

TEST REPORT

Applicant: Pine Store Limited

Address of Applicant: 1906, 19/F., Ginza Plaza, 2A Sai Yeung Choi South Street,
Mongkok, Kowloon, Hong Kong

Manufacturer/Factory: Pine Store Limited

**Address of
Manufacturer/Factory:** 1906, 19/F., Ginza Plaza, 2A Sai Yeung Choi South Street,
Mongkok, Kowloon, Hong Kong

Equipment Under Test (EUT)

Product Name: PineNote

Model No.: PineNote, PineNote Lite

Trade Mark:  PINE64

FCC ID: 2AWAG-PINENOTE

Applicable standards: FCC CFR Title 47 Part 15 Subpart E Section 15.407

Date of sample receipt: Sep.09, 2021

Date of Test: Sep.10, 2021-Sep.16, 2021

Date of report issue: Sep.22, 2021

Test Result : PASS *

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

Authorized Signature:



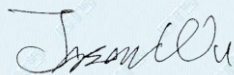
Robinson Luo
Laboratory Manager

This 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.

2 Version

Version No.	Date	Description
00	Sep.22, 2021	Original

Prepared By:



Date:

Sep.17, 2021

Project Engineer

Check By:



Date:

Sep.22, 2021

Reviewer

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4 Test Summary

Test Item	Section in CFR 47	Result
Antenna requirement	15.203	PASS
Emission Bandwidth and 99% Occupied Bandwidth	15.407(a)(12)	PASS
AC Power Line Conducted Emission	15.207	PASS
Peak Transmit Power	15.407(a)(1)	PASS
Power Spectral Density	15.407(a)(1)	PASS
Undesirable Emission	15.407(b), 15.205/15.209	PASS
Radiated Emission	15.205/15.209	PASS
Band Edge	15.407(b)(1)	PASS
Frequency Stability	15.407(g)	PASS

Remark:

Pass: The EUT complies with the essential requirements in the standard.

4.1 Measurement Uncertainty

Test Item	Frequency Range	Measurement Uncertainty	Notes
Radiated Emission	30MHz-200MHz	3.8039dB	(1)
Radiated Emission	200MHz-1GHz	3.9679dB	(1)
Radiated Emission	1GHz-18GHz	4.29dB	(1)
Radiated Emission	18GHz-40GHz	3.30dB	(1)
AC Power Line Conducted Emission	0.15MHz ~ 30MHz	3.44dB	(1)

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

5 General Information

5.1 General Description of EUT

Product Name:	PineNote			
Model No.:	PineNote, PineNote Lite			
Test Model No:	PineNote			
Remark: All models differences are the product name and appearance colour, others are same				
Serial No.:	N/A			
Hardware Version:	N/A			
Software Version:	N/A			
Test sample(s) ID:	GTSL202109000210-1			
Sample(s) Status:	Engineer sample			
Operation Frequency:	Band	Mode	Frequency Range(MHz)	Number of channels
	U-NII Band I	IEEE 802.11a	5180-5240	4
		IEEE 802.11n/ac 20MHz	5180-5240	4
		IEEE 802.11n/ac 40MHz	5190-5230	2
		IEEE 802.11n/ac 80MHz	5210	1
Modulation technology:	IEEE 802.11a: OFDM(BPSK/QPSK/16QAM/64QAM) IEEE 802.11n: OFDM(BPSK/QPSK/16QAM/64QAM) IEEE 802.11ac: OFDM (BPSK/QPSK/16QAM/64QAM/256QAM)			
Antenna Type:	Integrated antenna			
Antenna gain:	1.8dBi(Declare by applicant)			
Power supply:	DC 5V or DC 3.7V From battery			

Channel list for 802.11a/n(HT20)/ac(HT20)							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
36	5180MHz	40	5200MHz	44	5220MHz	48	5240MHz

Channel list for 802.11n(HT40)/ac(HT40)							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
38	5190MHz	46	5230MHz	/	/	/	/

Channel list for 802.11ac(HT80)							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
42	5210MHz	/	/	/	/	/	/

Selected Test Channel for 802.11a/n(HT20)/ac(HT20)		
Band	Channel	Frequency
U-NII Band I	The lowest channel (CH36)	5180MHz
	The middle channel (CH40)	5200MHz
	The highest channel (CH48)	5240MHz

Selected Test Channel for 802.11n(HT40)/ac(HT40)		
Band	Channel	Frequency
U-NII Band I	The lowest channel (CH38)	5190MHz
	The highest channel (CH46)	5230MHz

Selected Test Channel for 802.11ac(HT80)		
Band	Channel	Frequency
U-NII Band I	The lowest channel (CH42)	5210MHz

5.2 Test mode

Transmitting mode	Keep the EUT in transmitting with modulation. EUT was test with 99% duty cycle at its maximum power control level.
<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:	
Pre-scan all kind of data rate in lowest channel, and found the follow list which it was worst case.	
Mode	Data rate
802.11a	6 Mbps
802.11n(HT20)	6.5 Mbps
802.11n(HT40)	13.5 Mbps
802.11ac(HT20)	6.5 Mbps
802.11ac(HT40)	13.5 Mbps
802.11ac(HT80)	29.3 Mbps

