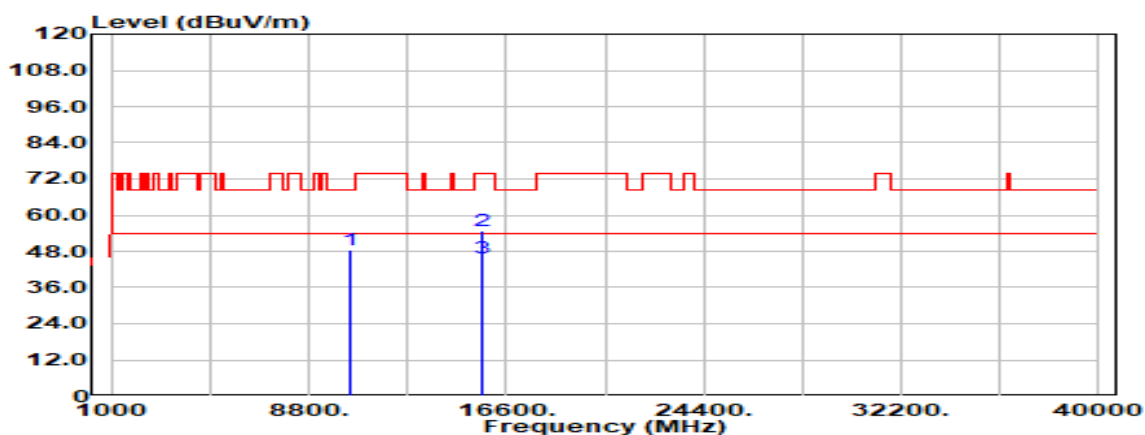


Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBμV)	Factor (dB)	Actual FS (dBUV/m)	Limit @3m (dBUV/m)	Margin (dB)
10360.000	Peak	30.96	18.27	49.23	68.20	-18.97
15540.000	Peak	33.21	22.34	55.54	74.00	-18.46
15540.000	Average	25.18	22.34	47.52	54.00	-6.48
N/A						

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

Test Mode	IEEE 802.11a / 5220 MHz	Temp/Hum	24.5(°C)/ 63%RH
Test Item	Harmonics	Test Date	August 18, 2022
Polarize	Vertical	Test Engineer	Ray Li
Detector	Peak / Average		

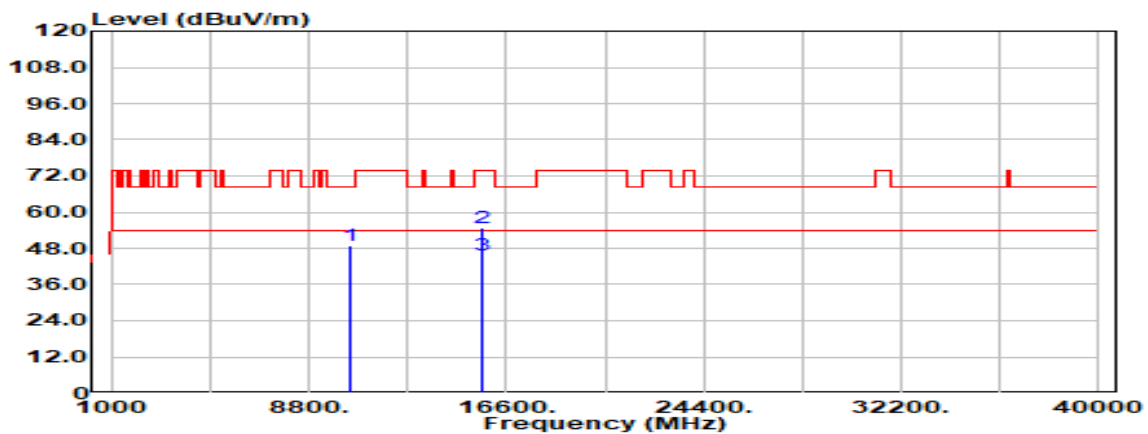


Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBμV)	Factor (dB)	Actual FS (dBUV/m)	Limit @3m (dBUV/m)	Margin (dB)
10440.000	Peak	30.19	18.35	48.53	68.20	-19.67
15660.000	Peak	32.02	22.55	54.57	74.00	-19.43
15660.000	Average	23.12	22.55	45.67	54.00	-8.33
N/A						

Remark:

- Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

Test Mode	IEEE 802.11a / 5220 MHz	Temp/Hum	24.5(°C)/ 63%RH
Test Item	Harmonic	Test Date	August 18, 2022
Polarize	Horizontal	Test Engineer	Ray Li
Detector	Peak / Average		

