



TEST REPORT

Applicant: Jiumao (Shenzhen) Industrial Co., LTD
Address of Applicant: 2nd Floor, Building 9, Jingxuan Industrial Park, Donghuan Road, Longhua District, Shenzhen
Manufacturer/Factory: Jiumao (Shenzhen) Industrial Co., LTD
Address of Manufacturer: 2nd Floor, Building 9, Jingxuan Industrial Park, Donghuan Road, Longhua District, Shenzhen
Product Name: Goldbulous Native 1080P projector
Model No.: M8, M7, M9, M6, M5, M3, M2, M1, M98, Q96, M10, M11, M96, M95
Trade Mark: JIUMAO
FCC ID: 2BB8K-M8
Applicable standards: FCC CFR Title 47 Part 15 Subpart E Section 15.407
Date of Test: Jul.14, 2023-Jul.29, 2023
Date of report issued: Aug.08, 2023
Test Result : PASS *

Remark:

* In the configuration tested, the EUT complied with the standards specified above.

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

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

Prepared By

Shenzhen ETR Standard Technology Co., Ltd.

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Approved by:

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Authorized Signature



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1 Test Summary

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

Remarks:

1. Pass: The EUT complies with the essential requirements in the standard.
2. Test according to ANSI C63.10:2013.

1.1 Measurement Uncertainty

Test Item	Measurement Uncertainty	Notes
Occupied Channel Bandwidth	±0.55%	(1)
RF output power, conducted	±0.99dB	(1)
Power Spectral Density, conducted	±0.61dB	(1)
Unwanted Emissions, conducted	±0.64dB	(1)
AC Power Line Conducted Emission	± 3.02dB	(1)
Radiated emissions 9K-30MHz	±3.98dB	(1)
Radiated emissions 30M- 1GHz	±4.30dB	(1)
Radiated emissions 1GHz-18GHz	±4.35dB	(1)
Radiated emissions 18GHz-40GHz	±4.59 dB	(1)

Note (1): The measurement uncertainty is for coverage factor of k=2 and a level of confidence of 95%.

2 General Information

2.1 General Description of EUT

Product Name:	Goldbulous Native 1080P projector
Model No.:	M8,M7,M9,M6,M5,M3,M2,M1,M98,Q96,M10,M11,M96,M95
Difference of model(s)	M8
Test Model:	All the model are the same circuit and RF module, except the model names and colors
Hardware Version:	N/A
Software Version:	N/A
Sample(s) Status:	Engineer sample
Operation Frequency:	☒ 5180-5240MHz for 802.11a/n(HT20)/ac20; 5190-5230MHz for 802.11n(HT40)/ac40; 5210MHz for 802.11 ac80; ☒ 5745-5825 MHz for 802.11a/n(HT20)/ac20; 5755-5795 MHz for 802.11n(HT40)/ac40; 5775MHz for 802.11 ac80;
Channel numbers:	☒ 4 channels for 802.11a/n20/ac20 in the 5180-5240MHz band; 2 channels for 802.11 n40/ac40 in the 5190-5230MHz band ; 1 channels for 802.11 ac80 in the 5210MHz band ; ☒ 5 channels for 802.11a/n20/ac20 in the 5745-5825MHz band ; 2 channels for 802.11 n40/ac40 in the 5755-5795MHz band ; 1 channels for 802.11 ac80 in the 5775MHz band
Channel bandwidth:	802.11a/802.11n(HT20)/ 802.11ac(HT20): 20MHz 802.11n(HT40)/ 802.11ac(HT40) : 40MHz 802.11ac(HT80) : 80MHz
Data Rate	802.11a: 6,9,12,18,24,36,48,54Mbps; 802.11n(HT20/HT40):MCS0-MCS15; 802.11ac(VHT/20/40/80):NSS1, MCS0-MCS9
Modulation technology:	Orthogonal Frequency Division Multiplexing (OFDM) with BPSK/QPSK/16QAM/64QAM/256QAM
Antenna Type:	FPCB Antenna
Antenna gain:	3.46 dBi(Declare by applicant) Note: Antenna information is provided by applicant, Testing lab is not responsible for the accuracy of the information.
Battery	N/A
Power supply:	AC 100-240V 50/60Hz

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

Note:

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

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

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

2.2 Test mode

Transmitting mode	Keep the EUT in continuously transmitting mode(or with a duty cycle $\geq 98\%$)
<i>Remark: During the test, the test voltage was tuned from 85% to 115% of the nominal rated supply voltage, and found that the worst case was under the nominal rated supply condition. So the report just shows that condition's data.</i>	

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

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

Conducted Emission	
Final Test Mode	Description
Mode 5	Link Mode

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

Note:

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



2.3 Description of Support Units

None.

2.4 Deviation from Standards

None.

2.5 Abnormalities from Standard Conditions

None.

2.6 Test Facility

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

2.7 Test Location

All tests were performed at:

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

2.8 Additional Instructions

Test Software	COM Port Command
Power level setup	Default



3 Test Instruments list

Conducted Emission

Item	Equipment name	Manufacturer	Model	Serial No.	Calibration date	Due date
1	EMI Test Receiver	Rohde&schwarz	ESCI3	100605	2023.3.02	2024.3.01
2	Artificial power network	schwarabeck	NSLK8127	8127483	2023.3.02	2024.3.01
3	Artificial power network	ETS	3186/2NM	1132	2023.3.02	2024.3.01
4	10dB attenuator	HUBER+SUHNER	10dB	/	2023.3.02	2024.3.01
5	Cable 4	HUBER SUNNER	3M	/	2023.3.02	2024.3.01
6	Absorbing Clamp	schwarabeck	MDS21	D69250	2023.3.06	2024.3.05

Radiated Emission &RF Conducted test:

Item	Equipment name	Manufacturer	Model	Serial No.	Calibration date	Due date
1	EMI Test Receiver	Rohde&schwarz	ESCI7	101032	2023.3.02	2024.3.01
2	Broadband antenna	schwarabeck	VULB9168	1064	2022.3.11	2024.3.10
3	Horn antenna	schwarabeck	BBHA9120D	9120D-1145	2022.3.11	2024.3.10
4	Amplifier	EMtrace	RP01A	50117	2023.3.02	2024.3.01
5	Amplifier	Space-Dtronics	EWLAN0118G-P40	19113001	2023.3.02	2024.3.01
6	Spectrum analyzer	KEYSIGHT	N9020A	MY55370280	2023.3.02	2024.3.01
7	Power detector meter	MWRFTtest	MW100-PSB	MW201020JYT	2022.11.09	2023.11.08
8	Signal generator	Agilent	N5182A	MY49060455	2022.11.09	2023.11.08
9	Spectrum analyzer	Rohde&schwarz	FSV40	102137	2023.3.02	2024.3.01
10	Amplifier	SKET	LNPA_1840-50	SK2019040302	2023.3.02	2024.3.01
11	Horn antenna	schwarabeck	BBHA 9170	946	2022.3.11	2024.3.10
12	Loop antenna	schwarabeck	FMZB 1519 B	1519	2022.3.11	2024.3.10
13	Cable 6	HUBER SUNNER	0.5M	/	2023.3.02	2024.3.01
14	Cable7	HUBER SUNNER	2.0M	/	2023.3.02	2024.3.01
15	Cable8	HUBER SUNNER	6.0M	/	2023.3.02	2024.3.01
16	Filter	Xin bo	XBLBQ-GTA29	210410-3-2	2023.3.06	2024.3.05

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

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

4 Test results and Measurement Data

4.1 Antenna requirement

Standard requirement:	FCC Part15 C Section 15.203
<i>15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.</i>	
E.U.T Antenna:	
<i>The antennas are FPCB antenna, the best case gain of the antennas are 3.46 dBi, reference to the appendix II for details</i>	

4.2 Conducted Emissions

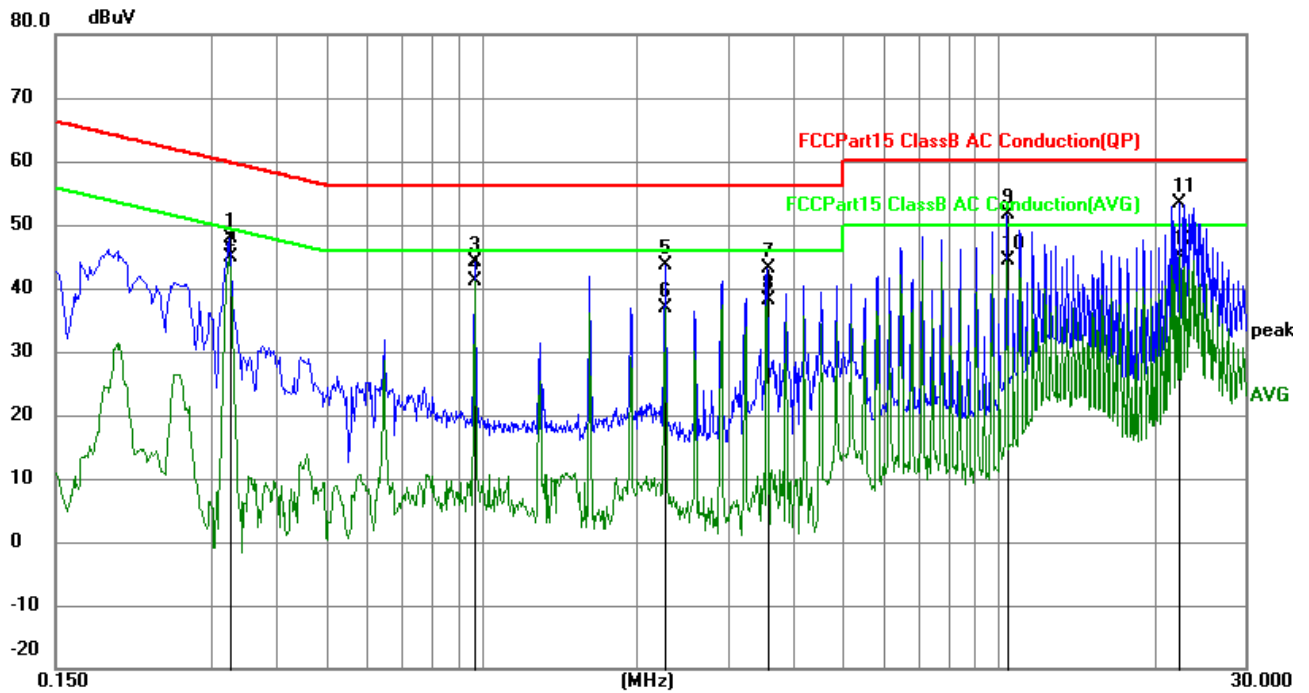
Test Requirement:	FCC Part15 C Section 15.207						
Test Method:	ANSI C63.10:2013						
Test Frequency Range:	150KHz to 30MHz						
Class / Severity:	Class B						
Receiver setup:	RBW=9KHz, VBW=30KHz, Sweep time=auto						
Limit:	Frequency range (MHz)		Limit (dBuV)				
			Quasi-peak		Average		
	0.15-0.5		66 to 56*		56 to 46*		
	0.5-5		56		46		
	5-30		60		50		
* Decreases with the logarithm of the frequency.							
Test setup:	Reference Plane Remark: E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m						
Test procedure:	1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment. 2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs). 3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10:2013 on conducted measurement.						
Test Instruments:	Refer to section 3.0 for details						
Test mode:	Refer to section 2.2 for details						
Test environment:	Temp.:	26.2°C	Humid.:	54%	Press.:	1012mbar	
Test voltage:	AC 120V, 60Hz						
Test results:	Pass						

Remark:

1. Both high voltage and low voltage have been tested, and the report only shows the worst case data with AC 120V/60Hz.
2. All mode have been tested, the report only shows the worst mode (802.11 n20 5825MHz) data.

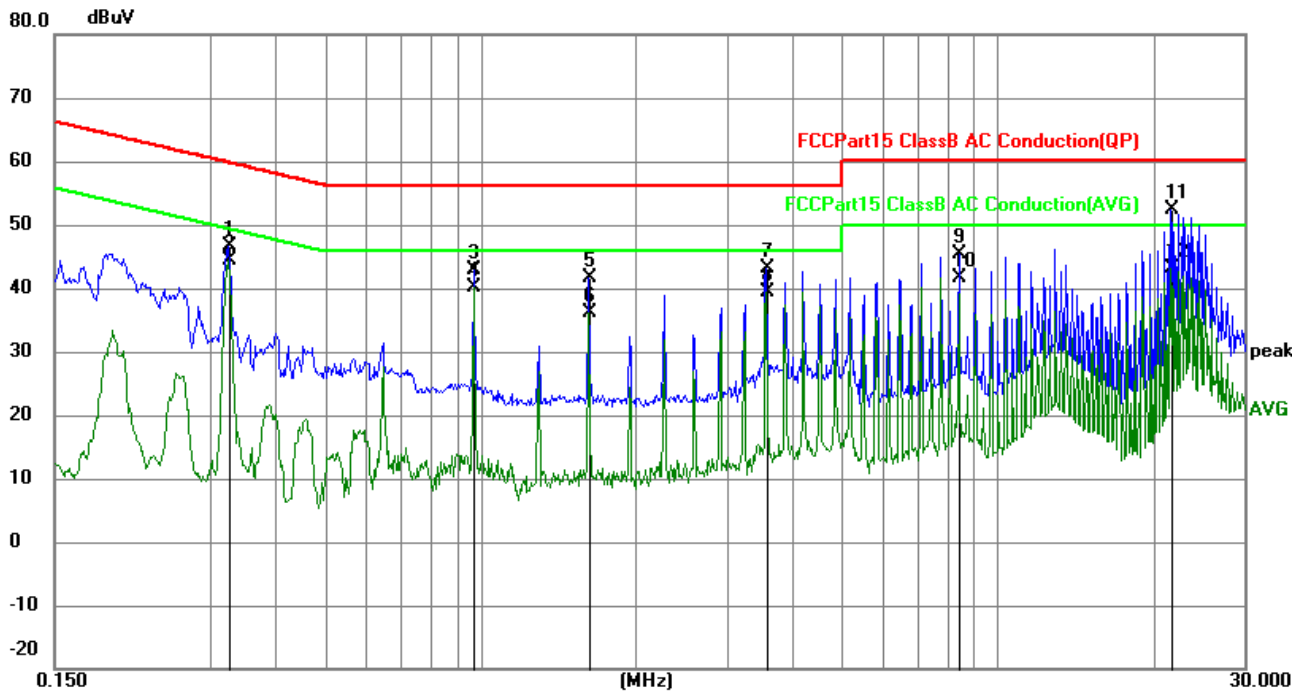
Measurement data

Line:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.3255	38.00	9.87	47.87	59.57	-11.70	QP
2	0.3255	34.97	9.87	44.84	49.57	-4.73	AVG
3	0.9734	34.19	9.96	44.15	56.00	-11.85	QP
4	0.9734	31.07	9.96	41.03	46.00	-4.97	AVG
5	2.2694	33.82	9.85	43.67	56.00	-12.33	QP
6	2.2694	27.07	9.85	36.92	46.00	-9.08	AVG
7	3.5655	33.28	9.84	43.12	56.00	-12.88	QP
8	3.5655	28.18	9.84	38.02	46.00	-7.98	AVG
9	10.3695	41.84	9.83	51.67	60.00	-8.33	QP
10	10.3695	34.65	9.83	44.48	50.00	-5.52	AVG
11	22.3530	43.79	9.62	53.41	60.00	-6.59	QP
12	22.3530	35.51	9.62	45.13	50.00	-4.87	AVG

Neutral:

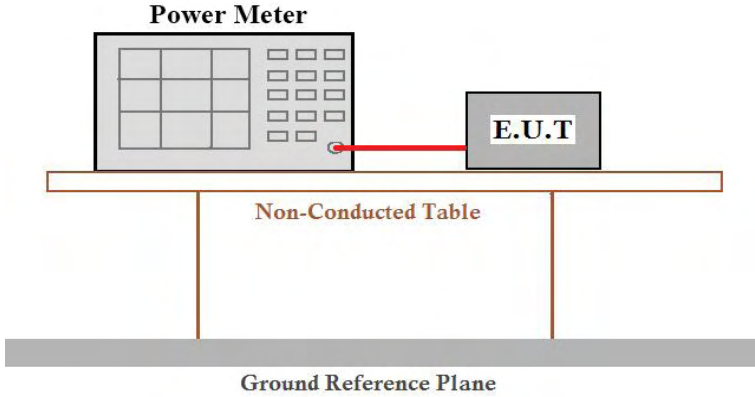


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.3255	36.83	9.87	46.70	59.57	-12.87	QP
2	0.3255	34.39	9.87	44.26	49.57	-5.31	AVG
3	0.9734	33.00	9.96	42.96	56.00	-13.04	QP
4	0.9734	30.29	9.96	40.25	46.00	-5.75	AVG
5	1.6209	31.69	9.90	41.59	56.00	-14.41	QP
6	1.6209	26.26	9.90	36.16	46.00	-9.84	AVG
7	3.5655	33.33	9.84	43.17	56.00	-12.83	QP
8	3.5655	29.45	9.84	39.29	46.00	-6.71	AVG
9	8.4253	35.57	9.83	45.40	60.00	-14.60	QP
10	8.4253	31.70	9.83	41.53	50.00	-8.47	AVG
11	21.7042	42.70	9.64	52.34	60.00	-7.66	QP
12	21.7042	33.60	9.64	43.24	50.00	-6.76	AVG

Notes:

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

4.3 Conducted Peak Output Power

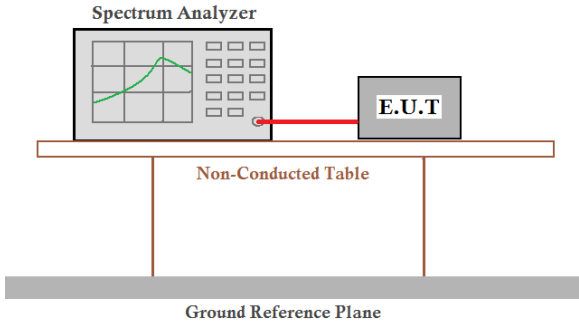
Test Requirement:	FCC Part15 E Section 15.407 (a)(1)/(a)(3)	
Test Method:	ANSI C63.10:2013 and KDB 789033 D02 General U-NII Test Procedures New Rules v02r01	
Limit:	5150-5250MHz : 250mW 5725~5850MHz : 1W	
Test setup:		
Test Instruments:	Refer to section 3.0 for details	
Test mode:	Refer to section 2.2 for details	
Test environment:	Temp.: 24.3°C	Humid.: 52%RH
Test voltage:	AC 120V	
Test results:	Pass	

