



TEST REPORT

Applicant: Jiumao (Shenzhen) Industrial Co., LTD.
Address of Applicant: 2nd Floor, Building 9, Jingxuan Industrial Park, Donghuan Road, Longhua District, Shenzhen
Manufacturer: Jiumao (Shenzhen) Industrial Co., LTD.
Address of Manufacturer: 2nd Floor, Building 9, Jingxuan Industrial Park, Donghuan Road, Longhua District, Shenzhen
Product Name: TV Stick
Model No.: M98-Y10,M98-Y9,M98-Y2,M98-Y3,TVR3,Q96,X2,X2PLUS,X3PLUS,X3PRO,M8,M8mini
Trade Mark: JIUMAO
FCC ID: 2BB8K-M98Y10
Applicable standards: FCC CFR Title 47 Part 15 Subpart E Section 15.407
Date of Test: Jun.11, 2025-Jun.23, 2025
Date of report issued: Jun.24, 2025

Remark:

The results shown in this test report refer only to the sample(s) tested , this test report cannot be reproduced, except in full without prior written permission of the company.

The report would be invalid without specific stamp of test institute and the signatures of compiler and approver

Prepared By

Shenzhen ETR Standard Technology Co., Ltd.

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

Compiled by:

Reviewed by:

Approved by:

Project Engineer

Project Manager

Authorized Signature



Report Revision History		
Report No.	Description	Issue Date
ET-25061787E03	Original	Jun.24, 2025

Contents

Page

1	TEST SUMMARY	4
1.1	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	8
2.4	TEST FACILITY	8
2.5	ADDITIONAL INSTRUCTIONS.....	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 &99% OCCUPY BANDWIDTH.....	20
4.6	POWER SPECTRAL DENSITY	28
4.7	BAND EDGE.....	36
4.7.1	Conducted test Method	36
4.8	SPURIOUS EMISSION	43
4.8.1	Radiated Emission Method	43
4.9	FREQUENCY STABILITY	53
5	TEST SETUP PHOTO	59
6	EUT CONSTRUCTIONAL DETAILS.....	59

1 Test Summary

Test Item	Section in CFR 47	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 KDB 789033 D02 General U-NII Test Procedures New Rules v02r01
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
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:	TV Stick
Model No.:	M98-Y10,M98-Y9,M98-Y2,M98-Y3,TVR3,Q96,X2,X2PLUS,X3PLUS,X3PRO,M8,M8mini
Difference of model(s)	All models have the same circuit and RF module, except for the model name and housing design
Test Model:	M98-Y10
Hardware Version:	V1.2
Software Version:	11
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:	Integrated Antenna
Antenna gain:	2.90 dBi(Declare by applicant) Note: Antenna information is provided by applicant, Testing lab is not responsible for the accuracy of the information.
Battery	N/A
Power supply:	N/A
Adapter Model:	DC 5V From Adapter

Operation Frequency each of channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
36	5180MHz	38	5190MHz	40	5200MHz	42	5210MHz
44	5220MHz	46	5230MHz	48	5240MHz	/	/
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
149	5745MHz	151	5755MHz	153	5765MHz	155	5775MHz
157	5785MHz	159	5795MHz	161	5805MHz	/	/
165	5825MHz	/					

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Test channel	Frequency (MHz)		
	802.11 a /n(HT20)/ac(VHT20)	802.11 n(HT40)/ac(VHT40)	802.11ac(VHT80)
Lowest channel	5180	5190	5210
Middle channel	5200	X	
Highest channel	5240		

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	X	
Highest channel	5825		

2.2 Test mode

Transmitting mode	Keep the EUT in continuously transmitting mode.
<i>Remark: During the test, the test voltage was tuned from 85% to 115% of the nominal rated supply voltage, and found that the worst case was under the nominal rated supply condition. So the report just shows that condition's data.</i>	

We have verified the construction and function in typical operation. All the test modes were carried out with the EUT in transmitting operation, which was shown in this test report and defined as follows:

Pretest Mode	Description
Mode 1	802.11a / n 20/ 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	ADAPTER	XIAO MI	MDY-11-EM	/

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	MP TOOL.EXE (v1.09)
Power level setup	Default

3 Test Instruments list

Conducted Emission

Item	Equipment name	Manufacturer	Model	Serial No.	Calibration date	Due date
1	EMI Test Receiver	Rohde&schwarz	ESCI3	100605	2025.3.06	2026.3.05
2	Artificial power network	schwarabeck	NSLK8127	8127483	2025.3.06	2026.3.05
3	Artificial power network	ETS	3186/2NM	1132	2025.3.06	2026.3.05
4	10dB attenuator	HUBER+SUHNER	10dB	/	2025.3.06	2026.3.05
5	Cable 4	HUBER SUNNER	3M	/	2025.3.06	2026.3.05
6	Absorbing Clamp	schwarabeck	MDS21	D69250	2025.3.06	2026.3.05

Radiated Emission &RF Conducted test:

Item	Equipment name	Manufacturer	Model	Serial No.	Calibration date	Due date
1	EMI Test Receiver	Rohde&schwarz	ESCI7	101032	2025.3.06	2026.3.05
2	Broadband antenna	schwarabeck	VULB9168	1064	2024.3.26	2026.3.25
3	Horn antenna	schwarabeck	BBHA9120D	9120D-1145	2024.3.22	2026.3.21
4	Amplifier	EMtrace	RP01A	50117	2025.3.06	2026.3.05
5	Amplifier	Space-Dtronic	EWLAN0118G-P40	19113001	2025.3.06	2026.3.05
6	Spectrum analyzer	KEYSIGHT	N9020A	MY55370280	2025.3.06	2026.3.05
7	Power detector meter	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).

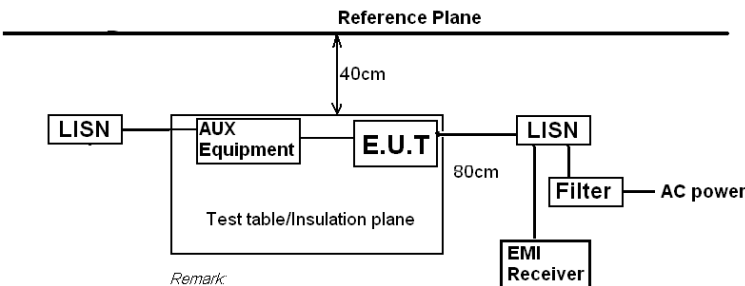
Software Name	Manufacturer	Model	Version
RF test software	MWRFtest	MTS 8310	V2.0.0.0
Conducted test software	EZ-EMC	Farad	Ver.EMC-CON 3A1.1
Radiated test software	EZ-EMC	Farad	Ver.FA-03A2 RE

4 Test results and Measurement Data

4.1 Antenna requirement

Standard requirement:	47CRF Part 15.203
<i>15.203 requirement:</i> <i>An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.</i>	
E.U.T Antenna:	
<i>The antenna is Integrated antenna, the best case gain of the antenna is 2.90 dBi, reference to the appendix II for details.</i>	

4.2 Conducted Emissions

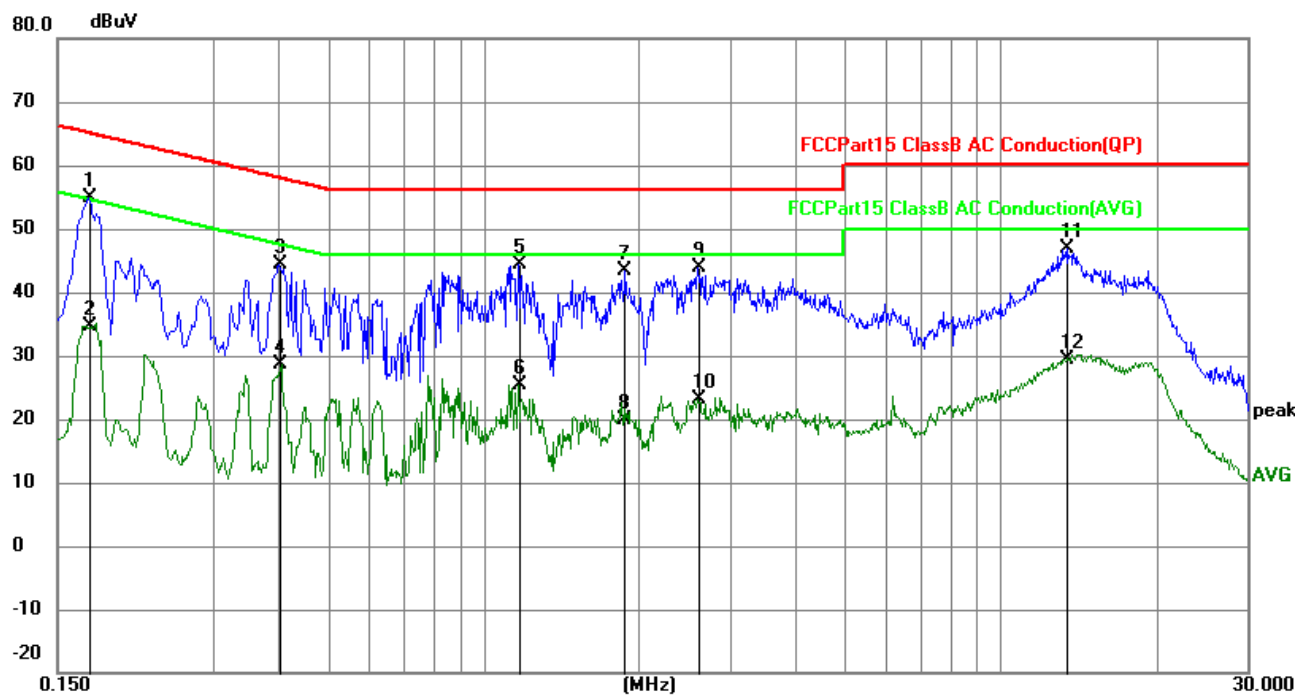
Test Requirement:	47CRF Part 15.207					
Test Method:	ANSI C63.10:2013					
Test Frequency Range:	150KHz to 30MHz					
Class / Severity:	Class B					
Receiver setup:	RBW=9KHz, VBW=30KHz, Sweep time=auto					
Limit:	Frequency range (MHz)		Limit (dBuV)			
			Quasi-peak		Average	
	0.15-0.5		66 to 56*		56 to 46*	
	0.5-5		56		46	
	5-30		60		50	
* Decreases with the logarithm of the frequency.						
Test setup:	Reference Plane  Remark E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m					
Test procedure:	1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment. 2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs). 3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10:2013 on conducted measurement.					
Test Instruments:	Refer to section 3.0 for details					
Test mode:	Refer to section 2.2 for details					
Test environment:	Temp.:	27.°C	Humid.:	58%	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 5745MHz)

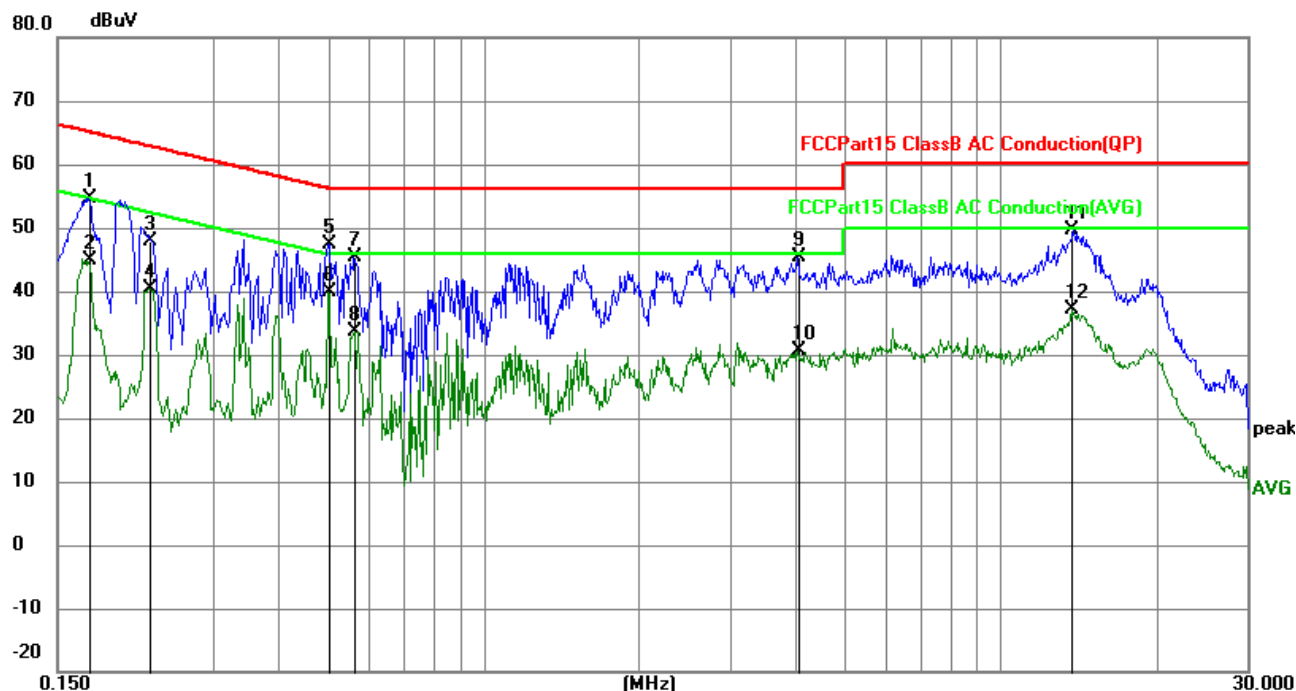
Measurement Result

Line:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1723	45.04	9.81	54.85	64.85	-10.00	QP
2	0.1723	24.82	9.81	34.63	54.85	-20.22	AVG
3	0.4020	34.54	9.90	44.44	57.81	-13.37	QP
4	0.4020	18.80	9.90	28.70	47.81	-19.11	AVG
5	1.1669	34.42	9.94	44.36	56.00	-11.64	QP
6	1.1669	15.41	9.94	25.35	46.00	-20.65	AVG
7	1.8731	33.62	9.86	43.48	56.00	-12.52	QP
8	1.8731	10.08	9.86	19.94	46.00	-26.06	AVG
9	2.5979	34.01	9.85	43.86	56.00	-12.14	QP
10	2.5979	13.24	9.85	23.09	46.00	-22.91	AVG
11	13.4205	37.15	9.77	46.92	60.00	-13.08	QP
12	13.4205	19.63	9.77	29.40	50.00	-20.60	AVG

Neutral:

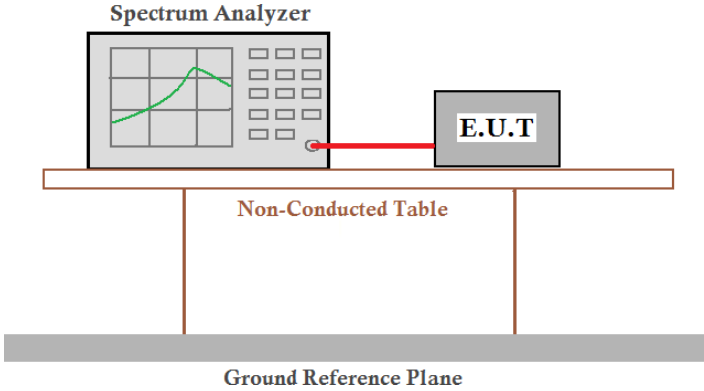


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1723	44.74	9.81	54.55	64.85	-10.30	QP
2	0.1723	35.03	9.81	44.84	54.85	-10.01	AVG
3	0.2265	38.11	9.82	47.93	62.58	-14.65	QP
4	0.2265	30.58	9.82	40.40	52.58	-12.18	AVG
5	0.5010	37.52	9.94	47.46	56.00	-8.54	QP
6	0.5010	29.98	9.94	39.92	46.00	-6.08	AVG
7	0.5636	35.44	9.94	45.38	56.00	-10.62	QP
8	0.5636	23.61	9.94	33.55	46.00	-12.45	AVG
9	4.0560	35.57	9.84	45.41	56.00	-10.59	QP
10	4.0560	20.82	9.84	30.66	46.00	-15.34	AVG
11	13.7217	39.83	9.78	49.61	60.00	-10.39	QP
12	13.7217	27.25	9.78	37.03	50.00	-12.97	AVG

Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level = Receiver Read level + LISN Factor + Cable Loss
4. If the average limit is met when using a quasi-peak detector receiver, the EUT shall be deemed to meet both limits and measurement with the average detector receiver is unnecessary.

