



TEST REPORT

Applicant: Nework LLC
Address of Applicant: 196 W Holt Ave Pomona CA 91768
Manufacturer: Nework LLC
Address of Manufacturer: 196 W Holt Ave Pomona CA 91768
Product Name: MoveMate
Model No.: MM-32C1A-AM-W,MM-32C2A-AM-W,MM-32C3A-AM-G,MM-32P1D-AM-W,MM-32P2D-AM-G,MM-32C1A-EU-W,MM-32C2A-EU-W,MM-32C3A-EU-G,MM-32P1D-EU-W,MM-32P2D-EU-G
Trade Mark: NEWORK
FCC ID: 2BLG9-32C1A
Applicable standards: FCC CFR Title 47 Part 15 Subpart E Section 15.407
Date of Test: Apri.09, 2025-Apri.25, 2025
Date of report issued: Apri.26, 2025

Remark:

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

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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	Jason Huang
Conducted Output Power	15.407 (a)(1)/(a)(3)	Pass	Kara Wu
26dB Bandwidth and 99% Occupied Bandwidth	15.407 (a)(12)	Pass	Kara Wu
6dB Bandwidth	15.407 (e)	Pass	Kara Wu
Power Spectral Density	15.407(a)(1)/(a)(3)	Pass	Kara Wu
Band Edge	15.407(b)(1)/(b)(4)	Pass	Kara Wu
Spurious Emission	15.205/15.209 15.407(b)(1)/(b)(4)/(b)(8)	Pass	Jason Huang
Frequency Stability	15.407(g)	Pass	Kara Wu

Remarks:

1. Pass: The EUT complies with the essential requirements in the standard.
2. Test according to ANSI C63.10:2013
3. Note: Compliance determination rules
 - 1).The Compliance determination of test results does not take into account measurement uncertainty. Measurement results are determined based on regulatory limitations or requirements specified by the applicant/manufacture. If measurement uncertainty is taken into account, the applicant/manufacture will bear all possible risks of non-compliance.
 - 2).The measurement uncertainty please refer to each test result in the "Measurement Uncertainty"

1.1 Measurement Uncertainty

Test Item	Measurement Uncertainty	Notes
Occupied Channel Bandwidth	0.55%	(1)
RF output power, conducted	±0.57 dB	(1)
Power Spectral Density, conducted	±0.61 dB	(1)
Unwanted Emissions, conducted	±0.64 dB	(1)
AC Power Line Conducted Emission	± 2.55 dB	(1)
Radiated emissions 9K-30MHz	±3.79 dB	(1)
Radiated emissions 30M- 1GHz	± 4.24 dB	(1)
Radiated emissions 1GHz-18GHz	± 4.26 dB	(1)
Radiated emissions 18GHz-40GHz	±4.17 dB	(1)
Frequency error	Uc=1X10-7	(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:	MoveMate
Model No.:	MM-32C1A-AM-W,MM-32C2A-AM-W,MM-32C3A-AM-G,MM-32P1D-AM-W,MM-32P2D-AM-G,MM-32C1A-EU-W,MM-32C2A-EU-W,MM-32C3A-EU-G,MM-32P1D-EU-W,MM-32P2D-EU-G
Difference of model(s)	All models have the same circuit and RF module, except for the model name
Test Model:	MM-32C1A-AM-W
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:	FPC Antenna
Antenna gain:	3.42 dBi(Note: Antenna information is provided by applicant, Testing lab is not responsible for the accuracy of the information.)
Battery	DC 14.8V 20000mAh
Power supply:	N/A
Adapter Model:	DC 14.8V From Battery or DC 18V From Adapter

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: For battery operated equipment, the EUT was performed using a new DC 14.8V battery.</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	/
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	/

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
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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	Engineering mode
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	2025.3.06	2026.3.05
2	Artificial power network	schwarabeck	NSLK8127	8127483	2025.3.06	2026.3.05
3	Artificial power network	ETS	3186/2NM	1132	2025.3.06	2026.3.05
4	10dB attenuator	HUBER+SUHNER	10dB	/	2025.3.06	2026.3.05
5	Cable 4	HUBER SUNNER	3M	/	2025.3.06	2026.3.05
6	Absorbing Clamp	schwarabeck	MDS21	D69250	2025.3.06	2026.3.05

Radiated Emission &RF Conducted test:

Item	Equipment name	Manufacturer	Model	Serial No.	Calibration date	Due date
1	EMI Test Receiver	Rohde&schwarz	ESCI7	101032	2025.3.06	2026.3.05
2	Broadband antenna	schwarabeck	VULB9168	1064	2024.3.26	2026.3.25
3	Horn antenna	schwarabeck	BBHA9120D	9120D-1145	2024.3.22	2026.3.21
4	Amplifier	EMtrace	RP01A	50117	2025.3.06	2026.3.05
5	Amplifier	Space-Dtronic	EWLAN0118G-P40	19113001	2025.3.06	2026.3.05
6	Spectrum analyzer	KEYSIGHT	N9020A	MY55370280	2025.3.06	2026.3.05
7	Power detector meter	MWRFTes	MW100-PSB	MW201020JYT	2025.3.06	2026.3.05
8	Signal generator	Agilent	N5182A	MY49060455	2025.3.06	2026.3.05
9	Spectrum analyzer	Rohde&schwarz	FSU40	1166.1660K43	2025.3.06	2026.3.05
10	Amplifier	SKET	LNPA_1840-50	SK2019040302	2025.3.06	2026.3.05
11	Horn antenna	schwarabeck	BBHA 9170	946	2024.3.22	2026.3.21
12	Loop antenna	schwarabeck	FMZB 1519 B	1519	2024.3.22	2026.3.21
13	Cable 6	HUBER SUNNER	0.5M	/	2025.3.06	2026.3.05
14	Cable7	HUBER SUNNER	2.0M	/	2025.3.06	2026.3.05
15	Cable8	HUBER SUNNER	6.0M	/	2025.3.06	2026.3.05
16	Filter	Xin bo	XBLBQ-GTA29	210410-3-2	2025.3.06	2026.3.05
17	Power meter	Rohde&Schwarz	NRP-Z11	1138.3004.02-117725-vh	2025.3.06	2026.3.05
18	Temp. & Humidity Chamber	Jiecheng Instrument	QA-LP-80	20160705001	2024/4/23	2025/4/22

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

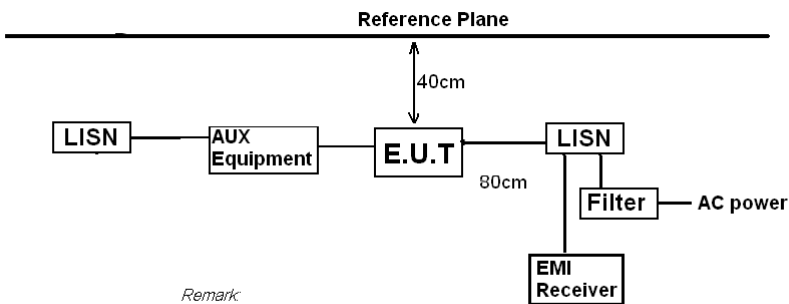
Software Name	Manufacturer	Model	Version
RF test software	MWRFTes	MTS 8310	V2.0.0.0
Conducted test software	EZ-EMC	Farad	Ver.EMC-CON 3A1.1
Radiated test software	EZ-EMC	Farad	Ver.FA-03A2 RE

4 Test results and Measurement Data

4.1 Antenna requirement

Standard requirement:	FCC Part15 C Section 15.203
<i>15.203 requirement:</i> <i>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 FPC Antenna, the best case gain of the antennas are 3.42 dBi, reference to the appendix II for details</i>	

4.2 Conducted Emissions

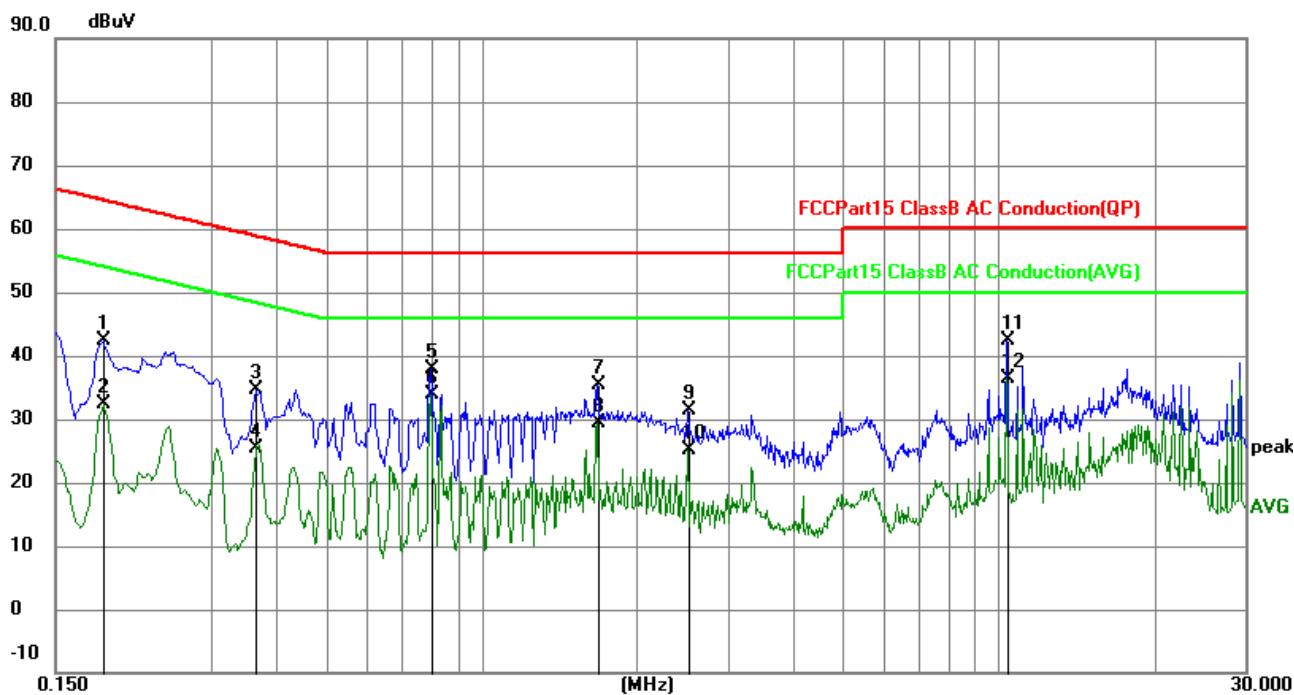
Test Requirement:	FCC Part15 C Section 15.207					
Test Method:	ANSI C63.10:2013					
Test Frequency Range:	150KHz to 30MHz					
Class / Severity:	Class B					
Receiver setup:	RBW=9KHz, VBW=30KHz, Sweep time=auto					
Limit:	Frequency range (MHz)		Limit (dBuV)			
			Quasi-peak		Average	
	0.15-0.5		66 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 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.:	24.1°C	Humid.:	54%	Press.:	1012mbar
Test voltage:	DC 18V From Adapter					
Test results:	Pass					

Remark:

1. Both high voltage and low voltage have been tested, and the report only shows the worst case data with AC 120V/60Hz.
2. All mode have been tested, the report only shows the worst mode (802.11n20 5200MHz)

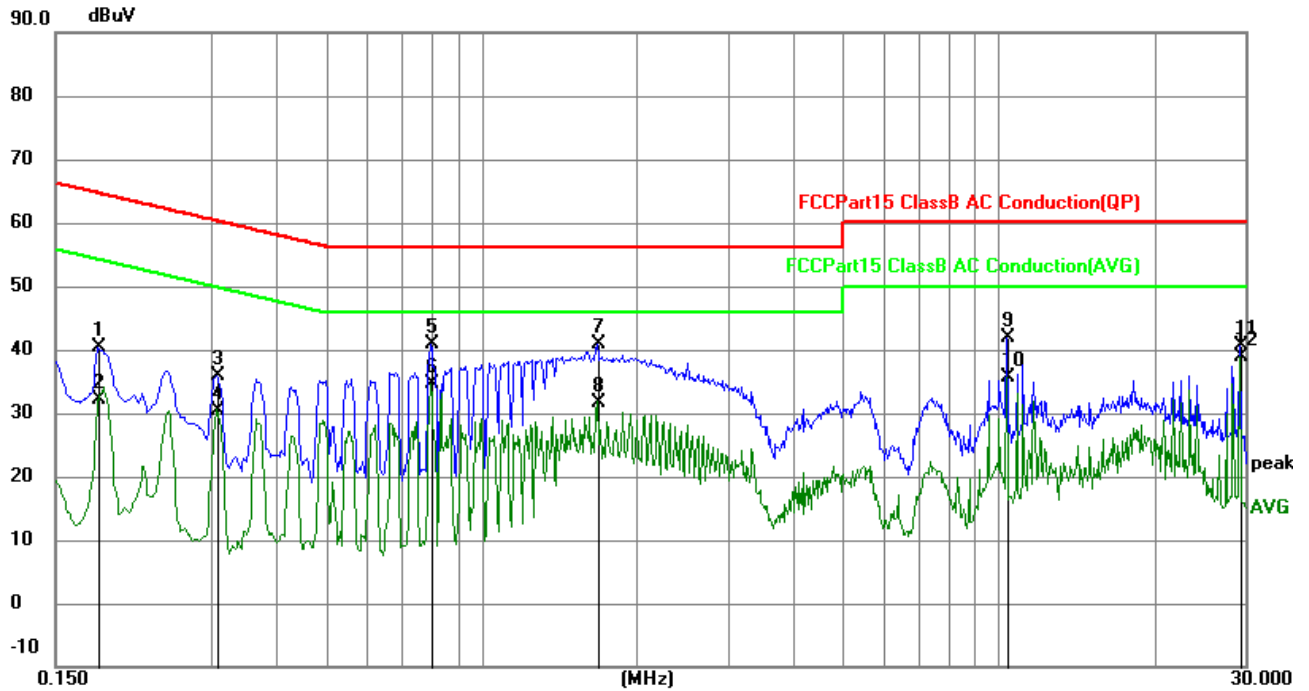
Measurement Result

Line:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1860	32.52	9.81	42.33	64.21	-21.88	QP
2	0.1860	22.54	9.81	32.35	54.21	-21.86	AVG
3	0.3660	24.75	9.89	34.64	58.59	-23.95	QP
4	0.3660	15.51	9.89	25.40	48.59	-23.19	AVG
5	0.7980	28.01	9.96	37.97	56.00	-18.03	QP
6	0.7980	23.81	9.96	33.77	46.00	-12.23	AVG
7	1.6755	25.43	9.89	35.32	56.00	-20.68	QP
8	1.6755	19.48	9.89	29.37	46.00	-16.63	AVG
9	2.5080	21.57	9.84	31.41	56.00	-24.59	QP
10	2.5080	15.40	9.84	25.24	46.00	-20.76	AVG
11	10.3605	32.50	9.83	42.33	60.00	-17.67	QP
12	10.3605	26.49	9.83	36.32	50.00	-13.68	AVG

Neutral:

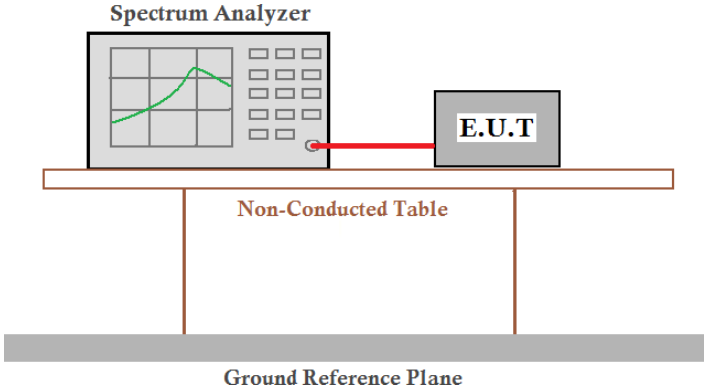


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1815	30.52	9.81	40.33	64.42	-24.09	QP
2	0.1815	22.36	9.81	32.17	54.42	-22.25	AVG
3	0.3075	26.12	9.87	35.99	60.04	-24.05	QP
4	0.3075	20.63	9.87	30.50	50.04	-19.54	AVG
5	0.7980	30.90	9.96	40.86	56.00	-15.14	QP
6	0.7980	24.59	9.96	34.55	46.00	-11.45	AVG
7	1.6755	30.99	9.89	40.88	56.00	-15.12	QP
8	1.6755	21.86	9.89	31.75	46.00	-14.25	AVG
9	10.3784	32.08	9.83	41.91	60.00	-18.09	QP
10	10.3784	25.90	9.83	35.73	50.00	-14.27	AVG
11	29.2875	31.05	9.50	40.55	60.00	-19.45	QP
12	29.2875	29.30	9.50	38.80	50.00	-11.20	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 Duty cycle

Test Method :	ANSI C63.10:2013	
Limit:	/	
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 the Spectrum Analyzer and the E.U.T are placed on a Non-Conducted Table. The table is supported by a Ground Reference Plane.	
Test Instruments:	Refer to section 3.0 for details	
Test mode:	Refer to section 2.2 for details	
Test environment:	Temp.: 22.3°C	Humid.: 66%RH
Test voltage:	DC 14.8V From Battery	
Test results:	Pass	

Measurement Result

5180-5240MHz

Mode	Duty cycle (%)	Correction Factor (dB)
TX 802.11a Mode	84.94	0.71
TX 802.11n20 Mode	80.46	0.94
TX 802.11ac20 Mode	84.35	0.74
TX 802.11n40 Mode	83.33	0.79
TX 802.11a40 Mode	83.67	0.77
TX 802.11ac80 Mode	82.89	0.81

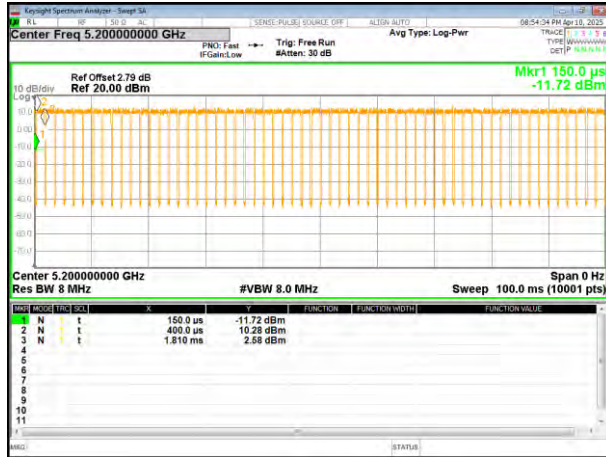
5745-5825 MHz

Mode	Duty cycle (%)	Correction Factor (dB)
TX 802.11a Mode	84.44	0.73
TX 802.11n20 Mode	84.78	0.72
TX 802.11ac20 Mode	84.44	0.73
TX 802.11n40 Mode	86.36	0.64
TX 802.11a40 Mode	82.61	0.83
TX 802.11ac80 Mode	89.29	0.49

