Report No.: ET-24091477E03

TEST REPORT

Applicant's name:	WALTON DIGI-TECH INDUSTRIES LIMITED
Address:	CHANDRA, KALIAKAIR, GAZIPUR,BANGLADESH
Manufacturer's Name:	WALTON DIGI-TECH INDUSTRIES LIMITED
Address :	CHANDRA, KALIAKAIR, GAZIPUR,BANGLADESH
Factory's Name:	WALTON DIGI-TECH INDUSTRIES LIMITED
Address :	CHANDRA, KALIAKAIR, GAZIPUR,BANGLADESH
Product Name:	OPS (OPS COMPUTER,OPS PC MODULE,OPS COMPUTER PC MODULE, COMPUTER）
Model No.:	WOI512,WOI712,WOI513,WOI713,WOI514,WOI714,WOI51A,WOI71A,WOI313, WOI31A
Trade Mark:	WALTON, Kaiman, ACC, AVIAN
FCC ID:	2BLY9-WOI512
Applicable standards:	FCC CFR Title 47 Part 15 Subpart C Section 15.247
Date of Test:	Sept.26,2024-Oct.12,2024
Date of report issued:	Mar.31,2025

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:
Carl kong	Smith chen	Smith chen
Project Engineer	Project Manager	Authorized Signature

Report Revision History		
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1 Test Summary

Test Item	Section in CFR 47	Result	Test by
Antenna requirement	15.203	Pass	/
AC Power Line Conducted Emission	15.207	Pass	Carr Kang
Conducted Output Power	15.407 (a)(1)/(a)(3)	Pass	Yvan Fan
26dB Bandwidth and 99% Occupied Bandwidth	15.407 (a)(12)	Pass	Yvan Fan
6dB Bandwidth	15.407 (e)	Pass	Yvan Fan
Power Spectral Density	15.407(a)(1)/(a)(3)	Pass	Yvan Fan
Band Edge	15.407(b)(1)/(b)(4)	Pass	Yvan Fan
Spurious Emission	15.205/15.209 15.407(b)(1)/(b)(4)/(b)(8)	Pass	Carr Kang
Frequency Stability	15.407(g)	Pass	Yvan Fan

Remarks:

1. *Pass: The EUT complies with the essential requirements in the standard.*
2. *Test according to ANSI C63.10:2013*
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	± 2.64 dB	(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:	OPS (OPS COMPUTER,OPS PC MODULE,OPS COMPUTER PC MODULE, COMPUTER）
Model No.:	WOI512,WOI712,WOI513,WOI713,WOI514,WOI714,WOI51A,WOI71A, WOI313,WOI31A
Difference of model(s)	All the model are the same circuit and RF module, except the model names and colors
Test Model:	WOI512
Hardware Version:	OP.INADLH.HA71(B23442)
Software Version:	OPS71C-SHA-002-V0.04-I
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:	External Antenna
Antenna gain:	4.65dBi (Note: Antenna information is provided by applicant, Testing lab is not responsible for the accuracy of the information.)
Battery	N/A

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	/
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	/

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	monitor	SKYWORTH	2BU1	/
2	mouse	DELL	/	/
3	keyboard	DELL	/	/
4	adapter	Jihongda	JHD-AP65U-190342BA-A	/

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

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	DRTU.EXE
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
18	Temp.& Humidity Chamber	Jiecheng	QA-LP-80	20160705001	2024.04.23	2025.4.22

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

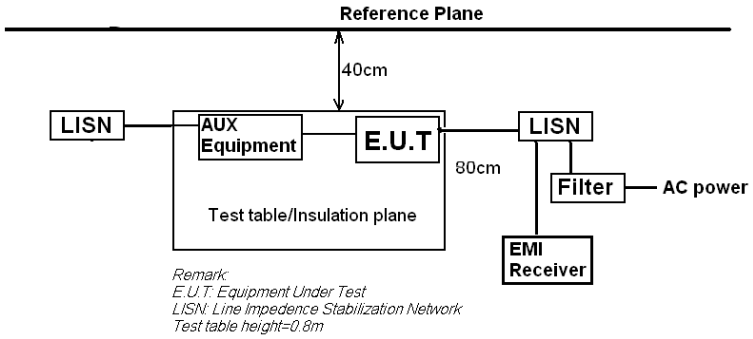
Software Name	Manufacturer	Model	Version
RF test software	MWRFtest	MTS 8310	V2.0.0.0
Conducted test software	EZ-EMC	Farad	Ver.EMC-CON 3A1.1
Radiated test software	EZ-EMC	Farad	Ver.FA-03A2 RE

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.*	
E.U.T Antenna:	
The antennas are External Antenna, the best case gain of the antennas are 4.65dBi, 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</td></tr>
<tr><td>Test Method:</td><td colspan="6">ANSI C63.10:2013</td></tr>
<tr><td>Test Frequency Range:</td><td colspan="6">150KHz to 30MHz</td></tr>
<tr><td>Class / Severity:</td><td colspan="6">Class B</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>24.9°C</td><td>Humid.:</td><td>49%</td><td>Press.:</td><td>1012mbar</td></tr>
<tr><td>Test voltage:</td><td colspan="6">DC 19V from adapter</td></tr>
<tr><td>Test results:</td><td colspan="6">Pass</td></tr>
</table>

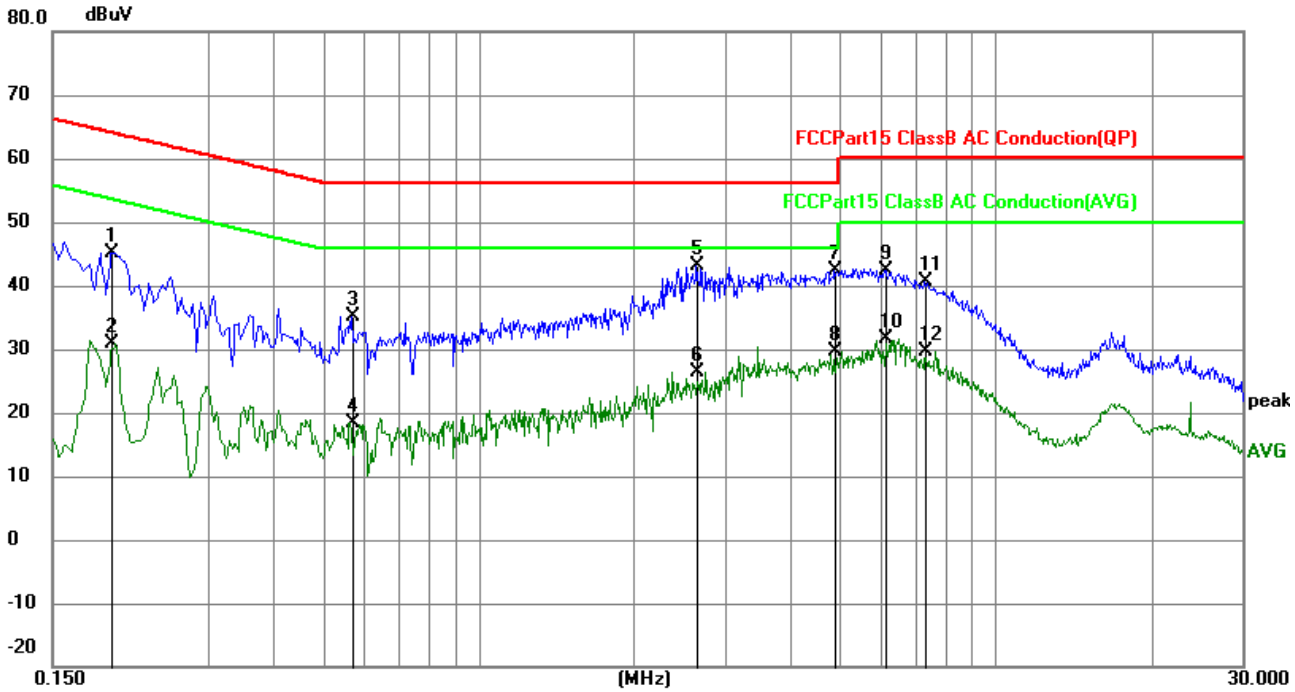
Remark:

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 (802.11a 5180MHz)

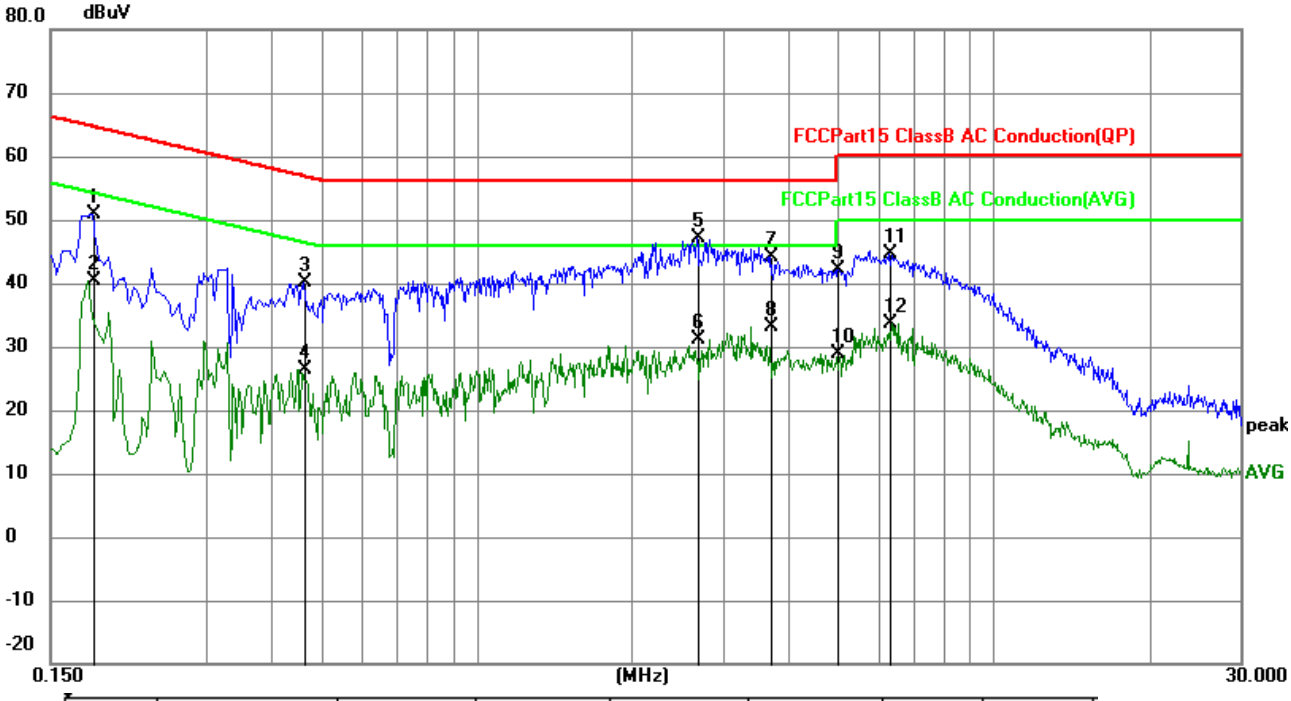
Measurement Result

Line:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1949	35.36	9.81	45.17	63.83	-18.66	QP
2	0.1949	21.16	9.81	30.97	53.83	-22.86	AVG
3	0.5684	25.29	9.94	35.23	56.00	-20.77	QP
4	0.5684	8.38	9.94	18.32	46.00	-27.68	AVG
5	2.6475	33.33	9.85	43.18	56.00	-12.82	QP
6	2.6475	16.55	9.85	26.40	46.00	-19.60	AVG
7	4.8930	32.59	9.83	42.42	56.00	-13.58	QP
8	4.8930	19.69	9.83	29.52	46.00	-16.48	AVG
9	6.1035	32.60	9.83	42.43	60.00	-17.57	QP
10	6.1035	21.86	9.83	31.69	50.00	-18.31	AVG
11	7.3230	30.82	9.83	40.65	60.00	-19.35	QP
12	7.3230	19.70	9.83	29.53	50.00	-20.47	AVG