5.3 Test Facility

The test facility is recognized, certified, or accredited by the following organizations: ● FCC—Registration No.: 381383 Designation Number: CN5029 Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files. ● IC —Registration No.: 9079A CAB identifier: CN0091 The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing ● NVLAP (LAB CODE:600179-0) Global United Technology Services Co., Ltd., is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP).
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5.4 Test Location

All tests were performed at:
Global United Technology Services Co., Ltd. Address: No. 123-128, Tower A, Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, sBaoan District, Shenzhen, Guangdong, China 518102 Tel: 0755-27798480 Fax: 0755-27798960

5.5 Description of Support Units

None.

5.6 Deviation from Standards

None.

5.7 Abnormalities from Standard Conditions

None.

5.8 Other Information Requested by the Customer

None.

5.9 Additional Instructions

EUT Software Settings:

Mode	Special software is used. The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.		
Test Software Name			
Mode	Channel	Frequency (MHz)	Soft Set
OFDM	CH36	5180	TX level : default
	CH38	5190	
	CH40	5200	
	CH42	5210	
	CH46	5230	
	CH48	5240	

6 Test Instruments list

Radiated Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)* 6.4(H)	GTS250	July. 02 2020	July. 01 2025
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	June. 24 2021	June. 23 2022
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	June. 24 2021	June. 23 2022
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120 D	GTS208	June. 24 2021	June. 23 2022
6	Horn Antenna	ETS-LINDGREN	3160	GTS217	June. 24 2021	June. 23 2022
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
8	Coaxial Cable	GTS	N/A	GTS213	June. 24 2021	June. 23 2022
9	Coaxial Cable	GTS	N/A	GTS211	June. 24 2021	June. 23 2022
10	Coaxial cable	GTS	N/A	GTS210	June. 24 2021	June. 23 2022
11	Coaxial Cable	GTS	N/A	GTS212	June. 24 2021	June. 23 2022
12	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	June. 24 2021	June. 23 2022
13	Amplifier(2GHz-20GHz)	HP	84722A	GTS206	June. 24 2021	June. 23 2022
14	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June. 24 2021	June. 23 2022
15	Band filter	Amindeon	82346	GTS219	June. 24 2021	June. 23 2022
16	Power Meter	Anritsu	ML2495A	GTS540	June. 24 2021	June. 23 2022
17	Power Sensor	Anritsu	MA2411B	GTS541	June. 24 2021	June. 23 2022
18	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	GTS575	June. 24 2021	June. 23 2022
19	Splitter	Agilent	11636B	GTS237	June. 24 2021	June. 23 2022
20	Loop Antenna	ZHINAN	ZN30900A	GTS534	June. 24 2021	June. 23 2022
21	Breitband hornantenne	SCHWARZBECK	BBHA 9170	GTS579	Oct. 18 2020	Oct. 17 2021
22	Amplifier	TDK	PA-02-02	GTS574	Oct. 18 2020	Oct. 17 2021
23	Amplifier	TDK	PA-02-03	GTS576	Oct. 18 2020	Oct. 17 2021
24	PSA Series Spectrum Analyzer	Rohde & Schwarz	FSP	GTS578	June. 24 2021	June. 23 2022

Conducted Emission						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Shielding Room	ZhongYu Electron	7.3(L)x3.1(W)x2.9(H)	GTS252	May.15 2019	May.14 2022
2	EMI Test Receiver	R&S	ESCI 7	GTS552	June. 24 2021	June. 23 2022
3	Coaxial Switch	ANRITSU CORP	MP59B	GTS225	June. 24 2021	June. 23 2022
4	ENV216 2-L-V-NETZNACHB.DE	ROHDE&SCHWARZ	ENV216	GTS226	June. 24 2021	June. 23 2022
5	Coaxial Cable	GTS	N/A	GTS227	N/A	N/A
6	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
7	Thermo meter	KTJ	TA328	GTS233	June. 24 2021	June. 23 2022
8	Absorbing clamp	Elektronik-Feinmechanik	MDS21	GTS229	June. 24 2021	June. 23 2022
9	ISN	SCHWARZBECK	NTFM 8158	GTS565	June. 24 2021	June. 23 2022
10	High voltage probe	SCHWARZBECK	TK9420	GTS537	July. 09 2021	July. 08 2022

