Report No.: ET-24040349E03

TEST REPORT

Applicant:	Jiumao (Shenzhen) Industrial Co., LTD
Address of Applicant:	2nd Floor, Building 9, Jingxuan Industrial Park, Donghuan Road, Longhua District, Shenzhen
Manufacturer/Factory:	Jiumao (Shenzhen) Industrial Co., LTD
Address of Manufacturer	2nd Floor, Building 9, Jingxuan Industrial Park, Donghuan Road, Longhua District, Shenzhen
Product Name:	Projector
Model No.:	A10,M10PLUS,M10,M8,M7,M9,M6,M5,M3,M2,M1,M98,Q96, M11,M96,M95,X18,X10,H10,M10,H10PLUS,X10PLUS, X18PRO,X10PRO,E350,E450,A10PRO,A10PLUS,M10PRO, E450PLUS,E350PLUS
Trade Mark:	JIUMAO
FCC ID:	2BB8K-A10
IC:	32496-A10
Applicable standards:	FCC CFR Title 47 Part 15 Subpart E Section 15.407 RSS-247 Issue 3
Date of Test:	Apr.24, 2024-May.08, 2024
Date of report issued:	May.28, 2024

Remark:

The results shown in this test report refer only to the sample(s) tested , this test report cannot be reproduced, except in full without prior written permission of the company.

The report would be invalid without specific stamp of test institute and the signatures of compiler and approver

Prepared By

Shenzhen ETR Standard Technology Co., Ltd.

Address: No.103, No.10, Phase I, Zone 3, Xinxing Industrial Park, Xinhe, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

Compiled by:	Reviewed by:	Approved by:
Project Engineer	Project Manager	Authorized Signature

Report Revision History		
Report No.	Description	Issue Date
ET-24040349E03	Original	May.28, 2024

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1 Test Summary

Test Item	Section in CFR 47	Result	Test by
Antenna requirement	15.203,RSS-Gen §6.8	Pass	/
AC Power Line Conducted Emission	15.207,RSS-Gen §8.8	Pass	Yao zhou
Conducted Output Power	15.407 (a)(1)/(a)(3) RSS-247 §6.2.1.1&6.2.4.2	Pass	Yvan Fan
26dB Bandwidth and 99% Occupied Bandwidth	15.407 (a)(12) ,RSS-Gen 6.7	Pass	Yvan Fan
6dB Bandwidth	15.407 (e),RSS-247 §6.2.4.2	Pass	Yvan Fan
Power Spectral Density	15.407(a)(1)/(a)(3) RSS-247 §6.2.1.1&6.2.4.2	Pass	Yvan Fan
Band Edge	15.407(b)(1)/(b)(4) RSS-247 §6.2.1.2&6.2.4.3	Pass	Yvan Fan
Spurious Emission	15.205/15.209 15.407(b)(1)/(b)(4)/(b)(8) RSS-247 §6.2.1.2&6.2.4.3	Pass	Yao zhou
Frequency Stability	15.407(g),RSS Gen§ 8.11	Pass	Yvan Fan

Remarks:

1. *Pass: The EUT complies with the essential requirements in the standard.*
2. *Test according to ANSI C63.10:2013 and RSS Gen.*
3. *Note: Compliance determination rules*

1).The Compliance determination of test results does not take into account measurement uncertainty. Measurement results are determined based on regulatory limitations or requirements specified by the applicant/manufacturer. If measurement uncertainty is taken into account, the applicant/manufacturer will bear all possible risks of non-compliance.

2).The measurement uncertainty please refer to each test result in the "Measurement Uncertainty"

1.1 Measurement Uncertainty

Test Item	Measurement Uncertainty	Notes
Occupied Channel Bandwidth	±0.55%	(1)
RF output power, conducted	±0.99dB	(1)
Power Spectral Density, conducted	±0.61dB	(1)
Unwanted Emissions, conducted	±0.64dB	(1)
AC Power Line Conducted Emission	± 3.02dB	(1)
Radiated emissions 9K-30MHz	±3.98dB	(1)
Radiated emissions 30M- 1GHz	±4.32dB	(1)
Radiated emissions 1GHz-18GHz	±4.56dB	(1)
Radiated emissions 18GHz-40GHz	±4.59 dB	(1)
Note (1): The measurement uncertainty is for coverage factor of k=2 and a level of confidence of 95%.		

2 General Information

2.1 General Description of EUT

Product Name:	Projector
Model No.:	A10,M10PLUS,M10,M8,M7,M9,M6,M5,M3,M2,M1,M98,Q96,M11,M96, M95,X18,X10,H10,M10,H10PLUS,X10PLUS,X18PRO,X10PRO,E350, E450,A10PRO,A10PLUS,M10PRO,E450PLUS,E350PLUS
Difference of model(s)	All the model are the same circuit and RF module, except the model names.
Test Model:	A10
Hardware Version:	N/A
Software Version:	N/A
Sample(s) Status:	Engineer sample
Operation Frequency:	☒5180-5240MHz for 802.11a/n(HT20)/ac20; 5190-5230MHz for 802.11n(HT40)/ac40; 5210MHz for 802.11 ac80; ☒5745-5825 MHz for 802.11a/n(HT20)/ac20; 5755-5795 MHz for 802.11n(HT40)/ac40; 5775MHz for 802.11 ac80;
Channel numbers:	☒4 channels for 802.11a/n20/ac20 in the 5180-5240MHz band; 2 channels for 802.11 n40/ac40 in the 5190-5230MHz band ; 1 channels for 802.11 ac80 in the 5210MHz band ; ☒5 channels for 802.11a/n20/ac20 in the 5745-5825MHz band ; 2 channels for 802.11 n40/ac40 in the 5755-5795MHz band ; 1 channels for 802.11 ac80 in the 5775MHz band
Channel bandwidth:	802.11a/802.11n(HT20)/ 802.11ac(HT20): 20MHz 802.11n(HT40)/ 802.11ac(HT40) : 40MHz 802.11ac(HT80) : 80MHz
Data Rate	802.11a: 6,9,12,18,24,36,48,54Mbps; 802.11n(HT20/HT40):MCS0-MCS15; 802.11ac(VHT/20/40/80):NSS1, MCS0-MCS9
Modulation technology:	Orthogonal Frequency Division Multiplexing (OFDM) with BPSK/QPSK/16QAM/64QAM/256QAM
Antenna Type:	Integrated antenna
Antenna gain:	3.46 dBi(Declare by applicant) Note: Antenna information is provided by applicant, Testing lab is not responsible for the accuracy of the information.
Battery	N/A
Power supply:	AC 100-240V 50/60Hz

For more details, refer to the user's manual of the EUT.

Operation Frequency each of channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
36	5180MHz	38	5190MHz	40	5200MHz	42	5210MHz
44	5220MHz	46	5230MHz	48	5240MHz	/	/
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
149	5745MHz	151	5755MHz	153	5765MHz	155	5775MHz
157	5785MHz	159	5795MHz	161	5805MHz	/	/
165	5825MHz	/					

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Test channel	Frequency (MHz)		
	802.11 a /n(HT20)/ac(HT20)	802.11 n(HT40)/ac(HT40)	802.11ac(HT80)
Lowest channel	5180	5190	5210
Middle channel	5200		
Highest channel	5240	5230	

Test channel	Frequency (MHz)		
	802.11 a /n(HT20)/ac(HT20)	802.11 n(HT40)/ac(HT40)	802.11ac(HT80)
Lowest channel	5745	5755	5775
Middle channel	5785		
Highest channel	5825	5795	

2.2 Test mode

Transmitting mode	Keep the EUT in continuously transmitting mode(or with a duty cycle ≥ 98%)

Remark: During the test, the test voltage was tuned from 85% to 115% of the nominal rated supply voltage, and found that the worst case was under the nominal rated supply condition. So the report just shows that condition's data.

We have verified the construction and function in typical operation. All the test modes were carried out with the EUT in transmitting operation, which was shown in this test report and defined as follows:

Pretest Mode	Description
Mode 1	802.11a / n 20 CH36/ CH40/ CH 48 802.11a /n 20 CH149/ CH157/ CH 165
Mode 2	802.11n 40 CH38/ CH 46 802.11n 40 CH 151 / CH 159
Mode 3	802.11 ac80 CH 42/CH 155
Mode 4	802.11a / n 20 CH36/ CH40/ CH 48 802.11a /n 20 CH149/ CH157/ CH 165
Mode 5	Link Mode

Conducted Emission	
Final Test Mode	Description
Mode 5	Link Mode

For Radiated Emission	
Final Test Mode	Description
Mode 1	802.11a / n 20 CH36/ CH40/ CH 48 802.11a /n 20 CH149/ CH157/ CH 165
Mode 2	802.11n 40 CH38/ CH 46 802.11n 40 CH 151 / CH 159
Mode 3	802.11 ac80 CH 42/CH 155
Mode 4	802.11a / n 20 CH36/ CH40/ CH 48 802.11a /n 20 CH149/ CH157/ CH 165

Note:

(1) The measurements are performed at all Bit Rate of Transmitter, the worst data was reported.

2.3 Description of Support Units

No.	Description	Manufacturer	Model	Serial Number
1	Notebook	Dell	Vostro 3520	/

2.4 Deviation from Standards

None.

2.5 Abnormalities from Standard Conditions

None.

2.6 Test Facility

Test laboratory:	Shenzhen ETR Standard Technology Co., Ltd.
CNAS Registration Number:	L11864
A2LA Certificate Number:	6640.01
FCC Designation Number:	CN1326
FCC Test Firm Registration:	183064
IC Company Number:	28440

2.7 Test Location

All tests were performed at:	
Laboratory location:	No.103, No.10, Phase I, Zone 3, Xinxing Industrial Park, Xinhe, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
Telephone:	+86 755 85259392

2.8 Additional Instructions

Test Software	COM Port Command
Power level setup	Default

3 Test Instruments list

Conducted Emission

Item	Equipment name	Manufacturer	Model	Serial No.	Calibration date	Due date
1	EMI Test Receiver	Rohde&schwarz	ESCI3	100605	2024.3.12	2025.3.11
2	Artificial power network	schwarabeck	NSLK8127	8127483	2024.3.12	2025.3.11
3	Artificial power network	ETS	3186/2NM	1132	2024.3.12	2025.3.11
4	10dB attenuator	HUBER+SUHNER	10dB	/	2024.3.12	2025.3.11
5	Cable 4	HUBER SUNNER	3M	/	2024.3.12	2025.3.11
6	Absorbing Clamp	schwarabeck	MDS21	D69250	2024.3.12	2025.3.11

Radiated Emission &RF Conducted test:

Item	Equipment name	Manufacturer	Model	Serial No.	Calibration date	Due date
1	EMI Test Receiver	Rohde&schwarz	ESCI7	101032	2024.3.12	2025.3.11
2	Broadband antenna	schwarabeck	VULB9168	1064	2024.3.19	2026.3.18
3	Horn antenna	schwarabeck	BBHA9120D	9120D-1145	2024.3.19	2026.3.18
4	Amplifier	EMtrace	RP01A	50117	2024.3.12	2025.3.11
5	Amplifier	Space-Dtronics	EWLAN0118G-P40	19113001	2024.3.12	2025.3.11
6	Spectrum analyzer	KEYSIGHT	N9020A	MY55370280	2024.3.12	2025.3.11
7	Power detector meter	MWRFtest	MW100-PSB	MW201020JYT	2024.3.12	2025.3.11
8	Signal generator	Agilent	N5182A	MY49060455	2024.3.12	2025.3.11
9	Spectrum analyzer	Rohde&schwarz	FSU40	1166.1660K43	2024.3.12	2025.3.11
10	Amplifier	SKET	LNPA_1840-50	SK2019040302	2024.3.12	2025.3.11
11	Horn antenna	schwarabeck	BBHA 9170	946	2024.3.19	2026.3.18
12	Loop antenna	schwarabeck	FMZB 1519 B	1519	2024.3.19	2026.3.18
13	Cable 6	HUBER SUNNER	0.5M	/	2024.3.12	2025.3.11
14	Cable7	HUBER SUNNER	2.0M	/	2024.3.12	2025.3.11
15	Cable8	HUBER SUNNER	6.0M	/	2024.3.12	2025.3.11
16	Filter	Xin bo	XBLBQ-GTA29	210410-3-2	2024.3.12	2025.3.11
17	Power meter	Rohde&Schwarz	NRP-Z11	1138.3004.02-117725-vh	2024.3.12	2025.3.11

Note: the calibration interval of the above test instruments is 12 or 24 months and the calibrations are traceable to international system unit (SI).

Software Name	Manufacturer	Model	Version
RF test software	MWRFtest	MTS 8310	V2.0.0.0
Conducted test software	EZ-EMC	Farad	Ver.EMC-CON 3A1.1
Radiated test software	EZ-EMC	Farad	Ver.FA-03A2 RE

4 Test results and Measurement Data

4.1 Antenna requirement

Standard requirement:	FCC Part15 C Section 15.203

15.203 requirement:

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, 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.

RSS-Gen 6.8:

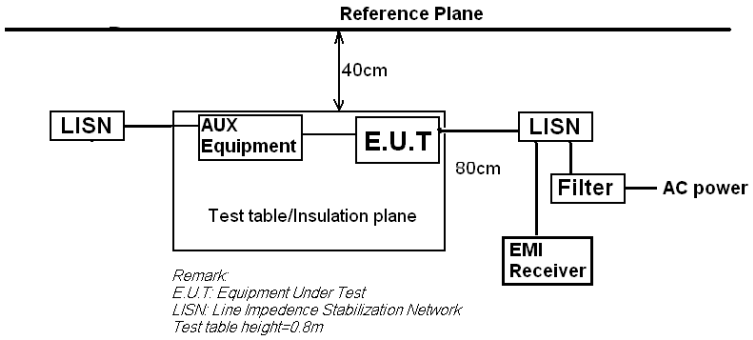
The applicant for equipment certification shall provide a list of all antenna types that may be used with the transmitter, where applicable (i.e. for transmitters with detachable antenna), indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna. The test report shall demonstrate the compliance of the transmitter with the limit for maximum equivalent isotropically radiated power (e.i.r.p.) specified in the applicable RSS, when the transmitter is equipped with any antenna type, selected from this list.

For expediting the testing, measurements may be performed using only the antenna with highest gain of each combination of transmitter and antenna type, with the transmitter output power set at the maximum level. However, the transmitter shall comply with the applicable requirements under all operational conditions and when in combination with any type of antenna from the list provided in the test report (and in the notice to be included in the user manual, provided below).

E.U.T Antenna:	

The antennas are Integrated antenna, the best case gain of the antennas are 3.46 dBi, reference to the appendix II for details

4.2 Conducted Emissions

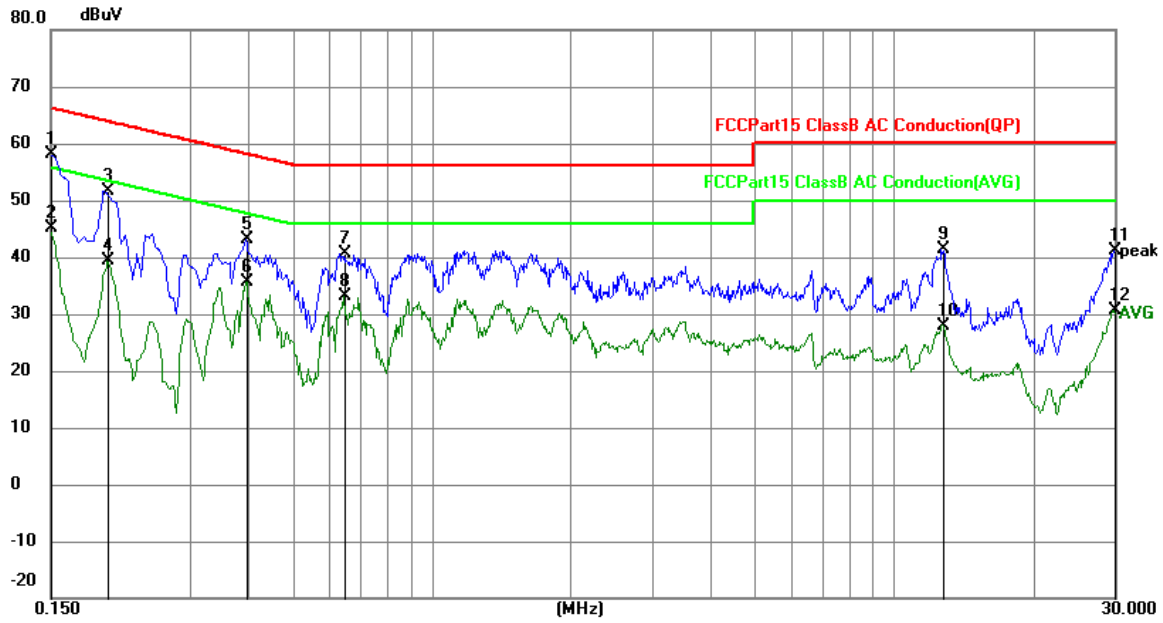
<table>
<tr><td>Test Requirement:</td><td colspan="6">FCC Part15 C Section 15.207, RSS-Gen §8.8</td></tr>
<tr><td>Test Method:</td><td colspan="6">ANSI C63.10:2013 and RSS-Gen</td></tr>
<tr><td>Test Frequency Range:</td><td colspan="6">150KHz to 30MHz</td></tr>
<tr><td>Receiver setup:</td><td colspan="6">RBW=9KHz, VBW=30KHz, Sweep time=auto</td></tr>
<tr><td>Limit:</td><td colspan="6">
<table>
<tr><td rowspan="2">Frequency range (MHz)</td><td colspan="2">Limit (dBuV)</td></tr>
<tr><td>Quasi-peak</td><td>Average</td></tr>
<tr><td>0.15-0.5</td><td>66 to 56*</td><td>56 to 46*</td></tr>
<tr><td>0.5-5</td><td>56</td><td>46</td></tr>
<tr><td>5-30</td><td>60</td><td>50</td></tr>
</table>
* Decreases with the logarithm of the frequency.
</td></tr>
<tr><td>Test setup:</td><td colspan="6"> 
</td></tr>
<tr><td>Test procedure:</td><td colspan="6">1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment.
2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs).
3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10:2013 on conducted measurement.</td></tr>
<tr><td>Test Instruments:</td><td colspan="6">Refer to section 3.0 for details</td></tr>
<tr><td>Test mode:</td><td colspan="6">Refer to section 2.2 for details</td></tr>
<tr><td>Test environment:</td><td>Temp.:</td><td>25.2°C</td><td>Humid.:</td><td>58%</td><td>Press.:</td><td>1012mbar</td></tr>
<tr><td>Test voltage:</td><td colspan="6">AC 120V, 60Hz</td></tr>
<tr><td>Test results:</td><td colspan="6">PASS</td></tr>
</table>

1. Both high voltage and low voltage have been tested, and the report only shows the worst case data with AC 120V/60Hz.

2. All mode have been tested, the report only shows the worst mode of 802.11ac20 (5180MHz)

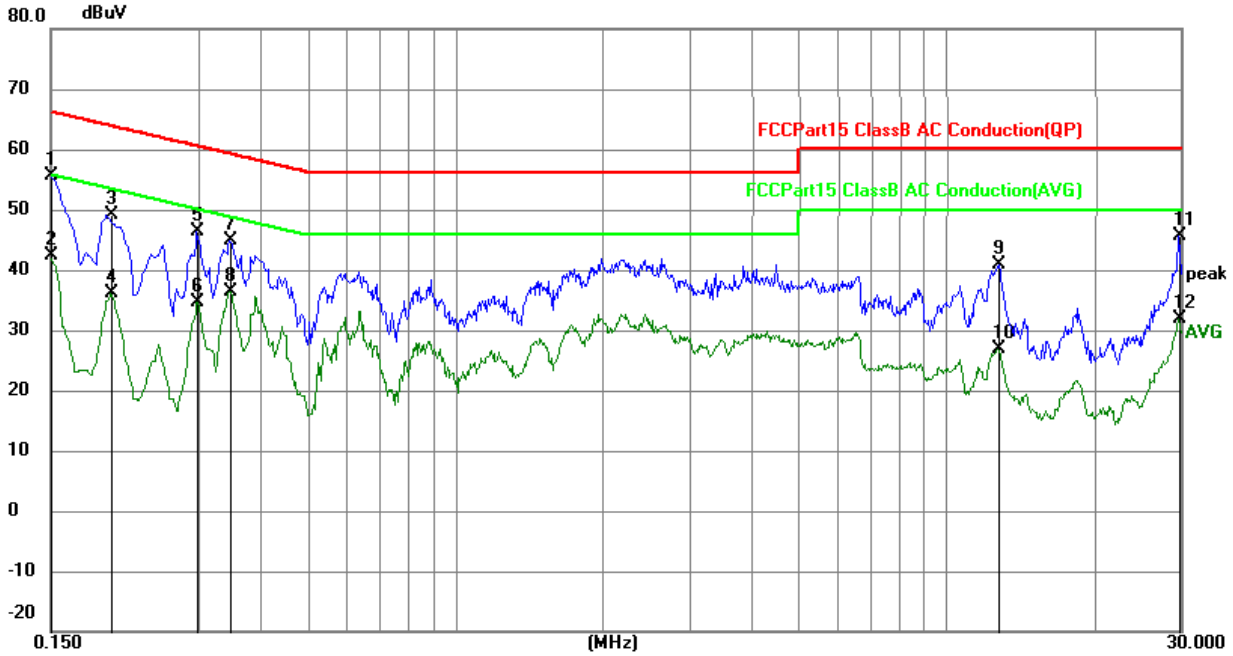
Measurement Result

Line:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1500	48.29	9.80	58.09	66.00	-7.91	QP
2	0.1500	35.37	9.80	45.17	56.00	-10.83	AVG
3	0.1995	41.86	9.81	51.67	63.63	-11.96	QP
4	0.1995	29.49	9.81	39.30	53.63	-14.33	AVG
5	0.3975	33.31	9.90	43.21	57.91	-14.70	QP
6	0.3975	25.76	9.90	35.66	47.91	-12.25	AVG
7	0.6450	30.58	9.94	40.52	56.00	-15.48	QP
8	0.6450	23.24	9.94	33.18	46.00	-12.82	AVG
9	12.7815	31.48	9.79	41.27	60.00	-18.73	QP
10	12.7815	18.21	9.79	28.00	50.00	-22.00	AVG
11	29.8770	31.74	9.49	41.23	60.00	-18.77	QP
12	29.8770	21.22	9.49	30.71	50.00	-19.29	AVG

