TEST REPORT

Applicant:	Shanghai Hub Union Industural Co.,Ltd.
Address of Applicant:	No.268 Ronghua Road, Songjiang Export Processing Zone, Shanghai, China, 201611
Manufacturer:	Shanghai Hub Union Industural Co.,Ltd.
Address of Manufacturer:	No.268 Ronghua Road, Songjiang Export Processing Zone, Shanghai, China, 201611
Factory:	Shanghai Hub Union Industural Co.,Ltd.
Address of Factory:	No.268 Ronghua Road, Songjiang Export Processing Zone, Shanghai, China, 201611
Product Name:	Mini PC
Model No.:	A6,A7,A8,A9,S5,S6,S7,S8,S9,P5,P6,P7,P8,P9,H5,H6,H7,H8,H9,X6,X7,X8,X9,Z6,Z7,Z8,Z9
Trade Mark:	reatan
FCC ID:	2BP52-A6
Applicable standards:	FCC CFR Title 47 Part 15 Subpart E Section 15.407
Date of Test:	Apri.22, 2025-May.26, 2025
Date of report issued:	May.27, 2025

Remark:

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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:
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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/manufacturer. If measurement uncertainty is taken into account, the applicant/manufacturer 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
Duty cycle	±0.05%	(1)
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:	Mini PC
Model No.:	A6,A7,A8,A9,S5,S6,S7,S8,S9,P5,P6,P7,P8,P9,H5,H6,H7,H8,H9,X6,X7,X8 ,X9,Z6,Z7,Z8,Z9
Difference of model(s)	All the model are the same circuit and RF module, except the model names
Test Model:	A6
Hardware Version:	N/A
Software Version:	N/A
Sample(s) Status:	Engineer sample
Operation Frequency:	☒5180-5240MHz for 802.11a/n(HT20)/ac20(VHT20); 5190-5230MHz for 802.11n(HT40)/ac40(VHT40); 5210MHz for 802.11 ac80(VHT40); ☒5745-5825 MHz for 802.11a/n(HT20)/ac20(VHT20); 5755-5795 MHz for 802.11n(HT40)/ac40(VHT40); 5775MHz for 802.11 ac80(VHT40);
Channel numbers:	☒4 channels for 802.11a/n20(HT20)/ac20(VHT20) in the 5180-5240MHz band; 2 channels for 802.11 n40(HT40)/ac40(VHT40) in the 5190-5230MHz band ; 1 channels for 802.11 ac80 in the 5210(VHT80)MHz band ; ☒5 channels for 802.11802.11a/n20(HT20)/ac20(VHT20) in the 5745-5825MHz band ; 2 channels for 802.11 n40(HT40)/ac40(VHT40) in the 5755-5795MHz band ; 1 channels for 802.11 5210(VHT80) in the 5775MHz band
Channel bandwidth:	802.11a/802.11n(HT20)/ 802.11ac(VHT20): 20MHz 802.11n(HT40)/ 802.11ac(VHT40) : 40MHz 802.11ac(VHT80) : 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:	UNII-1:4.42 dBi UNII-3:1.96 dBi (Note: Antenna information is provided by applicant, Testing lab is not responsible for the accuracy of the information.)
Battery	N/A
Power supply:	DC 19V From Adapter
Adapter Model:	Model: SOY-1900630US-523 Input:100-240V 50/60Hz 2.5A Output: DC 19V 6.3A

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(VHT20)	802.11 n(HT40)/ac(VHT40)	802.11ac(VHT80)
Lowest channel	5180	5190	5210
Middle channel	5200		
Highest channel	5240	5230	

Test channel	**Frequency (MHz)**		
	802.11 a /n(HT20)/ac(VHT20)	802.11 n(HT40)/ac(VHT40)	802.11ac(VHT80)
Lowest channel	5745	5755	5775
Middle channel	5785		
Highest channel	5825	5795	

2.2 Test mode

Transmitting mode	Keep the EUT in continuously transmitting mode(or with a duty cycle ≥ 98%)

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.

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/ ac 20 CH36/ CH40/ CH 48 802.11a /n 20/ac 20 CH149/ CH157/ CH 165
Mode 2	802.11n 40/ac 40 CH38/ CH 46 802.11n 40/ac 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/ ac 20 CH36/ CH40/ CH 48 802.11a /n 20/ac 20 CH149/ CH157/ CH 165
Mode 2	802.11n 40/ac 40 CH38/ CH 46 802.11n 40/ac 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
1	monitor	SKYWORTH	2BU1	/
2	mouse	DELL	MS116	/
3	keyboard	DELL	KB216t	/

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	DRTU.EXE（VERSION:0.0.0.0）
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-Dtronics	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	MWRFtest	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	FSV-40N	101321	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 Sensor	Keysight	U2021XA	MY54111006	2025.3.06	2026.3.05
18	Temp. & Humidity Chamber	Jiecheng Instrument	QA-LP-80	20160705001	2025/3/07	2026/3/06

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
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.*	
E.U.T Antenna:	
The antennas are FPC Antenna, the best case gain of the antennas are UNII-1:4.42 and UNII-3:1.96dBi, reference to the appendix II for details	

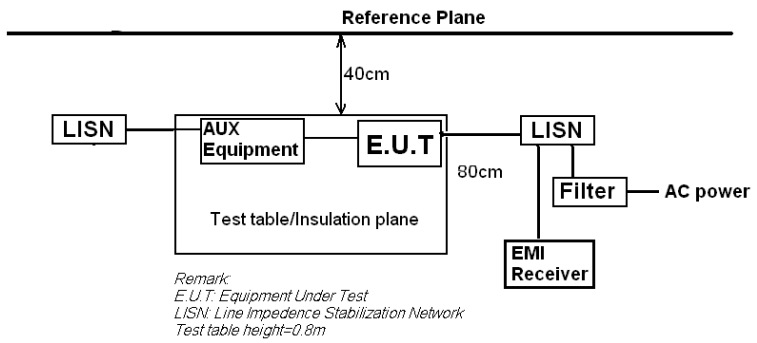
4.2 Conducted Emissions

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:



Test procedure:

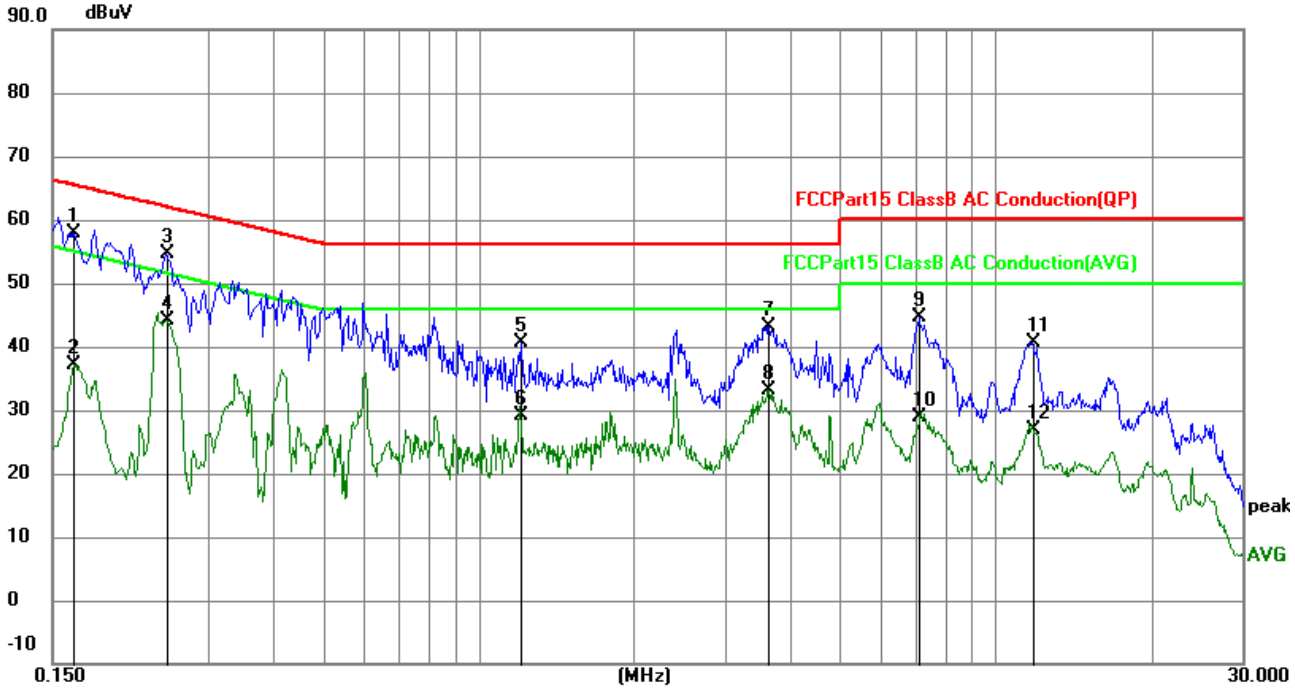
1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment.
2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling 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.:	23.3°C	Humid.:	52%	Press.:	1012mbar
Test voltage:	AC 120V 60Hz					
Test results:	Pass					

Remark:
1. Both high voltage and low voltage have been tested, and the report only shows the worst case data with AC 120V/60Hz.
2. All mode have been tested, the report only shows the worst mode (802.11a 5180MHz)

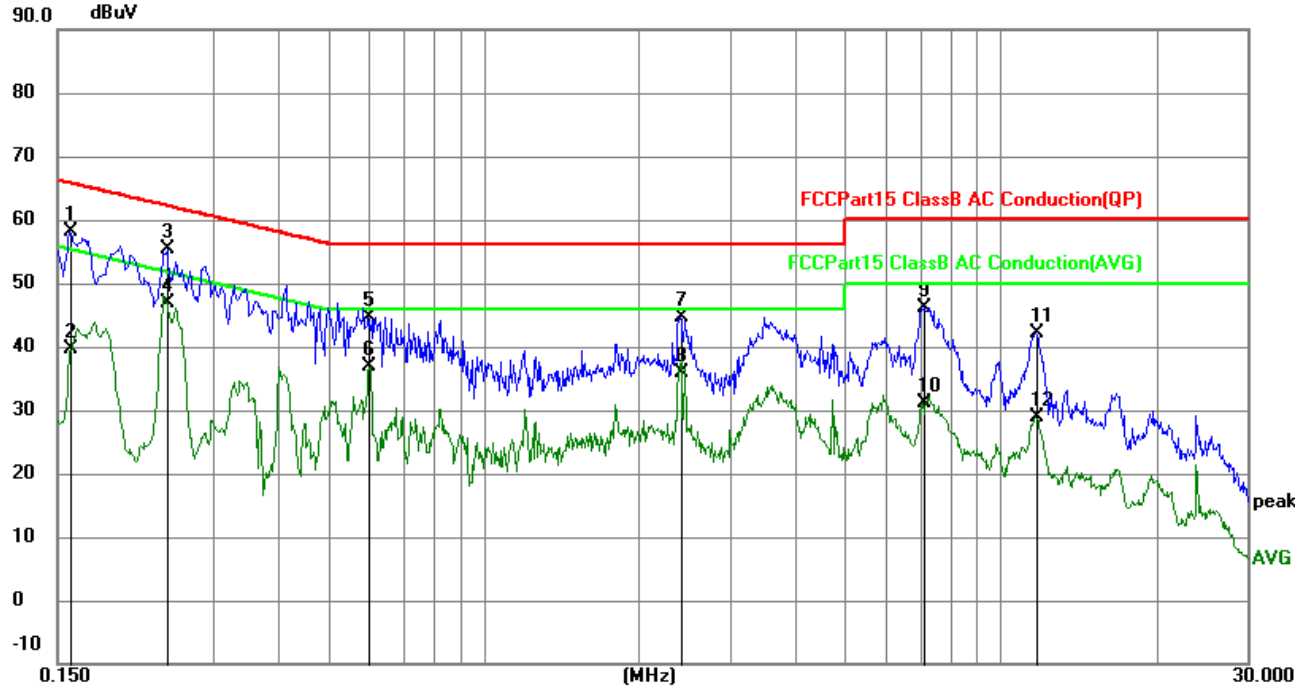
Measurement Result

Line:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1650	48.23	9.70	57.93	65.21	-7.28	QP
2	0.1650	27.45	9.70	37.15	55.21	-18.06	AVG
3	0.2489	45.00	9.71	54.71	61.79	-7.08	QP
4	0.2489	34.51	9.71	44.22	51.79	-7.57	AVG
5	1.2074	30.90	9.76	40.66	56.00	-15.34	QP
6	1.2074	19.49	9.76	29.25	46.00	-16.75	AVG
7	3.6284	33.44	9.74	43.18	56.00	-12.82	QP
8	3.6284	23.50	9.74	33.24	46.00	-12.76	AVG
9	7.1340	35.10	9.63	44.73	60.00	-15.27	QP
10	7.1340	19.20	9.63	28.83	50.00	-21.17	AVG
11	11.7911	31.25	9.48	40.73	60.00	-19.27	QP
12	11.7911	17.44	9.48	26.92	50.00	-23.08	AVG

Neutral:

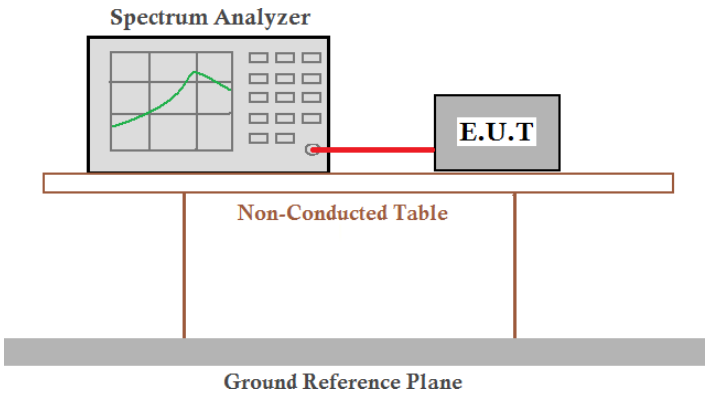


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1590	48.44	9.70	58.14	65.52	-7.38	QP
2	0.1590	29.98	9.70	39.68	55.52	-15.84	AVG
3	0.2444	45.57	9.71	55.28	61.95	-6.67	QP
4	0.2444	37.24	9.71	46.95	51.95	-5.00	AVG
5	0.6000	34.95	9.74	44.69	56.00	-11.31	QP
6	0.6000	27.11	9.74	36.85	46.00	-9.15	AVG
7	2.4043	34.84	9.75	44.59	56.00	-11.41	QP
8	2.4043	26.16	9.75	35.91	46.00	-10.09	AVG
9	7.1025	36.80	9.43	46.23	60.00	-13.77	QP
10	7.1025	21.65	9.43	31.08	50.00	-18.92	AVG
11	11.7149	32.66	9.42	42.08	60.00	-17.92	QP
12	11.7149	19.40	9.42	28.82	50.00	-21.18	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:		
Test Instruments:	Refer to section 3.0 for details	
Test mode:	Refer to section 2.2 for details	
Test environment:	Temp.: 21.6°C	Humid.: 56%RH
Test voltage:	DC 19V From Adapter	
Test results:	Pass	