RF Conducted Test:						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	MXA Signal Analyzer	Agilent	N9020A	GTS566	June. 24 2021	June. 23 2022
2	EMI Test Receiver	R&S	ESCI 7	GTS552	June. 24 2021	June. 23 2022
3	Spectrum Analyzer	Agilent	E4440A	GTS533	June. 24 2021	June. 23 2022
4	MXG vector Signal Generator	Agilent	N5182A	GTS567	June. 24 2021	June. 23 2022
5	ESG Analog Signal Generator	Agilent	E4428C	GTS568	June. 24 2021	June. 23 2022
6	USB RF Power Sensor	DARE	RPR3006W	GTS569	June. 24 2021	June. 23 2022
7	RF Switch Box	Shongyi	RFSW3003328	GTS571	June. 24 2021	June. 23 2022
8	Programmable Constant Temp & Humi Test Chamber	WEWON	WHTH-150L-40-880	GTS572	June. 24 2021	June. 23 2022

General used equipment:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Humidity/ Temperature Indicator	KTJ	TA328	GTS243	June. 24 2021	June. 23 2022
2	Barometer	ChangChun	DYM3	GTS255	June. 24 2021	June. 23 2022

7 Test results and Measurement Data

7.1 Antenna requirement:

Standard requirement:	FCC Part15 C Section 15.203
15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.	
E.U.T Antenna:	
<i>The antenna is Integrated antenna, the best case gain of the antenna is 1.8 dBi, reference to the appendix II for details.</i>	

7.2 Conducted Emissions

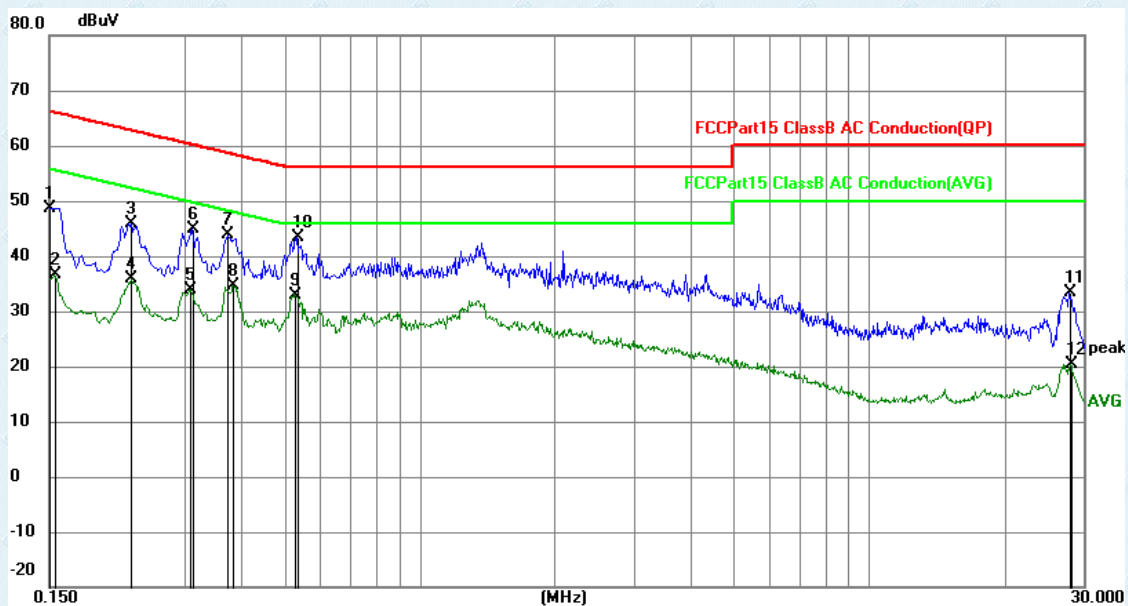
Test Requirement:	FCC Part15 C Section 15.207						
Test Method:	ANSI C63.10:2013						
Test Frequency Range:	150KHz to 30MHz						
Class / Severity:	Class B						
Receiver setup:	RBW=9KHz, VBW=30KHz						
Limit:	Frequency range (MHz)	Limit (dBuV)					
		Quasi-peak		Average			
	0.15-0.5	66 to 56*		56 to 46*			
	0.5-5	56		46			
	5-30	60		50			
* Decreases with the logarithm of the frequency.							
Test procedure	The E.U.T and simulators are connected to the main power through a line impedance stabilization network(L.I.S.N.). The provide a 50ohm/50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs). 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 setup:	Reference Plane LISN AUX Equipment E.U.T 40cm 80cm LISN Filter EMI Receiver AC power Test table/Insulation plane Remark E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m						
Test Instruments:	Refer to section 5.10 for details						
Test mode:	Refer to section 5.2 for details						
Test environment:	Temp.:	24.5 °C	Humid.:	54%	Press.:	1012mbar	
Test voltage:	AC 120V, 60Hz						
Test results:	Pass						

Measurement Data

An initial pre-scan was performed on the line and neutral lines with peak detector. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

