



TEST REPORT

Applicant: Shenzhen Baishi Internet Technology Co. , Ltd.
Address of Applicant: Room 616, 6th floor, Liangji Building,Fukang Community, Longhua Street,Shenzhen
Manufacturer/Factory: Shenzhen Baishi Internet Technology Co. , Ltd.
Address of Manufacturer: Room 616, 6th floor, Liangji Building,Fukang Community, Longhua Street,Shenzhen
Product Name: LED Projector
Model No.: X10,K9,K10,K11,H11,H12,H15,H21S,X6,X7,X8,X9,X11,X18,A6,A8,A9,M6,Z5,Z6,Z8,Z9,Z10,X801
Trade Mark: bsway
FCC ID: 2BADK-X10
Applicable standards: FCC CFR Title 47 Part 15 Subpart E Section 15.407
Date of Test: Feb.24, 2023- Mar.05, 2023
Date of report issued: Mar.06, 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.

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

Compiled by:

Reviewed by:

Approved by:

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:	LED Projector
Model No.:	X10,K9,K10,K11,H11,H12,H15,H21S,X6,X7,X8,X9,X11,X18,A6,A8,A9,M6,Z5,Z6,Z8,Z9,Z10,X801
Difference of model(s)	All the model are the same circuit and RF module, except the model names and colors
Test Model:	X10
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:	Integrated antenna
Antenna gain:	3.46 dBi(Note: Antenna information is provided by applicant, Testing lab is not responsible for the accuracy of the information.)
Power supply:	DC 19 form adapter with AC 100V-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	MP_Kit_RTL11ac_8822BS_SDIO_v0.02
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+SUHNER	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	MWRFTest	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	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	MWRFTest	MTS 8310	V2.0.0.0
Conducted test software	EZ-EMC	Farad	Ver.EMC-CON 3A1.1
Radiated test software	EZ-EMC	Farad	Ver.FA-03A2 RE

4 Test results and Measurement Data

4.1 Antenna requirement

Standard requirement:	FCC Part15 C Section 15.203
<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 Integrated 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.:	22.3°C	Humid.:	44%	Press.:	1012mbar
Test voltage:	AC 120V, 60Hz					
Test results:	Pass					

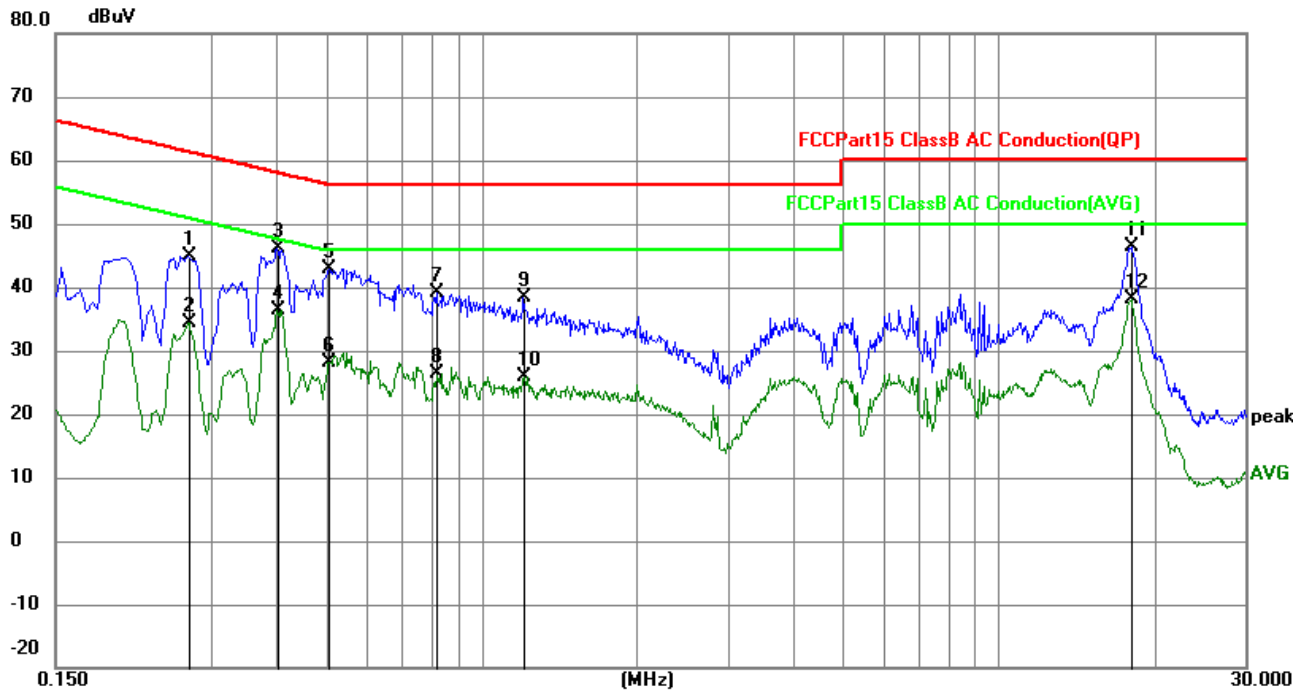
Remark:

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

2. The report only shows the worst mode (TX 802.11 ac20 5180MHz)

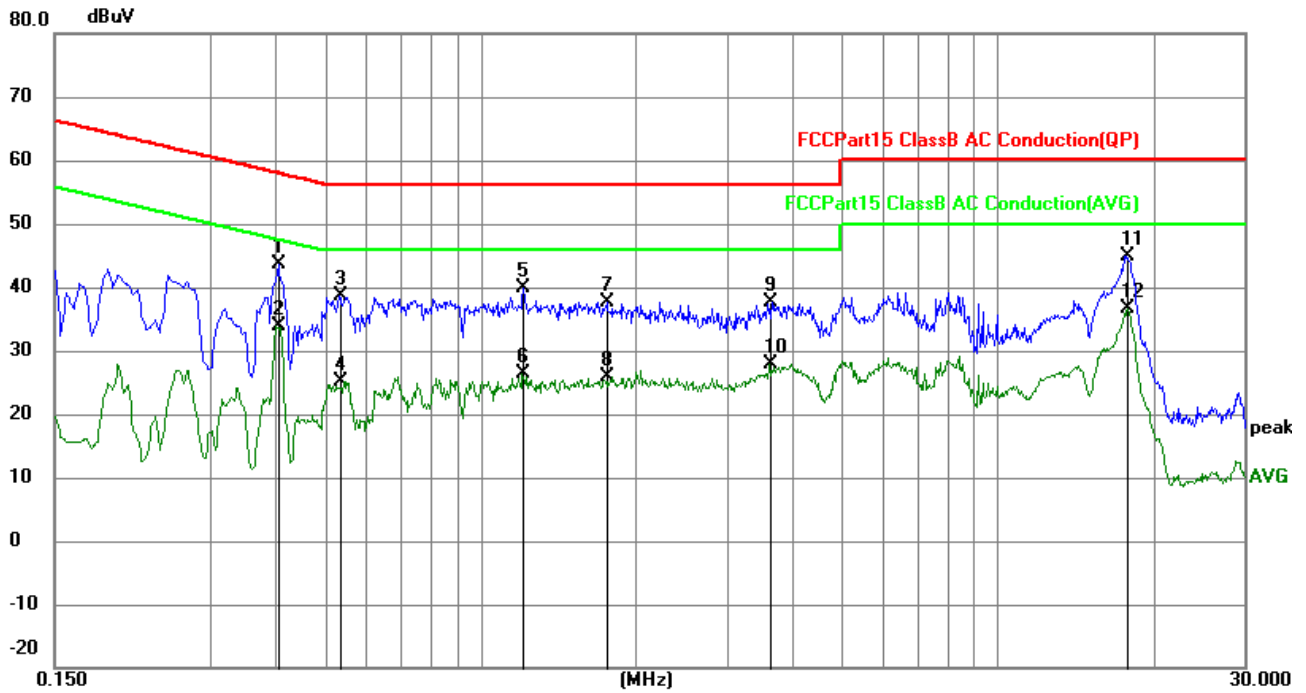
Measurement data

Line:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.2714	32.54	12.41	44.95	61.07	-16.12	QP
2	0.2714	22.01	12.41	34.42	51.07	-16.65	AVG
3	0.4020	33.84	12.38	46.22	57.81	-11.59	QP
4	0.4020	24.10	12.38	36.48	47.81	-11.33	AVG
5	0.5055	30.63	12.36	42.99	56.00	-13.01	QP
6	0.5055	15.82	12.36	28.18	46.00	-17.82	AVG
7	0.8205	26.79	12.32	39.11	56.00	-16.89	QP
8	0.8205	14.08	12.32	26.40	46.00	-19.60	AVG
9	1.2075	25.97	12.29	38.26	56.00	-17.74	QP
10	1.2075	13.62	12.29	25.91	46.00	-20.09	AVG
11	18.0735	33.78	12.51	46.29	60.00	-13.71	QP
12	18.0735	25.50	12.51	38.01	50.00	-11.99	AVG

Neutral:

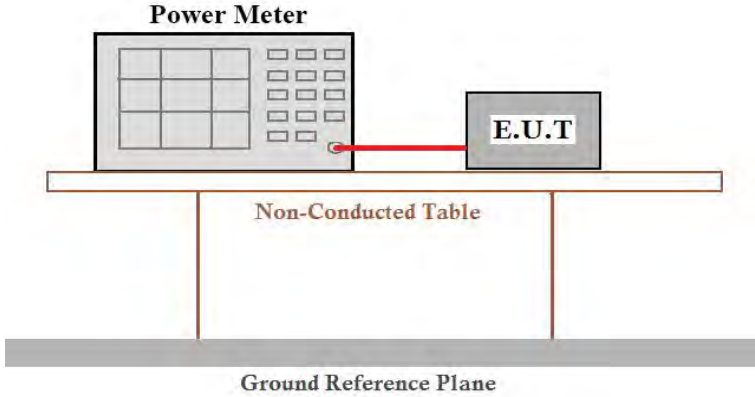


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.4065	31.19	12.37	43.56	57.72	-14.16	QP
2	0.4065	21.56	12.37	33.93	47.72	-13.79	AVG
3	0.5325	26.20	12.36	38.56	56.00	-17.44	QP
4	0.5325	12.87	12.36	25.23	46.00	-20.77	AVG
5	1.2074	27.48	12.29	39.77	56.00	-16.23	QP
6	1.2074	14.03	12.29	26.32	46.00	-19.68	AVG
7	1.7565	25.33	12.30	37.63	56.00	-18.37	QP
8	1.7565	13.49	12.30	25.79	46.00	-20.21	AVG
9	3.6240	25.32	12.32	37.64	56.00	-18.36	QP
10	3.6240	15.55	12.32	27.87	46.00	-18.13	AVG
11	17.7585	32.41	12.50	44.91	60.00	-15.09	QP
12	17.7585	24.07	12.50	36.57	50.00	-13.43	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

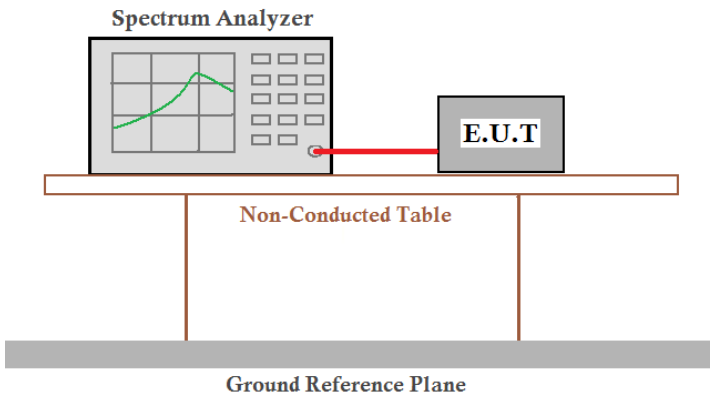
Measurement Data

Test Channel	Frequency (MHz)	Maximum output power (dBm)	LIMIT dBm	Result
TX 802.11a Mode				
CH36	5180	14.73	23.98	Pass
CH40	5200	14.44	23.98	Pass
CH48	5240	13.72	23.98	Pass
TX 802.11 n20 Mode				
CH36	5180	14.77	23.98	Pass
CH40	5200	14.35	23.98	Pass
CH48	5240	13.76	23.98	Pass
TX 802.11 ac20 Mode				
CH36	5180	14.78	23.98	Pass
CH40	5200	14.38	23.98	Pass
CH48	5240	13.78	23.98	Pass
TX 802.11 n40 Mode				
CH38	5190	13.90	23.98	Pass
CH46	5230	13.13	23.98	Pass
TX 802.11 ac40 Mode				
CH38	5190	13.87	23.98	Pass
CH46	5230	13.11	23.98	Pass
TX 802.11 ac80 Mode				
CH42	5210	12.38	23.98	Pass



Test Channel	Frequency	Maximum output power.	LIMIT	Result
	(MHz)	(dBm)	dBm	
TX 802.11a Mode				
CH149	5745	12.56	30	Pass
CH157	5785	12.70	30	Pass
CH165	5825	12.83	30	Pass
TX 802.11 n20 Mode				
CH149	5745	12.53	30	Pass
CH157	5785	12.60	30	Pass
CH165	5825	12.79	30	Pass
TX 802.11 ac20 Mode				
CH149	5745	12.52	30	Pass
CH157	5785	12.57	30	Pass
CH165	5825	12.78	30	Pass
TX 802.11 n40 Mode				
CH151	5755	11.44	30	Pass
CH159	5795	11.52	30	Pass
TX 802.11 ac40 Mode				
CH151	5755	11.33	30	Pass
CH159	5795	11.53	30	Pass
TX 802.11 ac80 Mode				
CH155	5775	10.44	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

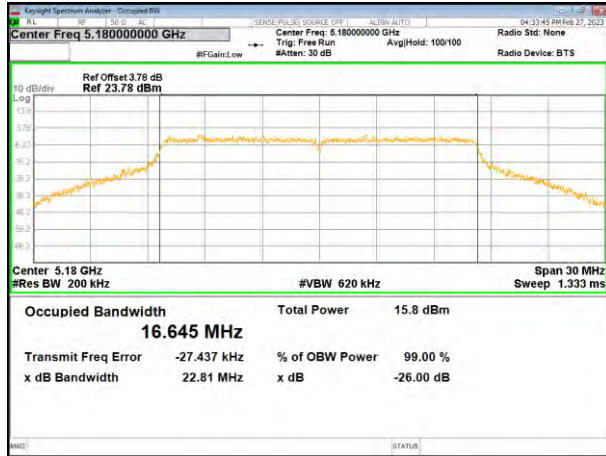
5180-5240MHz

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	22.81	22.46	23.13	44.28	43.59	--	Pass
Middle	23.62	22.30	22.73	--	--	84.06	
Highest	22.82	22.90	23.05	43.72	43.39	--	

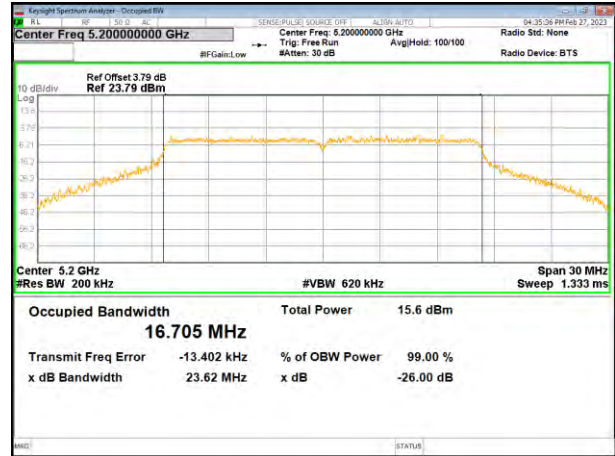
Test CH	99% Occupy Bandwidth (MHz)						Result
	802.11a	802.11n (HT20)	802.11ac (HT20)	802.11n (HT40)	802.11ac (HT40)	802.11ac (HT80)	
Lowest	16.645	17.835	17.817	36.355	36.389	--	Pass
Middle	16.705	17.825	17.848	--	--	75.117	
Highest	16.720	17.843	17.829	36.363	36.360	--	