Measurement Result

5180-5240MHz

Mode	Duty cycle (%)	Correction Factor (dB)
TX 802.11a Mode	84.89	0.71
TX 802.11n20 Mode	84.35	0.74
TX 802.11ac20 Mode	84.48	0.73
TX 802.11n40 Mode	87.79	0.57
TX 802.11ac40 Mode	88.78	0.52
TX 802.11ac80 Mode	85.58	0.68

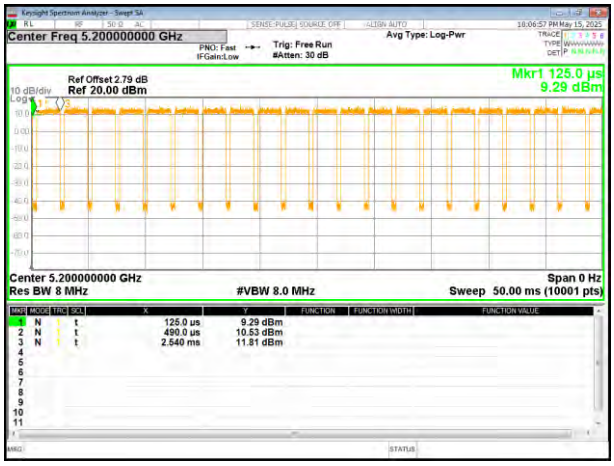
5745-5825 MHz

Mode	Duty cycle (%)	Correction Factor (dB)
TX 802.11a Mode	85.42	0.68
TX 802.11n20 Mode	84.44	0.73
TX 802.11ac20 Mode	95.37	0.21
TX 802.11n40 Mode	91.86	0.37
TX 802.11ac40 Mode	94.74	0.23
TX 802.11ac80 Mode	88.89	0.51

Test plot

5180-5240MHz

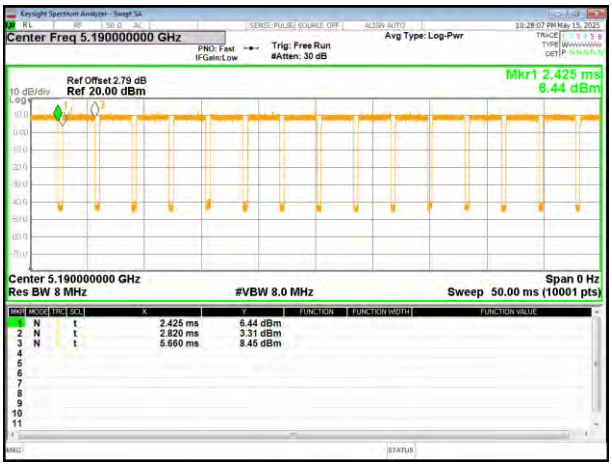
(802.11a) plot



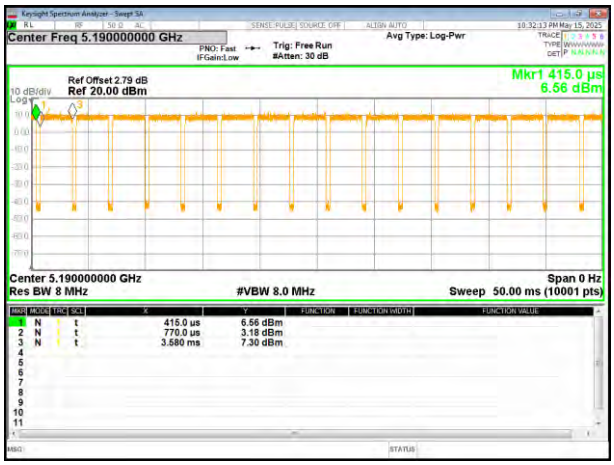
(802.11 n20) plot

(802.11ac20) plot

(802.11 n40) plot



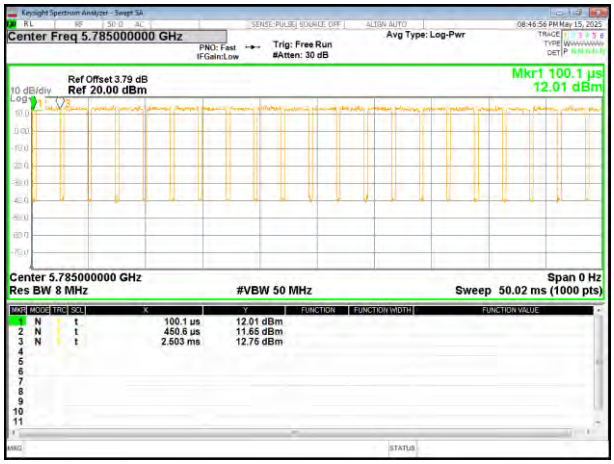
(802.11ac40) plot



(802.11ac80) plot

5745-5825 MHz

(802.11a) plot



(802.11 n20) plot

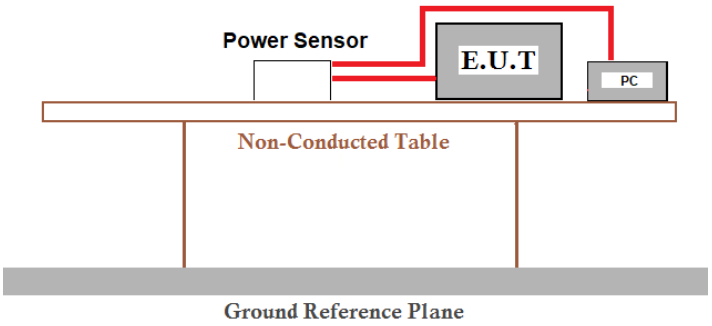
(802.11ac20) plot

(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:		
Test Instruments:	Refer to section 3.0 for details	
Test mode:	Refer to section 2.2 for details	
Test environment:	Temp.: 24.3°C	Humid.: 61%RH
Test voltage:	DC 19V From Adapter	
Test results:	Pass	

Measurement Result

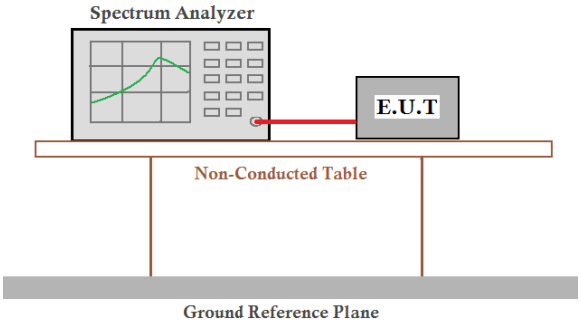
5180-5240MHz

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	13.80	14.51	23.98	Pass
CH40	5200	0.71	13.63	14.34	23.98	Pass
CH48	5240	0.71	13.39	14.10	23.98	Pass
TX 802.11 n20 Mode						
CH36	5180	0.74	13.64	14.38	23.98	Pass
CH40	5200	0.74	13.39	14.13	23.98	Pass
CH48	5240	0.74	13.38	14.12	23.98	Pass
TX 802.11 ac20 Mode						
CH36	5180	0.73	13.56	14.29	23.98	Pass
CH40	5200	0.73	13.46	14.19	23.98	Pass
CH48	5240	0.73	13.33	14.06	23.98	Pass
TX 802.11 n40 Mode						
CH38	5190	0.57	12.88	13.45	23.98	Pass
CH46	5230	0.57	12.75	13.32	23.98	Pass
TX 802.11 ac40 Mode						
CH38	5190	0.52	12.94	13.46	23.98	Pass
CH46	5230	0.52	12.74	13.26	23.98	Pass
TX 802.11 ac80 Mode						
CH42	5210	0.68	12.08	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	0.68	13.62	14.30	30	Pass
CH157	5785	0.68	13.41	14.09	30	Pass
CH165	5825	0.68	13.53	14.21	30	Pass
TX 802.11 n20 Mode						
CH149	5745	0.73	13.06	13.79	30	Pass
CH157	5785	0.73	13.16	13.89	30	Pass
CH165	5825	0.73	13.30	14.03	30	Pass
TX 802.11 ac20 Mode						
CH149	5745	0.21	13.17	13.38	30	Pass
CH157	5785	0.21	13.67	13.88	30	Pass
CH165	5825	0.21	13.73	13.94	30	Pass
TX 802.11 n40 Mode						
CH151	5755	0.37	12.76	13.13	30	Pass
CH159	5795	0.37	12.93	13.30	30	Pass
TX 802.11 ac40 Mode						
CH151	5755	0.23	12.73	12.96	30	Pass
CH159	5795	0.23	12.89	13.12	30	Pass
TX 802.11 ac80 Mode						
CH155	5775	0.51	12.29	12.80	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.: 24.3°C	Humid.: 61%RH
Test voltage:	DC 19V From Adapter	
Test results:	Pass	

Measurement Result

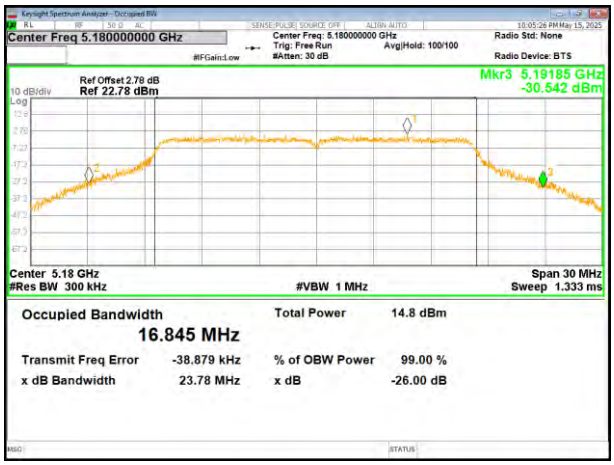
5180-5240MHz

Test CH	-26dB Channel Bandwidth (MHz)						Result
	802.11a	802.11n (HT20)	802.11ac (VHT20)	802.11n (HT40)	802.11ac (VHT40)	802.11ac (VHT80)	
Lowest	23.78	22.22	22.41	41.94	42.17	--	Pass
Middle	23.44	22.29	22.65	--	--	80.22	
Highest	24.44	22.73	22.76	41.57	42.19	--	

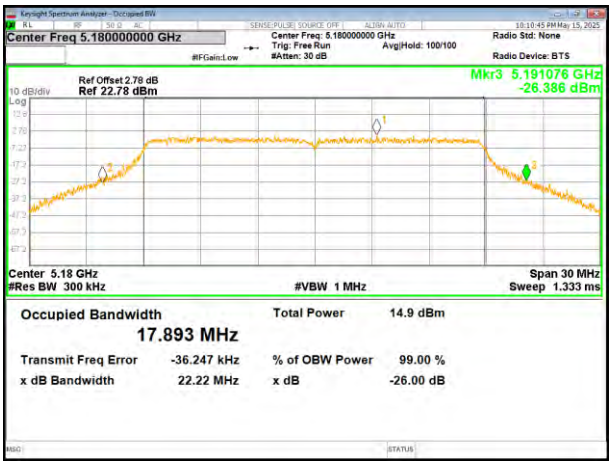
Test CH	99% Occupy Bandwidth (MHz)						Result
	802.11a	802.11n (HT20)	802.11ac (VHT20)	802.11n (HT40)	802.11ac (VHT40)	802.11ac (VHT80)	
Lowest	16.845	17.893	17.899	36.233	36.279	--	Pass
Middle	16.843	17.898	17.871	--	--	75.051	
Highest	16.788	17.901	17.902	36.242	36.251	--	