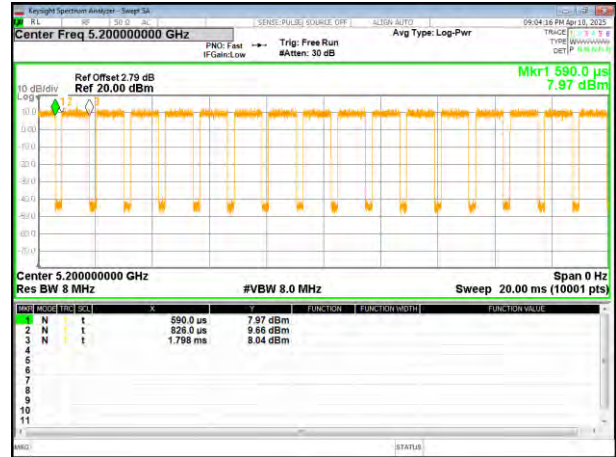
Test plot

5180-5240MHz

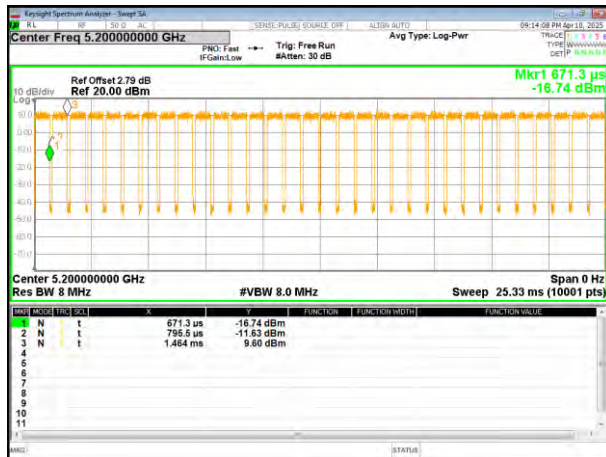
(802.11a) plot



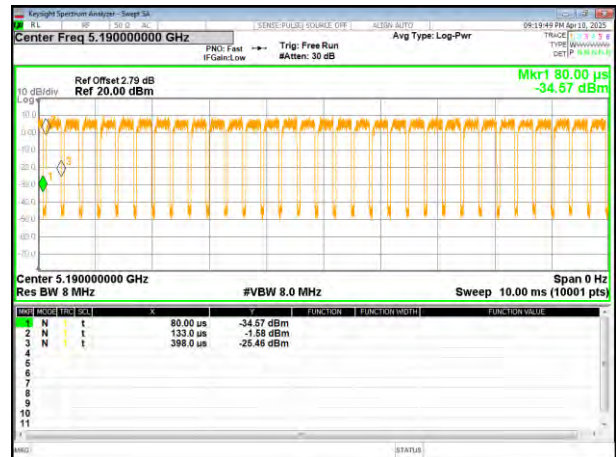
(802.11 n20) plot



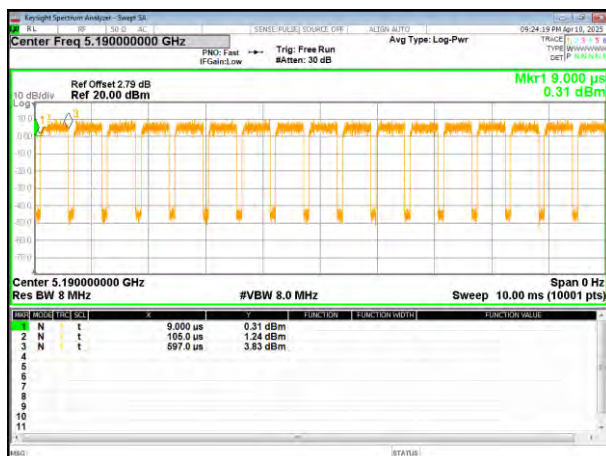
(802.11ac20) plot



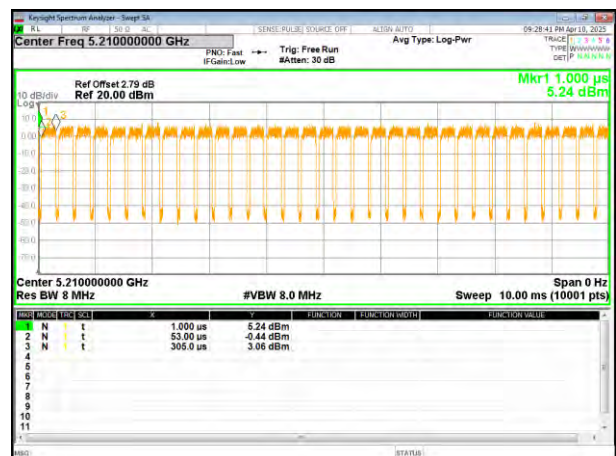
(802.11 n40) plot



(802.11ac40) plot

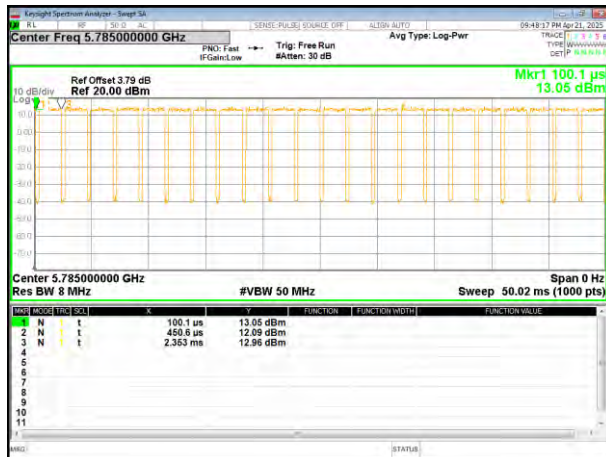


(802.11ac80) plot

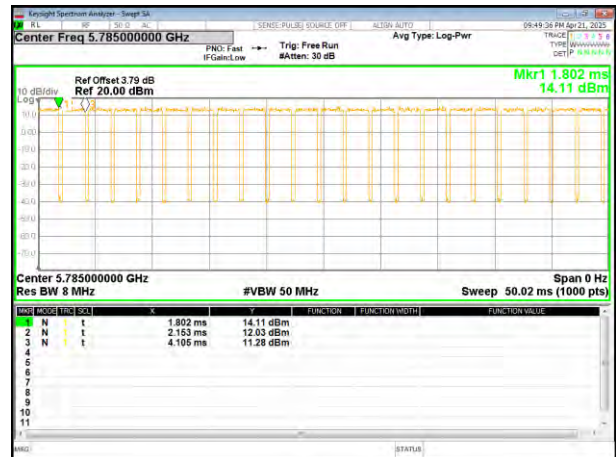


5745-5825 MHz

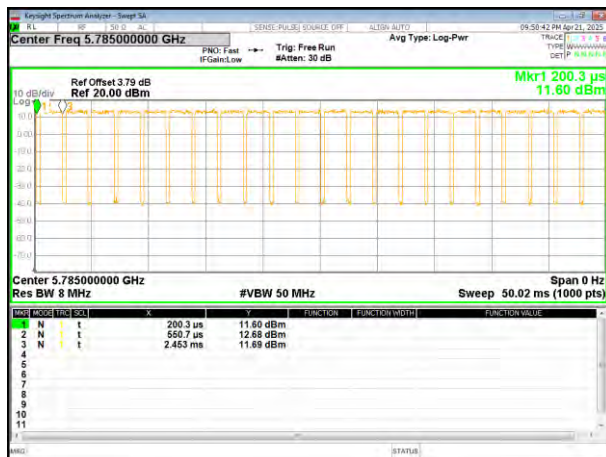
(802.11a) plot



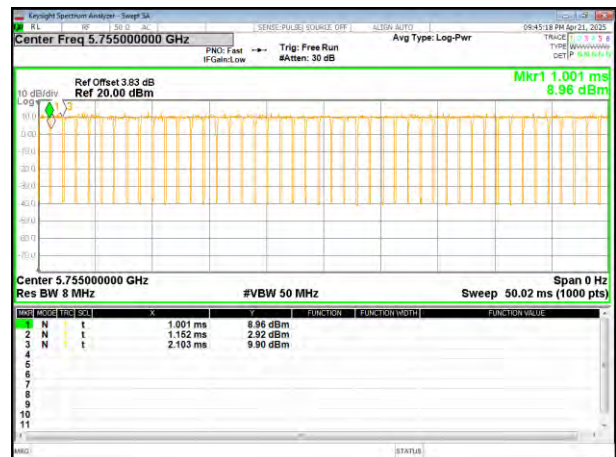
(802.11 n20) plot



(802.11ac20) plot



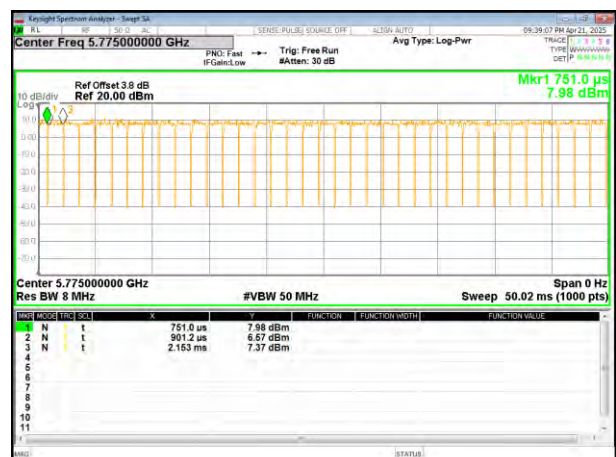
(802.11 n40) plot



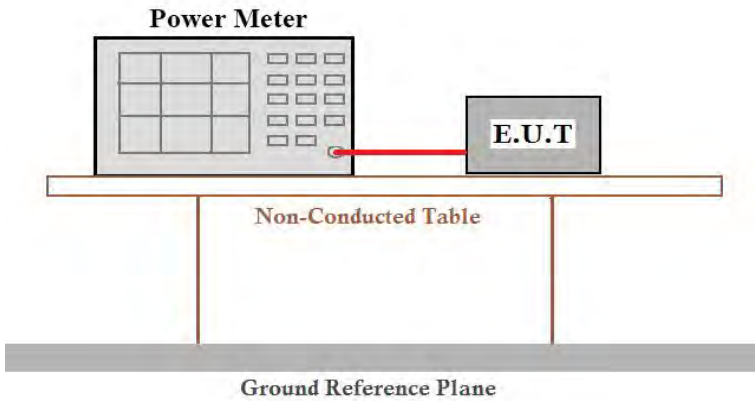
(802.11ac40) plot



(802.11ac80) plot



4.4 Conducted 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:	 The diagram illustrates the test setup. A 'Power Meter' is connected to an 'E.U.T' (Equipment Under Test) via a red cable. Both components 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 environment:	Temp.: 22.3°C	Humid.: 66%RH
Test voltage:	DC 14.8V From Battery	
Test results:	Pass	

Measurement Result

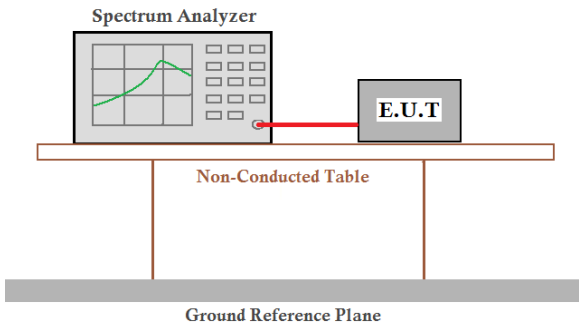
5180-5240MHz

Test Channel	Frequency	Correction Factor	Maximum output power	Total Power	LIMIT	Result
	(MHz)	(dB)	(dBm)	(dBm)	dBm	
TX 802.11a Mode						
CH36	5180	0.71	12.28	12.99	23.98	Pass
CH40	5200	0.71	12.03	12.74	23.98	Pass
CH48	5240	0.71	12.04	12.75	23.98	Pass
TX 802.11 n20 Mode						
CH36	5180	0.94	12.06	13.00	23.98	Pass
CH40	5200	0.94	12.53	13.47	23.98	Pass
CH48	5240	0.94	12.27	13.21	23.98	Pass
TX 802.11 ac20 Mode						
CH36	5180	0.74	12.15	12.89	23.98	Pass
CH40	5200	0.74	12.03	12.77	23.98	Pass
CH48	5240	0.74	12.20	12.94	23.98	Pass
TX 802.11 n40 Mode						
CH38	5190	0.79	11.92	12.71	23.98	Pass
CH46	5230	0.79	11.75	12.54	23.98	Pass
TX 802.11 ac40 Mode						
CH38	5190	0.77	11.91	12.68	23.98	Pass
CH46	5230	0.77	12.09	12.86	23.98	Pass
TX 802.11 ac80 Mode						
CH42	5210	0.81	11.95	12.76	23.98	Pass

5745-5825 MHz

Test Channel	Frequency	Correction Factor	Maximum output power	Total Power	LIMIT	Result
	(MHz)	(dB)	(dBm)	(dBm)	dBm	
TX 802.11a Mode						
CH149	5745	0.73	11.65	12.38	30	Pass
CH157	5785	0.73	11.86	12.59	30	Pass
CH165	5825	0.73	12.25	12.98	30	Pass
TX 802.11 n20 Mode						
CH149	5745	0.72	11.57	12.29	30	Pass
CH157	5785	0.72	11.69	12.41	30	Pass
CH165	5825	0.72	12.14	12.86	30	Pass
TX 802.11 ac20 Mode						
CH149	5745	0.73	11.62	12.35	30	Pass
CH157	5785	0.73	11.72	12.45	30	Pass
CH165	5825	0.73	12.13	12.86	30	Pass
TX 802.11 n40 Mode						
CH151	5755	0.64	11.81	12.45	30	Pass
CH159	5795	0.64	12.18	12.82	30	Pass
TX 802.11 ac40 Mode						
CH151	5755	0.83	11.90	12.73	30	Pass
CH159	5795	0.83	12.00	12.83	30	Pass
TX 802.11 ac80 Mode						
CH155	5775	0.49	11.96	12.45	30	Pass

4.5 Bandwidth &99% Occupy Bandwidth

Test Requirement:	FCC Part15 E Section 15.407(a)(12)&15.407(e)	
Test Method:	ANSI C63.10:2013 and KDB 789033 D02 General U-NII Test Procedures New Rules v02r01	
Limit:	Measurements in the 5.725-5.85 GHz band, the minimum bandwidth 6 dB bandwidth of U-NII devices shall be at least 500KHz. Measurements in the 5.15-5.25 GHz, 5.25-5.35 GHz, and the 5.47-5.725 GHz bands are made over a bandwidth of 1 MHz or the 26 dB emission bandwidth of the device, whichever is less. A narrower resolution bandwidth can be used, provided that the measured power is integrated over the full reference bandwidth.	
Test setup:		
Test Instruments:	Refer to section 3.0 for details	
Test mode:	Refer to section 2.2 for details	
Test environment:	Temp.: 22.3°C	Humid.: 66%RH
Test voltage:	DC 14.8V From Battery	
Test results:	Pass	

Measurement Result

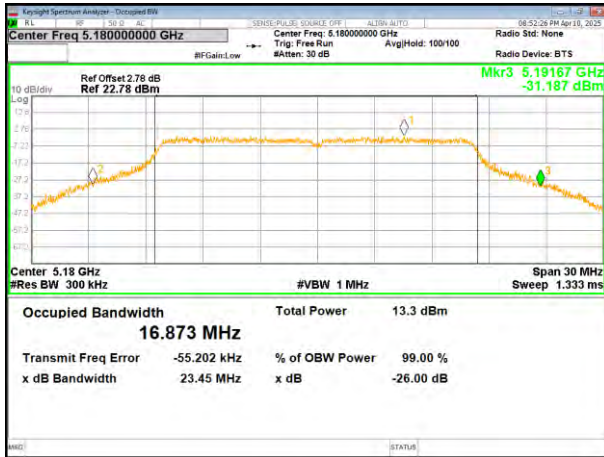
5180-5240MHz

Test CH	-26dB Channel Bandwidth (MHz)						Result
	802.11a	802.11n (HT20)	802.11ac (HT20)	802.11n (HT40)	802.11ac (HT40)	802.11ac (HT80)	
Lowest	23.45	22.26	22.25	42.14	42.02	--	Pass
Middle	22.90	22.40	22.60	--	--	79.72	
Highest	23.49	22.25	22.10	41.99	42.58	--	

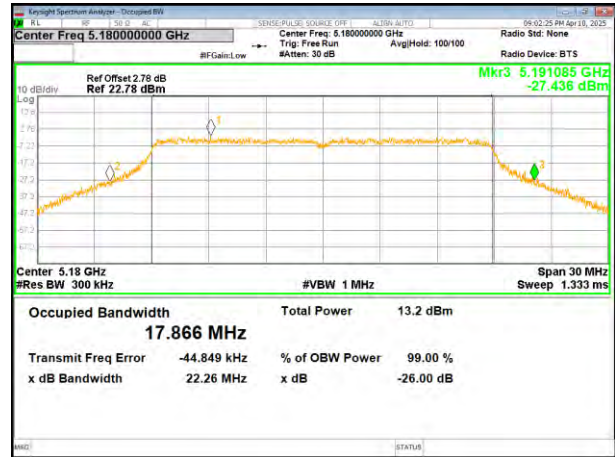
Test CH	99% Occupy Bandwidth (MHz)						Result
	802.11a	802.11n (HT20)	802.11ac (HT20)	802.11n (HT40)	802.11ac (HT40)	802.11ac (HT80)	
Lowest	16.684	17.751	17.700	36.320	36.368	--	Pass
Middle	16.663	17.758	17.715	--	--	74.954	
Highest	16.649	17.739	17.744	36.294	36.285	--	