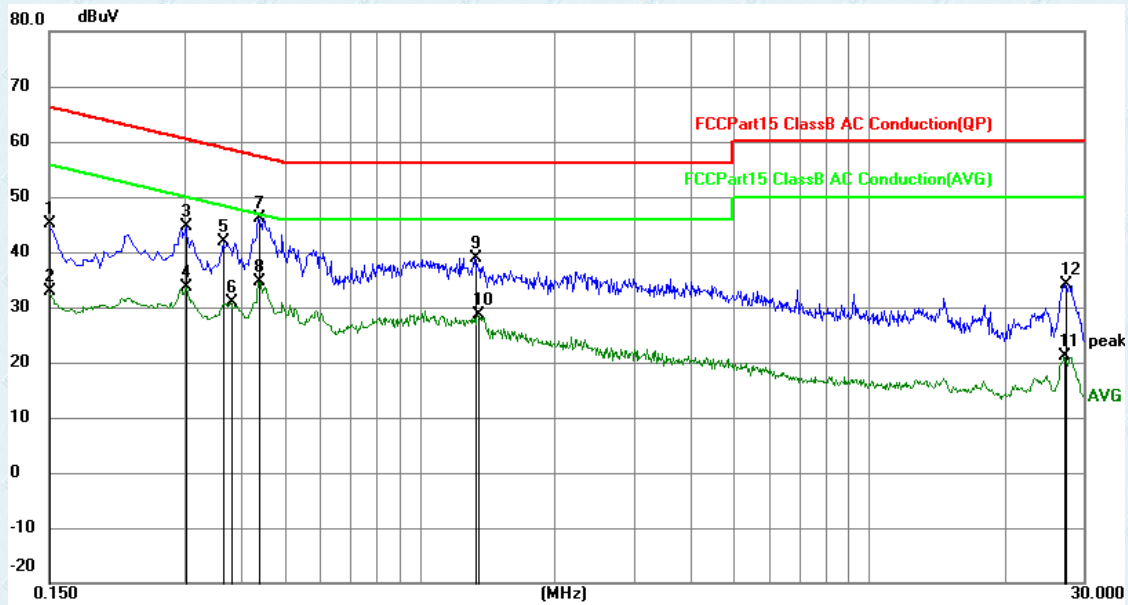
Remark: Both high and low voltages have been tested to show only the worst low voltage test data.

Line:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1500	36.22	12.49	48.71	66.00	-17.29	QP
2	0.1544	24.23	12.49	36.72	55.76	-19.04	AVG
3	0.2278	33.40	12.44	45.84	62.53	-16.69	QP
4	0.2278	23.53	12.44	35.97	52.53	-16.56	AVG
5	0.3074	21.54	12.39	33.93	50.04	-16.11	AVG
6	0.3119	32.38	12.39	44.77	59.92	-15.15	QP
7	0.3750	31.53	12.38	43.91	58.39	-14.48	QP
8	0.3840	22.26	12.38	34.64	48.19	-13.55	AVG
9	0.5279	20.64	12.36	33.00	46.00	-13.00	AVG
10	0.5322	31.04	12.36	43.40	56.00	-12.60	QP
11	27.9283	20.65	12.67	33.32	60.00	-26.68	QP
12	28.0365	7.64	12.67	20.31	50.00	-29.69	AVG

Neutral:

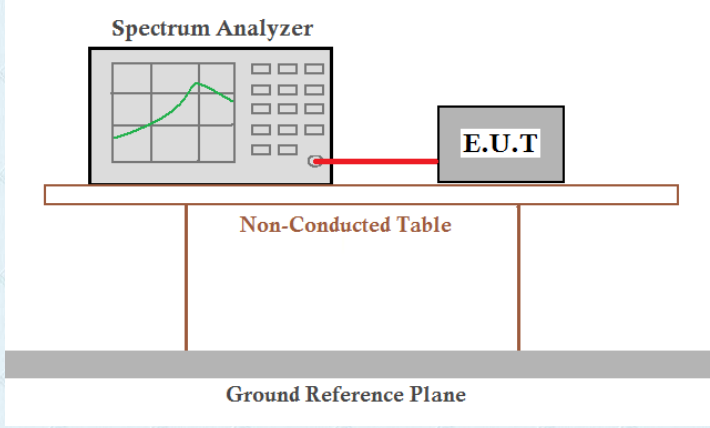


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1500	32.55	12.49	45.04	66.00	-20.96	QP
2	0.1500	20.31	12.49	32.80	56.00	-23.20	AVG
3	0.3029	32.25	12.39	44.64	60.16	-15.52	QP
4	0.3029	21.24	12.39	33.63	50.16	-16.53	AVG
5	0.3659	29.44	12.38	41.82	58.59	-16.77	QP
6	0.3795	18.45	12.38	30.83	48.29	-17.46	AVG
7	0.4380	33.76	12.37	46.13	57.10	-10.97	QP
8	0.4380	22.23	12.37	34.60	47.10	-12.50	AVG
9	1.3244	26.70	12.29	38.99	56.00	-17.01	QP
10	1.3467	16.31	12.29	28.60	46.00	-17.40	AVG
11	27.1448	8.57	12.66	21.23	50.00	-28.77	AVG
12	27.3521	21.49	12.66	34.15	60.00	-25.85	QP