Neutral:

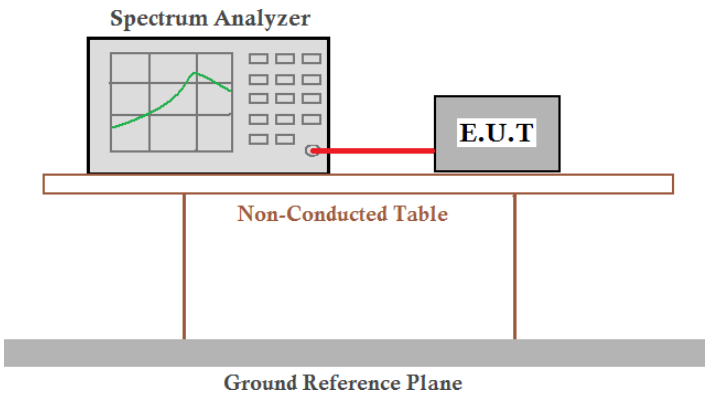


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1815	40.97	9.81	50.78	64.42	-13.64	QP
2	0.1815	30.56	9.81	40.37	54.42	-14.05	AVG
3	0.4650	30.08	9.93	40.01	56.60	-16.59	QP
4	0.4650	16.48	9.93	26.41	46.60	-20.19	AVG
5	2.6745	37.25	9.85	47.10	56.00	-8.90	QP
6	2.6745	21.35	9.85	31.20	46.00	-14.80	AVG
7	3.7050	34.39	9.84	44.23	56.00	-11.77	QP
8	3.7050	23.17	9.84	33.01	46.00	-12.99	AVG
9	5.0010	32.29	9.83	42.12	60.00	-17.88	QP
10	5.0010	19.06	9.83	28.89	50.00	-21.11	AVG
11	6.2925	34.72	9.83	44.55	60.00	-15.45	QP
12	6.2925	23.86	9.83	33.69	50.00	-16.31	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.: 22.9℃	Humid.: 49%RH
Test voltage:	DC 19V from adapter	
Test results:	Pass	

Measurement Result

5180-5240MHz

Mode	Duty cycle (%)	Correction Factor (dB)
TX 802.11a Mode	84.71	0.72
TX 802.11n20 Mode	84.89	0.71
TX 802.11ac20 Mode	83.33	0.79
TX 802.11n40 Mode	78.46	1.05
TX 802.11a40 Mode	82.13	0.86
TX 802.11ac80 Mode	72.58	1.39

5745-5825 MHz

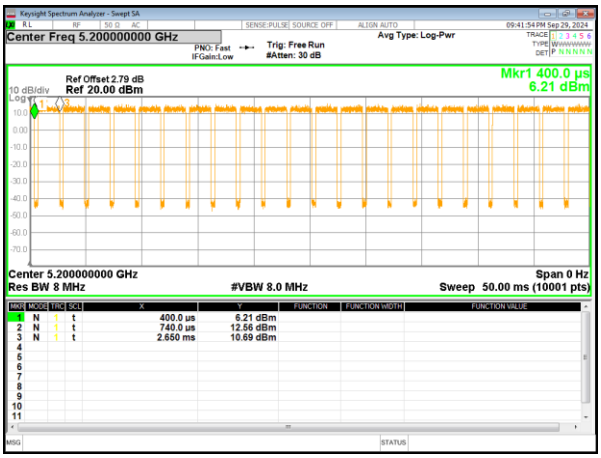
Mode	Duty cycle (%)	Correction Factor (dB)
TX 802.11a Mode	97.99	0.09
TX 802.11n20 Mode	96.06	0.17
TX 802.11ac20 Mode	96.57	0.15
TX 802.11n40 Mode	81.82	0.87
TX 802.11a40 Mode	95.55	0.2
TX 802.11ac80 Mode	91.29	0.40