Test plot 99% Occupy Bandwidth

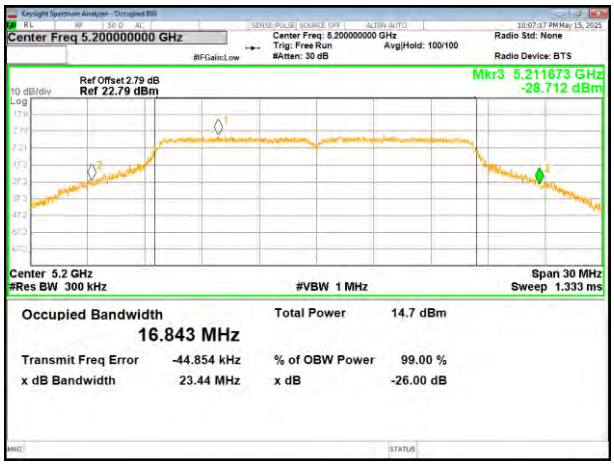
(802.11a) plot on channel 36



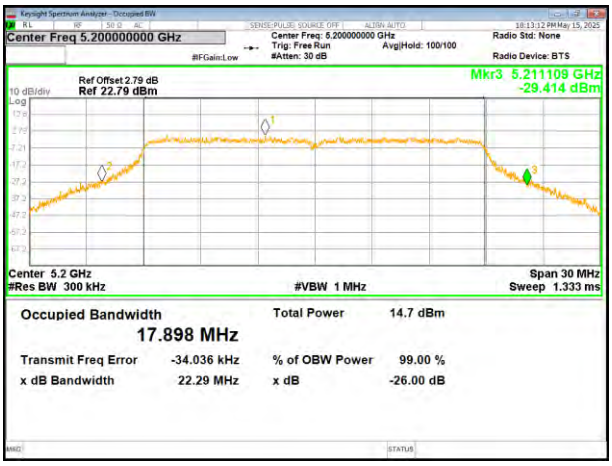
(802.11 n20) plot on channel 36



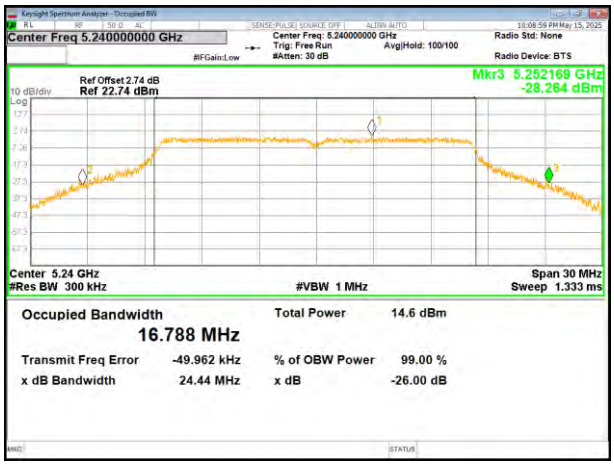
(802.11a) plot on channel 40



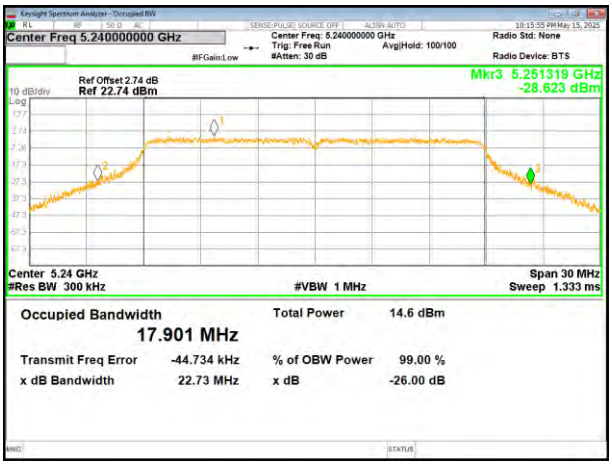
(802.11 n20) plot on channel 40



(802.11a) plot on channel 48

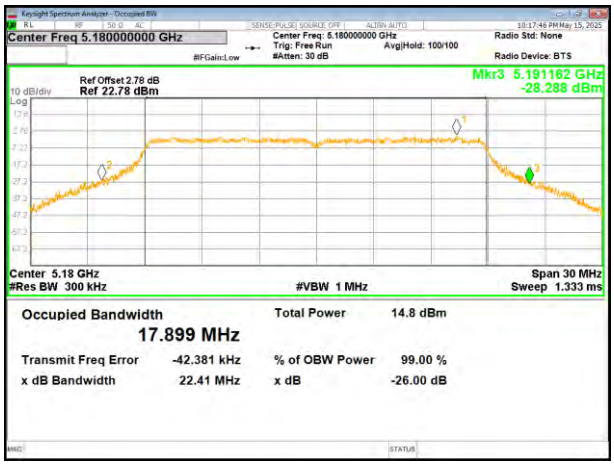


(802.11 n20) plot on channel 48

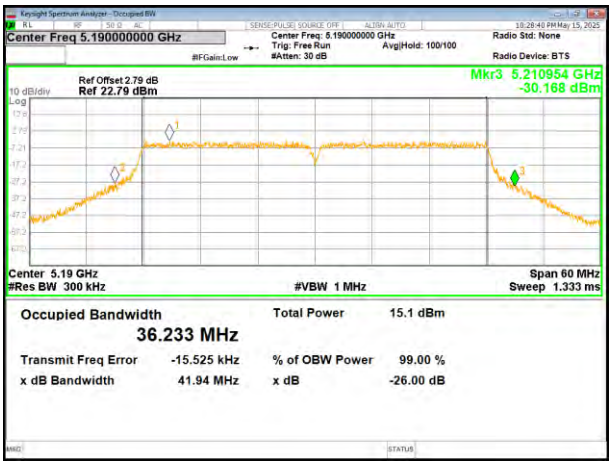


Test plot

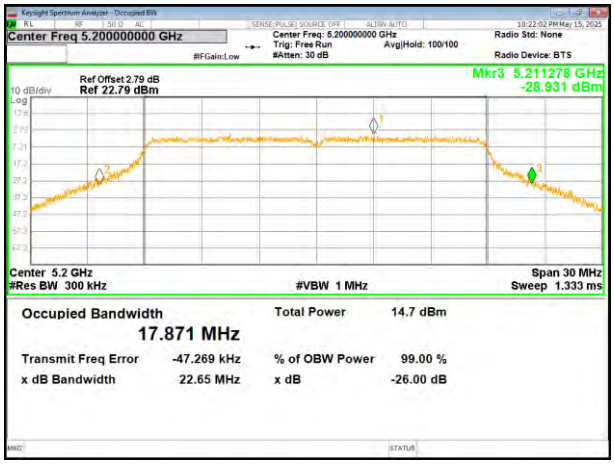
(802.11ac20) plot on channel 36



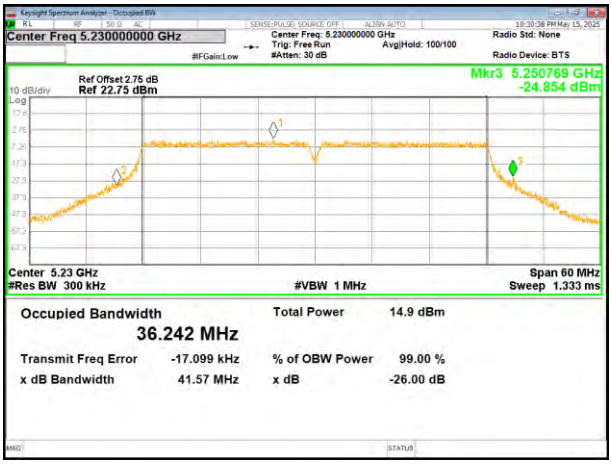
(802.11 n40) plot on channel 38



(802.11ac20) plot on channel 40



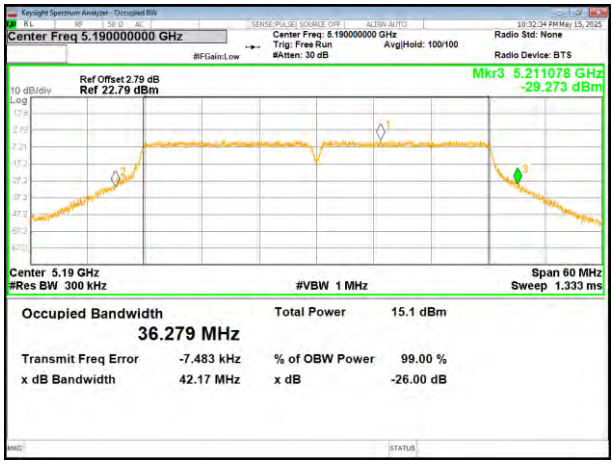
(802.11 n40) plot on channel 46



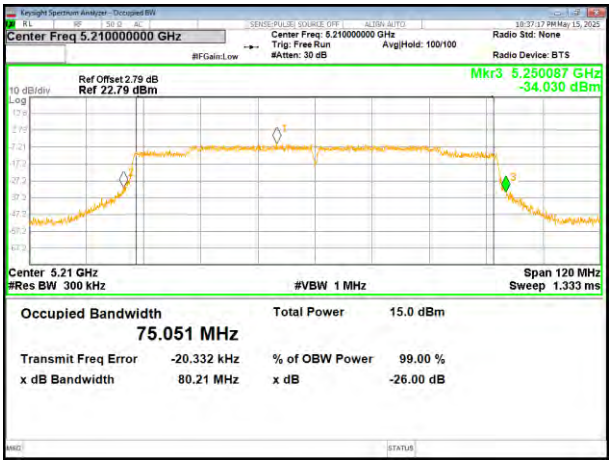
(802.11ac20) plot on channel 48

Test plot

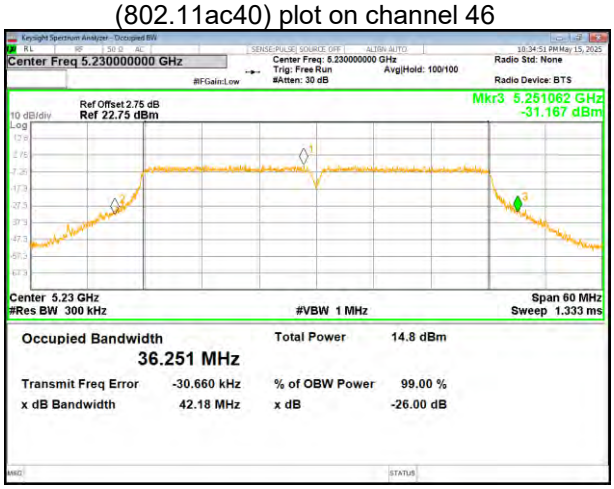
(802.11ac40) plot on channel 38



(802.11ac80) plot on channel 42



(802.11ac40) plot on channel 46



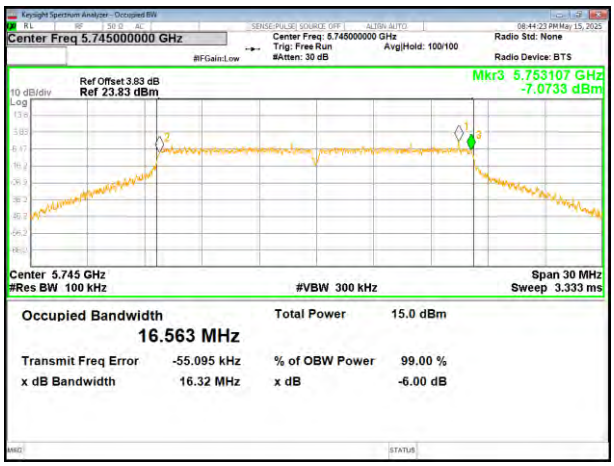
5745-5825MHz

Test CH	-6dB Channel Bandwidth (MHz)						Limit (KHz)	Result
	802.11a	802.11n (HT20)	802.11ac (VHT20)	802.11n (HT40)	802.11ac (VHT40)	802.11ac (VHT80)		
Lowest	16.32	17.54	17.59	36.44	36.39	--	>500	Pass
Middle	16.34	17.56	17.62	--	--	73.78		
Highest	16.33	17.63	17.57	36.39	36.37	--		