4.3 Duty cycle

Test Method :	ANSI C63.10:2013	
Limit:	/	
Test setup:	 The diagram illustrates the test setup. A Spectrum Analyzer, shown with a grid and a green curve on its screen, is connected to an E.U.T (Equipment Under Test) box by a red cable. Both the Spectrum Analyzer and the E.U.T are positioned on a table labeled 'Non-Conducted Table'. This table is supported by two vertical legs that rest on a thick grey bar at the bottom labeled 'Ground Reference Plane'.	
Test Instruments:	Refer to section 3.0 for details	
Test mode:	Refer to section 2.2 for details	
Test environment:	Temp.: 25.1°C	Humid.: 60%RH
Test voltage:	DC 5V	
Test results:	Pass	

Measurement Result

5180-5240MHz

Mode	Duty cycle (%)	Correction Factor (dB)
TX 802.11a Mode	84.48	0.73
TX 802.11n20 Mode	84.12	0.75
TX 802.11ac20 Mode	84.48	0.73
TX 802.11n40 Mode	83.90	0.76
TX 802.11a40 Mode	83.90	0.76
TX 802.11ac80 Mode	95.38	0.21

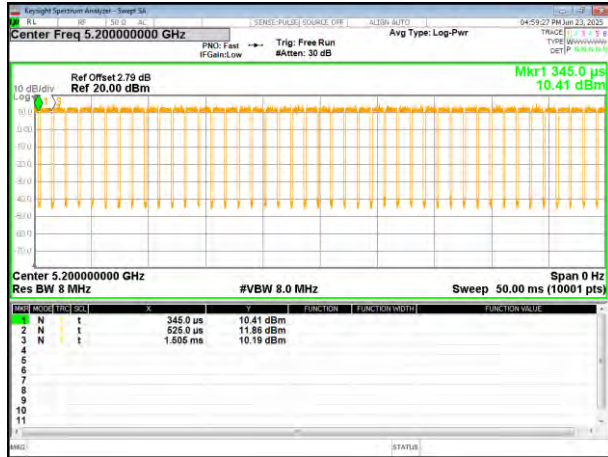
5745-5825 MHz

Mode	Duty cycle (%)	Correction Factor (dB)
TX 802.11a Mode	85.42	0.68
TX 802.11n20 Mode	85.42	0.68
TX 802.11ac20 Mode	85.42	0.68
TX 802.11n40 Mode	82.61	0.83
TX 802.11a40 Mode	81.82	0.87
TX 802.11ac80 Mode	86.36	0.64

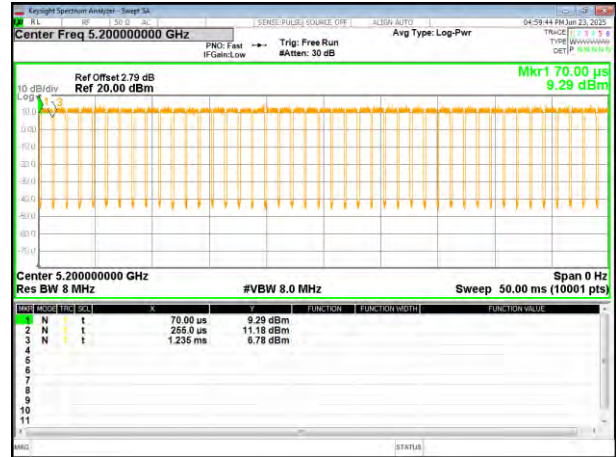
Test plot

5180-5240MHz

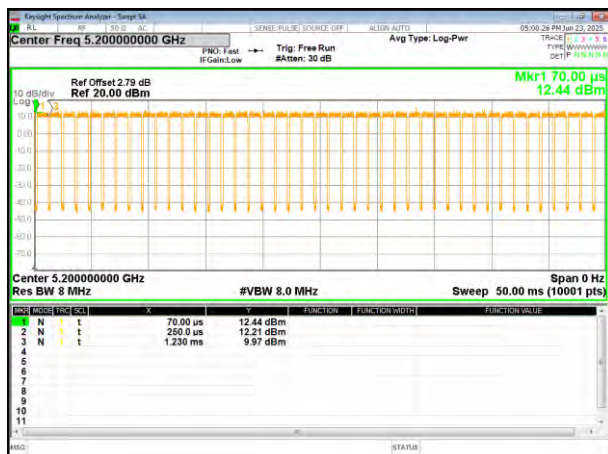
(802.11a) plot



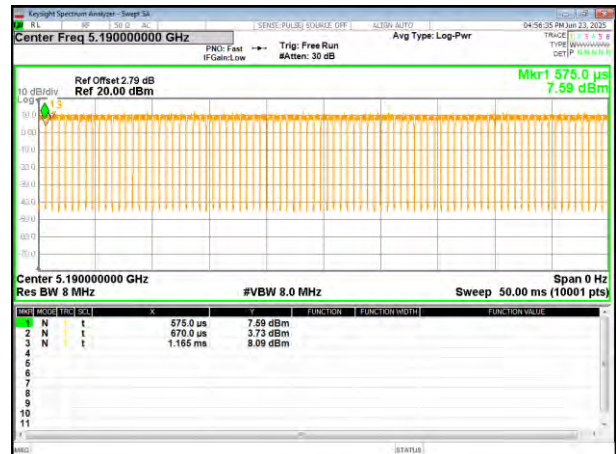
(802.11 n20) plot



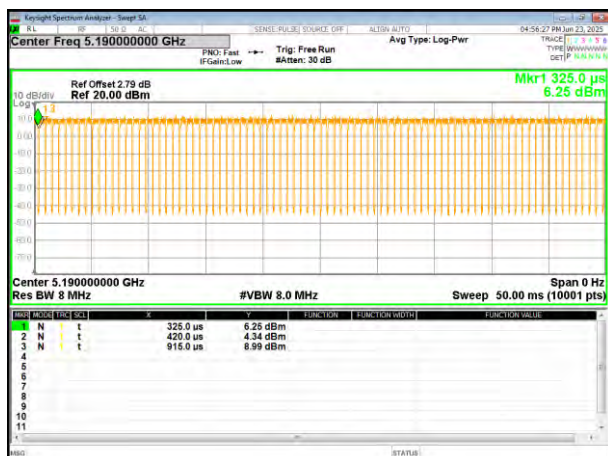
(802.11ac20) plot



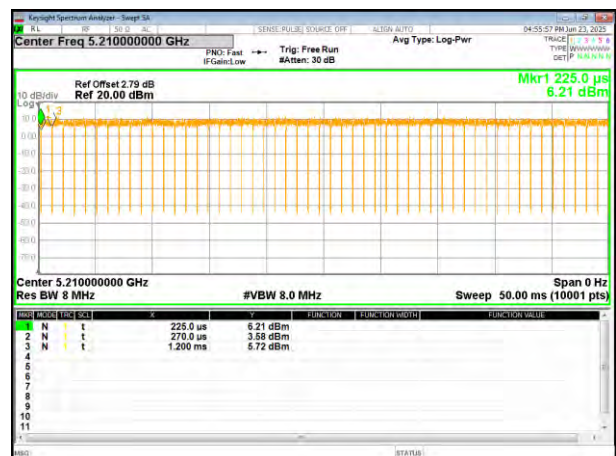
(802.11 n40) plot



(802.11ac40) plot

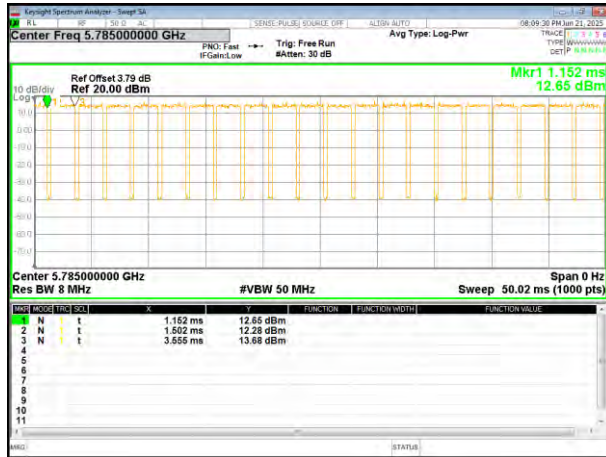


(802.11ac80) plot

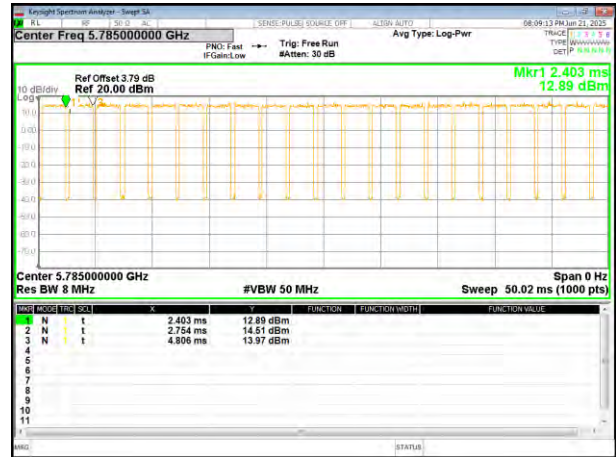


5745-5825 MHz

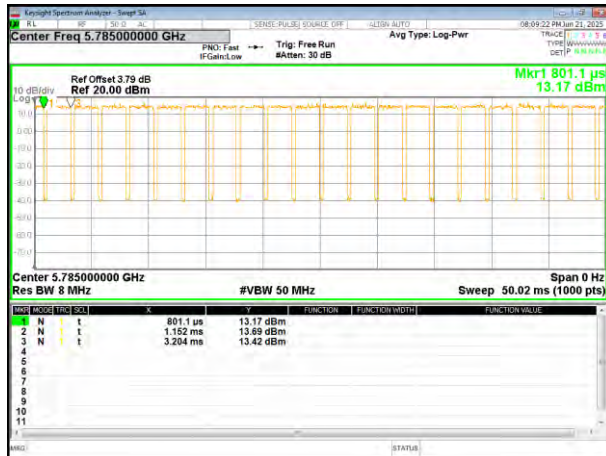
(802.11a) plot



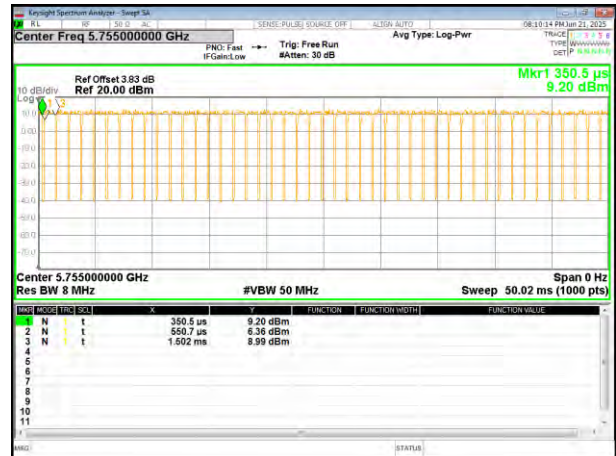
(802.11 n20) plot



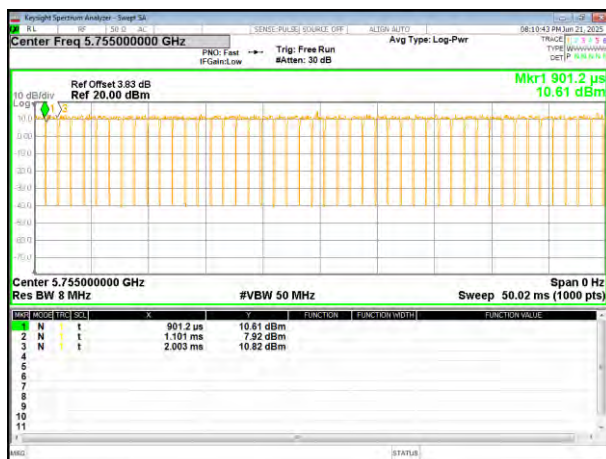
(802.11ac20) plot



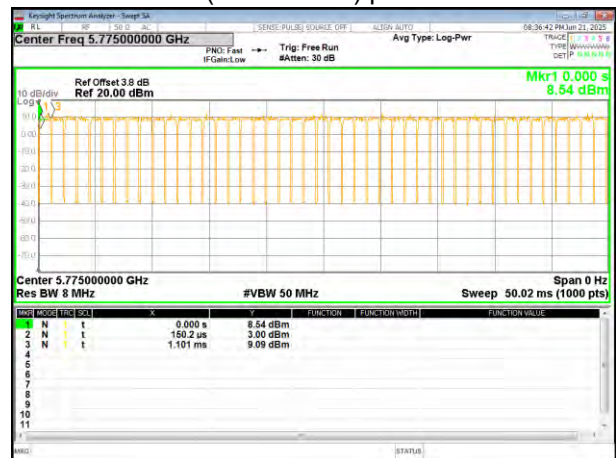
(802.11 n40) plot



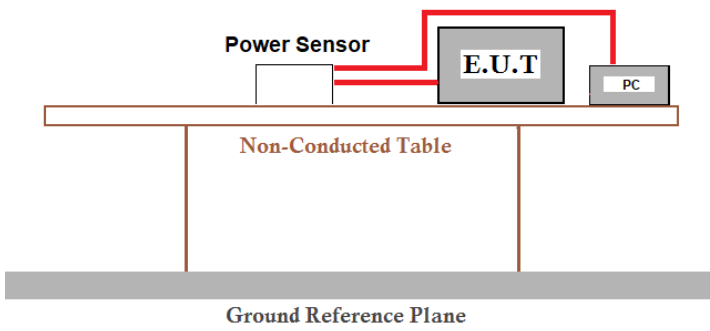
(802.11ac40) plot



(802.11ac80) plot



4.4 Conducted Output Power

Test Requirement:	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:	5150-5250MHz : 250mW 5725~5850MHz : 1W	
Test setup:	 The diagram illustrates the test setup. A 'Power Sensor' is connected via red lines to an 'E.U.T.' (Equipment Under Test) and a 'PC'. Both the E.U.T. and the PC are placed on a 'Non-Conducted Table'. This table is supported by two vertical legs and sits on a 'Ground Reference Plane', which is represented by a thick grey bar at the bottom.	
Test Instruments:	Refer to section 3.0 for details	
Test mode:	Refer to section 2.2 for details	
Test environment:	Temp.: 25.1°C	Humid.: 60%RH
Test voltage:	DC 5V	
Test results:	Pass	

