

TEST REPORT

Reference No. : WTD20S06032798W003 V2
FCC ID..... : 2AHYK-VZV12US
Applicant..... : SHENZHEN GIEC DIGITAL CO., LTD
Address : 1st&3rd Building, No.26 Puzai Road, Pingdi, Longgang District,
Shenzhen, China
Manufacturer : The same as above
Address : The same as above
Product Name : Android TV Box
Model No. : V12US
Brand : LVBX
Standards..... : FCC CFR47 Part 15 E Section 15.407: 2018
Date of Receipt sample..... : 2020-06-01
Date of Test..... : 2020-06-02 to 2020-06-18
Date of Issue : 2020-06-23
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
WTD20S06032 798W003	2020-06-01	2020-06-02 to 2020-06-18	2020-06-19	original	-	Replaced
WTD20S06032 798W003 V1	2020-06-01	2020-06-02 to 2020-06-18	2020-06-22	Version1	Updated	Replaced
WTD20S06032 798W003 V2	2020-06-01	2020-06-02 to 2020-06-18	2020-06-23	Version2	Updated	Valid

4 General Information

4.1 General Description of E.U.T.

Product:	Android TV Box
Model(s):	V12US
Model Description:	N/A
Wi-Fi Specification:	5G-802.11a/ n(HT20/40)/ac(HT20/40/80)
Hardware Version:	V1.0-3
Software Version:	V1.0.1.20200618
Highest frequency (Exclude Radio):	256MHz
Storage Location:	Internal Storage
Note:	N/A

4.2 Details of E.U.T.

Operation Frequency:	802.11a/ n(HT20/40)/ac(HT20/40/80): 5745MHz to 5825MHz
Max. RF output power:	U-NII-3: 18.43dBm
Type of Modulation:	OFDM
Antenna installation:	External Fixed antenna
Antenna Gain:	U-NII-3: 3.0dBi
Ratings:	Input: AC 100-240V~50/60Hz 0.4A Max Output: 5V~2000mA from adapter
Adapter:	Manufacturer: Shenzhen Keyu Power Supply Technology Co.,Ltd. Model No.: KA1201A-0502000US

4.3 Channel List

U-NII-3 (5.725-5.85GHz)	
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, Waltek Services (Shenzhen) Co.,Ltd.
<http://www.waltek.com.cn>

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)/ac(HT20):

channel	Frequency(MHz)
149	5745
157	5785
165	5825

For 802.11 n(HT40)/ac(HT40):

channel	Frequency(MHz)
151	5755
159	5795

For 802.11 ac(HT80):

channel	Frequency(MHz)
155	5775

4.4 Test Mode Description:

During testing, Channel and Power Controlling Software provided by the customer was used to control the operating channel as well as the 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.

Transmitting duty cycle is no less 98%.

The software is installed in operation system, named "RFTestTool.apk", Version 1, date 20160518.

Test Items	Mode	Data Rate	Channel	TX/RX
Radiated Emissions	802.11a	6 Mbps	U-NII-3 149/155/165	TX
	802.11n(HT20)	MCS0	U-NII-3 149/155/165	TX
	802.11n(HT40)	MCS0	U-NII-3 151/159	TX
	802.11ac(HT20)	MCS0	U-NII-3 149/155/165	TX
	802.11ac(HT40)	MCS0	U-NII-3 151/159	TX
	802.11ac(HT80)	MCS0	U-NII-3 155	TX
Duty Cycle	802.11a	6 Mbps	U-NII-3 149/155/165	TX
	802.11n(HT20)	MCS0	U-NII-3 149/155/165	TX
	802.11n(HT40)	MCS0	U-NII-3 151/159	TX
	802.11ac(HT20)	MCS0	U-NII-3 149/155/165	TX
	802.11ac(HT40)	MCS0	U-NII-3 151/159	TX
	802.11ac(HT80)	MCS0	U-NII-3 155	TX
Band Edge	802.11a	6 Mbps	U-NII-3 149/155/165	TX
	802.11n(HT20)	MCS0	U-NII-3 149/155/165	TX
	802.11n(HT40)	MCS0	U-NII-3 151/159	TX
	802.11ac(HT20)	MCS0	U-NII-3 149/155/165	TX
	802.11ac(HT40)	MCS0	U-NII-3 151/159	TX
	802.11ac(HT80)	MCS0	U-NII-3 155	TX
6dB Bandwidth	802.11a	6 Mbps	U-NII-3 149/155/165	TX
	802.11n(HT20)	MCS0	U-NII-3 149/155/165	TX
	802.11n(HT40)	MCS0	U-NII-3 151/159	TX
	802.11ac(HT20)	MCS0	U-NII-3 149/155/165	TX
	802.11ac(HT40)	MCS0	U-NII-3 151/159	TX
	802.11ac(HT80)	MCS0	U-NII-3 155	TX
26dB Bandwidth and 99% Occupied Bandwidth	802.11a	6 Mbps	U-NII-3 149/155/165	TX
	802.11n(HT20)	MCS0	U-NII-3 149/155/165	TX
	802.11n(HT40)	MCS0	U-NII-3 151/159	TX
	802.11ac(HT20)	MCS0	U-NII-3 149/155/165	TX
	802.11ac(HT40)	MCS0	U-NII-3 151/159	TX
	802.11ac(HT80)	MCS0	U-NII-3 155	TX

Conducted Output Power	802.11a	6 Mbps	U-NII-3 149/155/165	TX
	802.11n(HT20)	MCS0	U-NII-3 149/155/165	TX
	802.11n(HT40)	MCS0	U-NII-3 151/159	TX
	802.11ac(HT20)	MCS0	U-NII-3 149/155/165	TX
	802.11ac(HT40)	MCS0	U-NII-3 151/159	TX
	802.11ac(HT80)	MCS0	U-NII-3 155	TX
Power Spectral Density	802.11a	6 Mbps	U-NII-3 149/155/165	TX
	802.11n(HT20)	MCS0	U-NII-3 149/155/165	TX
	802.11n(HT40)	MCS0	U-NII-3 151/159	TX
	802.11ac(HT20)	MCS0	U-NII-3 149/155/165	TX
	802.11ac(HT40)	MCS0	U-NII-3 151/159	TX
	802.11ac(HT80)	MCS0	U-NII-3 155	TX
Frequency Stability	Un-modulation	/	U-NII-3 149/155/165	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 Services(Shenzhen) 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 Services(Shenzhen) 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

Conducted Emissions Test Site 1#						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1.	EMI Test Receiver	R&S	ESCI	100947	2019-09-17	2020-09-16
2.	LISN	R&S	ENV216	101215	2019-09-17	2020-09-16
3.	Cable	Top	TYPE16(3.5M)	-	2019-09-17	2020-09-16
Conducted Emissions Test Site 2#						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1.	EMI Test Receiver	R&S	ESCI	101155	2019-09-17	2020-09-16
2.	LISN	SCHWARZBECK	NSLK 8128	8128-289	2019-09-17	2020-09-16
3.	Limiter	York	MTS-IMP-136	261115-001-0024	2019-09-17	2020-09-16
4.	Cable	LARGE	RF300	-	2019-09-17	2020-09-16
3m Semi-anechoic Chamber for Radiation Emissions Test site 1#						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1	EMC Analyzer	Agilent	E7405A	MY45114943	2020-04-20	2021-04-19
2	Active Loop Antenna	Beijing Dazhi	ZN30900A	-	2020-04-20	2021-04-19
3	Trilog Broadband Antenna	SCHWARZBECK	VULB9163	336	2019-08-11	2020-08-10
4	Coaxial Cable (below 1GHz)	Top	TYPE16(13M)	-	2019-09-17	2020-09-16
5	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120 D	667	2020-04-19	2021-04-18
6	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9170	335	2020-04-20	2021-04-19
7	Broadband Preamplifier	COMPLIANCE DIRECTION	PAP-1G18	2004	2020-04-20	2021-04-19
8	Coaxial Cable (above 1GHz)	Top	1GHz-25GHz	EW02014-7	2020-04-20	2021-04-19
3m Semi-anechoic Chamber for Radiation Emissions Test site 2#						
Item	Equipment	Manufacturer	Model No.	Serial No	Last Calibration Date	Calibration Due Date
1	Test Receiver	R&S	ESCI	101296	2020-04-20	2021-04-19
2	Trilog Broadband Antenna	SCHWARZBECK	VULB9160	9160-3325	2020-04-25	2021-04-24
3	Amplifier	Compliance pirection systems inc	PAP-0203	22024	2020-04-20	2021-04-19
4	Cable	HUBER+SUHNER	CBL2	525178	2020-04-20	2021-04-19
RF Conducted Testing						

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1.	EMC Analyzer (9k~26.5GHz)	Agilent	E7405A	MY45114943	2019-09-17	2020-09-16
2.	Spectrum Analyzer (9k~6GHz)	R&S	FSL6	100959	2019-09-17	2020-09-16
3.	Signal Analyzer (9k~26.5GHz)	Agilent	N9010A	MY50520207	2019-09-17	2020-09-16

5.2 Description of Support Units

Equipment	Manufacturer	Model No.	Series No.
/	/	/	/

5.3 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)

5.4 Test Equipment Calibration

All the test equipments used are valid and calibrated by CEPREI Certification Body that address is No.110 Dongguan Zhuang RD. Guangzhou, P.R.China.

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	--
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 Conducted Emission

Test Requirement:	FCC CFR 47 Part 15 Section 15.207
Test Method:	ANSI C63.10:2013
Test Result:	PASS
Frequency Range:	150kHz to 30MHz
Class/Severity:	Class B
Limit:	66-56 dB μ V between 0.15MHz & 0.5MHz 56 dB μ V between 0.5MHz & 5MHz 60 dB μ V between 5MHz & 30MHz
Detector:	Peak for pre-scan (9kHz Resolution Bandwidth)

7.1 E.U.T. Operation

Operating Environment :

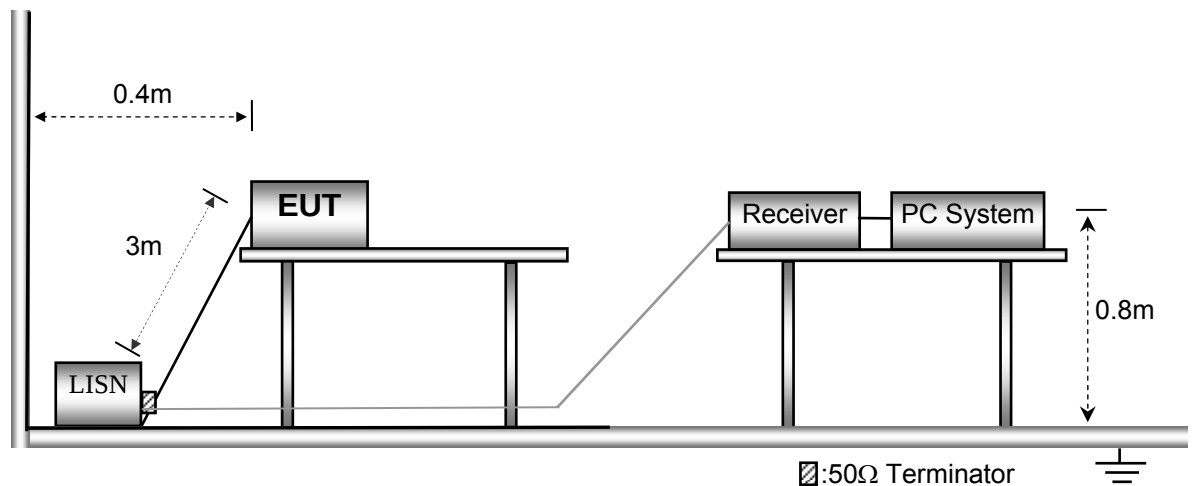
Temperature:	21.5 °C
Humidity:	51.9 % RH
Atmospheric Pressure:	101.2kPa

EUT Operation :

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

7.2 EUT Setup

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



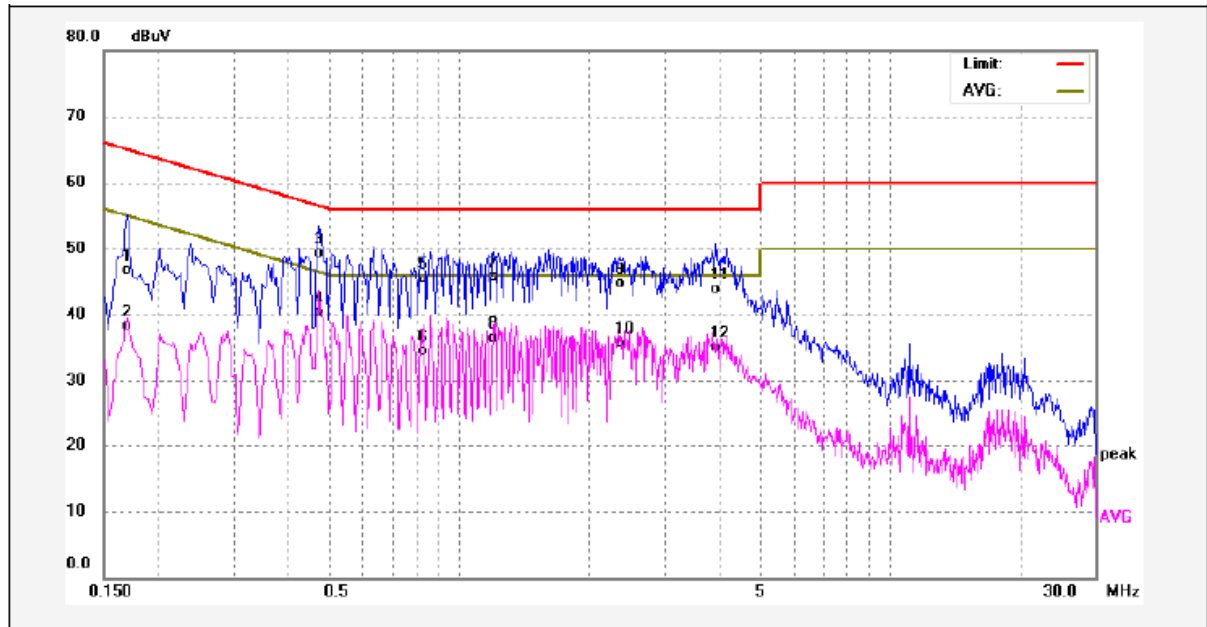
7.3 Measurement Description

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.

7.4 Conducted Emission Test Result

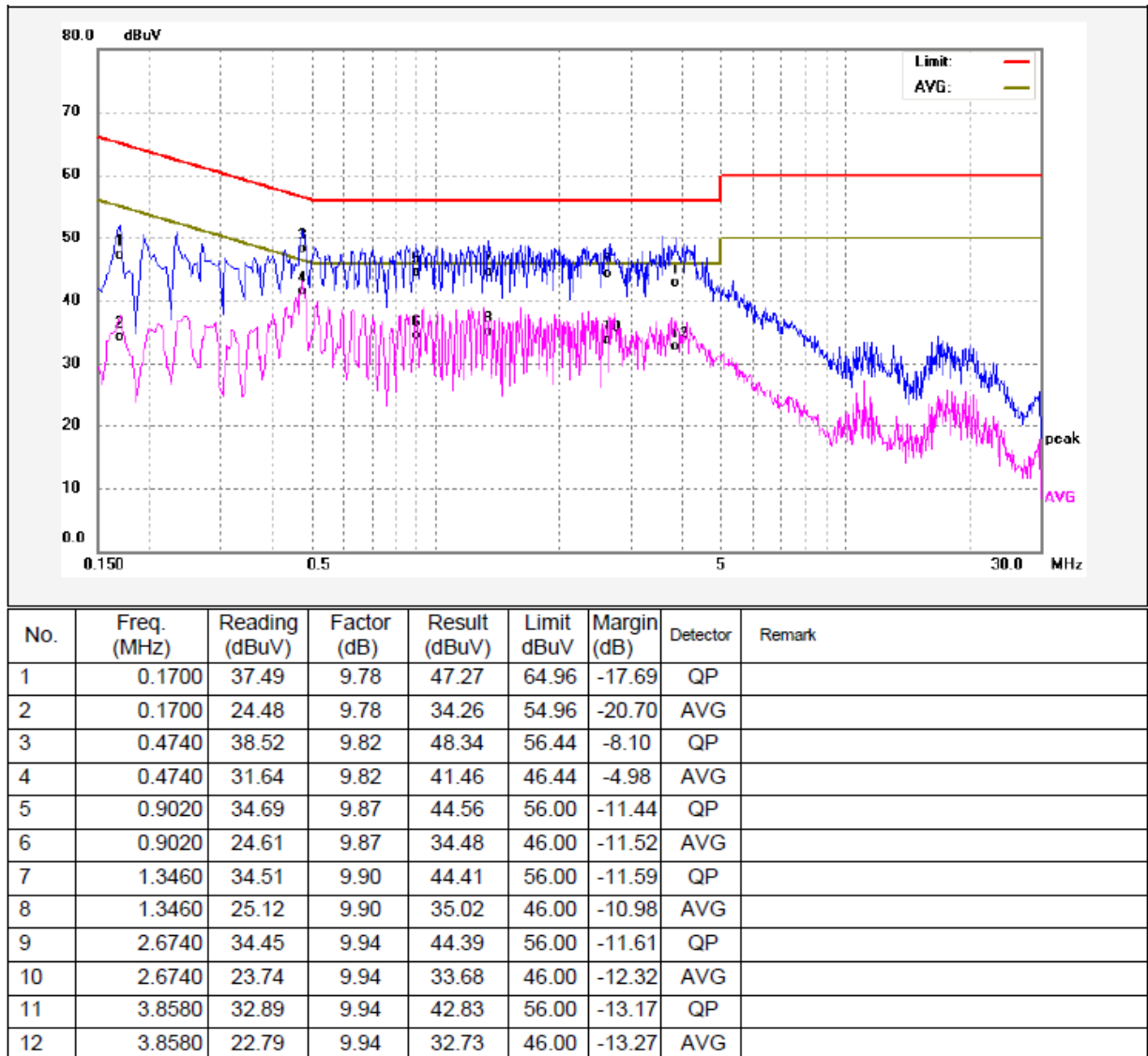
An initial pre-scan was performed on the live and neutral lines.