Neutral:

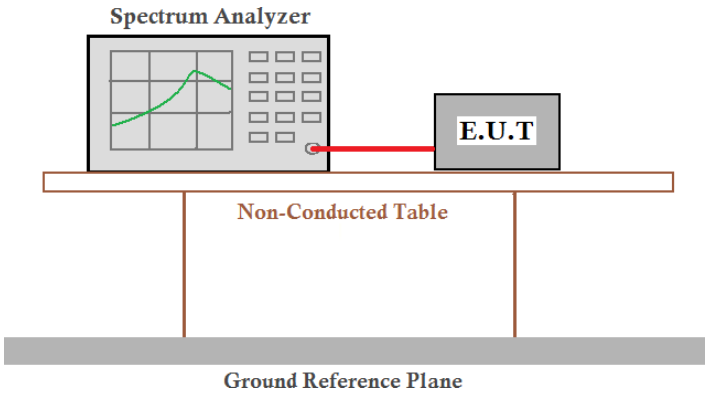


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1500	45.89	9.80	55.69	66.00	-10.31	QP
2	0.1500	32.48	9.80	42.28	56.00	-13.72	AVG
3	0.1995	39.20	9.81	49.01	63.63	-14.62	QP
4	0.1995	26.24	9.81	36.05	53.63	-17.58	AVG
5	0.2985	36.43	9.84	46.27	60.28	-14.01	QP
6	0.2985	24.80	9.84	34.64	50.28	-15.64	AVG
7	0.3480	35.05	9.88	44.93	59.01	-14.08	QP
8	0.3480	26.55	9.88	36.43	49.01	-12.58	AVG
9	12.7319	31.14	9.80	40.94	60.00	-19.06	QP
10	12.7319	16.97	9.80	26.77	50.00	-23.23	AVG
11	29.7690	36.07	9.49	45.56	60.00	-14.44	QP
12	29.7690	22.50	9.49	31.99	50.00	-18.01	AVG

Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level =Receiver Read level + LISN Factor + Cable Loss
4. *If the average limit is met when using a quasi-peak detector receiver, the EUT shall be deemed to meet both limits and measurement with the average detector receiver is unnecessary.*

4.3 Duty cycle

Test Method :	ANSI C63.10:2013	
Limit:	/	
Test setup:		
Test Instruments:	Refer to section 3.0 for details	
Test mode:	Refer to section 2.2 for details	
Test environment:	Temp.: 24.9℃	Humid.: 53%RH
Test voltage:	AC 120V, 60Hz	
Test results:	Pass	

Measurement Result

5180-5240MHz

Mode	Duty cycle (%)	Correction Factor (dB)
TX 802.11a Mode	97.90	0.09
TX 802.11n20 Mode	97.01	0.13
TX 802.11ac20 Mode	97.04	0.13
TX 802.11n40 Mode	94.20	0.26
TX 802.11ac40 Mode	95.59	0.20
TX 802.11ac80 Mode	91.67	0.38

5745-5825 MHz

Mode	Duty cycle (%)	Correction Factor (dB)
TX 802.11a Mode	97.20	0.12
TX 802.11n20 Mode	97.74	0.10
TX 802.11ac20 Mode	97.04	0.13
TX 802.11n40 Mode	94.20	0.26
TX 802.11ac40 Mode	94.20	0.26
TX 802.11ac80 Mode	88.89	0.51

Test plot

5180-5240MHz

(802.11a) plot on channel 40

(802.11 n20) plot on channel 40

Test plot

(802.11ac20) plot on channel 40

(802.11 n40) plot on channel 38

(802.11ac40) plot on channel 38

(802.11ac80) plot on channel 42

5745-5825 MHz

(802.11a) plot on channel 157

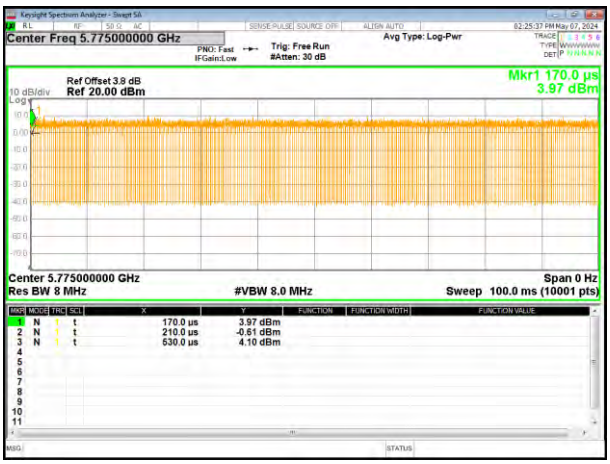
(802.11 n20) plot on channel 157

(802.11ac20) plot on channel 157

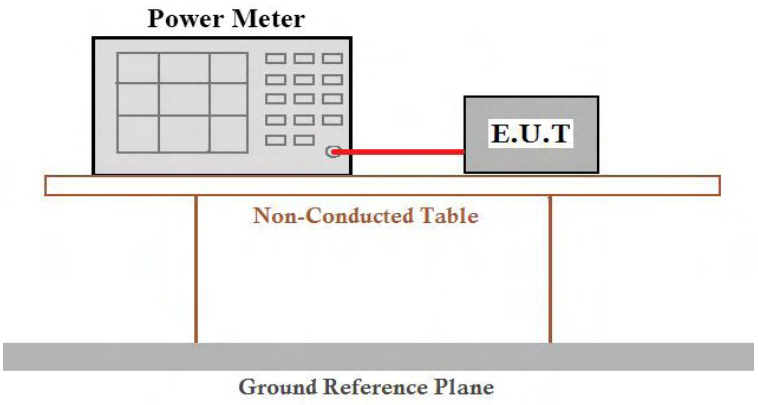
(802.11 n40) plot on channel 153

(802.11ac40) plot on channel 153

(802.11ac80) plot on channel 155



4.4 Conducted Output Power

Test Requirement:	FCC Part15 E Section 15.407 (a)(1)/(a)(3), RSS-247 §6.2.1.1&6.2.4.2	
Test Method:	ANSI C63.10:2013 and KDB 789033 D02 General U-NII Test Procedures New Rules v02r01 and RSS Gen	
Limit:	5150-5250MHz : 250mW 5725~5850MHz : 1W	
Test setup:		
Test Instruments:	Refer to section 3.0 for details	
Test mode:	Refer to section 2.2 for details	
Test environment:	Temp.: 24.9°C	Humid.: 53%RH
Test voltage:	AC 120V /60Hz	
Test results:	Pass	

Measurement Result

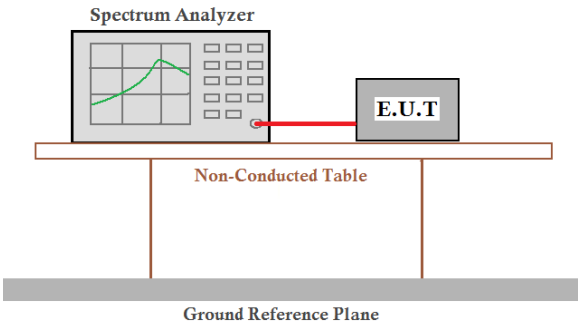
5180-5240MHz

Test Channel	Frequency	Correction Factor	Maximum output power	Total Power	LIMIT	Result
	(MHz)	(dB)	(dBm)	(dBm)	dBm	
TX 802.11a Mode						
CH36	5180	0.09	13.43	13.52	23.98	Pass
CH40	5200	0.09	14.26	14.35	23.98	Pass
CH48	5240	0.09	12.21	12.3	23.98	Pass
TX 802.11 n20 Mode						
CH36	5180	0.13	13.08	13.21	23.98	Pass
CH40	5200	0.13	12.76	12.89	23.98	Pass
CH48	5240	0.13	12.41	12.54	23.98	Pass
TX 802.11 ac20 Mode						
CH36	5180	0.13	15.50	15.63	23.98	Pass
CH40	5200	0.13	14.19	14.32	23.98	Pass
CH48	5240	0.13	11.76	11.89	23.98	Pass
TX 802.11 n40 Mode						
CH38	5190	0.26	14.92	15.18	23.98	Pass
CH46	5230	0.26	14.35	14.61	23.98	Pass
TX 802.11 ac40 Mode						
CH38	5190	0.20	11.92	12.12	23.98	Pass
CH46	5230	0.20	11.89	12.09	23.98	Pass
TX 802.11 ac80 Mode						
CH42	5210	0.38	11.10	11.48	23.98	Pass

5745-5825 MHz

Test Channel	Frequency	Correction Factor	Maximum output power	Total Power	LIMIT	Result
	(MHz)	(dB)	(dBm)	(dBm)	dBm	
TX 802.11a Mode						
CH149	5745	0.12	14.41	14.53	30	Pass
CH157	5785	0.12	13.89	14.01	30	Pass
CH165	5825	0.12	13.64	13.76	30	Pass
TX 802.11 n20 Mode						
CH149	5745	0.10	13.72	13.82	30	Pass
CH157	5785	0.10	13.86	13.96	30	Pass
CH165	5825	0.10	13.51	13.61	30	Pass
TX 802.11 ac20 Mode						
CH149	5745	0.13	14.33	14.46	30	Pass
CH157	5785	0.13	13.86	13.99	30	Pass
CH165	5825	0.13	13.53	13.66	30	Pass
TX 802.11 n40 Mode						
CH151	5755	0.26	12.72	12.98	30	Pass
CH159	5795	0.26	12.39	12.65	30	Pass
TX 802.11 ac40 Mode						
CH151	5755	0.26	12.75	13.01	30	Pass
CH159	5795	0.26	12.33	12.59	30	Pass
TX 802.11 ac80 Mode						
CH155	5775	0.51	11.49	12.00	30	Pass

4.5 26dB Bandwidth &99% Occupied Bandwidth

Test Requirement:	FCC Part15 E Section 15.407(a)(12)&15.407(e), RSS-247 §6.2.1.2&6.2.4.2
Test Method:	ANSI C63.10:2013 and KDB 789033 D02 General U-NII Test Procedures New Rules v02r01 and RSS Gen
Limit:	Measurements in the 5.725-5.85 GHz band, the minimum bandwidth 6 dB bandwidth of U-NII devices shall be at least 500KHz. Measurements in the 5.15-5.25 GHz, 5.25-5.35 GHz, and the 5.47-5.725 GHz bands are made over a bandwidth of 1 MHz or the 26 dB emission bandwidth of the device, whichever is less. A narrower resolution bandwidth can be used, provided that the measured power is integrated over the full reference bandwidth.
Test setup:	
Test Instruments:	Refer to section 3.0 for details
Test mode:	Refer to section 2.2 for details
Test environment:	Temp.: 24.9°C Humid.: 53%RH
Test voltage:	AC 120V /60Hz
Test results:	Pass

Measurement Result

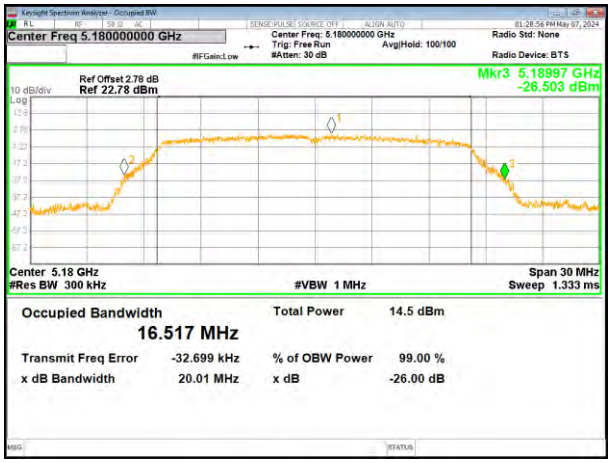
5180-5240MHz

Test CH	-26dB Channel Bandwidth (MHz)						Result
	802.11a	802.11n (HT20)	802.11ac (HT20)	802.11n (HT40)	802.11ac (HT40)	802.11ac (HT80)	
Lowest	20.01	20.16	20.47	39.85	39.52	--	Pass
Middle	19.77	20.21	20.58	--	--	78.87	
Highest	19.97	20.32	20.22	39.25	39.53	--	

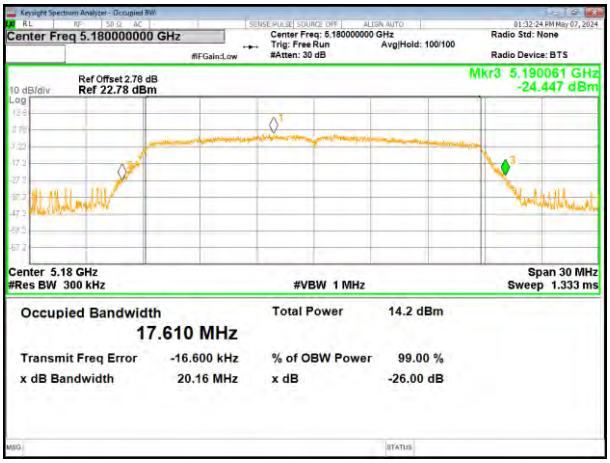
Test CH	99% Occupy Bandwidth (MHz)						Result
	802.11a	802.11n (HT20)	802.11ac (HT20)	802.11n (HT40)	802.11ac (HT40)	802.11ac (HT80)	
Lowest	16.395	17.520	17.527	35.934	35.991	--	Pass
Middle	16.373	17.528	17.535	--	--	75.145	
Highest	16.385	17.542	17.540	35.967	35.821	--	

