



Report No.: ET-22092019E03

TEST REPORT

Applicant: EP-TEC Solutions Pte Ltd
Address of Applicant: 2 Sims Close #05-07 Gemini @ Sims Singapore 387298
Manufacturer/Factory: EP-TEC Solutions Pte Ltd
Address of Manufacturer: 2 Sims Close #05-07 Gemini @ Sims Singapore 387298
Product Name: InfinityPro Interactive Flat Panel
Model No.: X Series, V Series, E Series
Trade Mark: InfinityPro
FCC ID: 2A8WI-XSERIES
Applicable standards: FCC CFR Title 47 Part 15 Subpart E Section 15.407
Date of Test: Sep.23, 2022- Oct.14, 2022
Date of report issued: Oct.18, 2022
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.

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

Compiled by:

Reviewed by:

Project Engineer

Project Manager



Authorized Signature



Report Revision History		
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1 Test Summary

Test Item	Section in CFR 47	Result	Test by
Antenna requirement	15.203	Pass	/
AC Power Line Conducted Emission	15.207	Pass	Carr Kang
Conducted Output Power	15.407 (a)(1)/(a)(3)	Pass	Yvan Fan
26dB Bandwidth and 99% Occupied Bandwidth	15.407 (a)(12)	Pass	Yvan Fan
6dB Bandwidth	15.407 (e)	Pass	Yvan Fan
Power Spectral Density	15.407(a)(1)/(a)(3)	Pass	Yvan Fan
Band Edge	15.407(b)(1)/(b)(4)	Pass	Yvan Fan
Spurious Emission	15.205/15.209 15.407(b)(1)/(b)(4)/(b)(8)	Pass	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:	InfinityPro Interactive Flat Panel
Model No.:	X Series, V Series, E Series
Difference of model(s)	All the models are the same circuit and RF module, except the appearance color.
Test Model:	X Series
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:	External antenna
Antenna gain:	2.76dBi(Declare by applicant)
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	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	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

No.	Description	Manufacturer	Model	Serial Number
/	/	/	/	/

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	RFTestTool.apk
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	2022.3.09	2023.3.08
2	amplifier	EMtrace	RP01A	50117	2022.3.09	2023.3.08
3	Artificial power network	schwarabeck	NSLK8127	8127483	2022.3.09	2023.3.08
4	Artificial power network	ETS	3186/2NM	1132	2022.3.09	2023.3.08
5	10dB attenuator	HUBER+SUNNER	10dB	/	2022.3.09	2023.3.08
6	Cable 4	HUBER SUNNER	3M	/	2022.3.09	2022.3.08
7	Absorbing Clamp	schwarabeck	MDS21	D69250	2022.3.11	2023.3.10

Radiated Emission & RF Conducted test:

Item	Equipment name	Manufacturer	Model	Serial No.	Calibration date	Due date
1	EMI Test Receiver	Rohde&schwarz	ESPI7	100605	2022.3.09	2023.3.08
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	2022.3.09	2023.3.08
5	amplifier	Space-Dtronics	EWLAN0118G-P40	19113001	2022.3.09	2023.3.08
6	Spectrum analyzer	KEYSIGHT	N9020A	MY55370280	2022.3.09	2023.3.08
7	Power detector box	MWRFTtest	MW100-PSB	MW201020JYT	2021.11.19	2022.11.18
8	Signal generator	Agilent	N5182A	MY49060455	2021.11.19	2022.11.18
9	Spectrum analyzer	Rohde&schwarz	FSV40	100363	2022.3.09	2023.3.08
10	amplifier	Aeroflex	DLE-161	097	2022.3.09	2023.3.08
11	Horn antenna	Com-Power	SAS-574	588	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	/	2022.3.09	2023.3.08
14	Cable7	HUBER SUNNER	2.0M	/	2022.3.09	2023.3.08
15	Cable8	HUBER SUNNER	6.0M	/	2022.3.09	2023.3.08

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 External antenna, the best case gain of the antennas are 2.76dBi, reference to the appendix II for details</i>	

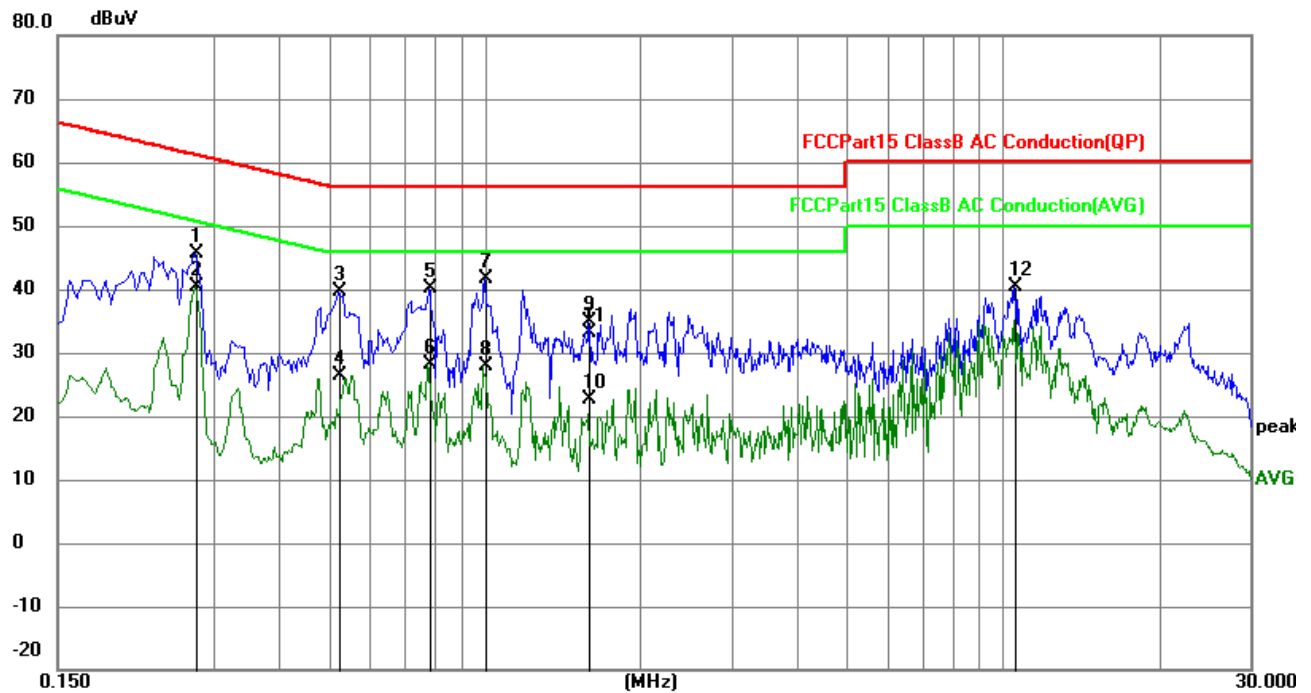
4.2 Conducted Emissions

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 <i>Remark: E.U.T.: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m</i>					
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.:	24.7°C	Humid.:	50%	Press.:	1012mbar
Test voltage:	AC 120V, 60Hz					
Test results:	Pass					

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

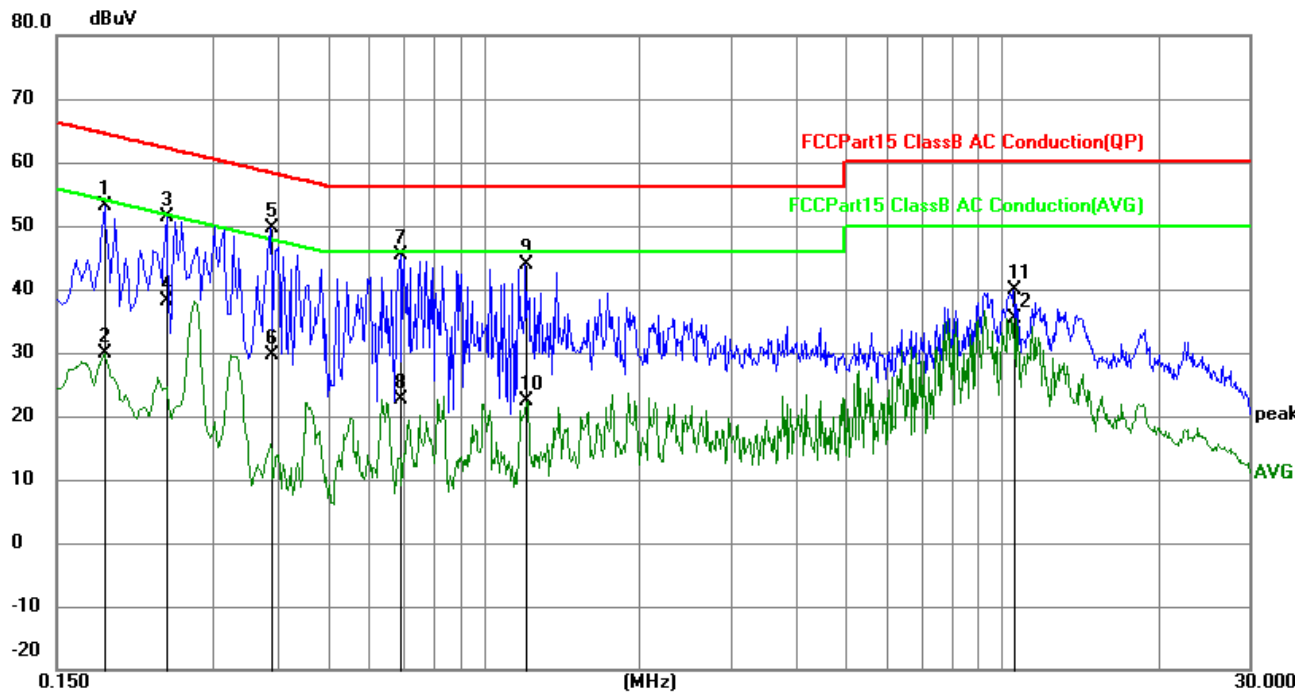
Measurement data

Line:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.2760	33.16	12.38	45.54	60.94	-15.40	QP
2	0.2760	28.07	12.38	40.45	50.94	-10.49	AVG
3	0.5231	27.38	12.33	39.71	56.00	-16.29	QP
4	0.5231	14.09	12.33	26.42	46.00	-19.58	AVG
5	0.7799	27.84	12.29	40.13	56.00	-15.87	QP
6	0.7799	15.74	12.29	28.03	46.00	-17.97	AVG
7	1.0002	29.28	12.26	41.54	56.00	-14.46	QP
8	1.0002	15.50	12.26	27.76	46.00	-18.24	AVG
9	1.5852	22.53	12.26	34.79	56.00	-21.21	QP
10	1.5852	10.39	12.26	22.65	46.00	-23.35	AVG
11	1.5852	20.95	12.26	33.21	46.00	-12.79	AVG
12	10.5180	28.24	12.26	40.50	60.00	-19.50	QP

Neutral:

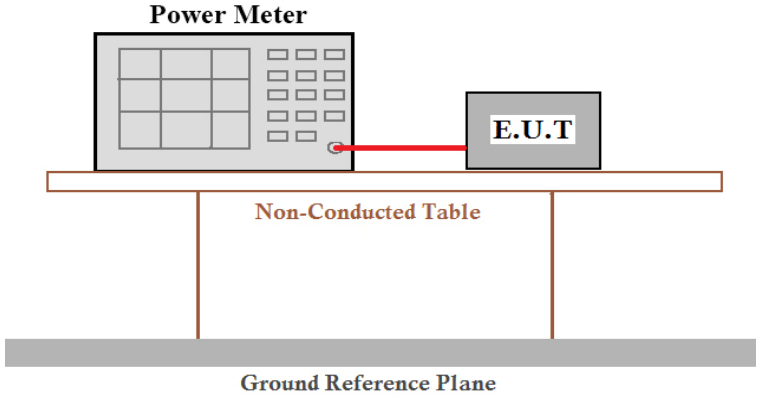


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1859	40.71	12.44	53.15	64.22	-11.07	QP
2	0.1859	17.41	12.44	29.85	54.22	-24.37	AVG
3	0.2444	38.89	12.40	51.29	61.95	-10.66	QP
4	0.2444	25.62	12.40	38.02	51.95	-13.93	AVG
5	0.3885	37.33	12.35	49.68	58.10	-8.42	QP
6	0.3885	17.20	12.35	29.55	48.10	-18.55	AVG
7	0.6900	32.99	12.30	45.29	56.00	-10.71	QP
8	0.6900	10.40	12.30	22.70	46.00	-23.30	AVG
9	1.2074	31.54	12.26	43.80	56.00	-12.20	QP
10	1.2074	10.16	12.26	22.42	46.00	-23.58	AVG
11	10.5180	27.50	12.26	39.76	60.00	-20.24	QP
12	10.5180	23.18	12.26	35.44	50.00	-14.56	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 results:	Pass

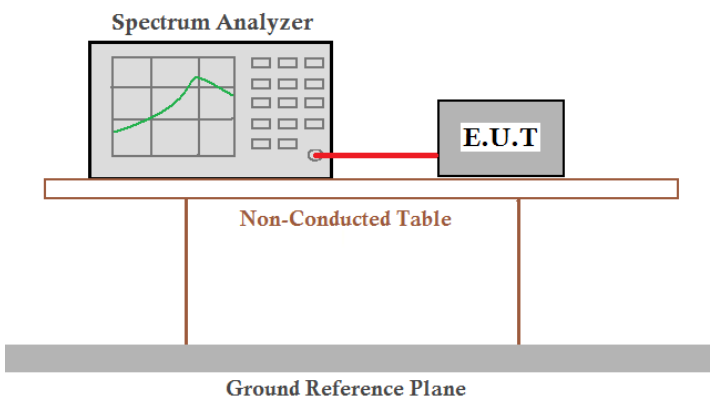
Measurement Data

Test Channel	Frequency	Maximum output power	LIMIT	Result
	(MHz)	(dBm)	dBm	
TX 802.11a Mode				
CH36	5180	13.93	23.98	Pass
CH40	5200	13.56	23.98	Pass
CH48	5240	13.73	23.98	Pass
TX 802.11 n20 Mode				
CH36	5180	13.77	23.98	Pass
CH40	5200	13.57	23.98	Pass
CH48	5240	13.68	23.98	Pass
TX 802.11 ac20 Mode				
CH36	5180	13.12	23.98	Pass
CH40	5200	12.76	23.98	Pass
CH48	5240	13.03	23.98	Pass
TX 802.11 n40 Mode				
CH38	5190	12.58	23.98	Pass
CH46	5230	12.47	23.98	Pass
TX 802.11 ac40 Mode				
CH38	5190	12.66	23.98	Pass
CH46	5230	12.47	23.98	Pass
TX 802.11 ac80 Mode				
CH42	5210	11.77	23.98	Pass



Test Channel	Frequency	Maximum output power.	LIMIT	Result
	(MHz)	(dBm)	dBm	
TX 802.11a Mode				
CH149	5745	12.30	30	Pass
CH157	5785	12.58	30	Pass
CH165	5825	12.84	30	Pass
TX 802.11 n20 Mode				
CH149	5745	11.73	30	Pass
CH157	5785	11.96	30	Pass
CH165	5825	12.10	30	Pass
TX 802.11 ac20 Mode				
CH149	5745	11.58	30	Pass
CH157	5785	11.89	30	Pass
CH165	5825	12.16	30	Pass
TX 802.11 n40 Mode				
CH151	5755	11.59	30	Pass
CH159	5795	11.80	30	Pass
TX 802.11 ac40 Mode				
CH151	5755	11.63	30	Pass
CH159	5795	11.78	30	Pass
TX 802.11 ac80 Mode				
CH155	5775	12.34	30	Pass