Live line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1700	36.93	9.78	46.71	64.96	-18.25	QP	
2	0.1700	28.44	9.78	38.22	54.96	-16.74	AVG	
3	0.4740	39.52	9.82	49.34	56.44	-7.10	QP	
4	0.4740	30.53	9.82	40.35	46.44	-6.09	AVG	
5	0.8300	35.67	9.86	45.53	56.00	-10.47	QP	
6	0.8300	24.57	9.86	34.43	46.00	-11.57	AVG	
7	1.2059	35.78	9.90	45.68	56.00	-10.32	QP	
8	1.2059	26.67	9.90	36.57	46.00	-9.43	AVG	
9	2.3780	34.69	9.95	44.64	56.00	-11.36	QP	
10	2.3780	25.72	9.95	35.67	46.00	-10.33	AVG	
11	3.9460	34.06	9.94	44.00	56.00	-12.00	QP	
12	3.9460	25.09	9.94	35.03	46.00	-10.97	AVG	

Neutral line:



8 Radiated Emissions

Test Requirement: FCC CFR47 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	$20\log^{(500)}$

8.1 EUT Operation

Operating Environment :

Temperature: 23.5 °C

Humidity: 52.1 % RH

Atmospheric Pressure: 101.2kPa

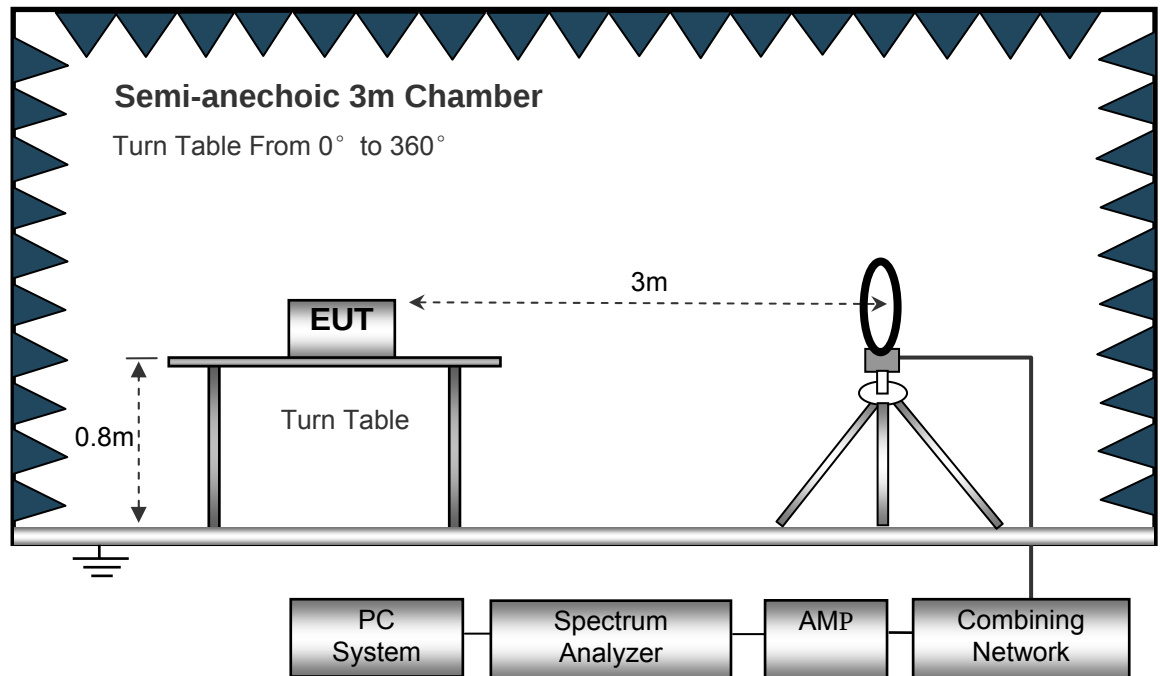
EUT Operation :

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

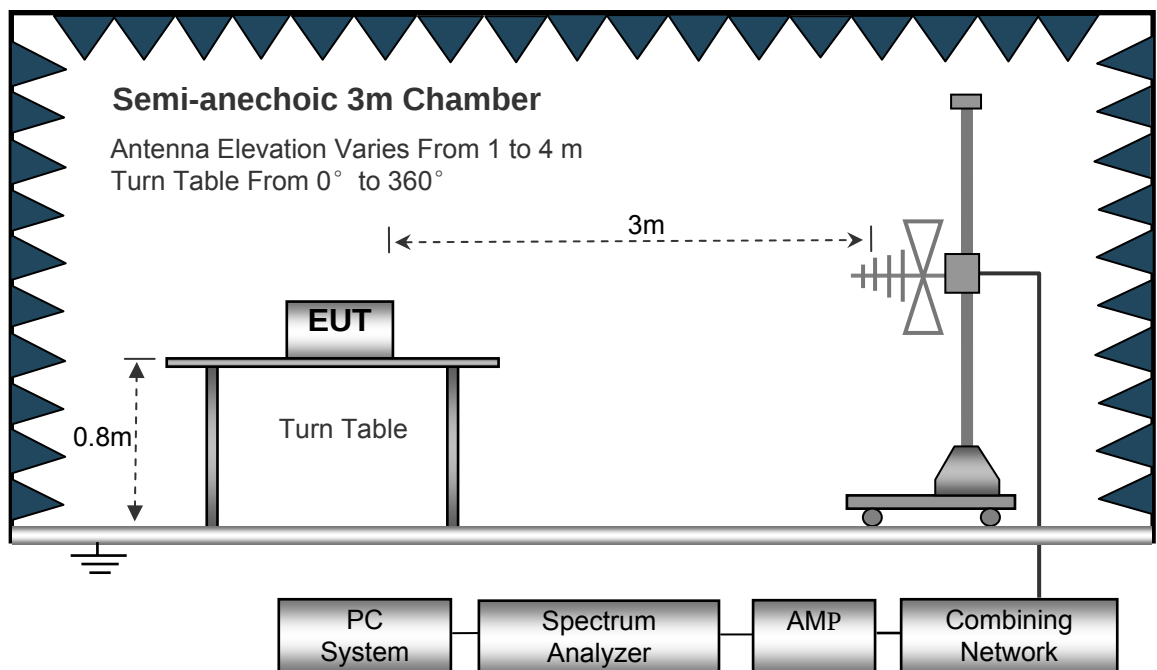
8.2 Test Setup

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

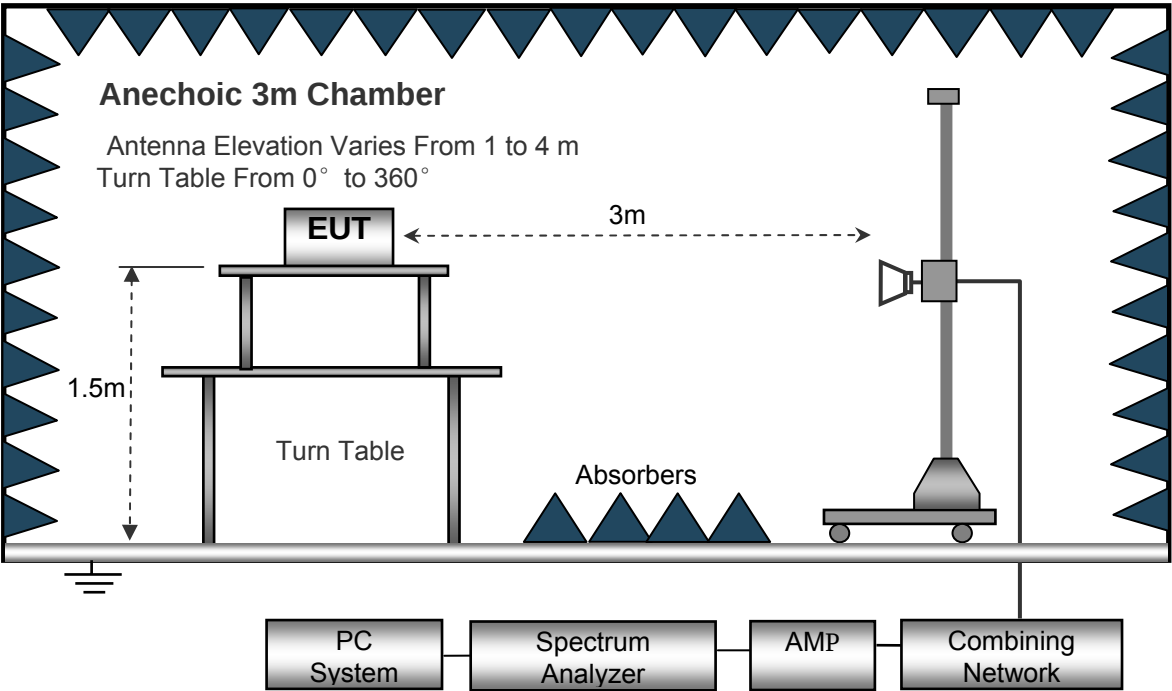
The test setup for emission measurement below 30MHz.



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



The test setup for emission measurement above 1 GHz.



8.3 Spectrum Analyzer Setup

Below 30MHz

Sweep Speed Auto
IF Bandwidth.....10kHz
Video Bandwidth.....10kHz
Resolution Bandwidth.....10kHz

30MHz ~ 1GHz

Sweep Speed Auto
DetectorPK
Resolution Bandwidth.....100kHz
Video Bandwidth.....300kHz

Above 1GHz

Sweep Speed Auto
DetectorPK
Resolution Bandwidth.....1MHz
Video Bandwidth.....3MHz
DetectorAve.
Resolution Bandwidth.....1MHz
Video Bandwidth.....10Hz

8.4 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.

8.5 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:

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

8.6 Summary of Test Results

Test Frequency: 9KHz~30MHz

Frequency	Measurement results dB μ V @3m	Detector PK/QP	Correct factor dB/m	Extrapolation factor dB	Measurement results (calculated) dB μ V/m @30m	Limits dB μ V/m @30m	Margin dB
(MHz)	Measurement results	Detector	Correct factor	Extrapolation factor	Measurement results (calculated)	Limits	Margin
802.11a U-NII-3 Low Channel 5745MHz							
6.021	25.34	QP	21.84	40.00	7.18	29.54	-22.36
15.730	25.36	QP	21.35	40.00	6.71	29.54	-22.83
25.680	25.18	QP	20.67	40.00	5.85	29.54	-23.69
802.11a U-NII-3 Middle Channel 5785MHz							
6.021	25.10	QP	21.84	40.00	6.94	29.54	-22.60
15.730	24.84	QP	21.35	40.00	6.19	29.54	-23.35
25.680	25.56	QP	20.67	40.00	6.23	29.54	-23.31
802.11a U-NII-3 High Channel 5825MHz							
6.021	25.08	QP	21.84	40.00	6.92	29.54	-22.62
15.730	24.96	QP	21.35	40.00	6.31	29.54	-23.23
25.680	25.30	QP	20.67	40.00	5.97	29.54	-23.57
802.11n20 U-NII-3 Low Channel 5745MHz							
6.021	25.30	QP	21.84	40.00	7.14	29.54	-22.40
15.730	25.12	QP	21.35	40.00	6.47	29.54	-23.07
25.680	25.34	QP	20.67	40.00	6.01	29.54	-23.53
802.11n20 U-NII-3 Middle Channel 5785MHz							
6.021	25.07	QP	21.84	40.00	6.91	29.54	-22.63
15.730	24.59	QP	21.35	40.00	5.94	29.54	-23.60
25.680	25.63	QP	20.67	40.00	6.30	29.54	-23.24
802.11n20 U-NII-3 High Channel 5825MHz							
6.021	25.33	QP	21.84	40.00	7.17	29.54	-22.37
15.730	24.69	QP	21.35	40.00	6.04	29.54	-23.50
25.680	25.18	QP	20.67	40.00	5.85	29.54	-23.69
802.11ac20 U-NII-3 Low Channel 5745MHz							
6.021	25.52	QP	21.84	40.00	7.36	29.54	-22.18

15.730	24.85	QP	21.35	40.00	6.20	29.54	-23.34
25.680	25.16	QP	20.67	40.00	5.83	29.54	-23.71
802.11ac20 U-NII-3 Middle Channel 5785MHz							
6.021	25.37	QP	21.84	40.00	7.21	29.54	-22.33
15.730	24.85	QP	21.35	40.00	6.20	29.54	-23.34
25.680	25.62	QP	20.67	40.00	6.29	29.54	-23.25
802.11ac20 U-NII-3 High Channel 5825MHz							
6.021	25.39	QP	21.84	40.00	7.23	29.54	-22.31
15.730	24.58	QP	21.35	40.00	5.93	29.54	-23.61
25.680	25.63	QP	20.67	40.00	6.30	29.54	-23.24
802.11n(HT40) U-NII-3 Low Channel 5755MHz							
6.021	25.63	QP	21.84	40.00	7.47	29.54	-22.07
15.730	24.87	QP	21.35	40.00	6.22	29.54	-23.32
25.680	24.96	QP	20.67	40.00	5.63	29.54	-23.91
802.11n(HT40) U-NII-3 High Channel 5795MHz							
6.021	25.11	QP	21.84	40.00	6.95	29.54	-22.59
15.730	24.65	QP	21.35	40.00	6.00	29.54	-23.54
25.680	25.06	QP	20.67	40.00	5.73	29.54	-23.81
802.11ac(HT40) U-NII-3 Low Channel 5755MHz							
6.021	25.61	QP	21.84	40.00	7.45	29.54	-22.09
15.730	25.20	QP	21.35	40.00	6.55	29.54	-22.99
25.680	24.97	QP	20.67	40.00	5.64	29.54	-23.90
802.11ac(HT40) U-NII-3 High Channel 5795MHz							
6.021	25.31	QP	21.84	40.00	7.15	29.54	-22.39
15.730	24.50	QP	21.35	40.00	5.85	29.54	-23.69
25.680	25.88	QP	20.67	40.00	6.55	29.54	-22.99
802.11ac(HT80) U-NII-3 Low Channel 5775MHz							
6.021	25.10	QP	21.84	40.00	6.94	29.54	-22.60
15.730	24.52	QP	21.35	40.00	5.87	29.54	-23.67
25.680	24.65	QP	20.67	40.00	5.32	29.54	-24.22

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-3 Low Channel 5745MHz									
223.45	39.46	QP	337	1.4	H	-11.62	27.84	46.00	-18.16
223.45	39.18	QP	11	1.6	V	-11.62	27.56	46.00	-18.44
4504.86	51.46	PK	56	1.2	H	-2.06	49.40	74.00	-24.60
4504.86	47.43	Ave	56	1.2	H	-2.06	45.37	54.00	-8.63
11490.00	41.03	PK	248	1.0	H	5.93	46.96	68.20	-21.24
11490.00	38.24	Ave	248	1.0	H	5.93	44.17	54.00	-9.83
5366.73	45.52	PK	240	1.5	H	-1.25	44.27	74.00	-29.73
5366.73	37.09	Ave	240	1.5	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)
802.11a U-NII-3 Middle channel 5785MHz									
223.45	37.86	QP	197	1.2	H	-11.62	26.24	46.00	-19.76
223.45	33.33	QP	359	1.1	V	-11.62	21.71	46.00	-24.29
4505.68	49.64	PK	301	1.1	H	-2.03	47.61	74.00	-26.39
4505.68	44.19	Ave	301	1.1	H	-2.03	42.16	54.00	-11.84
11570.00	42.39	PK	67	1.2	H	5.81	48.20	74.00	-25.80
11570.00	37.03	Ave	67	1.2	H	5.81	42.84	54.00	-11.16
5350.34	45.93	PK	234	1.9	H	-1.22	44.71	74.00	-29.29
5350.34	39.54	Ave	234	1.9	H	-1.22	38.32	54.00	-15.68
802.11a U-NII-3 High channel 5825MHz									
223.45	40.15	QP	131	1.8	H	-11.62	28.53	46.00	-17.47
223.45	38.28	QP	222	1.7	V	-11.62	26.66	46.00	-19.34
4524.50	53.44	PK	183	1.3	H	-1.84	51.60	74.00	-22.40
4524.50	47.88	Ave	183	1.3	H	-1.84	46.04	54.00	-7.96
11650.00	41.09	PK	354	1.2	H	5.84	46.93	68.20	-21.27
11650.00	35.96	Ave	354	1.2	H	5.84	41.80	54.00	-12.20
5367.34	45.49	PK	304	1.7	H	-1.30	44.19	74.00	-29.81
5367.34	38.38	Ave	304	1.7	H	-1.30	37.08	54.00	-16.92

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 Low Channel 5745MHz									
223.45	37.57	QP	245	1.1	H	-11.62	25.95	46.00	-20.05
223.45	53.09	QP	108	1.8	V	-11.62	41.47	46.00	-4.53
4529.18	45.58	PK	118	1.9	H	-2.06	43.52	74.00	-30.48
4529.18	46.96	Ave	118	1.9	H	-2.06	44.90	54.00	-9.10
11490.00	34.93	PK	345	1.7	H	5.93	40.86	68.20	-27.34
11490.00	46.87	Ave	345	1.7	H	5.93	52.80	54.00	-1.20
5381.03	45.89	PK	6	1.4	H	-1.25	44.64	74.00	-29.36
5381.03	39.13	Ave	6	1.4	H	-1.25	37.88	54.00	-16.12

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									
223.45	36.25	QP	309	1.5	H	-11.62	24.63	46.00	-21.37
223.45	53.63	QP	134	1.9	V	-11.62	42.01	46.00	-3.99
4504.68	47.05	PK	324	1.7	H	-2.03	45.02	74.00	-28.98
4504.68	48.42	Ave	324	1.7	H	-2.03	46.39	54.00	-7.61
11570.00	36.78	PK	206	1.8	H	5.81	42.59	68.20	-25.61
11570.00	45.56	Ave	206	1.8	H	5.81	51.37	54.00	-2.63
5377.16	46.08	PK	108	1.4	H	-1.22	44.86	74.00	-29.14
5377.16	37.47	Ave	108	1.4	H	-1.22	36.25	54.00	-17.75
802.11n(HT20) U-NII-3 High channel 5825MHz									
223.45	37.19	QP	266	1.2	H	-11.62	25.57	46.00	-20.43
223.45	32.94	QP	238	1.6	V	-11.62	21.32	46.00	-24.68
4505.36	45.70	PK	182	1.4	H	-1.97	43.73	74.00	-30.27
4505.36	43.93	Ave	182	1.4	H	-1.97	41.96	54.00	-12.04
11650.00	42.30	PK	89	1.9	H	5.84	48.14	74.00	-25.86
11650.00	35.48	Ave	89	1.9	H	5.84	41.32	54.00	-12.68
5352.16	46.88	PK	109	1.3	H	-1.12	45.76	74.00	-28.24
5352.16	39.77	Ave	109	1.3	H	-1.12	38.65	54.00	-15.35

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									
223.45	36.61	QP	268	1.7	H	-11.62	24.99	46.00	-21.01
223.45	46.74	QP	100	1.7	V	-11.62	35.12	46.00	-10.88
4500.26	41.05	PK	211	1.3	H	-1.96	39.09	74.00	-34.91
4500.26	31.30	Ave	211	1.3	H	-1.96	29.34	54.00	-24.66
11510.00	39.78	PK	25	1.8	H	5.88	45.66	68.20	-22.54
11510.00	35.29	Ave	25	1.8	H	5.88	41.17	54.00	-12.83
5371.26	46.74	PK	142	1.9	H	-1.01	45.73	74.00	-28.27
5371.26	39.78	Ave	142	1.9	H	-1.01	38.77	54.00	-15.23
802.11n(HT40) U-NII-3 High channel 5795MHz									
223.45	42.24	QP	250	1.4	H	-11.62	30.62	74.00	-43.38
223.45	35.00	QP	265	1.2	V	-11.62	23.38	74.00	-50.62
4538.78	37.27	PK	98	1.1	H	-1.92	35.35	74.00	-38.65
4538.78	33.15	Ave	98	1.1	H	-1.92	31.23	54.00	-22.77
11590.00	42.07	PK	182	1.5	H	5.63	47.70	74.00	-26.30
11590.00	35.50	Ave	182	1.5	H	5.63	41.13	54.00	-12.87
5379.25	46.45	PK	256	1.7	H	-1.04	45.41	74.00	-28.59
5379.25	39.44	Ave	256	1.7	H	-1.04	38.40	54.00	-15.60

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									
223.45	38.04	QP	335	1.0	H	-11.62	26.42	46.00	-19.58
223.45	46.68	QP	274	1.9	V	-11.62	35.06	46.00	-10.94
4515.46	45.05	PK	218	1.5	H	-1.92	43.13	74.00	-30.87
4515.46	33.83	Ave	218	1.5	H	-1.92	31.91	54.00	-22.09
11490.00	39.94	PK	357	1.1	H	5.93	45.87	68.20	-22.33
11490.00	34.36	Ave	357	1.1	H	5.93	40.29	54.00	-13.71
5351.38	46.84	PK	312	1.3	H	-1.03	45.81	74.00	-28.19
5351.38	37.97	Ave	312	1.3	H	-1.03	36.94	54.00	-17.06