Test plot

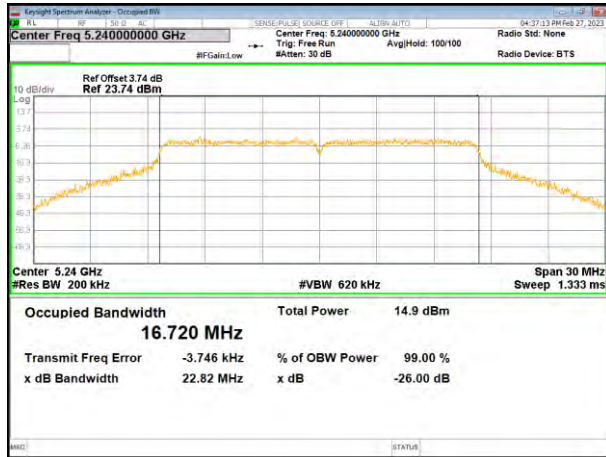
(802.11a) plot on channel 36



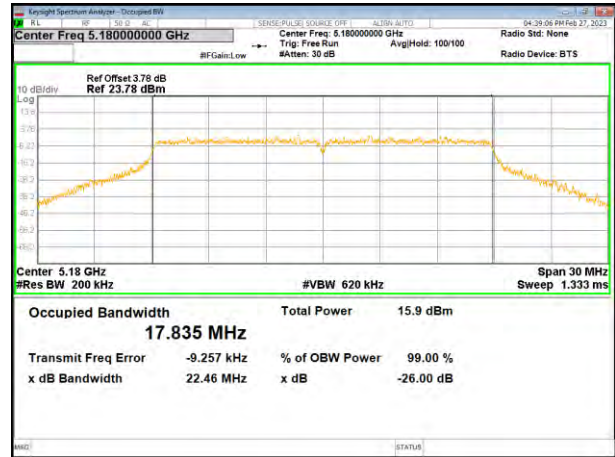
(802.11 n20) plot on channel 36



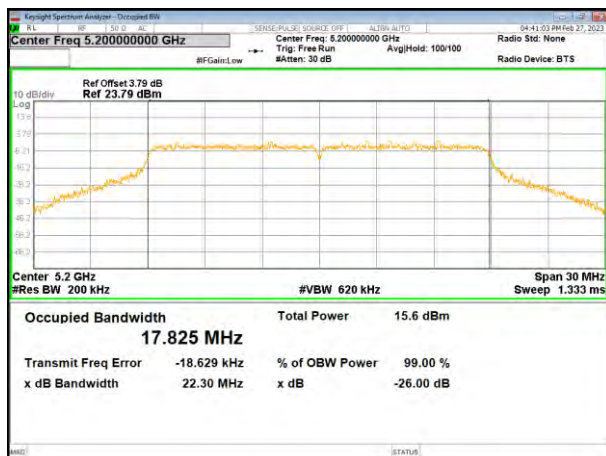
(802.11a) plot on channel 40



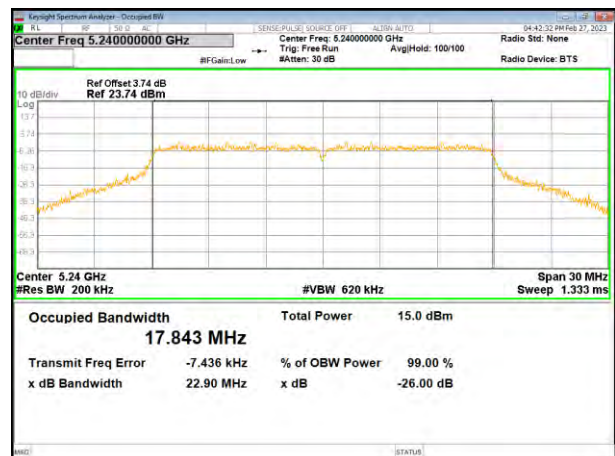
(802.11 n20) plot on channel 40



(802.11a) plot on channel 48

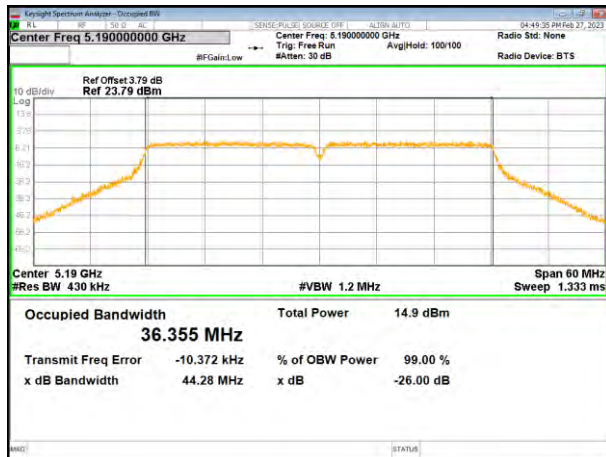


(802.11 n20) plot on channel 48

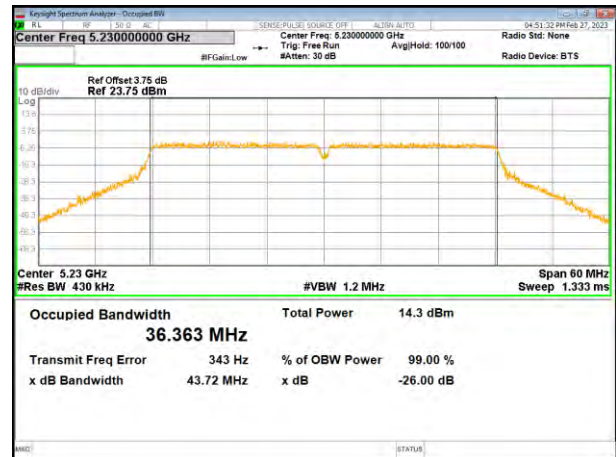


Test plot

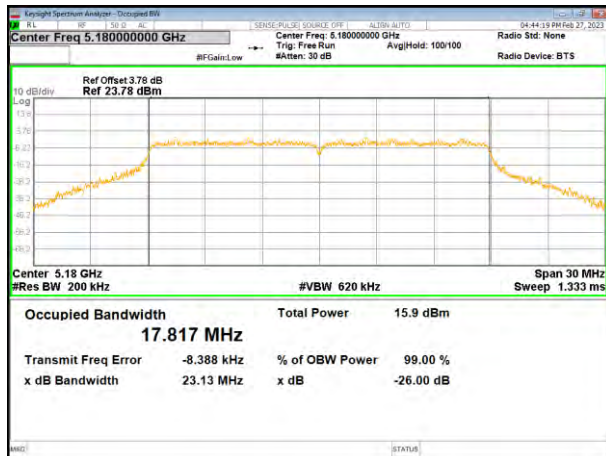
(802.11ac20) plot on channel 36



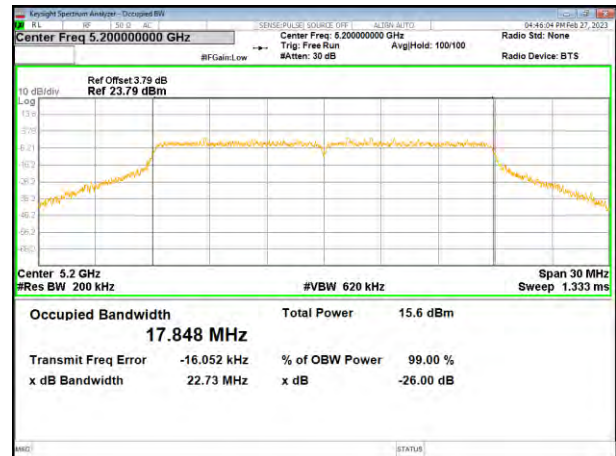
(802.11 n40) plot on channel 38



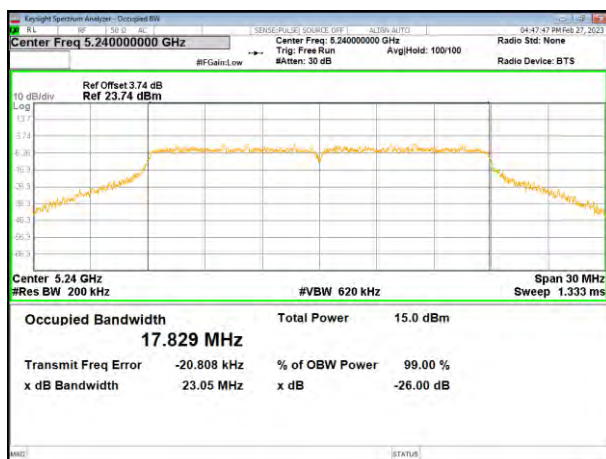
(802.11ac20) plot on channel 40



(802.11 n40) plot on channel 46

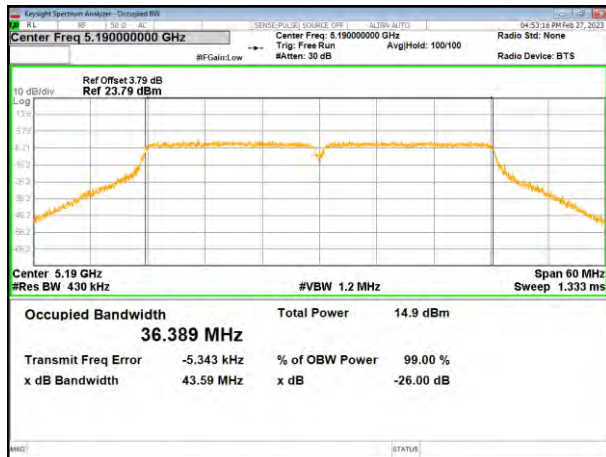


(802.11ac20) plot on channel 48

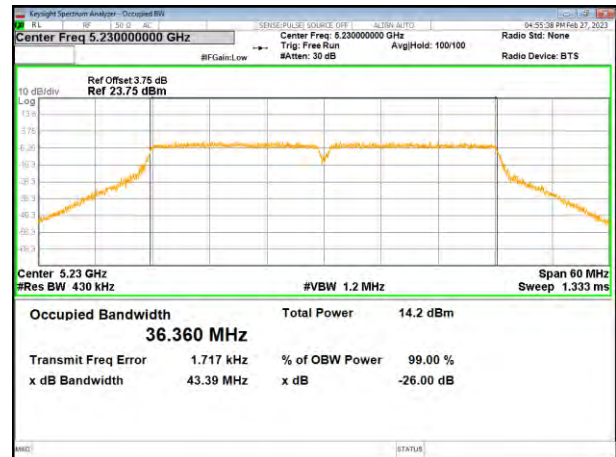


Test plot

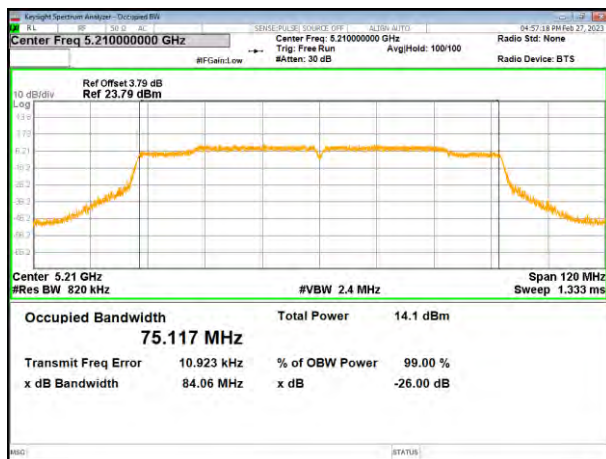
(802.11ac40) plot on channel 38



(802.11ac80) plot on channel 42



(802.11ac40) plot on channel 46





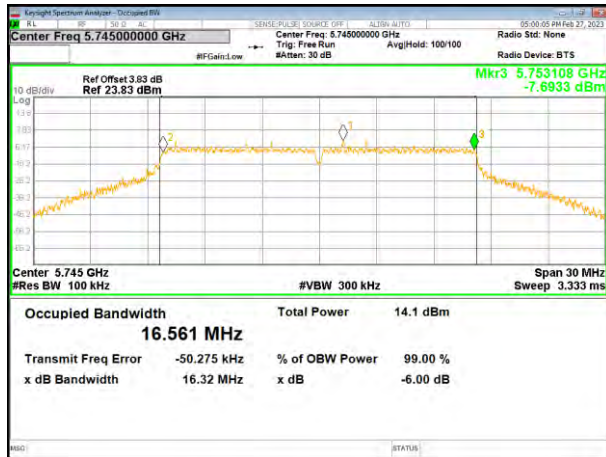
5745-5825MHz

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	17.57	17.60	36.33	36.30	--	>500	Pass
Middle	16.35	17.57	17.17	--	--	75.10		
Highest	16.34	17.56	17.55	36.03	36.30	--		

