

TEST REPORT

Reference No. : WTD24D08203365W005
FCC ID..... : XUJEVB624
Applicant : Launch Tech Co., Ltd.
Address : Launch Industrial Park, North of Wuhe Rd. Banxuegang, Longgang
Shenzhen China
Manufacturer : Launch Tech Co., Ltd.
Address : Launch Industrial Park, North of Wuhe Rd. Banxuegang, Longgang
Shenzhen China
Product Name : Modularized Wireless Equalizer
Model No. : EVB624
Standards..... : FCC 47CFR Part 15 Section 15.407
Date of Receipt sample..... : 2024-09-05
Date of Test..... : 2024-09-05 to 2024-11-05
Date of Issue : 2024-11-07
Test Result : **Pass**

Remarks:

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.

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3 Revision History

Test Report No.	Date of Receipt Sample	Date of Test	Date of Issue	Purpose	Comment	Approved
WTD24D08203365W005	2024-09-05	2024-09-05 to 2024-11-05	2024-11-07	Original	-	Valid
Note: The content of this report belongs to the RF main module of the host.						

4 General Information

4.1 General Description of E.U.T.

Product:	Modularized Wireless Equalizer
Model(s):	EVB624
Model Description:	N/A
Test Sample No.:	1-1/1
Wi-Fi Specification:	802.11a/n(HT20)/ac (VHT20) 802.11n(HT40)/ac (VHT40) 802.11ac (VHT80)
Hardware Version:	XY-Y30-V2
Software Version:	V1.0.15

4.2 Details of E.U.T.

Operation Frequency:	U-NII-1 802.11a/n (HT20) /ac (HT20), 5180-5240MHz 4CH 802.11n (HT40) /ac (HT40), 5190-5230MHz 2CH 802.11ac (HT80), 5210MHz 1CH U-NII-3 802.11a/n (HT20)/ac (HT20), 5745-5825MHz 5CH 802.11n (HT40)/ ac (HT40), 5755-5795MHz 2CH 802.11ac (HT80), 5775MHz 1CH
Max. RF output power:	U-NII-1: 21.63dBm U-NII-3: 22.45dBm
Type of Modulation:	802.11a: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11n: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)
Antenna installation:	External antenna with RP-SMA connector
Antenna Gain:	U-NII-1: 3.51dBi U-NII-3: 2.16dBi

Note:

#: The antenna gain is provided by the applicant, and the applicant should be responsible for its authenticity, WALTERK lab has not verified the authenticity of its information.

Ratings: AC 90-264V 50/60Hz

4.3 Channel List

U-NII-1 (5.15-5.25GHz)			
channel	Frequency(MHz)	channel	Frequency(MHz)
36	5180	38	5190
40	5200	42	5210
44	5220	46	5230
48	5240		

U-NII-3 (5.725-5.85GHz)			
channel	Frequency(MHz)	channel	Frequency(MHz)
149	5745	151	5755
153	5765	155	5775
157	5785	159	5795
161	5805	165	5825

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:

For 802.11a/n (HT20):

channel	Frequency(MHz)	channel	Frequency(MHz)
36	5180	40	5200
48	5240		

channel	Frequency(MHz)	channel	Frequency(MHz)
149	5745	157	5785
165	5825		

For 802.11n (HT40):

channel	Frequency(MHz)	channel	Frequency(MHz)
38	5190	46	5230

channel	Frequency(MHz)	channel	Frequency(MHz)
151	5755	159	5795

4.4 Test Mode Description

During testing, Channel and Power Controlling Software provided by the applicant was used to control the operating channel as well as the maximum output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

Test Items	Mode	Data Rate	TX/RX
Radiated Emissions	802.11a (HT20)	6 Mbps	TX
	802.11n/ac(HT20/40/80)	MCS0	TX
Duty Cycle	802.11a (HT20)	6 Mbps	TX
	802.11n/ac(HT20/40/80)	MCS0	TX
Band Edge	802.11a (HT20)	6 Mbps	TX
	802.11n/ac(HT20/40/80)	MCS0	TX
6dB Bandwidth	802.11a (HT20)	6 Mbps	TX
	802.11n/ac(HT20/40/80)	MCS0	TX
26dB Bandwidth and 99% Occupied Bandwidth	802.11a (HT20)	6 Mbps	TX
	802.11n/ac(HT20/40/80)	MCS0	TX
Conducted Output Power	802.11a (HT20)	6 Mbps	TX
	802.11n/ac(HT20/40/80)	MCS0	TX
Power Spectral Density	802.11a (HT20)	6 Mbps	TX
	802.11n/ac(HT20/40/80)	MCS0	TX
Frequency Stability	Un-modulation	/	TX

4.5 Test Facility

The test facility has a test site registered with the following organizations:

ISED CAB identifier: CN0013. Test Firm Registration No.: 7760A.

Waltek Testing Group Co., Ltd. Has been registered and fully described in a report filed with the Industry Canada. The acceptance letter from the Industry Canada is maintained in our files.

Registration number 7760A, October 15, 2016.

FCC Designation No.: CN1201. Test Firm Registration No.: 523476.

Waltek Testing Group Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration number 523476, September 10, 2019.

5 Equipment Used during Test

5.1 Equipments List

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date	Calibration Due Date
Conducted emissions from the AC mains power ports 2#						
1	EMI Test Receiver	R&S	ESCI	101155	2024-07-27	2025-07-26
2	LISN	SCHWARZBECK	NSLK 8128	8128-259	2023-11-30	2024-11-29
3	Limiter	CYBERTEK	EM5010	261115-001-0024	2024-07-27	2025-07-26
4	Cable	Laplace	RF300	-	2024-07-27	2025-07-26
3m Semi-anechoic Chamber for Radiation Emissions 1#						
1	Spectrum Analyzer	R&S	FSP30	100091	2024-04-22	2025-04-21
2	Amplifier	Agilent	8447D	2944A10178	2024-07-27	2025-07-26
3	Tri-log Broadband Antenna	SCHWARZBECK	VULB9163	336	2024-08-07	2025-08-06
4	Coaxial Cable	Top	TYPE16(13M)	-	2024-04-22	2025-04-21
5	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120D	667	2024-01-23	2025-01-22
6	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9170	335	2024-08-02	2025-08-01
7	Broadband Preamplifier	COMPLIANCE	PAP-1G18	2004	2024-07-27	2025-07-26
8	Coaxial Cable	Top	ZT26-NJ-NJ-8M/FA	-	2024-04-22	2025-04-21
9	Microwave Amplifier	SCHWARZBECK	BBV 9721	100472	2024-07-27	2025-07-26
10	Coaxial Cable	Top	ZT40-2.92J-2.92J-2.0M	17100919	2024-04-22	2025-04-21
3m Semi-anechoic Chamber for Radiation Emissions 2#						
1	Test Receiver	R&S	ESCI	101296	2024-04-22	2025-04-21
2	Trilog Broadband Antenna	SCHWARZBECK	VULB9160	9160-3325	2023-11-04	2024-11-03
3	Active Loop Antenna	Com-Power	AL-130R	10160007	2024-05-07	2025-05-06
4	Amplifier	ANRITSU	MH648A	M43381	2024-04-22	2025-04-21
5	Cable	HUBER+SUHNER	CBL2	525178	2024-04-22	2025-04-21
RF Conducting						
1	Spectrum Analyzer	R&S	FSP40	100501	2024-07-27	2025-07-26
2	Spectrum Analyzer	Agilent	N9020A	MY49100060	2024-07-27	2025-07-26

Test Software:

Test Item	Software name	Software version
Conducted Emission Radiated Emission(3m)	EZ-EMC	EZ-EMC(RA-03A1-1)

5.2 Measurement Uncertainty

Parameter	Uncertainty
Radio Frequency	$\pm 1 \times 10^{-6}$
RF Power	± 1.0 dB
RF Power Density	± 2.2 dB
Radiated Spurious Emissions test	± 5.03 dB (30M~1000MHz)
	± 5.47 dB (1000M~25000MHz)
Conducted Spurious Emissions test	± 3.64 dB (AC mains 150KHz~30MHz)

6 Test Summary

Test Items	Test Requirement	Result
Conducted Emissions	15.207(a)	PASS
Radiated Emissions	15.407(a) 15.205(a) 15.209(a)	PASS
Duty Cycle	KDB 789033	PASS
6dB Bandwidth	15.407(a)	PASS
26 dB Emission Bandwidth & 99% Occupied Bandwidth	15.407(a)	PASS
Maximum Conducted Output Power	15.407(a)	PASS
Power Spectral Density	15.407(a)	PASS
Restricted bands around fundamental frequency	15.407(a)	PASS
Antenna Requirement	15.203	PASS
Maximum Permissible Exposure (Exposure of Humans to RF Fields)	1.1307(b)(1)	PASS

7 Duty cycle

Test Requirement: FCC 47CFR Part 15 Section 15.407
KDB789033 D02 General U-NII Test Procedures New Rules v02r01, Section (B)

Test Method: ANSI C63.10: 2013

Test Limit: N/A

Test Result: PASS

Remark: Through Pre-scan, and found 802.11a at lowest channel is the worst case. Only the worst case is recorded in the report.

7.1 Summary of Test Results

Type of Modulation	On time ms	Period ms	Duty Cycle linear	Duty Cycle %	Duty Cycle Factor(dB)	Average Factor(dB)
U-NII-1 802.11a	1.378	1.438	0.96	95.83	0.19	-0.37
U-NII-1 802.11n(HT20)	1.293	1.348	0.96	95.92	0.18	-0.36
U-NII-1 802.11n(HT40)	0.645	0.69	0.93	93.48	0.29	-0.59
U-NII-1 802.11ac(HT20)	1.298	1.358	0.96	95.58	0.20	-0.39
U-NII-1 802.11ac(HT40)	0.651	0.698	0.93	93.27	0.30	-0.61
U-NII-1 802.11ac(HT80)	0.322	0.365	0.88	88.22	0.54	-1.09
U-NII-3 802.11a	1.392	1.437	0.97	96.87	0.14	-0.28
U-NII-3 802.11n(HT20)	1.296	1.35	0.96	96.00	0.18	-0.35
U-NII-3 802.11n(HT40)	0.645	0.688	0.94	93.75	0.28	-0.56
U-NII-3 802.11ac(HT20)	0.1475	0.1895	0.78	77.84	1.09	-2.18
U-NII-3 802.11ac(HT40)	0.644	0.698	0.92	92.26	0.35	-0.70
U-NII-3 802.11ac(HT80)	0.321	0.365	0.88	87.95	0.56	-1.12

Remark:

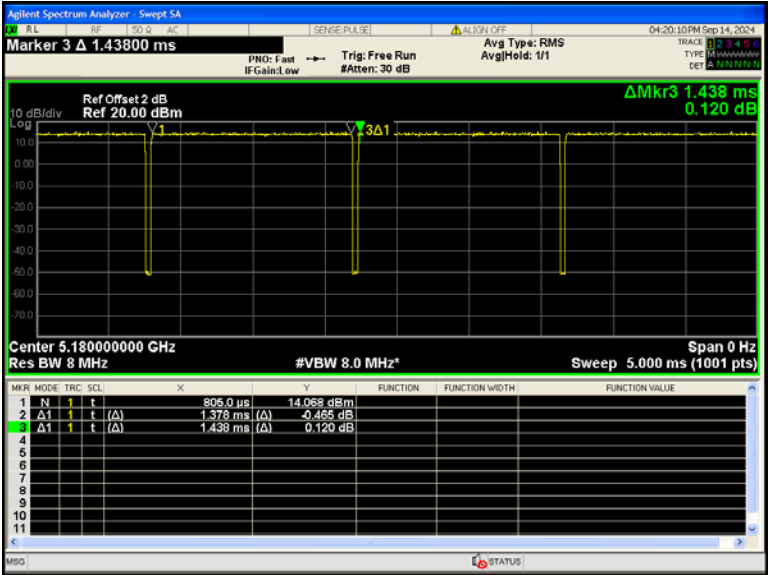
Duty cycle=On Time/period;

Duty cycle factor= $10 \cdot \log(1/\text{Duty cycle})$;

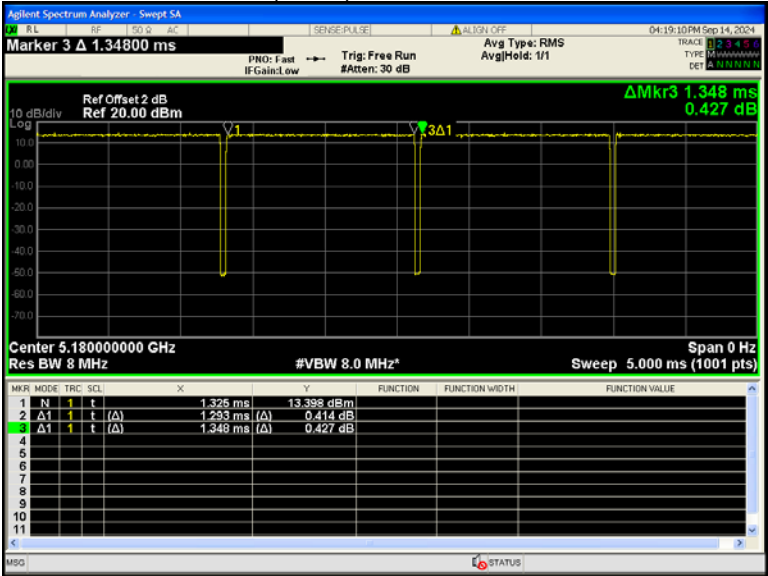
Average factor= $20 \log_{10} \text{Duty cycle}$

Test result plots shown as follows:

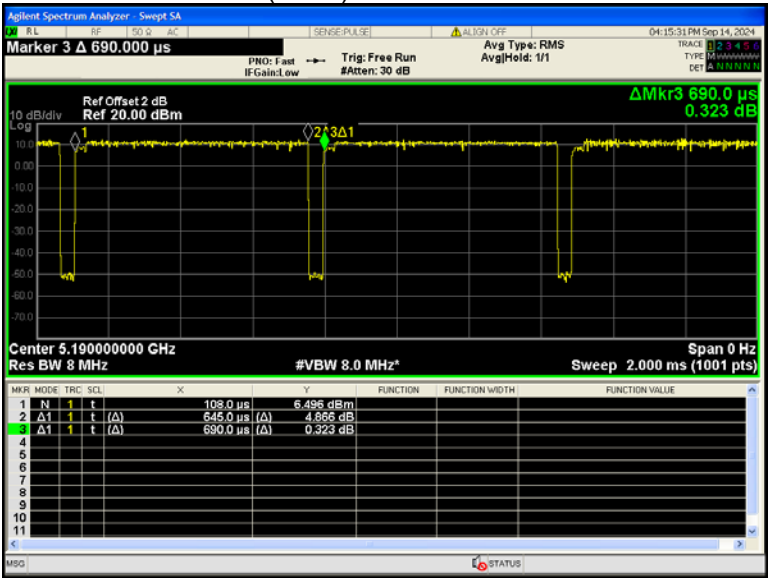
802.11a U-NII-1 Low channel



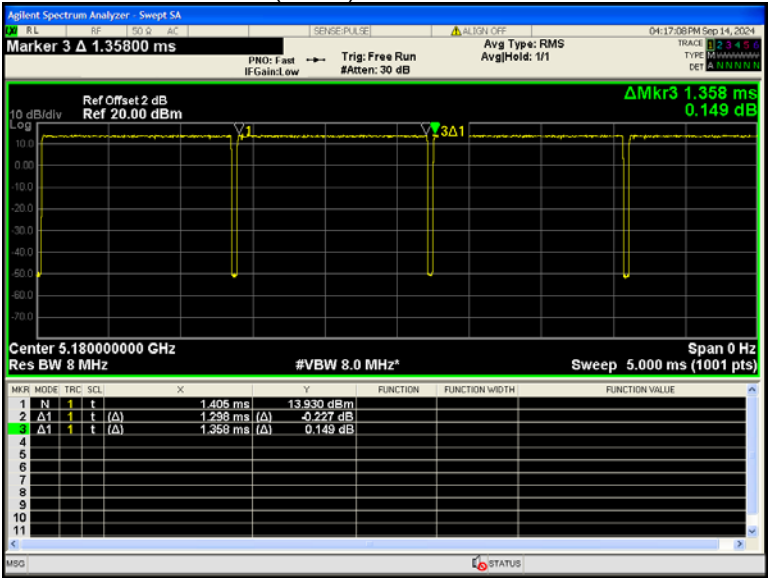
802.11n(HT20) U-NII-1 Low channel



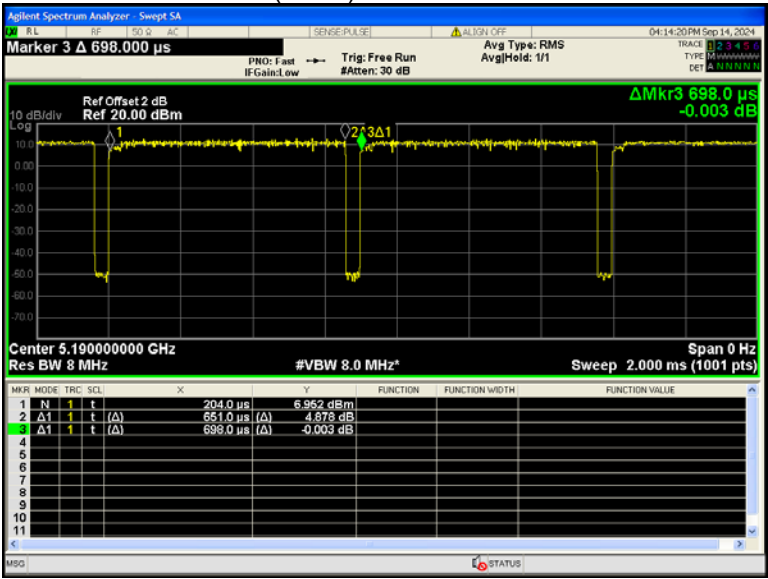
802.11n(HT40) U-NII-1 Low channel



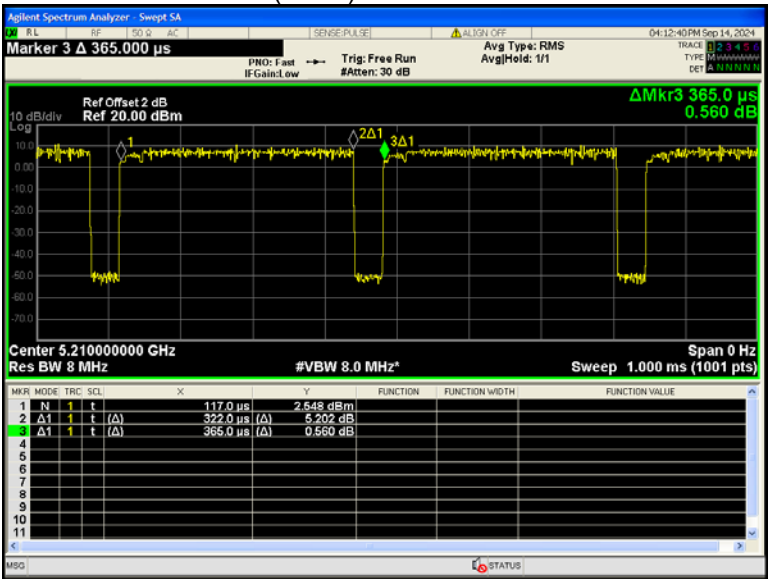
802.11ac(HT20) U-NII-1 Low channel



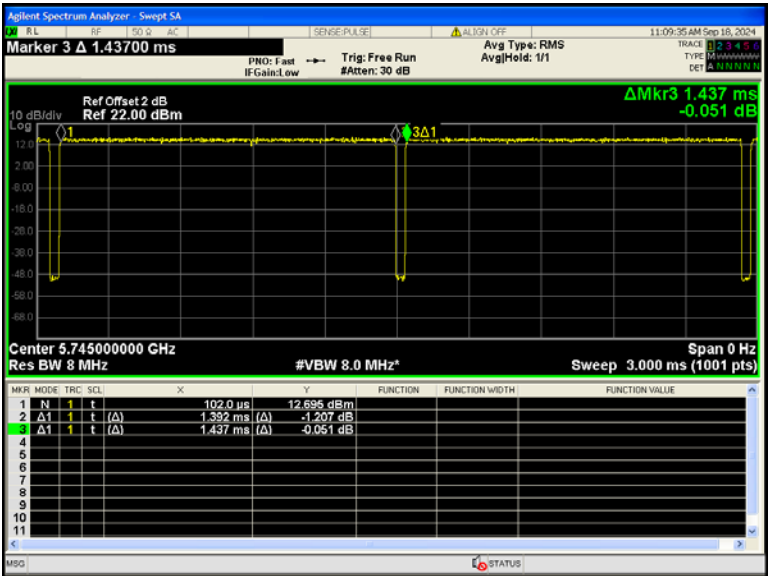
802.11ac(HT40) U-NII-1 Low channel



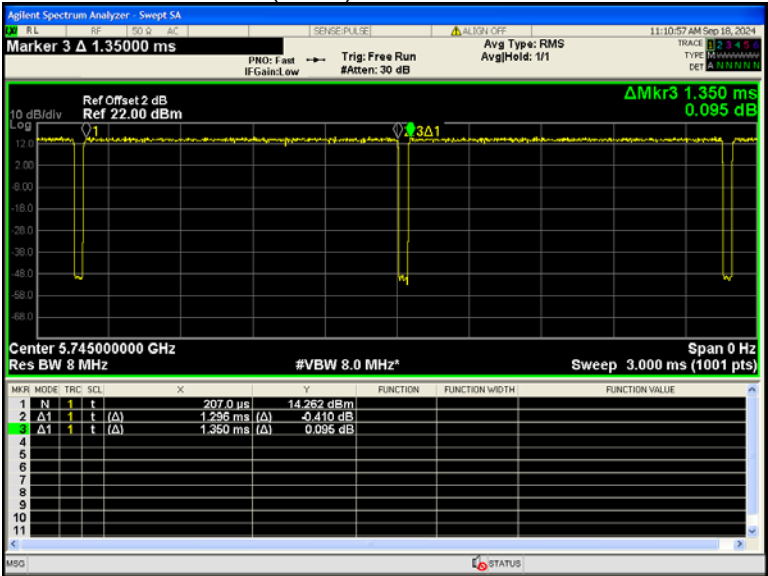
802.11ac(HT80) U-NII-1 Low channel



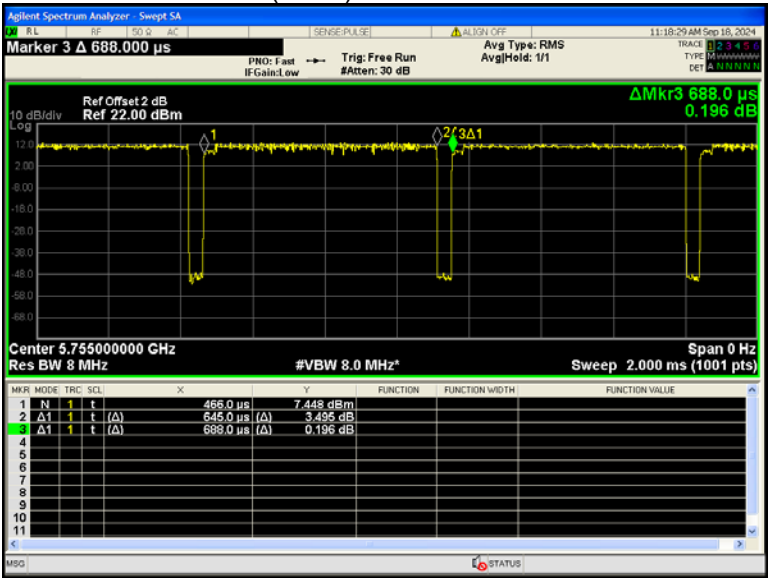
802.11a U-NII-3 Low channel



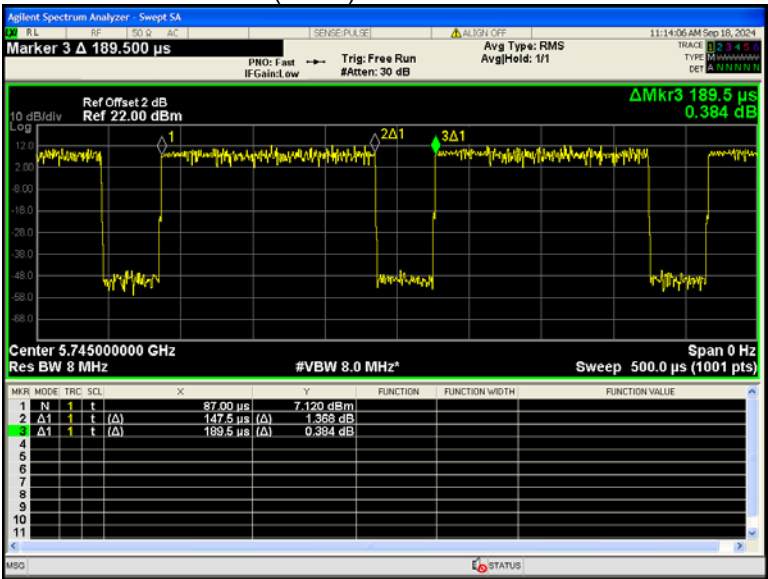
802.11n(HT20) U-NII-3 Low channel



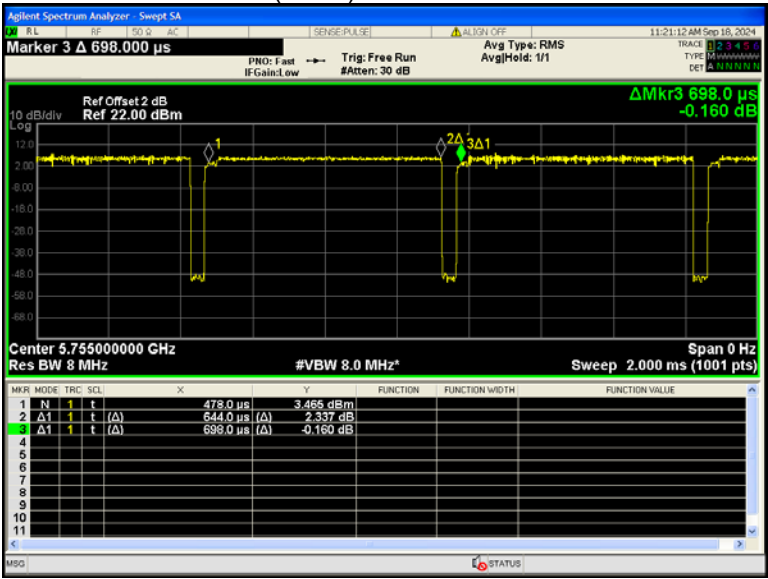
802.11n(HT40) U-NII-3 Low channel



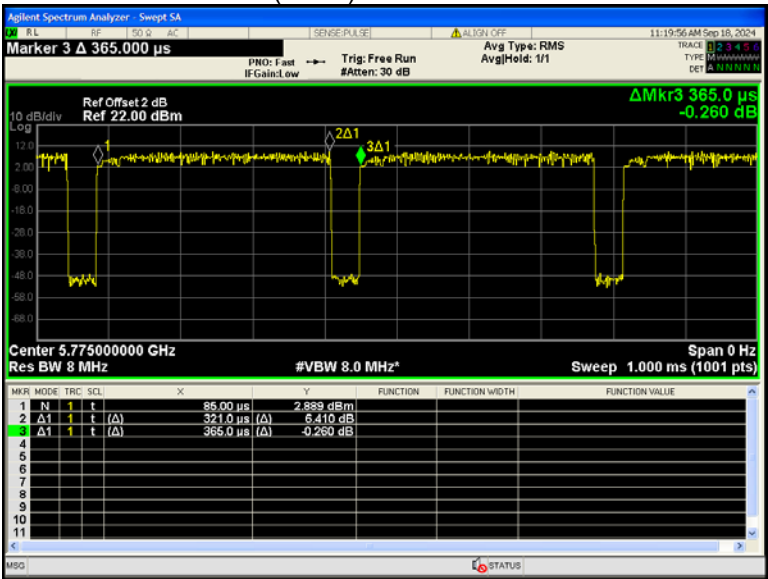
802.11ac(HT20) U-NII-3 Low channel



802.11ac(HT40) U-NII-3 Low channel



802.11ac(HT80) U-NII-3 Low channel



8 Conducted Emission

Test Requirement: 47CFR FCC Part15 Subpart C §15.207

Test Method: ANSI C63.10:2013

Test Result: PASS

Frequency Range: 150kHz to 30MHz

Limit:

Frequency (MHz)	Conducted Limit (dB μ V)	
	Quasi-peak	Average
0.15 to 0.5	66 to 56*	56 to 46*
0.5 to 5.0	56	46
5.0 to 30	60	50
*Decreases with the logarithm of the frequency.		

8.1 E.U.T. Operation

Operating Environment:

Temperature: 25.5 °C

Humidity: 46.3 % RH

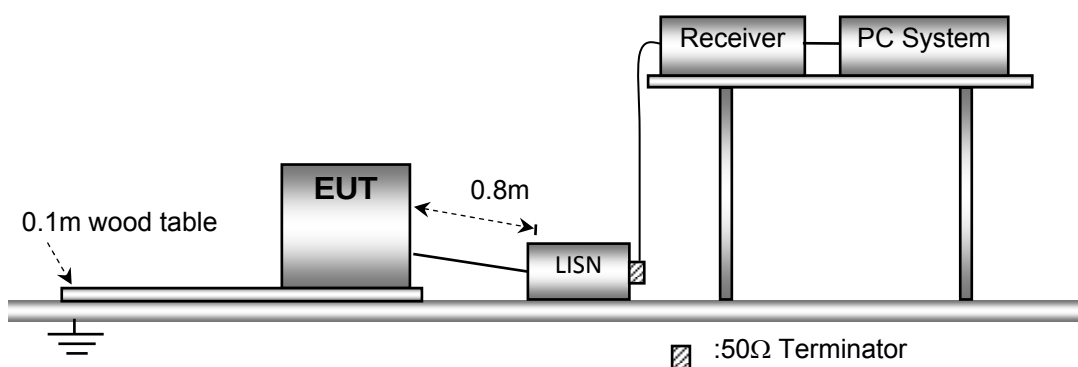
Atmospheric Pressure: 101.2kPa

EUT Operation:

The test was performed in Transmitting mode, the worst test data were shown in the report.

8.2 EUT Setup

The conducted emission tests were performed using the setup accordance with the ANSI C63.10:2013.



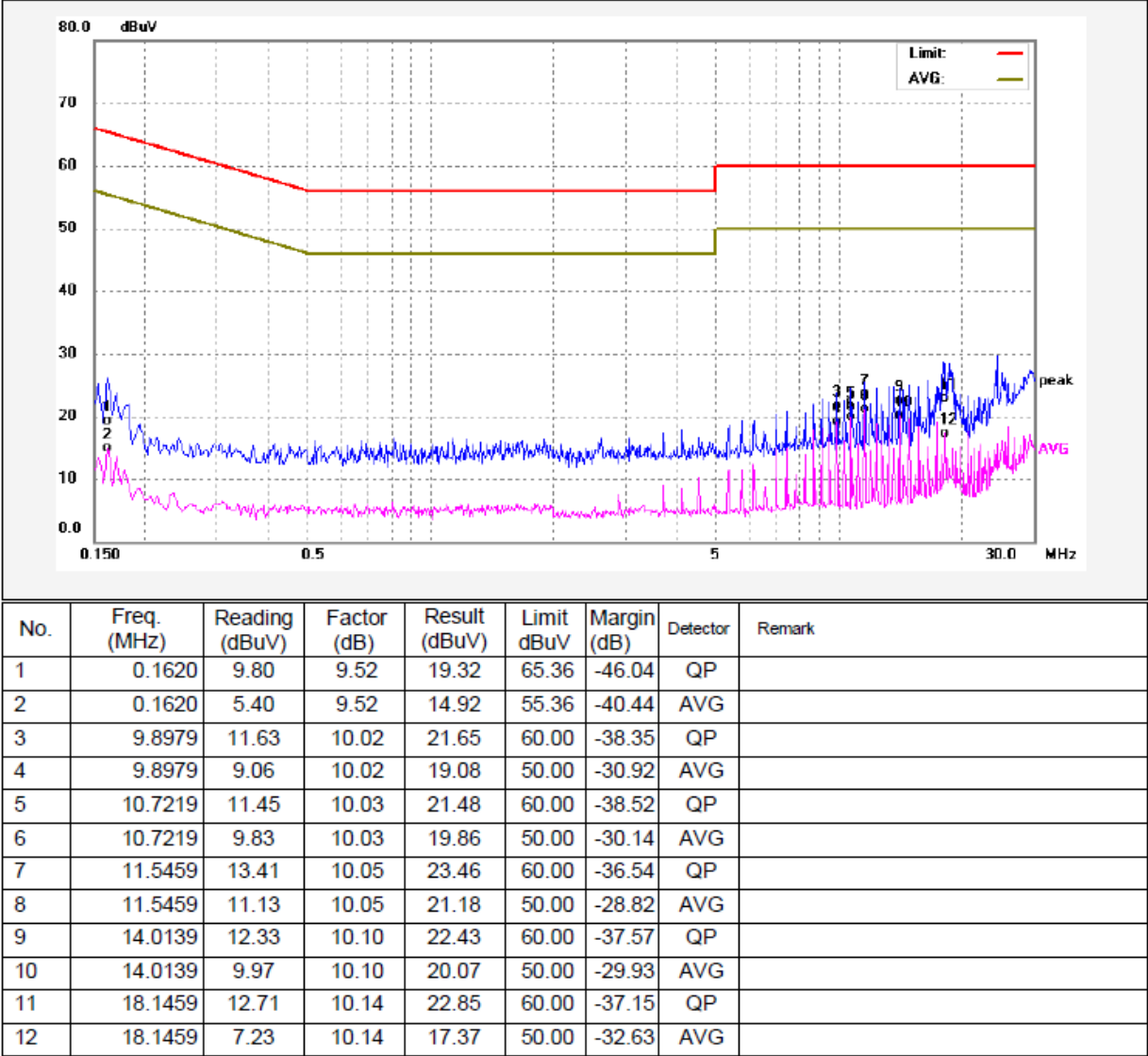
8.3 Measurement Description

The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

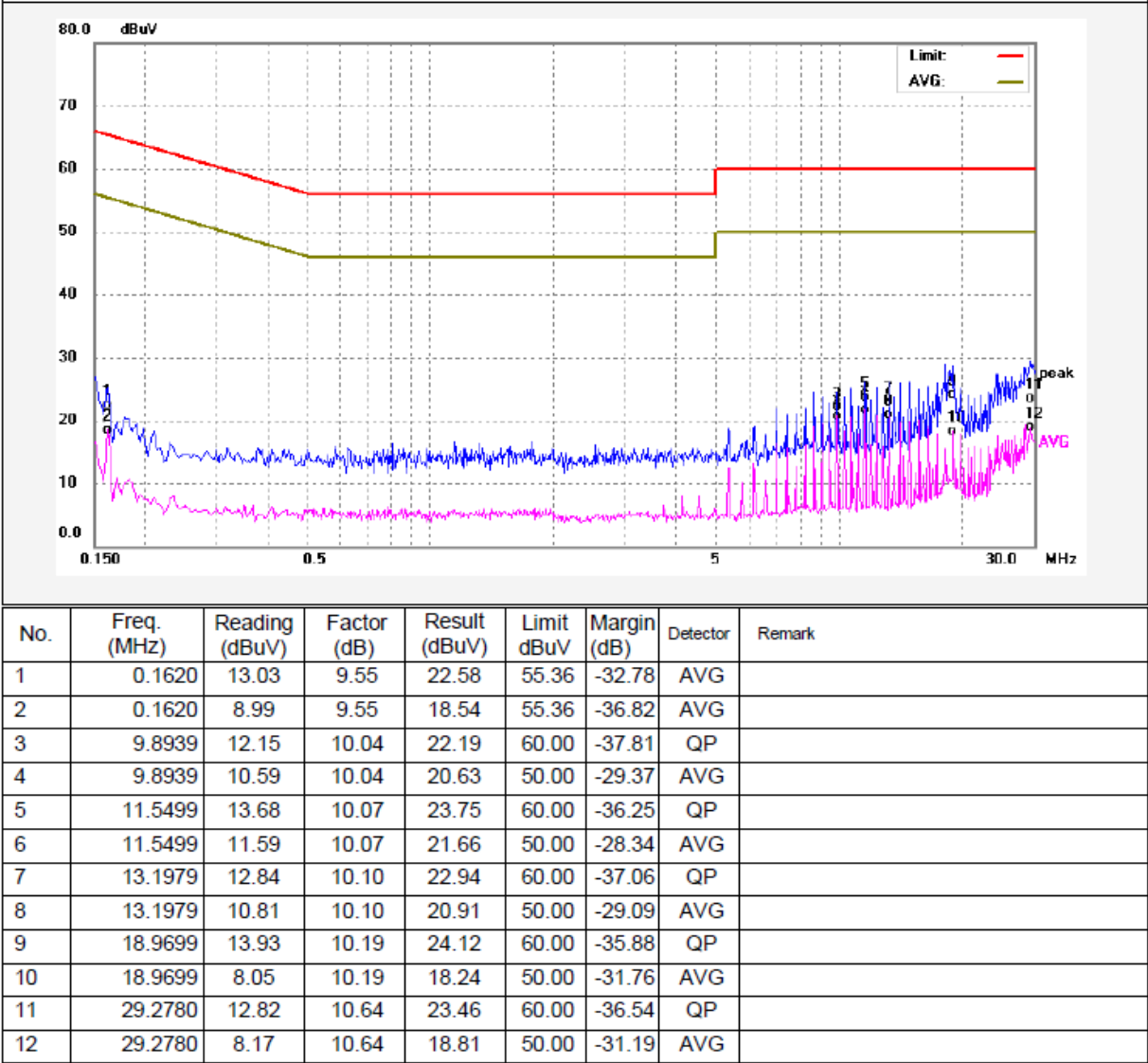
8.4 Conducted Emission Test Result

Remark: only the worst data (U-NII-1 802.11a High channel mode) were reported

Live line:



Neutral line:



9 Radiated Emissions

Test Requirement: FCC 47CFR Part 15 Section 15.209 & 15.407

Test Method: ANSI C63.10:2013

Test Result: PASS

Measurement Distance: 3m

Limit:

Frequency (MHz)	Field Strength		Field Strength Limit at 3m Measurement Distance	
	uV/m	Distance (m)	uV/m	dBuV/m
0.009 ~ 0.490	$2400/F(\text{kHz})$	300	$10000 * 2400/F(\text{kHz})$	$20\log^{(2400/F(\text{kHz}))} + 80$
0.490 ~ 1.705	$24000/F(\text{kHz})$	30	$100 * 24000/F(\text{kHz})$	$20\log^{(24000/F(\text{kHz}))} + 40$
1.705 ~ 30	30	30	$100 * 30$	$20\log^{(30)} + 40$
30 ~ 88	100	3	100	$20\log^{(100)}$
88 ~ 216	150	3	150	$20\log^{(150)}$
216 ~ 960	200	3	200	$20\log^{(200)}$
Above 960	500	3	500	$20\log^{(500)}$

9.1 EUT Operation

Operating Environment :

Temperature: 23.5 °C

Humidity: 52.1 % RH

Atmospheric Pressure: 101.2kPa

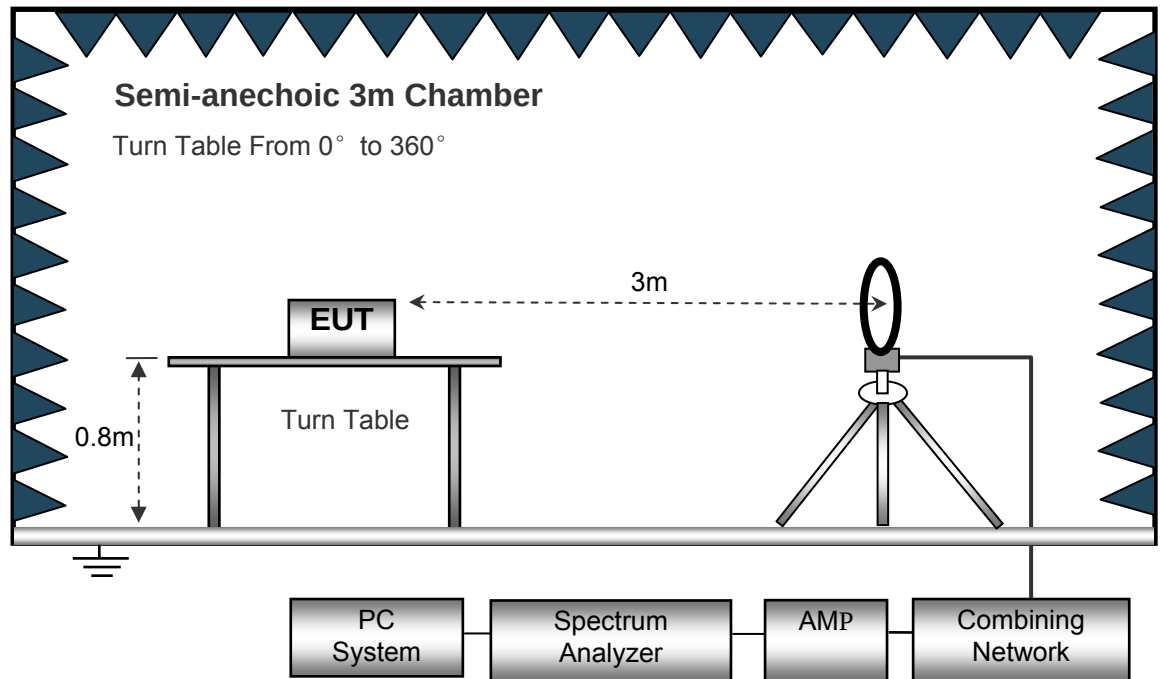
EUT Operation :

The test was performed in transmitting mode, the test data were shown in the report.

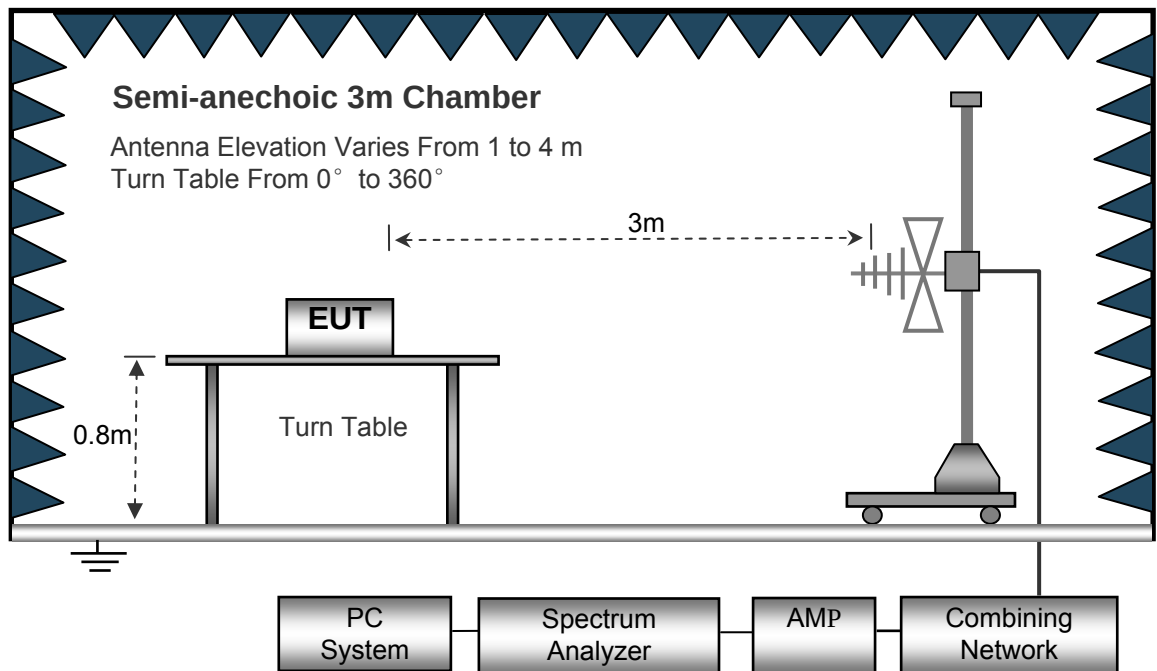
9.2 Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.10: 2013.