Test plot -26dB Channel Bandwidth

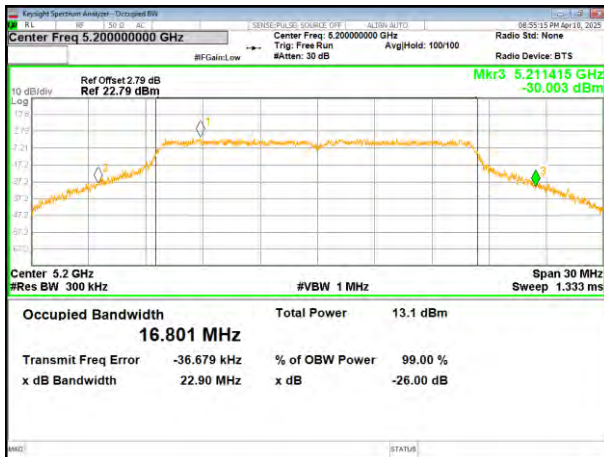
(802.11a) plot on channel 36



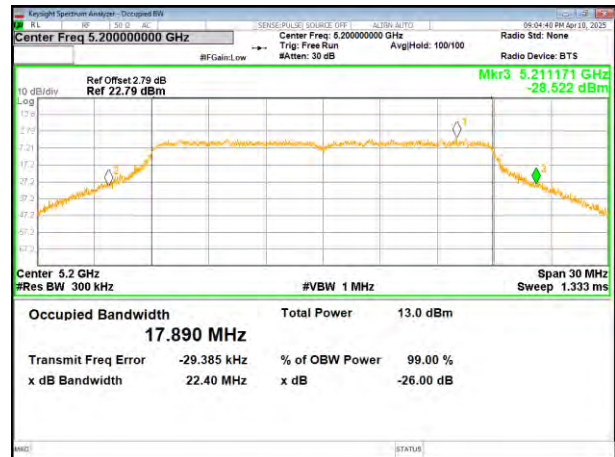
(802.11 n20) plot on channel 36



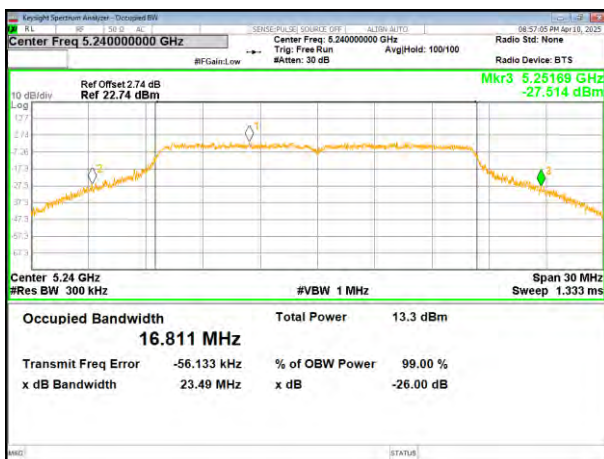
(802.11a) plot on channel 40



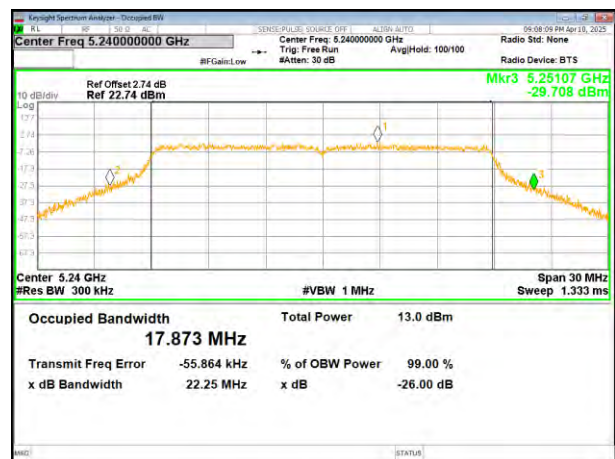
(802.11 n20) plot on channel 40



(802.11a) plot on channel 48

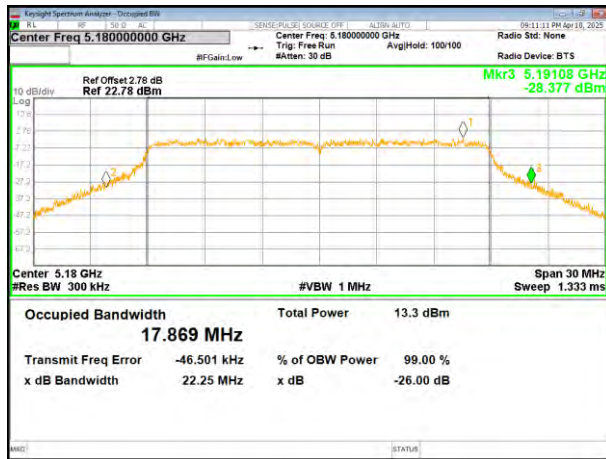


(802.11 n20) plot on channel 48

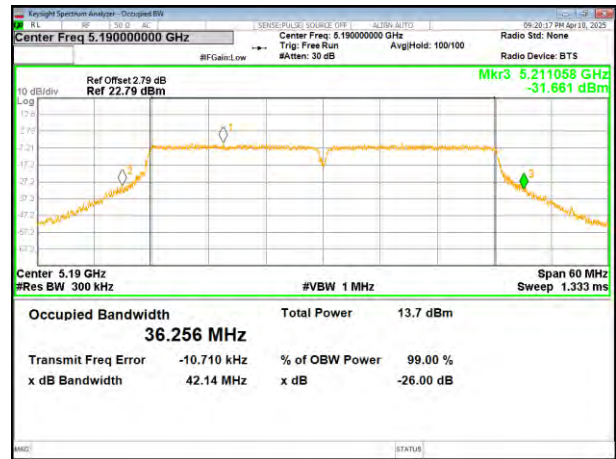


Test plot

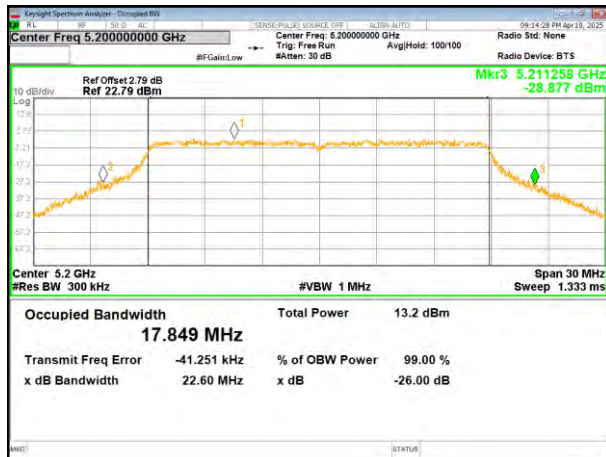
(802.11ac20) plot on channel 36



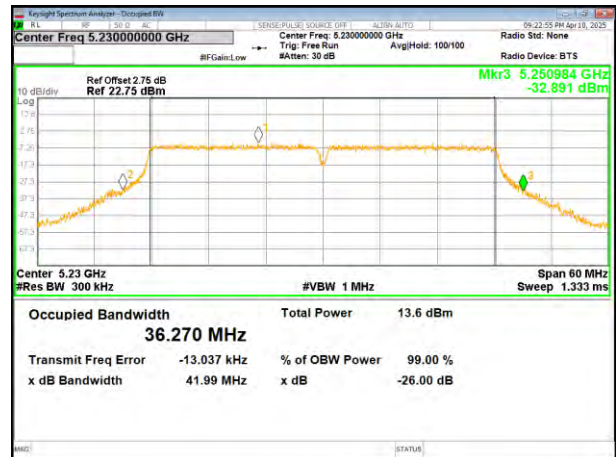
(802.11 n40) plot on channel 38



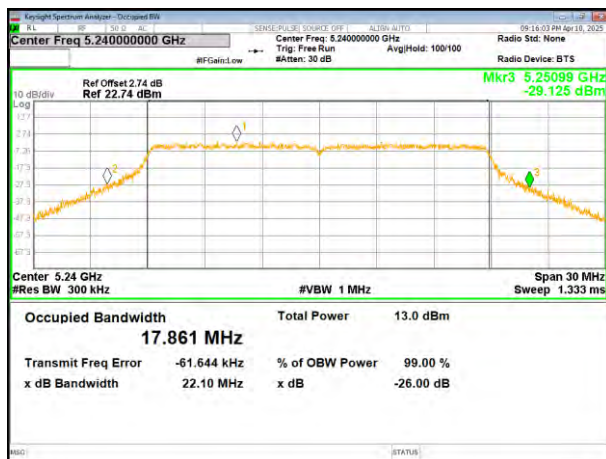
(802.11ac20) plot on channel 40



(802.11 n40) plot on channel 46

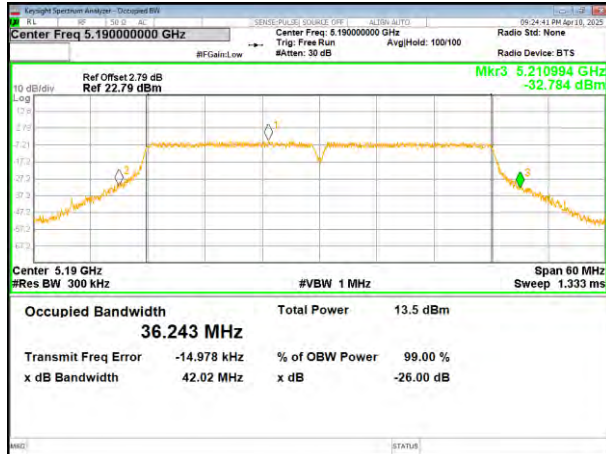


(802.11ac20) plot on channel 48

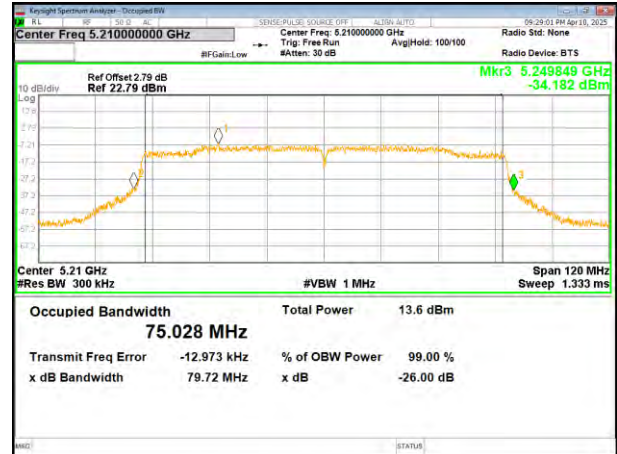


Test plot

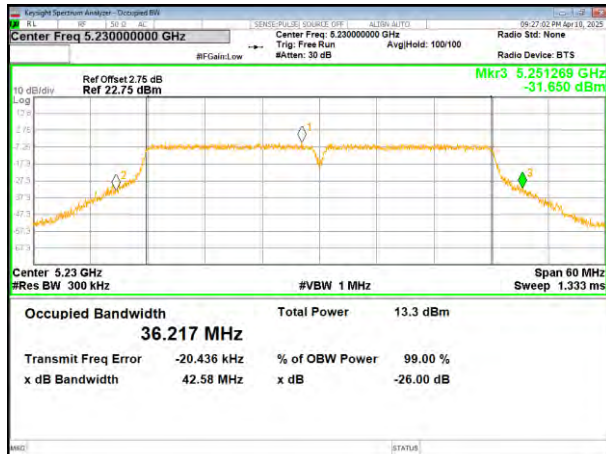
(802.11ac40) plot on channel 38



(802.11ac80) plot on channel 42

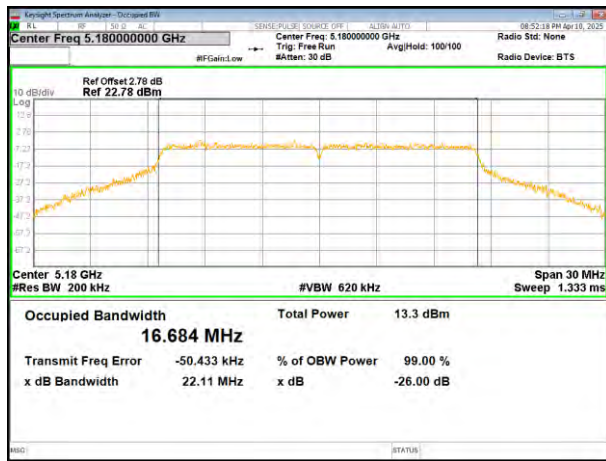


(802.11ac40) plot on channel 46

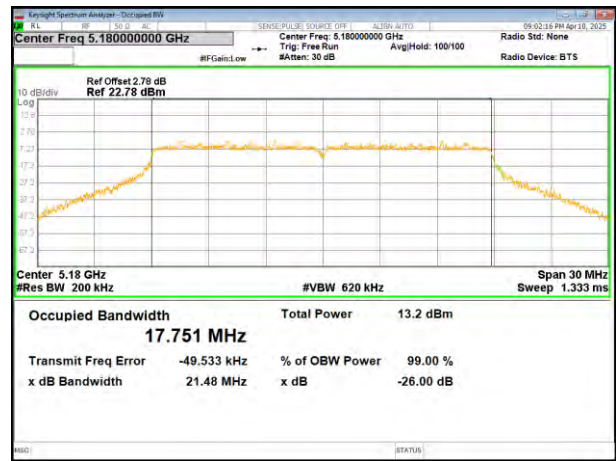


Test plot 99% Occupy Bandwidth

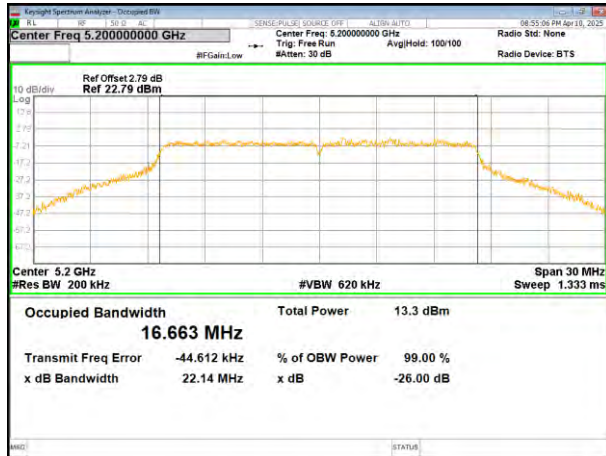
(802.11a) plot on channel 36



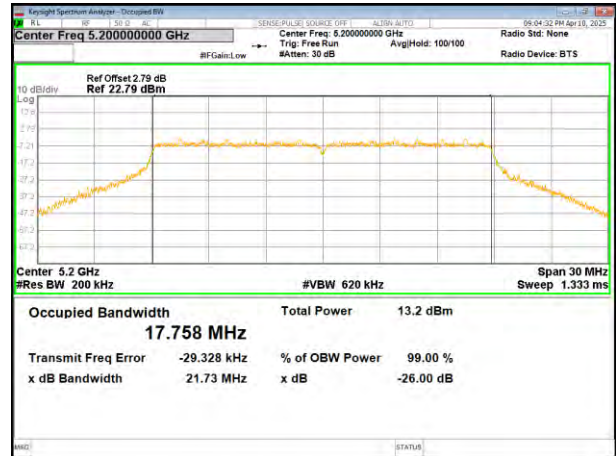
(802.11 n20) plot on channel 36



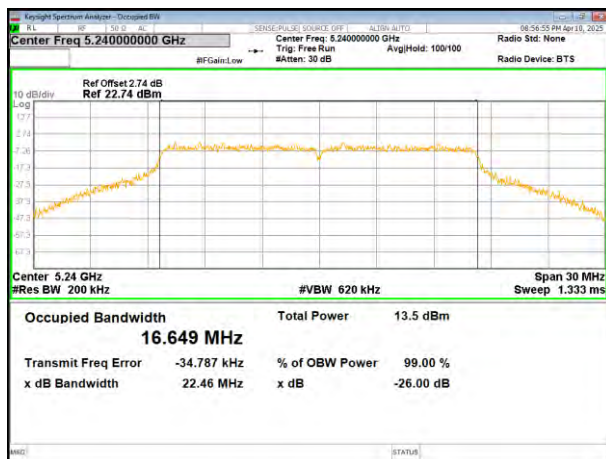
(802.11a) plot on channel 40



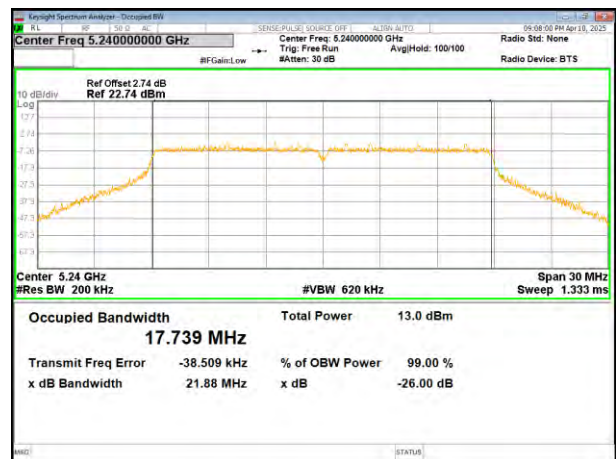
(802.11 n20) plot on channel 40



(802.11a) plot on channel 48

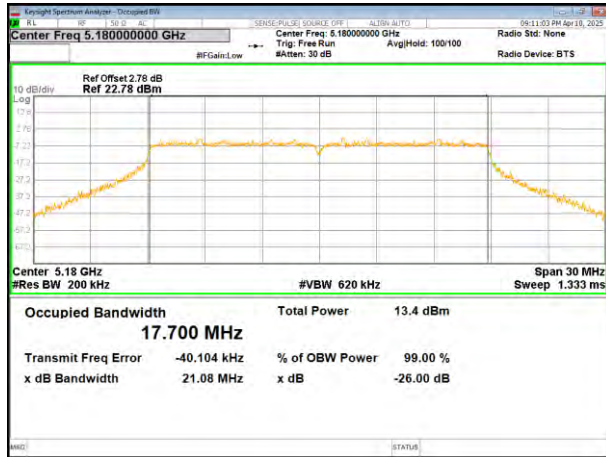


(802.11 n20) plot on channel 48

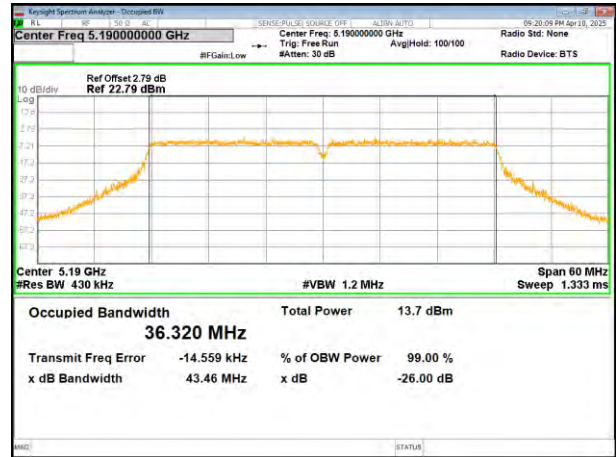


Test plot

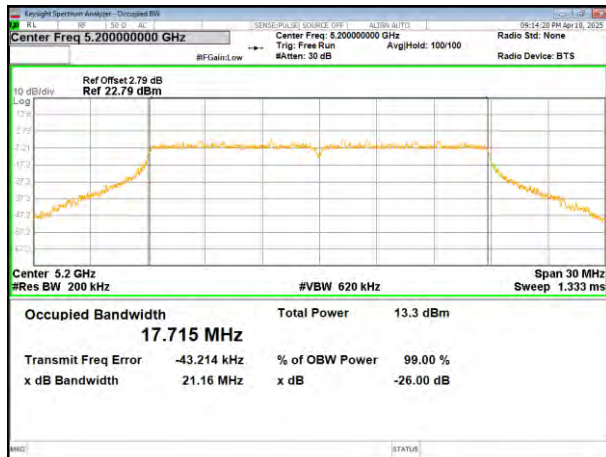
(802.11ac20) plot on channel 36



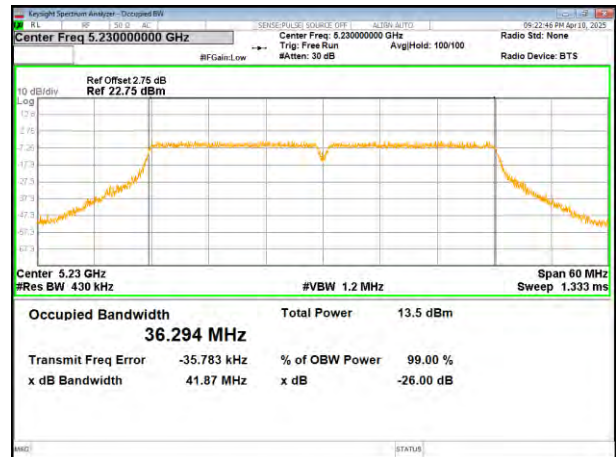
(802.11 n40) plot on channel 38



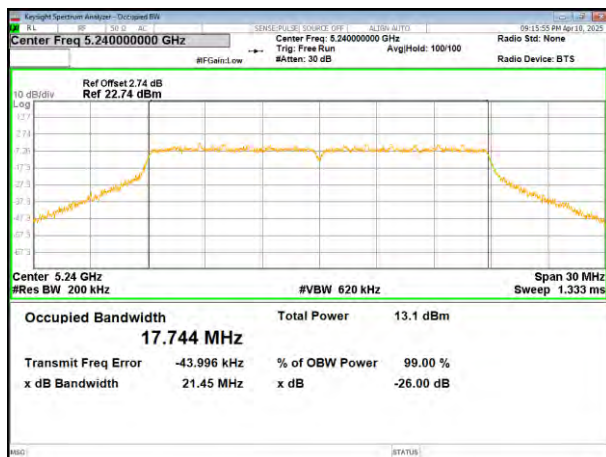
(802.11ac20) plot on channel 40



(802.11 n40) plot on channel 46

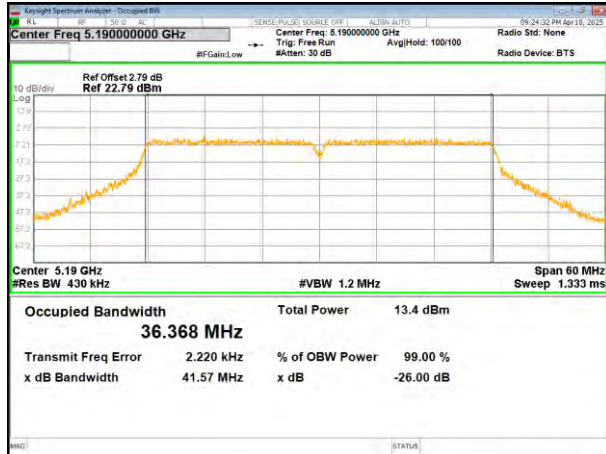


(802.11ac20) plot on channel 48

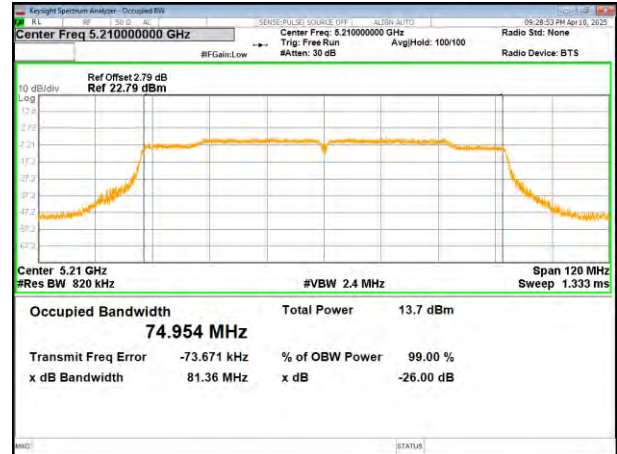


Test plot

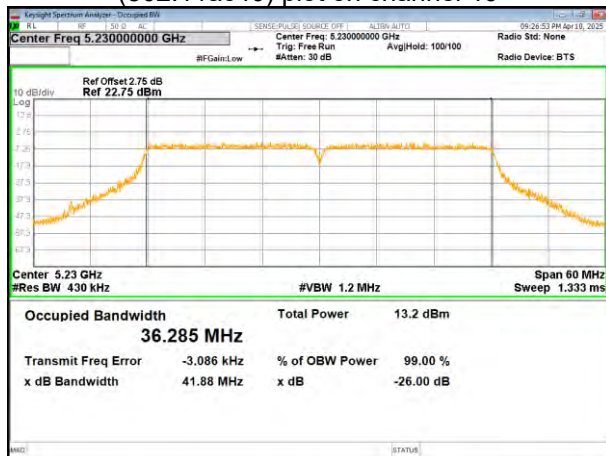
(802.11ac40) plot on channel 38



(802.11ac80) plot on channel 42



(802.11ac40) plot on channel 46



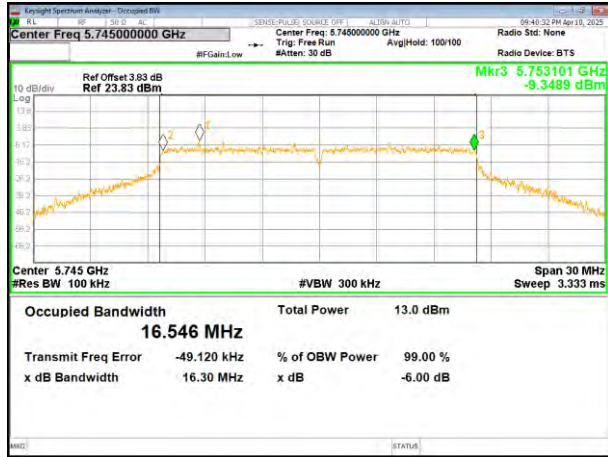
5745-5825MHz

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	16.30	17.57	17.65	36.41	36.37	--	>500	Pass
Middle	16.34	17.62	17.61	--	--	75.10		
Highest	16.30	17.65	17.59	36.37	36.06	--		