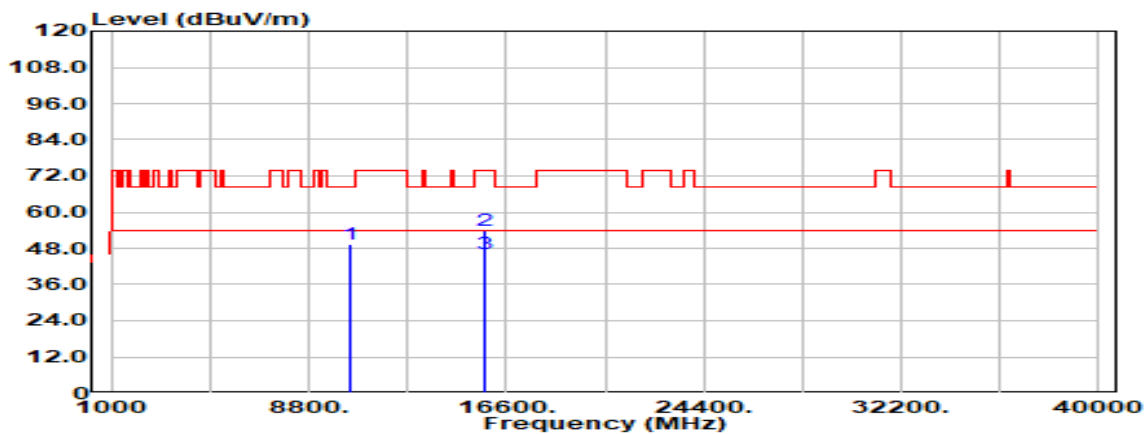


Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBUV)	Factor (dB)	Actual FS (dBUV/m)	Limit @3m (dBUV/m)	Margin (dB)
10440.000	Peak	30.56	18.35	48.91	68.20	-19.29
15660.000	Peak	32.05	22.55	54.60	74.00	-19.40
15660.000	Average	23.13	22.55	45.68	54.00	-8.32
N/A						

Remark:

- Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

Test Mode	IEEE 802.11a / 5240MHZ	Temp/Hum	24.5(°C)/ 63%RH
Test Item	Harmonic	Test Date	August 18, 2022
Polarize	Vertical	Test Engineer	Ray Li
Detector	Peak / Average		

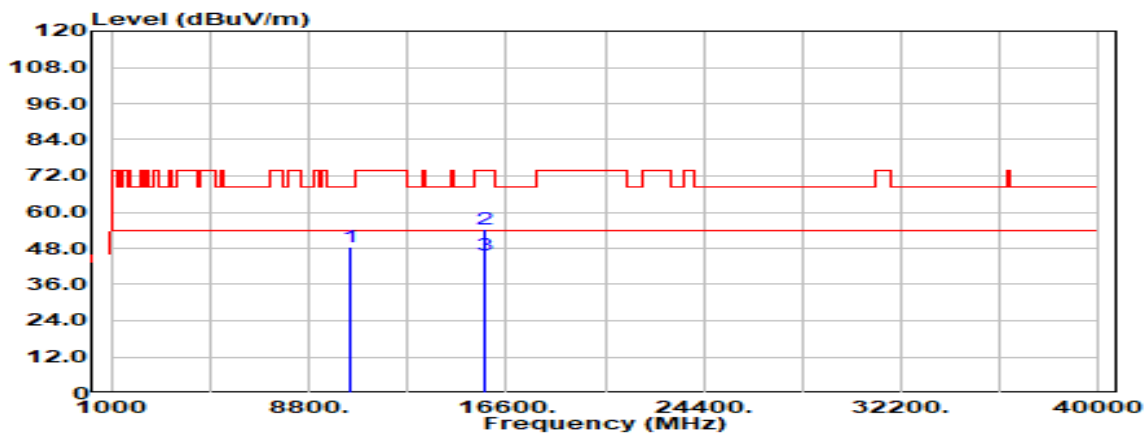


Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBUV)	Factor (dB)	Actual FS (dBUV/m)	Limit @3m (dBUV/m)	Margin (dB)
10480.000	Peak	31.17	18.39	49.56	68.20	-18.64
15720.000	Peak	30.84	23.12	53.96	74.00	-20.04
15720.000	Average	22.84	23.12	45.97	54.00	-8.03
N/A						

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

Test Mode	IEEE 802.11a / 5240MHZ	Temp/Hum	24.5(°C)/ 63%RH
Test Item	Harmonic	Test Date	August 18, 2022
Polarize	Horizontal	Test Engineer	Ray Li
Detector	Peak / Average		