Test plot -26dB Channel Bandwidth

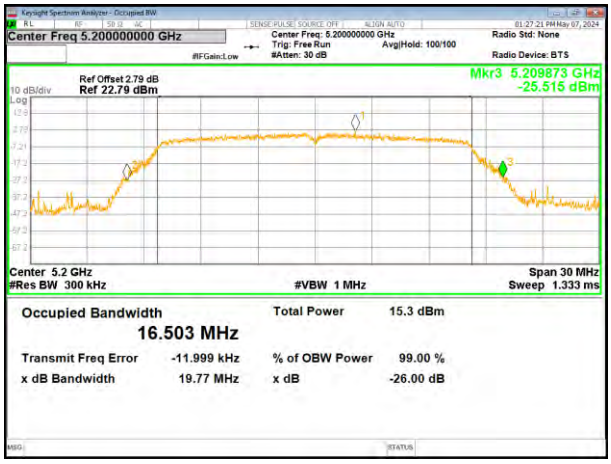
(802.11a) plot on channel 36



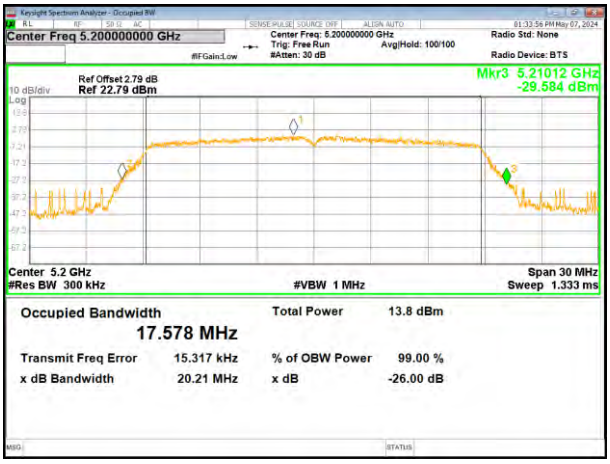
(802.11 n20) plot on channel 36



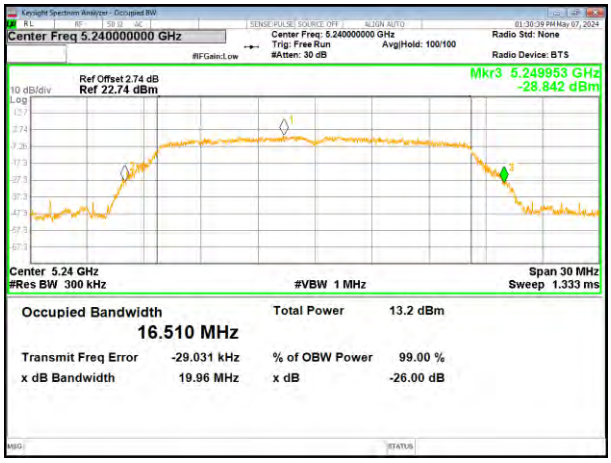
(802.11a) plot on channel 40



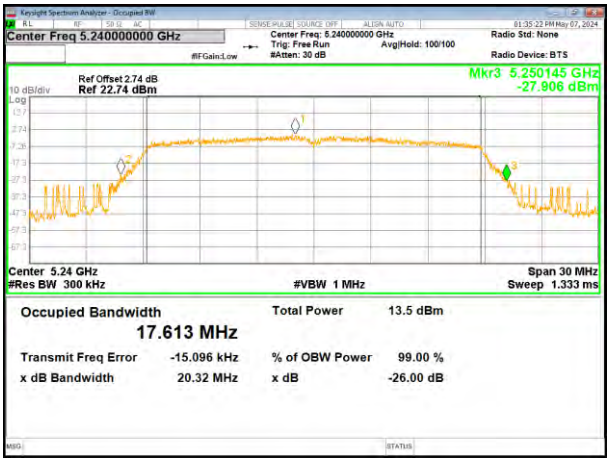
(802.11 n20) plot on channel 40



(802.11a) plot on channel 48

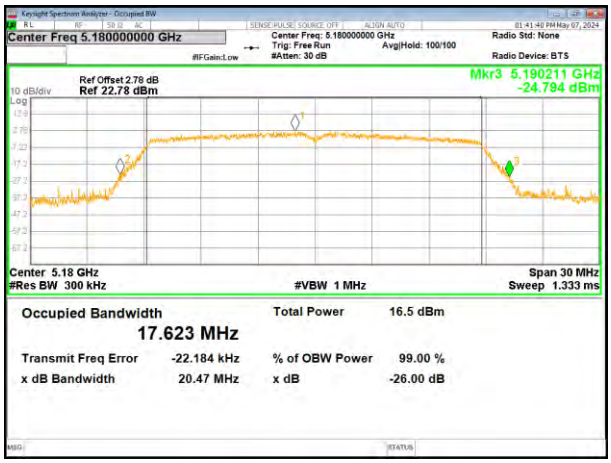


(802.11 n20) plot on channel 48



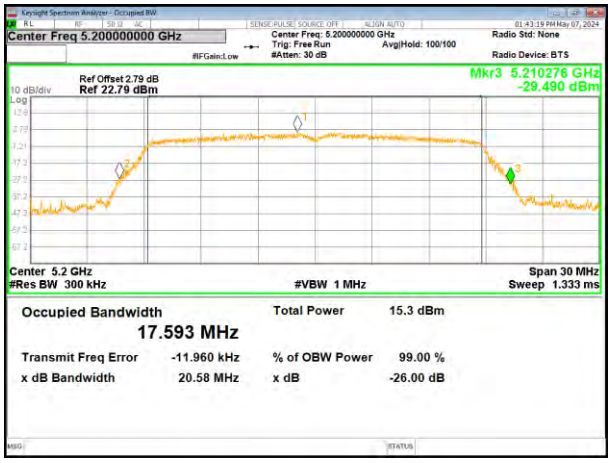
Test plot

(802.11ac20) plot on channel 36

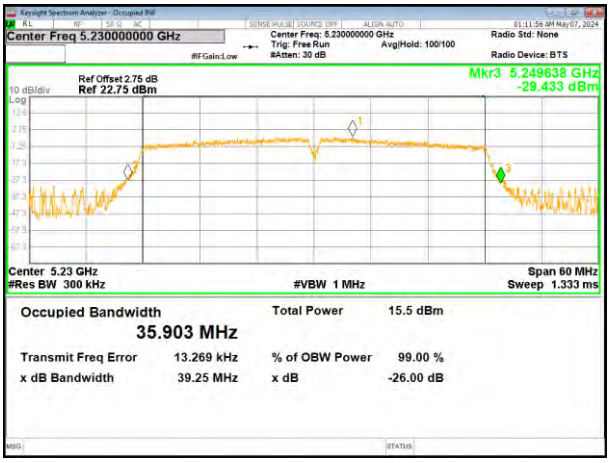


(802.11 n40) plot on channel 38

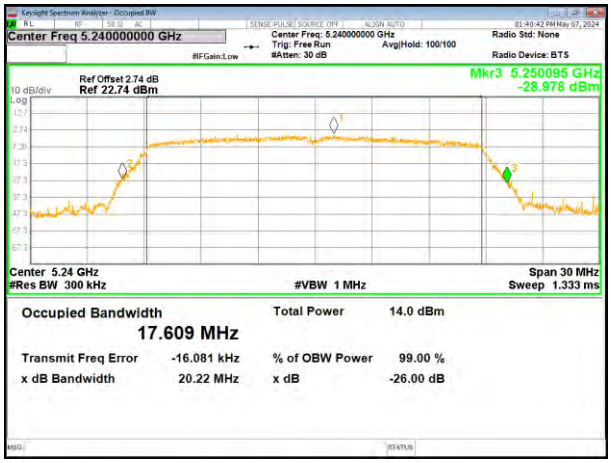
(802.11ac20) plot on channel 40



(802.11 n40) plot on channel 46

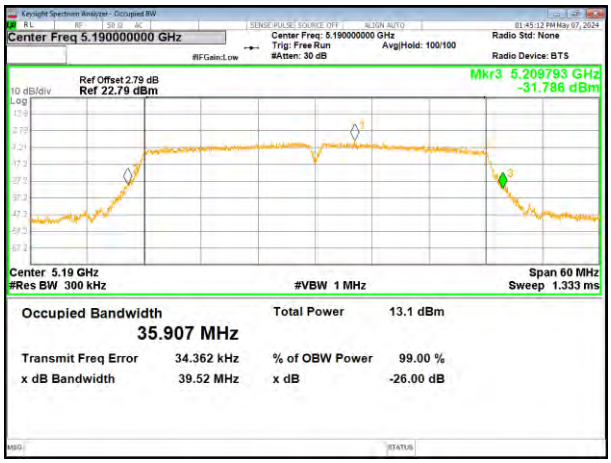


(802.11ac20) plot on channel 48

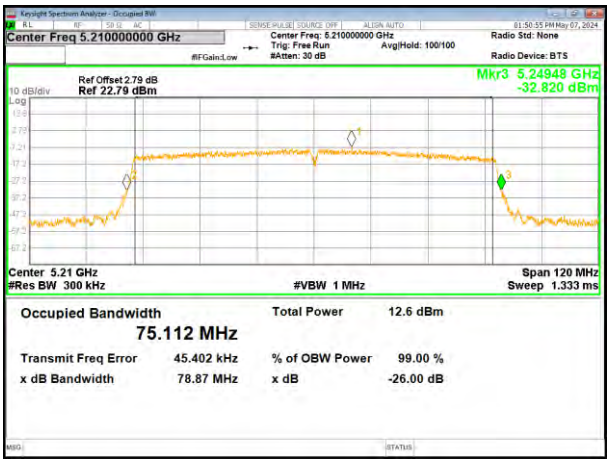


Test plot

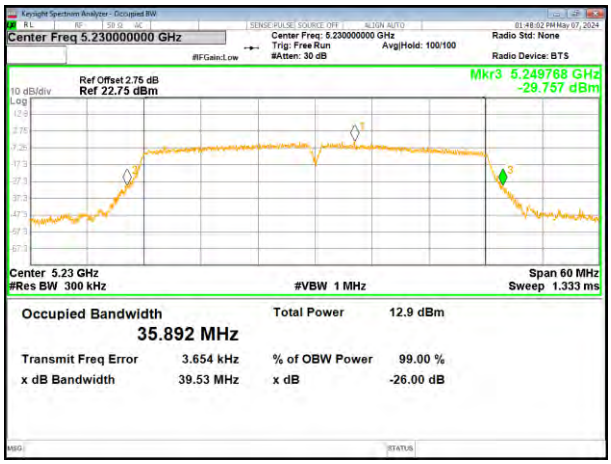
(802.11ac40) plot on channel 38



(802.11ac80) plot on channel 42

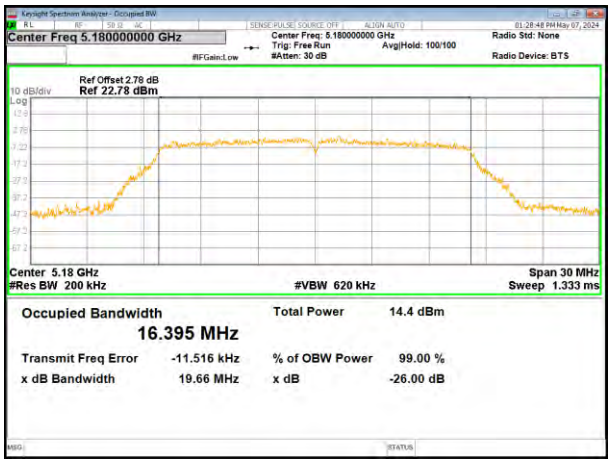


(802.11ac40) plot on channel 46

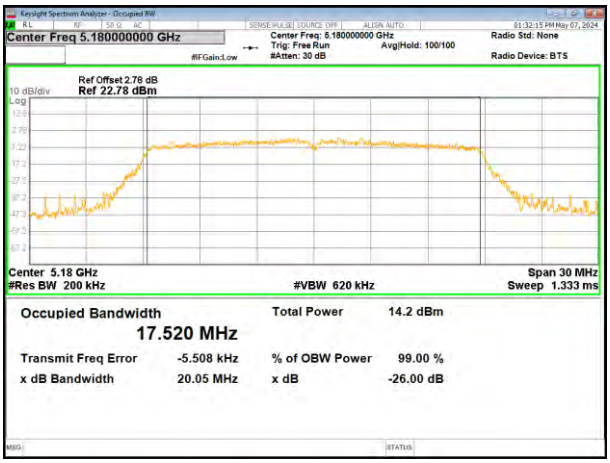


Test plot 99% Occupy Bandwidth

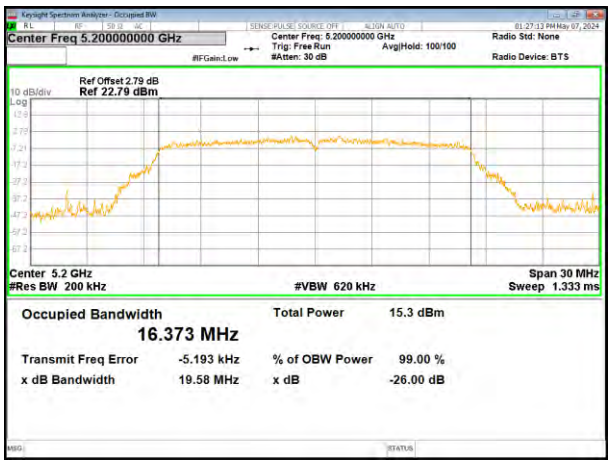
(802.11a) plot on channel 36



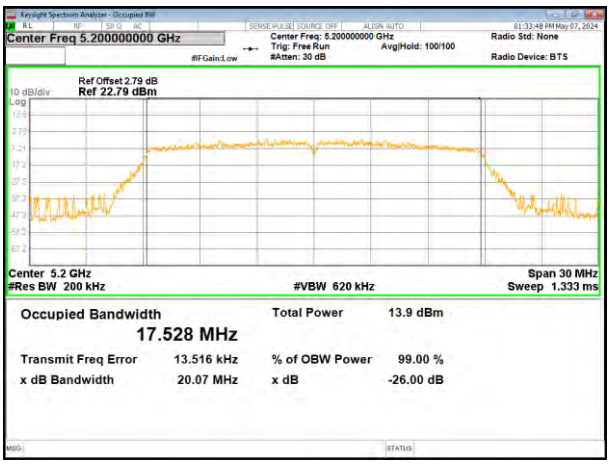
(802.11 n20) plot on channel 36



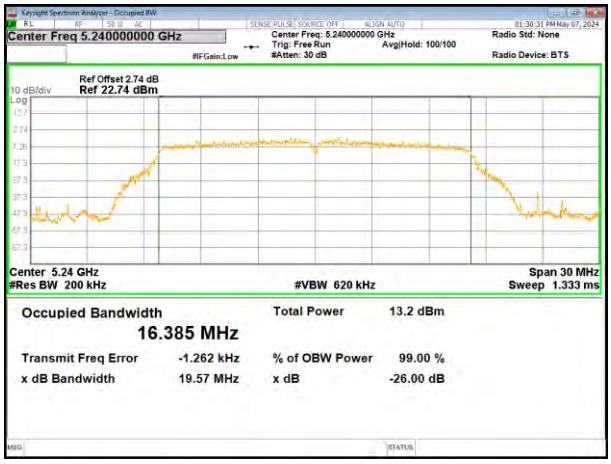
(802.11a) plot on channel 40



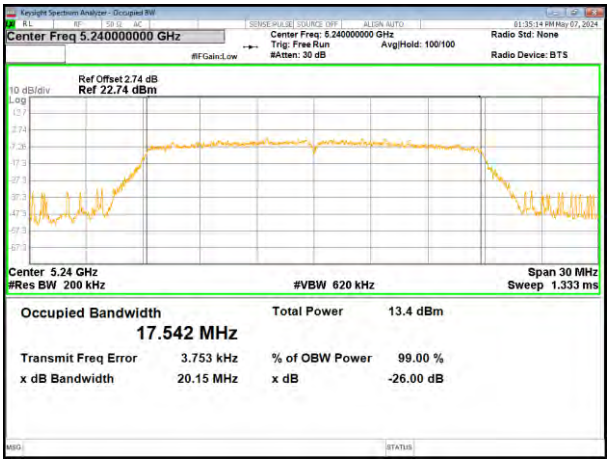
(802.11 n20) plot on channel 40



(802.11a) plot on channel 48

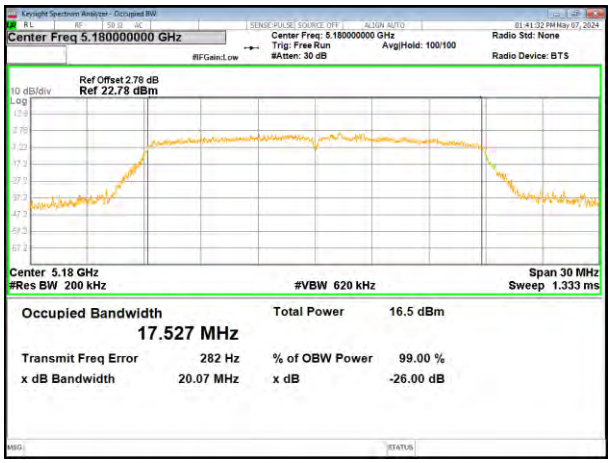


(802.11 n20) plot on channel 48

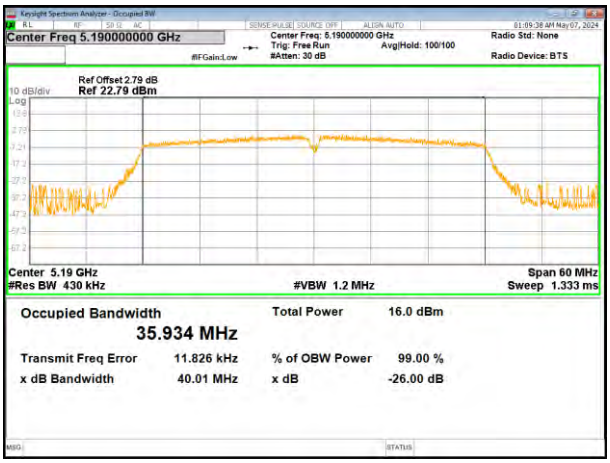


Test plot

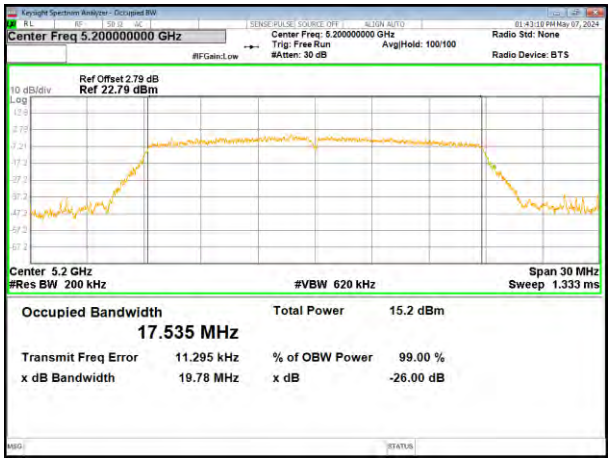
(802.11ac20) plot on channel 36



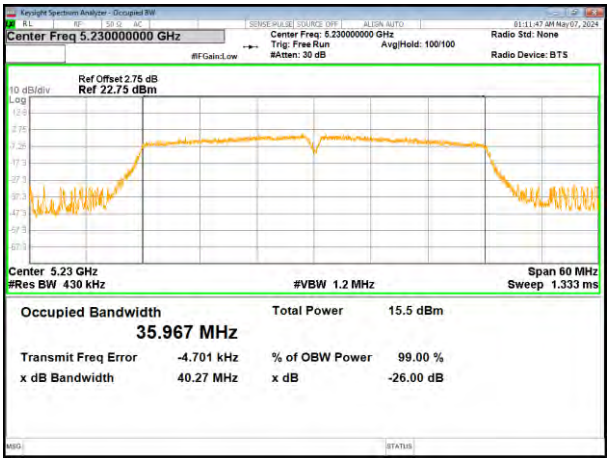
(802.11 n40) plot on channel 38



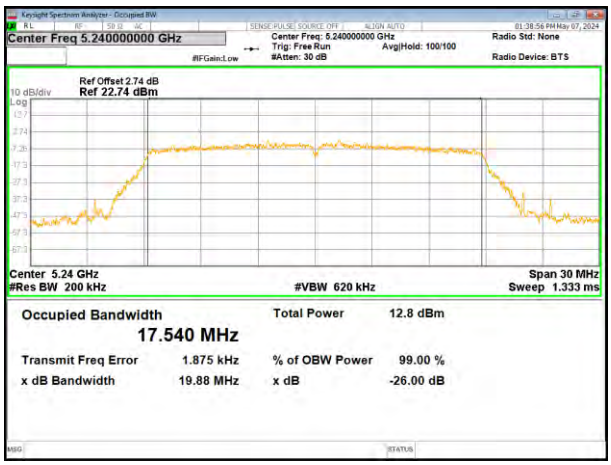
(802.11ac20) plot on channel 40



(802.11 n40) plot on channel 46

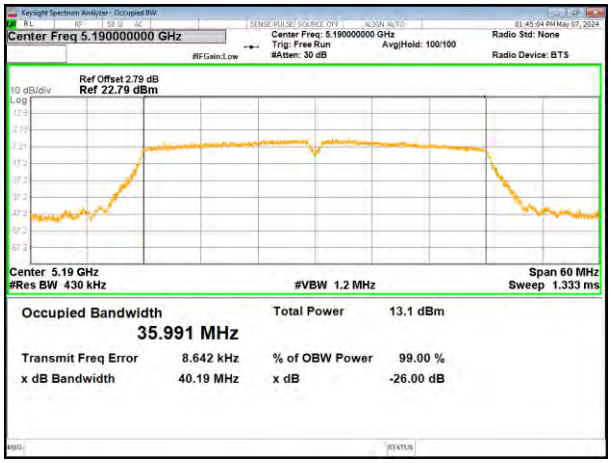


(802.11ac20) plot on channel 48

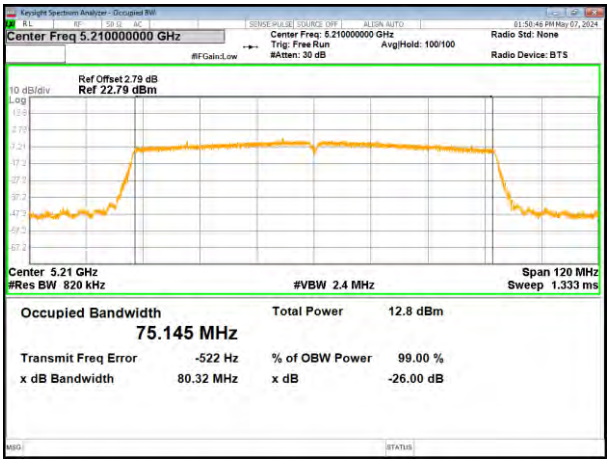


Test plot

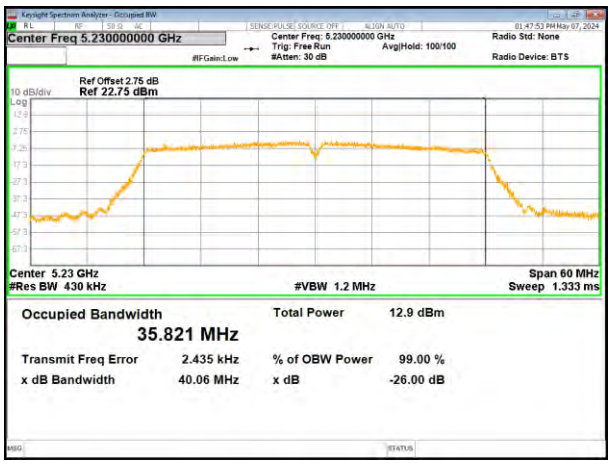
(802.11ac40) plot on channel 38



(802.11ac80) plot on channel 42



(802.11ac40) plot on channel 46



5745-5825MHz

Test CH	-6dB Channel Bandwidth (MHz)						Limit (KHz)	Result
	802.11a	802.11n (HT20)	802.11ac (HT20)	802.11n (HT40)	802.11ac (HT40)	802.11ac (HT80)		
Lowest	15.03	15.07	16.03	35.10	35.08	--	>500	Pass
Middle	15.34	15.13	13.87	--	--	75.11		
Highest	14.21	14.79	15.06	35.08	32.53	--		

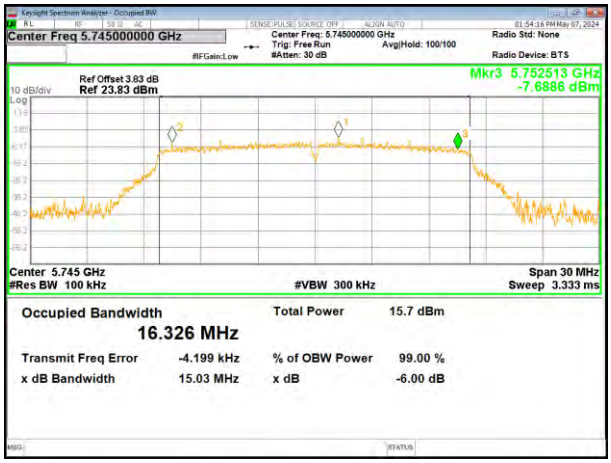
Remark: “---“is not applicable

Test CH	99% Bandwidth (MHz)						Limit (KHz)	Result
	802.11a	802.11n (HT20)	802.11ac (HT20)	802.11n (HT40)	802.11ac (HT40)	802.11ac (HT80)		
Lowest	16.401	17.520	17.563	35.993	35.886	--	>500	Pass
Middle	16.401	17.556	17.554	--	--	75.203		
Highest	16.380	17.560	17.538	35.930	35.904	--		