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 Middle channel 5785MHz									
223.45	38.55	QP	175	1.5	H	-11.62	26.93	46.00	-19.07
223.45	46.91	QP	335	1.6	V	-11.62	35.29	46.00	-10.71
4516.70	45.95	PK	244	1.6	H	-1.97	43.98	74.00	-30.02
4516.70	34.25	Ave	244	1.6	H	-1.97	32.28	54.00	-21.72
11570.00	41.24	PK	165	1.5	H	5.81	47.05	68.20	-21.15
11570.00	37.00	Ave	165	1.5	H	5.81	42.81	54.00	-11.19
5375.36	46.31	PK	308	1.5	H	-1.05	45.26	74.00	-28.74
5375.36	37.20	Ave	308	1.5	H	-1.05	36.15	54.00	-17.85
802.11ac(HT20) U-NII-3 High channel 5825MHz									
223.45	37.83	QP	259	1.6	H	-11.62	26.21	46.00	-19.79
223.45	46.65	QP	52	1.8	V	-11.62	35.03	46.00	-10.97
4535.54	45.74	PK	276	1.7	H	-1.88	43.86	74.00	-30.14
4535.54	34.37	Ave	276	1.7	H	-1.88	32.49	54.00	-21.51
11650.00	40.11	PK	232	1.6	H	5.84	45.95	68.20	-22.25
11650.00	37.64	Ave	232	1.6	H	5.84	43.48	54.00	-10.52
5389.86	46.70	PK	305	1.5	H	-1.06	45.64	74.00	-28.36
5389.86	37.19	Ave	305	1.5	H	-1.06	36.13	54.00	-17.87

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									
223.45	37.46	QP	334	1.1	H	-11.62	25.84	46.00	-20.16
223.45	45.69	QP	71	1.1	V	-11.62	34.07	46.00	-11.93
4503.04	34.41	PK	116	1.2	H	-1.92	32.49	74.00	-41.51
4503.04	25.72	Ave	116	1.2	H	-1.92	23.80	54.00	-30.20
11510.00	38.56	PK	97	2.0	H	5.88	44.44	68.20	-23.76
11510.00	33.93	Ave	97	2.0	H	5.88	39.81	54.00	-14.19
5384.12	46.25	PK	170	1.2	H	-1.07	45.18	74.00	-28.82
5384.12	37.14	Ave	170	1.2	H	-1.07	36.07	54.00	-17.93
802.11ac(HT40) U-NII-3 High channel 5795MHz									
223.45	38.08	QP	18	1.4	H	-11.62	26.46	46.00	-19.54
223.45	46.37	QP	51	1.7	V	-11.62	34.75	46.00	-11.25
4512.66	34.71	PK	301	1.2	H	-1.86	32.85	74.00	-41.15
4512.66	25.67	Ave	301	1.2	H	-1.86	23.81	54.00	-30.19
11590.00	40.48	PK	95	1.2	H	5.63	46.11	68.20	-22.09
11590.00	36.73	Ave	95	1.2	H	5.63	42.36	54.00	-11.64
5388.07	45.63	PK	303	1.5	H	-1.03	44.60	74.00	-29.40
5388.07	39.57	Ave	303	1.5	H	-1.03	38.54	54.00	-15.46

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-3 Low Channel 5775MHz									
4512.66	35.84	QP	9	1.2	H	-11.62	24.22	46.00	-21.78
4512.07	25.42	QP	249	1.4	V	-11.62	13.80	46.00	-32.20
4505.46	42.26	PK	64	1.2	H	-1.85	40.41	74.00	-33.59
4505.46	41.50	Ave	64	1.2	H	-1.85	39.65	54.00	-14.35
11550.00	40.82	PK	323	1.4	H	4.83	45.65	68.20	-22.55
11550.00	37.78	Ave	323	1.4	H	4.83	42.61	54.00	-11.39
5355.35	46.84	PK	209	1.1	H	-1.14	45.70	74.00	-28.30
5355.35	37.70	Ave	209	1.1	H	-1.14	36.56	54.00	-17.44

Test Frequency: 18GHz~40GHz

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

9 Duty cycle

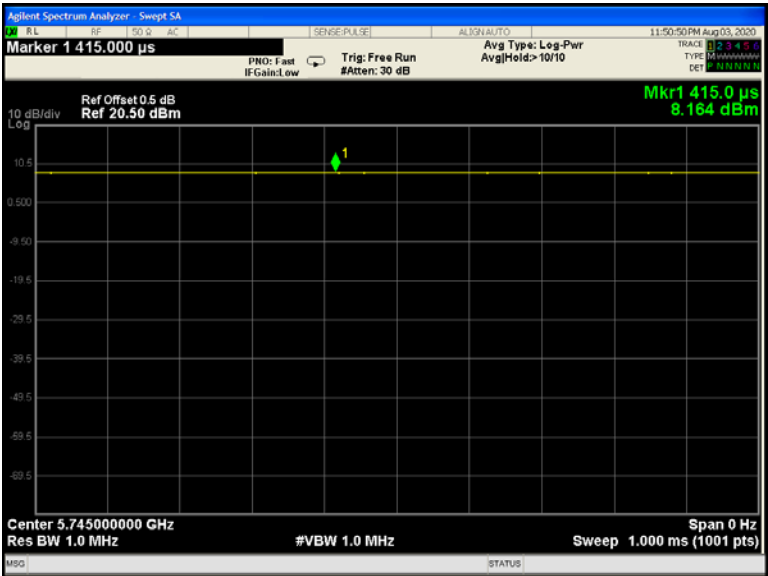
Test Requirement:	47 CFR Part 15C 15.407 KDB789033 D02 General U-NII Test Procedures New Rules v02r01, Section (B)
Test Method:	ANSI C63.10: 2013
Test Limit:	N/A
Test Result:	PASS
Remark:	Through Pre-scan, and found 802.11a at lowest channel is the worst case. Only the worst case is recorded in the report.

9.1 Summary of Test Results

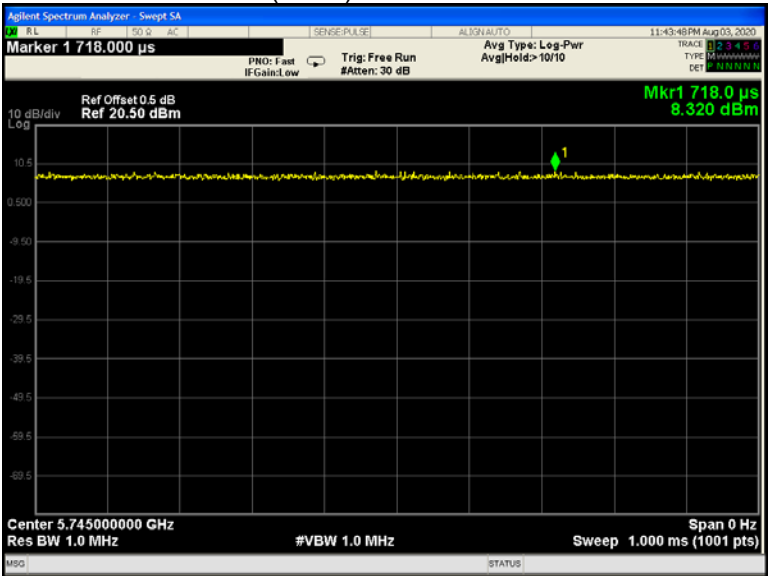
802.11a mode			
channel	On time(ms)	Period(ms)	Duty Cycle(%)
36	100	100	100
149	100	100	100
802.11n(HT20) mode			
channel	On time(ms)	Period(ms)	Duty Cycle(%)
36	100	100	100
149	100	100	100
802.11n(HT40) mode			
channel	On time(ms)	Period(ms)	Duty Cycle(%)
38	100	100	100
151	100	100	100
802.11ac(HT20) mode			
channel	On time(ms)	Period(ms)	Duty Cycle(%)
36	100	100	100
149	100	100	100
802.11ac(HT40) mode			
channel	On time(ms)	Period(ms)	Duty Cycle(%)
38	100	100	100
151	100	100	100
802.11ac(HT80) mode			
channel	On time(ms)	Period(ms)	Duty Cycle(%)
42	100	100	100
155	100	100	100

Test result plots shown as follows:

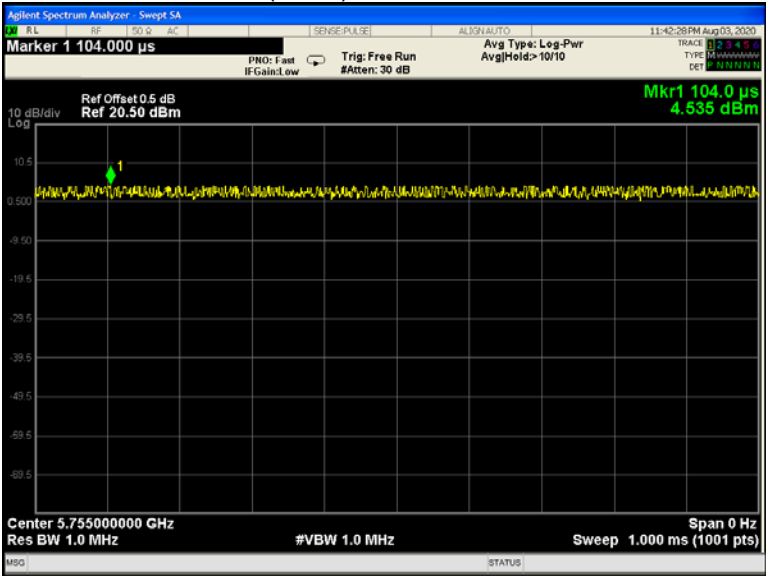
802.11a U-NII-3 Low channel



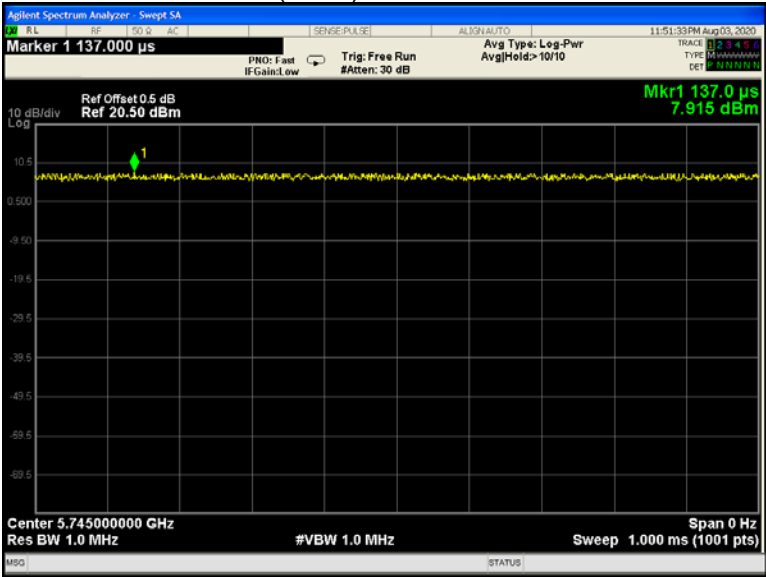
802.11n(HT20) U-NII-3 Low channel



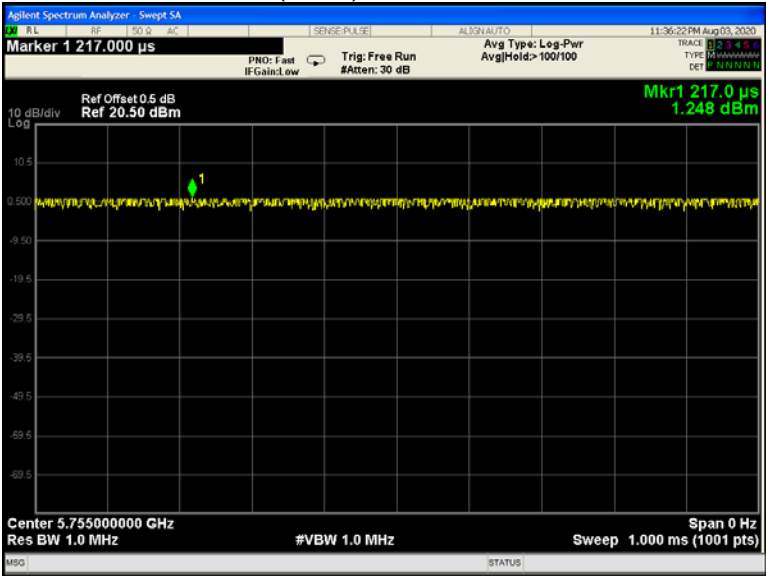
802.11n(HT40) U-NII-3 Low channel



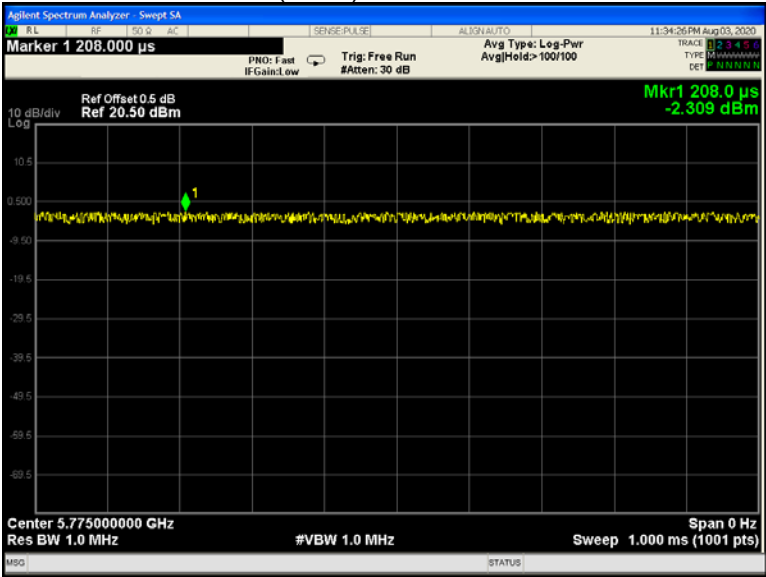
802.11ac(HT20) U-NII-3 Low channel



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



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



10 Band Edge

Test Requirement:	FCC CFR47 Part 15 Section 15.407
Test Method:	ANSI C63.10 2013
Test Limit:	(1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27dBm/MHz. (2) For transmitters operating in the 5.725-5.85 GHz band: All emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of -17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of -27 dBm/MHz.
Test Result:	PASS

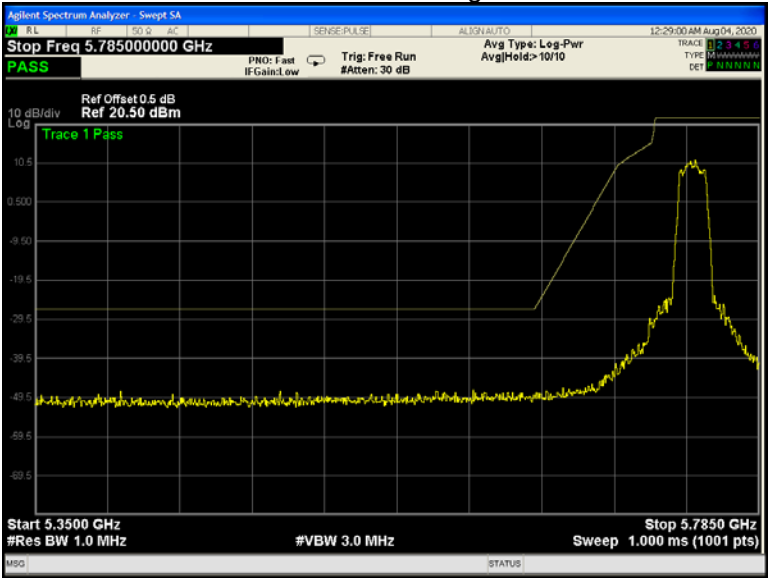
10.1 Test Produce

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.

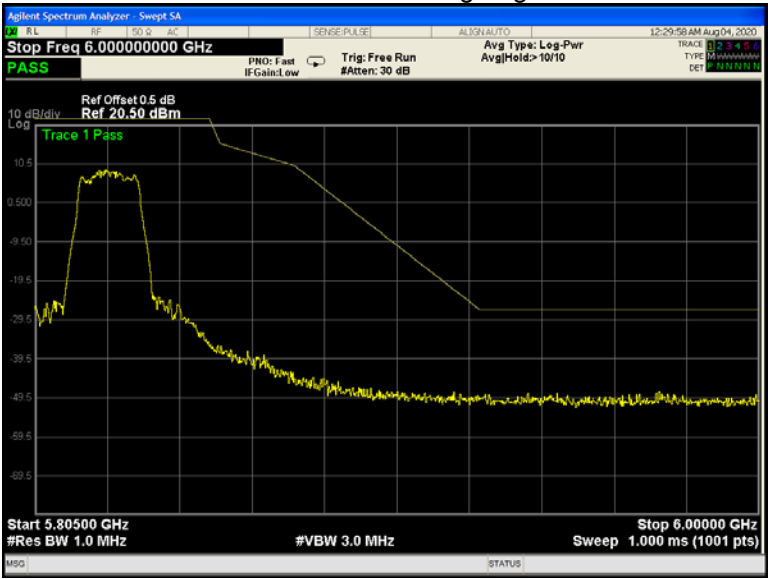
10.2 Test Result

Test result plots shown as follows:

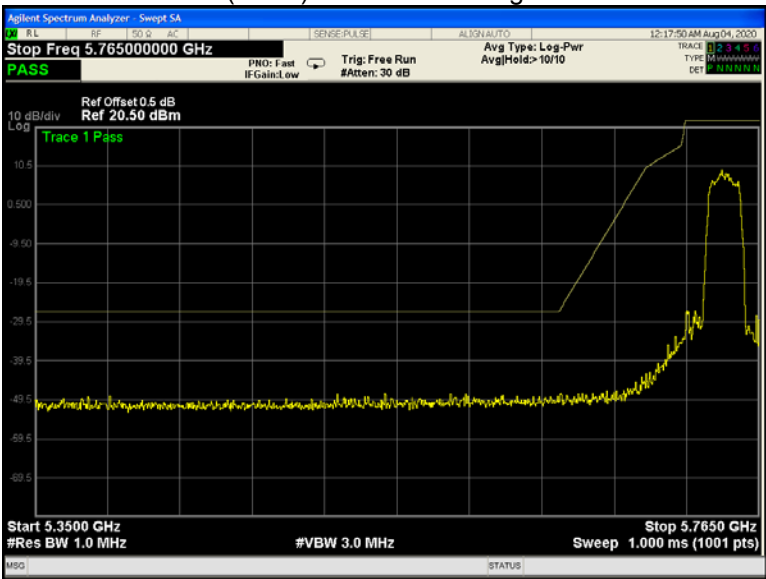
802.11a U-NII-3 Band edge-left side



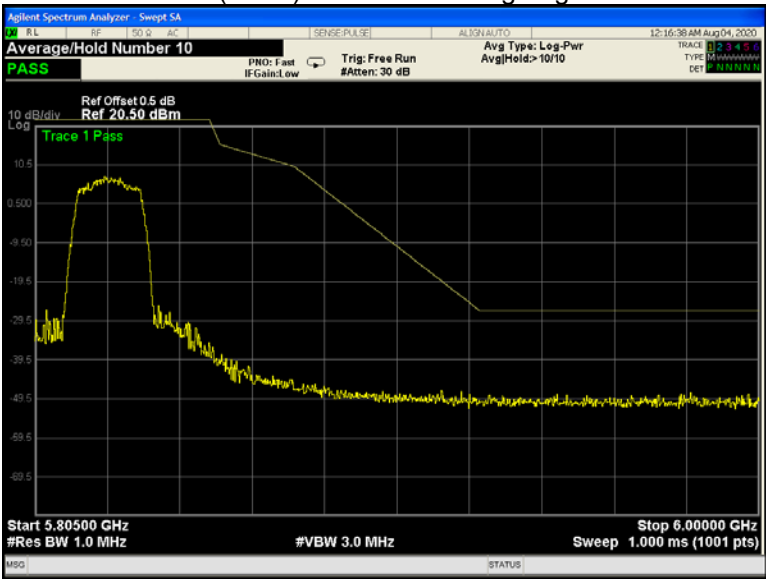
802.11a U-NII-3 Band edge-right side



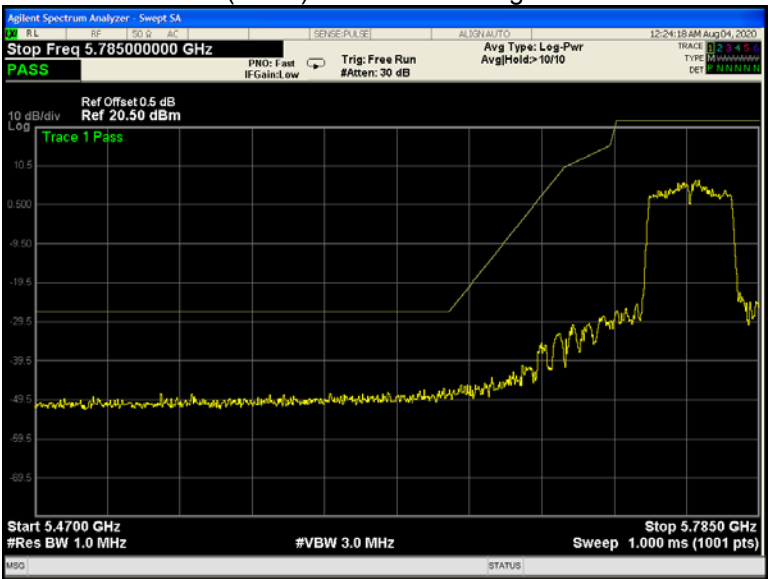
802.11n(HT20) U-NII-3 Band edge-left side