Test plot

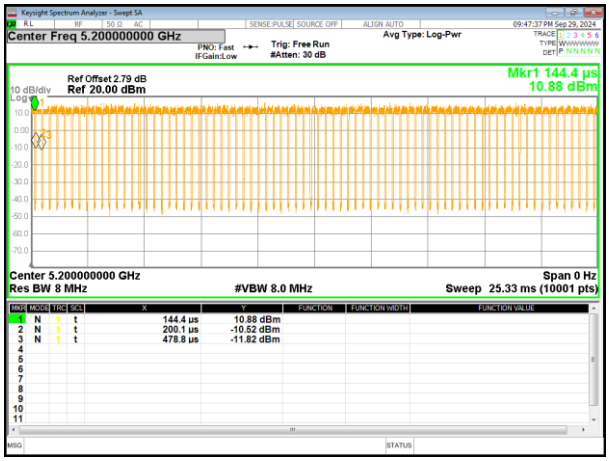
5180-5240MHz

(802.11a) plot on channel 40

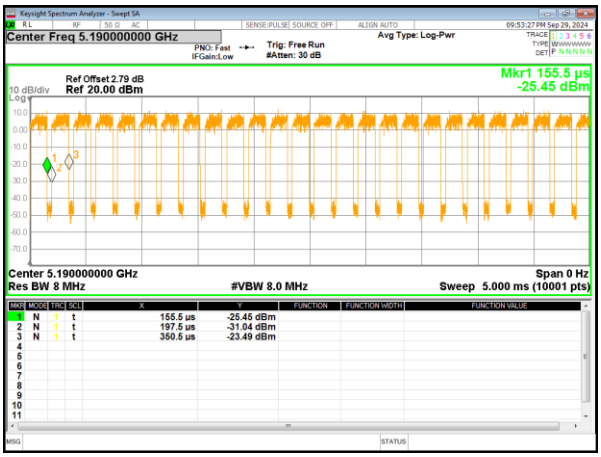
(802.11 n20) plot on channel 40



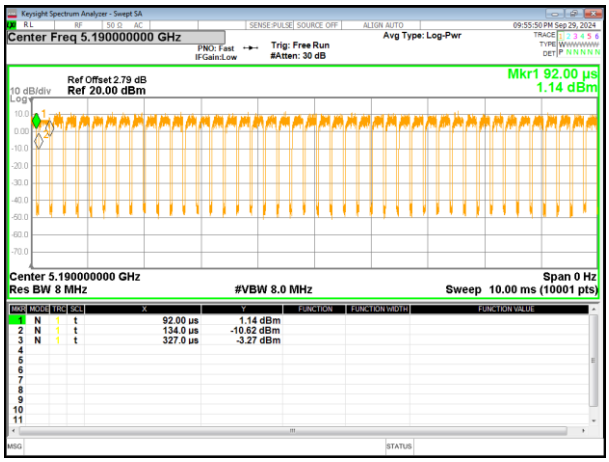
(802.11ac20) plot on channel 40



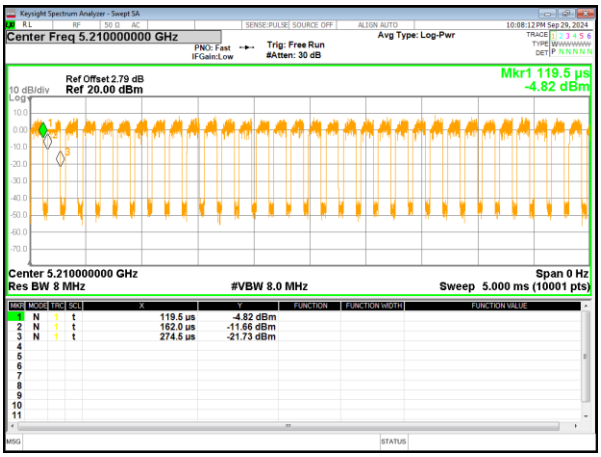
(802.11 n40) plot on channel 38



(802.11ac40) plot on channel 38

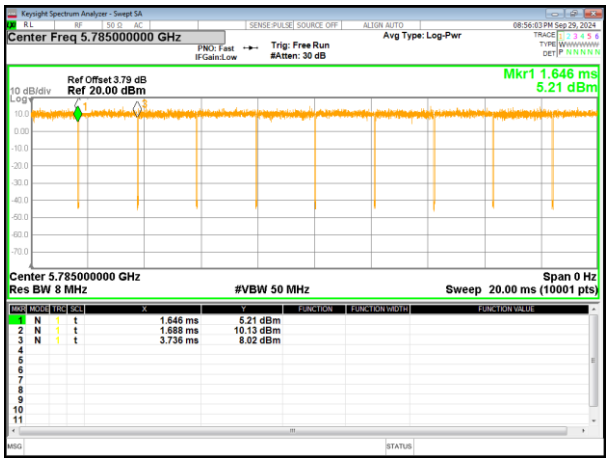


(802.11ac80) plot on channel 42

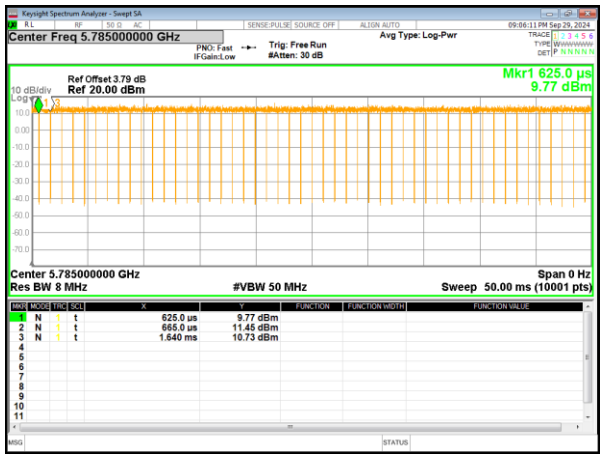


5745-5825 MHz

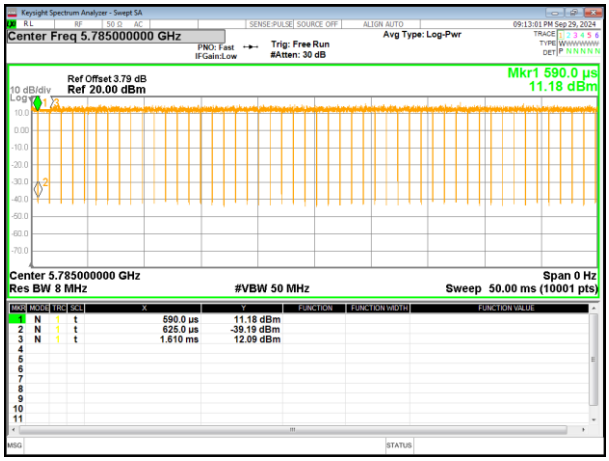
(802.11a) plot on channel 40



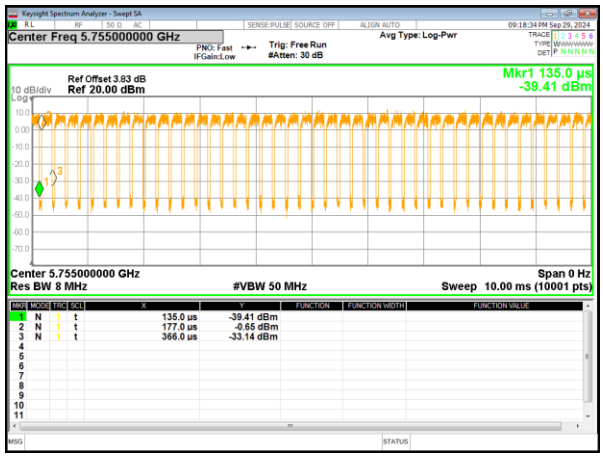
(802.11 n20) plot on channel 40



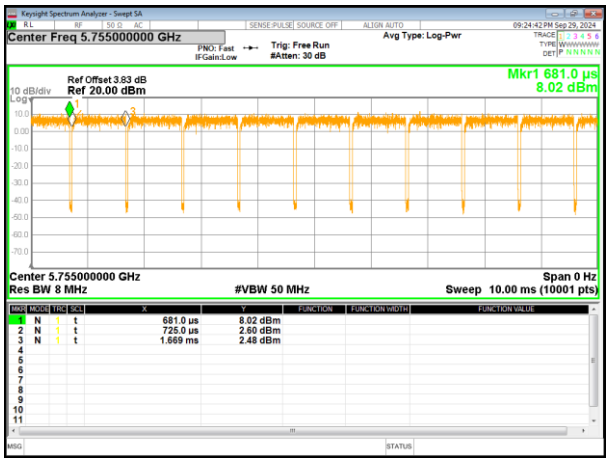
(802.11ac20) plot on channel 40



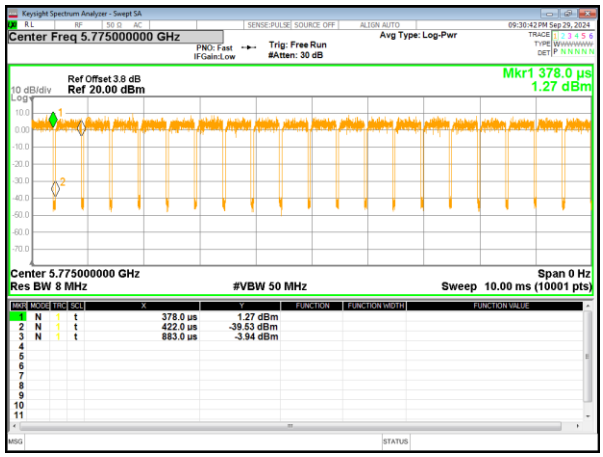
(802.11 n40) plot on channel 38



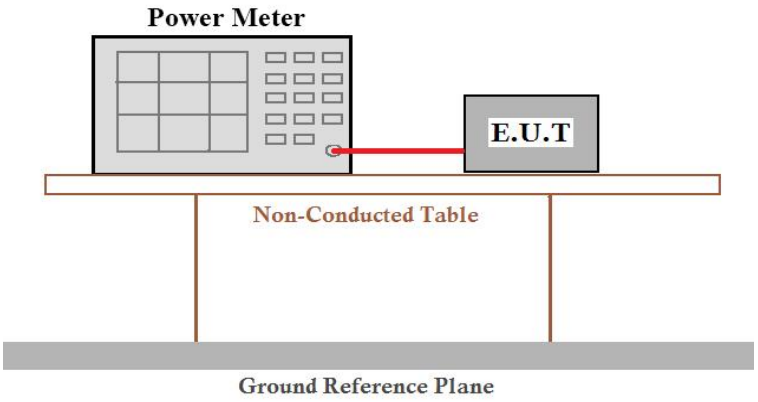
(802.11ac40) plot on channel 38



(802.11ac80) plot on channel 42



4.4 Conducted Output Power

Test Requirement:	FCC Part15 E Section 15.407 (a)(1)/(a)(3)	
Test Method:	ANSI C63.10:2013 and KDB 789033 D02 General U-NII Test Procedures New Rules v02r01	
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.: 22.9℃	Humid.: 49%RH
Test voltage:	DC 19V from adapter	
Test results:	Pass	

Measurement Result

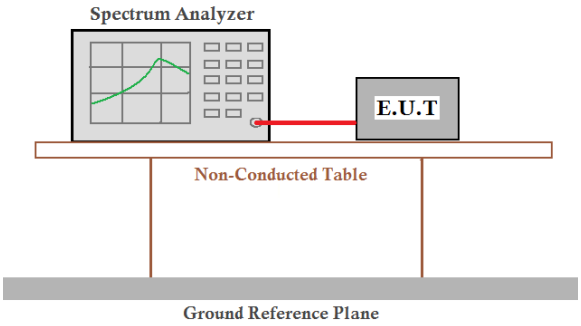
5180-5240MHz

Test Channel	Frequency	Correction Factor	Maximum output power	Total Power	LIMIT	Result
	(MHz)	(dB)	(dBm)	(dBm)	dBm	
TX 802.11a Mode						
CH36	5180	0.72	14.79	15.51	23.98	Pass
CH40	5200	0.72	14.66	15.38	23.98	Pass
CH48	5240	0.72	14.41	15.13	23.98	Pass
TX 802.11 n20 Mode						
CH36	5180	0.71	14.73	15.44	23.98	Pass
CH40	5200	0.71	14.56	15.27	23.98	Pass
CH48	5240	0.71	14.54	15.25	23.98	Pass
TX 802.11 ac20 Mode						
CH36	5180	0.79	14.75	15.54	23.98	Pass
CH40	5200	0.79	14.53	15.32	23.98	Pass
CH48	5240	0.79	14.46	15.25	23.98	Pass