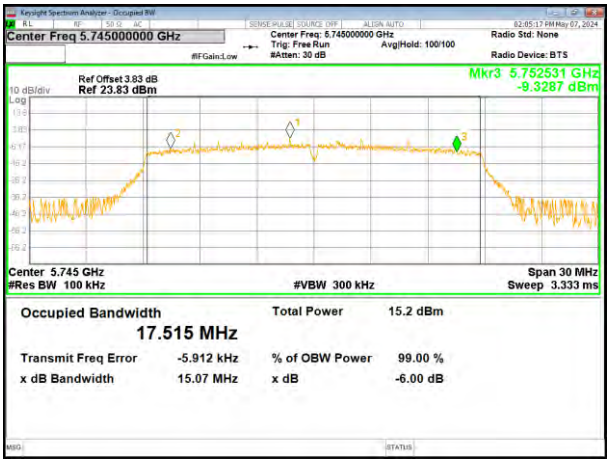
Remark: “---“is not applicable

Test plot -6dB Channel Bandwidth

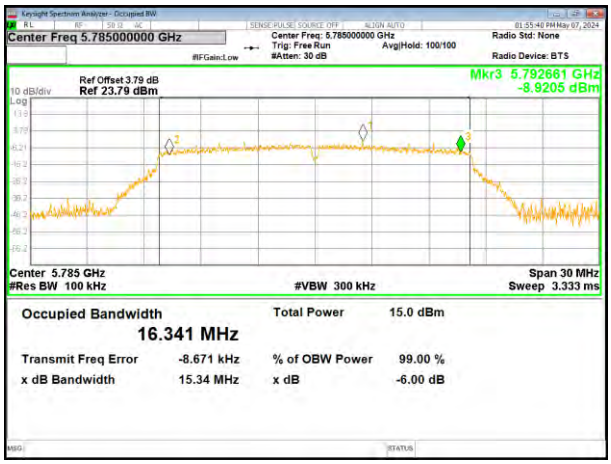
(802.11a) plot on channel 149



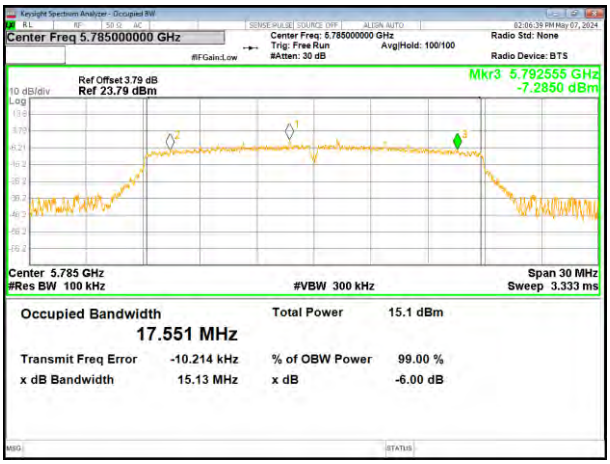
(802.11 n20) plot on channel 149



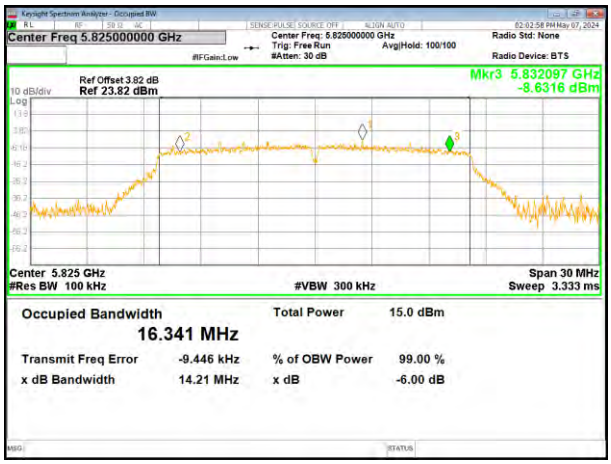
(802.11a) plot on channel 157



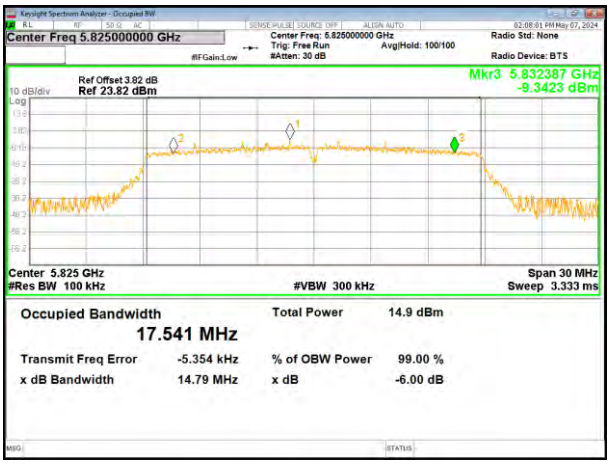
(802.11 n20) plot on channel 157



(802.11a) plot on channel 165

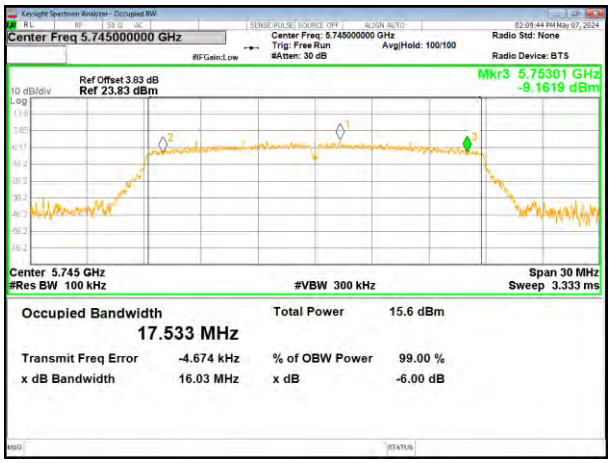


(802.11 n20) plot on channel 165

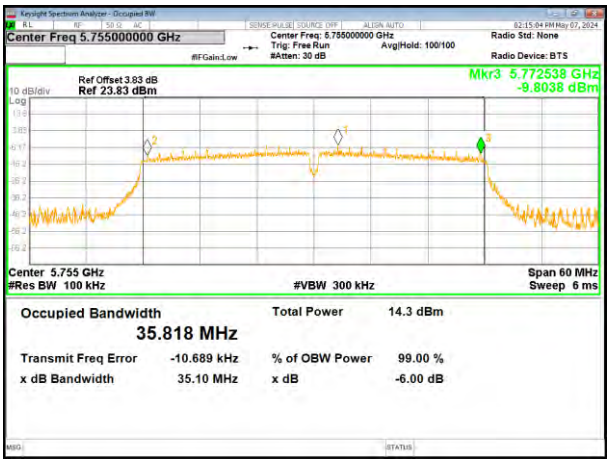


Test plot

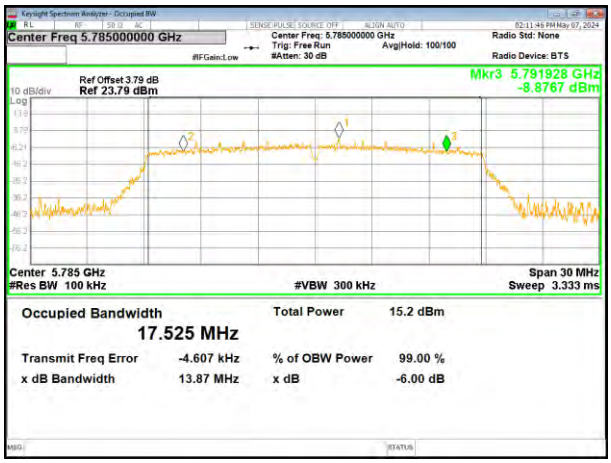
(802.11ac20) plot on channel 149



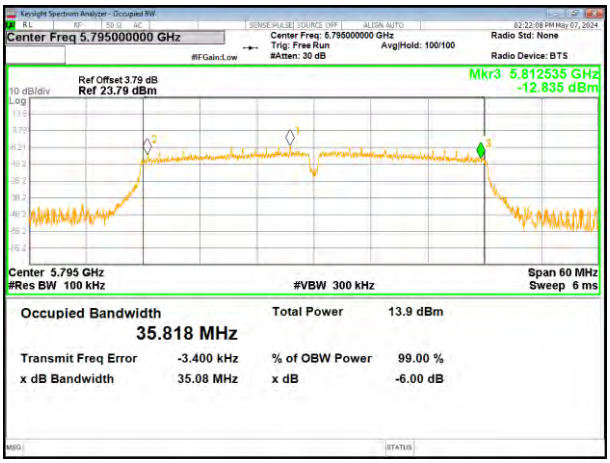
(802.11 n40) plot on channel 151



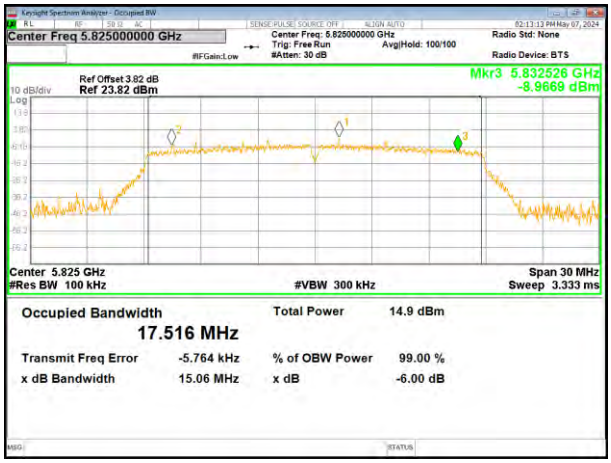
(802.11ac20) plot on channel 157



(802.11 n40) plot on channel 159

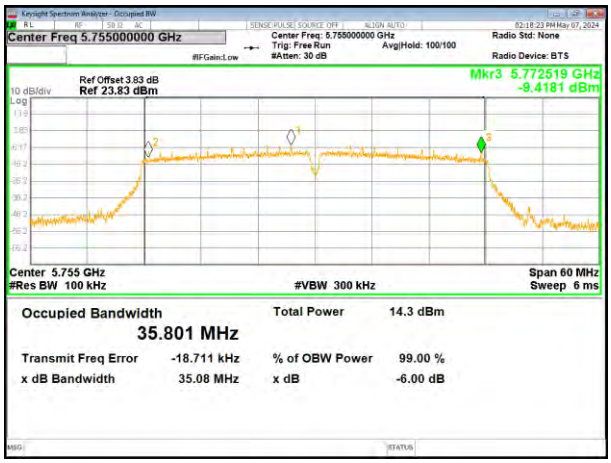


(802.11ac20) plot on channel 165

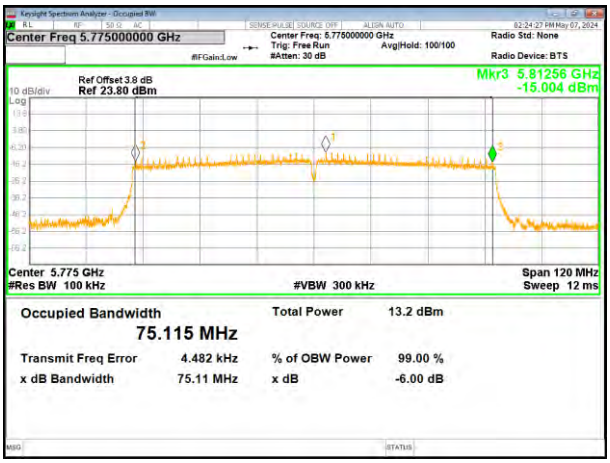


Test plot

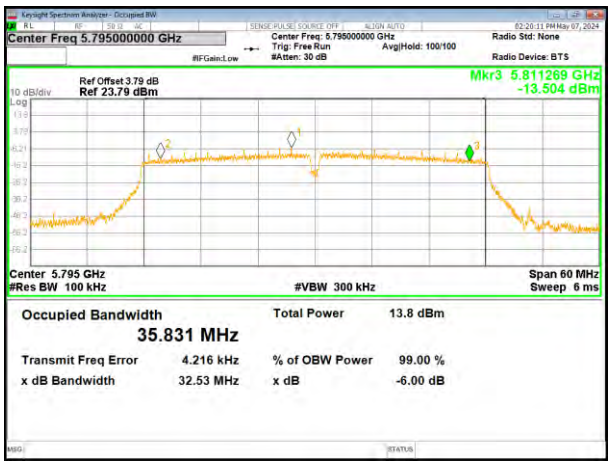
(802.11 ac40) plot on channel 151



(802.11 ac80) plot on channel 155

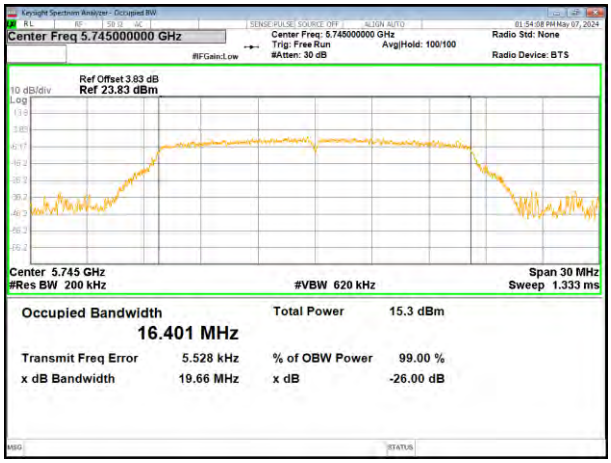


(802.11 ac40) plot on channel 159

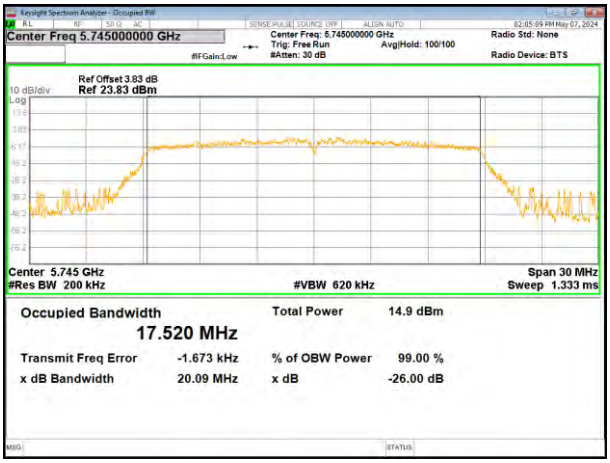


Test plot 99% Channel Bandwidth

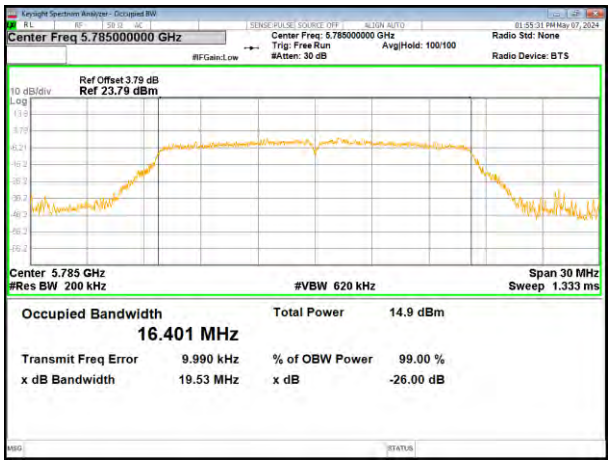
(802.11a) plot on channel 149



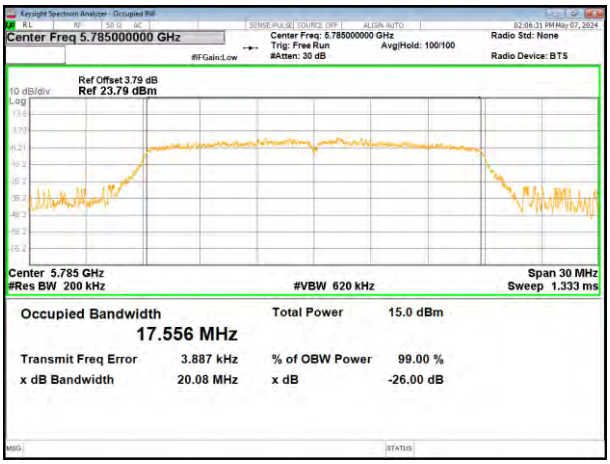
(802.11 n20) plot on channel 149



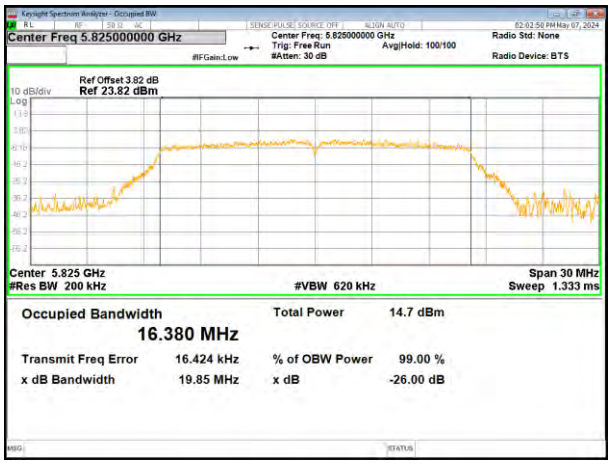
(802.11a) plot on channel 157



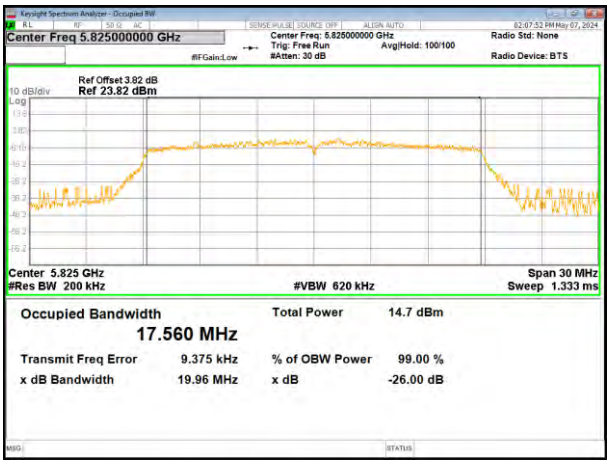
(802.11 n20) plot on channel 157



(802.11a) plot on channel 165

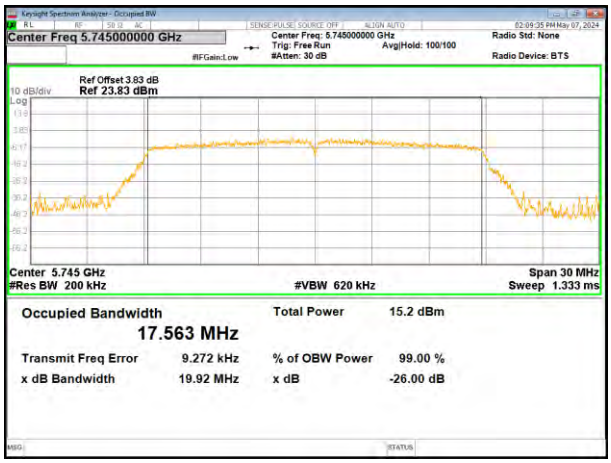


(802.11 n20) plot on channel 165

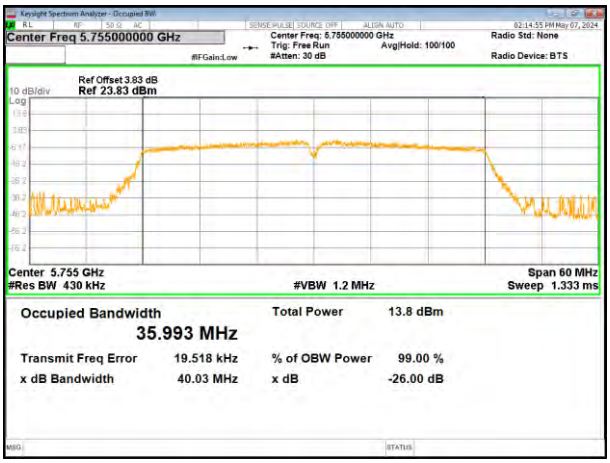


Test plot

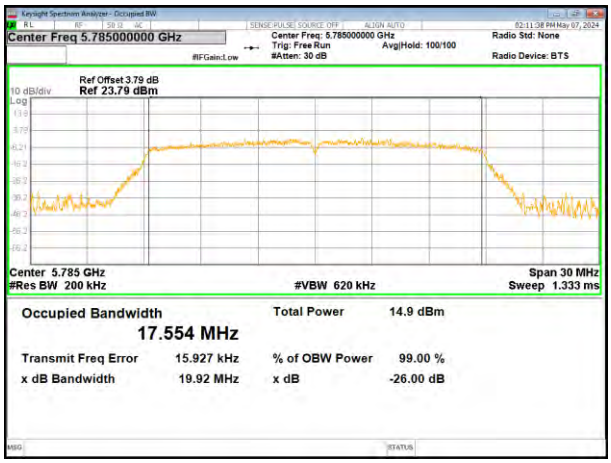
(802.11ac20) plot on channel 149



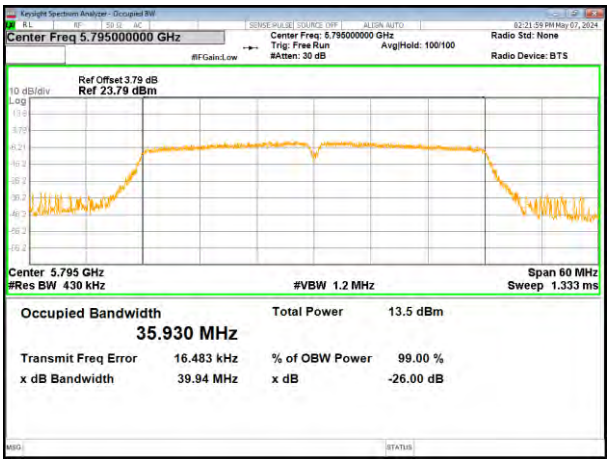
(802.11 n40) plot on channel 151



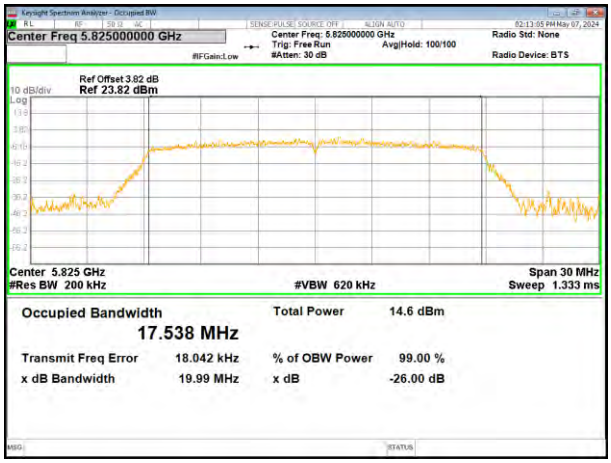
(802.11ac20) plot on channel 157



(802.11 n40) plot on channel 159

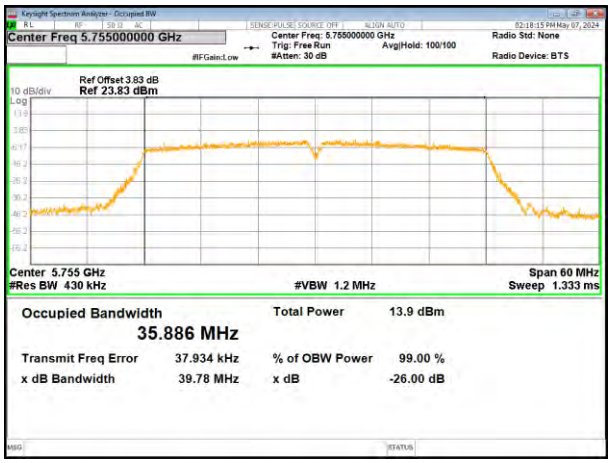


(802.11ac20) plot on channel 165

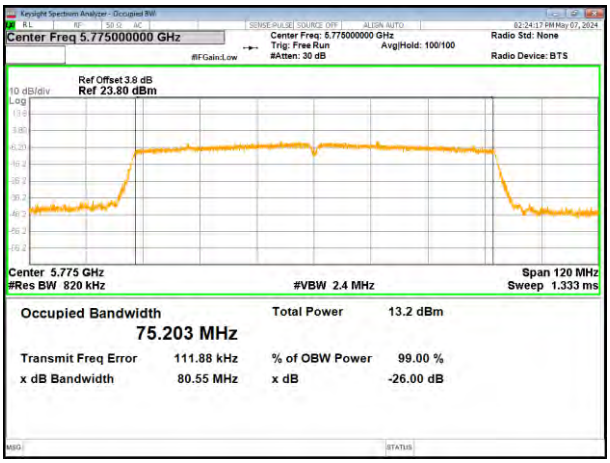


Test plot

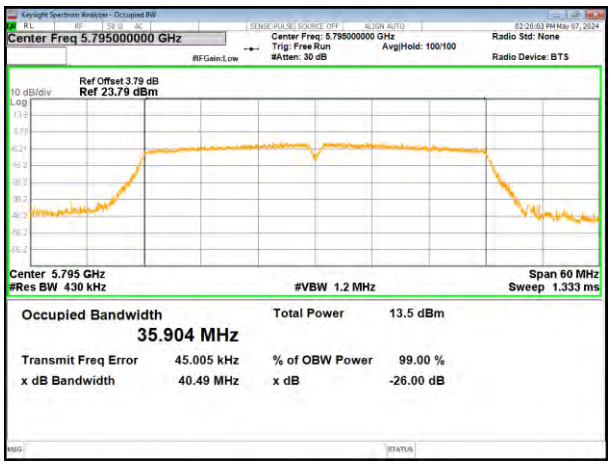
(802.11 ac40) plot on channel 151



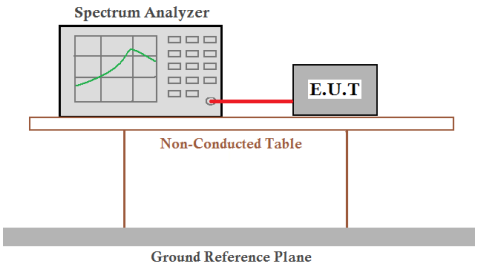
(802.11 ac80) plot on channel 155



(802.11 ac40) plot on channel 159



4.6 Power Spectral Density

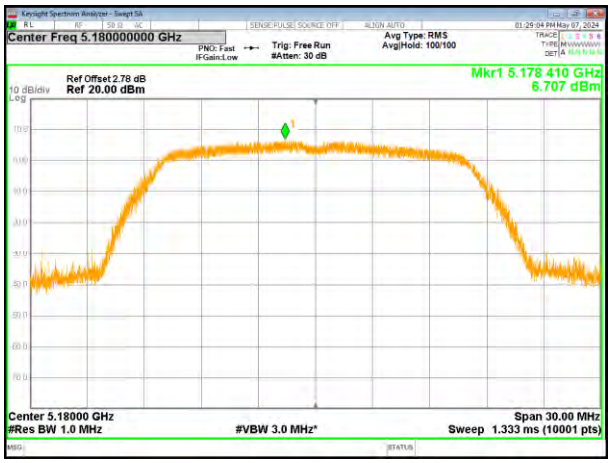
Test Requirement:	FCC Part15 E Section 15.407(a)(1)/ (a)(3), RSS-247 §6.2.1.1&6.2.4.2
Test Method:	ANSI C63.10:2013 and KDB 789033 D02 General U-NII Test Procedures New Rules v02r01 and RSS-Gen
Limit:	Frequency band (MHz) / Limit 5150-5250 / ≤17dBm/1MHz for master device 5150-5250 / ≤11dBm/1MHz for client device 5250-5350 / ≤11dBm/1MHz for client device 5470-5725 / ≤11dBm/1MHz for client device 5725-5850 / ≤30dBm/500kHz
Test setup:	