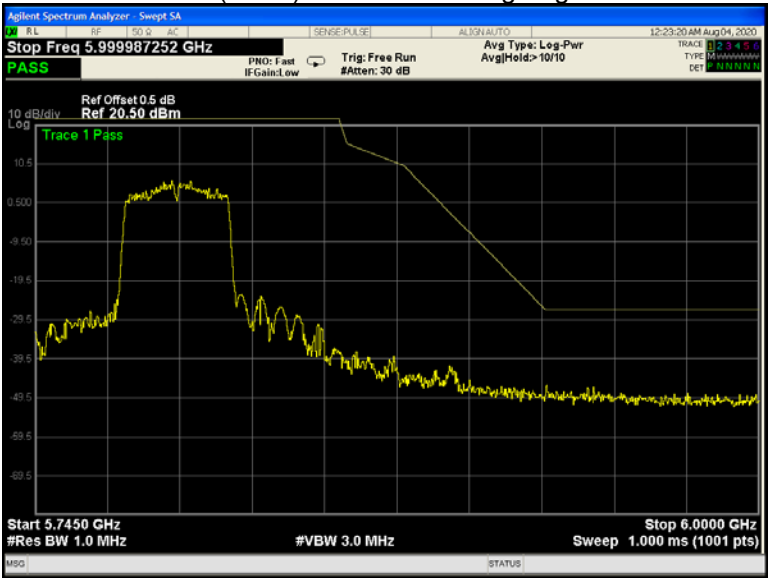
802.11n(HT20) U-NII-3 Band edge-right side



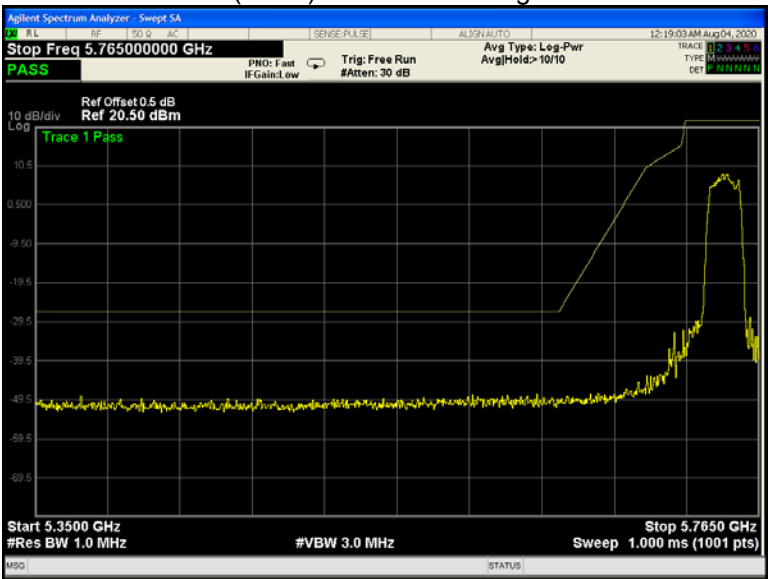
802.11n(HT40) U-NII-3 Band edge-left side



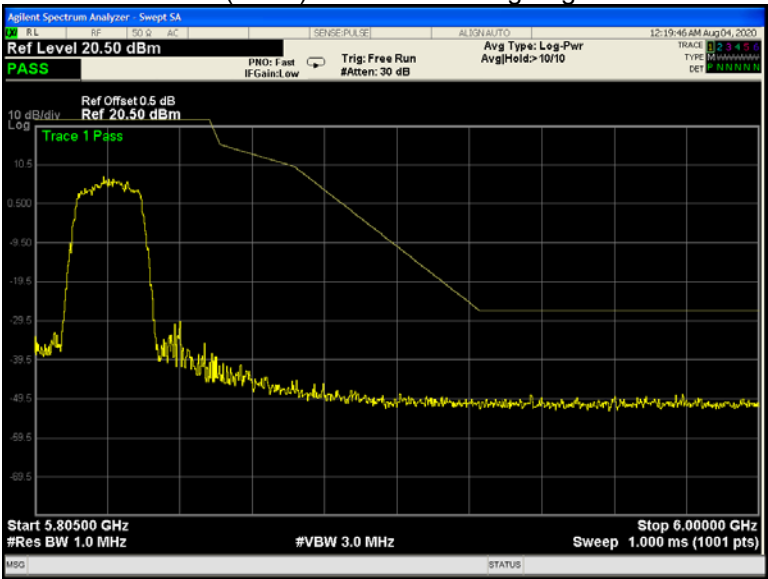
802.11n(HT40) U-NII-3 Band edge-right side



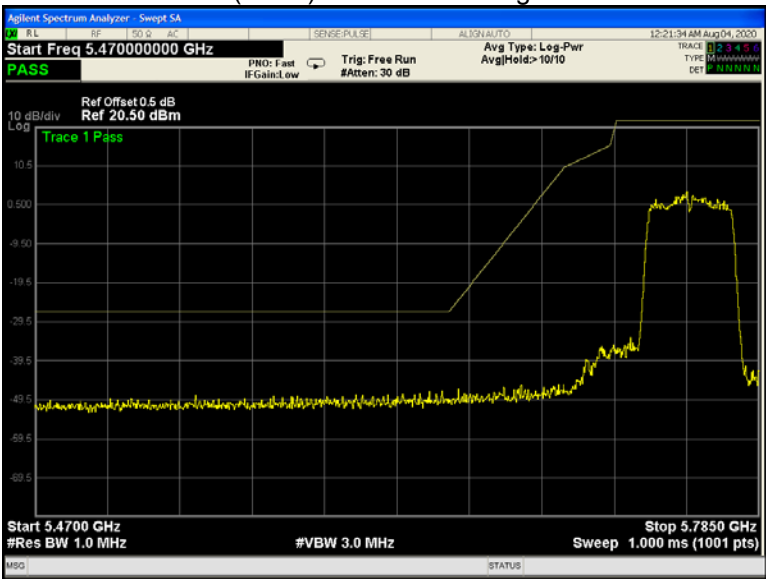
802.11ac(HT20) U-NII-3 Band edge-left side



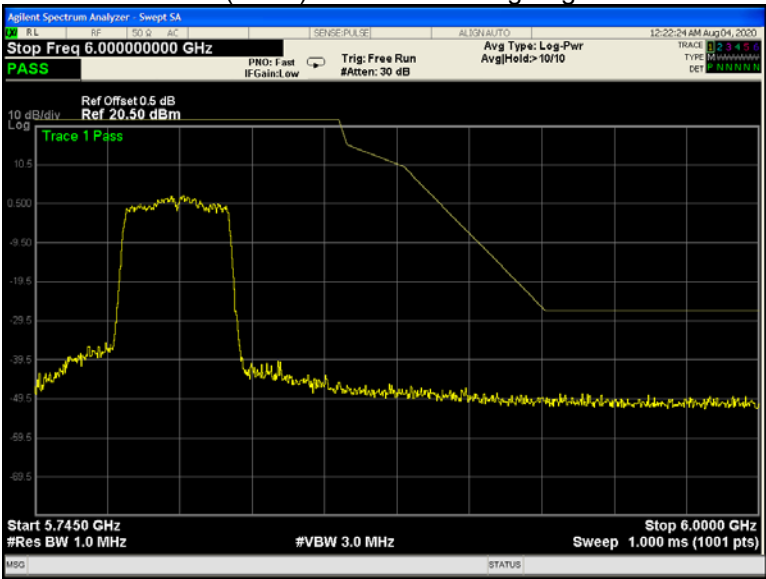
802.11ac(HT20) U-NII-3 Band edge-right side



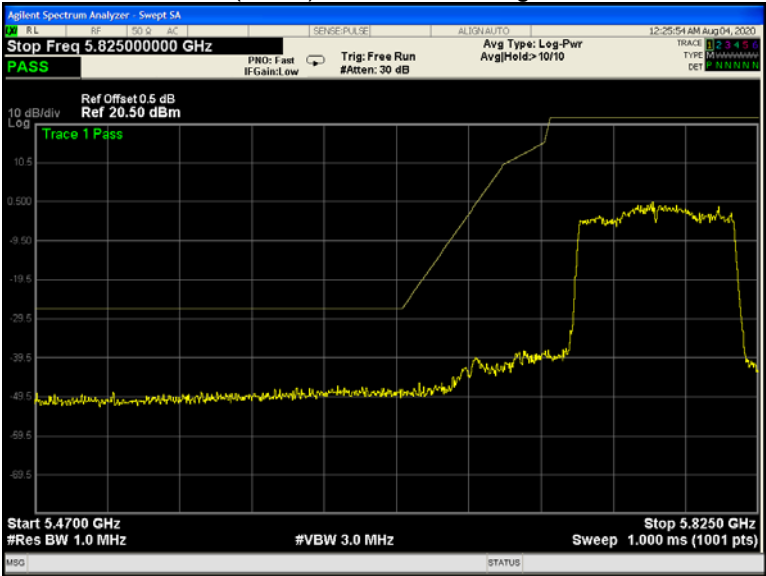
802.11ac(HT40) U-NII-3 Band edge-left side



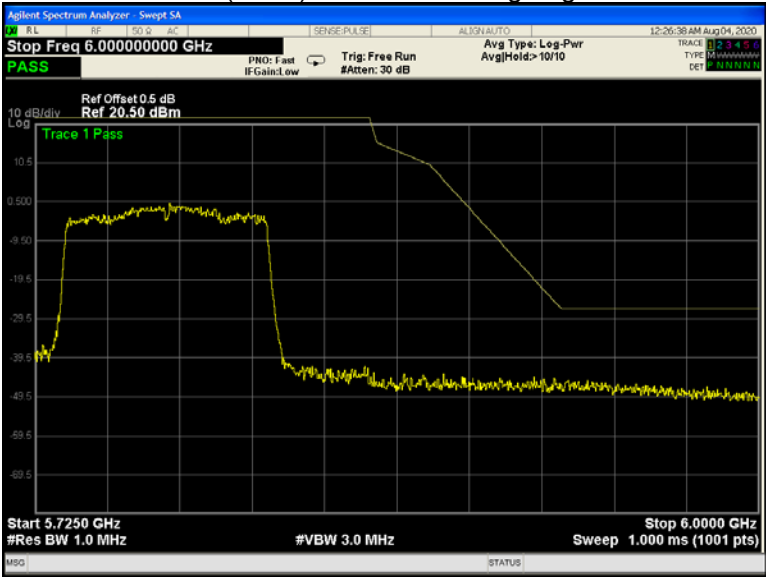
802.11ac(HT40) U-NII-3 Band edge-right side



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 CFR47 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:

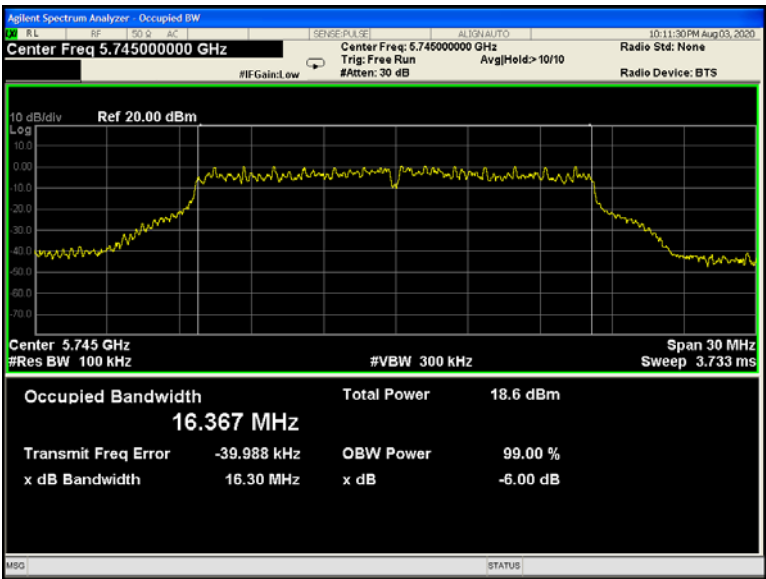
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: RBW = 100kHz, VBW = 300kHz

11.2 Test Result:

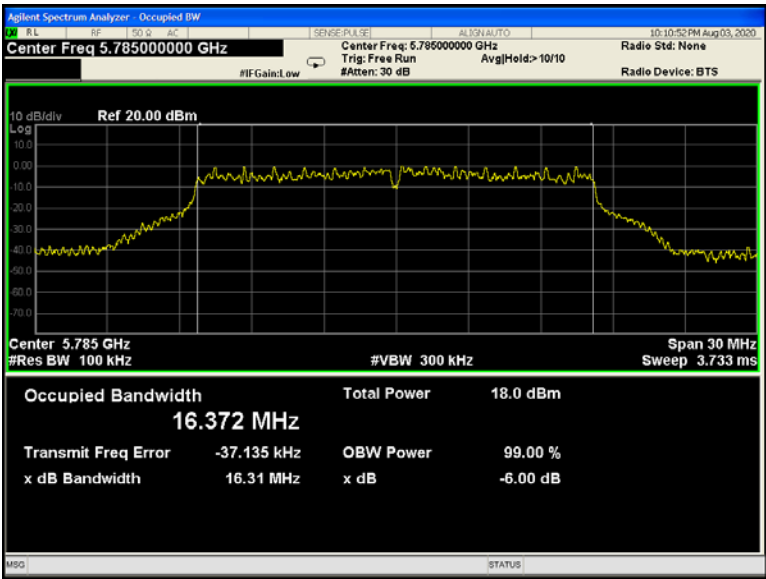
Band	Operation mode	6 dB Bandwidth (MHz)		
		Low	Middle	High
U-NII-3	802.11a	16.30	16.31	16.31
	802.11n(HT20)	17.64	17.69	17.66
	802.11n(HT40)	36.39	/	36.42
	802.11ac(HT20)	17.63	17.64	17.61
	802.11ac(HT40)	36.32	/	36.41
	802.11ac(HT80)	75.73	/	/

Test result plots shown as follows:

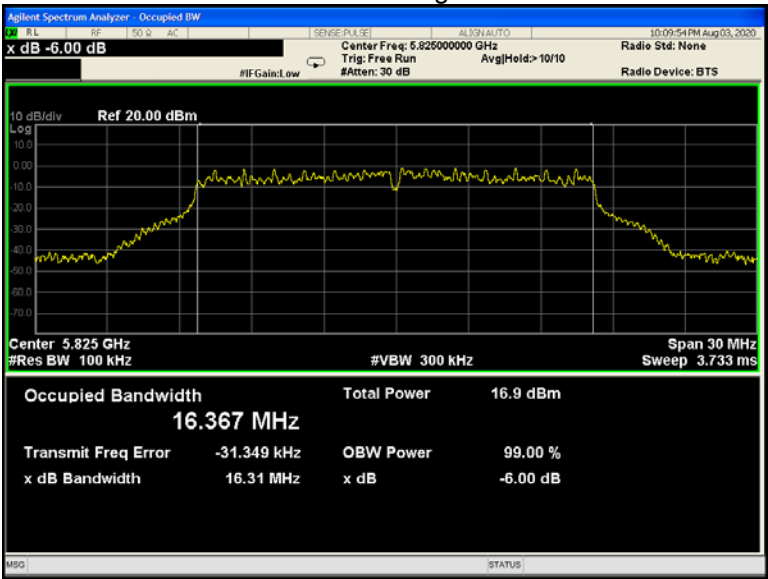
802.11a U-NII-3 Low channel



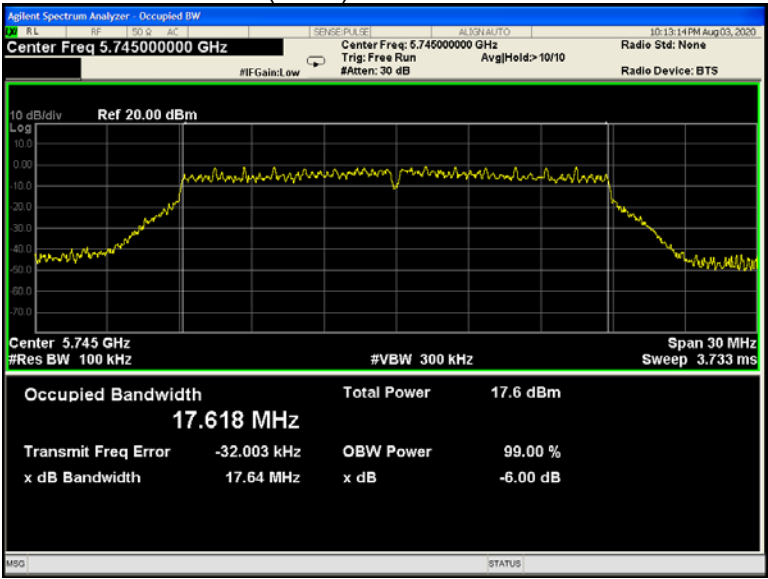
802.11a U-NII-3 Middle channel



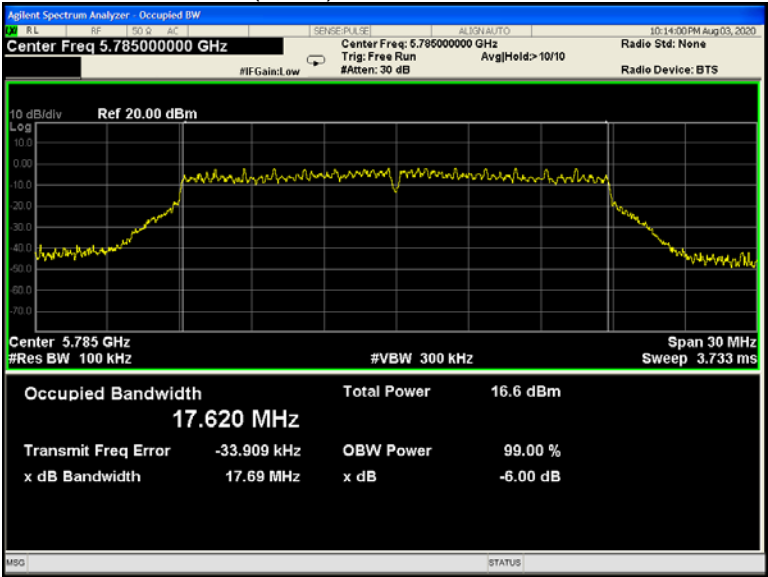
802.11a U-NII-3 High channel



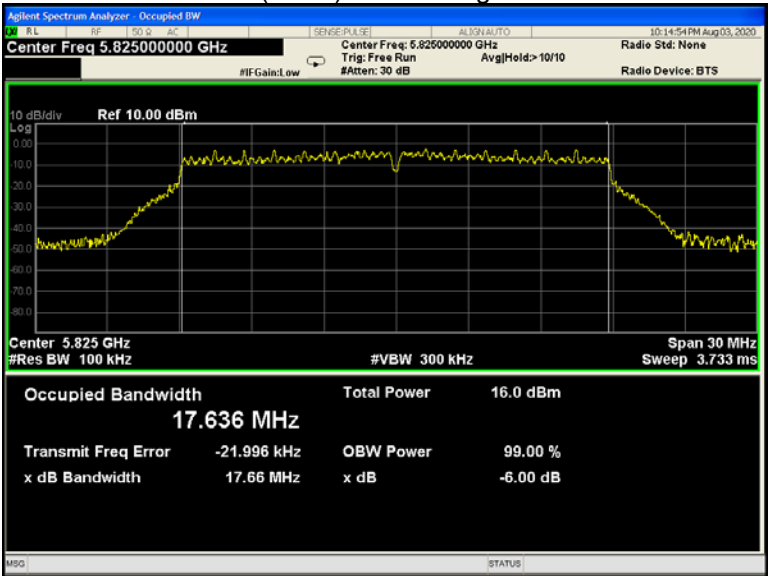
802.11n(HT20) U-NII-3 Low channel



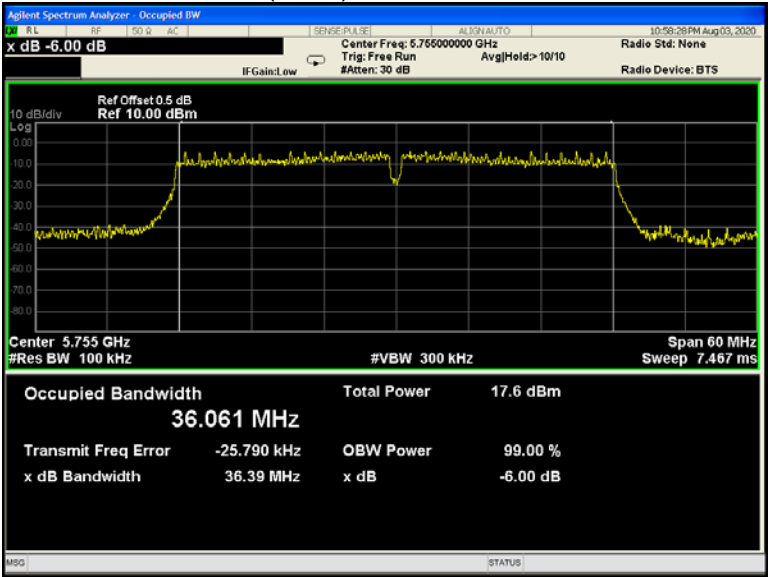
802.11n(HT20) U-NII-3 Middle channel



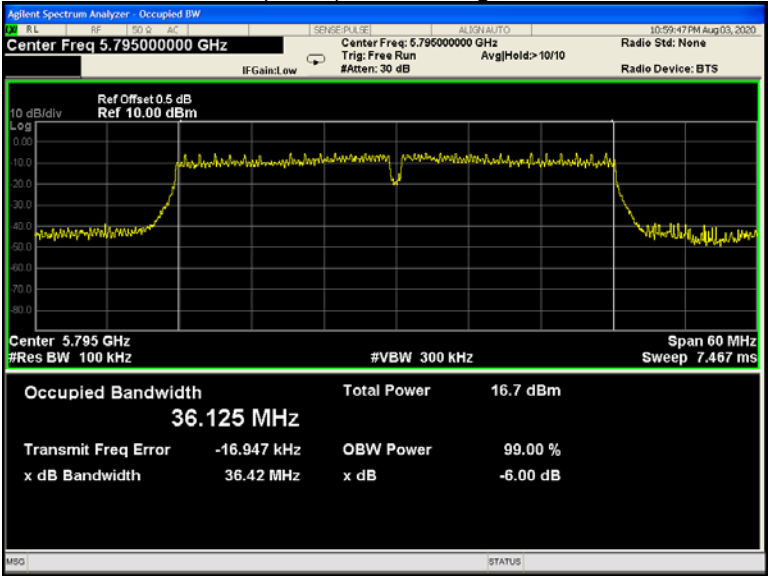
802.11n(HT20) U-NII-3 High channel



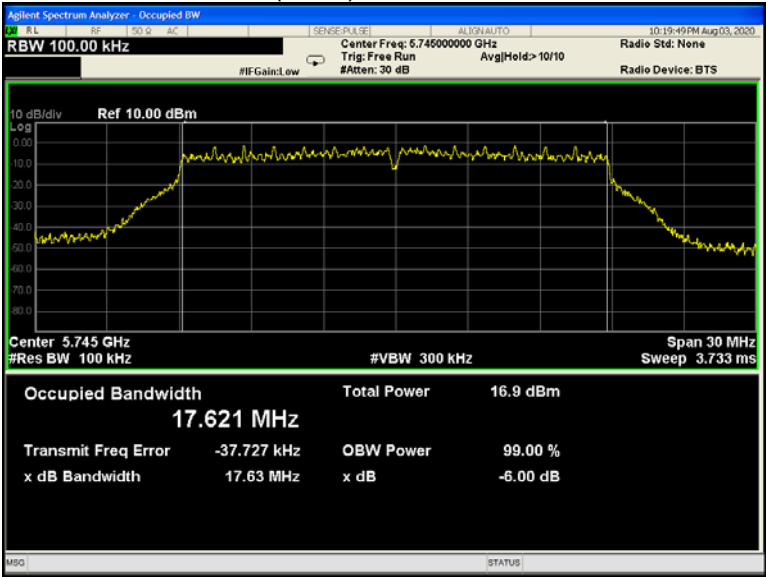
802.11n(HT40) U-NII-3 Low channel



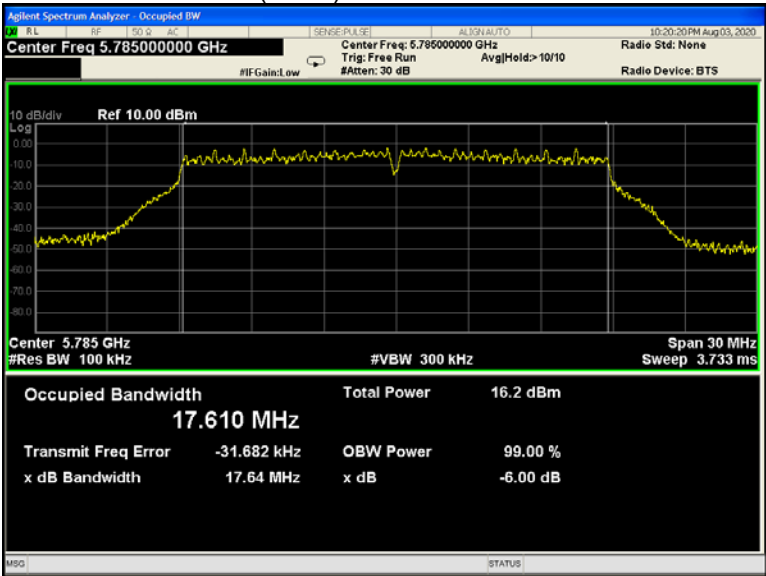
802.11n(HT40) U-NII-3 High channel



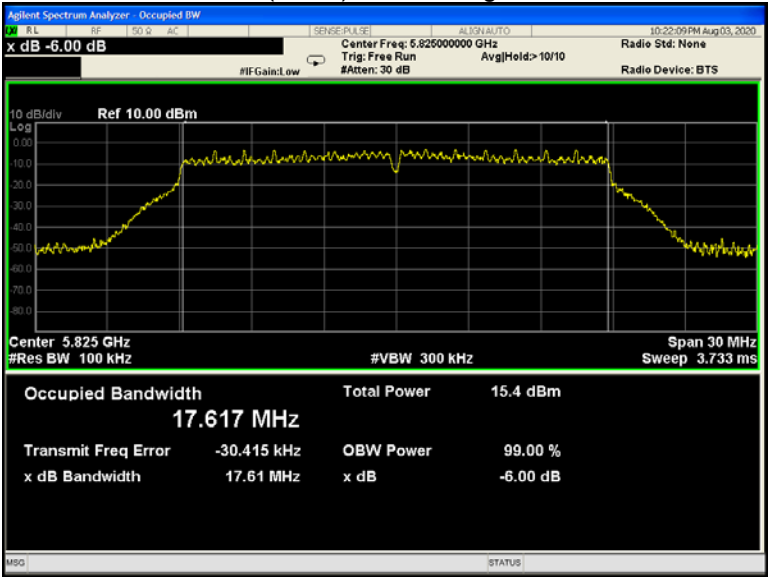
802.11ac(HT20) U-NII-3 Low channel



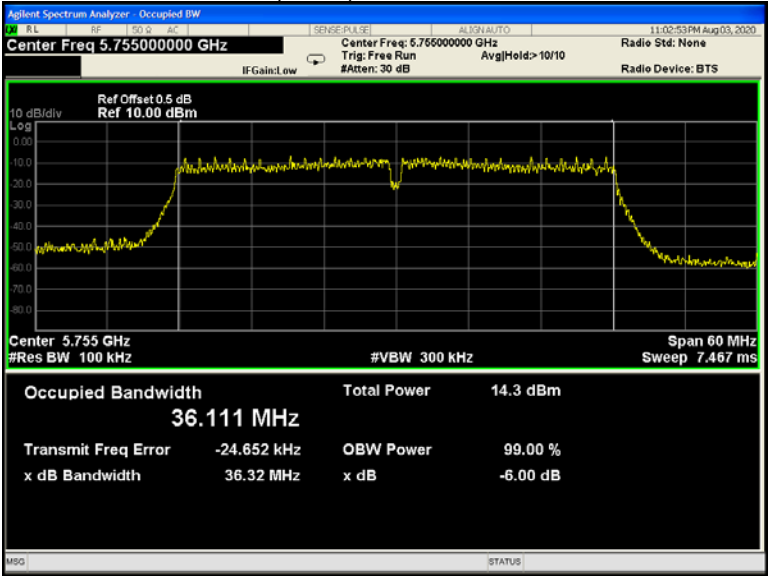
802.11ac(HT20) U-NII-3 Middle channel



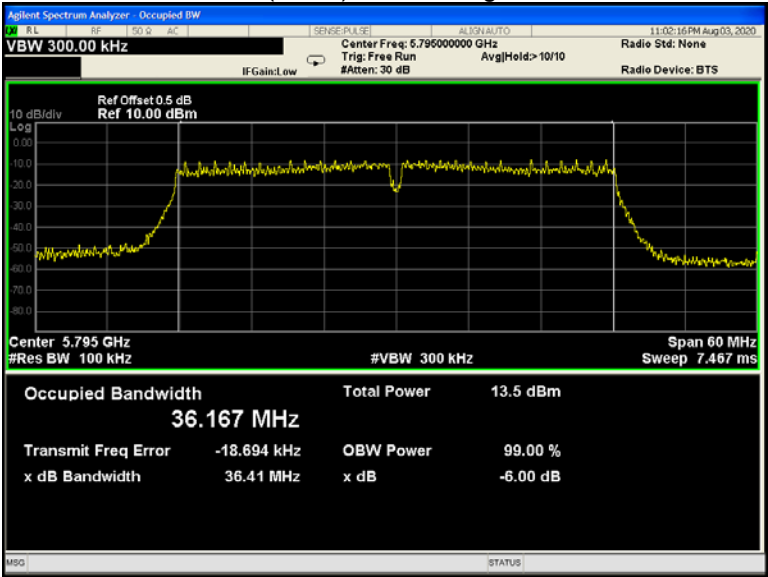
802.11ac(HT20) U-NII-3 High channel



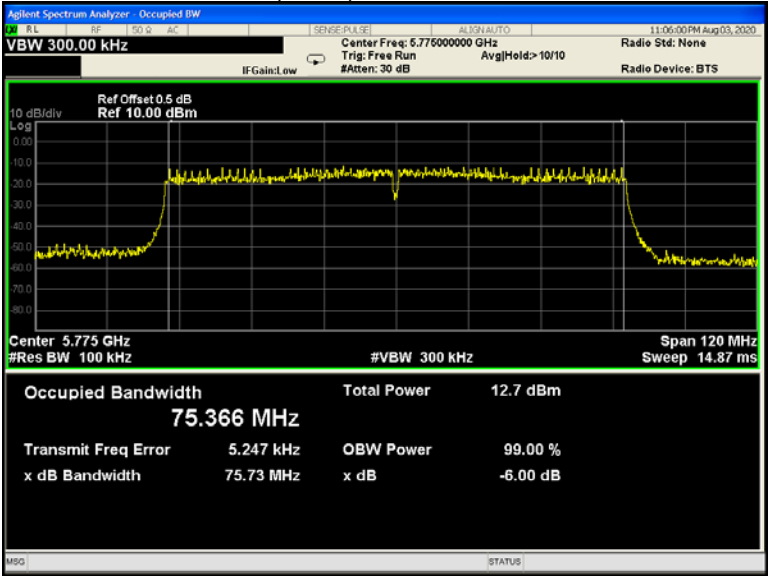
802.11ac(HT40) U-NII-3 Low channel



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



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



12 26 dB Bandwidth and 99% Occupied Bandwidth

Test Requirement:	47 CFR Part 15C 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:

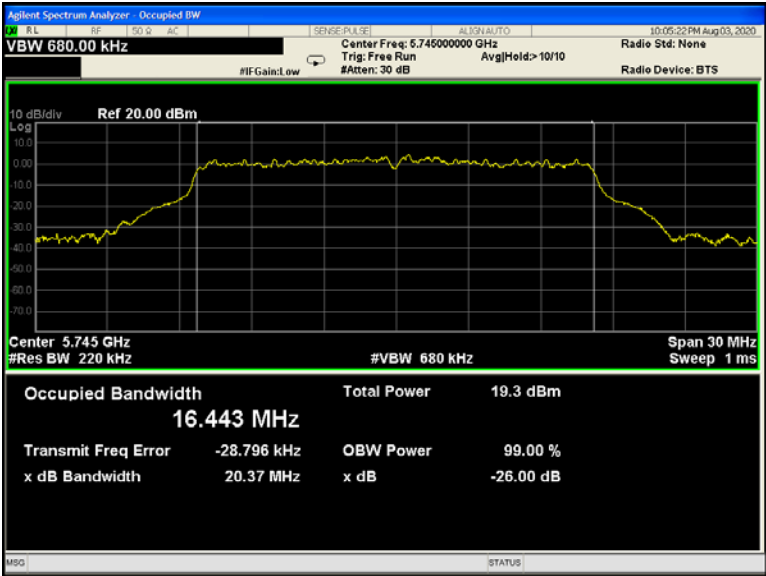
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: RBW = 1% to 5% of the OBW, VBW = 3x RBW

12.2 Test Result:

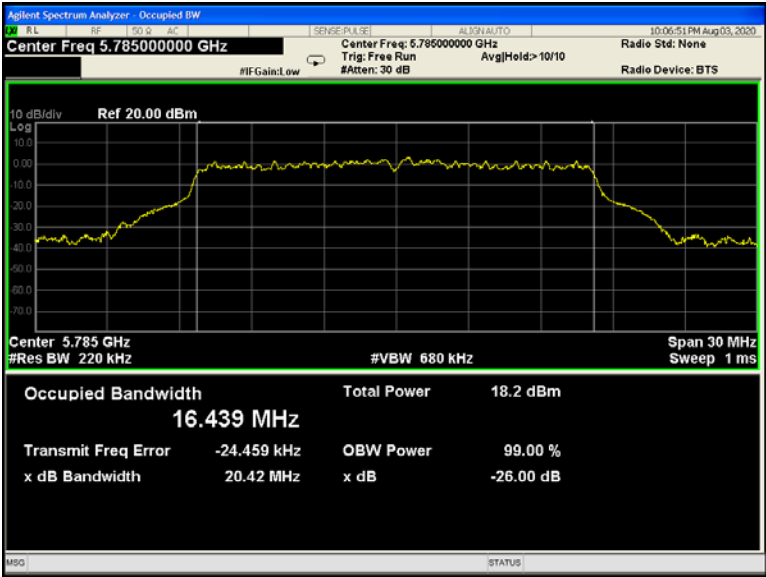
Band	Operation mode	26 dB Bandwidth (MHz)			99% Bandwidth (MHz)		
		Low	Middle	High	Low	Middle	High
U-NII-3	802.11a	20.37	20.42	20.33	16.443	16.439	16.441
	802.11n(HT20)	20.97	21.21	21.12	17.722	17.707	17.722
	802.11n(HT40)	39.44	/	39.31	36.185	/	36.194
	802.11ac(HT20)	20.89	21.08	21.19	17.753	17.730	17.737
	802.11ac(HT40)	39.93	/	39.65	36.341	/	36.361
	802.11ac(HT80)	80.28	/	/	75.644	/	/

Test result plots shown as follows:

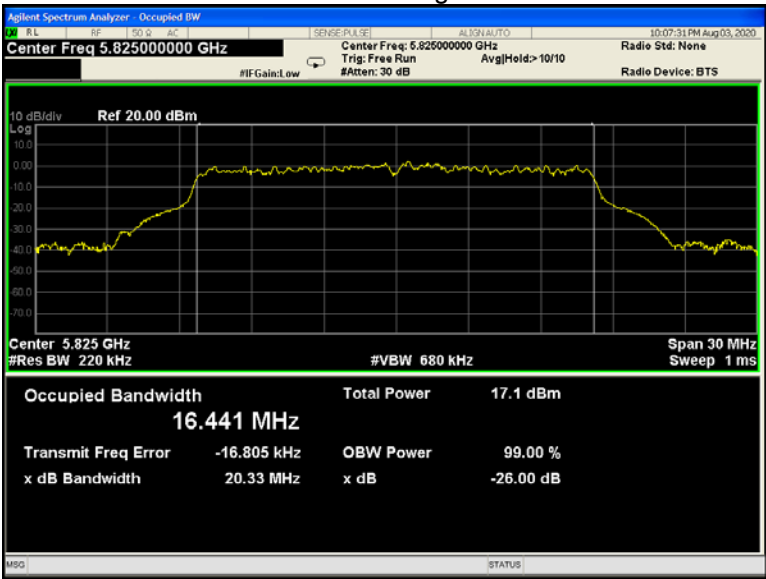
802.11a U-NII-3 Low channel



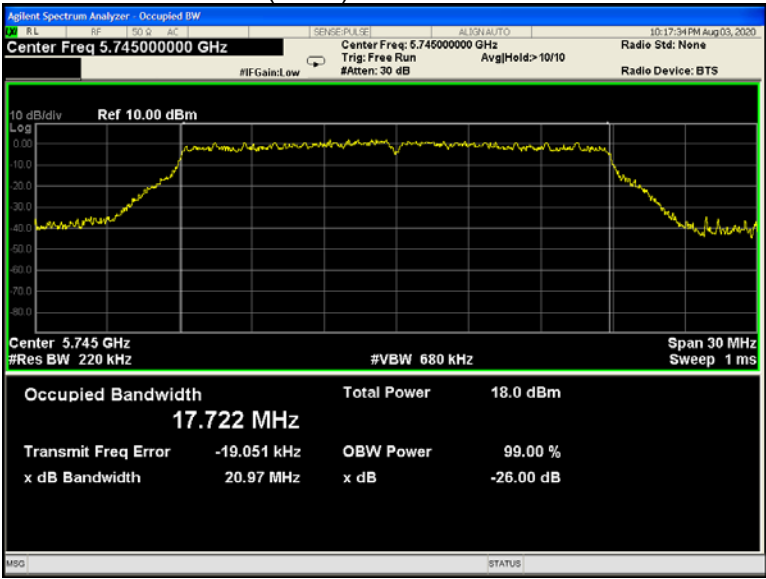
802.11a U-NII-3 Middle channel



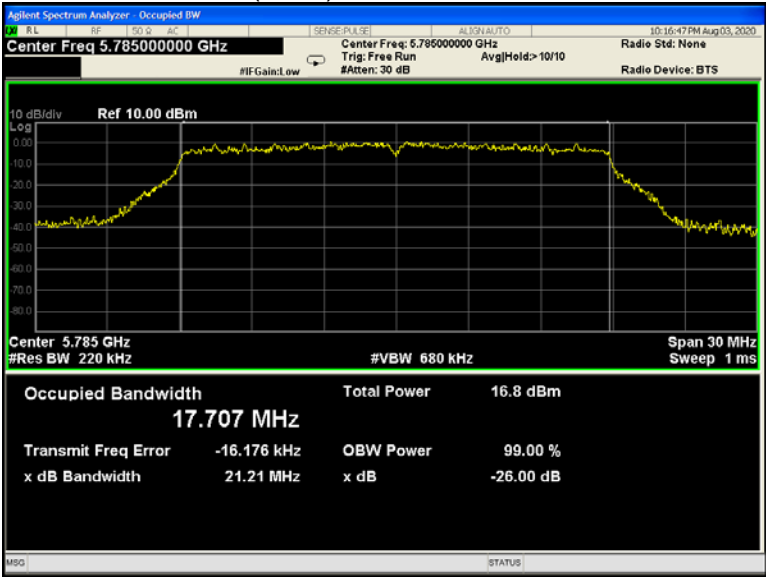
802.11a U-NII-3 High channel



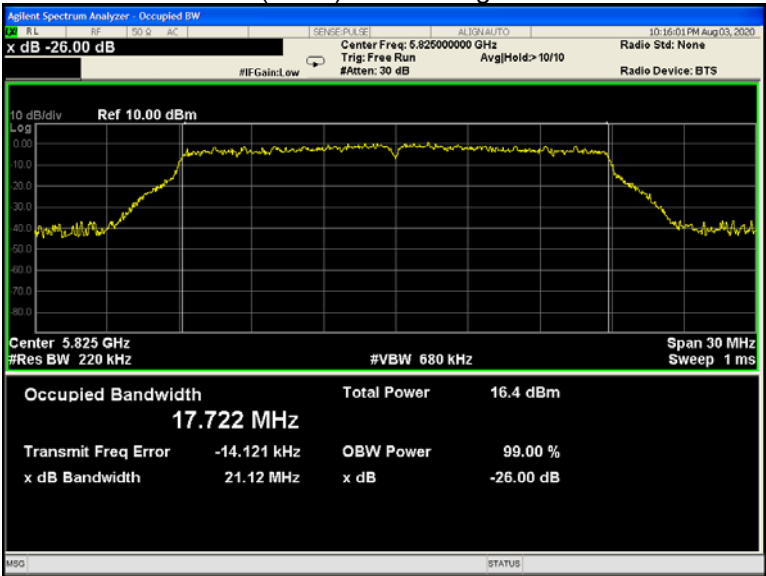
802.11n(HT20) U-NII-3 Low channel



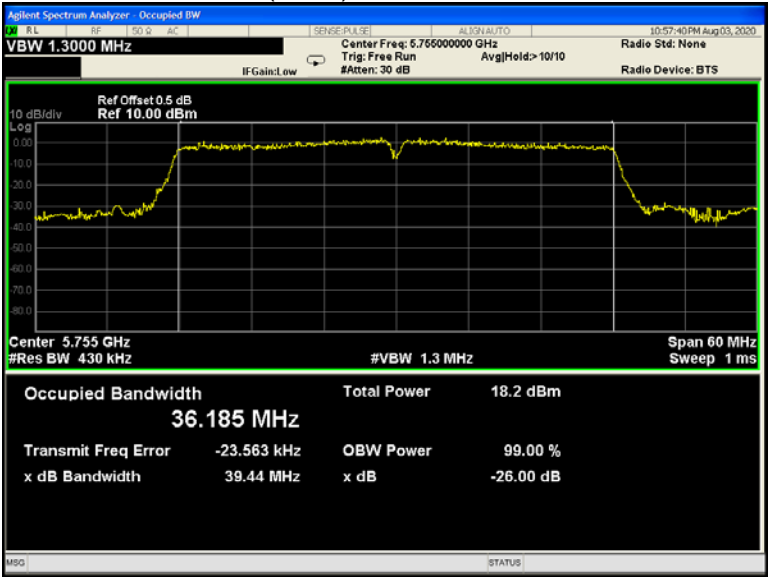
802.11n(HT20) U-NII-3 Middle channel



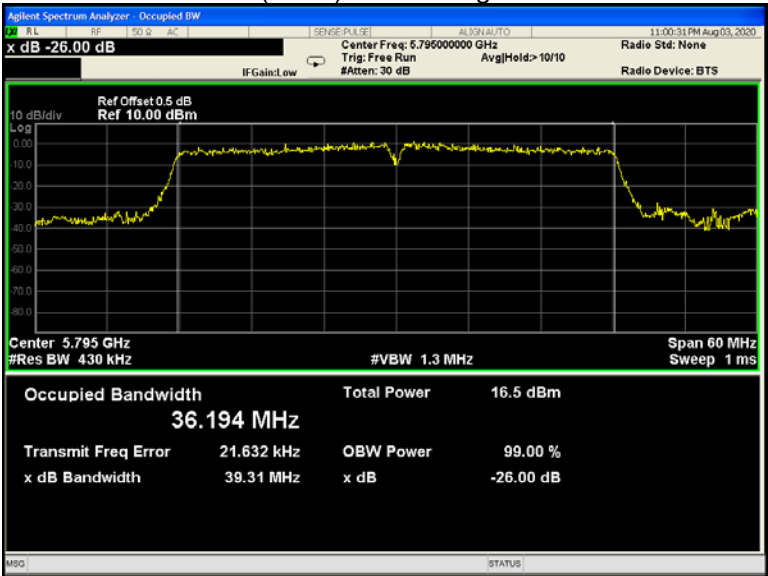
802.11n(HT20) U-NII-3 High channel



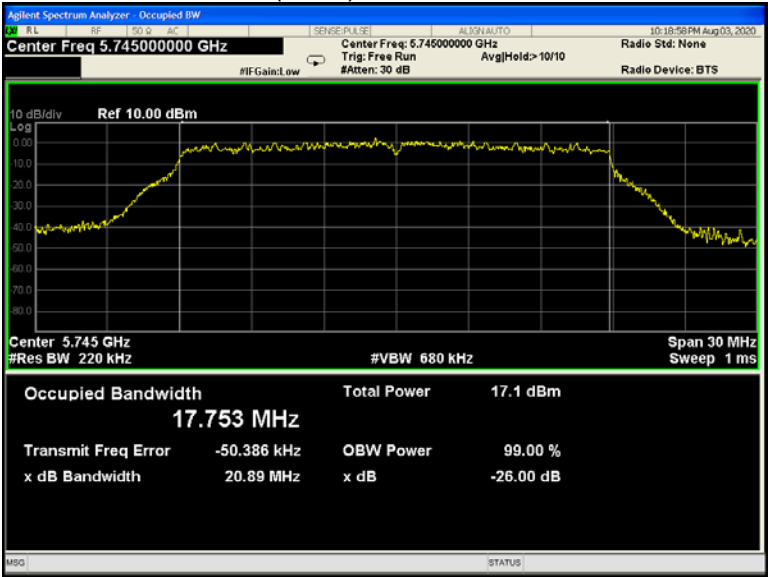
802.11n(HT40) U-NII-3 Low channel



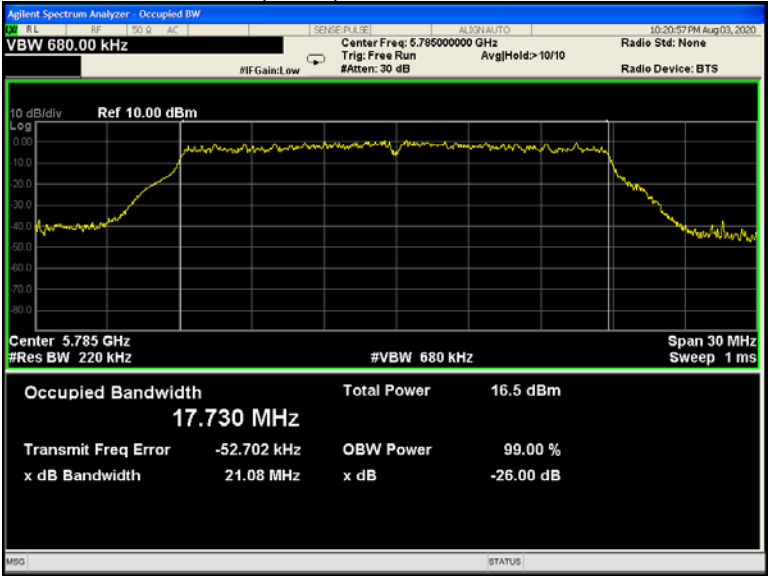
802.11n(HT40) U-NII-3 High channel



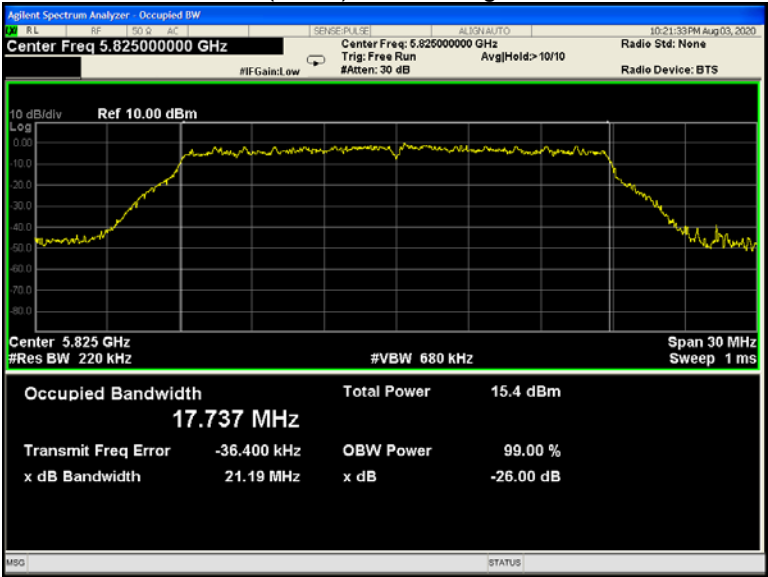
802.11ac(HT20) U-NII-3 Low channel



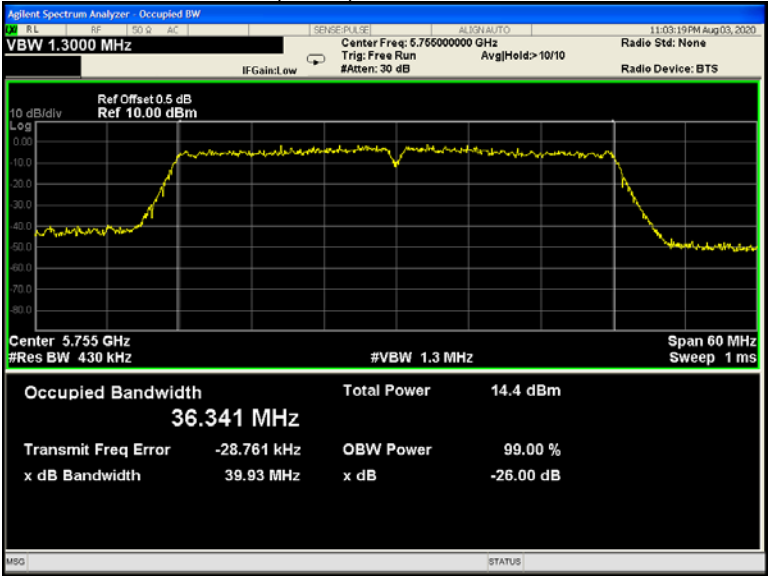
802.11ac(HT20) U-NII-3 Middle channel



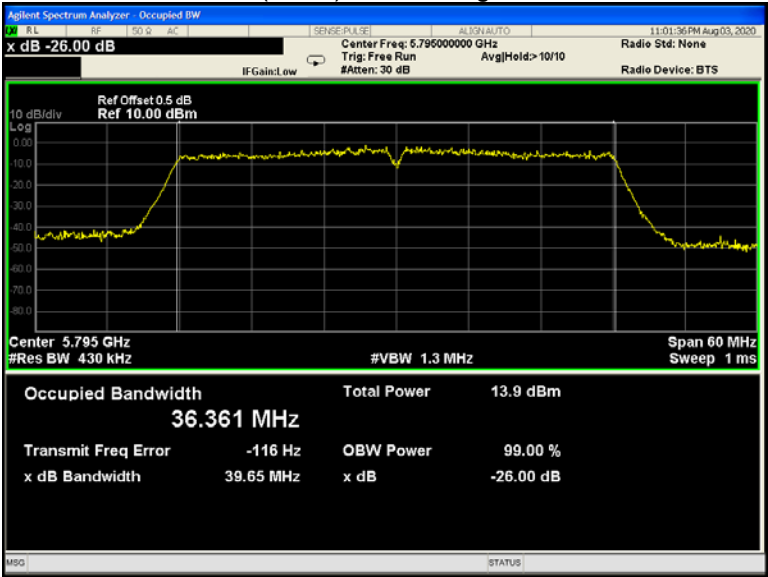
802.11ac(HT20) U-NII-3 High channel



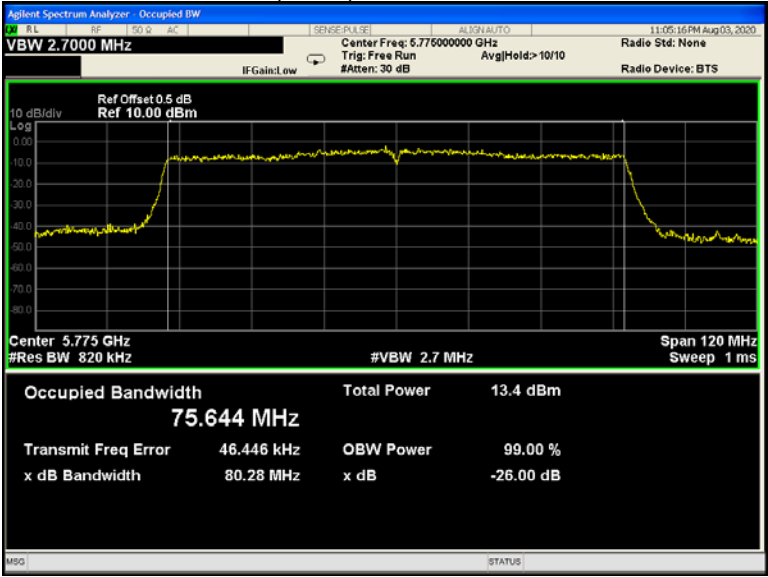
802.11ac(HT40) U-NII-3 Low channel



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



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



13 Conducted Output Power

Test Requirement:	FCC CFR47 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 E
Test Limit:	U-NII-1 250mW(24dBm) U-NII-3 1W(30dBm)
Test Result:	PASS Conducted output power= measurement power+10log(1/x)
Remark:	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 = RMS, Set the span to fully encompass the OBW.
3. Keep the EUT in transmitting at lowest, medium and highest channel individually. Record the max value.

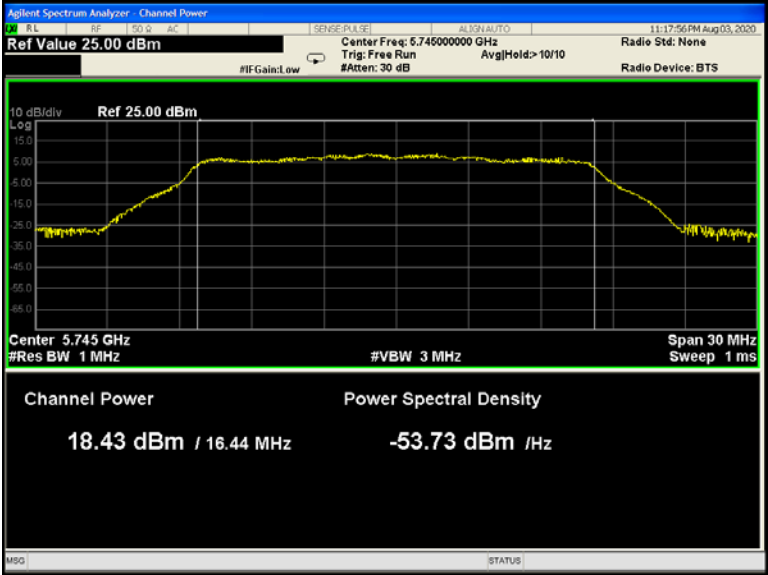
13.2 Test Result :

Band	Operation mode	Conducted Output Power (dBm)		
		Low	Middle	High
U-NII-3	802.11a	18.43	17.45	16.34
	802.11n(HT20)	16.34	15.85	14.80
	802.11n(HT40)	16.61	/	15.92
	802.11ac(HT20)	16.37	15.20	14.20
	802.11ac(HT40)	14.20	/	12.69
	802.11ac(HT80)	13.51	/	/

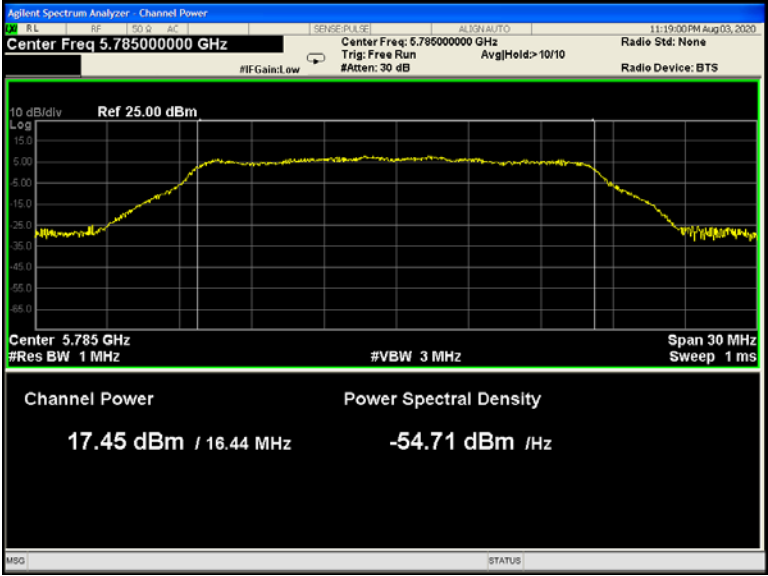
*Directional gain = G_{ANT} which is less than 6dBi. So the limit does not be reduced.

