



Report No.: ET-22060358E03

TEST REPORT

Applicant: Zhongqingzhizao Shenzhen Technology Co.ltd
Address of Applicant: 402-A, Building A, Yuanfen Industrial Zone Taoyuan Community,
Dalang Street District, Shenzhen
Manufacturer/Factory: Zhongqingzhizao Shenzhen Technology Co.ltd
Address of Manufacturer: 402-A, Building A, Yuanfen Industrial Zone Taoyuan Community,
Dalang Street District, Shenzhen
Product Name: Mini PC
Model No.: JB01,JB02,ZRO-1, ZRO-2, ZRO-3, ZRO-4, ZRO-5, ZRO-6,
ZRO-7, ZRO-8
Trade Mark: RATEYUSO
FCC ID: 2A7CZ-JB01
Applicable standards: FCC CFR Title 47 Part 15 Subpart E Section 15.407
Date of Test: May.26 , 2022- Jun.10, 2022
Date of report issued: Jun.13, 2022
Test Result : PASS *

Remark:

* In the configuration tested, the EUT complied with the standards specified above.

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

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

Prepared By

Shenzhen ETR Standard Technology Co., Ltd.

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Report Revision History		
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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	DEVIATION FROM STANDARDS	8
2.5	ABNORMALITIES FROM STANDARD CONDITIONS	8
2.6	TEST FACILITY	8
2.7	TEST LOCATION	8
2.8	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	CONDUCTED PEAK OUTPUT POWER	14
4.4	CHANNEL BANDWIDTH	16
4.5	POWER SPECTRAL DENSITY	24
4.6	BAND EDGE	32
4.6.1	Conducted test Method	32
4.7	SPURIOUS EMISSION	39
4.7.1	Radiated Emission Method	39
4.7.2	Conducted Emission Method	48
4.8	FREQUENCY STABILITY	55
5	TEST SETUP PHOTO	61
6	EUT CONSTRUCTIONAL DETAILS	61

1 Test Summary

Test Item	Section in CFR 47	Result	Test by
Antenna requirement	15.203	Pass	/
AC Power Line Conducted Emission	15.207	Pass	Carr Kang
Conducted Output Power	15.407 (a)(1)/(a)(3)	Pass	Yvan Fan
26dB Bandwidth and 99% Occupied Bandwidth	15.407 (a)(12)	Pass	Yvan Fan
6dB Bandwidth	15.407 (e)	Pass	Yvan Fan
Power Spectral Density	15.407(a)(1)/(a)(3)	Pass	Yvan Fan
Band Edge	15.407(b)(1)/(b)(4)	Pass	Yvan Fan
Spurious Emission	15.205/15.209 15.407(b)(1)/(b)(4)/(b)(8)	Pass	Qiao Li
Frequency Stability	15.407(g)	Pass	Yvan Fan

Remarks:

1. Pass: The EUT complies with the essential requirements in the standard.
2. Test according to ANSI C63.10:2013.

1.1 Measurement Uncertainty

Test Item	Measurement Uncertainty	Notes
Occupied Channel Bandwidth	±0.55%	(1)
RF output power, conducted	±0.99dB	(1)
Power Spectral Density, conducted	±0.61dB	(1)
Unwanted Emissions, conducted	±0.64dB	(1)
AC Power Line Conducted Emission	± 3.02dB	(1)
Radiated emissions 9K-30MHz	±3.98dB	(1)
Radiated emissions 30M- 1GHz	±4.30dB	(1)
Radiated emissions 1GHz-18GHz	±4.35dB	(1)
Radiated emissions 18GHz-40GHz	±4.59 dB	(1)

Note (1): The measurement uncertainty is for coverage factor of k=2 and a level of confidence of 95%.



2 General Information

2.1 General Description of EUT

Product Name:	Mini PC
Model No.:	JB01,JB02,ZRO-1, ZRO-2, ZRO-3, ZRO-4, ZRO-5, ZRO-6, ZRO-7, ZRO-8,
Difference of model(s)	All models different of product names, other are same.
Test Model:	JB01
Hardware Version:	N/A
Software Version:	N/A
Sample(s) Status:	Engineer sample
Operation Frequency:	☒ 5180-5240MHz for 802.11a/n(HT20)/ac20; 5190-5230MHz for 802.11n(HT40)/ac40; 5210MHz for 802.11 ac80; ☒ 5745-5825 MHz for 802.11a/n(HT20)/ac20; 5755-5795 MHz for 802.11n(HT40)/ac40; 5775MHz for 802.11 ac80;
Channel numbers:	☒ 4 channels for 802.11a/n20/ac20 in the 5180-5240MHz band; 2 channels for 802.11 n40/ac40 in the 5190-5230MHz band ; 1 channels for 802.11 ac80 in the 5210MHz band ; ☒ 5 channels for 802.11a/n20/ac20 in the 5745-5825MHz band ; 2 channels for 802.11 n40/ac40 in the 5755-5795MHz band ; 1 channels for 802.11 ac80 in the 5775MHz band
Channel bandwidth:	802.11a/802.11n(HT20)/ 802.11ac(HT20): 20MHz 802.11n(HT40)/ 802.11ac(HT40) : 40MHz 802.11ac(HT80) : 80MHz
Data Rate	802.11a: 6,9,12,18,24,36,48,54Mbps; 802.11n(HT20/HT40):MCS0-MCS15; 802.11ac(VHT/20/40/80):NSS1, MCS0-MCS9
Modulation technology:	Orthogonal Frequency Division Multiplexing (OFDM) with BPSK/QPSK/16QAM/64QAM/256QAM
Antenna Type:	Integrated antenna
Antenna gain:	2dBi(Declare by applicant)
Power supply:	DC 12V form adapter with AC 100-240V 50/60Hz

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

Note:

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

Test channel	Frequency (MHz)		
	802.11 a /n(HT20)/ac(HT20)	802.11 n(HT40)/ac(HT40)	802.11ac(HT80)
Lowest channel	5180	5190	5210
Middle channel	5200		
Highest channel	5240	5230	

Test channel	Frequency (MHz)		
	802.11 a /n(HT20)/ac(HT20)	802.11 n(HT40)/ac(HT40)	802.11ac(HT80)
Lowest channel	5745	5755	5775
Middle channel	5785		
Highest channel	5825	5795	

2.2 Test mode

Transmitting mode	Keep the EUT in continuously transmitting mode(or with a duty cycle $\geq$ 98%)
<i>Remark: During the test, the test voltage was tuned from 85% to 115% of the nominal rated supply voltage, and found that the worst case was under the nominal rated supply condition. So the report just shows that condition's data.</i>	

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

Pretest Mode	Description
Mode 1	802.11a / n 20 CH36/ CH40/ CH 48 802.11a /n 20 CH149/ CH157/ CH 165
Mode 2	802.11n 40 CH38/ CH 46 802.11n 40 CH 151 / CH 159
Mode 3	802.11 ac80 CH 42/CH 155
Mode 4	802.11a / n 20 CH36/ CH40/ CH 48 802.11a /n 20 CH149/ CH157/ CH 165
Mode 5	Link Mode

Conducted Emission	
Final Test Mode	Description
Mode 5	Link Mode

For Radiated Emission	
Final Test Mode	Description
Mode 1	802.11a / n 20 CH36/ CH40/ CH 48 802.11a /n 20 CH149/ CH157/ CH 165
Mode 2	802.11n 40 CH38/ CH 46 802.11n 40 CH 151 / CH 159
Mode 3	802.11 ac80 CH 42/CH 155
Mode 4	802.11a / n 20 CH36/ CH40/ CH 48 802.11a /n 20 CH149/ CH157/ CH 165

Note:

(1) The measurements are performed at all Bit Rate of Transmitter, the worst data was reported.



2.3 Description of Support Units

None.

2.4 Deviation from Standards

None.

2.5 Abnormalities from Standard Conditions

None.

2.6 Test Facility

Test laboratory:	Shenzhen ETR Standard Technology Co., Ltd.
CNAS Registration Number:	L11864
A2LA Certificate Number:	6640.01
FCC Designation Number:	CN1326
FCC Test Firm Registration:	183064

2.7 Test Location

All tests were performed at:

Laboratory location:	No.103, No.10, Phase I, Zone 3, Xinxing Industrial Park, Xinhe, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
Telephone:	+86 755 85259392

2.8 Additional Instructions

Test Software	DURT test
Power level setup	Default



3 Test Instruments list

Conducted Emission

Item	Equipment name	Manufacturer	Model	Serial No.	Calibration date	Due date
1	EMI Test Receiver	Rohde&schwarz	ESCI3	100605	2022.3.09	2023.3.08
2	amplifier	EMtrace	RP01A	50117	2022.3.09	2023.3.08
3	Artificial power network	schwarabeck	NSLK8127	8127483	2022.3.09	2023.3.08
4	Artificial power network	ETS	3186/2NM	1132	2022.3.09	2023.3.08
5	10dB attenuator	HUBER+SUHNER	10dB	/	2022.3.09	2023.3.08
6	Cable 4	HUBER SUNNER	3M	/	2022.3.09	2022.3.08
7	Absorbing Clamp	schwarabeck	MDS21	D69250	2022.3.11	2023.3.10

Radiated Emission & RF Conducted test:

Item	Equipment name	Manufacturer	Model	Serial No.	Calibration date	Due date
1	EMI Test Receiver	Rohde&schwarz	ESPI7	100605	2022.3.09	2023.3.08
2	Broadband antenna	schwarabeck	VULB9168	1064	2022.3.11	2024.3.10
3	Horn antenna	schwarabeck	BBHA9120D	9120D-1145	2022.3.11	2024.3.10
4	amplifier	EMtrace	RP01A	50117	2022.3.09	2023.3.08
5	amplifier	Space-Dtronic	EWLAN0118G-P40	19113001	2022.3.09	2023.3.08
6	Spectrum analyzer	KEYSIGHT	N9020A	MY55370280	2022.3.09	2023.3.08
7	Power detector box	MWRFTtest	MW100-PSB	MW201020JYT	2021.11.19	2022.11.18
8	Signal generator	Agilent	N5182A	MY49060455	2021.11.19	2022.11.18
9	Spectrum analyzer	Rohde&schwarz	FSV40	100363	2022.3.09	2023.3.08
10	amplifier	Aeroflex	DLE-161	097	2022.3.09	2023.3.08
11	Horn antenna	Com-Power	SAS-574	588	2022.3.11	2024.3.10
12	Loop antenna	schwarabeck	FMZB 1519 B	1519	2022.3.11	2024.3.10
13	Cable 6	HUBER SUNNER	0.5M	/	2022.3.09	2023.3.08
14	Cable7	HUBER SUNNER	2.0M	/	2022.3.09	2023.3.08
15	Cable8	HUBER SUNNER	6.0M	/	2022.3.09	2023.3.08

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

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

4 Test results and Measurement Data

4.1 Antenna requirement

Standard requirement:	FCC Part15 C Section 15.203
<i>15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.</i>	
E.U.T Antenna:	
<i>The antennas are Integrated antenna, the best case gain of the antennas are 2dBi, reference to the appendix II for details</i>	

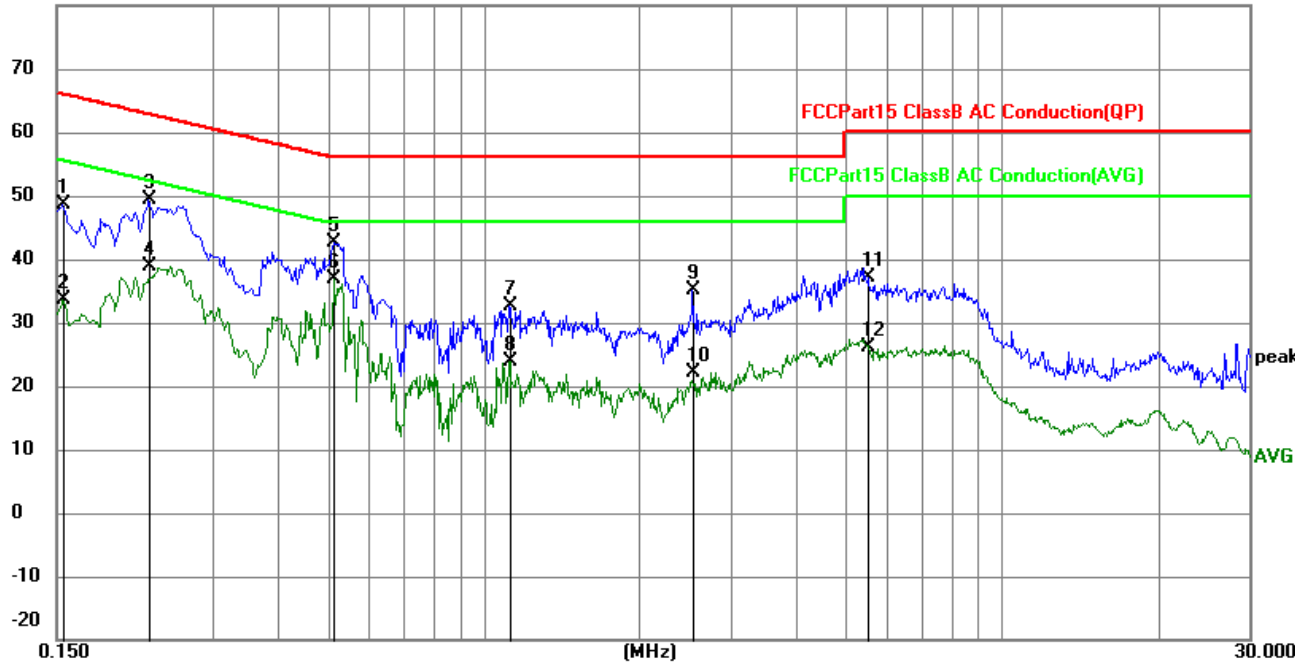
4.2 Conducted Emissions

Test Requirement:	FCC Part15 C Section 15.207					
Test Method:	ANSI C63.10:2013					
Test Frequency Range:	150KHz to 30MHz					
Class / Severity:	Class B					
Receiver setup:	RBW=9KHz, VBW=30KHz, Sweep time=auto					
Limit:	Frequency range (MHz)		Limit (dBuV)			
			Quasi-peak		Average	
	0.15-0.5		66 to 56*		56 to 46*	
	0.5-5		56		46	
	5-30		60		50	
* Decreases with the logarithm of the frequency.						
Test setup:	Reference Plane <i>Remark: E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m</i>					
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.:	25.6°C	Humid.:	54%	Press.:	1012mbar
Test voltage:	AC 120V, 60Hz					
Test results:	Pass					

Measurement data

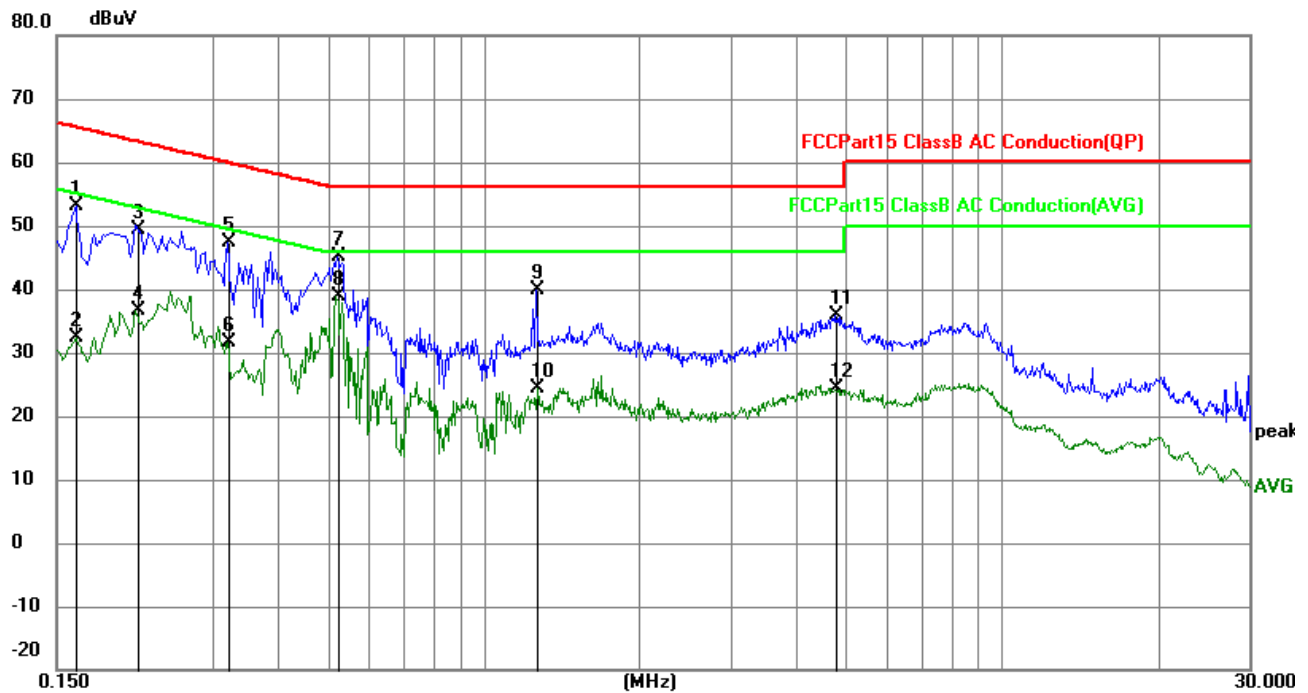
Line:

80.0 dBuV



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1544	36.14	12.49	48.63	65.76	-17.13	QP
2	0.1544	21.25	12.49	33.74	55.76	-22.02	AVG
3	0.2265	36.90	12.44	49.34	62.58	-13.24	QP
4	0.2265	26.47	12.44	38.91	52.58	-13.67	AVG
5	0.5143	30.37	12.36	42.73	56.00	-13.27	QP
6	0.5143	24.62	12.36	36.98	46.00	-9.02	AVG
7	1.1217	20.31	12.29	32.60	56.00	-23.40	QP
8	1.1217	11.71	12.29	24.00	46.00	-22.00	AVG
9	2.5350	22.80	12.31	35.11	56.00	-20.89	QP
10	2.5350	9.74	12.31	22.05	46.00	-23.95	AVG
11	5.5319	24.78	12.35	37.13	60.00	-22.87	QP
12	5.5319	13.71	12.35	26.06	50.00	-23.94	AVG