Measurement Result

Test Channel	Frequency	Maximum output power	LIMIT	Result
	(MHz)	(dBm)	dBm	
TX 802.11a Mode				
CH36	5180	12.04	23.98	Pass
CH40	5200	12.39	23.98	Pass
CH48	5240	11.85	23.98	Pass
TX 802.11 n20 Mode				
CH36	5180	11.73	23.98	Pass
CH40	5200	11.92	23.98	Pass
CH48	5240	12.28	23.98	Pass
TX 802.11 ac20 Mode				
CH36	5180	12.19	23.98	Pass
CH40	5200	12.37	23.98	Pass
CH48	5240	11.59	23.98	Pass
TX 802.11 n40 Mode				
CH38	5190	8.33	23.98	Pass
CH46	5230	8.59	23.98	Pass
TX 802.11 ac40 Mode				
CH38	5190	9.02	23.98	Pass
CH46	5230	8.59	23.98	Pass
TX 802.11 ac80 Mode				
CH42	5210	6.00	23.98	Pass

Test Channel	Frequency	Maximum output power.	LIMIT	Result
	(MHz)	(dBm)	dBm	
TX 802.11a Mode				
CH149	5745	13.60	30	Pass
CH157	5785	13.78	30	Pass
CH165	5825	14.14	30	Pass
TX 802.11 n20 Mode				
CH149	5745	12.78	30	Pass
CH157	5785	13.84	30	Pass
CH165	5825	14.47	30	Pass
TX 802.11 ac20 Mode				
CH149	5745	13.21	30	Pass
CH157	5785	13.90	30	Pass
CH165	5825	14.07	30	Pass
TX 802.11 n40 Mode				
CH151	5755	11.50	30	Pass
CH159	5795	11.97	30	Pass
TX 802.11 ac40 Mode				
CH151	5755	12.00	30	Pass
CH159	5795	12.07	30	Pass
TX 802.11 ac80 Mode				
CH155	5775	10.71	30	Pass

4.4 Bandwidth 99% Occupy Bandwidth

Test Requirement:	FCC Part15 E Section 15.407(a)(12)&15.407(e)	
Test Method:	ANSI C63.10:2013 and KDB 789033 D02 General U-NII Test Procedures New Rules v02r01	
Limit:	Measurements in the 5.725-5.85 GHz band, the minimum bandwidth 6 dB bandwidth of U-NII devices shall be at least 500KHz. Measurements in the 5.15-5.25 GHz, 5.25-5.35 GHz, and the 5.47-5.725 GHz bands are made over a bandwidth of 1 MHz or the 26 dB emission bandwidth of the device, whichever is less. A narrower resolution bandwidth can be used, provided that the measured power is integrated over the full reference bandwidth.	
Test setup:		
Test Instruments:	Refer to section 3.0 for details	
Test mode:	Refer to section 2.2 for details	
Test environment:	Temp.: 24.3°C	Humid.: 52%RH
Test voltage:	AC 120V	
Test results:	Pass	

Measurement Result

5180-5240MHz

Test CH	-26dB Channel Bandwidth (MHz)						Result
	802.11a	802.11n (HT20)	802.11ac (HT20)	802.11n (HT40)	802.11ac (HT40)	802.11ac (HT80)	
Lowest	20.76	21.01	21.31	40.88	41.59	--	Pass
Middle	20.59	21.14	21.37	--	--	80.38	
Highest	21.01	20.94	21.41	41.75	41.06	--	

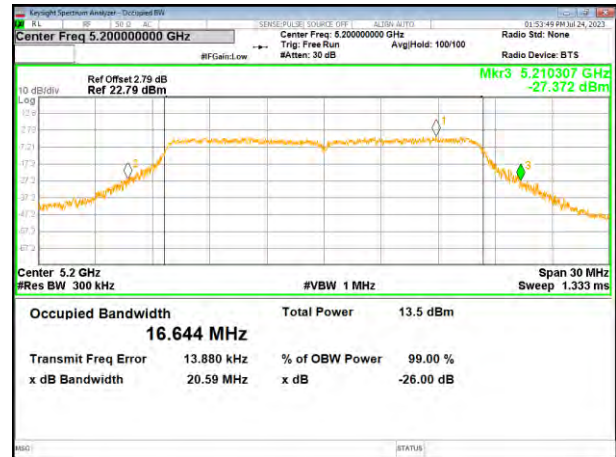
Test CH	99% Occupy Bandwidth (MHz)						Result
	802.11a	802.11n (HT20)	802.11ac (HT20)	802.11n (HT40)	802.11ac (HT40)	802.11ac (HT80)	
Lowest	16.677	17.706	17.726	36.140	36.100	--	Pass
Middle	16.644	17.720	17.727	--	--	75.413	
Highest	16.684	17.733	17.763	36.089	36.104	--	

Test plot

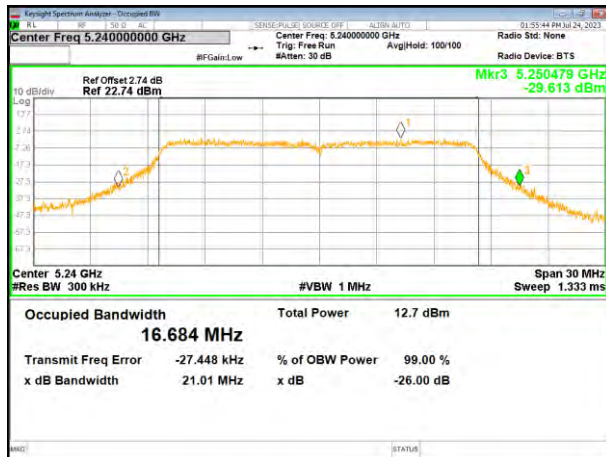
(802.11a) plot on channel 36



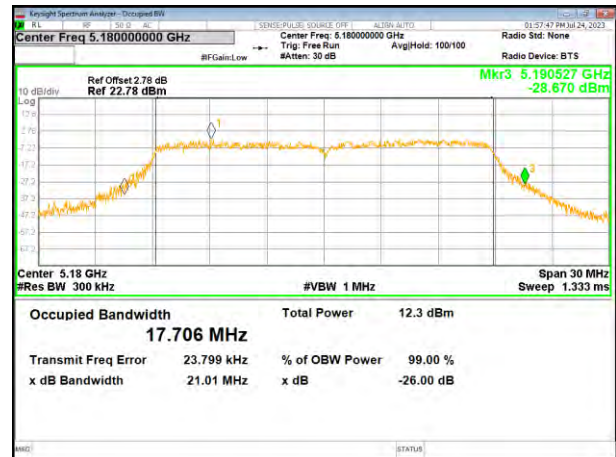
(802.11 n20) plot on channel 36



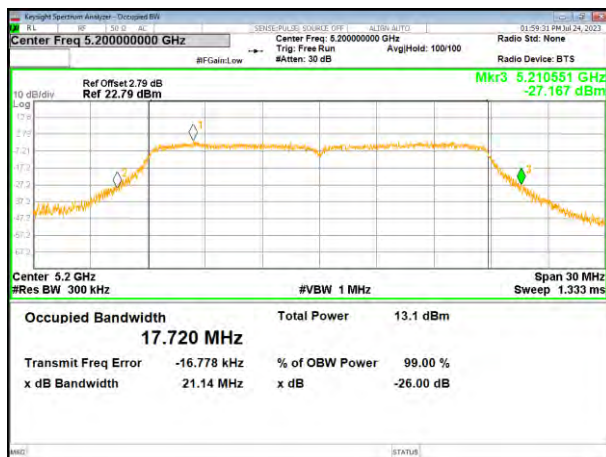
(802.11a) plot on channel 40



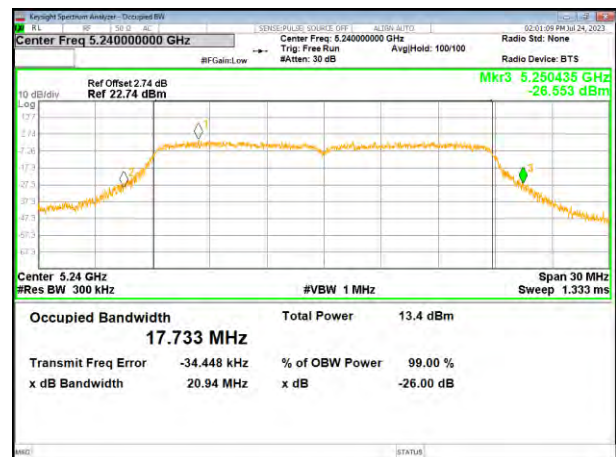
(802.11 n20) plot on channel 40



(802.11a) plot on channel 48

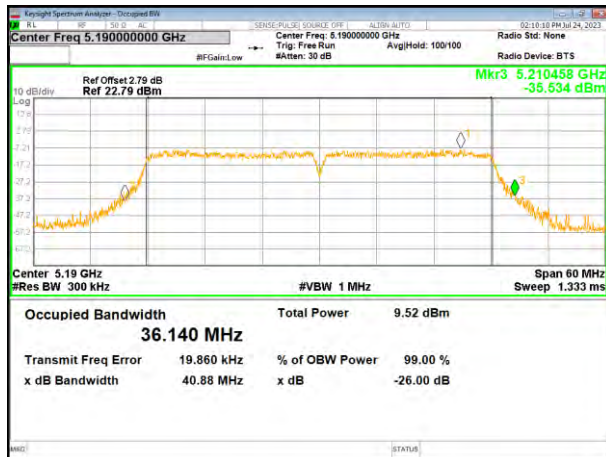


(802.11 n20) plot on channel 48

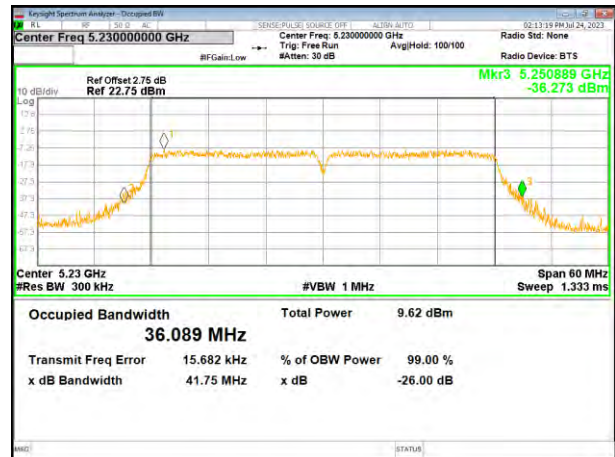


Test plot

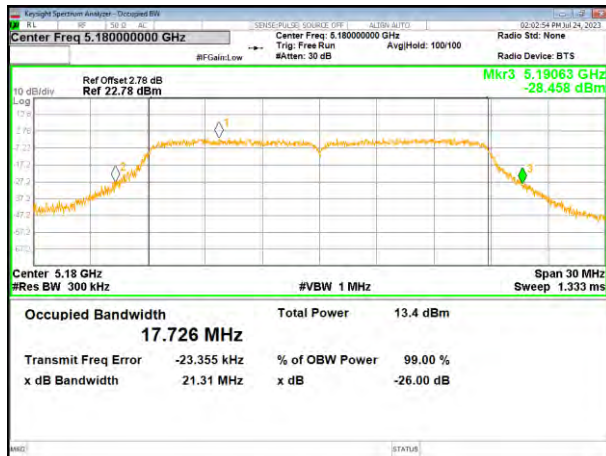
(802.11ac20) plot on channel 36



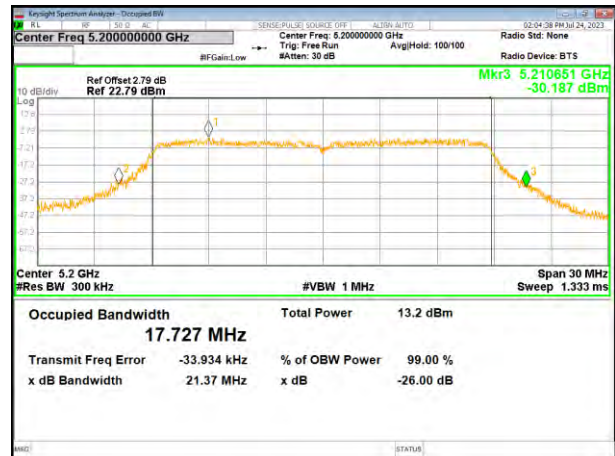
(802.11 n40) plot on channel 38



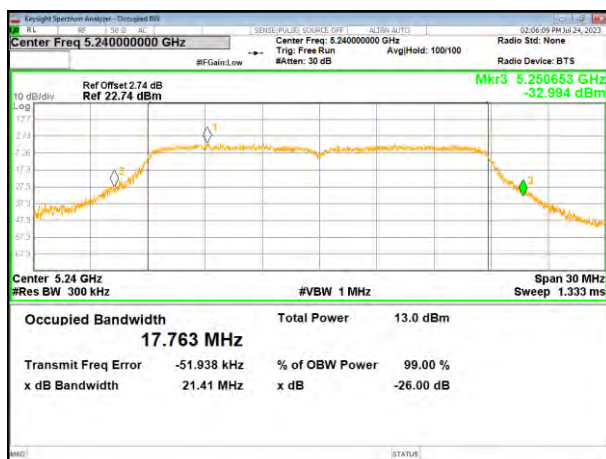
(802.11ac20) plot on channel 40



(802.11 n40) plot on channel 46

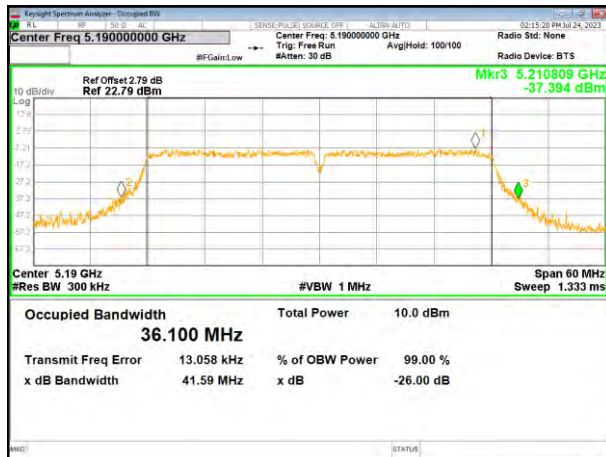


(802.11ac20) plot on channel 48

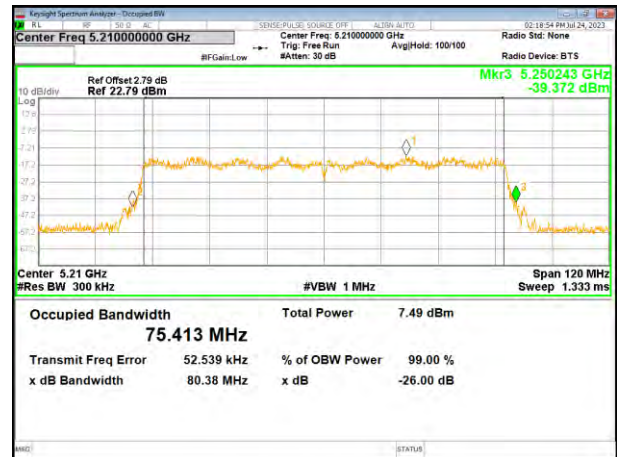


Test plot

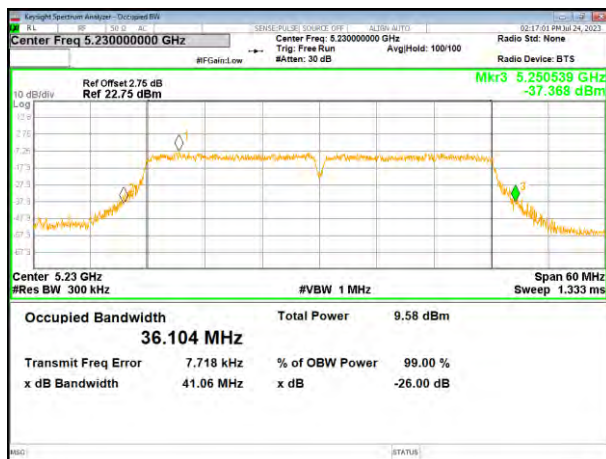
(802.11ac40) plot on channel 38



(802.11ac80) plot on channel 42



(802.11ac40) plot on channel 46





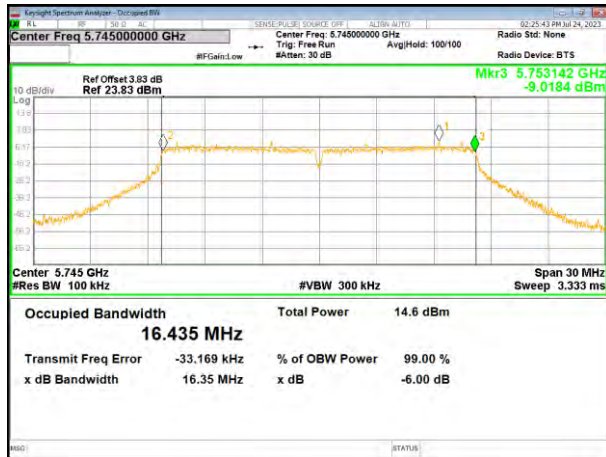
5745-5825MHz

Test CH	-6dB Channel Bandwidth (MHz)						Limit (KHz)	Result
	802.11a	802.11n (HT20)	802.11ac (HT20)	802.11n (HT40)	802.11ac (HT40)	802.11ac (HT80)		
Lowest	16.35	17.14	17.17	35.99	35.48	--	>500	Pass
Middle	16.34	17.25	16.85	--	--	74.10		
Highest	16.32	17.04	16.89	35.33	35.43	--		