4.4 Channel 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:	 The diagram illustrates the test setup. A Spectrum Analyzer is connected via a red cable to an E.U.T. (Equipment Under Test). Both are placed on a Non-Conducted Table. Below the table is a Ground Reference Plane.
Test Instruments:	Refer to section 3.0 for details
Test mode:	Refer to section 2.2 for details
Test results:	Pass

Measurement Data

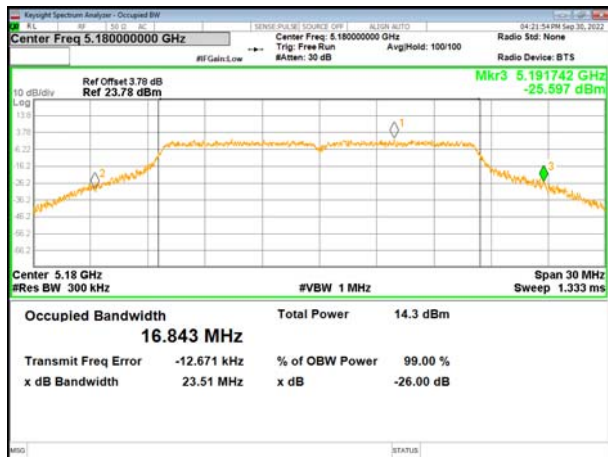
5180-5240MHz

Test CH	-26dB Channel Bandwidth (MHz)						Result
	802.11a	802.11n (HT20)	802.11ac (HT20)	802.11n (HT40)	802.11ac (HT40)	802.11ac (HT80)	
Lowest	23.51	24.58	23.81	44.20	43.38	--	Pass
Middle	24.26	24.12	24.64	--	--	82.41	
Highest	22.98	24.33	24.82	44.13	44.56	--	

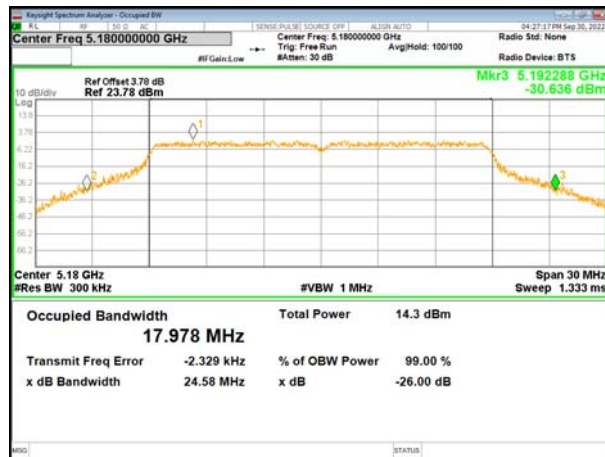
Test CH	99% Occupy Bandwidth (MHz)						Result
	802.11a	802.11n (HT20)	802.11ac (HT20)	802.11n (HT40)	802.11ac (HT40)	802.11ac (HT80)	
Lowest	16.843	17.978	17.951	36.245	36.279	--	Pass
Middle	16.886	17.979	17.968	--	--	75.193	
Highest	16.850	17.934	17.928	36.264	36.266	--	

Test plot

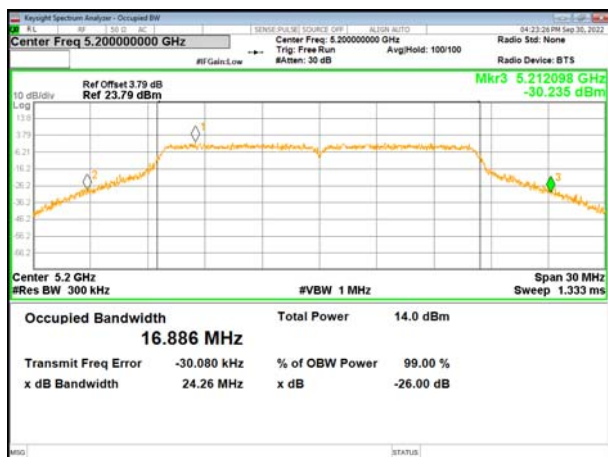
(802.11a) plot on channel 36



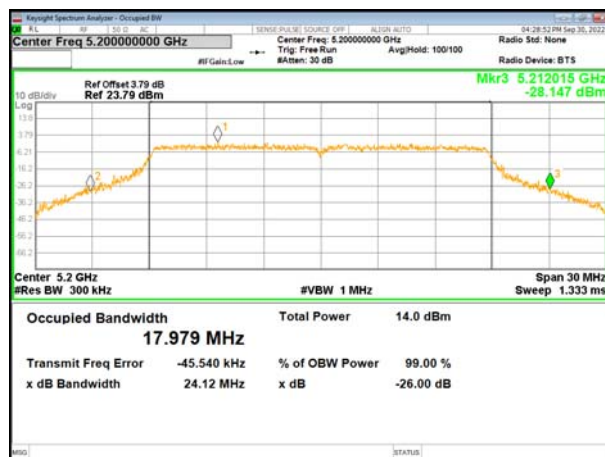
(802.11 n20) plot on channel 36



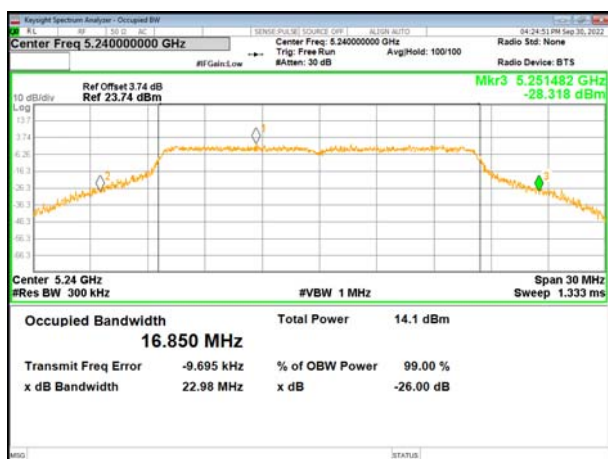
(802.11a) plot on channel 40



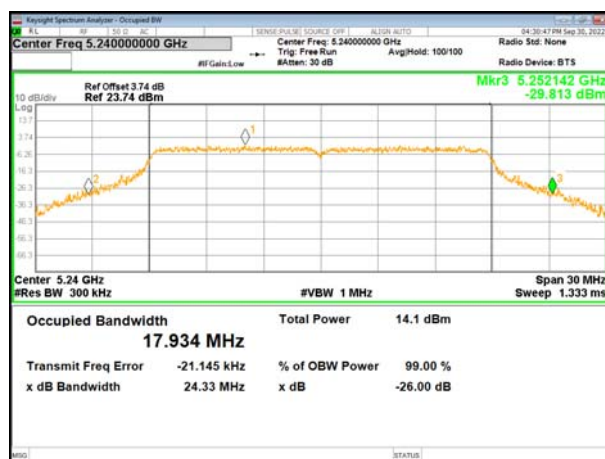
(802.11 n20) plot on channel 40



(802.11a) plot on channel 48

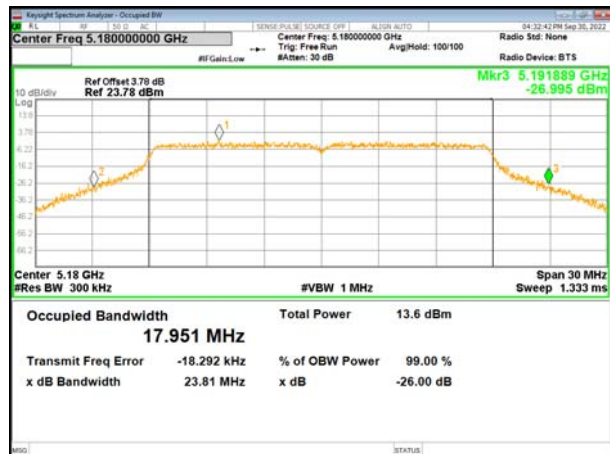


(802.11 n20) plot on channel 48

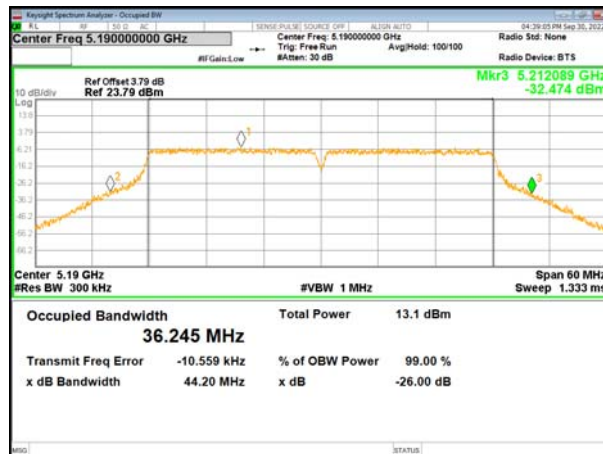


Test plot

(802.11ac20) plot on channel 36



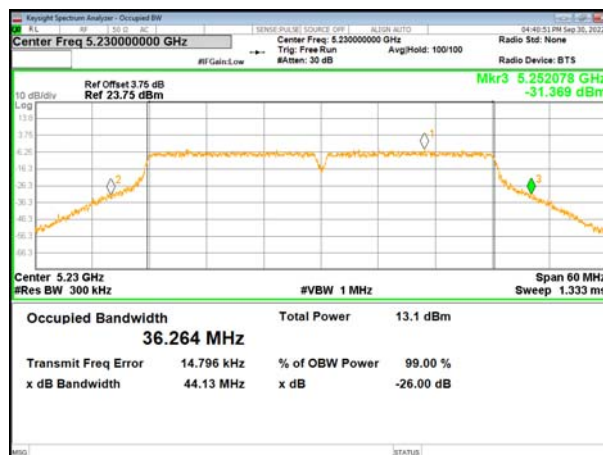
(802.11 n40) plot on channel 38



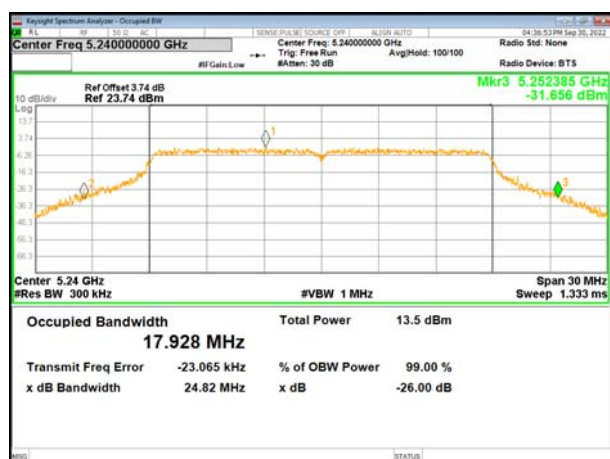
(802.11ac20) plot on channel 40



(802.11 n40) plot on channel 46



(802.11ac20) plot on channel 48

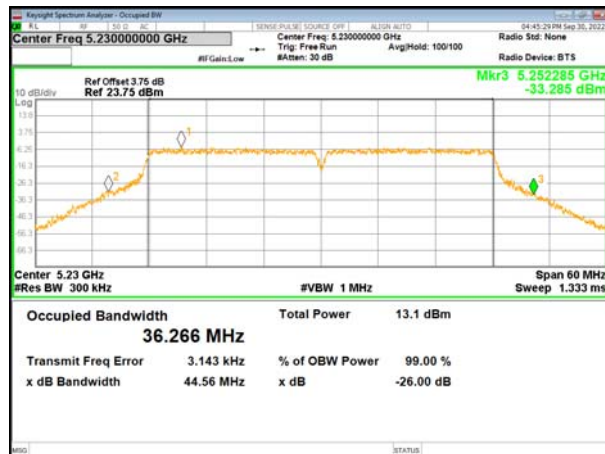


Test plot

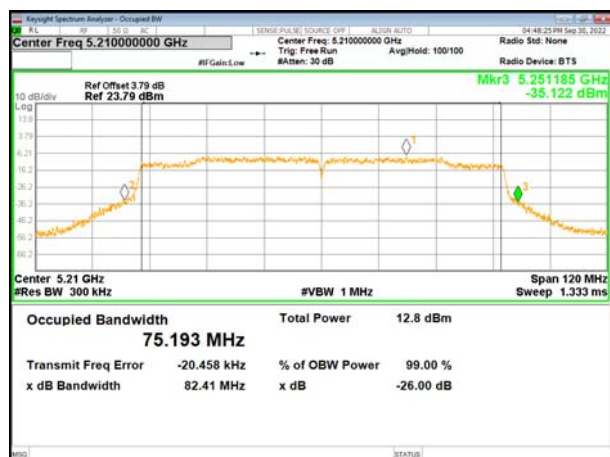
(802.11ac40) plot on channel 38



(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	16.32	17.56	17.57	36.02	36.29	--	>500	Pass
Middle	16.32	17.58	17.58	--	--	75.11		
Highest	16.31	17.57	17.56	36.33	36.30	--		