Neutral:

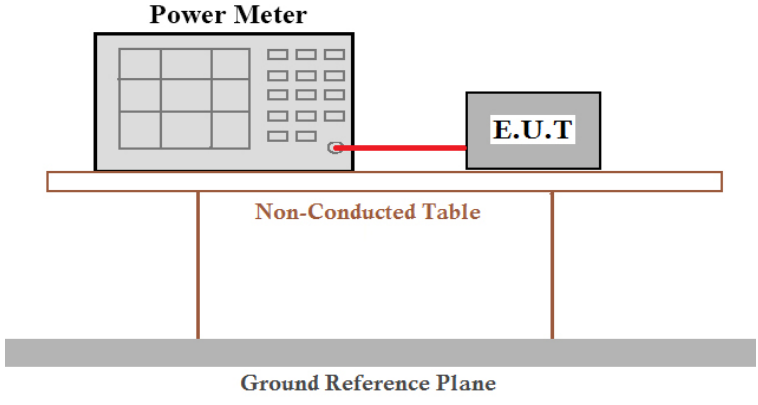


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1635	40.61	12.48	53.09	65.28	-12.19	QP
2	0.1635	19.79	12.48	32.27	55.28	-23.01	AVG
3	0.2149	37.00	12.45	49.45	63.01	-13.56	QP
4	0.2149	24.28	12.45	36.73	53.01	-16.28	AVG
5	0.3209	34.88	12.39	47.27	59.68	-12.41	QP
6	0.3209	19.14	12.39	31.53	49.68	-18.15	AVG
7	0.5231	32.68	12.36	45.04	56.00	-10.96	QP
8	0.5231	26.47	12.36	38.83	46.00	-7.17	AVG
9	1.2659	27.59	12.29	39.88	56.00	-16.12	QP
10	1.2659	12.07	12.29	24.36	46.00	-21.64	AVG
11	4.7850	23.46	12.34	35.80	56.00	-20.20	QP
12	4.7850	12.12	12.34	24.46	46.00	-21.54	AVG

Notes:

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

4.3 Conducted Peak Output Power

Test Requirement:	FCC Part15 E Section 15.407 (a)(1)/(a)(3)
Test Method:	ANSI C63.10:2013 and KDB 789033 D02 General U-NII Test Procedures New Rules v02r01
Limit:	5150-5250MHz : 250mW 5725~5850MHz : 1W
Test setup:	
Test Instruments:	Refer to section 3.0 for details
Test mode:	Refer to section 2.2 for details
Test results:	Pass

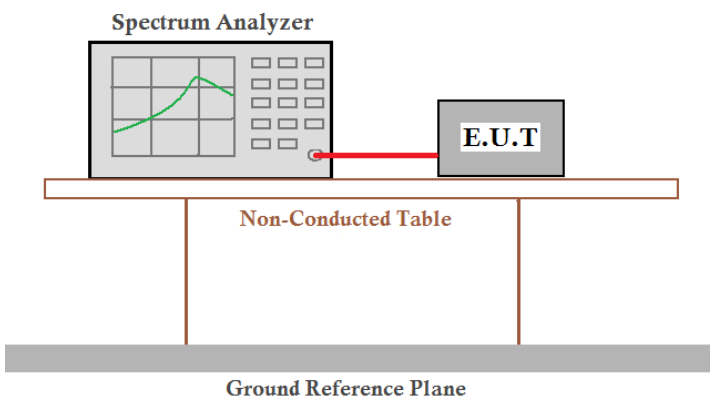
Measurement Data

Test Channel	Frequency	Maximum output power	LIMIT	Result
	(MHz)	(dBm)	dBm	
TX 802.11a Mode				
CH36	5180	11.56	23.98	Pass
CH40	5200	10.91	23.98	Pass
CH48	5240	10.91	23.98	Pass
TX 802.11 n20 Mode				
CH36	5180	11.37	23.98	Pass
CH40	5200	10.86	23.98	Pass
CH48	5240	10.79	23.98	Pass
TX 802.11 ac20 Mode				
CH36	5180	11.41	23.98	Pass
CH40	5200	10.94	23.98	Pass
CH48	5240	10.82	23.98	Pass
TX 802.11 n40 Mode				
CH38	5190	11.34	23.98	Pass
CH46	5230	10.94	23.98	Pass
TX 802.11 ac40 Mode				
CH38	5190	11.42	23.98	Pass
CH46	5230	10.92	23.98	Pass
TX 802.11 ac80 Mode				
CH42	5210	11.00	23.98	Pass



Test Channel	Frequency	Maximum output power.	LIMIT	Result
	(MHz)	(dBm)	dBm	
TX 802.11a Mode				
CH149	5745	9.34	30	Pass
CH157	5785	9.52	30	Pass
CH165	5825	10.08	30	Pass
TX 802.11 n20 Mode				
CH149	5745	9.24	30	Pass
CH157	5785	9.38	30	Pass
CH165	5825	10.21	30	Pass
TX 802.11 ac20 Mode				
CH149	5745	9.23	30	Pass
CH157	5785	9.31	30	Pass
CH165	5825	10.13	30	Pass
TX 802.11 n40 Mode				
CH151	5755	9.75	30	Pass
CH159	5795	9.94	30	Pass
TX 802.11 ac40 Mode				
CH151	5755	9.70	30	Pass
CH159	5795	9.81	30	Pass
TX 802.11 ac80 Mode				
CH155	5775	9.57	30	Pass

4.4 Channel Bandwidth

Test Requirement:	FCC Part15 E Section 15.407(a)(12)&15.407(e)
Test Method:	ANSI C63.10:2013 and KDB 789033 D02 General U-NII Test Procedures New Rules v02r01
Limit:	Measurements in the 5.725-5.85 GHz band, the minimum bandwidth 6 dB bandwidth of U-NII devices shall be at least 500KHz. Measurements in the 5.15-5.25 GHz, 5.25-5.35 GHz, and the 5.47-5.725 GHz bands are made over a bandwidth of 1 MHz or the 26 dB emission bandwidth of the device, whichever is less. A narrower resolution bandwidth can be used, provided that the measured power is integrated over the full reference bandwidth.
Test setup:	 The diagram illustrates the test setup. A Spectrum Analyzer is connected via a red cable to an E.U.T. (Equipment Under Test). Both are placed on a Non-Conducted Table. Below the table is a Ground Reference Plane.
Test Instruments:	Refer to section 3.0 for details
Test mode:	Refer to section 2.2 for details
Test results:	Pass

Measurement Data

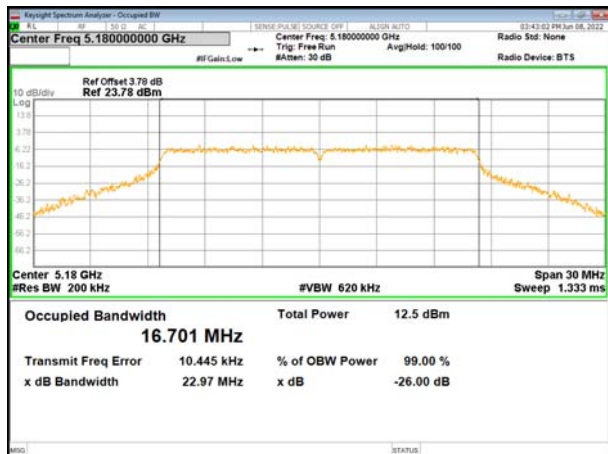
5180-5240MHz

Test CH	-26dB Channel Bandwidth (MHz)						Result
	802.11a	802.11n (HT20)	802.11ac (HT20)	802.11n (HT40)	802.11ac (HT40)	802.11ac (HT80)	
Lowest	23.28	24.35	23.92	45.07	44.04	--	Pass
Middle	24.14	24.02	24.00	--	--	81.94	
Highest	22.75	23.72	23.80	43.72	44.32	--	

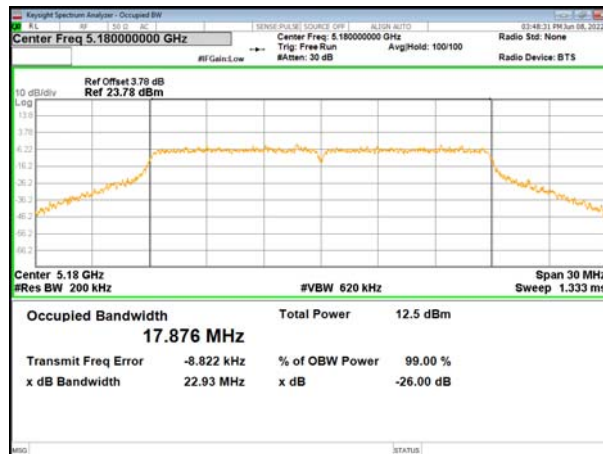
Test CH	99% Occupy Bandwidth (MHz)						Result
	802.11a	802.11n (HT20)	802.11ac (HT20)	802.11n (HT40)	802.11ac (HT40)	802.11ac (HT80)	
Lowest	16.70	17.88	17.84	36.32	36.38	--	Pass
Middle	16.68	17.84	17.89	--	--	75.12	
Highest	16.68	17.82	17.82	36.38	36.35	--	