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

7.3 Emission Bandwidth and 99% Occupied Bandwidth

Test Requirement:	FCC Part15 E Section 15.407
Test Method:	KDB 789033 D02 General U-NII Test Procedures New Rules v02r01
Limit:	N/A
Test setup:	 The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T (Equipment Under Test) via a red cable. Both the Spectrum Analyzer and the E.U.T are placed on a Non-Conducted Table. The table is supported by a Ground Reference Plane.
Test procedure:	According to KDB 789033 D02 General U-NII Test Procedures New Rules v02r01.
Test Instruments:	Refer to section 5.10 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

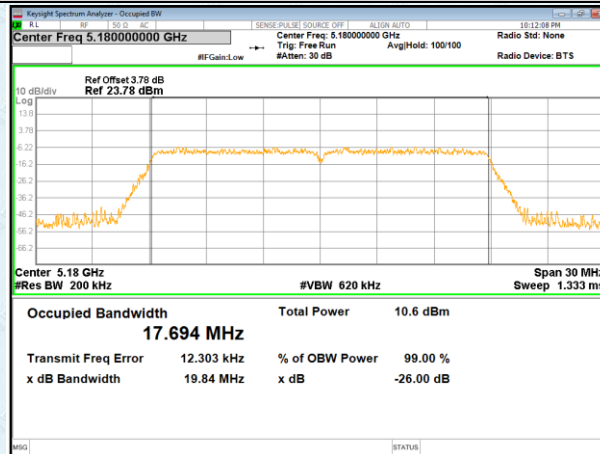
Measurement Data:

U-NII Band I							
CH. No.	Frequency (MHz)	99% Occupied Bandwidth (MHz)			26dB Occupied Bandwidth (MHz)		
		802.11a	802.11n(HT 20)	802.11ac(H T20)	802.11a	802.11n(HT 20)	802.11ac(H T20)
36	5180.00	16.616	17.694	17.701	19.56	19.84	19.91
40	5200.00	16.602	17.711	17.712	19.59	19.82	19.77
48	5240.00	16.629	17.725	17.689	19.56	19.89	19.89
CH. No.	Frequency (MHz)	99% Occupied Bandwidth (MHz)		26dB Occupied Bandwidth (MHz)			
		802.11n(HT40)	802.11ac(HT40)	802.11n(HT40)	802.11ac(HT40)		
38	5190.00	36.161	36.172	39.86	39.70		
46	5230.00	36.146	36.154	39.68	39.53		
CH. No.	Frequency (MHz)	99% Occupied Bandwidth (MHz)		26dB Occupied Bandwidth (MHz)			
		802.11ac(HT80)		802.11ac(HT80)			
42	5210.00	75.455		79.39			

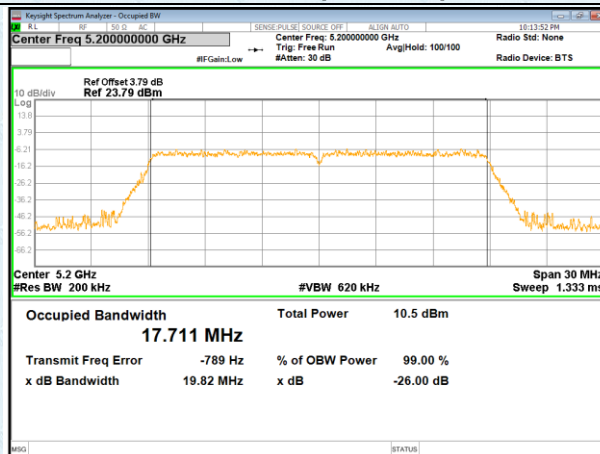
Test plots as followed:



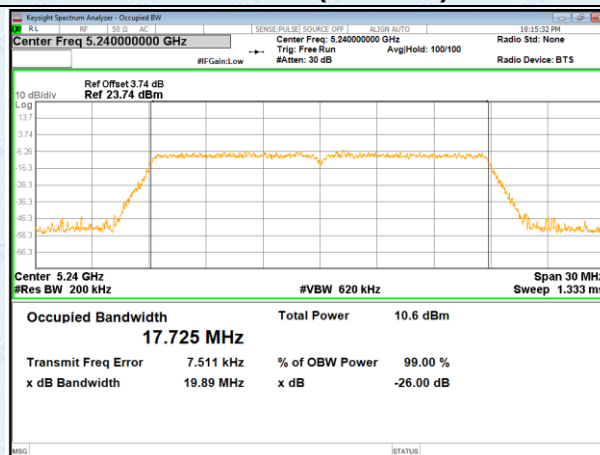
802.11n(HT20) mode



Channel 36 (5180MHz)