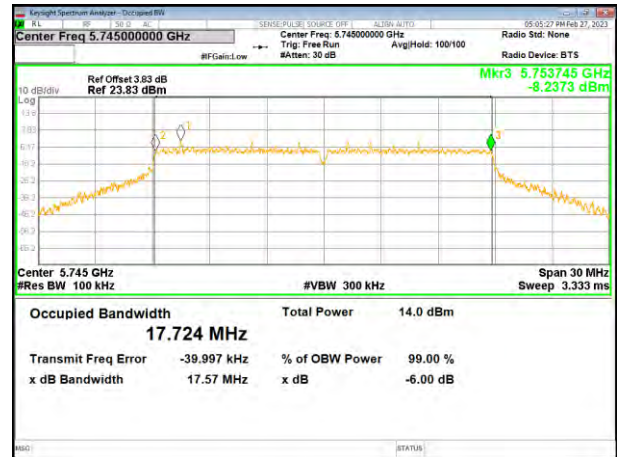
Remark: “---”is not applicable

Test plot

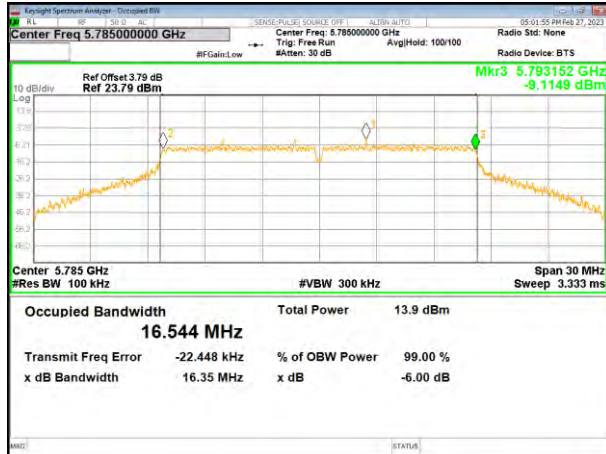
(802.11a) plot on channel 149



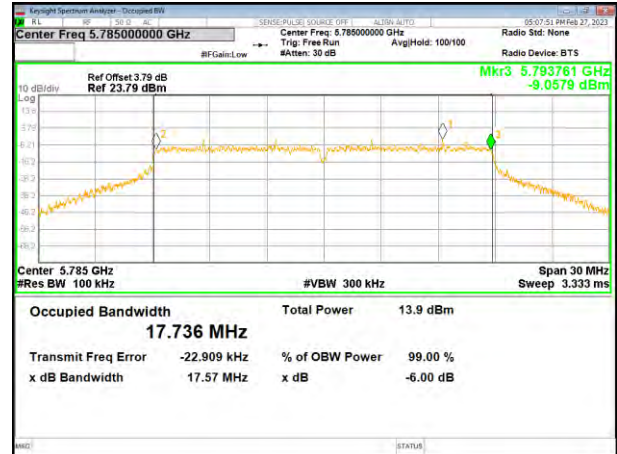
(802.11 n20) plot on channel 149



(802.11a) plot on channel 157



(802.11 n20) plot on channel 157



(802.11a) plot on channel 165

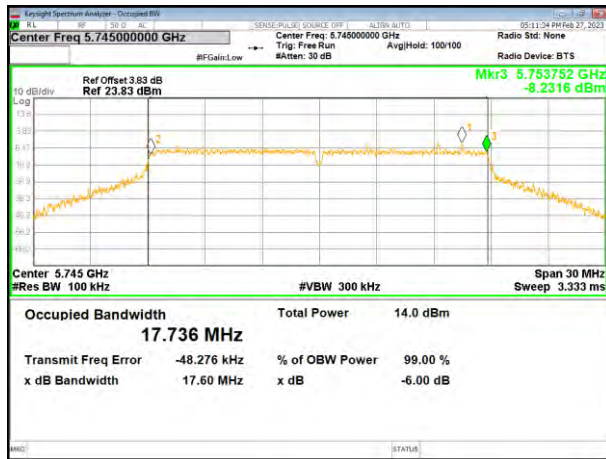


(802.11 n20) plot on channel 165

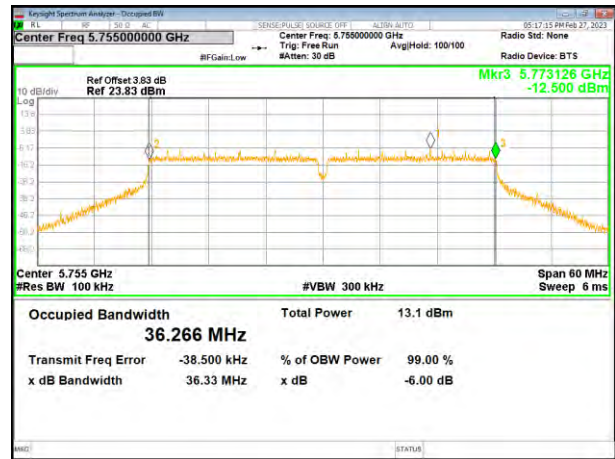


Test plot

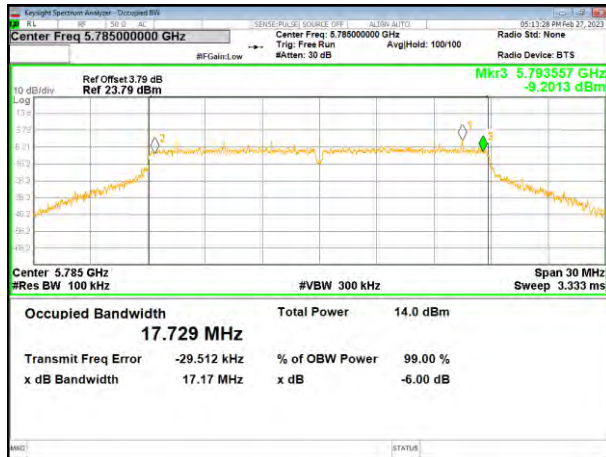
(802.11ac20) plot on channel 149



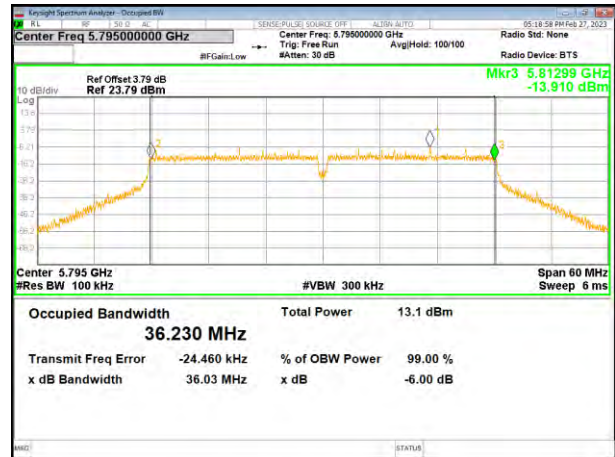
(802.11 n40) plot on channel 151



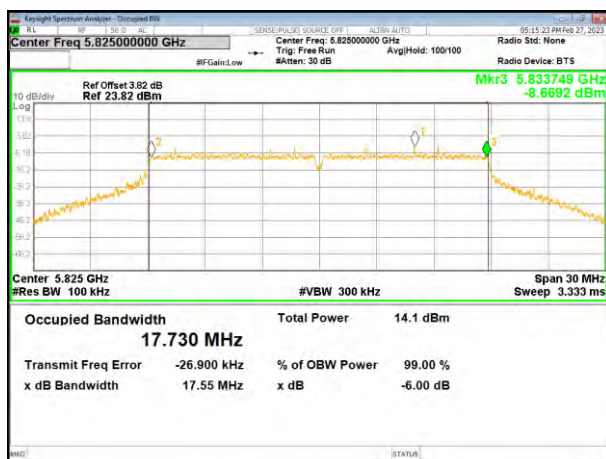
(802.11ac20) plot on channel 157



(802.11 n40) plot on channel 159

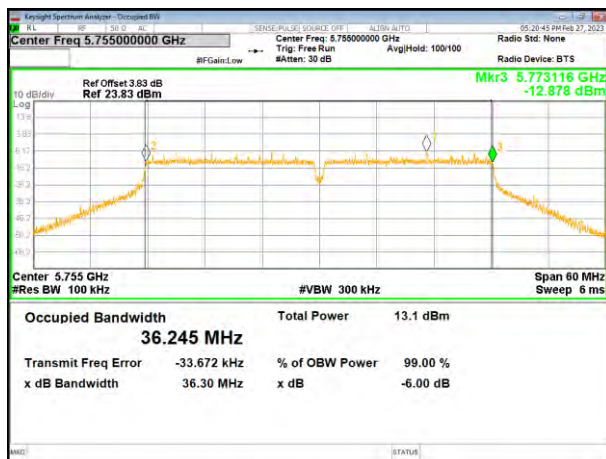


(802.11ac20) plot on channel 165

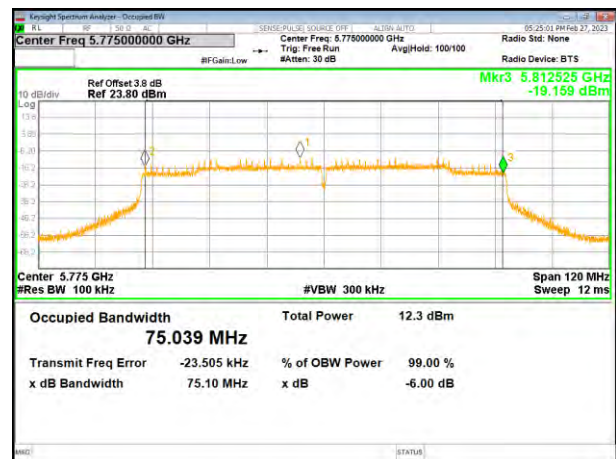


Test plot

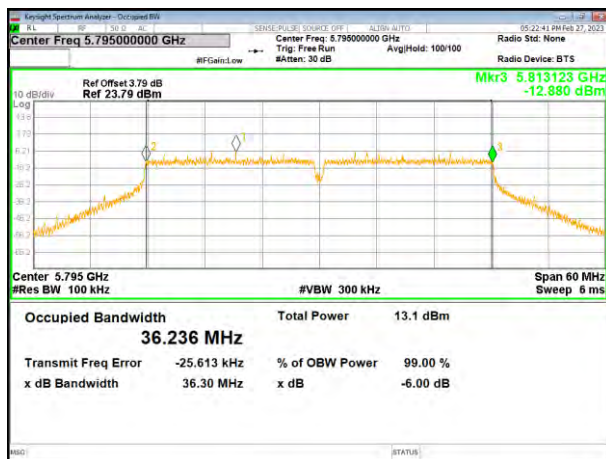
(802.11 ac40) plot on channel 151



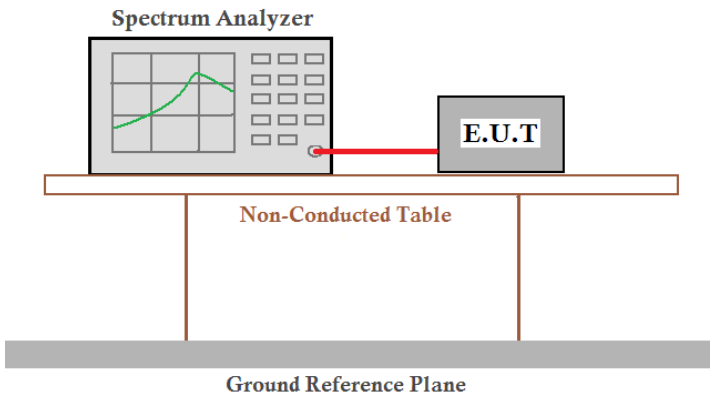
(802.11 ac80) plot on channel 155



(802.11 ac40) plot on channel 159



4.5 Power Spectral Density

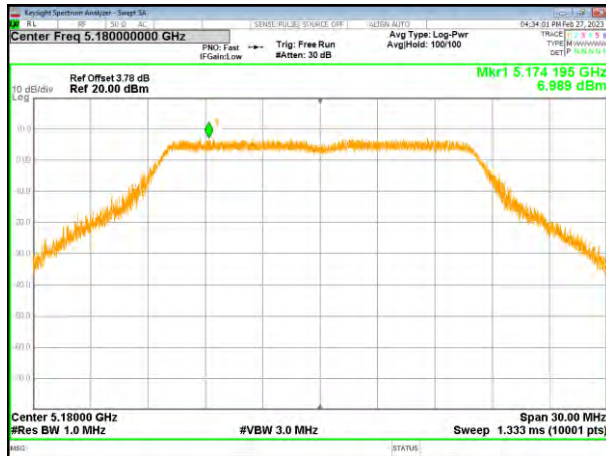
Test Requirement:	FCC Part15 E Section 15.407(a)(1)/ (a)(3)	
Test Method:	ANSI C63.10:2013 and KDB 789033 D02 General U-NII Test Procedures New Rules v02r01	
Limit:	Frequency band (MHz)	Limit
	5150-5250	≤17dBm/1MHz for master device
		≤11dBm/1MHz for client device
	5250-5350	≤11dBm/1MHz for client device
	5470-5725	≤11dBm/1MHz for client device
	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 results:	Pass	

Measurement Data

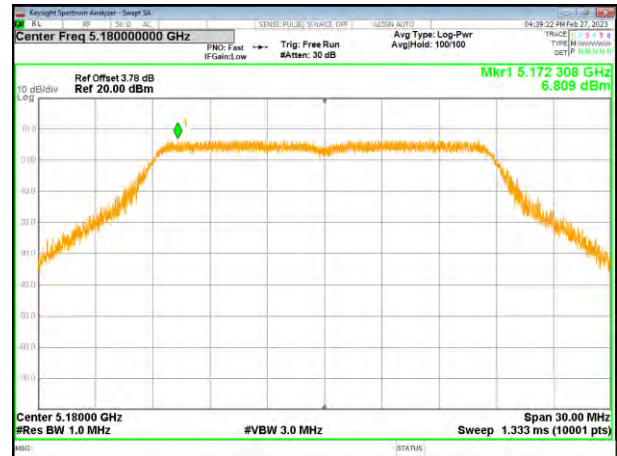
5180-5240MHz

Mode	Frequency	Measured Power Density (dBm/MHz)	Limit (dBm/MHz)
802.11 a	5180 MHz	6.989	11
	5200 MHz	7.143	11
	5240 MHz	6.179	11
802.11 n20	5180 MHz	6.809	11
	5200 MHz	6.545	11
	5240 MHz	6.135	11
802.11 ac20	5180 MHz	2.967	11
	5200 MHz	2.757	11
	5240 MHz	7.124	11
802.11 n40	5190 MHz	6.555	11
	5230 MHz	6.046	11
802.11 ac40	5190 MHz	3.298	11
	5230 MHz	2.447	11
802.11 ac80	5210 MHz	-0.656	11