Test plot

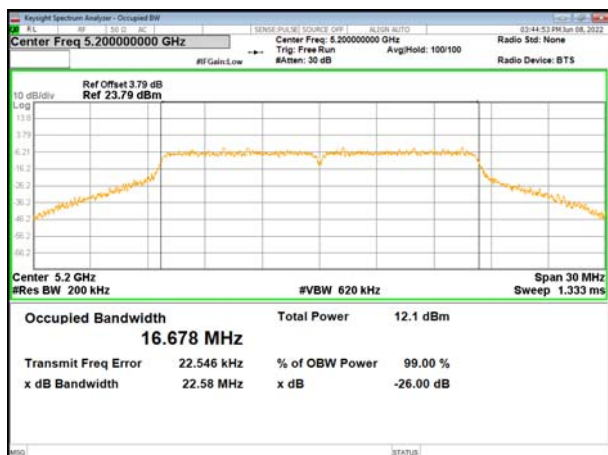
(802.11a) plot on channel 36



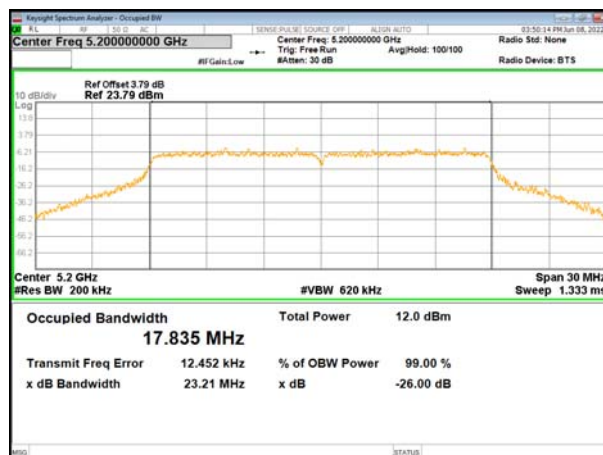
(802.11 n20) plot on channel 36



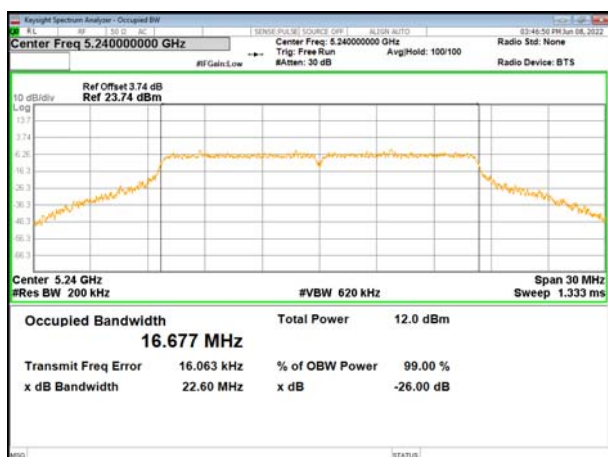
(802.11a) plot on channel 40



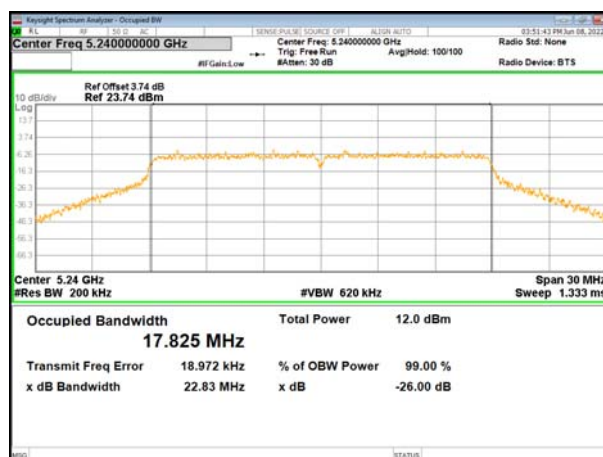
(802.11 n20) plot on channel 40



(802.11a) plot on channel 48

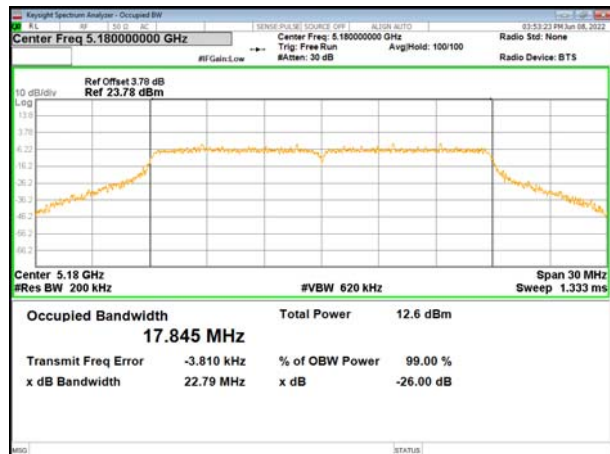


(802.11 n20) plot on channel 48

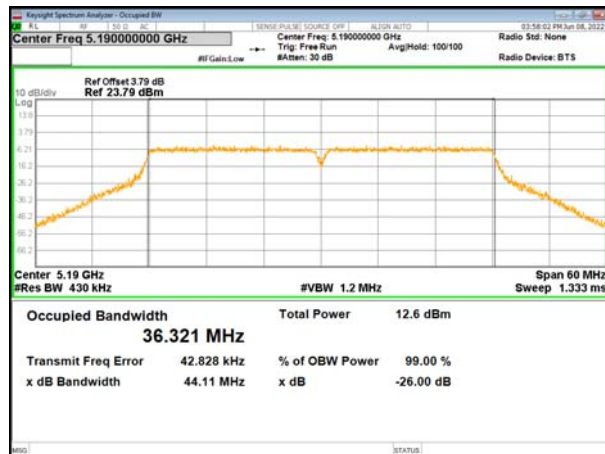


Test plot

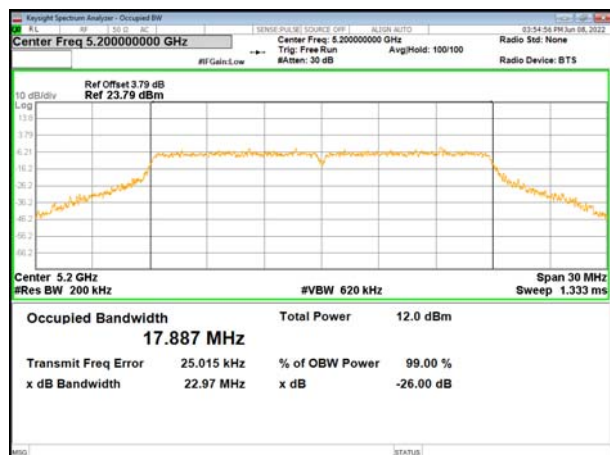
(802.11ac20) plot on channel 36



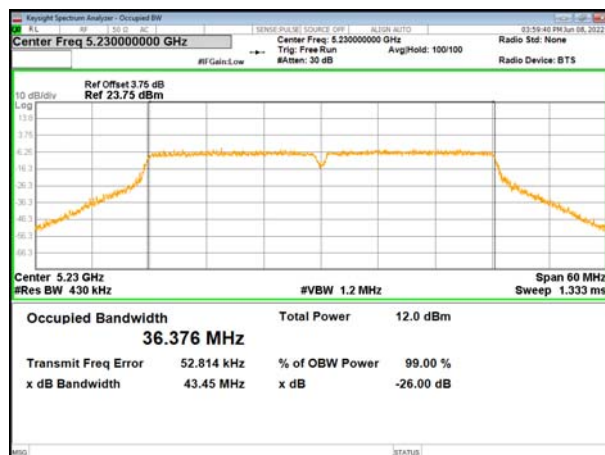
(802.11 n40) plot on channel 38



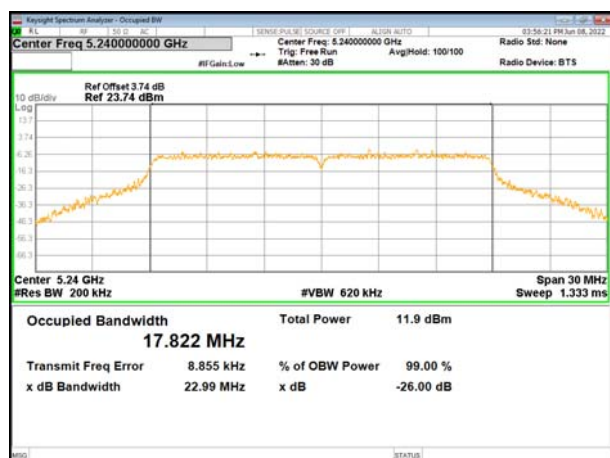
(802.11ac20) plot on channel 40



(802.11 n40) plot on channel 46

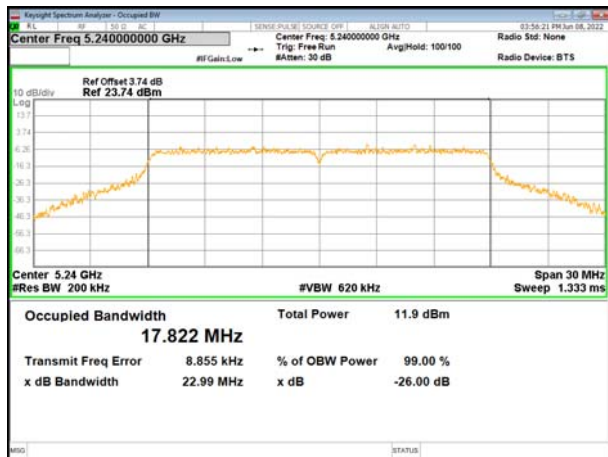


(802.11ac20) plot on channel 48

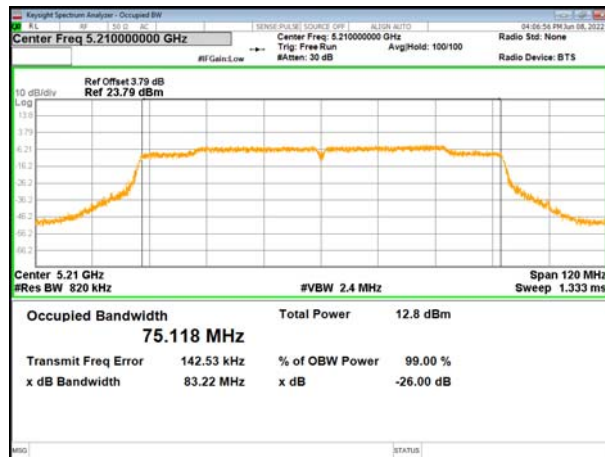


Test plot

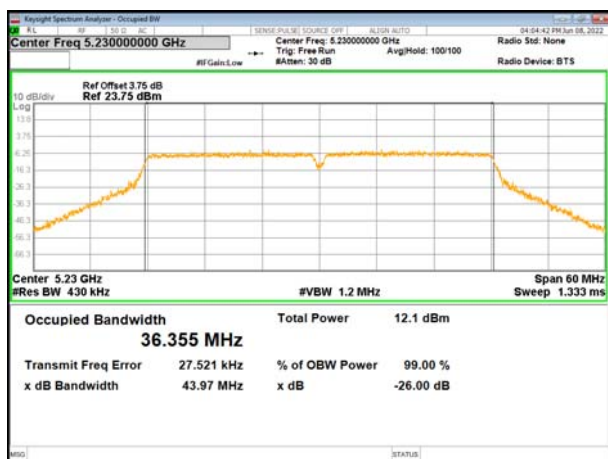
(802.11ac40) plot on channel 38



(802.11ac80) plot on channel 42



(802.11ac40) plot on channel 46





5745-5825MHz

Test CH	-6dB Channel Bandwidth (MHz)						Limit (KHz)	Result
	802.11a	802.11n (HT20)	802.11ac (HT20)	802.11n (HT40)	802.11ac (HT40)	802.11ac (HT80)		
Lowest	16.32	17.56	17.55	36.31	36.31	--	>500	Pass
Middle	16.36	17.56	17.21	--	--	75.06		
Highest	16.33	17.59	17.62	36.30	36.30	--		

Remark: "---" is not applicable

Test plot

(802.11a) plot on channel 149



(802.11 n20) plot on channel 149



(802.11a) plot on channel 157



(802.11 n20) plot on channel 157



(802.11a) plot on channel 165

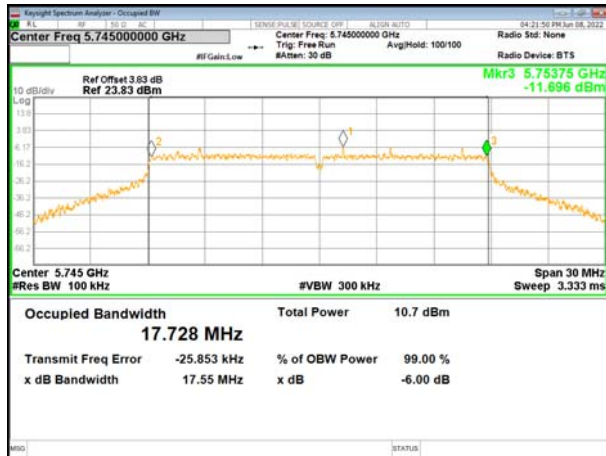


(802.11 n20) plot on channel 165

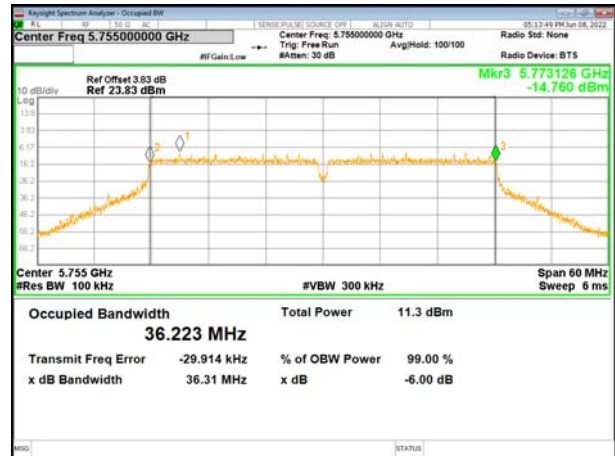


Test plot

(802.11ac20) plot on channel 149



(802.11 n40) plot on channel 151



(802.11ac20) plot on channel 157



(802.11 n40) plot on channel 159

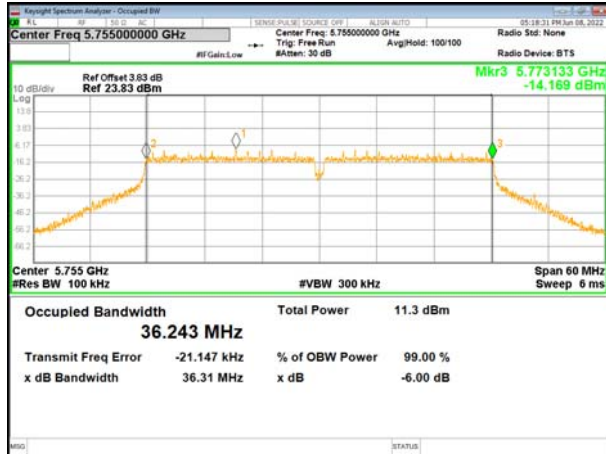


(802.11ac20) plot on channel 165

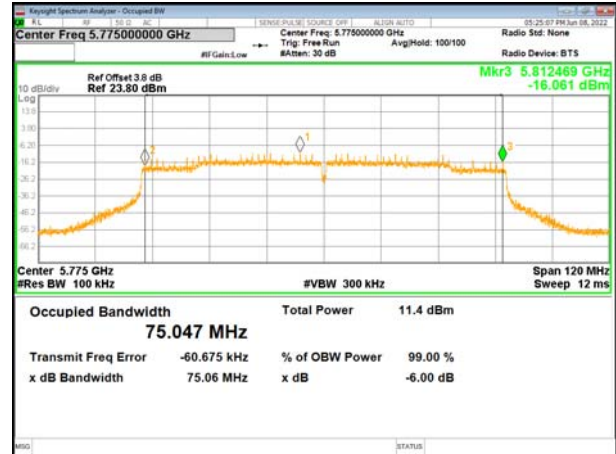


Test plot

(802.11 ac40) plot on channel 151



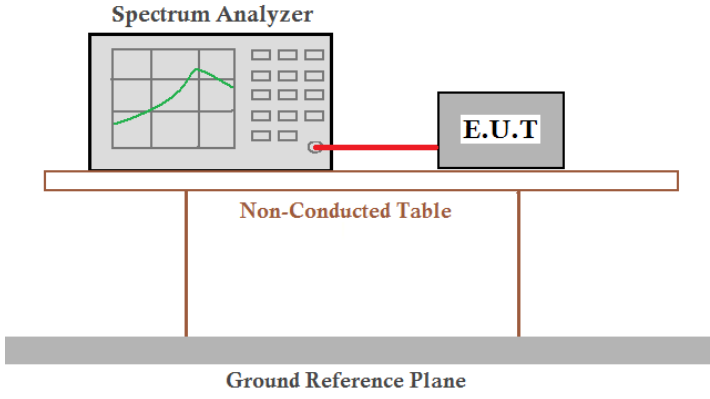
(802.11 ac80) plot on channel 155



(802.11 ac40) plot on channel 159



4.5 Power Spectral Density

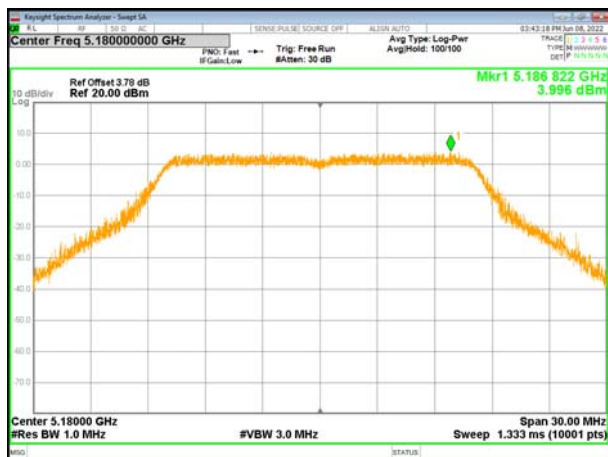
Test Requirement:	FCC Part15 E Section 15.407(a)(1)/ (a)(3)	
Test Method:	ANSI C63.10:2013 and KDB 789033 D02 General U-NII Test Procedures New Rules v02r01	
Limit:	Frequency band (MHz)	Limit
	5150-5250	≤17dBm/1MHz for master device
		≤11dBm/1MHz for client device
	5250-5350	≤11dBm/1MHz for client device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

Measurement Data

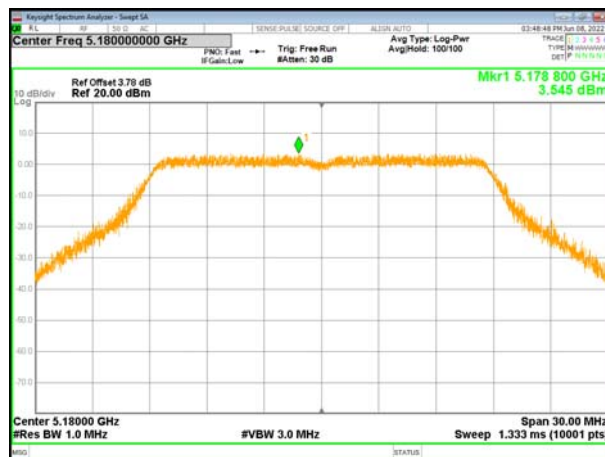
5180-5240MHz

Mode	Frequency	Measured Power Density (dBm/MHz)	Limit (dBm/MHz)
802.11 a	5180 MHz	3.996	11
	5200 MHz	3.981	11
	5240 MHz	3.503	11
802.11 n20	5180 MHz	3.545	11
	5200 MHz	3.051	11
	5240 MHz	3.008	11
802.11 ac20	5180 MHz	3.678	11
	5200 MHz	3.273	11
	5240 MHz	3.341	11
802.11 n40	5190 MHz	0.797	11
	5230 MHz	0.360	11
802.11 ac40	5190 MHz	1.037	11
	5230 MHz	0.597	11
802.11 ac80	5210 MHz	-1.956	11