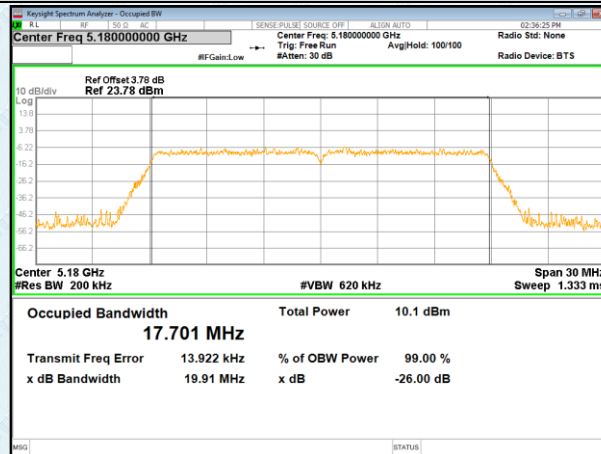


Channel 40 (5200MHz)

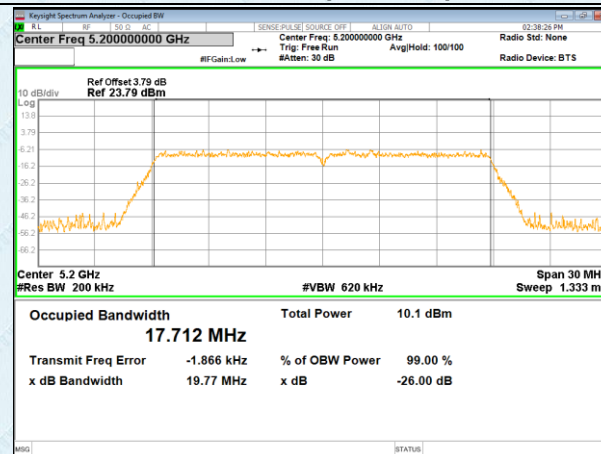


Channel 48 (5240MHz)

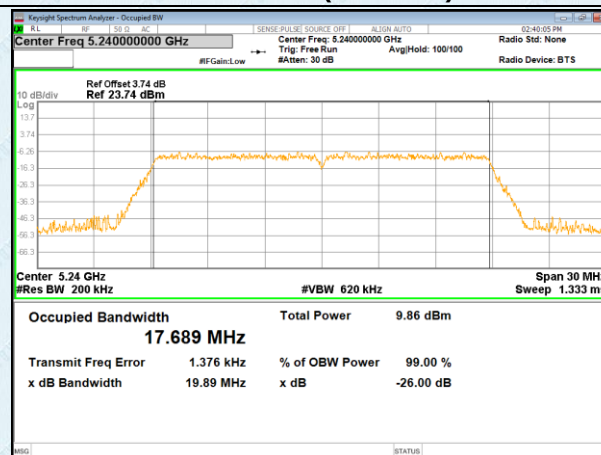
802.11ac(HT20) mode



Channel 36 (5180MHz)

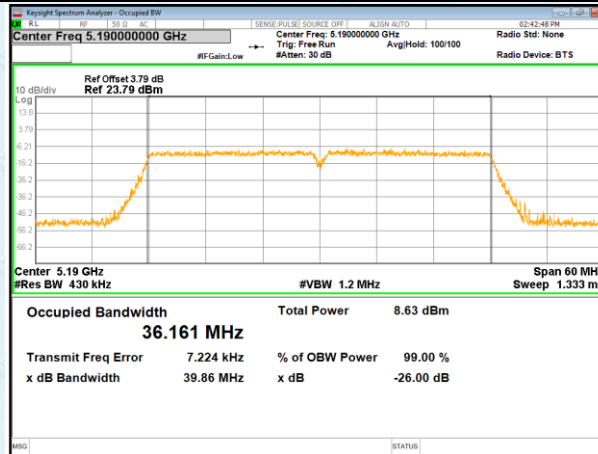


Channel 40 (5200MHz)

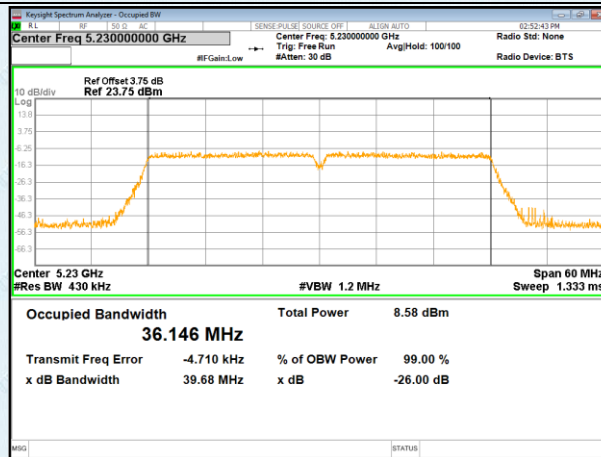


Channel 48 (5240MHz)