(802.11a) PSD plot on channel 36



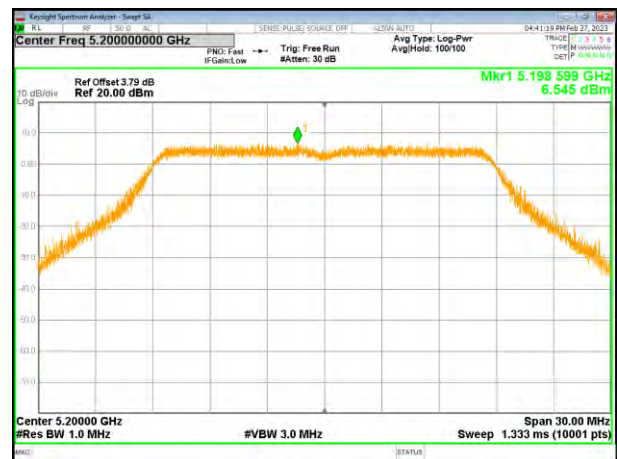
(802.11n20) PSD plot on channel 36



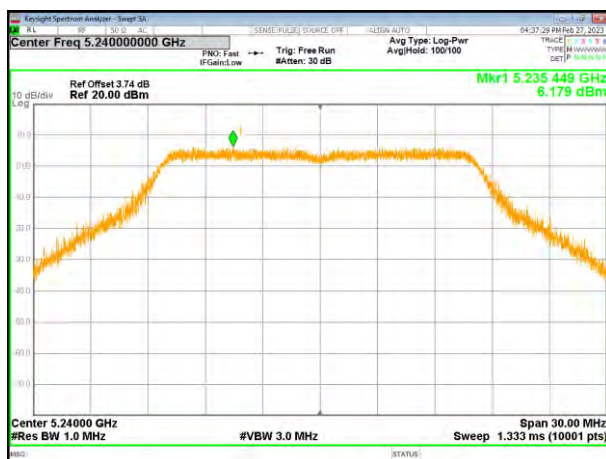
(802.11a) PSD plot on channel 40



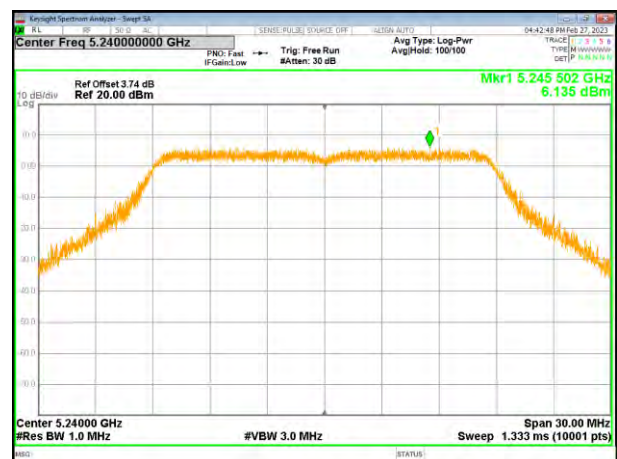
(802.11n20) PSD plot on channel 40



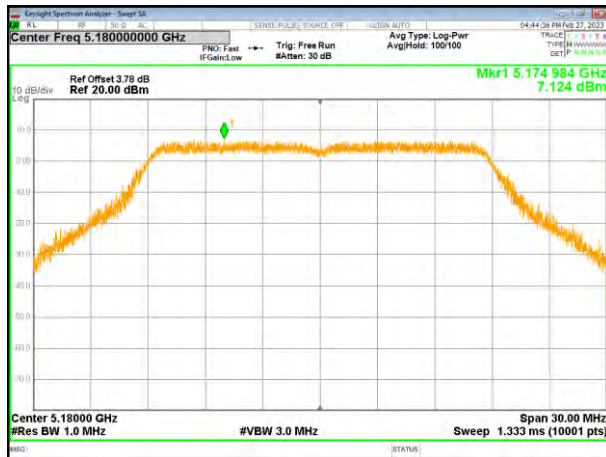
(802.11a) PSD plot on channel 48



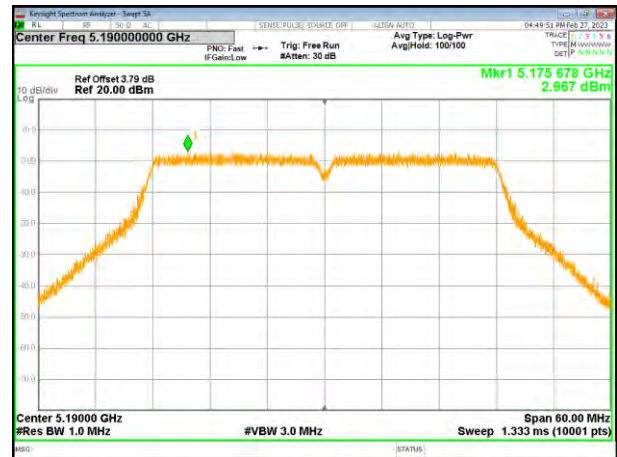
(802.11n20) PSD plot on channel 48



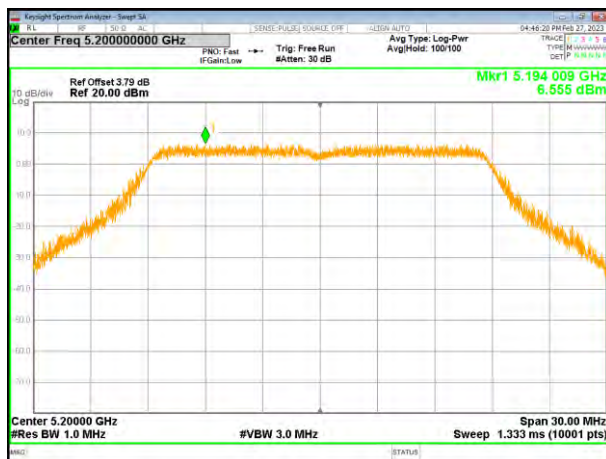
(802.11ac20) PSD plot on channel 36



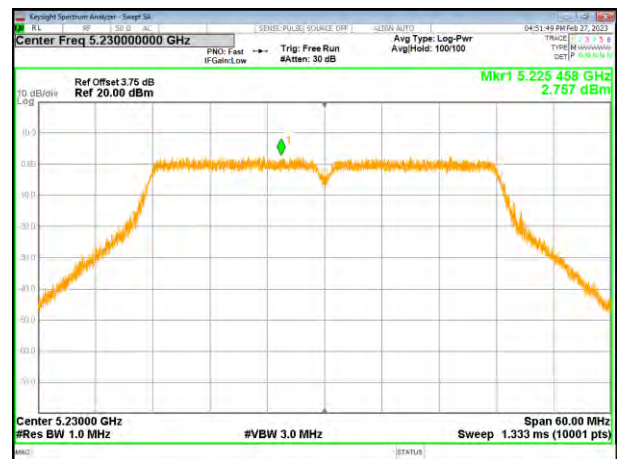
(802.11n40) PSD plot on channel 38



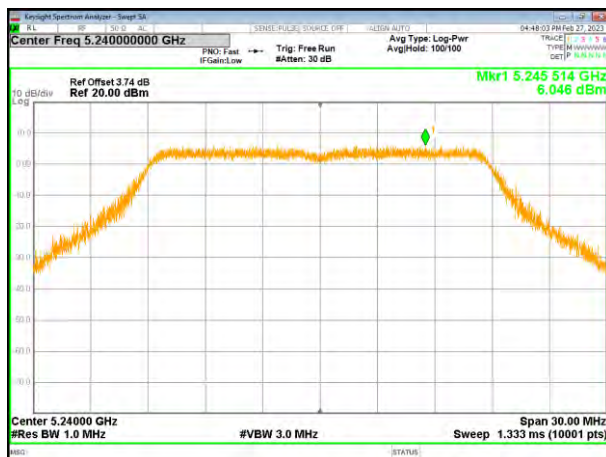
(802.11ac20) PSD plot on channel 40



(802.11n40) PSD plot on channel 46



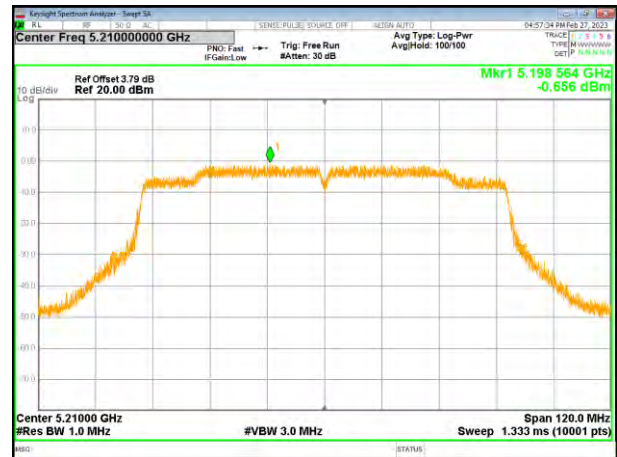
(802.11ac20) PSD plot on channel 48



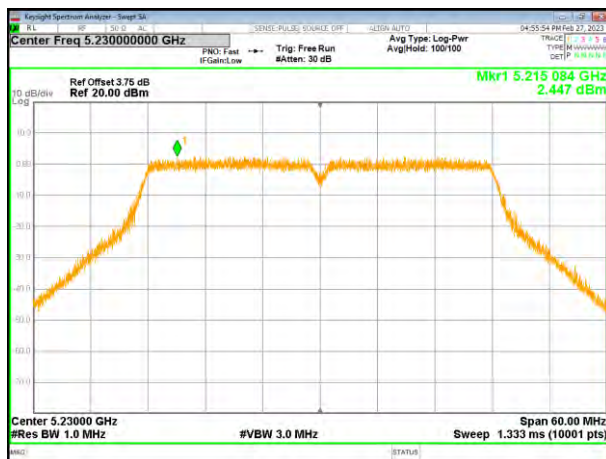
(802.11ac40) PSD plot on channel 38



(802.11ac80) PSD plot on channel 42



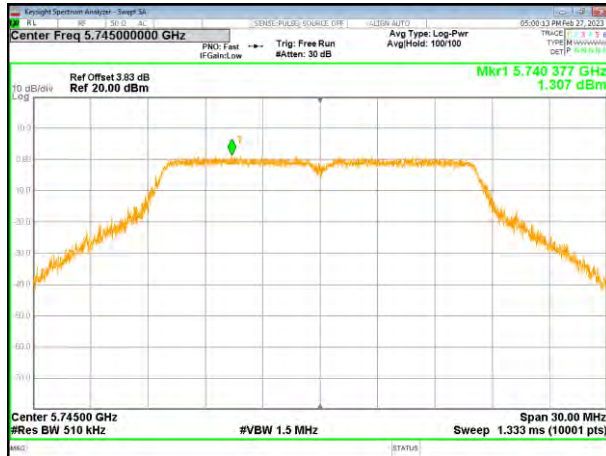
(802.11ac40) PSD plot on channel 46



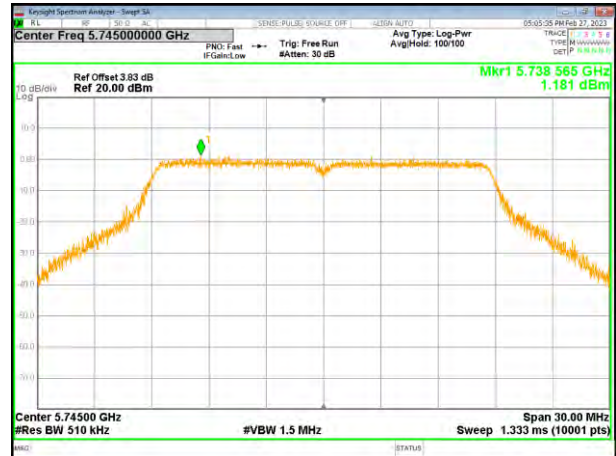
Mode	Frequency	Measured Power Density (dBm/510KHz)	Measured Power Density (dBm/500KHz)	Limit (dBm/MHz)
802.11 a	5745 MHz	1.307	1.221	30
	5785 MHz	1.924	1.838	30
	5825 MHz	1.488	1.402	30
802.11 n20	5745 MHz	1.181	1.095	30
	5785 MHz	1.254	1.168	30
	5825 MHz	1.771	1.685	30
802.11 ac20	5745 MHz	-2.497	-2.583	30
	5785 MHz	-2.953	-3.039	30
	5825 MHz	1.428	1.342	30
802.11 n40	5755 MHz	2.036	1.950	30
	5795 MHz	1.395	1.309	30
802.11 ac40	5755 MHz	-3.086	-3.172	30
	5795 MHz	-2.689	-2.775	30
802.11 AC80	5775 MHz	-6.197	-6.283	30

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

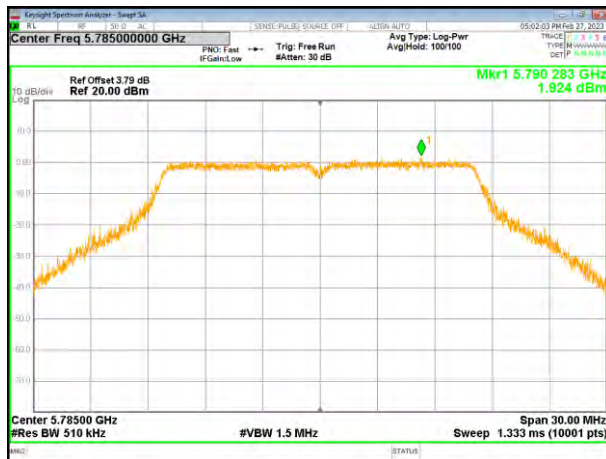
(802.11a) PSD plot on channel 149



(802.11n20) PSD plot on channel 149



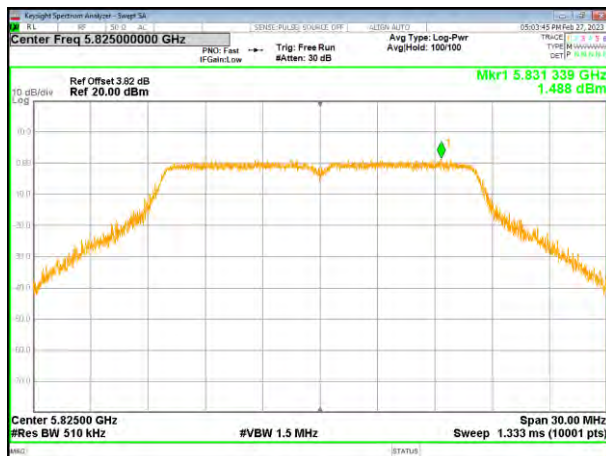
(802.11a) PSD plot on channel 157



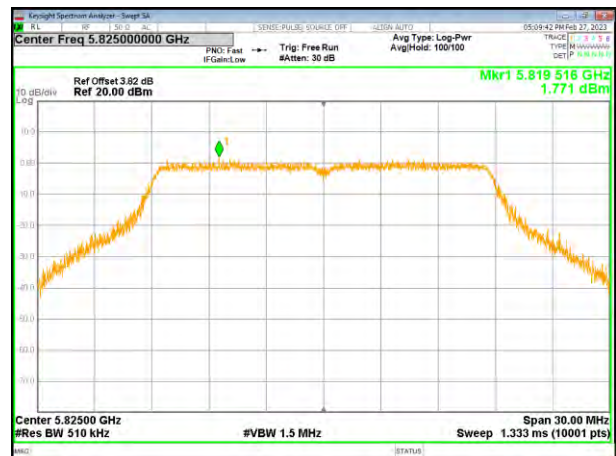
(802.11n20) PSD plot on channel 157



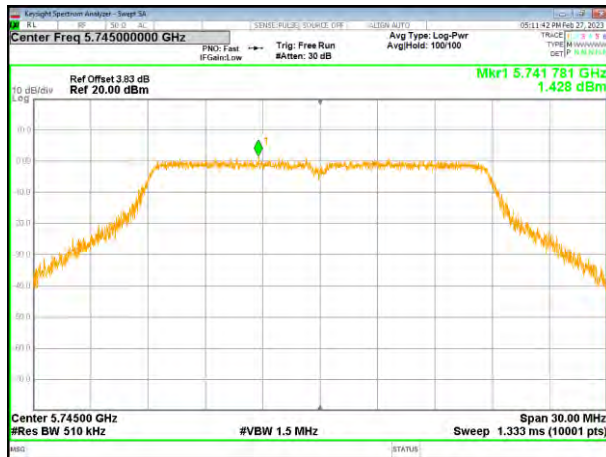
(802.11a) PSD plot on channel 165



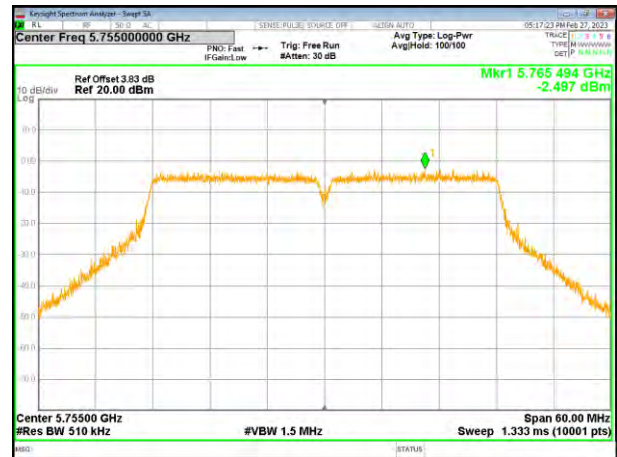
(802.11n20) PSD plot on channel 165



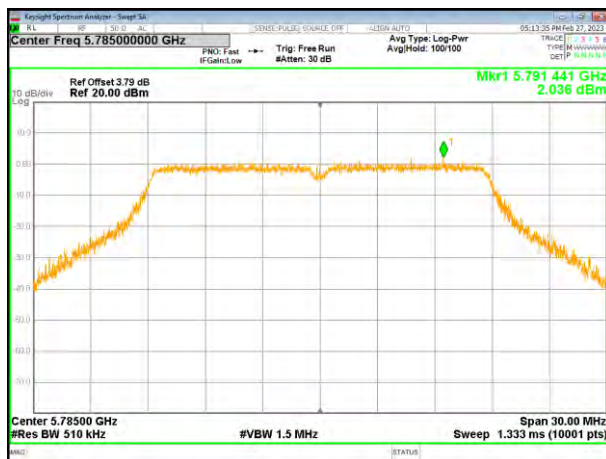
(802.11ac20) PSD plot on channel 149



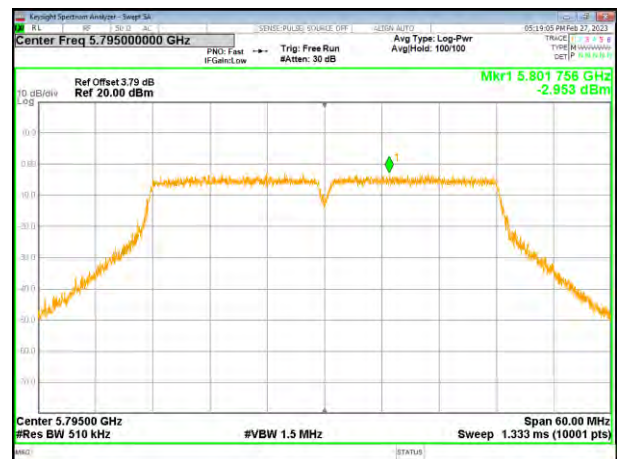
(802.11n40) PSD plot on channel 151



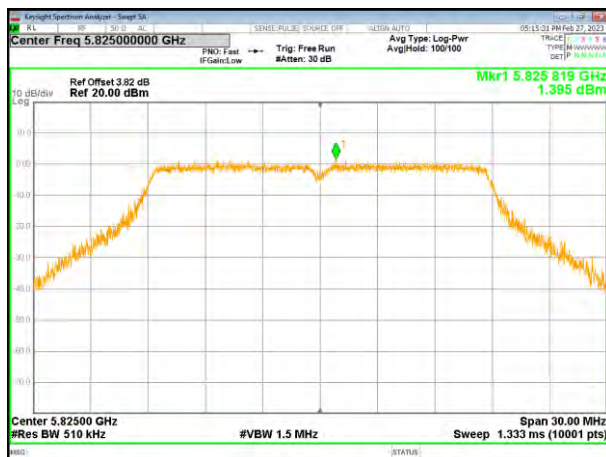
(802.11ac20) PSD plot on channel 157



(802.11n40) PSD plot on channel 159



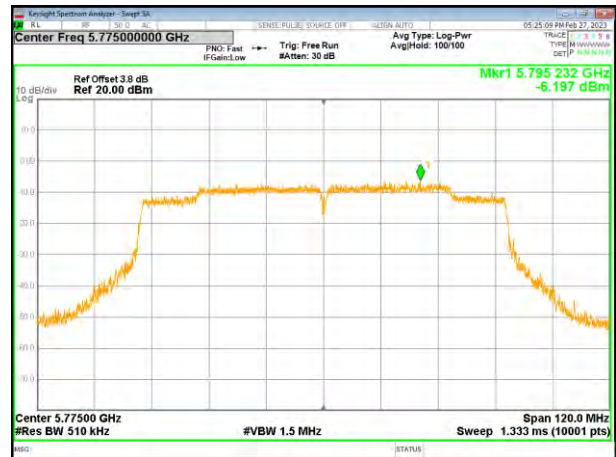
(802.11ac20) PSD plot on channel 165



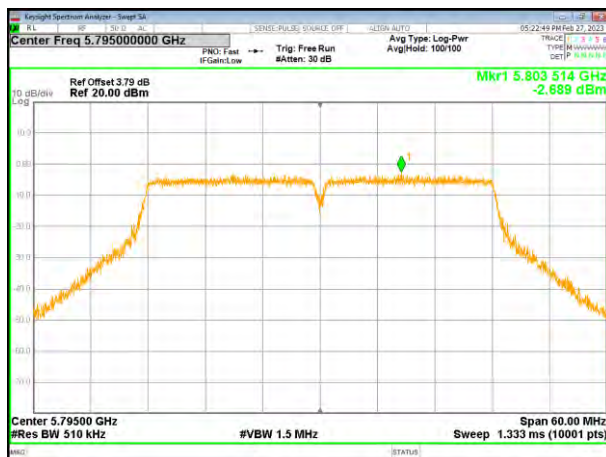
(802.11ac40) PSD plot on channel 151



(802.11ac80) PSD plot on channel 155

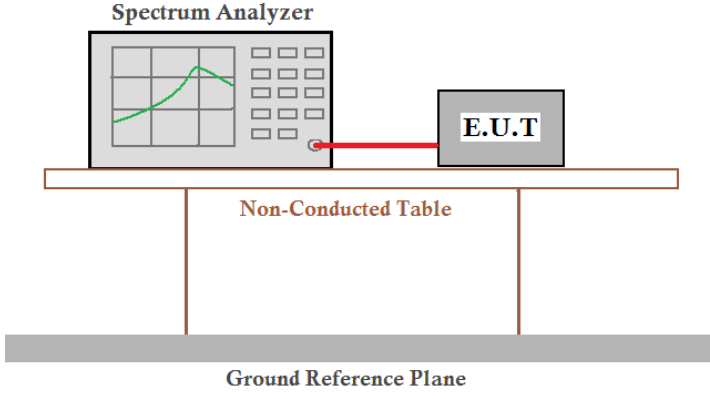


(802.11ac40) PSD plot on channel 159



4.6 Band edge

4.6.1 Conducted test Method

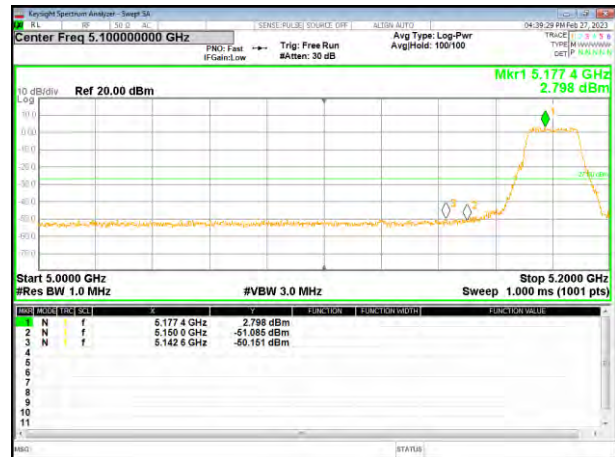
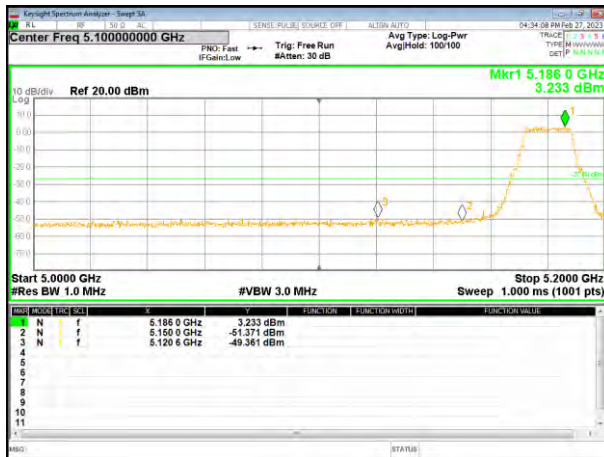
Test Requirement:	FCC Part15 C Section 15.209 and 15.205
Test Method:	ANSI C63.10: 2013
Limit:	All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below 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 results:	Pass