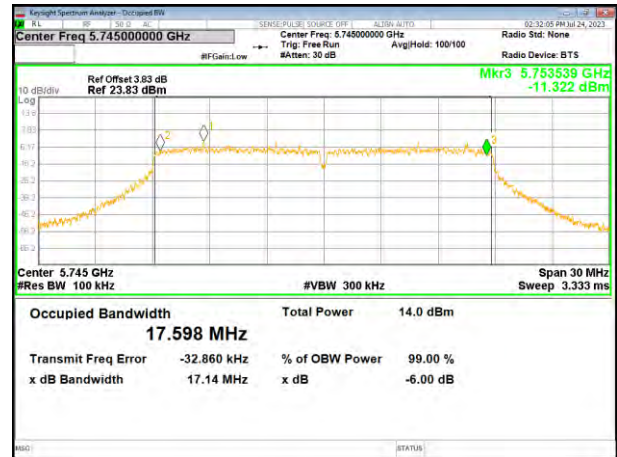
Remark: "---"is not applicable

Test plot

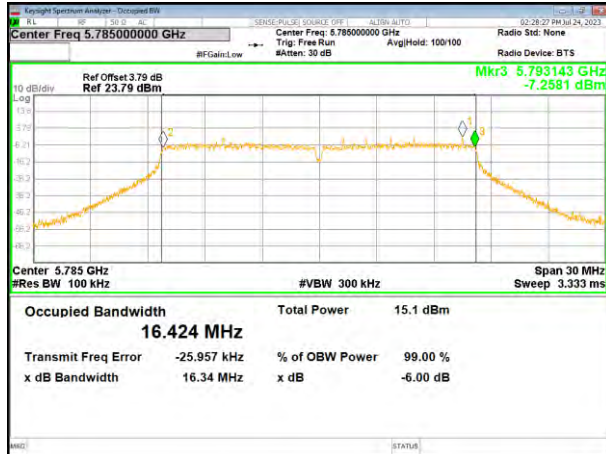
(802.11a) plot on channel 149



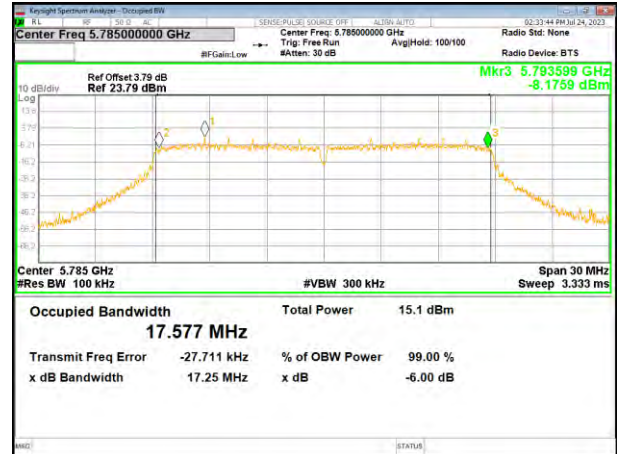
(802.11 n20) plot on channel 149



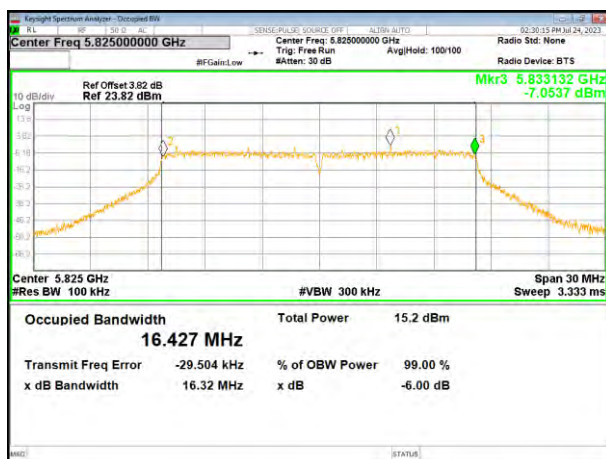
(802.11a) plot on channel 157



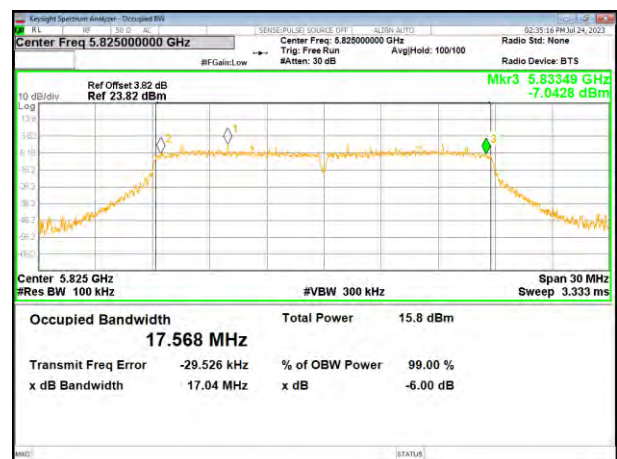
(802.11 n20) plot on channel 157



(802.11a) plot on channel 165

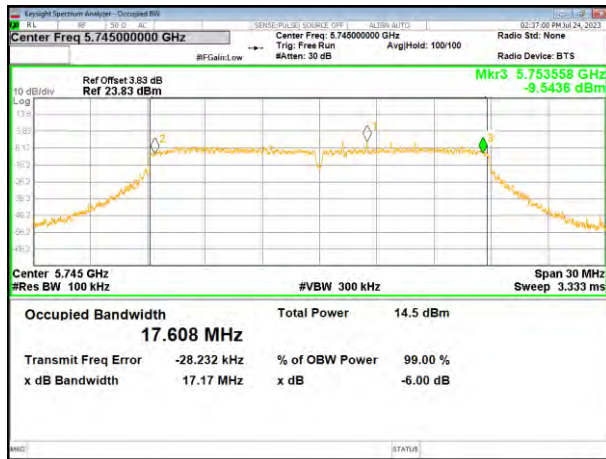


(802.11 n20) plot on channel 165

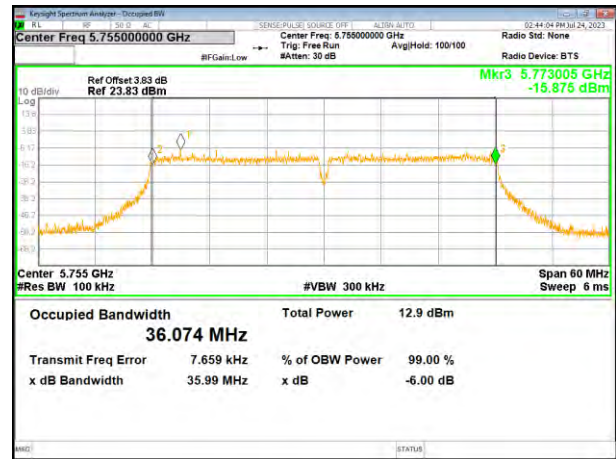


Test plot

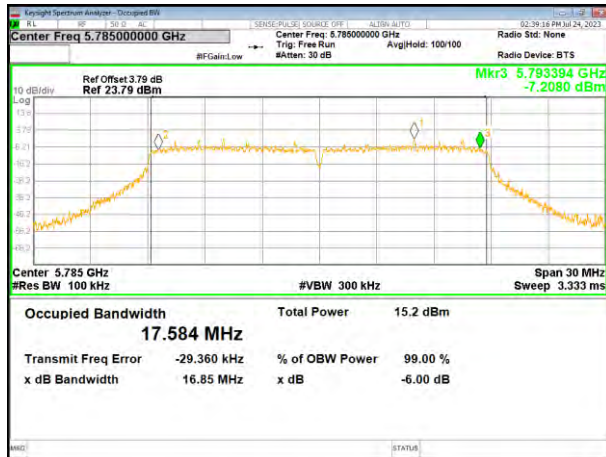
(802.11ac20) plot on channel 149



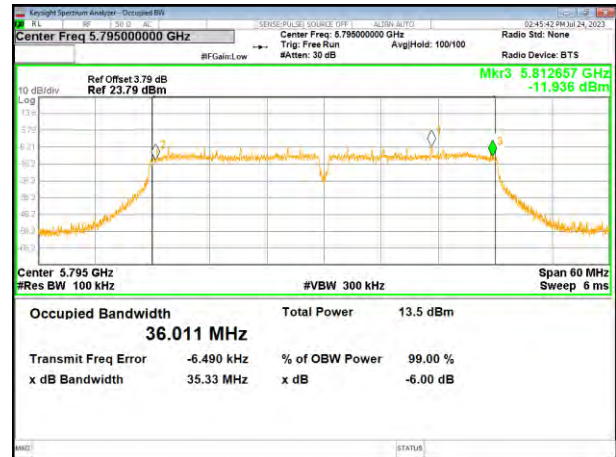
(802.11 n40) plot on channel 151



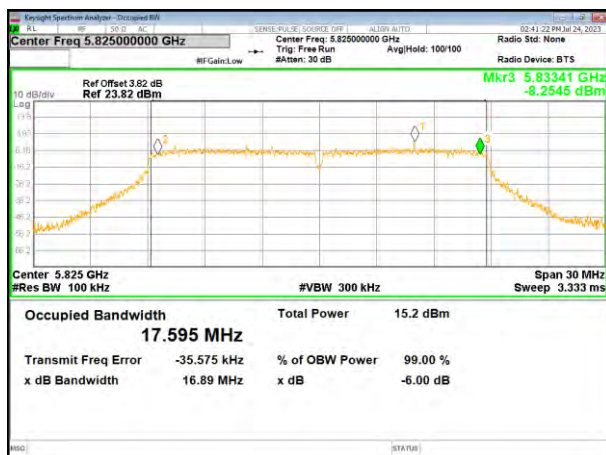
(802.11ac20) plot on channel 157



(802.11 n40) plot on channel 159

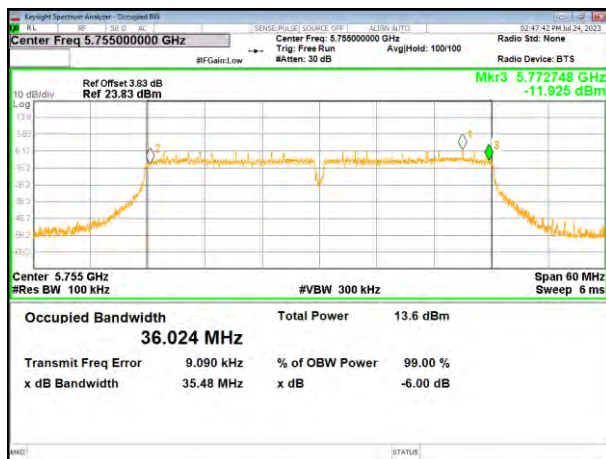


(802.11ac20) plot on channel 165

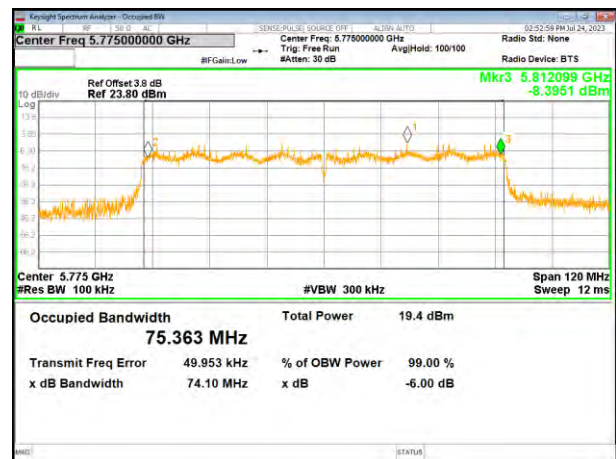


Test plot

(802.11 ac40) plot on channel 151



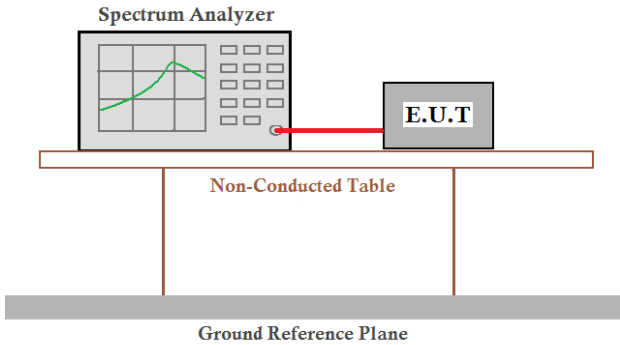
(802.11 ac80) plot on channel 155



(802.11 ac40) plot on channel 159



4.5 Power Spectral Density

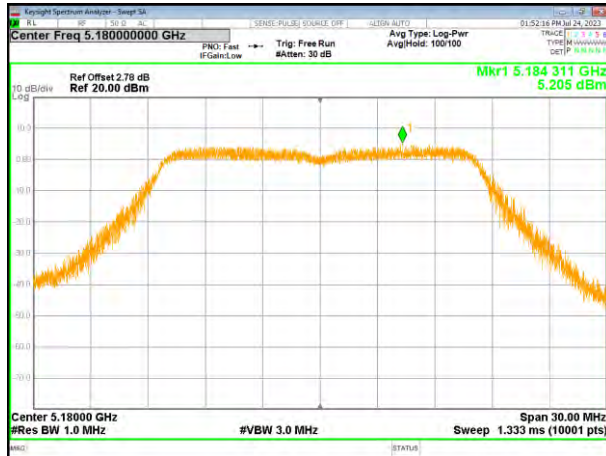
Test Requirement:	FCC Part15 E Section 15.407(a)(1)/ (a)(3)	
Test Method:	ANSI C63.10:2013 and KDB 789033 D02 General U-NII Test Procedures New Rules v02r01	
Limit:	Frequency band (MHz)	Limit
	5150-5250	≤17dBm/1MHz for master device
		≤11dBm/1MHz for client device
	5250-5350	≤11dBm/1MHz for client device
	5470-5725	≤11dBm/1MHz for client device
	5725-5850	≤30dBm/500kHz
Test setup:		
Test Instruments:	Refer to section 3.0 for details	
Test mode:	Refer to section 2.2 for details	
Test environment:	Temp.: 24.3°C	Humid.: 52%RH
Test voltage:	AC 120V	
Test results:	Pass	

Measurement Result

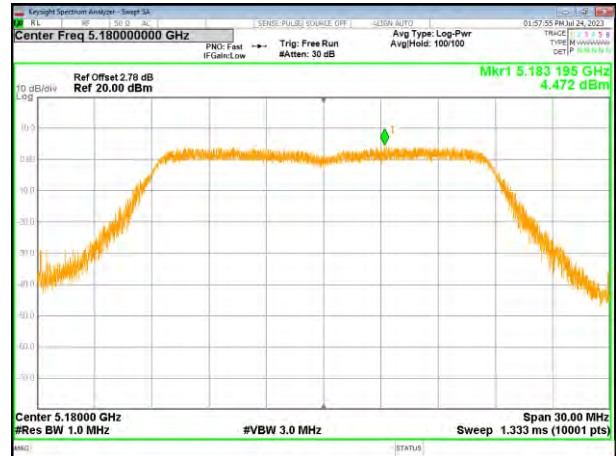
5180-5240MHz

Mode	Frequency	Measured Power Density (dBm/MHz)	Limit (dBm/MHz)
802.11 a	5180 MHz	5.205	11
	5200 MHz	5.073	11
	5240 MHz	4.878	11
802.11 n20	5180 MHz	4.472	11
	5200 MHz	4.678	11
	5240 MHz	4.912	11
802.11 ac20	5180 MHz	-1.5.00	11
	5200 MHz	-2.010	11
	5240 MHz	4.666	11
802.11 n40	5190 MHz	4.876	11
	5230 MHz	4.119	11
802.11 ac40	5190 MHz	-1.023	11
	5230 MHz	-1.664	11
802.11 ac80	5210 MHz	-5.811	11