802.11n(HT40) mode

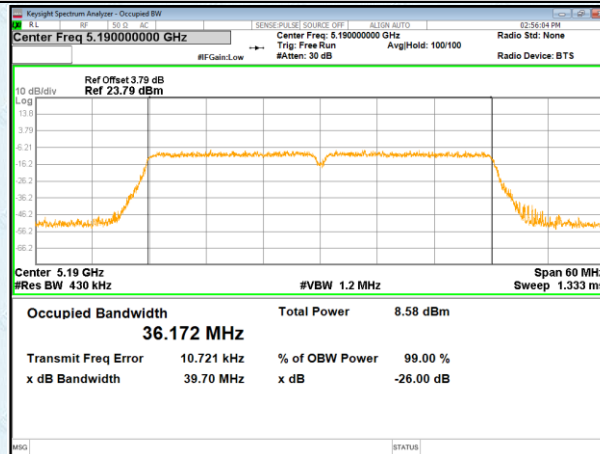


Channel 38 (5190MHz)

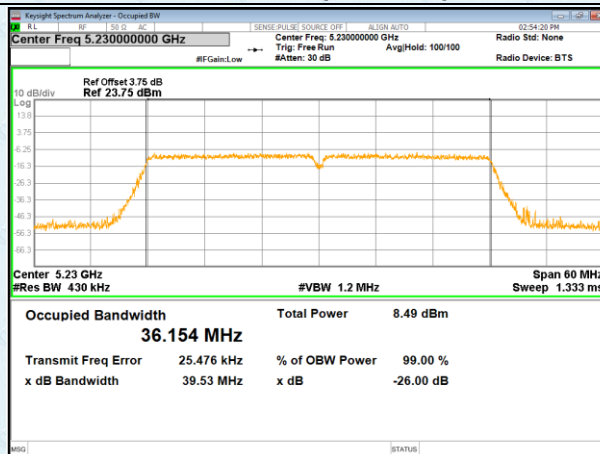


Channel 46 (5230MHz)

802.11ac(HT40) mode

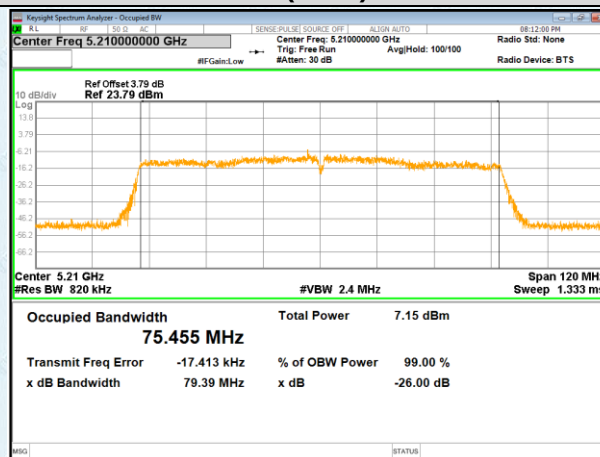


Channel 38 (5190MHz)



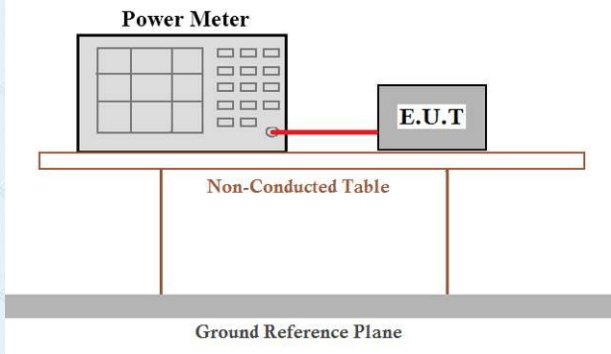
Channel 46 (5230MHz)

802.11ac(HT80) mode



Channel 42 (5210MHz)

7.4 Peak Transmit Power

Test Requirement:	FCC Part15 E Section 15.407	
Test Method:	KDB 789033 D02 General U-NII Test Procedures New Rules v02r01	
Limit:	Frequency band (MHz)	Limit
	5150-5250	$\leq 1\text{W}(30\text{dBm})$ for master device
		$\leq 250\text{mW}(23.98\text{dBm})$ for client device
	5250-5350	$\leq 250\text{mW}(23.98\text{dBm})$ for client device or $11\text{dBm}+10\log B^*$
	5470-5725	$\leq 250\text{mW}(23.98\text{dBm})$ for client device or $11\text{dBm}+10\log B^*$
Remark: *Where B is the 26dB emission bandwidth in MHz. The maximum conducted output power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage.		
Test setup:		
Test procedure:	Measurement using an RF average power meter (i) Measurements may be performed using a wideband RF power meter with a thermocouple detector or equivalent if all of the conditions listed below are satisfied a) The EUT is configured to transmit continuously or to transmit with a constant duty cycle. b) At all times when the EUT is transmitting, it must be transmitting at its maximum power control level. c) The integration period of the power meter exceeds the repetition period of the transmitted signal by at least a factor of five. (ii) If the transmitter does not transmit continuously, measure the duty cycle, x, of the transmitter output signal as described in section B). (iii) Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter. (iv) Adjust the measurement in dBm by adding $10\log(1/x)$ where x is the duty cycle (e.g., $10\log(1/0.25)$ if the duty cycle is 25 percent).	
Test Instruments:	Refer to section 5.10 for details	
Test mode:	Refer to section 5.2 for details	
Test results:	Pass	