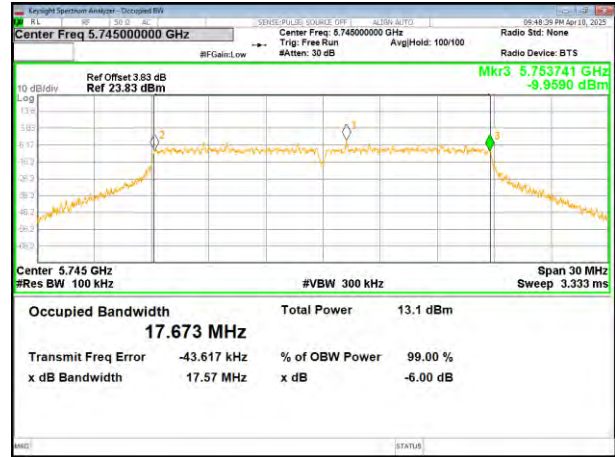
Remark: "---"is not applicable

Test plot

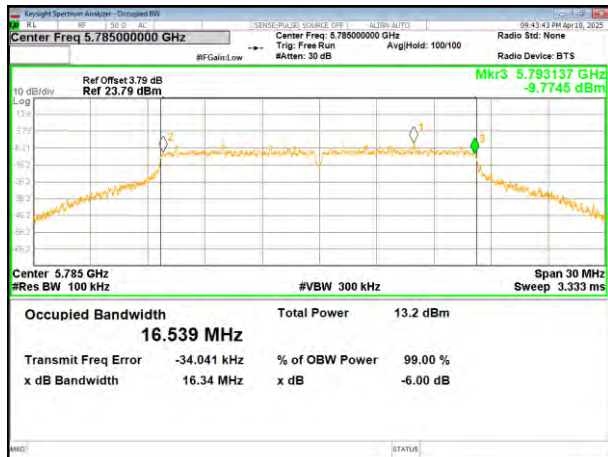
(802.11a) plot on channel 149



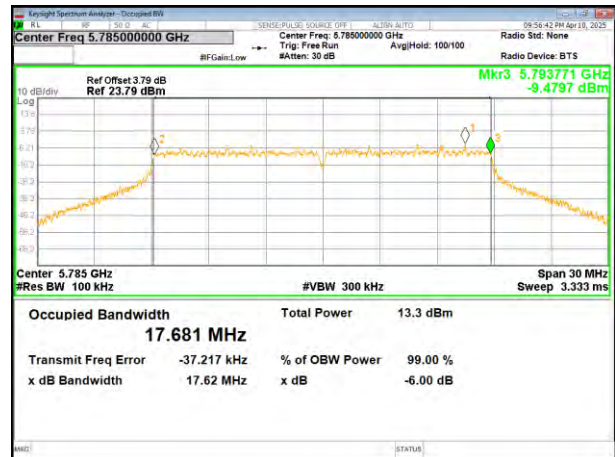
(802.11 n20) plot on channel 149



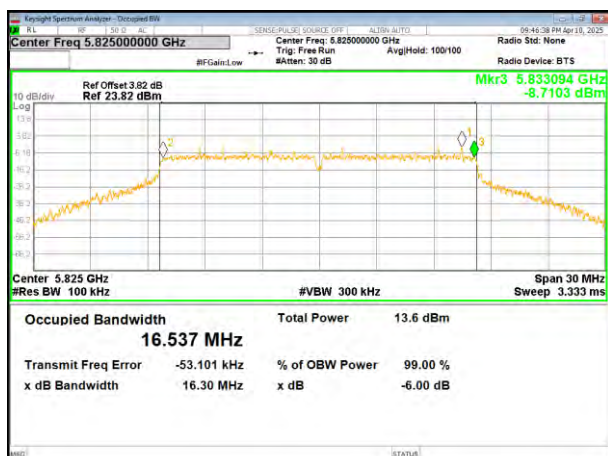
(802.11a) plot on channel 157



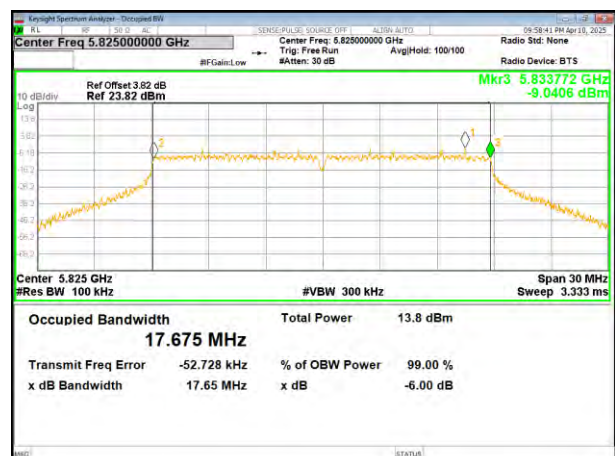
(802.11 n20) plot on channel 157



(802.11a) plot on channel 165

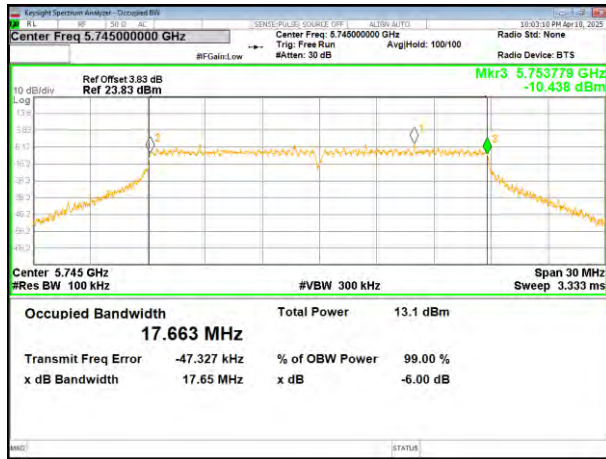


(802.11 n20) plot on channel 165

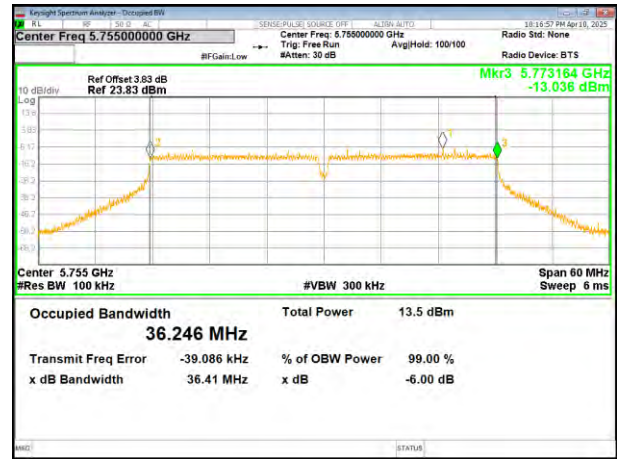


Test plot

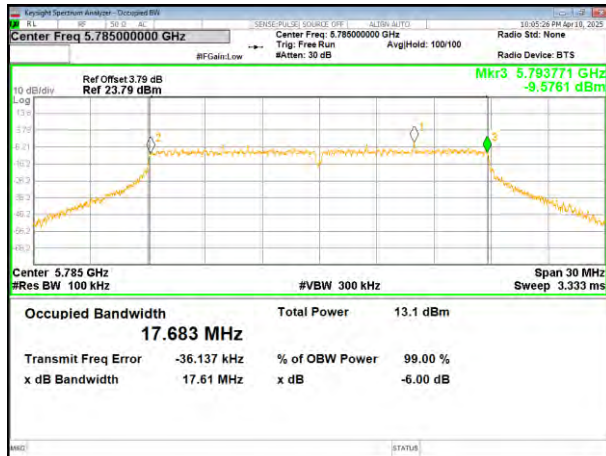
(802.11ac20) plot on channel 149



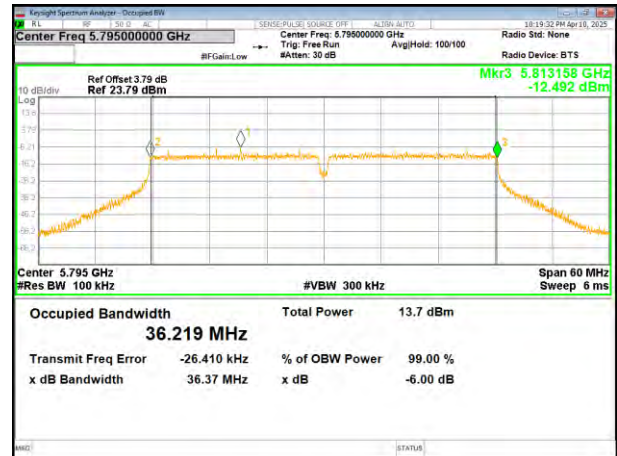
(802.11 n40) plot on channel 151



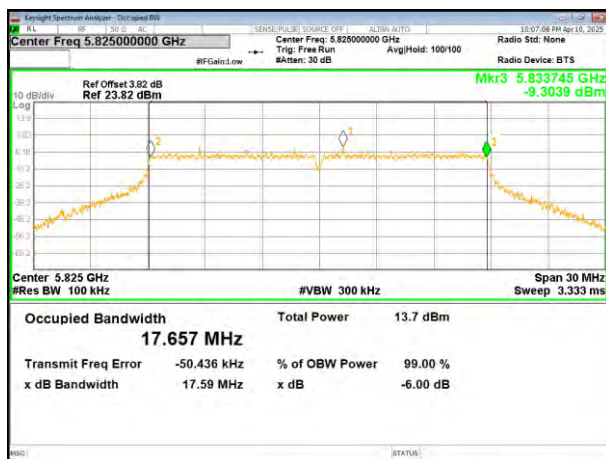
(802.11ac20) plot on channel 157



(802.11 n40) plot on channel 159

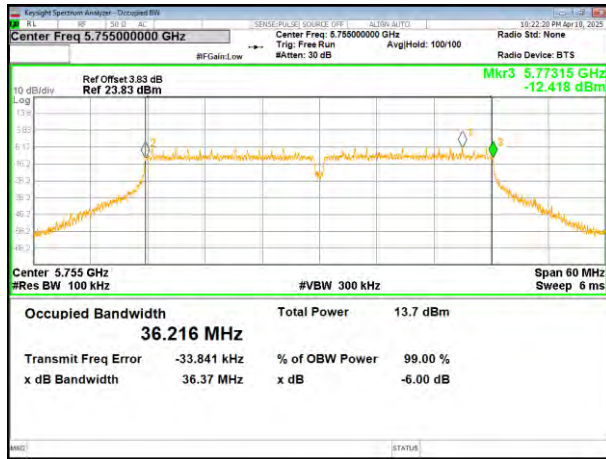


(802.11ac20) plot on channel 165

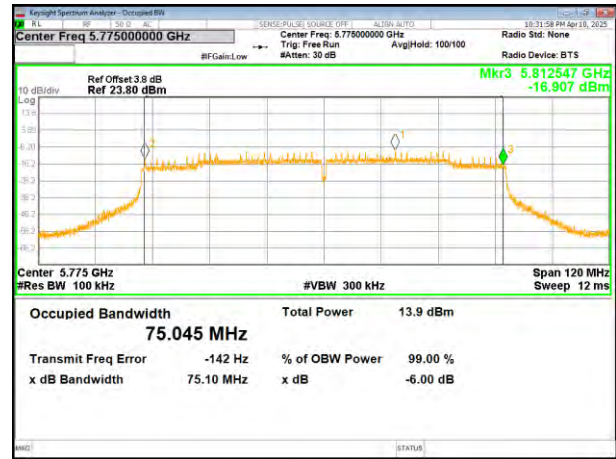


Test plot

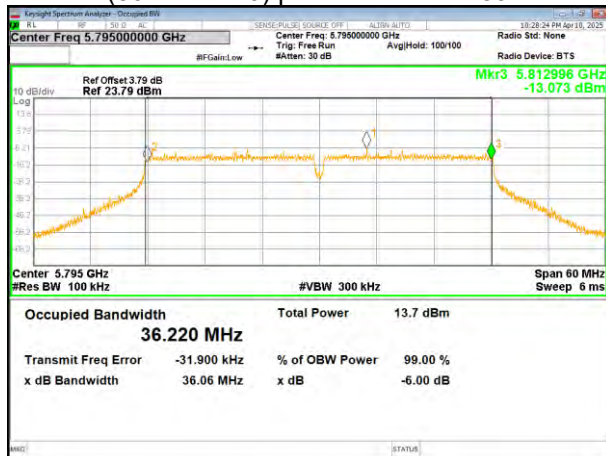
(802.11 ac40) plot on channel 151



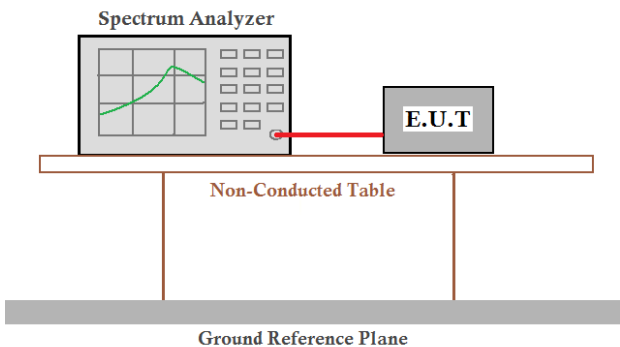
(802.11 ac80) plot on channel 155



(802.11 ac40) plot on channel 159



4.6 Power Spectral Density

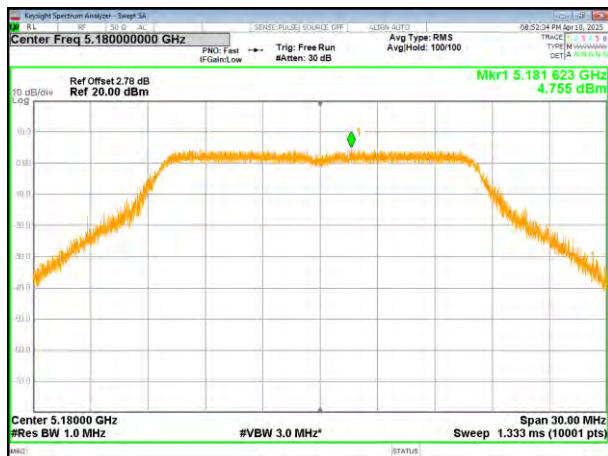
Test Requirement:	FCC Part15 E Section 15.407(a)(1)/ (a)(3)	
Test Method:	ANSI C63.10:2013 and KDB 789033 D02 General U-NII Test Procedures New Rules v02r01	
Limit:	Frequency band (MHz)	Limit
	5150-5250	≤17dBm/1MHz for master device
		≤11dBm/1MHz for client device
	5250-5350	≤11dBm/1MHz for client device
	5470-5725	≤11dBm/1MHz for client device
	5725-5850	≤30dBm/500kHz
Test setup:		
Test Instruments:	Refer to section 3.0 for details	
Test mode:	Refer to section 2.2 for details	
Test environment:	Temp.: 22.3°C	Humid.: 66%RH
Test voltage:	DC 14.8V From Battery	
Test results:	Pass	

Measurement Result

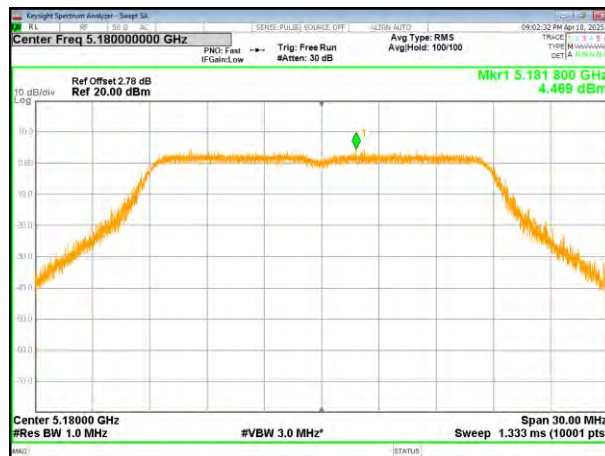
5180-5240MHz

Mode	Frequency	Measured Power Density (dBm/MHz)	Correction Factor (dB)	Total Measured Power Density (dBm/MHz)	Limit (dBm/MHz)
802.11 a	5180 MHz	4.755	0.710	5.465	11
	5200 MHz	4.668	0.710	5.378	11
	5240 MHz	4.491	0.710	5.201	11
802.11 n20	5180 MHz	4.469	0.940	5.409	11
	5200 MHz	4.910	0.940	5.850	11
	5240 MHz	4.180	0.940	5.120	11
802.11 ac20	5180 MHz	5.851	0.740	6.591	11
	5200 MHz	4.233	0.740	4.973	11
	5240 MHz	4.840	0.740	5.580	11
802.11 n40	5190 MHz	2.706	0.790	3.496	11
	5230 MHz	2.013	0.790	2.803	11
802.11 ac40	5190 MHz	2.032	0.770	2.802	11
	5230 MHz	2.140	0.770	2.910	11
802.11 ac80	5210 MHz	-1.610	0.810	-0.800	11

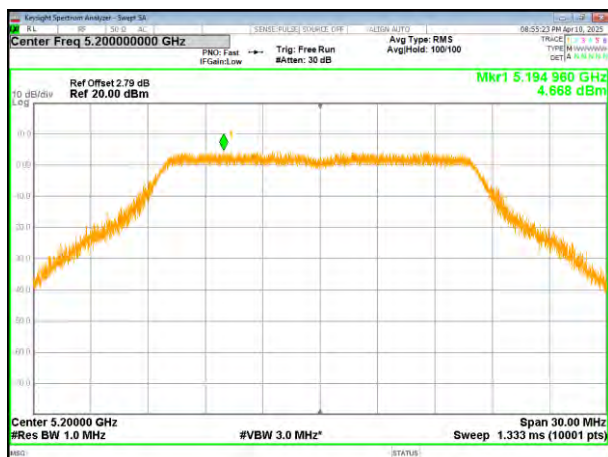
(802.11a) PSD plot on channel 36



(802.11n20) PSD plot on channel 36



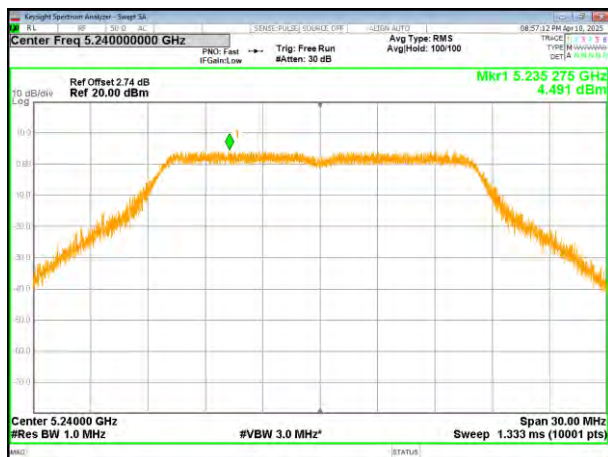
(802.11a) PSD plot on channel 40



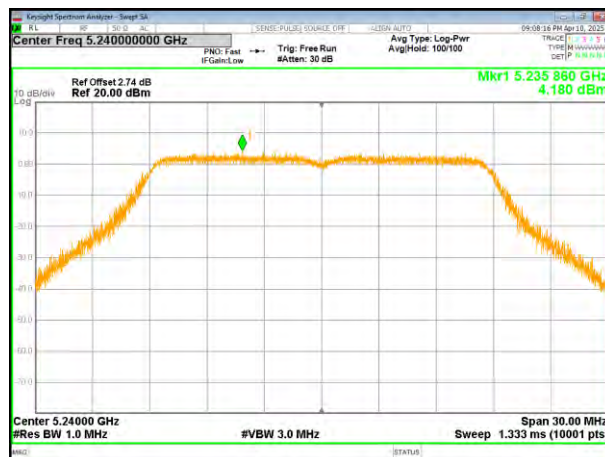
(802.11n20) PSD plot on channel 40



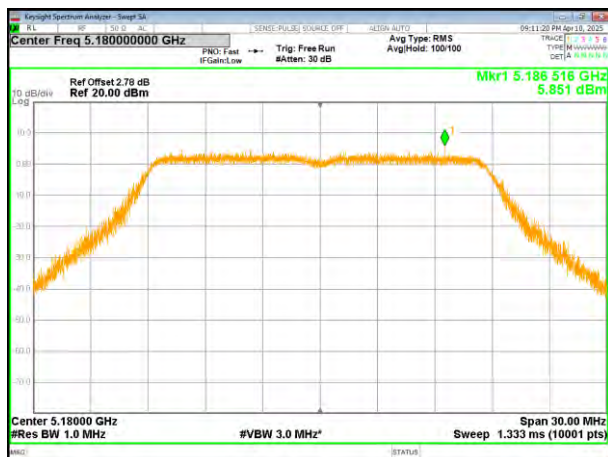
(802.11a) PSD plot on channel 48



(802.11n20) PSD plot on channel 48



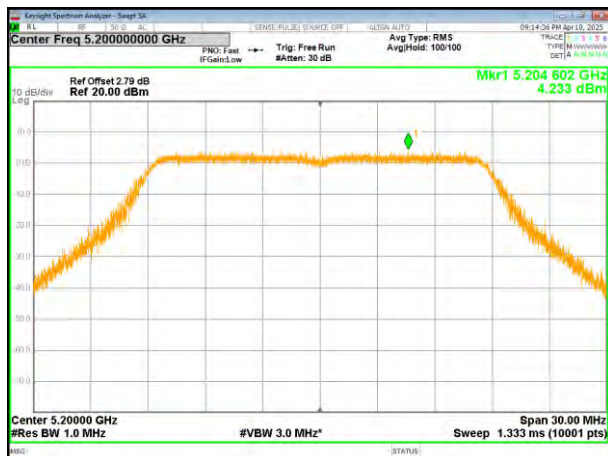
(802.11ac20) PSD plot on channel 36



(802.11n40) PSD plot on channel 38



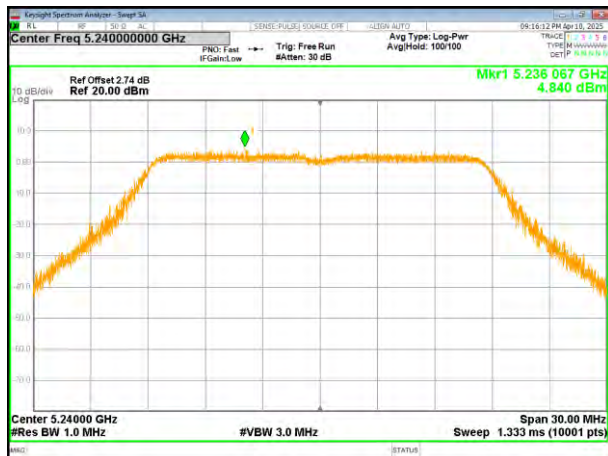
(802.11ac20) PSD plot on channel 40



(802.11n40) PSD plot on channel 46



(802.11ac20) PSD plot on channel 48



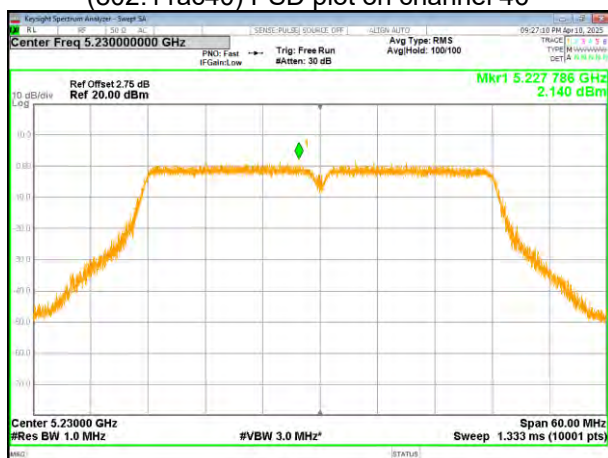
(802.11ac40) PSD plot on channel 38



(802.11ac80) PSD plot on channel 42



(802.11ac40) PSD plot on channel 46

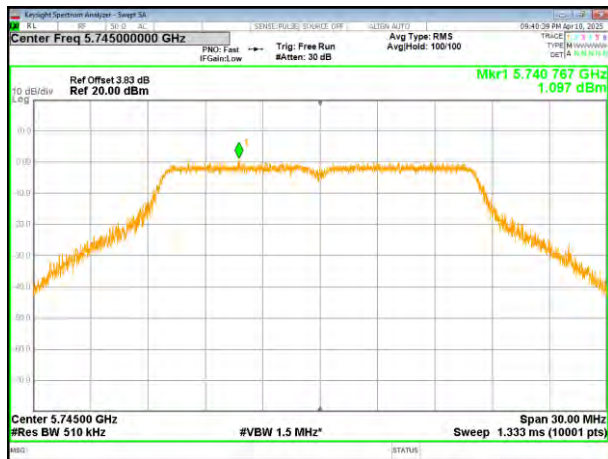


Mode	Frequency	Measured Power Density (dBm/510KHz)	Measured Power Density (dBm/500KHz)	Correction Factor (dB)	Total Measured Power Density (dBm/500KHz)	Limit (dBm/MHz)
802.11 a	5745 MHz	1.097	1.011	0.730	1.741	30
	5785 MHz	0.597	0.511	0.730	1.241	30
	5825 MHz	1.622	1.536	0.730	2.266	30
802.11 n20	5745 MHz	0.821	0.735	0.720	1.455	30
	5785 MHz	0.952	0.866	0.720	1.586	30
	5825 MHz	2.022	1.936	0.720	2.656	30
802.11ac20	5745 MHz	0.866	0.780	0.730	1.510	30
	5785 MHz	0.994	0.908	0.730	1.638	30
	5825 MHz	1.321	1.235	0.730	1.965	30
802.11 n40	5755 MHz	-1.902	-1.988	0.640	-1.348	30
	5795 MHz	-0.628	-0.714	0.640	-0.074	30
802.11ac40	5755 MHz	-1.405	-1.491	0.830	-0.661	30
	5795 MHz	-1.344	-1.430	0.830	-0.600	30
802.11ac80	5775 MHz	-3.768	-3.854	0.490	-3.364	30

