Report No.: ET-25051440E03

TEST REPORT

Applicant:	Shenzhen Haosi Mutual Technology Co., LTD
Address of Applicant:	401, Building P, No. 10, East of Shangxue Technology City, Bantian, Longgang District, Shenzhen,China
Manufacturer:	Shenzhen Haosi Mutual Technology Co., LTD
Address of Manufacturer:	401, Building P, No. 10, East of Shangxue Technology City, Bantian, Longgang District, Shenzhen,China
Product Name:	laptop
Model No.:	HS156-1, HS156
Trade Mark:	N/A
FCC ID:	2BPZ4-HS156
Applicable standards:	CFR Title 47 Part 15.407
Date of Test:	May.22, 2025-Jun.06, 2025
Date of report issued:	Jun.09, 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

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Compiled by:	Reviewed by:	Approved by:
Project Engineer	Project Manager	Authorized Signature

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Report Revision History		
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Contents

Page

1 TEST SUMMARY 4

MEASUREMENT UNCERTAINTY 4

2 GENERAL INFORMATION 5

2.1 GENERAL DESCRIPTION OF EUT 5
2.2 TEST MODE 7
2.3 DESCRIPTION OF SUPPORT UNITS 7
2.4 TEST FACILITY 7
2.5 ADDITIONAL INSTRUCTIONS 7
2.6 BLOCK DIAGRAM DISPLAYING THE CONFIGURATION OF THE TESTED SYSTEM 8

3 TEST INSTRUMENTS LIST 9

4 TEST RESULTS AND MEASUREMENT DATA 10

4.1 ANTENNA REQUIREMENT 10
4.2 CONDUCTED EMISSIONS 11
4.3 DUTY CYCLE 14
4.4 CONDUCTED OUTPUT POWER 18
4.5 BANDWIDTH 20
4.6 POWER SPECTRAL DENSITY 28
4.7 BAND EDGE 37
4.7.1 Conducted test Method 37
4.8 SPURIOUS EMISSION 44
4.8.1 Radiated Emission Method 44
4.9 FREQUENCY STABILITY 54

5 TEST SETUP PHOTO 60

6 EUT CONSTRUCTIONAL DETAILS 60

1 Test Summary

Test Item	Section	Result	Test by
Antenna requirement	47CRF part 15.203	Pass	/
AC Power Line Conducted Emission	47CRF part 15.207	Pass	Jason Huang
Conducted Output Power	47CRF part 15.407 (a)(1)/(a)(3)	Pass	Kara Wu
26dB Bandwidth and 99% Occupied Bandwidth	47CRF part 15.407 (a)(12)	Pass	Kara Wu
6dB Bandwidth	47CRF part 15.407 (e)	Pass	Kara Wu
Power Spectral Density	47CRF part 15.407(a)(1)/(a)(3)	Pass	Kara Wu
Band Edge	47CRF part 15.407(b)(1)/(b)(4)	Pass	Kara Wu
Spurious Emission	47CRF part 15.205/15.209 47CRF part 15.407(b)(1)/(b)(4)/(b)(8)	Pass	Jason Huang
Frequency Stability	47CRF part 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"

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)
Duty Cycle	0.03%	(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:	laptop
Model No.:	HS156-1, HS156
Difference of model(s)	All the model are the same circuit and RF module, except the model names.
Test Model:	HS156-1
Hardware Version:	P142.1
Software Version:	21H2
Sample(s) Status:	Engineer sample
Operation Frequency:	☒5180-5240MHz for 802.11a/n20/ac20; 5190-5230MHz for 802.11n40/ac40; 5210MHz for 802.11ac80 ☒5745-5825 MHz for 802.11a/n20/ac20; 5755-5795 MHz for 802.11n40)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/802.11n20/ 802.11ac20/ : 20MHz 802.11n(HT40)/ 802.11ac40 : 40MHz 802.11ac(VHT80) : 80MHz
Data Rate	802.11a: 6,9,12,18,24,36,48,54Mbps; 802.11n(20/40):MCS0-MCS15; 802.11ac(20/40/80):NSS1, MCS0-MCS9
Modulation technology:	Orthogonal Frequency Division Multiplexing (OFDM) with BPSK/QPSK/16QAM/64QAM/256QAM/1024QAM
Antenna Type:	FPCB antenna
Antenna gain:	3.66 dBi (Note: Antenna information is provided by applicant, Testing lab is not responsible for the accuracy of the information.)
Power supply:	7.6VDC From battery or 20VDC from adapter with 100-240Vac
Battery	Model:DC507091-2S1P 7.6V/5000mAh
Adapter Model:	Model:M120250-A060 Input:100-240Vac 50/60Hz Output:12Vdc 2.5A

For more details, refer to the user's manual of the EUT.

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 /n20/ac20/	802.11 n40/ac40/	802.11ac80
Lowest channel	5180	5190	5210
Middle channel	5200		
Highest channel	5240	5230	

Test channel	**Frequency (MHz)**		
	802.11 a /n20/ac20	802.11 n40/ac40	802.11ac80
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 max duty cycle.)
Remark: For battery operated equipment, the EUT was performed using a new DC 7.6V battery.	

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 20CH36/CH40/CH48 802.11a / n 20/ac 20CH149/CH157/CH165
Mode 2	802.11n40/CH38/CH46 802.11n 40CH 151/CH159
Mode 3	802.11 ac80 CH 42/CH155
Mode 4	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/ac20CH36/ CH40/ CH 48 802.11a/n 20/ac 20CH149/ CH157/ CH165
Mode 2	802.11n40CH38/ CH46 802.11n40CH 151/CH159
Mode 3	802.11 ac80 CH 42/CH155

Note: 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	mouse	DELL	MS116	/
2	keyboard	DELL	KB216t	/

2.4 Test Facility

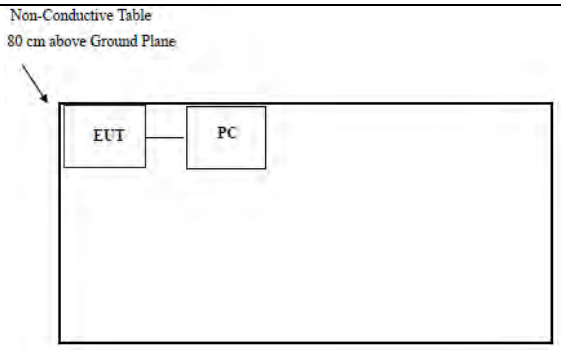
Test laboratory:	Shenzhen ETR Standard Technology Co., Ltd.
CNAS Registration Number:	L11864
A2LA Certificate Number:	6640.01
FCC Designation Number:	CN1326
FCC Test Firm Registration:	183064
IC Company Number:	28440
IC CAB identifier:	CN0132
Laboratory location:	No.103, No.10, Phase I, Zone 3, Xinxing Industrial Park, Xinhe, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

2.5 Additional Instructions

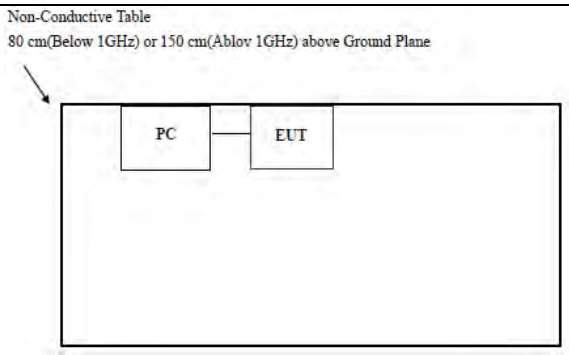
Test Software	DRTU.EXE(VERSION:0.0.0.0)
Power level setup	Default

2.6 Block diagram displaying the configuration of the tested system

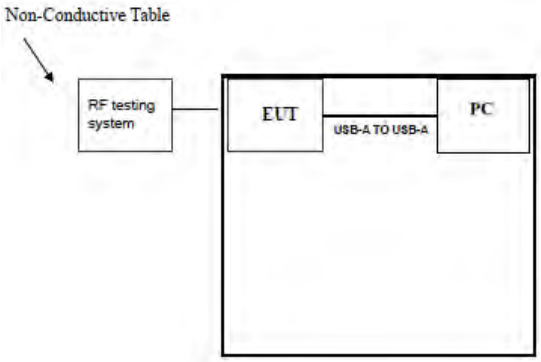
Conducted emission



Radiated emission



RF test



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:	47CRF Part 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.

EUT Antenna:

The antenna is FPCB antenna, the best case gain of the is 3.66dBi, reference to the below for details .

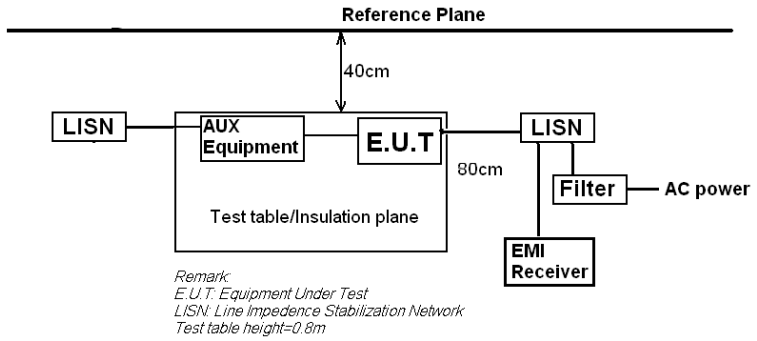
4.2 Conducted Emissions

Test Requirement:	47CRF Part 15.207
Test Method:	ANSI C63.10:2013
Test Frequency Range:	150KHz to 30MHz
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:



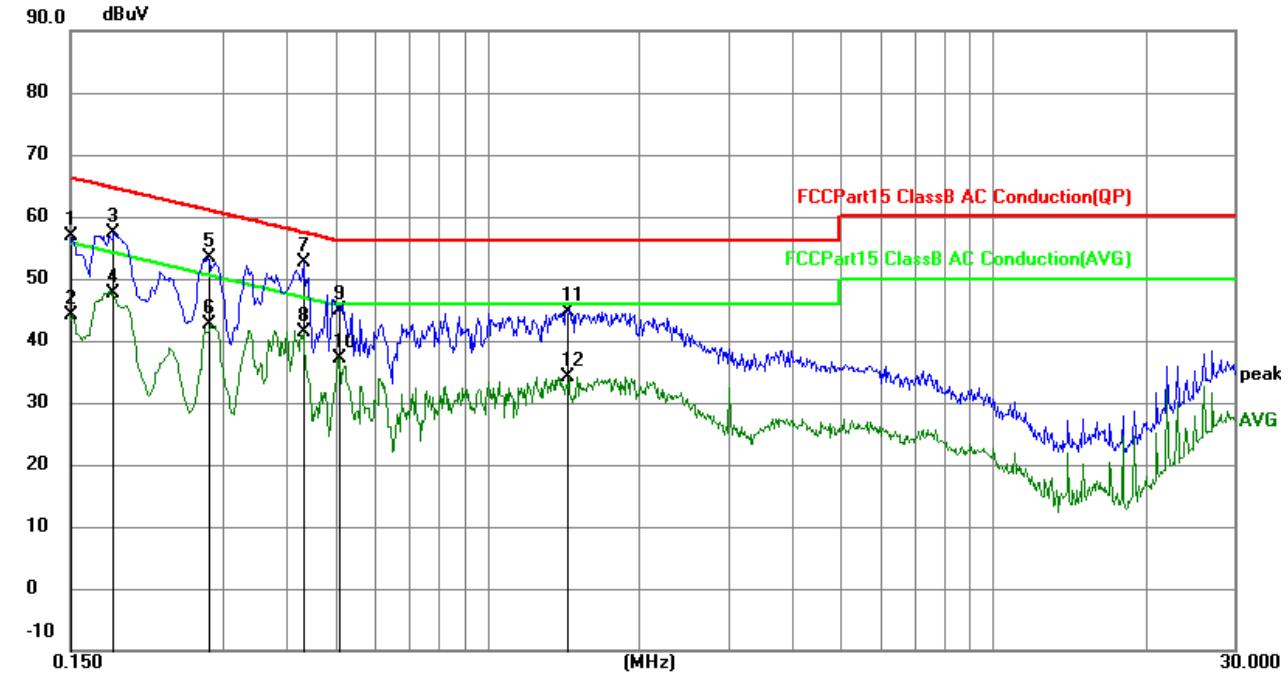
Test procedure:	1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment. 2. The peripheral devices are also connected to the main power through a LISN that provides 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.:	22.9°C	Humid.:	55%	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 (802.11n20 5200MHz)

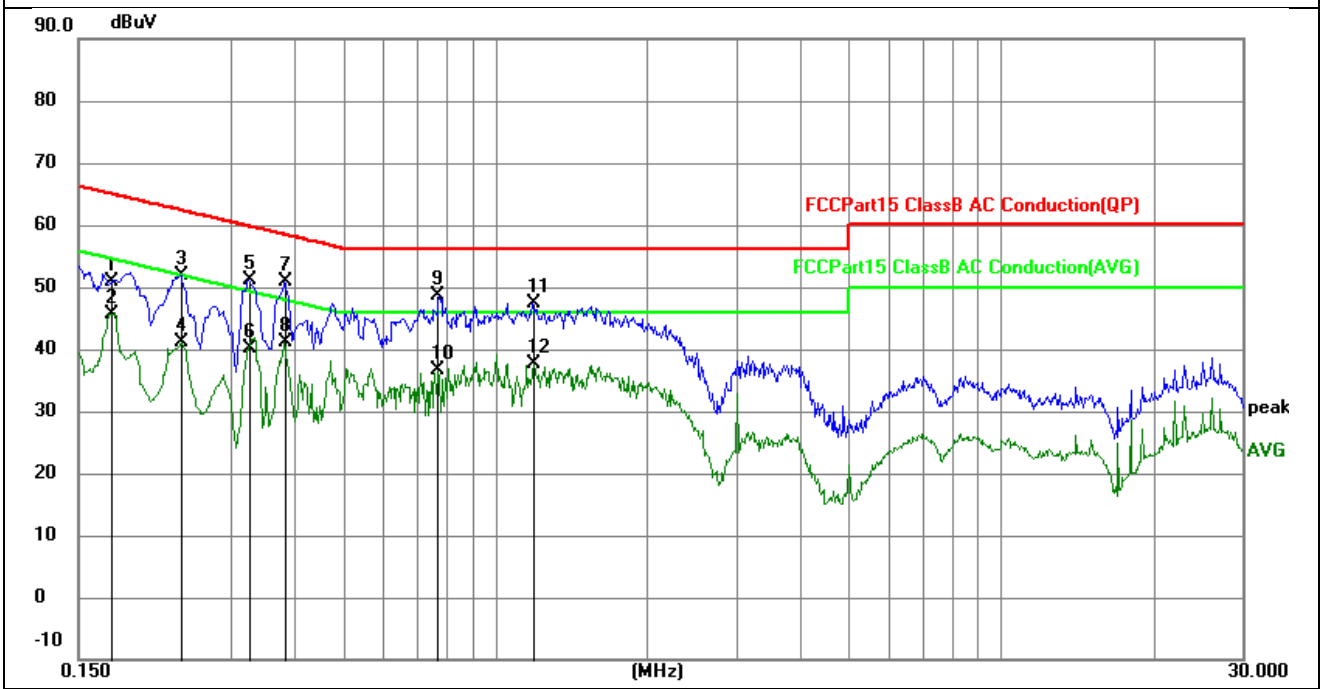
Measurement Result

Line:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1500	46.99	9.80	56.79	66.00	-9.21	QP
2	0.1500	34.29	9.80	44.09	56.00	-11.91	AVG
3	0.1824	47.46	9.81	57.27	64.38	-7.11	QP
4	0.1824	37.94	9.81	47.75	54.38	-6.63	AVG
5	0.2805	43.59	9.84	53.43	60.80	-7.37	QP
6	0.2805	32.78	9.84	42.62	50.80	-8.18	AVG
7	0.4334	42.67	9.91	52.58	57.19	-4.61	QP
8	0.4334	31.41	9.91	41.32	47.19	-5.87	AVG
9	0.5100	35.05	9.94	44.99	56.00	-11.01	QP
10	0.5100	27.15	9.94	37.09	46.00	-8.91	AVG
11	1.4369	34.82	9.91	44.73	56.00	-11.27	QP
12	1.4369	24.19	9.91	34.10	46.00	-11.90	AVG