Measurement Result

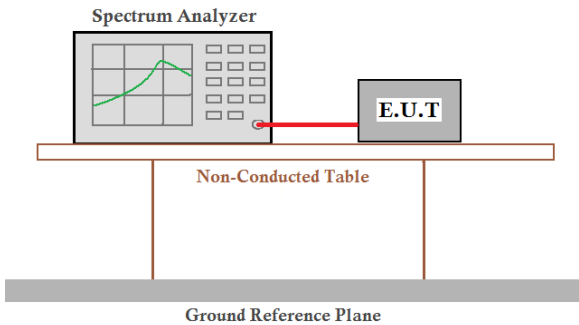
5180-5240MHz

Test Channel	Frequency	Correction Factor	Maximum output power	Total Power	LIMIT	Result
	(MHz)	(dB)	(dBm)	(dBm)	dBm	
TX 802.11a Mode						
CH36	5180	0.73	14.23	14.96	24	Pass
CH40	5200	0.73	14.05	14.78	24	Pass
CH48	5240	0.73	14.18	14.91	24	Pass
TX 802.11 n20 Mode						
CH36	5180	0.75	14.40	15.15	24	Pass
CH40	5200	0.75	14.25	15.00	24	Pass
CH48	5240	0.75	14.05	14.80	24	Pass
TX 802.11 ac20 Mode						
CH36	5180	0.73	14.06	14.79	24	Pass
CH40	5200	0.73	14.35	15.08	24	Pass
CH48	5240	0.73	13.96	14.69	24	Pass
TX 802.11 n40 Mode						
CH38	5190	0.76	13.79	14.55	24	Pass
CH46	5230	0.76	13.40	14.16	24	Pass
TX 802.11 ac40 Mode						
CH38	5190	0.76	13.91	14.67	24	Pass
CH46	5230	0.76	13.38	14.14	24	Pass
TX 802.11 ac80 Mode						
CH42	5210	0.21	12.35	12.56	24	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	14.86	15.54	30	Pass
CH157	5785	0.68	14.42	15.10	30	Pass
CH165	5825	0.68	14.04	14.72	30	Pass
TX 802.11 n20 Mode						
CH149	5745	0.68	14.30	14.98	30	Pass
CH157	5785	0.68	14.01	14.69	30	Pass
CH165	5825	0.68	14.51	15.19	30	Pass
TX 802.11 ac20 Mode						
CH149	5745	0.68	14.56	15.24	30	Pass
CH157	5785	0.68	14.39	15.07	30	Pass
CH165	5825	0.68	14.36	15.04	30	Pass
TX 802.11 n40 Mode						
CH151	5755	0.83	13.21	14.04	30	Pass
CH159	5795	0.83	13.65	14.48	30	Pass
TX 802.11 ac40 Mode						
CH151	5755	0.87	13.23	14.10	30	Pass
CH159	5795	0.87	13.59	14.46	30	Pass
TX 802.11 ac80 Mode						
CH155	5775	0.64	12.38	13.02	30	Pass

4.5 Bandwidth & 99% Occupancy 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.: 25.1°C	Humid.: 60%RH
Test voltage:	DC 5V	
Test results:	Pass	

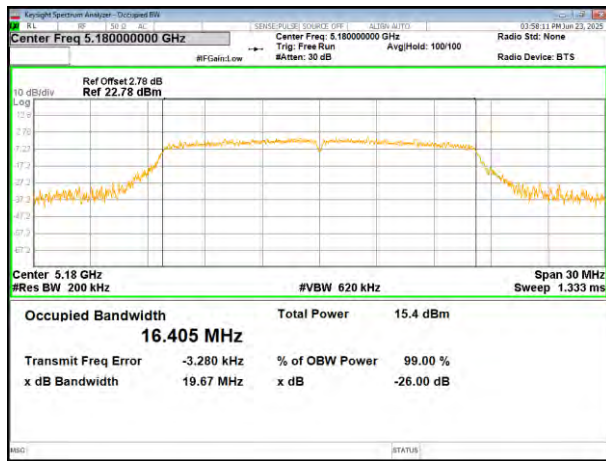
Measurement Result

5180-5240MHz

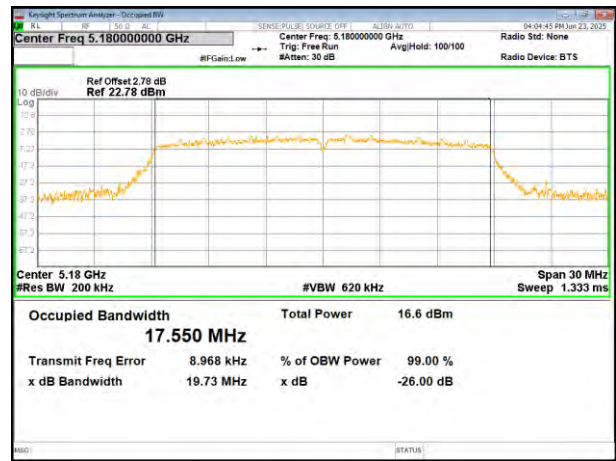
Test CH	-26dB Channel Bandwidth (MHz)						Result
	802.11a	802.11n (HT20)	802.11ac (HT20)	802.11n (HT40)	802.11ac (HT40)	802.11ac (HT80)	
Lowest	19.67	19.73	19.98	40.74	40.33	--	Pass
Middle	19.67	19.90	19.92	--	--	80.10	
Highest	20.10	20.03	20.14	53.54	45.07	--	