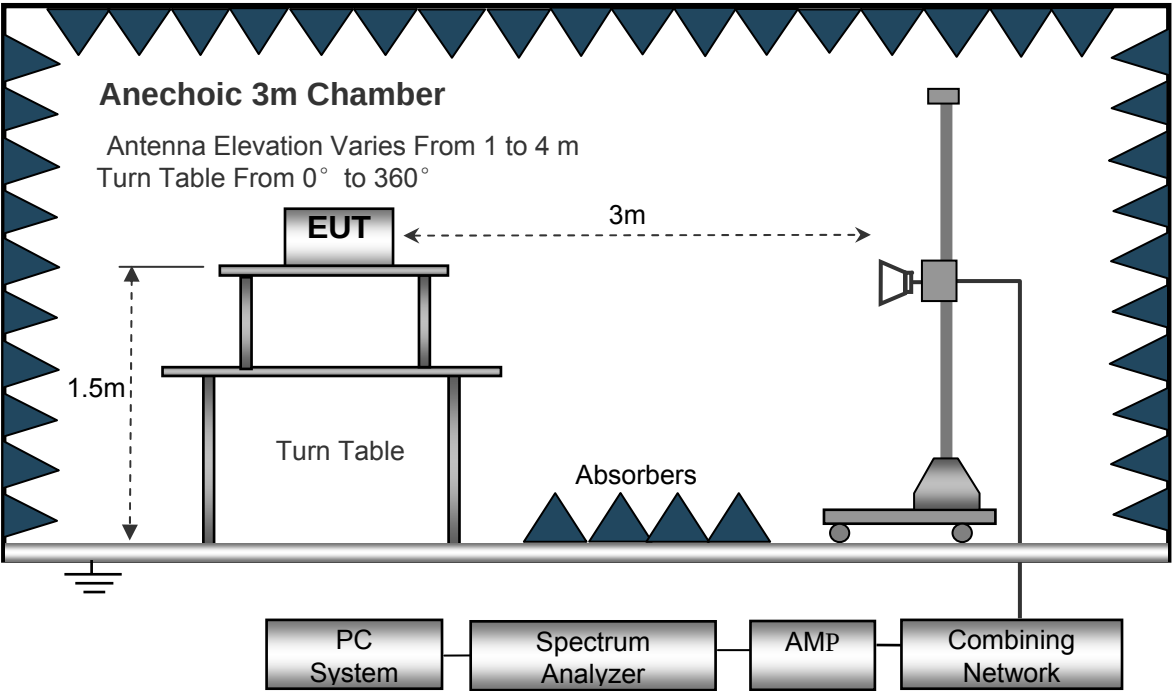
The test setup for emission measurement below 30MHz.



The test setup for emission measurement from 30 MHz to 1 GHz.



The test setup for emission measurement above 1 GHz.



9.3 Spectrum Analyzer Setup

Below 30MHz	
Sweep Speed	Auto
IF Bandwidth.....	10kHz
Video Bandwidth.....	10kHz
Resolution Bandwidth.....	10kHz
30MHz ~ 1GHz	
Sweep Speed	Auto
Detector	PK
Resolution Bandwidth.....	100kHz
Video Bandwidth.....	300kHz
Above 1GHz	
Sweep Speed	Auto
Detector	PK
Resolution Bandwidth.....	1MHz
Video Bandwidth.....	3MHz
Detector	Ave.
Resolution Bandwidth.....	1MHz
Video Bandwidth.....	10Hz

9.4 Test Procedure

1. The EUT is placed on a turntable, which is 0.8m above ground plane for below 1GHz and 1.5m for above 1GHz.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.
7. The radiation measurements are performed in X,Y and Z axis positioning(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand),the worst condition was tested putting the eut in X axis,so the worst data were shown as follow.
8. A 2.4GHz high –pass filter is used during radiated emissions above 1GHz measurement.

9.5 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Amplifier Gain}$$

The “Margin” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB means the emission is 7dB below the maximum limit for Class B. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{Limit}$$

9.6 Summary of Test Results

Test Frequency: 9KHz~30MHz

The measurements were more than 20 dB below the limit and not reported.

Test Frequency : 30MHz ~ 18GHz

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.407/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
802.11a U-NII-1 Low Channel 5180MHz									
231.85	36.49	QP	223	1.1	H	-11.62	24.87	46.00	-21.13
231.85	38.72	QP	240	1.4	V	-11.62	27.10	46.00	-18.90
4535.60	53.44	PK	355	1.1	H	-2.03	51.41	74.00	-22.59
4535.60	44.11	Ave	355	1.1	H	-2.03	42.08	54.00	-11.92
5144.69	53.70	PK	296	1.2	H	-1.02	52.68	74.00	-21.32
5144.69	44.84	Ave	296	1.2	H	-1.02	43.82	54.00	-10.18
10360.00	41.10	PK	2	1.1	H	5.33	46.43	74.00	-27.57
10360.00	37.93	Ave	2	1.1	H	5.33	43.26	54.00	-10.74
802.11a U-NII-1 Middle channel 5200MHz									
231.85	36.96	QP	274	1.2	H	-11.62	25.34	46.00	-20.66
231.85	38.72	QP	203	1.2	V	-11.62	27.10	46.00	-18.90
4539.60	53.24	PK	261	1.6	H	-1.94	51.30	74.00	-22.70
4539.60	43.01	Ave	261	1.6	H	-1.94	41.07	54.00	-12.93
5115.68	55.59	PK	269	1.5	H	-1.06	54.53	74.00	-19.47
5115.68	45.18	Ave	269	1.5	H	-1.06	44.12	54.00	-9.88
10400.00	41.15	PK	28	1.6	H	5.21	46.36	74.00	-27.64
10400.00	39.25	Ave	28	1.6	H	5.21	44.46	54.00	-9.54

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.407/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
802.11a U-NII-1 High channel 5240MHz									
231.85	36.23	QP	320	1.5	H	-11.62	24.61	46.00	-21.39
231.85	39.24	QP	232	1.0	V	-11.62	27.62	46.00	-18.38
4539.65	53.88	PK	208	1.4	H	-2.24	51.64	74.00	-22.36
4539.65	43.91	Ave	208	1.4	H	-2.24	41.67	54.00	-12.33
5141.28	55.85	PK	139	1.2	H	-1.09	54.76	74.00	-19.24
5141.28	45.08	Ave	139	1.2	H	-1.09	43.99	54.00	-10.01
10480.00	42.25	PK	138	1.1	H	5.14	47.39	74.00	-26.61
10480.00	37.03	Ave	138	1.1	H	5.14	42.17	54.00	-11.83
802.11a U-NII-3 Low Channel 5745MHz									
231.85	35.32	QP	184	1.9	H	-11.62	23.70	46.00	-22.30
231.85	40.13	QP	202	2.0	V	-11.62	28.51	46.00	-17.49
4501.81	54.65	PK	338	2.0	H	-2.06	52.59	74.00	-21.41
4501.81	43.82	Ave	338	2.0	H	-2.06	41.76	54.00	-12.24
5354.30	42.28	PK	17	1.5	H	5.93	48.21	74.00	-25.79
5354.30	37.49	Ave	17	1.5	H	5.93	43.42	54.00	-10.58
11490.00	45.90	PK	198	2.0	H	-1.25	44.65	74.00	-29.35
11490.00	39.47	Ave	198	2.0	H	-1.25	38.22	54.00	-15.78

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.407/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
802.11a U-NII-3 middle channel 5785MHz									
231.85	36.67	QP	233	1.7	H	-11.62	25.05	46.00	-20.95
231.85	40.27	QP	238	2.0	V	-11.62	28.65	46.00	-17.35
4514.87	55.09	PK	15	1.9	H	-2.03	53.06	74.00	-20.94
4514.87	42.81	Ave	15	1.9	H	-2.03	40.78	54.00	-13.22
5387.56	42.72	PK	282	1.8	H	5.81	48.53	74.00	-25.47
5387.56	36.47	Ave	282	1.8	H	5.81	42.28	54.00	-11.72
11570.00	46.23	PK	324	1.7	H	-1.22	45.01	74.00	-28.99
11570.00	39.28	Ave	324	1.7	H	-1.22	38.06	54.00	-15.94
802.11a U-NII-3 High channel 5825MHz									
231.85	35.99	QP	339	1.7	H	-11.62	24.37	46.00	-21.63
231.85	41.28	QP	330	1.5	V	-11.62	29.66	46.00	-16.34
4504.50	56.35	PK	326	2.0	H	-1.84	54.51	74.00	-19.49
4504.50	42.96	Ave	326	2.0	H	-1.84	41.12	54.00	-12.88
5354.13	42.94	PK	226	1.0	H	5.84	48.78	74.00	-25.22
5354.13	38.02	Ave	226	1.0	H	5.84	43.86	54.00	-10.14
11650.00	46.46	PK	301	1.7	H	-1.30	45.16	74.00	-28.84
11650.00	39.72	Ave	301	1.7	H	-1.30	38.42	54.00	-15.58

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.407/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
802.11n(HT20) U-NII-1 Low Channel 5180MHz									
231.85	33.08	QP	35	1.8	H	-11.62	21.46	46.00	-24.54
231.85	39.96	QP	24	1.1	V	-11.62	28.34	46.00	-17.66
4525.43	48.92	PK	113	1.9	H	-2.14	46.78	74.00	-27.22
4525.43	47.71	Ave	113	1.9	H	-2.14	45.57	54.00	-8.43
5133.05	45.86	PK	326	1.3	H	-1.06	44.80	74.00	-29.20
5133.05	38.07	Ave	326	1.3	H	-1.06	37.01	54.00	-16.99
10360.00	42.40	PK	306	1.7	H	5.33	47.73	74.00	-26.27
10360.00	37.51	Ave	306	1.7	H	5.33	42.84	54.00	-11.16
802.11n(HT20) U-NII-1 Middle channel 5200MHz									
231.85	33.89	QP	349	1.2	H	-11.62	22.27	46.00	-23.73
231.85	40.60	QP	12	1.2	V	-11.62	28.98	46.00	-17.02
4512.09	49.80	PK	212	1.7	H	-2.12	47.68	74.00	-26.32
4512.09	46.61	Ave	212	1.7	H	-2.12	44.49	54.00	-9.51
5141.27	46.54	PK	54	1.8	H	-1.06	45.48	74.00	-28.52
5141.27	37.28	Ave	54	1.8	H	-1.06	36.22	54.00	-17.78
10400.00	41.10	PK	286	1.8	H	5.21	46.31	74.00	-27.69
10400.00	35.85	Ave	286	1.8	H	5.21	41.06	54.00	-12.94

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.407/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
802.11n(HT20) U-NII-1 High channel 5240MHz									
231.85	33.66	QP	289	1.0	H	-11.62	22.04	46.00	-23.96
231.85	39.56	QP	237	1.8	V	-11.62	27.94	46.00	-18.06
4500.53	48.61	PK	224	1.5	H	-1.96	46.65	74.00	-27.35
4500.53	47.98	Ave	224	1.5	H	-1.96	46.02	54.00	-7.98
5121.50	47.36	PK	26	1.8	H	-1.06	46.30	74.00	-27.70
5121.50	37.03	Ave	26	1.8	H	-1.06	35.97	54.00	-18.03
10480.00	40.60	PK	19	1.2	H	5.14	45.74	74.00	-28.26
10480.00	36.96	Ave	19	1.2	H	5.14	42.10	54.00	-11.90
802.11n(HT20) U-NII-3 Low Channel 5745MHz									
231.85	38.16	QP	27	1.4	H	-11.62	26.54	46.00	-19.46
231.85	45.18	QP	170	1.8	V	-11.62	33.56	46.00	-12.44
4500.96	49.29	PK	43	1.6	H	-2.06	47.23	74.00	-26.77
4500.96	47.75	Ave	43	1.6	H	-2.06	45.69	54.00	-8.31
5380.92	38.37	PK	65	1.4	H	5.93	44.30	74.00	-29.70
5380.92	40.00	Ave	65	1.4	H	5.93	45.93	54.00	-8.07
11490.00	46.71	PK	31	1.9	H	-1.25	45.46	74.00	-28.54
11490.00	37.09	Ave	31	1.9	H	-1.25	35.84	54.00	-18.16

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.407/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
802.11n(HT20) U-NII-3 middle channel 5785MHz									
231.85	35.79	QP	72	1.2	H	-11.62	24.17	46.00	-21.83
231.85	46.51	QP	104	1.9	V	-11.62	34.89	46.00	-11.11
4522.73	45.74	PK	24	1.8	H	-2.03	43.71	74.00	-30.29
4522.73	46.96	Ave	24	1.8	H	-2.03	44.93	54.00	-9.07
5359.54	37.00	PK	125	1.0	H	5.81	42.81	74.00	-31.19
5359.54	38.57	Ave	125	1.0	H	5.81	44.38	54.00	-9.62
11570.00	45.66	PK	249	1.2	H	-1.22	44.44	74.00	-29.56
11570.00	38.91	Ave	249	1.2	H	-1.22	37.69	54.00	-16.31
802.11n(HT20) U-NII-3 High channel 5825MHz									
231.85	34.71	QP	330	1.4	H	-11.62	23.09	46.00	-22.91
231.85	46.93	QP	165	1.8	V	-11.62	35.31	46.00	-10.69
4512.87	45.31	PK	32	1.9	H	-1.84	43.47	74.00	-30.53
4512.87	46.64	Ave	32	1.9	H	-1.84	44.80	54.00	-9.20
5368.00	36.96	PK	69	1.2	H	5.84	42.80	74.00	-31.20
5368.00	39.77	Ave	69	1.2	H	5.84	45.61	54.00	-8.39
11650.00	46.41	PK	189	1.4	H	-1.30	45.11	74.00	-28.89
11650.00	39.78	Ave	189	1.4	H	-1.30	38.48	54.00	-15.52

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.407/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
802.11n(HT40) U-NII-1 Low Channel 5190MHz									
231.85	36.50	QP	223	1.6	H	-11.62	24.88	46.00	-21.12
231.85	40.38	QP	291	1.6	V	-11.62	28.76	46.00	-17.24
4501.60	44.61	PK	277	1.3	H	-1.89	42.72	74.00	-31.28
4501.60	34.80	Ave	277	1.3	H	-1.89	32.91	54.00	-21.09
5127.11	46.90	PK	11	1.3	H	-1.06	45.84	74.00	-28.16
5127.11	39.89	Ave	11	1.3	H	-1.06	38.83	54.00	-15.17
10380.00	38.43	PK	15	1.6	H	5.26	43.69	74.00	-30.31
10380.00	35.03	Ave	15	1.6	H	5.26	40.29	54.00	-13.71
802.11n(HT40) U-NII-1 High channel 5230MHz									
231.85	37.30	QP	290	1.6	H	-11.62	25.68	46.00	-20.32
231.85	40.00	QP	142	1.9	V	-11.62	28.38	46.00	-17.62
4502.58	45.41	PK	329	1.6	H	-1.94	43.47	74.00	-30.53
4502.58	34.19	Ave	329	1.6	H	-1.94	32.25	54.00	-21.75
5131.93	48.62	PK	90	1.6	H	-1.06	47.56	74.00	-26.44
5131.93	41.27	Ave	90	1.6	H	-1.06	40.21	54.00	-13.79
10460.00	42.20	PK	201	1.3	H	5.28	47.48	74.00	-26.52
10460.00	38.35	Ave	201	1.3	H	5.28	43.63	54.00	-10.37

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.407/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
802.11n(HT40) U-NII-3 Low Channel 5755MHz									
231.85	34.57	QP	51	1.1	H	-11.62	22.95	46.00	-23.05
231.85	45.36	QP	204	1.9	V	-11.62	33.74	46.00	-12.26
4511.96	42.01	PK	223	1.1	H	-1.96	40.05	74.00	-33.95
4511.96	34.16	Ave	223	1.1	H	-1.96	32.20	54.00	-21.80
5359.67	39.77	PK	197	1.9	H	5.88	45.65	74.00	-28.35
5359.67	34.09	Ave	197	1.9	H	5.88	39.97	54.00	-14.03
11510.00	46.55	PK	356	1.8	H	-1.01	45.54	74.00	-28.46
11510.00	39.26	Ave	356	1.8	H	-1.01	38.25	54.00	-15.75
802.11n(HT40) U-NII-3 High Channel 5795MHz									
231.85	34.01	QP	44	1.1	H	-11.62	22.39	46.00	-23.61
231.85	46.24	QP	360	1.5	V	-11.62	34.62	46.00	-11.38
4520.57	42.48	PK	288	1.5	H	-1.92	40.56	74.00	-33.44
4520.57	33.27	Ave	288	1.5	H	-1.92	31.35	54.00	-22.65
5387.25	43.01	PK	78	1.8	H	5.63	48.64	74.00	-25.36
5387.25	37.11	Ave	78	1.8	H	5.63	42.74	54.00	-11.26
11590.00	45.20	PK	182	1.7	H	-1.04	44.16	74.00	-29.84
11590.00	39.76	Ave	182	1.7	H	-1.04	38.72	54.00	-15.28

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.407/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
802.11ac(HT20) U-NII-1 Low Channel 5180MHz									
316.58	37.44	QP	343	1.7	H	-11.62	25.82	46.00	-20.18
316.58	41.15	QP	232	1.3	V	-11.62	29.53	46.00	-16.47
4533.71	46.17	PK	353	1.4	H	-1.86	44.31	74.00	-29.69
4533.71	40.41	Ave	353	1.4	H	-1.86	38.55	54.00	-15.45
5112.40	39.72	PK	317	1.2	H	-1.06	38.66	74.00	-35.34
5112.40	44.04	Ave	317	1.2	H	-1.06	42.98	54.00	-11.02
10360.00	46.80	PK	246	1.0	H	5.33	52.13	74.00	-21.87
10360.00	39.47	Ave	246	1.0	H	5.33	44.80	54.00	-9.20
802.11ac(HT20) U-NII-1 Middle Channel 5200MHz									
316.58	37.81	QP	82	1.5	H	-11.62	26.19	46.00	-19.81
316.58	41.31	QP	200	1.2	V	-11.62	29.69	46.00	-16.31
4510.52	45.67	PK	360	1.3	H	-1.82	43.85	74.00	-30.15
4510.52	40.01	Ave	360	1.3	H	-1.82	38.19	54.00	-15.81
5123.94	39.68	PK	131	1.4	H	-1.06	38.62	74.00	-35.38
5123.94	44.31	Ave	131	1.4	H	-1.06	43.25	54.00	-10.75
10400.00	41.64	PK	250	1.3	H	5.21	46.85	74.00	-27.15
10400.00	37.10	Ave	250	1.3	H	5.21	42.31	54.00	-11.69
802.11ac(HT20) U-NII-1 High Channel 5240MHz									
316.58	37.68	QP	144	1.4	H	-11.62	26.06	46.00	-19.94
316.58	42.23	QP	40	1.1	V	-11.62	30.61	46.00	-15.39
4507.29	45.18	PK	31	1.2	H	-1.81	43.37	74.00	-30.63
4507.29	39.42	Ave	31	1.2	H	-1.81	37.61	54.00	-16.39
5113.95	41.03	PK	41	1.6	H	-1.06	39.97	74.00	-34.03
5113.95	44.10	Ave	41	1.6	H	-1.06	43.04	54.00	-10.96
10480.00	42.21	PK	129	1.2	H	5.14	47.35	74.00	-26.65
10480.00	37.35	Ave	129	1.2	H	5.14	42.49	54.00	-11.51

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.407/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
802.11ac(HT20) U-NII-3 Low Channel 5745MHz									
316.58	37.07	QP	325	1.4	H	-11.62	25.45	46.00	-20.55
316.58	43.56	QP	25	1.9	V	-11.62	31.94	46.00	-14.06
4503.23	42.97	PK	336	1.3	H	-1.92	41.05	74.00	-32.95
4503.23	36.42	Ave	336	1.3	H	-1.92	34.50	54.00	-19.50
5366.63	39.56	PK	131	1.9	H	5.93	45.49	74.00	-28.51
5366.63	35.68	Ave	131	1.9	H	5.93	41.61	54.00	-12.39
11490.00	46.21	PK	1	1.7	H	-1.03	45.18	74.00	-28.82
11490.00	39.21	Ave	1	1.7	H	-1.03	38.18	54.00	-15.82
802.11ac(HT20) U-NII-3 Middle Channel 5785MHz									
316.58	36.52	QP	82	1.1	H	-11.62	24.90	46.00	-21.10
316.58	42.81	QP	328	1.7	V	-11.62	31.19	46.00	-14.81
4512.64	41.99	PK	35	1.3	H	-1.97	40.02	74.00	-33.98
4512.64	37.25	Ave	35	1.3	H	-1.97	35.28	54.00	-18.72
5387.03	41.48	PK	152	1.1	H	5.81	47.29	74.00	-26.71
5387.03	36.64	Ave	152	1.1	H	5.81	42.45	54.00	-11.55
11570.00	45.31	PK	88	1.4	H	-1.05	44.26	74.00	-29.74
11570.00	37.96	Ave	88	1.4	H	-1.05	36.91	54.00	-17.09
802.11ac(HT20) U-NII-3 High Channel 5825MHz									
316.58	36.46	QP	155	1.0	H	-11.62	24.84	46.00	-21.16
316.58	43.10	QP	25	1.4	V	-11.62	31.48	46.00	-14.52
4509.73	41.17	PK	16	2.0	H	-1.88	39.29	74.00	-34.71
4509.73	36.46	Ave	16	2.0	H	-1.88	34.58	54.00	-19.42
5356.21	42.78	PK	223	1.1	H	5.84	48.62	74.00	-25.38
5356.21	36.68	Ave	223	1.1	H	5.84	42.52	54.00	-11.48
11650.00	45.65	PK	223	1.8	H	-1.06	44.59	74.00	-29.41
11650.00	38.26	Ave	223	1.8	H	-1.06	37.20	54.00	-16.80