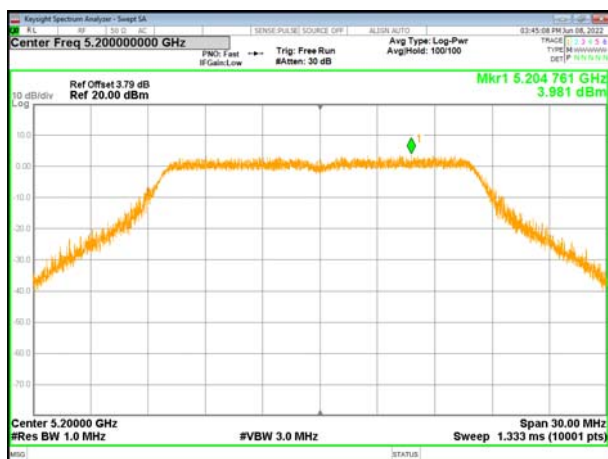
(802.11a) PSD plot on channel 36



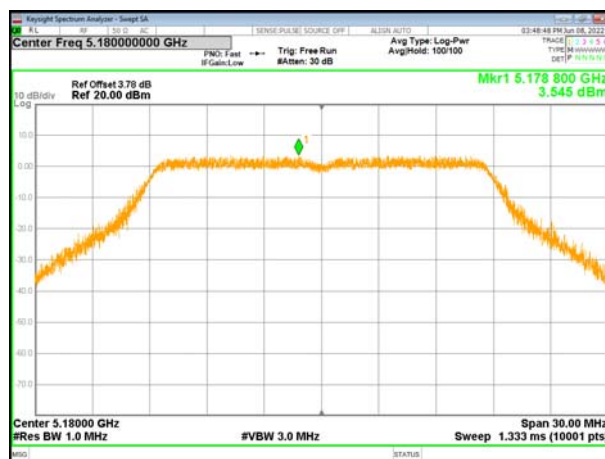
(802.11n20) PSD plot on channel 36



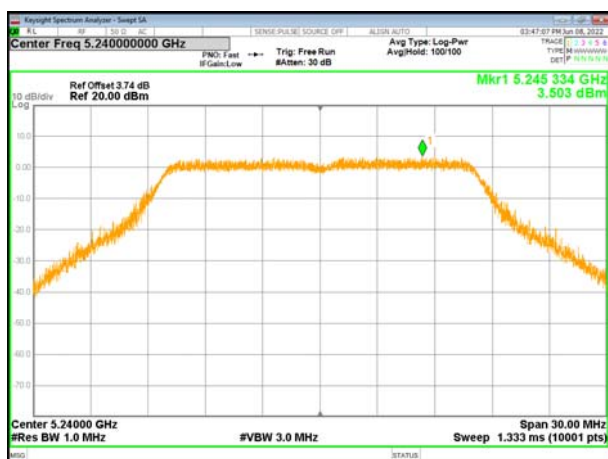
(802.11a) PSD plot on channel 40



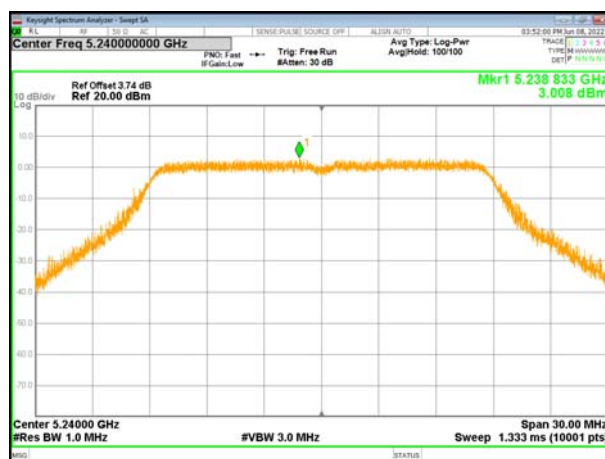
(802.11n20) PSD plot on channel 40



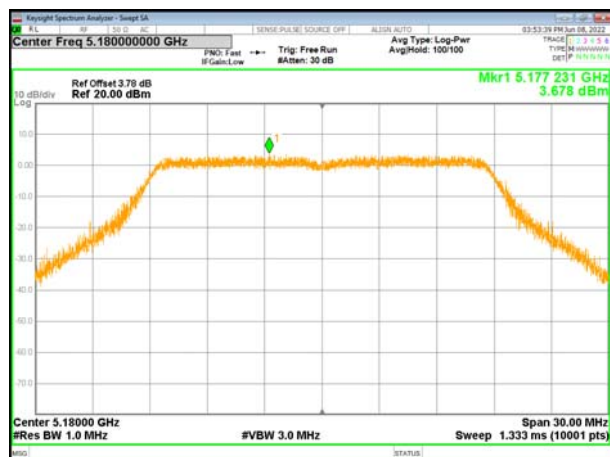
(802.11a) PSD plot on channel 48



(802.11n20) PSD plot on channel 48



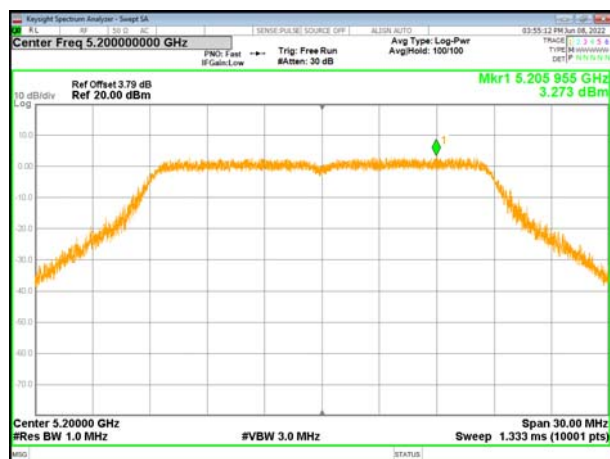
(802.11ac20) PSD plot on channel 36



(802.11n40) PSD plot on channel 38



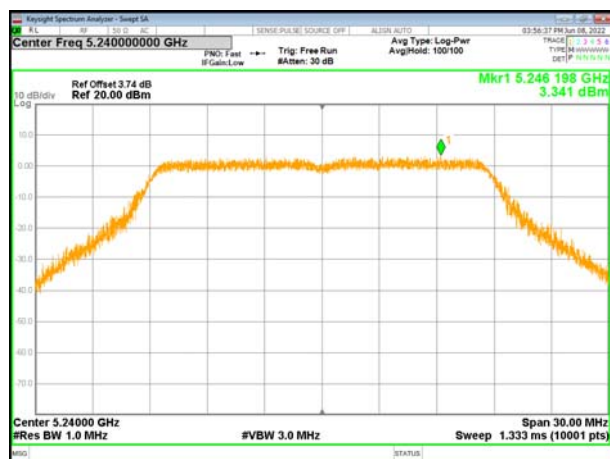
(802.11ac20) PSD plot on channel 40



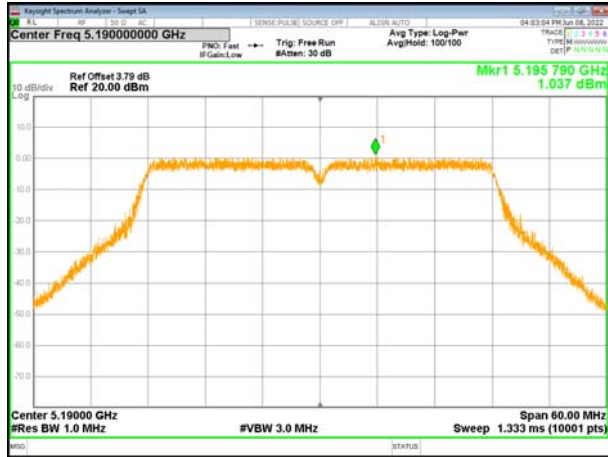
(802.11n40) PSD plot on channel 46



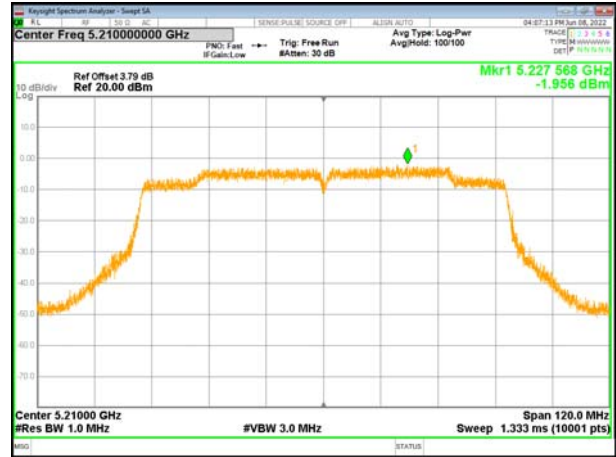
(802.11ac20) PSD plot on channel 48



(802.11ac40) PSD plot on channel 38



(802.11ac80) PSD plot on channel 42



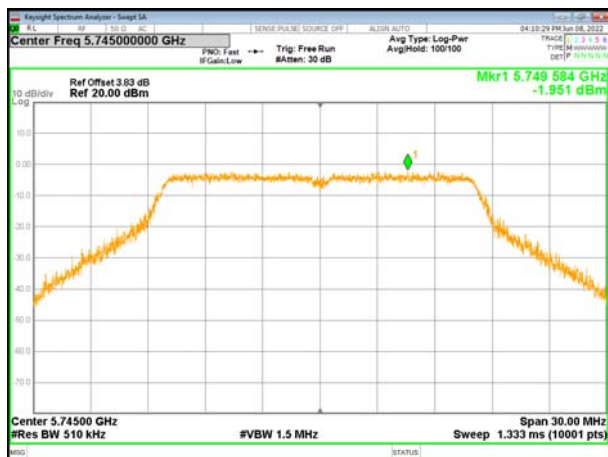
(802.11ac40) PSD plot on channel 46



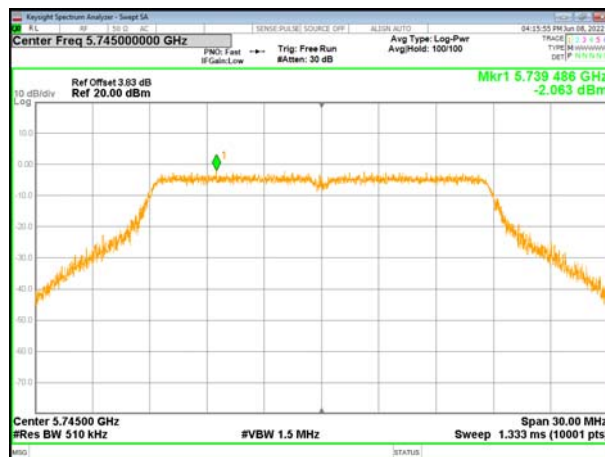
Mode	Frequency	Measured Power Density (dBm/510KHz)	Measured Power Density (dBm/500KHz)	Limit (dBm/MHz)
802.11 a	5745 MHz	-1.951	-2.037	30
	5785 MHz	-0.927	-1.013	30
	5825 MHz	-1.338	-1.424	30
802.11 n20	5745 MHz	-2.063	-2.149	30
	5785 MHz	-1.940	-2.026	30
	5825 MHz	-1.540	-1.626	30
802.11 ac20	5745 MHz	-2.467	-2.553	30
	5785 MHz	-1.714	-1.800	30
	5825 MHz	-1.647	-1.733	30
802.11 n40	5755 MHz	-4.361	-4.447	30
	5795 MHz	-4.363	-4.449	30
802.11 ac40	5755 MHz	-4.947	-5.033	30
	5795 MHz	-4.500	-4.586	30
802.11 AC80	5775 MHz	-7.414	-7.500	30

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

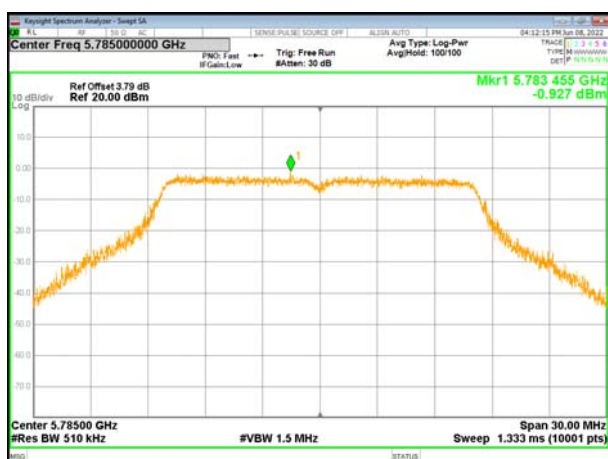
(802.11a) PSD plot on channel 149



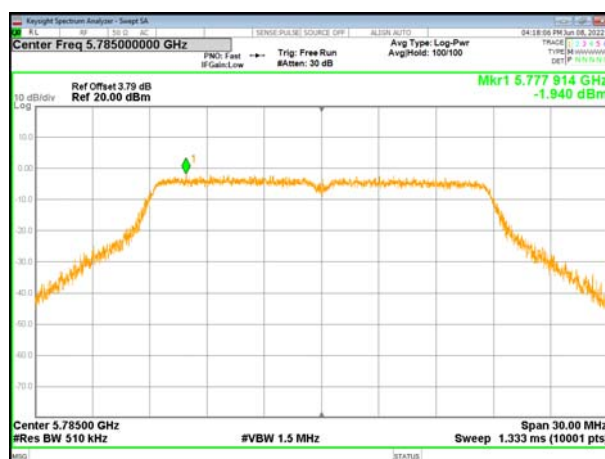
(802.11n20) PSD plot on channel 149



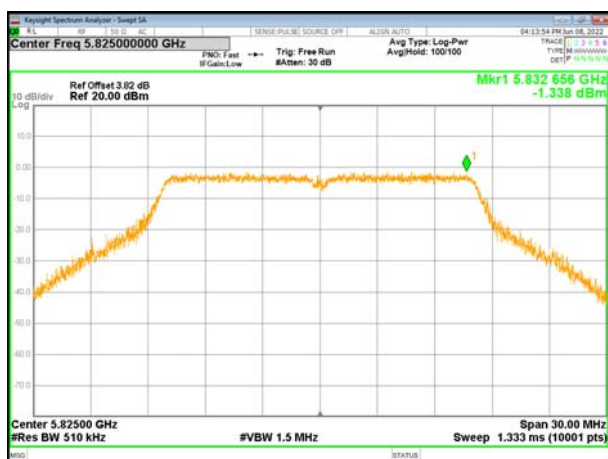
(802.11a) PSD plot on channel 157



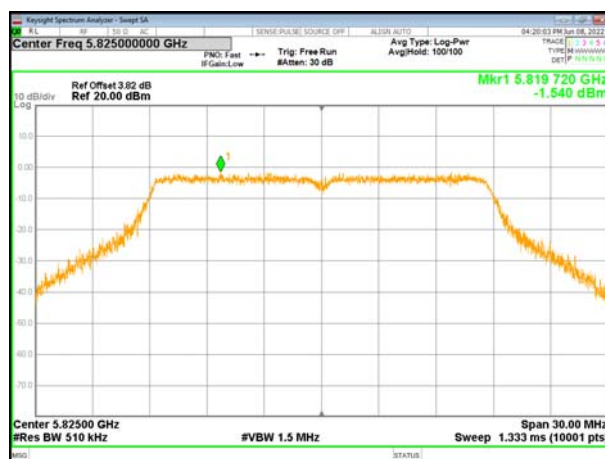
(802.11n20) PSD plot on channel 157



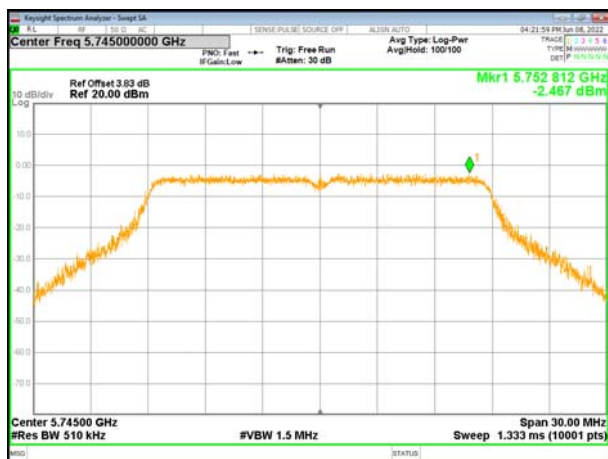
(802.11a) PSD plot on channel 165



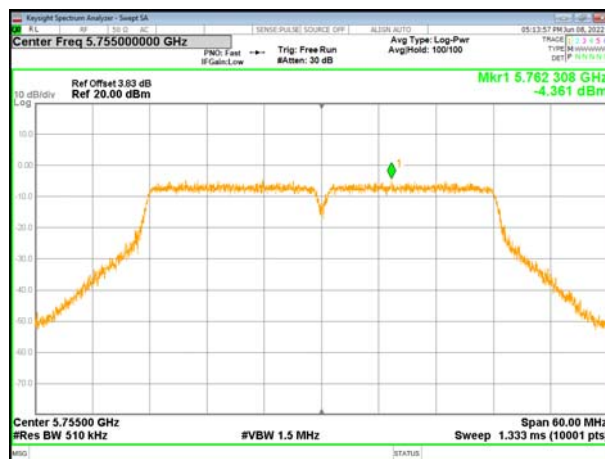
(802.11n20) PSD plot on channel 165



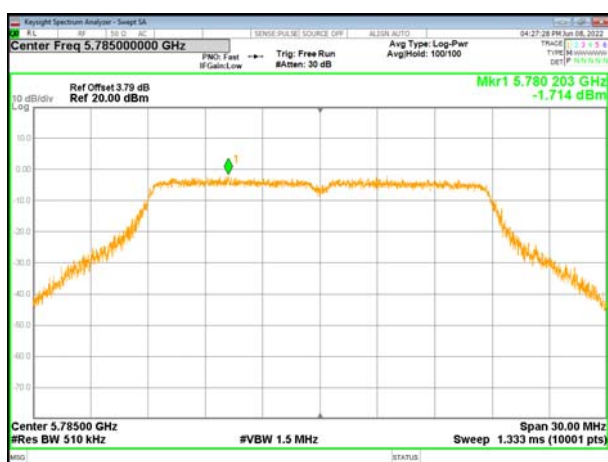
(802.11ac20) PSD plot on channel 149



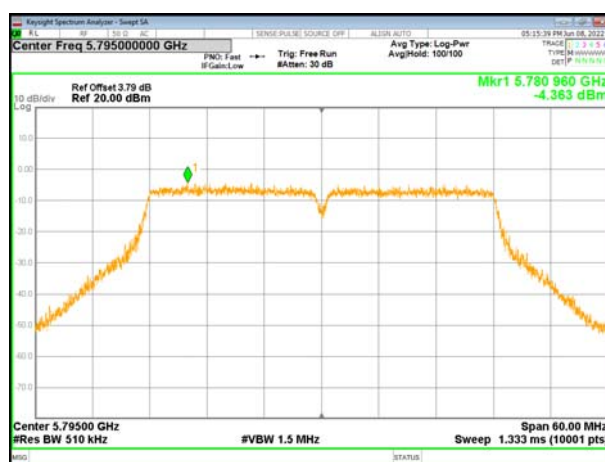
(802.11n40) PSD plot on channel 151



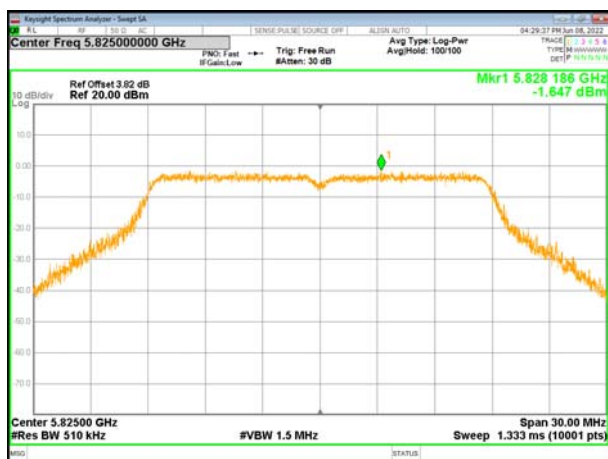
(802.11ac20) PSD plot on channel 157



(802.11n40) PSD plot on channel 159



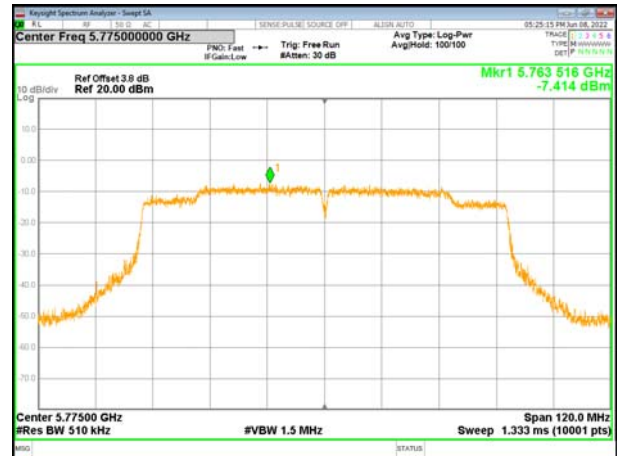
(802.11ac20) PSD plot on channel 165



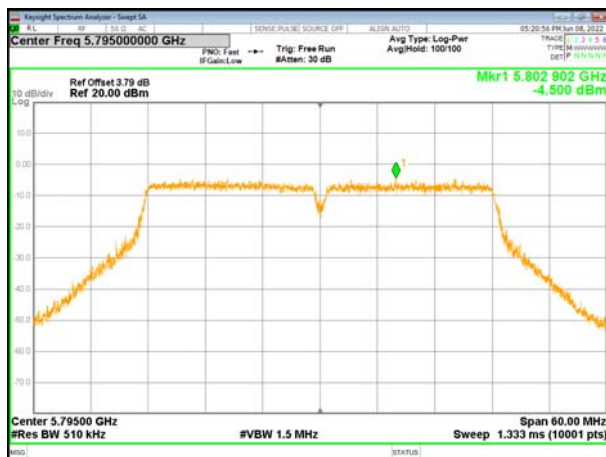
(802.11ac40) PSD plot on channel 151



(802.11ac80) PSD plot on channel 155

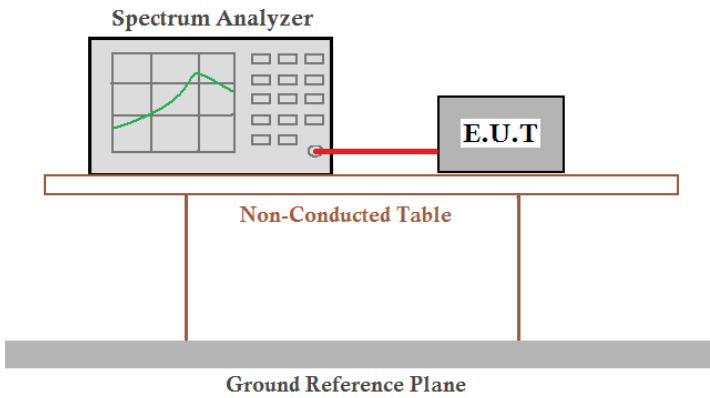


(802.11ac40) PSD plot on channel 159



4.6 Band edge

4.6.1 Conducted test Method

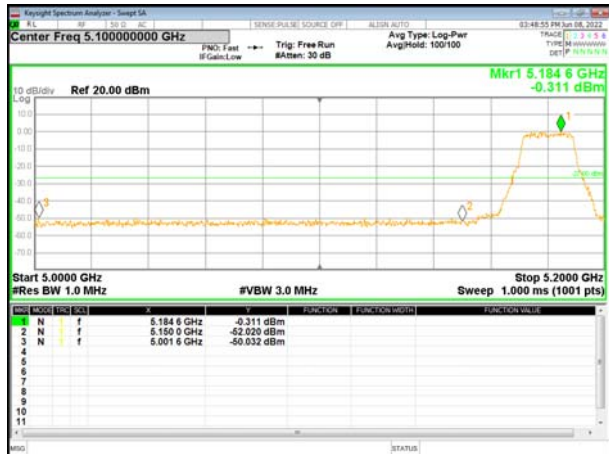
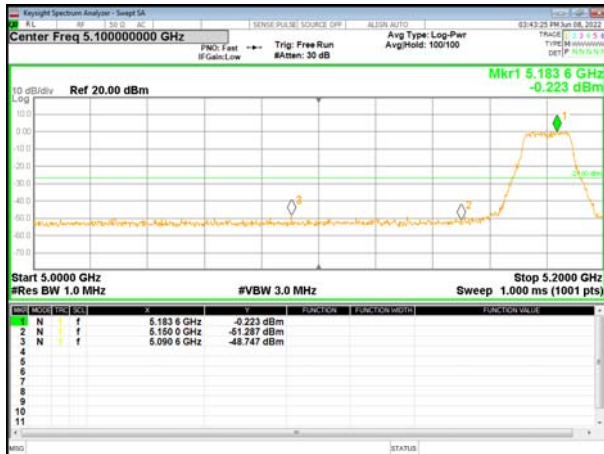
Test Requirement:	FCC Part15 C Section 15.209 and 15.205
Test Method:	ANSI C63.10: 2013
Limit:	All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.
Test setup:	 The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) via a red cable. Both are placed on a Non-Conducted Table, which is supported by a Ground Reference Plane.
Test Procedure:	1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator. 2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range. 3. Set RBW of spectrum analyzer to 1 MHz with a convenient frequency span. 4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency. 5. Repeat above procedures until all measured frequencies were complete..
Test Instruments:	Refer to section 3.0 for details
Test mode:	Refer to section 2.2 for details
Test results:	Pass