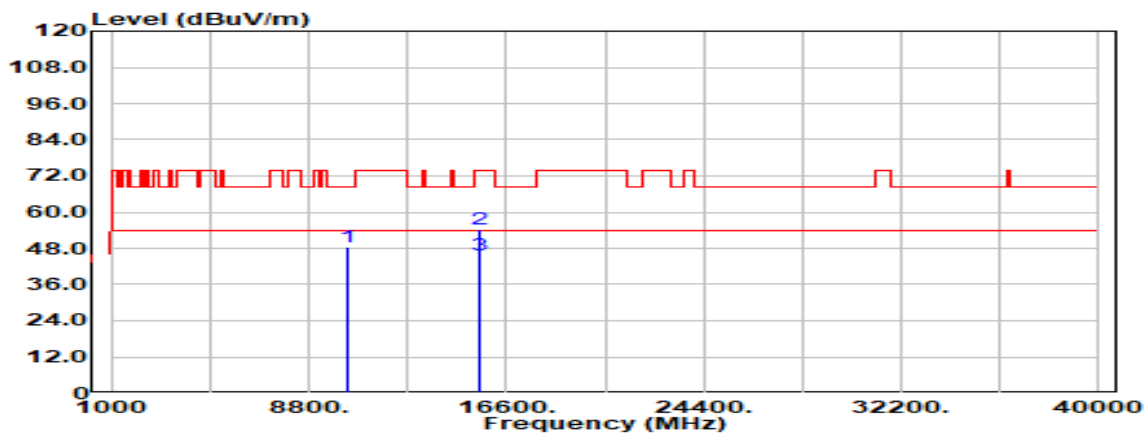


Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBUV)	Factor (dB)	Actual FS (dBUV/m)	Limit @3m (dBUV/m)	Margin (dB)
10480.000	Peak	29.93	18.39	48.32	68.20	-19.88
15720.000	Peak	31.31	23.12	54.43	74.00	-19.57
15720.000	Average	22.65	23.12	45.77	54.00	-8.23
N/A						

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

Test Mode	IEEE 802.11n HT20 / 5180 MHz	Temp/Hum	24.5(°C)/ 63%RH
Test Item	Harmonic	Test Date	August 18, 2022
Polarize	Vertical	Test Engineer	Ray Li
Detector	Peak / Average		

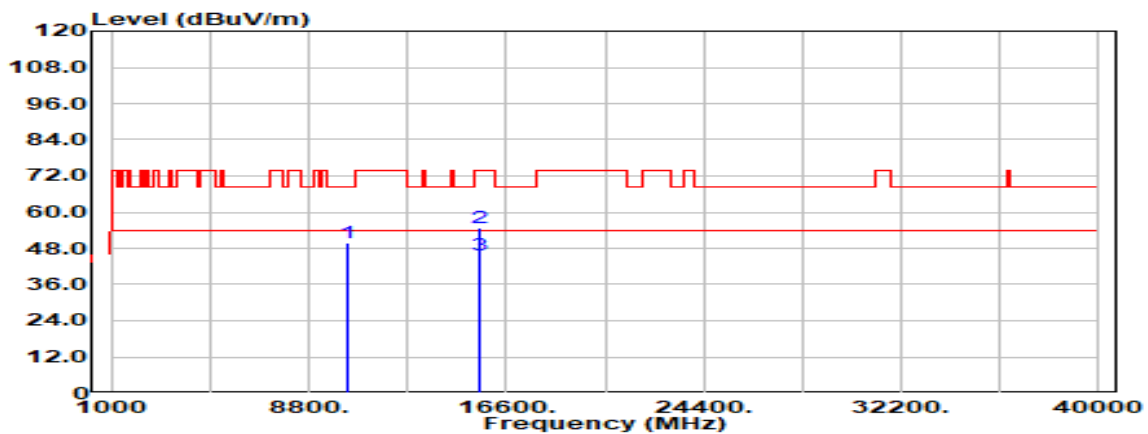


Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBμV)	Factor (dB)	Actual FS (dBUV/m)	Limit @3m (dBUV/m)	Margin (dB)
10360.000	Peak	30.00	18.27	48.27	68.20	-19.93
15540.000	Peak	32.02	22.34	54.36	74.00	-19.64
15540.000	Average	23.48	22.34	45.82	54.00	-8.18
N/A						

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

Test Mode	IEEE 802.11n HT20 / 5180 MHz	Temp/Hum	24.5(°C)/ 63%RH
Test Item	Harmonic	Test Date	August 18, 2022
Polarize	Horizontal	Test Engineer	Ray Li
Detector	Peak / Average		

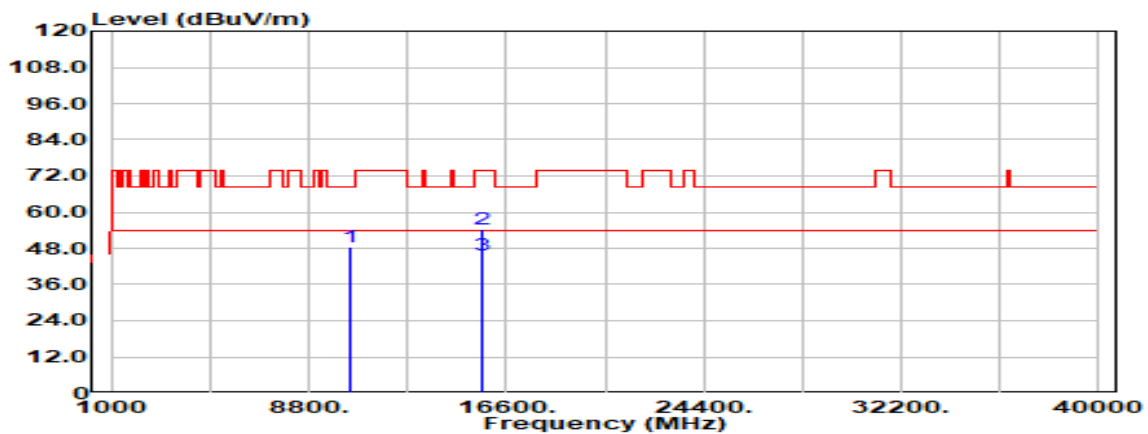


Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBPV)	Factor (dB)	Actual FS (dBPV/m)	Limit @3m (dBPV/m)	Margin (dB)
10360.000	Peak	31.38	18.27	49.64	68.20	-18.56
15540.000	Peak	32.47	22.34	54.81	74.00	-19.19
15540.000	Average	23.50	22.34	45.84	54.00	-8.16
N/A						