Neutral:

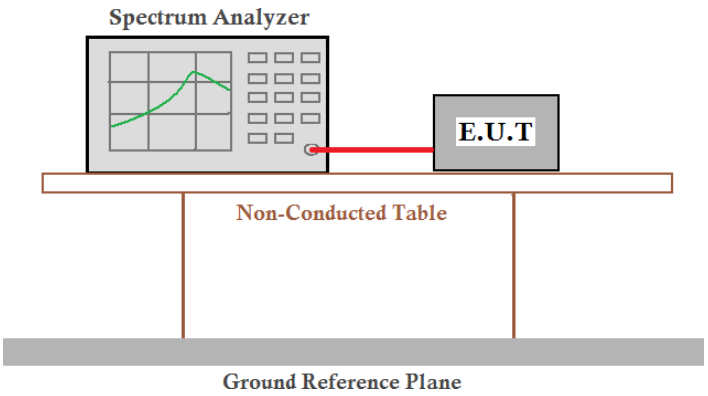


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1748	41.09	9.81	50.90	64.73	-13.83	QP
2	0.1748	35.90	9.81	45.71	54.73	-9.02	AVG
3	0.2400	42.10	9.82	51.92	62.10	-10.18	QP
4	0.2400	31.31	9.82	41.13	52.10	-10.97	AVG
5	0.3255	41.34	9.87	51.21	59.57	-8.36	QP
6	0.3255	30.23	9.87	40.10	49.57	-9.47	AVG
7	0.3840	40.92	9.89	50.81	58.19	-7.38	QP
8	0.3840	31.21	9.89	41.10	48.19	-7.09	AVG
9	0.7710	38.59	9.96	48.55	56.00	-7.45	QP
10	0.7710	26.55	9.96	36.51	46.00	-9.49	AVG
11	1.1894	37.49	9.94	47.43	56.00	-8.57	QP
12	1.1894	27.64	9.94	37.58	46.00	-8.42	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.: 23.5°C	Humid.:62%RH
Test voltage:	7.6VDC	
Test results:	Pass	

Measurement Result

5180-5240MHz

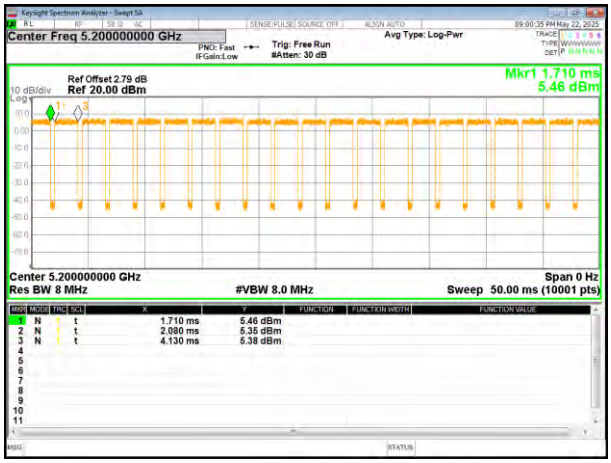
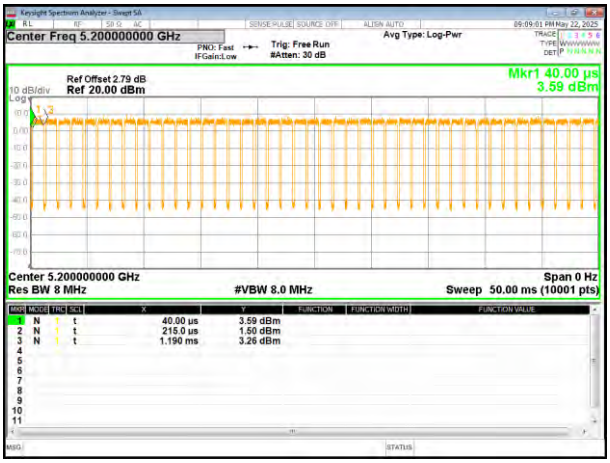
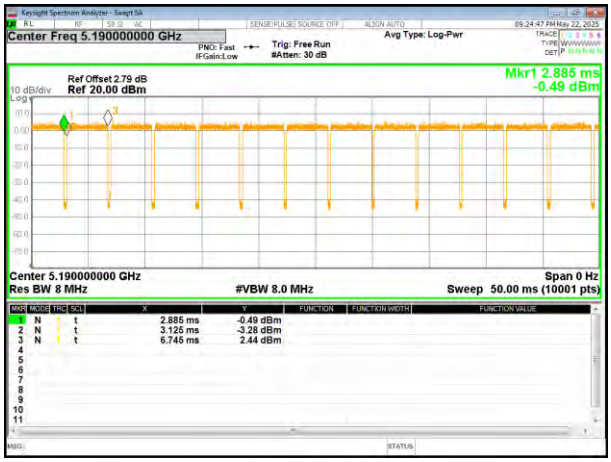
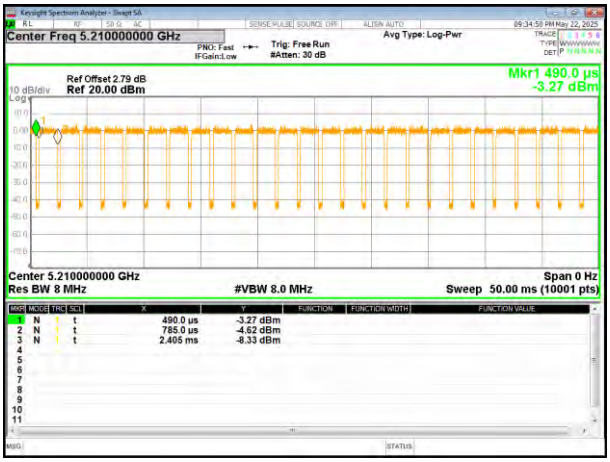
Mode	Duty cycle (%)	Correction Factor (dB)
TX 802.11a Mode	84.71	0.72
TX 802.11n20 Mode	84.78	0.72
TX 802.11ac20 Mode	84.48	0.73
TX 802.11n40 Mode	84.23	0.75
TX 802.11a40 Mode	93.78	0.28
TX 802.11ac80 Mode	84.60	0.73

5745-5825 MHz

Mode	Duty cycle (%)	Correction Factor (dB)
TX 802.11a Mode	85.42	0.68
TX 802.11n20 Mode	82.61	0.83
TX 802.11ac20 Mode	97.40	0.11
TX 802.11n40 Mode	94.74	0.23
TX 802.11ac40 Mode	92.31	0.35
TX 802.11ac80 Mode	85.00	0.71

Test plot

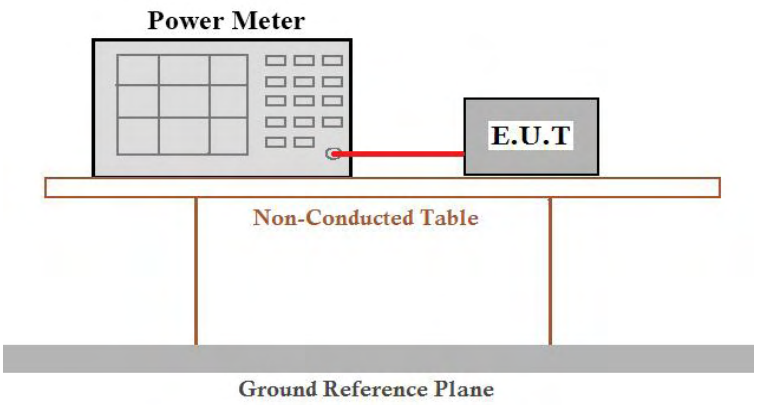
5180-5240MHz

(802.11a) plot	(802.11 n20) plot
	
(802.11ac20) plot	(802.11 n40) plot
(802.11 ac40) plot	(802.11 ac80) plot
	

5745-5825 MHz

(802.11a) plot	(802.11 n20) plot
(802.11ac20) plot	(802.11 n40) plot
(802.11 ac40) plot	(802.11 ac80) plot

4.4 Conducted Output Power

Test Requirement:	47CRF Part 15.407 (a)(1)/(a)(3)	
Test Method:	KDB 789033 D02 General U-NII Test Procedures New Rules v02r01 ANSI C63.10-2013	
Limit:	For FCC: 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.: 23.5°C	Humid.: 62%RH
Test voltage:	7.6VDC	
Test results:	Pass	

Measurement Result

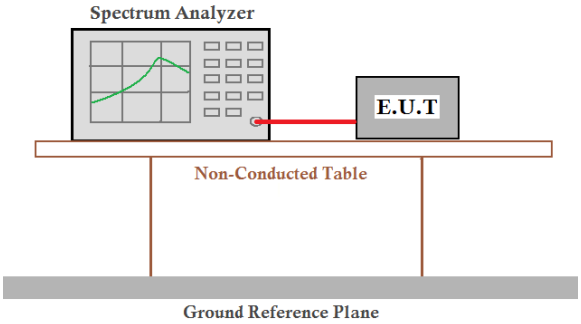
5180-5240MHz

Test Channel	Frequency	Correction Factor	Maximum output power	Total Power	LIMIT	Result
	(MHz)	(dB)	(dBm)	(dBm)	dBm	
TX 802.11a Mode						
CH36	5180	0.72	7.15	7.87	23.98	Pass
CH40	5200	0.72	7.22	7.94	23.98	Pass
CH48	5240	0.72	7.05	7.77	23.98	Pass
TX 802.11 n20 Mode						
CH36	5180	0.72	7.14	7.86	23.98	Pass
CH40	5200	0.72	7.16	7.88	23.98	Pass
CH48	5240	0.72	7.12	7.84	23.98	Pass
TX 802.11 ac20 Mode						
CH36	5180	0.73	7.07	7.80	23.98	Pass
CH40	5200	0.73	7.11	7.84	23.98	Pass
CH48	5240	0.73	7.13	7.86	23.98	Pass
TX 802.11 n40 Mode						
CH38	5190	0.75	7.07	7.82	23.98	Pass
CH46	5230	0.75	7.15	7.90	23.98	Pass
TX 802.11 ac40 Mode						
CH38	5190	0.28	7.18	7.46	23.98	Pass
CH46	5230	0.28	7.12	7.40	23.98	Pass
TX 802.11 ac80 Mode						
CH42	5210	0.73	7.08	7.81	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	6.82	7.50	30	Pass
CH157	5785	0.68	6.84	7.52	30	Pass
CH165	5825	0.68	6.83	7.51	30	Pass
TX 802.11 n20 Mode						
CH149	5745	0.83	6.29	7.12	30	Pass
CH157	5785	0.83	6.32	7.15	30	Pass
CH165	5825	0.83	6.40	7.23	30	Pass
TX 802.11 ac20 Mode						
CH149	5745	0.11	6.88	6.99	30	Pass
CH157	5785	0.11	7.03	7.14	30	Pass
CH165	5825	0.11	6.79	6.90	30	Pass
TX 802.11 n40 Mode						
CH151	5755	0.23	6.91	7.14	30	Pass
CH159	5795	0.23	6.85	7.08	30	Pass
TX 802.11 ac40 Mode						
CH151	5755	0.35	6.66	7.01	30	Pass
CH159	5795	0.35	6.71	7.06	30	Pass
TX 802.11 ac80 Mode						
CH155	5775	0.71	5.63	6.34	30	Pass

4.5 Bandwidth

Test Requirement:	47CRF Part 15.407(a)(12)&15.407(e),
Test Method:	KDB 789033 D02 General U-NII Test Procedures New Rules v02r01, ANSI C63.10:2013
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.: 23.5°C Humid.: 62%RH
Test voltage:	7.6VDC
Test results:	Pass

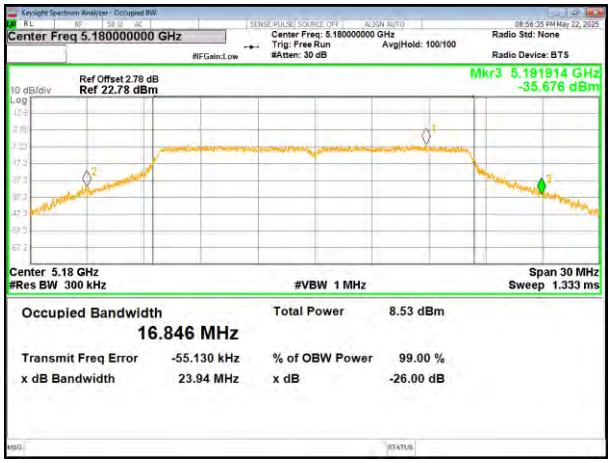
Measurement Result

5180-5240MHz

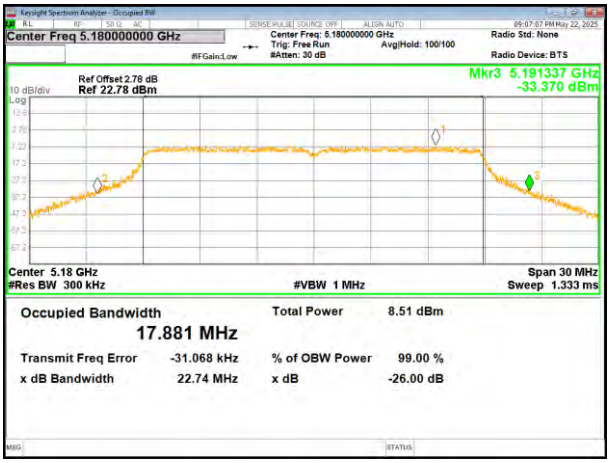
Test CH	-26dB Channel Bandwidth (MHz)						Result
	802.11a	802.11n20	802.11ac20	802.11n40	802.11ac40	802.11ac80	
Lowest	23.94	22.74	22.70	43.28	41.88	--	Pass
Middle	23.75	22.24	23.07	--	--	79.95	
Highest	24.62	22.52	22.85	43.77	42.11	--	