Remark: "---"is not applicable

Test plot

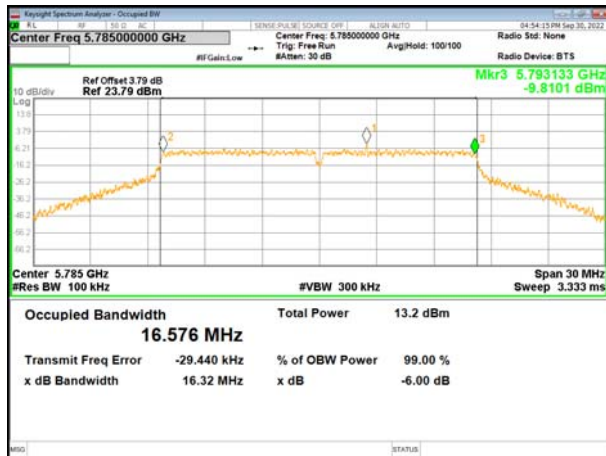
(802.11a) plot on channel 149



(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

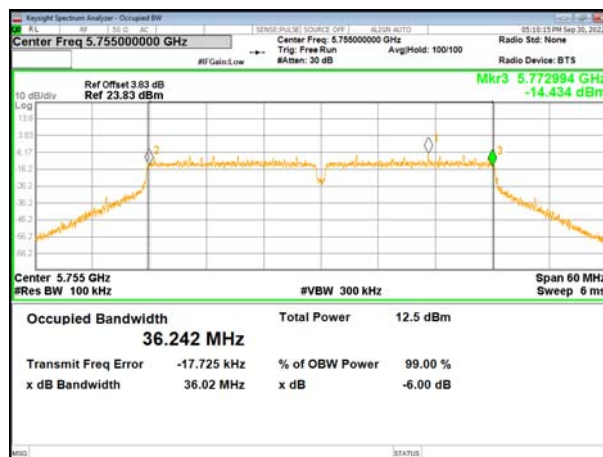


Test plot

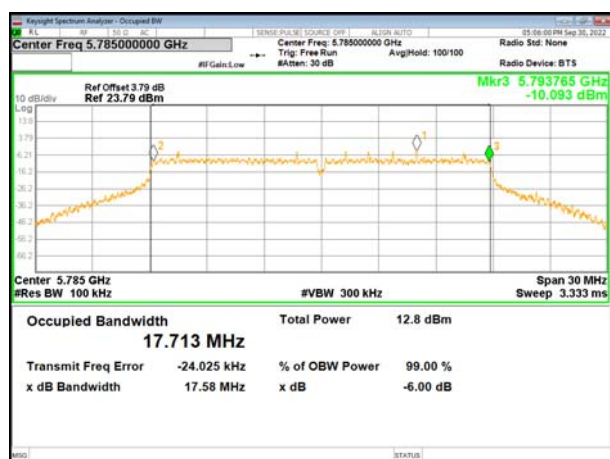
(802.11ac20) plot on channel 149



(802.11 n40) plot on channel 151



(802.11ac20) plot on channel 157



(802.11 n40) plot on channel 159

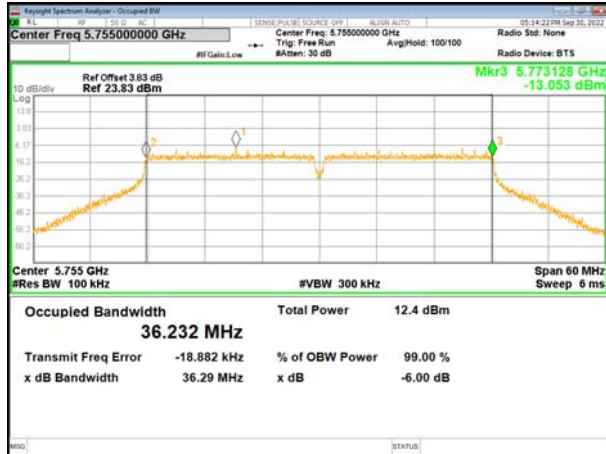


(802.11ac20) plot on channel 165

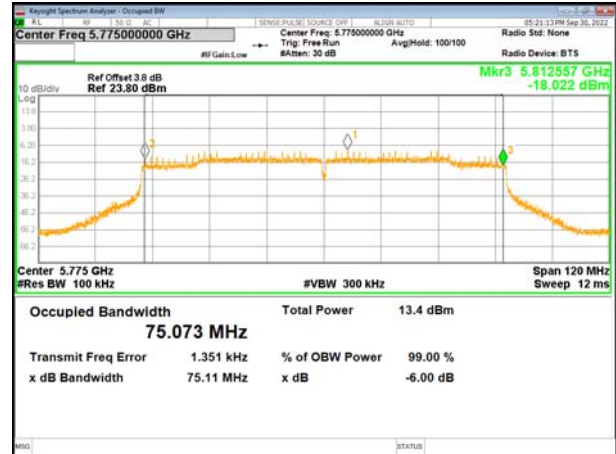


Test plot

(802.11 ac40) plot on channel 151



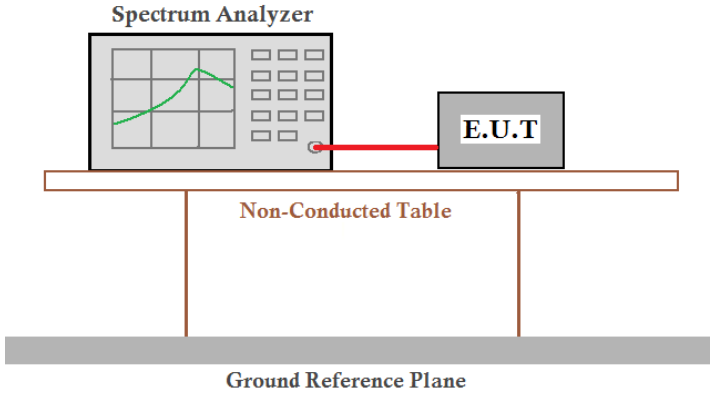
(802.11 ac80) plot on channel 155



(802.11 ac40) plot on channel 159



4.5 Power Spectral Density

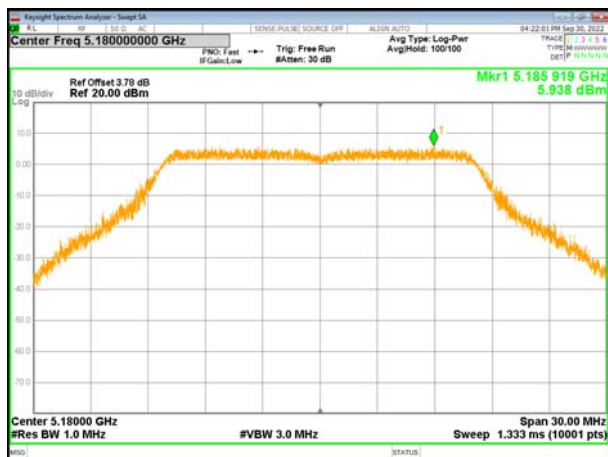
Test Requirement:	FCC Part15 E Section 15.407(a)(1)/ (a)(3)	
Test Method:	ANSI C63.10:2013 and KDB 789033 D02 General U-NII Test Procedures New Rules v02r01	
Limit:	Frequency band (MHz)	Limit
	5150-5250	≤17dBm/1MHz for master device
		≤11dBm/1MHz for client device
	5250-5350	≤11dBm/1MHz for client device
	5470-5725	≤11dBm/1MHz for client device
	725-5850	≤30dBm/500kHz
Test setup:		
Test Instruments:	Refer to section 3.0 for details	
Test mode:	Refer to section 2.2 for details	
Test results:	Pass	

Measurement Data

5180-5240MHz

Mode	Frequency	Measured Power Density (dBm/MHz)	Limit (dBm/MHz)
802.11 a	5180 MHz	5.938	11
	5200 MHz	5.404	11
	5240 MHz	5.686	11
802.11 n20	5180 MHz	5.195	11
	5200 MHz	5.098	11
	5240 MHz	5.106	11
802.11 ac20	5180 MHz	4.56	11
	5200 MHz	4.413	11
	5240 MHz	4.526	11
802.11 n40	5190 MHz	1.877	11
	5230 MHz	1.112	11
802.11 ac40	5190 MHz	1.537	11
	5230 MHz	1.288	11
802.11 ac80	5210 MHz	-1.624	11

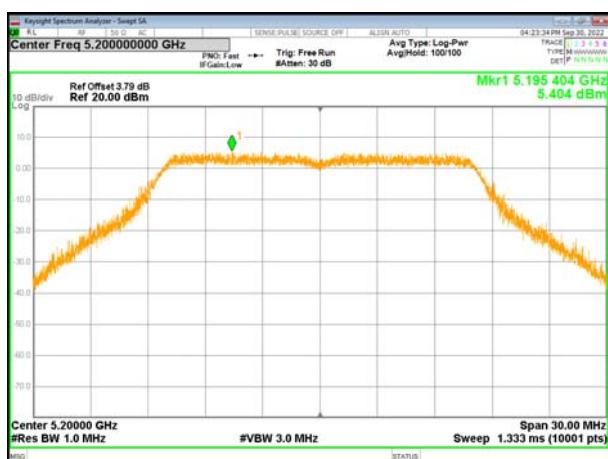
(802.11a) PSD plot on channel 36



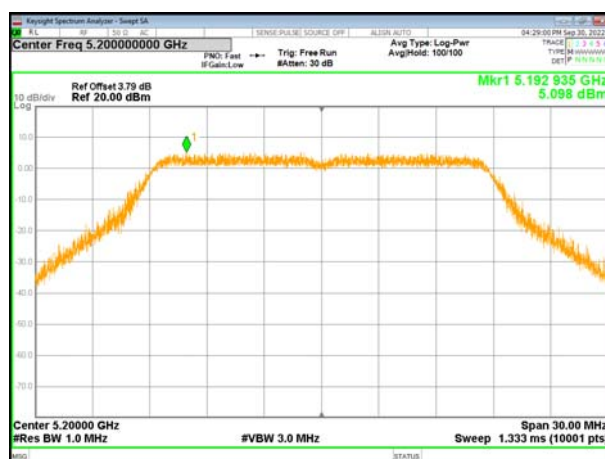
(802.11n20) PSD plot on channel 36



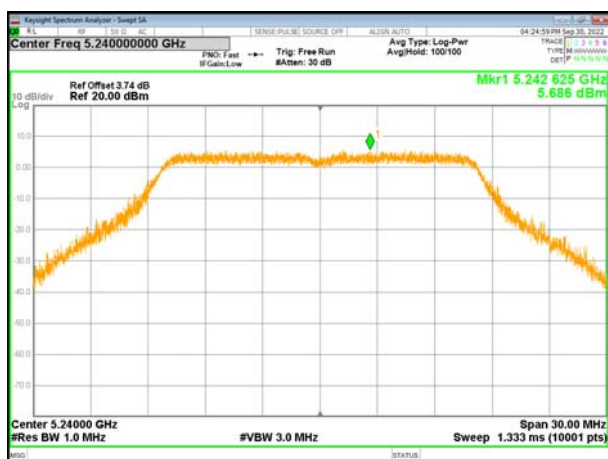
(802.11a) PSD plot on channel 40



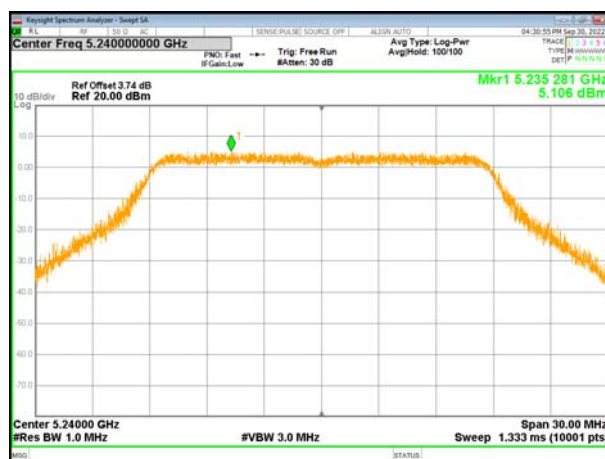
(802.11n20) PSD plot on channel 40



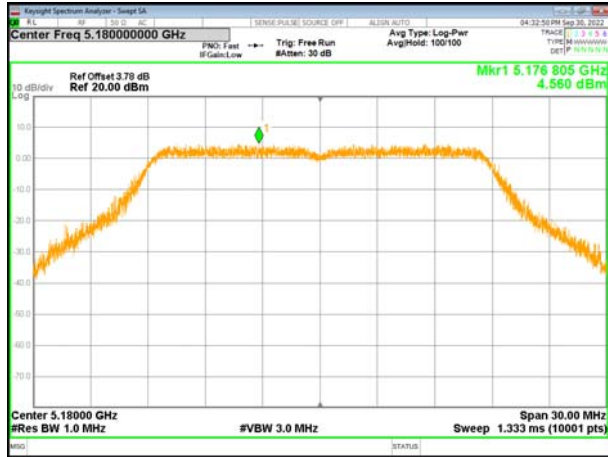
(802.11a) PSD plot on channel 48



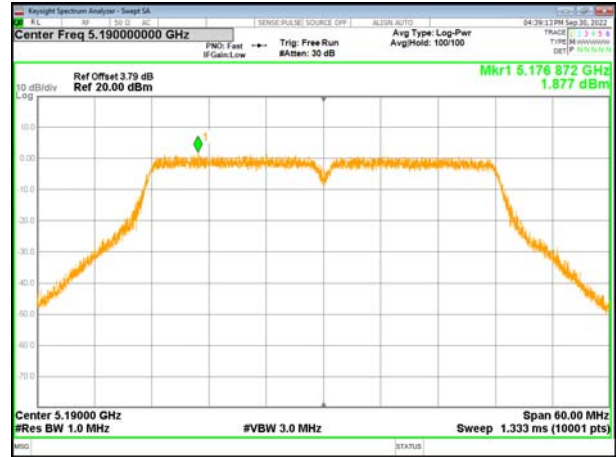
(802.11n20) PSD plot on channel 48



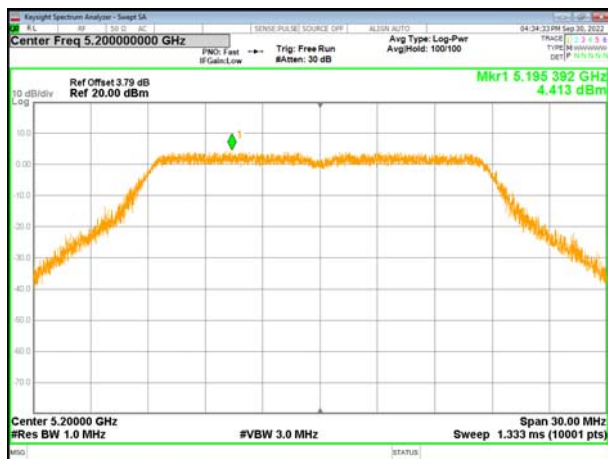
(802.11ac20) PSD plot on channel 36



(802.11n40) PSD plot on channel 38



(802.11ac20) PSD plot on channel 40



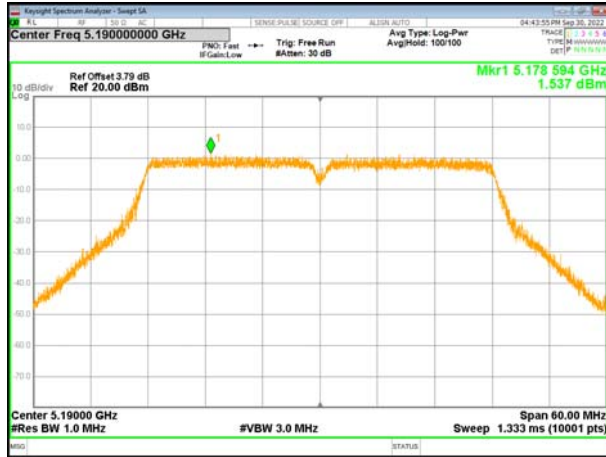
(802.11n40) PSD plot on channel 46



(802.11ac20) PSD plot on channel 48



(802.11ac40) PSD plot on channel 38



(802.11ac80) PSD plot on channel 42



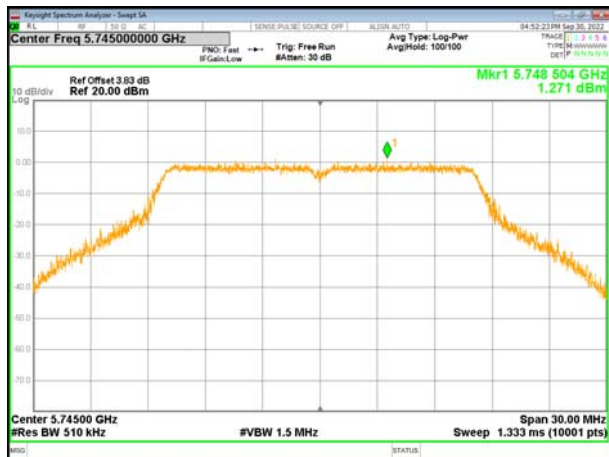
(802.11ac40) PSD plot on channel 46



Mode	Frequency	Measured Power Density (dBm/510KHz)	Measured Power Density (dBm/500KHz)	Limit (dBm/MHz)
802.11 a	5745 MHz	1.271	1.185	30
	5785 MHz	0.829	0.743	30
	5825 MHz	0.473	0.387	30
802.11 n20	5745 MHz	-0.266	-0.352	30
	5785 MHz	-0.084	-0.170	30
	5825 MHz	-0.027	-0.113	30
802.11 ac20	5745 MHz	-0.499	-0.585	30
	5785 MHz	-0.282	-0.368	30
	5825 MHz	0.0250	-0.061	30
802.11 n40	5755 MHz	-2.509	-2.595	30
	5795 MHz	-2.910	-2.996	30
802.11 ac40	5755 MHz	-2.812	-2.898	30
	5795 MHz	-3.244	-3.330	30
802.11 ac80	5775 MHz	-5.405	-5.491	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