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

Test Mode	IEEE 802.11n HT20 / 5220 MHz	Temp/Hum	24.5(°C)/ 63%RH
Test Item	Harmonic	Test Date	August 18, 2022
Polarize	Vertical	Test Engineer	Ray Li
Detector	Peak / Average		

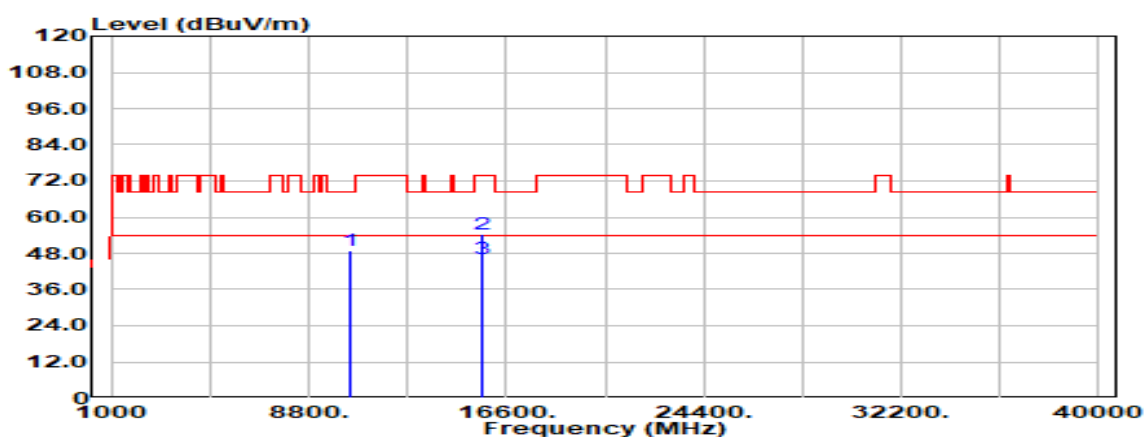


Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBUV)	Factor (dB)	Actual FS (dBUV/m)	Limit @3m (dBUV/m)	Margin (dB)
10440.000	Peak	30.14	18.35	48.48	68.20	-19.72
15660.000	Peak	31.87	22.55	54.42	74.00	-19.58
15660.000	Average	23.31	22.55	45.87	54.00	-8.13
N/A						

Remark:

- Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

Test Mode	IEEE 802.11n HT20 / 5220 MHz	Temp/Hum	24.5(°C)/ 63%RH
Test Item	Harmonic	Test Date	August 18, 2022
Polarize	Horizontal	Test Engineer	Ray Li
Detector	Peak / Average		

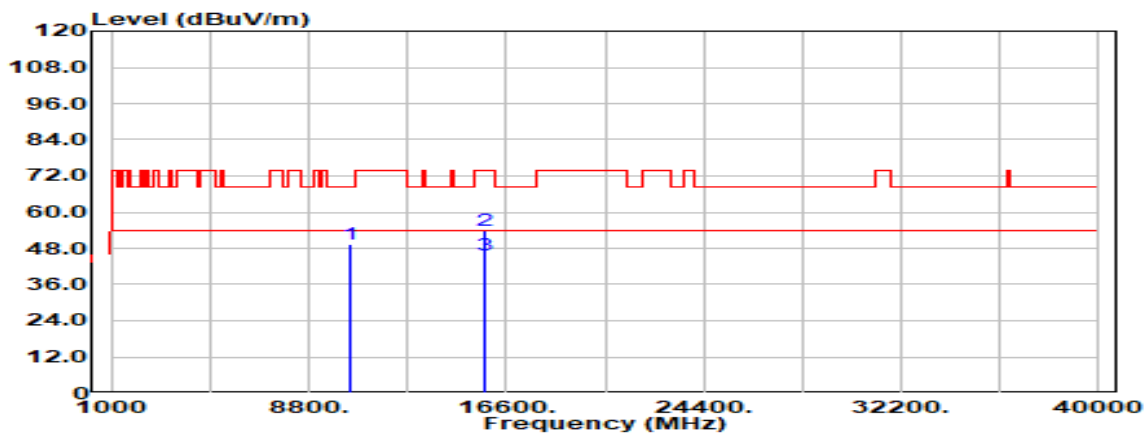


Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBμV)	Factor (dB)	Actual FS (dBμV/m)	Limit @3m (dBμV/m)	Margin (dB)
10440.000	Peak	30.44	18.35	48.79	68.20	-19.41
15660.000	Peak	31.74	22.55	54.29	74.00	-19.71
15660.000	Average	23.44	22.55	45.99	54.00	-8.01
N/A						

Remark:

- Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

Test Mode	IEEE 802.11n HT20 / 5240 MHz	Temp/Hum	24.5(°C)/ 63%RH
Test Item	Harmonic	Test Date	August 18, 2022
Polarize	Vertical	Test Engineer	Ray Li
Detector	Peak / Average		