TX 802.11 n40 Mode						
CH38	5190	1.05	13.96	15.01	23.98	Pass
CH46	5230	1.05	13.49	14.54	23.98	Pass
TX 802.11 ac40 Mode						
CH38	5190	0.86	13.69	14.55	23.98	Pass
CH46	5230	0.86	13.51	14.37	23.98	Pass
TX 802.11 ac80 Mode						
CH42	5210	1.39	12.51	13.90	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	0.09	14.70	14.79	30	Pass
CH157	5785	0.09	14.62	14.71	30	Pass
CH165	5825	0.09	14.70	14.79	30	Pass
TX 802.11 n20 Mode						
CH149	5745	0.17	14.40	14.57	30	Pass
CH157	5785	0.17	14.01	14.18	30	Pass
CH165	5825	0.17	14.09	14.26	30	Pass
TX 802.11 ac20 Mode						
CH149	5745	0.15	14.47	14.62	30	Pass
CH157	5785	0.15	14.10	14.25	30	Pass
CH165	5825	0.15	14.11	14.26	30	Pass
TX 802.11 n40 Mode						
CH151	5755	0.87	13.83	14.70	30	Pass
CH159	5795	0.87	13.44	14.31	30	Pass
TX 802.11 ac40 Mode						
CH151	5755	0.2	13.67	13.87	30	Pass
CH159	5795	0.2	13.55	13.75	30	Pass
TX 802.11 ac80 Mode						
CH155	5775	0.4	12.86	13.26	30	Pass

4.5 Bandwidth 99% Occupy Bandwidth

Test Requirement:	FCC Part15 E Section 15.407(a)(12)&15.407(e)
Test Method:	ANSI C63.10:2013 and KDB 789033 D02 General U-NII Test Procedures New Rules v02r01
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.: 22.9℃ Humid.: 49%RH
Test voltage:	DC 19V from adapter
Test results:	Pass

Measurement Result

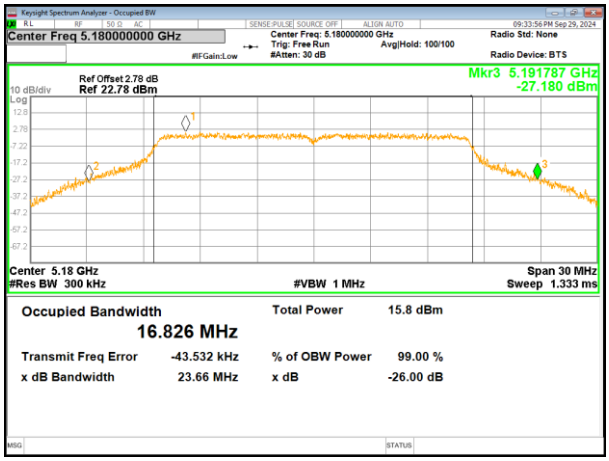
5180-5240MHz

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	23.66	24.01	21.29	39.86	40.82	--	Pass
Middle	23.09	22.92	21.31	--	--	79.12	
Highest	23.50	23.33	21.64	39.85	40.30	--	

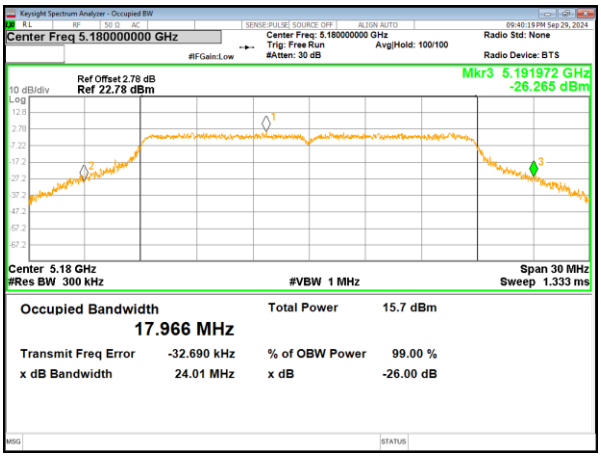
Test CH	99% Occupy Bandwidth (MHz)						Result
	802.11a	802.11n (HT20)	802.11ac (HT20)	802.11n (HT40)	802.11ac (HT40)	802.11ac (HT80)	
Lowest	16.708	17.810	17.707	36.293	36.329	--	Pass
Middle	16.683	17.812	17.699	--	--	75.081	
Highest	16.680	17.848	17.727	36.288	36.315	--	