Test Instruments:	Refer to section 3.0 for details
Test mode:	Refer to section 2.2 for details
Test environment:	Temp.: 24.9°C / Humid.: 53%RH
Test voltage:	AC 120V /60Hz
Test results:	Pass

Measurement Result

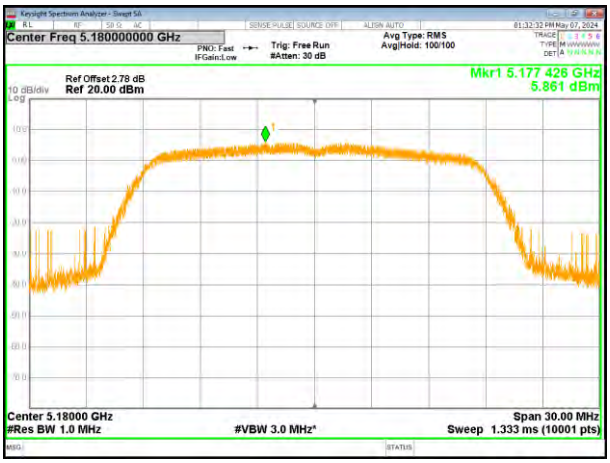
5180-5240MHz

Mode	Frequency	Measured Power Density (dBm/MHz)	Correction Factor (dB)	Total Measured Power Density (dBm/MHz)	Limit (dBm/MHz)
802.11 a	5180 MHz	6.707	0.09	6.797	11
	5200 MHz	7.219	0.09	7.309	11
	5240 MHz	5.126	0.09	5.216	11
802.11 n20	5180 MHz	5.861	0.13	5.991	11
	5200 MHz	5.837	0.13	5.967	11
	5240 MHz	5.923	0.13	6.053	11
802.11 ac20	5180 MHz	5.199	0.13	5.329	11
	5200 MHz	4.462	0.13	4.592	11
	5240 MHz	5.199	0.13	5.329	11
802.11 n40	5190 MHz	5.199	0.26	5.459	11
	5230 MHz	4.462	0.26	4.722	11
802.11 ac40	5190 MHz	2.155	0.20	2.355	11
	5230 MHz	1.865	0.20	2.065	11
802.11 ac80	5210 MHz	-1.701	0.38	-1.321	11

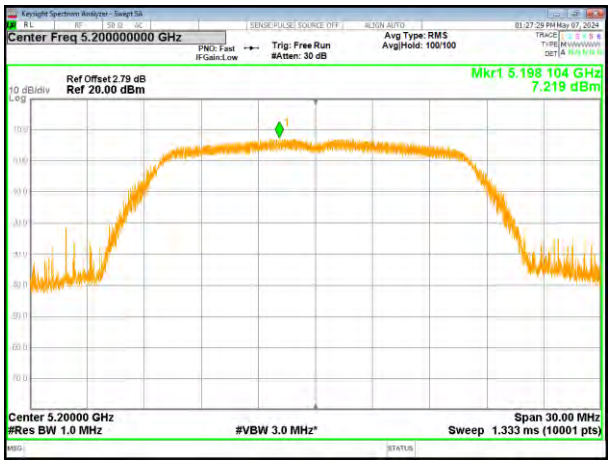
(802.11a) PSD plot on channel 36



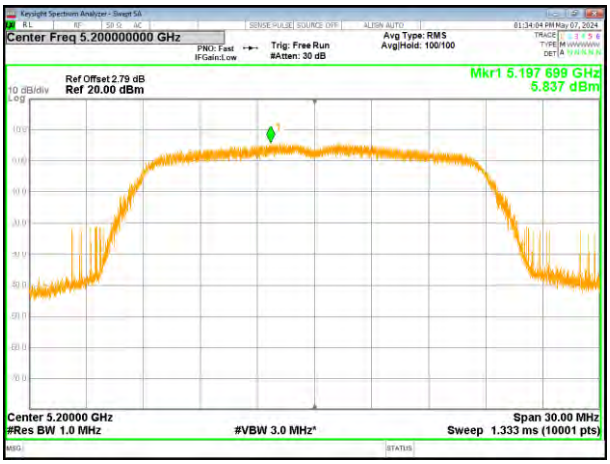
(802.11n20) PSD plot on channel 36



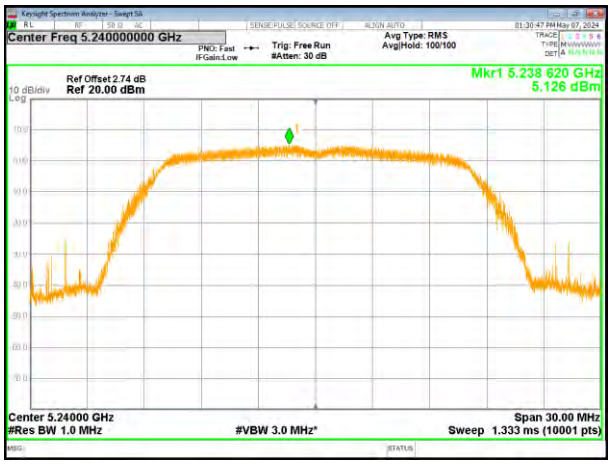
(802.11a) PSD plot on channel 40



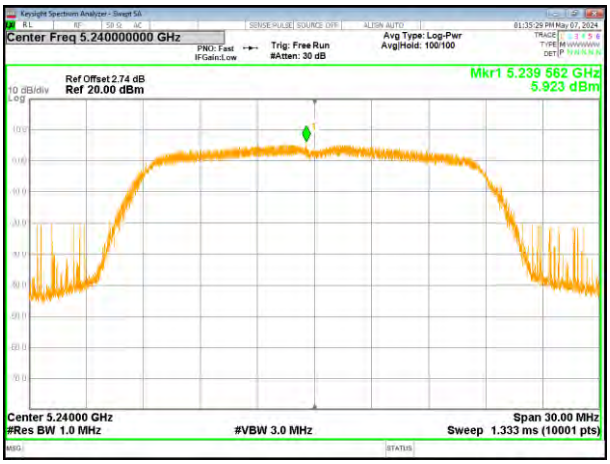
(802.11n20) PSD plot on channel 40



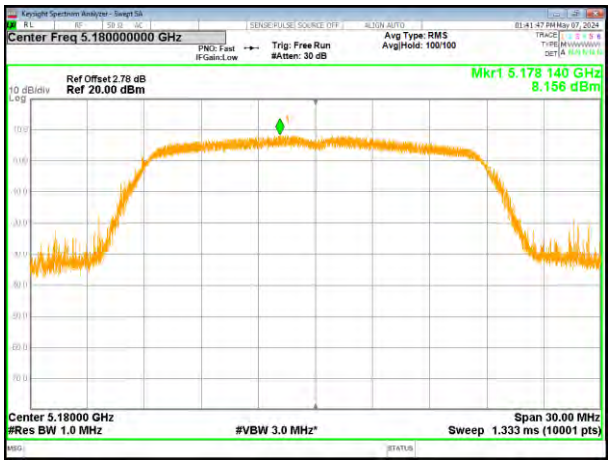
(802.11a) PSD plot on channel 48



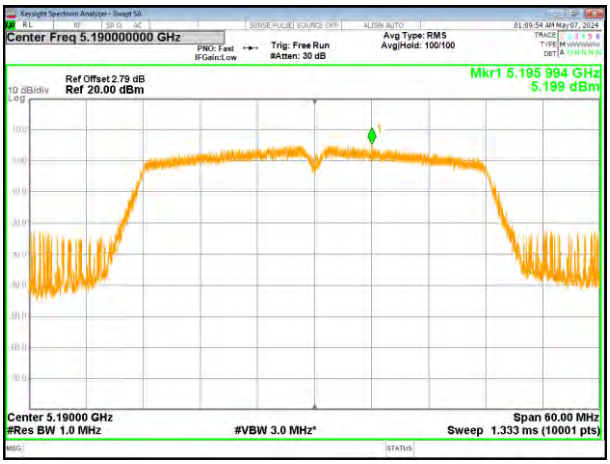
(802.11n20) PSD plot on channel 48



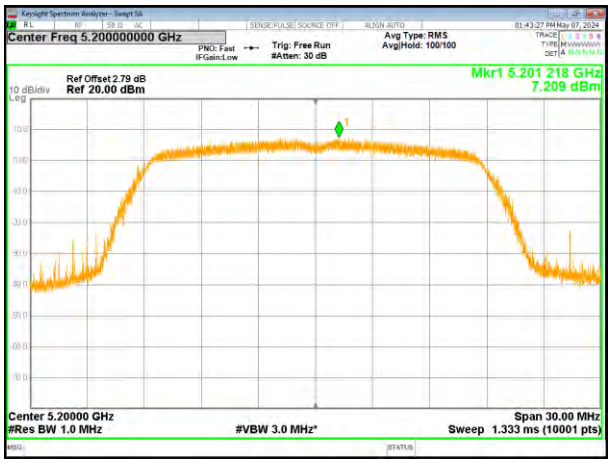
(802.11ac20) PSD plot on channel 36



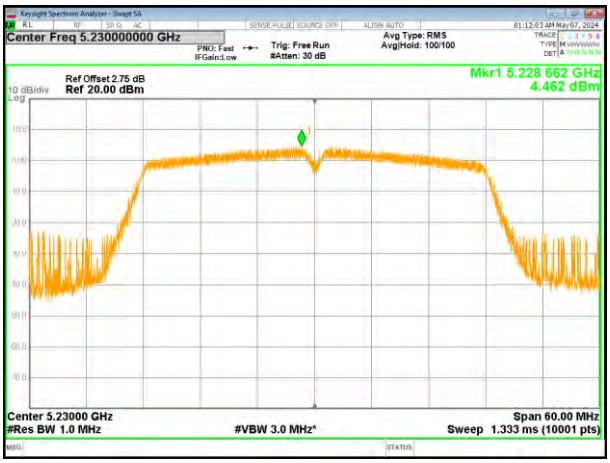
(802.11n40) PSD plot on channel 38



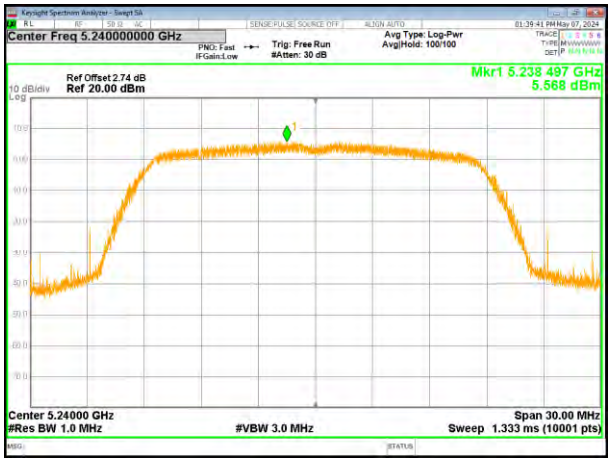
(802.11ac20) PSD plot on channel 40



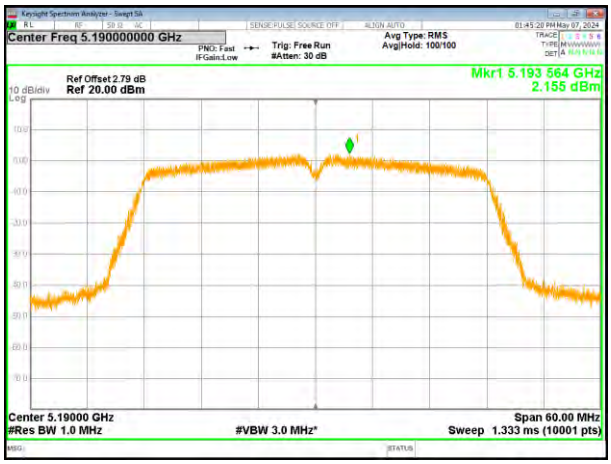
(802.11n40) PSD plot on channel 46



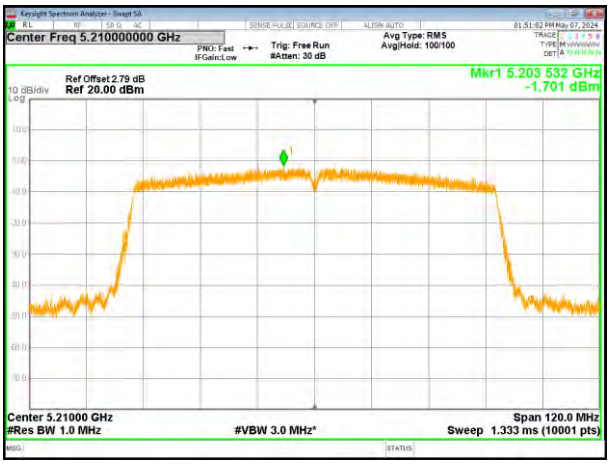
(802.11ac20) PSD plot on channel 48



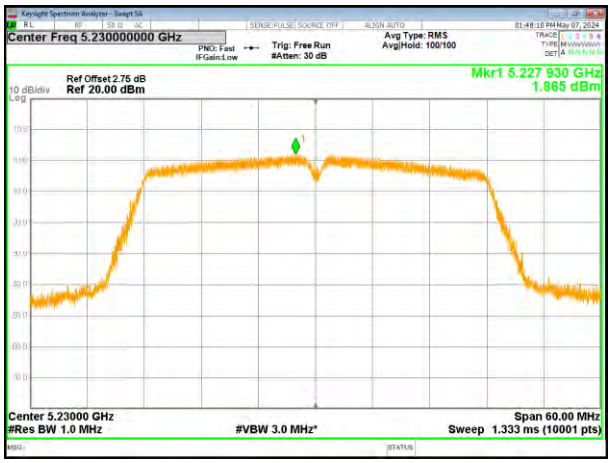
(802.11ac40) PSD plot on channel 38



(802.11ac80) PSD plot on channel 42



(802.11ac40) PSD plot on channel 46

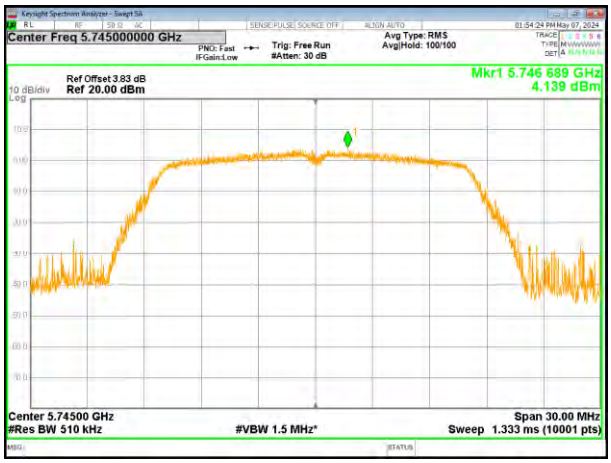


Mode	Frequency	Measured Power Density (dBm/510KHz)	Measured Power Density (dBm/500KHz)	Correction Factor (dB)	Total Measured Power Density (dBm/500KHz)	Limit (dBm/MHz)
802.11 a	5745 MHz	4.139	4.053	0.12	4.173	30
	5785 MHz	3.747	3.661	0.12	3.781	30
	5825 MHz	3.300	3.214	0.12	3.334	30
802.11 n20	5745 MHz	3.817	3.731	0.10	3.831	30
	5785 MHz	3.157	3.071	0.10	3.171	30
	5825 MHz	2.919	2.833	0.10	2.933	30
802.11ac20	5745 MHz	3.868	3.782	0.13	3.912	30
	5785 MHz	3.492	3.406	0.13	3.536	30
	5825 MHz	3.442	3.356	0.13	3.486	30
802.11 n40	5755 MHz	-0.551	-0.637	0.26	-0.377	30
	5795 MHz	-1.058	-1.144	0.26	-0.884	30
802.11ac40	5755 MHz	-0.593	-0.679	0.26	-0.419	30
	5795 MHz	-1.301	-1.387	0.26	-1.127	30
802.11ac80	5775 MHz	-5.013	-5.099	0.51	-4.589	30

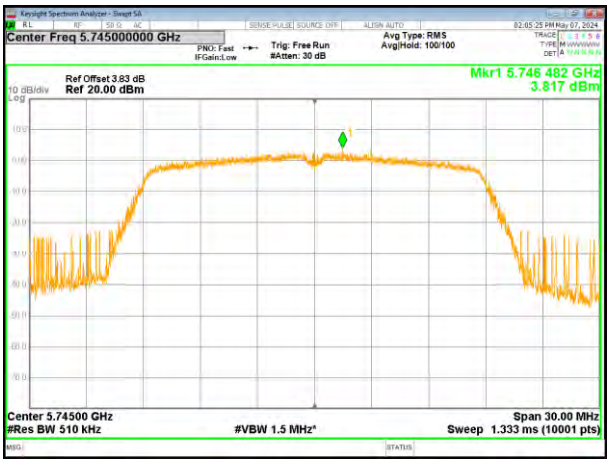
Note: 1. If the measurement is X dBm/510kHz, thus X dBm/510kHz = $(10^{X/10})$*(500 / 510) dBm/500kHz