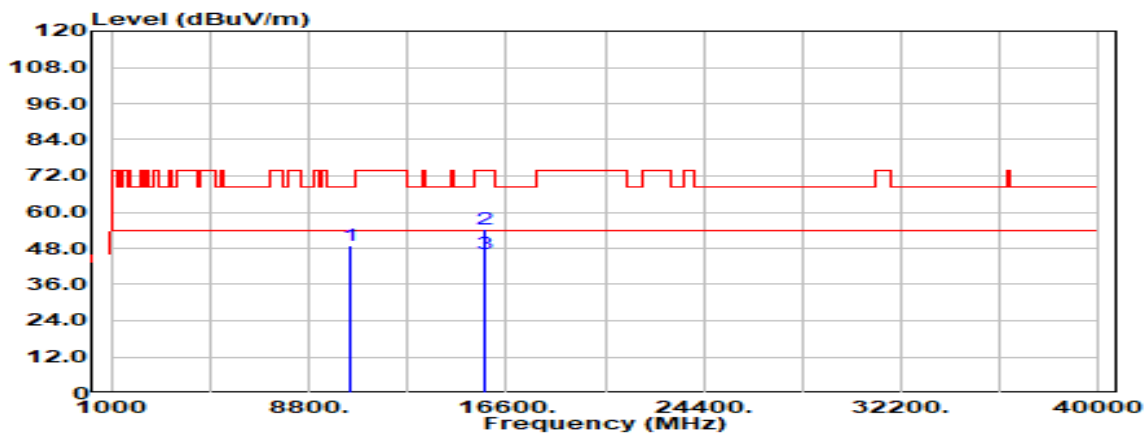


Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBμV)	Factor (dB)	Actual FS (dBμV/m)	Limit @3m (dBμV/m)	Margin (dB)
10480.000	Peak	30.75	18.39	49.13	68.20	-19.07
15720.000	Peak	30.59	23.12	53.71	74.00	-20.29
15720.000	Average	22.78	23.12	45.91	54.00	-8.09
N/A						

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

Test Mode	IEEE 802.11n HT20 / 5240 MHz	Temp/Hum	24.5(°C)/ 63%RH
Test Item	Harmonic	Test Date	August 18, 2022
Polarize	Horizontal	Test Engineer	Ray Li
Detector	Peak / Average		

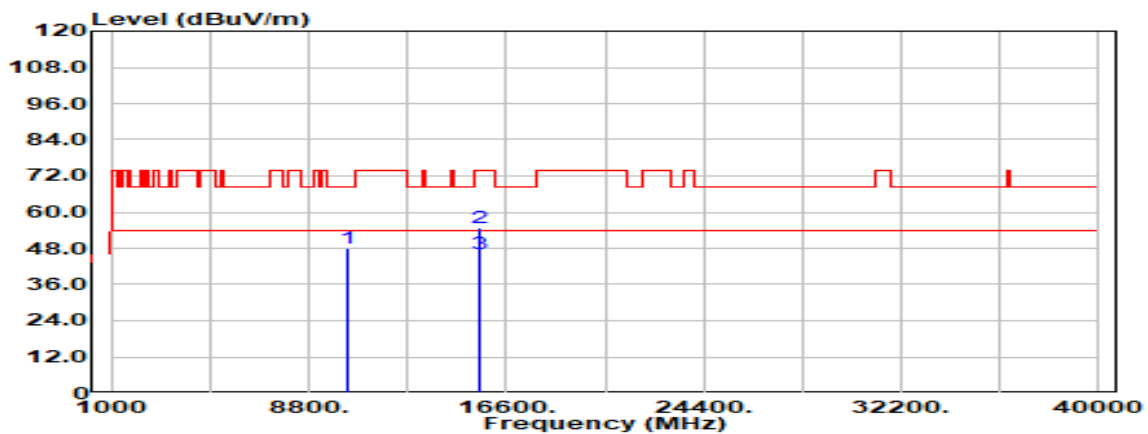


Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBUV)	Factor (dB)	Actual FS (dBUV/m)	Limit @3m (dBUV/m)	Margin (dB)
10480.000	Peak	30.38	18.39	48.77	68.20	-19.43
15720.000	Peak	31.15	23.12	54.27	74.00	-19.73
15720.000	Average	22.90	23.12	46.02	54.00	-7.98
N/A						

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

Test Mode	IEEE 802.11n HT40 / 5190 MHz	Temp/Hum	24.5(°C)/ 63%RH
Test Item	Harmonic	Test Date	August 18, 2022
Polarize	Vertical	Test Engineer	Ray Li
Detector	Peak / Average		