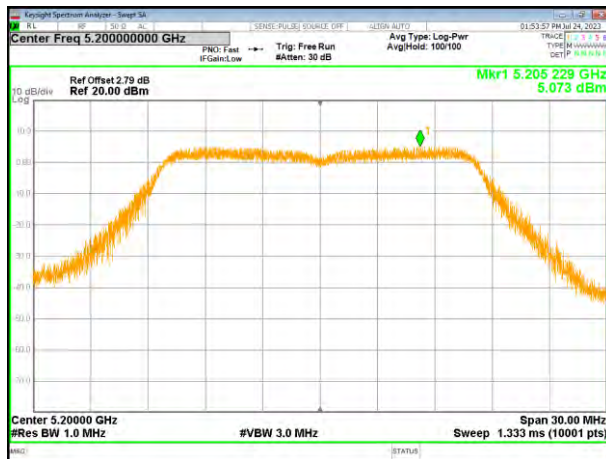
(802.11a) PSD plot on channel 36



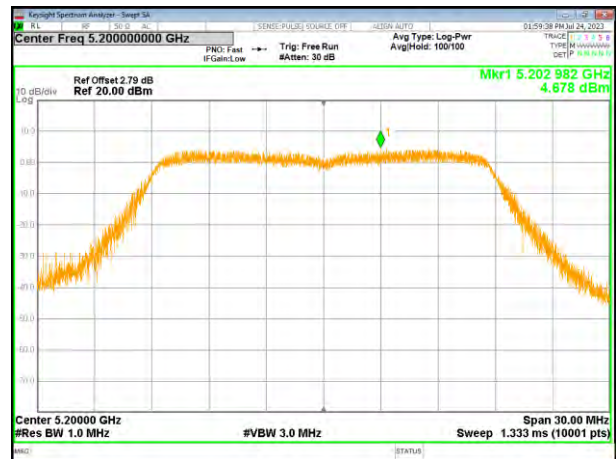
(802.11n20) PSD plot on channel 36



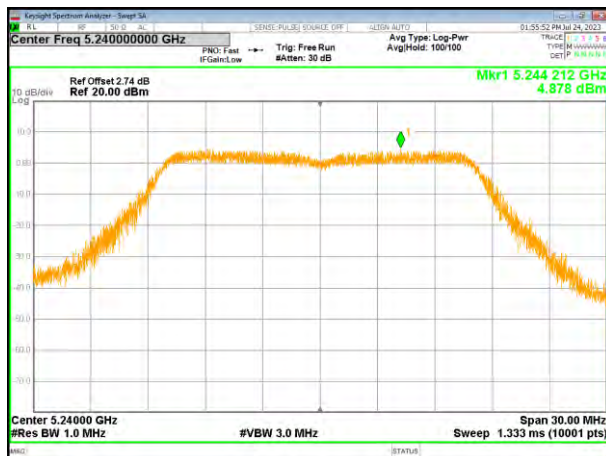
(802.11a) PSD plot on channel 40



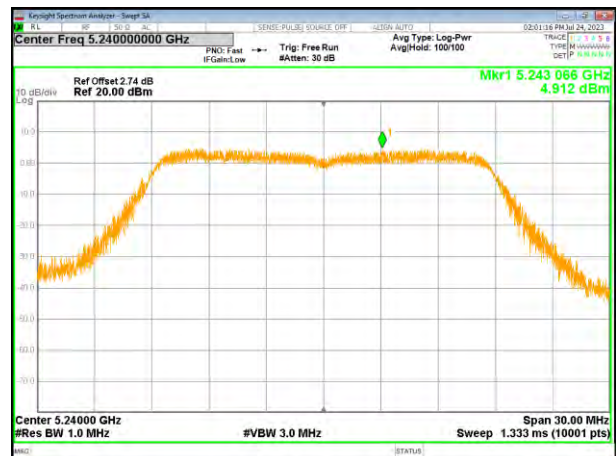
(802.11n20) PSD plot on channel 40



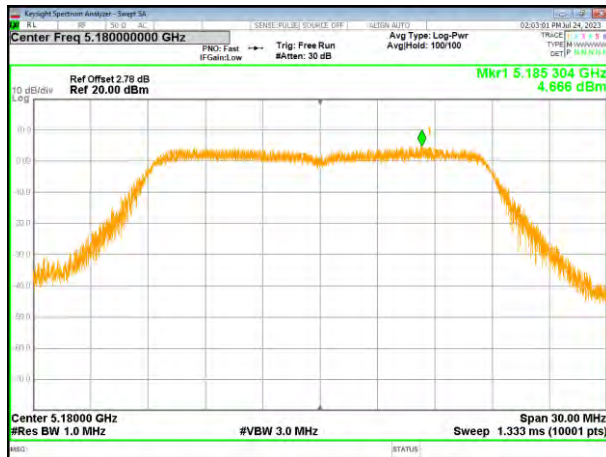
(802.11a) PSD plot on channel 48



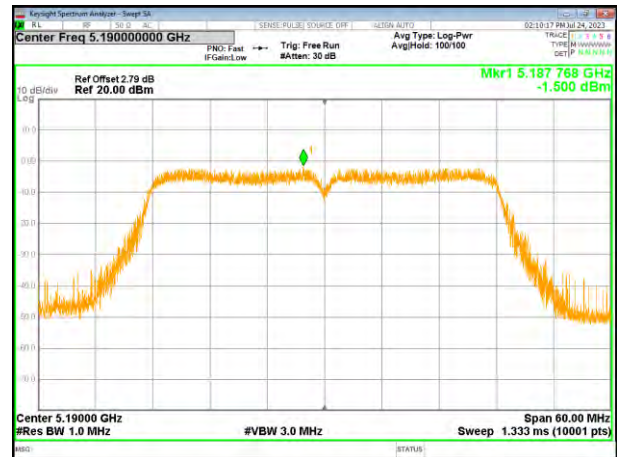
(802.11n20) PSD plot on channel 48



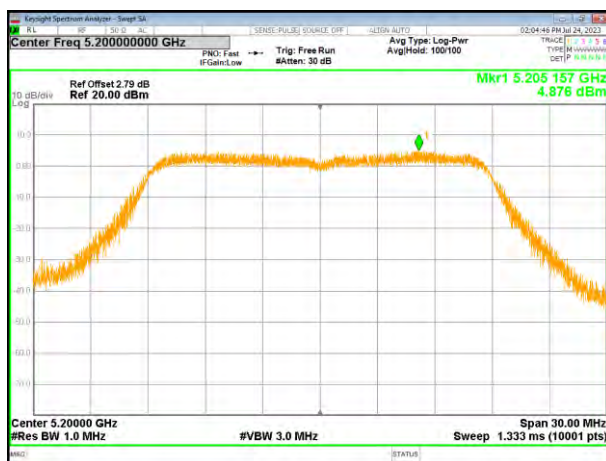
(802.11ac20) PSD plot on channel 36



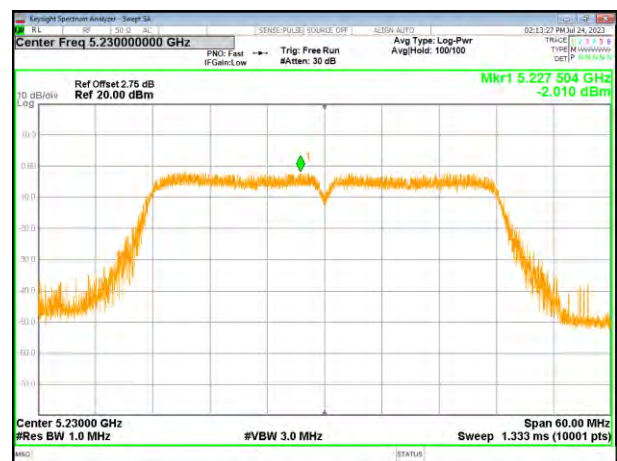
(802.11n40) PSD plot on channel 38



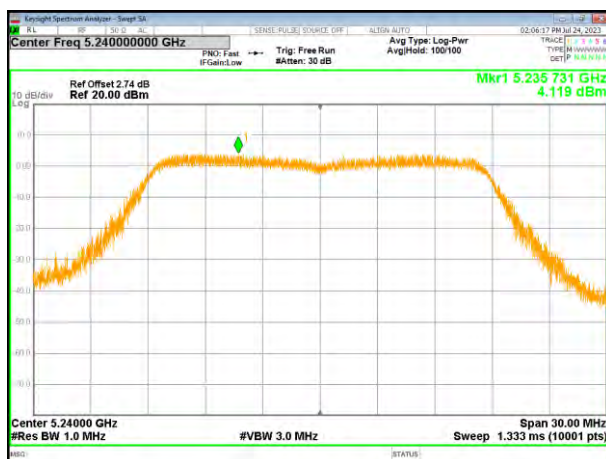
(802.11ac20) PSD plot on channel 40



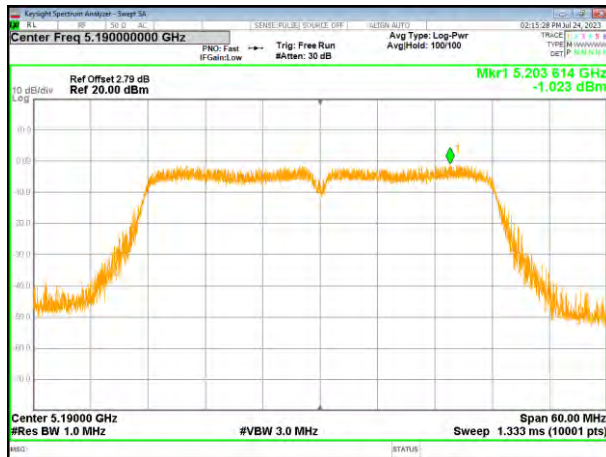
(802.11n40) PSD plot on channel 46



(802.11ac20) PSD plot on channel 48



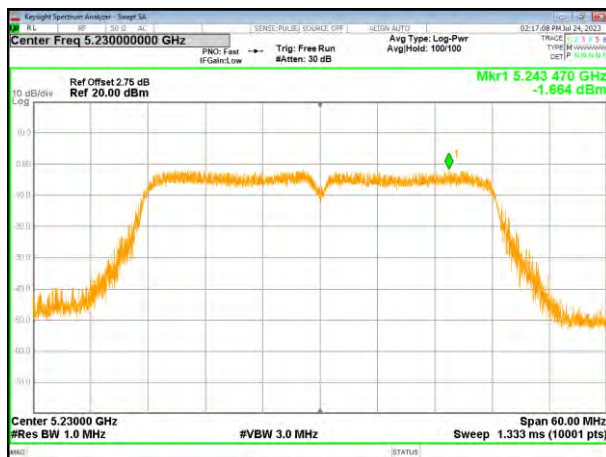
(802.11ac40) PSD plot on channel 38



(802.11ac80) PSD plot on channel 42



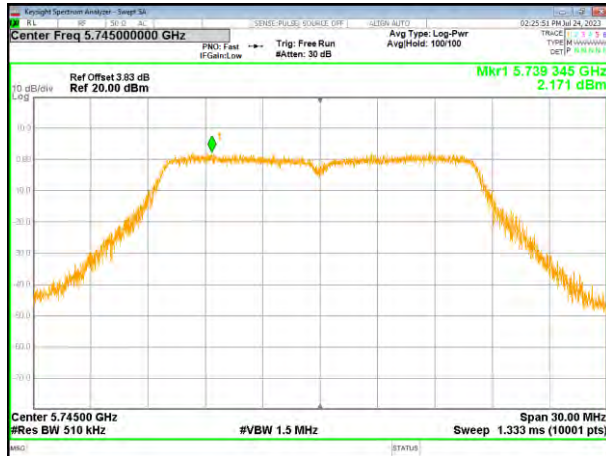
(802.11ac40) PSD plot on channel 46



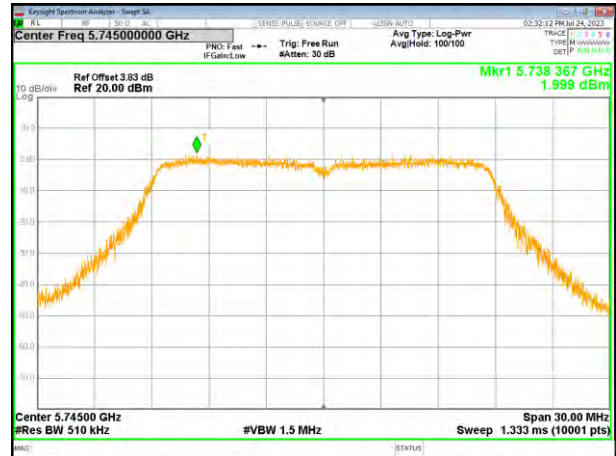
Mode	Frequency	Measured Power Density (dBm/510KHz)	Measured Power Density (dBm/500KHz)	Limit (dBm/MHz)
802.11 a	5745 MHz	2.171	2.085	30
	5785 MHz	3.866	3.780	30
	5825 MHz	4.102	4.016	30
802.11 n20	5745 MHz	1.999	1.913	30
	5785 MHz	2.236	2.150	30
	5825 MHz	3.191	3.105	30
802.11 ac20	5745 MHz	-2.600	-2.686	30
	5785 MHz	-1.918	-2.004	30
	5825 MHz	1.761	1.675	30
802.11 n40	5755 MHz	2.123	2.037	30
	5795 MHz	2.378	2.292	30
802.11 ac40	5755 MHz	-2.142	-2.228	30
	5795 MHz	-1.759	-1.845	30
802.11 AC80	5775 MHz	1.702	1.616	30

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

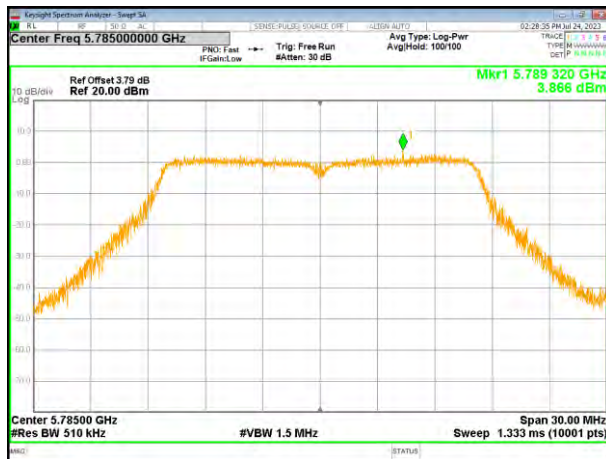
(802.11a) PSD plot on channel 149



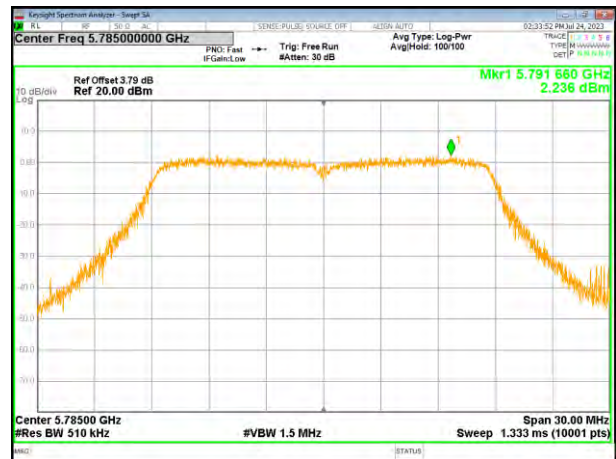
(802.11n20) PSD plot on channel 149



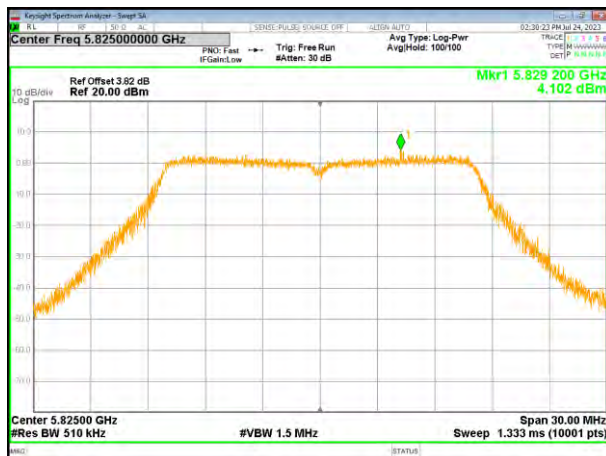
(802.11a) PSD plot on channel 157



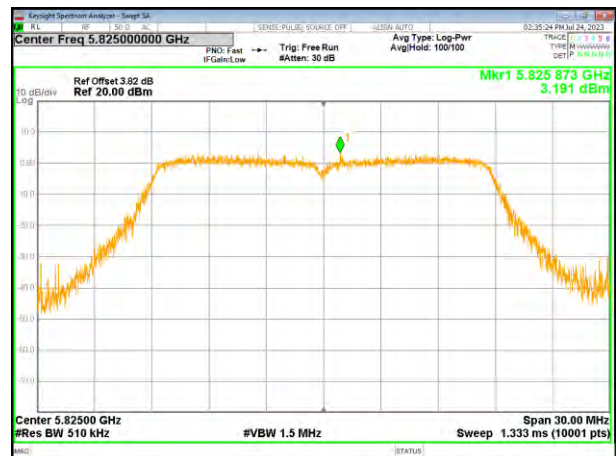
(802.11n20) PSD plot on channel 157



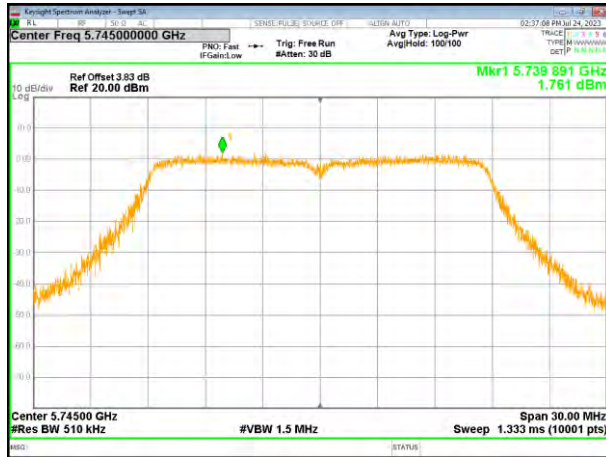
(802.11a) PSD plot on channel 165



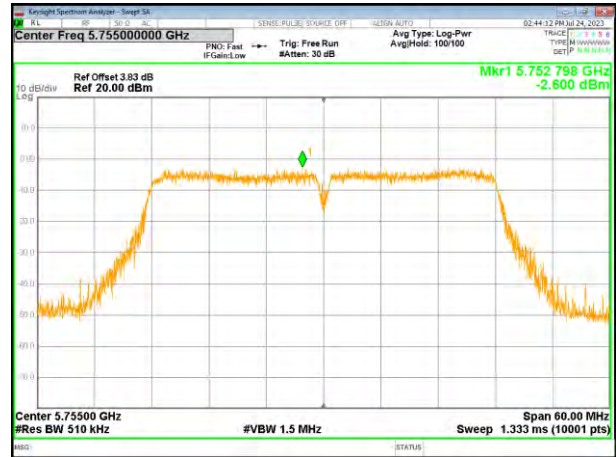
(802.11n20) PSD plot on channel 165



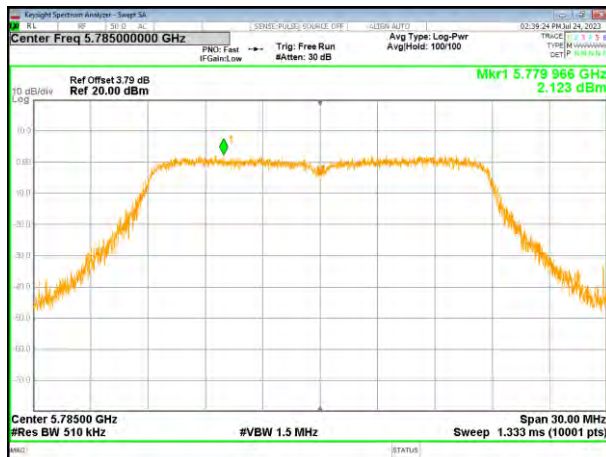
(802.11ac20) PSD plot on channel 149



(802.11n40) PSD plot on channel 151



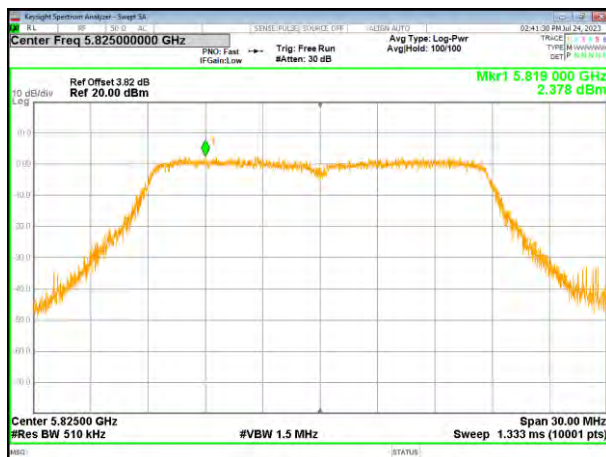
(802.11ac20) PSD plot on channel 157



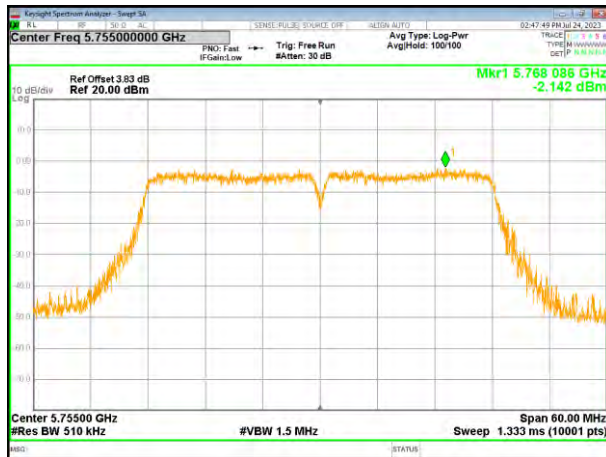
(802.11n40) PSD plot on channel 159



(802.11ac20) PSD plot on channel 165



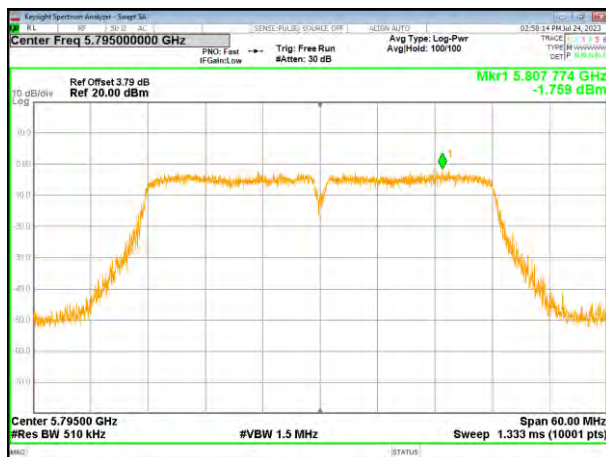
(802.11ac40) PSD plot on channel 151



(802.11ac80) PSD plot on channel 155

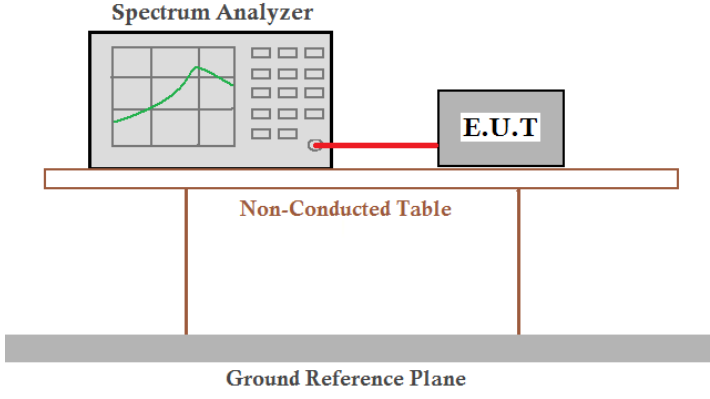


(802.11ac40) PSD plot on channel 159



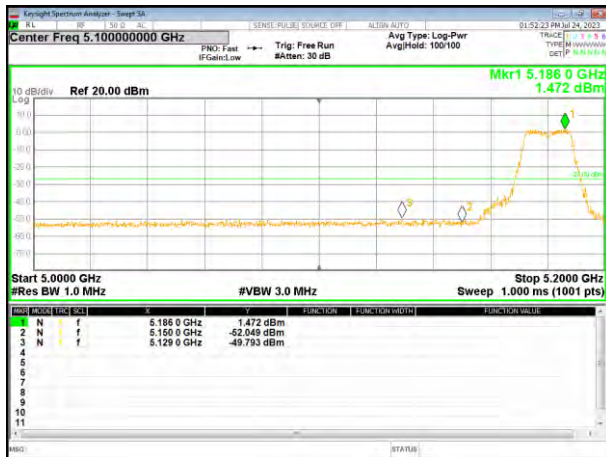
4.6 Band edge

4.6.1 Conducted test Method

Test Requirement:	FCC Part15 C Section 15.209 and 15.205	
Test Method:	ANSI C63.10: 2013	
Limit:	All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.	
Test setup:	 The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) via a red cable. Both are placed on a Non-Conducted Table, which is supported by a Ground Reference Plane.	
Test Procedure:	1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator. 2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range. 3. Set RBW of spectrum analyzer to 1 MHz with a convenient frequency span. 4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency. 5. Repeat above procedures until all measured frequencies were complete..	
Test Instruments:	Refer to section 3.0 for details	
Test mode:	Refer to section 2.2 for details	
Test environment:	Temp.: 24.3°C	Humid.: 52%RH
Test voltage:	AC 120V	
Test results:	Pass	