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.407/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
802.11ac(HT40) U-NII-1 Low Channel 5190MHz									
316.58	35.38	QP	232	1.2	H	-11.62	23.76	46.00	-22.24
316.58	43.60	QP	144	2.0	V	-11.62	31.98	46.00	-14.02
4538.48	35.34	PK	261	1.6	H	-1.91	33.43	74.00	-40.57
4538.48	30.97	Ave	261	1.6	H	-1.91	29.06	54.00	-24.94
5137.34	47.95	PK	173	1.8	H	-1.06	46.89	74.00	-27.11
5137.34	40.99	Ave	173	1.8	H	-1.06	39.93	54.00	-14.07
10380.00	40.92	PK	102	1.3	H	5.26	46.18	74.00	-27.82
10380.00	36.25	Ave	102	1.3	H	5.26	41.51	54.00	-12.49
802.11ac(HT40) U-NII-1 High Channel 5230MHz									
316.58	36.31	QP	319	1.1	H	-11.62	24.69	46.00	-21.31
316.58	43.45	QP	178	1.1	V	-11.62	31.83	46.00	-14.17
4531.57	35.98	PK	248	1.5	H	-1.93	34.05	74.00	-39.95
4531.57	31.60	Ave	248	1.5	H	-1.93	29.67	54.00	-24.33
5145.36	48.28	PK	191	1.4	H	-1.06	47.22	74.00	-26.78
5145.36	40.50	Ave	191	1.4	H	-1.06	39.44	54.00	-14.56
10460.00	41.24	PK	248	1.4	H	5.28	46.52	74.00	-27.48
10460.00	37.48	Ave	248	1.4	H	5.28	42.76	54.00	-11.24

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.407/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
802.11ac(HT40) U-NII-3 Low Channel 5755MHz									
316.58	35.56	QP	181	1.5	H	-11.62	23.94	46.00	-22.06
316.58	44.83	QP	322	1.0	V	-11.62	33.21	46.00	-12.79
4536.00	33.89	PK	2	1.3	H	-1.92	31.97	74.00	-42.03
4536.00	30.51	Ave	2	1.3	H	-1.92	28.59	54.00	-25.41
5363.99	39.40	PK	220	1.7	H	5.88	45.28	74.00	-28.72
5363.99	36.20	Ave	220	1.7	H	5.88	42.08	54.00	-11.92
11510.00	46.32	PK	219	1.7	H	-1.07	45.25	74.00	-28.75
11510.00	38.78	Ave	219	1.7	H	-1.07	37.71	54.00	-16.29
802.11ac(HT40) U-NII-3 High Channel 5795MHz									
316.58	35.63	QP	263	1.9	H	-11.62	24.01	46.00	-21.99
316.58	45.31	QP	315	1.3	V	-11.62	33.69	46.00	-12.31
4509.85	33.01	PK	323	1.8	H	-1.86	31.15	74.00	-42.85
4509.85	30.07	Ave	323	1.8	H	-1.86	28.21	54.00	-25.79
5356.69	42.70	PK	293	2.0	H	5.63	48.33	74.00	-25.67
5356.69	37.17	Ave	293	2.0	H	5.63	42.80	54.00	-11.20
11590.00	46.72	PK	213	1.6	H	-1.03	45.69	74.00	-28.31
11590.00	38.18	Ave	213	1.6	H	-1.03	37.15	54.00	-16.85

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.407/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
802.11ac(HT80) U-NII-1 Low Channel 5210MHz									
316.58	45.68	QP	133	1.4	H	-11.62	34.06	46.00	-11.94
316.58	33.00	QP	246	1.5	V	-11.62	21.38	46.00	-24.62
4533.21	29.81	PK	124	1.4	H	-1.88	27.93	74.00	-46.07
4533.21	42.37	Ave	124	1.4	H	-1.88	40.49	54.00	-13.51
5120.23	36.26	PK	296	1.8	H	-1.06	35.20	74.00	-38.80
5120.23	47.50	Ave	296	1.8	H	-1.06	46.44	54.00	-7.56
10420.00	42.30	PK	341	1.9	H	4.65	46.95	74.00	-27.05
10420.00	37.48	Ave	341	1.9	H	4.65	42.13	54.00	-11.87
802.11ac(HT80) U-NII-3 Low Channel 5775MHz									
316.58	33.87	QP	175	1.7	H	-11.62	22.25	46.00	-23.75
316.58	30.14	QP	281	1.1	V	-11.62	18.52	46.00	-27.48
4533.16	43.01	PK	5	1.8	H	-1.85	41.16	74.00	-32.84
4533.16	41.73	Ave	5	1.8	H	-1.85	39.88	54.00	-14.12
5355.64	41.63	PK	177	1.6	H	4.83	46.46	74.00	-27.54
5355.64	38.25	Ave	177	1.6	H	4.83	43.08	54.00	-10.92
11550.00	46.82	PK	138	1.9	H	-1.14	45.68	74.00	-28.32
11550.00	37.19	Ave	138	1.9	H	-1.14	36.05	54.00	-17.95

Test Frequency: 12GHz~40GHz

The measurements were more than 20 dB below the limit and not reported.

10 Band Edge

Test Requirement:	FCC 47CFR Part 15 Section 15.407
Test Method:	ANSI C63.10 2013
Test Limit:	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 -27dBm/MHz. For transmitters operating in the 5.25-5.35 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. For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz. For transmitters operating in the 5.725-5.85 GHz band: (i) 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. (ii) Devices certified before March 2, 2017 with antenna gain greater than 10 dBi may demonstrate compliance with the emission limits in §15.247(d), but manufacturing, marketing and importing of devices certified under this alternative must cease by March 2, 2018. Devices certified before March 2, 2018 with antenna gain of 10 dBi or less may demonstrate compliance with the emission limits in §15.247(d), but manufacturing, marketing and importing of devices certified under this alternative must cease before March 2, 2020.
Test Result:	PASS

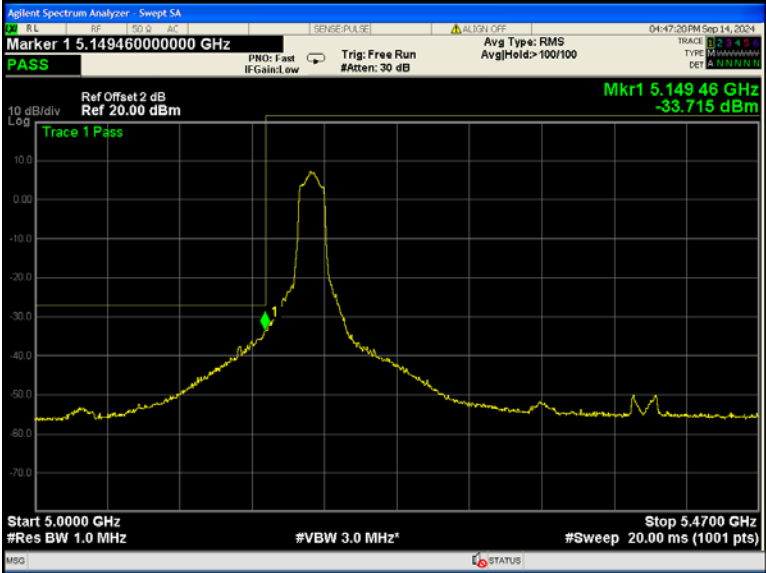
10.1 Test Produce

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 to 100 kHz and VBW of spectrum analyzer to 300 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
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.

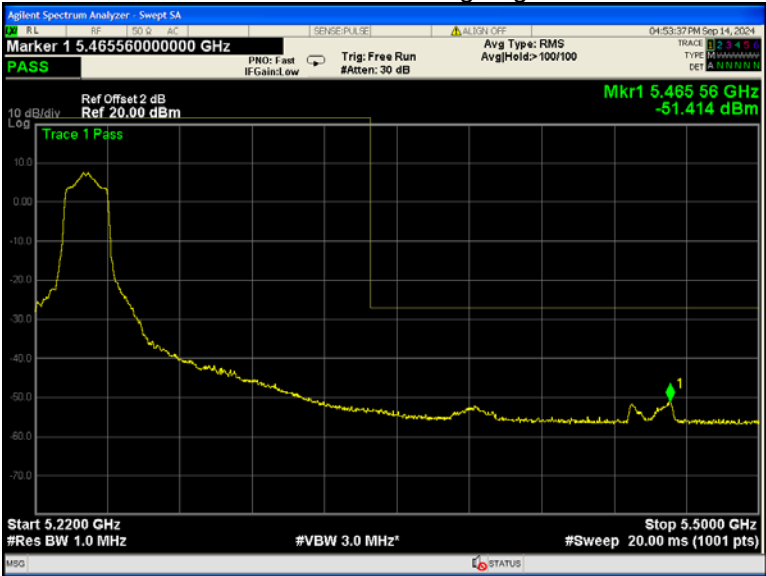
10.2 Test Result

Test result plots shown as follows:

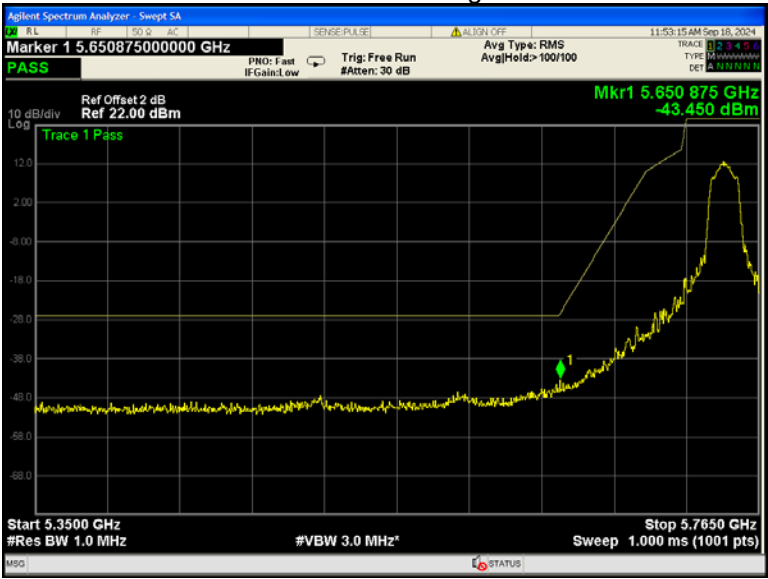
802.11a U-NII-1 Band edge-left side



802.11a U-NII-1 Band edge-right side



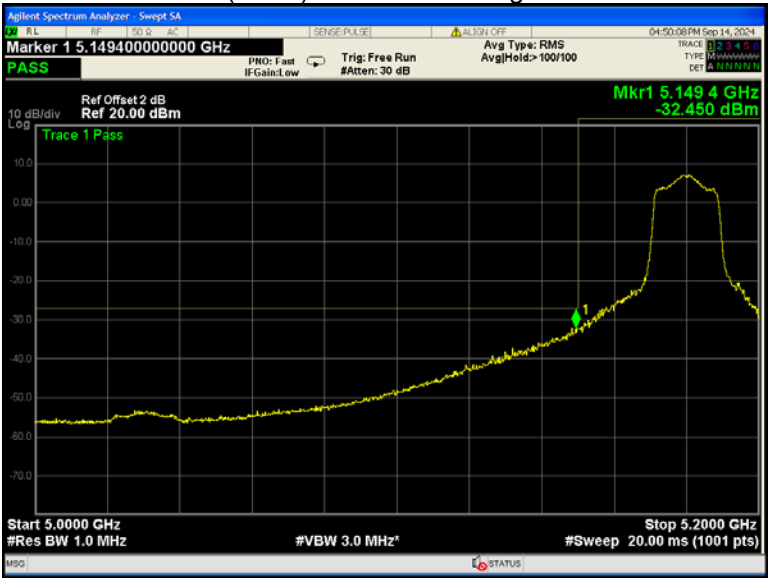
802.11a U-NII-3 Band edge-left side



802.11a U-NII-3 Band edge-right side



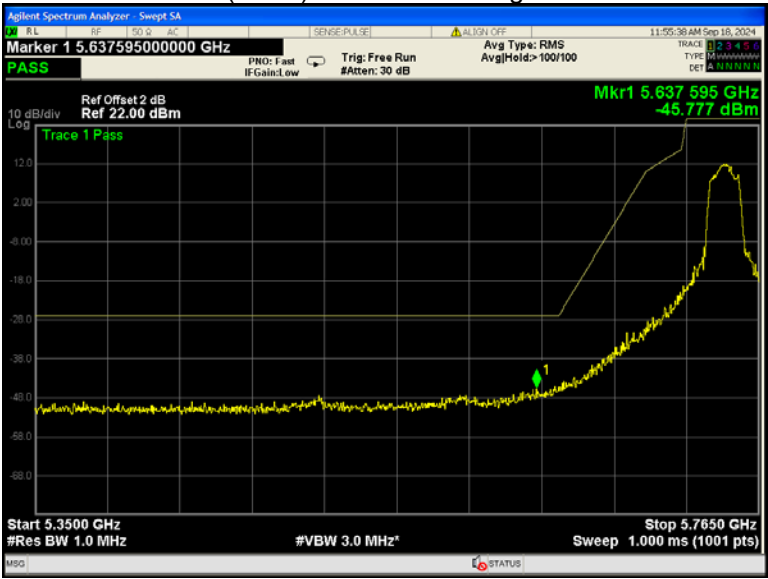
802.11n(HT20) U-NII-1 Band edge-left side



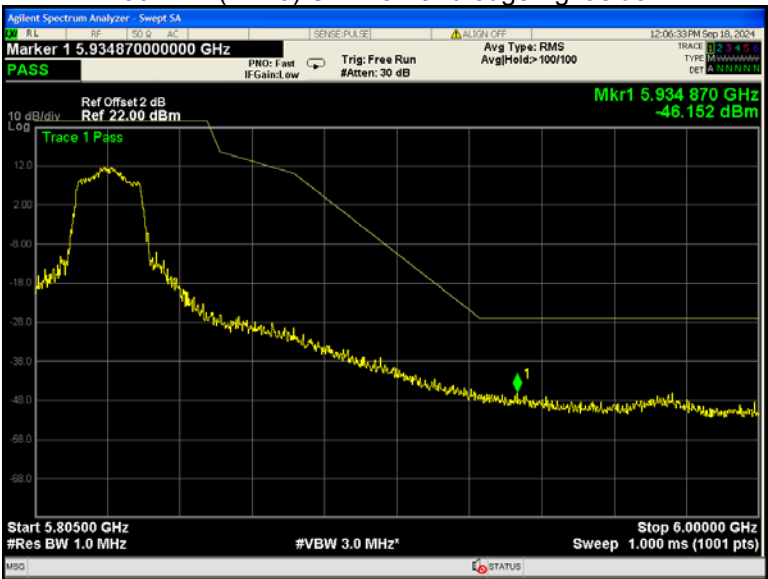
802.11n(HT20) U-NII-1 Band edge-right side



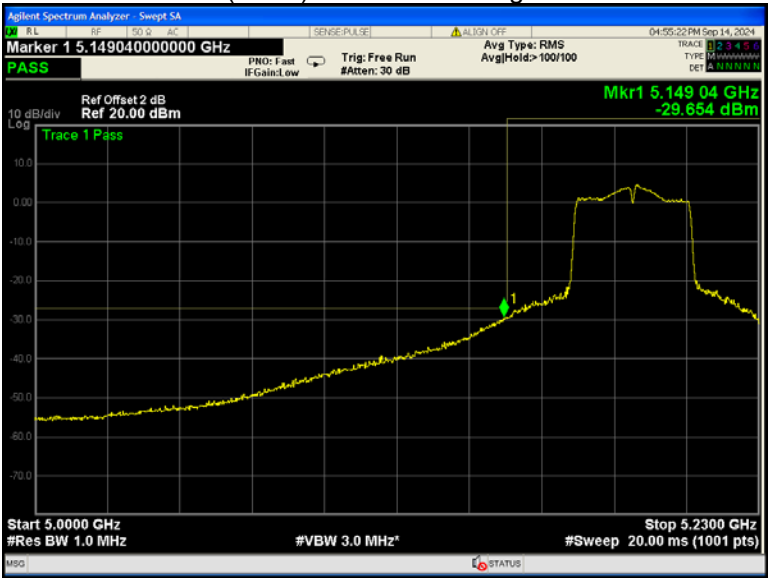
802.11n(HT20) U-NII-3 Band edge-left side



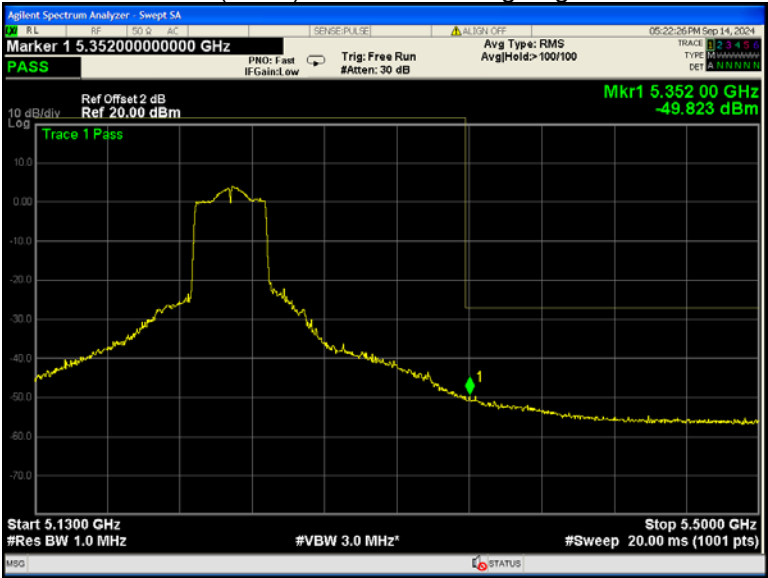
802.11n(HT20) U-NII-3 Band edge-right side



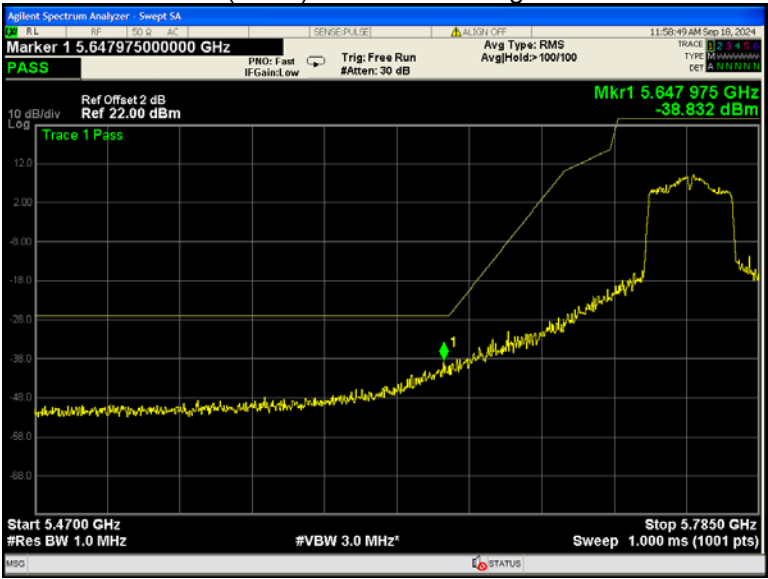
802.11n(HT40) U-NII-1 Band edge-left side



802.11n(HT40) U-NII-1 Band edge-right side



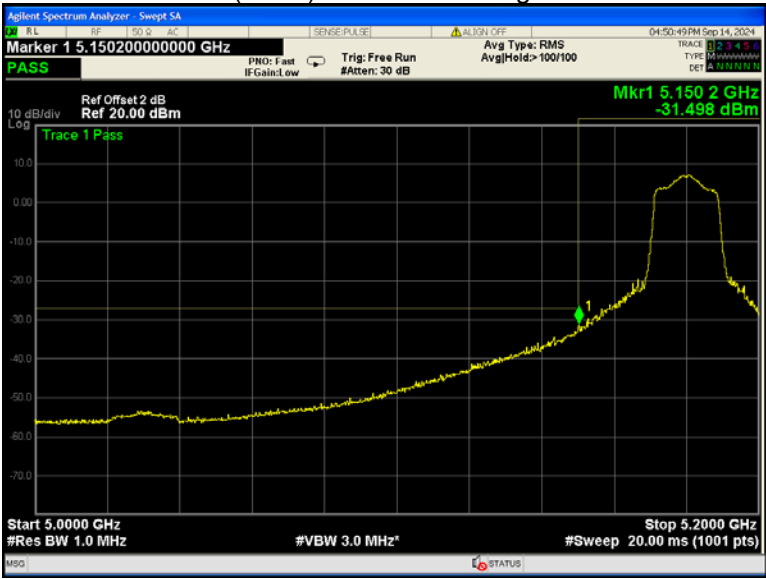
802.11n(HT40) U-NII-3 Band edge-left side



802.11n(HT40) U-NII-3 Band edge-right side



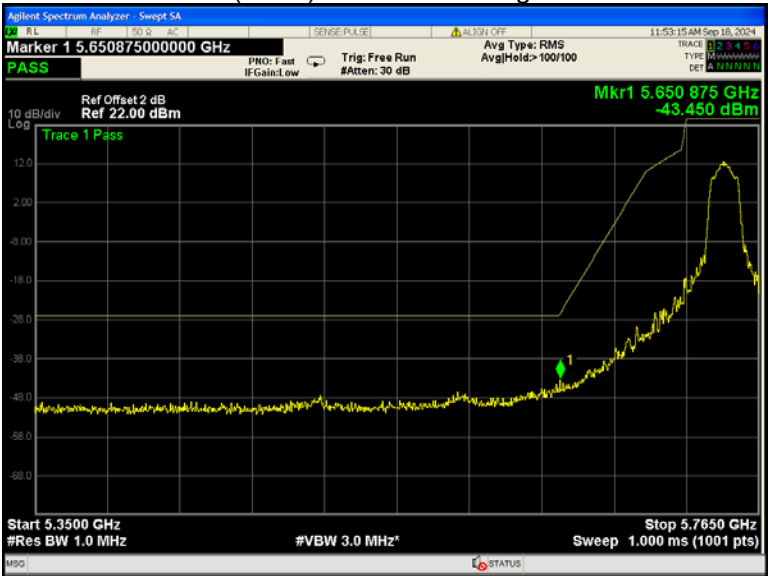
802.11ac(HT20) U-NII-1 Band edge-left side