2. Correction Factor (dB)= duty cycle factor

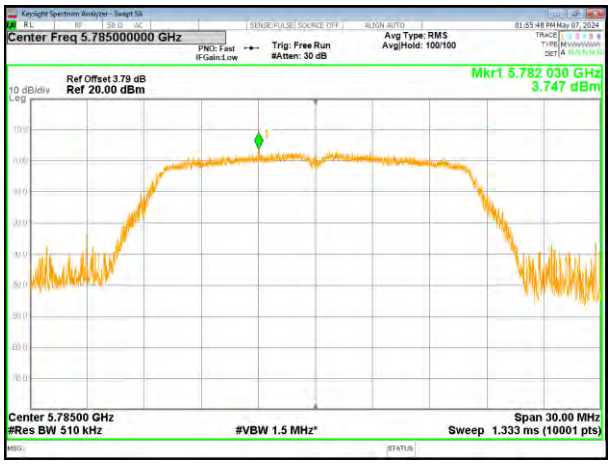
(802.11a) PSD plot on channel 149



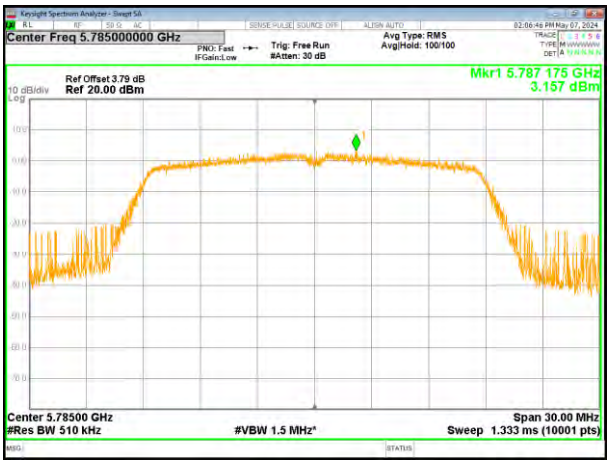
(802.11n20) PSD plot on channel 149



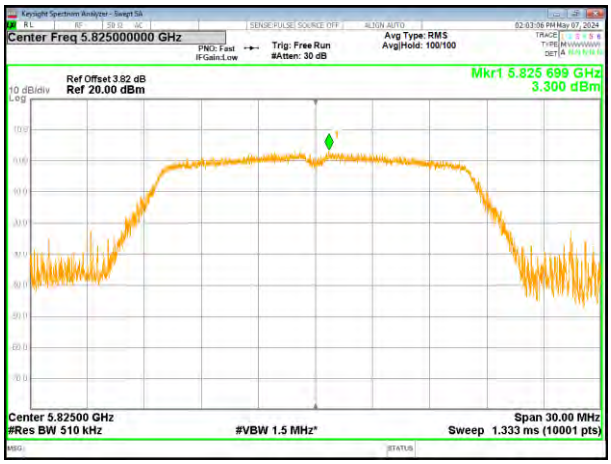
(802.11a) PSD plot on channel 157



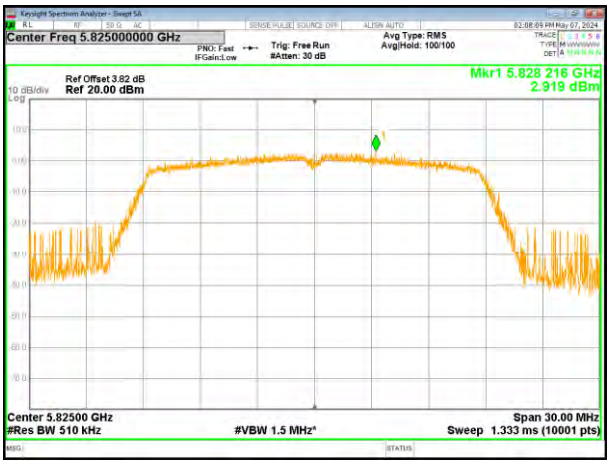
(802.11n20) PSD plot on channel 157



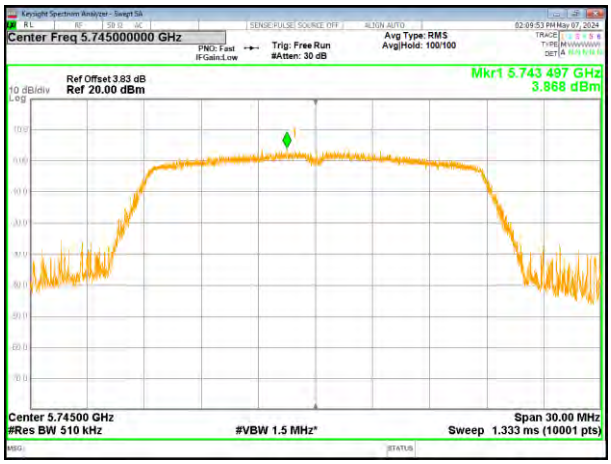
(802.11a) PSD plot on channel 165



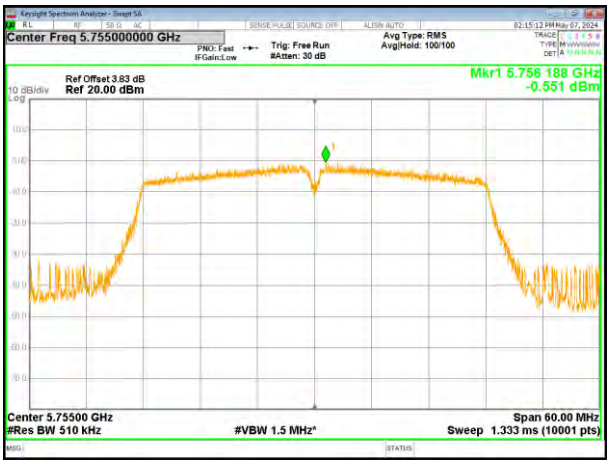
(802.11n20) PSD plot on channel 165



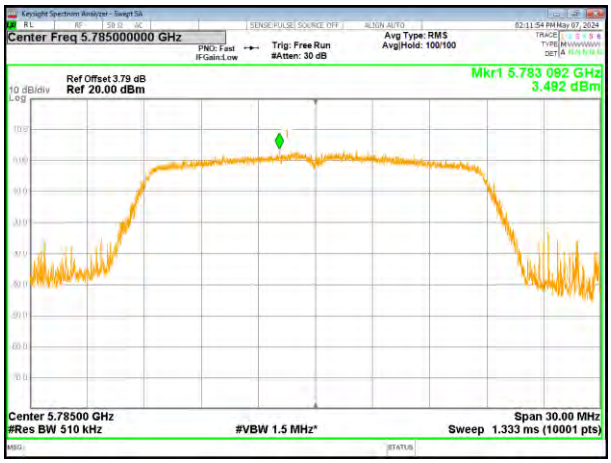
(802.11ac20) PSD plot on channel 149



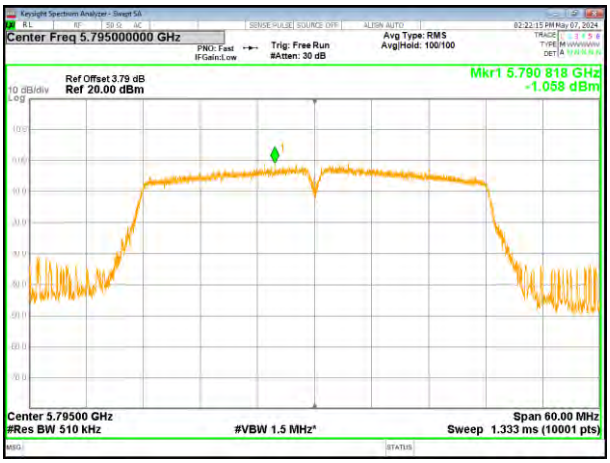
(802.11n40) PSD plot on channel 151



(802.11ac20) PSD plot on channel 157

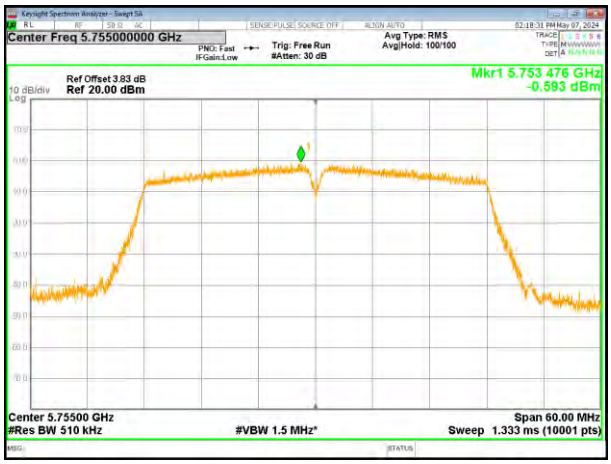


(802.11n40) PSD plot on channel 159



(802.11ac20) PSD plot on channel 165

(802.11ac40) PSD plot on channel 151

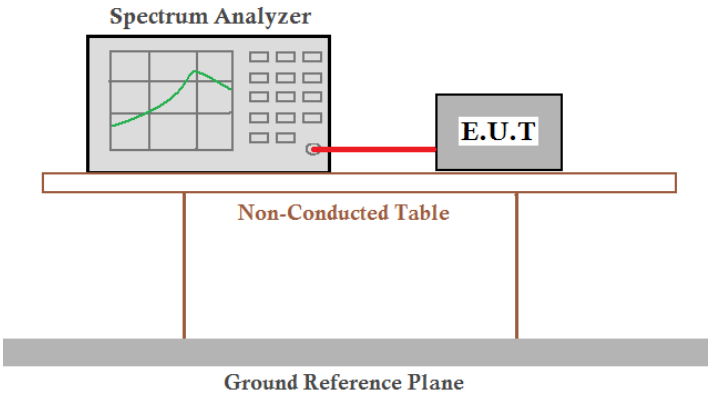


(802.11ac80) PSD plot on channel 155

(802.11ac40) PSD plot on channel 159

4.7 Band edge

4.7.1 Conducted test Method

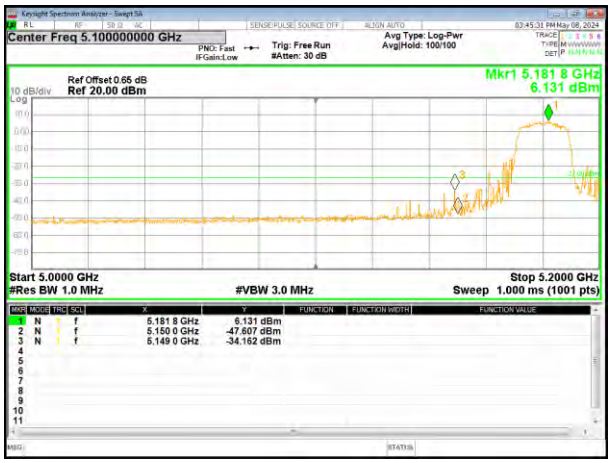
Test Requirement:	FCC Part15 C Section 15.209 and 15.205, RSS-247 §6.2.1.2&6.2.4.3
Test Method:	ANSI C63.10: 2013 and RSS-Gen
Limit:	1. For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz. 2. For transmitters operating solely in the 5.725-5.850 GHz band:All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.
Test setup:	
Test Procedure:	1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator. 2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range. 3. Set RBW of spectrum analyzer to 1 MHz with a convenient frequency span. 4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency. 5. Repeat above procedures until all measured frequencies were complete..
Test Instruments:	Refer to section 3.0 for details
Test mode:	Refer to section 2.2 for details
Test environment:	Temp.: 24.9°C Humid.: 53%RH
Test voltage:	AC 120V /60Hz
Test results:	Pass

Remark: Antenna gain and cable loss data included in Offset.

5.180~5.240 GHz

(802.11a) Band Edge, Left Side

(802.11n20) Band Edge, Left Side

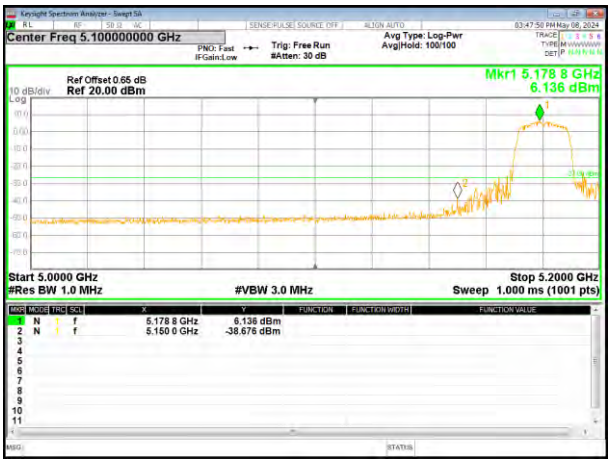


(802.11a) Band Edge, Right Side

(802.11n20) Band Edge, Right Side

5.180~5.240 GHz

(802.11ac20) Band Edge, Left Side



(802.11n40) Band Edge, Left Side

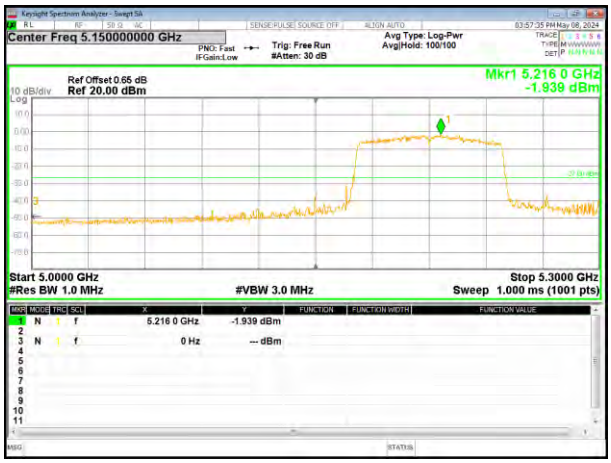
(802.11ac20) Band Edge, Right Side

(802.11n40) Band Edge, Right Side

5.180~5.240 GHz

(802.11ac40) Band Edge, Left Side

(802.11ac80) Band Edge



(802.11ac40) Band Edge, Right Side

5.745~5.825 GHz

(802.11a) Band Edge, Left Side

(802.11n20) Band Edge, Left Side

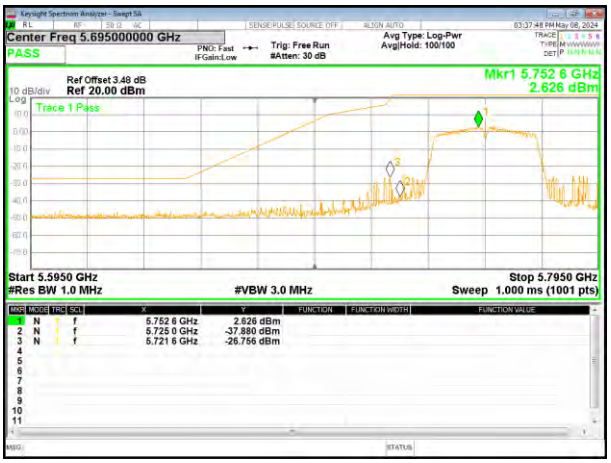
(802.11a) Band Edge, Right Side

(802.11n20) Band Edge, Right Side

5.745~5.825 GHz

(802.11ac20) Band Edge, Left Side

(802.11n40) Band Edge, Left Side



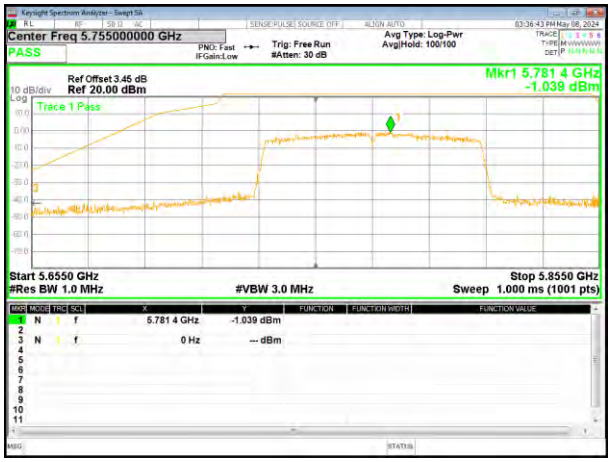
(802.11ac20) Band Edge, Right Side

(802.11n40) Band Edge, Right Side

5.745~5.825 GHz

(802.11ac40) Band Edge, Left Side

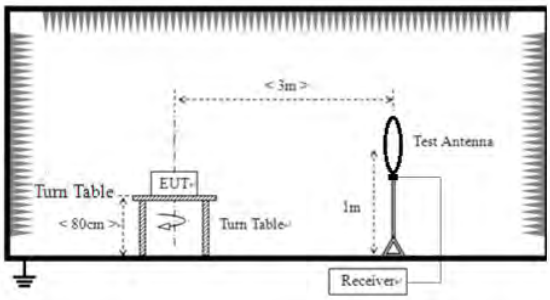
(802.11ac80) Band Edge



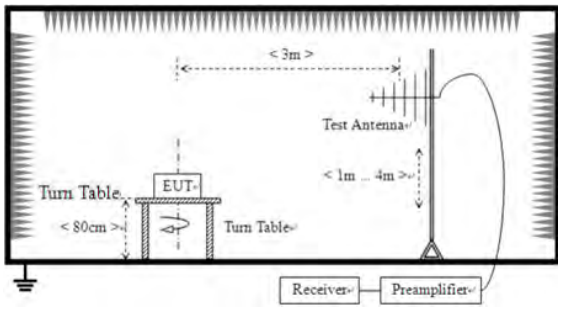
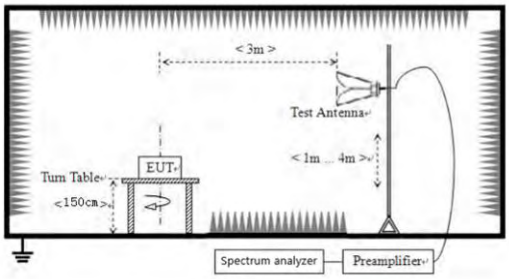
(802.11ac40) Band Edge, Right Side

4.8 Spurious Emission

4.8.1 Radiated Emission Method

<table>
<tr><td>Test Requirement:</td><td>FCC Part15 C Section 15.209, Part 15E Section 15.407(b)(4)
RSS-247 §6.2.1.2&6.2.4.3</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.10:2013 and RSS-Gen</td></tr>
<tr><td>Test Frequency Range:</td><td>9kHz to 40GHz</td></tr>
<tr><td>Test site:</td><td>Measurement Distance: 3m</td></tr>
<tr><td>Receiver setup:</td><td>
<table>
<tr><th>Frequency</th><th>Detector</th><th>RBW</th><th>VBW</th><th>Value</th></tr>
<tr><td>9kHz-150KHz</td><td>Quasi-peak</td><td>200Hz</td><td>1kHz</td><td>Quasi-peak Value</td></tr>
<tr><td>150kHz-30MHz</td><td>Quasi-peak</td><td>9kHz</td><td>30kHz</td><td>Quasi-peak Value</td></tr>
<tr><td>30MHz-1GHz</td><td>Quasi-peak</td><td>120KHz</td><td>300KHz</td><td>Quasi-peak Value</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>Peak</td><td>1MHz</td><td>3MHz</td><td>Peak Value</td></tr>
<tr><td>AV</td><td>1MHz</td><td>3MHz</td><td>Average Value</td></tr>
</table>
</td></tr>
<tr><td>Limit:</td><td>
<table>
<tr><th>Frequency</th><th>Limit (uV/m)</th><th>Value</th><th>Measurement Distance</th></tr>
<tr><td>0.009MHz-0.490MHz</td><td>2400/F(KHz)</td><td>QP</td><td>300m</td></tr>
<tr><td>0.490MHz-1.705MHz</td><td>24000/F(KHz)</td><td>QP</td><td>300m</td></tr>
<tr><td>1.705MHz-30MHz</td><td>30</td><td>QP</td><td>30m</td></tr>
<tr><td>30MHz-88MHz</td><td>100</td><td>QP</td><td rowspan="4">3m</td></tr>
<tr><td>88MHz-216MHz</td><td>150</td><td>QP</td></tr>
<tr><td>216MHz-960MHz</td><td>200</td><td>QP</td></tr>
<tr><td>960MHz-1GHz</td><td>500</td><td>QP</td></tr>
</table>
<table>
<tr><th>Frequency</th><th>Limit (dBm/MHz)</th><th>Remark</th></tr>
<tr><td>Above 1GHz</td><td>-27.0</td><td>Peak Value</td></tr>
</table>
</td></tr>
<tr><td>Test setup:</td><td>For radiated emissions from 9kHz to 30MHz
 

For radiated emissions from 30MHz to1GHz</td></tr>
</table>

	 For radiated emissions above 1GHz 
Test Procedure:	1. The EUT was placed on the top of a rotating table (0.8m for below 1GHz and 1.5 meters for above 1GHz) above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation. 2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. 4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading. 5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet. The radiation measurements are performed in X, Y, Z axis positioning. And found the X axis positioning which it is worse case, only the test worst case mode is recorded in the report.
Test Instruments:	Refer to section 3.0 for details
Test mode:	Refer to section 2.2 for details
Test results:	Pass

Remarks:

1. The report only shows the worst mode.

2. Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis which it is worse case.