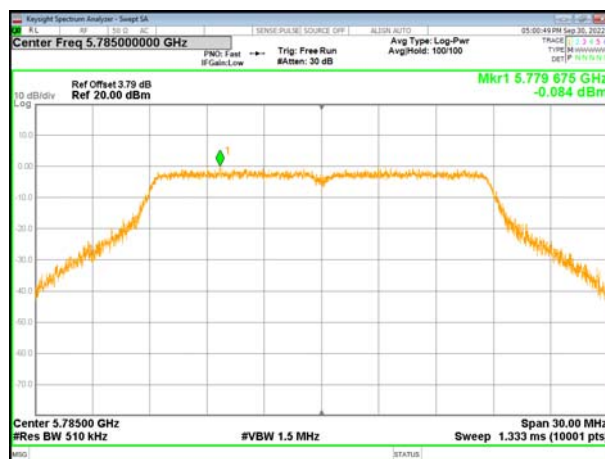
(802.11n20) PSD plot on channel 149



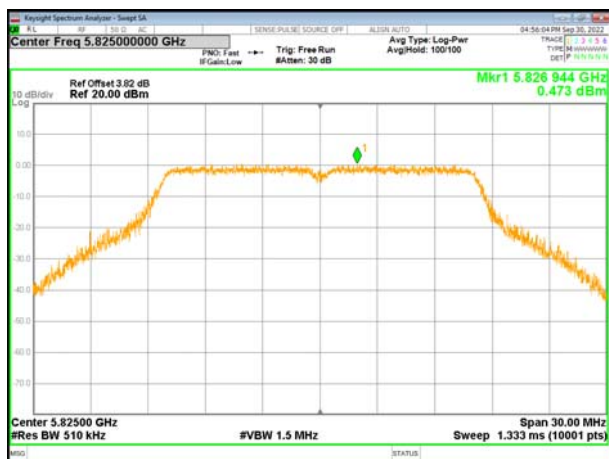
(802.11a) PSD plot on channel 157



(802.11n20) PSD plot on channel 157



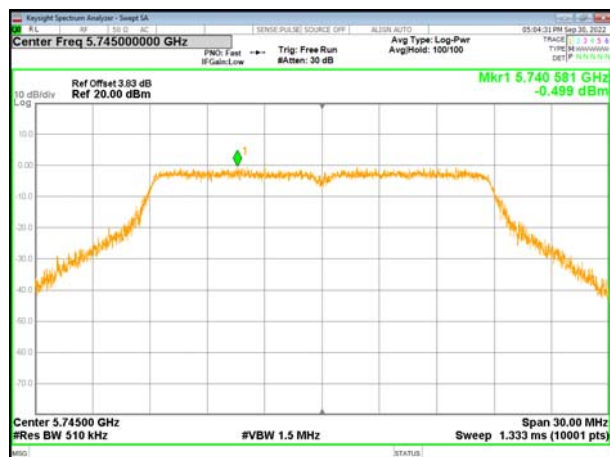
(802.11a) PSD plot on channel 165



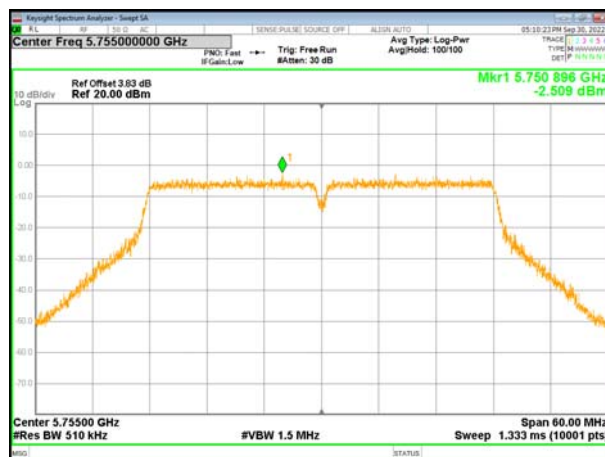
(802.11n20) PSD plot on channel 165



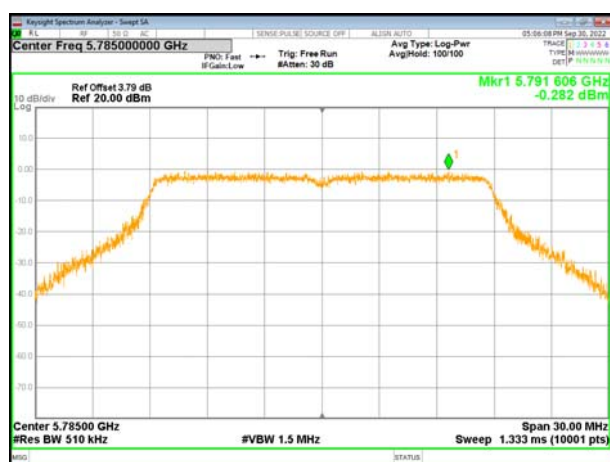
(802.11ac20) PSD plot on channel 149



(802.11n40) PSD plot on channel 151



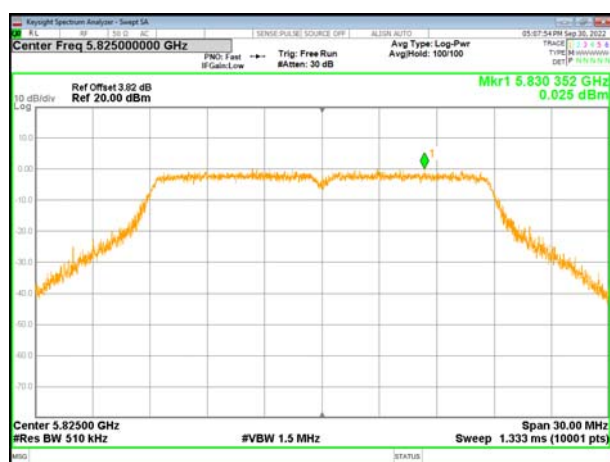
(802.11ac20) PSD plot on channel 157



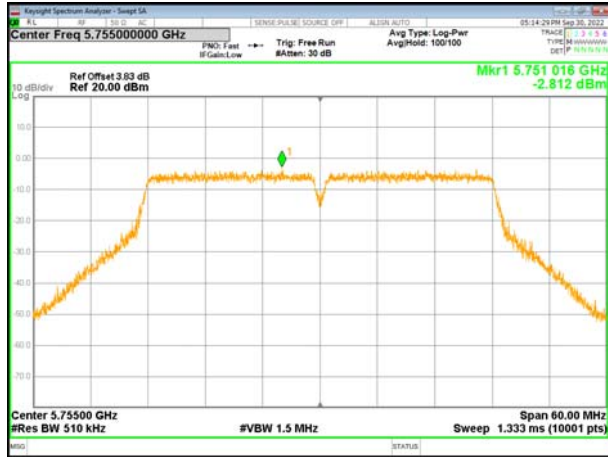
(802.11n40) PSD plot on channel 159



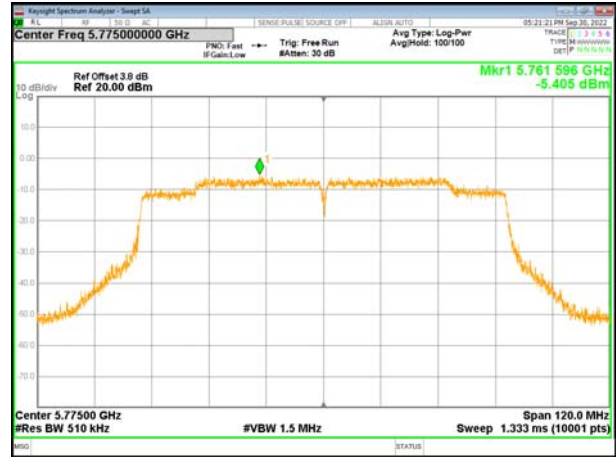
(802.11ac20) PSD plot on channel 165



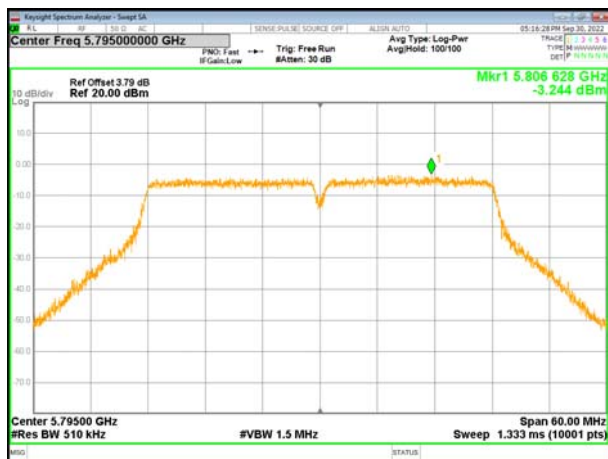
(802.11ac40) PSD plot on channel 151



(802.11ac80) PSD plot on channel 155

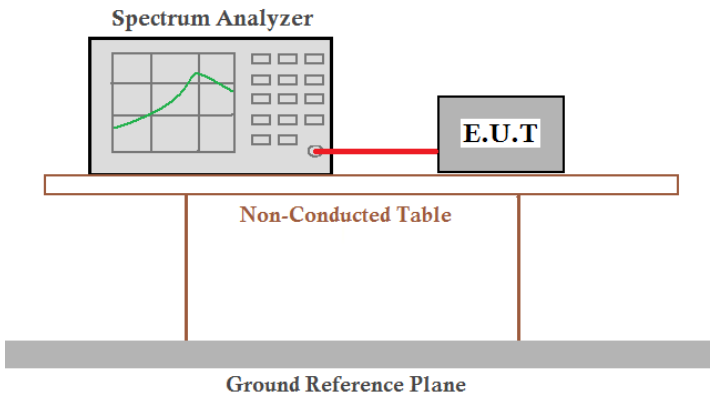


(802.11ac40) PSD plot on channel 159



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. The E.U.T. is 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 results:	Pass

Remarks:/

5.180~5.240 GHz

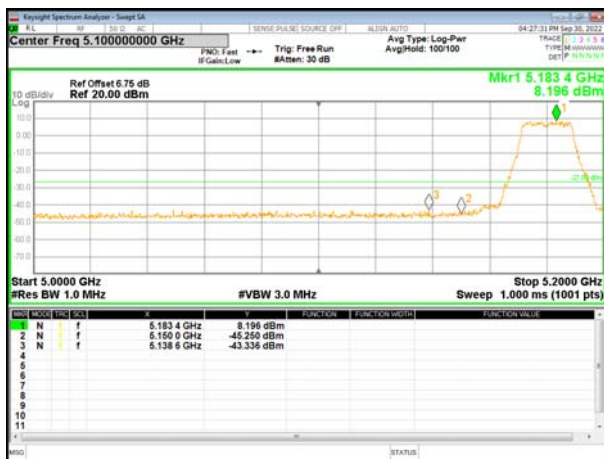
(802.11a) Band Edge, Left Side

(802.11n20) Band Edge, Left Side



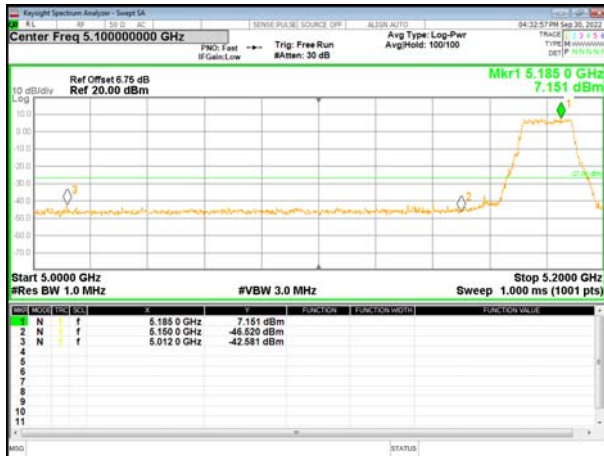
(802.11a) Band Edge, Right Side

(802.11n20) Band Edge, Right Side

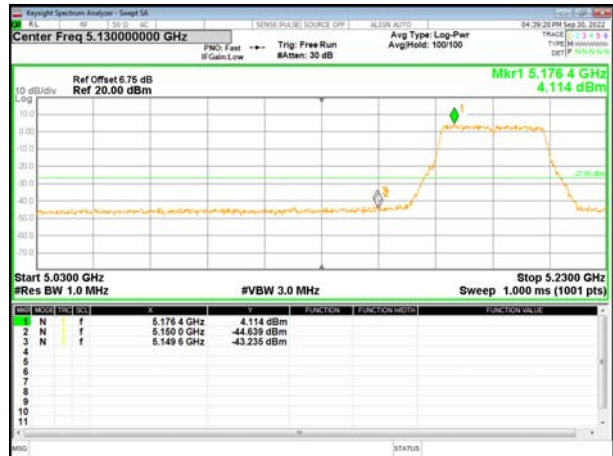


5.180~5.240 GHz

(802.11ac20) Band Edge, Left Side



(802.11n40) Band Edge, Left Side



(802.11ac20) Band Edge, Right Side



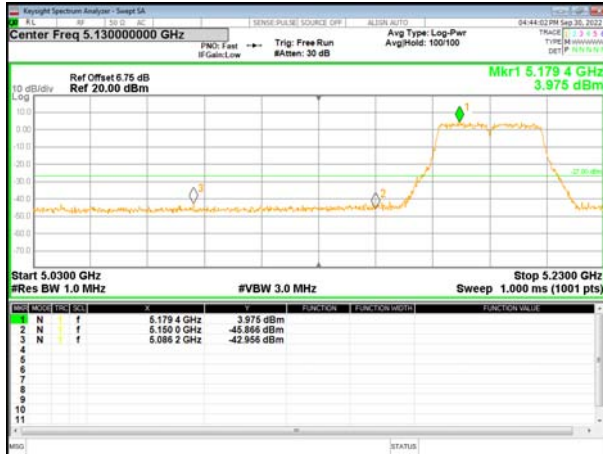
(802.11n40) Band Edge, Right Side



5.180~5.240 GHz

(802.11ac40) Band Edge, Left Side

(802.11ac80) Band Edge



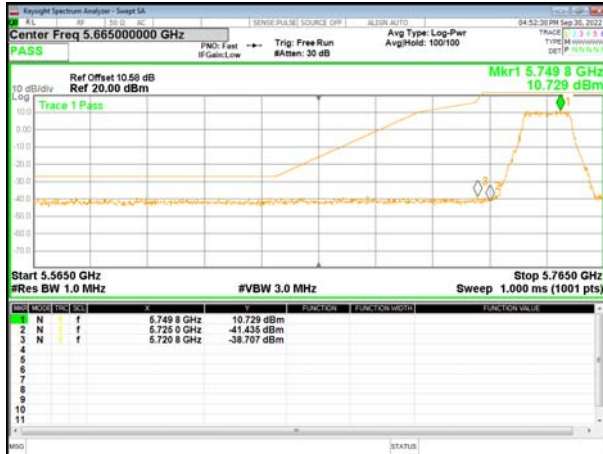
(802.11ac40) Band Edge, Right Side



5.745~5.825 GHz

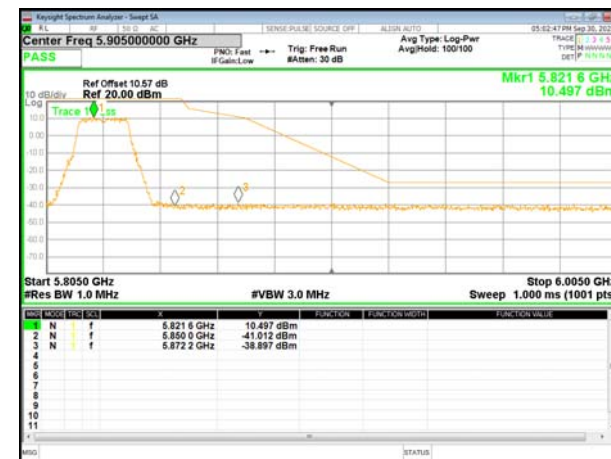
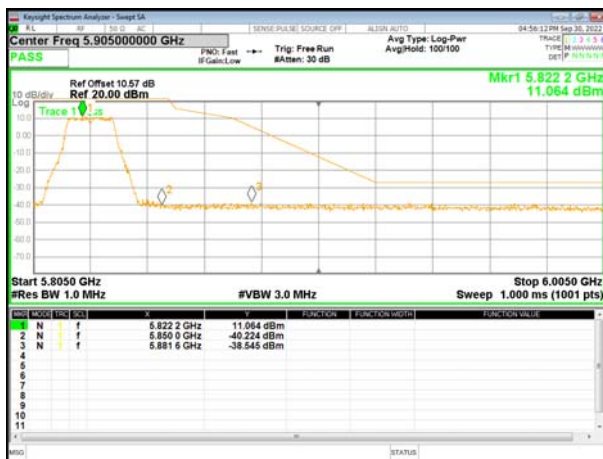
(802.11a) Band Edge, Left Side