Test plot 99% Occupy Bandwidth

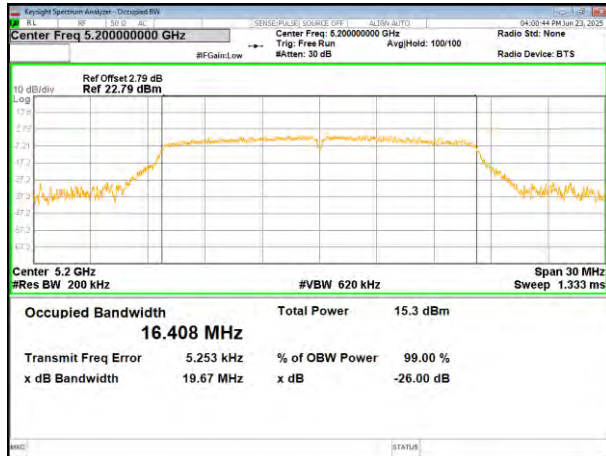
(802.11a) plot on channel 36



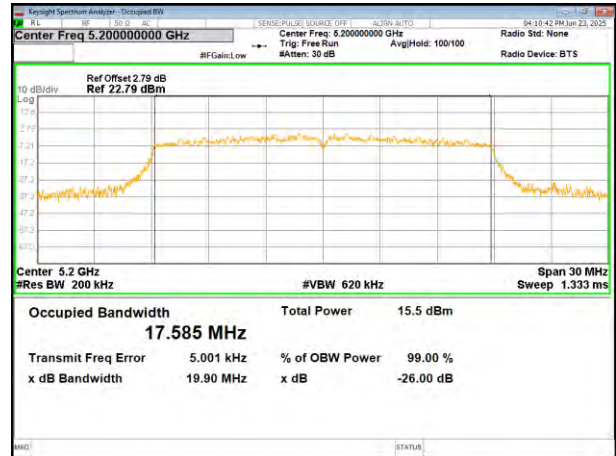
(802.11 n20) plot on channel 36



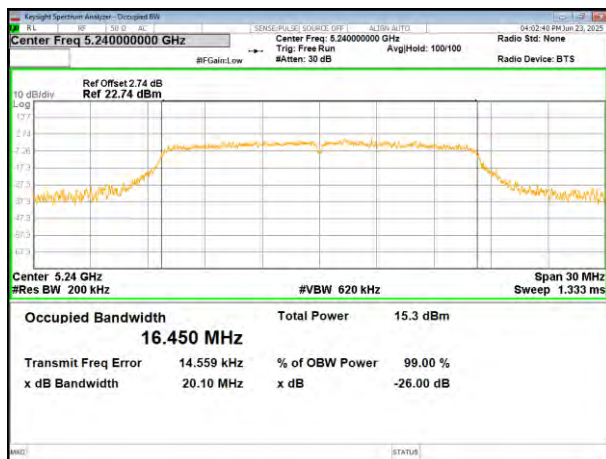
(802.11a) plot on channel 40



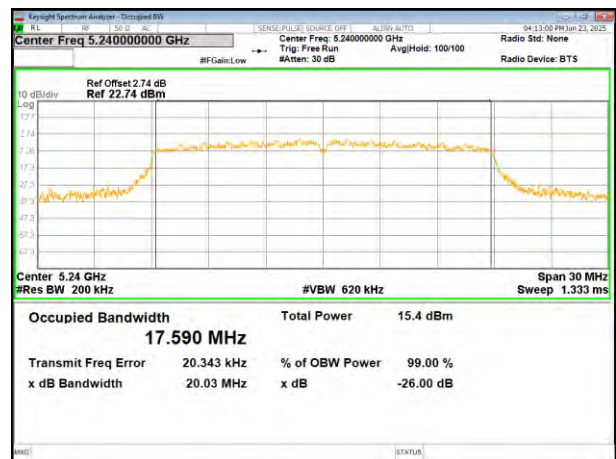
(802.11 n20) plot on channel 40



(802.11a) plot on channel 48

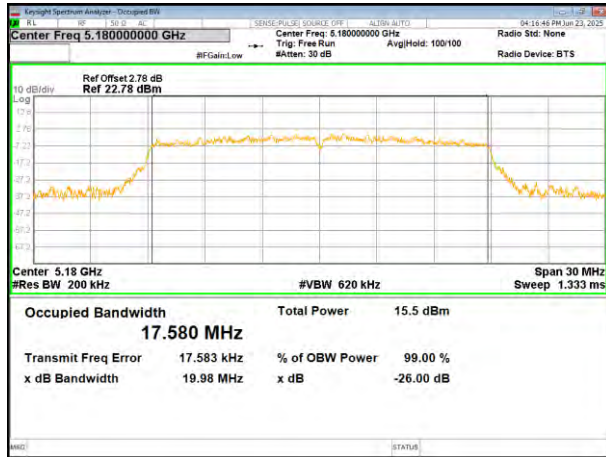


(802.11 n20) plot on channel 48

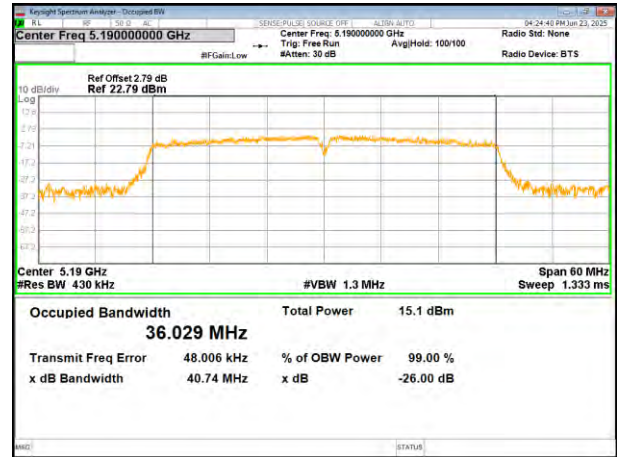


Test plot

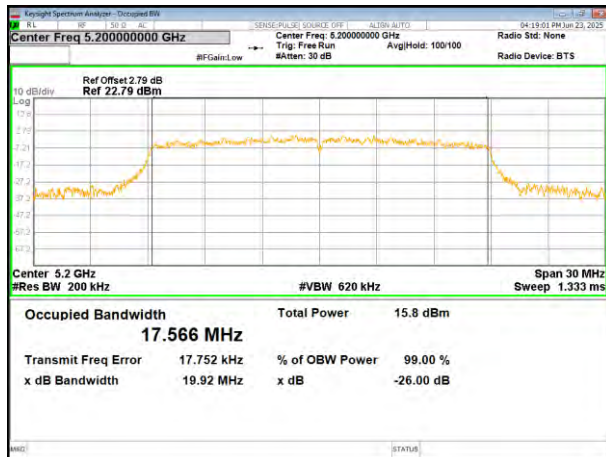
(802.11ac20) plot on channel 36



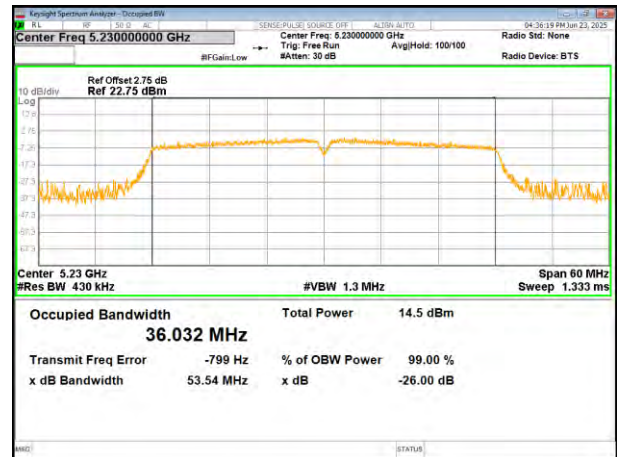
(802.11 n40) plot on channel 38



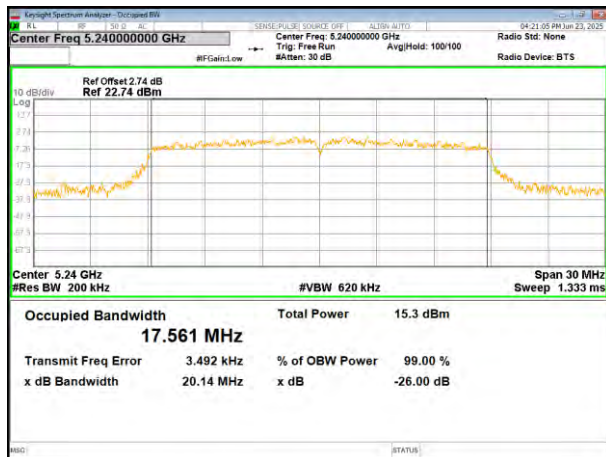
(802.11ac20) plot on channel 40



(802.11 n40) plot on channel 46

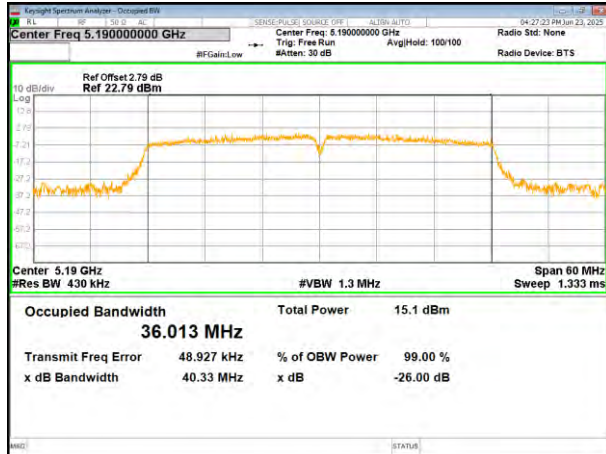


(802.11ac20) plot on channel 48

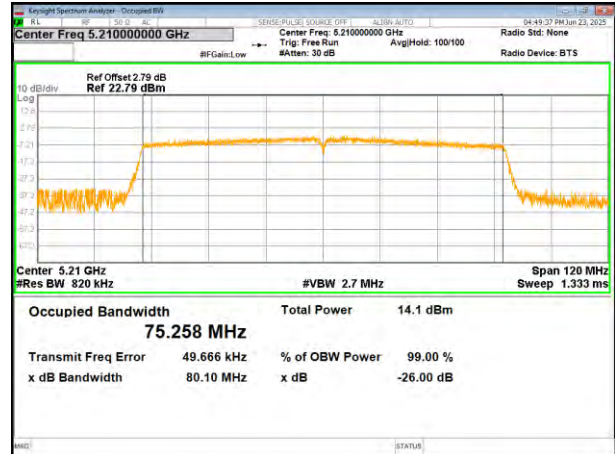


Test plot

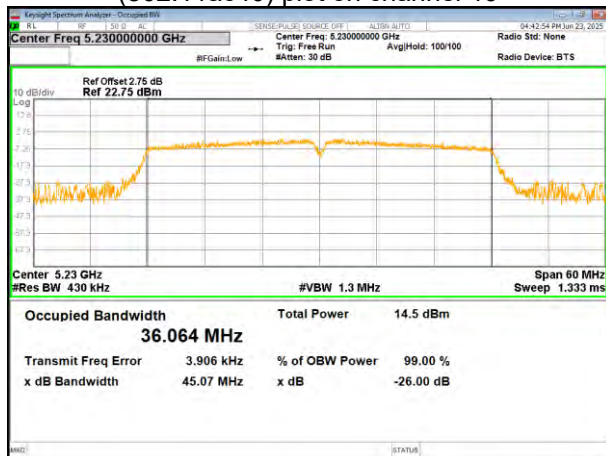
(802.11ac40) plot on channel 38



(802.11ac80) plot on channel 42



(802.11ac40) plot on channel 46



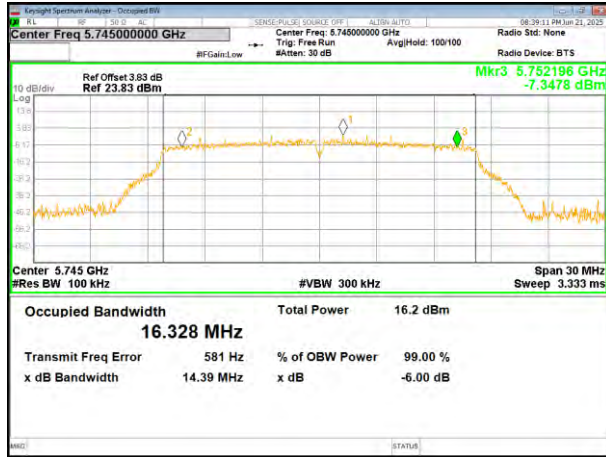
5745-5825MHz

Test CH	-6dB Channel Bandwidth (MHz)						Limit (KHz)	Result
	802.11a	802.11n (HT20)	802.11ac (HT20)	802.11n (HT40)	802.11ac (HT40)	802.11ac (HT80)		
Lowest	14.39	13.81	15.07	35.11	35.10	--	>500	Pass
Middle	15.27	15.05	15.12	--	--	75.12		
Highest	15.05	15.09	14.46	35.08	35.08	--		