802.11ac(HT20) U-NII-1 Band edge-right side



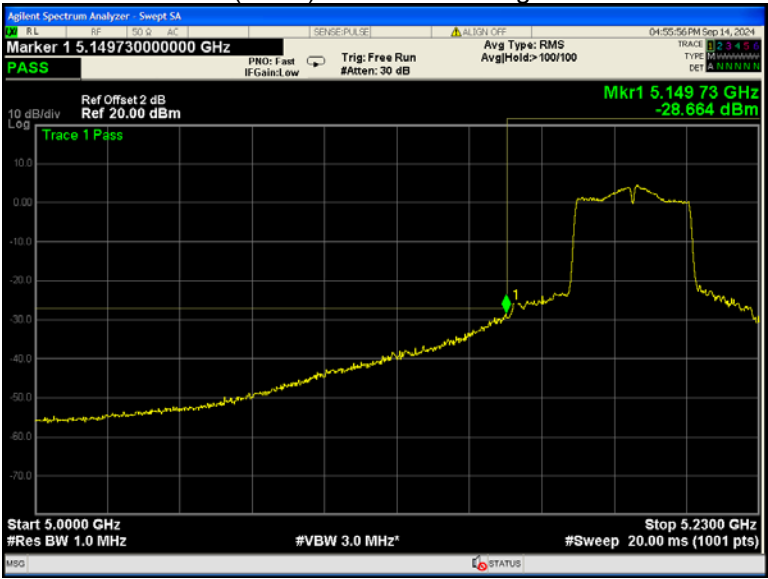
802.11ac(HT20) U-NII-3 Band edge-left side



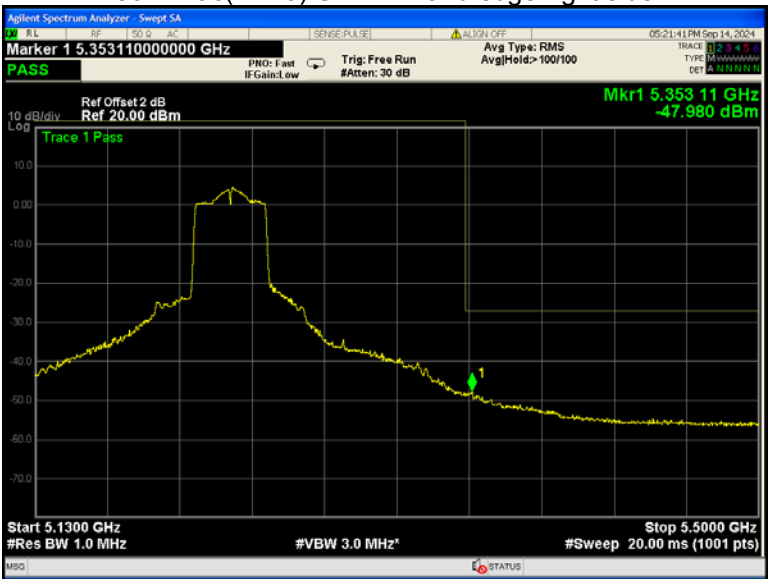
802.11ac(HT20) U-NII-3 Band edge-right side



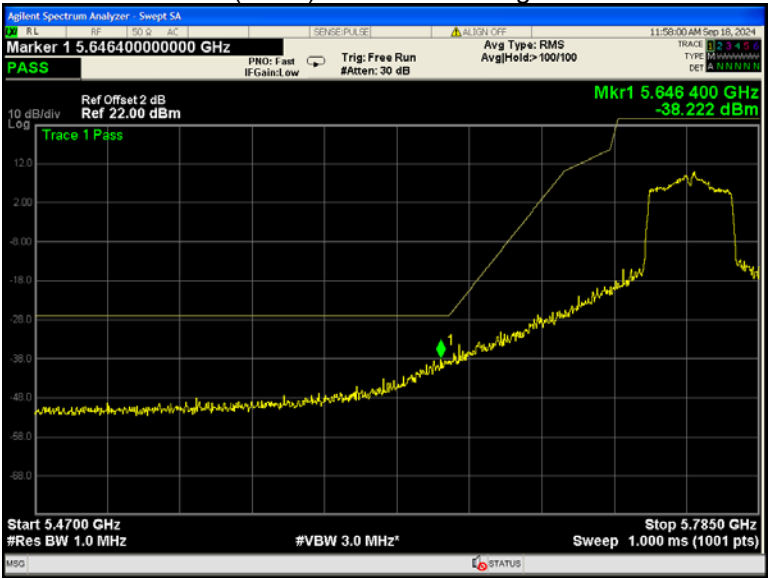
802.11ac(HT40) U-NII-1 Band edge-left side



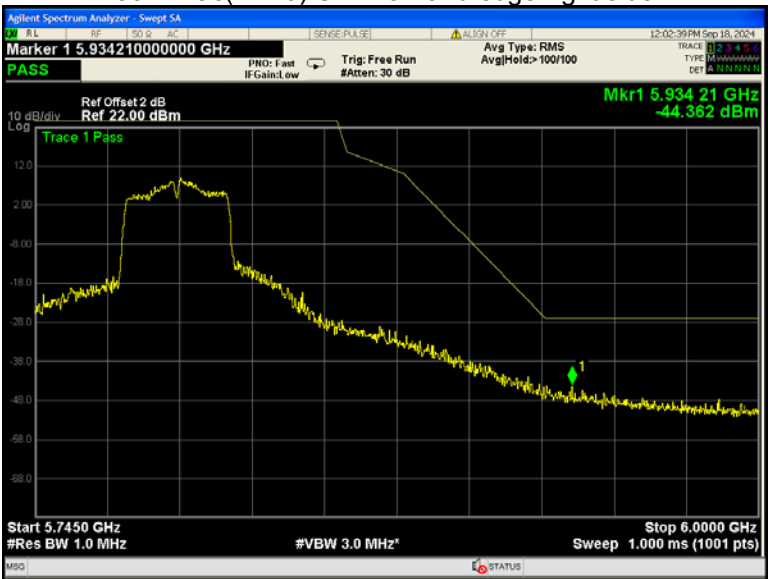
802.11ac(HT40) U-NII-1 Band edge-right side



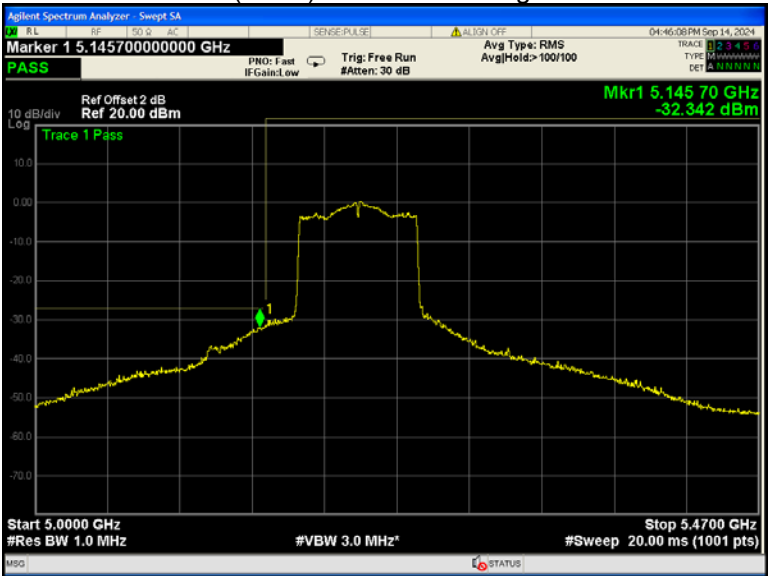
802.11ac(HT40) U-NII-3 Band edge-left side



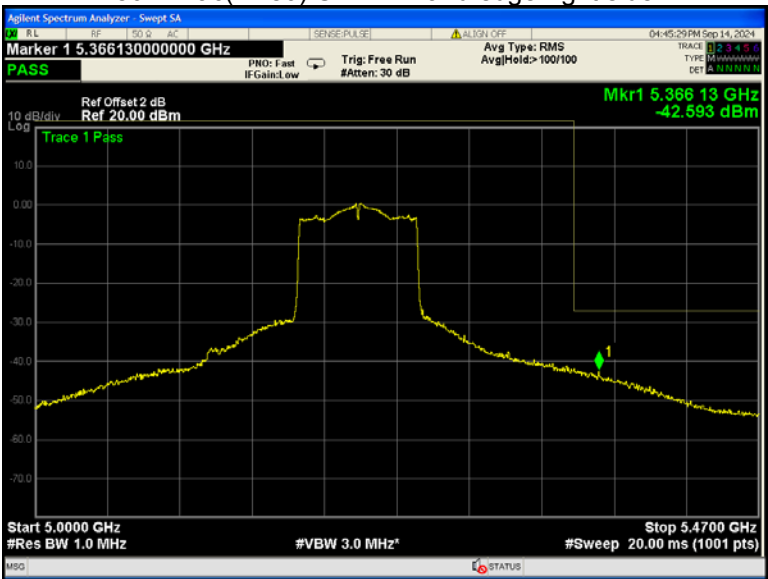
802.11ac(HT40) U-NII-3 Band edge-right side



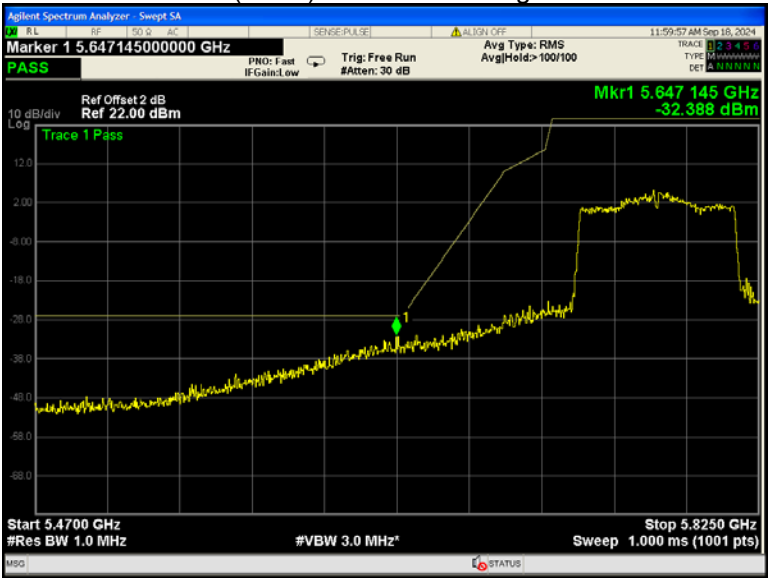
802.11ac(HT80) U-NII-1 Band edge-left side



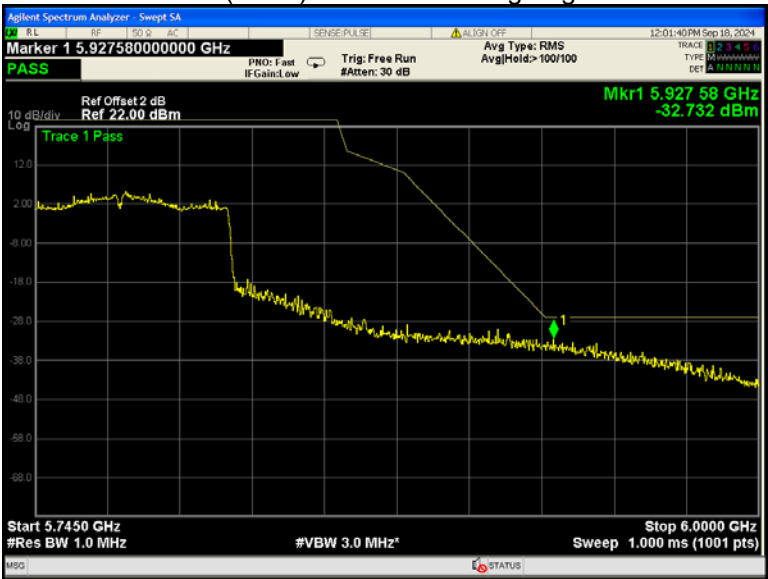
802.11ac(HT80) U-NII-1 Band edge-right side



802.11ac(HT80) U-NII-3 Band edge-left side



802.11ac(HT80) U-NII-3 Band edge-right side



11 6 dB Bandwidth

Test Requirement:	FCC 47CFR Part 15 Section 15.407(e) KDB662911 D01 Multiple Transmitter Output v02r01
Test Method:	KDB789033 D02 General U-NII Test Procedures New Rules v02r01 Section C
Test Limit:	≥ 500 kHz
Test Result:	PASS

11.1 Test Procedure

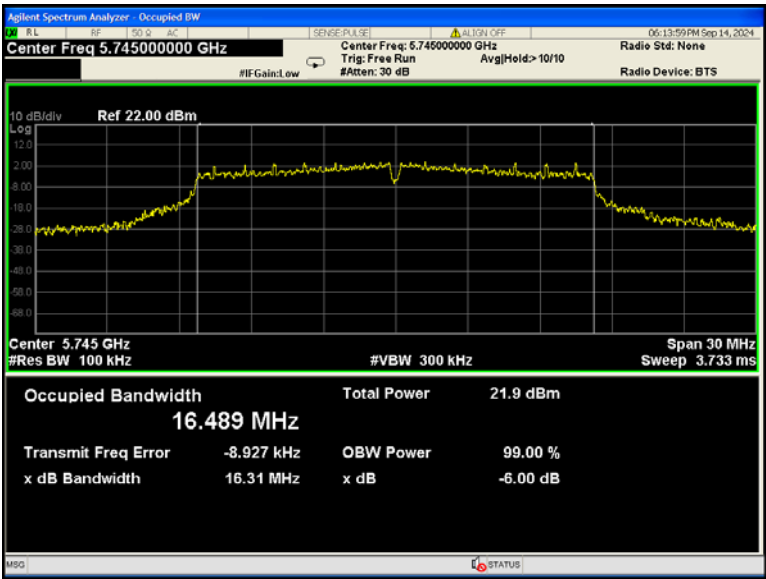
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: RBW = 100kHz, VBW = 300kHz

11.2 Test Result

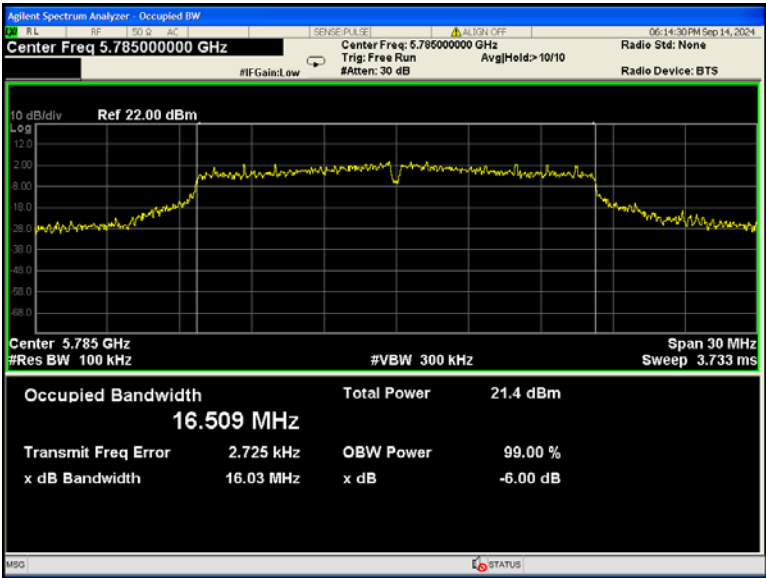
Band	Operation mode	6 dB Bandwidth (MHz)		
		Low	Middle	High
U-NII-3	802.11a	16.489	16.509	16.482
	802.11n(HT20)	17.696	17.734	17.685
	802.11n(HT40)	36.144	/	36.233
	802.11ac(HT20)	17.665	17.715	17.671
	802.11ac(HT40)	36.195	/	36.157
	802.11ac(HT80)	/	75.525	/

Test result plots shown as follows:

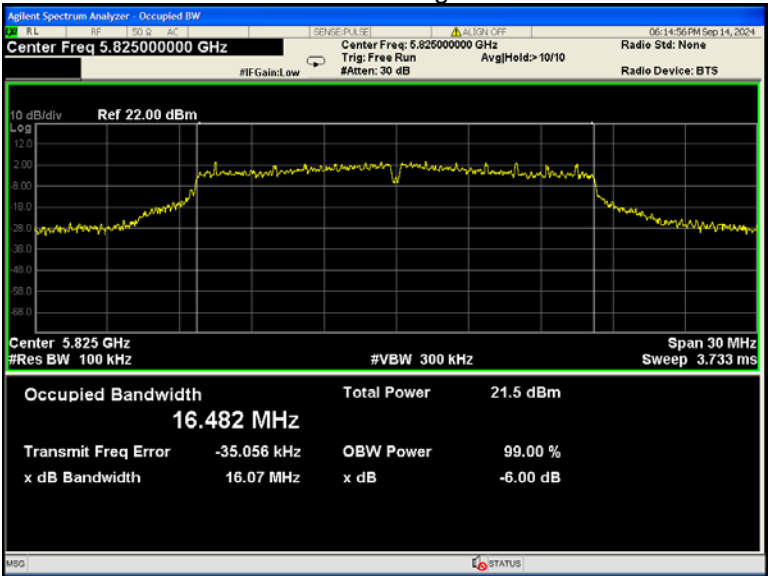
802.11a U-NII-3 Low channel



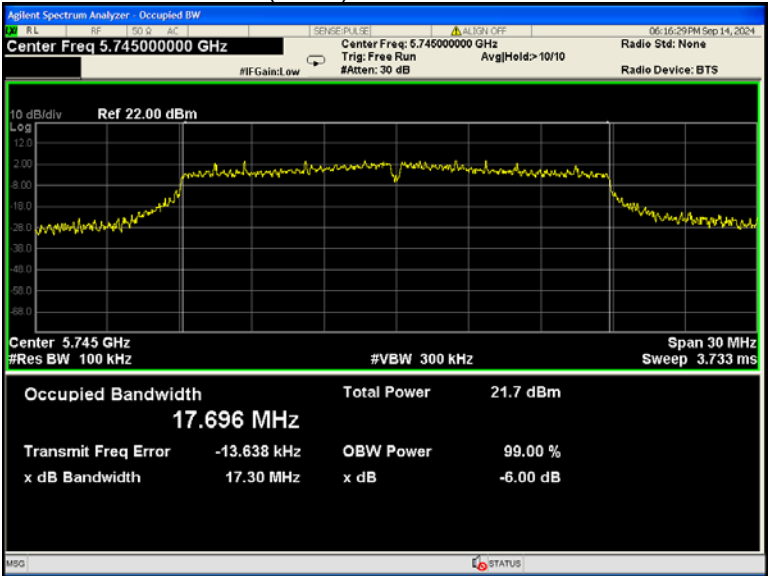
802.11a U-NII-3 Middle channel



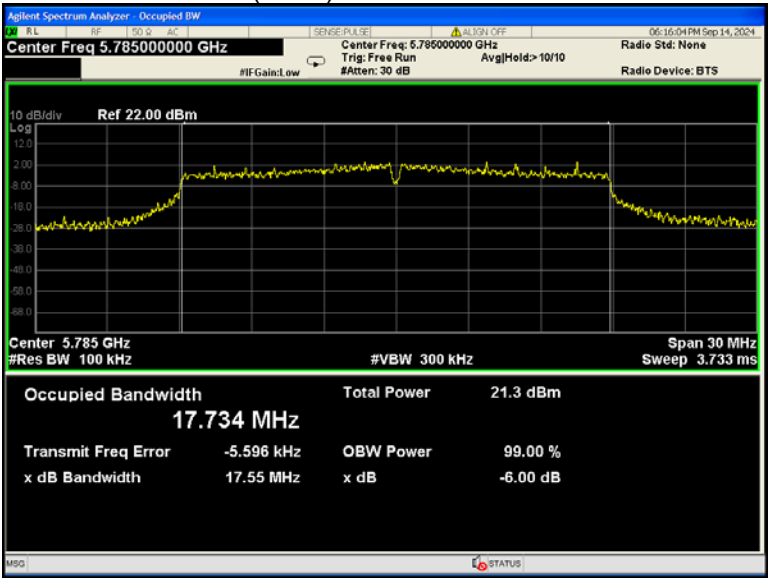
802.11a U-NII-3 High channel



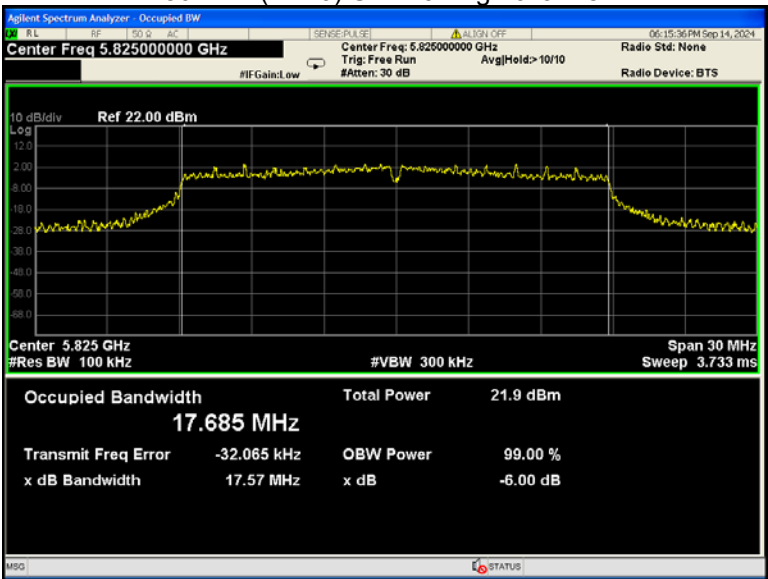
802.11n(HT20) U-NII-3 Low channel



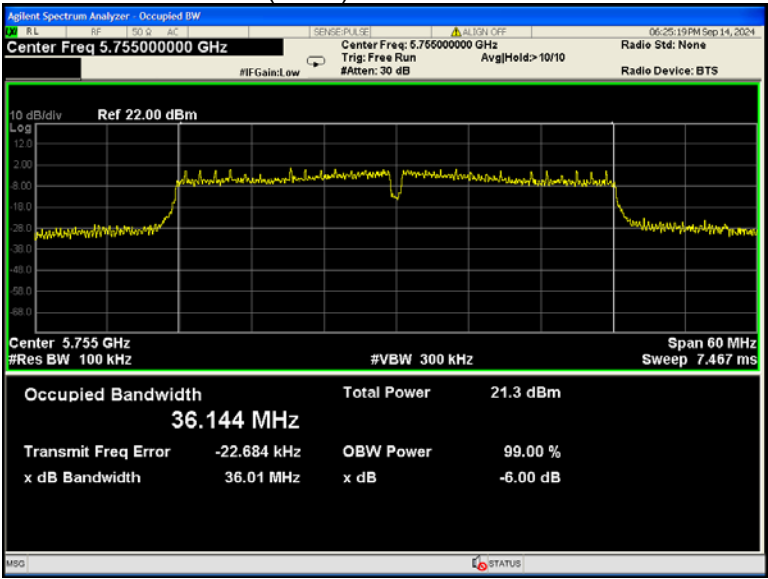
802.11n(HT20) U-NII-3 Middle channel



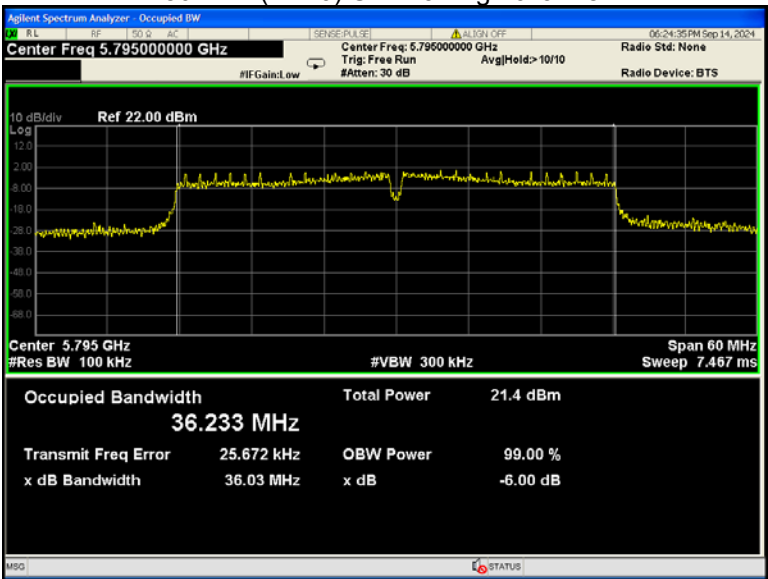
802.11n(HT20) U-NII-3 High channel



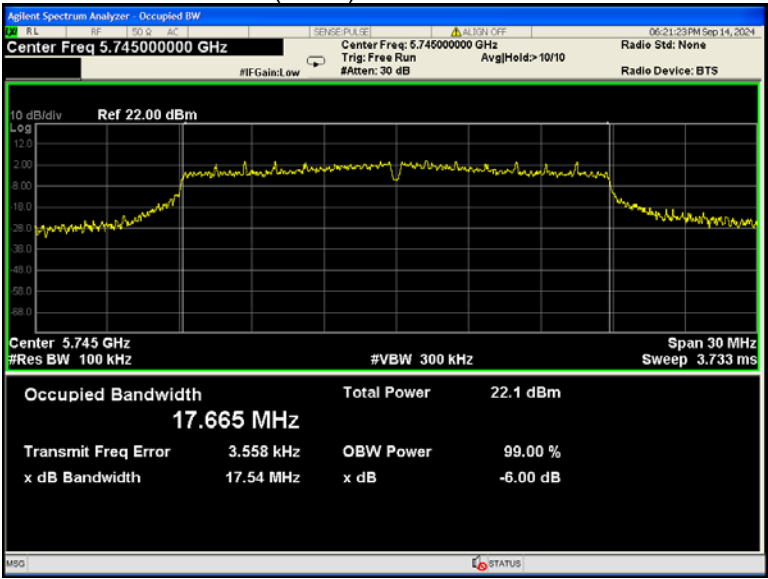
802.11n(HT40) U-NII-3 Low channel



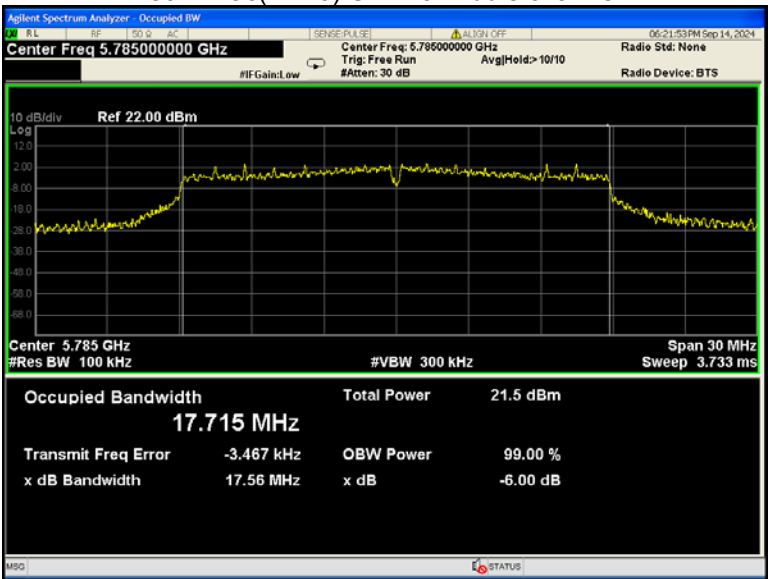
802.11n(HT40) U-NII-3 High channel



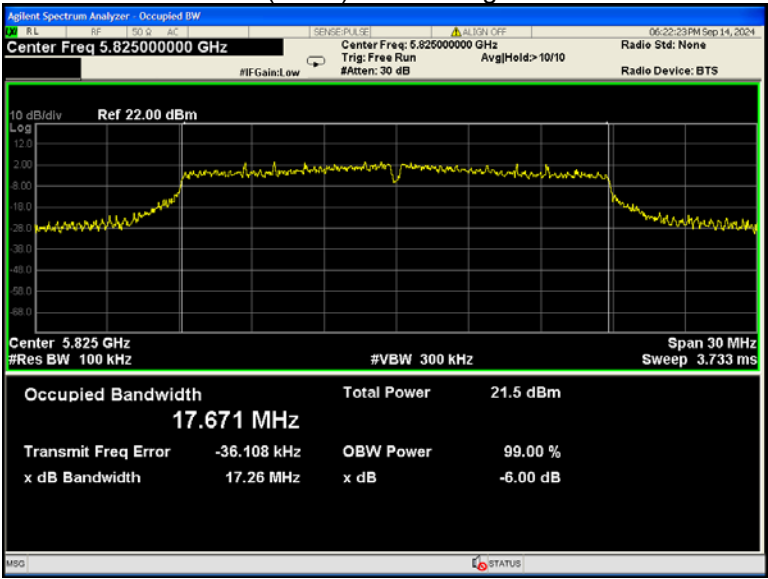
802.11ac(HT20) U-NII-3 Low channel



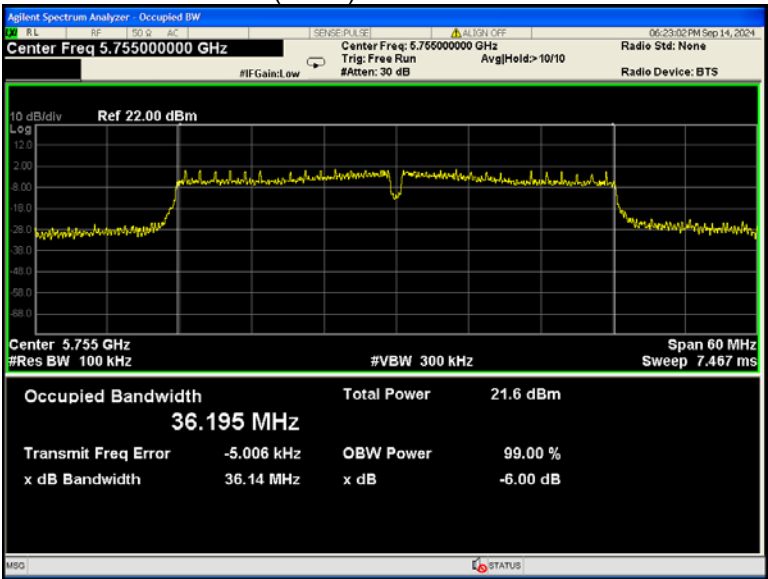
802.11ac(HT20) U-NII-3 Middle channel



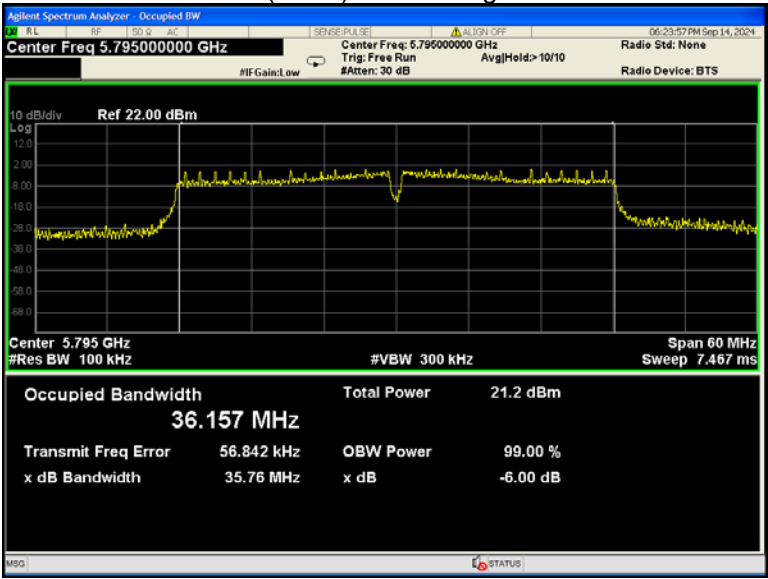
802.11ac(HT20) U-NII-3 High channel



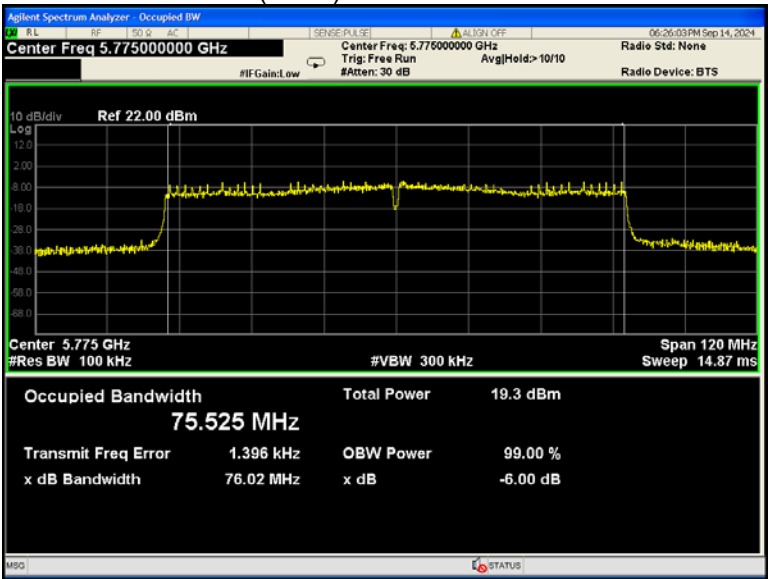
802.11ac(HT40) U-NII-3 Low channel



802.11ac(HT40) U-NII-3 High channel



802.11ac(HT80) U-NII-3 Middle channel



12 26 dB Bandwidth and 99% Occupied Bandwidth

Test Requirement:	FCC 47CFR Part 15 Section 15.407 (a) KDB662911 D01 Multiple Transmitter Output v02r01
Test Method:	KDB789033 D02 General U-NII Test Procedures New Rules v02r01 Section D
Test Limit:	No restriction limits
Test Result:	PASS

12.1 Test Procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: RBW = 1% to 5% of the OBW, VBW = 3x RBW

12.2 Test Result

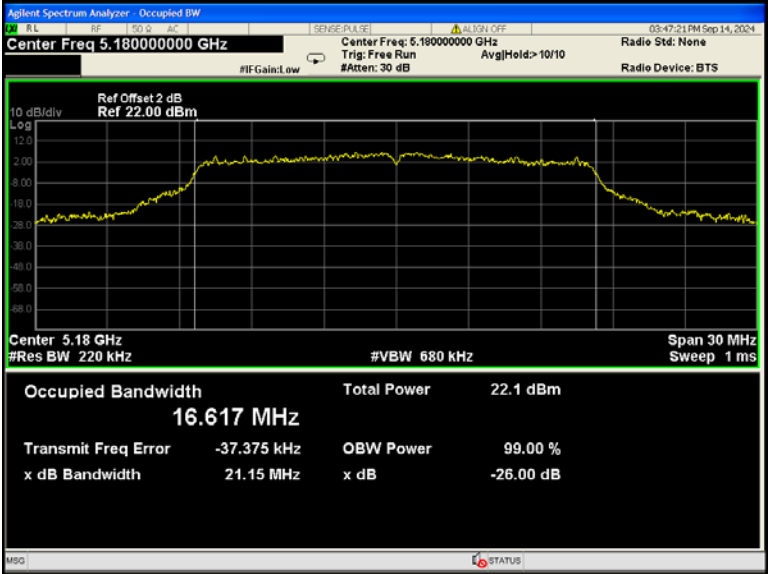
Band	Operation mode	26 dB Bandwidth (MHz)			99% Bandwidth (MHz)		
		Low	Middle	High	Low	Middle	High
U-NII-1	802.11a	21.15	20.99	21.31	16.617	17.649	16.608
	802.11n(HT20)	23.68	25.07	22.42	17.811	17.830	17.762
	802.11n(HT40)	49.45	/	48.75	36.245	/	36.192
	802.11ac(HT20)	21.27	21.45	21.32	17.831	17.827	17.801
	802.11ac(HT40)	40.08	/	40.13	36.516	/	36.493
	802.11ac(HT80)	/	82.97	/	/	75.682	/

Band	Operation mode	99% Bandwidth (MHz)		
		Low	Middle	High
U-NII-3	802.11a	16.707	16.745	16.714
	802.11n(HT20)	17.821	17.917	17.841
	802.11n(HT40)	36.299	/	36.345
	802.11ac(HT20)	17.817	17.927	17.842
	802.11ac(HT40)	36.305	/	36.445
	802.11ac(HT80)	/	75.839	/

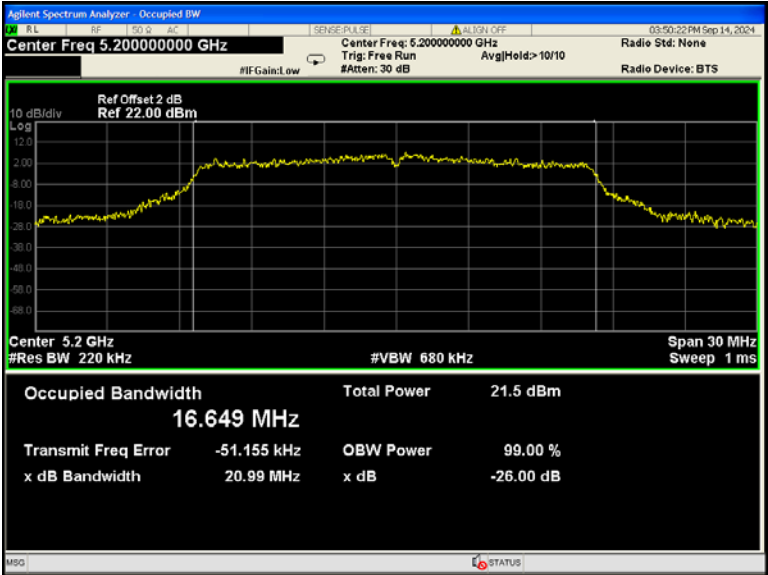
Test result plots shown as follows:

26 dB Bandwidth and 99% Occupied Bandwidth

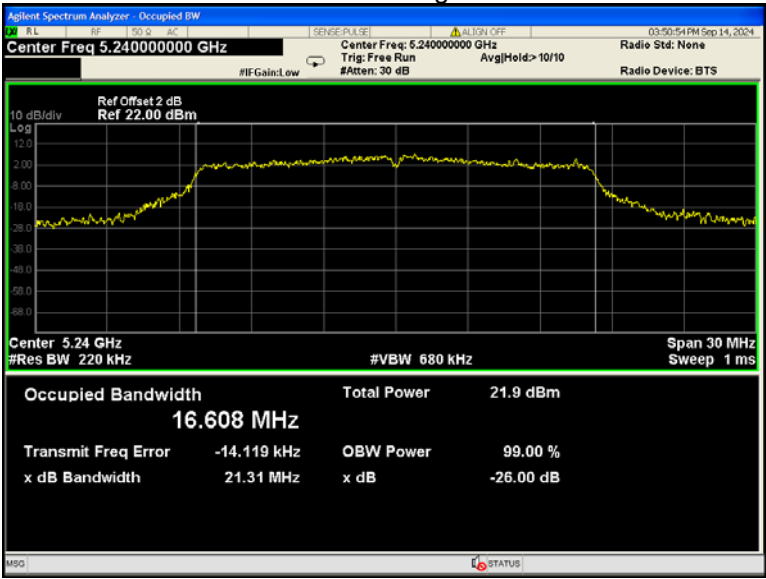
802.11a U-NII-1 Low channel



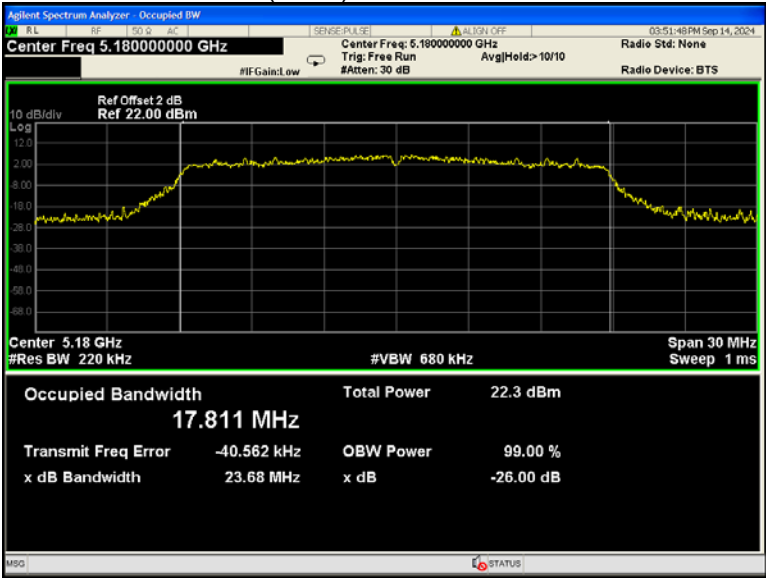
802.11a U-NII-1 Middle channel



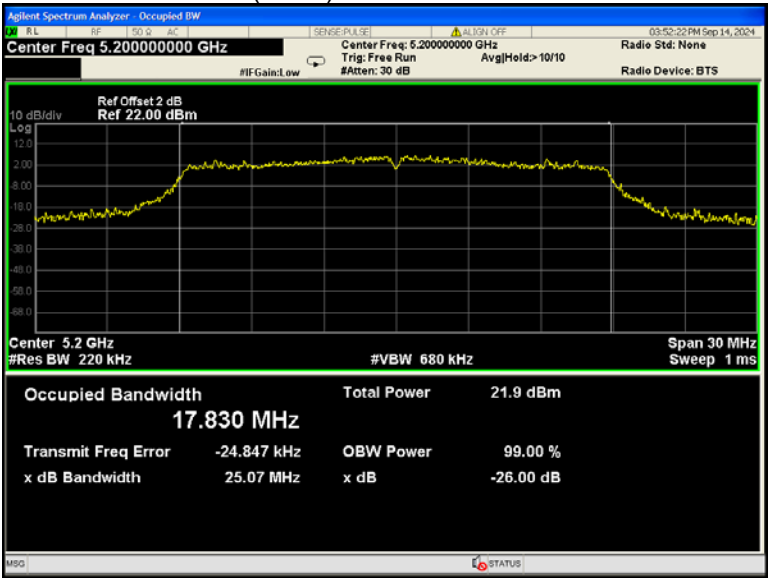
802.11a U-NII-1 High channel



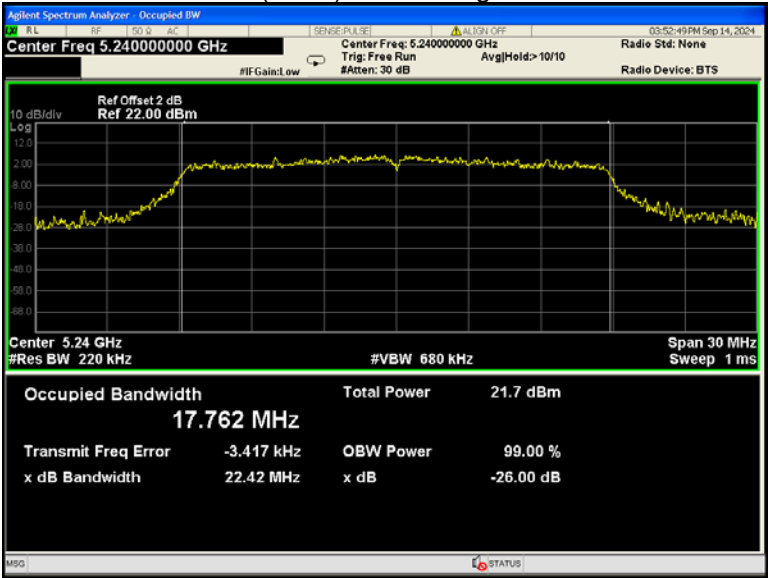
802.11n(HT20) U-NII-1 Low channel



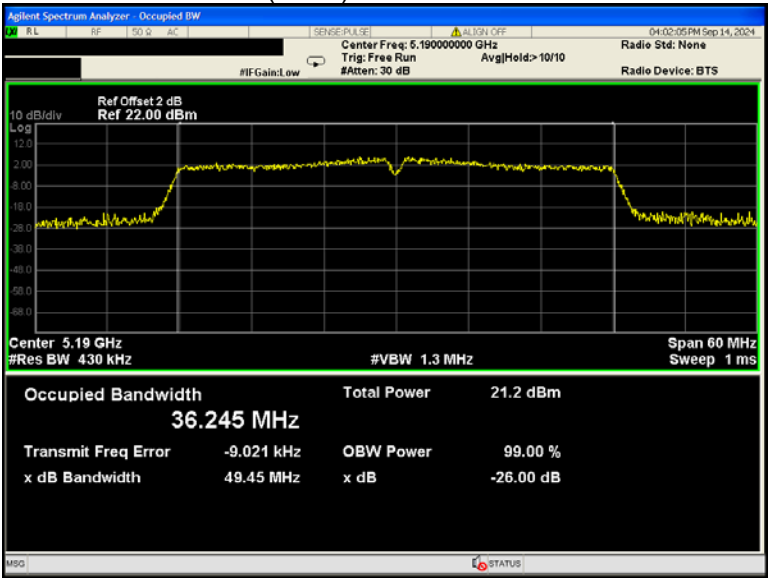
802.11n(HT20) U-NII-1 Middle channel



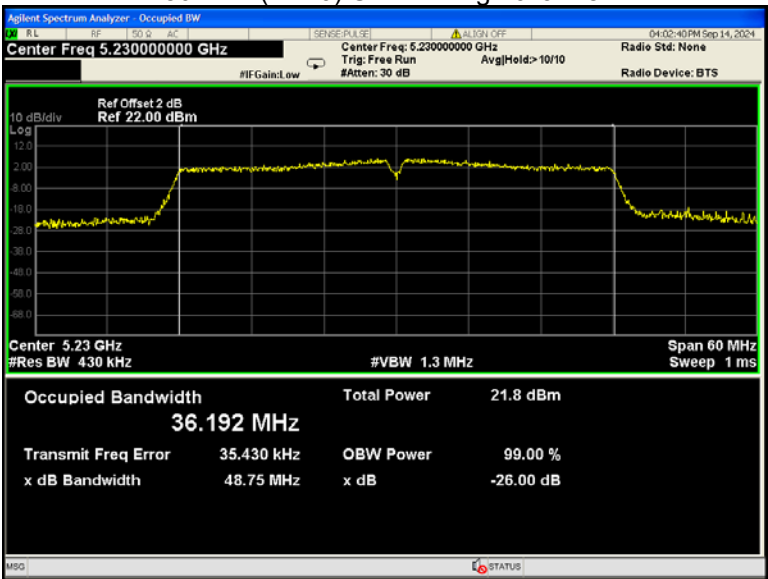
802.11n(HT20) U-NII-1 High channel



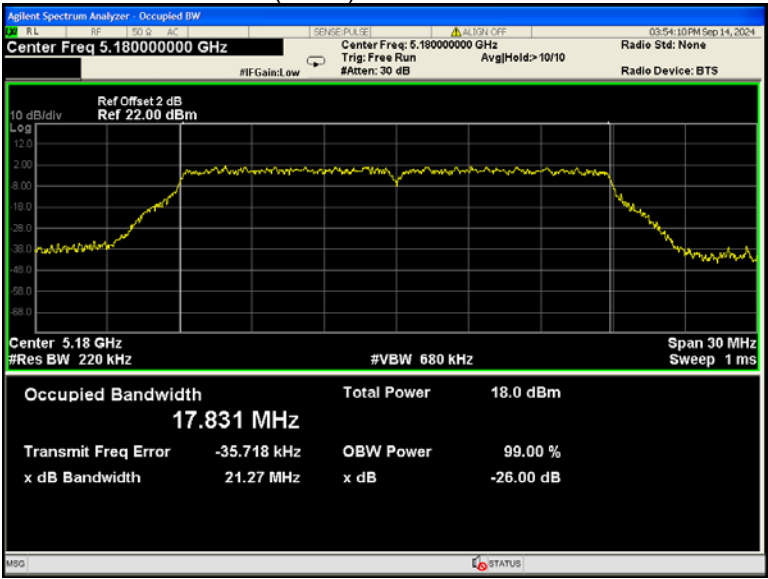
802.11n(HT40) U-NII-1 Low channel



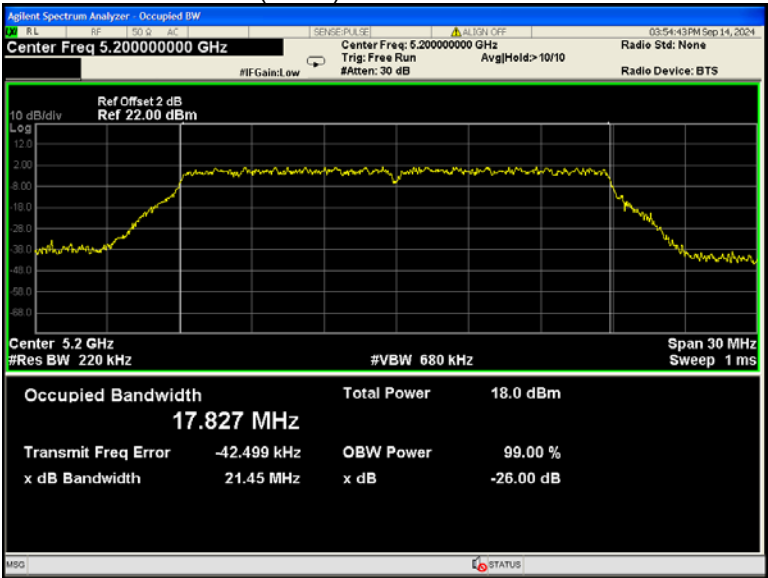
802.11n(HT40) U-NII-1 High channel



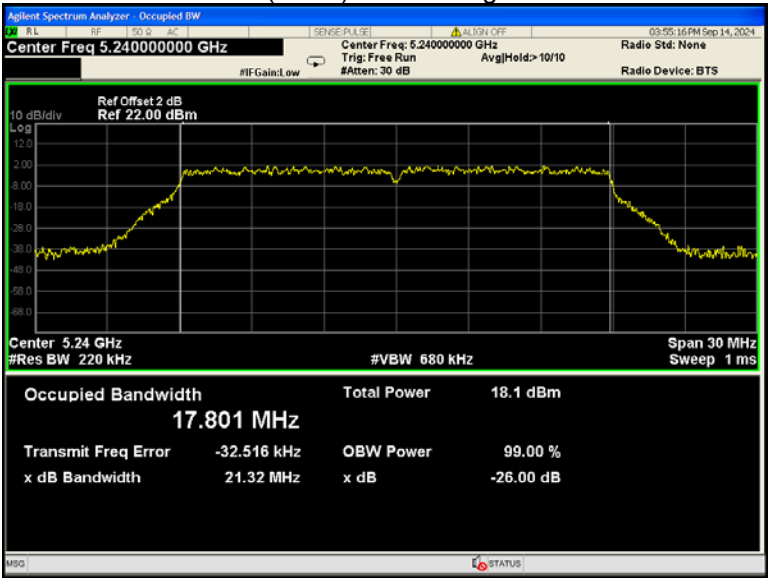
802.11ac(HT20) U-NII-1 Low channel



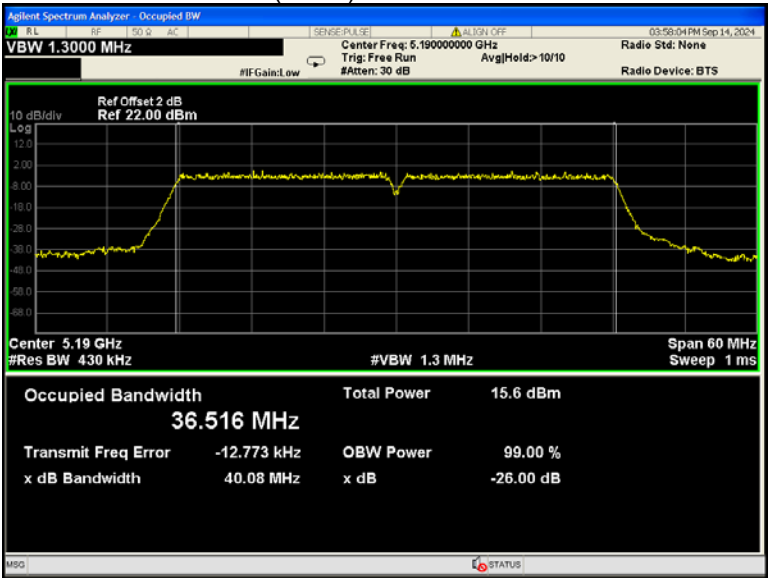
802.11ac(HT20) U-NII-1 Middle channel



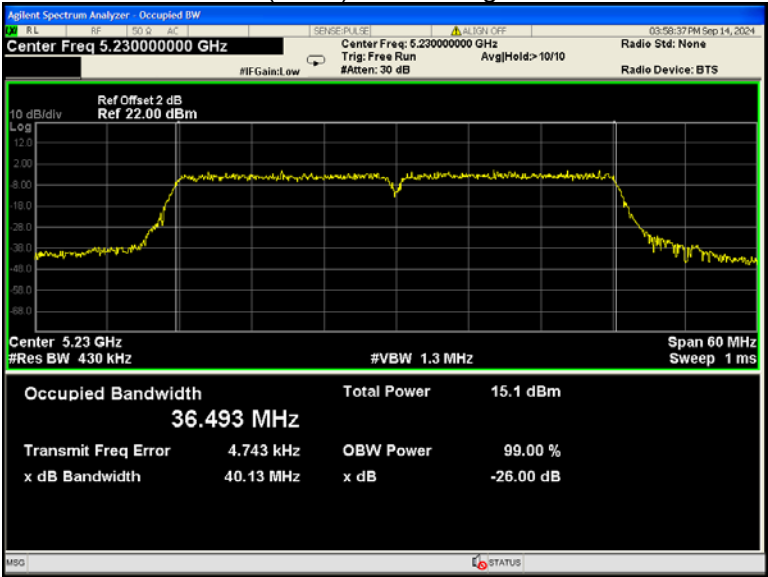
802.11ac(HT20) U-NII-1 High channel



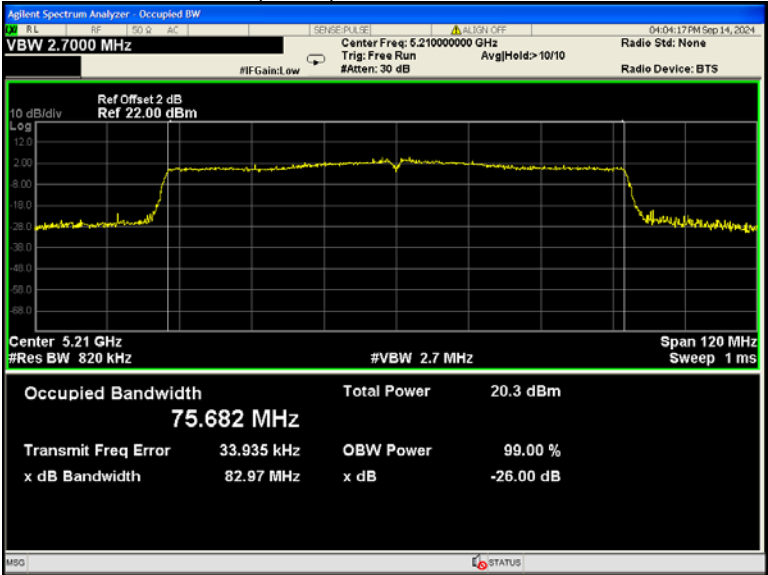
802.11ac(HT40) U-NII-1 Low channel



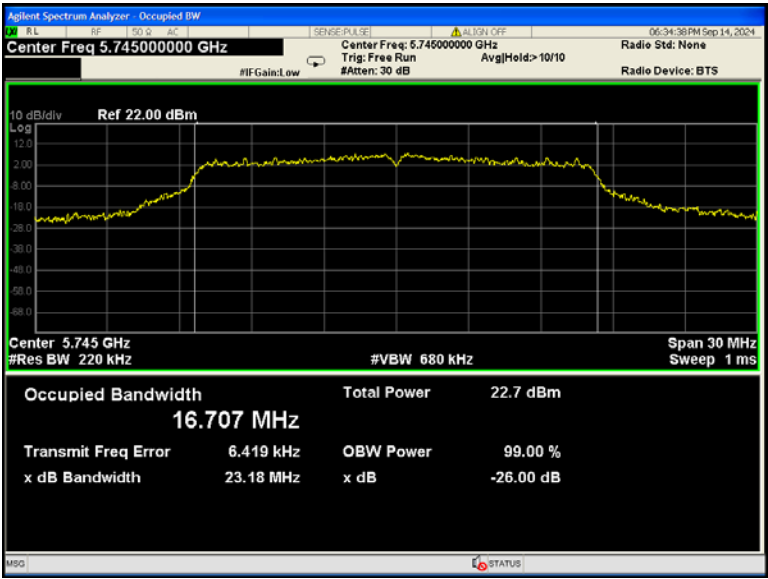
802.11ac(HT40) U-NII-1 High channel



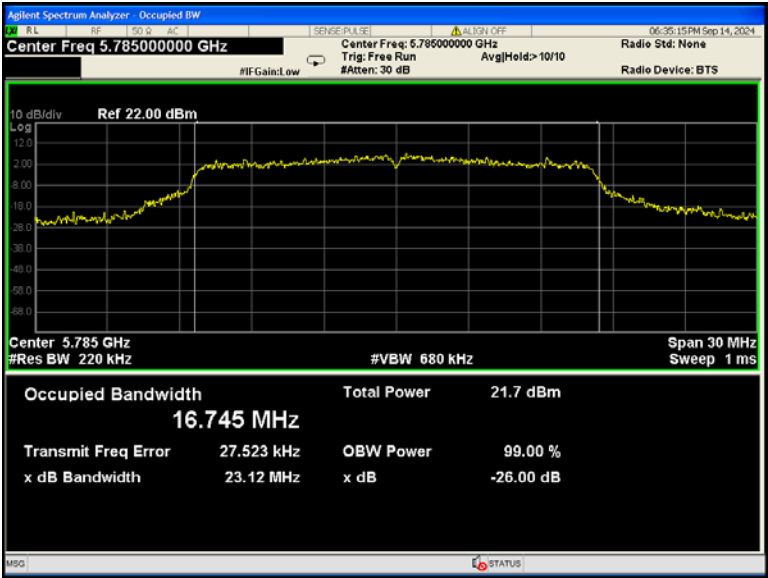
802.11ac(HT80) U-NII-1 Middle channel



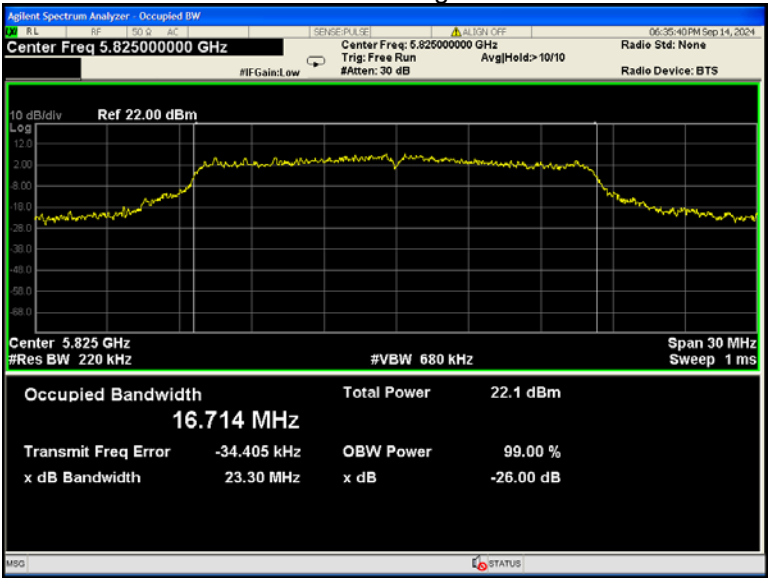
802.11a U-NII-3 Low channel



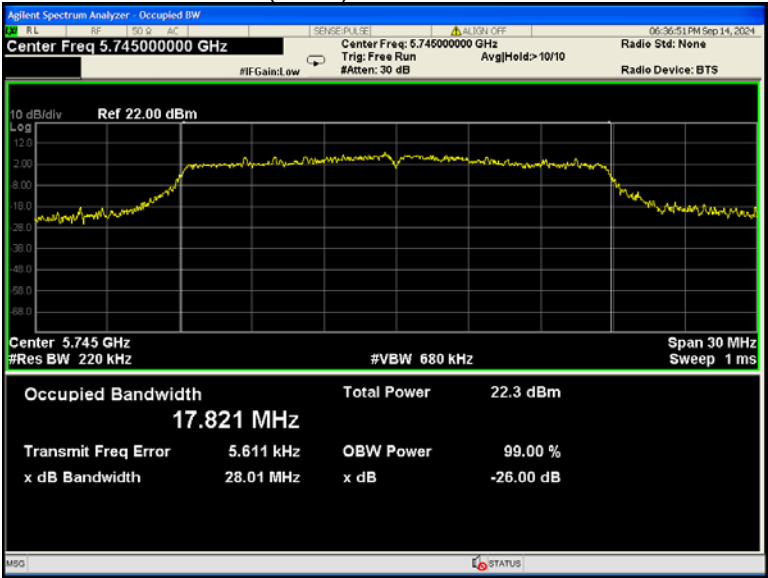
802.11a U-NII-3 Middle channel



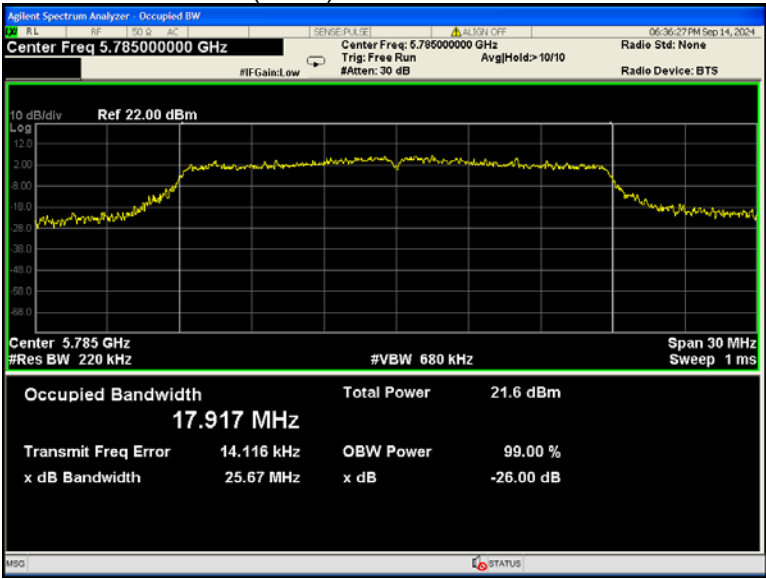
802.11a U-NII-3 High channel



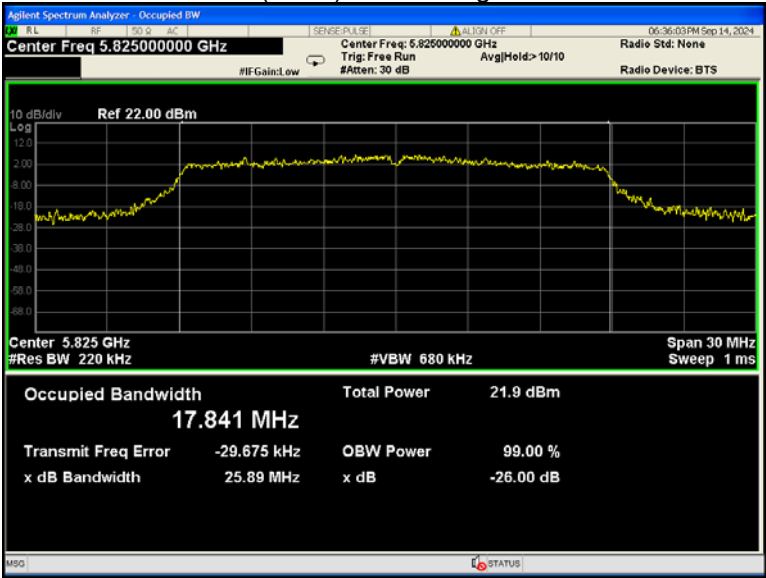
802.11n(HT20) U-NII-3 Low channel



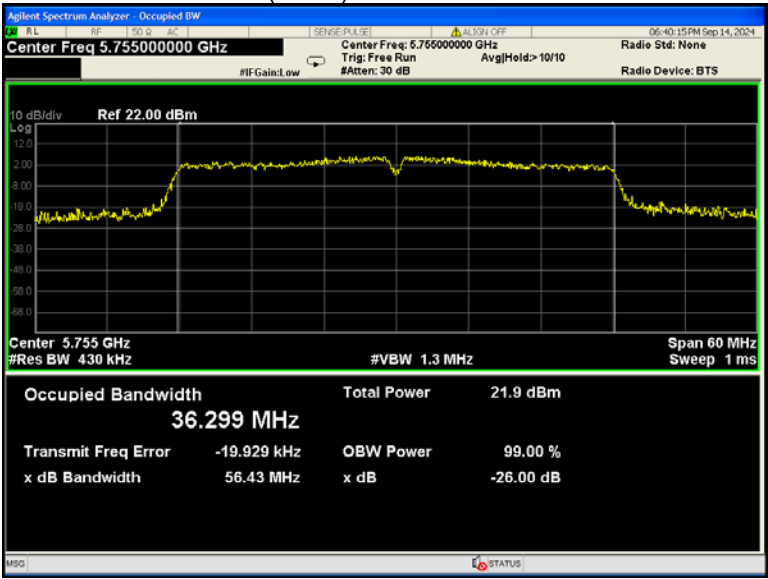
802.11n(HT20) U-NII-3 Middle channel



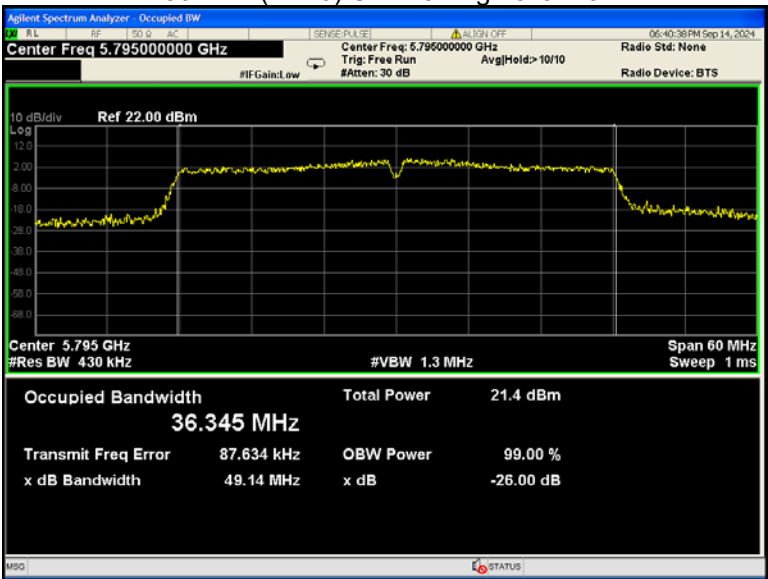
802.11n(HT20) U-NII-3 High channel



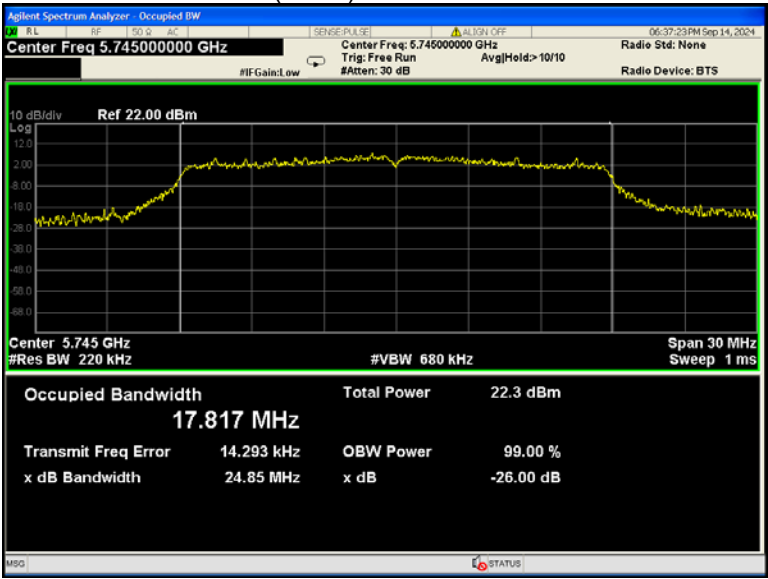
802.11n(HT40) U-NII-3 Low channel



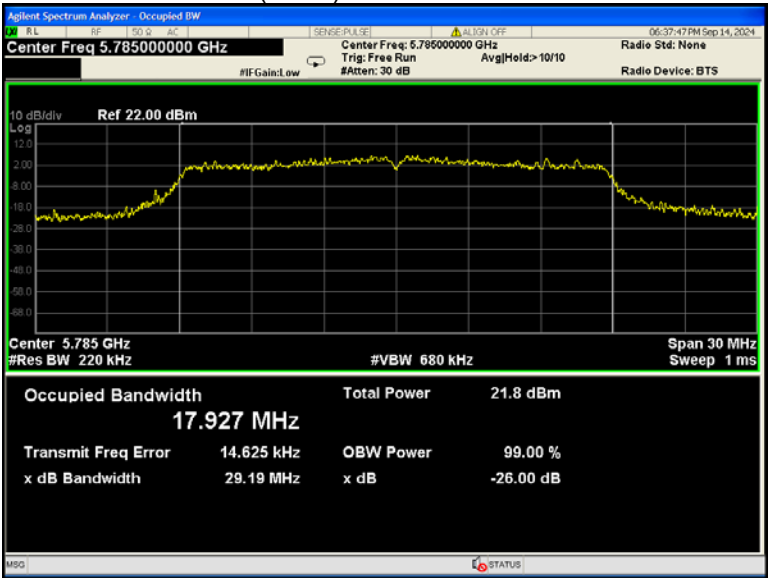
802.11n(HT40) U-NII-3 High channel



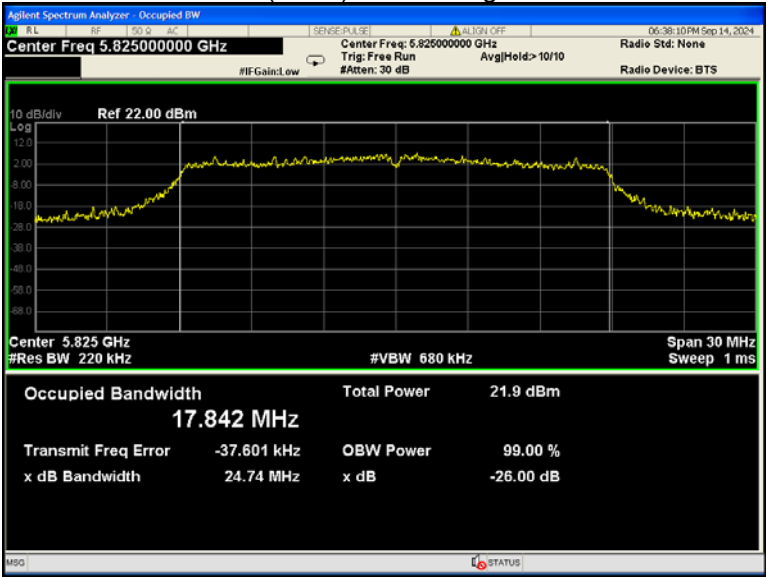
802.11ac(HT20) U-NII-3 Low channel



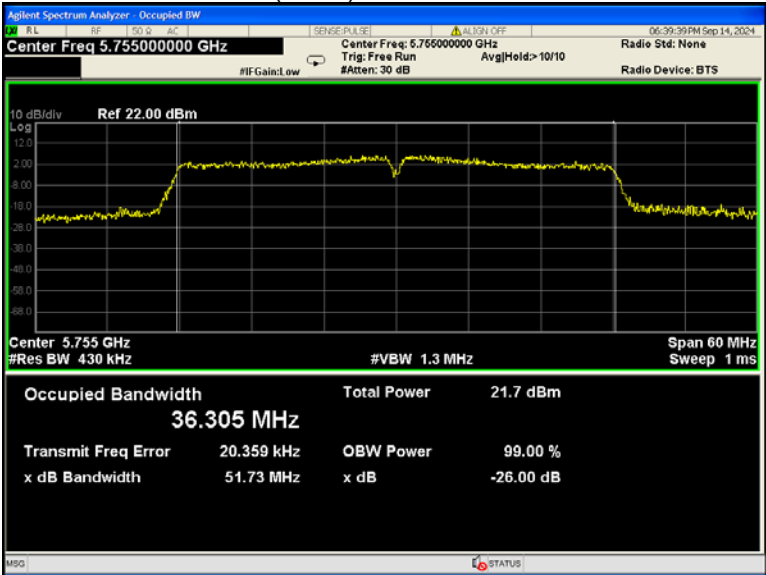
802.11ac(HT20) U-NII-3 Middle channel



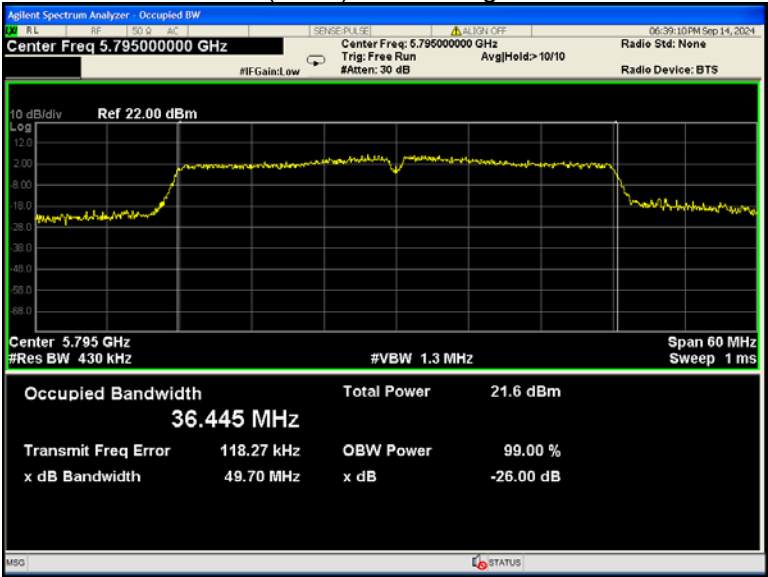
802.11ac(HT20) U-NII-3 High channel



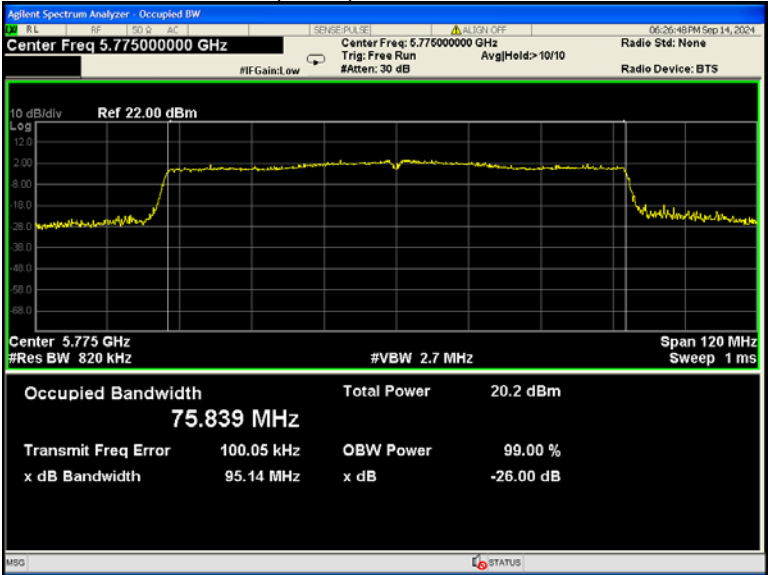
802.11ac(HT40) U-NII-3 Low channel



802.11ac(HT40) U-NII-3 High channel



802.11ac(HT80) U-NII-3 Low channel



13 Conducted Output Power

Test Requirement:	FCC 47CFR Part 15 Section 15.407(a)
Test Method:	KDB662911 D01 Multiple Transmitter Output v02r01 KDB789033 D02 General U-NII Test Procedures New Rules v02r01 Section E