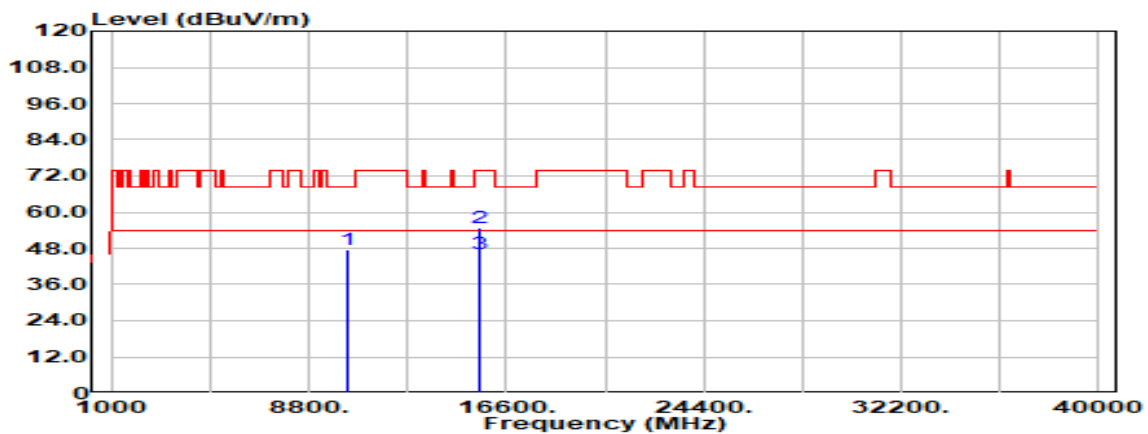


Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBUV)	Factor (dB)	Actual FS (dBUV/m)	Limit @3m (dBUV/m)	Margin (dB)
10380.000	Peak	29.93	18.26	48.19	68.20	-20.01
15570.000	Peak	32.53	22.26	54.79	74.00	-19.21
15570.000	Average	23.90	22.26	46.16	54.00	-7.84
N/A						

Remark:

- Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

Test Mode	IEEE 802.11n HT40 / 5190 MHz	Temp/Hum	24.5(°C)/ 63%RH
Test Item	Harmonic	Test Date	August 18, 2022
Polarize	Horizontal	Test Engineer	Ray Li
Detector	Peak / Average		

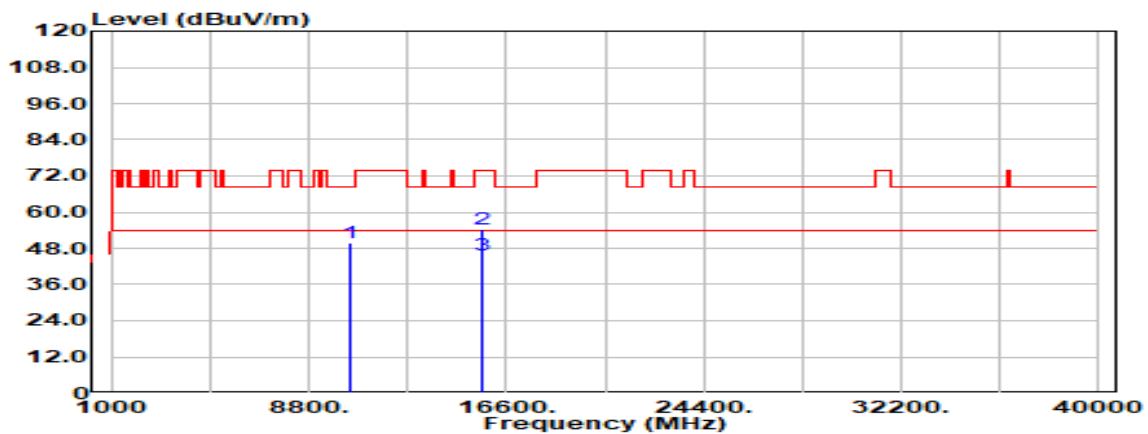


Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBμV)	Factor (dB)	Actual FS (dBμV/m)	Limit @3m (dBμV/m)	Margin (dB)
10380.000	Peak	29.25	18.26	47.52	68.20	-20.68
15570.000	Peak	32.37	22.26	54.63	74.00	-19.37
15570.000	Average	23.80	22.26	46.06	54.00	-7.94
N/A						

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

Test Mode	IEEE 802.11n HT40 / 5230 MHz	Temp/Hum	24.5(°C)/ 63%RH
Test Item	Harmonic	Test Date	August 18, 2022
Polarize	Vertical	Test Engineer	Ray Li
Detector	Peak / Average		

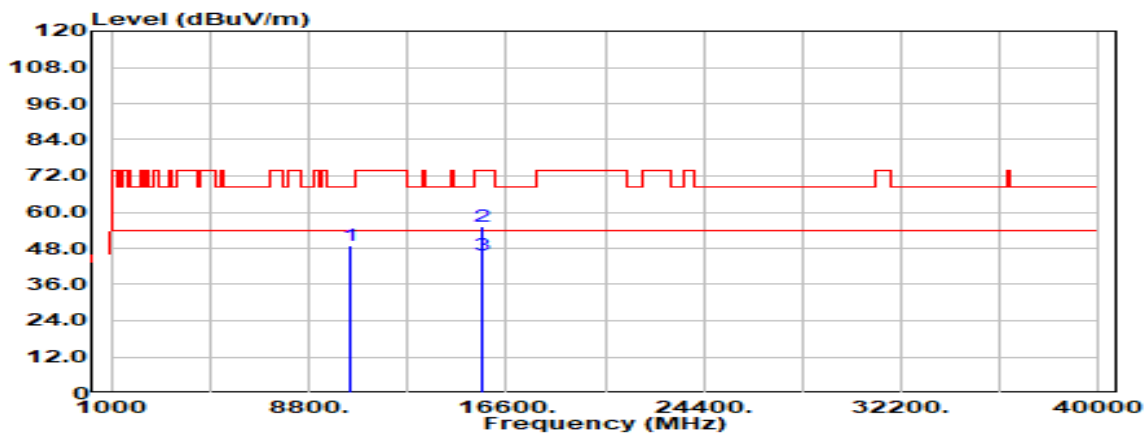


Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBμV)	Factor (dB)	Actual FS (dBμV/m)	Limit @3m (dBμV/m)	Margin (dB)
10460.000	Peak	31.54	18.38	49.92	68.20	-18.28
15690.000	Peak	31.20	22.92	54.12	74.00	-19.88
15690.000	Average	22.67	22.92	45.59	54.00	-8.41
N/A						