Note: 1. If the measurement is X dBm/510kHz, thus $X \text{ dBm/510kHz} = (10^{X/10}) \cdot (500 / 510) \text{ dBm/500kHz}$

2. Correction Factor (dB)= duty cycle factor

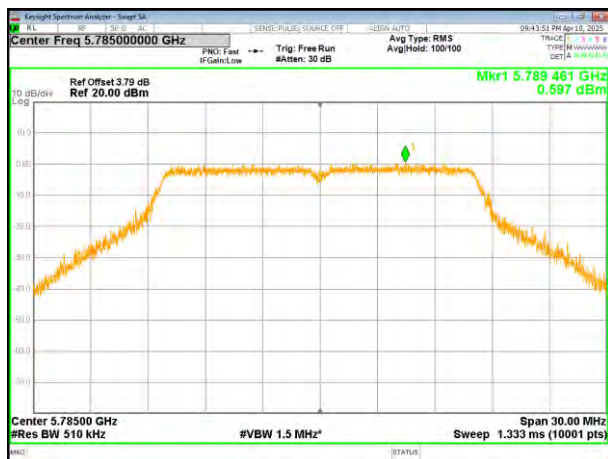
(802.11a) PSD plot on channel 149



(802.11n20) PSD plot on channel 149



(802.11a) PSD plot on channel 157



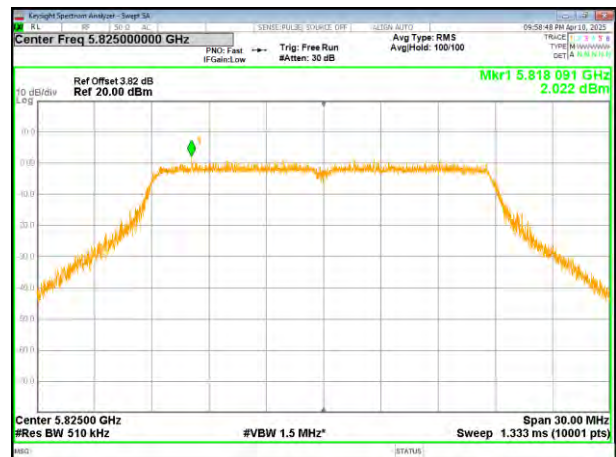
(802.11n20) PSD plot on channel 157



(802.11a) PSD plot on channel 165



(802.11n20) PSD plot on channel 165



(802.11ac20) PSD plot on channel 149



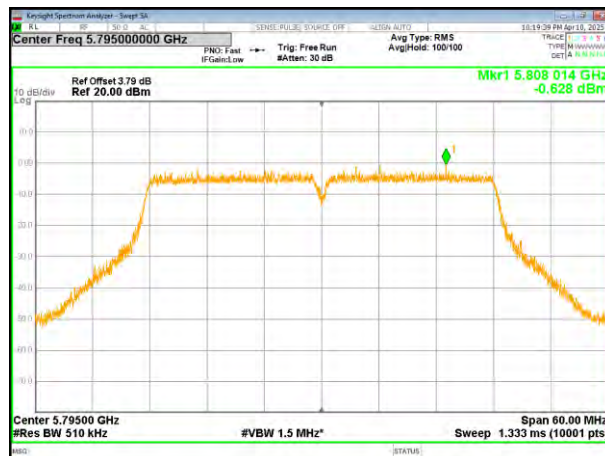
(802.11n40) PSD plot on channel 151



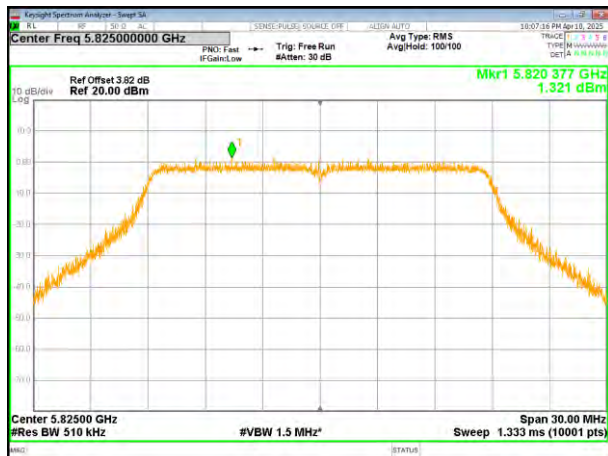
(802.11ac20) PSD plot on channel 157



(802.11n40) PSD plot on channel 159



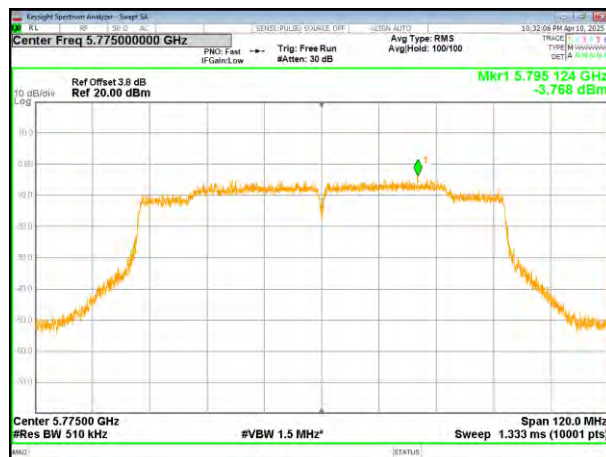
(802.11ac20) PSD plot on channel 165



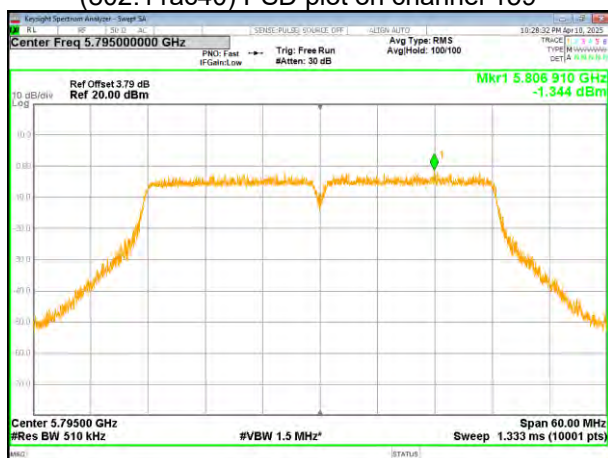
(802.11ac40) PSD plot on channel 151



(802.11ac80) PSD plot on channel 155

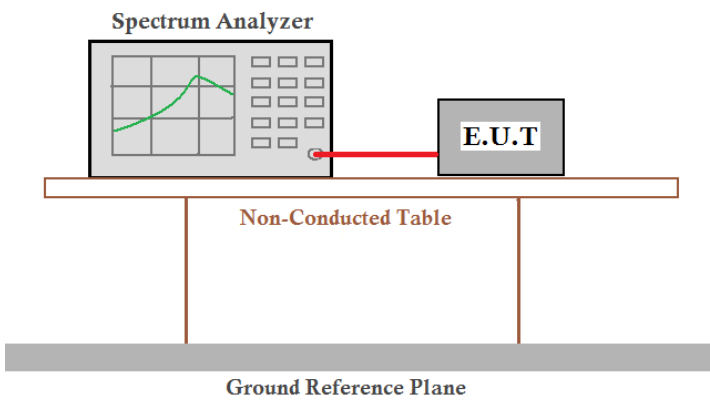


(802.11ac40) PSD plot on channel 159



4.7 Band edge

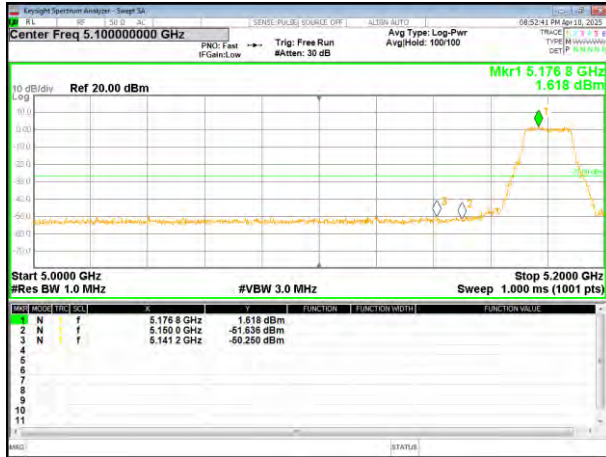
4.7.1 Conducted test Method

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. The table is supported by a Ground Reference Plane.	
Test Procedure:	1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator. 2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range. 3. Set RBW of spectrum analyzer to 1 MHz with a convenient frequency span. 4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency. 5. Repeat above procedures until all measured frequencies were complete..	
Test Instruments:	Refer to section 3.0 for details	
Test mode:	Refer to section 2.2 for details	
Test environment:	Temp.: 22.3°C	Humid.: 66%RH
Test voltage:	DC 14.8V From Battery	
Test results:	Pass	

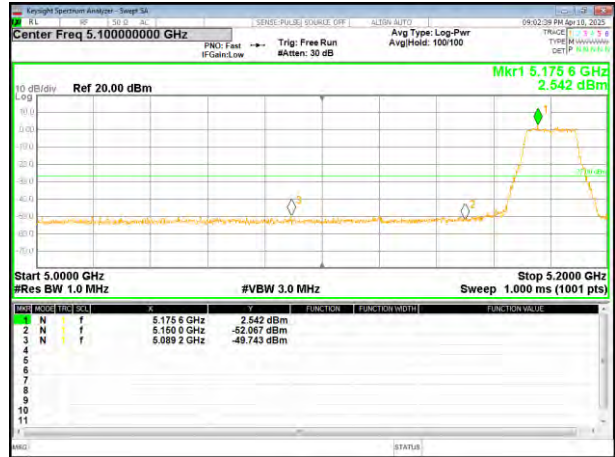
Remark: Due to the margin value of the sideband test being greater than the antenna gain value, the test meets the requirements

5.180~5.240 GHz

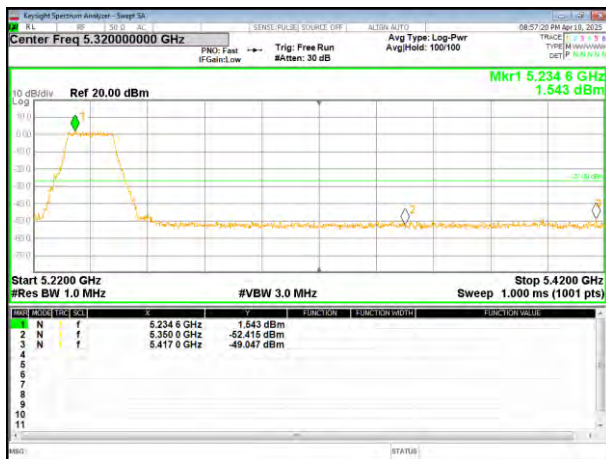
(802.11a) Band Edge, Left Side



(802.11n20) Band Edge, Left Side



(802.11a) Band Edge, Right Side

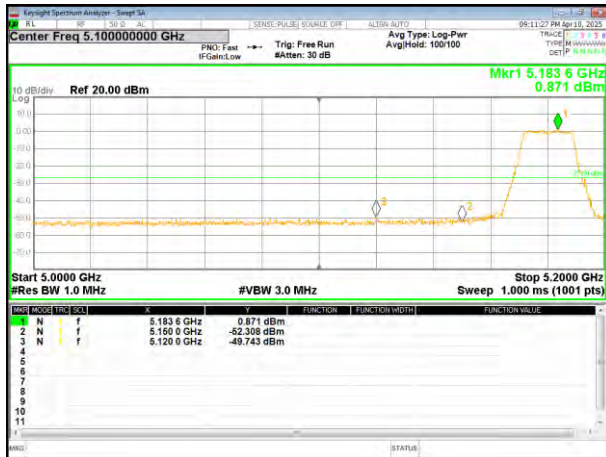


(802.11n20) Band Edge, Right Side

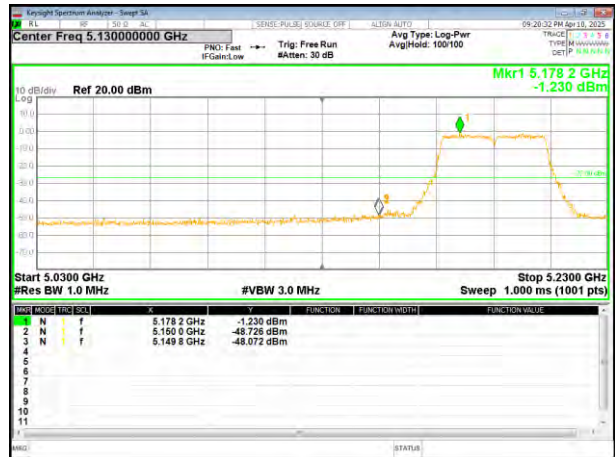


Remark: The antenna gain and cable loss were not compensated in the test data, and the margin value of the Band Edge test was greater than the sum of the antenna gain and cable loss, so the test met the requirements

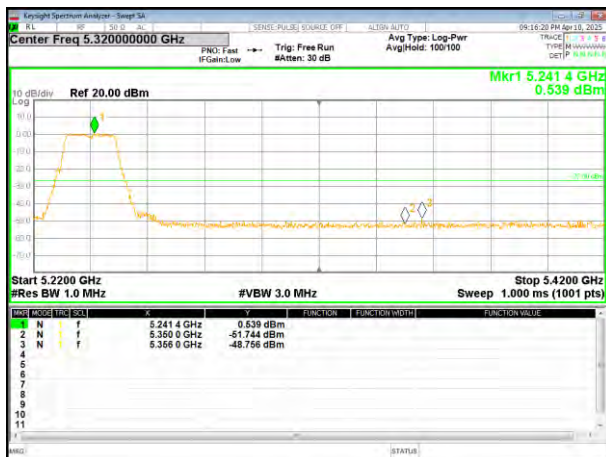
(802.11ac20) Band Edge, Left Side



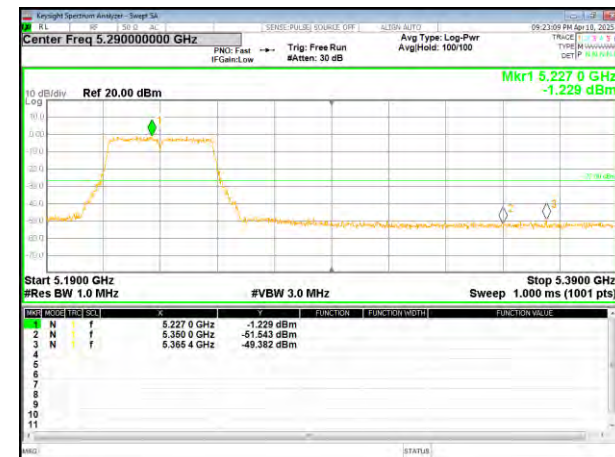
(802.11n40) Band Edge, Left Side



(802.11ac20) Band Edge, Right Side

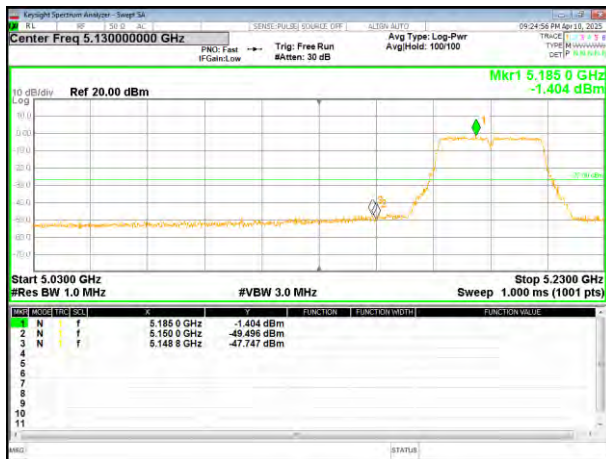


(802.11n40) Band Edge, Right Side

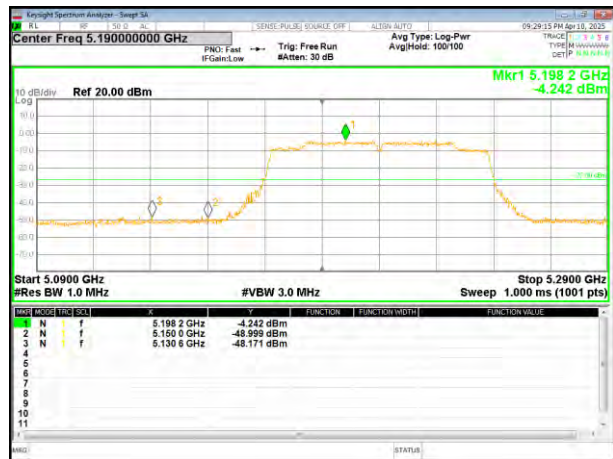


Remark: The antenna gain and cable loss were not compensated in the test data, and the margin value of the Band Edge test was greater than the sum of the antenna gain and cable loss, so the test met the requirements

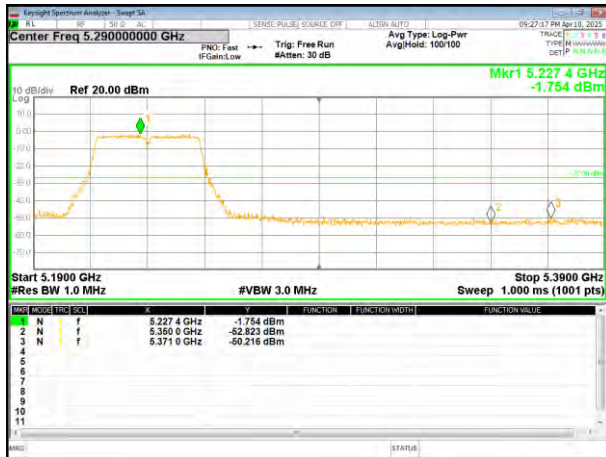
(802.11ac40) Band Edge, Left Side



(802.11ac80) Band Edge



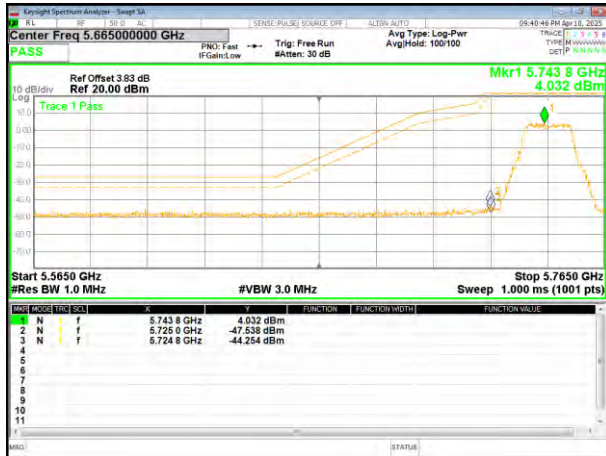
(802.11ac40) Band Edge, Right Side



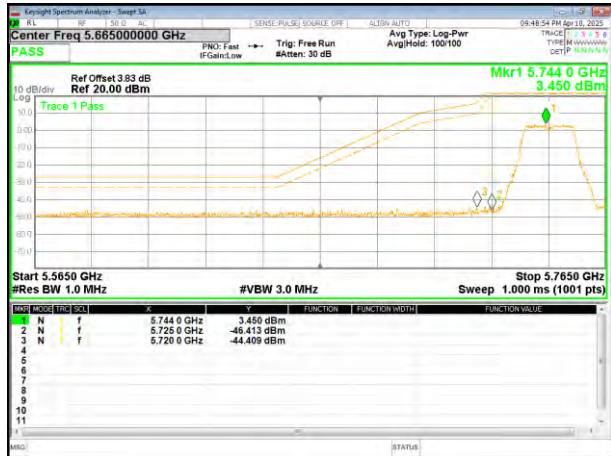
Remark: The antenna gain and cable loss were not compensated in the test data, and the margin value of the Band Edge test was greater than the sum of the antenna gain and cable loss, so the test met the requirements

5.745~5.825 GHz

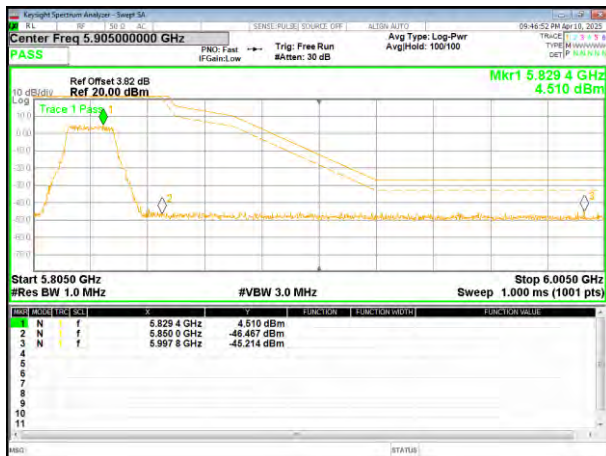
(802.11a) Band Edge, Left Side



(802.11n20) Band Edge, Left Side



(802.11a) Band Edge, Right Side

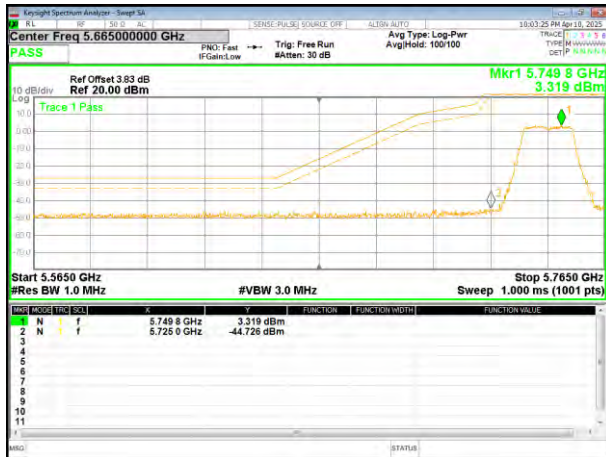


(802.11n20) Band Edge, Right Side

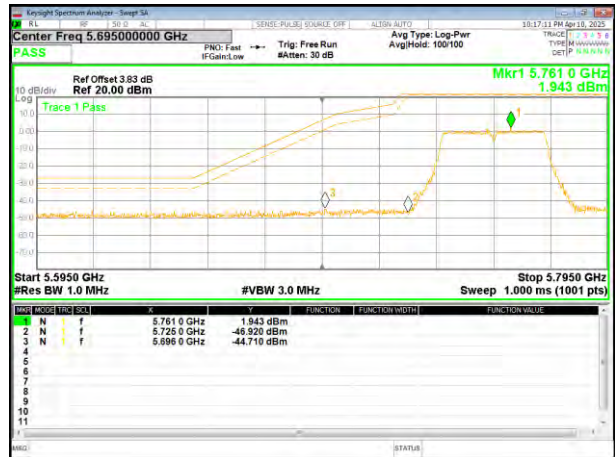


Remark: Antenna gain and cable loss data included in Offset.