Test result plots shown as follows:

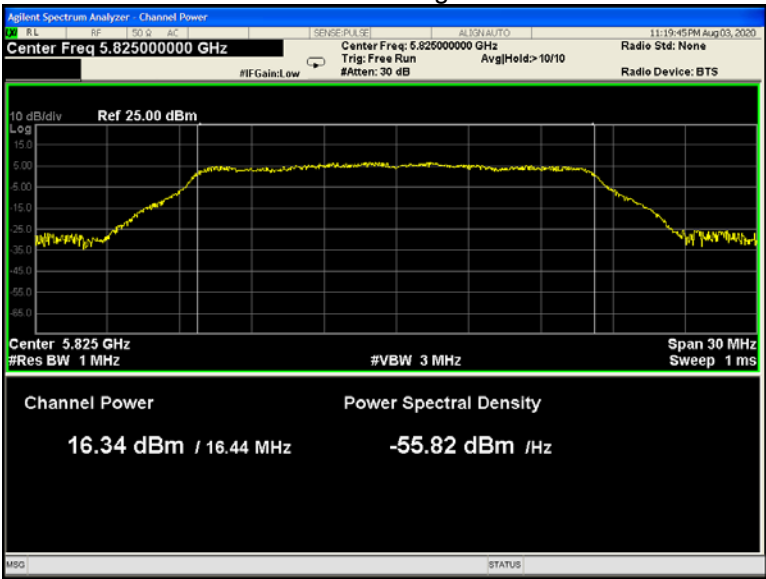
802.11a U-NII-3 Low channel



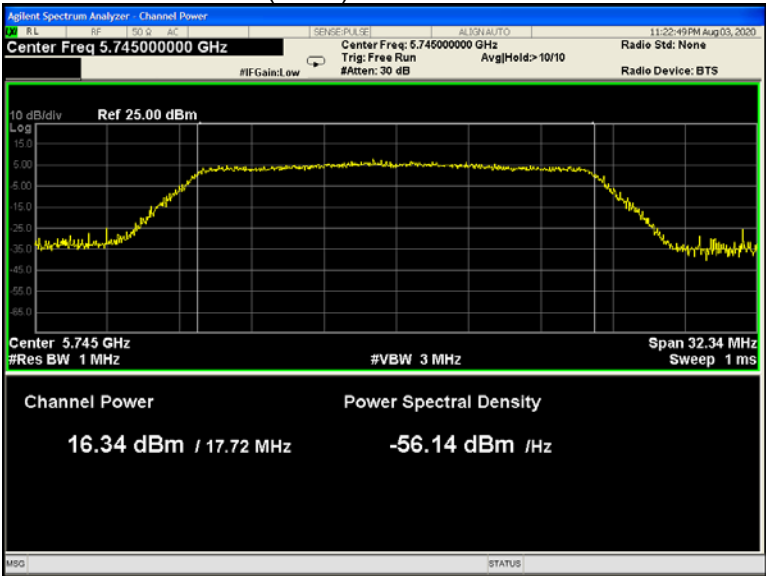
802.11a U-NII-3 Middle channel



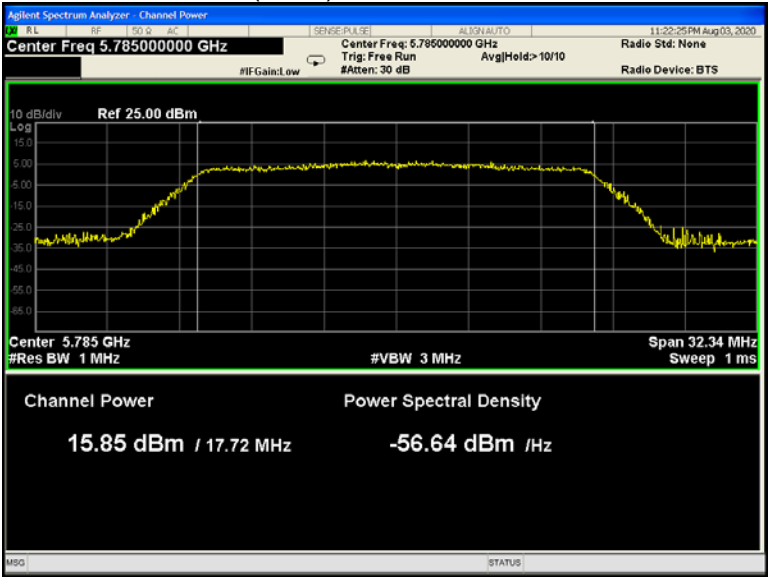
802.11a U-NII-3 High channel



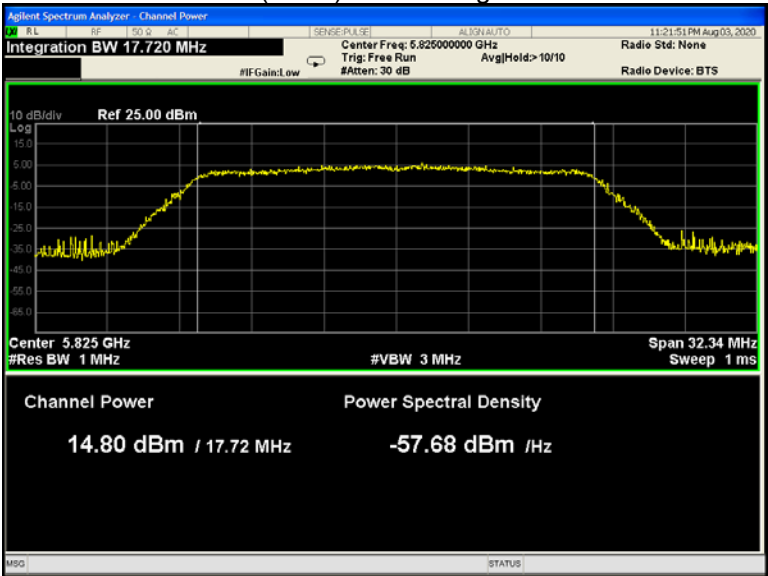
802.11n(HT20) U-NII-3 Low channel



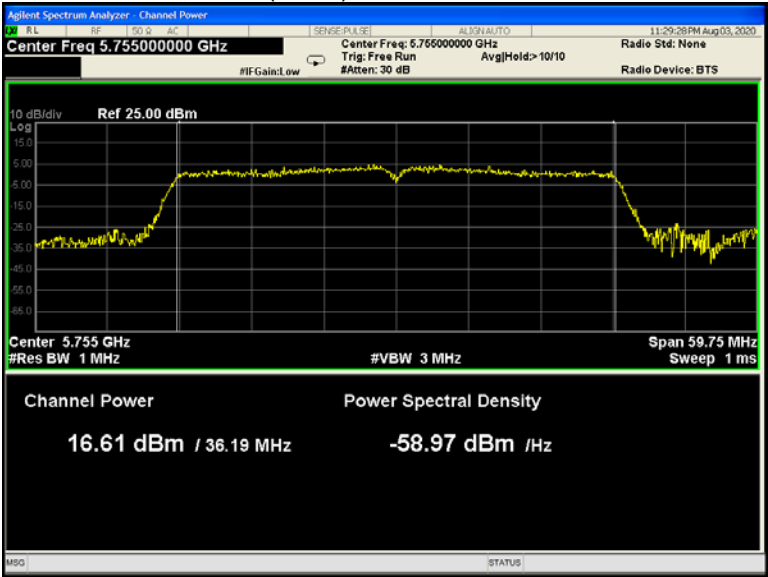
802.11n(HT20) U-NII-3 Middle channel



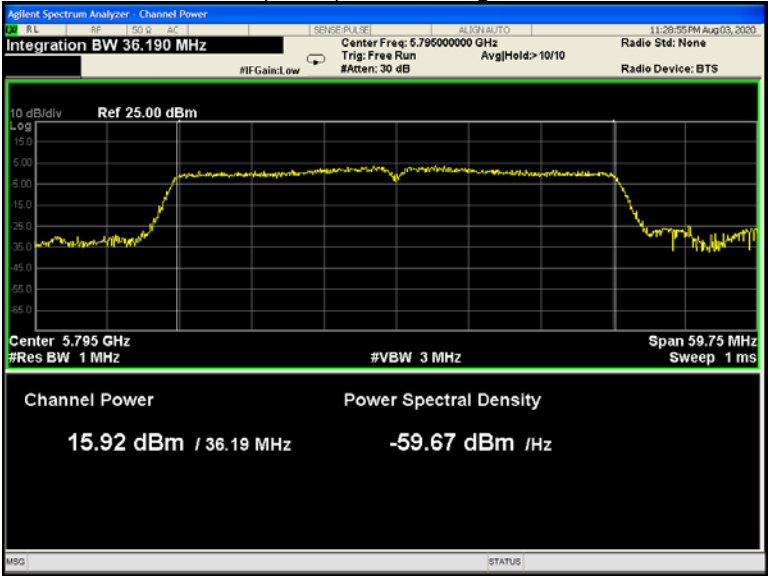
802.11n(HT20) U-NII-3 High channel



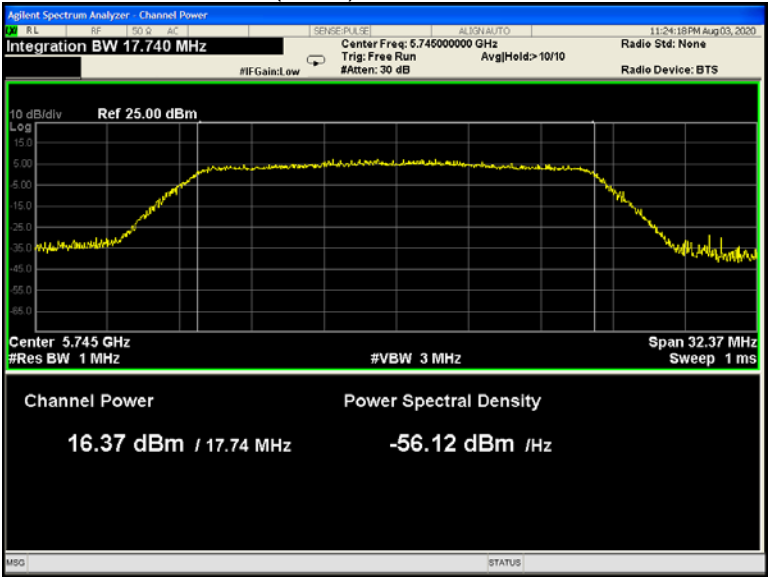
802.11n(HT40) U-NII-3 Low channel



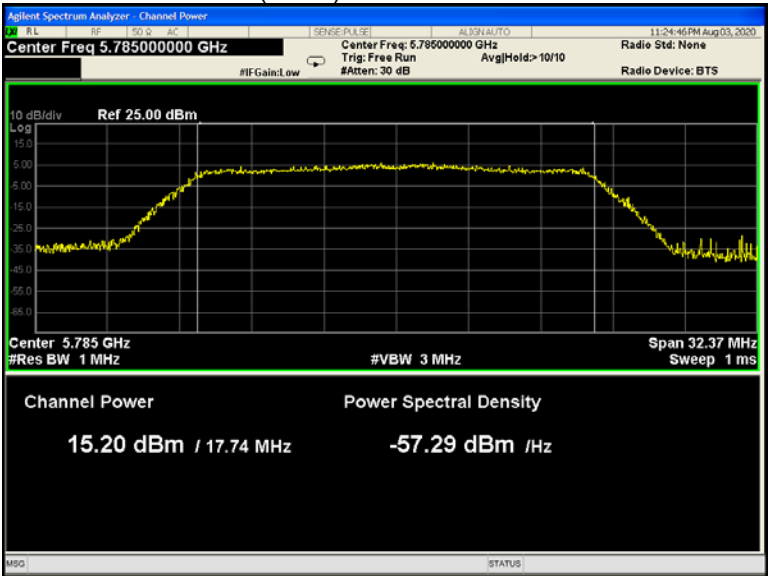
802.11n(HT40) U-NII-3 High channel



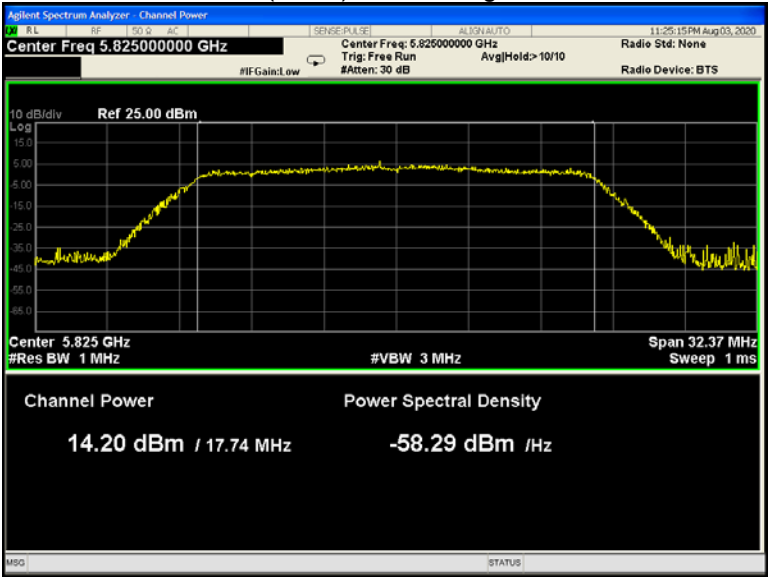
802.11ac(HT20) U-NII-3 Low channel



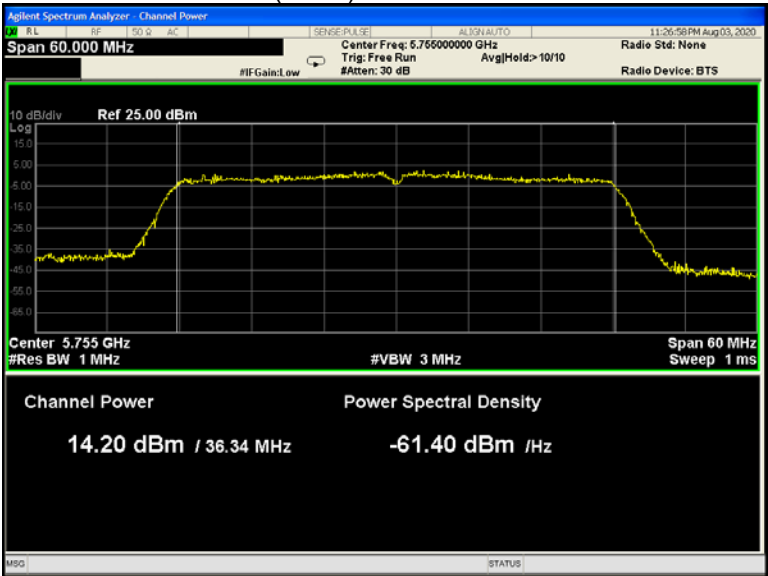
802.11ac(HT20) U-NII-3 Middle channel



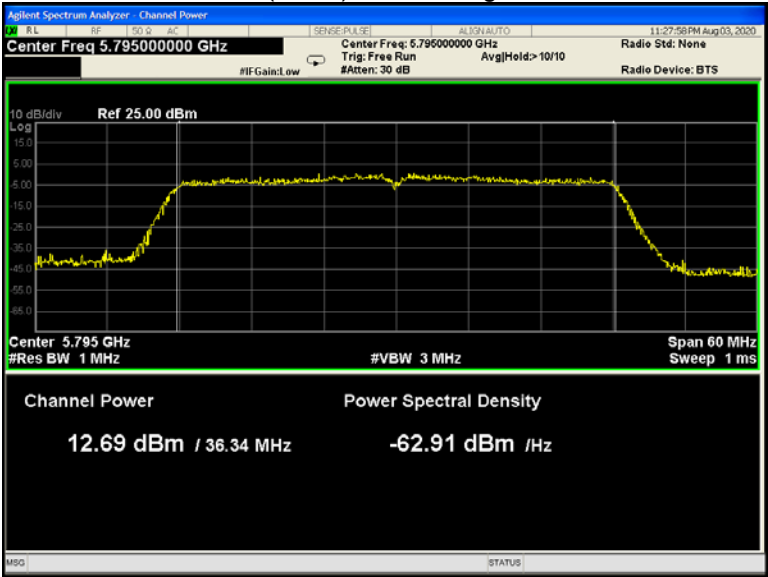
802.11ac(HT20) U-NII-3 High channel



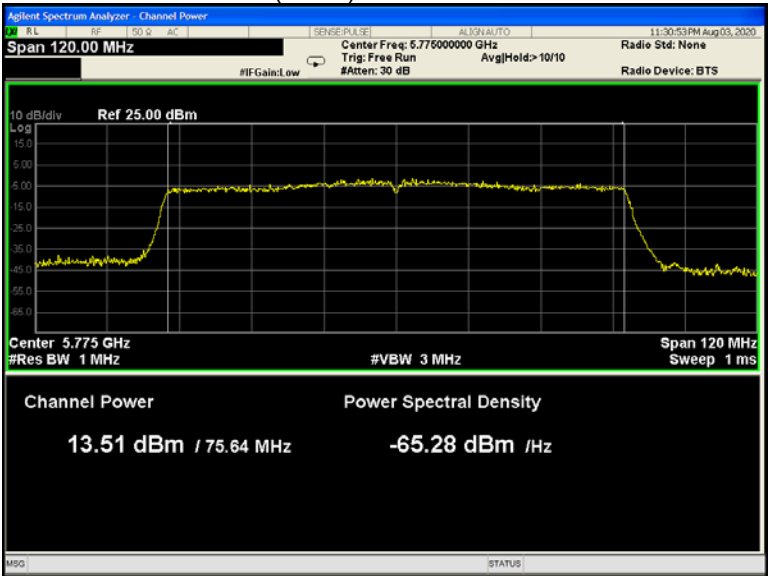
802.11ac(HT40) U-NII-3 Low channel



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



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



14 Power Spectral density

Test Requirement:	FCC CFR47 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 F
Test Limit:	$\leq 11.00\text{dBm/MHz}$ for Operation in the U-NII-1(5150MHz-5250MHz)of mobile device $\leq 30.00\text{dBm/500KHz}$ for Operation in the U-NII-3(5725MHz- 5850MHz)of device
Test Result:	PASS

14.1 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 = 510KHz, VBW $\geq 3 \times$ RBW Sweep = auto; Detector Function = RMS. Trace = Max hold.
3. Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. The limit is specified in one of the subparagraphs of this Section
Submit this plot.

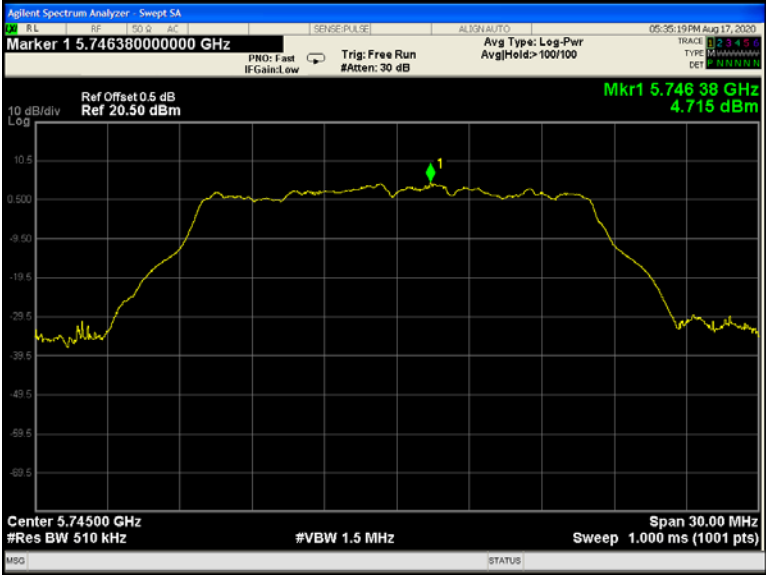
14.2 Test Result:

Band	Operation mode	Power Spectral Density (dBm/MHz)		
		Low	Middle	High
U-NII-3	802.11a	4.715	4.720	3.870
	802.11n(HT20)	4.074	3.900	3.244
	802.11n(HT40)	2.179	/	1.942
	802.11ac(HT20)	3.721	4.030	3.363
	802.11ac(HT40)	-1.489	/	-1.633
	802.11ac(HT80)	-4.411	/	/
	Limit	$\leq 30.00 \text{ dBm}/500 \text{ kHz}$		

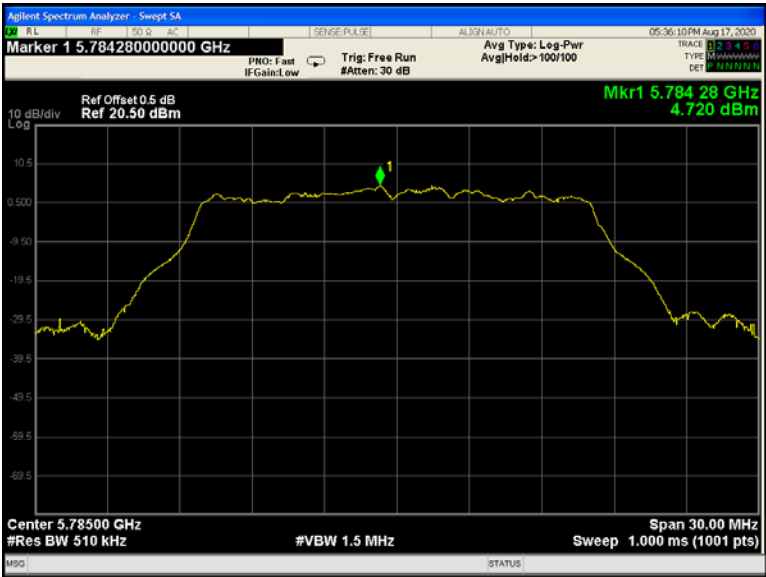
* Directional gain = G_{ANT} which is less than 6dBi. So the limit does not be reduced.