(802.11n20) Band Edge, Left Side



(802.11a) Band Edge, Right Side

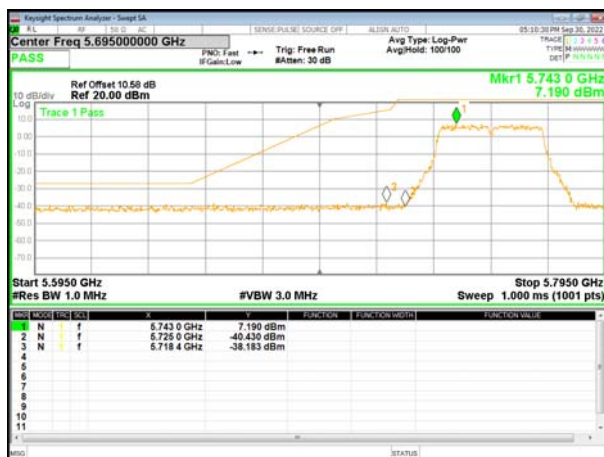
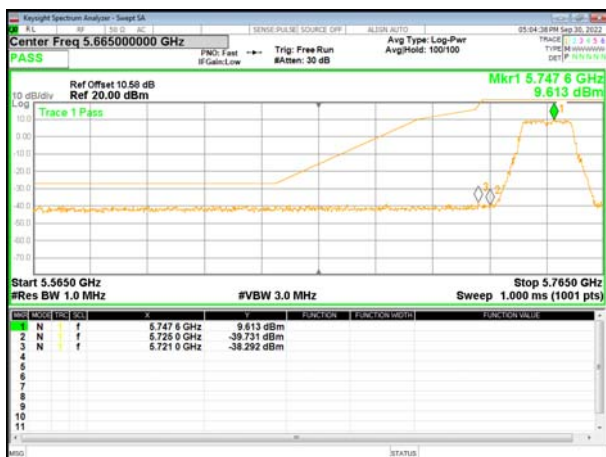
(802.11n20) Band Edge, Right Side



5.745~5.825 GHz

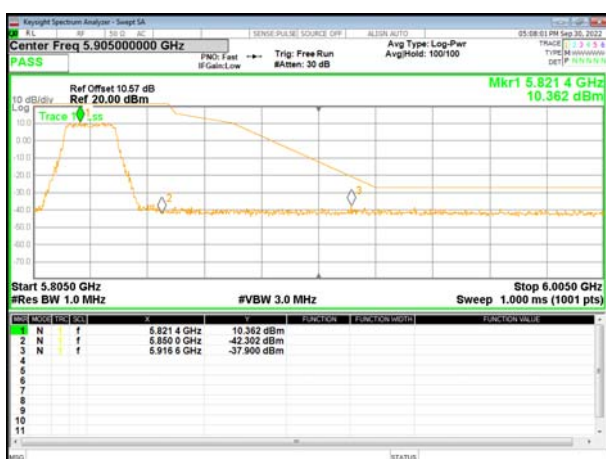
(802.11ac20) Band Edge, Left Side

(802.11n40) Band Edge, Left Side



(802.11ac20) Band Edge, Right Side

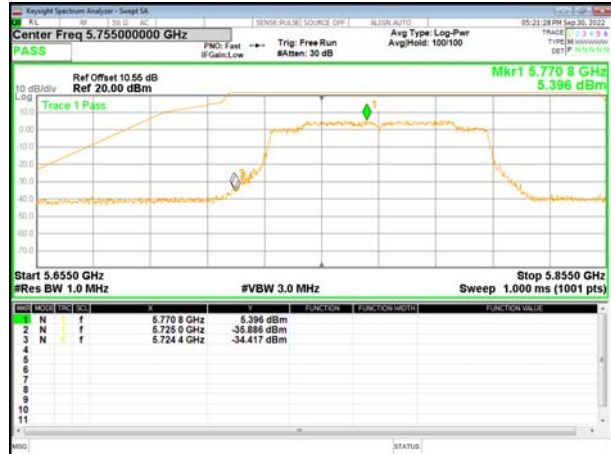
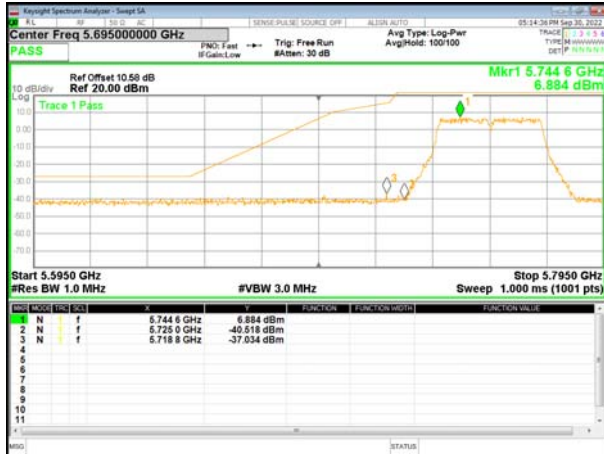
(802.11n40) Band Edge, Right Side



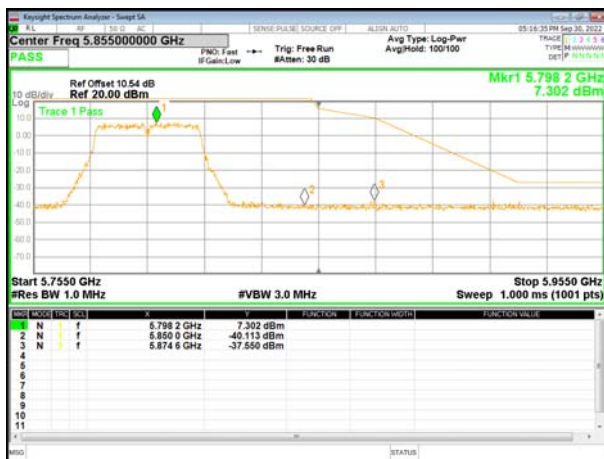
5.745~5.825 GHz

(802.11ac40) Band Edge, Left Side

(802.11ac80) Band Edge

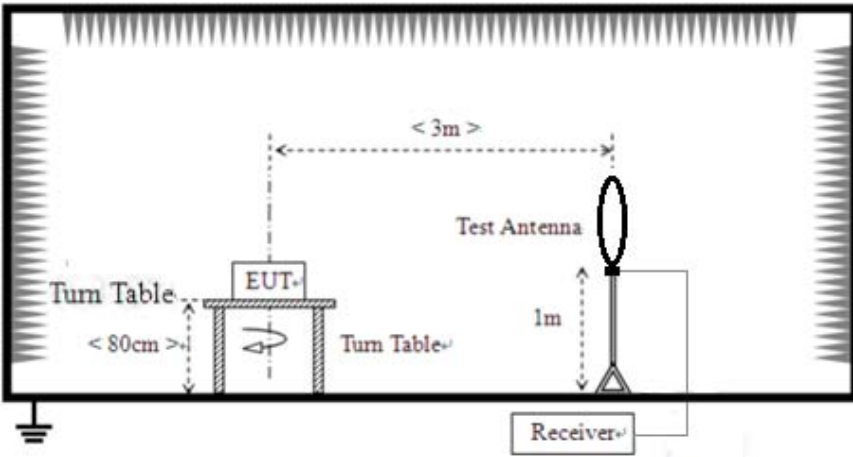


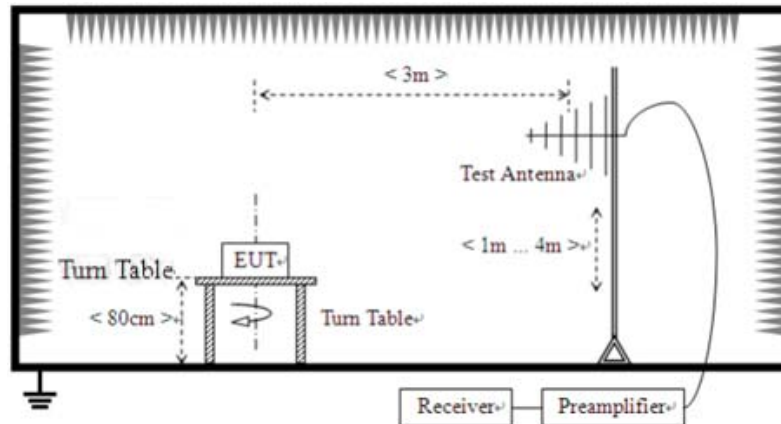
(802.11ac40) Band Edge, Right Side



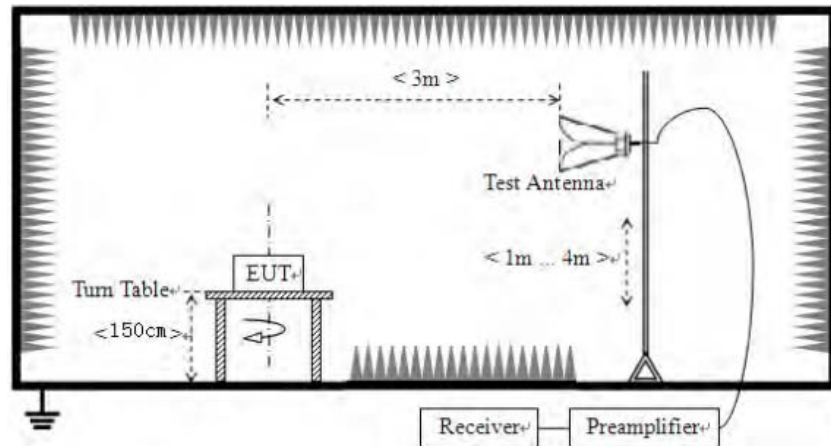
4.7 Spurious Emission

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. 7. 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 environment:	Temp.:	24.9 °C	Humid.:	51%	Press.:	1012mbar
Test voltage:	DC 5V from adapter					
Test results:	Pass					

Remarks:

1. All antennas was tested, only show the worst case 802.11n20 mode test data.
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.
3. According to KDB 789033 D02v02r01 section G) 1) d),for measurements above 1000 MHz @3m distance, the limit of field strength is computed as follows:
 $E[\text{dBuV/m}] = \text{EIRP}[\text{dBm}] + 95.2;$
For example, if $\text{EIRP} = -27\text{dBm}$
 $E[\text{dBuV/m}] = -27 + 95.2 = 68.2\text{dBuV/m}.$

Measurement Data:

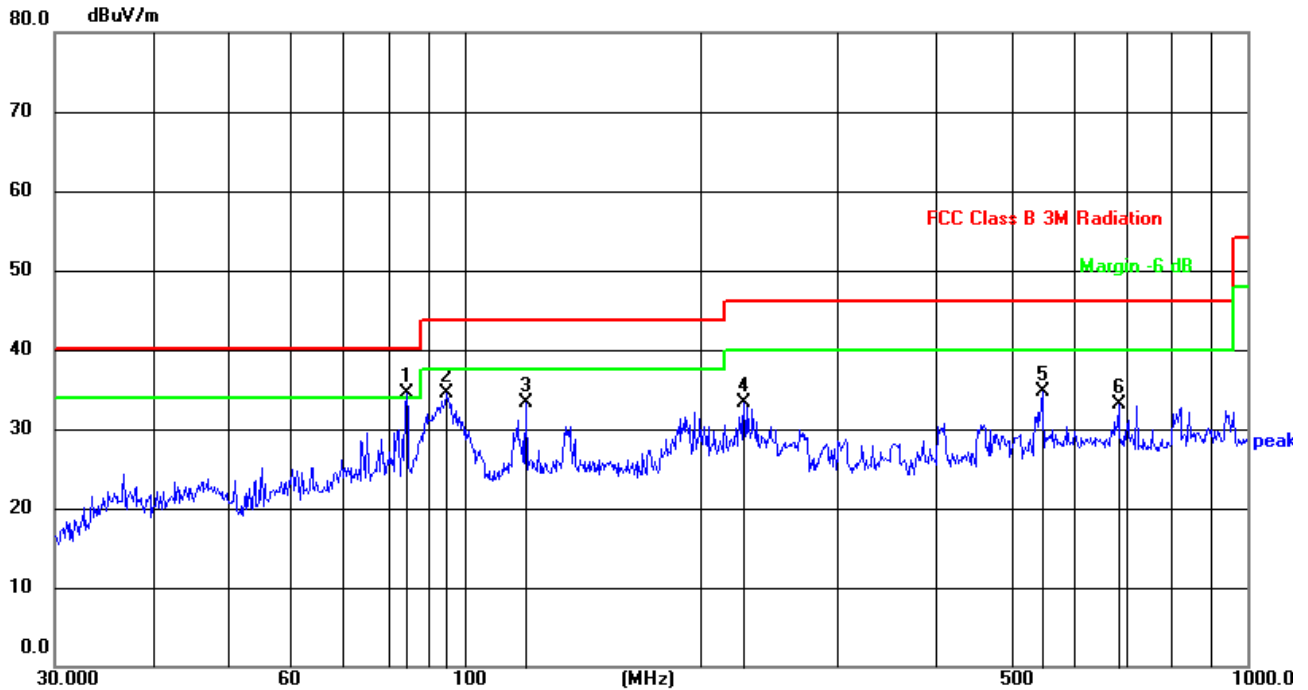
9 kHz ~ 30 MHz

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

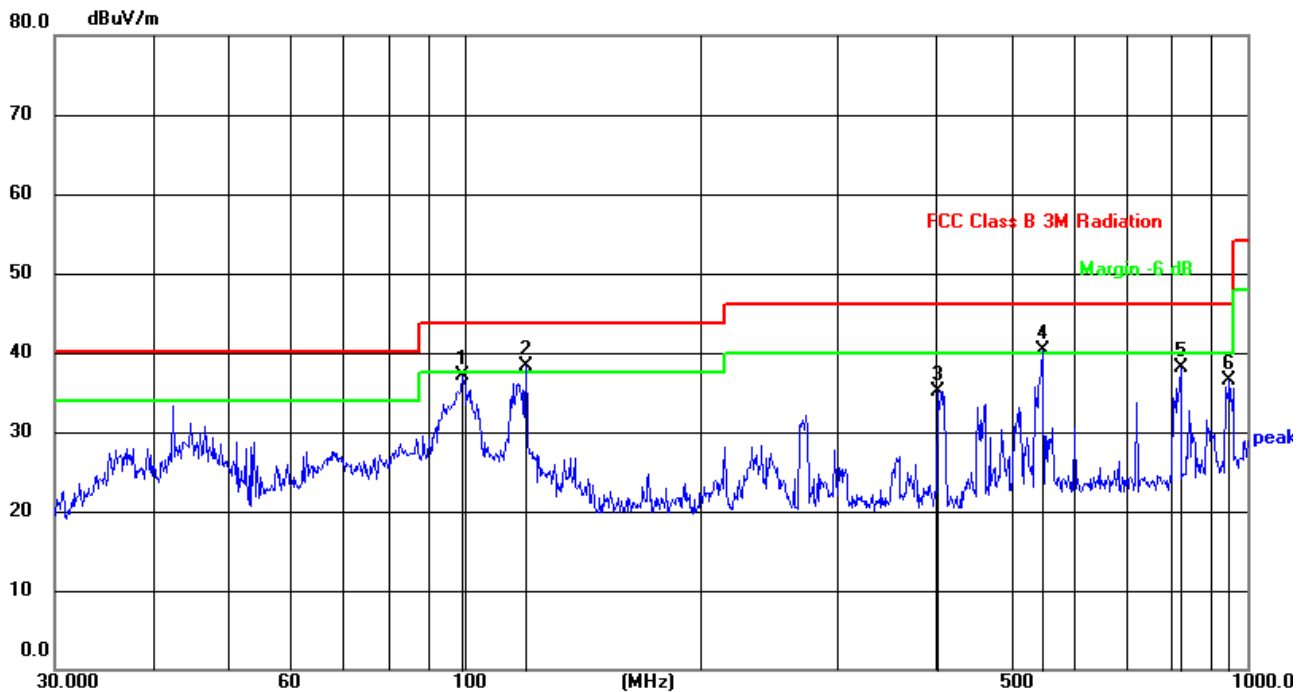
Temperature:	25.4℃	Relative Humidity:	47%
Pressure:	1010 hPa	Test Voltage :	AC 120V
Test Mode :	5.2G TX- 802.11n20		