Remarks:

5.180~5.240 GHz

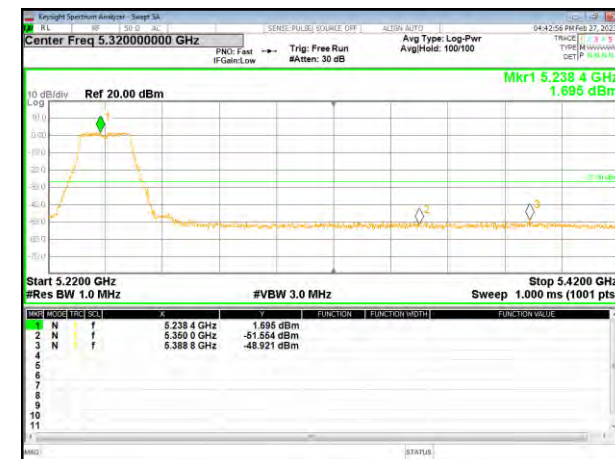
(802.11a) Band Edge, Left Side

(802.11n20) Band Edge, Left Side



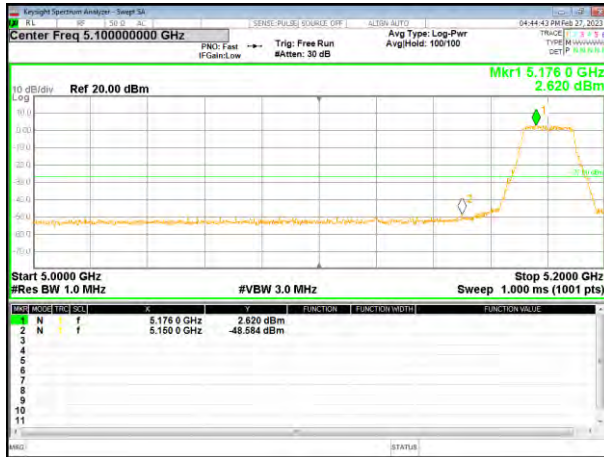
(802.11a) Band Edge, Right Side

(802.11n20) Band Edge, Right Side

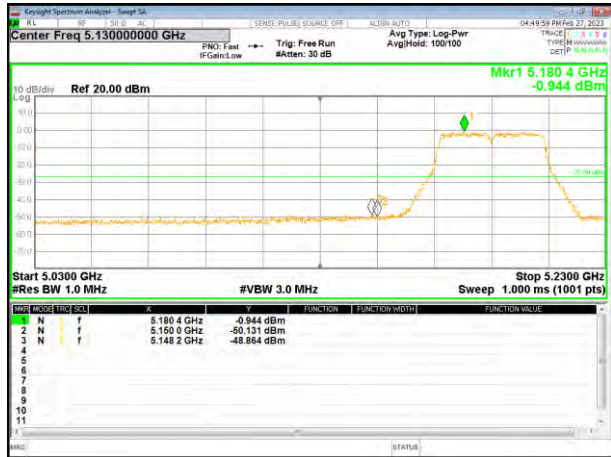


5.180~5.240 GHz

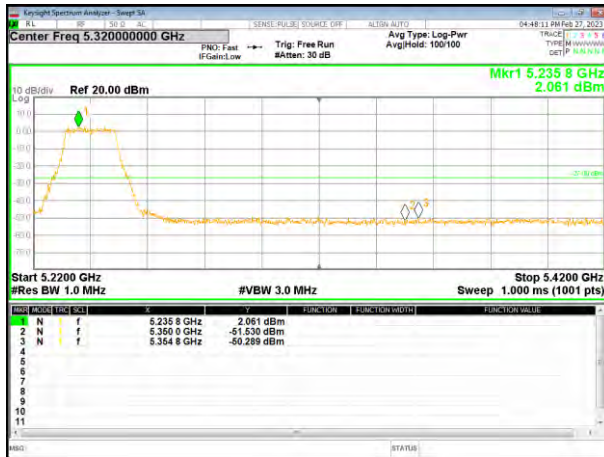
(802.11ac20) Band Edge, Left Side



(802.11n40) Band Edge, Left Side



(802.11ac20) Band Edge, Right Side



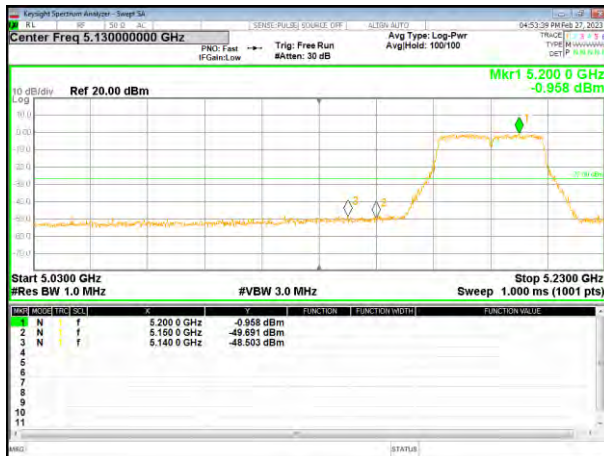
(802.11n40) Band Edge, Right Side



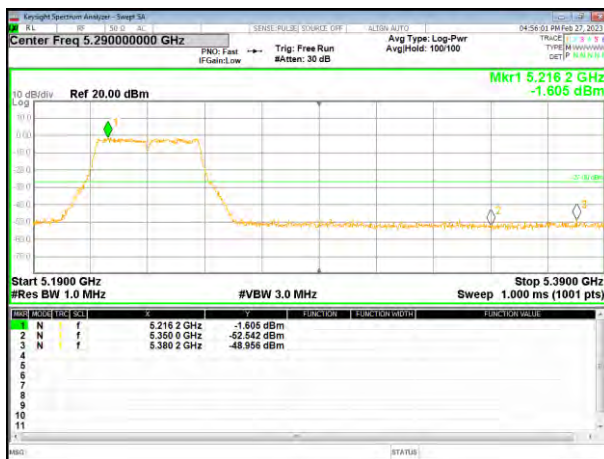
5.180~5.240 GHz

(802.11ac40) Band Edge, Left Side

(802.11ac80) Band Edge



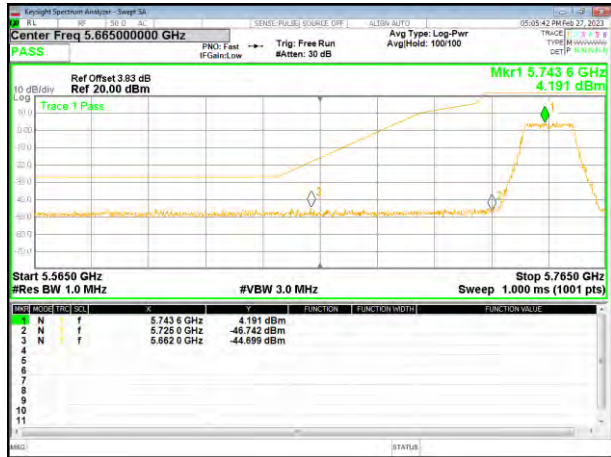
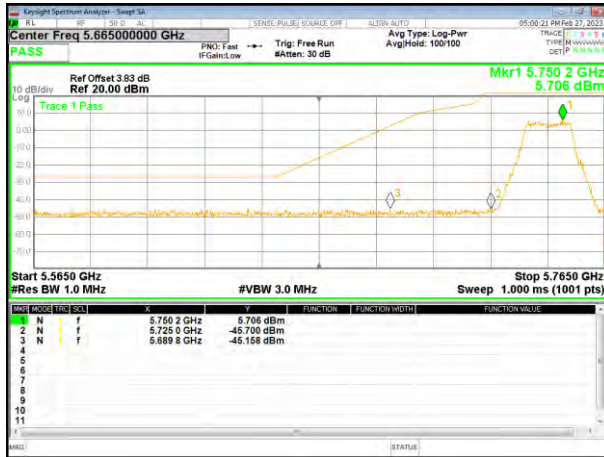
(802.11ac40) Band Edge, Right Side



5.745~5.825 GHz

(802.11a) Band Edge, Left Side

(802.11n20) Band Edge, Left Side



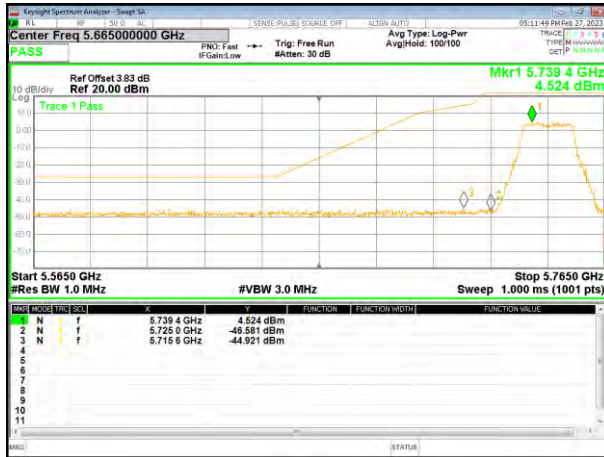
(802.11a) Band Edge, Right Side

(802.11n20) Band Edge, Right Side

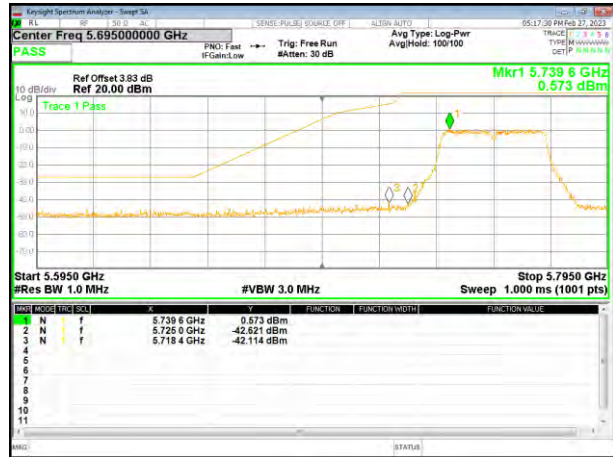


5.745~5.825 GHz

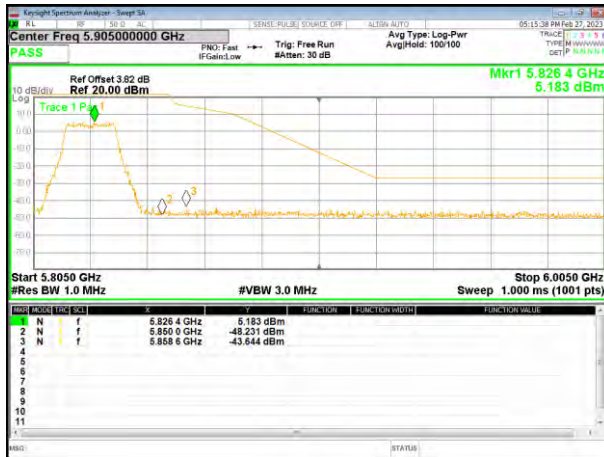
(802.11ac20) Band Edge, Left Side



(802.11n40) Band Edge, Left Side



(802.11ac20) Band Edge, Right Side



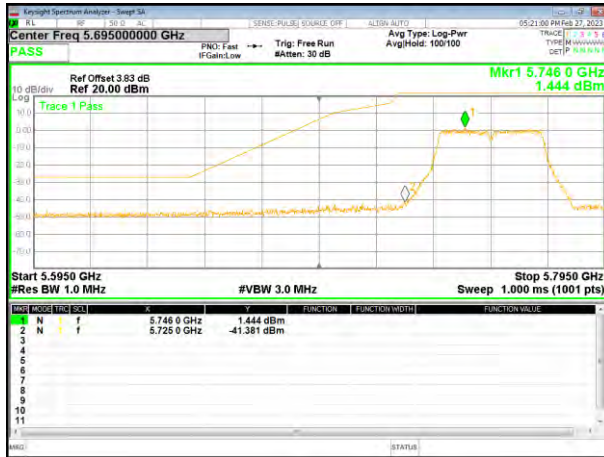
(802.11n40) Band Edge, Right Side



5.745~5.825 GHz

(802.11ac40) Band Edge, Left Side

(802.11ac80) Band Edge

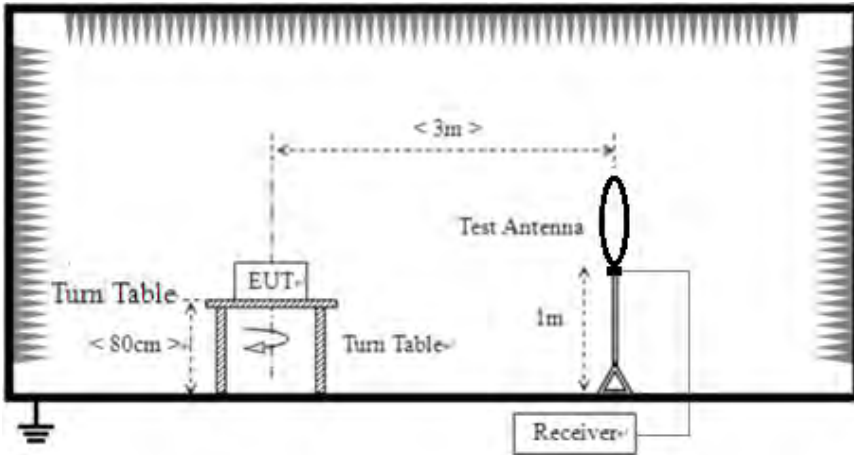


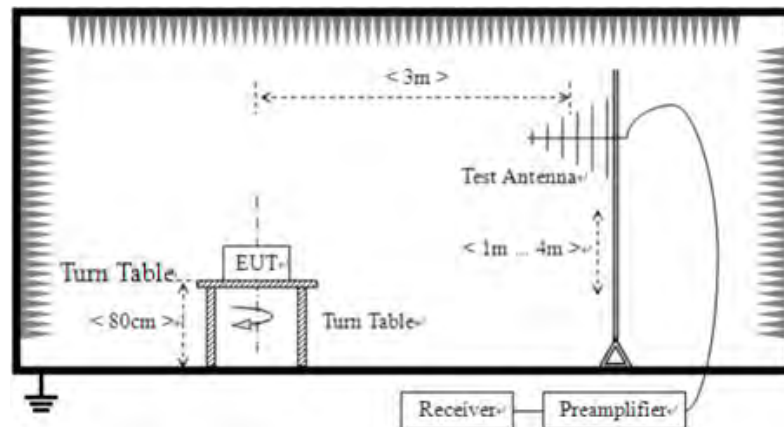
(802.11ac40) Band Edge, Right Side



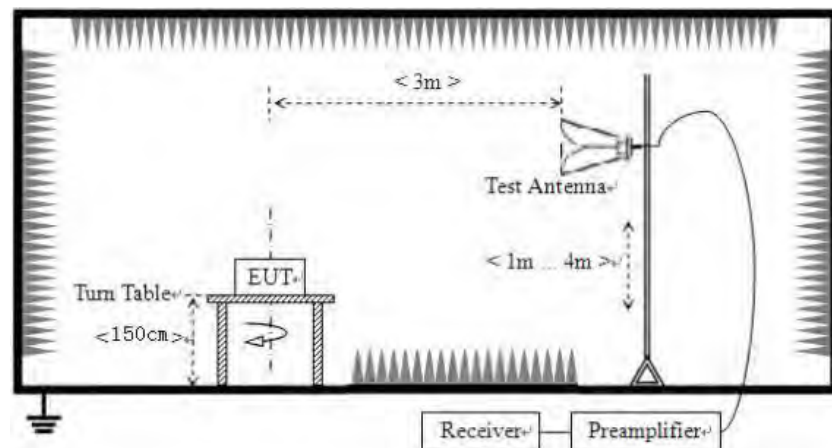
4.7 Spurious Emission

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 to 1GHz				



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.:	23.7.6°C	Humid.:	46%	Press.:	1012mbar
Test voltage:	AC 120V					
Test results:	Pass					

Remarks:

- 1. The report only shows the worst mode (TX 802.11 ac20 5180MHz)*
- 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:

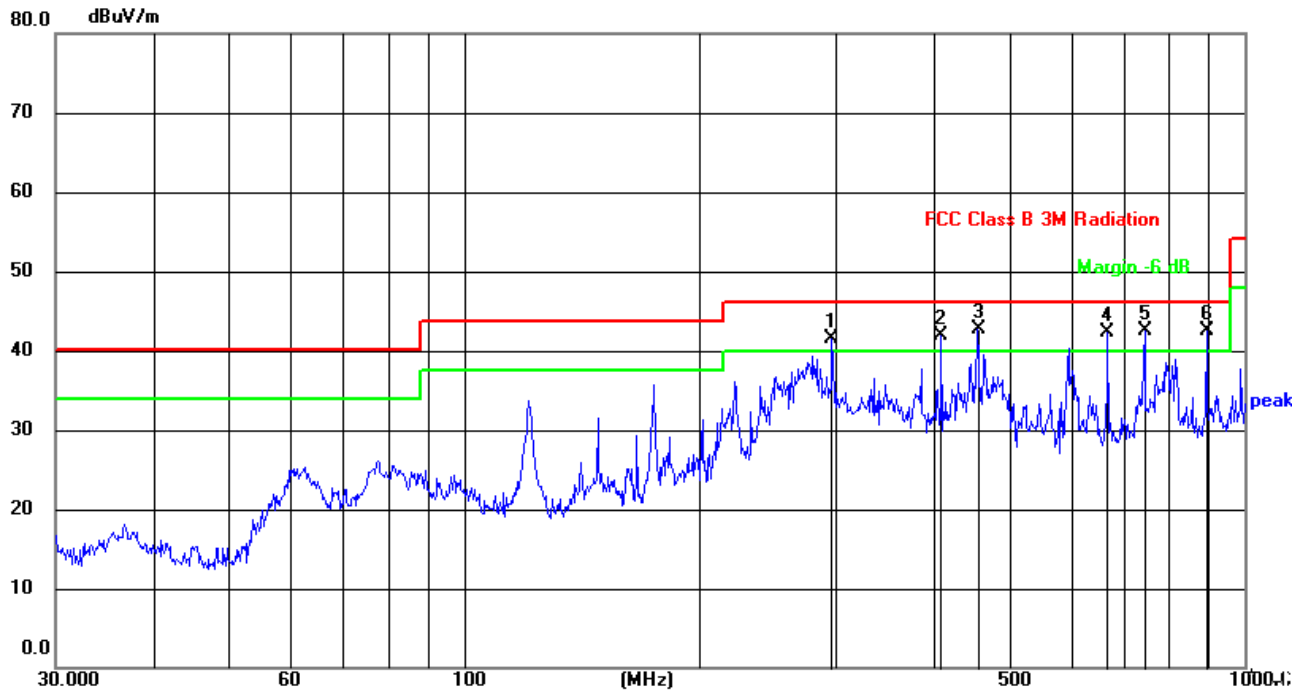
9 kHz ~ 30 MHz

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

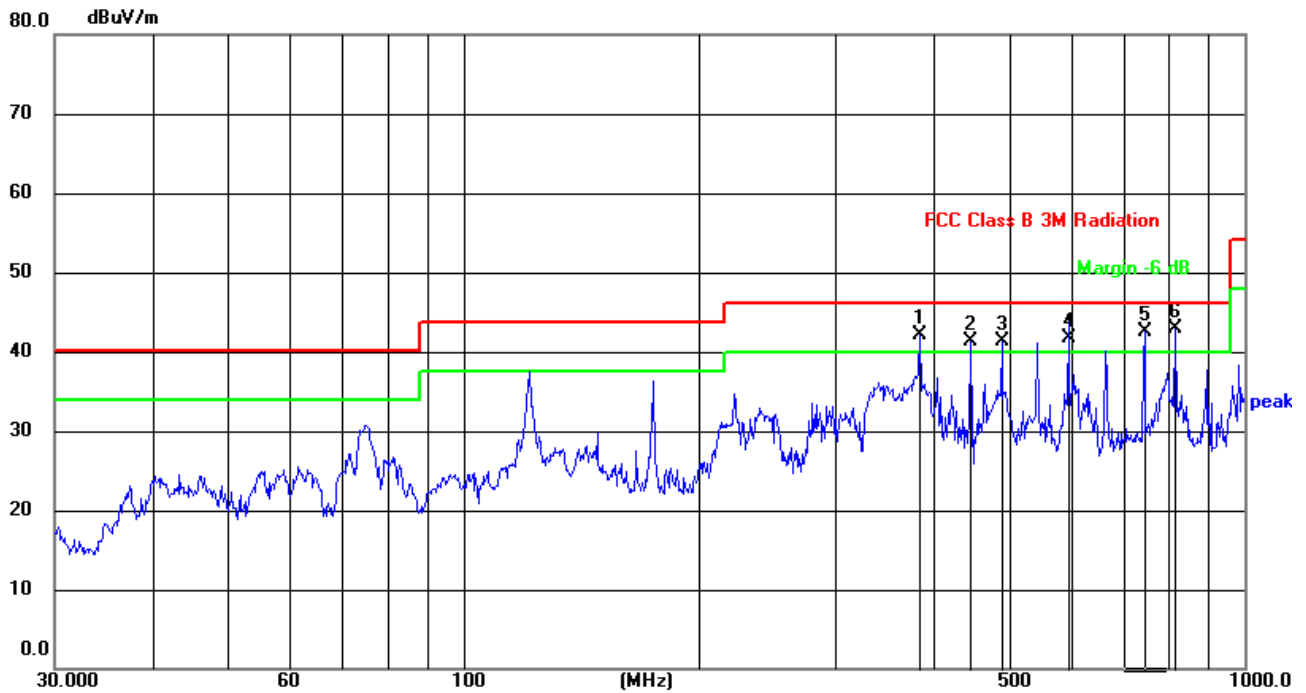
Temperature:	23.7℃	Relative Humidity:	46%
Pressure:	1010 hPa	Test Voltage :	AC120V
Test Mode :	5.2G TX- 802.11ac20		

Horizontal:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	296.1836	59.93	-18.50	41.43	46.00	-4.57	QP
2	408.9458	57.95	-16.12	41.83	46.00	-4.17	QP
3	454.3100	57.42	-14.66	42.76	46.00	-3.24	QP
4	668.1422	51.83	-9.54	42.29	46.00	-3.71	QP
5	744.8659	50.68	-8.26	42.42	46.00	-3.58	QP
6	893.8564	49.13	-6.64	42.49	46.00	-3.51	QP

Vertical:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	383.9318	58.97	-16.80	42.17	46.00	-3.83	QP
2	446.4139	56.26	-14.88	41.38	46.00	-4.62	QP
3	489.0267	55.28	-13.99	41.29	46.00	-4.71	QP
4	595.1326	53.01	-11.31	41.70	46.00	-4.30	QP
5	744.8659	50.67	-8.25	42.42	46.00	-3.58	QP
6	815.9678	50.16	-7.20	42.96	46.00	-3.04	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.

**Above 1GHz:**

Temperature:	23.7°C	Relative Humidity:	46%
Pressure:	1010 hPa	Test Voltage :	AC120V
Test Mode :	5.2G TX- 802.11ac20		

802.11ac20

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	54.28	46.20	8.27	38.50	54.85	68.20	-13.35	PK
V	10360.00	43.59	46.20	8.27	38.50	44.16	54.00	-9.84	AV
V	15540.00	51.19	46.30	10.35	38.70	53.94	74.00	-20.06	PK
V	15540.00	40.43	46.30	10.35	38.70	43.18	54.00	-10.82	AV
V	20720.00	60.94	57.40	11.93	37.80	53.27	68.20	-14.93	PK
V	20720.00	50.19	57.40	11.93	37.80	42.52	54.00	-11.48	AV
V	25900.00	58.41	56.50	13.45	39.70	55.06	68.20	-13.14	PK
V	25900.00	47.23	56.50	13.45	39.70	43.88	54.00	-10.12	AV
H	10360.00	54.20	46.20	8.27	38.50	54.77	68.20	-13.43	PK
H	10360.00	42.12	46.20	8.27	38.50	42.69	54.00	-11.31	AV
H	15540.00	50.13	46.30	10.35	38.70	52.88	74.00	-21.12	PK
H	15540.00	37.82	46.30	10.35	38.70	40.57	54.00	-13.43	AV
H	20720.00	63.32	57.40	11.93	37.80	55.65	68.20	-12.55	PK
H	20720.00	51.15	57.40	11.93	37.80	43.48	54.00	-10.52	AV
H	25900.00	59.50	56.50	13.45	39.70	56.15	68.20	-12.05	PK
H	25900.00	47.27	56.50	13.45	39.70	43.92	54.00	-10.08	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	53.26	46.20	8.27	38.50	53.83	68.20	-14.37	PK
V	10400.00	43.33	46.20	8.27	38.50	43.90	54.00	-10.10	AV
V	15600.00	51.53	46.30	10.35	38.40	53.98	74.00	-20.02	PK
V	15600.00	42.06	46.30	10.35	38.40	44.51	54.00	-9.49	AV
V	20800.00	62.23	57.40	11.93	37.80	54.56	68.20	-13.64	PK
V	20800.00	51.82	57.40	11.93	37.80	44.15	54.00	-9.85	AV
V	26000.00	57.01	56.50	13.45	39.80	53.76	68.20	-14.44	PK
V	26000.00	48.57	56.50	13.45	39.80	45.32	54.00	-8.68	AV
H	10400.00	53.92	46.20	8.27	38.50	54.49	68.20	-13.71	PK
H	10400.00	43.61	46.20	8.27	38.50	44.18	54.00	-9.82	AV
H	15600.00	51.51	46.30	10.35	38.40	53.96	74.00	-20.04	PK
H	15600.00	42.06	46.30	10.35	38.40	44.51	54.00	-9.49	AV
H	20800.00	61.10	57.40	11.93	37.80	53.43	68.20	-14.77	PK
H	20800.00	49.57	57.40	11.93	37.80	41.90	54.00	-12.10	AV
H	26000.00	56.70	56.50	13.45	39.80	53.45	68.20	-14.75	PK
H	26000.00	47.71	56.50	13.45	39.80	44.46	54.00	-9.54	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	49.84	46.20	8.27	38.60	50.51	68.20	-17.69	PK
V	10480.00	39.11	46.20	8.27	38.60	39.78	54.00	-14.22	AV
V	15720.00	47.23	46.30	10.35	38.40	49.68	74.00	-24.32	PK
V	15720.00	36.67	46.30	10.35	38.40	39.12	54.00	-14.88	AV
V	20960.00	58.08	57.40	11.93	37.50	50.11	68.20	-18.09	PK
V	20960.00	48.88	57.40	11.93	37.50	40.91	54.00	-13.09	AV
V	26200.00	53.77	56.50	13.45	40.10	50.82	68.20	-17.38	PK
V	26200.00	43.66	56.50	13.45	40.10	40.71	54.00	-13.29	AV
H	10480.00	50.10	46.20	8.27	38.60	50.77	68.20	-17.43	PK
H	10480.00	39.11	46.20	8.27	38.60	39.78	54.00	-14.22	AV
H	15720.00	47.59	46.30	10.35	38.40	50.04	74.00	-23.96	PK
H	15720.00	36.78	46.30	10.35	38.40	39.23	54.00	-14.77	AV
H	20960.00	58.28	57.40	11.93	37.50	50.31	68.20	-17.89	PK
H	20960.00	48.77	57.40	11.93	37.50	40.80	54.00	-13.20	AV
H	26200.00	53.45	56.50	13.45	40.10	50.50	68.20	-17.70	PK
H	26200.00	42.99	56.50	13.45	40.10	40.04	54.00	-13.96	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 emission levels of other frequencies are very lower than the limit and not show in test report.emissions more than 20 dB below the limit do not need to be reported.
4. The worst mode is 802.11ac20, only the worst data is recorded.



Temperature:	23.7℃	Relative Humidity:	46%
Pressure:	1010 hPa	Test Voltage :	AC120V
Test Mode :	5.8G TX- 802.11ac20		

802.11ac20

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	49.13	46.10	8.77	39.10	50.90	74.00	-23.10	PK
V	11490.00	40.66	46.10	8.77	39.10	42.43	54.00	-11.57	AV
V	17235.00	46.62	47.60	11.10	38.70	48.82	68.20	-19.38	PK
V	17235.00	39.04	47.60	11.10	38.70	41.24	54.00	-12.76	AV
V	22980.00	55.68	56.90	12.73	37.70	49.21	74.00	-24.79	PK
V	22980.00	47.37	56.90	12.73	37.70	40.90	54.00	-13.10	AV
V	28725.00	52.37	55.60	14.25	40.30	51.32	68.20	-16.88	PK
V	28725.00	43.54	55.60	14.25	40.30	42.49	54.00	-11.51	AV
H	11490.00	49.63	46.10	8.77	39.10	51.40	74.00	-22.60	PK
H	11490.00	40.48	46.10	8.77	39.10	42.25	54.00	-11.75	AV
H	17235.00	47.68	47.60	11.10	38.70	49.88	68.20	-18.32	PK
H	17235.00	39.47	47.60	11.10	38.70	41.67	54.00	-12.33	AV
H	22980.00	57.98	56.90	12.73	37.70	51.51	74.00	-22.49	PK
H	22980.00	47.13	56.90	12.73	37.70	40.66	54.00	-13.34	AV
H	28725.00	54.41	55.60	14.25	40.30	53.36	68.20	-14.84	PK
H	28725.00	44.19	55.60	14.25	40.30	43.14	54.00	-10.86	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	48.94	46.10	8.77	39.10	50.71	74.00	-23.29	PK
V	11570.00	40.47	46.10	8.77	39.10	42.24	54.00	-11.76	AV
V	17355.00	46.42	47.60	11.10	38.70	48.62	68.20	-19.58	PK
V	17355.00	38.83	47.60	11.10	38.70	41.03	54.00	-12.97	AV
V	23140.00	55.49	56.90	12.73	37.70	49.02	74.00	-24.98	PK
V	23140.00	47.17	56.90	12.73	37.70	40.70	54.00	-13.30	AV
V	28925.00	52.17	55.60	14.25	40.30	51.12	68.20	-17.08	PK
V	28925.00	43.34	55.60	14.25	40.30	42.29	54.00	-11.71	AV
H	11570.00	49.43	46.10	8.77	39.10	51.20	74.00	-22.80	PK
H	11570.00	40.27	46.10	8.77	39.10	42.04	54.00	-11.96	AV
H	17355.00	47.48	47.60	11.10	38.70	49.68	68.20	-18.52	PK
H	17355.00	39.27	47.60	11.10	38.70	41.47	54.00	-12.53	AV
H	23140.00	57.78	56.90	12.73	37.70	51.31	74.00	-22.69	PK
H	23140.00	46.94	56.90	12.73	37.70	40.47	54.00	-13.53	AV
H	28925.00	54.22	55.60	14.25	40.30	53.17	68.20	-15.03	PK
H	28925.00	43.99	55.60	14.25	40.30	42.94	54.00	-11.06	AV

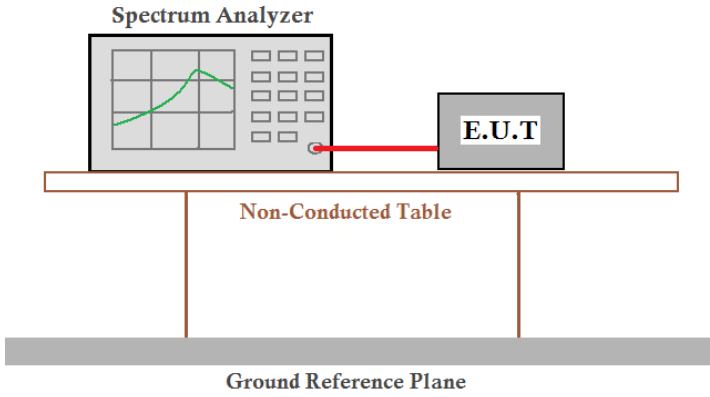


Polar (H/V)	Frequency	Meter Reading	Pre- amplifier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detect or Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
High Channel:5825MHz									
V	11650.00	50.07	46.10	8.77	39.10	51.84	74.00	-22.16	PK
V	11650.00	40.65	46.10	8.77	39.10	42.42	54.00	-11.58	AV
V	17475.00	47.86	47.90	11.23	38.90	50.09	68.20	-18.11	PK
V	17475.00	39.90	47.90	11.23	38.90	42.13	54.00	-11.87	AV
V	23300.00	57.90	57.10	12.73	37.80	51.33	68.20	-16.87	PK
V	23300.00	48.14	57.10	12.73	37.80	41.57	54.00	-12.43	AV
V	29125.00	54.50	55.80	14.25	40.50	53.45	68.20	-14.75	PK
V	29125.00	45.29	55.80	14.25	40.50	44.24	54.00	-9.76	AV
H	11650.00	52.15	46.10	8.77	39.10	53.92	74.00	-20.08	PK
H	11650.00	43.14	46.10	8.77	39.10	44.91	54.00	-9.09	AV
H	17475.00	49.12	47.90	11.23	38.90	51.35	68.20	-16.85	PK
H	17475.00	41.23	47.90	11.23	38.90	43.46	54.00	-10.54	AV
H	23300.00	59.36	57.10	12.73	37.80	52.79	68.20	-15.41	PK
H	23300.00	49.65	57.10	12.73	37.80	43.08	54.00	-10.92	AV
H	29125.00	55.60	55.80	14.25	40.50	54.55	68.20	-13.65	PK
H	29125.00	46.05	55.80	14.25	40.50	45.00	54.00	-9.00	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 emission levels of other frequencies are very lower than the limit and not show in test report.emissions more than 20 dB below the limit do not need to be reported.
4. The worst mode is 802.11ac20, only the worst data is recorded.