Measurement Data:

9 kHz ~ 30 MHz

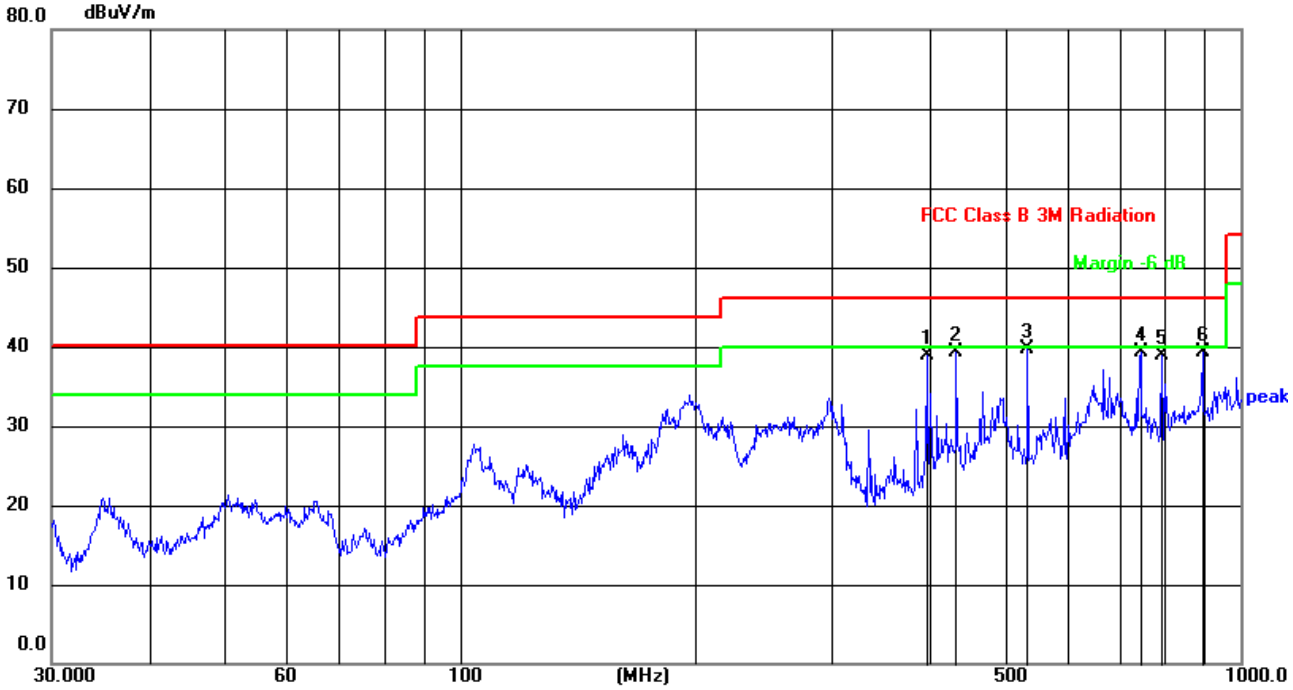
The emission from 9 kHz to 30MHz was pre-tested and found the result was 20dB lower than the limit, and according to 15.31(o) & RSS-Gen 6.13, the test result no need to reported.

Below 1GHz

Remark: The test data shows only the worst case 802.11ac20 mode.

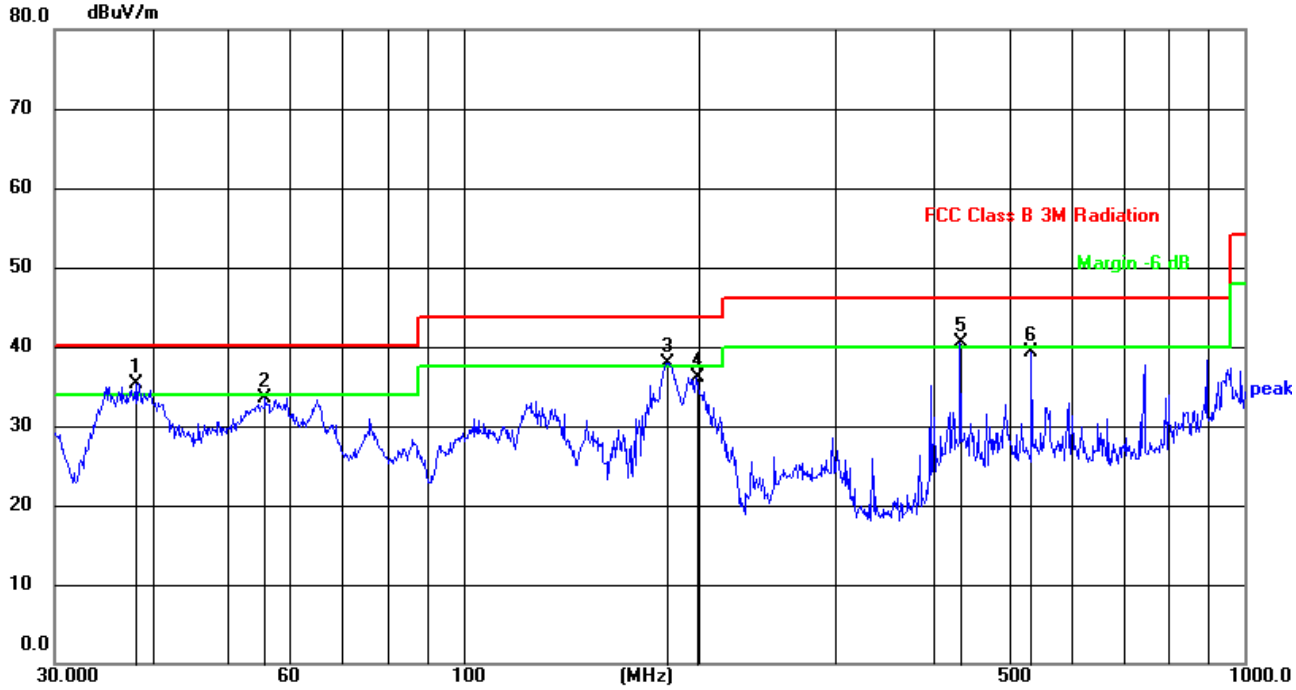
Temperature:	24.9℃	Relative Humidity:	53%
Pressure:	101.2kPar	Test Voltage :	AC120V/60Hz
Test Mode :	5.2G TX- 802.11ac20 (5180MHz)		

Horizontal:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	396.2415	56.31	-17.42	38.89	46.00	-7.11	QP
2	432.5456	55.28	-16.05	39.23	46.00	-6.77	QP
3	533.8321	53.04	-13.27	39.77	46.00	-6.23	QP
4	744.8660	47.59	-8.21	39.38	46.00	-6.62	QP
5	793.3958	45.62	-6.71	38.91	46.00	-7.09	QP
6	893.8566	44.82	-5.54	39.28	46.00	-6.72	QP

Vertical:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	38.0783	56.62	-21.24	35.38	40.00	-4.62	QP
2	55.8047	55.75	-22.23	33.52	40.00	-6.48	QP
3	182.5592	60.64	-22.68	37.96	43.50	-5.54	QP
4	198.5880	59.42	-23.34	36.08	43.50	-7.42	QP
5	432.5457	56.53	-16.05	40.48	46.00	-5.52	QP
6	533.8321	52.63	-13.27	39.36	46.00	-6.64	QP

Remarks:
1. Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
2. The emission levels of other frequencies are very lower than the limit and not show in test report.

Above 1GHz:

Temperature：	24.9℃	Relative Humidity：	53%
Pressure：	101.2kPar	Test Voltage ：	AC120V/60Hz
Test Mode ：	5.2G TX- 802.11ac20		

Polar (H/V)	Frequency	Meter Reading	Pre-amplifier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detector Type
	MHz	dBuV	dB	dB	dB	dBuV/m	dBuV/m	dB	
Low Channel:5180MHz									
V	10360.00	50.87	46.20	8.27	38.50	51.44	68.20	-16.76	PK
V	10360.00	41.31	46.20	8.27	38.50	41.88	54.00	-12.12	AV
V	15540.00	52.82	46.30	10.35	38.70	55.57	74.00	-18.43	PK
V	15540.00	38.79	46.30	10.35	38.70	41.54	54.00	-12.46	AV
V	20720.00	58.66	57.40	11.93	37.80	50.99	68.20	-17.21	PK
V	20720.00	49.53	57.40	11.93	37.80	41.86	54.00	-12.14	AV
V	25900.00	54.66	56.50	13.45	39.70	51.31	68.20	-16.89	PK
V	25900.00	44.59	56.50	13.45	39.70	41.24	54.00	-12.76	AV
H	10360.00	50.32	46.20	8.27	38.50	50.89	68.20	-17.31	PK
H	10360.00	40.21	46.20	8.27	38.50	40.78	54.00	-13.22	AV
H	15540.00	54.76	46.30	10.35	38.70	57.51	74.00	-16.49	PK
H	15540.00	40.15	46.30	10.35	38.70	42.90	54.00	-11.10	AV
H	20720.00	59.08	57.40	11.93	37.80	51.41	68.20	-16.79	PK
H	20720.00	49.63	57.40	11.93	37.80	41.96	54.00	-12.04	AV
H	25900.00	56.40	56.50	13.45	39.70	53.05	68.20	-15.15	PK
H	25900.00	45.59	56.50	13.45	39.70	42.24	54.00	-11.76	AV

Polar (H/V)	Frequency	Meter Reading	Pre-amplifier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Middle Channel:5200MHz									
V	10400.00	50.86	46.20	8.27	38.50	51.43	68.20	-16.77	PK
V	10400.00	41.00	46.20	8.27	38.50	41.57	54.00	-12.43	AV
V	15600.00	53.93	46.30	10.35	38.40	56.38	74.00	-17.62	PK
V	15600.00	39.1	46.30	10.35	38.40	41.55	54.00	-12.45	AV
V	20800.00	59.00	57.40	11.93	37.80	51.33	68.20	-16.87	PK
V	20800.00	49.08	57.40	11.93	37.80	41.41	54.00	-12.59	AV
V	26000.00	54.01	56.50	13.45	39.80	50.76	68.20	-17.44	PK
V	26000.00	45.49	56.50	13.45	39.80	42.24	54.00	-11.76	AV
H	10400.00	50.36	46.20	8.27	38.50	50.93	68.20	-17.27	PK
H	10400.00	40.29	46.20	8.27	38.50	40.86	54.00	-13.14	AV
H	15600.00	55.68	46.30	10.35	38.40	58.13	74.00	-15.87	PK
H	15600.00	40.01	46.30	10.35	38.40	42.46	54.00	-11.54	AV
H	20800.00	58.75	57.40	11.93	37.80	51.08	68.20	-17.12	PK
H	20800.00	48.04	57.40	11.93	37.80	40.37	54.00	-13.63	AV
H	26000.00	55.13	56.50	13.45	39.80	51.88	68.20	-16.32	PK
H	26000.00	45.10	56.50	13.45	39.80	41.85	54.00	-12.15	AV

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
High Channel:5240MHz									
V	10480.00	50.77	46.20	8.27	38.60	51.44	68.20	-16.76	PK
V	10480.00	40.22	46.20	8.27	38.60	40.89	54.00	-13.11	AV
V	15720.00	54.57	46.30	10.35	38.40	57.02	74.00	-16.98	PK
V	15720.00	38.42	46.30	10.35	38.40	40.87	54.00	-13.13	AV
V	20960.00	58.89	57.40	11.93	37.50	50.92	68.20	-17.28	PK
V	20960.00	47.84	57.40	11.93	37.50	39.87	54.00	-14.13	AV
V	26200.00	51.96	56.50	13.45	40.10	49.01	68.20	-19.19	PK
V	26200.00	42.64	56.50	13.45	40.10	39.69	54.00	-14.31	AV
H	10480.00	47.76	46.20	8.27	38.60	48.43	68.20	-19.77	PK
H	10480.00	38.97	46.20	8.27	38.60	39.64	54.00	-14.36	AV
H	15720.00	51.40	46.30	10.35	38.40	53.85	74.00	-20.15	PK
H	15720.00	36.04	46.30	10.35	38.40	38.49	54.00	-15.51	AV
H	20960.00	58.54	57.40	11.93	37.50	50.57	68.20	-17.63	PK
H	20960.00	48.54	57.40	11.93	37.50	40.57	54.00	-13.43	AV
H	26200.00	54.22	56.50	13.45	40.10	51.27	68.20	-16.93	PK
H	26200.00	45.26	56.50	13.45	40.10	42.31	54.00	-11.69	AV

Remark:
1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier,
Margin= Emission Level - Limit
2. If peak below the average limit, the average emission was no test.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Temperature：	24.9℃	Relative Humidity：	53%
Pressure：	101.2kPar	Test Voltage ：	AC120V/60Hz
Test Mode ：	5.8G TX- 802.11ac20		

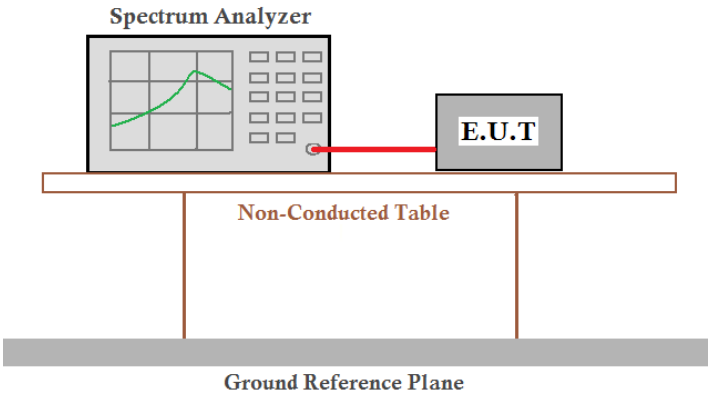
Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenn Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Typ
Low Channel:5745MHz									
V	11490.00	52.77	46.10	8.77	39.10	54.54	74.00	-19.46	PK
V	11490.00	37.85	46.10	8.77	39.10	39.62	54.00	-14.38	AV
V	17235.00	45.49	47.60	11.10	38.70	47.69	68.20	-20.51	PK
V	17235.00	36.92	47.60	11.10	38.70	39.12	54.00	-14.88	AV
V	22980.00	59.12	56.90	12.73	37.70	52.65	74.00	-21.35	PK
V	22980.00	44.79	56.90	12.73	37.70	38.32	54.00	-15.68	AV
V	28725.00	49.69	55.60	14.25	40.30	48.64	68.20	-19.56	PK
V	28725.00	40.67	55.60	14.25	40.30	39.62	54.00	-14.38	AV
H	11490.00	51.77	46.10	8.77	39.10	53.54	74.00	-20.46	PK
H	11490.00	38.30	46.10	8.77	39.10	40.07	54.00	-13.93	AV
H	17235.00	46.65	47.60	11.10	38.70	48.85	68.20	-19.35	PK
H	17235.00	37.53	47.60	11.10	38.70	39.73	54.00	-14.27	AV
H	22980.00	60.36	56.90	12.73	37.70	53.89	74.00	-20.11	PK
H	22980.00	45.10	56.90	12.73	37.70	38.63	54.00	-15.37	AV
H	28725.00	52.71	55.60	14.25	40.30	51.66	68.20	-16.54	PK
H	28725.00	43.14	55.60	14.25	40.30	42.09	54.00	-11.91	AV

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Middle Channel:5785MHz									
V	11570.00	51.14	46.10	8.77	39.10	52.91	74.00	-21.09	PK
V	11570.00	37.1	46.10	8.77	39.10	38.87	54.00	-15.13	AV
V	17355.00	46.64	47.60	11.10	38.70	48.84	68.20	-19.36	PK
V	17355.00	37.73	47.60	11.10	38.70	39.93	54.00	-14.07	AV
V	23140.00	60.05	56.90	12.73	37.70	53.58	74.00	-20.42	PK
V	23140.00	45.33	56.90	12.73	37.70	38.86	54.00	-15.14	AV
V	28925.00	49.12	55.60	14.25	40.30	48.07	68.20	-20.13	PK
V	28925.00	40.8	55.60	14.25	40.30	39.75	54.00	-14.25	AV
H	11570.00	50.79	46.10	8.77	39.10	52.56	74.00	-21.44	PK
H	11570.00	36.91	46.10	8.77	39.10	38.68	54.00	-15.32	AV
H	17355.00	44.96	47.60	11.10	38.70	47.16	68.20	-21.04	PK
H	17355.00	37.08	47.60	11.10	38.70	39.28	54.00	-14.72	AV
H	23140.00	59.17	56.90	12.73	37.70	52.7	74.00	-21.30	PK
H	23140.00	46.19	56.90	12.73	37.70	39.72	54.00	-14.28	AV
H	28925.00	50.83	55.60	14.25	40.30	49.78	68.20	-18.42	PK
H	28925.00	42.59	55.60	14.25	40.30	41.54	54.00	-12.46	AV

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
High Channel:5825MHz									
V	11650.00	49.72	46.10	8.77	39.10	51.49	74.00	-22.51	PK
V	11650.00	36.76	46.10	8.77	39.10	38.53	54.00	-15.47	AV
V	17475.00	44.71	47.90	11.23	38.90	46.94	68.20	-21.26	PK
V	17475.00	37.68	47.90	11.23	38.90	39.91	54.00	-14.09	AV
V	23300.00	54.66	57.10	12.73	37.80	48.09	68.20	-20.11	PK
V	23300.00	46.78	57.10	12.73	37.80	40.21	54.00	-13.79	AV
V	29125.00	50.94	55.80	14.25	40.50	49.89	68.20	-18.31	PK
V	29125.00	42.30	55.80	14.25	40.50	41.25	54.00	-12.75	AV
H	11650.00	51.87	46.10	8.77	39.10	53.64	74.00	-20.36	PK
H	11650.00	39.11	46.10	8.77	39.10	40.88	54.00	-13.12	AV
H	17475.00	46.39	47.90	11.23	38.90	48.62	68.20	-19.58	PK
H	17475.00	39.66	47.90	11.23	38.90	41.89	54.00	-12.11	AV
H	23300.00	54.51	57.10	12.73	37.80	47.94	68.20	-20.26	PK
H	23300.00	47.22	57.10	12.73	37.80	40.65	54.00	-13.35	AV
H	29125.00	51.83	55.80	14.25	40.50	50.78	68.20	-17.42	PK
H	29125.00	42.40	55.80	14.25	40.50	41.35	54.00	-12.65	AV

Remark:
1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier,
Margin= Emission Level - Limit
2. If peak below the average limit, the average emission was no test.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

4.8.2 Conducted Emission Method

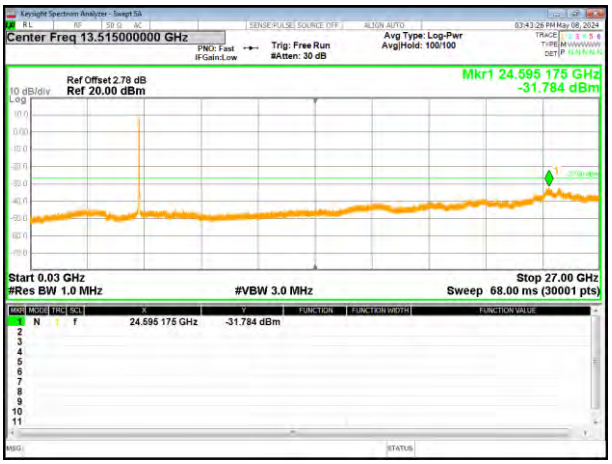
Test Requirement:	FCC Part15 C Section 15.209, Part 15E Section 15.407(b)(4), RSS-247 §6.2.1.2&6.2.4.3 and RSS-Gen	
Test Method:	ANSI C63.10:2013	
Limit:	-27dBm/MHz	
Test setup:		
Test Instruments:	Refer to section 3.0 for details	
Test mode:	Refer to section 2.2 for details	
Test environment:	Temp.: 24.9°C	Humid.:53%RH
Test voltage:	AC 120V/60Hz	
Test results:	Pass	

Remark: Antenna gain and cable loss data included in Offset.