Test plot -26dB Channel Bandwidth

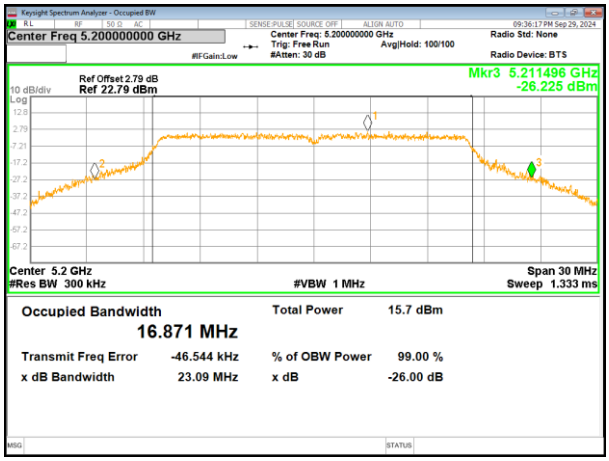
(802.11a) plot on channel 36



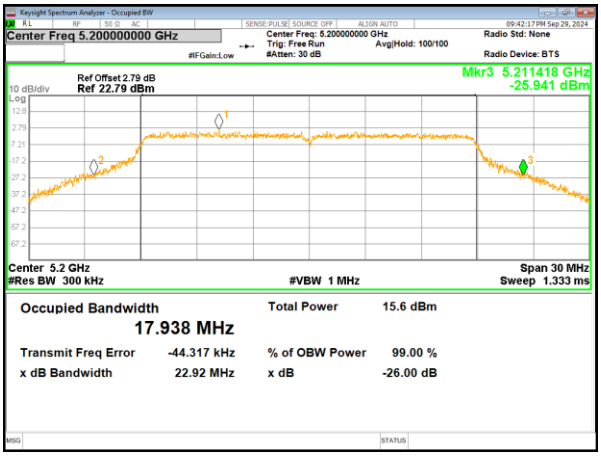
(802.11 n20) plot on channel 36



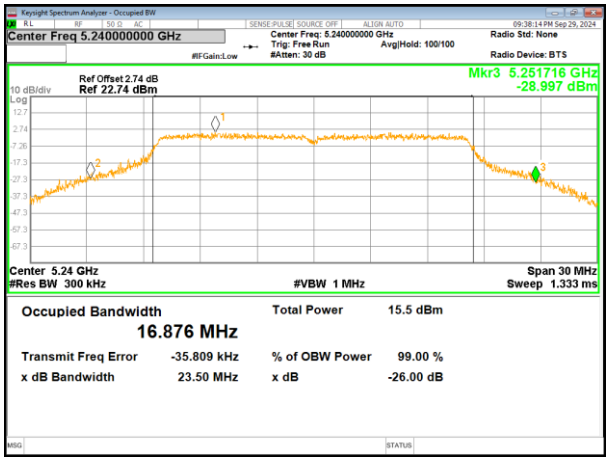
(802.11a) plot on channel 40



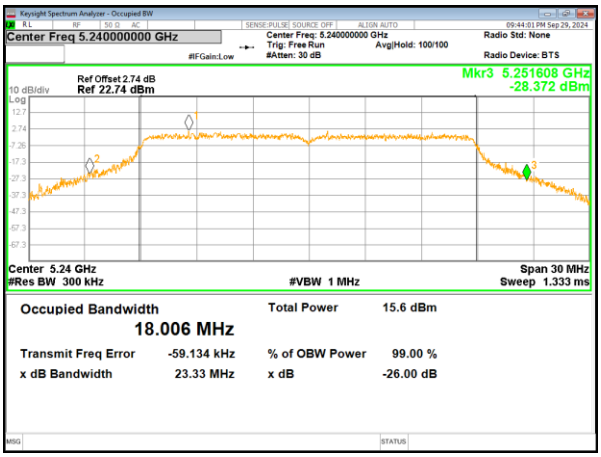
(802.11 n20) plot on channel 40



(802.11a) plot on channel 48

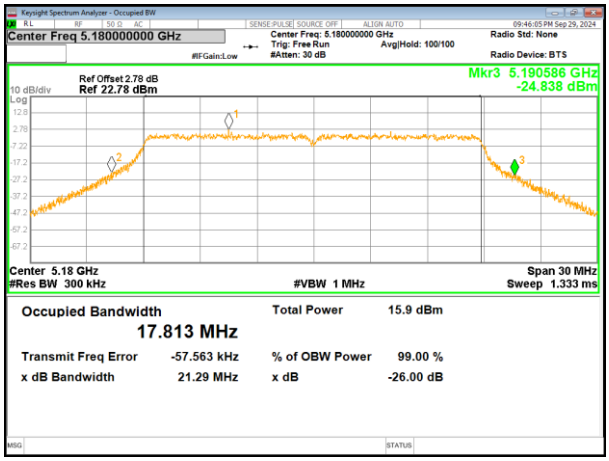


(802.11 n20) plot on channel 48

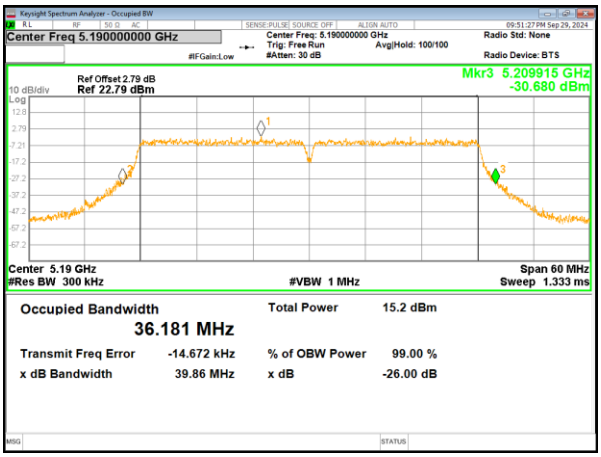


Test plot

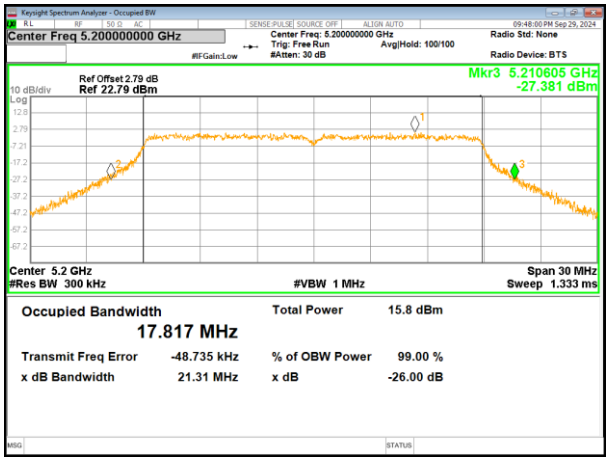
(802.11ac20) plot on channel 36



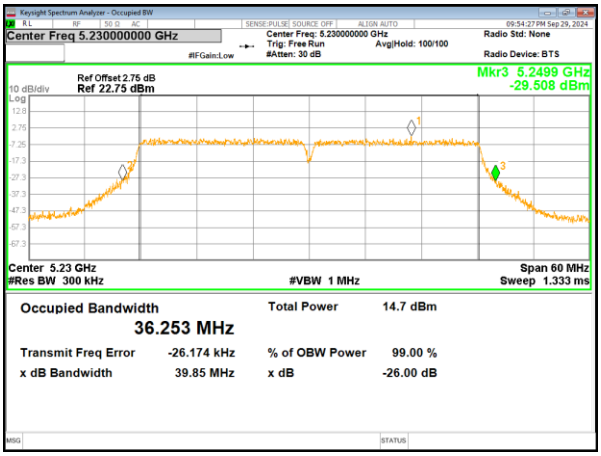
(802.11 n40) plot on channel 38



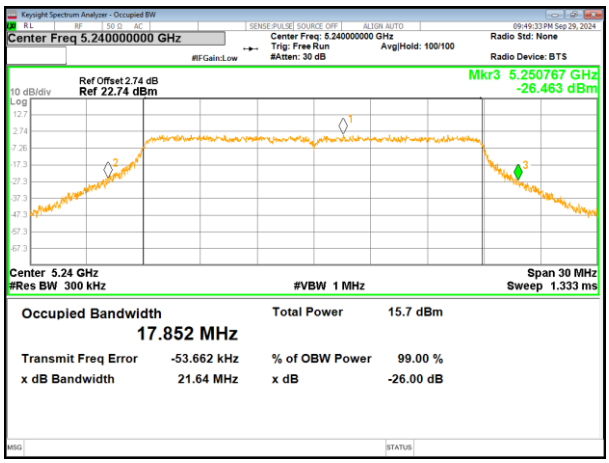
(802.11ac20) plot on channel 40



(802.11 n40) plot on channel 46

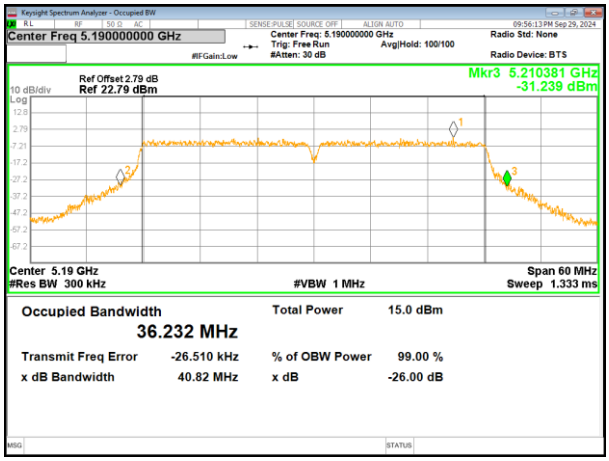


(802.11ac20) plot on channel 48

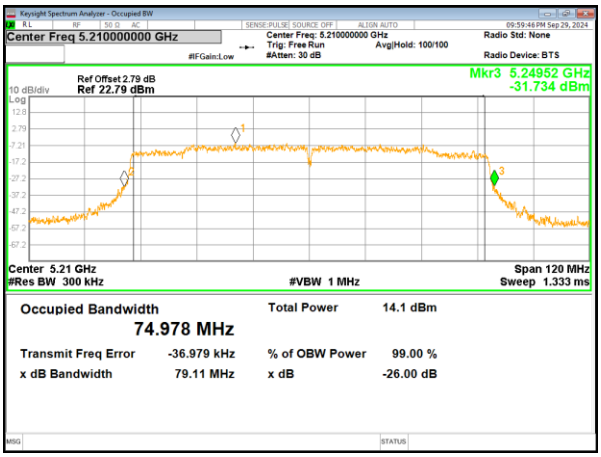


Test plot

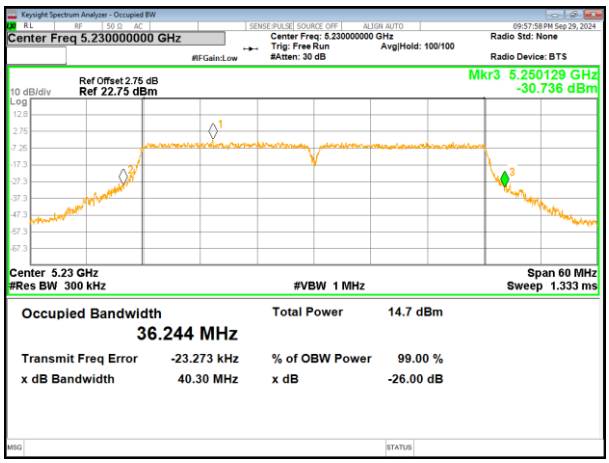
(802.11ac40) plot on channel 38



(802.11ac80) plot on channel 42

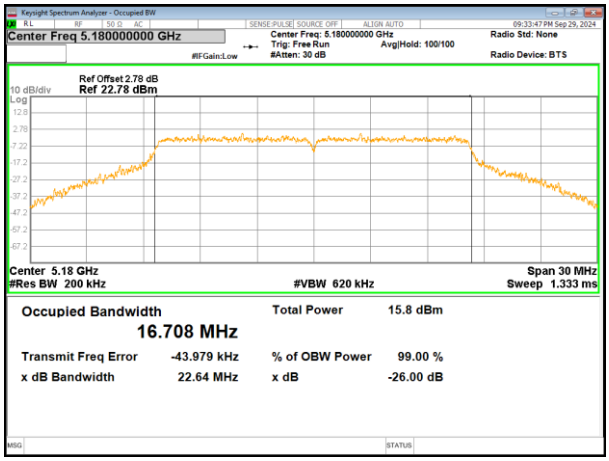


(802.11ac40) plot on channel 46

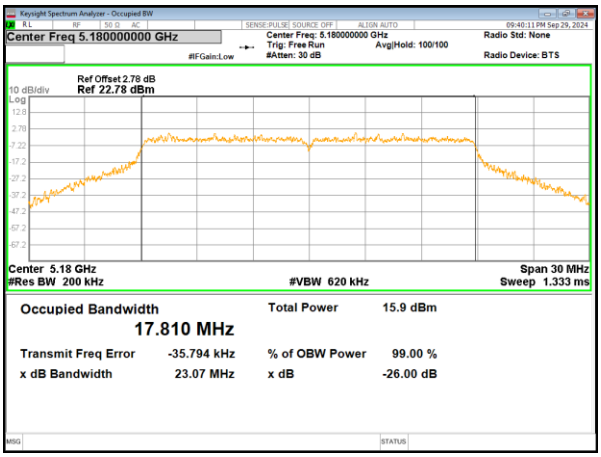


Test plot 99% Occupy Bandwidth

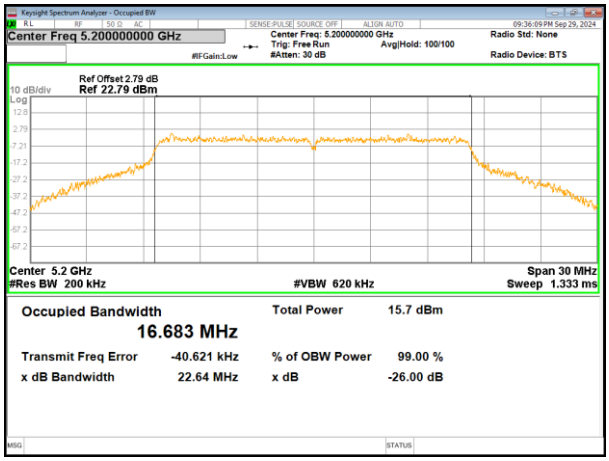