5.180~5.240 GHz

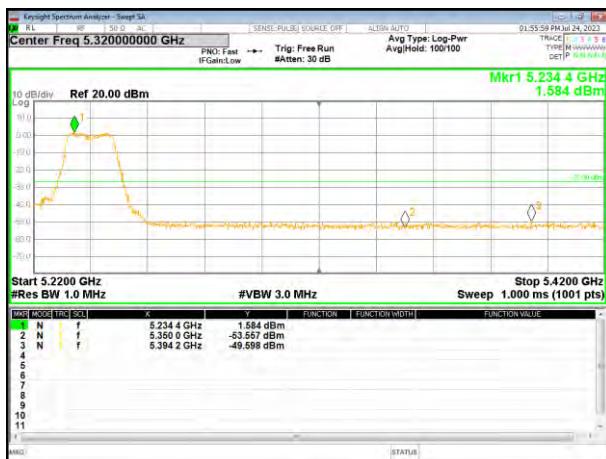
(802.11a) Band Edge, Left Side



(802.11n20) Band Edge, Left Side



(802.11a) Band Edge, Right Side

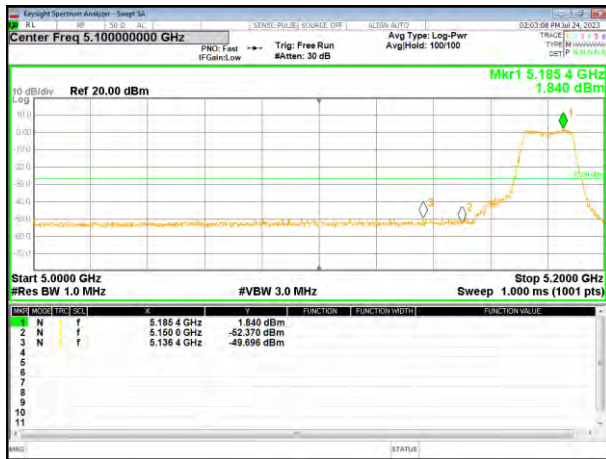


(802.11n20) Band Edge, Right Side

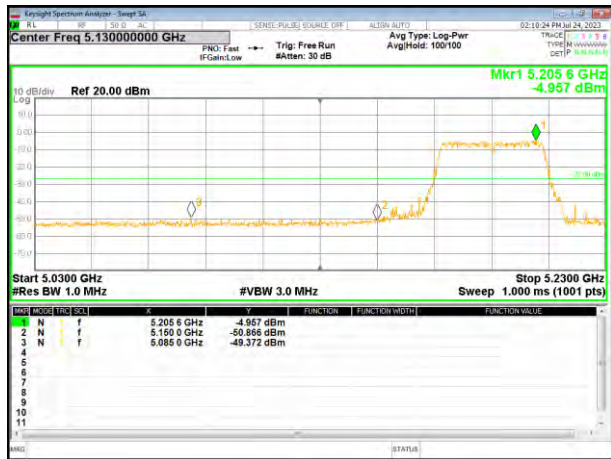


5.180~5.240 GHz

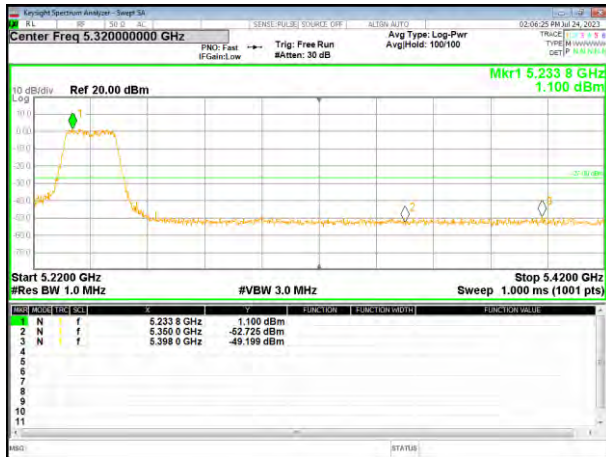
(802.11ac20) Band Edge, Left Side



(802.11n40) Band Edge, Left Side



(802.11ac20) Band Edge, Right Side

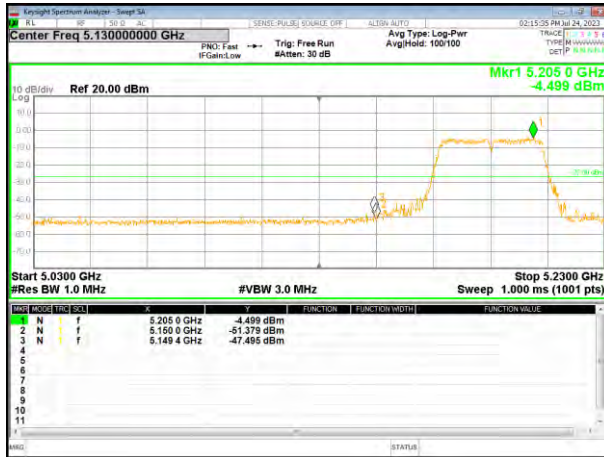


(802.11n40) Band Edge, Right Side

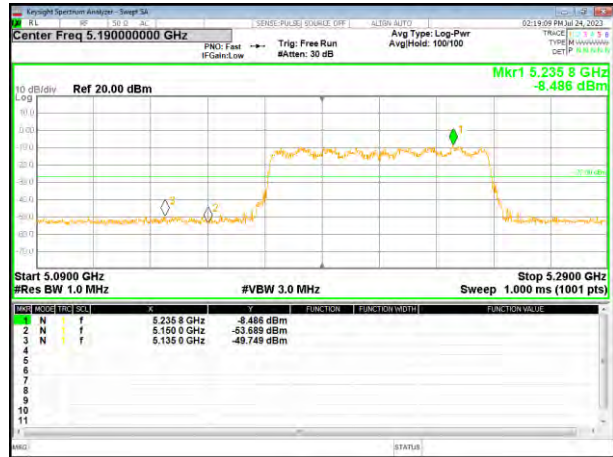


5.180~5.240 GHz

(802.11ac40) Band Edge, Left Side



(802.11ac80) Band Edge

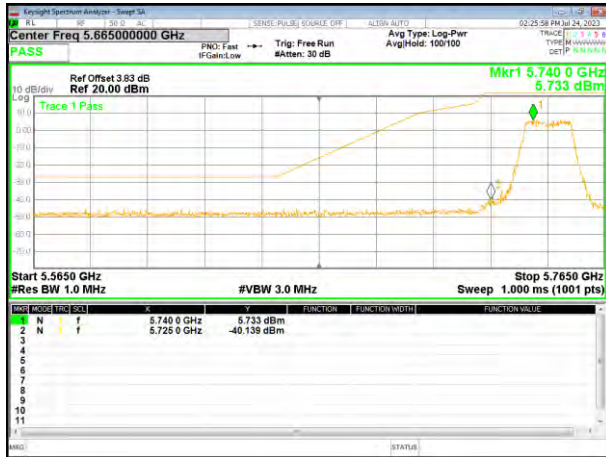


(802.11ac40) Band Edge, Right Side

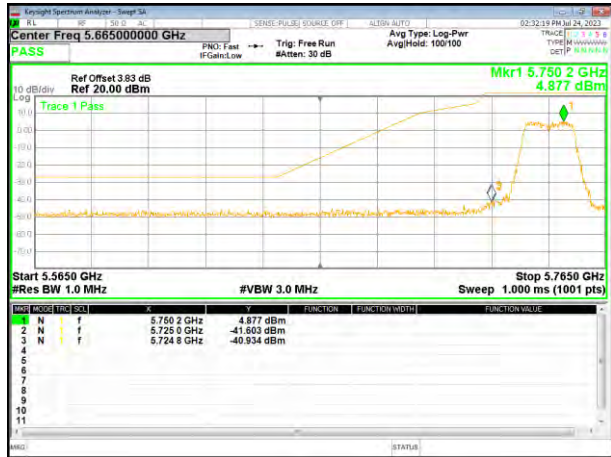


5.745~5.825 GHz

(802.11a) Band Edge, Left Side



(802.11n20) Band Edge, Left Side



(802.11a) Band Edge, Right Side

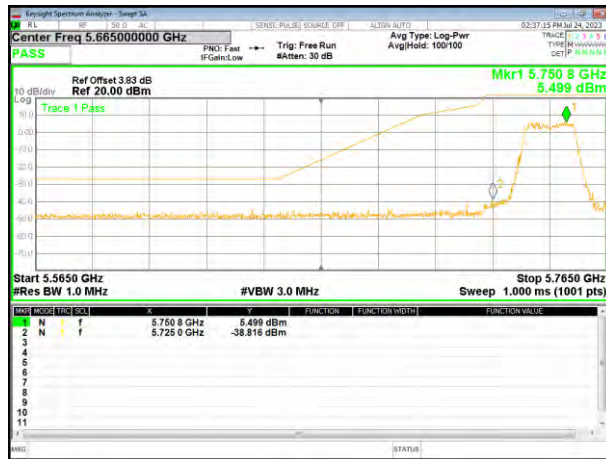


(802.11n20) Band Edge, Right Side

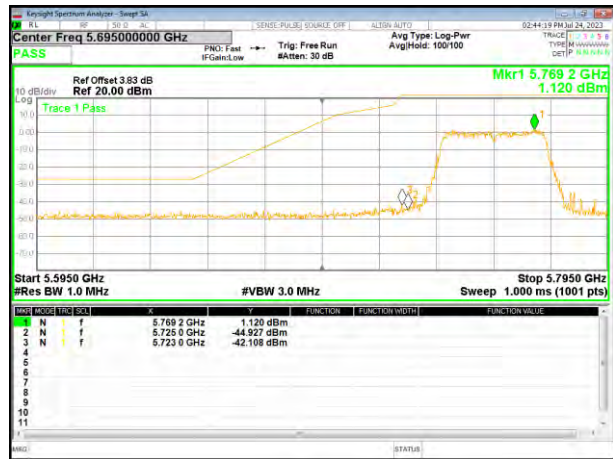


5.745~5.825 GHz

(802.11ac20) Band Edge, Left Side



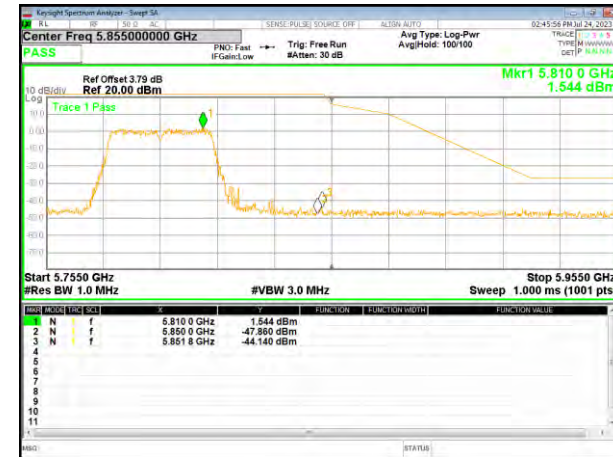
(802.11n40) Band Edge, Left Side



(802.11ac20) Band Edge, Right Side

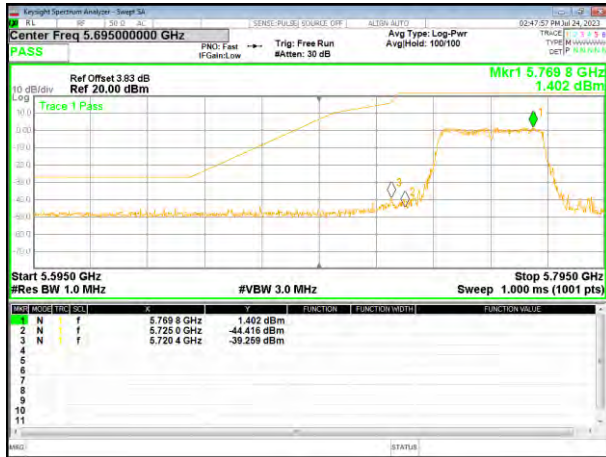


(802.11n40) Band Edge, Right Side



5.745~5.825 GHz

(802.11ac40) Band Edge, Left Side



(802.11ac80) Band Edge

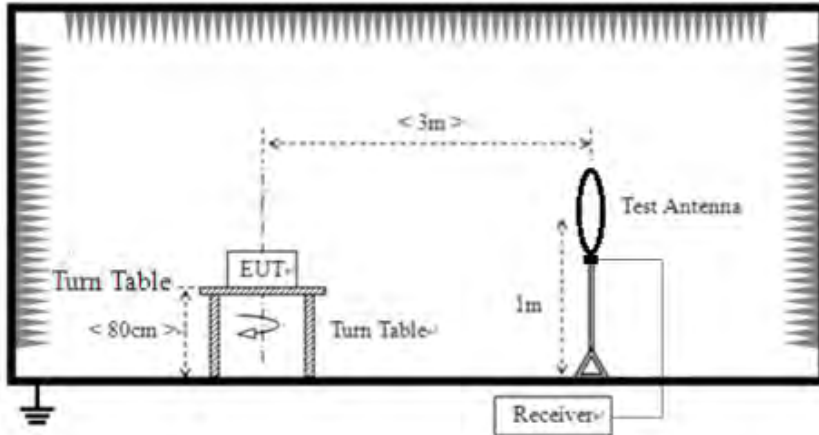


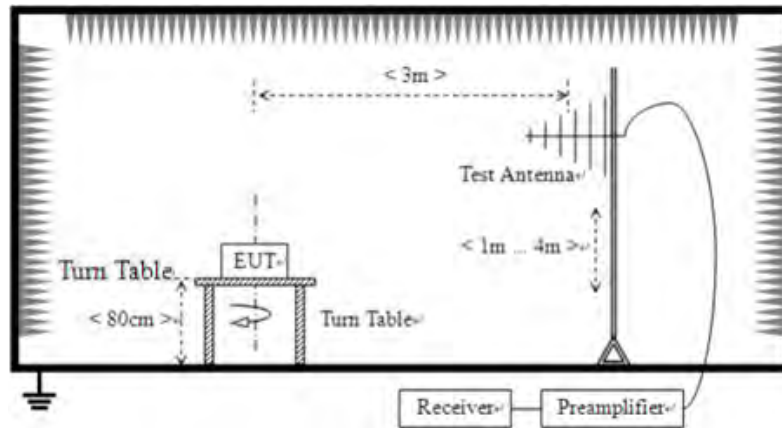
(802.11ac40) Band Edge, Right Side



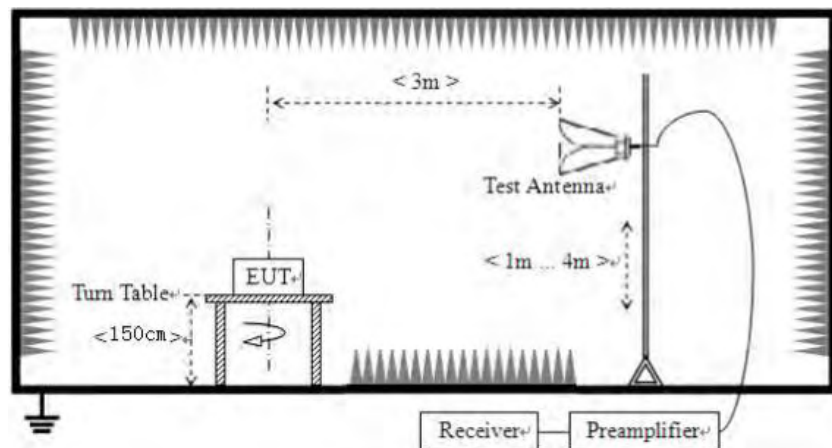
4.7 Spurious Emission

4.7.1 Radiated Emission Method

Test Requirement:	FCC Part15 C Section 15.209, Part 15E Section 15.407(b)(4)				
Test Method:	ANSI C63.10:2013				
Test Frequency Range:	9kHz to 40GHz				
Test site:	Measurement Distance: 3m				
Receiver setup:	Frequency	Detector	RBW	VBW	Value
	9kHz-150KHz	Quasi-peak	200Hz	1kHz	Quasi-peak Value
	150kHz-30MHz	Quasi-peak	9kHz	30kHz	Quasi-peak Value
	30MHz-1GHz	Quasi-peak	120KHz	300KHz	Quasi-peak Value
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
		AV	1MHz	3MHz	Average Value
Limit:	Frequency		Limit (uV/m)	Value	Measurement Distance
	0.009MHz-0.490MHz		2400/F(KHz)	QP	300m
	0.490MHz-1.705MHz		24000/F(KHz)	QP	300m
	1.705MHz-30MHz		30	QP	30m
	30MHz-88MHz		100	QP	3m
	88MHz-216MHz		150	QP	
	216MHz-960MHz		200	QP	
	960MHz-1GHz		500	QP	
	Frequency		Limit (dBm/MHz)	Remark	
	Above 1GHz		-27.0	Peak Value	
Test setup:	For radiated emissions from 9kHz to 30MHz				
					