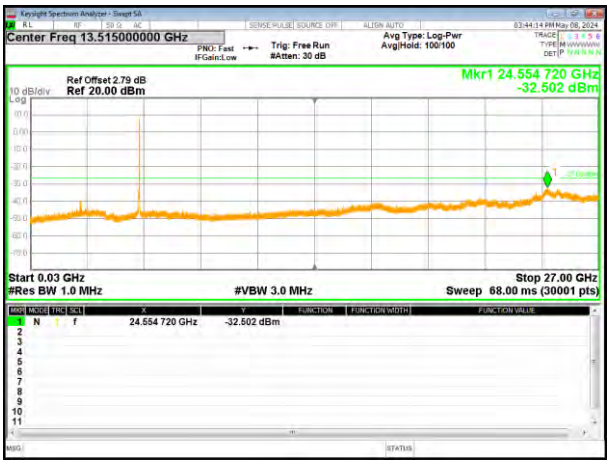
5180-5240MHz

Test Plot

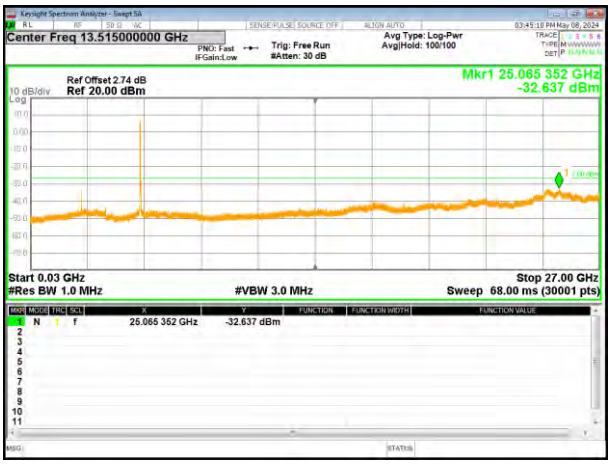
802.11a on channel 36



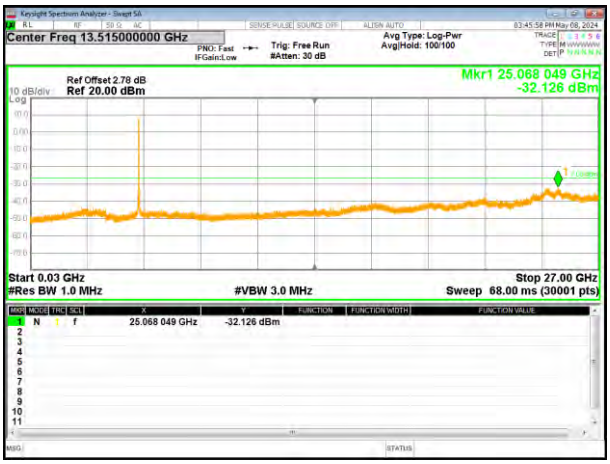
802.11a on channel 40



802.11a on channel 48

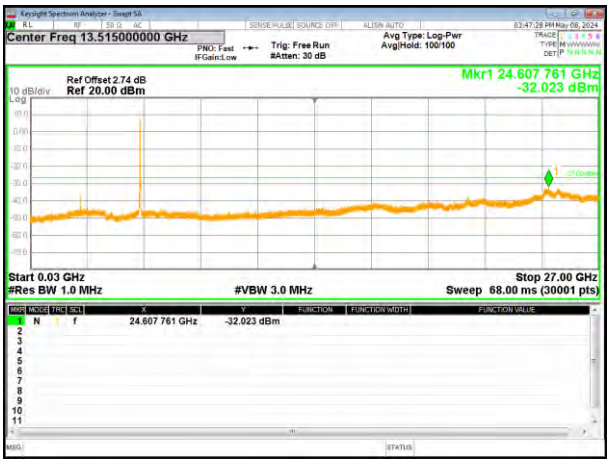


802.11n20 on channel 36



802.11n20 on channel 40

802.11n20 on channel 48

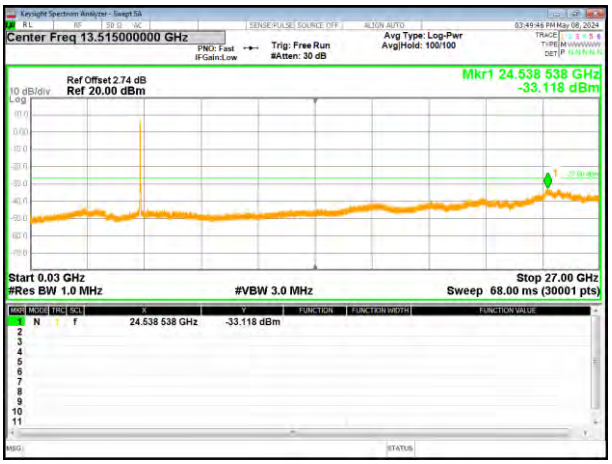


Test Plot

802.11ac20 on channel 36

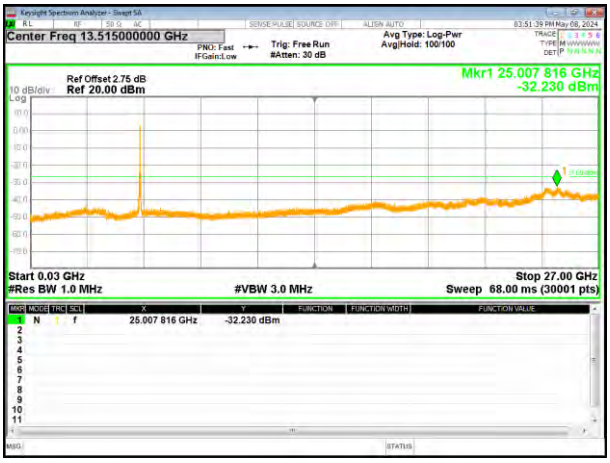
802.11ac20 on channel 40

802.11ac20 on channel 48



802.11n40 on channel 38

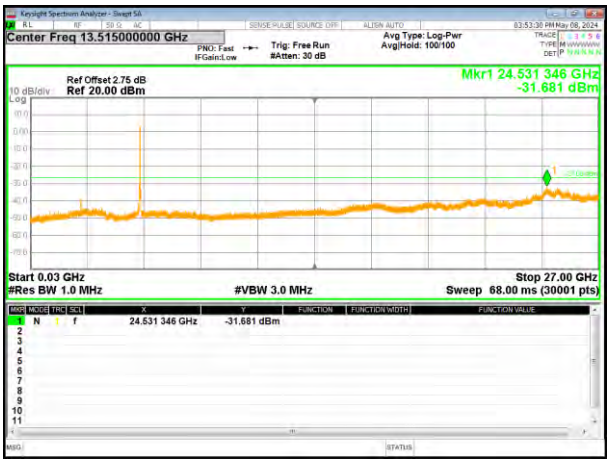
802.11n40 on channel 46



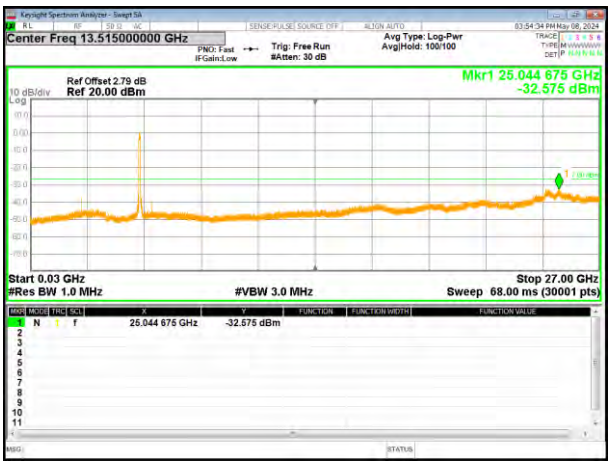
Test Plot

802.11ac40 on channel 38

802.11ac40 on channel 46



802.11ac80 on channel 42

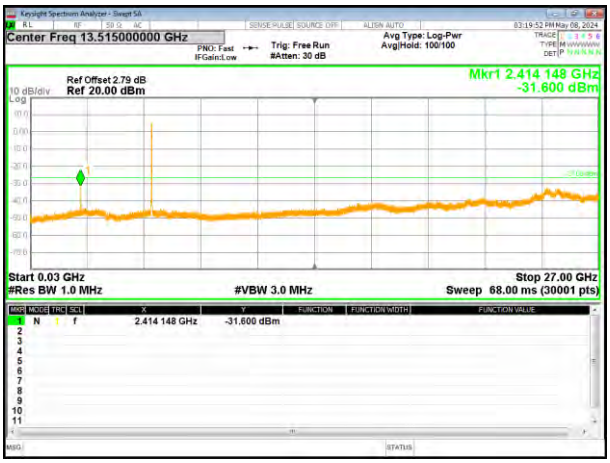


5745-5825MHz

Test Plot

802.11a on channel 149

802.11a on channel 157



802.11a on channel 165

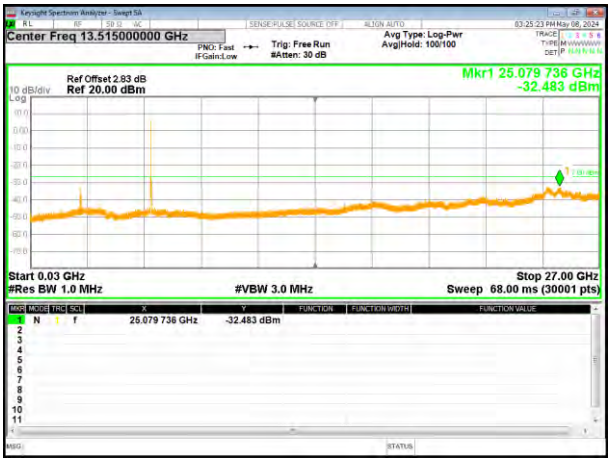
802.11n20 on channel 149

802.11n20 on channel 157

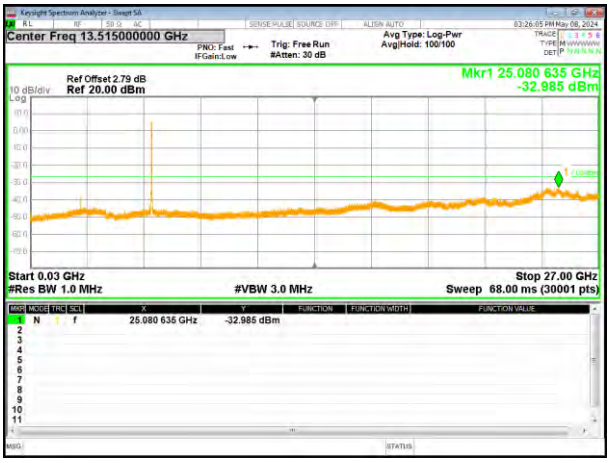
802.11n20 on channel 165

Test Plot

802.11ac20 on channel 149



802.11ac20 on channel 157



802.11ac20 on channel 165

802.11n40 on channel 151

802.11n40 on channel 159

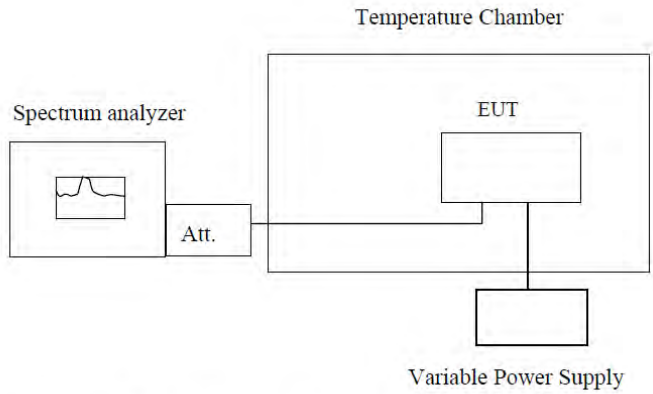
Test Plot

802.11ac40 on channel 151

802.11ac40 on channel 159

802.11ac80 on channel 155

4.9 Frequency stability

Test Requirement:	FCC Part15 C Section 15.407(g) ,RSS Gen§ 8.11
Test Method:	ANSI C63.10:2013, FCC Part 2.1055 and RSS-Gen
Limit:	Manufactures of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified
Test Procedure:	a. The EUT was placed inside the environmental test chamber and powered by nominal DC voltage. b. Turn the EUT on and couple its output to a spectrum analyzer. c. Turn the EUT off and set the chamber to the highest temperature specified. d. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 Minutes. e. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature. f. The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 Minute s. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.
Test setup:	 **Note :** Measurement setup for testing on Antenna connector
Test Instruments:	Refer to section 3.0 for details
Test mode:	Refer to section 2.2 for details
Test results:	Pass

Remark: Set the EUT transmits at un-modulation mode to test frequency stability.

Measurement data:

Frequency stability versus Temp.					
Power Supply: AC120V					
Temp. (°C)	Operating Frequency (MHz)	0 minute	2 minute	5 minute	10 minute
		Measured Frequency (MHz)	Measured Frequency (MHz)	Measured Frequency (MHz)	Measured Frequency (MHz)
-30	5180	5180.349	5179.775	5180.041	5180.317
	5190	5190.345	5189.771	5190.053	5190.327
	5200	5200.340	5199.766	5200.044	5200.318
	5210	5210.346	5209.772	5210.045	5210.319
	5220	5220.341	5219.767	5220.053	5220.324
	5230	5230.339	5229.765	5230.070	5230.342
	5240	5240.312	5239.739	5240.043	5240.314
-20	5180	5180.340	5179.766	5180.062	5180.338
	5190	5190.331	5189.757	5190.062	5190.333
	5200	5200.339	5199.765	5200.056	5200.328
	5210	5210.331	5209.757	5210.046	5210.334
	5220	5220.352	5219.778	5220.057	5220.327
	5230	5230.330	5229.756	5300.056	5230.325
	5240	5240.348	5239.775	5240.059	5240.298
-10	5180	5180.349	5179.775	5180.041	5180.317
	5190	5190.345	5189.771	5190.053	5190.327
	5200	5200.340	5199.766	5200.044	5200.318
	5210	5210.346	5209.772	5210.045	5210.319
	5220	5220.341	5219.767	5220.053	5220.324
	5230	5230.339	5229.765	5230.070	5230.342
	5240	5240.312	5239.739	5240.043	5240.314
0	5180	5180.126	5179.754	5180.053	5180.328
	5190	5200.298	5189.765	5190.045	5190.328
	5200	5200.296	5199.756	5200.053	5200.319
	5210	5210.351	5209.757	5210.045	5300.323
	5220	5220.340	5219.764	5220.067	5220.317
	5230	5230.327	5229.782	5230.044	5230.338
	5240	5240.344	5239.755	5240.063	5240.316
10	5180	5180.328	5179.766	5180.062	5180.329
	5190	5190.339	5189.757	5190.059	5190.319
	5200	5200.330	5199.765	5200.054	5200.327

	5210	5210.331	5209.757	5210.060	5210.319
	5220	5220.338	5219.778	5220.056	5220.338
	5230	5230.356	5229.756	5230.053	5230.316
	5240	5240.341	5239.775	5240.027	5240.334
20	5180	5180.406	5179.019	5180.311	5180.091
	5190	5190.349	5189.808	5190.356	5190.355
	5200	5200.344	5199.799	5200.365	5200.380
	5210	5210.350	5299.810	5210.358	5210.364
	5220	5220.345	5219.799	5220.380	5220.354
	5230	5230.343	5229.820	5230.358	5230.382
	5240	5240.316	5239.799	5240.377	5240.370
30	5180	5180.332	5179.807	5180.364	5180.374
	5190	5190.343	5189.799	5190.356	5190.374
	5200	5200.334	5199.807	5200.365	5190.369
	5210	5210.335	5209.799	5210.358	5210.364
	5220	5220.342	5219.820	5220.380	5220.370
	5230	5230.360	5229.798	5230.358	5220.364
	5240	5240.332	5239.817	5240.377	5240.362
40	5180	5180.344	5179.806	5180.150	5180.353
	5190	5190.335	5189.808	5200.324	5190.363
	5200	5200.343	5199.799	5200.322	5200.354
	5210	5210.335	5299.810	5210.378	5210.355
	5220	5220.356	5219.799	5220.368	5220.361
	5230	5230.334	5229.820	5230.355	5230.379
	5240	5240.352	5239.799	5240.373	5240.351
50	5180	5180.344	5179.807	5180.364	5180.326
	5190	5190.335	5189.799	5190.356	5190.355
	5200	5200.343	5199.807	5200.365	5200.380
	5210	5210.335	5209.799	5210.358	5210.364
	5220	5220.356	5219.820	5220.380	5220.354
	5230	5230.334	5229.798	5230.358	5230.382
	5240	5240.352	5239.817	5240.377	5240.370

Frequency stability versus Voltage					
Temperature: 25°C					
Power Supply (VAC)	Operating Frequency (MHz)	0 minute	2 minute	5 minute	10 minute
		Measured Frequency (MHz)	Measured Frequency (MHz)	Measured Frequency (MHz)	Measured Frequency (MHz)
102	5180	5180.353	5179.810	5180.364	5180.489
	5190	5190.349	5199.804	5190.356	5200.363
	5200	5200.344	5199.832	5200.365	5200.388
	5210	5210.350	5209.810	5210.358	5210.366
	5220	5220.345	5219.825	5220.380	5220.380
	5230	5230.343	5229.818	5230.358	5230.373
	5240	5240.316	5239.827	5240.373	5240.381
120	5180	5180.339	5179.825	5180.363	5180.374
	5190	5190.335	5179.931	5190.365	5190.372
	5200	5200.343	5199.807	5200.357	5200.366
	5210	5210.336	5209.832	5300.373	5210.356
	5220	5220.356	5219.810	5220.359	5220.365
	5230	5230.334	5229.825	5230.379	5300.361
	5240	5240.352	5239.819	5240.359	5240.367
138	5180	5180.353	5179.816	5180.352	5180.353
	5190	5190.349	5189.813	5190.364	5190.363
	5200	5200.344	5199.808	5200.356	5200.353
	5210	5210.350	5209.814	5210.358	5210.355
	5220	5220.345	5219.809	5220.366	5220.361
	5230	5230.343	5229.807	5230.384	5230.384
	5240	5240.316	5239.781	5240.357	5240.351

Frequency stability versus Temp.					
Power Supply: AC120V					
Temp. (°C)	Operating Frequency (MHz)	0 minute Measured Frequency (MHz)	2 minute Measured Frequency (MHz)	5 minute Measured Frequency (MHz)	10 minute Measured Frequency (MHz)
-30	5745	5745.346	5744.842	5745.409	5745.339
	5755	5755.360	5754.814	5755.426	5755.357
	5775	5775.345	5774.838	5775.413	5775.337
	5785	5785.332	5784.838	5785.400	5785.363
	5795	5795.326	5794.829	5795.395	5795.355
	5825	5825.360	5824.845	5825.432	5825.363
-20	5745	5745.326	5744.828	5745.395	5745.350
	5755	5755.341	5754.830	5755.421	5755.363
	5775	5775.340	5774.834	5775.404	5775.348
	5785	5785.343	5784.826	5785.413	5785.334
	5795	5795.353	5794.817	5795.412	5795.328
	5825	5825.335	5824.827	5825.425	5825.361
-10	5745	5745.336	5744.818	5745.411	5744.969
	5755	5755.362	5754.825	5755.414	5755.352
	5775	5775.358	5774.843	5775.419	5775.353
	5785	5785.342	5784.819	5785.411	5785.355
	5795	5795.331	5794.815	5795.403	5795.338
	5825	5825.266	5824.818	5825.415	5825.333
0	5745	5745.330	5744.807	5745.411	5745.340
	5755	5755.355	5754.823	5755.414	5755.365
	5775	5775.336	5774.823	5775.419	5775.361
	5785	5785.345	5784.826	5785.411	5785.344
	5795	5795.343	5794.839	5795.403	5795.333
	5825	5825.353	5824.819	5825.415	5825.267
10	5745	5745.330	5744.817	5745.400	5745.335
	5755	5755.355	5754.834	5755.408	5755.346
	5775	5775.336	5774.836	5775.402	5775.363
	5785	5785.345	5784.818	5785.394	5785.338
	5795	5795.343	5794.835	5795.402	5795.334
	5825	5825.353	5824.834	5825.334	5825.336
20	5745	5745.346	5744.842	5745.409	5745.339
	5755	5755.360	5754.814	5755.426	5755.357
	5775	5775.345	5774.838	5775.413	5775.337
	5785	5785.332	5784.838	5785.400	5785.363
	5795	5795.326	5794.829	5795.395	5795.355
	5825	5825.360	5824.845	5825.432	5825.363
30	5745	5745.336	5744.828	5745.394	5745.364
	5755	5755.343	5754.830	5755.418	5755.335
	5775	5775.360	5774.834	5775.421	5775.358
	5785	5785.336	5784.826	5785.403	5785.357
	5795	5795.332	5794.817	5795.421	5795.348
	5825	5825.335	5824.827	5825.422	5825.362
40	5745	5745.346	5744.812	5745.411	5745.333
	5755	5755.360	5754.837	5755.414	5755.365

	5775	5775.345	5774.819	5775.419	5775.361
	5785	5785.332	5784.828	5785.411	5785.344
	5795	5795.326	5794.826	5795.403	5795.333
	5825	5825.360	5824.837	5825.415	5825.267
50	5745	5745.325	5744.828	5745.395	5745.350
	5755	5755.341	5754.830	5755.421	5755.363
	5775	5775.340	5774.834	5775.404	5775.348
	5785	5785.343	5784.826	5785.413	5785.334
	5795	5795.350	5794.817	5795.412	5795.328
	5825	5825.335	5824.827	5825.425	5825.361

Frequency stability versus Voltage					
Temperature: 25°C					
Power Supply (VAC)	Operating Frequency (MHz)	0 minute Measured Frequency (MHz)	2 minute Measured Frequency (MHz)	5 minute Measured Frequency (MHz)	10 minute Measured Frequency (MHz)
102	5745	5745.325	5744.817	5745.400	5745.334
	5755	5755.341	5754.824	5755.418	5755.358
	5775	5775.340	5774.817	5775.421	5775.339
	5785	5785.343	5784.809	5785.403	5785.347
	5795	5795.354	5794.816	5795.422	5795.345
	5825	5825.335	5824.746	5825.422	5825.354
120	5745	5745.325	5744.828	5745.395	5745.350
	5755	5755.341	5754.830	5755.421	5755.363
	5775	5775.340	5774.834	5775.404	5775.348
	5785	5785.343	5784.826	5785.413	5785.334
	5795	5795.350	5794.817	5795.412	5795.328
	5825	5825.335	5824.827	5825.425	5825.361
138	5745	5745.330	5744.817	5745.400	5745.335
	5755	5755.355	5754.834	5755.408	5755.346
	5775	5775.336	5774.836	5775.402	5775.363
	5785	5785.345	5784.818	5785.394	5785.338
	5795	5795.343	5794.835	5795.402	5795.334
	5825	5825.353	5824.834	5825.334	5825.336

5 Test Setup Photo

Reference to the **appendix I** for details.

6 EUT Constructional Details

Reference to the **appendix II** for details.

------END------