(802.11a) plot on channel 36



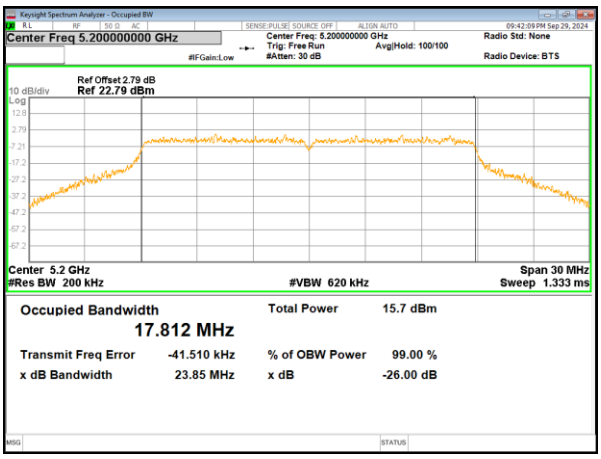
(802.11 n20) plot on channel 36



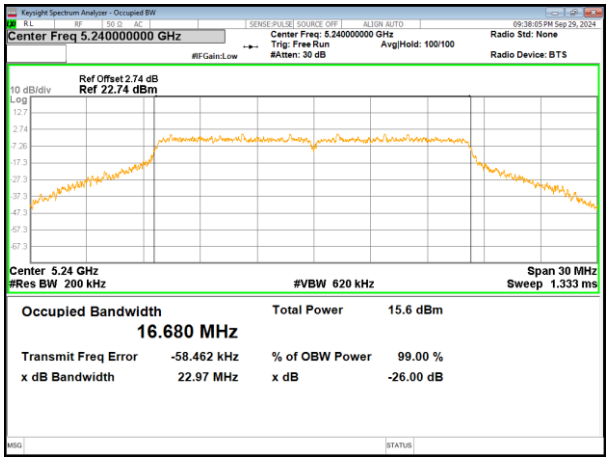
(802.11a) plot on channel 40



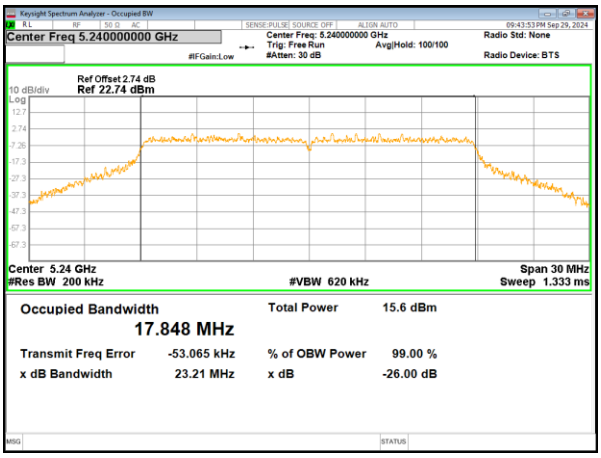
(802.11 n20) plot on channel 40



(802.11a) plot on channel 48

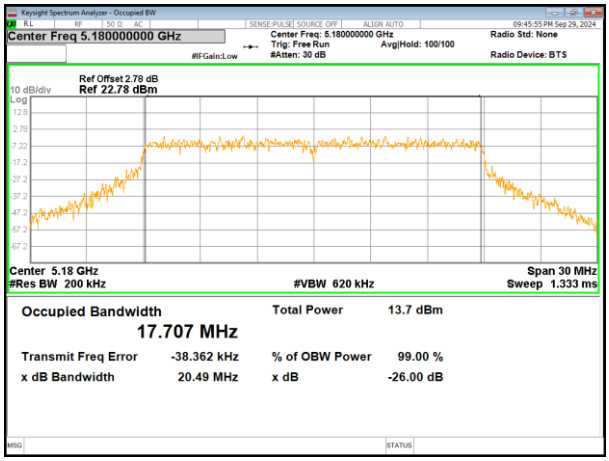


(802.11 n20) plot on channel 48

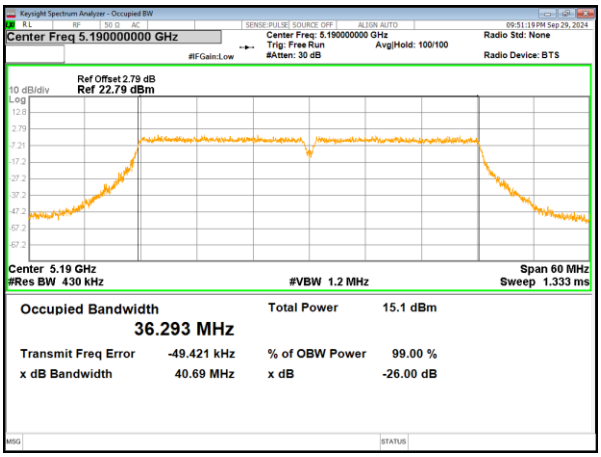


Test plot

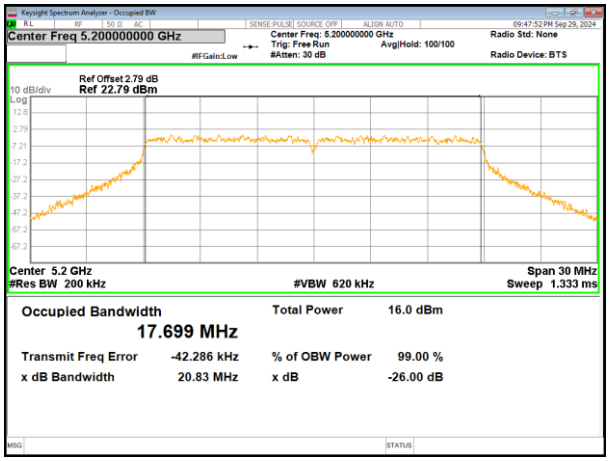
(802.11ac20) plot on channel 36



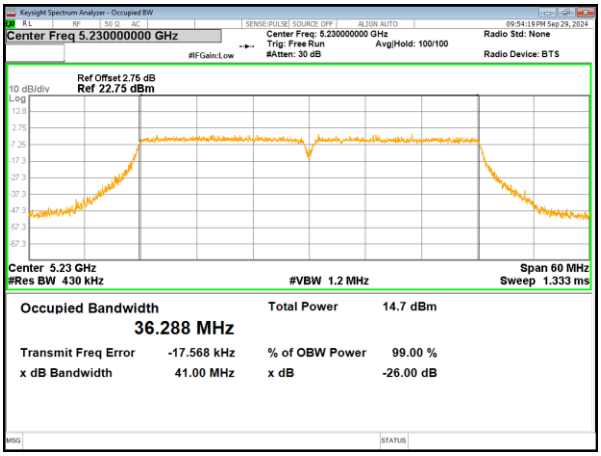
(802.11 n40) plot on channel 38



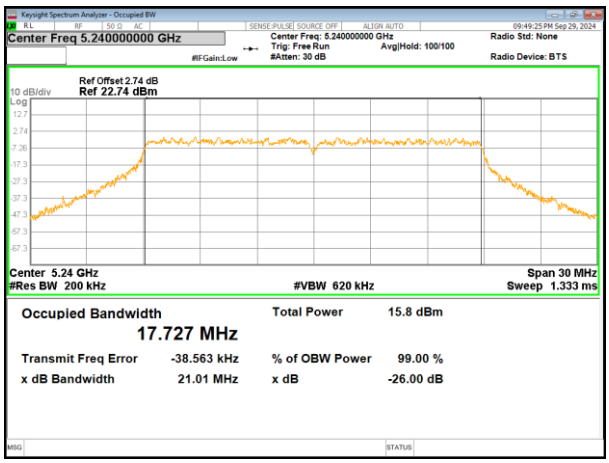
(802.11ac20) plot on channel 40



(802.11 n40) plot on channel 46

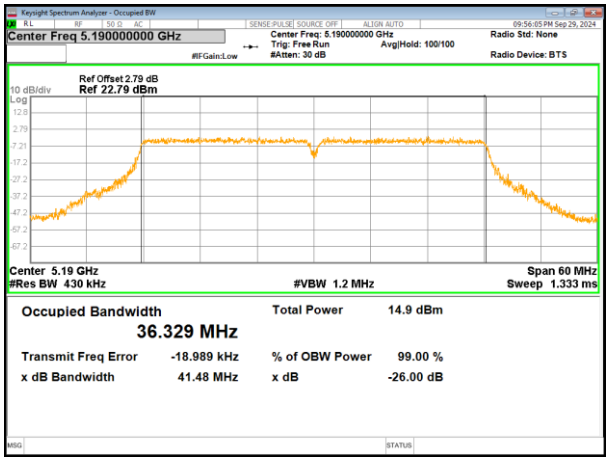


(802.11ac20) plot on channel 48

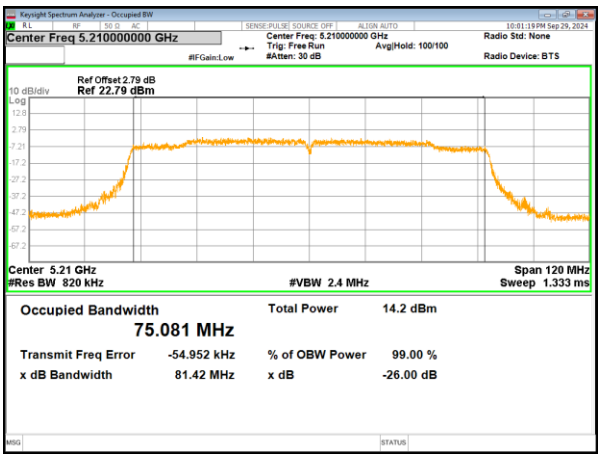


Test plot

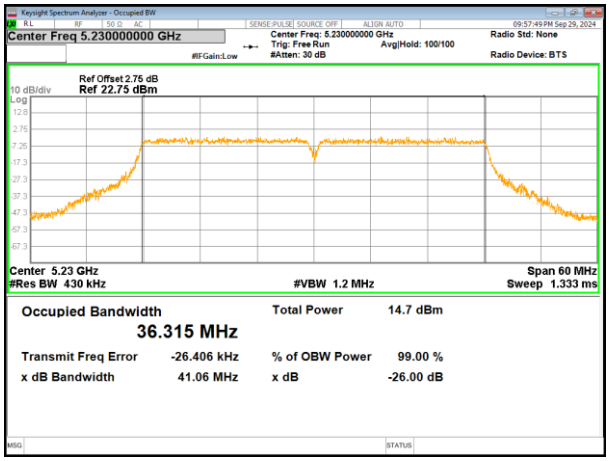
(802.11ac40) plot on channel 38



(802.11ac80) plot on channel 42



(802.11ac40) plot on channel 46



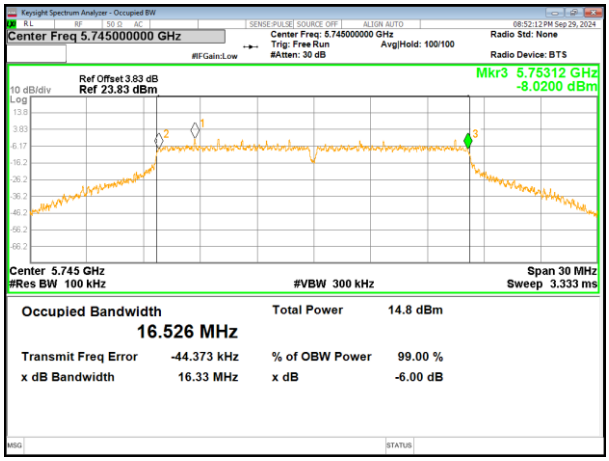
5745-5825MHz

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	16.33	17.61	17.65	36.39	36.29	--	>500	Pass
Middle	16.33	17.61	17.65	--	--	75.02		
Highest	16.34	17.61	17.62	36.40	36.32	--		