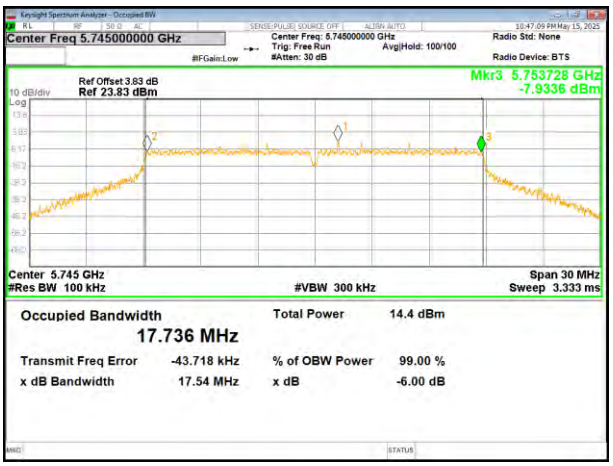
Remark: “---“is not applicable

Test plot

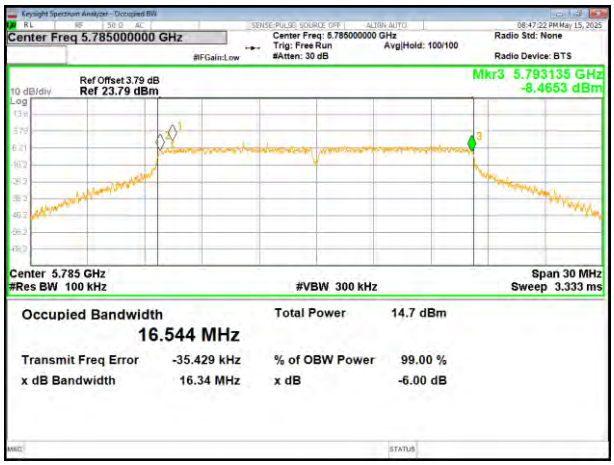
(802.11a) plot on channel 149



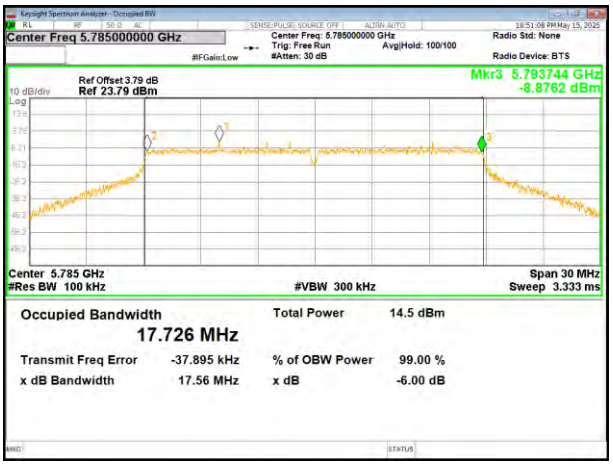
(802.11 n20) plot on channel 149



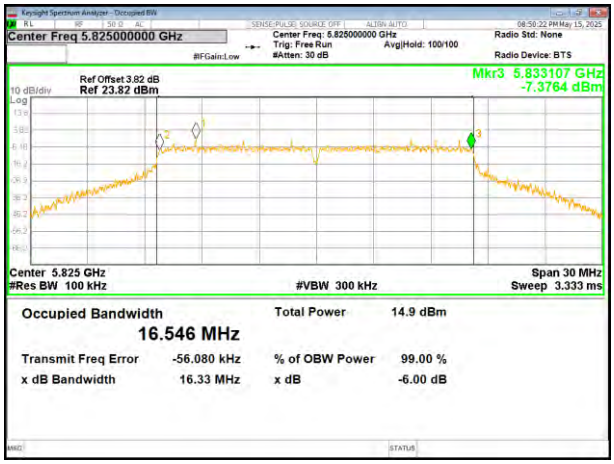
(802.11a) plot on channel 157



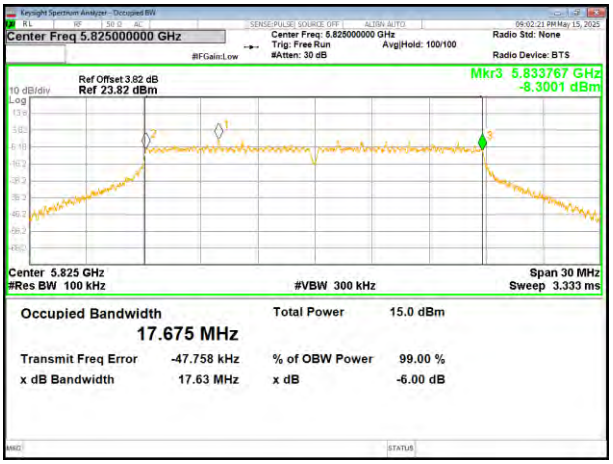
(802.11 n20) plot on channel 157



(802.11a) plot on channel 165

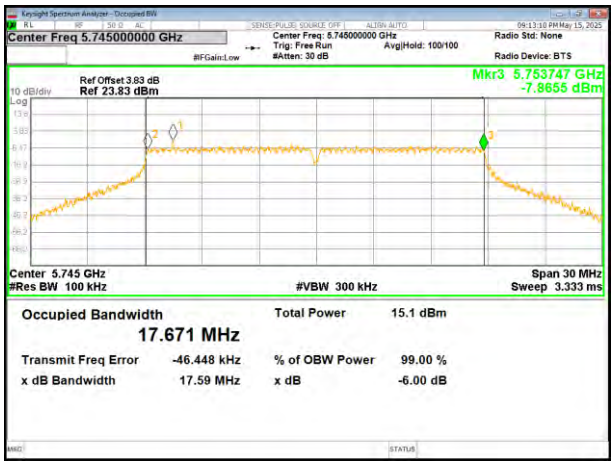


(802.11 n20) plot on channel 165

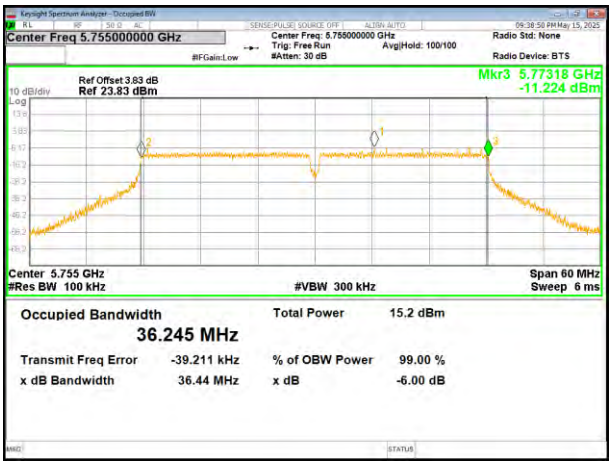


Test plot

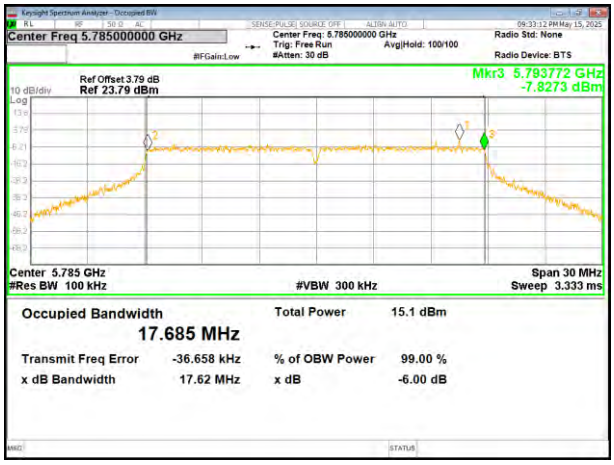
(802.11ac20) plot on channel 149



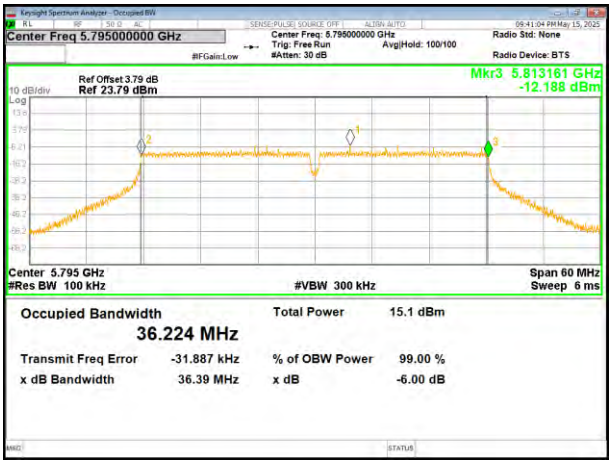
(802.11 n40) plot on channel 151



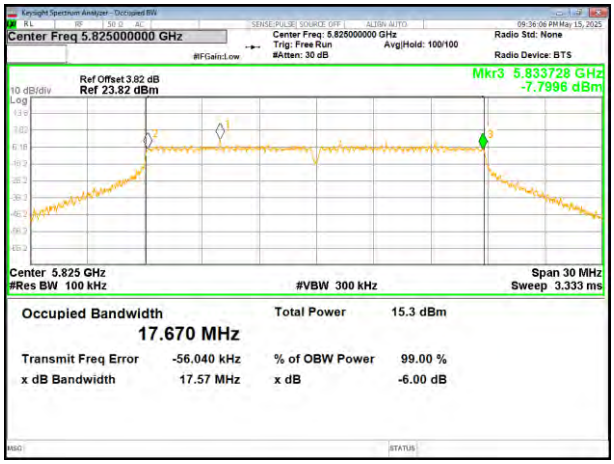
(802.11ac20) plot on channel 157



(802.11 n40) plot on channel 159

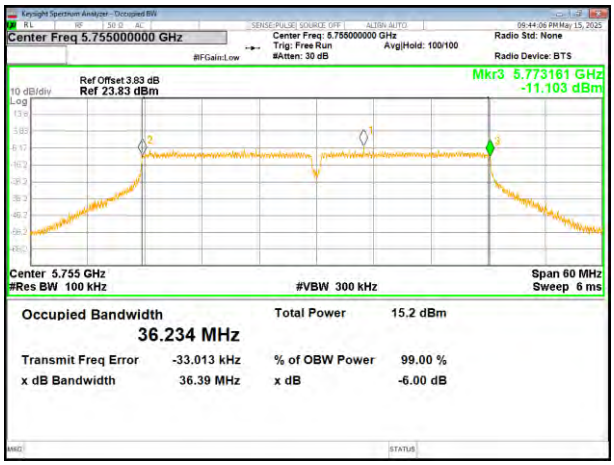


(802.11ac20) plot on channel 165

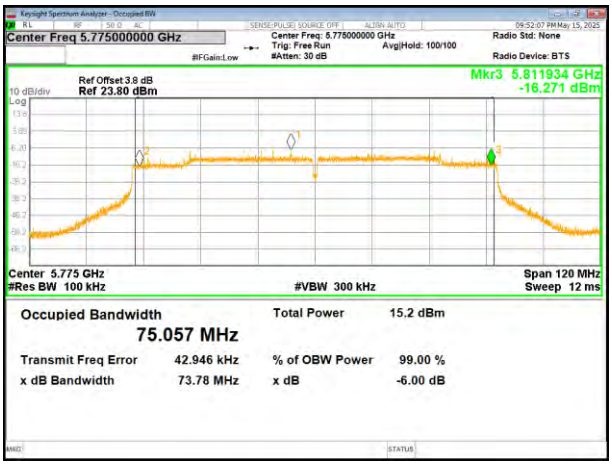


Test plot

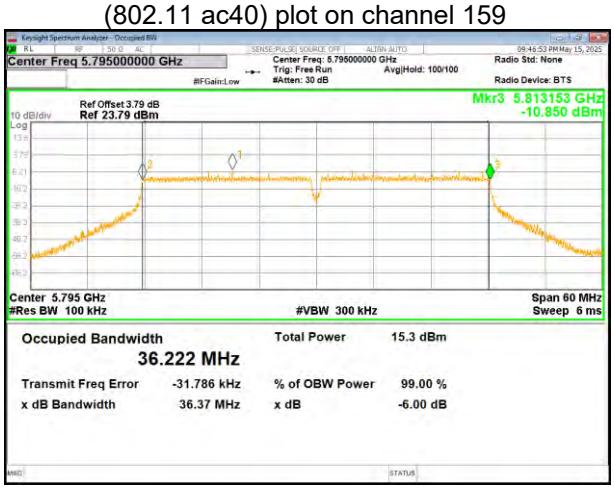
(802.11 ac40) plot on channel 151



(802.11 ac80) plot on channel 155



(802.11 ac40) plot on channel 159

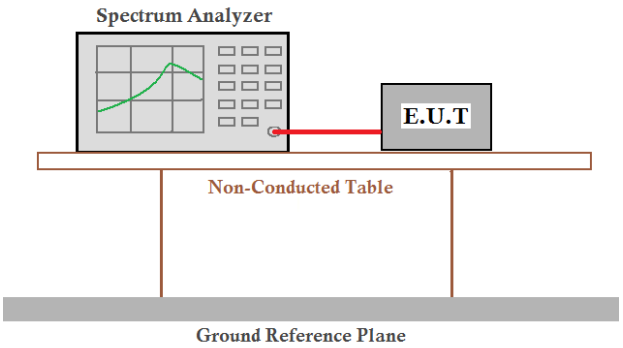


4.6 Power Spectral Density

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:



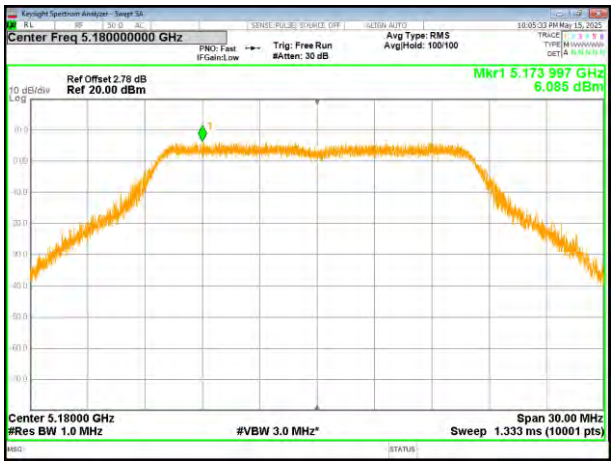
Test Instruments:	Refer to section 3.0 for details	
Test mode:	Refer to section 2.2 for details	
Test environment:	Temp.: 23.4°C	Humid.: 62%RH
Test voltage:	DC 5V From Adapter	
Test results:	Pass	

Measurement Result

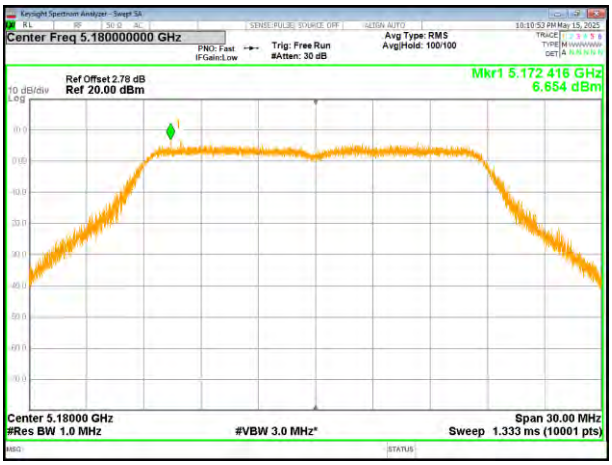
5180-5240MHz

Mode	Frequency	Measured Power Density (dBm/MHz)	Correction Factor (dB)	Total Measured Power Density (dBm/MHz)	Limit (dBm/MHz)
802.11 a	5180 MHz	6.085	0.71	6.795	11
	5200 MHz	5.974	0.71	6.684	11
	5240 MHz	5.947	0.71	6.657	11
802.11 n20	5180 MHz	6.654	0.74	7.394	11
	5200 MHz	6.613	0.74	7.353	11
	5240 MHz	5.616	0.74	6.356	11
802.11 ac20	5180 MHz	3.664	0.73	4.394	11
	5200 MHz	3.555	0.73	4.285	11
	5240 MHz	5.911	0.73	6.641	11
802.11 n40	5190 MHz	6.147	0.57	6.717	11
	5230 MHz	5.978	0.57	6.548	11
802.11 ac40	5190 MHz	3.828	0.52	4.348	11
	5230 MHz	3.463	0.52	3.983	11
802.11 ac80	5210 MHz	1.480	0.68	2.160	11