	For radiated emissions from 30MHz to1GHz				



For radiated emissions above 1GHz



Test Procedure:

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



	method as specified and then reported in a data sheet. The radiation measurements are performed in X, Y, Z axis positioning. And found the X axis positioning which it is worse case, only the test worst case mode is recorded in the report.
Test Instruments:	Refer to section 3.0 for details
Test mode:	Refer to section 2.2 for details
Test results:	Pass

Remarks:

- 1. The report only shows the worst mode.*
- 2. Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis which it is worse case.*

Measurement Data:

9 kHz ~ 30 MHz

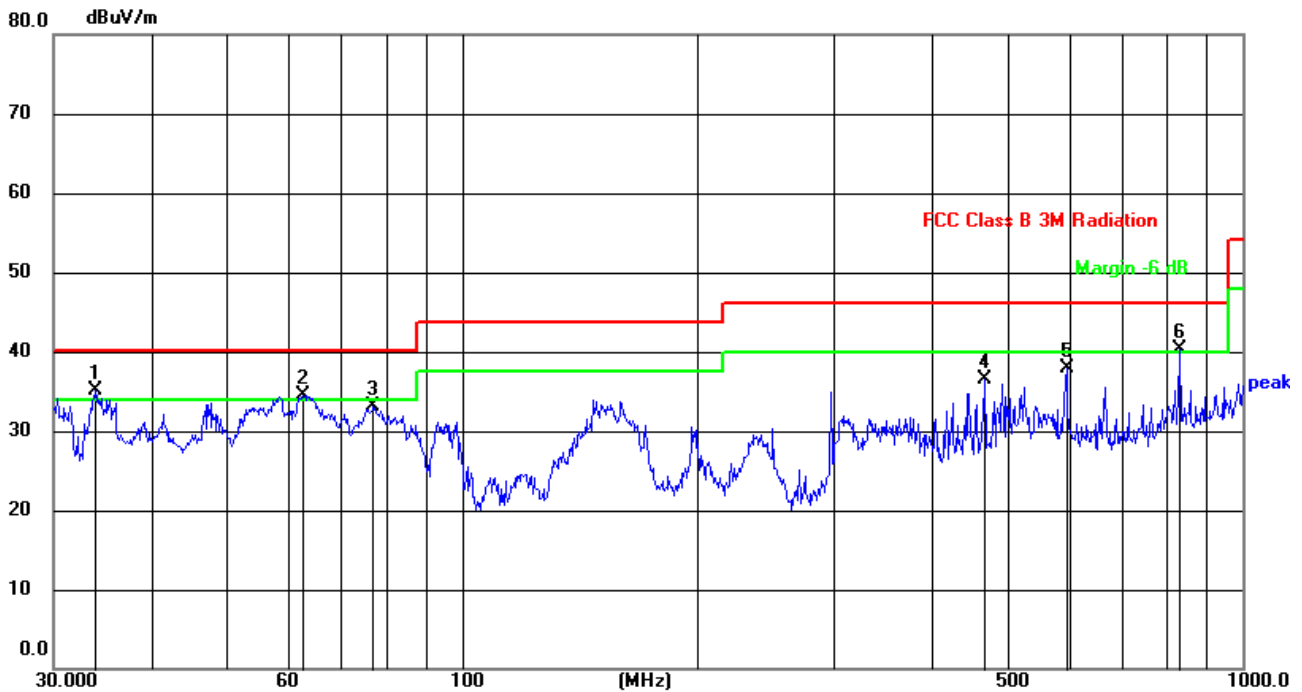
The emission from 9 kHz to 30MHz was pre-tested and found the result was 20dB lower than the limit, and according to 15.31(o) & RSS-Gen 6.13, the test result no need to reported.

Below 1GHz

Remark: The test data shows only the worst case 802.11n20 mode.

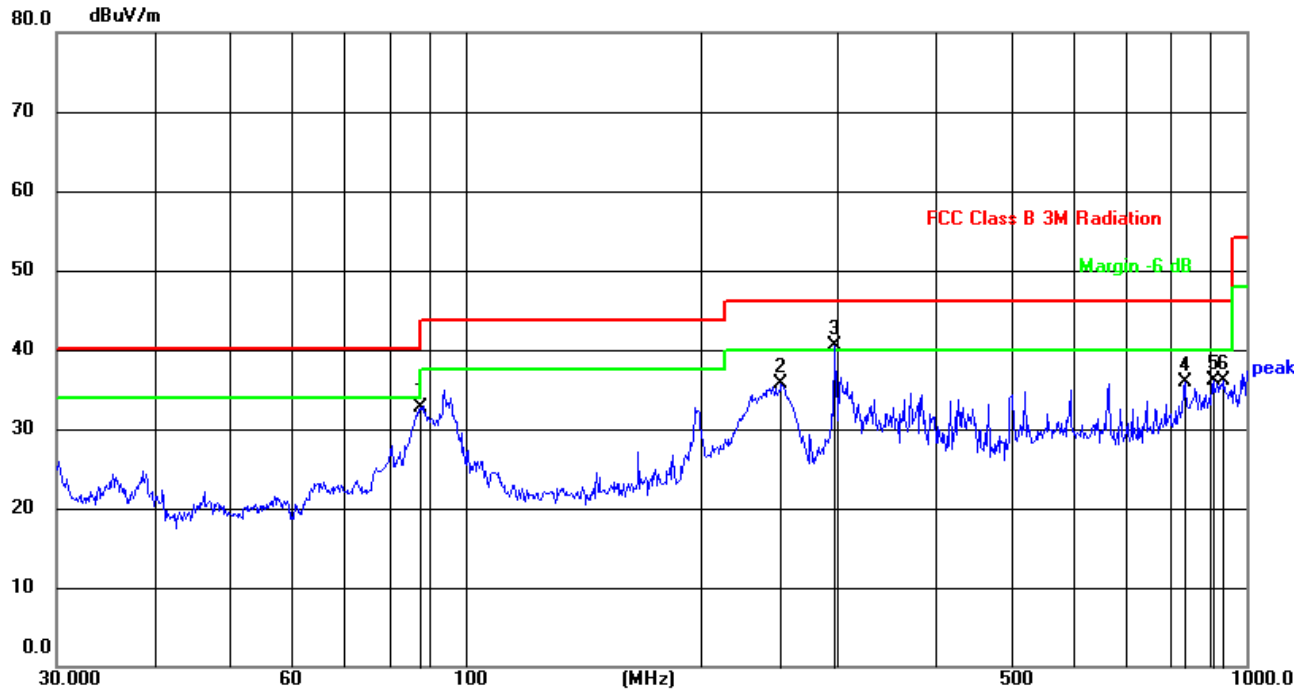
Temperature:	24.3°C	Relative Humidity:	52%
Pressure:	1010 hPa	Test Voltage :	AC 120V
Test Mode :	5.8G TX-802.11 n20		

Horizontal:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	33.9172	57.14	-21.94	35.20	40.00	-4.80	QP
2	62.6505	57.56	-22.97	34.59	40.00	-5.41	QP
3	77.0502	58.59	-25.51	33.08	40.00	-6.92	QP
4	467.2348	51.99	-15.54	36.45	46.00	-9.55	QP
5	595.1326	49.71	-11.86	37.85	46.00	-8.15	QP
6	830.4000	46.73	-6.36	40.37	46.00	-5.63	QP

Vertical:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	87.7245	58.26	-25.56	32.70	40.00	-7.30	QP
2	253.8366	57.97	-22.19	35.78	46.00	-10.22	QP
3	297.2238	60.92	-20.40	40.52	46.00	-5.48	QP
4	833.3170	42.31	-6.35	35.96	46.00	-10.04	QP
5	906.4823	41.32	-5.23	36.09	46.00	-9.91	QP
6	935.5461	40.32	-4.29	36.03	46.00	-9.97	QP

Remarks:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
2. The emission levels of other frequencies are very lower than the limit and not show in test report.
3. The test data shows only the worst case 802.11n20 mode

**Above 1GHz:***Remark: The test data shows only the worst case 802.11a mode.*

Temperature:	24.3℃	Relative Humidity:	52%
Pressure:	1010 hPa	Test Voltage :	AC 120V
Test Mode :	5.2G TX- 802.11a		

Polar (H/V)	Frequency	Meter Reading	Pre- amplifier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detect or Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Low Channel:5180MHz									
V	10360.00	48.90	46.20	8.27	38.50	49.47	68.20	-18.73	PK
V	10360.00	39.50	46.20	8.27	38.50	40.07	54.00	-13.93	AV
V	15540.00	46.18	46.30	10.35	38.70	48.93	74.00	-25.07	PK
V	15540.00	36.73	46.30	10.35	38.70	39.48	54.00	-14.52	AV
V	20720.00	54.75	57.40	11.93	37.80	47.08	68.20	-21.12	PK
V	20720.00	45.30	57.40	11.93	37.80	37.63	54.00	-16.37	AV
V	25900.00	52.53	56.50	13.45	39.70	49.18	68.20	-19.02	PK
V	25900.00	42.69	56.50	13.45	39.70	39.34	54.00	-14.66	AV
H	10360.00	48.82	46.20	8.27	38.50	49.39	68.20	-18.81	PK
H	10360.00	38.21	46.20	8.27	38.50	38.78	54.00	-15.22	AV
H	15540.00	45.25	46.30	10.35	38.70	48.00	74.00	-26.00	PK
H	15540.00	34.43	46.30	10.35	38.70	37.18	54.00	-16.82	AV
H	20720.00	56.84	57.40	11.93	37.80	49.17	68.20	-19.03	PK
H	20720.00	46.15	57.40	11.93	37.80	38.48	54.00	-15.52	AV
H	25900.00	53.49	56.50	13.45	39.70	50.14	68.20	-18.07	PK
H	25900.00	42.73	56.50	13.45	39.70	39.38	54.00	-14.62	AV

Polar (H/V)	Frequency	Meter Reading	Pre- amplifier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detect or Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Middle Channel:5200MHz									
V	10400.00	47.99	46.20	8.27	38.50	48.56	68.20	-19.64	PK
V	10400.00	39.27	46.20	8.27	38.50	39.84	54.00	-14.16	AV
V	15600.00	46.47	46.30	10.35	38.40	48.92	74.00	-25.08	PK
V	15600.00	38.16	46.30	10.35	38.40	40.61	54.00	-13.39	AV
V	20800.00	55.88	57.40	11.93	37.80	48.21	68.20	-19.99	PK
V	20800.00	46.74	57.40	11.93	37.80	39.07	54.00	-14.93	AV
V	26000.00	51.30	56.50	13.45	39.80	48.05	68.20	-20.15	PK
V	26000.00	43.87	56.50	13.45	39.80	40.62	54.00	-13.38	AV
H	10400.00	48.57	46.20	8.27	38.50	49.14	68.20	-19.06	PK
H	10400.00	39.52	46.20	8.27	38.50	40.09	54.00	-13.91	AV
H	15600.00	46.46	46.30	10.35	38.40	48.91	74.00	-25.10	PK
H	15600.00	38.16	46.30	10.35	38.40	40.61	54.00	-13.39	AV
H	20800.00	54.89	57.40	11.93	37.80	47.22	68.20	-20.98	PK
H	20800.00	44.75	57.40	11.93	37.80	37.08	54.00	-16.92	AV
H	26000.00	51.02	56.50	13.45	39.80	47.77	68.20	-20.43	PK
H	26000.00	43.12	56.50	13.45	39.80	39.87	54.00	-14.13	AV

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre- amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detect or Type
High Channel:5240MHz									
V	10480.00	44.99	46.20	8.27	38.60	45.66	68.20	-22.54	PK
V	10480.00	35.57	46.20	8.27	38.60	36.24	54.00	-17.76	AV
V	15720.00	42.69	46.30	10.35	38.40	45.14	74.00	-28.86	PK
V	15720.00	33.42	46.30	10.35	38.40	35.87	54.00	-18.13	AV
V	20960.00	52.24	57.40	11.93	37.50	44.27	68.20	-23.93	PK
V	20960.00	44.15	57.40	11.93	37.50	36.18	54.00	-17.82	AV
V	26200.00	48.45	56.50	13.45	40.10	45.50	68.20	-22.70	PK
V	26200.00	39.56	56.50	13.45	40.10	36.61	54.00	-17.39	AV
H	10480.00	45.22	46.20	8.27	38.60	45.89	68.20	-22.31	PK
H	10480.00	35.57	46.20	8.27	38.60	36.24	54.00	-17.76	AV
H	15720.00	43.02	46.30	10.35	38.40	45.47	74.00	-28.53	PK
H	15720.00	33.52	46.30	10.35	38.40	35.97	54.00	-18.03	AV
H	20960.00	52.41	57.40	11.93	37.50	44.44	68.20	-23.76	PK
H	20960.00	44.05	57.40	11.93	37.50	36.08	54.00	-17.92	AV
H	26200.00	48.17	56.50	13.45	40.10	45.22	68.20	-22.99	PK
H	26200.00	38.97	56.50	13.45	40.10	36.02	54.00	-17.98	AV

Remark:

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



Temperature:	24.3℃	Relative Humidity:	52%
Pressure:	1010 hPa	Test Voltage :	AC 120V
Test Mode :	5.8G TX- 802.11n20		

Polar (H/V)	Frequency	Meter Readi g	Pre- amplifier	Cable Loss	Antenn Factor	Emission Level	Limits	Margin	Detect or Typ
	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Low Channel:5745MHz									
V	11490.00	44.37	46.10	8.77	39.10	46.14	74.00	-27.86	PK
V	11490.00	36.93	46.10	8.77	39.10	38.70	54.00	-15.30	AV
V	17235.00	42.16	47.60	11.10	38.70	44.36	68.20	-23.84	PK
V	17235.00	35.50	47.60	11.10	38.70	37.70	54.00	-16.30	AV
V	22980.00	50.12	56.90	12.73	37.70	43.65	74.00	-30.35	PK
V	22980.00	42.83	56.90	12.73	37.70	36.36	54.00	-17.64	AV
V	28725.00	47.22	55.60	14.25	40.30	46.17	68.20	-22.04	PK
V	28725.00	39.45	55.60	14.25	40.30	38.40	54.00	-15.60	AV
H	11490.00	44.81	46.10	8.77	39.10	46.58	74.00	-27.42	PK
H	11490.00	36.77	46.10	8.77	39.10	38.54	54.00	-15.46	AV
H	17235.00	43.09	47.60	11.10	38.70	45.29	68.20	-22.91	PK
H	17235.00	35.88	47.60	11.10	38.70	38.08	54.00	-15.92	AV
H	22980.00	52.15	56.90	12.73	37.70	45.68	74.00	-28.32	PK
H	22980.00	42.62	56.90	12.73	37.70	36.15	54.00	-17.85	AV
H	28725.00	49.01	55.60	14.25	40.30	47.96	68.20	-20.24	PK
H	28725.00	40.02	55.60	14.25	40.30	38.97	54.00	-15.03	AV

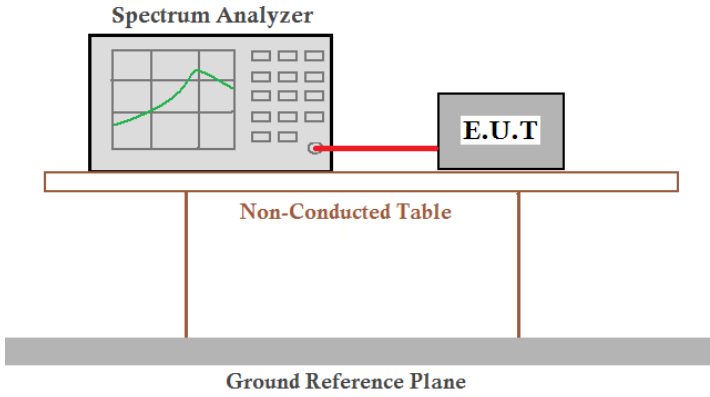
Polar (H/V)	Frequency	Meter Reading	Pre- amplifier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detect or Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Middle Channel:5785MHz									
V	11570.00	44.20	46.10	8.77	39.10	45.97	74.00	-28.03	PK
V	11570.00	36.77	46.10	8.77	39.10	38.54	54.00	-15.47	AV
V	17355.00	41.99	47.60	11.10	38.70	44.19	68.20	-24.01	PK
V	17355.00	35.32	47.60	11.10	38.70	37.52	54.00	-16.48	AV
V	23140.00	49.96	56.90	12.73	37.70	43.49	74.00	-30.51	PK
V	23140.00	42.65	56.90	12.73	37.70	36.18	54.00	-17.82	AV
V	28925.00	47.03	55.60	14.25	40.30	45.98	68.20	-22.22	PK
V	28925.00	39.28	55.60	14.25	40.30	38.23	54.00	-15.77	AV
H	11570.00	44.63	46.10	8.77	39.10	46.40	74.00	-27.60	PK
H	11570.00	36.58	46.10	8.77	39.10	38.35	54.00	-15.65	AV
H	17355.00	42.92	47.60	11.10	38.70	45.12	68.20	-23.08	PK
H	17355.00	35.70	47.60	11.10	38.70	37.90	54.00	-16.10	AV
H	23140.00	51.97	56.90	12.73	37.70	45.50	74.00	-28.50	PK
H	23140.00	42.45	56.90	12.73	37.70	35.98	54.00	-18.02	AV
H	28925.00	48.84	55.60	14.25	40.30	47.79	68.20	-20.41	PK
H	28925.00	39.85	55.60	14.25	40.30	38.80	54.00	-15.20	AV

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre- amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detect or Type
High Channel:5825MHz									
V	11650.00	45.20	46.10	8.77	39.10	46.97	74.00	-27.03	PK
V	11650.00	36.92	46.10	8.77	39.10	38.69	54.00	-15.31	AV
V	17475.00	43.25	47.90	11.23	38.90	45.48	68.20	-22.72	PK
V	17475.00	36.25	47.90	11.23	38.90	38.48	54.00	-15.52	AV
V	23300.00	52.08	57.10	12.73	37.80	45.51	68.20	-22.69	PK
V	23300.00	43.50	57.10	12.73	37.80	36.93	54.00	-17.07	AV
V	29125.00	49.10	55.80	14.25	40.50	48.05	68.20	-20.15	PK
V	29125.00	40.99	55.80	14.25	40.50	39.94	54.00	-14.06	AV
H	11650.00	47.03	46.10	8.77	39.10	48.80	74.00	-25.21	PK
H	11650.00	39.11	46.10	8.77	39.10	40.88	54.00	-13.12	AV
H	17475.00	44.37	47.90	11.23	38.90	46.60	68.20	-21.61	PK
H	17475.00	37.42	47.90	11.23	38.90	39.65	54.00	-14.35	AV
H	23300.00	53.36	57.10	12.73	37.80	46.79	68.20	-21.41	PK
H	23300.00	44.83	57.10	12.73	37.80	38.26	54.00	-15.74	AV
H	29125.00	50.06	55.80	14.25	40.50	49.01	68.20	-19.19	PK
H	29125.00	41.67	55.80	14.25	40.50	40.62	54.00	-13.38	AV