Remark: “---“is not applicable

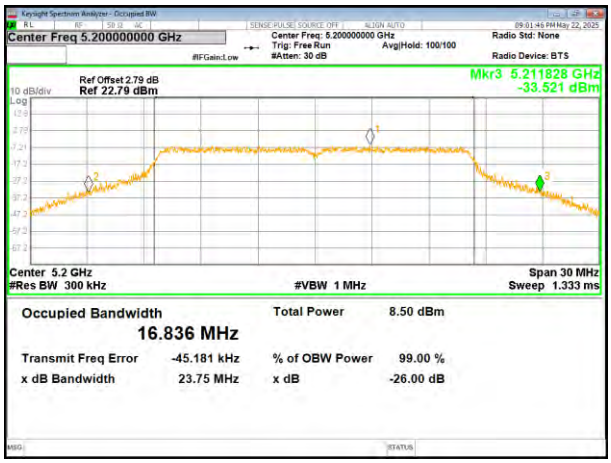
(802.11a) plot on channel 36



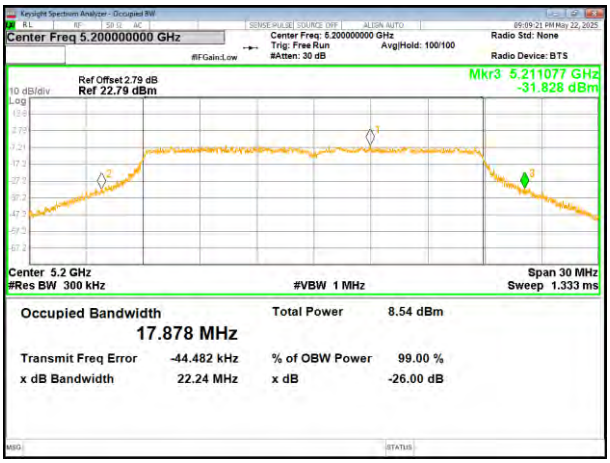
(802.11 n20) plot on channel 36



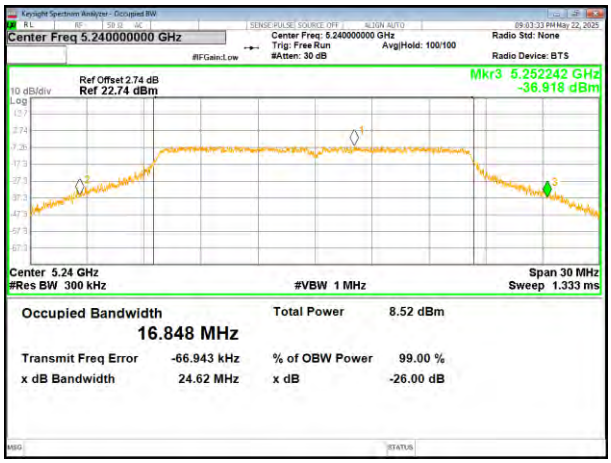
(802.11a) plot on channel 40



(802.11 n20) plot on channel 40

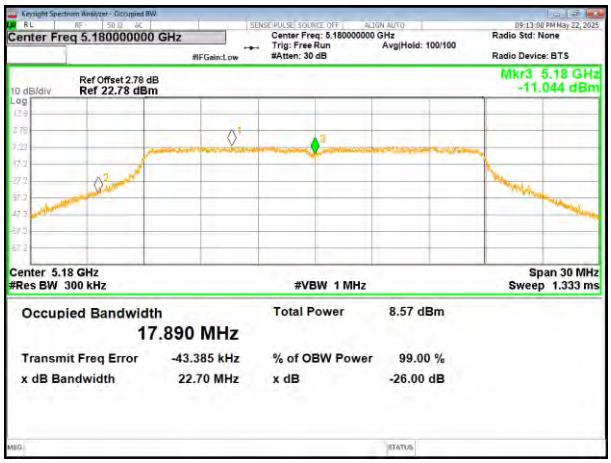


(802.11a) plot on channel 48

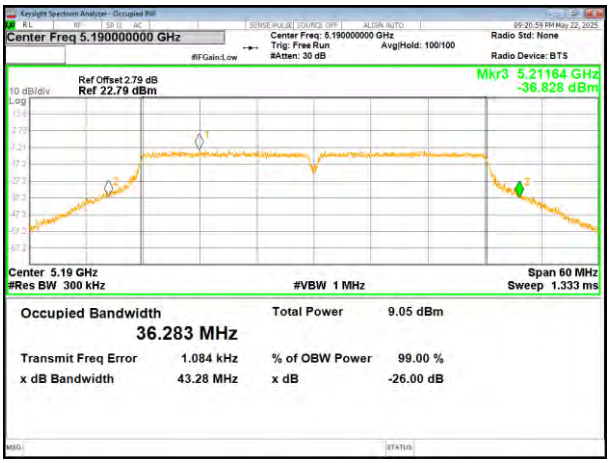


(802.11 n20) plot on channel 48

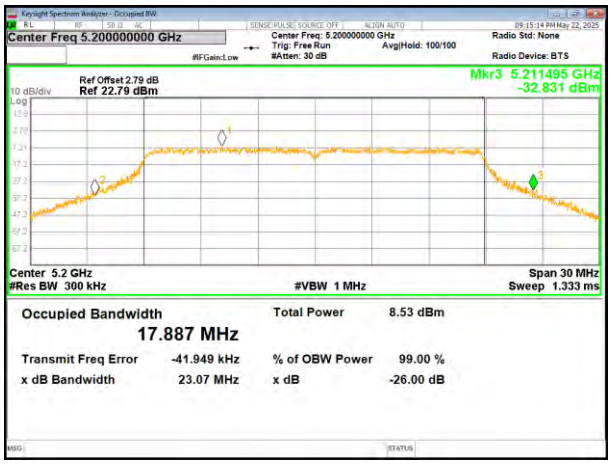
(802.11ac20) plot on channel 36



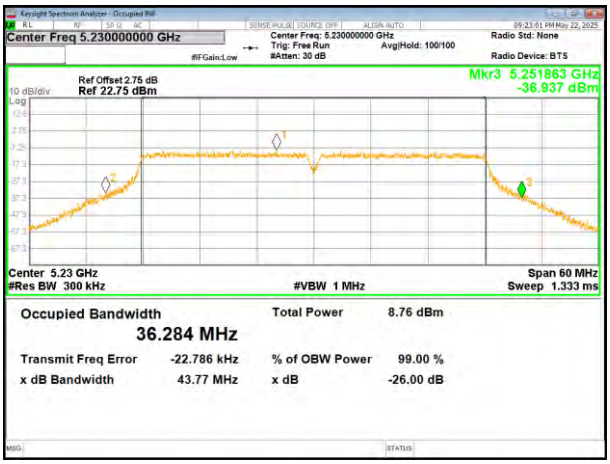
(802.11n40) plot on channel 38



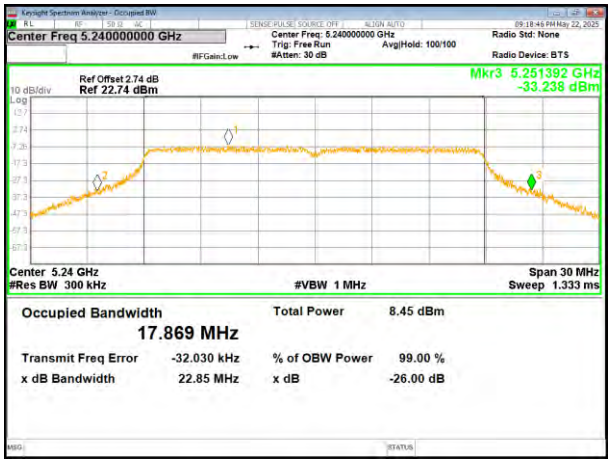
(802.11ac20) plot on channel 40



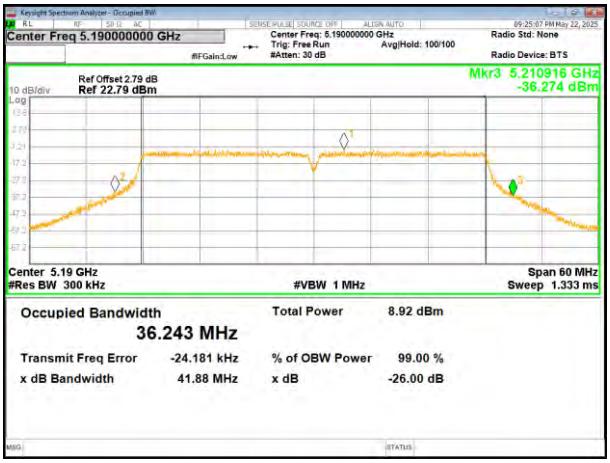
(802.11n40) plot on channel 46

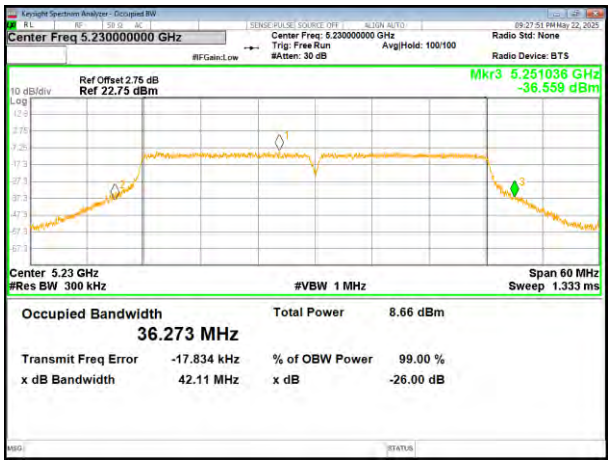
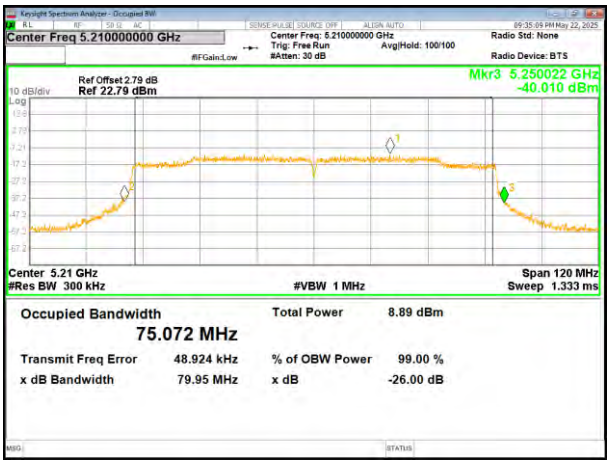


(802.11ac20) plot on channel 48



(802.11ac40) plot on channel 38



(802.11ac40) plot on channel 46	(802.11ac80) plot on channel 42
	

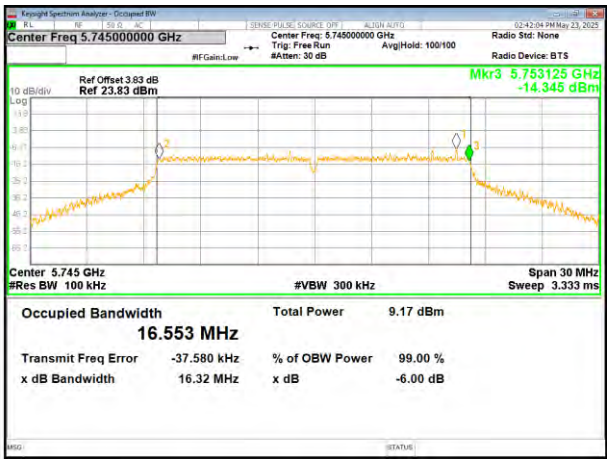
5745-5825MHz

Test CH	-6dB Channel Bandwidth (MHz)						Limit (KHz)	Result
	802.11a	802.11n 20	802.11ac 20	802.11n 40	802.11ac 40	802.11ac 80		
Lowest	16.32	17.67	17.59	36.36	36.43	--	>500	Pass
Middle	16.31	17.63	17.62	--	--	75.10		
Highest	16.34	17.64	17.66	36.42	36.33	--		