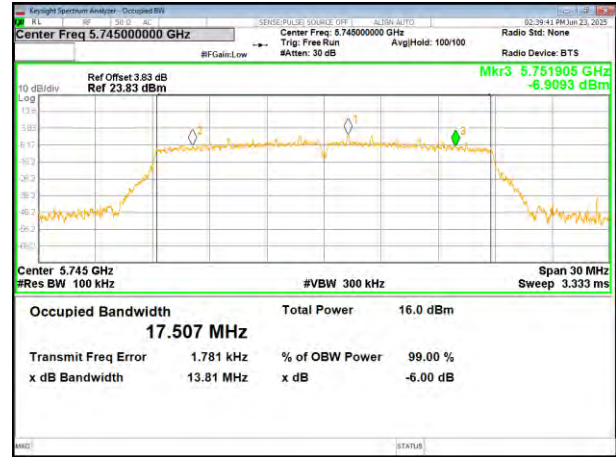
Remark: "---" is not applicable

Test plot

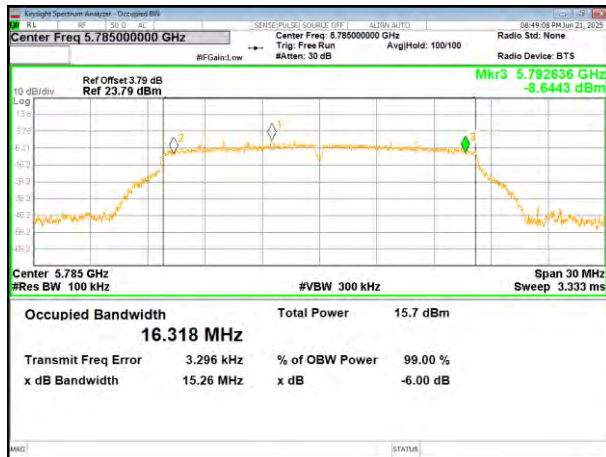
(802.11a) plot on channel 149



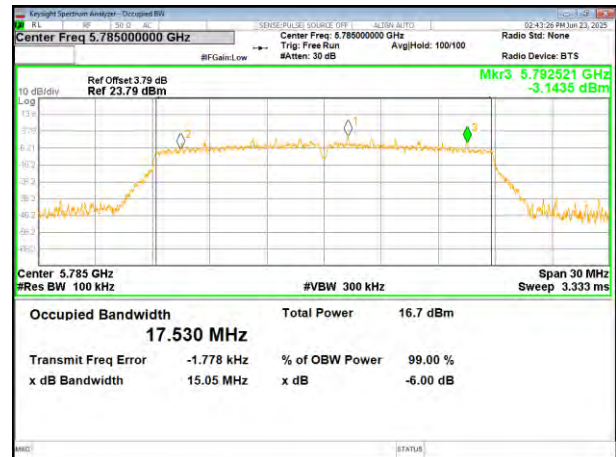
(802.11 n20) plot on channel 149



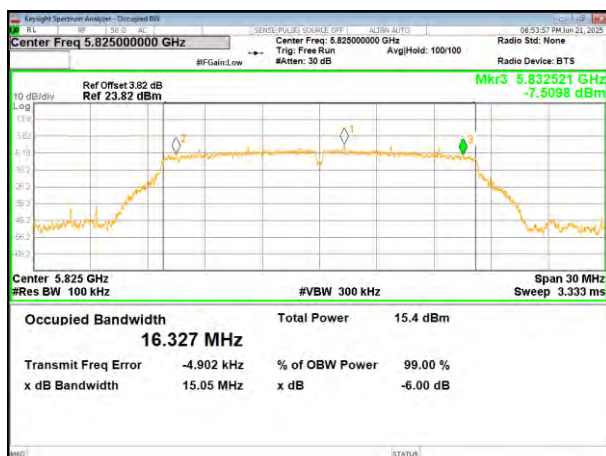
(802.11a) plot on channel 157



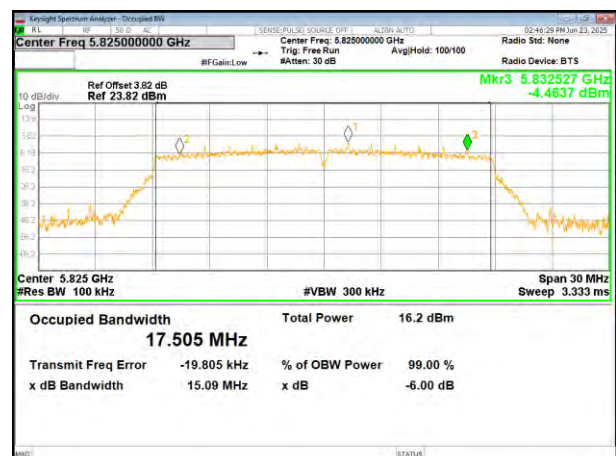
(802.11 n20) plot on channel 157



(802.11a) plot on channel 165

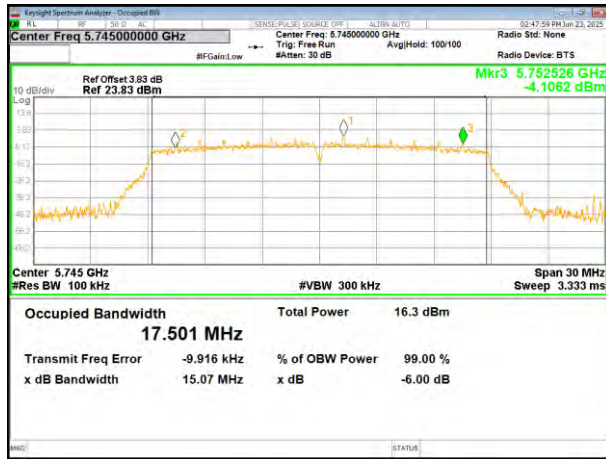


(802.11 n20) plot on channel 165

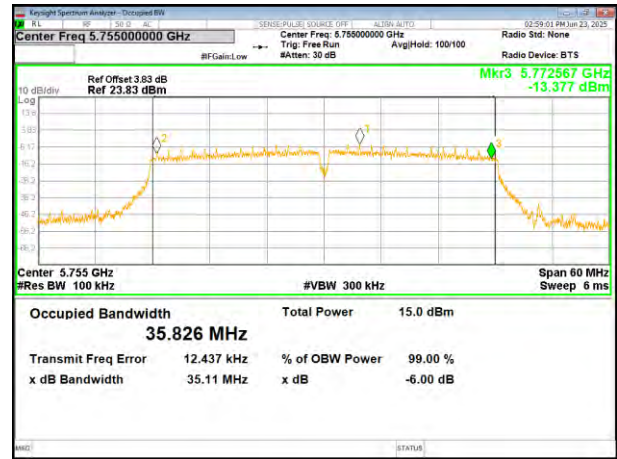


Test plot

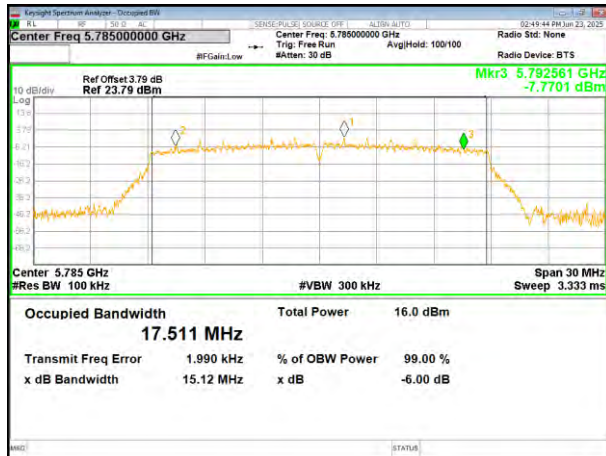
(802.11ac20) plot on channel 149



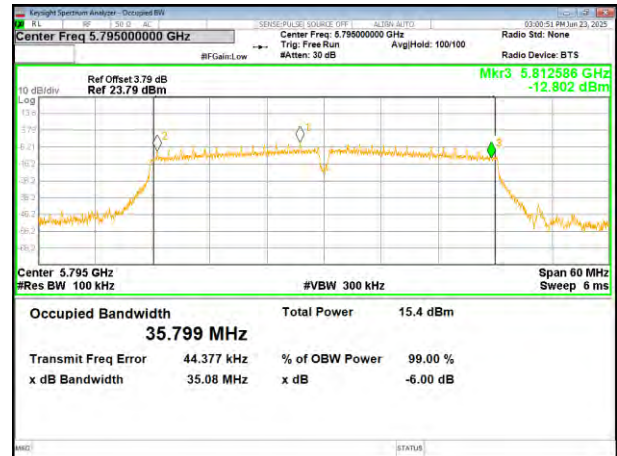
(802.11 n40) plot on channel 151



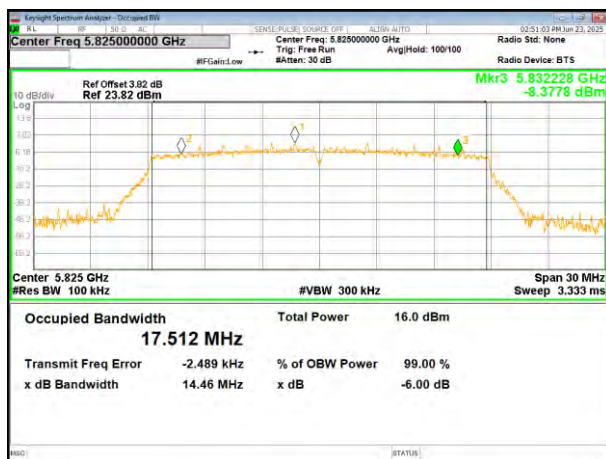
(802.11ac20) plot on channel 157



(802.11 n40) plot on channel 159

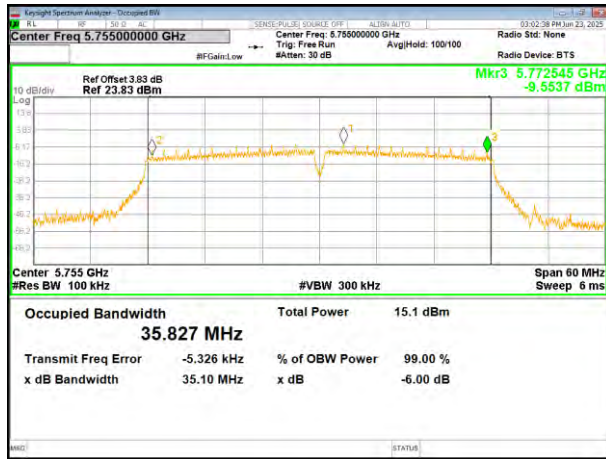


(802.11ac20) plot on channel 165

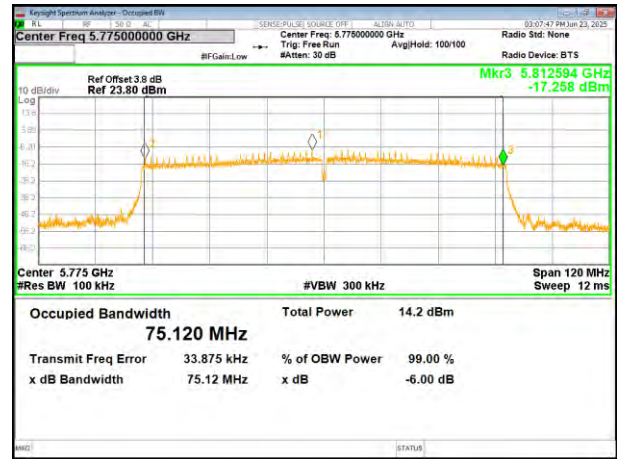


Test plot

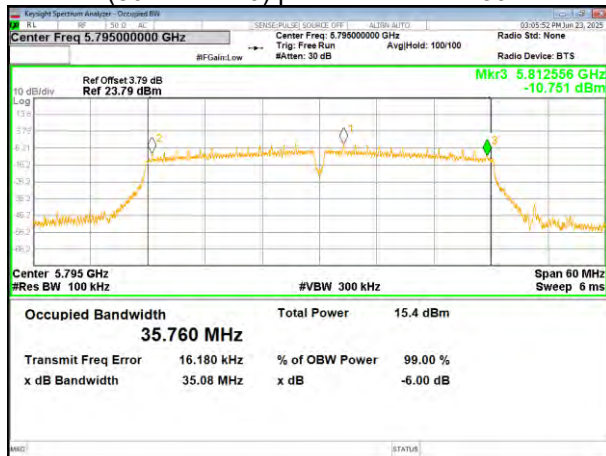
(802.11 ac40) plot on channel 151



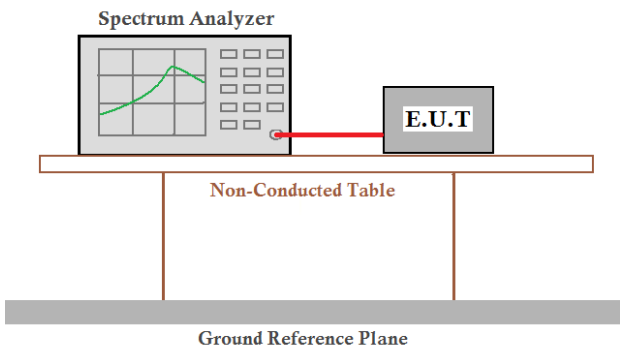
(802.11 ac80) plot on channel 155



(802.11 ac40) plot on channel 159



4.6 Power Spectral Density

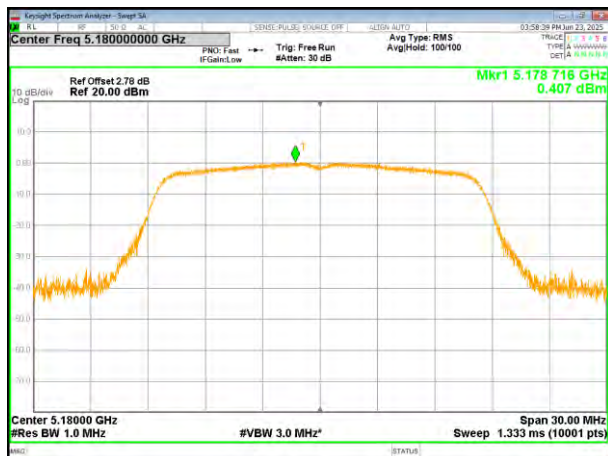
Test Requirement:	47CRF Part 15.407(a)(1)/ (a)(3)	
Test Method:	KDB 789033 D02 General U-NII Test Procedures New Rules v02r01, ANSI C63.10:2013	
Limit:	Frequency band (MHz)	Limit
	5150-5250	≤17dBm/1MHz for master device
		≤11dBm/1MHz for client device
	5250-5350	≤11dBm/1MHz for client device
	5470-5725	≤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.: 25.1°C	Humid.: 60%RH
Test voltage:	DC 5V	
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	0.407	0.730	1.137	11
	5200 MHz	0.230	0.730	0.960	11
	5240 MHz	-0.165	0.730	0.565	11
802.11 n20	5180 MHz	-0.110	0.750	0.640	11
	5200 MHz	-0.831	0.750	-0.081	11
	5240 MHz	-1.798	0.750	-1.048	11
802.11 ac20	5180 MHz	-1.131	0.730	-0.401	11
	5200 MHz	-0.818	0.730	-0.088	11
	5240 MHz	-1.273	0.730	-0.543	11
802.11 n40	5190 MHz	-4.339	0.760	-3.579	11
	5230 MHz	-4.126	0.760	-3.366	11
802.11 ac40	5190 MHz	-4.522	0.760	-3.762	11
	5230 MHz	-8.156	0.760	-7.396	11
802.11 ac80	5210 MHz	-8.968	0.210	-8.758	11

(802.11a) PSD plot on channel 36



(802.11n20) PSD plot on channel 36



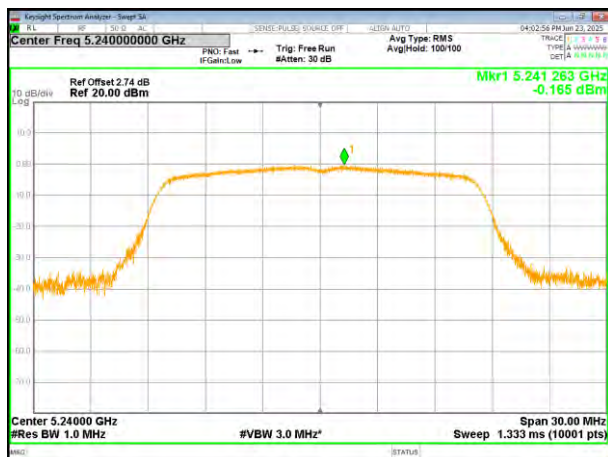
(802.11a) PSD plot on channel 40



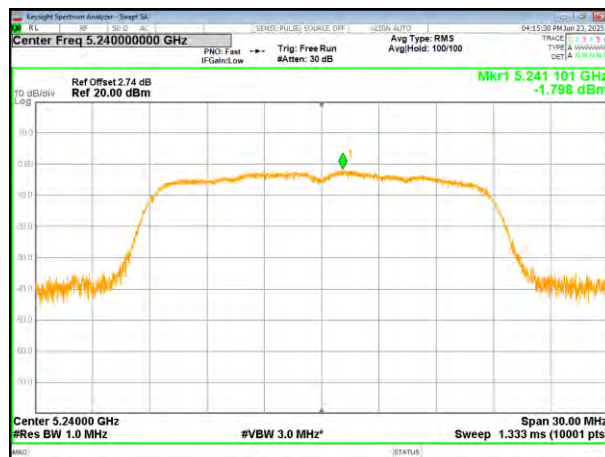
(802.11n20) PSD plot on channel 40



(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



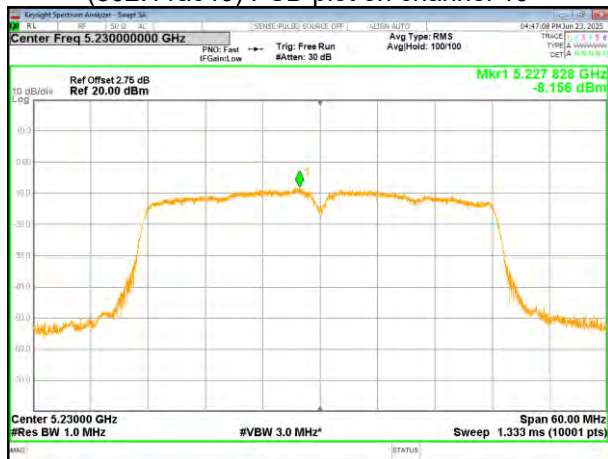
(802.11ac40) PSD plot on channel 38



(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	-3.027	-3.113	0.680	-2.433	30
	5785 MHz	-2.280	-2.366	0.680	-1.686	30
	5825 MHz	-3.014	-3.100	0.680	-2.420	30
802.11 n20	5745 MHz	-3.051	-3.137	0.680	-2.457	30
	5785 MHz	-2.324	-2.410	0.680	-1.730	30
	5825 MHz	-2.833	-2.919	0.680	-2.239	30
802.11ac20	5745 MHz	-2.758	-2.844	0.680	-2.164	30
	5785 MHz	-2.767	-2.853	0.680	-2.173	30
	5825 MHz	-2.847	-2.933	0.680	-2.253	30
802.11 n40	5755 MHz	-7.253	-7.339	0.830	-6.509	30
	5795 MHz	-6.972	-7.058	0.830	-6.228	30
802.11ac40	5755 MHz	-7.251	-7.337	0.870	-6.467	30
	5795 MHz	-6.708	-6.794	0.870	-5.924	30
802.11ac80	5775 MHz	-11.317	-11.403	0.640	-10.763	30

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

2. Correction Factor (dB)= duty cycle factor

(802.11a) PSD plot on channel 149



(802.11n20) PSD plot on channel 149



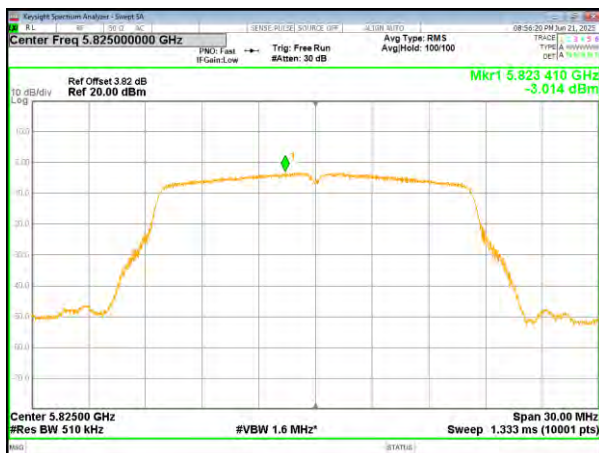
(802.11a) PSD plot on channel 157



(802.11n20) PSD plot on channel 157



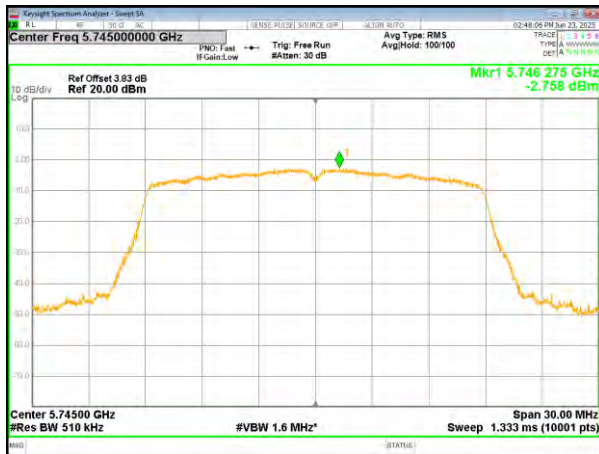
(802.11a) PSD plot on channel 165



(802.11n20) PSD plot on channel 165



(802.11ac20) PSD plot on channel 149



(802.11n40) PSD plot on channel 151



(802.11ac20) PSD plot on channel 157



(802.11n40) PSD plot on channel 159



(802.11ac20) PSD plot on channel 165



(802.11ac40) PSD plot on channel 151



(802.11ac80) PSD plot on channel 155

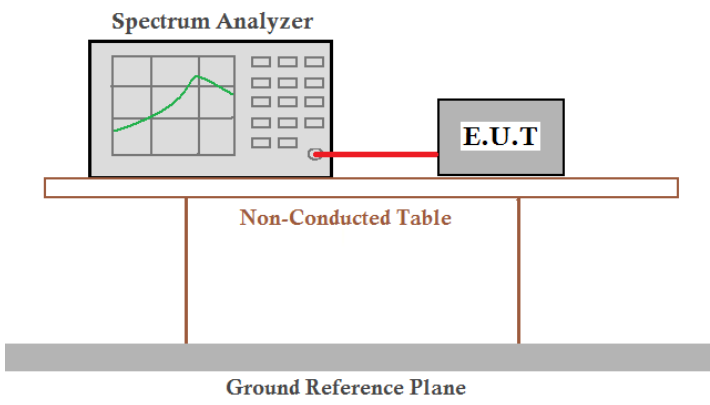


(802.11ac40) PSD plot on channel 159



4.7 Band edge

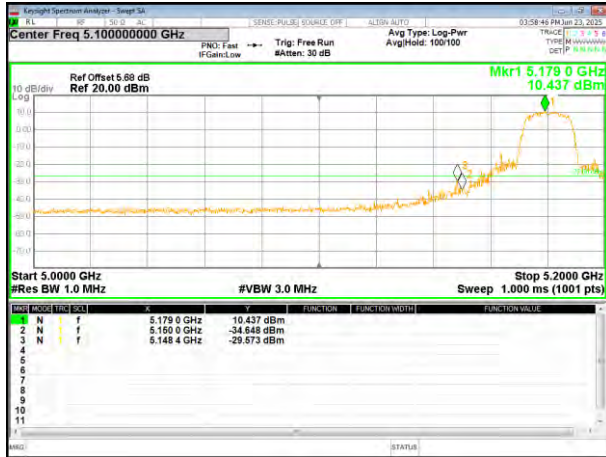
4.7.1 Conducted test Method

Test Requirement:	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:	 The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) via a red cable. Both are placed on a Non-Conducted Table, which is supported by a Ground Reference Plane.	
Test Procedure:	1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator. 2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range. 3. Set RBW of spectrum analyzer to 1 MHz with a convenient frequency span. 4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency. 5. Repeat above procedures until all measured frequencies were complete..	
Test Instruments:	Refer to section 3.0 for details	
Test mode:	Refer to section 2.2 for details	
Test environment:	Temp.: 25.1°C	Humid.: 60%RH
Test voltage:	DC 5V	
Test results:	Pass	