Remark:

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

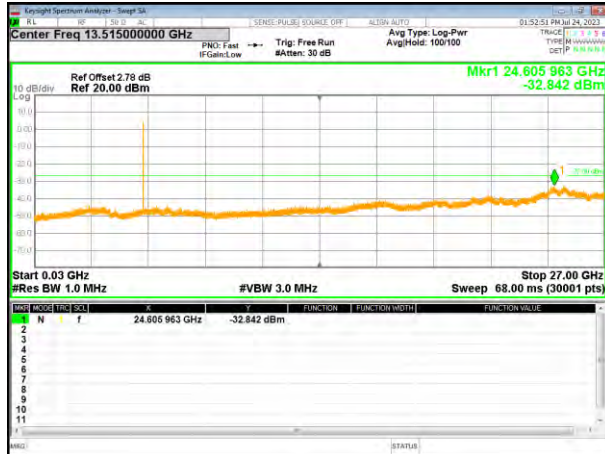
4.7.2 Conducted Emission Method

Test Requirement:	FCC Part15 C Section 15.209, Part 15E Section 15.407(b)(4)	
Test Method:	ANSI C63.10:2013	
Limit:	-27dBm/MHz	
Test setup:	 The diagram illustrates the test setup for conducted emissions. A Spectrum Analyzer is connected to an Equipment Under Test (E.U.T.) via a red cable. Both the Spectrum Analyzer and the E.U.T. are placed on a Non-Conducted Table. The table is supported by a Ground Reference Plane.	
Test Instruments:	Refer to section 3.0 for details	
Test mode:	Refer to section 2.2 for details	
Test environment:	Temp.: 24.3°C	Humid.: 52%RH
Test voltage:	AC 120V	
Test results:	Pass	