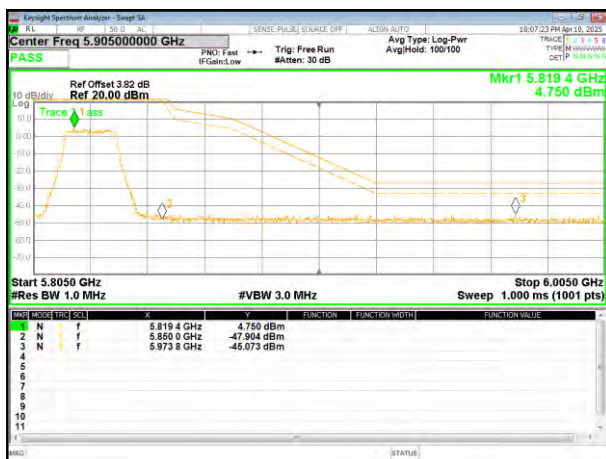
(802.11ac20) Band Edge, Left Side



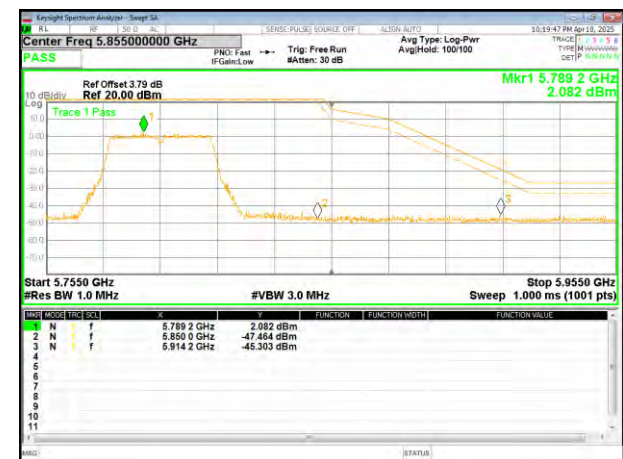
(802.11n40) Band Edge, Left Side



(802.11ac20) Band Edge, Right Side

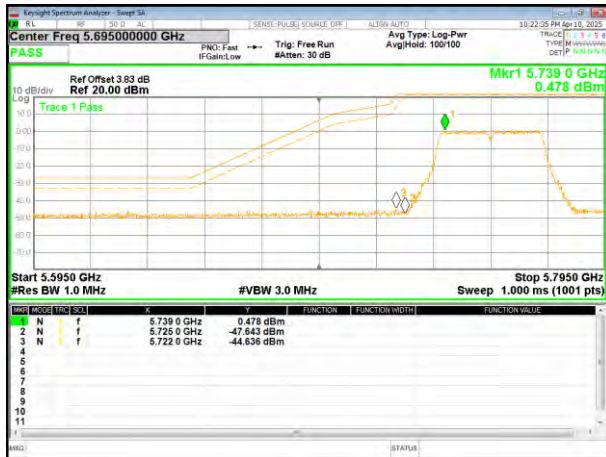


(802.11n40) Band Edge, Right Side



Remark: Antenna gain and cable loss data included in Offset.

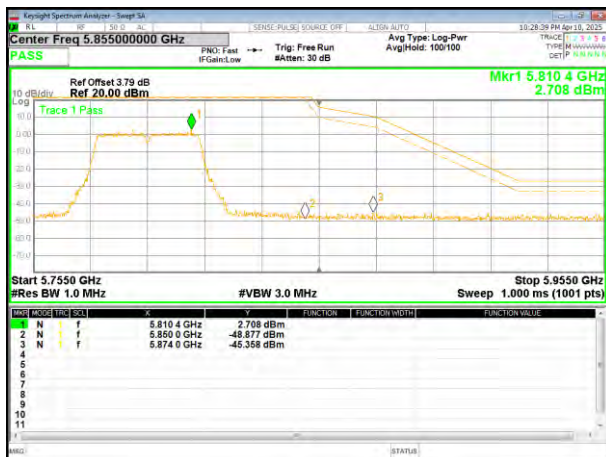
(802.11ac40) Band Edge, Left Side



(802.11ac80) Band Edge



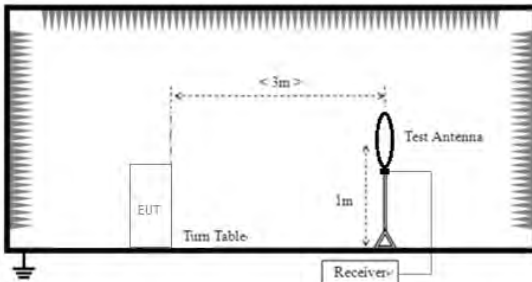
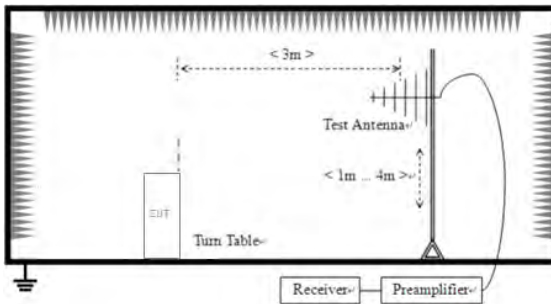
(802.11ac40) Band Edge, Right Side

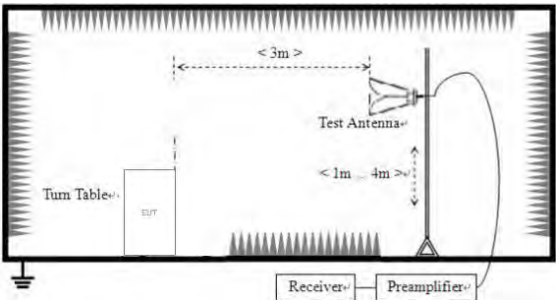


Remark: Antenna gain and cable loss data included in Offset.

4.8 Spurious Emission

4.8.1 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. Place the EUT on a rotating table on a horizontal surface. Rotate the table 360 degrees to determine the position of the highest radiation. 2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. 4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading. 5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet. The radiation measurements are performed in X, Y, Z axis positioning. And found the X axis positioning which it is worse case, only the test worst case mode is recorded in the report.
Test Instruments:	Refer to section 3.0 for details
Test mode:	Refer to section 2.2 for details
Test results:	Pass

Remarks:

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

Measurement Data:
9 kHz ~ 30 MHz

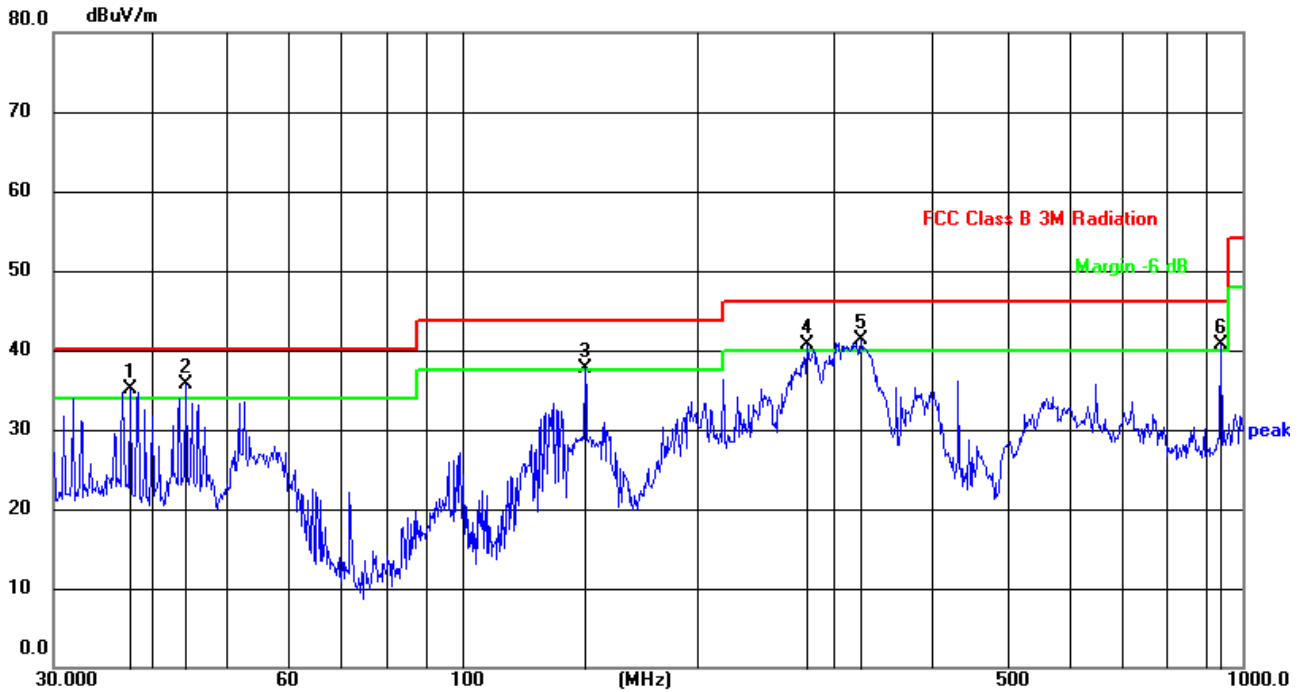
The emission from 9 kHz to 30MHz was pre-tested and found the result was 20dB lower than the limit, and according to 15.31(o) & RSS-Gen 6.13, the test result no need to reported.

Below 1GHz

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

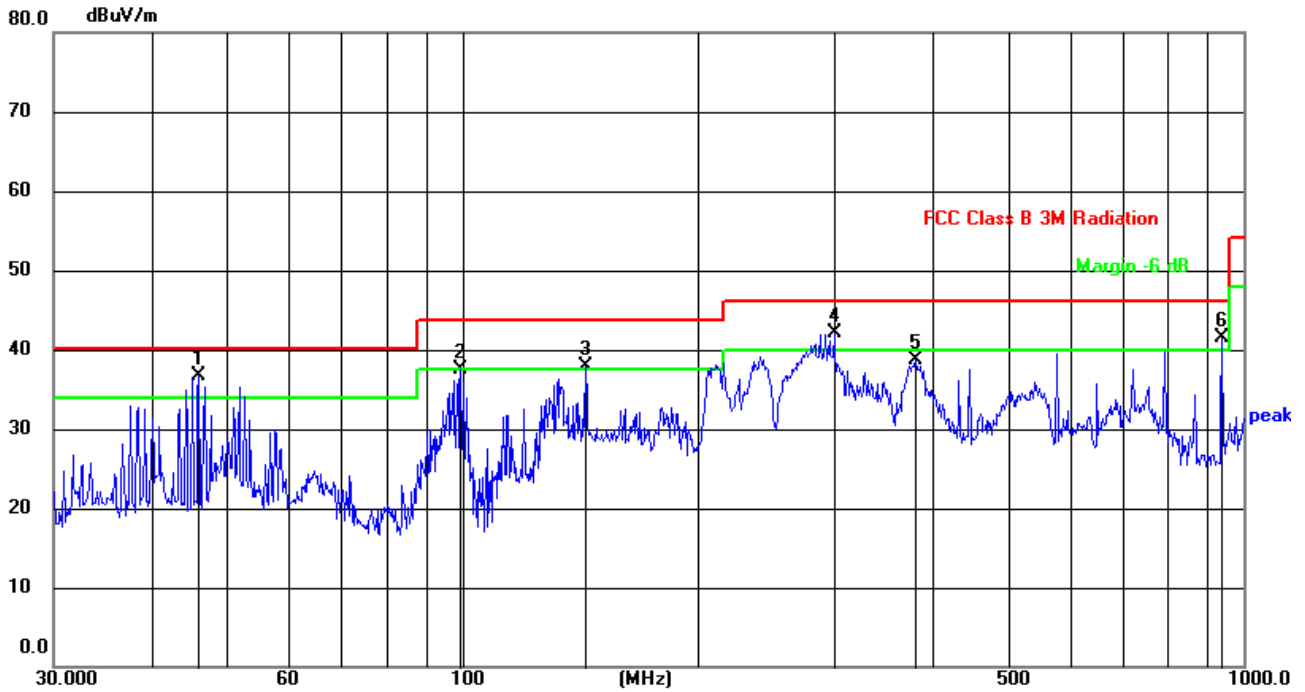
Temperature:	22.3°C	Relative Humidity:	66%
Pressure:	101.2kPa	Test Voltage :	DC 14.8V From Battery
Test Mode :	5.2G TX- 802.11n20 (5200MHz)		

Horizontal:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	37.6796	56.35	-21.31	35.04	40.00	-4.96	QP
2	44.2751	56.95	-21.15	35.80	40.00	-4.20	QP
3	143.8294	58.92	-21.20	37.72	43.50	-5.78	QP
4	277.0935	62.09	-21.46	40.63	46.00	-5.37	QP
5	324.4560	60.56	-19.31	41.25	46.00	-4.75	QP
6	938.8325	44.81	-4.18	40.63	46.00	-5.37	QP

Vertical:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	46.0162	57.97	-21.31	36.66	40.00	-3.34	QP
2	99.5279	62.67	-25.22	37.45	43.50	-6.05	QP
3	143.8294	59.18	-21.20	37.98	43.50	-5.52	QP
4	299.3158	62.30	-20.29	42.01	46.00	-3.99	QP
5	381.2485	56.65	-17.95	38.70	46.00	-7.30	QP
6	938.8325	45.59	-4.18	41.41	46.00	-4.59	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 802.11a mode

Above 1GHz:

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

Temperature:	22.3°C	Relative Humidity:	66%
Pressure:	101.2kPa	Test Voltage :	DC 14.8V From Battery
Test Mode :	5.2G TX- 802.11n20		

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	44.84	46.20	8.27	38.50	45.41	68.20	-22.79	PK
V	10360.00	39.88	46.20	8.27	38.50	40.45	54.00	-13.55	AV
V	15540.00	49.76	46.30	10.35	38.70	52.51	74.00	-21.49	PK
V	15540.00	38.34	46.30	10.35	38.70	41.09	54.00	-12.91	AV
V	20720.00	55.66	57.40	11.93	37.80	47.99	68.20	-20.21	PK
V	20720.00	50.83	57.40	11.93	37.80	43.16	54.00	-10.84	AV
V	25900.00	52.08	56.50	13.45	39.70	48.73	68.20	-19.47	PK
V	25900.00	46.43	56.50	13.45	39.70	43.08	54.00	-10.92	AV
V	31080.00	48.84	56.10	16.12	41.60	50.46	68.20	-17.74	PK
V	31080.00	43.74	56.10	16.12	41.60	45.36	54.00	-8.64	AV
V	36260.00	45.69	56.80	18.29	42.80	49.98	68.20	-18.22	PK
V	36260.00	40.56	56.80	18.29	42.80	44.85	54.00	-9.15	AV
H	10360.00	44.26	46.20	8.27	38.50	44.83	68.20	-23.37	PK
H	10360.00	39.32	46.20	8.27	38.50	39.89	54.00	-14.11	AV
H	15540.00	49.53	46.30	10.35	38.70	52.28	74.00	-21.72	PK
H	15540.00	38.76	46.30	10.35	38.70	41.51	54.00	-12.49	AV
H	20720.00	55.43	57.40	11.93	37.80	47.76	68.20	-20.44	PK
H	20720.00	49.88	57.40	11.93	37.80	42.21	54.00	-11.79	AV
H	25900.00	52.06	56.50	13.45	39.70	48.71	68.20	-19.49	PK
H	25900.00	46.85	56.50	13.45	39.70	43.50	54.00	-10.50	AV
H	31080.00	48.03	56.10	16.12	41.60	49.65	68.20	-18.55	PK
H	31080.00	42.51	56.10	16.12	41.60	44.13	54.00	-9.87	AV
H	36260.00	45.55	56.80	18.29	42.80	49.84	68.20	-18.36	PK
H	36260.00	41.07	56.80	18.29	42.80	45.36	54.00	-8.64	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:5200MHz									
V	10400.00	44.24	46.20	8.27	38.50	44.81	68.20	-23.39	PK
V	10400.00	39.73	46.20	8.27	38.50	40.30	54.00	-13.70	AV
V	15600.00	49.23	46.30	10.35	38.40	51.68	74.00	-22.32	PK
V	15600.00	37.97	46.30	10.35	38.40	40.42	54.00	-13.58	AV
V	20800.00	55.42	57.40	11.93	37.80	47.75	68.20	-20.45	PK
V	20800.00	50.07	57.40	11.93	37.80	42.40	54.00	-11.60	AV
V	26000.00	52.21	56.50	13.45	39.80	48.96	68.20	-19.24	PK
V	26000.00	46.64	56.50	13.45	39.80	43.39	54.00	-10.61	AV
V	31200.00	48.15	56.10	16.12	41.60	49.77	68.20	-18.43	PK
V	31200.00	42.88	56.10	16.12	41.60	44.50	54.00	-9.50	AV
V	36400.00	45.69	56.80	18.29	42.80	49.98	68.20	-18.22	PK
V	36400.00	41.08	56.80	18.29	42.80	45.37	54.00	-8.63	AV
H	10400.00	44.73	46.20	8.27	38.50	45.30	68.20	-22.90	PK
H	10400.00	40.44	46.20	8.27	38.50	41.01	54.00	-12.99	AV
H	15600.00	51.02	46.30	10.35	38.40	53.47	74.00	-20.53	PK
H	15600.00	39.90	46.30	10.35	38.40	42.35	54.00	-11.65	AV
H	20800.00	56.48	57.40	11.93	37.80	48.81	68.20	-19.39	PK
H	20800.00	50.81	57.40	11.93	37.80	43.14	54.00	-10.86	AV
H	26000.00	49.95	56.50	13.45	39.80	46.70	68.20	-21.50	PK
H	26000.00	36.75	56.50	13.45	39.80	33.50	54.00	-20.50	AV
H	31200.00	47.99	56.10	16.12	41.60	49.61	68.20	-18.59	PK
H	31200.00	42.49	56.10	16.12	41.60	44.11	54.00	-9.89	AV
H	36400.00	45.41	56.80	18.29	42.80	49.70	68.20	-18.50	PK
H	36400.00	40.15	56.80	18.29	42.80	44.44	54.00	-9.56	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	42.82	46.20	8.27	38.60	43.49	68.20	-24.71	PK
V	10480.00	38.07	46.20	8.27	38.60	38.74	54.00	-15.26	AV
V	15720.00	44.91	46.30	10.35	38.40	47.36	74.00	-26.64	PK
V	15720.00	34.95	46.30	10.35	38.40	37.40	54.00	-16.60	AV
V	20960.00	51.94	57.40	11.93	37.50	43.97	68.20	-24.23	PK
V	20960.00	46.94	57.40	11.93	37.50	38.97	54.00	-15.03	AV
V	26200.00	47.86	56.50	13.45	40.10	44.91	68.20	-23.29	PK
V	26200.00	43.61	56.50	13.45	40.10	40.66	54.00	-13.34	AV
V	31440.00	45.00	56.10	16.12	41.30	46.32	68.20	-21.88	PK
V	31440.00	40.11	56.10	16.12	41.30	41.43	54.00	-12.57	AV
V	36680.00	42.02	56.80	18.29	43.10	46.61	68.20	-21.59	PK
V	36680.00	37.81	56.80	18.29	43.10	42.40	54.00	-11.60	AV
H	10480.00	42.00	46.20	8.27	38.60	42.67	68.20	-25.53	PK
H	10480.00	37.11	46.20	8.27	38.60	37.78	54.00	-16.22	AV
H	15720.00	46.26	46.30	10.35	38.40	48.71	74.00	-25.29	PK
H	15720.00	35.92	46.30	10.35	38.40	38.37	54.00	-15.63	AV
H	20960.00	52.70	57.40	11.93	37.50	44.73	68.20	-23.47	PK
H	20960.00	47.28	57.40	11.93	37.50	39.31	54.00	-14.69	AV
H	26200.00	48.29	56.50	13.45	40.10	45.34	68.20	-22.86	PK
H	26200.00	44.31	56.50	13.45	40.10	41.36	54.00	-12.64	AV
H	31440.00	45.24	56.10	16.12	41.30	46.56	68.20	-21.64	PK
H	31440.00	41.15	56.10	16.12	41.30	42.47	54.00	-11.53	AV
H	36680.00	43.05	56.80	18.29	43.10	47.64	68.20	-20.56	PK
H	36680.00	42.82	56.80	18.29	43.10	47.41	54.00	-6.59	AV