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

Test Mode	IEEE 802.11n HT40 / 5230 MHz	Temp/Hum	24.5(°C)/ 63%RH
Test Item	Harmonic	Test Date	August 18, 2022
Polarize	Horizontal	Test Engineer	Ray Li
Detector	Peak / Average		

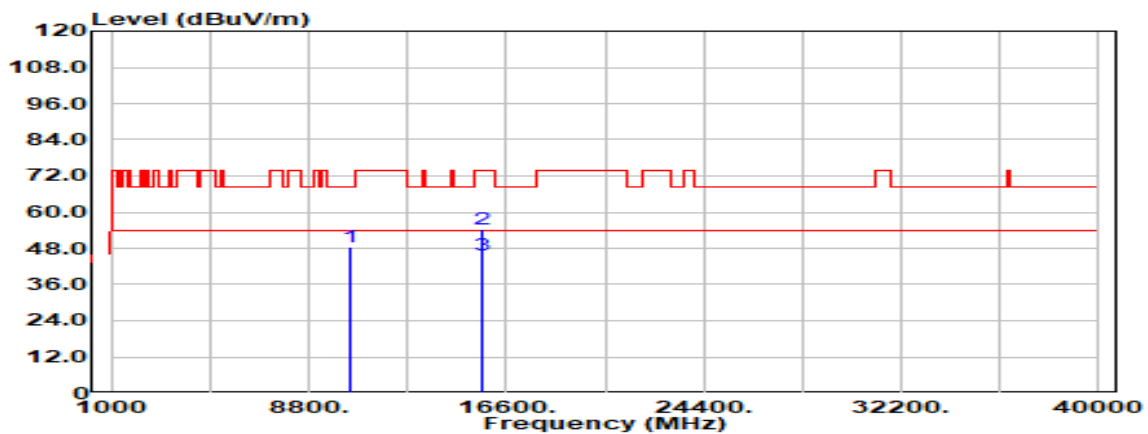


Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBμV)	Factor (dB)	Actual FS (dBμV/m)	Limit @3m (dBμV/m)	Margin (dB)
10460.000	Peak	30.58	18.38	48.95	68.20	-19.25
15690.000	Peak	32.11	22.92	55.03	74.00	-18.97
15690.000	Average	22.74	22.92	45.66	54.00	-8.34
N/A						

Remark:

- Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

Test Mode	IEEE 802.11ac VHT80 / 5210 MHz	Temp/Hum	24.5(°C)/ 63%RH
Test Item	Harmonic	Test Date	August 18, 2022
Polarize	Vertical	Test Engineer	Ray Li
Detector	Peak / Average		

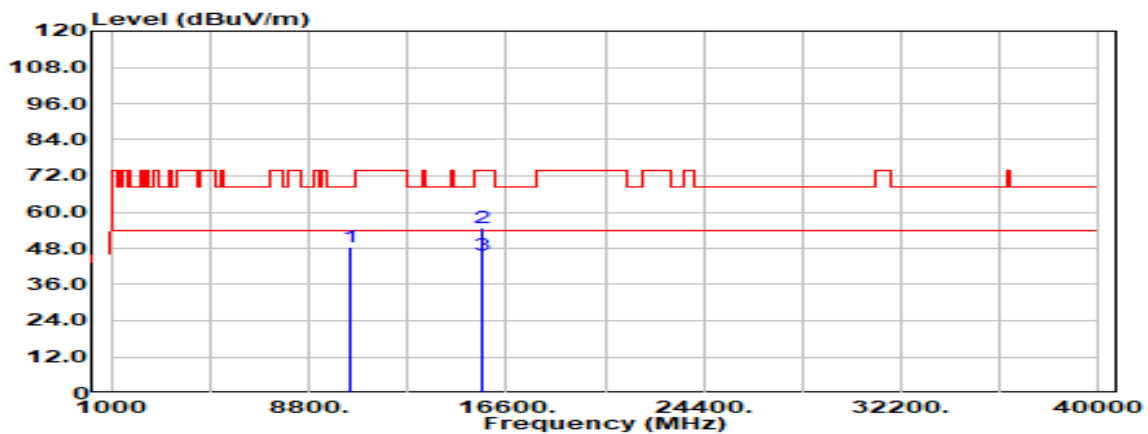


Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBμV)	Factor (dB)	Actual FS (dBμV/m)	Limit @3m (dBμV/m)	Margin (dB)
10420.000	Peak	30.21	18.30	48.52	68.20	-19.68
15630.000	Peak	32.10	22.32	54.42	74.00	-19.58
15630.000	Average	23.28	22.32	45.60	54.00	-8.40
N/A						