Horizontal:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	84.4054	54.92	-20.38	34.54	40.00	-5.46	QP
2	95.0929	54.66	-20.15	34.51	43.50	-8.99	QP
3	119.8555	52.50	-19.28	33.22	43.50	-10.28	QP
4	227.6904	51.64	-18.42	33.22	46.00	-12.78	QP
5	547.0976	47.32	-12.56	34.76	46.00	-11.24	QP
6	684.7453	42.44	-9.38	33.06	46.00	-12.94	QP

Vertical:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	99.5279	57.05	-19.97	37.08	43.50	-6.42	QP
2	119.8555	57.28	-19.05	38.23	43.50	-5.27	QP
3	401.8383	51.56	-16.38	35.18	46.00	-10.82	QP
4	547.0976	52.89	-12.56	40.33	46.00	-5.67	QP
5	821.7103	45.23	-7.11	38.12	46.00	-7.88	QP
6	948.7608	41.54	-4.99	36.55	46.00	-9.45	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:

Temperature:	25.4℃	Relative Humidity:	47%
Pressure:	1010 hPa	Test Voltage :	AC 120V
Test Mode :	5.2G TX- 802.11n20		

802.11n20

Polar (H/V)	Frequency	Meter Read n g	Pre- amplifie r	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	46.11	46.20	8.27	38.50	46.68	68.20	-21.52	PK
V	10360.00	36.79	46.20	8.27	38.50	37.36	54.00	-16.64	AV
V	15540.00	43.41	46.30	10.35	38.70	46.16	74.00	-27.84	PK
V	15540.00	34.04	46.30	10.35	38.70	36.79	54.00	-17.21	AV
V	20720.00	51.92	57.40	11.93	37.80	44.25	68.20	-23.95	PK
V	20720.00	42.54	57.40	11.93	37.80	34.87	54.00	-19.13	AV
V	25900.00	49.72	56.50	13.45	39.70	46.37	68.20	-21.83	PK
V	25900.00	39.96	56.50	13.45	39.70	36.61	54.00	-17.39	AV
H	10360.00	46.04	46.20	8.27	38.50	46.61	68.20	-21.59	PK
H	10360.00	35.51	46.20	8.27	38.50	36.08	54.00	-17.92	AV
H	15540.00	42.49	46.30	10.35	38.70	45.24	74.00	-28.76	PK
H	15540.00	31.75	46.30	10.35	38.70	34.50	54.00	-19.50	AV
H	20720.00	54.00	57.40	11.93	37.80	46.33	68.20	-21.87	PK
H	20720.00	43.38	57.40	11.93	37.80	35.71	54.00	-18.29	AV
H	25900.00	50.67	56.50	13.45	39.70	47.32	68.20	-20.88	PK
H	25900.00	40.00	56.50	13.45	39.70	36.65	54.00	-17.35	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	50.14	46.2	8.27	38.5	50.71	68.20	-17.49	PK
V	10400.00	41.15	46.20	8.27	38.50	41.72	54.00	-12.28	AV
V	15600.00	49.60	46.30	10.35	38.40	52.05	74.00	-21.95	PK
V	15600.00	39.84	46.30	10.35	38.40	42.29	54.00	-11.71	AV
V	20800.00	60.63	57.40	11.93	37.80	52.96	68.20	-15.24	PK
V	20800.00	49.90	57.40	11.93	37.80	42.23	54.00	-11.77	AV
V	26000.00	55.25	56.50	13.45	39.80	52.00	68.20	-16.20	PK
V	26000.00	46.55	56.50	13.45	39.80	43.30	54.00	-10.70	AV
H	10400.00	52.07	46.20	8.27	38.50	52.64	68.20	-15.56	PK
H	10400.00	41.45	46.20	8.27	38.50	42.02	54.00	-11.98	AV
H	15600.00	49.58	46.30	10.35	38.40	52.03	74.00	-21.97	PK
H	15600.00	39.84	46.30	10.35	38.40	42.29	54.00	-11.71	AV
H	20800.00	59.46	57.40	11.93	37.80	51.79	68.20	-16.41	PK
H	20800.00	47.58	57.40	11.93	37.80	39.91	54.00	-14.09	AV
H	26000.00	54.93	56.50	13.45	39.80	51.68	68.20	-16.52	PK
H	26000.00	45.66	56.50	13.45	39.80	42.41	54.00	-11.59	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	47.45	46.20	8.27	38.60	48.12	68.20	-20.08	PK
V	10480.00	36.75	46.20	8.27	38.60	37.42	54.00	-16.58	AV
V	15720.00	44.85	46.30	10.35	38.40	47.30	74.00	-26.70	PK
V	15720.00	34.32	46.30	10.35	38.40	36.77	54.00	-17.23	AV
V	20960.00	55.66	57.40	11.93	37.50	47.69	68.20	-20.51	PK
V	20960.00	46.49	57.40	11.93	37.50	38.52	54.00	-15.48	AV
V	26200.00	51.37	56.50	13.45	40.10	48.42	68.20	-19.78	PK
V	26200.00	41.28	56.50	13.45	40.10	38.33	54.00	-15.67	AV
H	10480.00	47.71	46.20	8.27	38.60	48.38	68.20	-19.82	PK
H	10480.00	36.75	46.20	8.27	38.60	37.42	54.00	-16.58	AV
H	15720.00	45.20	46.30	10.35	38.40	47.65	74.00	-26.35	PK
H	15720.00	34.43	46.30	10.35	38.40	36.88	54.00	-17.12	AV
H	20960.00	55.85	57.40	11.93	37.50	47.88	68.20	-20.32	PK
H	20960.00	46.38	57.40	11.93	37.50	38.41	54.00	-15.59	AV
H	26200.00	51.05	56.50	13.45	40.10	48.10	68.20	-20.10	PK
H	26200.00	40.62	56.50	13.45	40.10	37.67	54.00	-16.33	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. The worst mode is 802.11n20, only the worst data is recorded.



Temperature:	25.4℃	Relative Humidity:	47%
Pressure:	1010 hPa	Test Voltage :	AC 120V
Test Mode :	5.8G TX- 802.11n20		

802.11n20

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre- amplifier (dB)	Cable Loss (dB)	Antenn Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detect or Typ
Low Channel:5745MHz									
V	11490.00	49.44	46.10	8.77	39.10	51.21	74.00	-22.79	PK
V	11490.00	40.37	46.10	8.77	39.10	42.14	54.00	-11.86	AV
V	17235.00	46.74	47.60	11.10	38.70	48.94	68.20	-19.26	PK
V	17235.00	38.63	47.60	11.10	38.70	40.83	54.00	-13.17	AV
V	22980.00	56.44	56.90	12.73	37.70	49.97	74.00	-24.03	PK
V	22980.00	47.55	56.90	12.73	37.70	41.08	54.00	-12.92	AV
V	28725.00	52.89	55.60	14.25	40.30	51.84	68.20	-16.36	PK
V	28725.00	43.45	55.60	14.25	40.30	42.40	54.00	-11.60	AV
H	11490.00	49.96	46.10	8.77	39.10	51.73	74.00	-22.27	PK
H	11490.00	40.17	46.10	8.77	39.10	41.94	54.00	-12.06	AV
H	17235.00	47.87	47.60	11.10	38.70	50.07	68.20	-18.13	PK
H	17235.00	39.10	47.60	11.10	38.70	41.30	54.00	-12.70	AV
H	22980.00	58.89	56.90	12.73	37.70	52.42	74.00	-21.58	PK
H	22980.00	47.30	56.90	12.73	37.70	40.83	54.00	-13.17	AV
H	28725.00	55.08	55.60	14.25	40.30	54.03	68.20	-14.17	PK
H	28725.00	44.15	55.60	14.25	40.30	43.10	54.00	-10.90	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
Middle Channel:5785MHz									
V	11570.00	39.15	46.10	8.77	39.10	40.92	74.00	-33.08	PK
V	11570.00	30.95	46.10	8.77	39.10	32.72	54.00	-21.28	AV
V	17355.00	38.23	47.70	11.10	38.40	40.03	68.20	-28.17	PK
V	17355.00	30.87	47.70	11.10	38.40	32.67	54.00	-21.33	AV
V	23140.00	45.76	56.90	12.73	37.80	39.39	74.00	-34.61	PK
V	23140.00	37.70	56.90	12.73	37.80	31.33	54.00	-22.67	AV
V	28925.00	42.14	55.60	14.25	40.50	41.29	68.20	-26.91	PK
V	28925.00	34.78	55.60	14.25	40.50	33.93	54.00	-20.07	AV
H	11570.00	40.73	46.10	8.77	39.10	42.50	74.00	-31.50	PK
H	11570.00	32.02	46.10	8.77	39.10	33.79	54.00	-20.21	AV
H	17355.00	37.92	47.70	11.10	38.40	39.72	68.20	-28.48	PK
H	17355.00	30.39	47.70	11.10	38.40	32.19	54.00	-21.81	AV
H	23140.00	46.57	56.90	12.73	37.80	40.20	74.00	-33.80	PK
H	23140.00	38.87	56.90	12.73	37.80	32.50	54.00	-21.50	AV
H	28925.00	43.53	55.60	14.25	40.50	42.68	68.20	-25.52	PK
H	28925.00	35.51	55.60	14.25	40.50	34.66	54.00	-19.34	AV

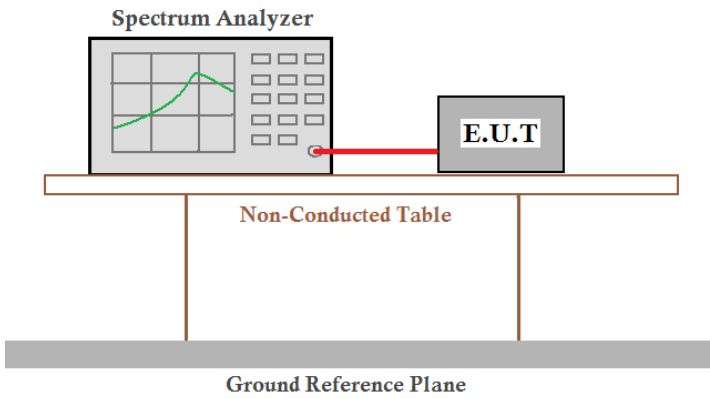


Polar (H/V)	Frequency	Meter Reading	Pre- amplifier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detect or Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
High Channel:5825MHz									
V	11650.00	44.73	46.10	8.77	39.10	46.50	74.00	-27.50	PK
V	11650.00	35.83	46.10	8.77	39.10	37.60	54.00	-16.40	AV
V	17475.00	42.64	47.90	11.23	38.90	44.87	68.20	-23.33	PK
V	17475.00	35.13	47.90	11.23	38.90	37.36	54.00	-16.64	AV
V	23300.00	52.12	57.10	12.73	37.80	45.55	68.20	-22.65	PK
V	23300.00	42.92	57.10	12.73	37.80	36.35	54.00	-17.65	AV
V	29125.00	48.92	55.80	14.25	40.50	47.87	68.20	-20.33	PK
V	29125.00	40.21	55.80	14.25	40.50	39.16	54.00	-14.84	AV
H	11650.00	46.69	46.10	8.77	39.10	48.46	74.00	-25.54	PK
H	11650.00	38.18	46.10	8.77	39.10	39.95	54.00	-14.05	AV
H	17475.00	43.83	47.90	11.23	38.90	46.06	68.20	-22.14	PK
H	17475.00	36.38	47.90	11.23	38.90	38.61	54.00	-15.39	AV
H	23300.00	53.50	57.10	12.73	37.80	46.93	68.20	-21.27	PK
H	23300.00	44.33	57.10	12.73	37.80	37.76	54.00	-16.24	AV
H	29125.00	49.95	55.80	14.25	40.50	48.90	68.20	-19.30	PK
H	29125.00	40.94	55.80	14.25	40.50	39.89	54.00	-14.11	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. The worst mode is 802.11n20, only the worst data is recorded.