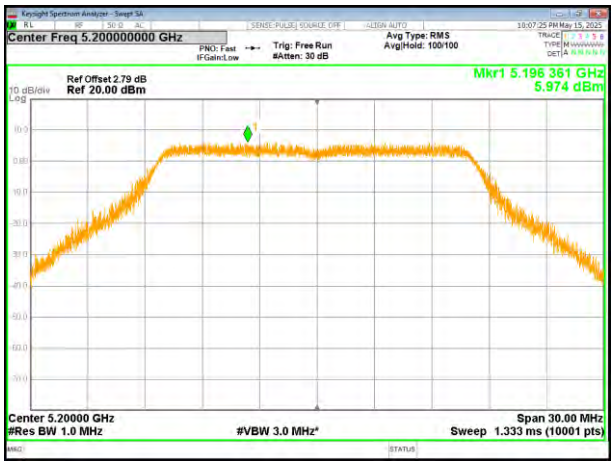
(802.11a) PSD plot on channel 36



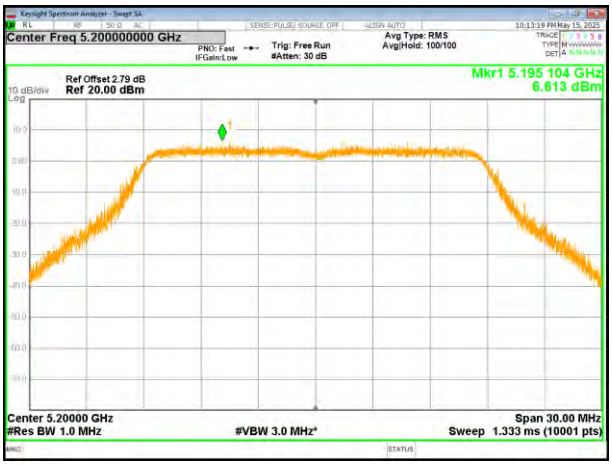
(802.11n20) PSD plot on channel 36



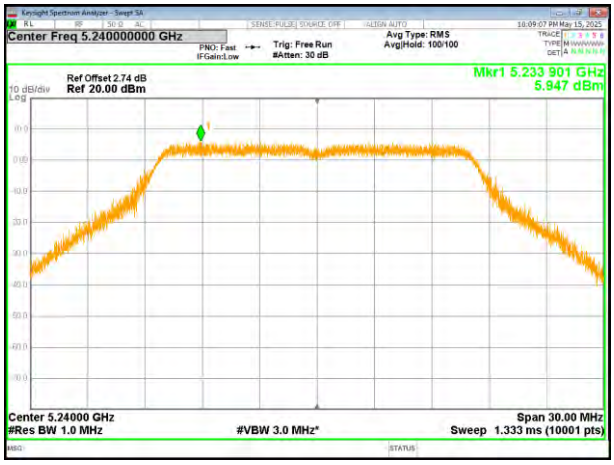
(802.11a) PSD plot on channel 40



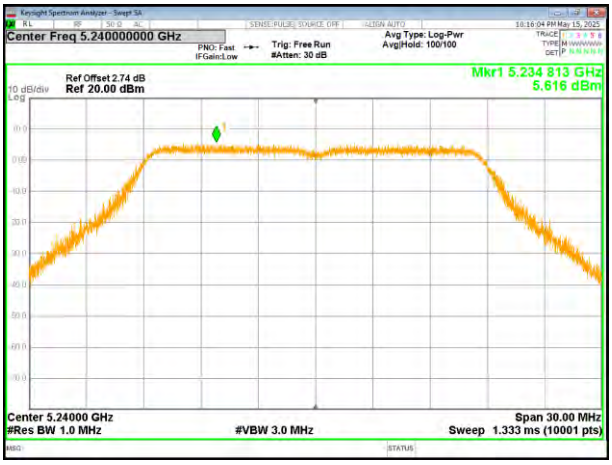
(802.11n20) PSD plot on channel 40



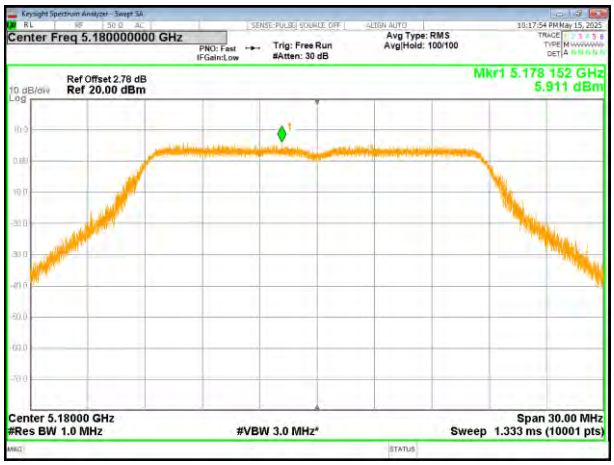
(802.11a) PSD plot on channel 48



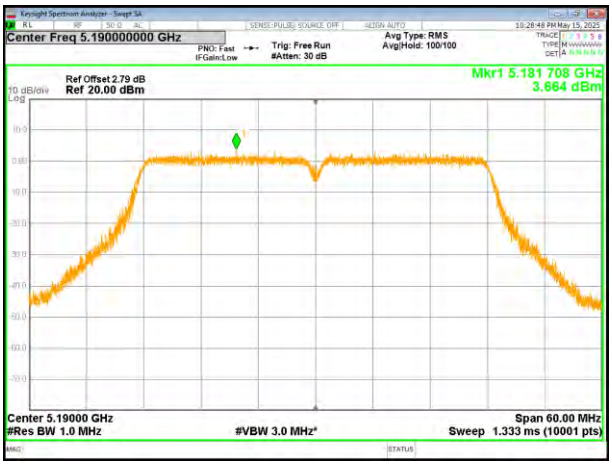
(802.11n20) PSD plot on channel 48



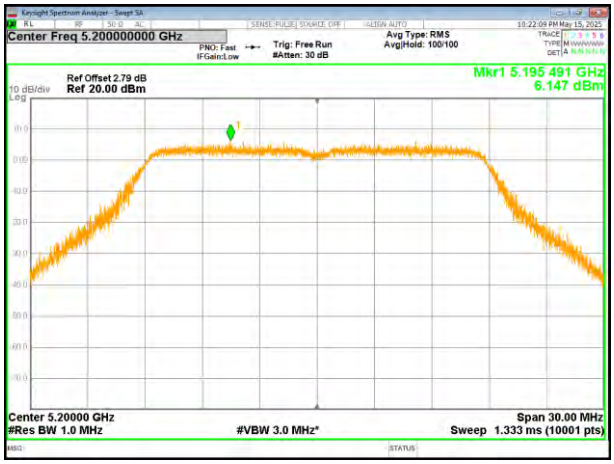
(802.11ac20) PSD plot on channel 36



(802.11n40) PSD plot on channel 38

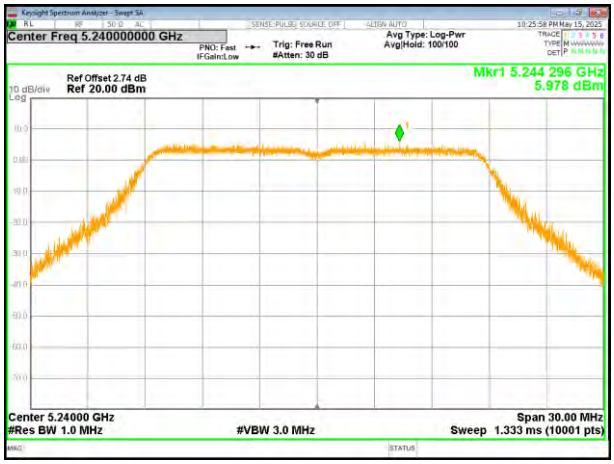


(802.11ac20) PSD plot on channel 40

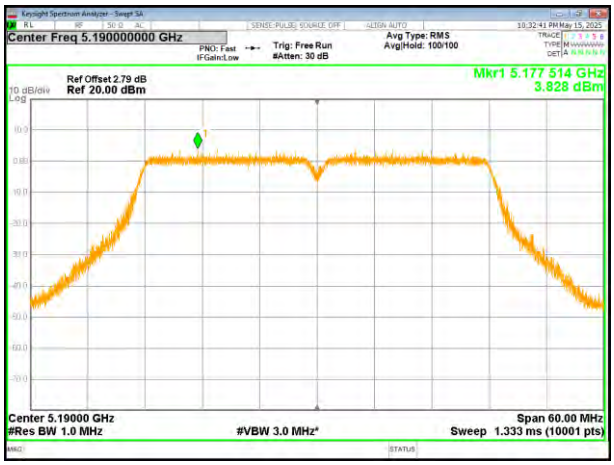


(802.11n40) PSD plot on channel 46

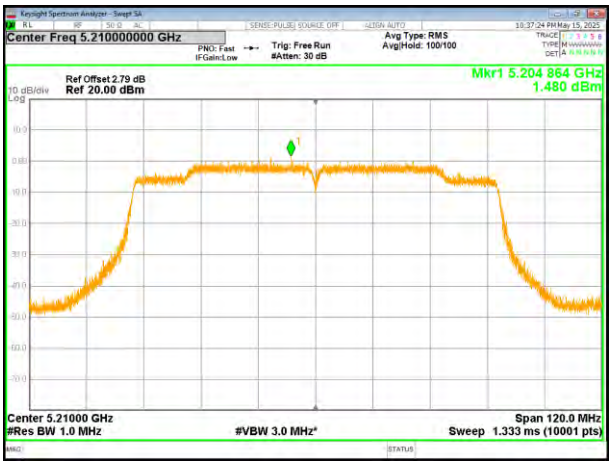
(802.11ac20) PSD plot on channel 48



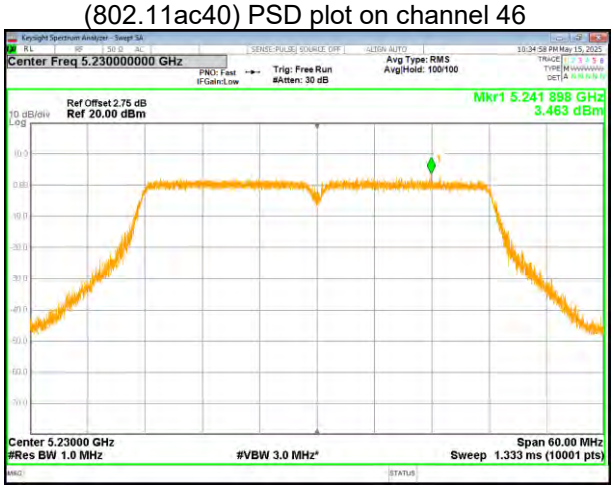
(802.11ac40) PSD plot on channel 38



(802.11ac80) PSD plot on channel 42



(802.11ac40) PSD plot on channel 46

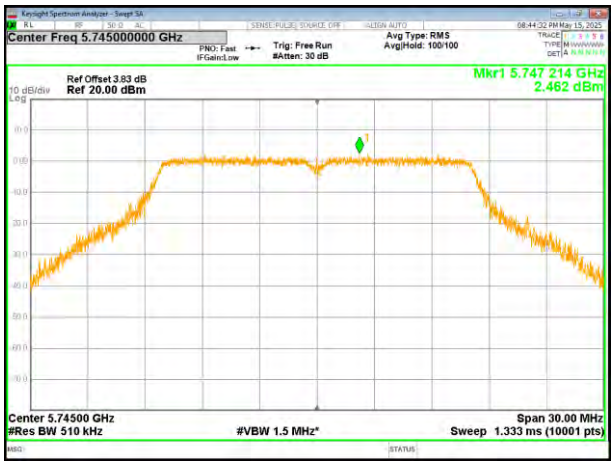


Mode	Frequency	Measured Power Density (dBm/510KHz)	Measured Power Density (dBm/500KHz)	Correction Factor (dB)	Total Measured Power Density (dBm/500KHz)	Limit (dBm/MHz)
802.11 a	5745 MHz	2.462	2.376	0.680	3.056	30
	5785 MHz	2.810	2.724	0.680	3.404	30
	5825 MHz	2.522	2.436	0.680	3.116	30
802.11 n20	5745 MHz	1.829	1.743	0.730	2.473	30
	5785 MHz	1.748	1.662	0.730	2.392	30
	5825 MHz	2.946	2.860	0.730	3.590	30
802.11ac20	5745 MHz	2.879	2.793	0.210	3.003	30
	5785 MHz	3.616	3.530	0.210	3.740	30
	5825 MHz	3.503	3.417	0.210	3.627	30
802.11 n40	5755 MHz	0.057	-0.029	0.370	0.341	30
	5795 MHz	-0.038	-0.124	0.370	0.246	30
802.11ac40	5755 MHz	-0.157	-0.243	0.230	-0.013	30
	5795 MHz	-0.096	-0.182	0.230	0.048	30
802.11ac80	5775 MHz	-2.668	-2.754	0.510	-2.244	30

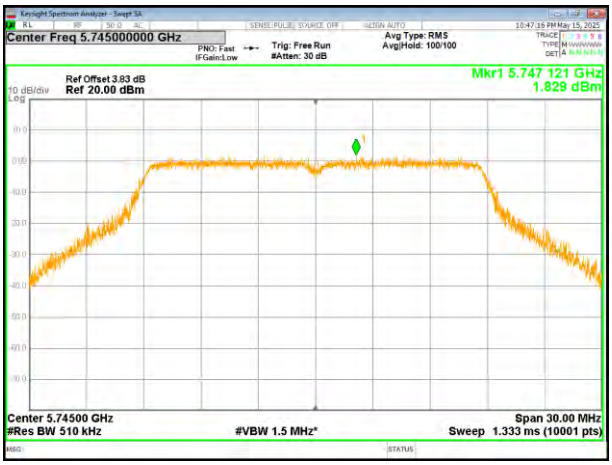
Note: 1. If the measurement is X dBm/510kHz, thus X dBm/510kHz = $(10^{X/10})$*(500 / 510) dBm/500kHz