Remark:

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

Temperature:	22.3°C	Relative Humidity:	66%
Pressure:	101.2kPa	Test Voltage :	DC 14.8V From Battery
Test Mode :	5.8G TX- 802.11a		

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	48.92	46.10	8.77	39.10	50.69	74.00	-23.31	PK
V	11490.00	39.00	46.10	8.77	39.10	40.77	54.00	-13.23	AV
V	17235.00	45.14	47.60	11.10	38.70	47.34	68.20	-20.86	PK
V	17235.00	39.62	47.60	11.10	38.70	41.82	54.00	-12.18	AV
V	22980.00	57.75	56.90	12.73	37.70	51.28	74.00	-22.72	PK
V	22980.00	47.86	56.90	12.73	37.70	41.39	54.00	-12.61	AV
V	28725.00	49.89	55.60	14.25	40.30	48.84	68.20	-19.36	PK
V	28725.00	44.47	55.60	14.25	40.30	43.42	54.00	-10.58	AV
V	34470.00	45.84	55.90	17.26	42.10	49.30	68.20	-18.90	PK
V	34470.00	41.01	55.90	17.26	42.10	44.47	54.00	-9.53	AV
H	11490.00	49.24	46.10	8.77	39.10	51.01	74.00	-22.99	PK
H	11490.00	38.31	46.10	8.77	39.10	40.08	54.00	-13.92	AV
H	17235.00	43.58	47.60	11.10	38.70	45.78	68.20	-22.42	PK
H	17235.00	38.22	47.60	11.10	38.70	40.42	54.00	-13.58	AV
H	22980.00	60.15	56.90	12.73	37.70	53.68	74.00	-20.32	PK
H	22980.00	48.80	56.90	12.73	37.70	42.33	54.00	-11.67	AV
H	28725.00	49.87	55.60	14.25	40.30	48.82	68.20	-19.38	PK
H	28725.00	45.33	55.60	14.25	40.30	44.28	54.00	-9.72	AV
H	34470.00	46.25	55.90	17.26	42.10	49.71	68.20	-18.49	PK
H	34470.00	41.84	55.90	17.26	42.10	45.30	54.00	-8.70	AV

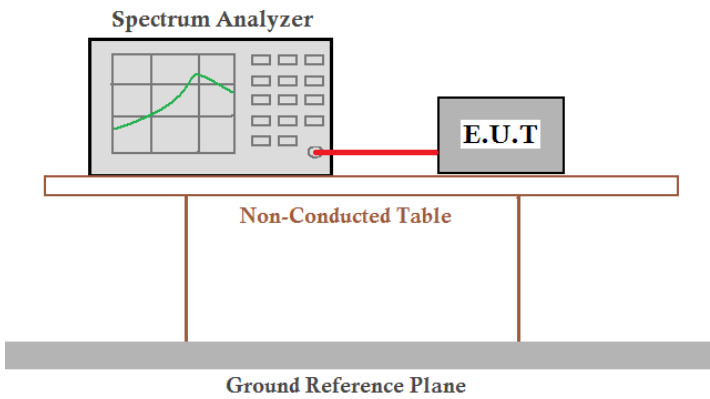
Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre- amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detect or Type
Middle Channel:5785MHz									
V	11570.00	49.63	46.10	8.77	39.10	51.40	74.00	-22.60	PK
V	11570.00	38.73	46.10	8.77	39.10	40.50	54.00	-13.50	AV
V	17355.00	45.11	47.60	11.10	38.70	47.31	68.20	-20.89	PK
V	17355.00	40.21	47.60	11.10	38.70	42.41	54.00	-11.59	AV
V	23140.00	57.39	56.90	12.73	37.70	50.92	74.00	-23.08	PK
V	23140.00	47.15	56.90	12.73	37.70	40.68	54.00	-13.32	AV
V	28925.00	49.37	55.60	14.25	40.30	48.32	68.20	-19.88	PK
V	28925.00	45.45	55.60	14.25	40.30	44.40	54.00	-9.60	AV
V	34710.00	45.62	55.90	17.26	42.40	49.38	68.20	-18.82	PK
V	34710.00	40.61	55.90	17.26	42.40	44.37	54.00	-9.63	AV
H	11570.00	50.48	46.10	8.77	39.10	52.25	74.00	-21.75	PK
H	11570.00	39.75	46.10	8.77	39.10	41.52	54.00	-12.48	AV
H	17355.00	43.38	47.60	11.10	38.70	45.58	68.20	-22.62	PK
H	17355.00	39.69	47.60	11.10	38.70	41.89	54.00	-12.11	AV
H	23140.00	60.44	56.90	12.73	37.70	53.97	74.00	-20.03	PK
H	23140.00	48.85	56.90	12.73	37.70	42.38	54.00	-11.62	AV
H	28925.00	49.64	55.60	14.25	40.30	48.59	68.20	-19.61	PK
H	28925.00	46.11	55.60	14.25	40.30	45.06	54.00	-8.94	AV
H	34710.00	47.36	55.90	17.26	42.40	51.12	68.20	-17.08	PK
H	34710.00	42.63	55.90	17.26	42.40	46.39	54.00	-7.61	AV

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre- amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detect or Type
High Channel:5825MHz									
V	11650.00	47.93	46.10	8.77	39.10	49.70	74.00	-24.30	PK
V	11650.00	38.08	46.10	8.77	39.10	39.85	54.00	-14.15	AV
V	17475.00	44.38	47.90	11.23	38.90	46.61	68.20	-21.59	PK
V	17475.00	39.68	47.90	11.23	38.90	41.91	54.00	-12.09	AV
V	23300.00	55.53	57.10	12.73	37.80	48.96	68.20	-19.24	PK
V	23300.00	49.95	57.10	12.73	37.80	43.38	54.00	-10.62	AV
V	29125.00	49.85	55.80	14.25	40.50	48.80	68.20	-19.40	PK
V	29125.00	44.12	55.80	14.25	40.50	43.07	54.00	-10.93	AV
V	34950.00	44.10	56.30	17.91	42.50	48.21	68.20	-19.99	PK
V	34950.00	40.19	56.30	17.91	42.50	44.30	54.00	-9.70	AV
H	11650.00	50.94	46.10	8.77	39.10	52.71	74.00	-21.29	PK
H	11650.00	39.58	46.10	8.77	39.10	41.35	54.00	-12.65	AV
H	17475.00	42.43	47.90	11.23	38.90	44.66	68.20	-23.54	PK
H	17475.00	38.53	47.90	11.23	38.90	40.76	54.00	-13.24	AV
H	23300.00	54.47	57.10	12.73	37.80	47.90	68.20	-20.30	PK
H	23300.00	50.83	57.10	12.73	37.80	44.26	54.00	-9.74	AV
H	29125.00	50.77	55.80	14.25	40.50	49.72	68.20	-18.48	PK
H	29125.00	46.07	55.80	14.25	40.50	45.02	54.00	-8.98	AV
H	34950.00	47.93	56.30	17.91	42.50	52.04	68.20	-16.16	PK
H	34950.00	38.08	56.30	17.91	42.50	42.19	54.00	-11.81	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.

4.8.2 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:		
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.: 66%RH
Test voltage:	DC 14.8V From Battery	
Test results:	Pass	

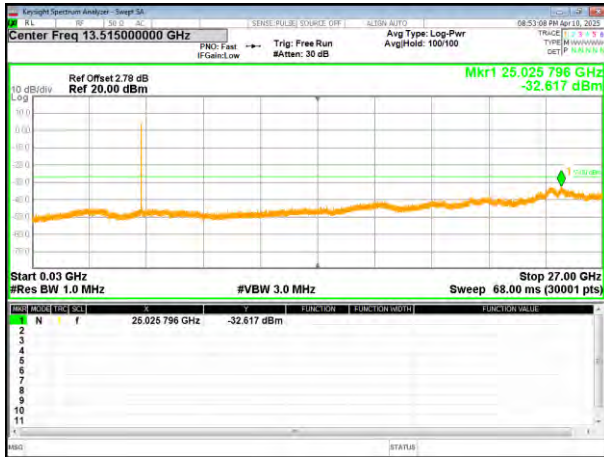
Remark:

1. Antenna gain and cable loss data included in Offset.
2. We tested 30MHz-40GHz frequency and found 27GHz-40GHz test data was very lower (close to the noise of the spectrum analyzer). The test report only showed data for 30MHz-27GHz.