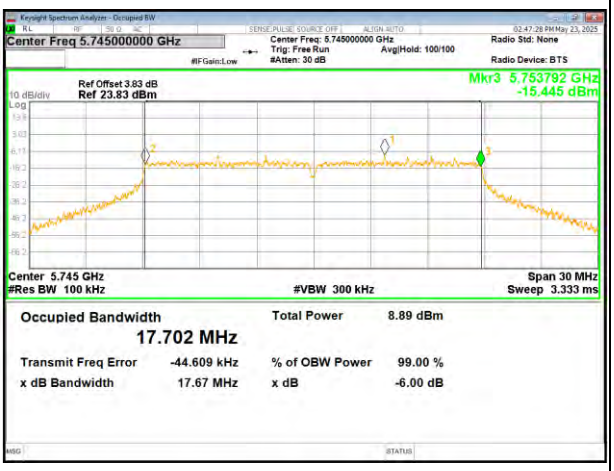
Remark: “---“is not applicable

Test plot -6dB Channel Bandwidth

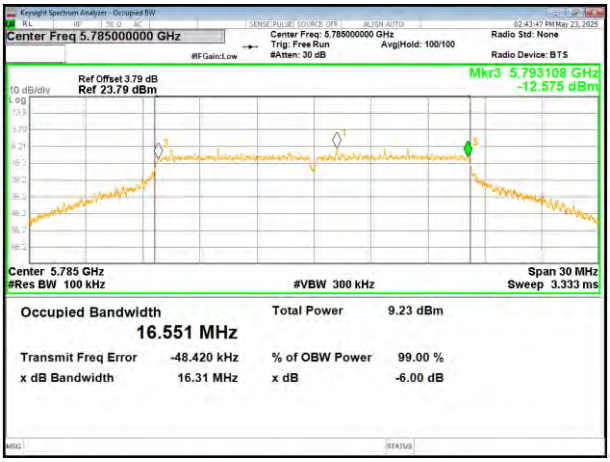
(802.11a) plot on channel 149



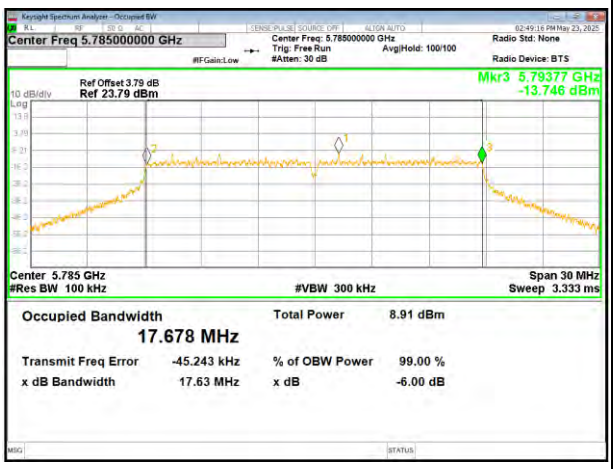
(802.11 n20) plot on channel 149



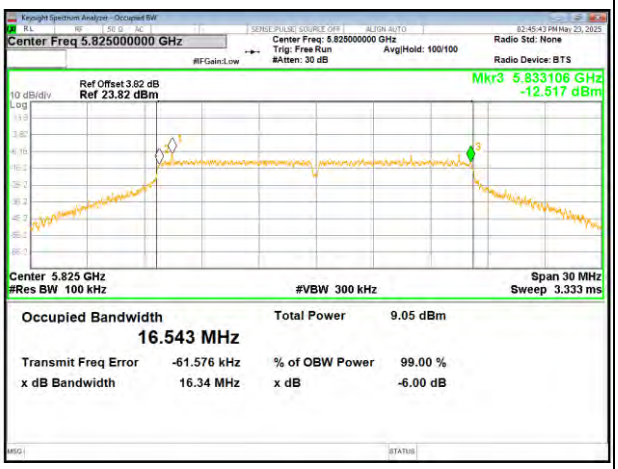
(802.11a) plot on channel 157



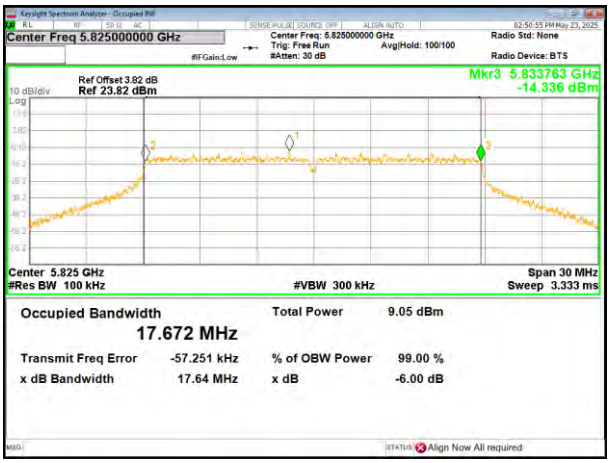
(802.11 n20) plot on channel 157



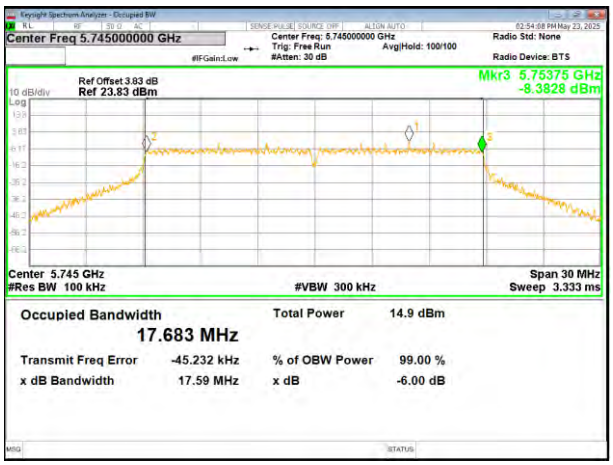
(802.11a) plot on channel 165



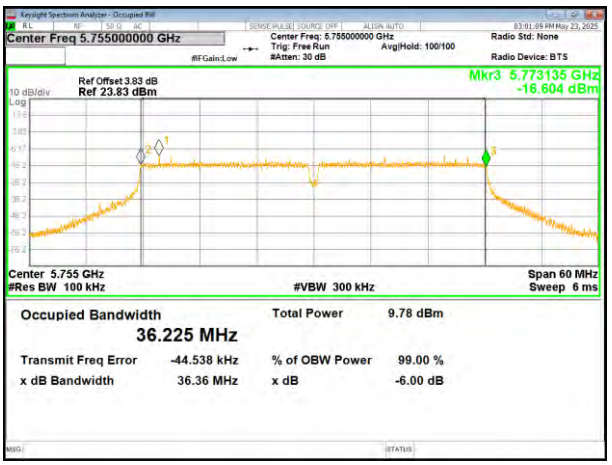
(802.11 n20) plot on channel 165



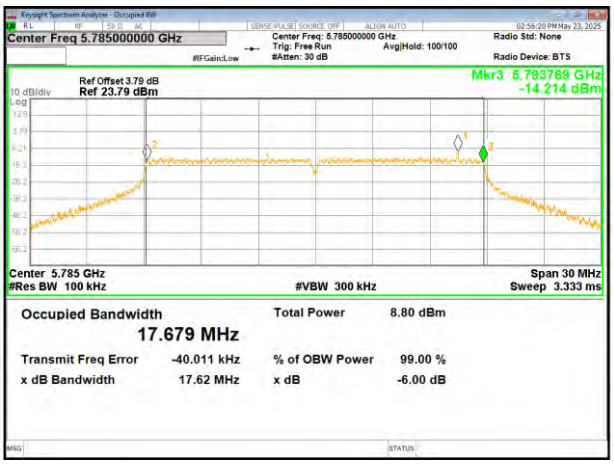
(802.11ac20) plot on channel 149



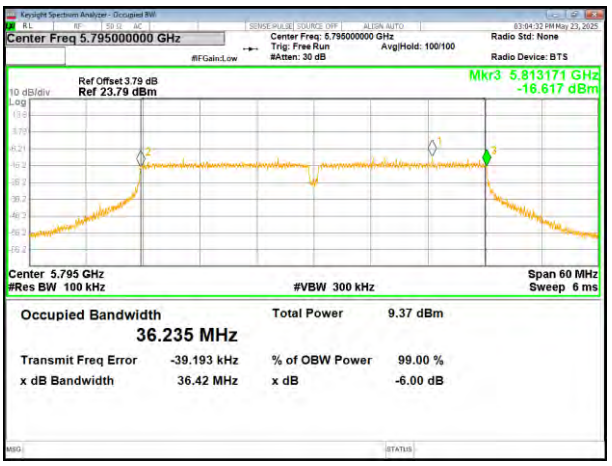
(802.11 n40) plot on channel 151



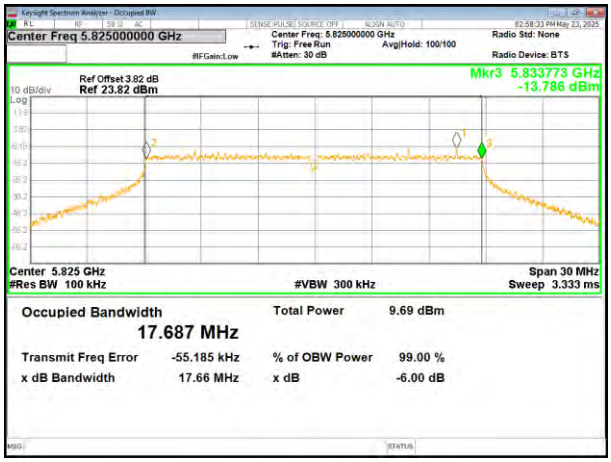
(802.11ac20) plot on channel 157



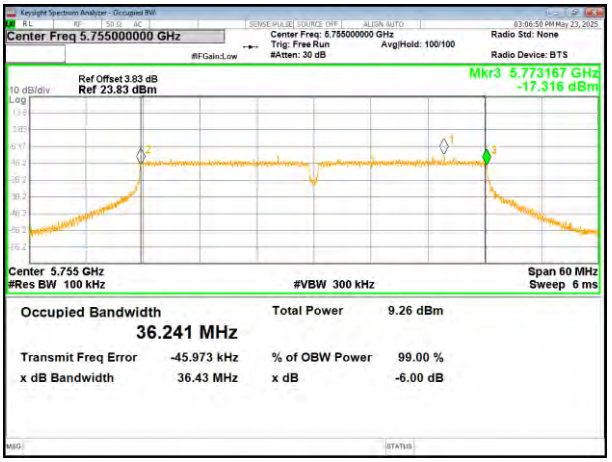
(802.11 n40) plot on channel 159

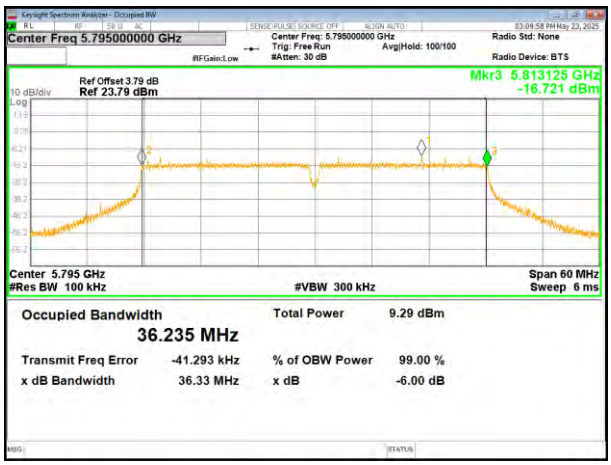
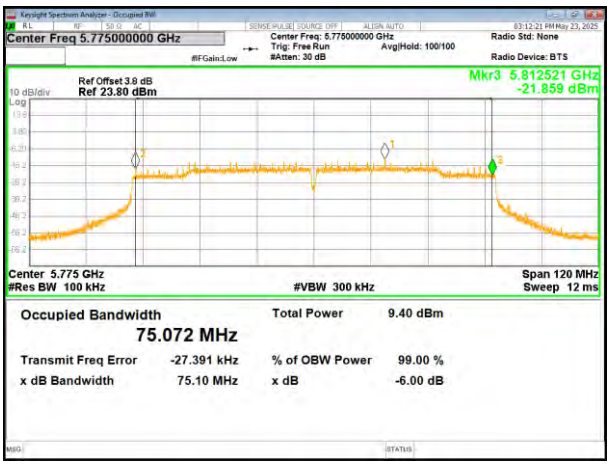


(802.11ac20) plot on channel 165



(802.11 ac40) plot on channel 151



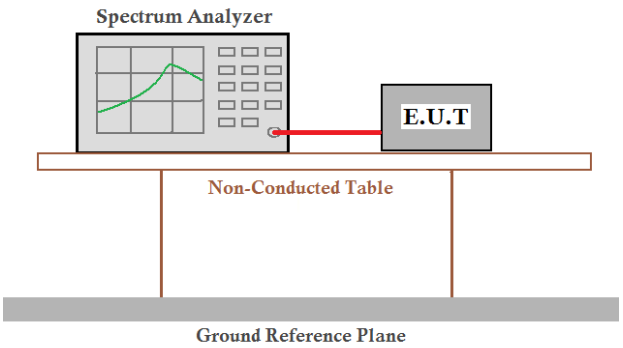
(802.11 ac40) plot on channel 159	(802.11 ac80) plot on channel 155
	

4.6 Power Spectral Density

Test Requirement:	47CRF Part 15.407(a)(1)/ (a)(3)
Test Method:	KDB 789033 D02 General U-NII Test Procedures New Rules v02r01, ANSI C63.10:2013
Limit:	

Frequency band (MHz)	Limit for FCC
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
Frequency band (MHz)	Limit for IC
5150-5250	≤10dBm/1MHz (e.i.r.p spectral density)
5250-5350	≤11dBm/1MHz
5470-5725	≤11dBm/1MHz
5725-5850	≤30dBm/500kHz

Test setup:

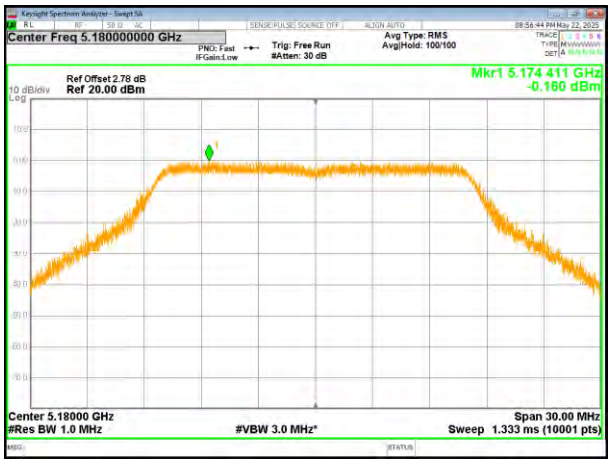
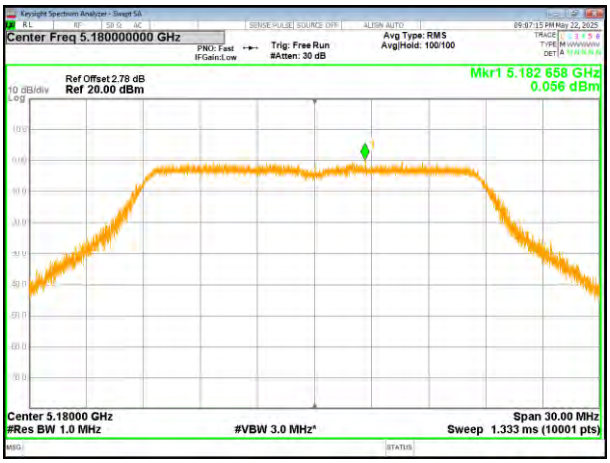
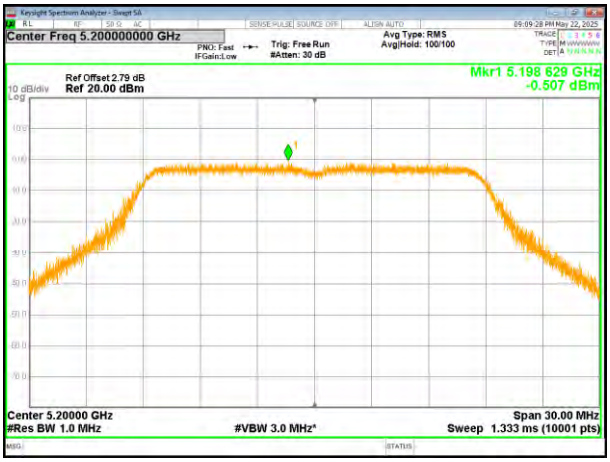
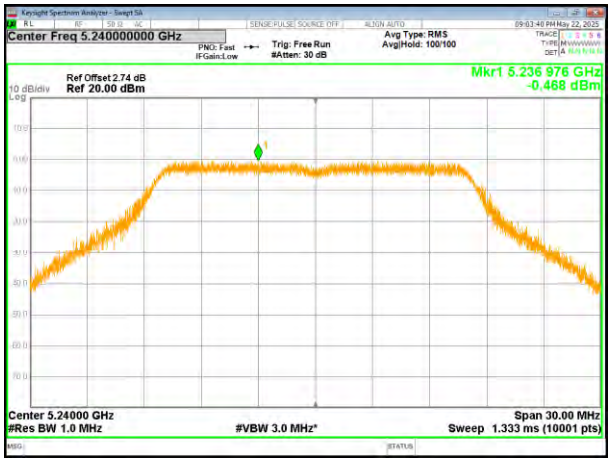
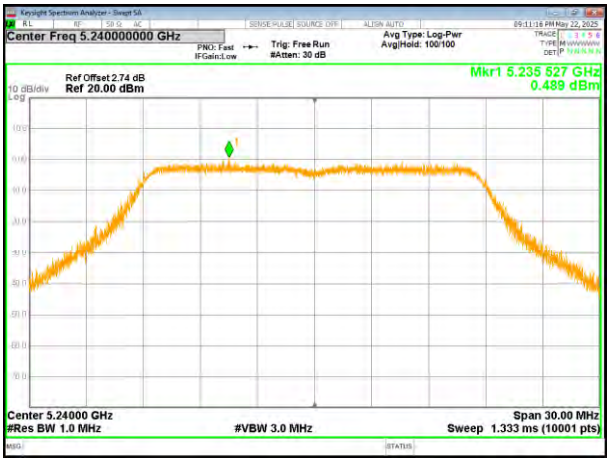


Test Instruments:	Refer to section 3.0 for details	
Test mode:	Refer to section 2.2 for details	
Test environment:	Temp.: 23.5°C	Humid.: 62%RH
Test voltage:	7.6VDC	
Test results:	Pass	