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

Test Mode	IEEE 802.11ac VHT80 / 5210 MHz	Temp/Hum	24.5(°C)/ 63%RH
Test Item	Harmonic	Test Date	August 18, 2022
Polarize	Horizontal	Test Engineer	Ray Li
Detector	Peak / Average		



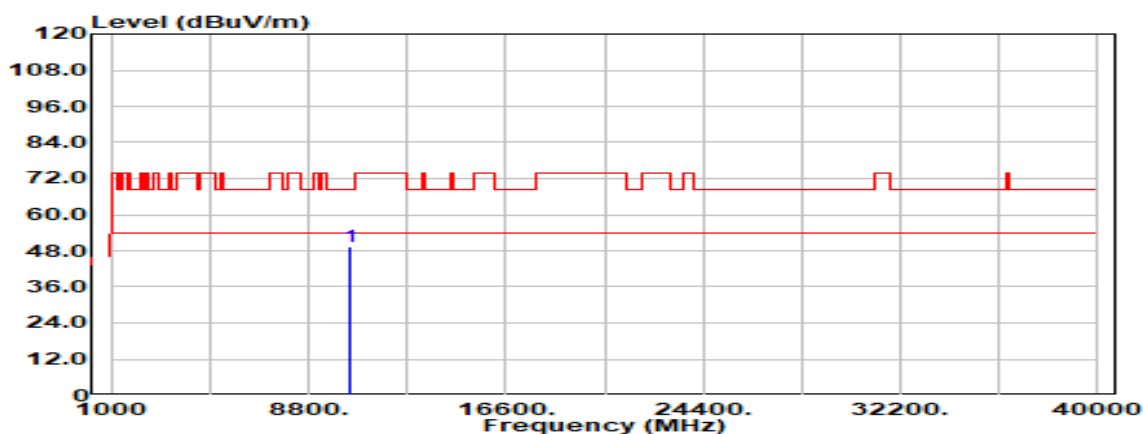
Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBμV)	Factor (dB)	Actual FS (dBμV/m)	Limit @3m (dBμV/m)	Margin (dB)
10420.000	Peak	30.10	18.30	48.40	68.20	-19.80
15630.000	Peak	32.46	22.32	54.78	74.00	-19.22
15630.000	Average	23.42	22.32	45.74	54.00	-8.26
N/A						

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

Simultaneously transmit system (WLAN+BT)

Test Mode	IEEE 802.11a(Band 1) / BT BR	Temp/Hum	24.4(°C)/ 64%RH
Test Item	Harmonic	Test Date	August 22, 2022
Polarize	Vertical	Test Engineer	Tony Chao
Detector	Peak / Average		

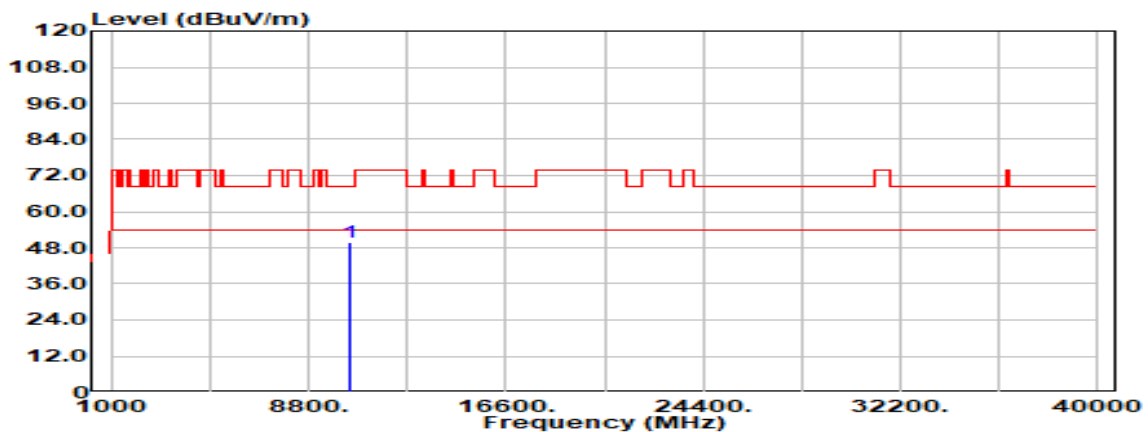


Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBUV)	Factor (dB)	Actual FS (dBUV/m)	Limit @3m (dBUV/m)	Margin (dB)
10440.000	Peak	31.11	18.35	49.45	68.20	-18.75
N/A						

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

Test Mode	IEEE 802.11a(Band 1) / BT BR	Temp/Hum	24.4(°C)/ 64%RH
Test Item	Harmonic	Test Date	August 22, 2022
Polarize	Horizontal	Test Engineer	Tony Chao
Detector	Peak / Average		



Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBPμV)	Factor (dB)	Actual FS (dBPμV/m)	Limit @3m (dBPμV/m)	Margin (dB)
10440.000	Peak	31.44	18.35	49.78	68.20	-18.42
N/A						

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

-- End of Test Report --