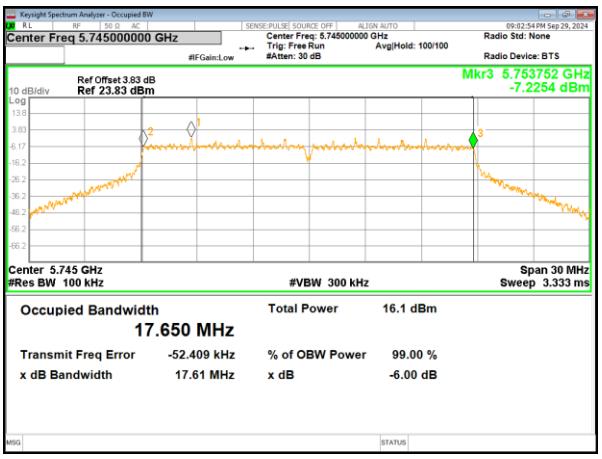
Remark: “---“is not applicable

Test plot

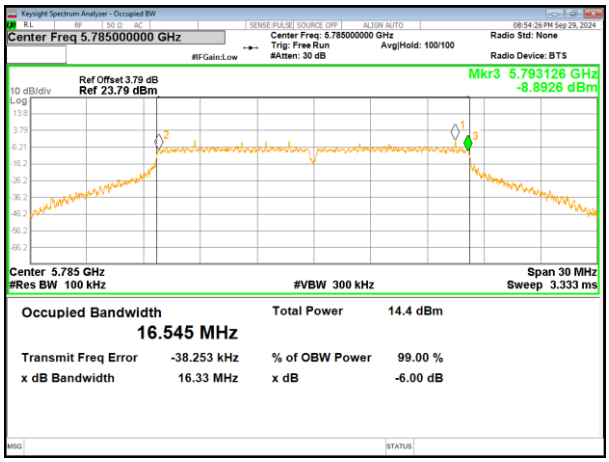
(802.11a) plot on channel 149



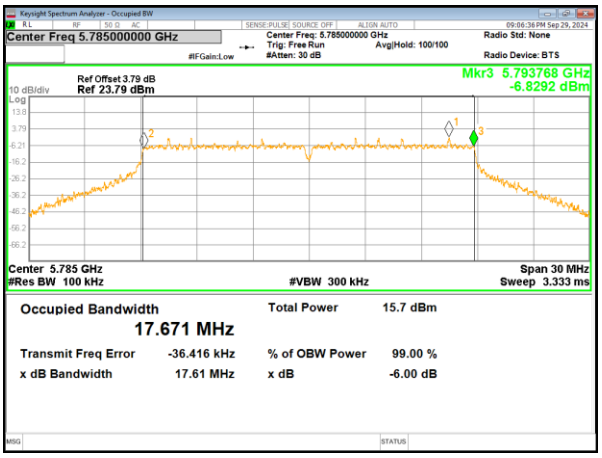
(802.11 n20) plot on channel 149



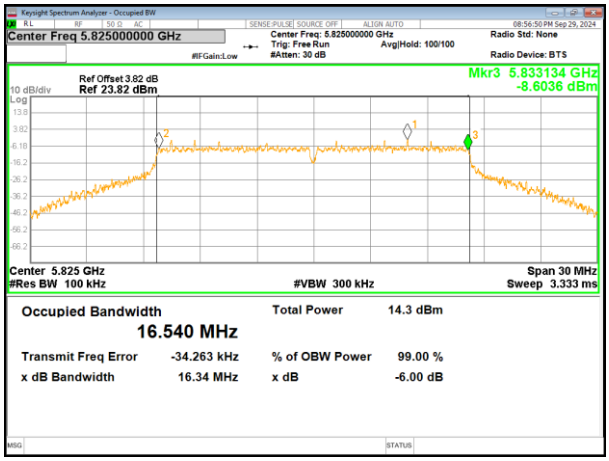
(802.11a) plot on channel 157



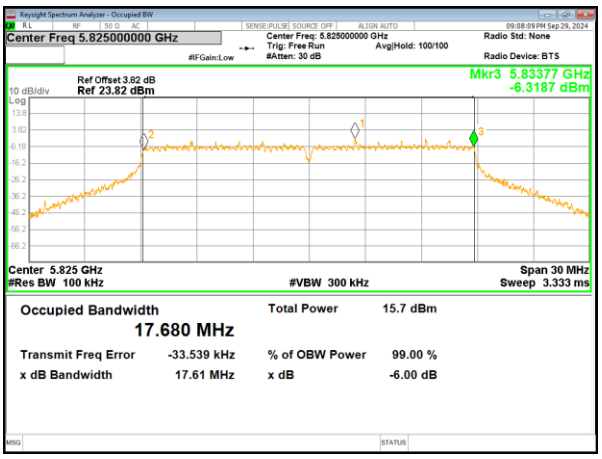
(802.11 n20) plot on channel 157



(802.11a) plot on channel 165

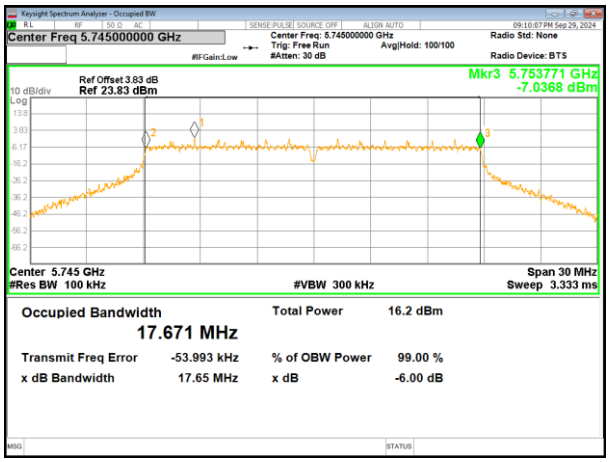


(802.11 n20) plot on channel 165

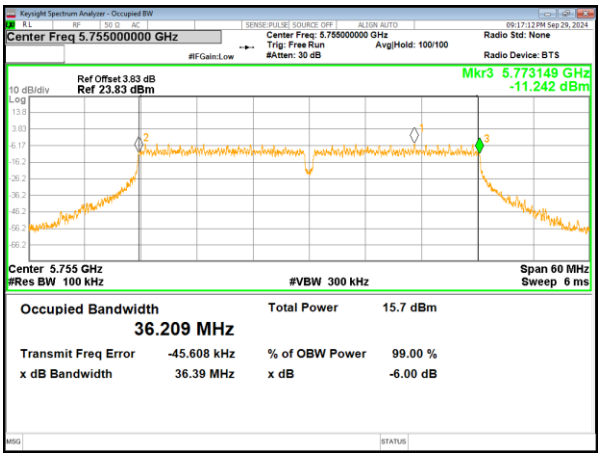


Test plot

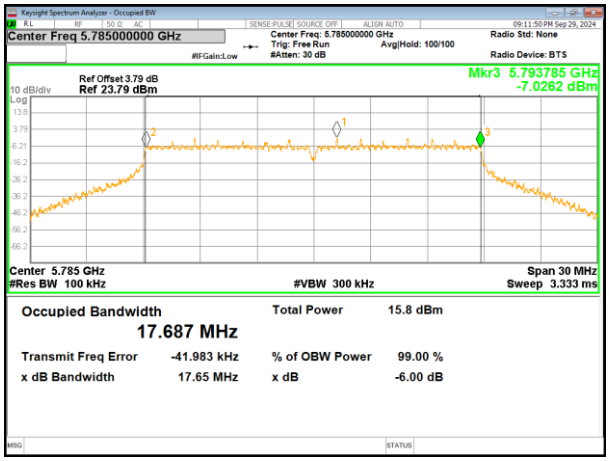
(802.11ac20) plot on channel 149



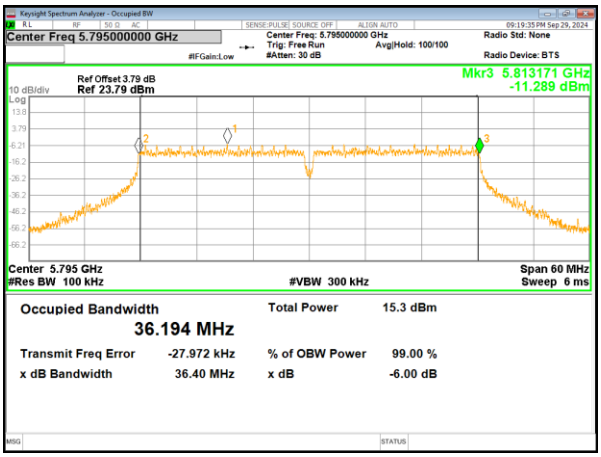
(802.11 n40) plot on channel 151



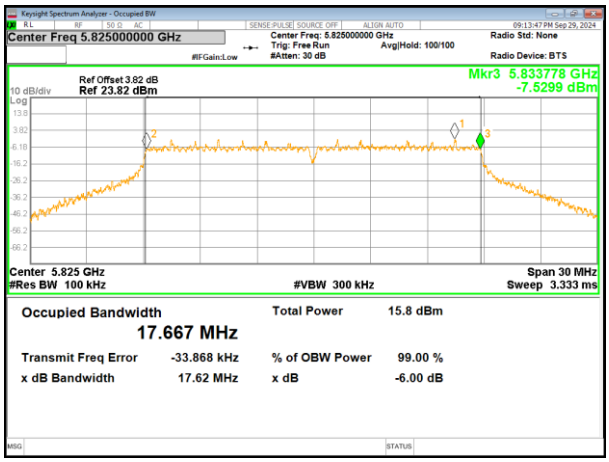
(802.11ac20) plot on channel 157



(802.11 n40) plot on channel 159

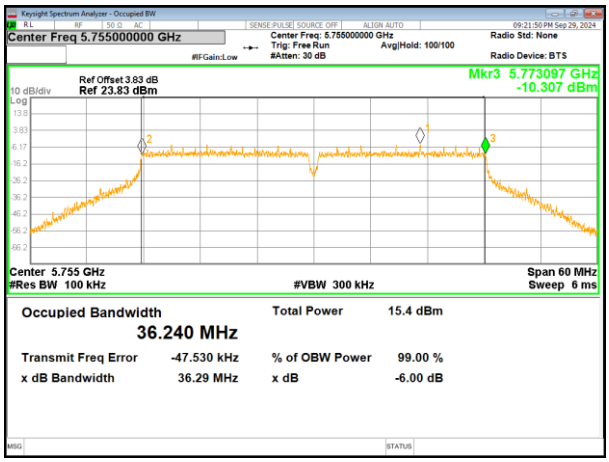


(802.11ac20) plot on channel 165

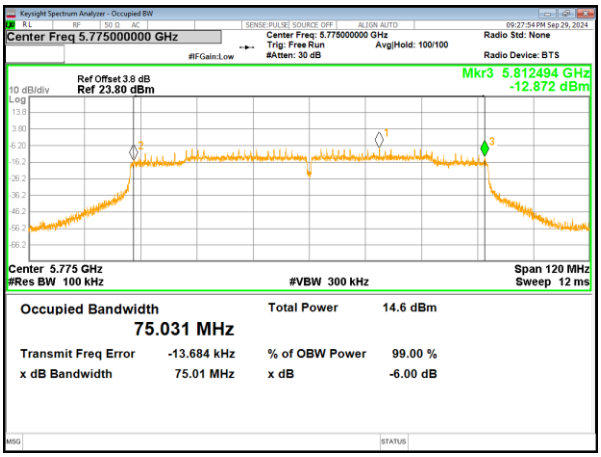


Test plot

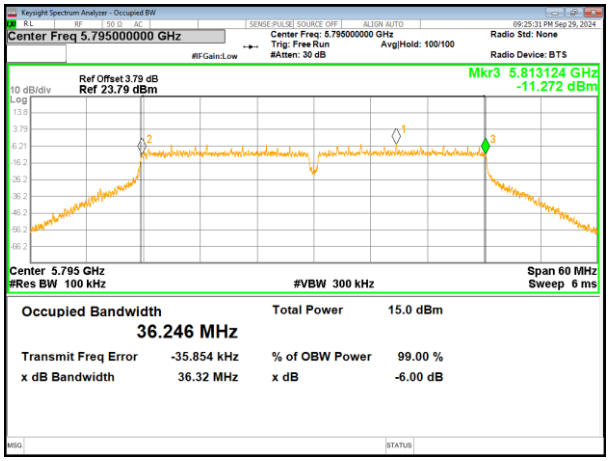
(802.11 ac40) plot on channel 151



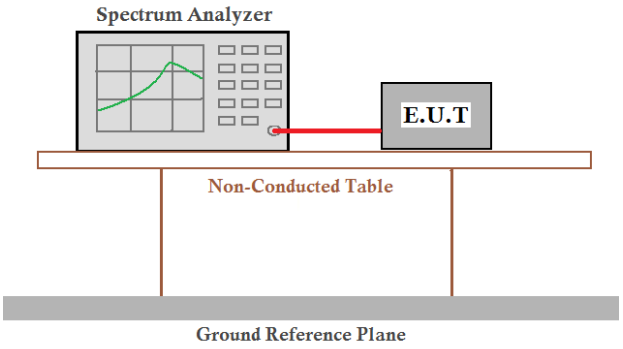
(802.11 ac80) plot on channel 155



(802.11 ac40) plot on channel 159



4.6 Power Spectral Density

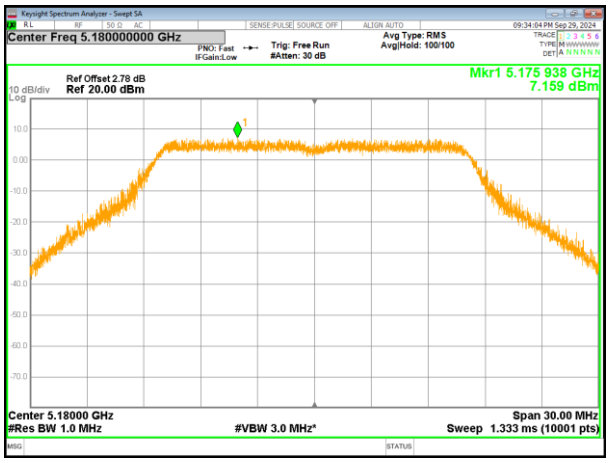
Test Requirement:	FCC Part15 E Section 15.407(a)(1)/ (a)(3)
Test Method:	ANSI C63.10:2013 and KDB 789033 D02 General U-NII Test Procedures New Rules v02r01
Limit:	Frequency band (MHz) / Limit 5150-5250 / ≤17dBm/1MHz for master device 5150-5250 / ≤11dBm/1MHz for client device 5250-5350 / ≤11dBm/1MHz for 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.: 22.9℃ / Humid.: 49%RH
Test voltage:	DC 19V from adapter
Test results:	Pass

Measurement Result

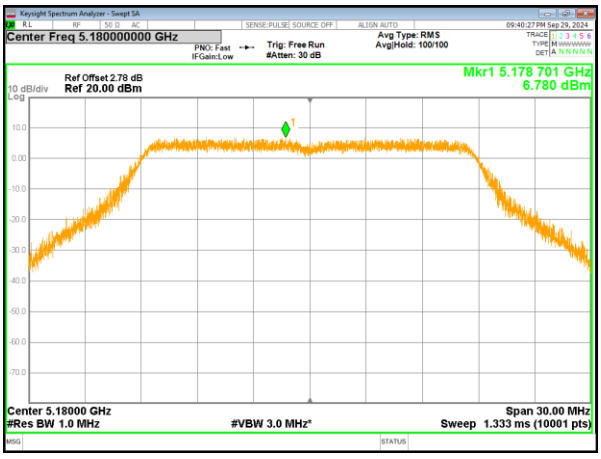
5180-5240MHz

Mode	Frequency	Measured Power Density (dBm/MHz)	Correction Factor (dB)	Total Measured Power Density (dBm/MHz)	Limit (dBm/MHz)
802.11 a	5180 MHz	7.159	0.720	7.879	11
	5200 MHz	7.337	0.720	8.057	11
	5240 MHz	6.968	0.720	7.688	11
802.11 n20	5180 MHz	6.780	0.710	7.490	11
	5200 MHz	6.760	0.710	7.470	11
	5240 MHz	6.776	0.710	7.486	11
802.11 ac20	5180 MHz	7.277	0.790	8.067	11
	5200 MHz	7.150	0.790	7.940	11
	5240 MHz	7.003	0.790	7.793	11
802.11 n40	5190 MHz	3.487	1.050	4.537	11
	5230 MHz	2.830	1.050	3.880	11
802.11 ac40	5190 MHz	3.578	0.860	4.438	11
	5230 MHz	2.971	0.860	3.831	11
802.11 ac80	5210 MHz	-0.564	1.390	0.826	11