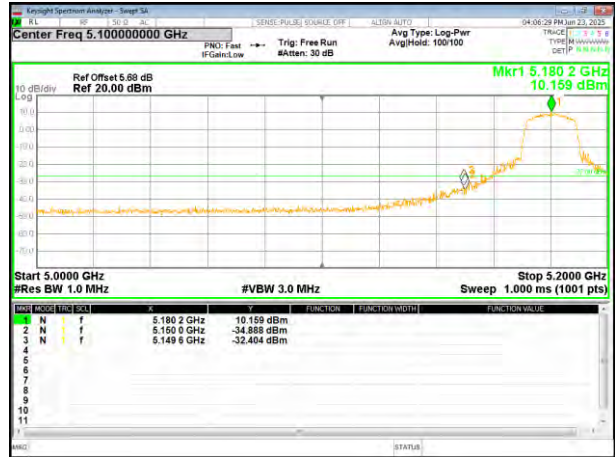
Remark: Due to the margin value of the sideband test being greater than the antenna gain value, the test meets the requirements

5.180~5.240 GHz

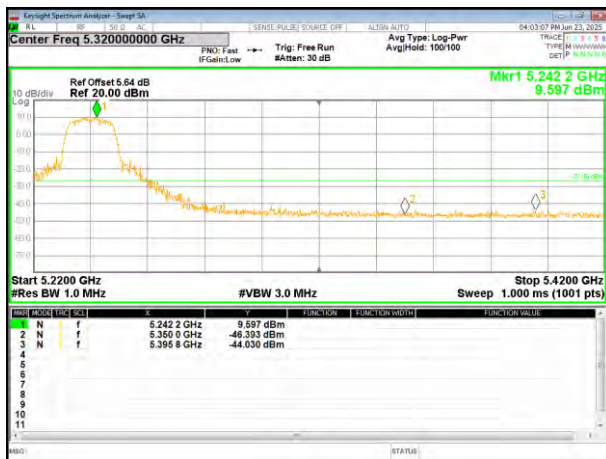
(802.11a) Band Edge, Left Side



(802.11n20) Band Edge, Left Side



(802.11a) Band Edge, Right Side

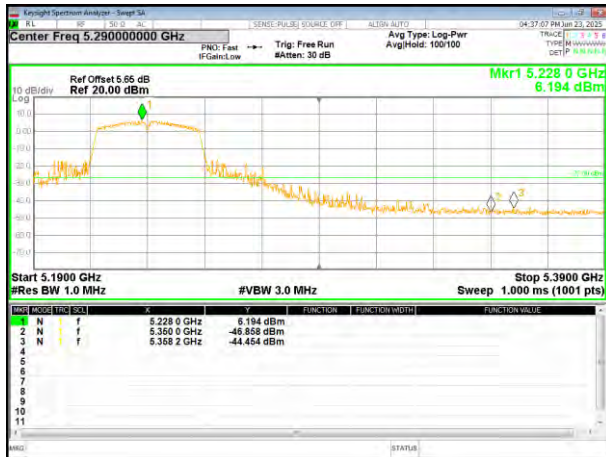


(802.11n20) Band Edge, Right Side

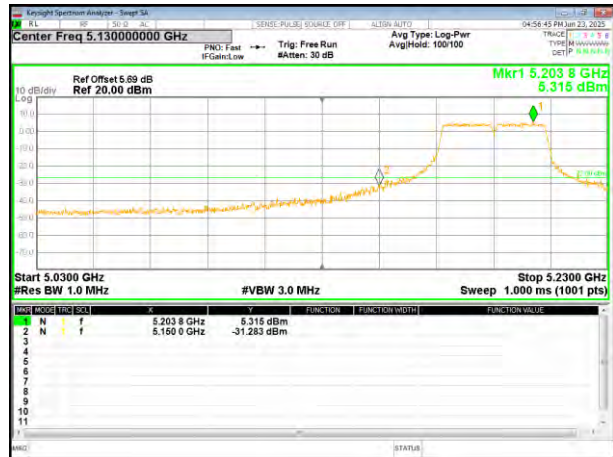


Remark: The antenna gain and cable loss were not compensated in the test data, and the margin value of the Band Edge test was greater than the sum of the antenna gain and cable loss, so the test met the requirements

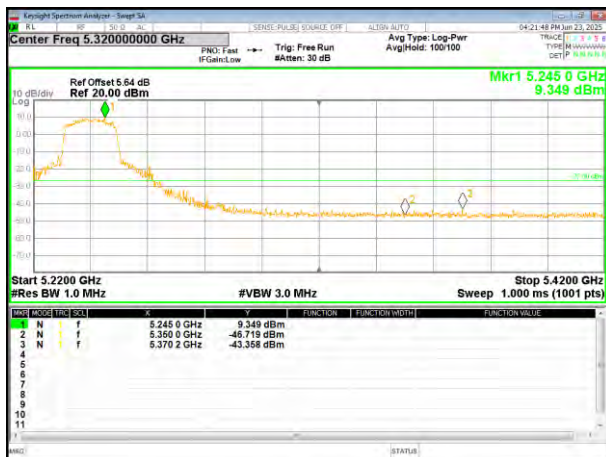
(802.11ac20) Band Edge, Left Side



(802.11n40) Band Edge, Left Side



(802.11ac20) Band Edge, Right Side

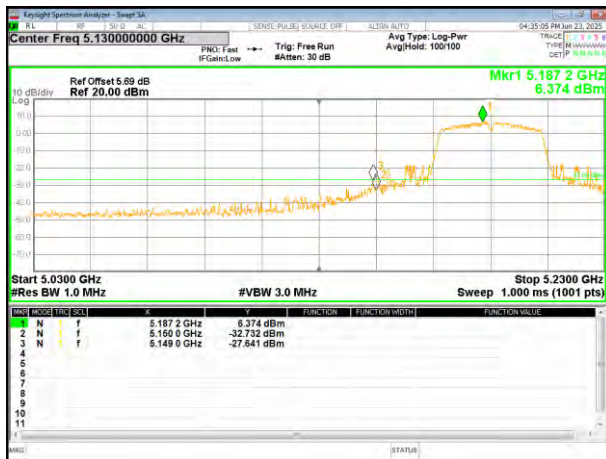


(802.11n40) Band Edge, Right Side



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

(802.11ac40) Band Edge, Left Side



(802.11ac80) Band Edge



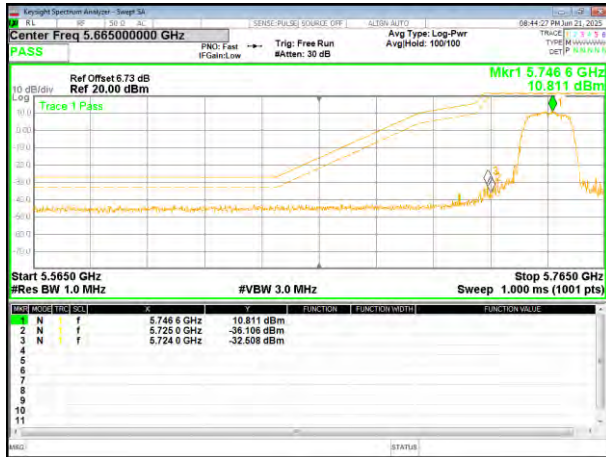
(802.11ac40) Band Edge, Right Side



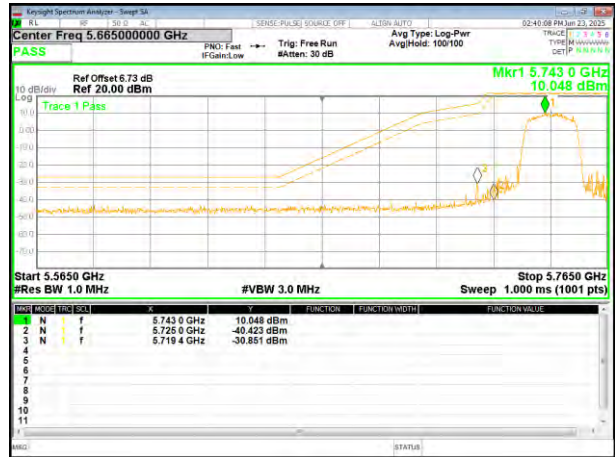
Remark: The antenna gain and cable loss were not compensated in the test data, and the margin value of the Band Edge test was greater than the sum of the antenna gain and cable loss, so the test met the requirements

5.745~5.825 GHz

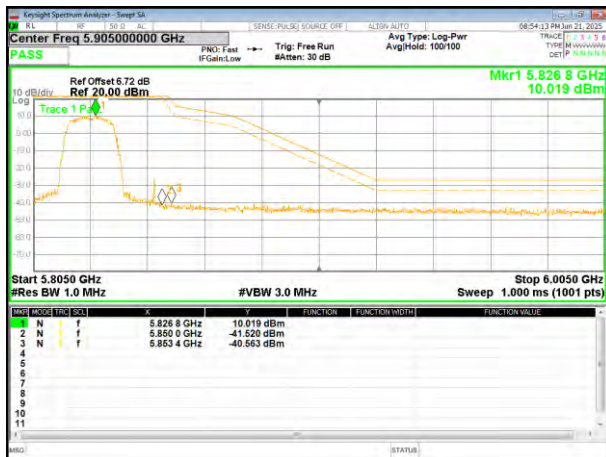
(802.11a) Band Edge, Left Side



(802.11n20) Band Edge, Left Side



(802.11a) Band Edge, Right Side

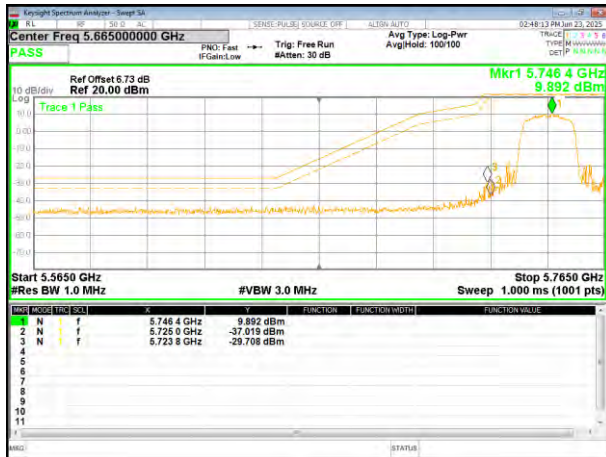


(802.11n20) Band Edge, Right Side



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

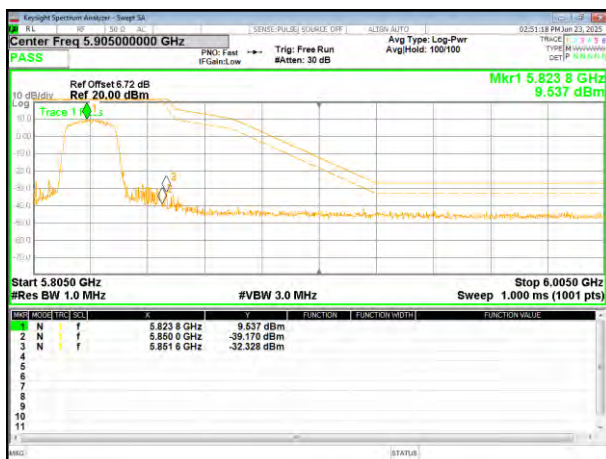
(802.11ac20) Band Edge, Left Side



(802.11n40) Band Edge, Left Side



(802.11ac20) Band Edge, Right Side

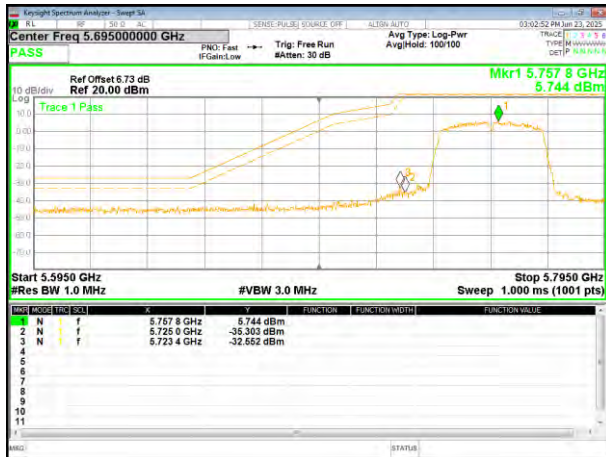


(802.11n40) Band Edge, Right Side



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

(802.11ac40) Band Edge, Left Side



(802.11ac80) Band Edge



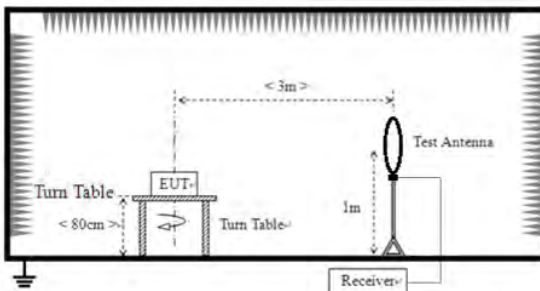
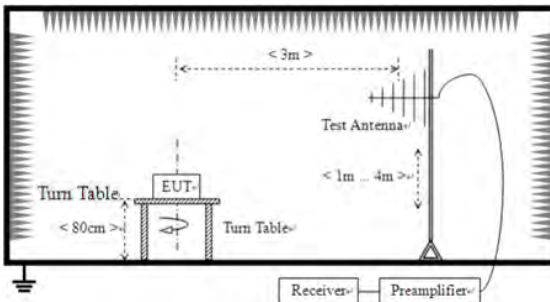
(802.11ac40) Band Edge, Right Side

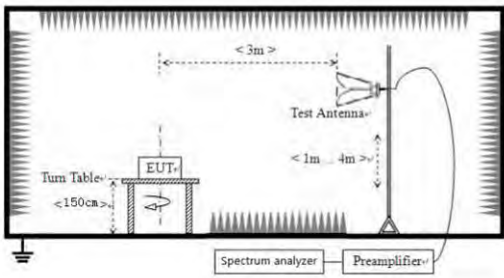


Remark: Antenna gain and cable loss data included in Offset.