Remarks:/

5.180~5.240 GHz

(802.11a) Band Edge, Left Side

(802.11n20) Band Edge, Left Side



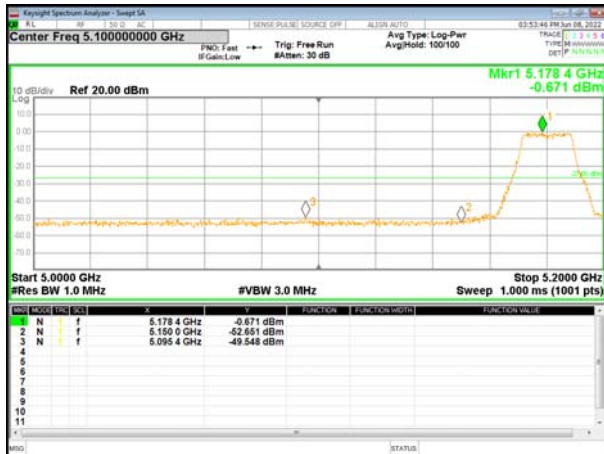
(802.11a) Band Edge, Right Side

(802.11n20) Band Edge, Right Side

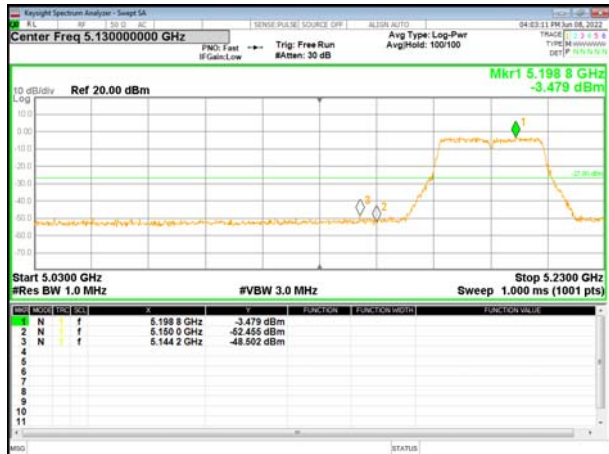


5.180~5.240 GHz

(802.11ac20) Band Edge, Left Side



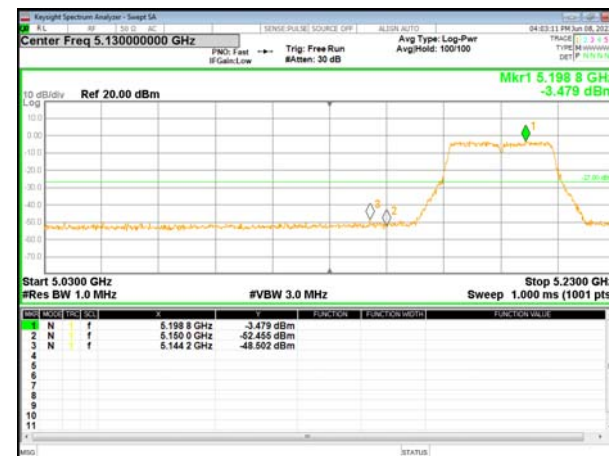
(802.11n40) Band Edge, Left Side



(802.11ac20) Band Edge, Right Side



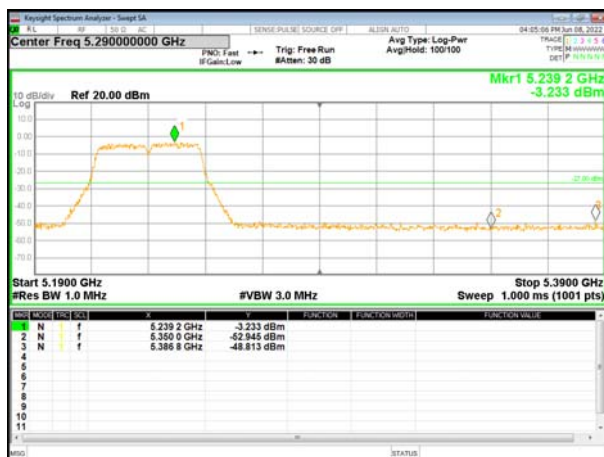
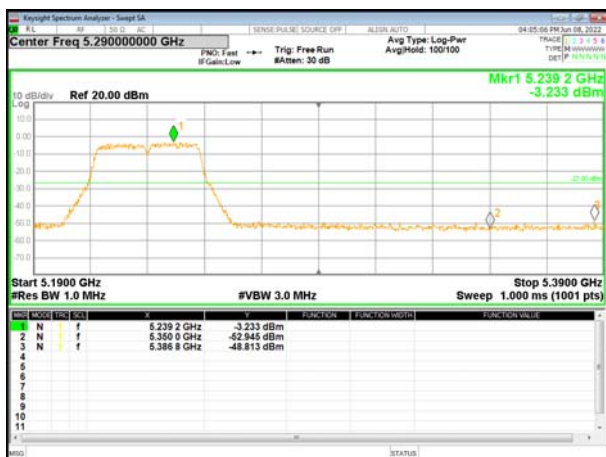
(802.11n40) Band Edge, Right Side



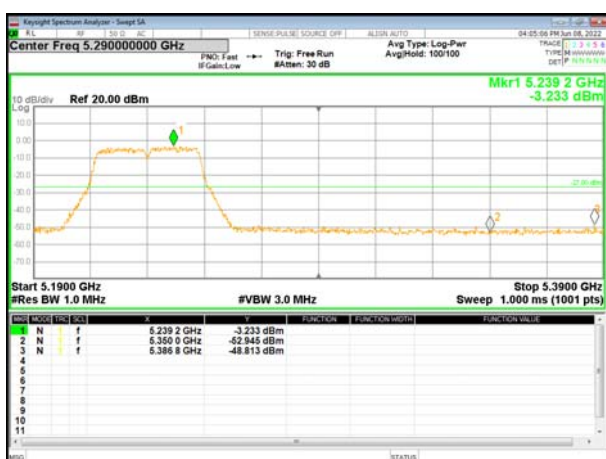
5.180~5.240 GHz

(802.11ac40) Band Edge, Left Side

(802.11ac80) Band Edge



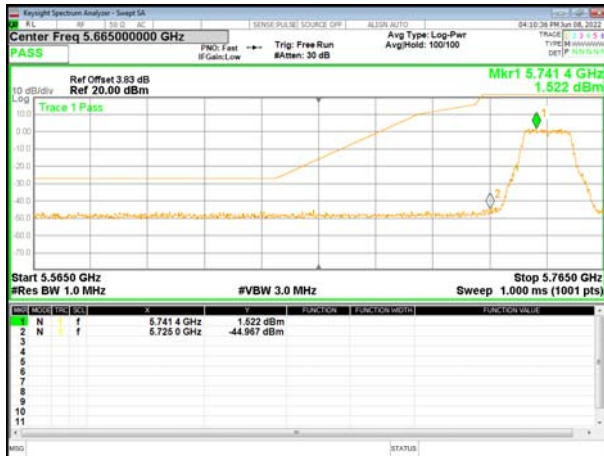
(802.11ac40) Band Edge, Right Side



5.745~5.825 GHz

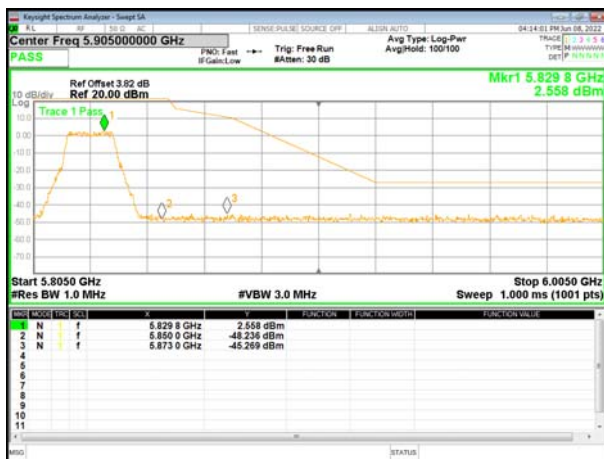
(802.11a) Band Edge, Left Side

(802.11n20) Band Edge, Left Side



(802.11a) Band Edge, Right Side

(802.11n20) Band Edge, Right Side



5.745~5.825 GHz

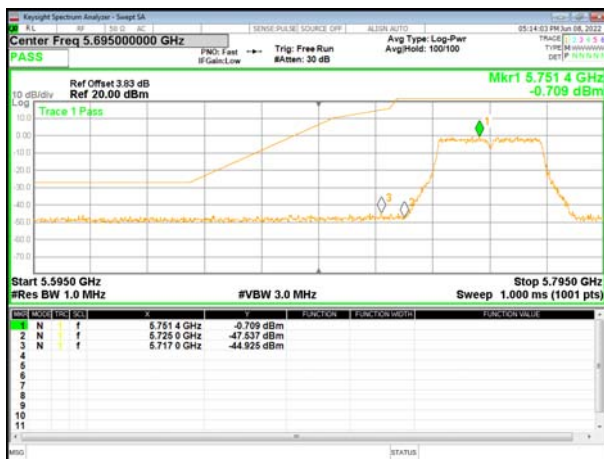
(802.11ac20) Band Edge, Left Side

(802.11n40) Band Edge, Left Side



(802.11ac20) Band Edge, Right Side

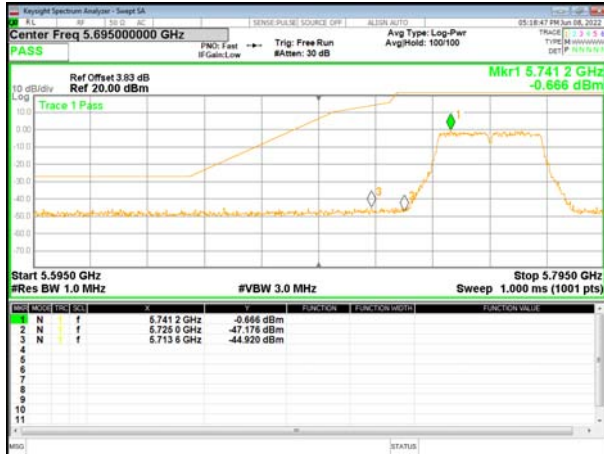
(802.11n40) Band Edge, Right Side



5.745~5.825 GHz

(802.11ac40) Band Edge, Left Side

(802.11ac80) Band Edge

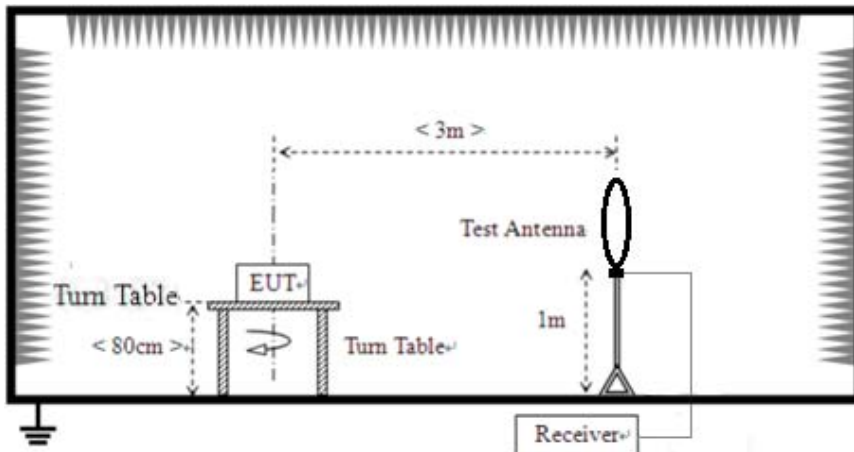


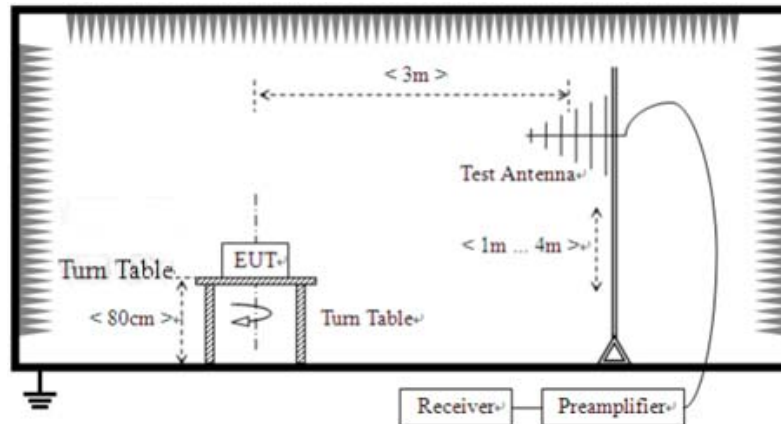
(802.11ac40) Band Edge, Right Side



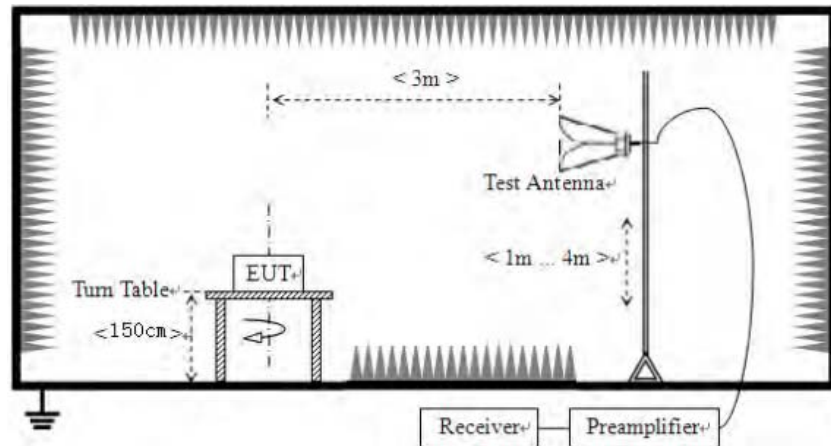
4.7 Spurious Emission

4.7.1 Radiated Emission Method

Test Requirement:	FCC Part15 C Section 15.209, Part 15E Section 15.407(b)(4)					
Test Method:	ANSI C63.10:2013					
Test Frequency Range:	9kHz to 40GHz					
Test site:	Measurement Distance: 3m					
Receiver setup:	Frequency	Detector	RBW	VBW	Value	
	9kHz-150KHz	Quasi-peak	200Hz	1kHz	Quasi-peak Value	
	150kHz-30MHz	Quasi-peak	9kHz	30kHz	Quasi-peak Value	
	30MHz-1GHz	Quasi-peak	120KHz	300KHz	Quasi-peak Value	
	Above 1GHz	Peak	1MHz	3MHz	Peak Value	
		AV	1MHz	3MHz	Average Value	
Limit:	Frequency		Limit (uV/m)	Value	Measurement Distance	
	0.009MHz-0.490MHz		2400/F(KHz)	QP	300m	
	0.490MHz-1.705MHz		24000/F(KHz)	QP	300m	
	1.705MHz-30MHz		30	QP	30m	
	30MHz-88MHz		100	QP	3m	
	88MHz-216MHz		150	QP		
	216MHz-960MHz		200	QP		
	960MHz-1GHz		500	QP		
	Frequency		Limit (dBm/MHz)	Remark		
	Above 1GHz		-27.0	Peak Value		
	Test setup:	For radiated emissions from 9kHz to 30MHz				
						
	For radiated emissions from 30MHz 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. 7. The radiation measurements are performed in X, Y, Z axis positioning. And found the X axis positioning which it is worse case, only the test worst case mode is recorded in the report.					
Test Instruments:	Refer to section 3.0 for details					
Test mode:	Refer to section 2.2 for details					
Test environment:	Temp.:	25.6 °C	Humid.:	55%	Press.:	1012mbar
Test voltage:	DC 12V from adapter					
Test results:	Pass					

Remarks:

1. All antennas was tested, only show the worst case 802.11n20 mode test data.
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:

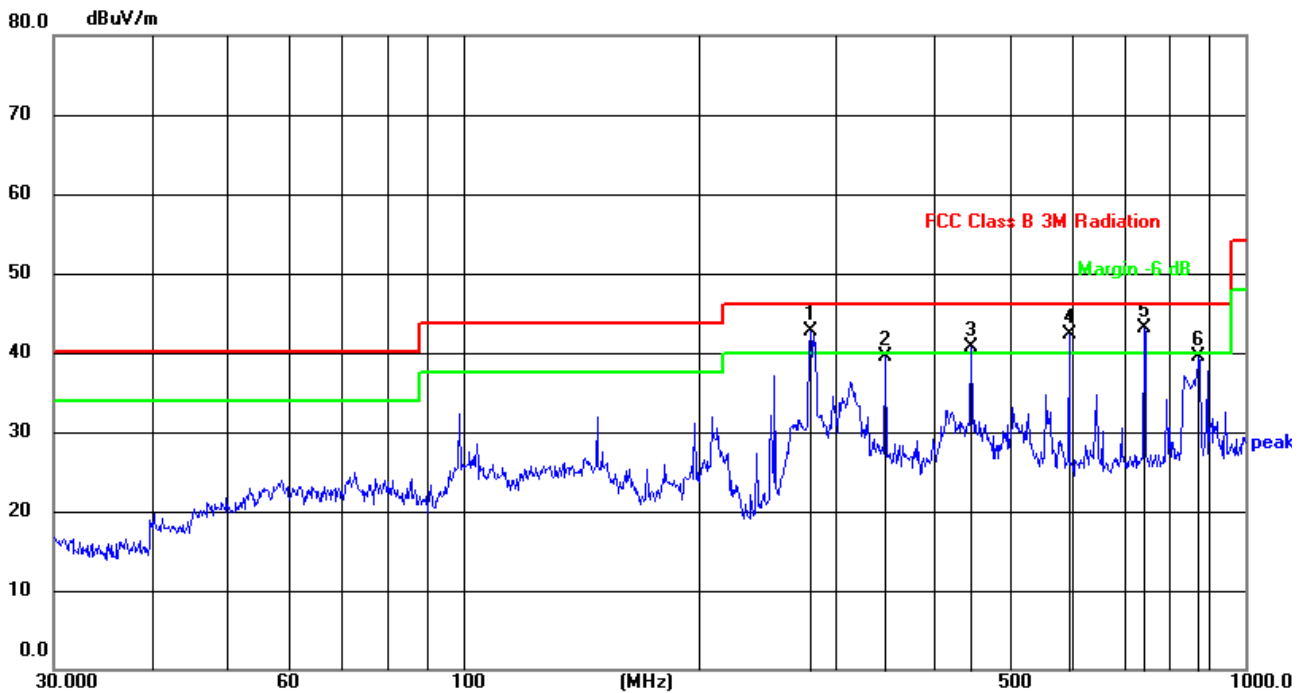
9 kHz ~ 30 MHz

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

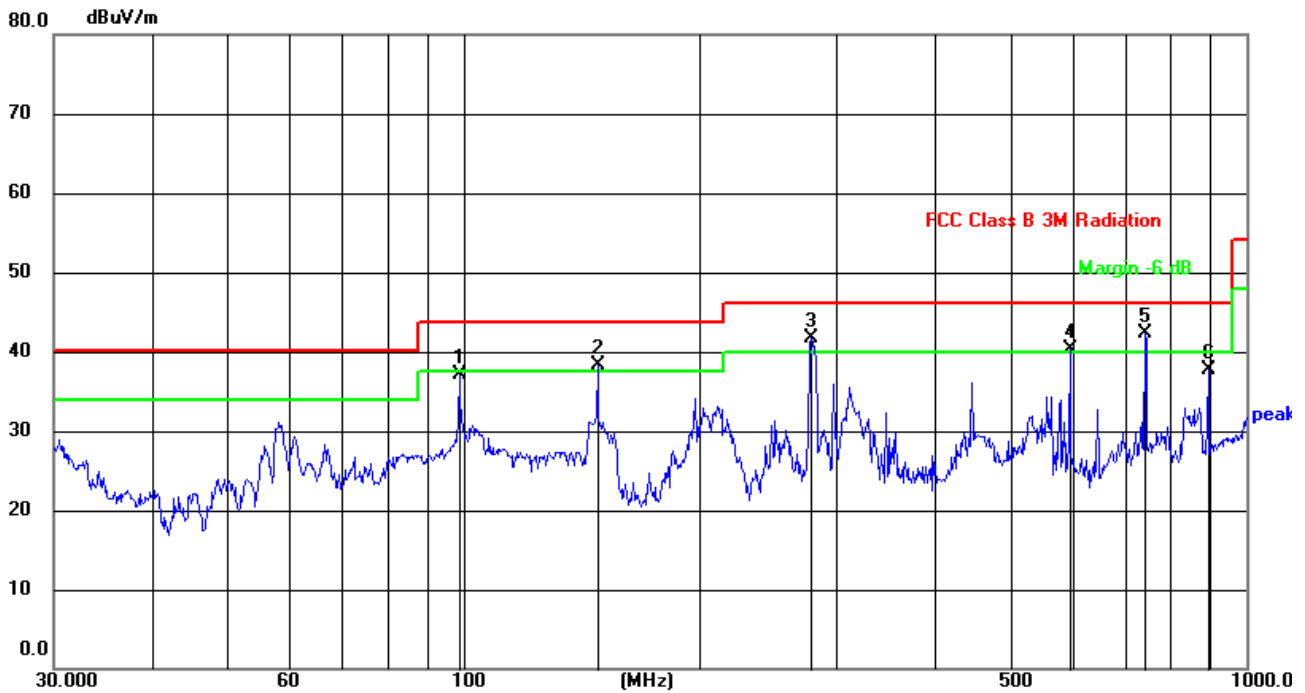
Temperature:	25.6℃	Relative Humidity:	55%
Pressure:	1010 hPa	Test Voltage :	DC12V
Test Mode :	5.2G TX- 802.11n20		

Horizontal:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	278.0668	61.10	-18.40	42.70	46.00	-3.30	QP
2	346.8091	56.41	-16.83	39.58	46.00	-6.42	QP
3	446.4139	55.57	-14.87	40.70	46.00	-5.30	QP
4	595.1326	52.62	-10.41	42.21	46.00	-3.79	QP
5	742.2586	51.43	-8.32	43.11	46.00	-2.89	QP
6	872.1832	46.27	-6.82	39.45	46.00	-6.55	QP

Vertical:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	98.8324	57.04	-19.98	37.06	43.50	-6.44	QP
2	148.4410	57.16	-18.95	38.21	43.50	-5.29	QP
3	278.0668	59.53	-17.91	41.62	46.00	-4.38	QP
4	595.1326	51.70	-11.31	40.39	46.00	-5.61	QP
5	742.2586	50.52	-8.29	42.23	46.00	-3.77	QP
6	893.8564	43.61	-5.99	37.62	46.00	-8.38	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:**

Temperature:	25.6℃	Relative Humidity:	55%
Pressure:	1010 hPa	Test Voltage :	DC12V
Test Mode :	5.2G TX- 802.11n20		

802.11n20

Polar (H/V)	Frequency	Meter Read n g	Pre- amplifie r	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detect or Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Low Channel:5180MHz									
V	10360.00	54.56	46.2	8.27	38.5	55.13	74.00	-18.87	PK
V	10360.00	41.8	46.2	8.27	38.5	42.37	54.00	-11.63	AV
V	15540.00	50.58	46.3	10.35	38.7	53.33	74.00	-20.67	PK
V	15540.00	38.57	46.3	10.35	38.7	41.32	54.00	-12.68	AV
V	20720.00	59.55	57.4	11.93	37.8	51.88	74.00	-22.12	PK
V	20720.00	49.11	57.4	11.93	37.8	41.44	54.00	-12.56	AV
V	25900.00	56.68	56.5	13.45	39.7	53.33	74.00	-20.67	PK
V	25900.00	45.93	56.5	13.45	39.7	42.58	54.00	-11.42	AV
H	10360.00	52.48	46.2	8.27	38.5	53.05	74.00	-20.95	PK
H	10360.00	40.74	46.2	8.27	38.5	41.31	54.00	-12.69	AV
H	15540.00	49.02	46.3	10.35	38.7	51.77	74.00	-22.23	PK
H	15540.00	36.56	46.3	10.35	38.7	39.31	54.00	-14.69	AV
H	20720.00	61.79	57.4	11.93	37.8	54.12	74.00	-19.88	PK
H	20720.00	49.8	57.4	11.93	37.8	42.13	54.00	-11.87	AV
H	25900.00	57.7	56.5	13.45	39.7	54.35	74.00	-19.65	PK
H	25900.00	45.76	56.5	13.45	39.7	42.41	54.00	-11.59	AV

Polar (H/V)	Frequency	Meter Reading	Pre- amplifier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detect or Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Middle Channel:5200MHz									
V	10400.00	50.76	46.2	8.27	38.5	51.33	74.00	-22.67	PK
V	10400.00	40.95	46.2	8.27	38.5	41.52	54.00	-12.48	AV
V	15600.00	48.79	46.3	10.35	38.4	51.24	74.00	-22.76	PK
V	15600.00	38.97	46.3	10.35	38.4	41.42	54.00	-12.58	AV
V	20800.00	59.75	57.4	11.93	37.8	52.08	74.00	-21.92	PK
V	20800.00	48.84	57.4	11.93	37.8	41.17	54.00	-12.83	AV
V	26000.00	54.47	56.5	13.45	39.8	51.22	74.00	-22.78	PK
V	26000.00	45.65	56.5	13.45	39.8	42.40	54.00	-11.60	AV
H	10400.00	51.59	46.2	8.27	38.5	52.16	74.00	-21.84	PK
H	10400.00	41.38	46.2	8.27	38.5	41.95	54.00	-12.05	AV
H	15600.00	48.78	46.3	10.35	38.4	51.23	74.00	-22.77	PK
H	15600.00	38.56	46.3	10.35	38.4	41.01	54.00	-12.99	AV
H	20800.00	58.83	57.4	11.93	37.8	51.16	74.00	-22.84	PK
H	20800.00	47.53	57.4	11.93	37.8	39.86	54.00	-14.14	AV
H	26000.00	54.57	56.5	13.45	39.8	51.32	74.00	-22.68	PK
H	26000.00	45.05	56.5	13.45	39.8	41.80	54.00	-12.20	AV



Polar (H/V)	Frequency	Meter Reading	Pre- amplifier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detect or Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
High Channel:5240MHz									
V	51.67	46.2	8.27	38.6	52.34	74.00	-21.66	51.67	PK
V	41.27	46.2	8.27	38.6	41.94	54.00	-12.06	41.27	AV
V	49.09	46.3	10.35	38.4	51.54	74.00	-22.46	49.09	PK
V	38.42	46.3	10.35	38.4	40.87	54.00	-13.13	38.42	AV
V	60.19	57.4	11.93	37.5	52.22	74.00	-21.78	60.19	PK
V	50.04	57.4	11.93	37.5	42.07	54.00	-11.93	50.04	AV
V	55.45	56.5	13.45	40.1	52.50	74.00	-21.50	55.45	PK
V	45.41	56.5	13.45	40.1	42.46	54.00	-11.54	45.41	AV
H	51.51	46.2	8.27	38.6	52.18	74.00	-21.82	51.51	PK
H	40.75	46.2	8.27	38.6	41.42	54.00	-12.58	40.75	AV
H	48.75	46.3	10.35	38.4	51.20	74.00	-22.80	48.75	PK
H	38.5	46.3	10.35	38.4	40.95	54.00	-13.05	38.5	AV
H	60.27	57.4	11.93	37.5	52.30	74.00	-21.70	60.27	PK
H	50.2	57.4	11.93	37.5	42.23	54.00	-11.77	50.2	AV
H	55.72	56.5	13.45	40.1	52.77	74.00	-21.23	55.72	PK
H	44.80	56.5	13.45	40.1	41.85	54.00	-12.15	44.80	AV

Remark:

1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier, Margin= Emission Level - Limit
2. If peak below the average limit, the average emission was no test.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
4. The worst mode is 802.11n20, only the worst data is recorded.



Temperature:	25.6℃	Relative Humidity:	55%
Pressure:	1010 hPa	Test Voltage :	DC12V
Test Mode :	5.8G TX- 802.11n20		

802.11n20

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre- amplifier (dB)	Cable Loss (dB)	Antenn Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detect or Typ
Low Channel:5745MHz									
V	11490.00	48.46	46.1	8.77	39.1	50.23	74.00	-23.77	PK
V	11490.00	39.31	46.1	8.77	39.1	41.08	54.00	-12.92	AV
V	17235.00	46.77	47.6	11.1	38.7	48.97	74.00	-25.03	PK
V	17235.00	38.24	47.6	11.1	38.7	40.44	54.00	-13.56	AV
V	22980.00	55.63	56.9	12.73	37.7	49.16	74.00	-24.84	PK
V	22980.00	46.74	56.9	12.73	37.7	40.27	54.00	-13.73	AV
V	28725.00	52.18	55.6	14.25	40.3	51.13	74.00	-22.87	PK
V	28725.00	42.85	55.6	14.25	40.3	41.80	54.00	-12.20	AV
H	11490.00	49.55	46.1	8.77	39.1	51.32	74.00	-22.68	PK
H	11490.00	39.28	46.1	8.77	39.1	41.05	54.00	-12.95	AV
H	17235.00	46.97	47.6	11.1	38.7	49.17	74.00	-24.83	PK
H	17235.00	38.00	47.6	11.1	38.7	40.20	54.00	-13.80	AV
H	22980.00	57.48	56.9	12.73	37.7	51.01	74.00	-22.99	PK
H	22980.00	46.89	56.9	12.73	37.7	40.42	54.00	-13.58	AV
H	28725.00	54.37	55.6	14.25	40.3	53.32	74.00	-20.68	PK
H	28725.00	43.61	55.6	14.25	40.3	42.56	54.00	-11.44	AV

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre- amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detect or Type
Middle Channel:5785MHz									
V	11570.00	49.42	46.1	8.77	39.1	51.19	74.00	-22.81	PK
V	11570.00	40.16	46.1	8.77	39.1	41.93	54.00	-12.07	AV
V	17355.00	48.91	47.7	11.1	38.4	50.71	74.00	-23.29	PK
V	17355.00	39.8	47.7	11.1	38.4	41.60	54.00	-12.40	AV
V	23140.00	57.86	56.9	12.73	37.8	51.49	74.00	-22.51	PK
V	23140.00	48.31	56.9	12.73	37.8	41.94	54.00	-12.06	AV
V	28925.00	53.54	55.6	14.25	40.5	52.69	74.00	-21.31	PK
V	28925.00	43.93	55.6	14.25	40.5	43.08	54.00	-10.92	AV
H	11570.00	51.71	46.1	8.77	39.1	53.48	74.00	-20.52	PK
H	11570.00	42.15	46.1	8.77	39.1	43.92	54.00	-10.08	AV
H	17355.00	48.34	47.7	11.1	38.4	50.14	74.00	-23.86	PK
H	17355.00	39.83	47.7	11.1	38.4	41.63	54.00	-12.37	AV
H	23140.00	58.52	56.9	12.73	37.8	52.15	74.00	-21.85	PK
H	23140.00	49.41	56.9	12.73	37.8	43.04	54.00	-10.96	AV
H	28925.00	55.17	55.6	14.25	40.5	54.32	74.00	-19.68	PK
H	28925.00	45.02	55.6	14.25	40.5	44.17	54.00	-9.83	AV

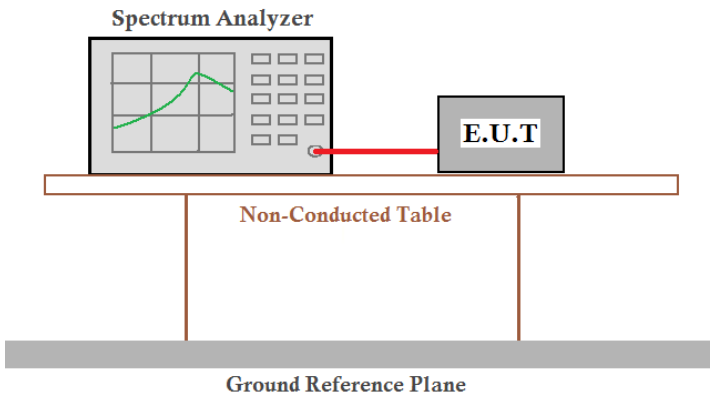


Polar (H/V)	Frequency	Meter Reading	Pre- amplifier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detect or Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
High Channel:5825MHz									
V	11650.00	49.71	46.1	8.77	39.1	51.48	74.00	-22.52	PK
V	11650.00	39.68	46.1	8.77	39.1	41.45	54.00	-12.55	AV
V	17475.00	47.72	47.9	11.23	38.9	49.95	74.00	-24.05	PK
V	17475.00	39.1	47.9	11.23	38.9	41.33	54.00	-12.67	AV
V	23300.00	58.16	57.1	12.73	37.8	51.59	74.00	-22.41	PK
V	23300.00	47.82	57.1	12.73	37.8	41.25	54.00	-12.75	AV
V	29125.00	54.66	55.8	14.25	40.5	53.61	74.00	-20.39	PK
V	29125.00	44.24	55.8	14.25	40.5	43.19	54.00	-10.81	AV
H	11650.00	51.84	46.1	8.77	39.1	53.61	74.00	-20.39	PK
H	11650.00	42.26	46.1	8.77	39.1	44.03	54.00	-9.97	AV
H	17475.00	49.49	47.9	11.23	38.9	51.72	74.00	-22.28	PK
H	17475.00	40.35	47.9	11.23	38.9	42.58	54.00	-11.42	AV
H	23300.00	60.29	57.1	12.73	37.8	53.72	74.00	-20.28	PK
H	23300.00	48.67	57.1	12.73	37.8	42.10	54.00	-11.90	AV
H	29125.00	55.74	55.8	14.25	40.5	54.69	74.00	-19.31	PK
H	29125.00	45.07	55.8	14.25	40.5	44.02	54.00	-9.98	AV

Remark:

1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier, Margin= Emission Level - Limit
2. If peak below the average limit, the average emission was no test.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
4. The worst mode is 802.11n20, only the worst data is recorded.