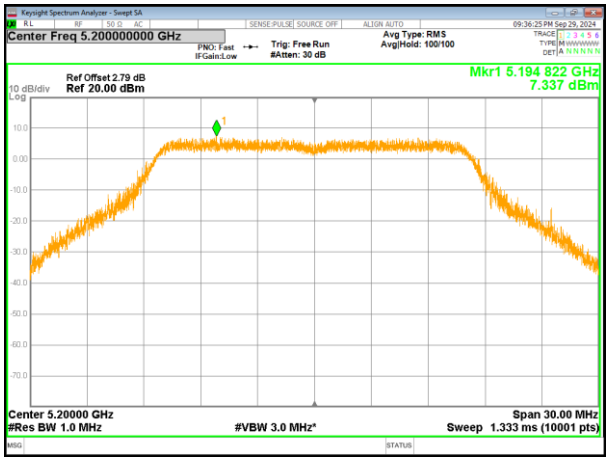
(802.11a) PSD plot on channel 36



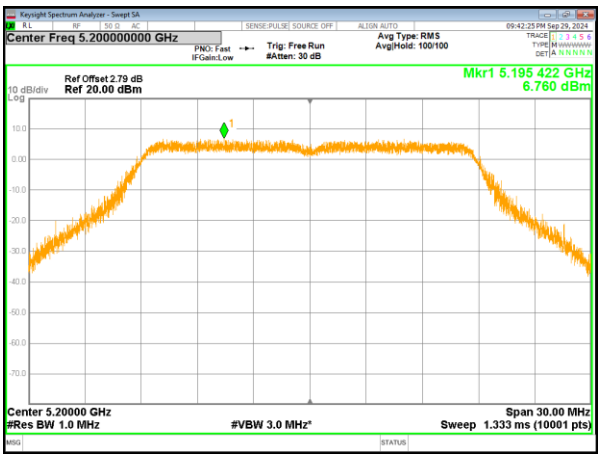
(802.11n20) PSD plot on channel 36



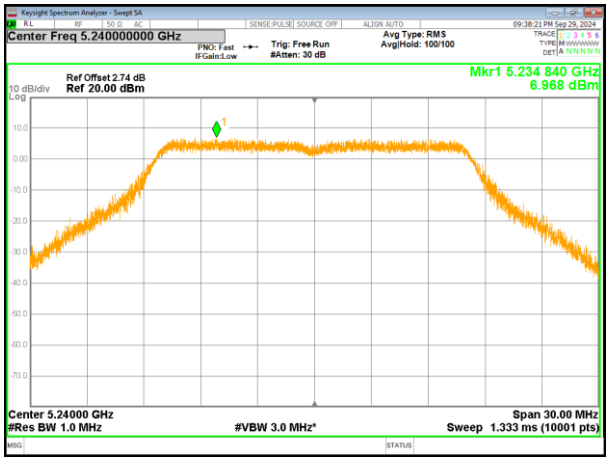
(802.11a) PSD plot on channel 40



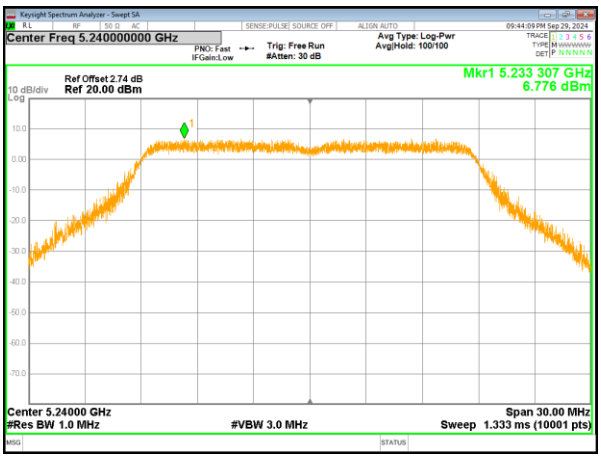
(802.11n20) PSD plot on channel 40



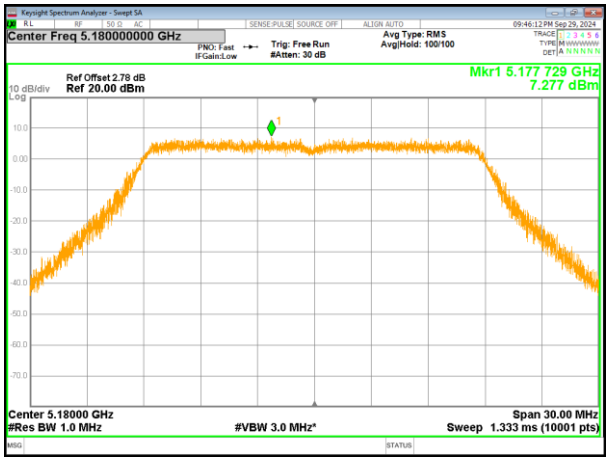
(802.11a) PSD plot on channel 48



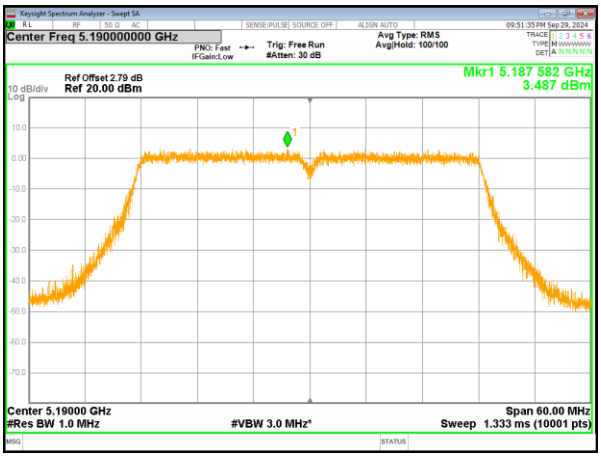
(802.11n20) PSD plot on channel 48



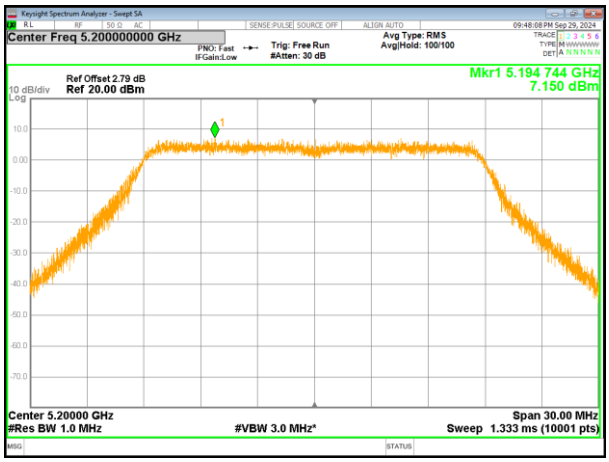
(802.11ac20) PSD plot on channel 36



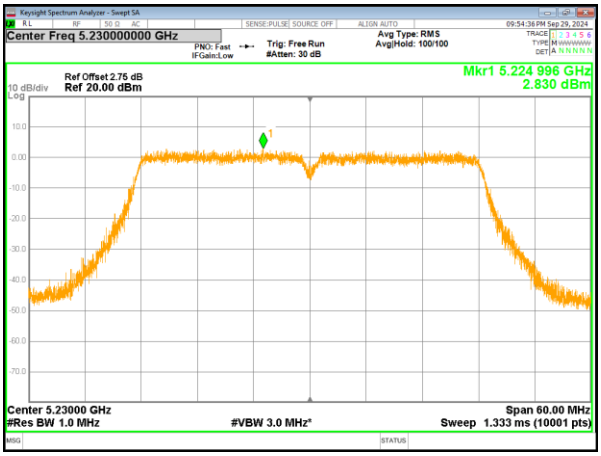
(802.11n40) PSD plot on channel 38



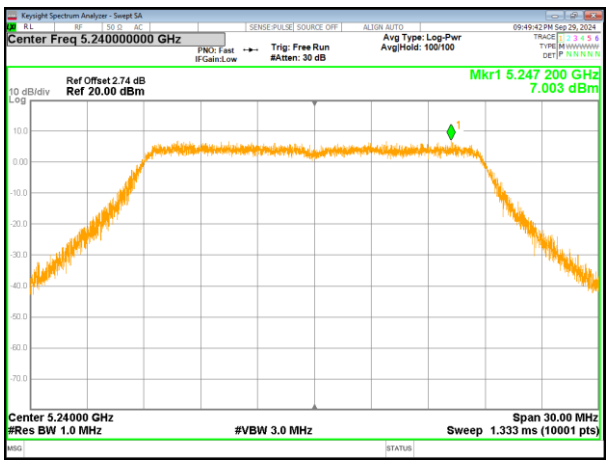
(802.11ac20) PSD plot on channel 40



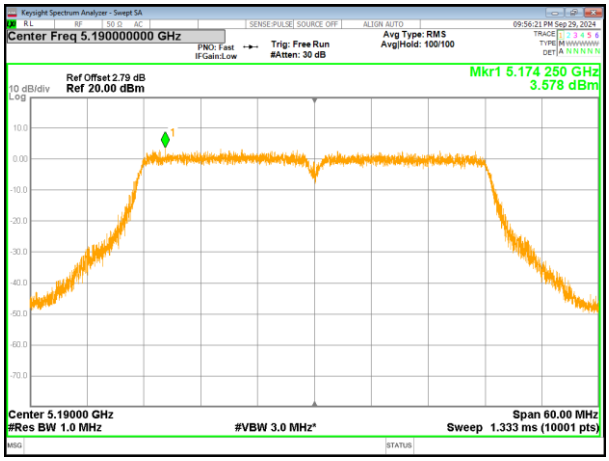
(802.11n40) PSD plot on channel 46



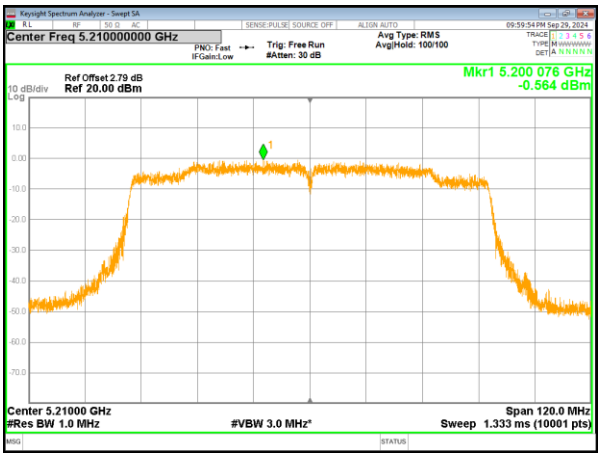
(802.11ac20) PSD plot on channel 48



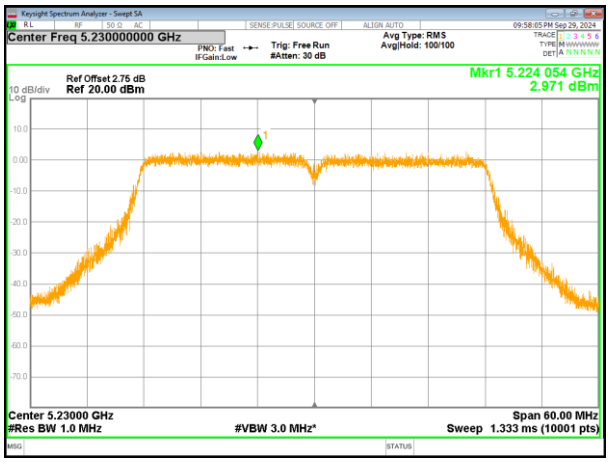
(802.11ac40) PSD plot on channel 38



(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	1.931	1.845	0.090	1.935	30
	5785 MHz	1.481	1.395	0.090	1.485	30
	5825 MHz	1.848	1.762	0.090	1.852	30
802.11 n20	5745 MHz	4.281	4.195	0.170	4.365	30
	5785 MHz	3.070	2.984	0.170	3.154	30
	5825 MHz	3.564	3.478	0.170	3.648	30
802.11ac20	5745 MHz	3.911	3.825	0.150	3.975	30
	5785 MHz	3.097	3.011	0.150	3.161	30
	5825 MHz	3.947	3.861	0.150	4.011	30
802.11 n40	5755 MHz	-0.190	-0.276	0.870	0.594	30
	5795 MHz	0.829	0.743	0.870	1.613	30
802.11ac40	5755 MHz	-0.618	-0.704	0.200	-0.504	30
	5795 MHz	-0.945	-1.031	0.200	-0.831	30
802.11ac80	5775 MHz	-3.709	-3.795	0.400	-3.395	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+RBW factor