2. Correction Factor (dB)= duty cycle factor

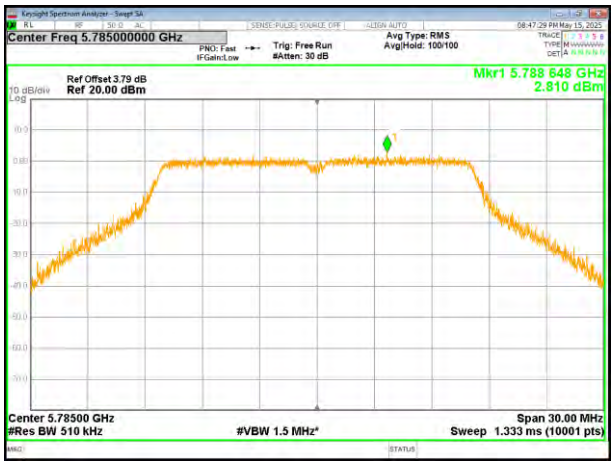
(802.11a) PSD plot on channel 149



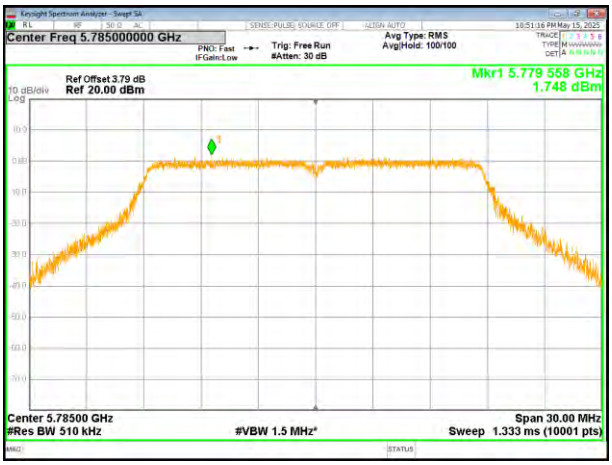
(802.11n20) PSD plot on channel 149



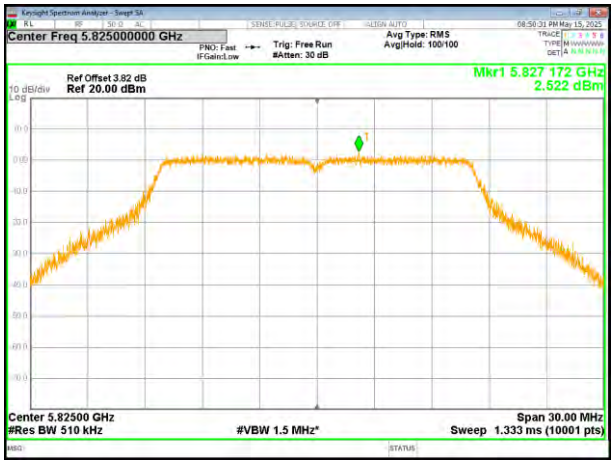
(802.11a) PSD plot on channel 157



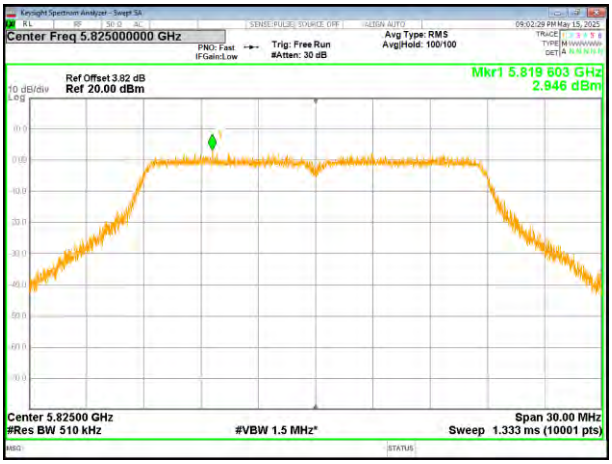
(802.11n20) PSD plot on channel 157



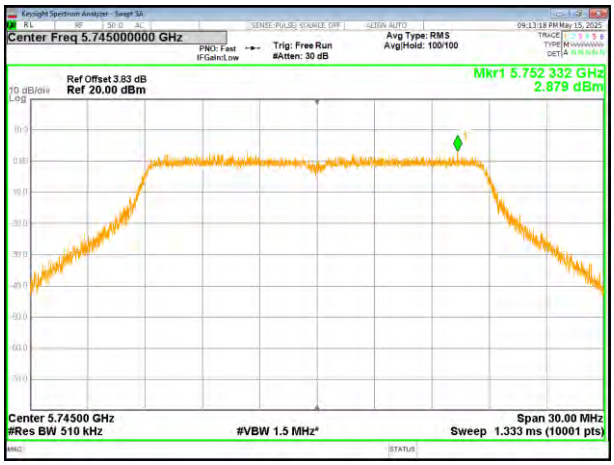
(802.11a) PSD plot on channel 165



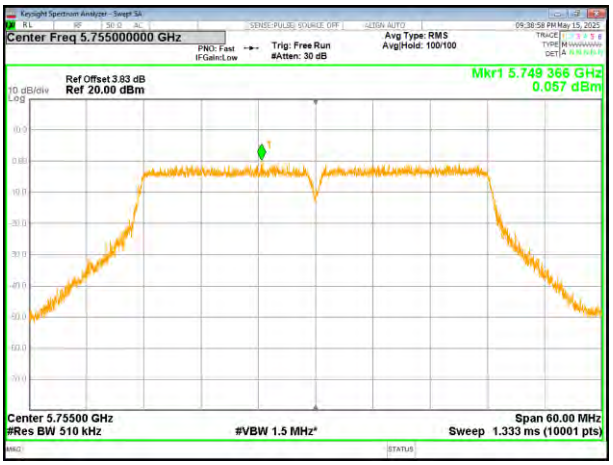
(802.11n20) PSD plot on channel 165



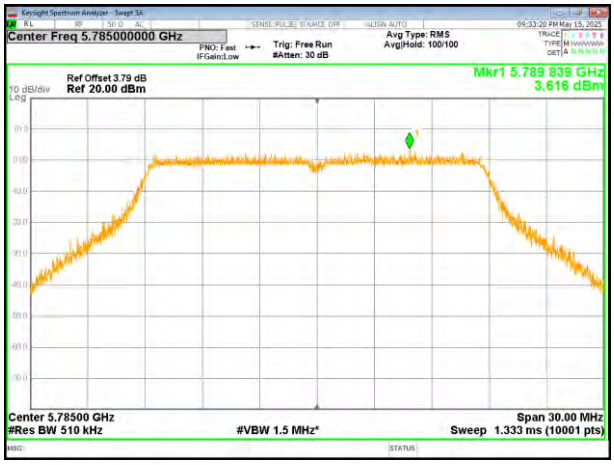
(802.11ac20) PSD plot on channel 149



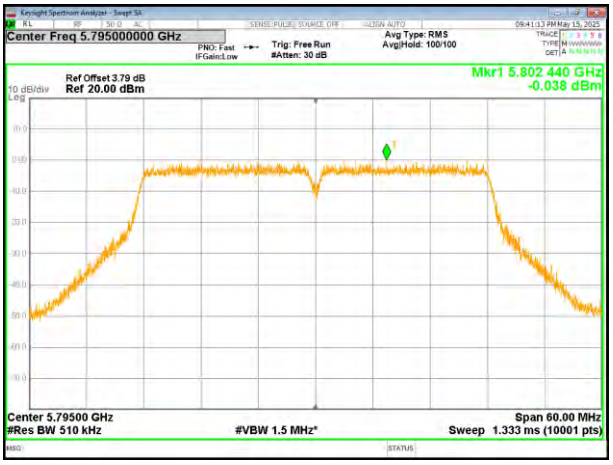
(802.11n40) PSD plot on channel 151



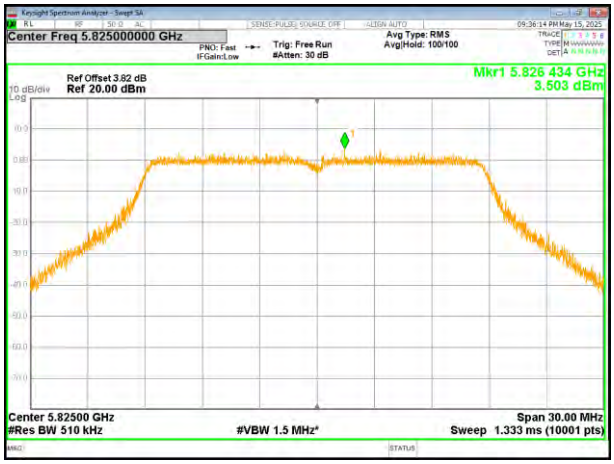
(802.11ac20) PSD plot on channel 157



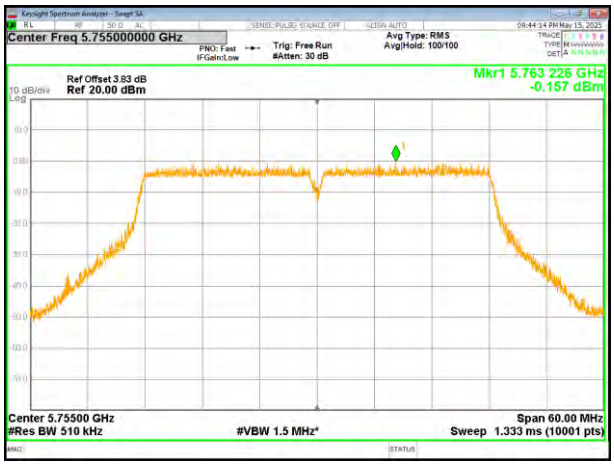
(802.11n40) PSD plot on channel 159



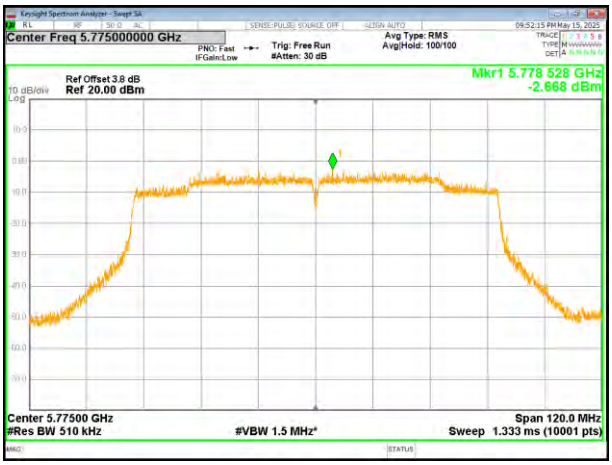
(802.11ac20) PSD plot on channel 165



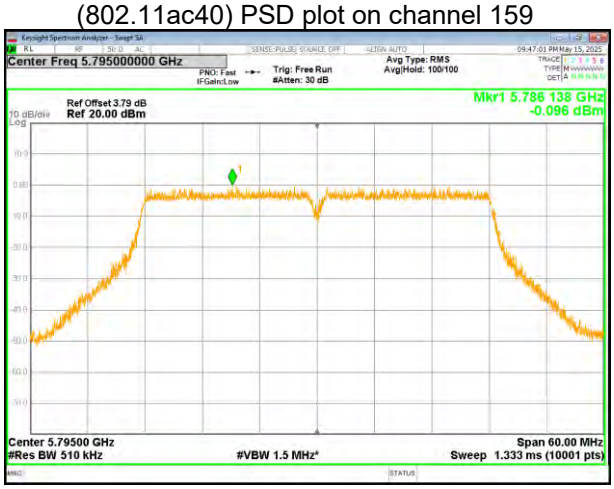
(802.11ac40) PSD plot on channel 151



(802.11ac80) PSD plot on channel 155

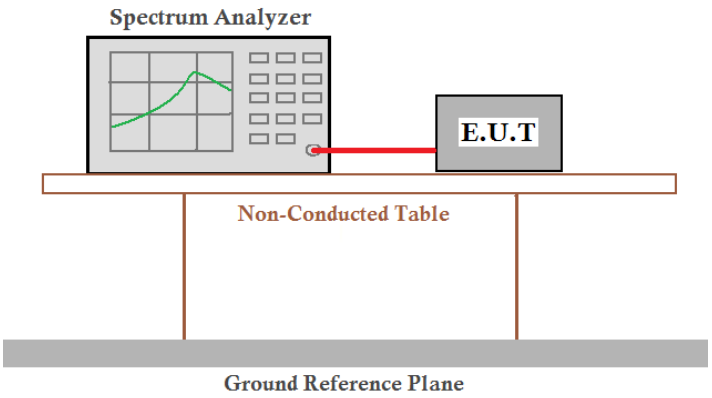


(802.11ac40) PSD plot on channel 159



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:		
Test Procedure:	1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator. 2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range. 3. Set RBW of spectrum analyzer to 1 MHz with a convenient frequency span. 4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency. 5. Repeat above procedures until all measured frequencies were complete..	
Test Instruments:	Refer to section 3.0 for details	
Test mode:	Refer to section 2.2 for details	
Test environment:	Temp.: 24.3°C	Humid.: 61%RH
Test voltage:	DC 19V From Adapter	
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

(802.11a) Band Edge, Left Side

(802.11n20) Band Edge, Left Side

(802.11a) Band Edge, Right Side

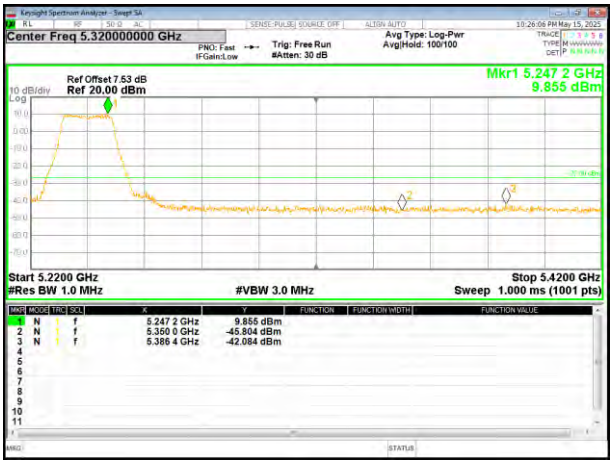
(802.11n20) Band Edge, Right Side

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

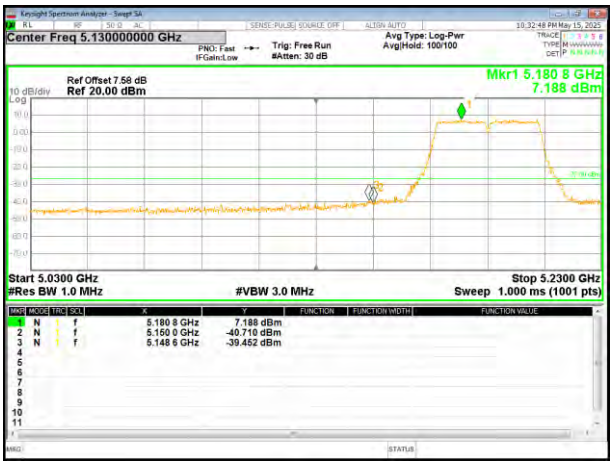
(802.11ac20) Band Edge, Right Side



(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

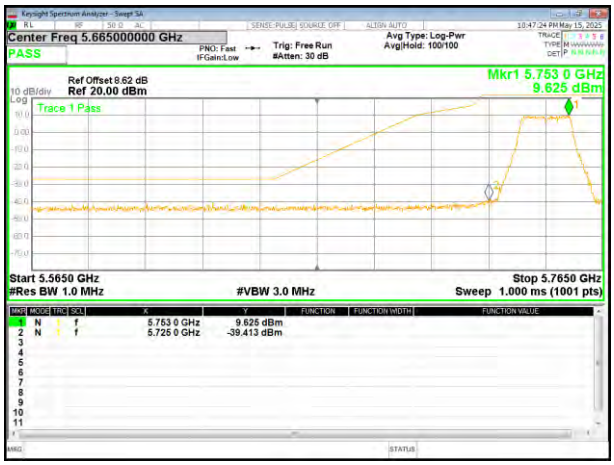
(802.11ac40) Band Edge, Right Side

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

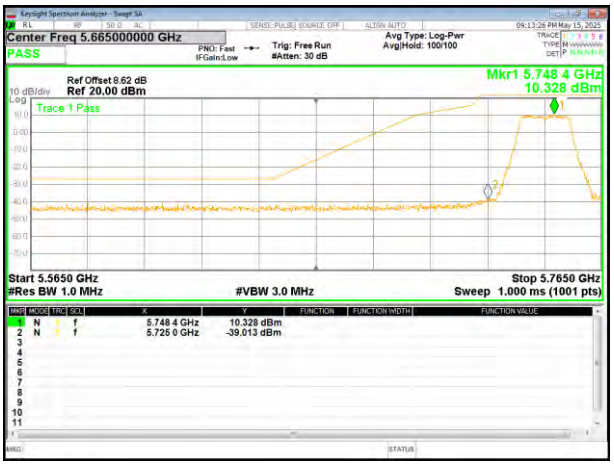


(802.11a) Band Edge, Right Side

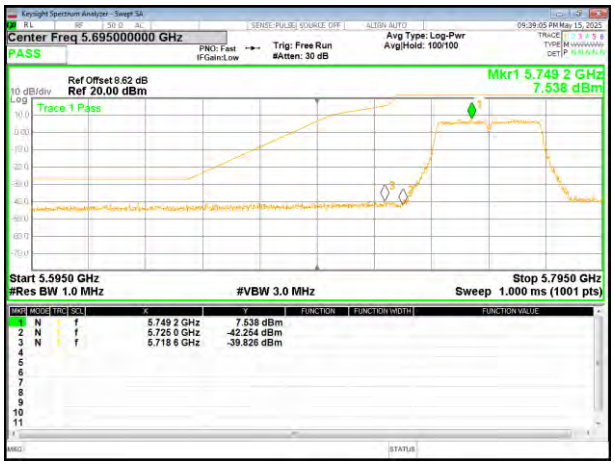
(802.11n20) Band Edge, Right Side

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

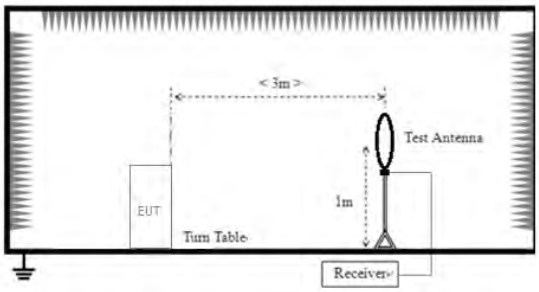
Limit:

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	

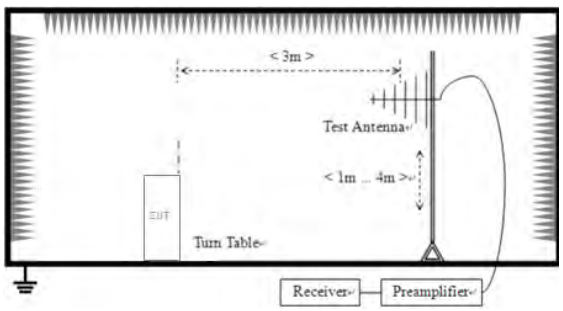
Frequency	Limit (dBm/MHz)	Remark
Above 1GHz	-27.0	Peak Value

Test setup:

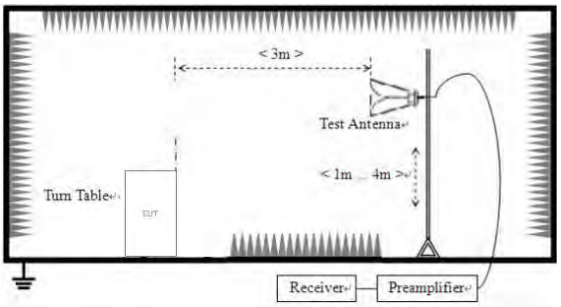
For radiated emissions from 9kHz to 30MHz



For radiated emissions from 30MHz to1GHz



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

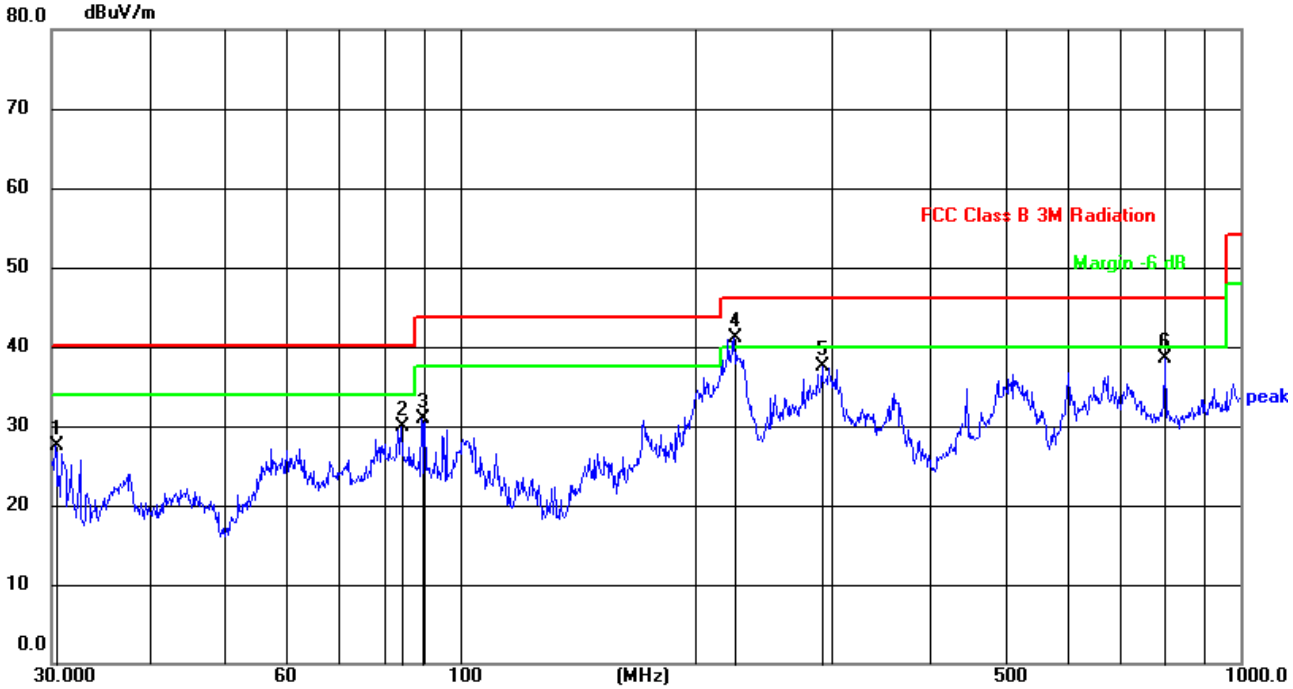
The emission from 9 kHz to 30MHz was pre-tested and found the result was 20dB lower than the limit, and according to 15.31(o) & RSS-Gen 6.13, the test result no need to reported.