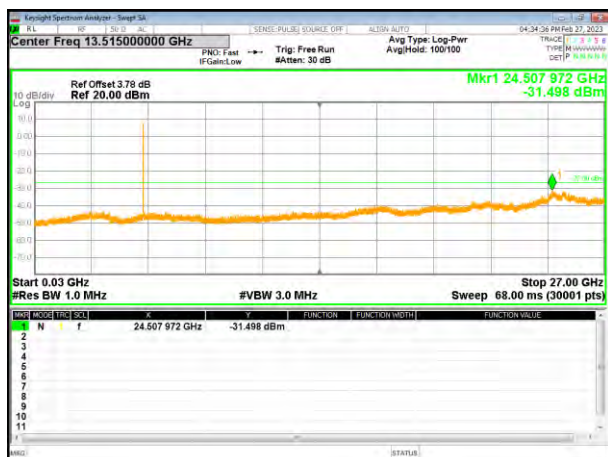
4.7.2 Conducted Emission Method

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

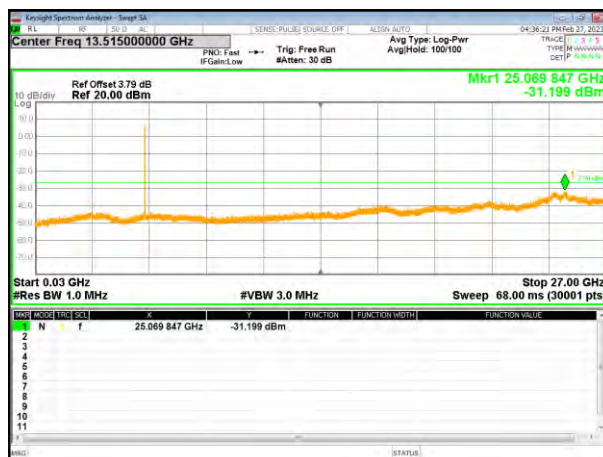
5180-5240MHz

Test Plot

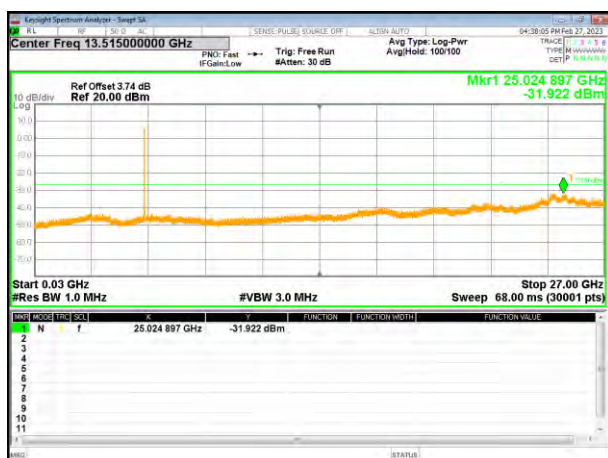
802.11a on channel 36



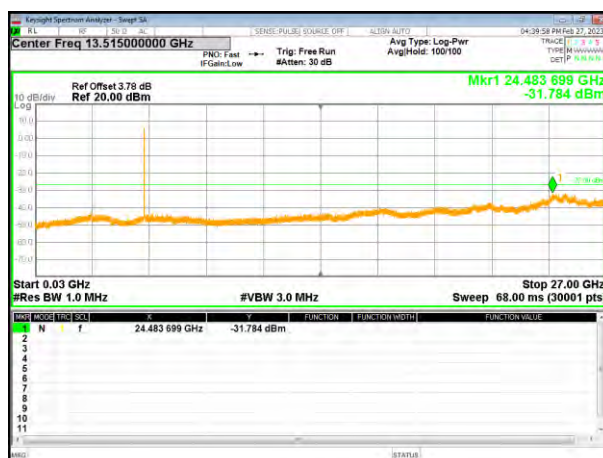
802.11a on channel 40



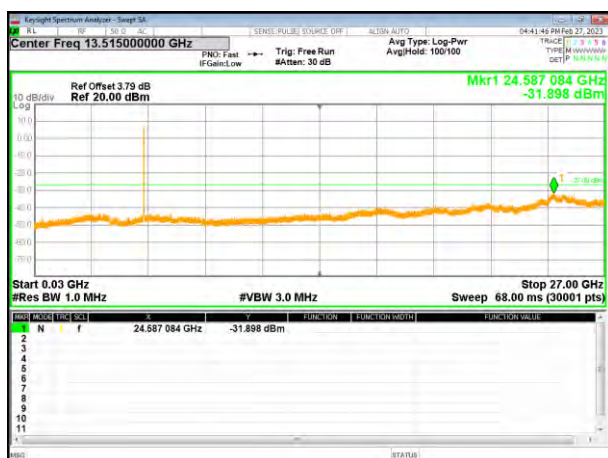
802.11a on channel 48



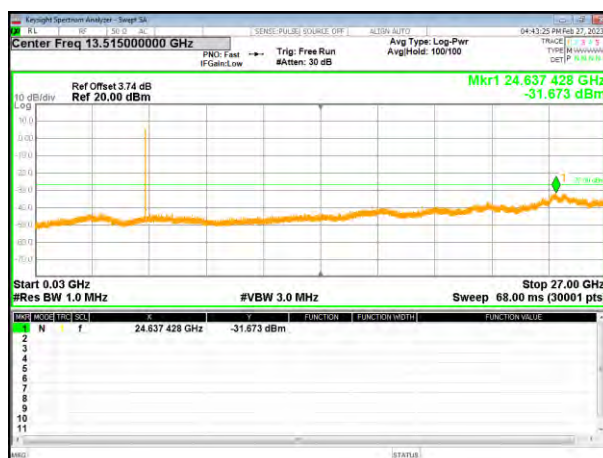
802.11n20 on channel 36



802.11n20 on channel 40

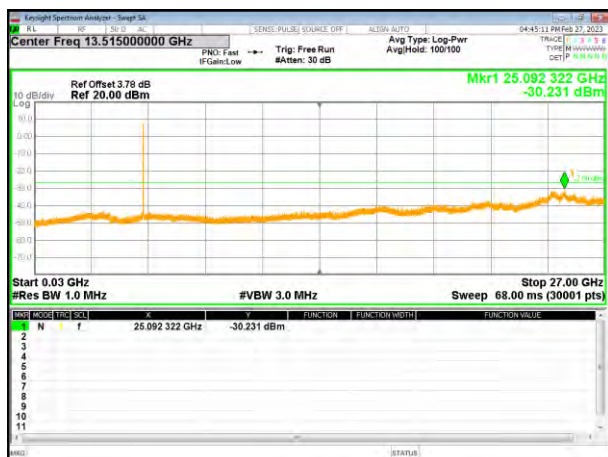


802.11n20 on channel 48

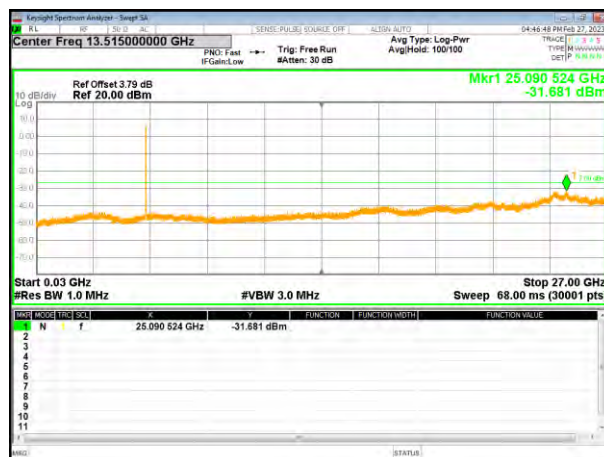


Test Plot

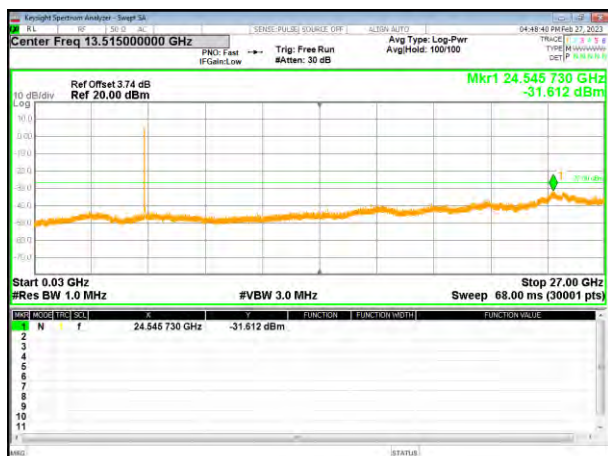
802.11ac20 on channel 36



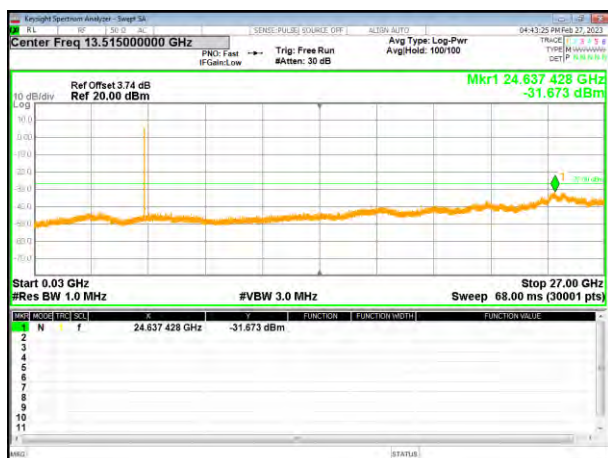
802.11ac20 on channel 40



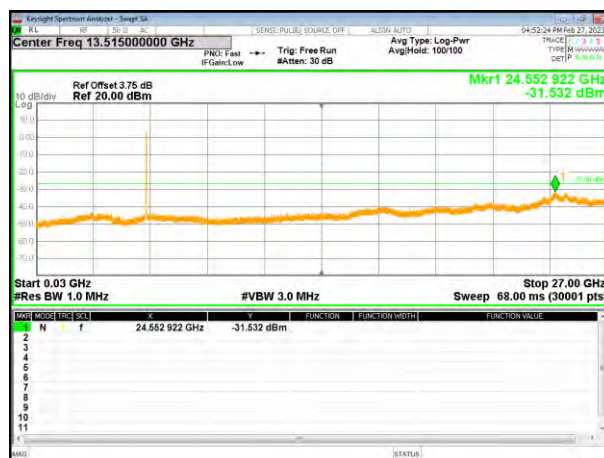
802.11ac20 on channel 48



802.11n40 on channel 38



802.11n40 on channel 46

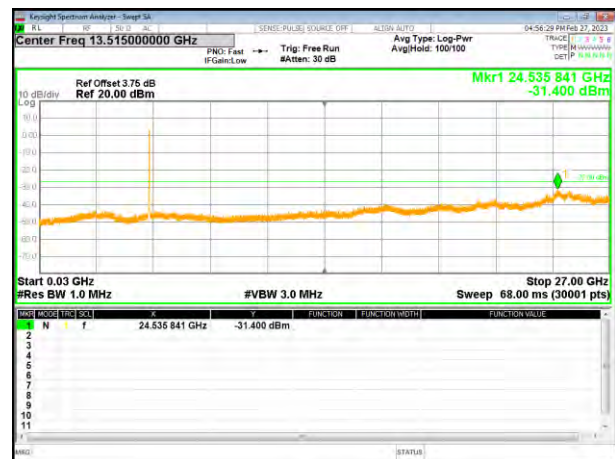


Test Plot

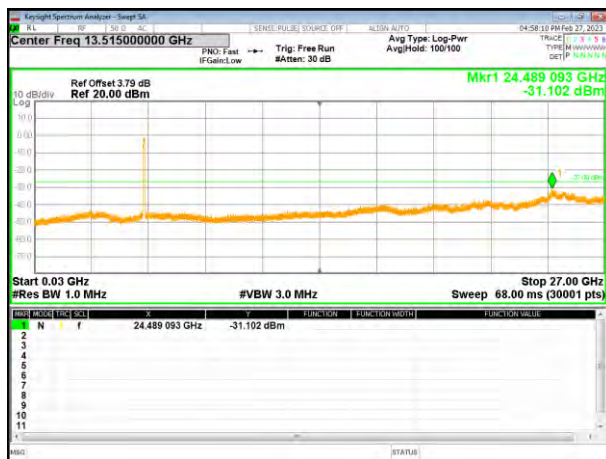
802.11ac40 on channel 38



802.11ac40 on channel 46



802.11ac80 on channel 42

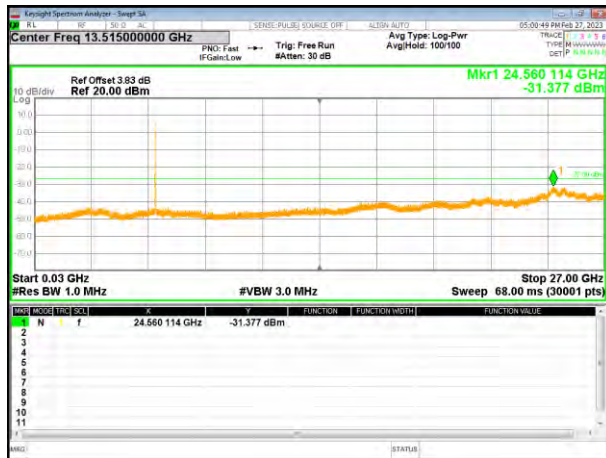




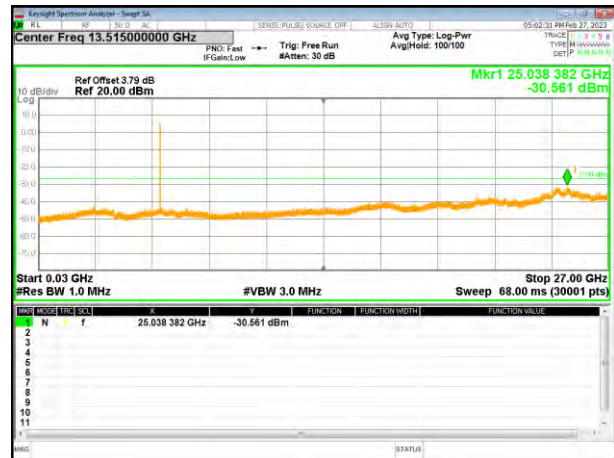
5745-5825MHz

Test Plot

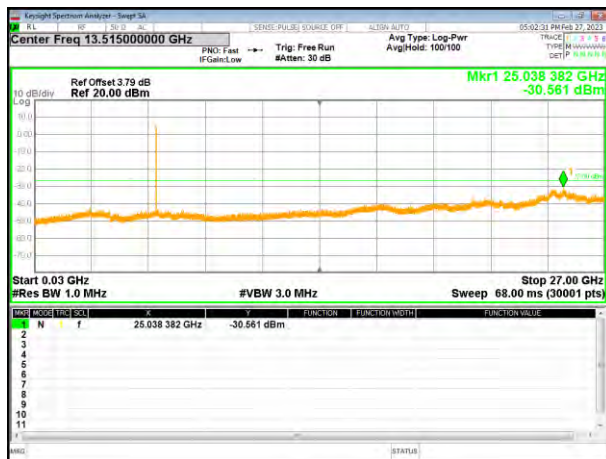
802.11a on channel 149



802.11a on channel 157



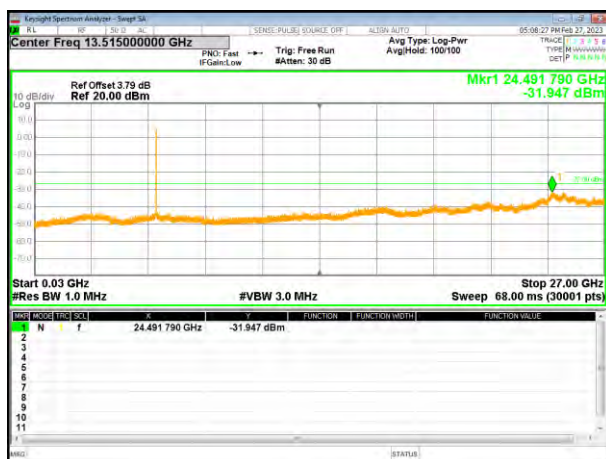
802.11a on channel 165



802.11n20 on channel 149



802.11n20 on channel 157

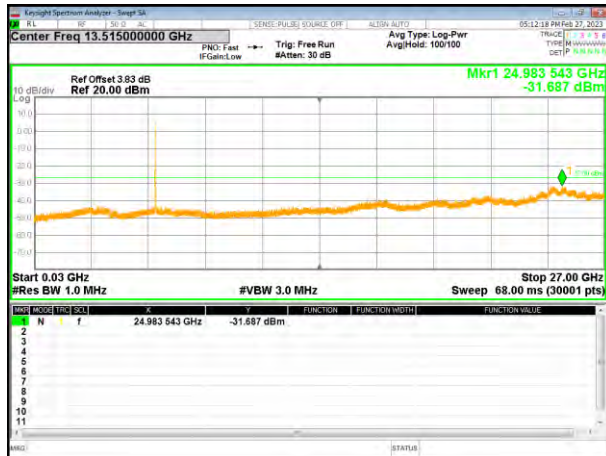


802.11n20 on channel 165

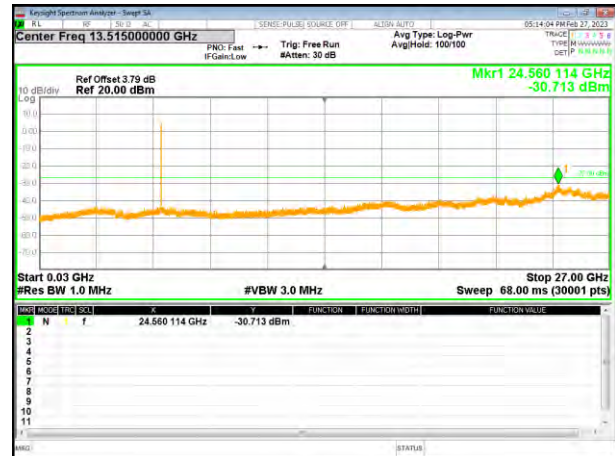


Test Plot

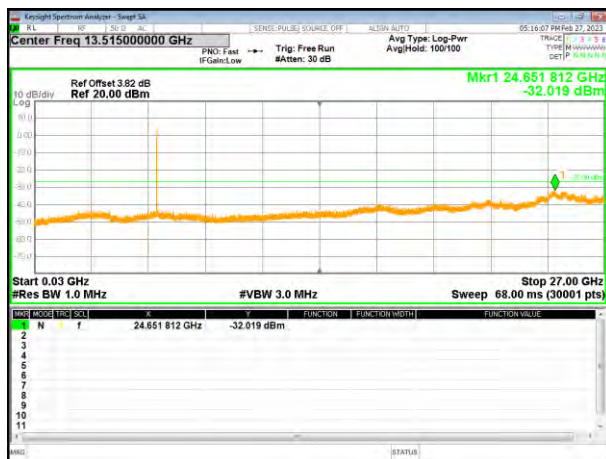
802.11ac20 on channel 149



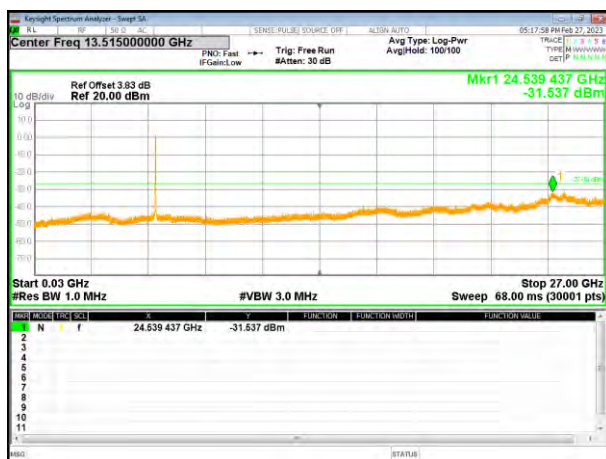
802.11ac20 on channel 157



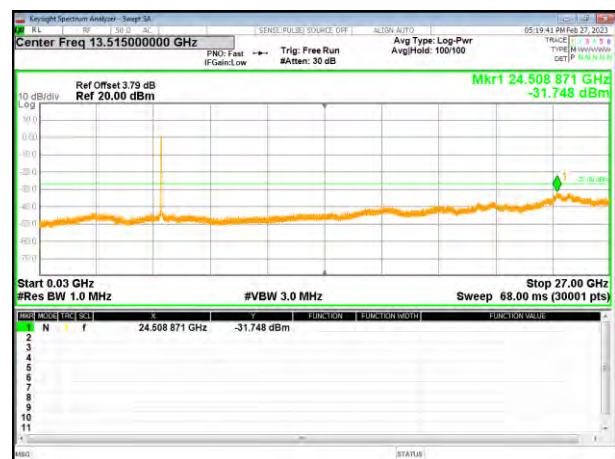
802.11ac20 on channel 165



802.11n40 on channel 151

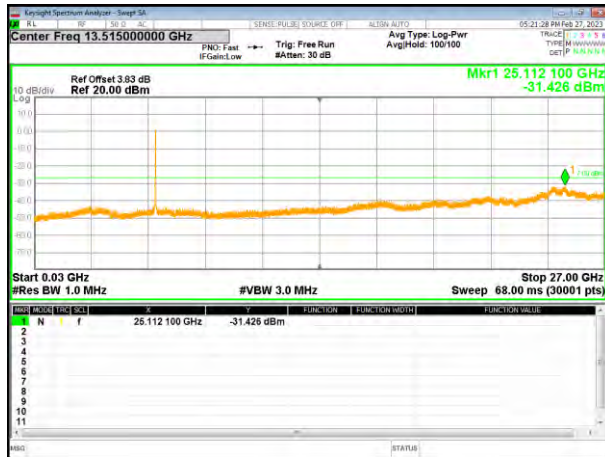


802.11n40 on channel 159

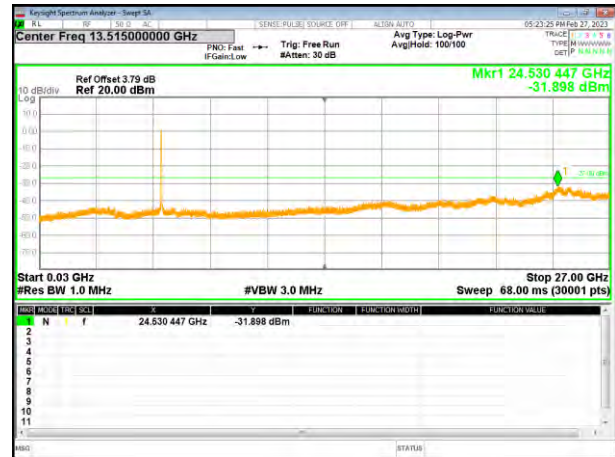


Test Plot

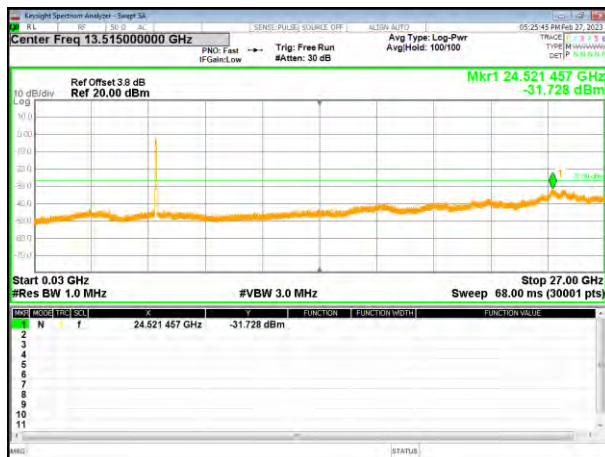
802.11ac40 on channel 151



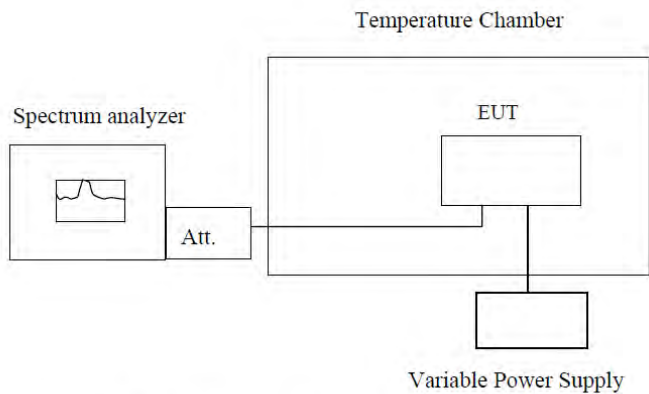
802.11ac40 on channel 159



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:	- The EUT was placed inside the environmental test chamber and powered by nominal DC voltage. - Turn the EUT on and couple its output to a spectrum analyzer. - Turn the EUT off and set the chamber to the highest temperature specified. - 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. - Repeat step 2 and 3 with the temperature chamber set to the lowest temperature. - The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 Minute - 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: DC 19V					
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	5180.132	5179.879	5179.938	5179.807
	5190	5190.128	5199.753	5199.813	5189.818
	5200	5200.123	5199.778	5199.838	5199.808
	5210	5210.129	5209.756	5209.816	5209.809
	5220	5220.124	5219.771	5219.831	5219.816
	5230	5230.122	5229.764	5229.823	5229.833
	5240	5240.095	5239.772	5239.831	5239.818
-20	5180	5180.123	5179.755	5179.823	5179.828
	5190	5190.114	5189.745	5189.822	5189.824
	5200	5200.122	5199.753	5199.816	5199.818
	5210	5210.114	5209.745	5209.806	5209.824
	5220	5220.135	5219.766	5219.816	5219.819
	5230	5230.113	5229.744	5229.812	5229.816
	5240	5240.131	5239.762	5239.817	5239.789
-10	5180	5180.132	5179.764	5179.802	5179.807
	5190	5190.128	5189.759	5189.813	5189.818
	5200	5200.123	5199.754	5199.804	5199.808
	5210	5210.129	5209.76	5209.805	5209.809
	5220	5220.124	5219.755	5219.812	5219.816
	5230	5230.122	5229.753	5229.829	5229.833
	5240	5240.095	5239.726	5239.801	5239.805
0	5180	5179.909	5179.743	5179.814	5179.818
	5190	5200.081	5189.753	5189.805	5189.819
	5200	5200.079	5199.744	5199.813	5199.809
	5210	5210.134	5209.745	5209.805	5209.814
	5220	5220.123	5219.752	5219.826	5219.809
	5230	5230.110	5229.77	5229.803	5229.829
	5240	5240.127	5239.742	5239.821	5239.807
10	5180	5180.111	5179.755	5179.823	5179.819
	5190	5190.122	5189.745	5189.819	5189.81
	5200	5200.113	5199.753	5199.814	5199.817
	5210	5210.114	5209.745	5209.82	5209.809
	5220	5220.121	5219.766	5219.815	5219.83
	5230	5230.139	5229.744	5229.812	5229.807
	5240	5240.124	5239.762	5239.785	5239.825
20	5180	5180.132	5179.754	5179.814	5179.78

	5190	5190.128	5189.754	5189.805	5189.81
	5200	5200.123	5199.745	5199.813	5199.834
	5210	5210.129	5299.752	5209.805	5209.818
	5220	5220.124	5219.745	5219.826	5219.809
	5230	5230.122	5229.766	5229.803	5229.836
	5240	5240.095	5239.744	5239.821	5239.824
30	5180	5180.111	5179.755	5179.814	5179.828
	5190	5190.122	5189.745	5189.805	5179.828
	5200	5200.113	5199.753	5199.813	5189.824
	5210	5210.114	5209.745	5209.805	5199.818
	5220	5220.121	5219.766	5219.826	5209.824
	5230	5230.139	5229.744	5229.803	5219.819
	5240	5240.111	5239.762	5239.821	5229.816
40	5180	5180.123	5179.754	5179.6	5179.807
	5190	5190.114	5189.754	5199.772	5189.818
	5200	5200.122	5199.745	5199.77	5199.808
	5210	5210.114	5299.752	5209.825	5209.809
	5220	5220.135	5219.745	5219.814	5219.816