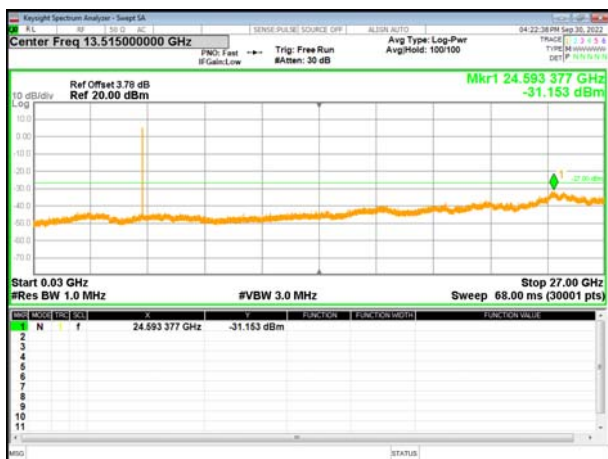
4.7.2 Conducted Emission Method

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 results:	Pass

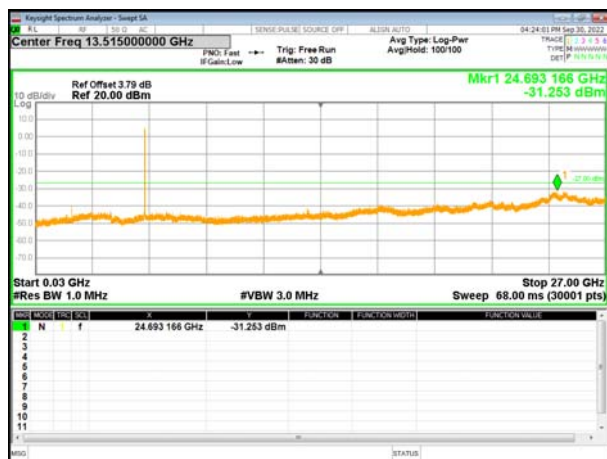
5180-5240MHz

Test Plot

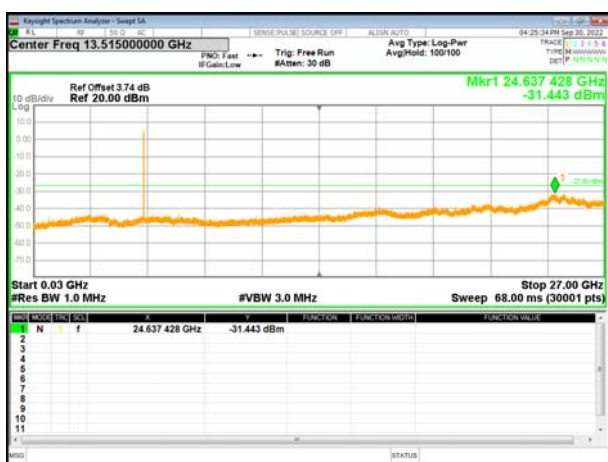
802.11a on channel 36



802.11a on channel 40



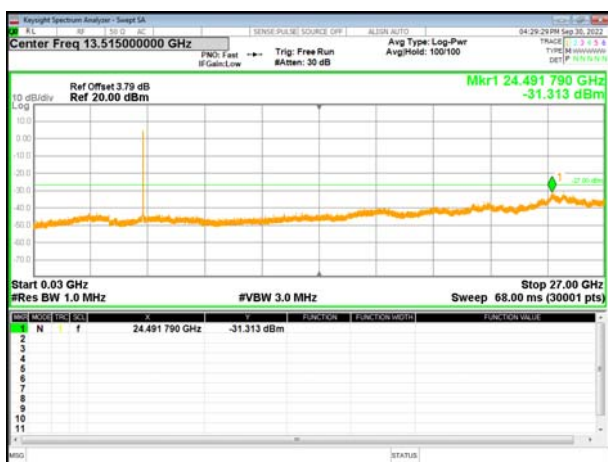
802.11a on channel 48



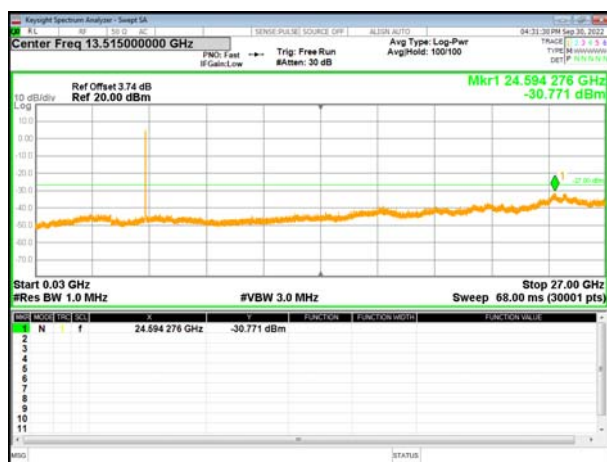
802.11n20 on channel 36



802.11n20 on channel 40



802.11n20 on channel 48



Test Plot

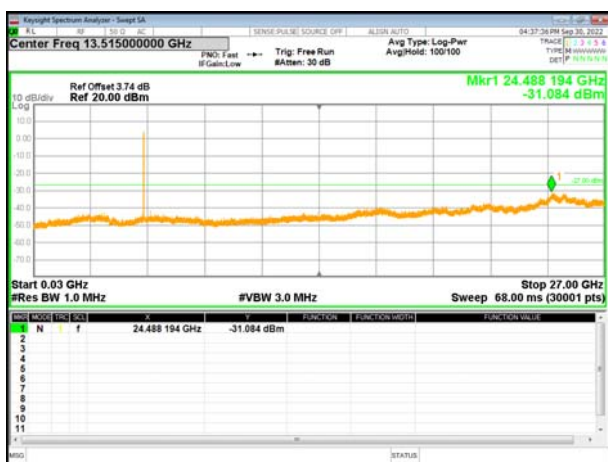
802.11ac20 on channel 36



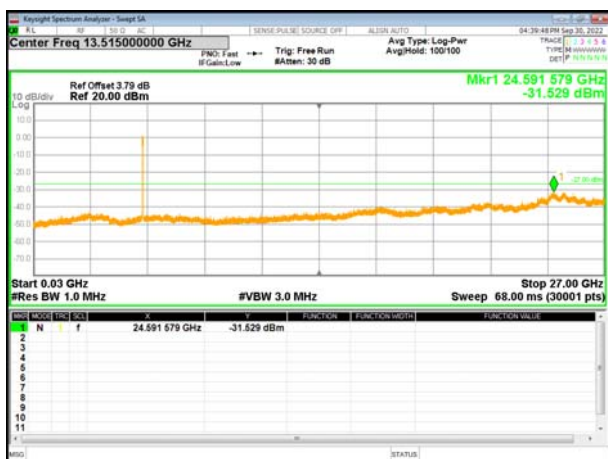
802.11ac20 on channel 40



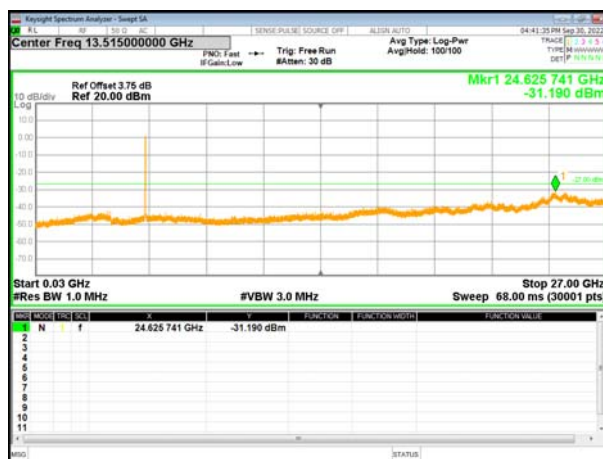
802.11ac20 on channel 48



802.11n40 on channel 38

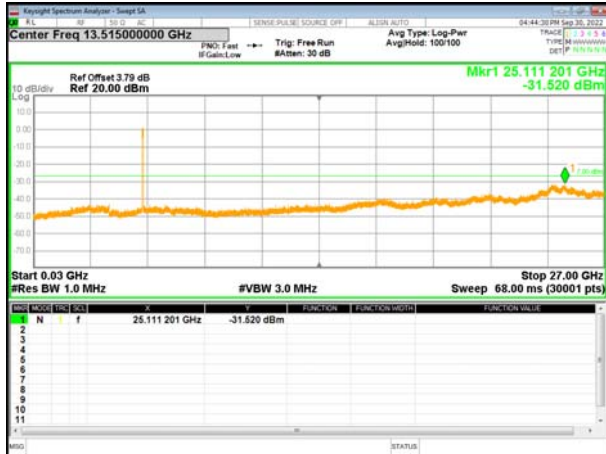


802.11n40 on channel 46

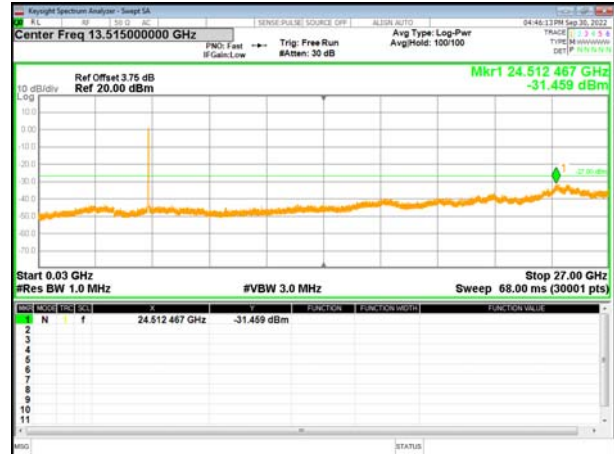


Test Plot

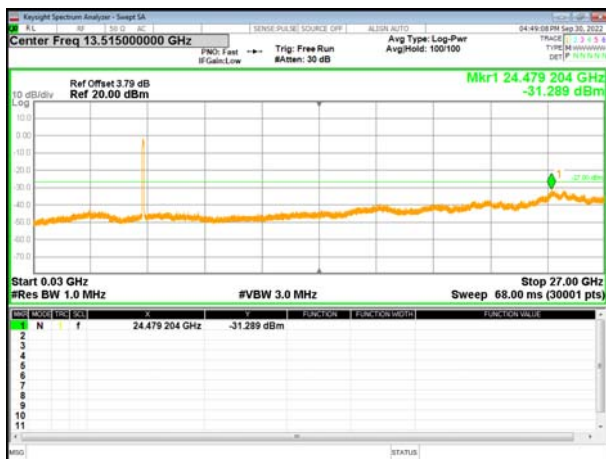
802.11ac40 on channel 38



802.11ac40 on channel 46



802.11ac80 on channel 42

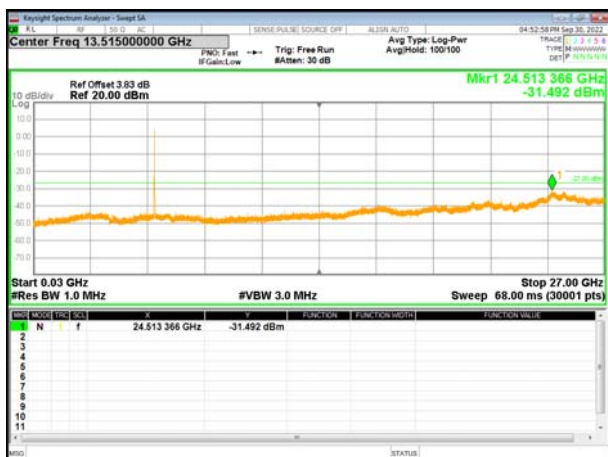




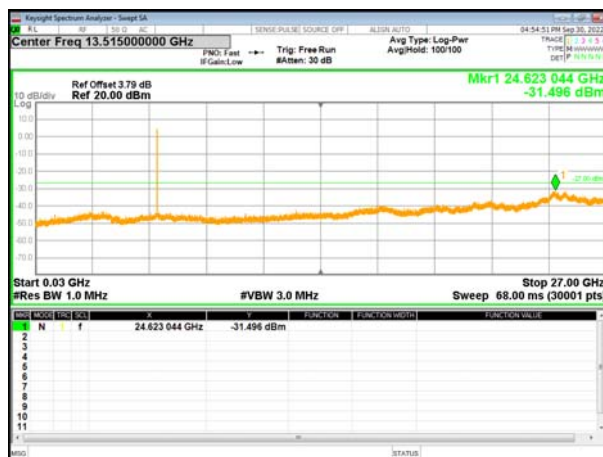
5745-5825MHz

Test Plot

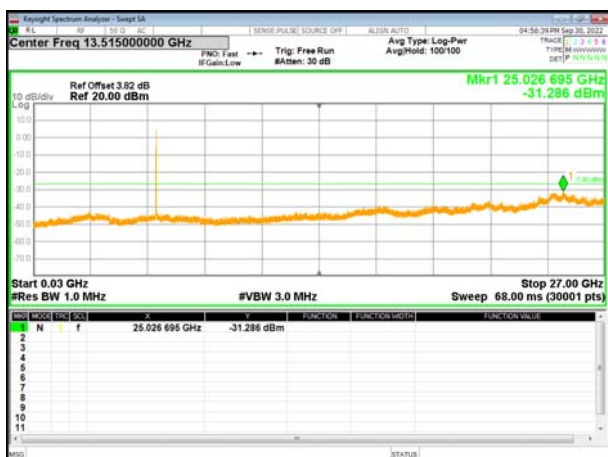
802.11a on channel 149



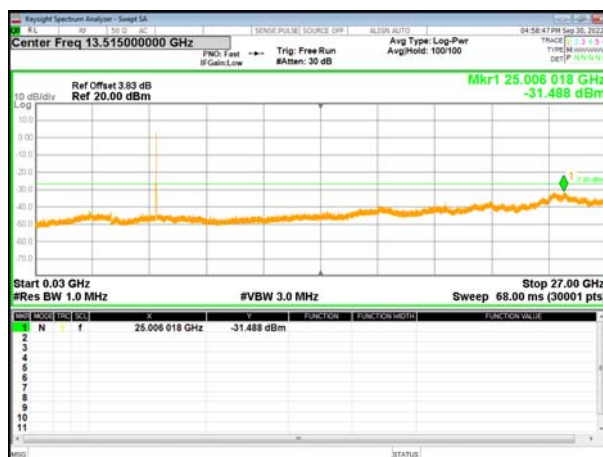
802.11a on channel 157



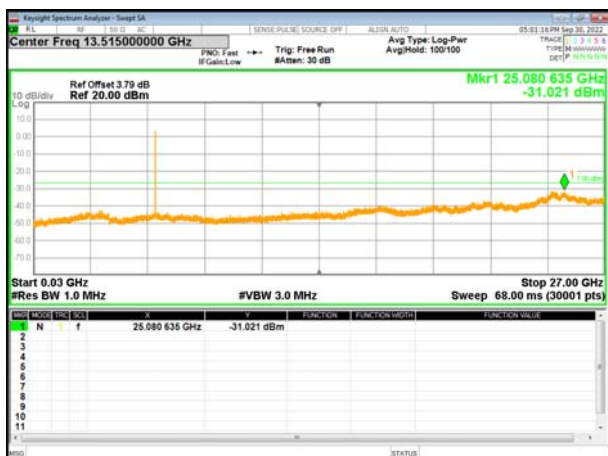
802.11a on channel 165



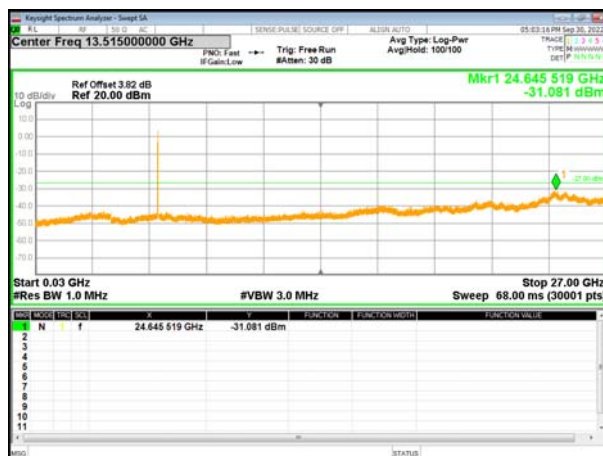
802.11n20 on channel 149



802.11n20 on channel 157

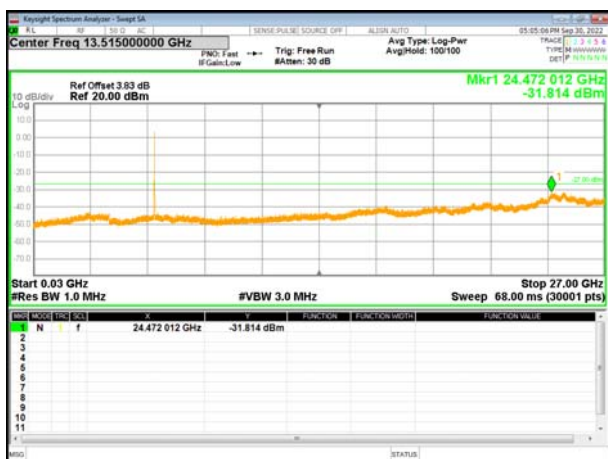


802.11n20 on channel 165

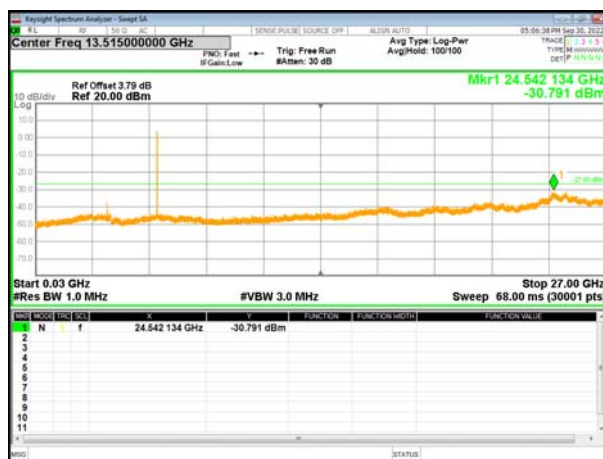


Test Plot

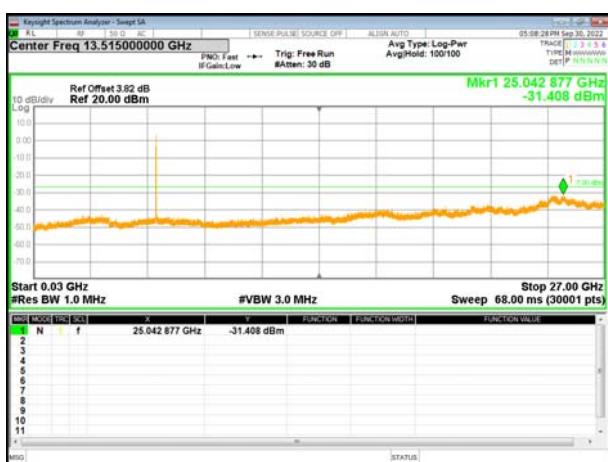
802.11ac20 on channel 149



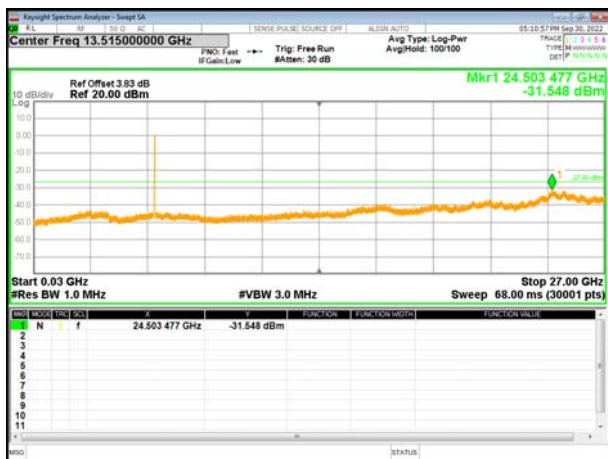
802.11ac20 on channel 157



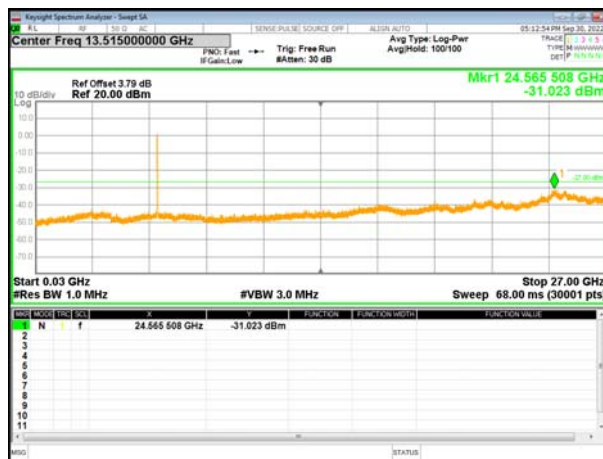
802.11ac20 on channel 165



802.11n40 on channel 151

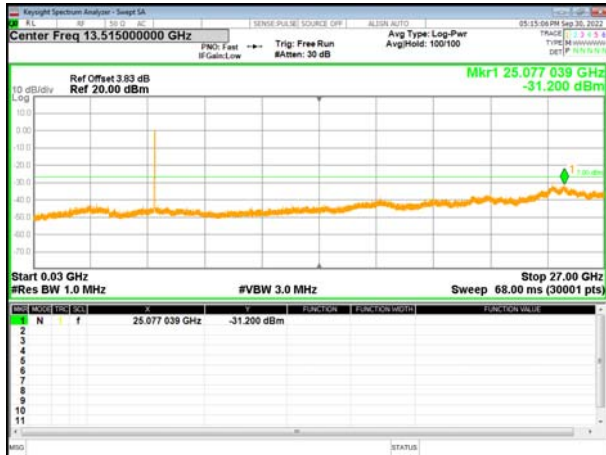


802.11n40 on channel 159

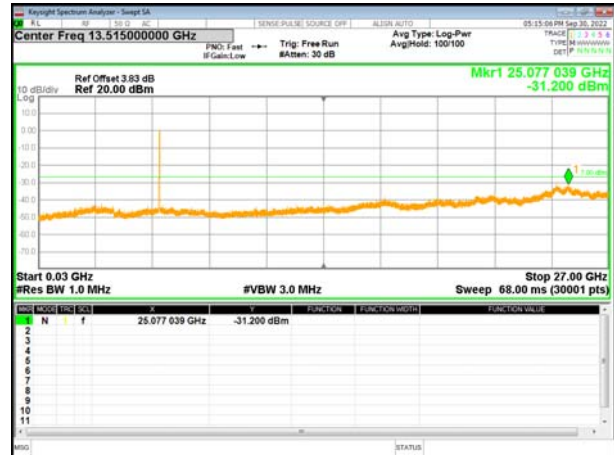


Test Plot

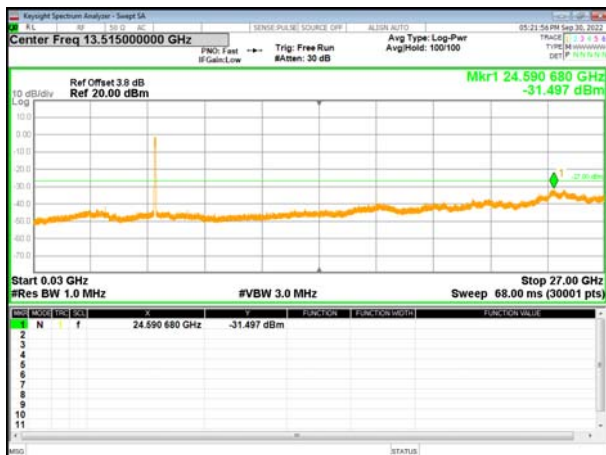
802.11ac40 on channel 151



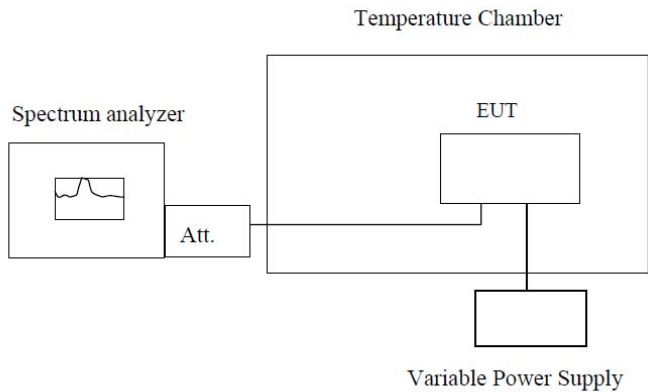
802.11ac40 on channel 159



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: AC120V					
Temp. (°C)	Operating Frequency (MHz)	0 minute Measured Frequency (MHz)	2 minute Measured Frequency (MHz)	5 minute Measured Frequency (MHz)	10 minute Measured Frequency (MHz)
-30	5180	5179.998	5180.076	5179.798	5179.927
	5190	5189.994	5199.950	5199.672	5189.938
	5200	5199.989	5199.975	5199.697	5199.929
	5210	5209.995	5209.953	5209.674	5209.930
	5220	5219.990	5219.968	5219.689	5219.936
	5230	5229.988	5229.961	5229.681	5229.954
	5240	5239.961	5239.969	5239.689	5239.939
-20	5180	5179.989	5179.952	5179.683	5179.948
	5190	5189.980	5189.942	5189.682	5189.944
	5200	5199.988	5199.950	5199.675	5199.939
	5210	5209.980	5209.942	5209.664	5209.945
	5220	5220.001	5219.963	5219.674	5219.939
	5230	5229.979	5229.941	5229.667	5229.937
	5240	5239.997	5239.959	5239.675	5239.910
-10	5180	5179.998	5179.961	5179.662	5179.927
	5190	5189.994	5189.956	5189.673	5189.938
	5200	5199.989	5199.951	5199.663	5199.929
	5210	5209.995	5209.957	5209.663	5209.930
	5220	5219.990	5219.952	5219.670	5219.936
	5230	5229.988	5229.950	5229.687	5229.954
	5240	5239.961	5239.923	5239.659	5239.926
0	5180	5179.775	5179.940	5179.674	5179.938
	5190	5199.947	5189.950	5189.665	5189.939
	5200	5199.945	5199.941	5199.672	5199.930
	5210	5210.000	5209.942	5209.663	5209.937
	5220	5219.989	5219.949	5219.684	5219.929
	5230	5229.976	5229.967	5229.661	5229.950
	5240	5239.993	5239.939	5239.679	5239.928
10	5180	5179.977	5179.952	5179.683	5179.939
	5190	5189.988	5189.942	5189.679	5189.930
	5200	5199.979	5199.950	5199.673	5199.938
	5210	5209.980	5209.942	5209.678	5209.930
	5220	5219.987	5219.963	5219.673	5219.950
	5230	5230.005	5229.941	5229.670	5229.928
	5240	5239.990	5239.959	5239.643	5239.946



20	5180	5180.002	5179.992	5179.985	5179.936
	5190	5189.998	5189.993	5189.976	5189.966
	5200	5199.993	5199.984	5199.984	5199.991
	5210	5209.999	5299.992	5209.976	5209.975
	5220	5219.994	5219.984	5219.997	5219.966
	5230	5229.992	5230.005	5229.975	5229.994
	5240	5239.965	5239.983	5239.993	5239.982
30	5180	5179.981	5179.993	5179.985	5179.984
	5190	5189.992	5189.984	5189.976	5179.984
	5200	5199.983	5199.992	5199.984	5189.980
	5210	5209.984	5209.984	5209.976	5199.975
	5220	5219.991	5220.005	5219.997	5209.981
	5230	5230.009	5229.983	5229.975	5219.976
	5240	5239.981	5240.001	5239.993	5229.974
40	5180	5179.993	5179.992	5179.771	5179.963
	5190	5189.984	5189.993	5199.943	5189.974
	5200	5199.992	5199.984	5199.941	5199.965
	5210	5209.984	5299.992	5209.996	5209.966
	5220	5220.005	5219.984	5219.985	5219.973
	5230	5229.983	5230.005	5229.972	5229.991