4.7.2 Conducted Emission Method

Test Requirement:	FCC Part15 C Section 15.209, Part 15E Section 15.407(b)(4)
Test Method:	ANSI C63.10:2013
Limit:	-27dBm/MHz
Test setup:	 The diagram illustrates the test setup for conducted emissions. A Spectrum Analyzer is connected to an Equipment Under Test (E.U.T.) via a red cable. Both the Spectrum Analyzer and the E.U.T. are placed on a Non-Conducted Table. The table is supported by a Ground Reference Plane.
Test Instruments:	Refer to section 3.0 for details
Test mode:	Refer to section 2.2 for details
Test results:	Pass



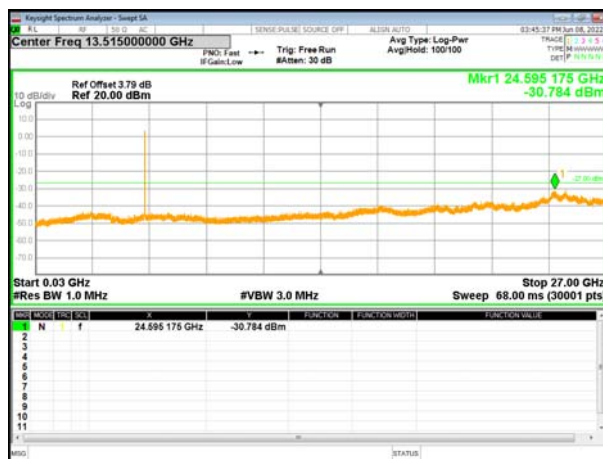
5180-5240MHz

Test Plot

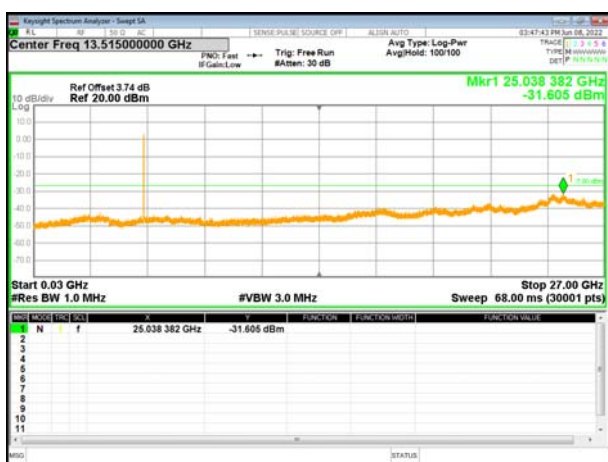
802.11a on channel 36



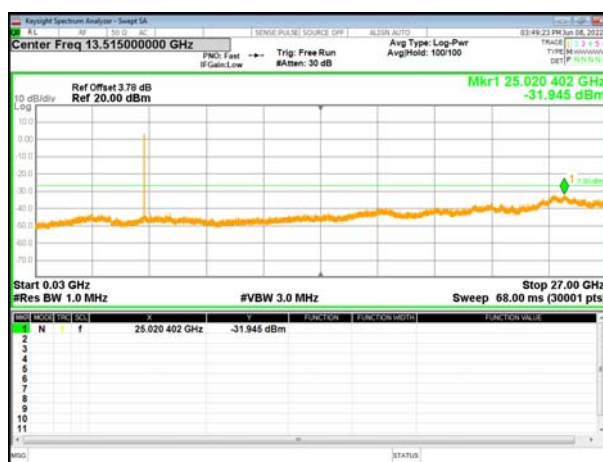
802.11a on channel 40



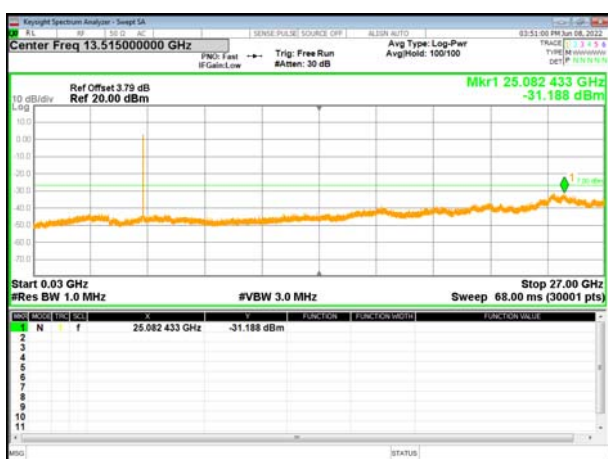
802.11a on channel 48



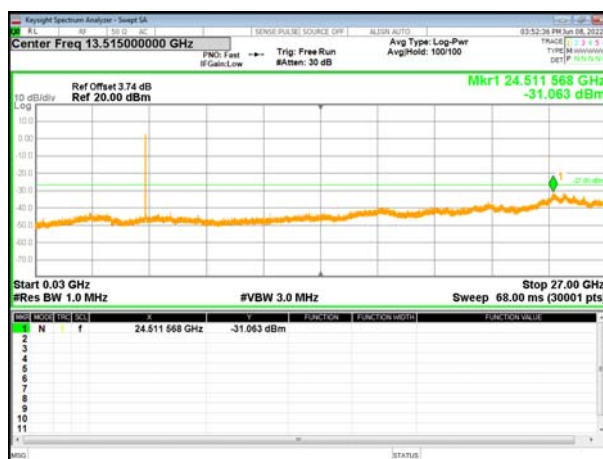
802.11n20 on channel 36



802.11n20 on channel 40

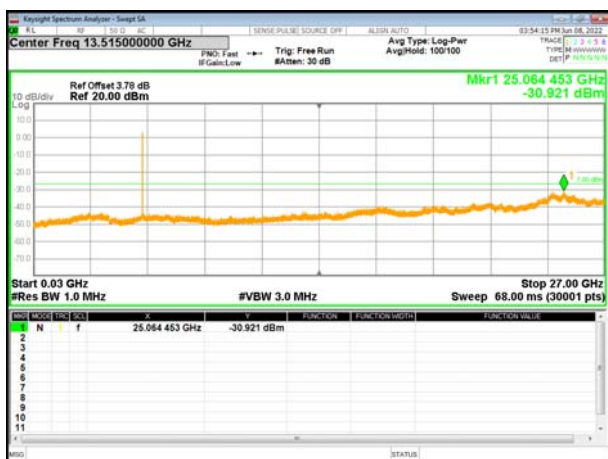


802.11n20 on channel 48

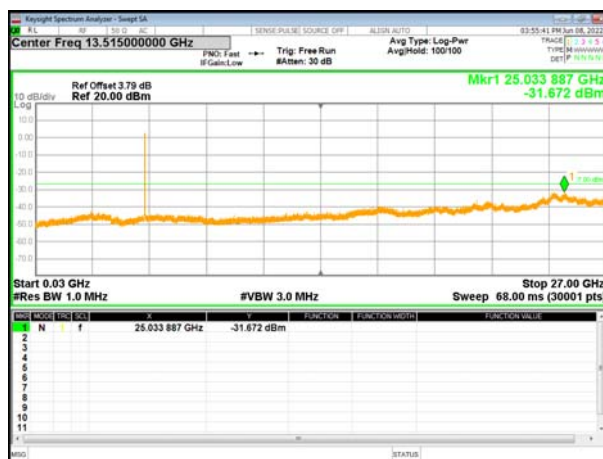


Test Plot

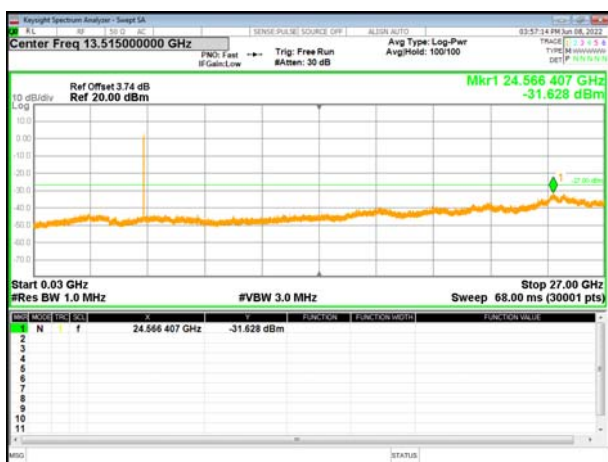
802.11ac20 on channel 36



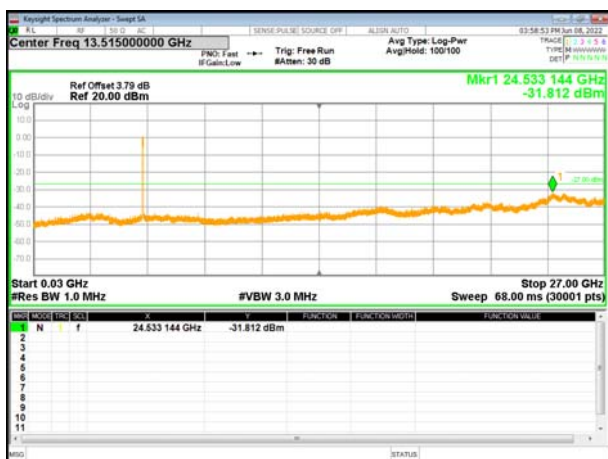
802.11ac20 on channel 40



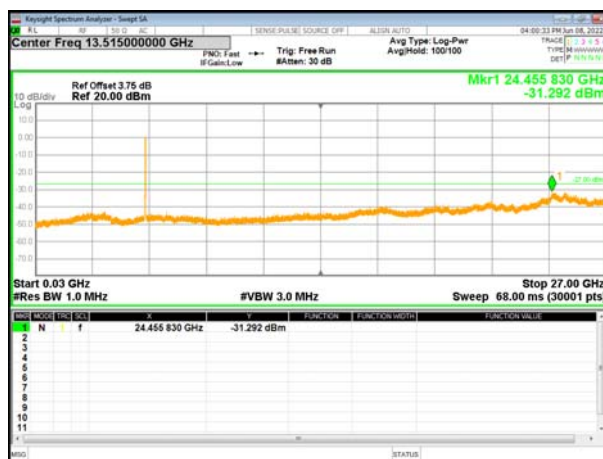
802.11ac20 on channel 48



802.11n40 on channel 38

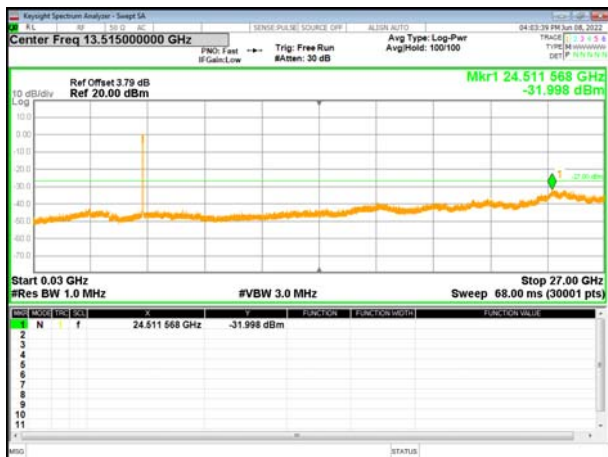


802.11n40 on channel 46

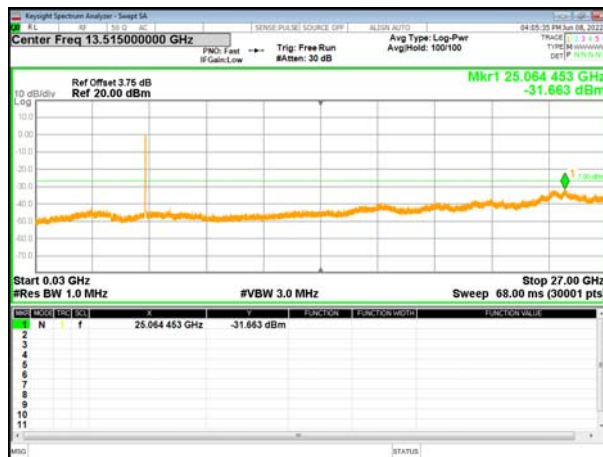


Test Plot

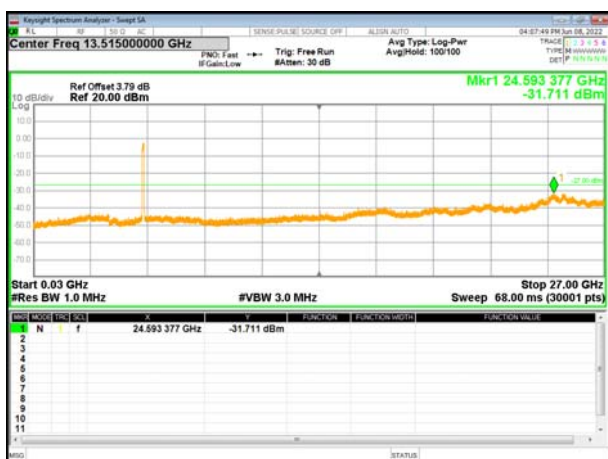
802.11ac40 on channel 38



802.11ac40 on channel 46



802.11ac80 on channel 42

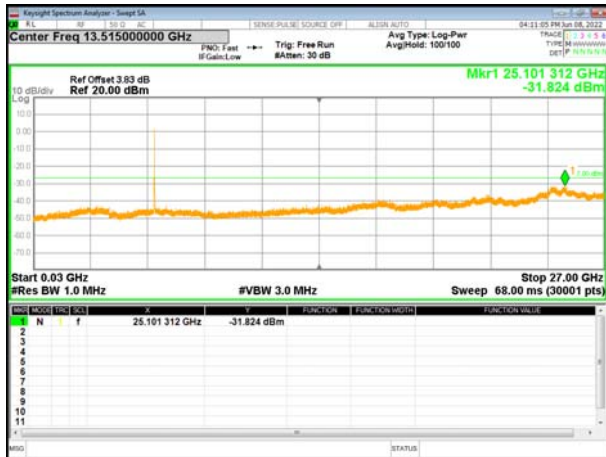




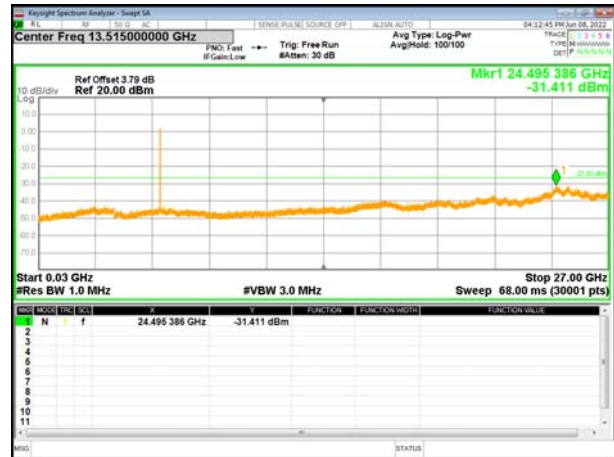
5745-5825MHz

Test Plot

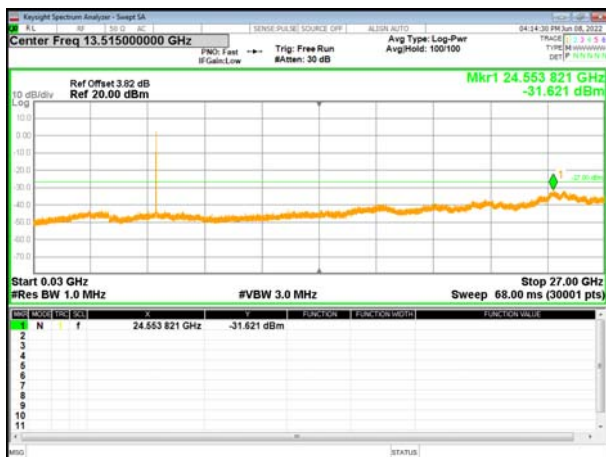
802.11a on channel 149



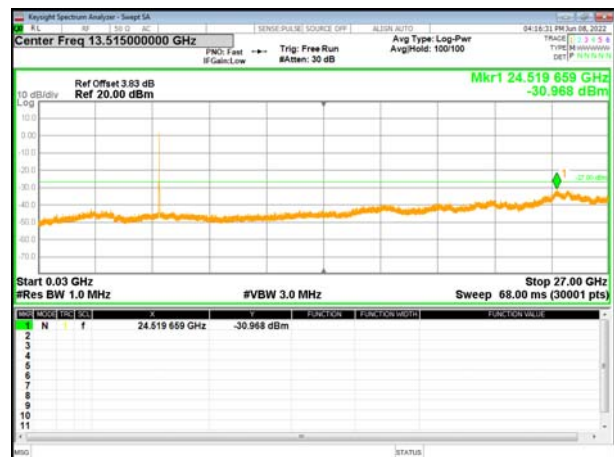
802.11a on channel 157



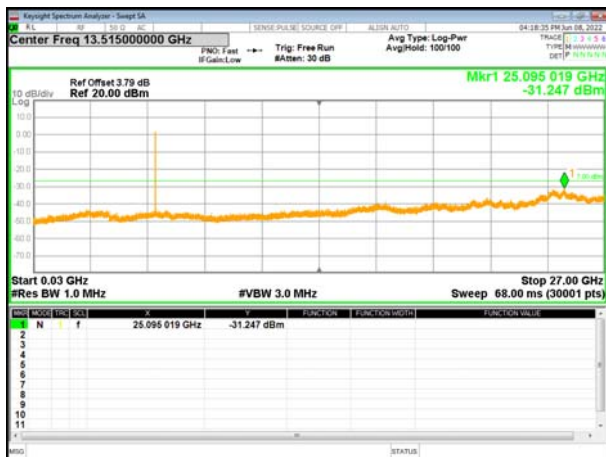
802.11a on channel 165



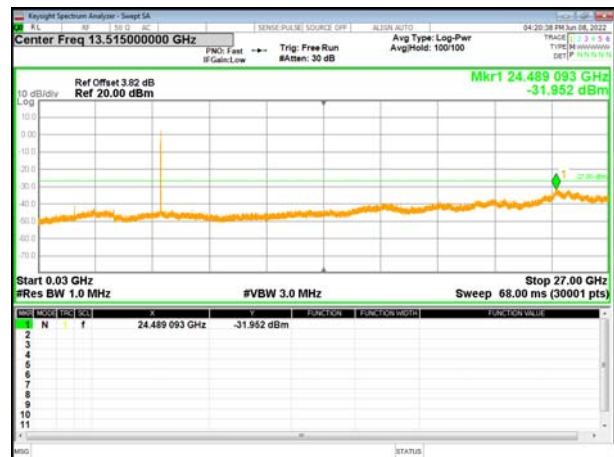
802.11n20 on channel 149



802.11n20 on channel 157

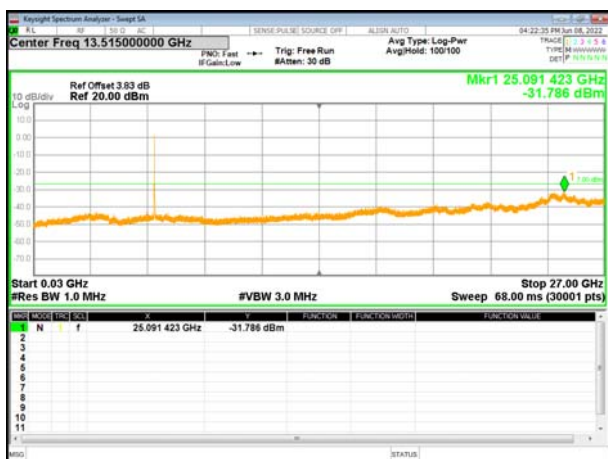


802.11n20 on channel 165

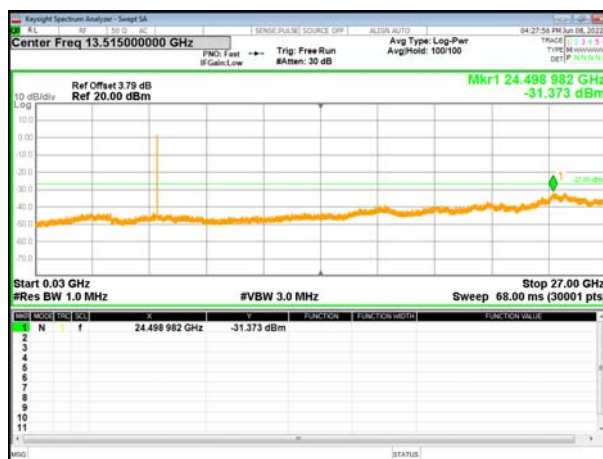


Test Plot

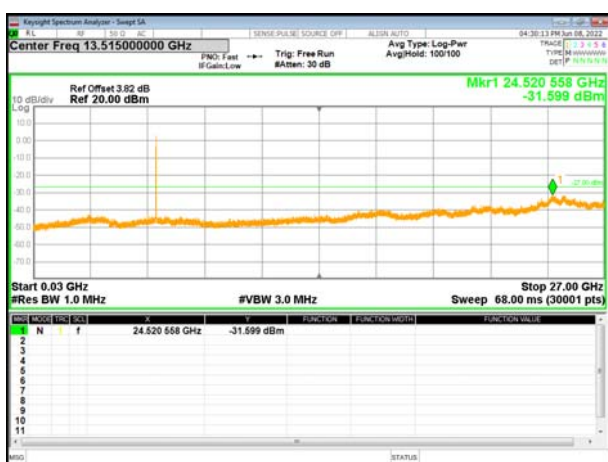
802.11ac20 on channel 149



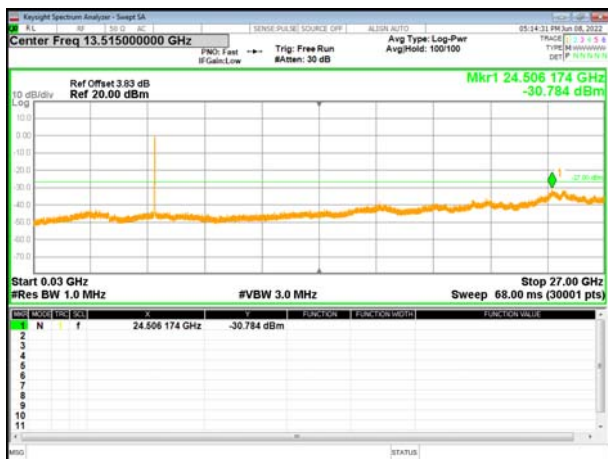
802.11ac20 on channel 157



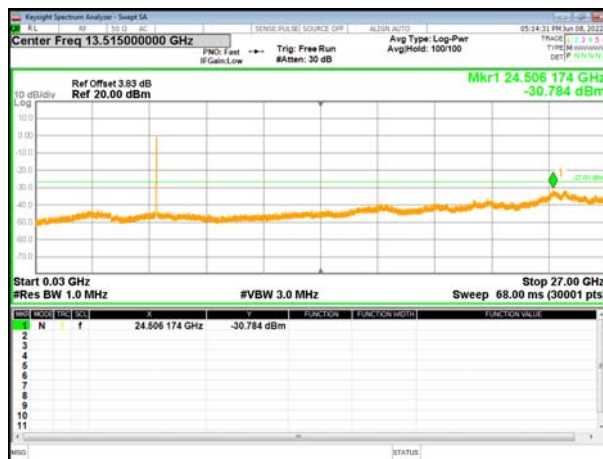
802.11ac20 on channel 165



802.11n40 on channel 151

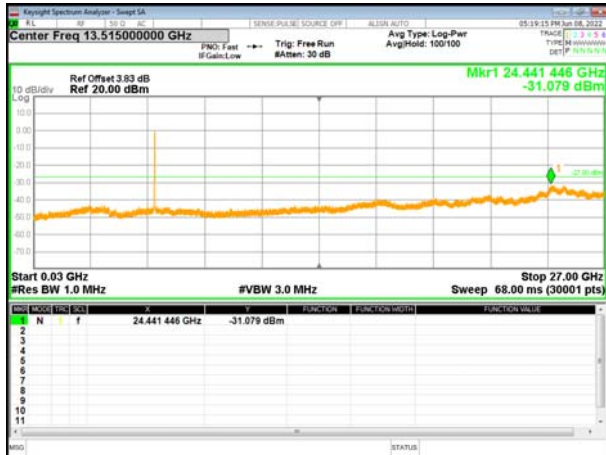


802.11n40 on channel 159

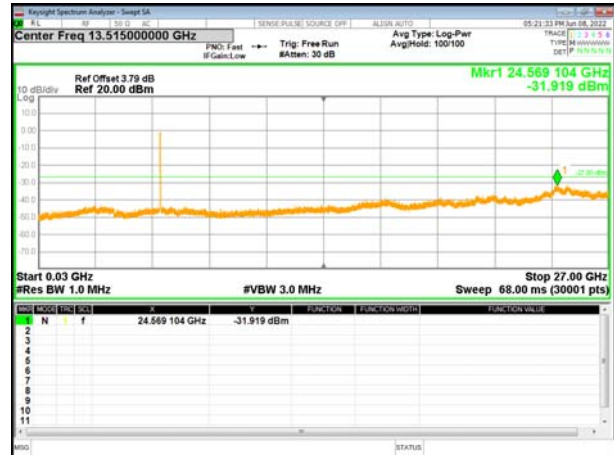


Test Plot

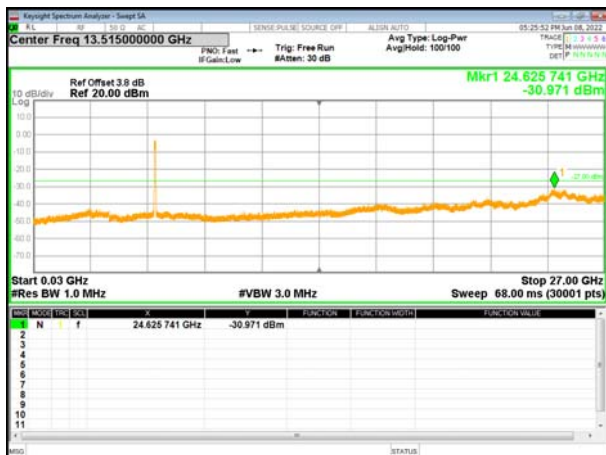
802.11ac40 on channel 151



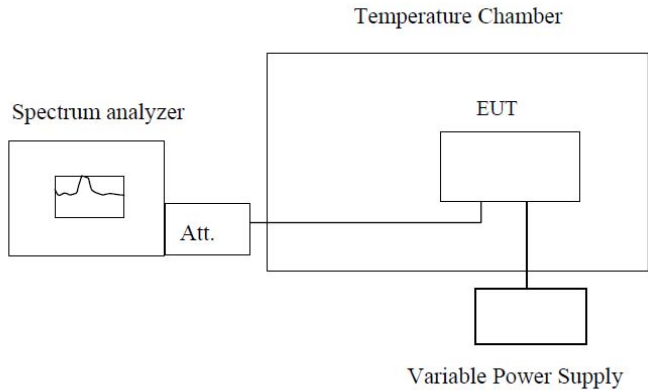
802.11ac40 on channel 159



802.11ac80 on channel 155



4.8 Frequency stability

Test Requirement:	FCC Part15 C Section 15.407(g)
Test Method:	ANSI C63.10:2013, FCC Part 2.1055
Limit:	Manufactures of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified
Test Procedure:	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 12V					
Temp. (°C)	Operating Frequency (MHz)	0 minute Measured Frequency (MHz)	2 minute Measured Frequency (MHz)	5 minute Measured Frequency (MHz)	10 minute Measured Frequency (MHz)
-30	5180	5180.181	5179.855	5179.990	5179.742
	5190	5190.175	5189.866	5189.986	5189.728
	5200	5200.188	5199.857	5199.981	5199.729
	5210	5210.192	5209.858	5209.987	5209.751
	5220	5220.178	5219.865	5219.982	5219.737
	5230	5230.171	5229.883	5229.980	5229.747
	5240	5240.199	5239.868	5239.953	5239.753
-20	5180	5180.311	5179.871	5179.981	5179.725
	5190	5200.186	5189.865	5189.972	5189.736
	5200	5200.211	5199.865	5199.980	5199.727
	5210	5210.189	5209.877	5209.972	5209.728
	5220	5220.204	5219.868	5219.993	5219.735
	5230	5230.197	5229.871	5229.971	5229.753
	5240	5240.205	5239.868	5239.989	5239.738
-10	5180	5180.181	5179.855	5179.990	5179.742
	5190	5190.175	5189.866	5189.986	5189.728
	5200	5200.188	5199.857	5199.981	5199.729
	5210	5210.192	5209.858	5209.987	5209.751
	5220	5220.178	5219.865	5219.982	5219.737
	5230	5230.171	5229.883	5229.980	5229.747
	5240	5240.199	5239.868	5239.953	5239.753
0	5180	5190.186	5179.867	5179.981	5179.725
	5190	5200.177	5189.858	5189.972	5189.736
	5200	5210.178	5199.866	5199.980	5199.727
	5210	5220.185	5209.858	5209.972	5209.728
	5220	5230.203	5219.879	5219.993	5219.735
	5230	5240.175	5229.857	5229.971	5229.753
	5240	5190.186	5239.875	5239.989	5239.738
10	5180	5180.187	5179.876	5179.969	5179.746
	5190	5190.178	5189.872	5189.980	5189.742
	5200	5200.186	5199.867	5199.971	5199.737
	5210	5210.178	5209.873	5209.972	5209.743
	5220	5220.199	5219.868	5219.979	5219.738
	5230	5230.177	5229.866	5229.997	5229.736
	5240	5240.195	5239.839	5239.969	5239.709



20	5180	5180.196	5179.885	5179.980	5179.737
	5190	5190.195	5179.991	5189.981	5189.728
	5200	5200.189	5199.866	5199.972	5199.736
	5210	5210.179	5209.891	5299.980	5209.728
	5220	5220.189	5219.869	5219.972	5219.749
	5230	5300.187	5229.884	5229.993	5229.727
	5240	5240.191	5239.877	5239.971	5239.745
30	5180	5180.186	5179.871	5179.975	5179.741
	5190	5190.187	5189.865	5189.969	5189.735
	5200	5200.178	5199.865	5199.982	5199.735
	5210	5300.186	5209.877	5209.986	5209.747
	5220	5220.178	5219.868	5219.972	5219.738
	5230	5230.199	5299.871	5229.965	5299.741
	5240	5240.177	5239.868	5239.993	5239.738
40	5180	5180.181	5179.885	5179.980	5179.746
	5190	5190.175	5189.855	5189.972	5179.746