	5230	5230.113	5229.766	5229.8	5229.833
	5240	5240.131	5239.744	5239.817	5239.805
50	5180	5180.123	5179.755	5179.814	5179.78
	5190	5190.114	5189.745	5189.805	5189.81
	5200	5200.122	5199.753	5199.813	5199.834
	5210	5210.114	5209.745	5209.805	5209.818
	5220	5220.135	5219.766	5219.826	5219.809
	5230	5230.113	5229.744	5229.803	5229.836
	5240	5240.131	5239.762	5239.821	5239.824

Frequency stability versus Voltage					
Temperature: 25°C					
Power Supply (VDC)	Operating Frequency (MHz)	0 minute Measured Frequency (MHz)	2 minute Measured Frequency (MHz)	5 minute Measured Frequency (MHz)	10 minute Measured Frequency (MHz)
16.15	5180	5180.132	5179.879	5179.814	5179.943
	5190	5190.128	5199.753	5189.805	5199.817
	5200	5200.123	5199.778	5199.813	5199.842
	5210	5210.129	5209.756	5209.805	5209.82
	5220	5220.124	5219.771	5219.826	5219.835
	5230	5230.122	5229.764	5229.803	5229.827
	5240	5240.095	5239.772	5239.821	5239.835
19.00	5180	5180.123	5179.773	5179.813	5179.828
	5190	5190.114	5179.879	5189.814	5189.827
	5200	5200.122	5199.753	5199.805	5199.82
	5210	5210.114	5209.778	5299.811	5209.81
	5220	5220.135	5219.756	5219.805	5219.82
	5230	5230.113	5229.771	5229.825	5299.815
	5240	5240.131	5239.764	5239.803	5239.821
21.85	5180	5180.132	5179.764	5179.802	5179.807
	5190	5190.128	5189.759	5189.813	5189.818
	5200	5200.123	5199.754	5199.804	5199.808
	5210	5210.129	5209.76	5209.805	5209.809
	5220	5220.124	5219.755	5219.812	5219.816
	5230	5230.122	5229.753	5229.829	5229.833
	5240	5240.095	5239.726	5239.801	5239.805



Frequency stability versus Temp.					
Power Supply: DC 19V					
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	5745.115	5744.736	5744.791	5744.789
	5755	5755.122	5754.742	5754.798	5754.777
	5775	5775.138	5774.734	5774.814	5774.788
	5785	5785.114	5784.726	5784.789	5784.794
	5795	5795.110	5794.733	5794.785	5794.812
	5825	5825.113	5824.661	5824.788	5824.803
-20	5745	5745.104	5744.747	5744.785	5744.8
	5755	5755.120	5754.748	5754.81	5754.813
	5775	5775.118	5774.751	5774.79	5774.798
	5785	5785.121	5784.743	5784.798	5784.784
	5795	5795.132	5794.734	5794.796	5794.778
	5825	5825.113	5824.742	5824.806	5824.811
-10	5745	5745.115	5744.737	5744.801	5744.42
	5755	5755.141	5754.743	5754.803	5754.802
	5775	5775.136	5774.76	5774.805	5774.803
	5785	5785.120	5784.736	5784.796	5784.805
	5795	5795.109	5794.732	5794.787	5794.788
	5825	5825.044	5824.734	5824.796	5824.783
0	5745	5745.109	5744.726	5744.801	5742.825
	5755	5755.134	5754.741	5754.803	5754.815
	5775	5775.114	5774.74	5774.805	5774.811
	5785	5785.123	5784.743	5784.796	5784.794
	5795	5795.121	5794.754	5794.787	5794.783
	5825	5825.131	5824.734	5824.796	5824.717
10	5745	5745.109	5744.736	5744.79	5744.79
	5755	5755.134	5754.752	5754.797	5754.796
	5775	5775.114	5774.753	5774.788	5774.813
	5785	5785.123	5784.735	5784.779	5784.788
	5795	5795.121	5794.752	5794.786	5794.784
	5825	5825.131	5824.749	5824.715	5824.786
20	5745	5745.125	5744.761	5744.801	5744.789
	5755	5755.139	5754.732	5754.815	5754.807
	5775	5775.123	5774.755	5774.799	5774.787
	5785	5785.110	5784.755	5784.785	5784.813
	5795	5795.104	5794.746	5794.779	5794.805
	5825	5825.138	5824.76	5824.813	5824.813
30	5745	5745.115	5744.747	5744.79	5744.814
	5755	5755.122	5754.748	5754.807	5754.785
	5775	5775.138	5774.751	5774.807	5774.808
	5785	5785.114	5784.743	5784.788	5784.807
	5795	5795.110	5794.734	5794.805	5794.798
	5825	5825.113	5824.742	5824.803	5824.812
40	5745	5745.125	5744.731	5744.801	5742.825
	5755	5755.139	5754.755	5754.803	5754.815



	5775	5775.123	5774.736	5774.805	5774.811
	5785	5785.110	5784.745	5784.796	5784.794
	5795	5795.104	5794.743	5794.787	5794.783
	5825	5825.138	5824.752	5824.796	5824.717
50	5745	5745.125	5744.761	5744.801	5744.789
	5755	5755.139	5754.732	5754.815	5754.807
	5775	5775.123	5774.755	5774.799	5774.787
	5785	5785.110	5784.755	5784.785	5784.813
	5795	5795.104	5794.746	5794.779	5794.805
	5825	5825.138	5824.76	5824.813	5824.813

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)
16.15	5745	5745.104	5744.736	5744.790	5744.784
	5755	5755.120	5754.742	5754.807	5754.808
	5775	5775.118	5774.734	5774.807	5774.789
	5785	5785.121	5784.726	5784.788	5784.797
	5795	5795.132	5794.733	5794.805	5794.795
	5825	5825.113	5824.661	5824.803	5824.804
19.00	5745	5745.104	5744.747	5744.785	5744.800
	5755	5755.120	5754.748	5754.810	5754.813
	5775	5775.118	5774.751	5774.790	5774.798
	5785	5785.121	5784.743	5784.798	5784.784
	5795	5795.132	5794.734	5794.796	5794.778
	5825	5825.113	5824.742	5824.806	5824.811
21.85	5745	5745.125	5744.761	5744.801	5744.789
	5755	5755.139	5754.732	5754.815	5754.807
	5775	5775.123	5774.755	5774.799	5774.787
	5785	5785.110	5784.755	5784.785	5784.813
	5795	5795.104	5794.746	5794.779	5794.805
	5825	5825.138	5824.760	5824.813	5824.813



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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