Test result plots shown as follows:

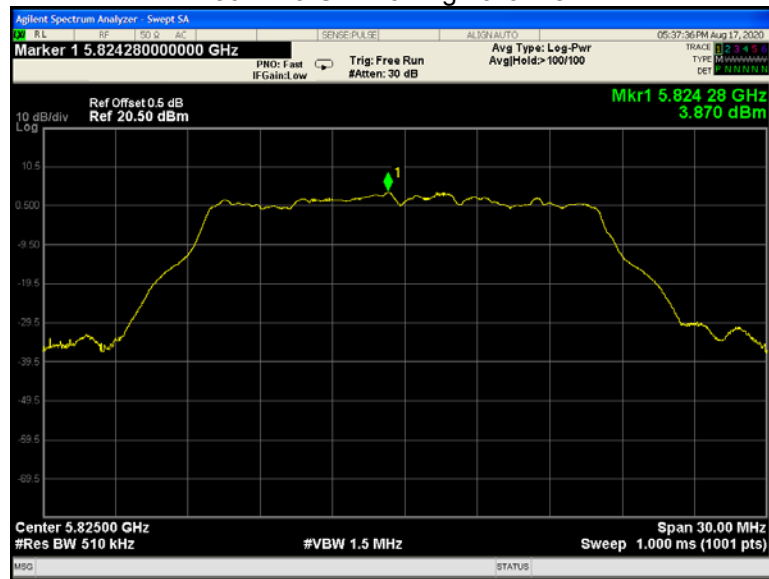
802.11a U-NII-3 Low channel



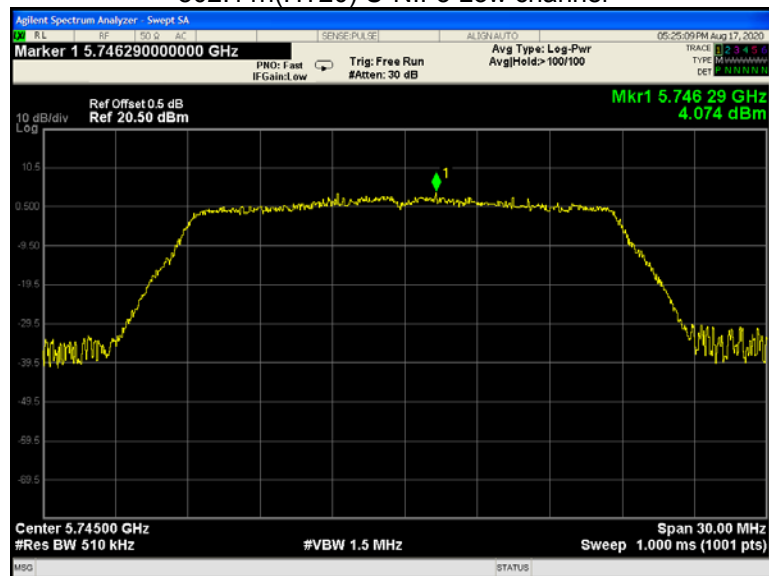
802.11a U-NII-3 Middle channel



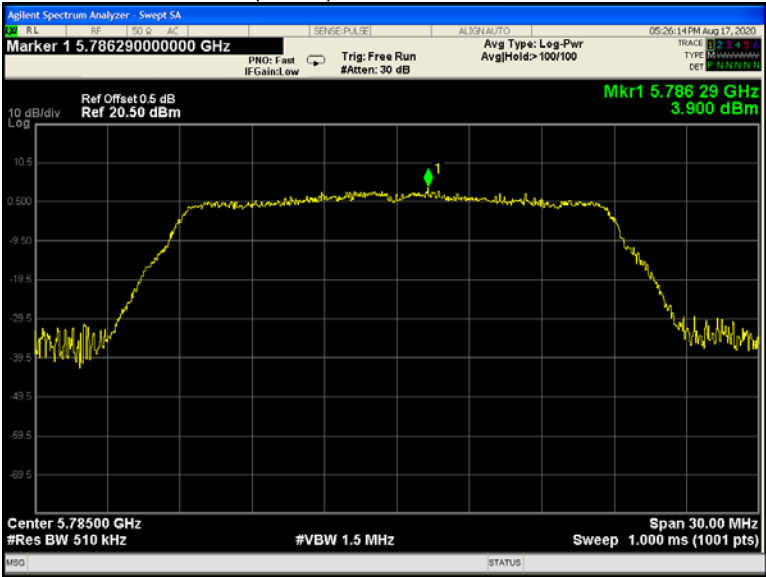
802.11a U-NII-3 High channel



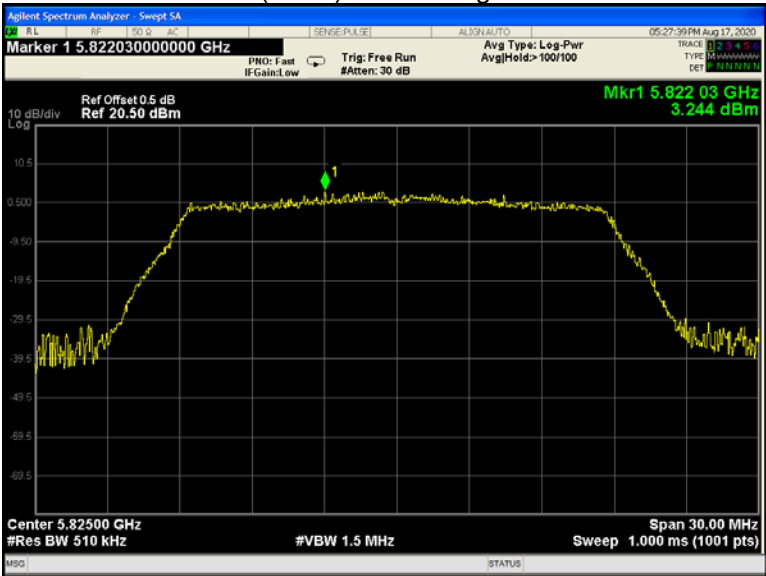
802.11n(HT20) U-NII-3 Low channel



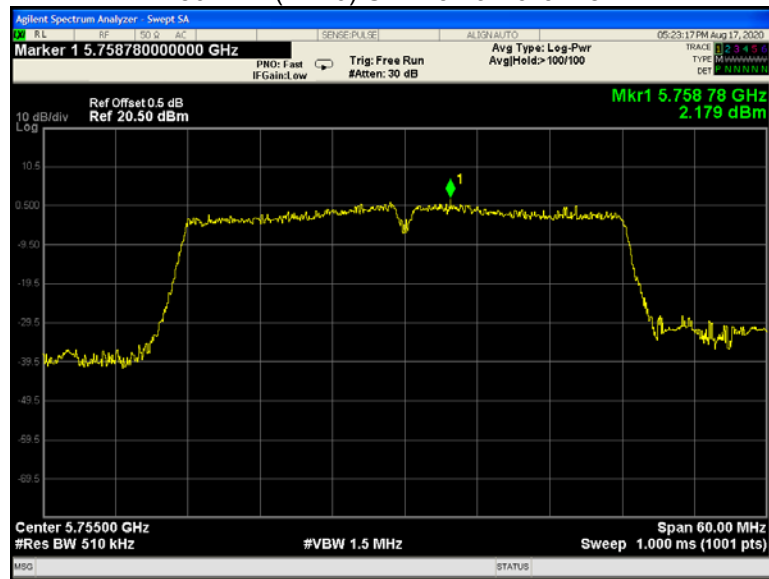
802.11n(HT20) U-NII-3 Middle channel



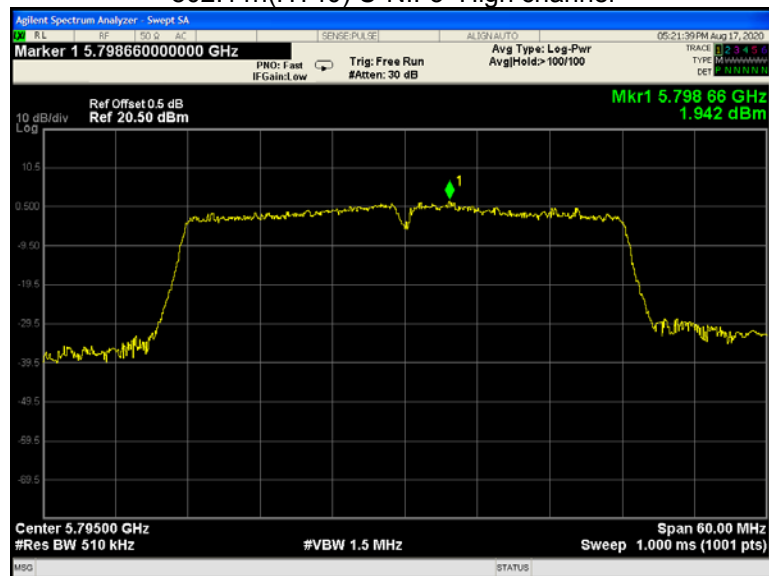
802.11n(HT20) U-NII-3 High channel



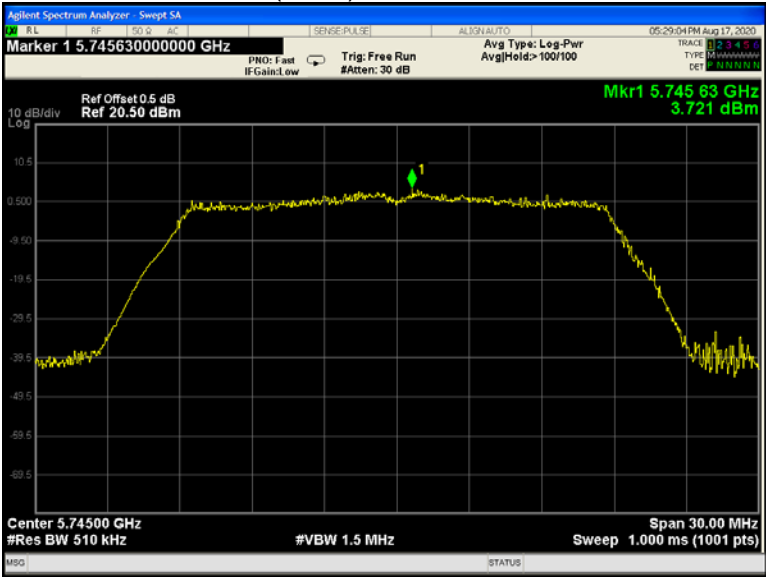
802.11n(HT40) U-NII-3 Low channel



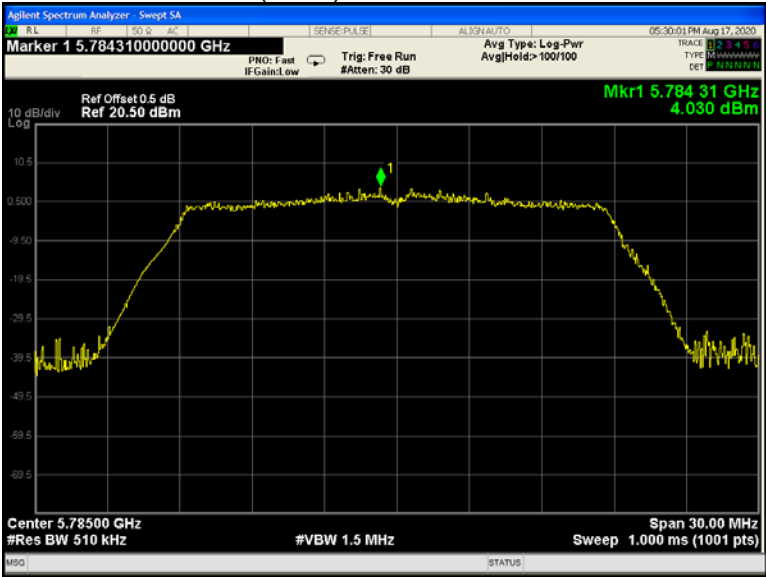
802.11n(HT40) U-NII-3 High channel



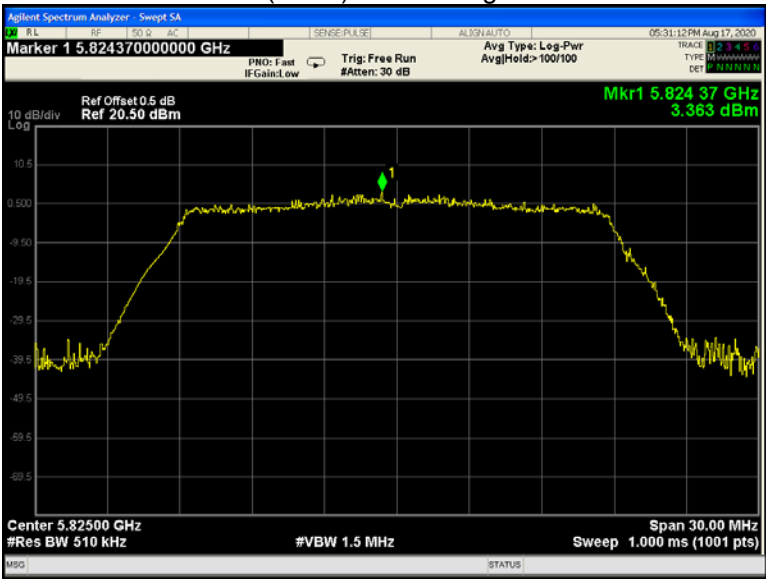
802.11ac(HT20) U-NII-3 Low channel



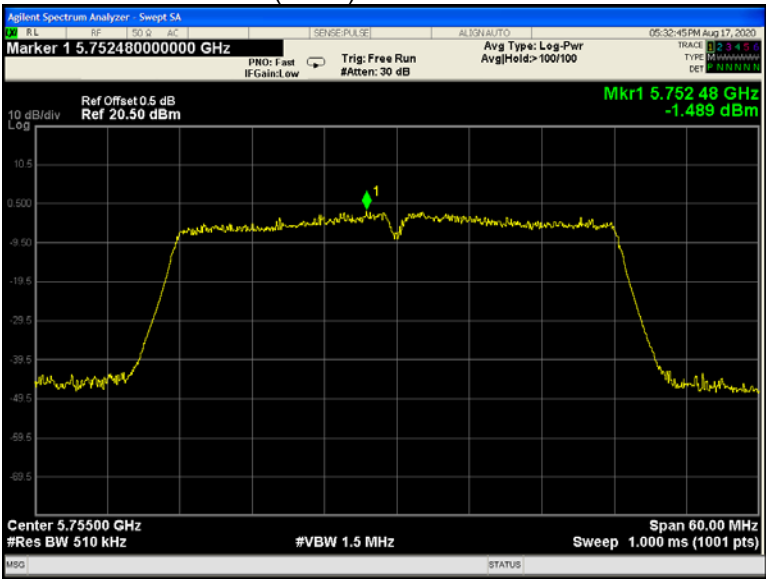
802.11ac(HT20) U-NII-3 Middle channel



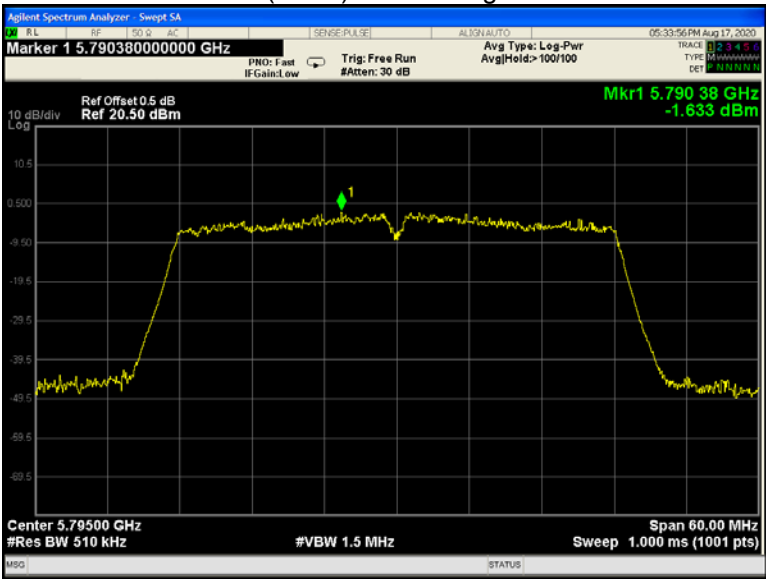
802.11ac(HT20) U-NII-3 High channel



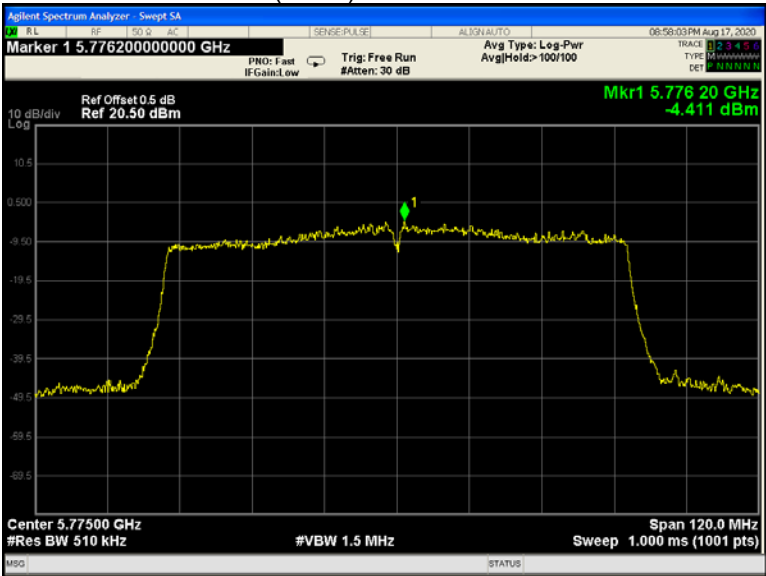
802.11ac(HT40) U-NII-3 Low channel



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



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



15 Frequency Stability

Test Requirement:	FCC CFR47 Part 15 Section 15.407(g)
Test Method:	ANSI C63.10:2013
Test Limit:	Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the users manual or 20ppm.
Test Result:	PASS

15.1 Test Procedure:

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
EUT have transmitted absence of unmodulation signal and fixed channelise. Set the spectrum analyzer span to view the entire absence of modulation emissions bandwidth. Set RBW = 10 kHz, VBW = 10 kHz with peak detector and maxhold settings. f_c is declaring of channel frequency. Then the frequency error formula is $(f_c - f)/f_c \times 10^6$ ppm and the limit is less than ± 20 ppm. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value.
2. Extreme temperature rule is $-15^{\circ}\text{C} \sim 45^{\circ}\text{C}$.

15.2 Test Result:

U-NII-3 Test Frequency:5785MHz				
Temperature (°C)	Power Supply (VAC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	120	/	/	/
45		1919	2.2933	20
30		1911	2.2847	20
20		1915	2.2895	20
10		1923	2.2986	20
0		1907	2.2799	20
-10		1908	2.2807	20
-15		1914	2.2872	20
-30		/	/	/
20	108	1918	2.2926	20
20	132	1906	2.2784	20

16 Antenna 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 shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

This device uses of one antenna that uses a specified coupling to the intentional radiator. Antenna connectors complied with the requirement.

17 RF Exposure

Remark: refer to MPE test report: WTD20S06032798W002.

18 Photographs of test setup and EUT.

Note: Please refer to appendix: Appendix-V12US-Photos.

=====End of Report=====