	5200	5200.188	5199.868	5199.980	5189.742
	5210	5210.192	5209.872	5209.972	5199.737
	5220	5220.178	5219.858	5219.993	5209.743
	5230	5230.171	5229.851	5229.971	5219.738
	5240	5240.199	5239.879	5239.989	5229.736
50	5180	5180.187	5179.861	5179.985	5179.751
	5190	5190.178	5189.855	5189.979	5189.743
	5200	5200.186	5199.868	5199.979	5199.667
	5210	5210.178	5209.872	5209.991	5209.729
	5220	5220.199	5219.858	5219.982	5219.744
	5230	5230.177	5229.851	5299.985	5299.736
	5240	5240.195	5239.879	5239.982	5239.745

Frequency stability versus Voltage					
Temperature: 25°C					
Power Supply (VDC)	Operating Frequency (MHz)	0 minute Measured Frequency (MHz)	2 minute Measured Frequency (MHz)	5 minute Measured Frequency (MHz)	10 minute Measured Frequency (MHz)
11.58	5180	5180.186	5179.866	5179.985	5179.731
	5190	5190.187	5189.867	5189.979	5189.725
	5200	5200.178	5199.858	5199.979	5199.738
	5210	5300.186	5299.866	5209.991	5209.742
	5220	5220.178	5219.858	5219.982	5219.728
	5230	5230.199	5229.879	5299.985	5229.721
	5240	5240.177	5239.857	5239.982	5239.749
12.04	5180	5180.191	5179.876	5179.942	5179.736
	5190	5190.185	5189.872	5189.972	5189.737
	5200	5200.185	5199.867	5199.997	5199.728
	5210	5210.197	5209.873	5209.981	5299.736
	5220	5220.188	5219.868	5219.972	5219.728
	5230	5300.191	5229.866	5230.000	5229.749
	5240	5240.188	5239.839	5239.988	5239.727
13.26	5180	5180.148	5179.991	5179.969	5179.746
	5190	5190.178	5199.866	5189.980	5189.742
	5200	5200.203	5199.891	5199.971	5199.737
	5210	5210.187	5209.869	5209.972	5209.743
	5220	5220.178	5219.884	5219.979	5219.738
	5230	5230.206	5229.877	5229.997	5229.736
	5240	5240.194	5239.885	5239.969	5239.709



Frequency stability versus Temp.					
Power Supply: DC 12V					
Temp. (°C)	Operating Frequency (MHz)	0 minute Measured Frequency (MHz)	2 minute Measured Frequency (MHz)	5 minute Measured Frequency (MHz)	10 minute Measured Frequency (MHz)
-30	5745	5745.108	5744.749	5744.997	5744.991
	5755	5755.115	5754.756	5755.022	5744.557
	5775	5775.107	5774.773	5775.003	5754.940
	5785	5785.099	5784.749	5785.012	5774.941
	5795	5795.106	5794.745	5795.010	5784.944
	5825	5825.035	5824.748	5825.020	5794.927
-20	5745	5755.116	5754.755	5755.010	5754.915
	5755	5775.133	5774.747	5775.027	5774.926
	5775	5785.109	5784.739	5785.003	5784.933
	5785	5795.105	5794.746	5794.999	5794.951
	5795	5825.108	5824.675	5825.002	5824.943
	5825	5755.116	5754.755	5755.010	5754.915
-10	5745	5745.109	5744.748	5745.003	5744.926
	5755	5755.116	5754.755	5755.010	5754.915
	5775	5775.133	5774.747	5775.027	5774.926
	5785	5785.109	5784.739	5785.003	5784.933
	5795	5795.105	5794.746	5794.999	5794.951
	5825	5825.108	5824.675	5825.002	5824.943
0	5745	5745.103	5744.748	5745.002	5744.927
	5755	5755.128	5754.765	5755.009	5754.934
	5775	5775.109	5774.766	5775.001	5774.951
	5785	5785.118	5784.748	5784.993	5784.927
	5795	5795.116	5794.765	5795.000	5794.923
	5825	5825.126	5824.763	5824.929	5824.926
10	5745	5745.098	5744.759	5744.997	5744.926
	5755	5755.114	5754.761	5755.022	5754.933
	5775	5775.113	5774.764	5775.003	5774.925
	5785	5785.116	5784.756	5785.012	5784.917
	5795	5795.127	5794.747	5795.010	5794.924
	5825	5825.108	5824.756	5825.020	5824.853
20	5745	5745.108	5744.749	5745.002	5744.951
	5755	5755.127	5754.756	5755.019	5754.923
	5775	5775.107	5774.773	5775.020	5774.946
	5785	5785.134	5784.749	5785.002	5784.946
	5795	5795.126	5794.745	5795.019	5794.937
	5825	5825.135	5824.748	5825.017	5824.952
30	5745	5745.098	5744.759	5744.997	5744.926
	5755	5755.114	5754.761	5755.022	5754.933
	5775	5775.113	5774.764	5775.003	5774.925
	5785	5785.116	5784.756	5785.012	5784.917
	5795	5795.127	5794.747	5795.010	5794.924
	5825	5825.108	5824.756	5825.020	5824.853
40	5745	5745.119	5744.748	5744.997	5744.921
	5755	5755.121	5754.765	5755.022	5754.946
	5775	5775.124	5774.766	5775.003	5774.927
	5785	5785.116	5784.748	5785.012	5784.936



	5795	5795.107	5794.765	5795.010	5794.934
	5825	5825.116	5824.763	5825.020	5824.944
50	5745	5744.739	5744.738	5744.997	5744.904
	5755	5755.122	5754.754	5755.022	5754.926
	5775	5775.123	5774.753	5775.003	5774.935
	5785	5785.126	5784.756	5785.012	5784.926
	5795	5795.109	5794.767	5795.010	5794.937
	5825	5825.105	5824.748	5825.020	5824.940

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)
11.58	5745	5745.119	5744.749	5745.013	5744.926
	5755	5755.121	5754.756	5755.015	5754.943
	5775	5775.124	5774.773	5775.018	5774.944
	5785	5785.116	5784.749	5785.010	5784.926
	5795	5795.107	5794.745	5795.001	5794.943
	5825	5825.116	5824.748	5825.010	5824.941
12.04	5745	5745.108	5744.749	5745.002	5744.951
	5755	5755.127	5754.756	5755.019	5754.923
	5775	5775.107	5774.773	5775.020	5774.946
	5785	5785.134	5784.749	5785.002	5784.946
	5795	5795.126	5794.745	5795.019	5794.937
	5825	5825.135	5824.748	5825.017	5824.952
13.26	5745	5745.119	5744.759	5745.002	5744.916
	5755	5755.121	5754.761	5755.021	5754.932
	5775	5775.124	5774.764	5775.001	5774.931
	5785	5785.116	5784.756	5785.028	5784.934
	5795	5795.107	5794.747	5795.020	5794.945
	5825	5825.116	5824.756	5825.029	5824.926



5 Test Setup Photo

Reference to the **appendix I** for details.

6 EUT Constructional Details

Reference to the **appendix II** for details.

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