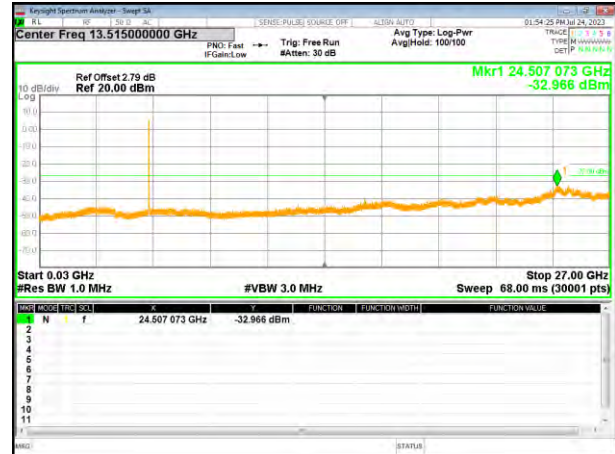
5180-5240MHz

Test Plot

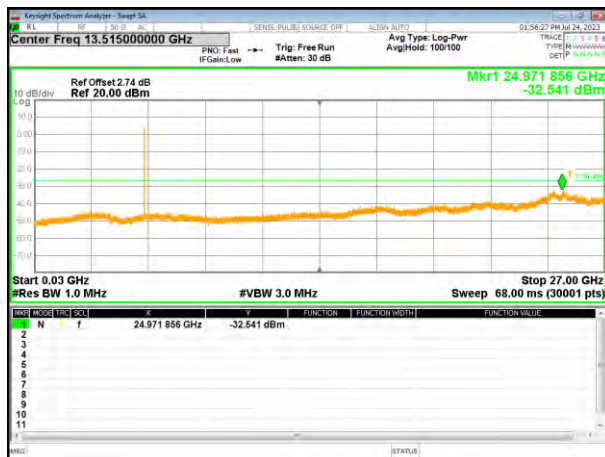
802.11a on channel 36



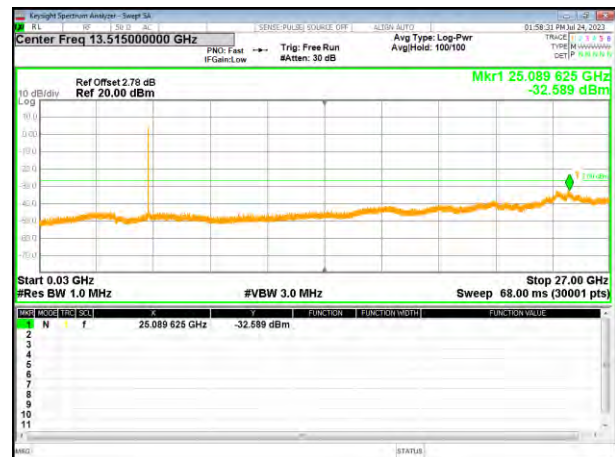
802.11a on channel 40



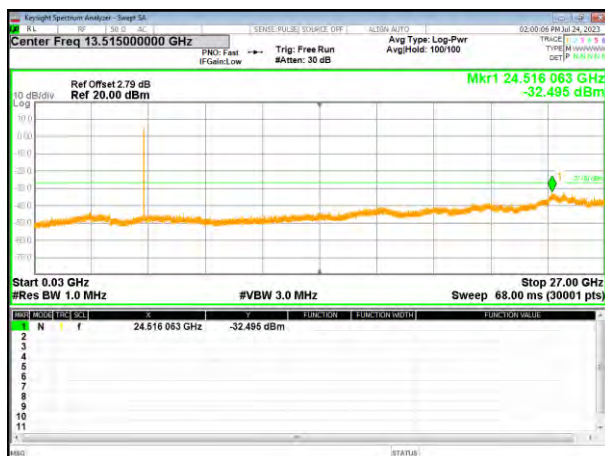
802.11a on channel 48



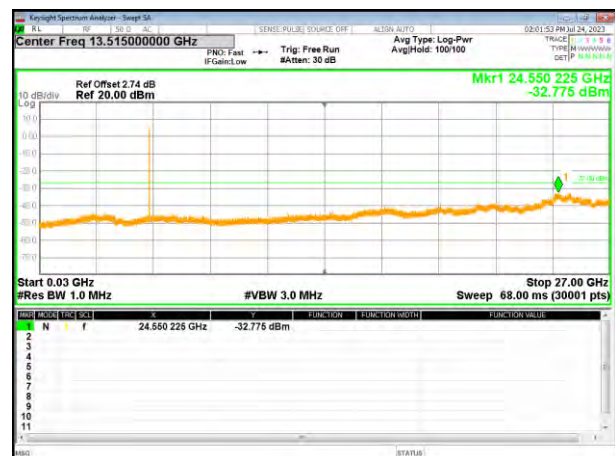
802.11n20 on channel 36



802.11n20 on channel 40

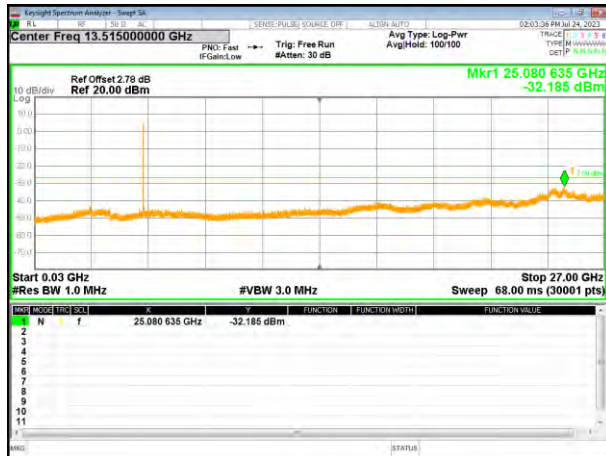


802.11n20 on channel 48

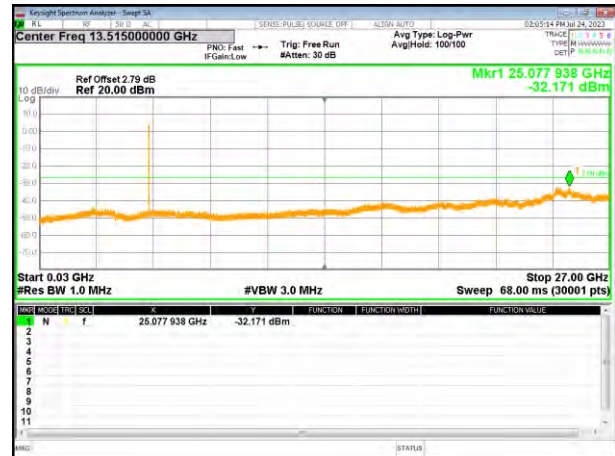


Test Plot

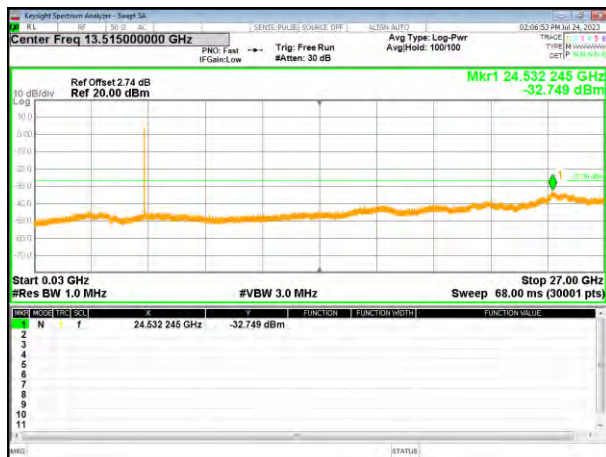
802.11ac20 on channel 36



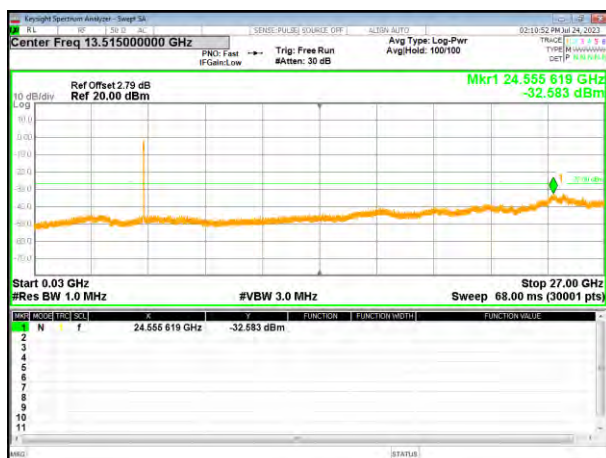
802.11ac20 on channel 40



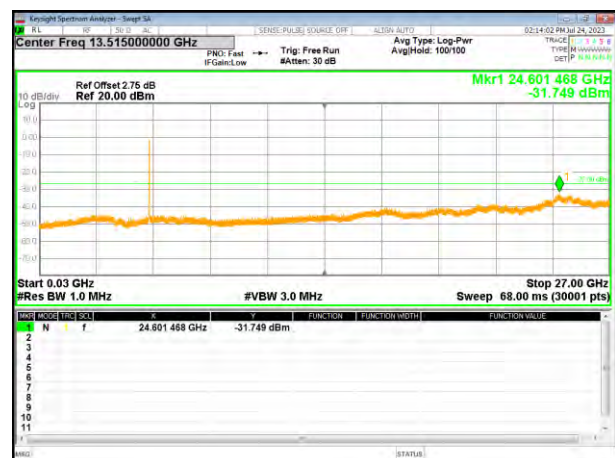
802.11ac20 on channel 48



802.11n40 on channel 38

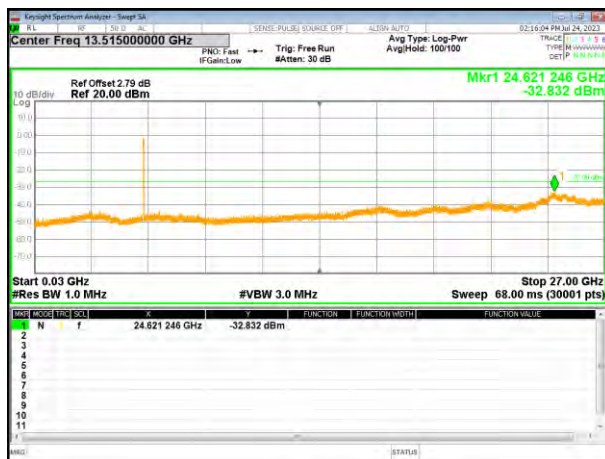


802.11n40 on channel 46

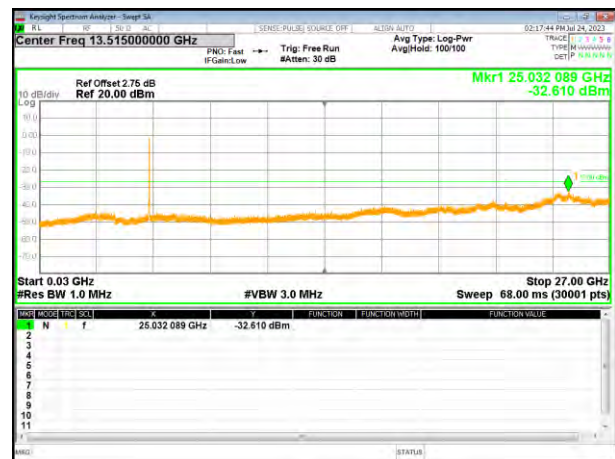


Test Plot

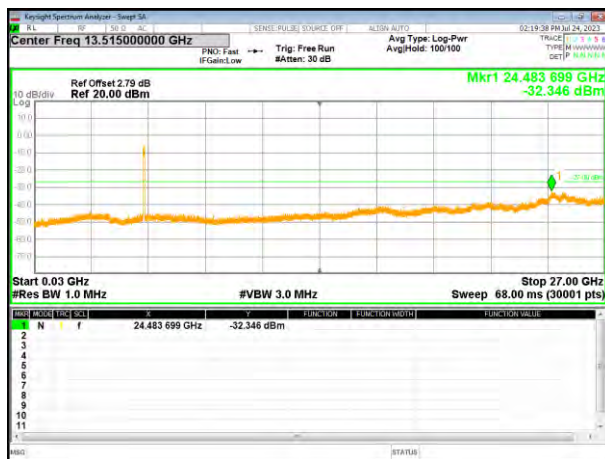
802.11ac40 on channel 38



802.11ac40 on channel 46



802.11ac80 on channel 42





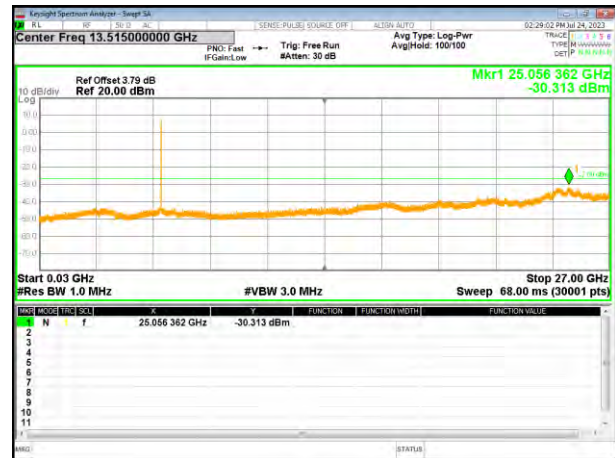
5745-5825MHz

Test Plot

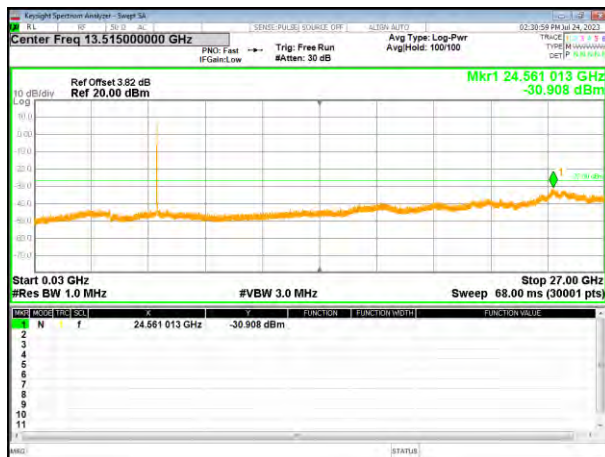
802.11a on channel 149



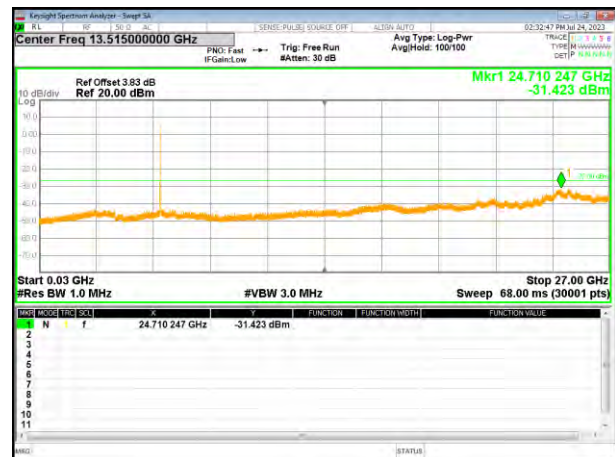
802.11a on channel 157



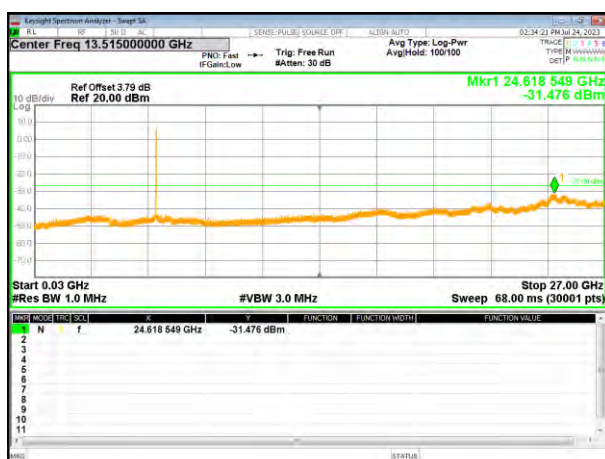
802.11a on channel 165



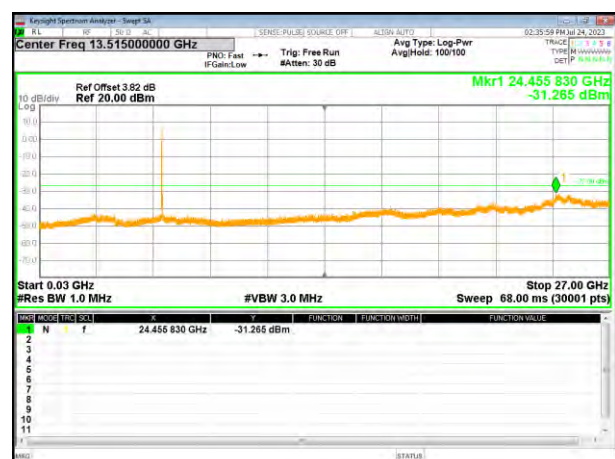
802.11n20 on channel 149



802.11n20 on channel 157

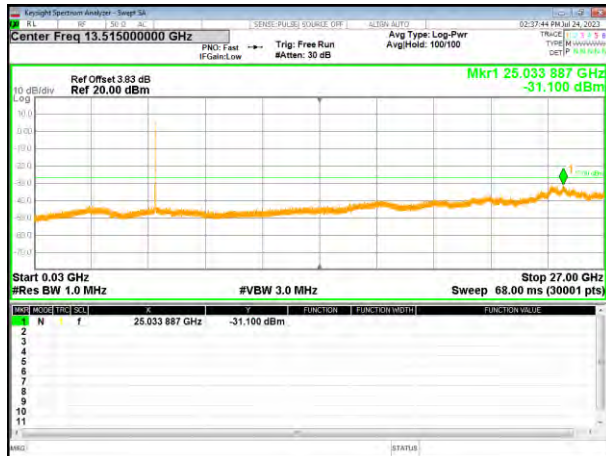


802.11n20 on channel 165

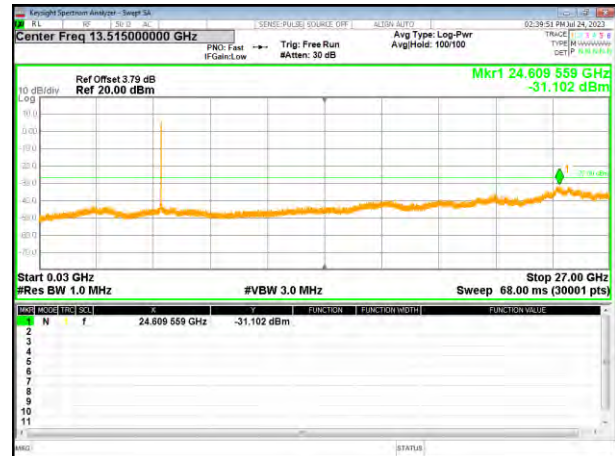


Test Plot

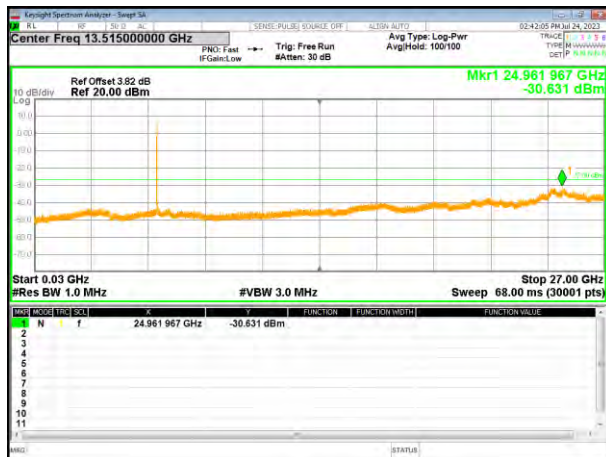
802.11ac20 on channel 149



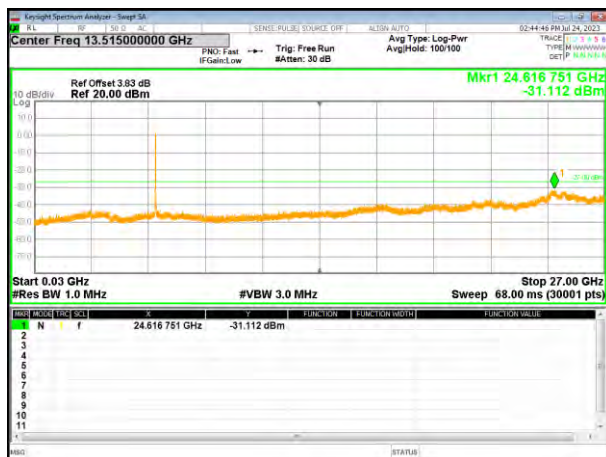
802.11ac20 on channel 157



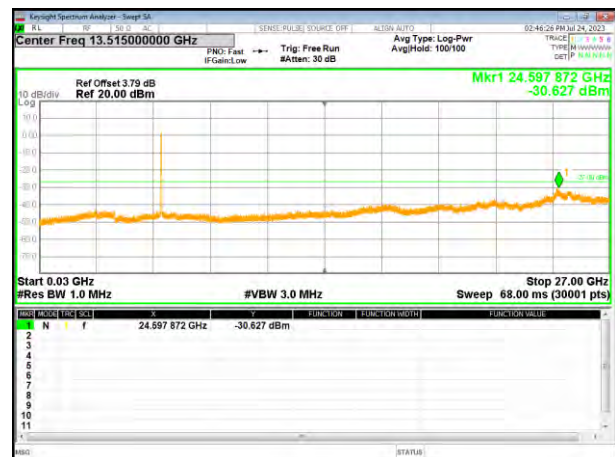
802.11ac20 on channel 165



802.11n40 on channel 151

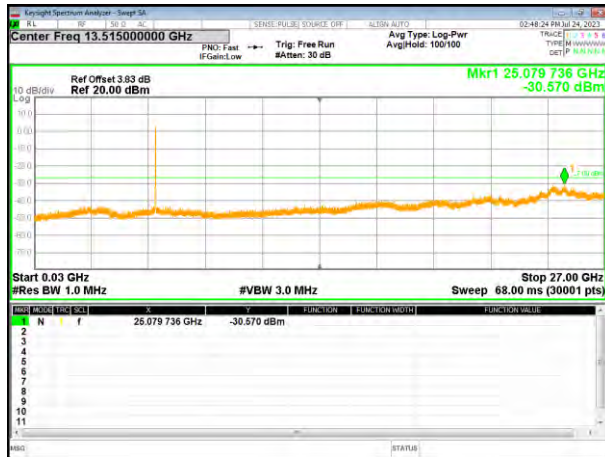


802.11n40 on channel 159

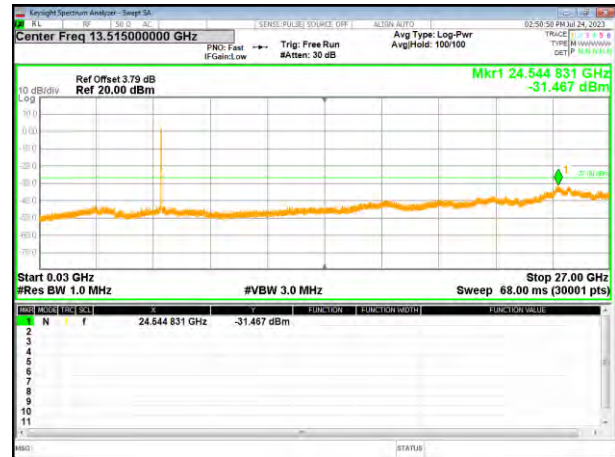


Test Plot

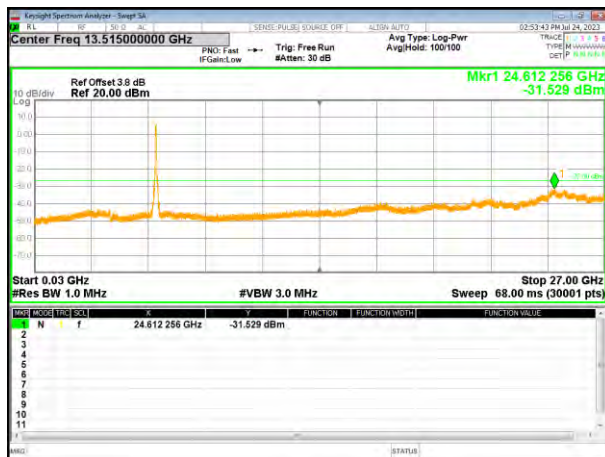
802.11ac40 on channel 151



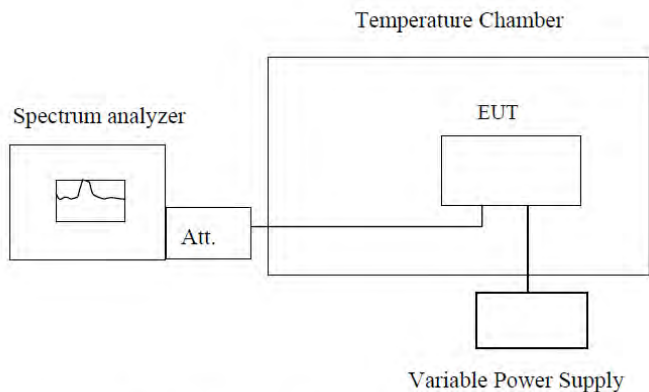
802.11ac40 on channel 159



802.11ac80 on channel 155



4.8 Frequency stability

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

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



Measurement data:

Frequency stability versus Temp.					
Power Supply: AC 120V					
Temp. (°C)	Operating Frequency (MHz)	0 minute Measured Frequency (MHz)	2 minute Measured Frequency (MHz)	5 minute Measured Frequency (MHz)	10 minute Measured Frequency (MHz)
-30	5180	5180.176	5179.612	5180.040	5179.674
	5190	5190.172	5199.485	5199.915	5189.685
	5200	5200.167	5199.510	5199.940	5199.675
	5210	5210.173	5209.487	5209.918	5209.676
	5220	5220.168	5219.502	5219.933	5219.683
	5230	5230.164	5229.493	5229.924	5229.699
	5240	5240.137	5239.500	5239.932	5239.684
-20	5180	5180.167	5179.488	5179.925	5179.695
	5190	5190.158	5189.478	5189.924	5189.691
	5200	5200.166	5199.485	5199.918	5199.685
	5210	5210.158	5209.476	5209.908	5209.691
	5220	5220.179	5219.497	5219.918	5219.686
	5230	5230.155	5229.473	5299.912	5229.682
	5240	5240.173	5239.490	5239.918	5239.655
-10	5180	5180.176	5179.497	5179.904	5179.674
	5190	5190.172	5189.492	5189.915	5189.685
	5200	5200.167	5199.486	5199.906	5199.675
	5210	5210.173	5209.491	5209.907	5209.676
	5220	5220.168	5219.486	5219.914	5219.683
	5230	5230.164	5229.482	5229.930	5229.699
	5240	5240.137	5239.454	5239.902	5239.671
0	5180	5179.953	5179.476	5179.916	5179.685
	5190	5200.125	5189.486	5189.907	5189.686
	5200	5200.123	5199.476	5199.915	5199.676
	5210	5210.178	5209.476	5209.907	5299.679
	5220	5220.167	5219.483	5219.928	5219.676
	5230	5230.152	5229.499	5229.904	5229.695
	5240	5240.169	5239.470	5239.922	5239.673
10	5180	5180.155	5179.488	5179.925	5179.686
	5190	5190.166	5189.478	5189.921	5189.677
	5200	5200.157	5199.485	5199.916	5199.684



	5210	5210.158	5209.476	5209.922	5209.676
	5220	5220.165	5219.497	5219.917	5219.697
	5230	5230.181	5229.473	5229.913	5229.673
	5240	5240.166	5239.490	5239.886	5239.691
20	5180	5180.176	5179.487	5179.916	5179.647
	5190	5190.172	5189.487	5189.907	5189.677
	5200	5200.167	5199.477	5199.915	5199.701
	5210	5210.173	5299.475	5209.907	5209.685
	5220	5220.168	5219.476	5219.928	5219.676
	5230	5230.164	5229.495	5229.904	5229.702
	5240	5240.137	5239.472	5239.922	5239.690
30	5180	5180.155	5179.488	5179.916	5179.695
	5190	5190.166	5189.478	5189.907	5179.695
	5200	5200.157	5199.485	5199.915	5189.691
	5210	5210.158	5209.476	5209.907	5199.685
	5220	5220.165	5219.497	5219.928	5209.691
	5230	5230.181	5229.473	5229.904	5219.686
	5240	5240.153	5239.490	5239.922	5229.682
40	5180	5180.167	5179.487	5179.702	5179.674
	5190	5190.158	5189.487	5199.874	5189.685
	5200	5200.166	5199.477	5199.872	5199.675
	5210	5210.158	5299.475	5209.927	5209.676
	5220	5220.179	5219.476	5219.916	5219.683
	5230	5230.155	5229.495	5229.901	5229.699
	5240	5240.173	5239.472	5239.918	5239.671
50	5180	5180.167	5179.488	5179.916	5179.647
	5190	5190.158	5189.478	5189.907	5189.677
	5200	5200.166	5199.485	5199.915	5199.701
	5210	5210.158	5209.476	5209.907	5209.685
	5220	5220.179	5219.497	5219.928	5219.676
	5230	5230.155	5229.473	5229.904	5229.702
	5240	5240.173	5239.490	5239.922	5239.690

Frequency stability versus Voltage					
Temperature: 25°C					
Power Supply (VAC)	Operating Frequency (MHz)	0 minute	2 minute	5 minute	10 minute
		Measured Frequency (MHz)	Measured Frequency (MHz)	Measured Frequency (MHz)	Measured Frequency (MHz)
102	5180	5180.176	5179.612	5179.916	5179.810
	5190	5190.172	5199.485	5189.907	5199.684
	5200	5200.167	5199.510	5199.915	5199.709
	5210	5210.173	5209.487	5209.907	5209.687
	5220	5220.168	5219.502	5219.928	5219.702
	5230	5230.164	5229.493	5229.904	5229.693
	5240	5240.137	5239.500	5239.922	5239.701
120	5180	5180.167	5179.506	5179.915	5179.695
	5190	5190.158	5179.612	5189.916	5189.694
	5200	5200.166	5199.485	5199.907	5199.687
	5210	5210.158	5209.509	5299.911	5209.677
	5220	5220.179	5219.487	5219.907	5219.687
	5230	5230.155	5229.500	5229.926	5299.680
	5240	5240.173	5239.492	5239.904	5239.687
138	5180	5180.176	5179.497	5179.904	5179.674
	5190	5190.172	5189.492	5189.915	5189.685
	5200	5200.167	5199.486	5199.906	5199.675
	5210	5210.173	5209.491	5209.907	5209.676
	5220	5220.168	5219.486	5219.914	5219.683
	5230	5230.164	5229.482	5229.930	5229.699
	5240	5240.137	5239.454	5239.902	5239.671



Frequency stability versus Temp.					
Power Supply: AC 120V					
Temp. (°C)	Operating Frequency (MHz)	0 minute Measured Frequency (MHz)	2 minute Measured Frequency (MHz)	5 minute Measured Frequency (MHz)	10 minute Measured Frequency (MHz)
-30	5745	5745.142	5744.419	5744.882	5744.645
	5755	5755.150	5754.424	5754.889	5754.633
	5775	5775.164	5774.415	5774.904	5774.644
	5785	5785.140	5784.405	5784.879	5784.649
	5795	5795.136	5794.411	5794.875	5794.667
	5825	5825.138	5824.337	5824.878	5824.658
-20	5745	5745.131	5744.430	5744.876	5744.656
	5755	5755.148	5754.430	5754.901	5754.669
	5775	5775.144	5774.432	5774.881	5774.654
	5785	5785.147	5784.422	5784.888	5784.639
	5795	5795.158	5794.412	5794.886	5794.633
	5825	5825.138	5824.418	5824.895	5824.666
-10	5745	5745.142	5744.420	5744.892	5744.276
	5755	5755.169	5754.425	5754.894	5754.658
	5775	5775.162	5774.441	5774.895	5774.659
	5785	5785.146	5784.415	5784.886	5784.660
	5795	5795.135	5794.410	5794.877	5794.643
	5825	5825.069	5824.410	5824.885	5824.638
0	5745	5745.136	5744.409	5744.892	5742.681
	5755	5755.162	5754.423	5754.894	5754.671
	5775	5775.141	5774.421	5774.895	5774.667
	5785	5785.149	5784.422	5784.886	5784.649
	5795	5795.147	5794.432	5794.877	5794.638
	5825	5825.155	5824.410	5824.885	5824.572
10	5745	5745.136	5744.419	5744.881	5744.646
	5755	5755.162	5754.434	5754.888	5754.652
	5775	5775.141	5774.434	5774.879	5774.669
	5785	5785.149	5784.414	5784.869	5784.643
	5795	5795.147	5794.430	5794.876	5794.639
	5825	5825.155	5824.425	5824.805	5824.641
20	5745	5745.152	5744.444	5744.892	5744.645
	5755	5755.167	5754.414	5754.906	5754.663
	5775	5775.149	5774.436	5774.889	5774.643
	5785	5785.136	5784.434	5784.875	5784.668
	5795	5795.130	5794.424	5794.869	5794.660
	5825	5825.162	5824.436	5824.902	5824.668
30	5745	5745.142	5744.430	5744.881	5744.670
	5755	5755.150	5754.430	5754.898	5754.641
	5775	5775.164	5774.432	5774.897	5774.664
	5785	5785.140	5784.422	5784.878	5784.662
	5795	5795.136	5794.412	5794.895	5794.653
	5825	5825.138	5824.418	5824.892	5824.667
40	5745	5745.152	5744.414	5744.892	5742.681



	5755	5755.167	5754.437	5754.894	5754.671
	5775	5775.149	5774.417	5774.895	5774.667
	5785	5785.136	5784.424	5784.886	5784.649
	5795	5795.130	5794.421	5794.877	5794.638
	5825	5825.162	5824.428	5824.885	5824.572
50	5745	5745.152	5744.444	5744.892	5744.645
	5755	5755.167	5754.414	5754.906	5754.663
	5775	5775.149	5774.436	5774.889	5774.643
	5785	5785.136	5784.434	5784.875	5784.668
	5795	5795.130	5794.424	5794.869	5794.660
	5825	5825.162	5824.436	5824.902	5824.668

Frequency stability versus Voltage					
Temperature: 25°C					
Power Supply (VAC)	Operating Frequency (MHz)	0 minute Measured Frequency (MHz)	2 minute Measured Frequency (MHz)	5 minute Measured Frequency (MHz)	10 minute Measured Frequency (MHz)
102	5745	5745.131	5744.419	5744.881	5744.640
	5755	5755.148	5754.424	5754.898	5754.664
	5775	5775.144	5774.415	5774.897	5774.645
	5785	5785.147	5784.405	5784.878	5784.652
	5795	5795.158	5794.411	5794.895	5794.650
	5825	5825.138	5824.337	5824.892	5824.659
120	5745	5745.131	5744.430	5744.876	5744.656
	5755	5755.148	5754.430	5754.901	5754.669
	5775	5775.144	5774.432	5774.881	5774.654
	5785	5785.147	5784.422	5784.888	5784.639
	5795	5795.158	5794.412	5794.886	5794.633
	5825	5825.138	5824.418	5824.895	5824.666
138	5745	5745.152	5744.444	5744.892	5744.645
	5755	5755.167	5754.414	5754.906	5754.663
	5775	5775.149	5774.436	5774.889	5774.643
	5785	5785.136	5784.434	5784.875	5784.668
	5795	5795.130	5794.424	5794.869	5794.660
	5825	5825.162	5824.436	5824.902	5824.668



5 Test Setup Photo

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

6 EUT Constructional Details

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

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