Test Limit:	U-NII-1 250mW(24dBm) U-NII-2A 250mW(24dBm) U-NII-2C 250mW(24dBm) U-NII-3 1W(30dBm)
Test Result:	PASS
Remark:	Conducted output power= measurement power+10log(1/x) X is duty cycle=1, so 10log(1/1)=0 Conducted output power= measurement power

13.1 Test Procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 1 MHz. VBW = 3 MHz. Sweep = auto; Detector Function = Peak, Set the span to fully encompass the DTS bandwidth.
3. Keep the EUT in transmitting at lowest, medium and highest channel individually. Record the max value.

13.2 Test Result

Band	Operation mode	Channel	Measurements (dBm)	Duty Cycle Factor (dB)	Conducted Output Power (dBm)
U-NII-1	802.11a	Low	20.9	0.19	21.09
		Middle	21.44		21.63
		High	20.88		21.07
	802.11n(HT20)	Low	20.97	0.18	21.15
		Middle	21.04		21.22
		High	20.86		21.04
	802.11n(HT40)	Low	20.7	0.29	20.99
		High	21		21.29
	802.11ac(HT20)	Low	20.79	0.20	20.99
		Middle	20.85		21.05
		High	20.91		21.11
	802.11ac(HT40)	Low	20.58	0.30	20.88
		High	20.86		21.16
	802.11ac(HT80)	Low	19.91	0.54	20.45

Band	Operation mode	Channel	Measurements (dBm)	Duty Cycle Factor (dB)	Conducted Output Power (dBm)
U-NII-3	802.11a	Low	21.59	0.14	21.73
		Middle	21.01		21.15
		High	21.29		21.43
	802.11n(HT20)	Low	21.33	0.18	21.51
		Middle	20.88		21.06
		High	21.39		21.57
	802.11n(HT40)	Low	21.20	0.28	21.48
		High	20.92		21.20
	802.11ac(HT20)	Low	21.36	1.09	22.45
		Middle	21.07		22.16
		High	21.05		22.14
	802.11ac(HT40)	Low	21.30	0.35	21.65
		High	20.97		21.32
	802.11ac(HT80)	Low	19.87	0.56	20.43

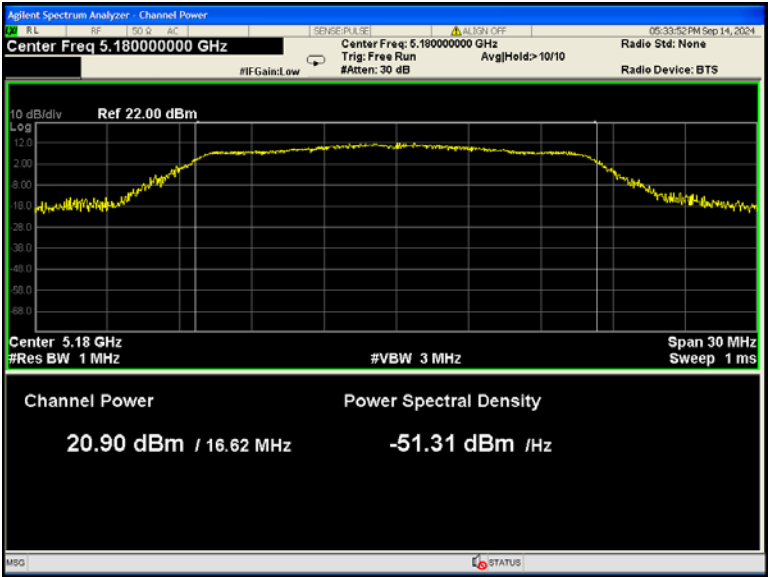
Note:

1. Conducted Output Power = Measurements + Duty Cycle Factor

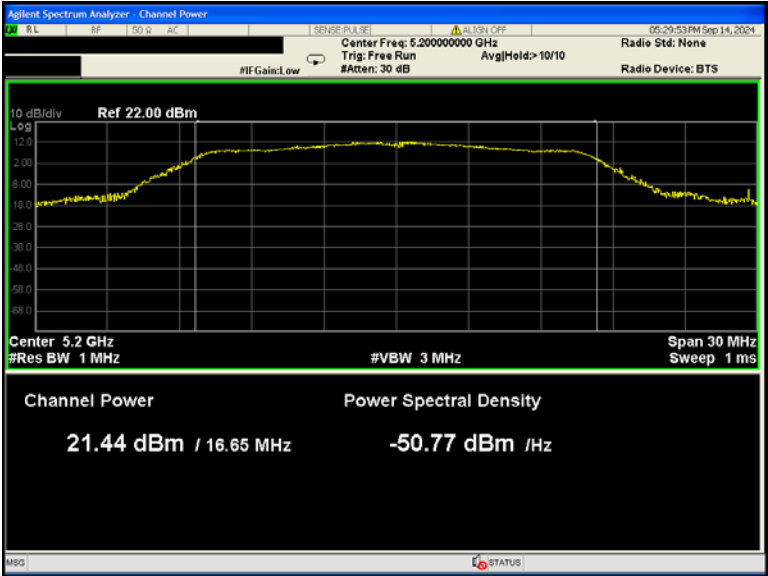
* All transmit signals are completely uncorrelated with each other, Directional gain = G_{ANT} which is less than 6dBi. So the limit does not be reduced.

Test result plots shown as follows:

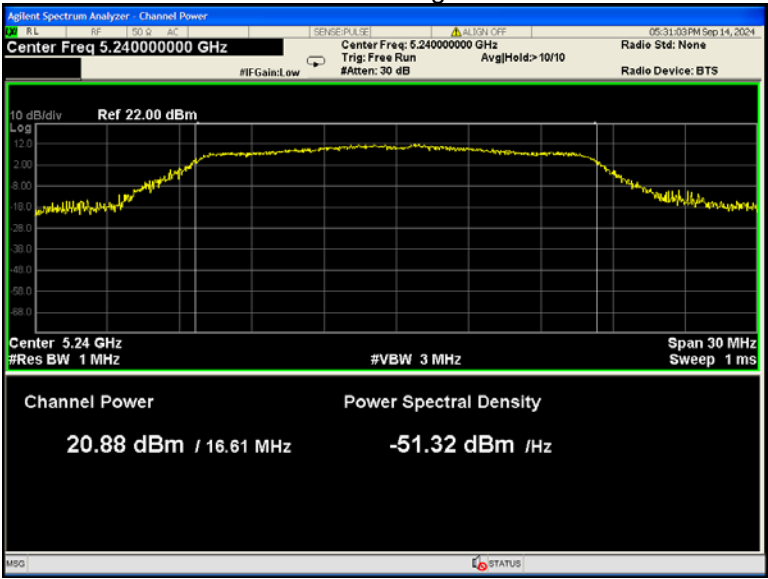
802.11a U-NII-1 Low channel



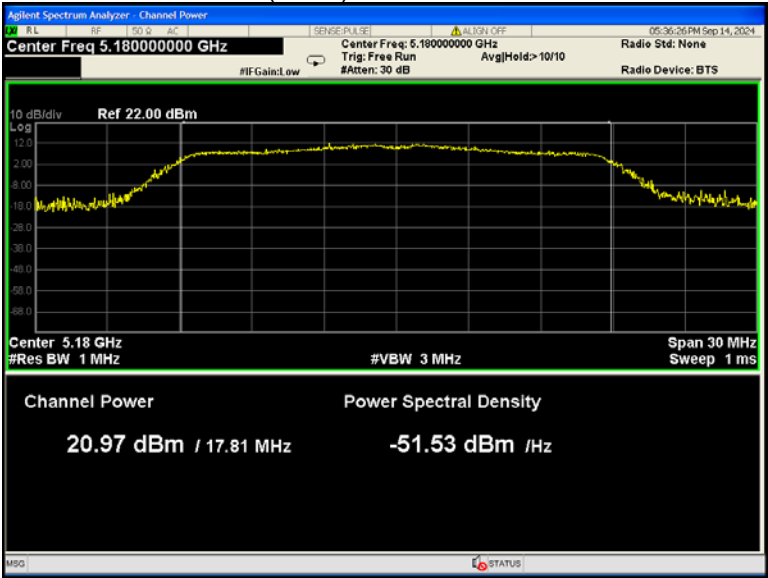
802.11a U-NII-1 Middle channel



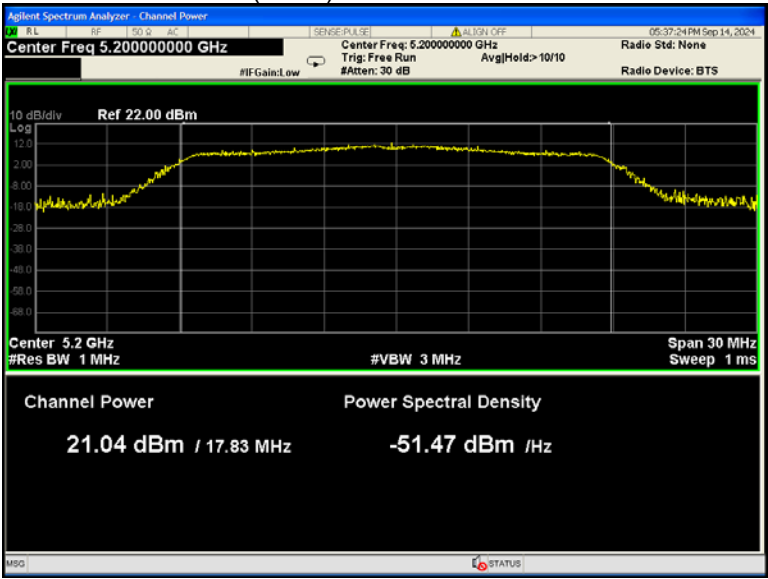
802.11a U-NII-1 High channel



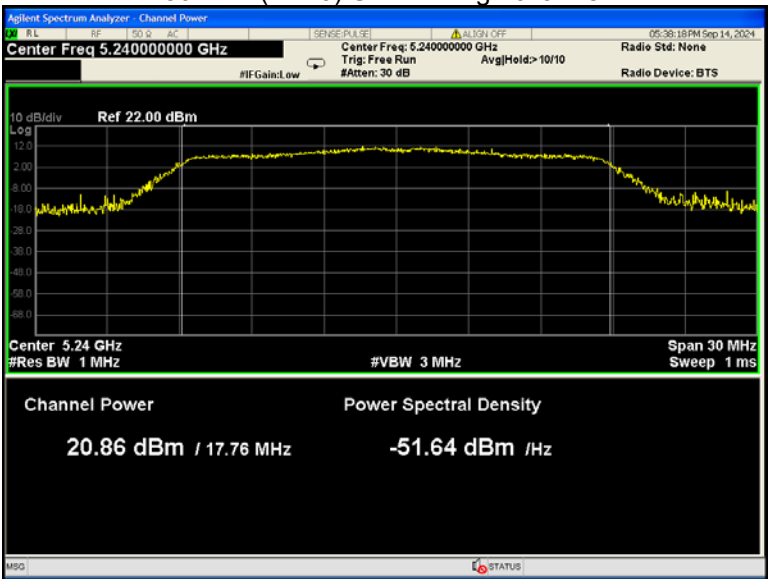
802.11n(HT20) U-NII-1 Low channel



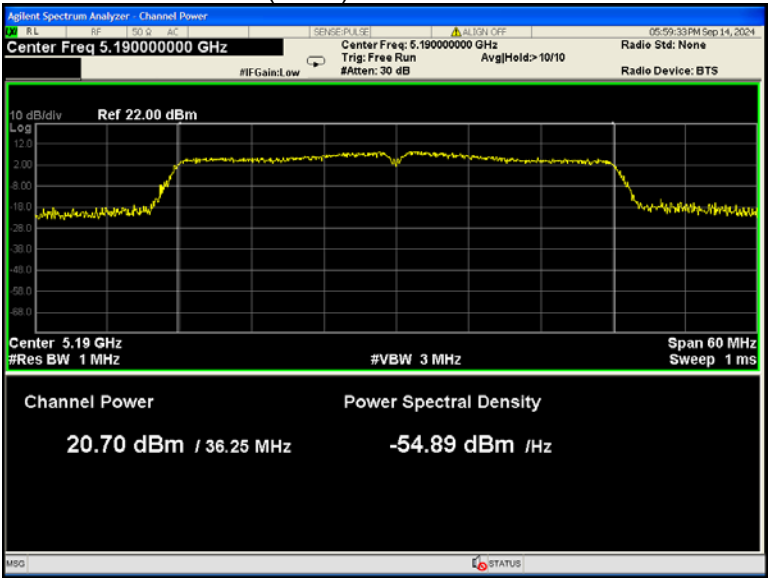
802.11n(HT20) U-NII-1 Middle channel



802.11n(HT20) U-NII-1 High channel



802.11n(HT40) U-NII-1 Low channel



802.11n(HT40) U-NII-1 High channel