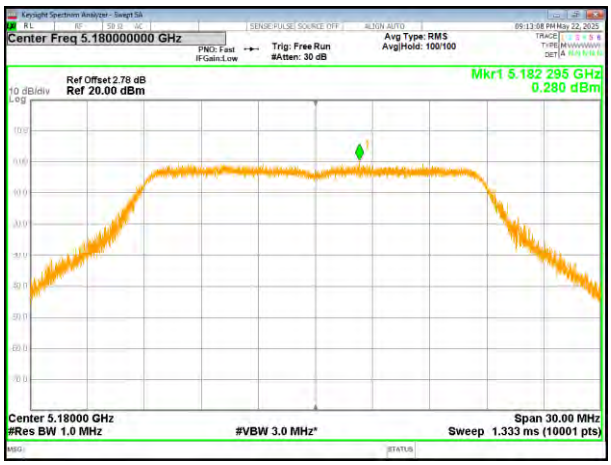
Measurement Result See next page

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	-0.160	0.72	0.560	11
	5200 MHz	-0.246	0.72	0.474	11
	5240 MHz	-0.468	0.72	0.252	11
802.11 n20	5180 MHz	0.056	0.72	0.776	11
	5200 MHz	-0.507	0.72	0.213	11
	5240 MHz	0.489	0.72	1.209	11
802.11 ac20	5180 MHz	0.280	0.73	1.010	11
	5200 MHz	-0.516	0.73	0.214	11
	5240 MHz	0.570	0.73	1.300	11
802.11 n40	5190 MHz	-2.416	0.75	-1.666	11
	5230 MHz	-2.724	0.75	-1.974	11
802.11 ac40	5190 MHz	-2.989	0.28	-2.709	11
	5230 MHz	-2.767	0.28	-2.487	11
802.11 ac80	5210 MHz	-5.661	0.73	-4.931	11

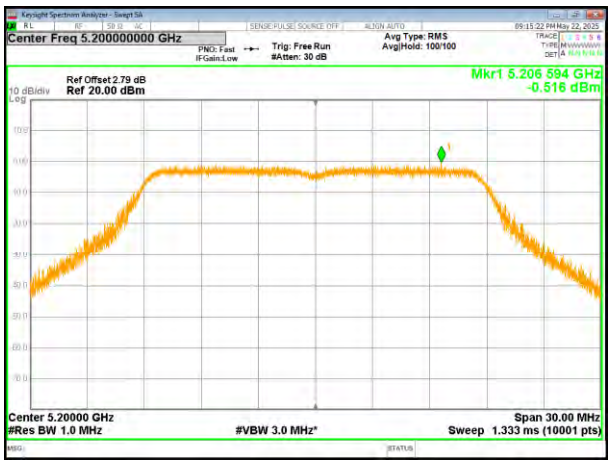
(802.11a) PSD plot on channel 36	(802.11n20) PSD plot on channel 36
	
(802.11a) PSD plot on channel 40	(802.11n20) PSD plot on channel 40
	
(802.11a) PSD plot on channel 48	(802.11n20) PSD plot on channel 48
	

(802.11ac20) PSD plot on channel 36

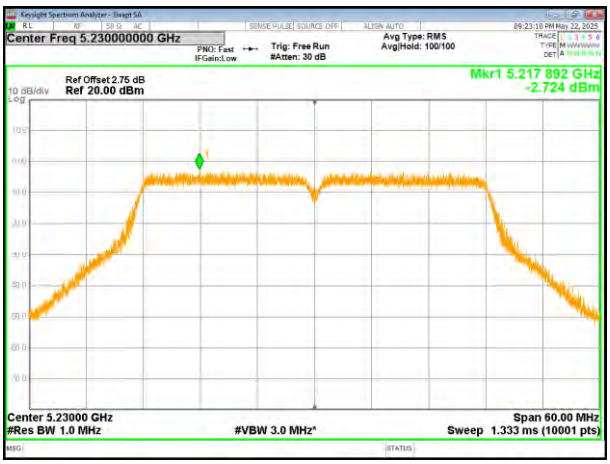


(802.11n40) PSD plot on channel 38

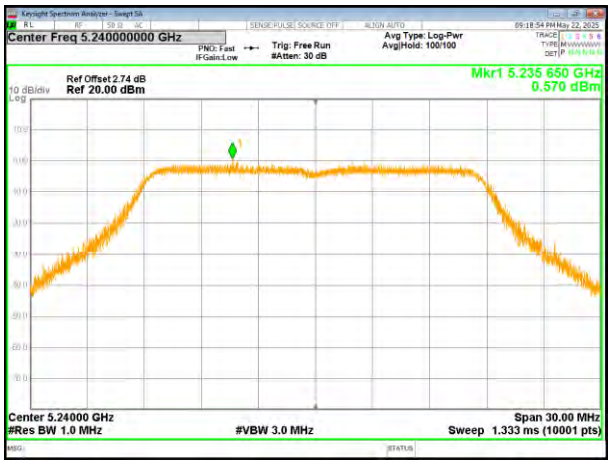
(802.11ac20) PSD plot on channel 40



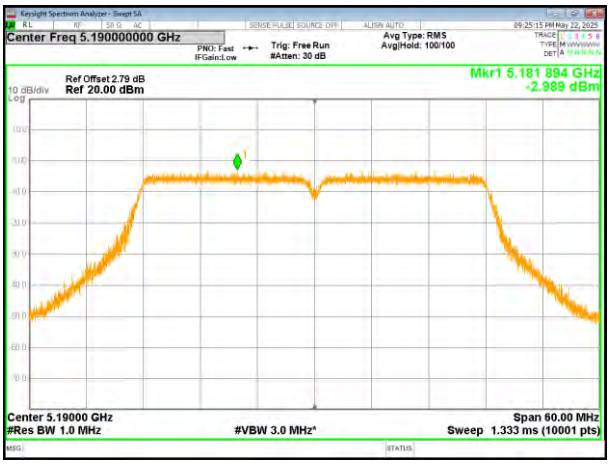
(802.11n40) PSD plot on channel 46

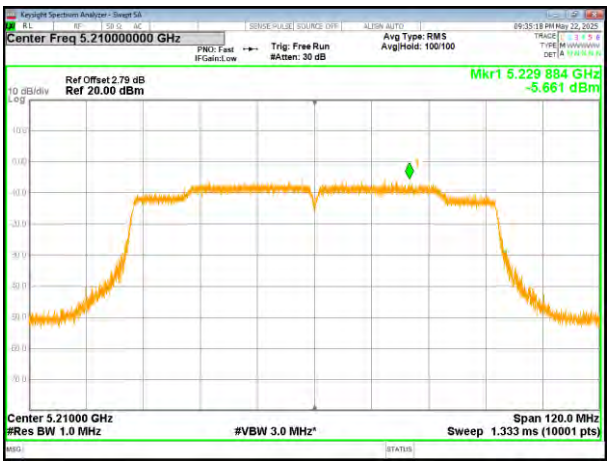


(802.11ac20) PSD plot on channel 48



(802.11ac40) PSD plot on channel 38



(802.11ac40) PSD plot on channel 46	(802.11ac80) PSD plot on channel 42
	

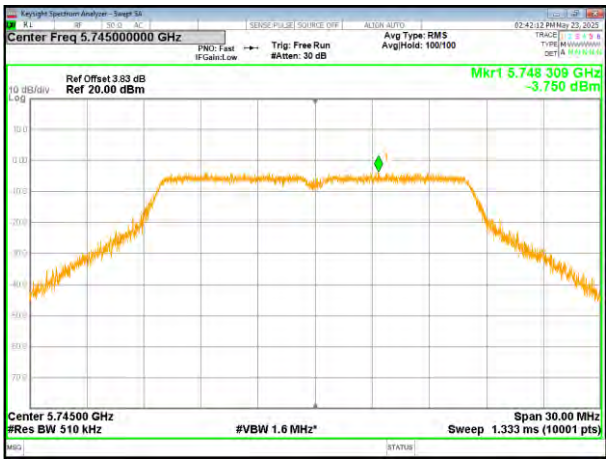
5745-5825MHz

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	-3.750	-3.836	0.68	-3.156	30
	5785 MHz	-2.622	-2.708	0.68	-2.028	30
	5825 MHz	-3.280	-3.366	0.68	-2.686	30
802.11 n20	5745 MHz	-3.458	-3.544	0.83	-2.714	30
	5785 MHz	-3.541	-3.627	0.83	-2.797	30
	5825 MHz	-3.103	-3.189	0.83	-2.359	30
802.11ac20	5745 MHz	-3.337	-3.423	0.11	-3.313	30
	5785 MHz	-3.466	-3.552	0.11	-3.442	30
	5825 MHz	-2.703	-2.789	0.11	-2.679	30
802.11 n40	5755 MHz	-5.431	-5.517	0.23	-5.287	30
	5795 MHz	-5.840	-5.926	0.23	-5.696	30
802.11ac40	5755 MHz	-6.142	-6.228	0.35	-5.878	30
	5795 MHz	-5.710	-5.796	0.35	-5.446	30
802.11ac80	5775 MHz	-8.193	-8.279	0.71	-7.569	30

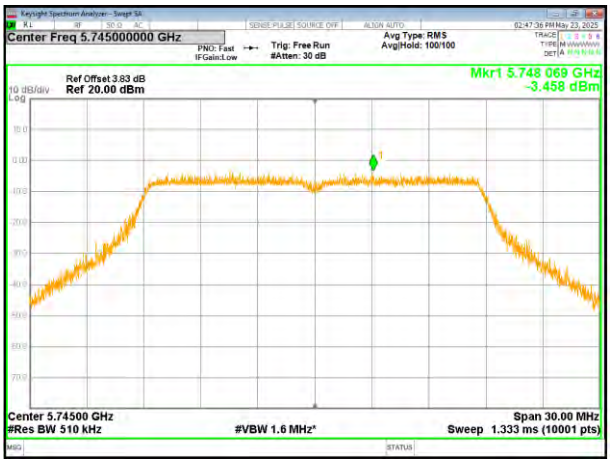
Note: 1. If the measurement is X dBm/510kHz, thus X dBm/510kHz = $(10^{X/10})*(500 / 510)$ dBm/500kHz