Below 1GHz

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

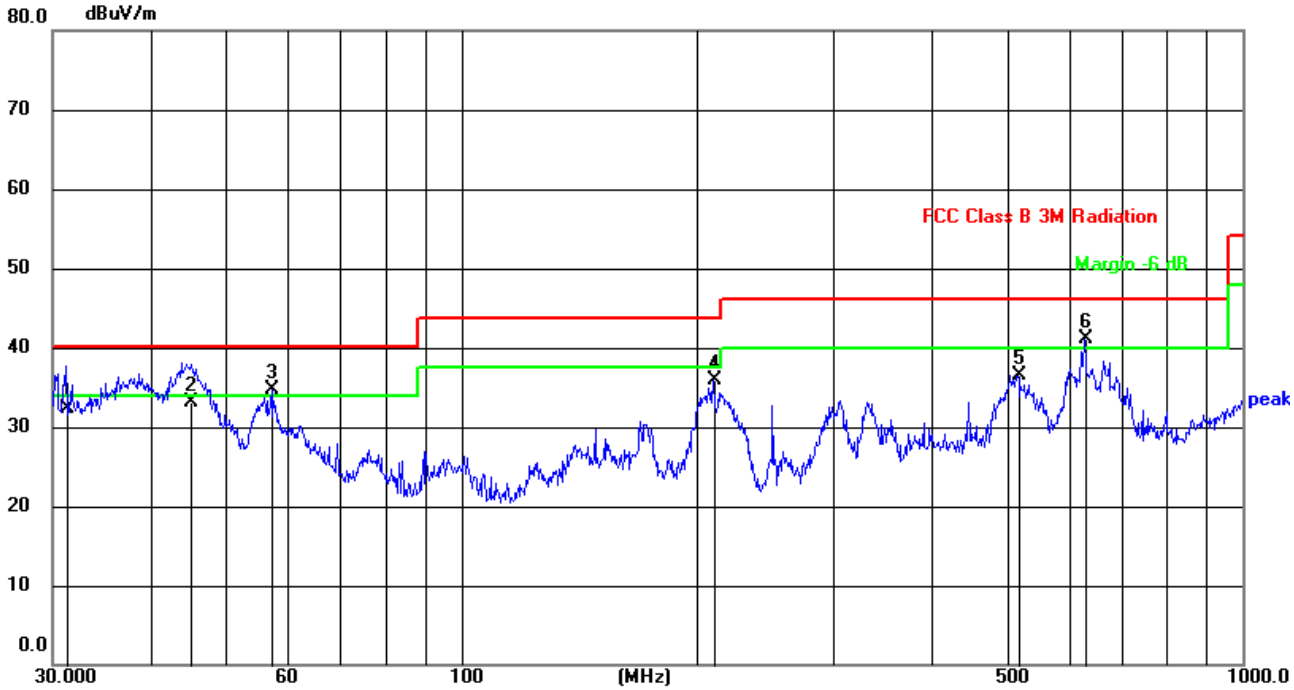
Temperature:	24.3℃	Relative Humidity:	61%
Pressure:	101.2kPar	Test Voltage :	AC 120V 60Hz
Test Mode :	5.2G TX- 802.11a(5180MHz)		

Horizontal:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	30.3173	50.26	-22.71	27.55	40.00	-12.45	QP
2	84.1100	55.60	-25.79	29.81	40.00	-10.19	QP
3	89.2764	56.30	-25.45	30.85	43.50	-12.65	QP
4	224.5193	64.38	-23.32	41.06	46.00	-4.94	QP
5	291.0360	58.33	-20.74	37.59	46.00	-8.41	QP
6	801.7863	44.98	-6.49	38.49	46.00	-7.51	QP

Vertical:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	31.1798	54.82	-22.52	32.30	40.00	-7.70	QP
2	45.0583	54.39	-21.19	33.20	40.00	-6.80	QP
3	57.1914	57.09	-22.34	34.75	40.00	-5.25	QP
4	210.0482	59.42	-23.48	35.94	43.50	-7.56	QP
5	515.4374	50.28	-13.77	36.51	46.00	-9.49	QP
6	627.2738	51.82	-10.64	41.18	46.00	-4.82	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 802.11a mode.

Temperature:	24.3℃	Relative Humidity:	61%
Pressure:	101.2kPar	Test Voltage :	AC 120V 60Hz
Test Mode :	5.2G TX- 802.11a		

Polar (H/V)	Frequency	Meter Reading	Pre-amplifier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detector Type
	MHz	dBuV	dB	dB	dB	dBuV/m	dBuV/m	dB	
Low Channel:5180MHz									
V	10360.00	43.30	46.20	8.27	38.50	43.87	68.20	-24.33	PK
V	10360.00	38.30	46.20	8.27	38.50	38.87	54.00	-15.13	AV
V	15540.00	47.32	46.30	10.35	38.70	50.07	74.00	-23.93	PK
V	15540.00	38.17	46.30	10.35	38.70	40.92	54.00	-13.08	AV
V	20720.00	50.73	57.40	11.93	37.80	43.06	68.20	-25.14	PK
V	20720.00	47.94	57.40	11.93	37.80	40.27	54.00	-13.73	AV
V	25900.00	46.70	56.50	13.45	39.70	43.35	68.20	-24.85	PK
V	25900.00	42.17	56.50	13.45	39.70	38.82	54.00	-15.18	AV
V	31080.00	44.91	56.10	16.12	41.60	46.53	68.20	-21.67	PK
V	31080.00	39.35	56.10	16.12	41.60	40.97	54.00	-13.03	AV
V	36260.00	42.34	56.80	18.29	42.80	46.63	68.20	-21.57	PK
V	36260.00	37.80	56.80	18.29	42.80	42.09	54.00	-11.91	AV
H	10360.00	42.42	46.20	8.27	38.50	42.99	68.20	-25.21	PK
H	10360.00	37.57	46.20	8.27	38.50	38.14	54.00	-15.86	AV
H	15540.00	46.73	46.30	10.35	38.70	49.48	74.00	-24.52	PK
H	15540.00	36.26	46.30	10.35	38.70	39.01	54.00	-14.99	AV
H	20720.00	50.59	57.40	11.93	37.80	42.92	68.20	-25.28	PK
H	20720.00	46.09	57.40	11.93	37.80	38.42	54.00	-15.58	AV
H	25900.00	47.82	56.50	13.45	39.70	44.47	68.20	-23.73	PK
H	25900.00	44.00	56.50	13.45	39.70	40.65	54.00	-13.35	AV
H	31080.00	44.80	56.10	16.12	41.60	46.42	68.20	-21.78	PK
H	31080.00	40.31	56.10	16.12	41.60	41.93	54.00	-12.07	AV
H	36260.00	41.40	56.80	18.29	42.80	45.69	68.20	-22.51	PK
H	36260.00	37.61	56.80	18.29	42.80	41.90	54.00	-12.10	AV

Remark:

1. Emission Level = Meter Reading + Factor,
   Factor=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.

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)	Detector Type
Middle Channel:5200MHz									
V	10400.00	43.14	46.20	8.27	38.50	43.71	68.20	-24.49	PK
V	10400.00	38.11	46.20	8.27	38.50	38.68	54.00	-15.32	AV
V	15600.00	45.24	46.30	10.35	38.40	47.69	74.00	-26.31	PK
V	15600.00	35.28	46.30	10.35	38.40	37.73	54.00	-16.27	AV
V	20800.00	49.92	57.40	11.93	37.80	42.25	68.20	-25.95	PK
V	20800.00	45.28	57.40	11.93	37.80	37.61	54.00	-16.39	AV
V	26000.00	46.17	56.50	13.45	39.80	42.92	68.20	-25.28	PK
V	26000.00	42.15	56.50	13.45	39.80	38.90	54.00	-15.10	AV
V	31200.00	44.58	56.10	16.12	41.60	46.20	68.20	-22.00	PK
V	31200.00	40.21	56.10	16.12	41.60	41.83	54.00	-12.17	AV
V	36400.00	42.02	56.80	18.29	42.80	46.31	68.20	-21.89	PK
V	36400.00	37.31	56.80	18.29	42.80	41.60	54.00	-12.40	AV
H	10400.00	43.09	46.20	8.27	38.50	43.66	68.20	-24.54	PK
H	10400.00	39.14	46.20	8.27	38.50	39.71	54.00	-14.29	AV
H	15600.00	45.98	46.30	10.35	38.40	48.43	74.00	-25.57	PK
H	15600.00	35.79	46.30	10.35	38.40	38.24	54.00	-15.76	AV
H	20800.00	49.29	57.40	11.93	37.80	41.62	68.20	-26.58	PK
H	20800.00	44.69	57.40	11.93	37.80	37.02	54.00	-16.98	AV
H	26000.00	45.80	56.50	13.45	39.80	42.55	68.20	-25.65	PK
H	26000.00	41.53	56.50	13.45	39.80	38.28	54.00	-15.72	AV
H	31200.00	44.71	56.10	16.12	41.60	46.33	68.20	-21.87	PK
H	31200.00	39.83	56.10	16.12	41.60	41.45	54.00	-12.55	AV
H	36400.00	42.78	56.80	18.29	42.80	47.07	68.20	-21.13	PK
H	36400.00	37.77	56.80	18.29	42.80	42.06	54.00	-11.94	AV

Remark:

1. Emission Level = Meter Reading + Factor,
   Factor=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.

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)	Detector Type
High Channel:5240MHz									
V	10480.00	41.40	46.20	8.27	38.60	42.07	68.20	-26.13	PK
V	10480.00	36.88	46.20	8.27	38.60	37.55	54.00	-16.45	AV
V	15720.00	44.92	46.30	10.35	38.40	47.37	74.00	-26.63	PK
V	15720.00	34.88	46.30	10.35	38.40	37.33	54.00	-16.67	AV
V	20960.00	50.32	57.40	11.93	37.50	42.35	68.20	-25.85	PK
V	20960.00	45.64	57.40	11.93	37.50	37.67	54.00	-16.33	AV
V	26200.00	47.47	56.50	13.45	40.10	44.52	68.20	-23.68	PK
V	26200.00	43.10	56.50	13.45	40.10	40.15	54.00	-13.85	AV
V	31440.00	45.07	56.10	16.12	41.30	46.39	68.20	-21.81	PK
V	31440.00	40.40	56.10	16.12	41.30	41.72	54.00	-12.28	AV
V	36680.00	41.15	56.80	18.29	43.10	45.74	68.20	-22.46	PK
V	36680.00	36.58	56.80	18.29	43.10	41.17	54.00	-12.83	AV
H	10480.00	40.35	46.20	8.27	38.60	41.02	68.20	-27.18	PK
H	10480.00	35.85	46.20	8.27	38.60	36.52	54.00	-17.48	AV
H	15720.00	45.15	46.30	10.35	38.40	47.60	74.00	-26.40	PK
H	15720.00	34.85	46.30	10.35	38.40	37.30	54.00	-16.70	AV
H	20960.00	49.83	57.40	11.93	37.50	41.86	68.20	-26.34	PK
H	20960.00	45.55	57.40	11.93	37.50	37.58	54.00	-16.42	AV
H	26200.00	44.57	56.50	13.45	40.10	41.62	68.20	-26.58	PK
H	26200.00	39.79	56.50	13.45	40.10	36.84	54.00	-17.16	AV
H	31440.00	44.04	56.10	16.12	41.30	45.36	68.20	-22.84	PK
H	31440.00	39.65	56.10	16.12	41.30	40.97	54.00	-13.03	AV
H	36680.00	42.12	56.80	18.29	43.10	46.71	68.20	-21.49	PK
H	36680.00	37.73	56.80	18.29	43.10	42.32	54.00	-11.68	AV

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

Temperature:	24.3℃	Relative Humidity:	61%
Pressure:	101.2kPar	Test Voltage :	AC 120V 60Hz
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)	Detector Typ
Low Channel:5745MHz									
V	11490.00	45.67	46.10	8.77	39.10	47.44	74.00	-26.56	PK
V	11490.00	35.49	46.10	8.77	39.10	37.26	54.00	-16.74	AV
V	17235.00	40.86	47.60	11.10	38.70	43.06	68.20	-25.14	PK
V	17235.00	36.15	47.60	11.10	38.70	38.35	54.00	-15.65	AV
V	22980.00	53.46	56.90	12.73	37.70	46.99	74.00	-27.01	PK
V	22980.00	43.09	56.90	12.73	37.70	36.62	54.00	-17.38	AV
V	28725.00	44.39	55.60	14.25	40.30	43.34	68.20	-24.86	PK
V	28725.00	40.30	55.60	14.25	40.30	39.25	54.00	-14.75	AV
V	34470.00	43.34	55.90	17.26	42.10	46.80	68.20	-21.40	PK
V	34470.00	38.48	55.90	17.26	42.10	41.94	54.00	-12.06	AV
H	11490.00	45.24	46.10	8.77	39.10	47.01	74.00	-26.99	PK
H	11490.00	35.36	46.10	8.77	39.10	37.13	54.00	-16.87	AV
H	17235.00	40.78	47.60	11.10	38.70	42.98	68.20	-25.22	PK
H	17235.00	36.03	47.60	11.10	38.70	38.23	54.00	-15.77	AV
H	22980.00	52.63	56.90	12.73	37.70	46.16	74.00	-27.84	PK
H	22980.00	43.44	56.90	12.73	37.70	36.97	54.00	-17.03	AV
H	28725.00	45.68	55.60	14.25	40.30	44.63	68.20	-23.57	PK
H	28725.00	41.75	55.60	14.25	40.30	40.70	54.00	-13.30	AV
H	34470.00	43.29	55.90	17.26	42.10	46.75	68.20	-21.45	PK
H	34470.00	38.59	55.90	17.26	42.10	42.05	54.00	-11.95	AV

Remark:

1. Emission Level = Meter Reading + Factor,
   Factor=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.

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)	Detector Type
Middle Channel:5785MHz									
V	11570.00	46.18	46.10	8.77	39.10	47.95	74.00	-26.05	PK
V	11570.00	36.55	46.10	8.77	39.10	38.32	54.00	-15.68	AV
V	17355.00	40.48	47.60	11.10	38.70	42.68	68.20	-25.52	PK
V	17355.00	36.53	47.60	11.10	38.70	38.73	54.00	-15.27	AV
V	23140.00	55.10	56.90	12.73	37.70	48.63	74.00	-25.37	PK
V	23140.00	45.02	56.90	12.73	37.70	38.55	54.00	-15.45	AV
V	28925.00	45.78	55.60	14.25	40.30	44.73	68.20	-23.47	PK
V	28925.00	41.16	55.60	14.25	40.30	40.11	54.00	-13.89	AV
V	34710.00	42.34	55.90	17.26	42.40	46.10	68.20	-22.10	PK
V	34710.00	38.02	55.90	17.26	42.40	41.78	54.00	-12.22	AV
H	11570.00	45.45	46.10	8.77	39.10	47.22	74.00	-26.78	PK
H	11570.00	35.78	46.10	8.77	39.10	37.55	54.00	-16.45	AV
H	17355.00	40.87	47.60	11.10	38.70	43.07	68.20	-25.13	PK
H	17355.00	36.42	47.60	11.10	38.70	38.62	54.00	-15.38	AV
H	23140.00	56.19	56.90	12.73	37.70	49.72	74.00	-24.28	PK
H	23140.00	45.97	56.90	12.73	37.70	39.50	54.00	-14.50	AV
H	28925.00	44.96	55.60	14.25	40.30	43.91	68.20	-24.29	PK
H	28925.00	41.18	55.60	14.25	40.30	40.13	54.00	-13.87	AV
H	34710.00	42.62	55.90	17.26	42.40	46.38	68.20	-21.82	PK
H	34710.00	38.26	55.90	17.26	42.40	42.02	54.00	-11.98	AV

Remark:

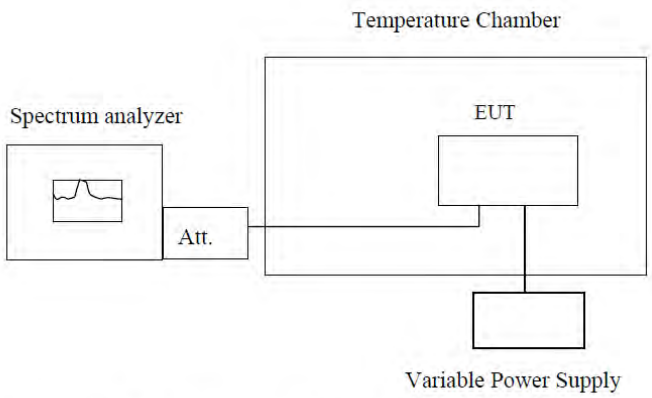
1. Emission Level = Meter Reading + Factor,
   Factor=Antenna Factor + Cable Loss – Pre-amplifier
   Margin= Emission Level – Limit
2. If peak below the average limit, the average emission was no test.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible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

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)	Detector Type
High Channel:5825MHz									
V	11650.00	46.70	46.10	8.77	39.10	48.47	74.00	-25.53	PK
V	11650.00	36.51	46.10	8.77	39.10	38.28	54.00	-15.72	AV
V	17475.00	38.80	47.90	11.23	38.90	41.03	68.20	-27.17	PK
V	17475.00	34.67	47.90	11.23	38.90	36.90	54.00	-17.10	AV
V	23300.00	49.84	57.10	12.73	37.80	43.27	68.20	-24.93	PK
V	23300.00	45.24	57.10	12.73	37.80	38.67	54.00	-15.33	AV
V	29125.00	45.73	55.80	14.25	40.50	44.68	68.20	-23.52	PK
V	29125.00	40.97	55.80	14.25	40.50	39.92	54.00	-14.08	AV
V	34950.00	41.86	56.30	17.91	42.50	45.97	68.20	-22.23	PK
V	34950.00	37.87	56.30	17.91	42.50	41.98	54.00	-12.02	AV
H	11650.00	45.68	46.10	8.77	39.10	47.45	74.00	-26.55	PK
H	11650.00	35.89	46.10	8.77	39.10	37.66	54.00	-16.34	AV
H	17475.00	40.68	47.90	11.23	38.90	42.91	68.20	-25.29	PK
H	17475.00	36.01	47.90	11.23	38.90	38.24	54.00	-15.76	AV
H	23300.00	50.63	57.10	12.73	37.80	44.06	68.20	-24.14	PK
H	23300.00	46.92	57.10	12.73	37.80	40.35	54.00	-13.65	AV
H	29125.00	44.76	55.80	14.25	40.50	43.71	68.20	-24.49	PK
H	29125.00	39.85	55.80	14.25	40.50	38.80	54.00	-15.20	AV
H	34950.00	42.53	56.30	17.91	42.50	46.64	68.20	-21.56	PK
H	34950.00	37.47	56.30	17.91	42.50	41.58	54.00	-12.42	AV

Remark:

1. Emission Level = Meter Reading + Factor,
   Factor=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.

4.9 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: DC19 V					
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	5179.977	5179.986	5180.044	5180.008
	5190	5189.971	5189.997	5190.045	5190.007
	5200	5199.984	5199.988	5200.036	5200.001
	5210	5209.988	5209.989	5300.046	5209.991
	5220	5219.974	5219.996	5220.037	5220.001
	5230	5229.967	5230.014	5230.058	5299.999
	5240	5179.977	5179.986	5240.036	5240.003
-20	5180	5179.769	5179.986	5180.045	5179.998
	5190	5199.941	5189.997	5190.036	5189.999
	5200	5199.939	5199.988	5200.044	5199.990
	5210	5209.994	5209.989	5210.037	5299.998
	5220	5219.983	5219.996	5220.058	5219.990
	5230	5229.970	5230.014	5230.036	5230.011
	5240	5239.987	5239.986	5240.054	5239.989
-10	5180	5179.992	5179.997	5180.045	5179.960
	5190	5189.988	5189.998	5190.036	5189.990
	5200	5199.983	5199.989	5200.044	5200.015
	5210	5209.989	5299.997	5210.037	5209.999
	5220	5219.984	5219.989	5220.058	5219.990
	5230	5229.982	5230.010	5230.036	5230.018
	5240	5239.955	5239.988	5240.054	5240.006
0	5180	5179.983	5179.959	5180.044	5180.008
	5190	5189.974	5189.989	5190.045	5190.007
	5200	5199.982	5200.014	5200.036	5200.001
	5210	5209.974	5209.998	5300.046	5209.991
	5220	5219.995	5219.989	5220.037	5220.001
	5230	5229.973	5230.017	5230.058	5299.999
	5240	5239.991	5240.005	5240.036	5240.003
10	5180	5179.971	5179.998	5180.045	5180.008
	5190	5189.982	5189.989	5190.036	5180.008
	5200	5199.973	5199.997	5200.044	5190.004
	5210	5209.974	5209.989	5210.037	5199.999
	5220	5219.981	5220.010	5220.058	5210.005
	5230	5229.999	5229.988	5230.036	5220.000
	5240	5239.971	5240.006	5240.054	5229.998
20	5180	5179.992	5179.997	5180.045	5179.960
	5190	5189.988	5189.998	5190.036	5189.990

	5200	5199.983	5199.989	5200.044	5200.015
	5210	5209.989	5299.997	5210.037	5209.999
	5220	5219.984	5219.989	5220.058	5219.990
	5230	5229.982	5230.010	5230.036	5230.018
	5240	5239.955	5239.988	5240.054	5240.006
30	5180	5179.992	5179.997	5180.045	5179.960
	5190	5189.988	5189.998	5190.036	5189.990
	5200	5199.983	5199.989	5200.044	5200.015
	5210	5209.989	5299.997	5210.037	5209.999
	5220	5219.984	5219.989	5220.058	5219.990
	5230	5229.982	5230.010	5230.036	5230.018
	5240	5239.955	5239.988	5240.054	5240.006
40	5180	5179.982	5179.986	5180.045	5179.998
	5190	5189.983	5189.997	5190.036	5189.999
	5200	5199.974	5199.988	5200.044	5199.990
	5210	5299.982	5209.989	5210.037	5299.998
	5220	5219.974	5219.996	5220.058	5219.990
	5230	5229.995	5230.014	5230.036	5230.011
	5240	5239.973	5239.986	5240.054	5239.989
50	5180	5179.944	5179.997	5180.033	5180.123
	5190	5189.974	5189.998	5190.044	5199.998
	5200	5199.999	5199.989	5200.035	5200.023
	5210	5209.983	5299.997	5210.037	5210.001
	5220	5219.974	5219.989	5220.044	5220.016
	5230	5230.002	5230.010	5230.062	5230.009
	5240	5239.990	5239.988	5240.034	5240.017

Frequency stability versus Voltage					
Temperature: 25°C					
Power Supply (VDC)	Operating Frequency (MHz)	0 minute	2 minute	5 minute	10 minute
		Measured Frequency (MHz)	Measured Frequency (MHz)	Measured Frequency (MHz)	Measured Frequency (MHz)
DC16.15V	5180	5179.977	5179.986	5180.054	5180.004
	5190	5189.971	5189.997	5190.050	5189.990
	5200	5199.984	5199.988	5200.045	5199.991
	5210	5209.988	5209.989	5210.052	5210.013
	5220	5219.974	5219.996	5220.047	5219.999
	5230	5229.967	5230.014	5230.045	5230.009
	5240	5180.107	5180.002	5180.045	5179.987
DC19V	5180	5199.982	5189.996	5190.036	5189.998
	5190	5200.007	5199.996	5200.044	5199.989
	5200	5209.985	5210.008	5210.037	5209.990
	5210	5220.000	5219.999	5220.058	5219.997
	5220	5229.993	5300.002	5230.036	5230.015
	5230	5240.001	5239.999	5240.054	5240.000
	5240	5180.107	5180.002	5180.045	5179.987
DC21.85V	5180	5189.982	5179.998	5180.044	5179.998
	5190	5199.973	5189.989	5190.045	5189.999
	5200	5209.974	5199.997	5200.036	5199.990
	5210	5219.981	5209.989	5300.046	5299.998
	5220	5229.999	5220.010	5220.037	5219.990
	5230	5239.984	5229.988	5230.058	5230.011
	5240	5179.971	5240.006	5240.036	5239.989

Frequency stability versus Temp.					
Power Supply: DC 19V					
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	5745	5745.005	5744.981	5744.673	5744.968
	5755	5744.953	5754.997	5755.057	5754.990
	5775	5754.975	5774.996	5775.058	5774.999
	5785	5774.984	5784.999	5785.061	5784.990
	5795	5784.976	5795.010	5795.045	5795.001
	5825	5794.987	5824.991	5825.041	5825.004
-20	5745	5744.970	5744.981	5745.054	5744.991
	5755	5754.995	5754.997	5755.056	5755.017
	5775	5774.976	5774.996	5775.059	5775.013
	5785	5784.986	5784.999	5785.051	5784.997
	5795	5794.984	5795.010	5795.043	5794.986
	5825	5824.994	5824.991	5825.052	5824.921
-10	5745	5744.975	5744.992	5745.038	5745.055
	5755	5754.982	5754.999	5755.063	5744.620
	5775	5774.974	5775.016	5775.044	5755.004
	5785	5784.967	5784.992	5785.053	5775.005
	5795	5794.974	5794.988	5795.052	5785.008
	5825	5824.903	5824.991	5825.062	5794.991
0	5745	5744.970	5744.991	5745.043	5744.991
	5755	5754.995	5755.008	5755.050	5754.998
	5775	5774.976	5775.009	5775.042	5775.015
	5785	5784.986	5784.991	5785.034	5784.991
	5795	5794.984	5795.008	5795.042	5794.987
	5825	5824.994	5825.006	5824.971	5824.990
10	5745	5744.976	5744.991	5745.044	5744.990
	5755	5754.983	5754.998	5755.051	5754.979
	5775	5775.000	5774.990	5775.068	5774.990
	5785	5784.977	5784.982	5785.044	5784.997
	5795	5794.973	5794.989	5795.041	5795.015
	5825	5824.976	5824.918	5825.044	5825.007
20	5745	5744.986	5745.016	5745.054	5744.990
	5755	5755.000	5754.988	5755.068	5755.009
	5775	5774.985	5775.011	5775.053	5774.989
	5785	5784.973	5785.011	5785.040	5785.016
	5795	5794.967	5795.002	5795.035	5795.008
	5825	5825.001	5825.017	5825.069	5825.017
30	5745	5744.965	5745.002	5745.038	5745.001
	5755	5754.981	5755.004	5755.063	5755.015
	5775	5774.980	5775.007	5775.044	5775.000
	5785	5784.984	5784.999	5785.053	5784.987
	5795	5794.995	5794.990	5795.052	5794.981
	5825	5824.976	5824.999	5825.062	5825.015
40	5745	5744.986	5744.991	5745.038	5744.985
	5755	5754.988	5755.008	5755.063	5755.010
	5775	5774.991	5775.009	5775.044	5774.991
	5785	5784.984	5784.991	5785.053	5785.000

	5795	5794.975	5795.008	5795.052	5794.998
	5825	5824.984	5825.006	5825.062	5825.008
50	5745	5744.970	5744.991	5745.043	5744.991
	5755	5754.995	5755.008	5755.050	5754.998
	5775	5774.976	5775.009	5775.042	5775.015
	5785	5784.986	5784.991	5785.034	5784.991
	5795	5794.984	5795.008	5795.042	5794.987
	5825	5824.994	5825.006	5824.971	5824.990

Frequency stability versus Voltage					
Temperature: 25°C					
Power Supply (VDC)	Operating Frequency (MHz)	0 minute	2 minute	5 minute	10 minute
		Measured Frequency (MHz)	Measured Frequency (MHz)	Measured Frequency (MHz)	Measured Frequency (MHz)
DC16.15V	5745	5744.970	5744.991	5745.043	5744.991
	5755	5754.995	5755.008	5755.050	5754.998
	5775	5774.976	5775.009	5775.042	5775.015
	5785	5784.986	5784.991	5785.034	5784.991
	5795	5794.984	5795.008	5795.042	5794.987
	5825	5824.994	5825.006	5824.971	5824.990
DC19V	5745	5744.976	5745.002	5745.043	5745.015
	5755	5754.983	5755.004	5755.060	5754.987
	5775	5775.000	5775.007	5775.061	5775.010
	5785	5784.977	5784.999	5785.043	5785.010
	5795	5794.973	5794.990	5795.061	5795.001
	5825	5824.976	5824.999	5825.059	5825.016
DC21.85V	5745	5744.986	5744.970	5745.021	5744.990
	5755	5754.988	5754.941	5755.043	5754.997
	5775	5774.991	5774.965	5775.052	5774.989
	5785	5784.984	5784.966	5785.043	5784.981
	5795	5794.975	5794.956	5795.055	5794.988
	5825	5824.984	5824.977	5825.058	5824.917

5 Test Setup Photo

Reference to the file No.: ET-25041201SP for details.

6 EUT Constructional Details

Reference to the file No.: ET-25041201EP and ET-25041201IP for details.

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