4.8 Spurious Emission

4.8.1 Radiated Emission Method

Test Requirement:	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 to 1GHz				
					
	For radiated emissions above 1GHz				

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

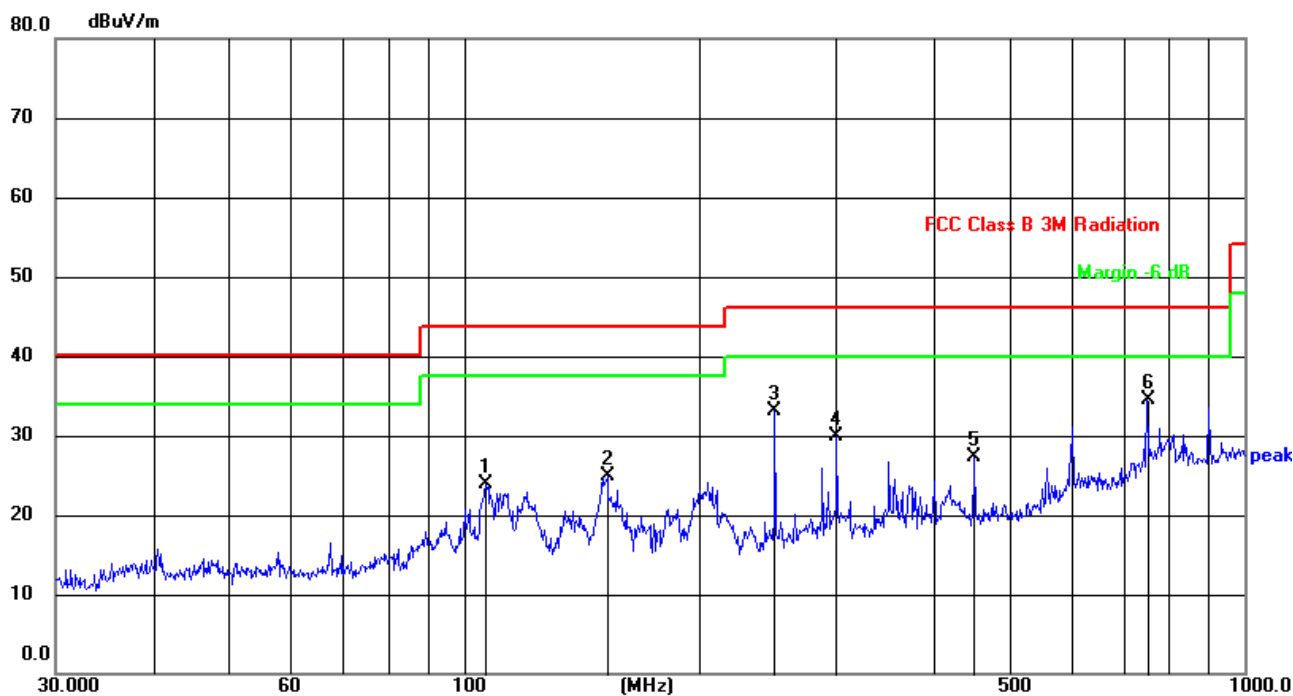
The emission from 9 kHz to 30MHz was pre-tested and found the result was 20dB lower than the limit, and according to 15.31(o) & RSS-Gen 6.13, the test result no need to reported.

Below 1GHz

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

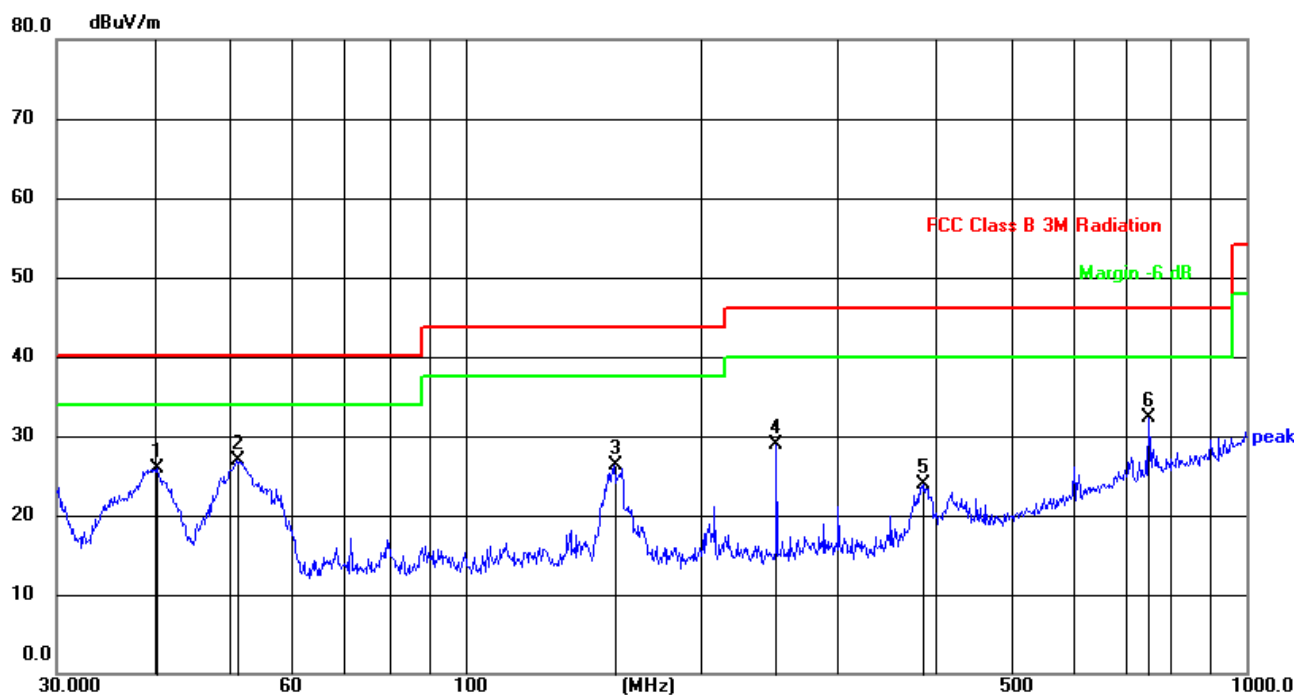
Temperature:	25.1°C	Relative Humidity:	60%
Pressure:	101.2kPa	Test Voltage :	DC 5V
Test Mode :	5.8G TX- 802.11a (5745MHz)		

Horizontal:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	106.7587	43.86	-19.98	23.88	43.50	-19.62	QP
2	152.6641	43.64	-18.70	24.94	43.50	-18.56	QP
3	250.3010	51.29	-18.25	33.04	46.00	-12.96	QP
4	300.3672	48.43	-18.55	29.88	46.00	-16.12	QP
5	451.1349	42.01	-14.75	27.26	46.00	-18.74	QP
6	750.1083	42.71	-8.24	34.47	46.00	-11.53	QP

Vertical:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	40.2757	46.50	-20.60	25.90	40.00	-14.10	QP
2	50.9420	47.88	-20.95	26.93	40.00	-13.07	QP
3	155.3644	45.15	-18.92	26.23	43.50	-17.27	QP
4	250.3010	47.10	-18.25	28.85	46.00	-17.15	QP
5	386.6338	40.62	-16.76	23.86	46.00	-22.14	QP
6	750.1082	40.49	-8.24	32.25	46.00	-13.75	QP

Remarks:

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

Above 1GHz:

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

Temperature:	25.1°C	Relative Humidity:	60%
Pressure:	101.2kPa	Test Voltage :	5VDC
Test Mode :	5.2G TX- 802.11n20		

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	41.44	1.77	43.21	68.20	-24.99	PK
V	10360.00	36.86	1.77	38.63	54.00	-15.37	AV
V	15540.00	45.99	7.72	53.71	74.00	-20.29	PK
V	15540.00	35.44	7.72	43.16	54.00	-10.84	AV
V	20720.00	51.46	-5.73	45.73	68.20	-22.47	PK
V	20720.00	46.98	-5.73	41.25	54.00	-12.75	AV
V	25900.00	48.13	-2.89	45.24	68.20	-22.96	PK
V	25900.00	42.92	-2.89	40.03	54.00	-13.97	AV
V	31080.00	45.14	1.66	46.80	68.20	-21.40	PK
V	31080.00	40.44	1.66	42.10	54.00	-11.90	AV
V	36260.00	42.24	4.63	46.87	68.20	-21.33	PK
V	36260.00	37.49	4.63	42.12	54.00	-11.88	AV
H	10360.00	40.91	1.77	42.68	68.20	-25.52	PK
H	10360.00	36.35	1.77	38.12	54.00	-15.88	AV
H	15540.00	45.78	7.72	53.50	74.00	-20.50	PK
H	15540.00	35.83	7.72	43.55	54.00	-10.45	AV
H	20720.00	51.24	-5.73	45.51	68.20	-22.69	PK
H	20720.00	46.11	-5.73	40.38	54.00	-13.62	AV
H	25900.00	48.12	-2.89	45.23	68.20	-22.97	PK
H	25900.00	43.31	-2.89	40.42	54.00	-13.58	AV
H	31080.00	44.39	1.66	46.05	68.20	-22.15	PK
H	31080.00	39.29	1.66	40.95	54.00	-13.05	AV
H	36260.00	42.11	4.63	46.74	68.20	-21.46	PK
H	36260.00	37.96	4.63	42.59	54.00	-11.41	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	40.90	1.85	42.75	68.20	-25.45	PK
V	10400.00	36.72	1.85	38.57	54.00	-15.43	AV
V	15600.00	45.50	7.64	53.14	74.00	-20.86	PK
V	15600.00	35.11	7.64	42.75	54.00	-11.25	AV
V	20800.00	51.23	-5.67	45.56	68.20	-22.64	PK
V	20800.00	46.28	-5.67	40.61	54.00	-13.39	AV
V	26000.00	48.27	-2.85	45.42	68.20	-22.78	PK
V	26000.00	43.11	-2.85	40.26	54.00	-13.74	AV
V	31200.00	44.51	1.57	46.08	68.20	-22.12	PK
V	31200.00	39.64	1.57	41.21	54.00	-12.79	AV
V	36400.00	42.24	4.93	47.17	68.20	-21.03	PK
V	36400.00	37.97	4.93	42.90	54.00	-11.10	AV
H	10400.00	41.35	1.85	43.20	68.20	-25.00	PK
H	10400.00	37.38	1.85	39.23	54.00	-14.77	AV
H	15600.00	47.16	7.64	54.80	74.00	-19.20	PK
H	15600.00	36.88	7.64	44.52	54.00	-9.48	AV
H	20800.00	52.20	-5.67	46.53	68.20	-21.67	PK
H	20800.00	46.96	-5.67	41.29	54.00	-12.71	AV
H	26000.00	46.18	-2.85	43.33	68.20	-24.87	PK
H	26000.00	33.96	-2.85	31.11	54.00	-22.89	AV
H	31200.00	44.36	1.57	45.93	68.20	-22.27	PK
H	31200.00	39.27	1.57	40.84	54.00	-13.16	AV
H	36400.00	41.97	4.93	46.90	68.20	-21.30	PK
H	36400.00	37.11	4.93	42.04	54.00	-11.96	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	42.50	2.02	44.52	68.20	-23.68	PK
V	10480.00	37.78	2.02	39.80	54.00	-14.20	AV
V	15720.00	44.57	7.46	52.03	74.00	-21.97	PK
V	15720.00	34.68	7.46	42.14	54.00	-11.86	AV
V	20960.00	51.55	-5.56	45.99	68.20	-22.21	PK
V	20960.00	46.59	-5.56	41.03	54.00	-12.97	AV
V	26200.00	47.50	-2.50	45.00	68.20	-23.20	PK
V	26200.00	43.28	-2.50	40.78	54.00	-13.22	AV
V	31440.00	44.67	1.39	46.06	68.20	-22.14	PK
V	31440.00	39.81	1.39	41.20	54.00	-12.80	AV
V	36680.00	41.71	5.25	46.96	68.20	-21.24	PK
V	36680.00	37.53	5.25	42.78	54.00	-11.22	AV
H	10480.00	41.69	2.02	43.71	68.20	-24.49	PK
H	10480.00	36.83	2.02	38.85	54.00	-15.15	AV
H	15720.00	45.92	7.46	53.38	74.00	-20.62	PK
H	15720.00	35.65	7.46	43.11	54.00	-10.89	AV
H	20960.00	52.29	-5.56	46.73	68.20	-21.47	PK
H	20960.00	46.92	-5.56	41.36	54.00	-12.64	AV
H	26200.00	47.93	-2.50	45.43	68.20	-22.77	PK
H	26200.00	43.98	-2.50	41.48	54.00	-12.52	AV
H	31440.00	44.91	1.39	46.30	68.20	-21.90	PK
H	31440.00	40.84	1.39	42.23	54.00	-11.77	AV
H	36680.00	42.72	5.15	47.87	68.20	-20.33	PK
H	36680.00	42.50	5.15	47.65	54.00	-6.35	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:	25.1°C	Relative Humidity:	60%
Pressure:	101.2kPa	Test Voltage :	5VDC
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	45.23	3.31	48.54	74.00	-25.46	PK
V	11490.00	36.06	3.31	39.37	54.00	-14.63	AV
V	17235.00	41.72	10.10	51.82	68.20	-16.38	PK
V	17235.00	36.62	10.10	46.72	54.00	-7.28	AV
V	22980.00	53.38	-4.61	48.77	74.00	-25.23	PK
V	22980.00	44.24	-4.61	39.63	54.00	-14.37	AV
V	28725.00	46.12	0.87	46.99	68.20	-21.21	PK
V	28725.00	41.11	0.87	41.98	54.00	-12.02	AV
V	34470.00	42.37	3.82	46.19	68.20	-22.01	PK
V	34470.00	37.91	3.82	41.73	54.00	-12.27	AV
H	11490.00	45.51	3.31	48.82	74.00	-25.18	PK
H	11490.00	35.41	3.31	38.72	54.00	-15.28	AV
H	17235.00	40.28	10.10	50.38	68.20	-17.82	PK
H	17235.00	35.33	10.10	45.43	54.00	-8.57	AV
H	22980.00	55.60	-4.61	50.99	74.00	-23.01	PK
H	22980.00	45.10	-4.61	40.49	54.00	-13.51	AV
H	28725.00	46.10	0.87	46.97	68.20	-21.23	PK
H	28725.00	41.90	0.87	42.77	54.00	-11.23	AV
H	34470.00	42.75	3.82	46.57	68.20	-21.63	PK
H	34470.00	38.67	3.82	42.49	54.00	-11.51	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	45.88	3.34	49.22	74.00	-24.78	PK
V	11570.00	35.80	3.34	39.14	54.00	-14.86	AV
V	17355.00	41.69	10.52	52.21	68.20	-15.99	PK
V	17355.00	37.17	10.52	47.69	54.00	-6.31	AV
V	23140.00	53.05	-4.66	48.39	74.00	-25.61	PK
V	23140.00	43.58	-4.66	38.92	54.00	-15.08	AV
V	28925.00	45.63	1.36	46.99	68.20	-21.21	PK
V	28925.00	42.01	1.36	43.37	54.00	-10.63	AV
V	34710.00	42.17	3.95	46.12	68.20	-22.08	PK
V	34710.00	37.54	3.95	41.49	54.00	-12.51	AV
H	11570.00	46.66	3.34	50.00	74.00	-24.00	PK
H	11570.00	36.74	3.34	40.08	54.00	-13.92	AV
H	17355.00	40.09	10.52	50.61	68.20	-17.59	PK
H	17355.00	33.36	10.52	43.88	54.00	-10.12	AV
H	23140.00	52.44	-4.66	47.78	74.00	-26.22	PK
H	23140.00	41.51	-4.66	36.85	54.00	-17.15	AV
H	28925.00	51.24	1.36	52.60	68.20	-15.60	PK
H	28925.00	45.91	1.36	47.27	54.00	-6.73	AV
H	34710.00	51.51	3.95	55.46	68.20	-12.74	PK
H	34710.00	40.78	3.95	44.73	54.00	-9.27	AV