2. Correction Factor (dB)= duty cycle factor

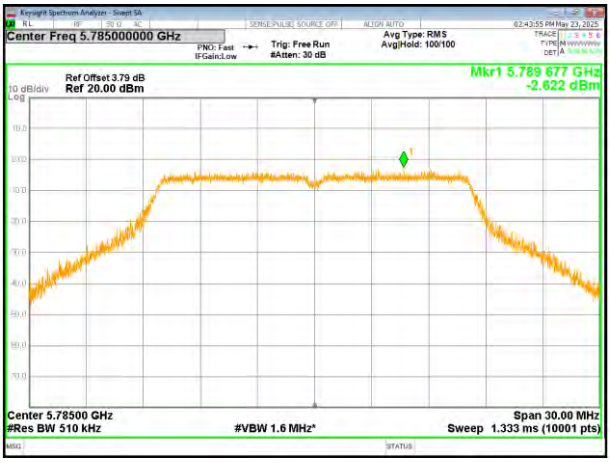
(802.11a) PSD plot on channel 149



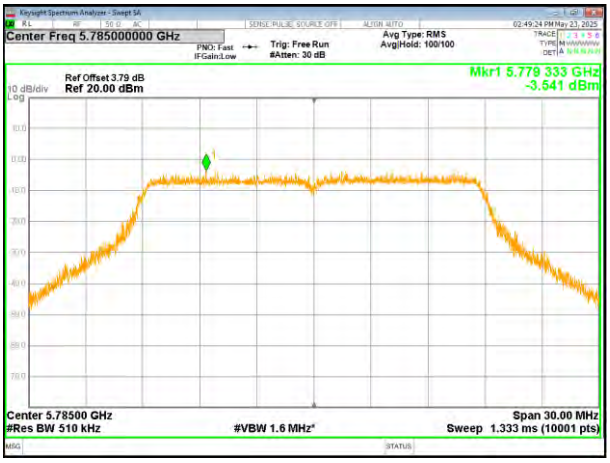
(802.11n20) PSD plot on channel 149



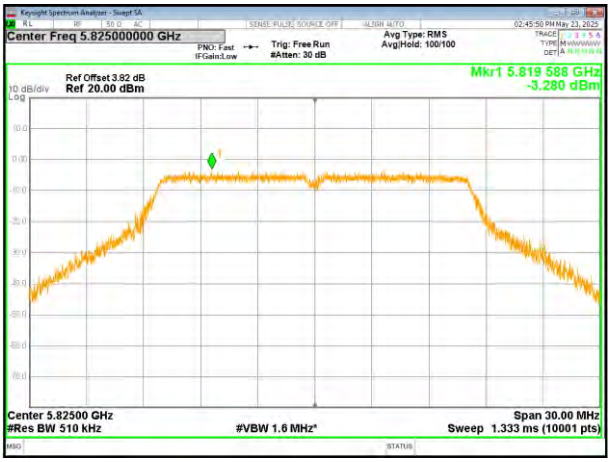
(802.11a) PSD plot on channel 157



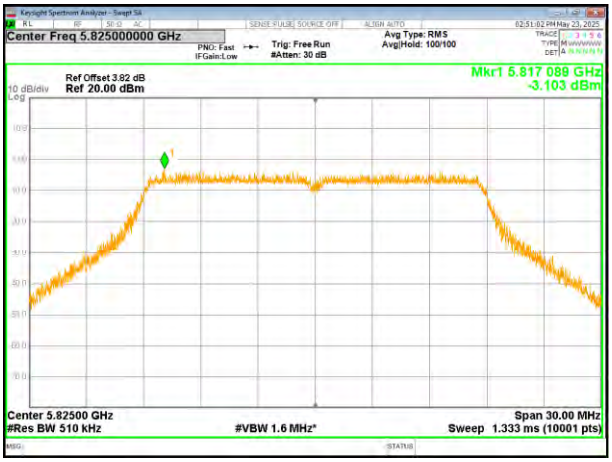
(802.11n20) PSD plot on channel 157



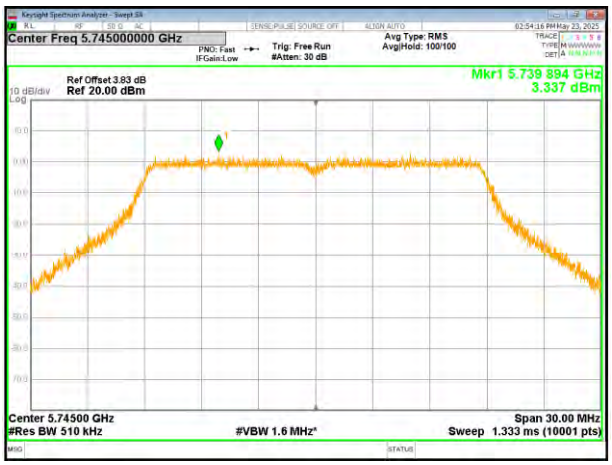
(802.11a) PSD plot on channel 165



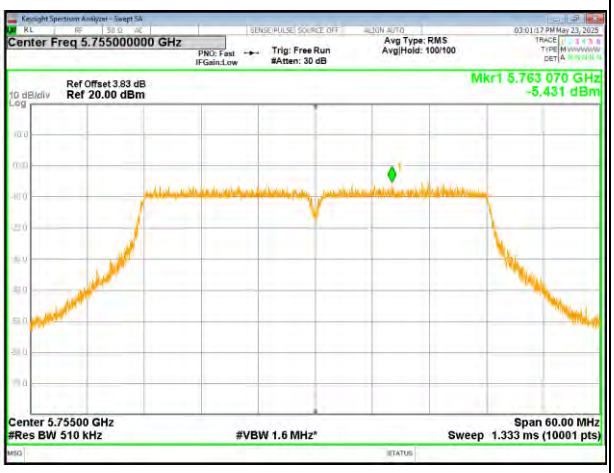
(802.11n20) PSD plot on channel 165



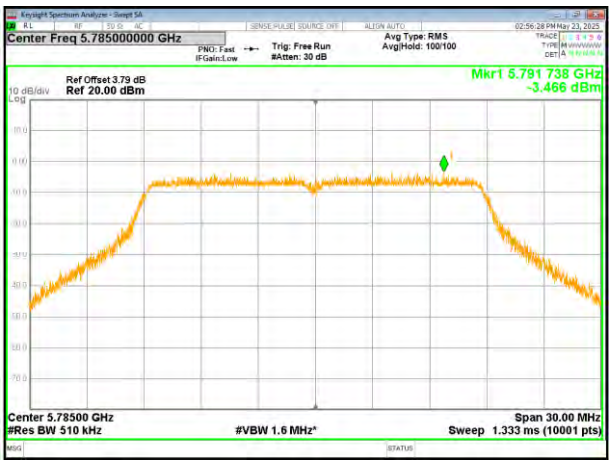
(802.11ac20) PSD plot on channel 149



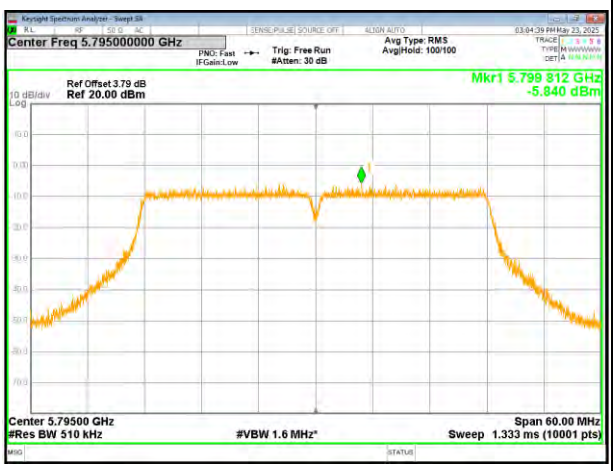
(802.11n40) PSD plot on channel 151



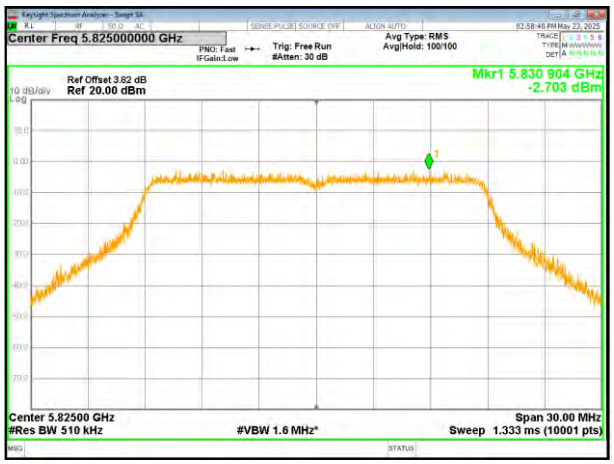
(802.11ac20) PSD plot on channel 157



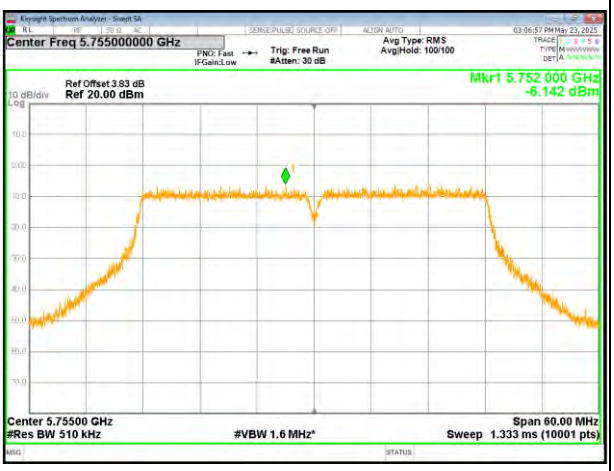
(802.11n40) PSD plot on channel 159

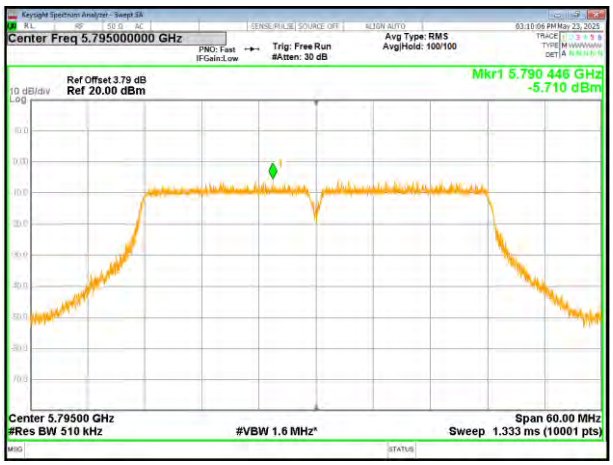
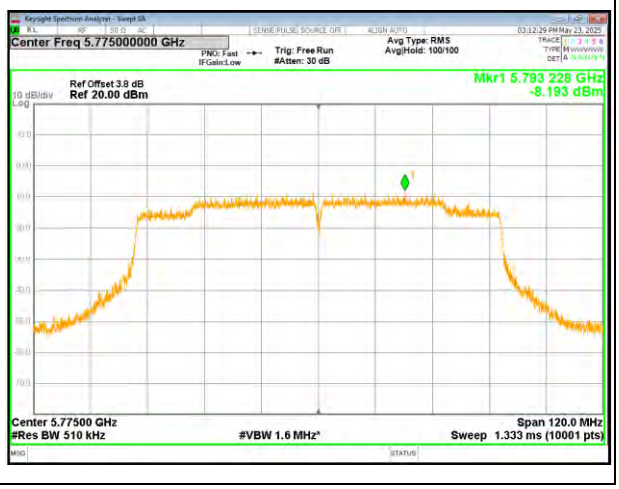


(802.11ac20) PSD plot on channel 165



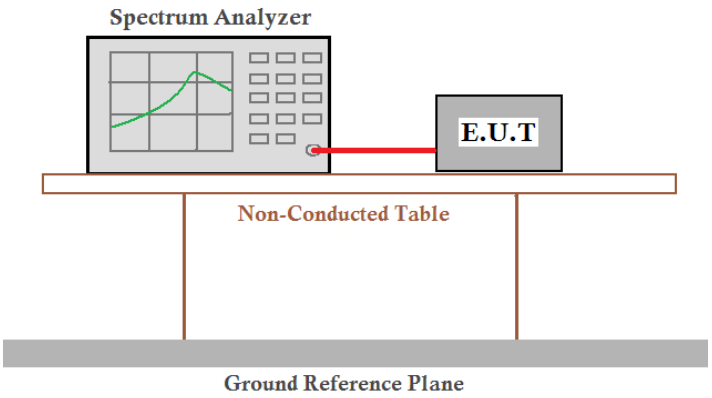
(802.11ac40) PSD plot on channel 151



(802.11ac40) PSD plot on channel 159	(802.11ac80) PSD plot on channel 155
	

4.7 Band edge

4.7.1 Conducted test Method

Test Requirement:	47CRF Part 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 to1 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.: 23.5°C	Humid.: 62%RH
Test voltage:	7.6VDC	
Test results:	Pass	

5.180~5.240 GHz

(802.11a) Band Edge, Left Side

(802.11n20) Band Edge, Left Side

(802.11a) Band Edge, Right Side

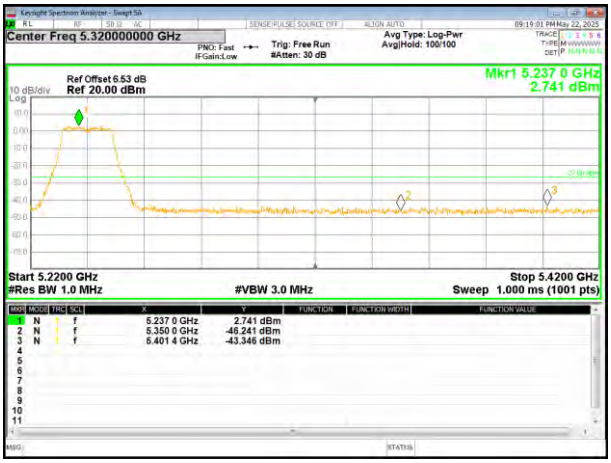
(802.11n20) Band Edge, Right Side

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

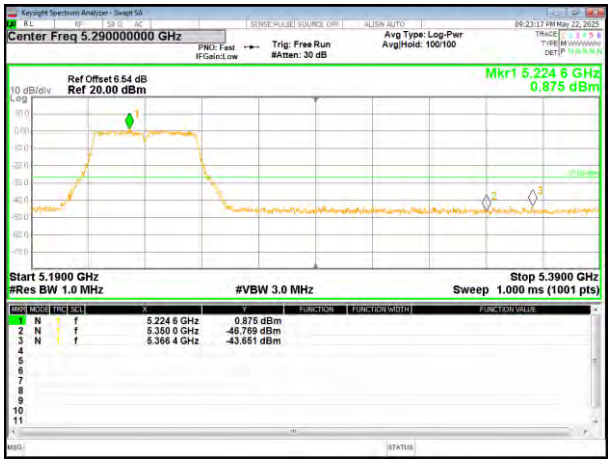
(802.11ac20) Band Edge, Left Side

(802.11n40) Band Edge, Left Side

(802.11ac20) Band Edge, Right Side

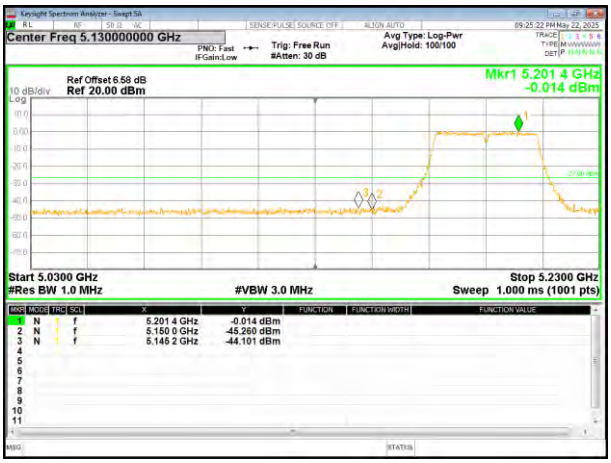


(802.11n40) Band Edge, Right Side

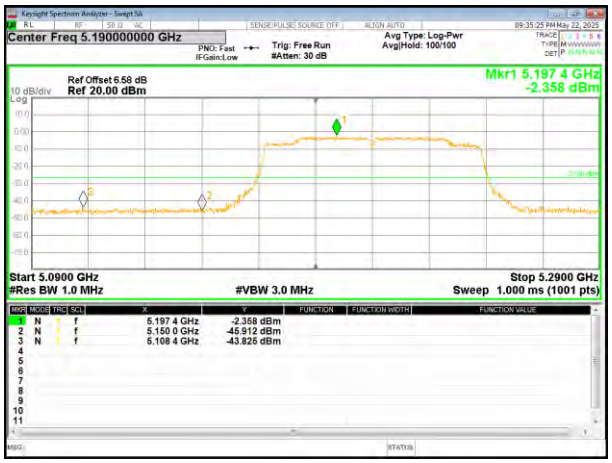


Remark: The antenna gain and cable loss were not compensated in the test data, and the margin value of the Band Edge test was greater than the sum of the antenna gain and cable loss, so the test met the requirements

(802.11ac40) Band Edge, Left Side



(802.11ac80) Band Edge



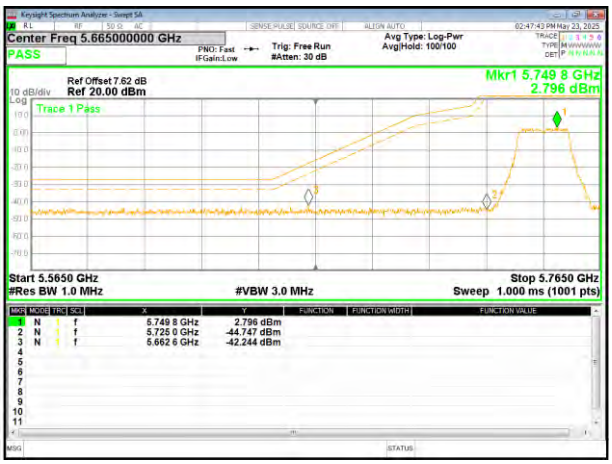
(802.11ac40) Band Edge, Right Side

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

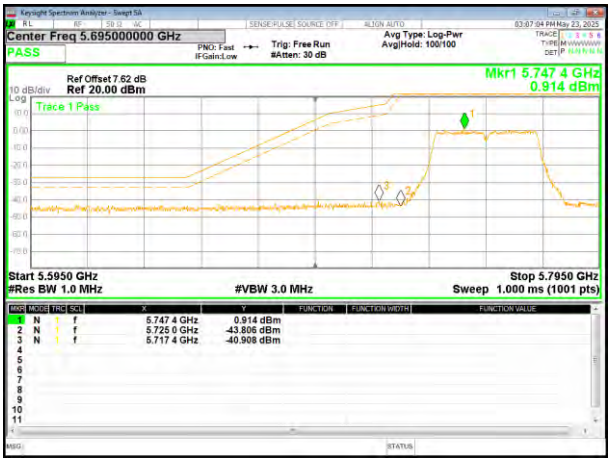
(802.11n40) Band Edge, Left Side

(802.11ac20) Band Edge, Right Side

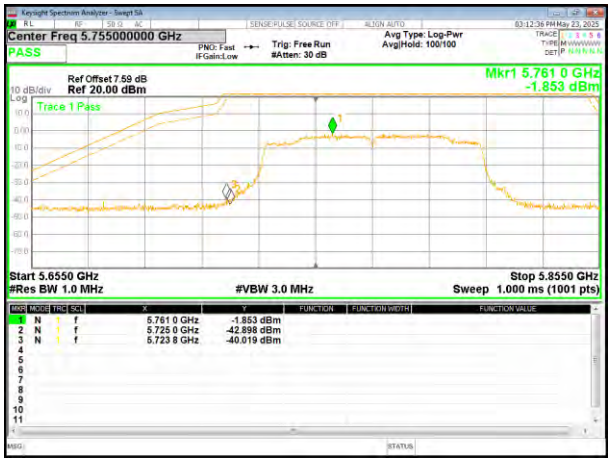
(802.11n40) Band Edge, Right Side

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:	47CRF Part 15.209, Part 15E Section 15.407(b)(4)
Test Method:	ANSI C63.10:2013
Test Frequency Range:	9kHz to 40GHz
Test site:	Measurement Distance: 3m

Receiver setup:

Frequency	Detector	RBW	VBW	Value
9kHz-150KHz	Quasi-peak	200Hz	1kHz	Quasi-peak Value
150kHz-30MHz	Quasi-peak	9kHz	30kHz	Quasi-peak Value
30MHz-1GHz	Quasi-peak	120KHz	300KHz	Quasi-peak Value
Above 1GHz	Peak	1MHz	3MHz	Peak Value
	AV	1MHz	3MHz	Average Value

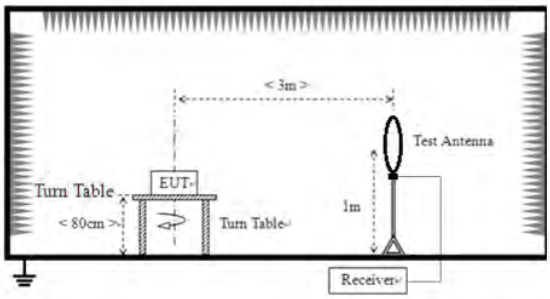
Limit:

Frequency	Limit (uV/m)	Value	Measurement Distance
0.009MHz-0.490MHz	2400/F(KHz)	QP	300m
0.490MHz-1.705MHz	24000/F(KHz)	QP	300m
1.705MHz-30MHz	30	QP	30m
30MHz-88MHz	100	QP	3m
88MHz-216MHz	150	QP	
216MHz-960MHz	200	QP	
960MHz-1GHz	500	QP	

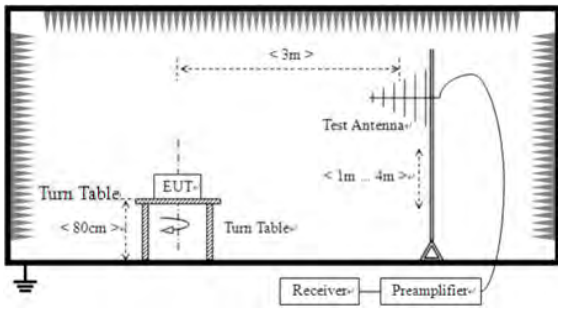
Frequency	Limit (dBm/MHz)	Remark
Above 1GHz	-27.0	Peak Value

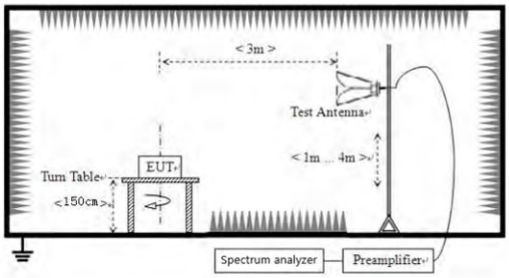
Test setup:

For radiated emissions from 9kHz to 30MHz



For radiated emissions from 30MHz to1GHz



	For radiated emissions above 1GHz 
Test Procedure:	1. The EUT was placed on the top of a rotating table (0.8m for below 1GHz and 1.5 meters for above 1GHz) above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation. 2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. 4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading. 5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet. The radiation measurements are performed in X, Y, Z axis positioning. And found the X axis positioning which it is worse case, only the test worst case mode is recorded in the report.
Test Instruments:	Refer to section 3.0 for details
Test mode:	Refer to section 2.2 for details
Test results:	Pass

Remarks:

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

Measurement Data:

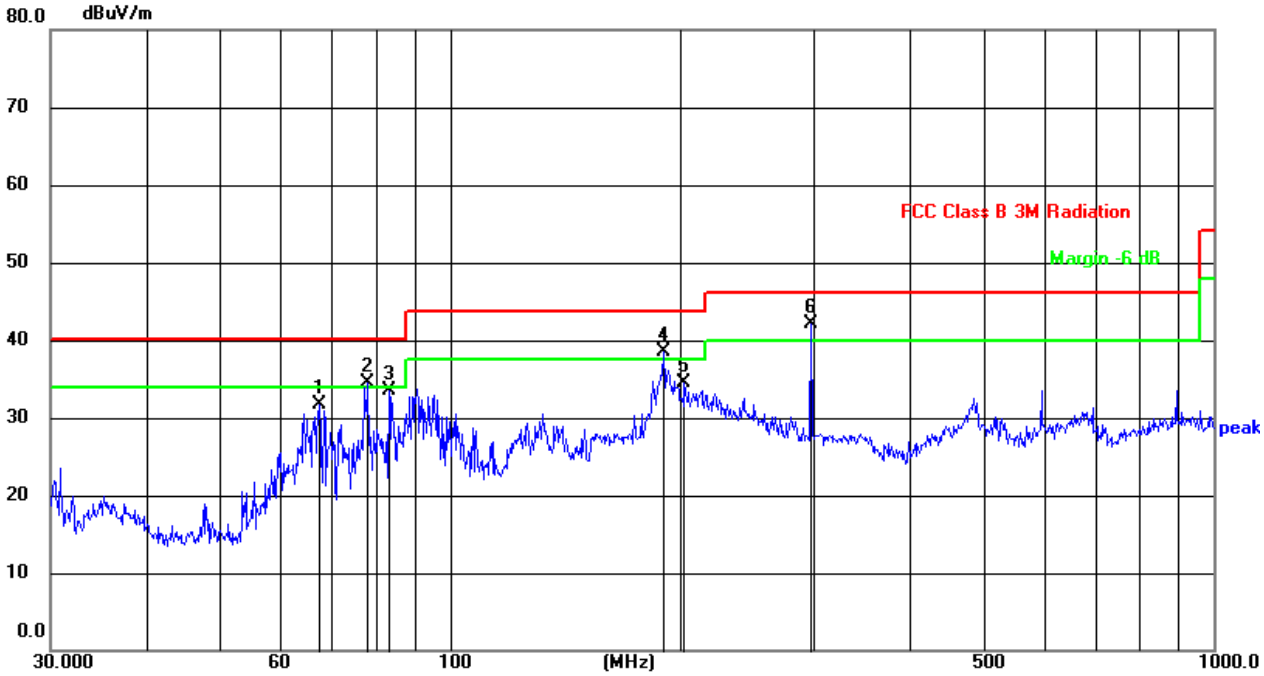
9 kHz ~ 30 MHz

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

Below 1GHz

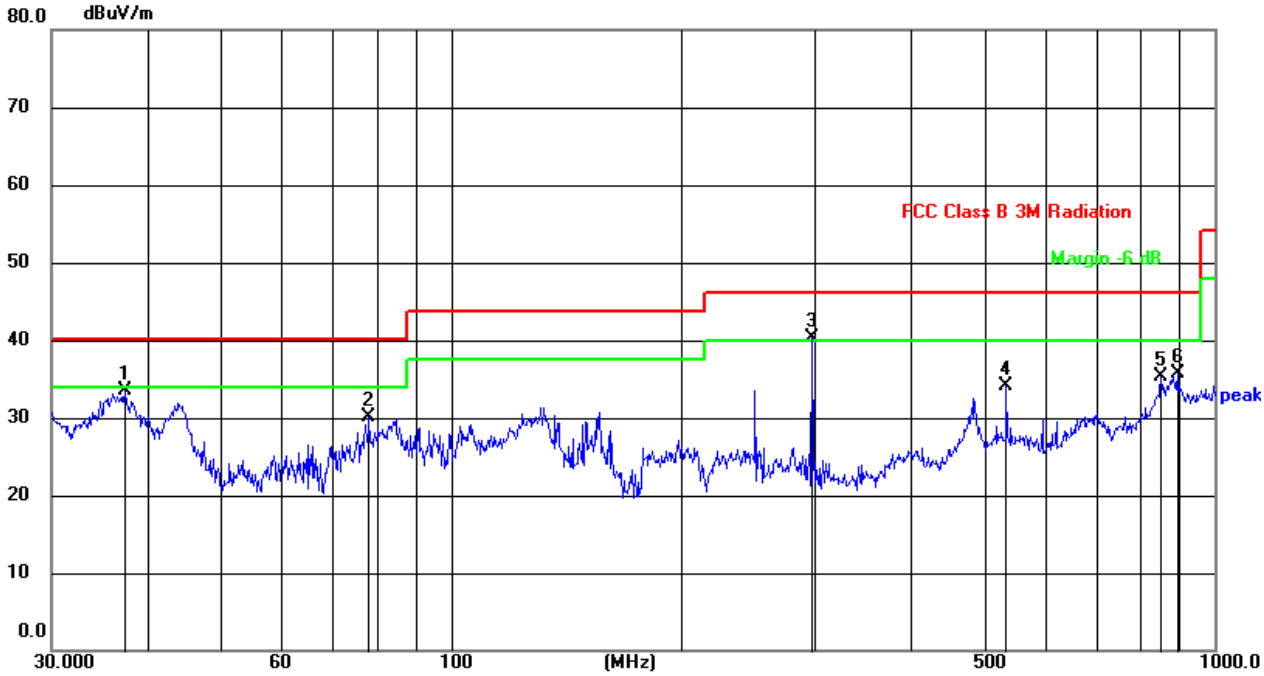
Temperature:	23.50℃	Relative Humidity:	62%RH
Pressure:	101.2kPar	Test Voltage :	12VDC from adapter with 120Vac
Test Mode :	TX- 802.11n20 (5200MHz)		

Horizontal:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	67.4381	52.30	-20.65	31.65	40.00	-8.35	QP
2	78.1388	54.95	-20.52	34.43	40.00	-5.57	QP
3	83.2297	53.87	-20.42	33.45	40.00	-6.55	QP
4	190.4050	56.58	-18.04	38.54	43.50	-4.96	QP
5	202.8103	53.11	-18.62	34.49	43.50	-9.01	QP
6	297.2238	60.63	-18.54	42.09	46.00	-3.91	QP

Vertical:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	37.4164	54.48	-20.96	33.52	40.00	-6.48	QP
2	78.1388	50.45	-20.33	30.12	40.00	-9.88	QP
3	297.2238	58.28	-18.03	40.25	46.00	-5.75	QP
4	533.8320	46.99	-12.94	34.05	46.00	-11.95	QP
5	851.0353	41.99	-6.72	35.27	46.00	-10.73	QP
6	893.8565	41.73	-6.00	35.73	46.00	-10.27	QP

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

Above 1GHz:

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

Temperature:	23.5℃	Relative Humidity:	62%
Pressure:	101.2kPar	Test Voltage :	7.4VDC
Test Mode :	5.2G TX- 802.11a		

Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detect or Type
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
Low Channel:5180MHz							
V	10360.00	48.90	1.77	50.67	68.20	-17.53	PK
V	10360.00	37.62	1.77	39.39	54.00	-14.61	AV
V	15540.00	45.56	7.72	53.28	74.00	-20.72	PK
V	15540.00	34.80	7.72	42.52	54.00	-11.48	AV
V	20720.00	56.64	-5.73	50.91	68.20	-17.29	PK
V	20720.00	44.97	-5.73	39.24	54.00	-14.76	AV
V	25900.00	52.93	-2.89	50.04	68.20	-18.16	PK
V	25900.00	42.35	-2.89	39.46	54.00	-14.54	AV
V	31080.00	54.12	1.66	55.78	68.20	-12.42	PK
V	31080.00	42.18	1.66	43.84	54.00	-10.16	AV
V	36260.00	51.15	4.63	55.78	68.20	-12.42	PK
V	36260.00	38.80	4.63	43.43	54.00	-10.57	AV
H	10360.00	48.90	1.77	50.67	68.20	-17.53	PK
H	10360.00	37.81	1.77	39.58	54.00	-14.42	AV
H	15540.00	44.46	7.72	52.18	74.00	-21.82	PK
H	15540.00	33.79	7.72	41.51	54.00	-12.49	AV
H	20720.00	55.28	-5.73	49.55	68.20	-18.65	PK
H	20720.00	43.94	-5.73	38.21	54.00	-15.79	AV
H	25900.00	52.58	-2.89	49.69	68.20	-18.51	PK
H	25900.00	41.52	-2.89	38.63	54.00	-15.37	AV
H	31080.00	53.02	1.66	54.68	68.20	-13.52	PK
H	31080.00	41.96	1.66	43.62	54.00	-10.38	AV
H	36260.00	51.46	4.63	56.09	68.20	-12.11	PK
H	36260.00	39.89	4.63	44.52	54.00	-9.48	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	Meter Reading	Factor	Emission Level	Limits	Margin	Detect or Type
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
Middle Channel:5200Hz							
V	10400.00	47.81	1.85	49.66	68.20	-18.54	PK
V	10400.00	38.43	1.85	40.28	54.00	-13.72	AV
V	15600.00	42.67	7.64	50.31	74.00	-23.69	PK
V	15600.00	32.80	7.64	40.44	54.00	-13.56	AV
V	20800.00	57.64	-5.67	51.97	68.20	-16.23	PK
V	20800.00	48.29	-5.67	42.62	54.00	-11.38	AV
V	26000.00	53.43	-2.85	50.58	68.20	-17.62	PK
V	26000.00	40.94	-2.85	38.09	54.00	-15.91	AV
V	31200.00	51.19	1.57	52.76	68.20	-15.44	PK
V	31200.00	42.26	1.57	43.83	54.00	-10.17	AV
V	36400.00	50.59	4.93	55.52	68.20	-12.68	PK
V	36400.00	39.84	4.93	44.77	54.00	-9.23	AV
H	10400.00	48.72	1.85	50.57	68.20	-17.63	PK
H	10400.00	38.44	1.85	40.29	54.00	-13.71	AV
H	15600.00	44.31	7.64	51.95	74.00	-22.05	PK
H	15600.00	32.99	7.64	40.63	54.00	-13.37	AV
H	20800.00	55.61	-5.67	49.94	68.20	-18.26	PK
H	20800.00	44.28	-5.67	38.61	54.00	-15.39	AV
H	26000.00	54.48	-2.85	51.63	68.20	-16.57	PK
H	26000.00	43.33	-2.85	40.48	54.00	-13.52	AV
H	31200.00	53.27	1.57	54.84	68.20	-13.36	PK
H	31200.00	41.95	1.57	43.52	54.00	-10.48	AV
H	36400.00	50.54	4.93	55.47	68.20	-12.73	PK
H	36400.00	39.90	4.93	44.83	54.00	-9.17	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	Meter Reading	Factor	Emission Level	Limits	Margin	Detect or Type
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
High Channel:5240MHz							
V	10480.00	48.86	2.02	50.88	68.20	-17.32	PK
V	10480.00	37.37	2.02	39.39	54.00	-14.61	AV
V	15720.00	43.10	7.46	50.56	74.00	-23.44	PK
V	15720.00	32.81	7.46	40.27	54.00	-13.73	AV
V	20960.00	55.59	-5.56	50.03	68.20	-18.17	PK
V	20960.00	44.07	-5.56	38.51	54.00	-15.49	AV
V	26200.00	53.33	-2.50	50.83	68.20	-17.37	PK
V	26200.00	43.07	-2.50	40.57	54.00	-13.43	AV
V	31440.00	54.56	1.39	55.95	68.20	-12.25	PK
V	31440.00	42.90	1.39	44.29	54.00	-9.71	AV
V	36680.00	50.22	5.25	55.47	68.20	-12.73	PK
V	36680.00	39.61	5.25	44.86	54.00	-9.14	AV
H	10480.00	49.70	2.02	51.72	68.20	-16.48	PK
H	10480.00	39.36	2.02	41.38	54.00	-12.62	AV
H	15720.00	44.18	7.46	51.64	74.00	-22.36	PK
H	15720.00	33.30	7.46	40.76	54.00	-13.24	AV
H	20960.00	55.59	-5.56	50.03	68.20	-18.17	PK
H	20960.00	44.34	-5.56	38.78	54.00	-15.22	AV
H	26200.00	55.54	-2.50	53.04	68.20	-15.16	PK
H	26200.00	45.81	-2.50	43.31	54.00	-10.69	AV
H	31440.00	53.45	1.39	54.84	68.20	-13.36	PK
H	31440.00	42.50	1.39	43.89	54.00	-10.11	AV
H	36680.00	50.56	5.15	55.71	68.20	-12.49	PK
H	36680.00	39.02	5.15	44.17	54.00	-9.83	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:	23.5℃	Relative Humidity:	62%
Pressure:	101.2kPar	Test Voltage :	7.4VDC
Test Mode :	5.8G TX- 802.11a		

Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detect or Type
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
Low Channel:5745MHz							
V	11490.00	48.06	3.31	51.37	74.00	-22.63	PK
V	11490.00	37.23	3.31	40.54	54.00	-13.46	AV
V	17235.00	42.73	10.10	52.83	68.20	-15.37	PK
V	17235.00	31.66	10.10	41.76	54.00	-12.24	AV
V	22980.00	54.45	-4.61	49.84	74.00	-24.16	PK
V	22980.00	44.23	-4.61	39.62	54.00	-14.38	AV
V	28725.00	49.84	0.87	50.71	68.20	-17.49	PK
V	28725.00	40.76	0.87	41.63	54.00	-12.37	AV
V	34470.00	50.73	3.82	54.55	68.20	-13.65	PK
V	34470.00	39.39	3.82	43.21	54.00	-10.79	AV
H	11490.00	48.01	3.31	51.32	74.00	-22.68	PK
H	11490.00	37.48	3.31	40.79	54.00	-13.21	AV
H	17235.00	41.47	10.10	51.57	68.20	-16.63	PK
H	17235.00	30.68	10.10	40.78	54.00	-13.22	AV
H	22980.00	54.42	-4.61	49.81	74.00	-24.19	PK
H	22980.00	43.67	-4.61	39.06	54.00	-14.94	AV
H	28725.00	53.06	0.87	53.93	68.20	-14.27	PK
H	28725.00	42.51	0.87	43.38	54.00	-10.62	AV
H	34470.00	51.82	3.82	55.64	68.20	-12.56	PK
H	34470.00	40.13	3.82	43.95	54.00	-10.05	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	Meter Reading	Factor	Emission Level	Limits	Margin	Detect or Type
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
Low Channel:5785MHz							
V	11570.00	47.95	3.34	51.29	74.00	-22.71	PK
V	11570.00	37.11	3.34	40.45	54.00	-13.55	AV
V	17355.00	41.32	10.52	51.84	68.20	-16.36	PK
V	17355.00	30.22	10.52	40.74	54.00	-13.26	AV
V	23140.00	54.48	-4.66	49.82	74.00	-24.18	PK
V	23140.00	43.29	-4.66	38.63	54.00	-15.37	AV
V	28925.00	52.22	1.36	53.58	68.20	-14.62	PK
V	28925.00	41.57	1.36	42.93	54.00	-11.07	AV
V	34710.00	51.88	3.95	55.83	68.20	-12.37	PK
V	34710.00	40.34	3.95	44.29	54.00	-9.71	AV
H	11570.00	48.60	3.34	51.94	74.00	-22.06	PK
H	11570.00	38.39	3.34	41.73	54.00	-12.27	AV
H	17355.00	40.42	10.52	50.94	68.20	-17.26	PK
H	17355.00	30.87	10.52	41.39	54.00	-12.61	AV
H	23140.00	54.46	-4.66	49.8	74.00	-24.20	PK
H	23140.00	43.54	-4.66	38.88	54.00	-15.12	AV
H	28925.00	53.39	1.36	54.75	68.20	-13.45	PK
H	28925.00	42.43	1.36	43.79	54.00	-10.21	AV
H	34710.00	52.06	3.95	56.01	68.20	-12.19	PK
H	34710.00	40.41	3.95	44.36	54.00	-9.64	AV

Remark:

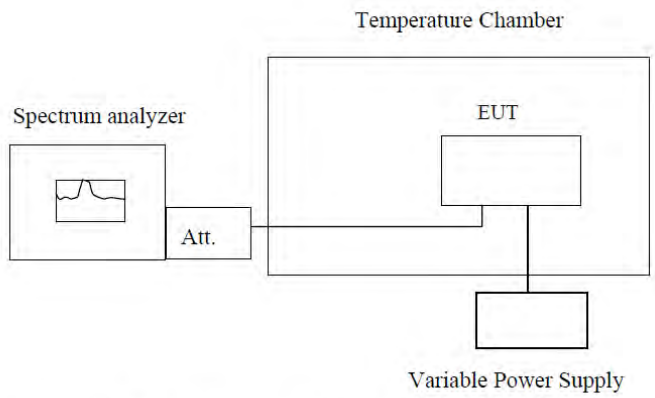
1. Emission Level = Meter Reading + Factor,
   Factor=Antenna Factor + Cable Loss – Pre-amplifier
   Margin= Emission Level – Limit
2. If peak below the average limit, the average emission was no test.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible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

Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detect or Type
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
Low Channel:5825MHz							
V	11650.00	47.46	3.36	50.82	74.00	-23.18	PK
V	11650.00	36.60	3.36	39.96	54.00	-14.04	AV
V	17475.00	40.99	10.93	51.92	68.20	-16.28	PK
V	17475.00	30.66	10.93	41.59	54.00	-12.41	AV
V	23300.00	55.08	-4.77	50.31	68.20	-17.89	PK
V	23300.00	44.08	-4.77	39.31	54.00	-14.69	AV
V	29125.00	51.83	1.65	53.48	68.20	-14.72	PK
V	29125.00	41.04	1.65	42.69	54.00	-11.31	AV
V	34950.00	50.46	4.09	54.55	68.20	-13.65	PK
V	34950.00	39.82	4.09	43.91	54.00	-10.09	AV
H	11650.00	47.39	3.36	50.75	74.00	-23.25	PK
H	11650.00	36.81	3.36	40.17	54.00	-13.83	AV
H	17475.00	40.02	10.93	50.95	68.20	-17.25	PK
H	17475.00	28.83	10.93	39.76	54.00	-14.24	AV
H	23300.00	54.93	-4.77	50.16	68.20	-18.04	PK
H	23300.00	43.6	-4.77	38.83	54.00	-15.17	AV
H	29125.00	50.79	1.65	52.44	68.20	-15.76	PK
H	29125.00	42.06	1.65	43.71	54.00	-10.29	AV
H	34950.00	51.43	4.09	55.52	68.20	-12.68	PK
H	34950.00	40.69	4.09	44.78	54.00	-9.22	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:	47CRF Part 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: 7.6VDC					
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	5179.910	5180.167	5179.824	5179.743
	5190	5189.906	5180.273	5189.825	5189.741
	5200	5199.914	5200.149	5199.816	5199.735
	5210	5209.907	5210.174	5299.822	5209.725
	5220	5219.927	5220.152	5219.816	5219.734
	5230	5229.904	5229.988	5229.835	5299.728
	5240	5239.922	5239.987	5239.814	5239.735
-20	5180	5179.984	5179.973	5179.986	5179.977
	5190	5189.985	5189.984	5189.977	5189.978
	5200	5199.915	5199.994	5199.924	5199.757
	5210	5209.921	5209.982	5209.916	5209.735
	5220	5219.916	5219.981	5219.937	5219.749
	5230	5229.997	5229.992	5229.976	5229.990
	5240	5239.975	5239.973	5239.994	5239.968
-10	5180	5179.984	5179.984	5179.986	5179.946
	5190	5189.985	5189.985	5189.977	5189.976
	5200	5199.976	5199.976	5199.985	5200.001
	5210	5299.984	5299.984	5209.977	5209.985
	5220	5219.976	5219.976	5219.998	5219.976
	5230	5229.997	5229.997	5229.976	5230.004
	5240	5239.975	5239.975	5239.994	5239.992
0	5180	5179.936	5180.287	5179.342	5179.674
	5190	5189.932	5190.283	5189.352	5189.684
	5200	5199.927	5200.278	5199.342	5199.675
	5210	5209.933	5210.284	5209.342	5209.676
	5220	5219.928	5220.280	5219.348	5219.681
	5230	5229.926	5230.279	5229.364	5229.698
	5240	5239.999	5239.993	5239.995	5239.953
10	5180	5179.973	5179.985	5179.986	5179.992
	5190	5189.984	5189.976	5189.977	5199.977
	5200	5199.975	5199.984	5199.985	5199.988
	5210	5209.976	5209.976	5209.977	5209.724
	5220	5219.983	5219.997	5219.998	5219.730
	5230	5230.001	5229.975	5229.976	5229.752
	5240	5239.973	5239.993	5239.994	5239.719
20	5180	5179.994	5179.984	5179.986	5179.939
	5190	5189.990	5189.985	5189.977	5189.969

	5200	5199.985	5199.976	5199.985	5199.994
	5210	5209.991	5299.984	5209.977	5209.978
	5220	5219.986	5219.976	5219.998	5219.969
	5230	5229.984	5229.997	5229.976	5229.997
	5240	5239.957	5239.975	5239.994	5239.985
30	5180	5179.973	5179.982	5179.825	5179.858
	5190	5189.984	5189.986	5189.816	5199.732
	5200	5199.994	5199.974	5199.824	5199.757
	5210	5209.982	5209.982	5209.816	5209.735
	5220	5219.981	5219.997	5219.837	5219.749
	5230	5229.992	5229.979	5229.814	5229.741
	5240	5239.973	5239.979	5239.828	5239.749
40	5180	5179.984	5179.973	5179.986	5179.977
	5190	5189.985	5189.984	5189.977	5189.978
	5200	5199.915	5199.994	5199.924	5199.757
	5210	5209.921	5209.982	5209.916	5209.735
	5220	5219.916	5219.981	5219.937	5219.749
	5230	5229.997	5229.992	5229.976	5229.990
	5240	5239.975	5239.973	5239.994	5239.968
50	5180	5179.825	5179.984	5179.974	5179.992
	5190	5189.816	5189.985	5189.985	5199.977
	5200	5199.824	5199.976	5199.976	5199.988
	5210	5209.816	5210.156	5209.816	5209.724
	5220	5219.837	5219.988	5219.823	5219.730
	5230	5229.814	5229.989	5229.840	5229.752
	5240	5239.828	5239.983	5239.812	5239.719

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 Frequenc y (MHz)
8.74VDC	5180	5179.910	5180.167	5179.824	5179.743
	5190	5189.906	5180.273	5189.825	5189.741
	5200	5199.914	5200.149	5199.816	5199.735
	5210	5209.907	5210.174	5299.822	5209.725
	5220	5219.927	5220.152	5219.816	5219.734
	5230	5229.904	5229.988	5229.835	5299.728
	5240	5239.922	5239.987	5239.814	5239.735
7.4VDC	5180	5179.924	5179.979	5179.825	5179.858
	5190	5189.920	5189.986	5189.816	5199.732
	5200	5199.915	5199.974	5199.824	5199.757
	5210	5209.921	5209.982	5209.816	5209.735
	5220	5219.916	5219.987	5219.837	5219.749
	5230	5229.913	5229.996	5229.814	5229.741
	5240	5239.986	5239.969	5239.828	5239.749
6.46VDC	5180	5179.994	5179.994	5179.974	5179.966
	5190	5189.990	5189.990	5189.985	5189.977
	5200	5199.985	5199.985	5199.976	5199.967
	5210	5209.991	5209.991	5209.977	5209.969
	5220	5219.986	5219.986	5219.984	5219.976
	5230	5229.984	5229.984	5229.993	5229.999
	5240	5239.957	5239.957	5239.974	5239.966

Frequency stability versus Temp.					
Power Supply: 7.6VDC					
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	5744.966	5744.976	5744.977	5744.890
	5755	5754.982	5754.983	5754.994	5754.915
	5775	5774.981	5774.975	5774.995	5774.895
	5785	5784.984	5784.967	5784.977	5784.904
	5795	5794.995	5794.974	5794.995	5794.902
	5825	5824.976	5824.903	5824.992	5824.911
-20	5745	5744.971	5744.976	5744.977	5744.970
	5755	5754.996	5754.993	5754.984	5754.977
	5775	5774.977	5774.994	5774.976	5774.994
	5785	5784.986	5784.976	5784.968	5784.970
	5795	5794.984	5794.993	5794.975	5794.966
	5825	5824.994	5824.991	5824.904	5824.969
-10	5745	5744.987	5744.972	5744.980	5745.034
	5755	5754.989	5754.997	5754.994	5744.599
	5775	5774.992	5774.978	5774.979	5754.983
	5785	5784.984	5784.987	5784.966	5774.984
	5795	5794.975	5794.985	5794.960	5784.987
	5825	5824.984	5824.995	5824.994	5794.970
0	5745	5744.970	5744.976	5744.978	5744.969
	5755	5754.980	5754.983	5754.985	5754.958
	5775	5775.001	5774.975	5775.002	5774.969
	5785	5784.977	5784.967	5784.978	5784.976
	5795	5794.973	5794.974	5794.974	5794.994
	5825	5824.971	5824.903	5824.977	5824.986
10	5745	5744.976	5744.977	5744.972	5744.980
	5755	5754.983	5754.994	5754.997	5754.994
	5775	5774.975	5774.995	5774.978	5774.979
	5785	5784.967	5784.977	5784.987	5784.966
	5795	5794.974	5794.995	5794.985	5794.960
	5825	5824.903	5824.992	5824.995	5824.994
20	5745	5744.987	5744.976	5744.988	5744.969
	5755	5755.001	5754.993	5754.986	5754.988
	5775	5774.986	5774.994	5774.987	5774.968
	5785	5784.973	5784.976	5784.974	5784.995
	5795	5794.967	5794.993	5794.968	5794.987
	5825	5825.001	5824.991	5824.981	5824.996
30	5745	5744.966	5744.987	5744.972	5744.980
	5755	5754.982	5754.989	5754.997	5754.994
	5775	5774.981	5774.992	5774.978	5774.979
	5785	5784.984	5784.984	5784.987	5784.966
	5795	5794.995	5794.975	5794.985	5794.960
	5825	5824.976	5824.984	5824.995	5824.994
40	5745	5744.977	5744.976	5744.972	5744.964
	5755	5754.984	5754.993	5754.997	5754.989
	5775	5774.976	5774.994	5774.978	5774.970
	5785	5784.968	5784.976	5784.987	5784.979
	5795	5794.975	5794.993	5794.985	5794.977
	5825	5824.904	5824.991	5824.995	5824.987

50	5745	5744.971	5744.976	5744.977	5744.970
	5755	5754.996	5754.993	5754.984	5754.977
	5775	5774.977	5774.994	5774.976	5774.994
	5785	5784.986	5784.976	5784.968	5784.970
	5795	5794.984	5794.993	5794.975	5794.966
	5825	5824.994	5824.991	5824.904	5824.969

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)
8.74VDC	5745	5744.966	5744.976	5744.977	5744.964
	5755	5754.982	5754.983	5754.994	5754.989
	5775	5774.981	5774.975	5774.995	5774.970
	5785	5784.984	5784.967	5784.977	5784.979
	5795	5794.995	5794.974	5794.995	5794.977
	5825	5824.976	5824.903	5824.992	5824.987
7.4VDC	5745	5744.966	5744.987	5744.972	5744.980
	5755	5754.982	5754.989	5754.997	5754.994
	5775	5774.981	5774.992	5774.978	5774.979
	5785	5784.984	5784.984	5784.987	5784.966
	5795	5794.991	5794.975	5794.985	5794.960
	5825	5824.976	5824.984	5824.995	5824.992
6.46VDC	5745	5744.986	5745.184	5744.988	5744.989
	5755	5754.992	5755.156	5754.979	5754.988
	5775	5774.987	5775.180	5774.987	5774.979
	5785	5784.974	5785.180	5784.974	5784.990
	5795	5794.990	5794.975	5794.985	5794.986
	5825	5824.989	5824.984	5824.995	5824.991

5 Test Setup Photo

Reference to the file No.: ET-25051440SP for details.

6 EUT Constructional Details

Reference to the file No.: ET-25051440EP and ET-25051440IP for details.

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