	5240	5240.001	5239.983	5239.989	5239.963
50	5180	5179.993	5179.993	5179.985	5179.936
	5190	5189.984	5189.984	5189.976	5189.966
	5200	5199.992	5199.992	5199.984	5199.991
	5210	5209.984	5209.984	5209.976	5209.975
	5220	5220.005	5220.005	5219.997	5219.966
	5230	5229.983	5229.983	5229.975	5229.994
	5240	5240.001	5240.001	5239.993	5239.982

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	5180	5180.002	5180.116	5179.985	5180.099
	5190	5189.998	5199.989	5189.976	5199.974
	5200	5199.993	5200.017	5199.984	5199.999
	5210	5209.999	5209.995	5209.976	5209.977
	5220	5219.994	5220.010	5219.997	5219.992
	5230	5229.992	5230.003	5229.975	5229.985
	5240	5239.965	5240.011	5239.989	5239.993
120	5180	5179.988	5180.011	5179.984	5179.984
	5190	5189.984	5180.117	5189.985	5189.983
	5200	5199.992	5199.992	5199.976	5199.977
	5210	5209.985	5210.017	5299.984	5209.967
	5220	5220.005	5219.995	5219.976	5219.977
	5230	5229.983	5230.010	5229.996	5299.975
	5240	5240.001	5240.003	5239.975	5239.979
138	5180	5180.002	5180.002	5179.973	5179.963
	5190	5189.998	5189.998	5189.984	5189.974
	5200	5199.993	5199.993	5199.975	5199.964
	5210	5209.999	5209.999	5209.976	5209.966
	5220	5219.994	5219.994	5219.983	5219.973
	5230	5229.992	5229.992	5230.001	5229.996
	5240	5239.965	5239.965	5239.973	5239.963



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	5744.979	5744.985	5744.977	5744.966
	5755	5754.989	5754.992	5754.984	5754.955
	5775	5775.010	5774.984	5775.001	5774.966
	5785	5784.986	5784.976	5784.977	5784.973
	5795	5794.982	5794.983	5794.973	5794.991
	5825	5824.980	5824.912	5824.976	5824.983
-20	5745	5744.976	5744.996	5744.971	5744.977
	5755	5754.991	5754.998	5754.996	5754.991
	5775	5774.990	5775.001	5774.977	5774.976
	5785	5784.993	5784.993	5784.986	5784.963
	5795	5795.003	5794.984	5794.984	5794.957
	5825	5824.985	5824.993	5824.994	5824.991
-10	5745	5744.986	5744.986	5744.987	5744.596
	5755	5755.012	5754.993	5754.989	5754.980
	5775	5775.008	5775.010	5774.992	5774.981
	5785	5784.992	5784.986	5784.984	5784.984
	5795	5794.981	5794.982	5794.975	5794.967
	5825	5824.916	5824.984	5824.984	5824.963
0	5745	5744.980	5744.975	5744.987	5744.967
	5755	5755.005	5754.991	5754.989	5754.993
	5775	5774.986	5774.990	5774.992	5774.989
	5785	5784.995	5784.993	5784.984	5784.973
	5795	5794.993	5795.006	5794.975	5794.962
	5825	5825.003	5824.985	5824.984	5824.897
10	5745	5744.980	5744.985	5744.976	5744.962
	5755	5755.005	5755.002	5754.983	5754.974
	5775	5774.986	5775.003	5774.975	5774.991
	5785	5784.995	5784.985	5784.967	5784.967
	5795	5794.993	5795.002	5794.974	5794.963
	5825	5825.003	5825.000	5824.903	5824.966
20	5745	5744.996	5745.010	5744.985	5744.966
	5755	5755.010	5754.982	5755.001	5754.985
	5775	5774.995	5775.005	5774.986	5774.965
	5785	5784.982	5785.005	5784.973	5784.992
	5795	5794.976	5794.996	5794.967	5794.984
	5825	5825.010	5825.011	5825.001	5824.993
30	5745	5744.986	5744.996	5744.970	5744.991
	5755	5754.993	5754.998	5754.993	5754.963
	5775	5775.010	5775.001	5774.994	5774.986
	5785	5784.986	5784.993	5784.976	5784.986
	5795	5794.982	5794.984	5794.993	5794.977
	5825	5824.985	5824.993	5824.991	5824.992
40	5745	5744.996	5744.980	5744.987	5744.960
	5755	5755.010	5755.005	5754.989	5754.993
	5775	5774.995	5774.986	5774.992	5774.989
	5785	5784.982	5784.995	5784.984	5784.973



50	5795	5794.976	5794.993	5794.975	5794.962
	5825	5825.010	5825.003	5824.984	5824.897
	5745	5744.996	5745.010	5744.987	5744.966
	5755	5754.990	5754.982	5755.000	5754.985
	5775	5774.995	5775.005	5774.986	5774.965
	5785	5784.982	5785.005	5784.973	5784.993
	5795	5794.976	5794.995	5794.967	5794.984
	5825	5825.010	5825.015	5825.001	5824.993

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	5744.975	5744.985	5744.976	5744.961
	5755	5754.991	5754.992	5754.993	5754.986
	5775	5774.990	5774.984	5774.994	5774.967
	5785	5784.993	5784.976	5784.976	5784.976
	5795	5795.004	5794.983	5794.994	5794.974
	5825	5824.985	5824.912	5824.991	5824.984
120	5745	5744.975	5744.996	5744.971	5744.977
	5755	5754.991	5754.998	5754.996	5754.991
	5775	5774.990	5775.001	5774.977	5774.976
	5785	5784.993	5784.993	5784.986	5784.963
	5795	5795.000	5794.984	5794.984	5794.957
	5825	5824.985	5824.993	5824.994	5824.991
138	5745	5744.996	5745.009	5744.987	5744.966
	5755	5755.010	5754.982	5755.001	5754.985
	5775	5774.995	5775.005	5774.986	5774.965
	5785	5784.982	5785.005	5784.973	5784.992
	5795	5794.976	5794.996	5794.967	5794.984
	5825	5825.010	5825.011	5825.001	5824.993



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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