5180-5240MHz

Test Plot

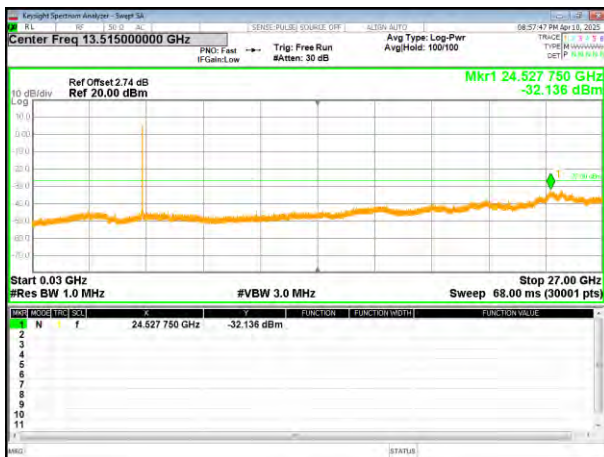
802.11a on channel 36



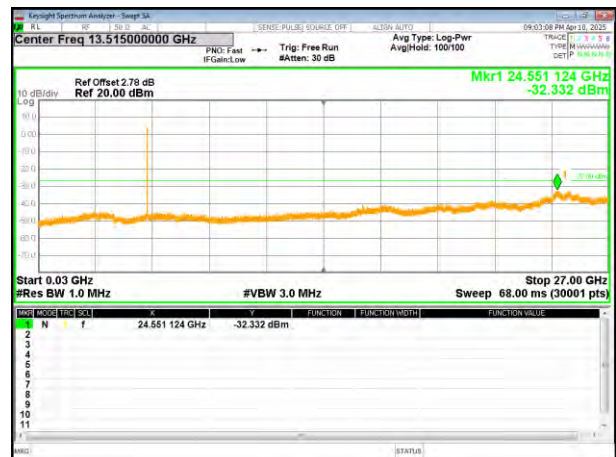
802.11a on channel 40



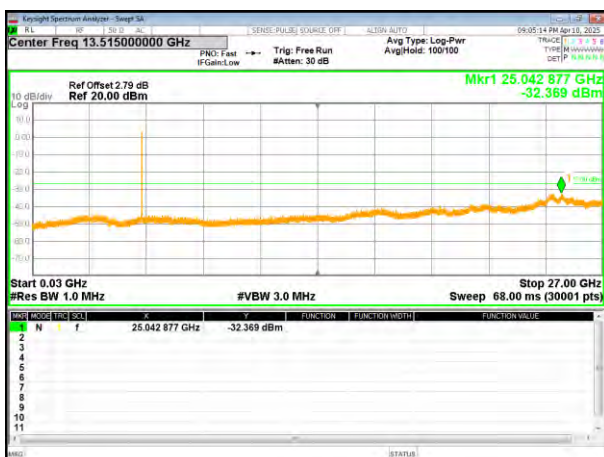
802.11a on channel 48



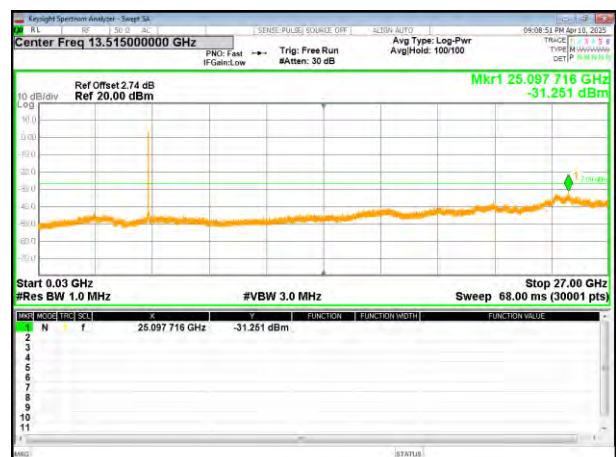
802.11n20 on channel 36



802.11n20 on channel 40

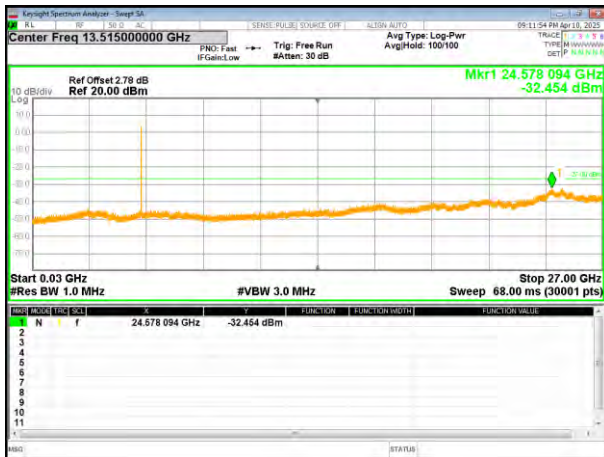


802.11n20 on channel 48

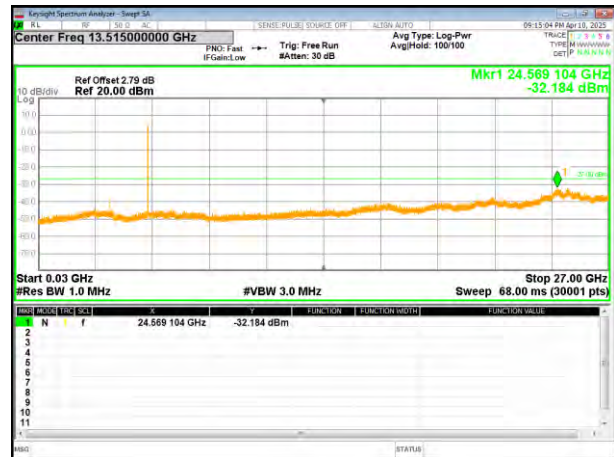


Test Plot

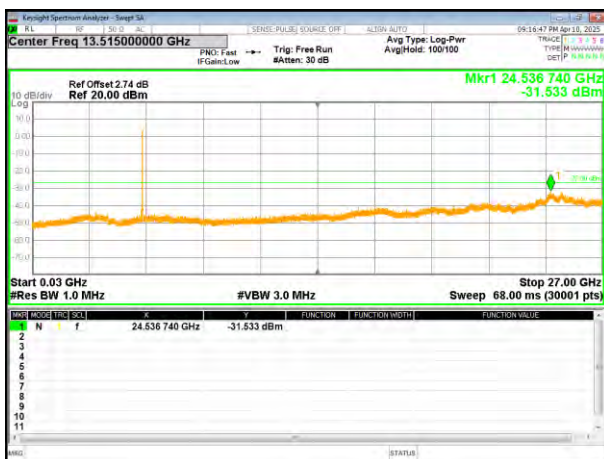
802.11ac20 on channel 36



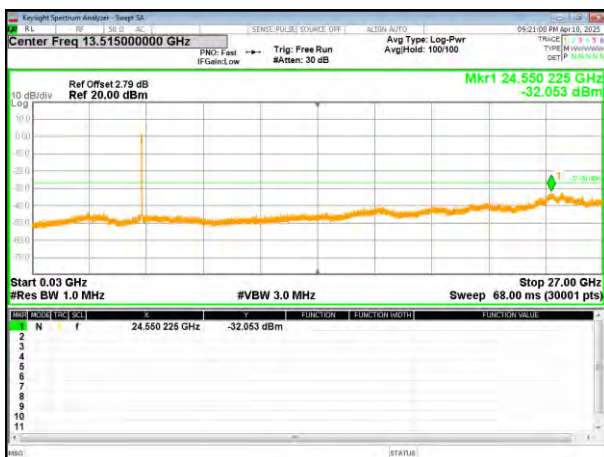
802.11ac20 on channel 40



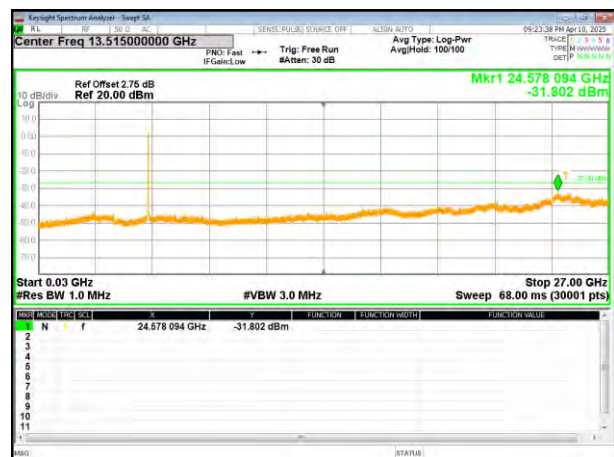
802.11ac20 on channel 48



802.11n40 on channel 38

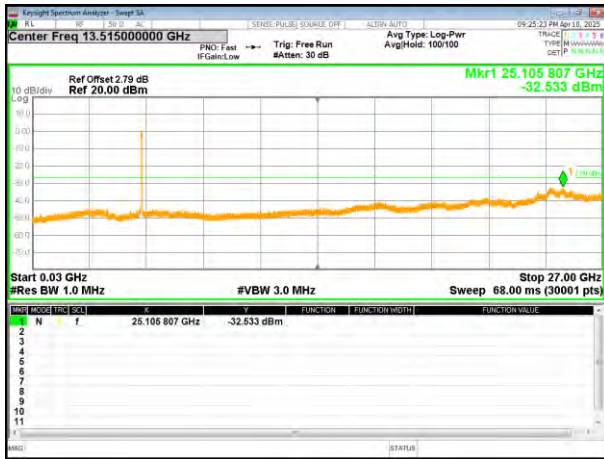


802.11n40 on channel 46

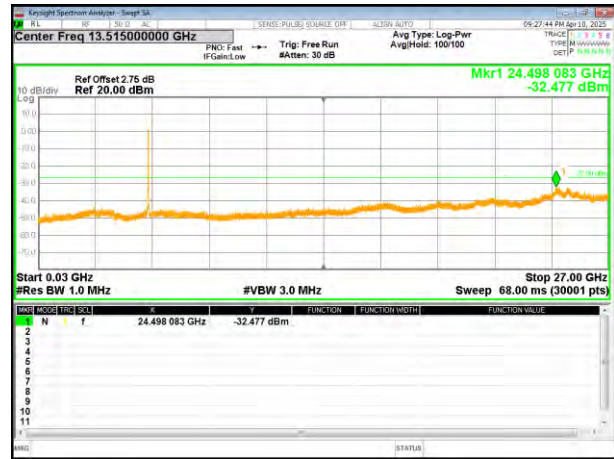


Test Plot

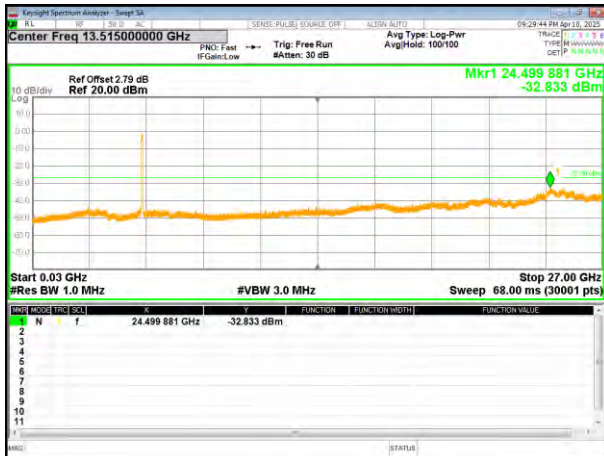
802.11ac40 on channel 38



802.11ac40 on channel 46



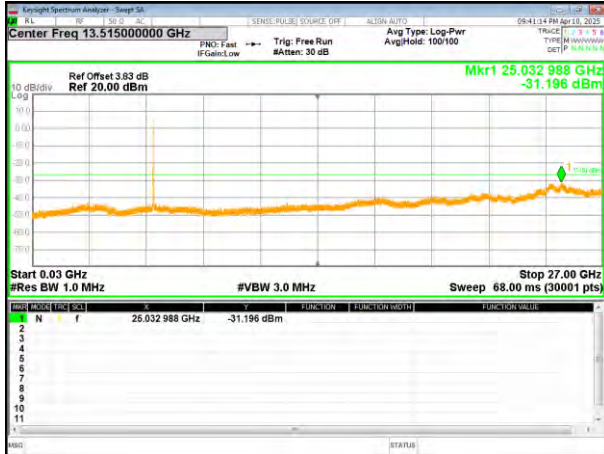
802.11ac80 on channel 42



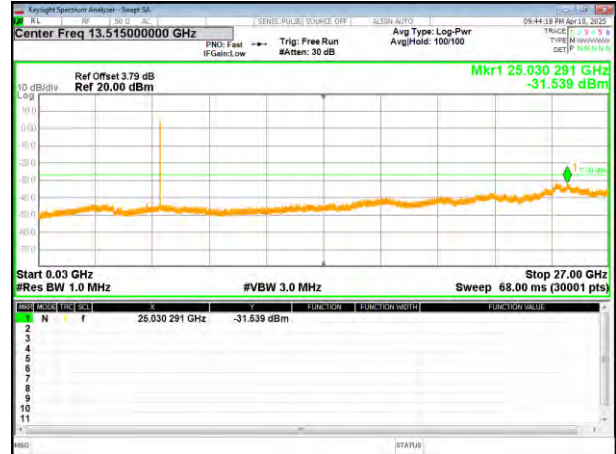
5745-5825MHz

Test Plot

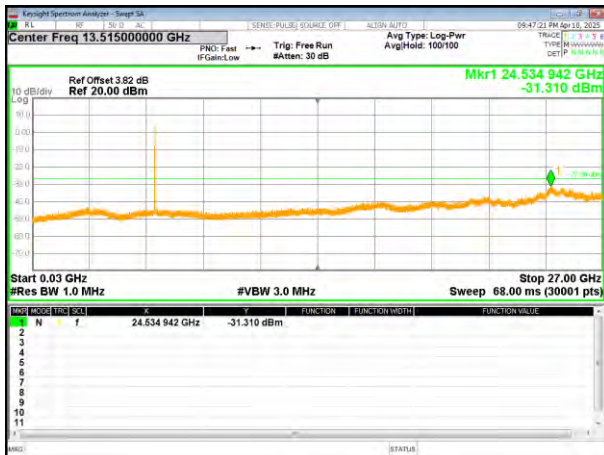
802.11a on channel 149



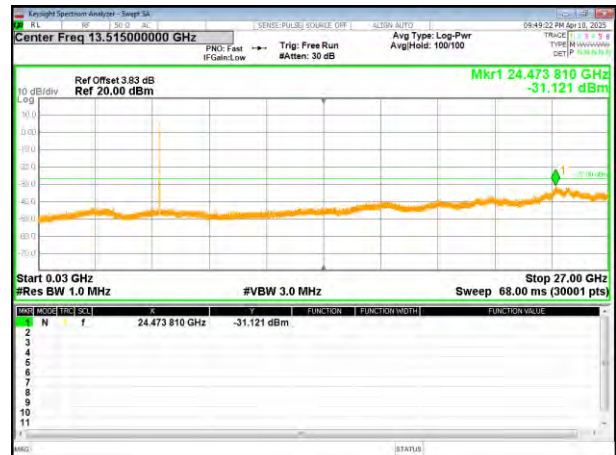
802.11a on channel 157



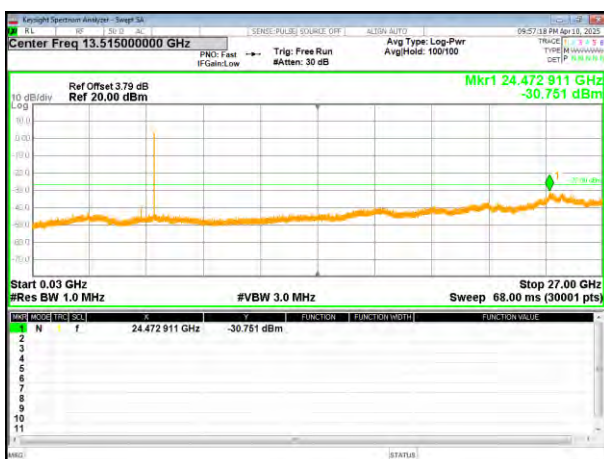
802.11a on channel 165



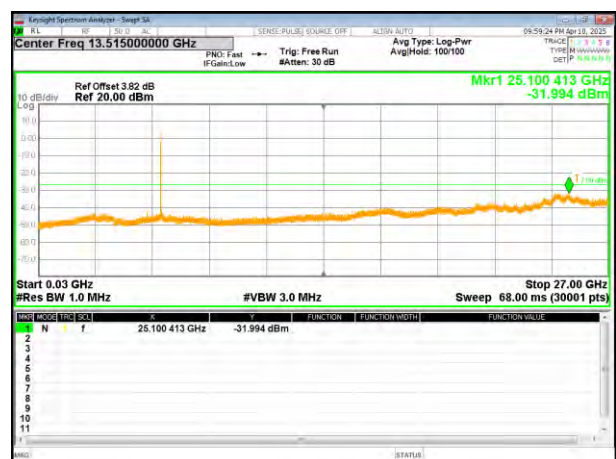
802.11n20 on channel 149



802.11n20 on channel 157

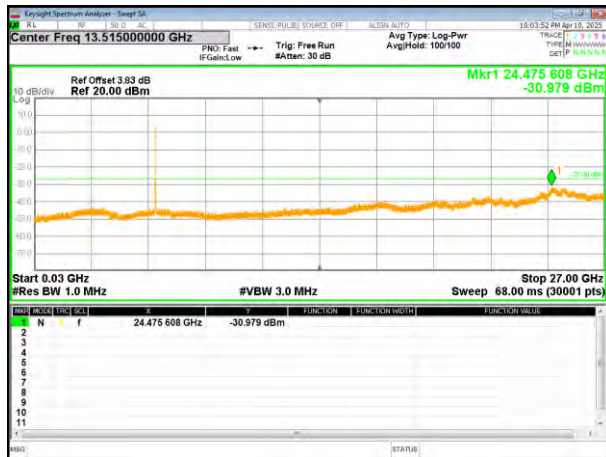


802.11n20 on channel 165

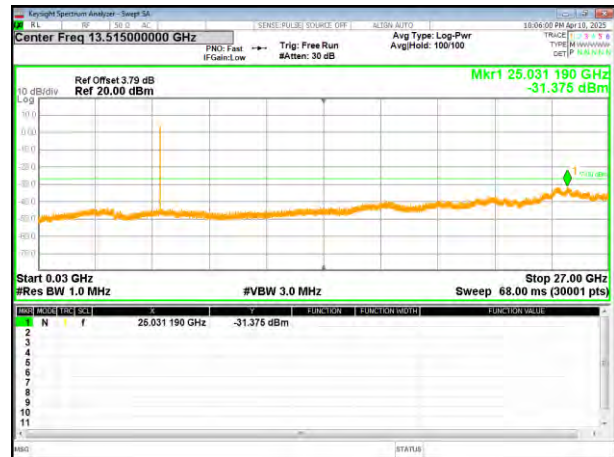


Test Plot

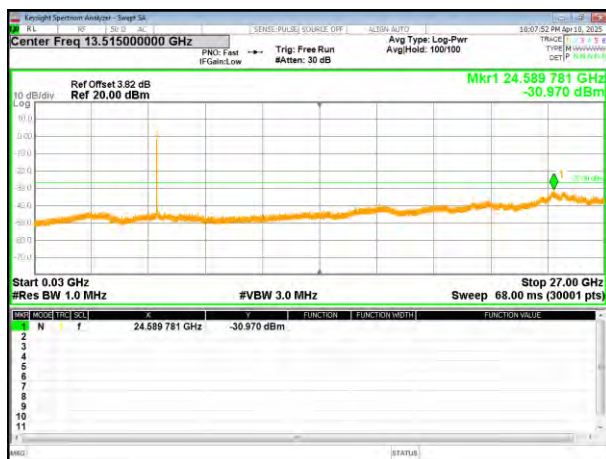
802.11ac20 on channel 149



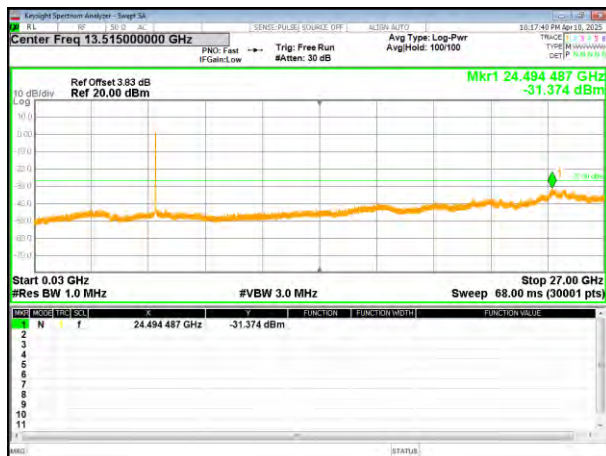
802.11ac20 on channel 157



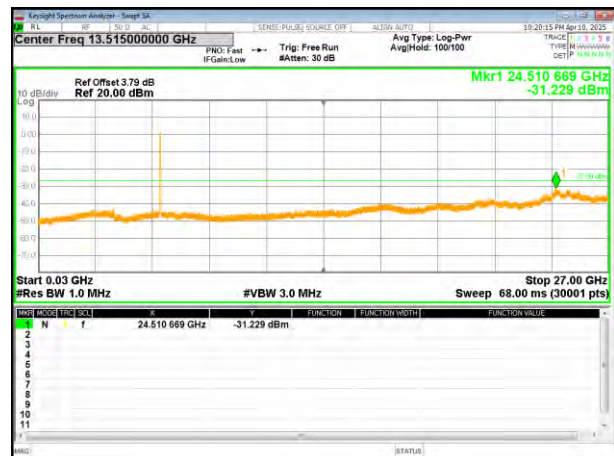
802.11ac20 on channel 165



802.11n40 on channel 151

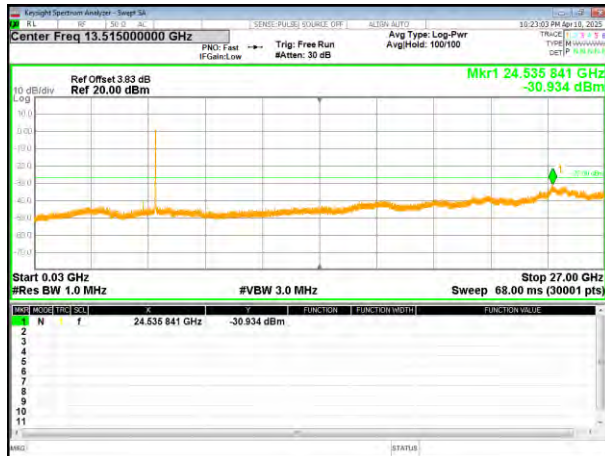


802.11n40 on channel 159

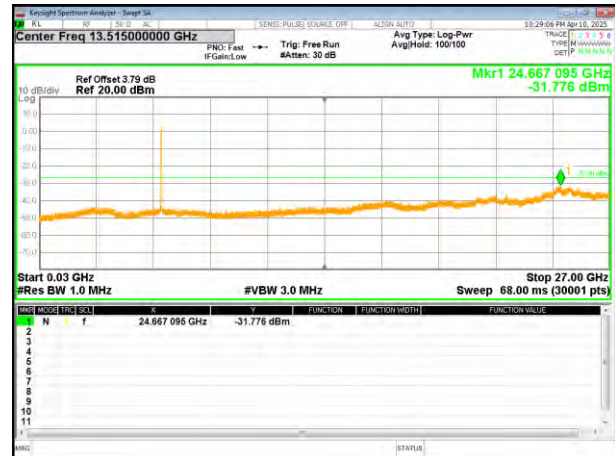


Test Plot

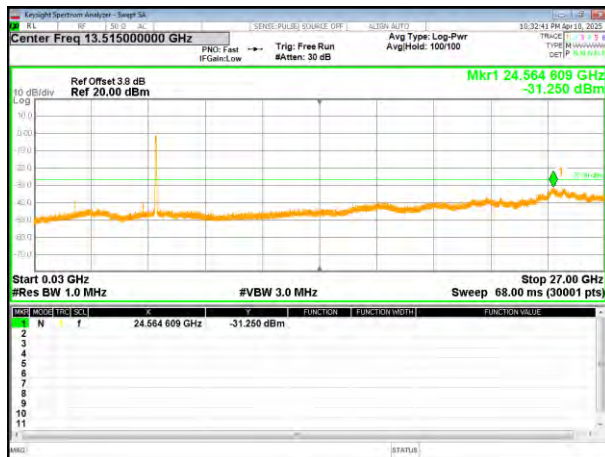
802.11ac40 on channel 151



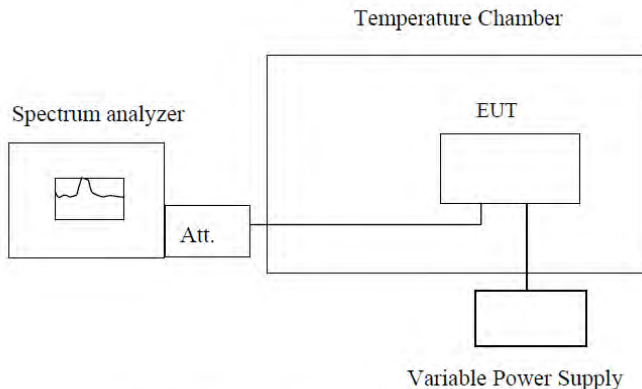
802.11ac40 on channel 159



802.11ac80 on channel 155



4.9 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: DC 14.8V					
Temp. (°C)	Operating Frequency (MHz)	0 minute	2 minute	5 minute	10 minute
		Measured Frequency (MHz)	Measured Frequency (MHz)	Measured Frequency (MHz)	Measured Frequency (MHz)
-30	5180	5179.945	5180.011	5180.009	5179.988
	5190	5189.935	5190.041	5190.009	5189.988
	5200	5199.945	5200.061	5199.999	5199.978
	5210	5209.935	5210.041	5300.009	5209.968
	5220	5219.955	5220.041	5219.999	5219.978
	5230	5229.935	5230.061	5230.019	5299.978
	5240	5239.955	5240.051	5239.999	5239.978
-20	5180	5179.955	5180.041	5180.009	5179.938
	5190	5189.955	5190.041	5189.999	5189.968
	5200	5199.945	5200.041	5200.009	5199.998
	5210	5209.955	5300.041	5209.999	5209.978
	5220	5219.945	5220.041	5220.019	5219.968
	5230	5229.945	5230.061	5229.999	5229.998
	5240	5239.915	5240.031	5240.019	5239.988
-10	5180	5179.905	5180.041	5180.009	5179.988
	5190	5189.935	5190.041	5189.999	5189.988
	5200	5199.965	5200.041	5200.009	5199.978
	5210	5209.945	5300.041	5209.999	5209.988
	5220	5219.935	5220.041	5220.019	5219.978
	5230	5229.965	5230.061	5229.999	5229.978
	5240	5239.955	5240.031	5240.019	5239.948
0	5180	5179.945	5180.011	5180.009	5179.988
	5190	5189.935	5190.041	5190.009	5189.988
	5200	5199.945	5200.061	5199.999	5199.978
	5210	5209.935	5210.041	5300.009	5209.968
	5220	5219.955	5220.041	5219.999	5219.978
	5230	5229.935	5230.061	5230.019	5299.978
	5240	5239.955	5240.051	5239.999	5239.978
10	5180	5179.935	5180.041	5180.009	5179.988
	5190	5189.945	5190.041	5189.999	5179.988
	5200	5199.935	5200.041	5200.009	5189.988
	5210	5209.935	5210.041	5209.999	5199.978
	5220	5219.945	5220.061	5220.019	5209.988
	5230	5229.965	5230.031	5229.999	5219.978
	5240	5239.935	5240.051	5240.019	5229.978
20	5180	5179.955	5180.041	5180.009	5179.938
	5190	5189.955	5190.041	5189.999	5189.968

	5200	5199.945	5200.041	5200.009	5199.998
	5210	5209.955	5300.041	5209.999	5209.978
	5220	5219.945	5220.041	5220.019	5219.968
	5230	5229.945	5230.061	5229.999	5229.998
	5240	5239.915	5240.031	5240.019	5239.988
30	5180	5179.955	5180.041	5180.009	5179.938
	5190	5189.955	5190.041	5189.999	5189.968
	5200	5199.945	5200.041	5200.009	5199.998
	5210	5209.955	5300.041	5209.999	5209.978
	5220	5219.945	5220.041	5220.019	5219.968
	5230	5229.945	5230.061	5229.999	5229.998
	5240	5239.915	5240.031	5240.019	5239.988
40	5180	5179.945	5180.031	5180.009	5179.978
	5190	5189.945	5190.041	5189.999	5189.978
	5200	5199.935	5200.031	5200.009	5199.968
	5210	5299.945	5210.041	5209.999	5299.978
	5220	5219.935	5220.041	5220.019	5219.968
	5230	5229.955	5230.061	5229.999	5229.988
	5240	5239.935	5240.031	5240.019	5239.968
50	5180	5179.905	5180.041	5179.999	5180.098
	5190	5189.935	5190.041	5190.009	5199.978
	5200	5199.965	5200.041	5199.999	5199.998
	5210	5209.945	5300.041	5209.999	5209.978
	5220	5219.935	5220.041	5220.009	5219.998
	5230	5229.965	5230.061	5230.029	5229.988
	5240	5239.955	5240.031	5239.999	5239.998

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)
DC 17.02V	5180	5179.945	5180.031	5180.019	5179.988
	5190	5189.935	5190.041	5190.019	5189.968
	5200	5199.945	5200.031	5200.009	5199.968
	5210	5209.955	5210.041	5210.019	5209.988
	5220	5219.935	5220.041	5220.009	5219.978
	5230	5229.935	5230.061	5230.009	5229.988
	5240	5180.075	5180.051	5180.009	5179.968
DC 14.80V	5180	5199.945	5190.041	5189.999	5189.978
	5190	5199.975	5200.041	5200.009	5199.968
	5200	5209.945	5210.051	5209.999	5209.968
	5210	5219.965	5220.051	5220.019	5219.978
	5220	5229.955	5300.051	5229.999	5229.998
	5230	5239.965	5240.051	5240.019	5239.978
	5240	5180.075	5180.051	5180.009	5179.968
DC 12.58V	5180	5179.955	5180.051	5179.999	5179.968
	5190	5189.955	5190.051	5190.009	5189.978
	5200	5199.945	5200.041	5199.999	5199.968
	5210	5209.955	5210.051	5209.999	5209.968
	5220	5219.945	5220.051	5220.009	5219.978
	5230	5229.945	5230.041	5230.029	5229.998
	5240	5239.915	5240.021	5239.999	5239.968

Frequency stability versus Temp.					
Power Supply: DC 14.8V					
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	5744.964	5745.031	5744.629	5744.948
	5755	5744.914	5755.041	5755.019	5754.968
	5775	5754.934	5775.041	5775.019	5774.978
	5785	5774.944	5785.041	5785.019	5784.968
	5795	5784.934	5795.051	5794.999	5794.978
	5825	5794.944	5825.041	5824.999	5824.988
-20	5745	5744.934	5745.031	5745.009	5744.968
	5755	5754.954	5755.041	5755.009	5754.998
	5775	5774.934	5775.041	5775.019	5774.988
	5785	5784.944	5785.041	5785.009	5784.978
	5795	5794.944	5795.051	5794.999	5794.968
	5825	5824.954	5825.041	5825.009	5824.898
-10	5745	5744.934	5745.041	5744.999	5745.038
	5755	5754.944	5755.041	5755.019	5744.598
	5775	5774.934	5775.061	5774.999	5754.988
	5785	5784.924	5785.041	5785.009	5774.988
	5795	5794.934	5795.031	5795.009	5784.988
	5825	5824.864	5825.041	5825.019	5794.968
0	5745	5744.934	5745.041	5744.999	5744.968
	5755	5754.944	5755.041	5755.009	5754.958
	5775	5774.964	5775.031	5775.029	5774.968
	5785	5784.934	5785.031	5784.999	5784.978
	5795	5794.934	5795.031	5794.999	5794.998
	5825	5824.934	5824.961	5824.999	5824.988
10	5745	5744.924	5745.051	5744.999	5744.978
	5755	5754.944	5755.051	5755.019	5754.998
	5775	5774.944	5775.051	5774.999	5774.978
	5785	5784.944	5785.041	5785.009	5784.968
	5795	5794.954	5795.031	5795.009	5794.958
	5825	5824.934	5825.041	5825.019	5824.998
20	5745	5744.944	5745.061	5745.009	5744.968
	5755	5754.964	5755.031	5755.029	5754.988
	5775	5774.944	5775.061	5775.009	5774.968
	5785	5784.934	5785.061	5784.999	5784.998
	5795	5794.924	5795.051	5794.989	5794.988
	5825	5824.964	5825.061	5825.029	5824.998
30	5745	5744.924	5745.051	5744.999	5744.978
	5755	5754.944	5755.051	5755.019	5754.998
	5775	5774.944	5775.051	5774.999	5774.978
	5785	5784.944	5785.041	5785.009	5784.968
	5795	5794.954	5795.031	5795.009	5794.958
	5825	5824.934	5825.041	5825.019	5824.998
40	5745	5744.944	5745.041	5744.999	5744.968
	5755	5754.954	5755.051	5755.019	5754.988
	5775	5774.954	5775.051	5774.999	5774.968
	5785	5784.944	5785.041	5785.009	5784.978

50	5795	5794.934	5795.051	5795.009	5794.978
	5825	5824.944	5825.051	5825.019	5824.988
	5745	5744.934	5745.041	5744.999	5744.968
	5755	5754.954	5755.051	5755.009	5754.978
	5775	5774.934	5775.051	5774.999	5774.998
	5785	5784.944	5785.041	5784.989	5784.968
	5795	5794.944	5795.051	5794.999	5794.968
	5825	5824.954	5825.051	5824.929	5824.968

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)
DC 17.02V	5745	5744.924	5745.041	5744.999	5744.968
	5755	5754.944	5755.041	5755.019	5754.988
	5775	5774.944	5775.031	5775.019	5774.968
	5785	5784.944	5785.031	5784.999	5784.978
	5795	5794.954	5795.031	5795.019	5794.978
	5825	5824.934	5824.961	5825.019	5824.988
DC 14.80V	5745	5744.924	5745.051	5744.999	5744.978
	5755	5754.944	5755.051	5755.019	5754.998
	5775	5774.944	5775.051	5774.999	5774.978
	5785	5784.944	5785.041	5785.009	5784.968
	5795	5794.954	5795.031	5795.009	5794.958
	5825	5824.934	5825.041	5825.019	5824.998
DC 12.58V	5745	5744.944	5745.061	5745.009	5744.968
	5755	5754.964	5755.031	5755.029	5754.988
	5775	5774.944	5775.061	5775.009	5774.968
	5785	5784.934	5785.061	5784.999	5784.998
	5795	5794.924	5795.051	5794.989	5794.988
	5825	5824.964	5825.061	5825.029	5824.998

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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