Remark:

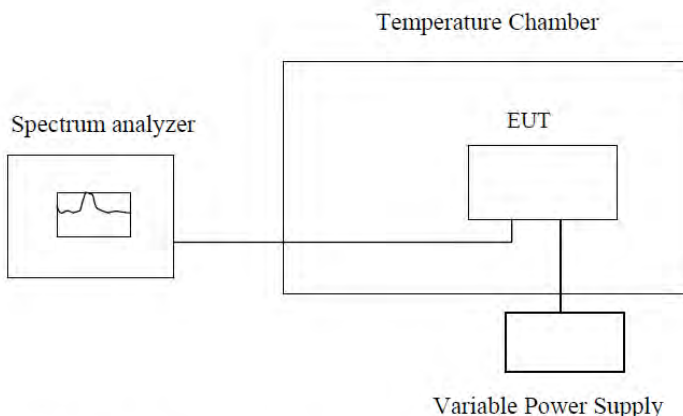
1. Emission Level = Meter Reading + Factor,
Factor=Antenna Factor + Cable Loss – Pre-amplifier
Margin= Emission Level – Limit
2. If peak below the average limit, the average emission was no test.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value 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	44.30	3.36	47.66	74.00	-26.34	PK
V	11650.00	35.19	3.36	38.55	54.00	-15.45	AV
V	17475.00	41.02	10.93	51.95	68.20	-16.25	PK
V	17475.00	36.68	10.93	47.61	54.00	-6.39	AV
V	23300.00	51.33	-4.77	46.56	68.20	-21.64	PK
V	23300.00	46.18	-4.77	41.41	54.00	-12.59	AV
V	29125.00	46.08	1.65	47.73	68.20	-20.47	PK
V	29125.00	40.78	1.65	42.43	54.00	-11.57	AV
V	34950.00	40.76	4.09	44.85	68.20	-23.35	PK
V	34950.00	37.15	4.09	41.24	54.00	-12.76	AV
H	11650.00	47.09	3.36	50.45	74.00	-23.55	PK
H	11650.00	36.59	3.36	39.95	54.00	-14.05	AV
H	17475.00	39.22	10.93	50.15	68.20	-18.05	PK
H	17475.00	35.61	10.93	46.54	54.00	-7.46	AV
H	23300.00	50.34	-4.77	45.57	68.20	-22.63	PK
H	23300.00	46.98	-4.77	42.21	54.00	-11.79	AV
H	29125.00	46.92	1.65	48.57	68.20	-19.63	PK
H	29125.00	42.58	1.65	44.23	54.00	-9.77	AV
H	34950.00	44.30	4.09	48.39	68.20	-19.81	PK
H	34950.00	35.19	4.09	39.28	54.00	-14.72	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: DC 5V					
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	5179.937	5179.962	5179.990
	5190	5189.968	5189.967	5189.963	5189.989
	5200	5199.976	5199.992	5199.954	5199.983
	5210	5209.968	5209.976	5299.962	5209.973
	5220	5219.989	5219.967	5219.954	5219.983
	5230	5229.967	5229.995	5229.975	5299.981
	5240	5239.985	5239.983	5239.953	5239.985
-20	5180	5179.986	5179.975	5179.963	5179.942
	5190	5189.982	5189.976	5189.954	5189.972
	5200	5199.977	5199.967	5199.962	5199.997
	5210	5209.983	5299.975	5209.954	5209.981
	5220	5219.978	5219.967	5219.975	5219.972
	5230	5229.976	5229.988	5229.953	5230.000
	5240	5239.949	5239.966	5239.971	5239.988
-10	5180	5179.938	5179.975	5179.963	5179.990
	5190	5189.968	5189.976	5189.954	5189.986
	5200	5199.993	5199.967	5199.962	5199.981
	5210	5209.977	5299.975	5209.954	5209.987
	5220	5219.968	5219.967	5219.975	5219.982
	5230	5229.996	5229.988	5229.953	5229.980
	5240	5239.984	5239.966	5239.971	5239.953
0	5180	5179.977	5179.937	5179.962	5179.990
	5190	5189.968	5189.967	5189.963	5189.989
	5200	5199.976	5199.992	5199.954	5199.983
	5210	5209.968	5209.976	5299.962	5209.973
	5220	5219.989	5219.967	5219.954	5219.983
	5230	5229.967	5229.995	5229.975	5299.981
	5240	5239.985	5239.983	5239.953	5239.985
10	5180	5179.965	5179.976	5179.963	5179.990
	5190	5189.976	5189.967	5189.954	5179.990
	5200	5199.967	5199.975	5199.962	5189.986
	5210	5209.968	5209.967	5209.954	5199.981
	5220	5219.975	5219.988	5219.975	5209.987
	5230	5229.993	5229.966	5229.953	5219.982
	5240	5239.965	5239.984	5239.971	5229.980
20	5180	5179.986	5179.975	5179.963	5179.942
	5190	5189.982	5189.976	5189.954	5189.972

	5200	5199.977	5199.967	5199.962	5199.997
	5210	5209.983	5299.975	5209.954	5209.981
	5220	5219.978	5219.967	5219.975	5219.972
	5230	5229.976	5229.988	5229.953	5230.000
	5240	5239.949	5239.966	5239.971	5239.988
30	5180	5179.986	5179.975	5179.963	5179.942
	5190	5189.982	5189.976	5189.954	5189.972
	5200	5199.977	5199.967	5199.962	5199.997
	5210	5209.983	5299.975	5209.954	5209.981
	5220	5219.978	5219.967	5219.975	5219.972
	5230	5229.976	5229.988	5229.953	5230.000
	5240	5239.949	5239.966	5239.971	5239.988
40	5180	5179.976	5179.964	5179.963	5179.980
	5190	5189.977	5189.975	5189.954	5189.981
	5200	5199.968	5199.966	5199.962	5199.972
	5210	5299.976	5209.967	5209.954	5299.980
	5220	5219.968	5219.974	5219.975	5219.972
	5230	5229.989	5229.992	5229.953	5229.993
	5240	5239.967	5239.964	5239.971	5239.971
50	5180	5179.938	5179.975	5179.951	5180.105
	5190	5189.968	5189.976	5189.962	5199.980
	5200	5199.993	5199.967	5199.953	5200.005
	5210	5209.977	5299.975	5209.954	5209.983
	5220	5219.968	5219.967	5219.961	5219.998
	5230	5229.996	5229.988	5229.979	5229.991
	5240	5239.984	5239.966	5239.951	5239.999

Frequency stability versus Voltage					
Temperature: 25°C					
Power Supply (VAC)	Operating Frequency (MHz)	0 minute Measured Frequency (MHz)	2 minute Measured Frequency (MHz)	5 minute Measured Frequency (MHz)	10 minute Measured Frequency (MHz)
DC 4.25V	5180	5179.971	5179.964	5179.972	5179.986
	5190	5189.965	5189.975	5189.968	5189.972
	5200	5199.978	5199.966	5199.963	5199.973
	5210	5209.982	5209.967	5209.969	5209.995
	5220	5219.968	5219.974	5219.964	5219.981
	5230	5229.961	5229.992	5229.962	5229.991
	5240	5180.101	5179.980	5179.963	5179.969
DC 5V	5180	5199.976	5189.974	5189.954	5189.980
	5190	5200.001	5199.974	5199.962	5199.971
	5200	5209.979	5209.986	5209.954	5209.972
	5210	5219.994	5219.977	5219.975	5219.979
	5220	5229.987	5299.980	5229.953	5229.997
	5230	5239.995	5239.977	5239.971	5239.982
	5240	5180.101	5179.980	5179.963	5179.969
DC 5.75V	5180	5179.986	5179.985	5179.951	5179.969
	5190	5189.982	5189.981	5189.962	5189.980
	5200	5199.977	5199.976	5199.953	5199.970
	5210	5209.983	5209.982	5209.954	5209.972
	5220	5219.978	5219.977	5219.961	5219.979
	5230	5229.976	5229.975	5229.979	5230.002
	5240	5239.949	5239.948	5239.951	5239.969

Frequency stability versus Temp.					
Power Supply: DC 5V					
Temp. (°C)	Operating Frequency (MHz)	0 minute Measured Frequency (MHz)	2 minute Measured Frequency (MHz)	5 minute Measured Frequency (MHz)	10 minute Measured Frequency (MHz)
-30	5745	5744.999	5744.957	5744.584	5744.950
	5755	5744.947	5754.973	5754.968	5754.972
	5775	5754.969	5774.972	5774.969	5774.981
	5785	5774.978	5784.975	5784.972	5784.972
	5795	5784.969	5794.986	5794.955	5794.983
	5825	5794.980	5824.967	5824.951	5824.986
-20	5745	5744.964	5744.957	5744.965	5744.973
	5755	5754.989	5754.973	5754.967	5754.999
	5775	5774.970	5774.972	5774.970	5774.995
	5785	5784.979	5784.975	5784.962	5784.979
	5795	5794.977	5794.986	5794.953	5794.968
	5825	5824.987	5824.967	5824.962	5824.903
-10	5745	5744.969	5744.968	5744.949	5745.037
	5755	5754.976	5754.975	5754.974	5744.602
	5775	5774.968	5774.992	5774.955	5754.986
	5785	5784.960	5784.968	5784.964	5774.987
	5795	5794.967	5794.964	5794.962	5784.990
	5825	5824.896	5824.967	5824.972	5794.973
0	5745	5744.963	5744.967	5744.955	5744.972
	5755	5754.973	5754.974	5754.962	5754.961
	5775	5774.994	5774.966	5774.979	5774.972
	5785	5784.970	5784.958	5784.955	5784.979
	5795	5794.966	5794.965	5794.951	5794.997
	5825	5824.964	5824.894	5824.954	5824.989
10	5745	5744.960	5744.978	5744.949	5744.983
	5755	5754.975	5754.980	5754.974	5754.997
	5775	5774.974	5774.983	5774.955	5774.982
	5785	5784.977	5784.975	5784.964	5784.969
	5795	5794.987	5794.966	5794.962	5794.963
	5825	5824.969	5824.975	5824.972	5824.997
20	5745	5744.980	5744.992	5744.965	5744.972
	5755	5754.994	5754.964	5754.979	5754.991
	5775	5774.979	5774.987	5774.964	5774.971
	5785	5784.966	5784.987	5784.951	5784.998
	5795	5794.960	5794.978	5794.945	5794.990
	5825	5824.994	5824.993	5824.979	5824.999
30	5745	5744.959	5744.978	5744.949	5744.983
	5755	5754.975	5754.980	5754.974	5754.997
	5775	5774.974	5774.983	5774.955	5774.982
	5785	5784.977	5784.975	5784.964	5784.969
	5795	5794.988	5794.966	5794.962	5794.963
	5825	5824.969	5824.975	5824.972	5824.997
40	5745	5744.980	5744.967	5744.949	5744.967
	5755	5754.982	5754.984	5754.974	5754.992
	5775	5774.985	5774.985	5774.955	5774.973
	5785	5784.977	5784.967	5784.964	5784.982

50	5795	5794.968	5794.984	5794.962	5794.980
	5825	5824.977	5824.982	5824.972	5824.990
	5745	5744.964	5744.967	5744.954	5744.973
	5755	5754.989	5754.984	5754.961	5754.980
	5775	5774.970	5774.985	5774.953	5774.997
	5785	5784.979	5784.967	5784.945	5784.973
	5795	5794.977	5794.984	5794.952	5794.969
	5825	5824.987	5824.982	5824.881	5824.972

Frequency stability versus Voltage					
Temperature: 25°C					
Power Supply (VAC)	Operating Frequency (MHz)	0 minute Measured Frequency (MHz)	2 minute Measured Frequency (MHz)	5 minute Measured Frequency (MHz)	10 minute Measured Frequency (MHz)
DC 4.25V	5745	5744.959	5744.967	5744.954	5744.967
	5755	5754.975	5754.974	5754.971	5754.992
	5775	5774.974	5774.966	5774.972	5774.973
	5785	5784.977	5784.958	5784.954	5784.982
	5795	5794.988	5794.965	5794.972	5794.980
	5825	5824.969	5824.894	5824.969	5824.990
DC 5V	5745	5744.959	5744.978	5744.949	5744.983
	5755	5754.975	5754.980	5754.974	5754.997
	5775	5774.974	5774.983	5774.955	5774.982
	5785	5784.977	5784.975	5784.964	5784.969
	5795	5794.984	5794.966	5794.962	5794.963
	5825	5824.969	5824.975	5824.972	5824.997
DC5.75V	5745	5744.980	5744.991	5744.965	5744.972
	5755	5754.994	5754.964	5754.979	5754.991
	5775	5774.979	5774.987	5774.964	5774.971
	5785	5784.966	5784.987	5784.951	5784.998
	5795	5794.960	5794.978	5794.945	5794.990
	5825	5824.994	5824.993	5824.979	5824.999

5 Test Setup Photo

Reference to the file No.: ET-25061787SP for details.

6 EUT Constructional Details

Reference to the file No.: ET-25061787EP and ET-25061787IP for details

-----END-----