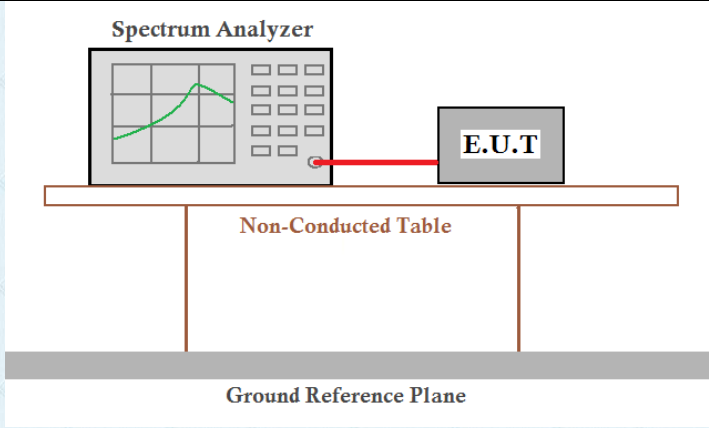
Measurement Data

U-NII Band I

802.11a mode						
CH No.	Frequency (MHz)	Measured Power (dBm)	Duty Factor	Output Power (dBm)	Limit (dBm)	Result
36	5180.00	6.81	0	6.81	23.98	Pass
40	5200.00	6.96	0	6.96	23.98	Pass
48	5240.00	6.68	0	6.68	23.98	Pass
802.11n(HT20) mode						
CH No.	Frequency (MHz)	Measured Power (dBm)	Duty Factor	Output Power (dBm)	Limit (dBm)	Result
36	5180.00	7.52	0	7.52	23.98	Pass
40	5200.00	7.58	0	7.58	23.98	Pass
48	5240.00	7.57	0	7.57	23.98	Pass
802.11ac(HT20) mode						
CH No.	Frequency (MHz)	Measured Power (dBm)	Duty Factor	Output Power (dBm)	Limit (dBm)	Result
36	5180.00	7.01	0	7.01	23.98	Pass
40	5200.00	7.02	0	7.02	23.98	Pass
48	5240.00	6.82	0	6.82	23.98	Pass
802.11n(HT40) mode						
CH No.	Frequency (MHz)	Measured Power (dBm)	Duty Factor	Output Power (dBm)	Limit (dBm)	Result
38	5190.00	6.52	0	6.52	23.98	Pass
46	5230.00	6.58	0	6.58	23.98	Pass
802.11 ac(HT40) mode						
CH No.	Frequency (MHz)	Measured Power (dBm)	Duty Factor	Output Power (dBm)	Limit (dBm)	Result
38	5190.00	6.51	0	6.51	23.98	Pass
46	5230.00	5.72	0	5.72	23.98	Pass
802.11 ac(HT80) mode						
CH No.	Frequency (MHz)	Measured Power (dBm)	Duty Factor	Output Power (dBm)	Limit (dBm)	Result
42	5210.00	4.63	0	4.63	23.98	Pass

Note: Output Power = Measured Power + Duty Factor
Duty Factor = 10 log (1/Duty Cycle)

7.5 Power Spectral Density

Test Requirement:	FCC Part15 E Section 15.407	
Test Method:	KDB 789033 D02 General U-NII Test Procedures New Rules v02r01	
Limit:	Frequency band (MHz)	Limit
	5150-5250	≤17dBm in 1MHz for master device
		≤11 Bm in 1MHz for client device
	5250-5350	≤11dBm in 1MHz for client device
	5470-5725	≤11dBm in 1MHz for client device
Remark: The maximum power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test.		
Test setup:	 The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) via a red cable. Both the Spectrum Analyzer and the E.U.T. are placed on a Non-Conducted Table. The table is supported by a Ground Reference Plane.	
Test procedure:	1) Create an average power spectrum for the EUT operating mode being tested by following the instructions in section E)2) for measuring maximum conducted output power using a spectrum analyzer or EMI receiver: select the appropriate test method (SA-1, SA-2, SA-3, or alternatives to each) and apply it up to, but not including, the step labeled, "Compute power...". 2) Use the peak search function on the instrument to find the peak of the spectrum. 3) Make the following adjustments to the peak value of the spectrum, if applicable: a) If Method SA-2 or SA-2 Alternative was used, add 10 log(1/x), where x is the duty cycle, to the peak of the spectrum. b) If Method SA-3 Alternative was used and the linear mode was used in step E)2)g)(viii), add 1 dB to the final result to compensate for the difference between linear averaging and power averaging. 4) The result is the PSD.	
Test Instruments:	Refer to section 5.10 for details	
Test mode:	Refer to section 5.2 for details	
Test results:	Pass	

Measurement Data

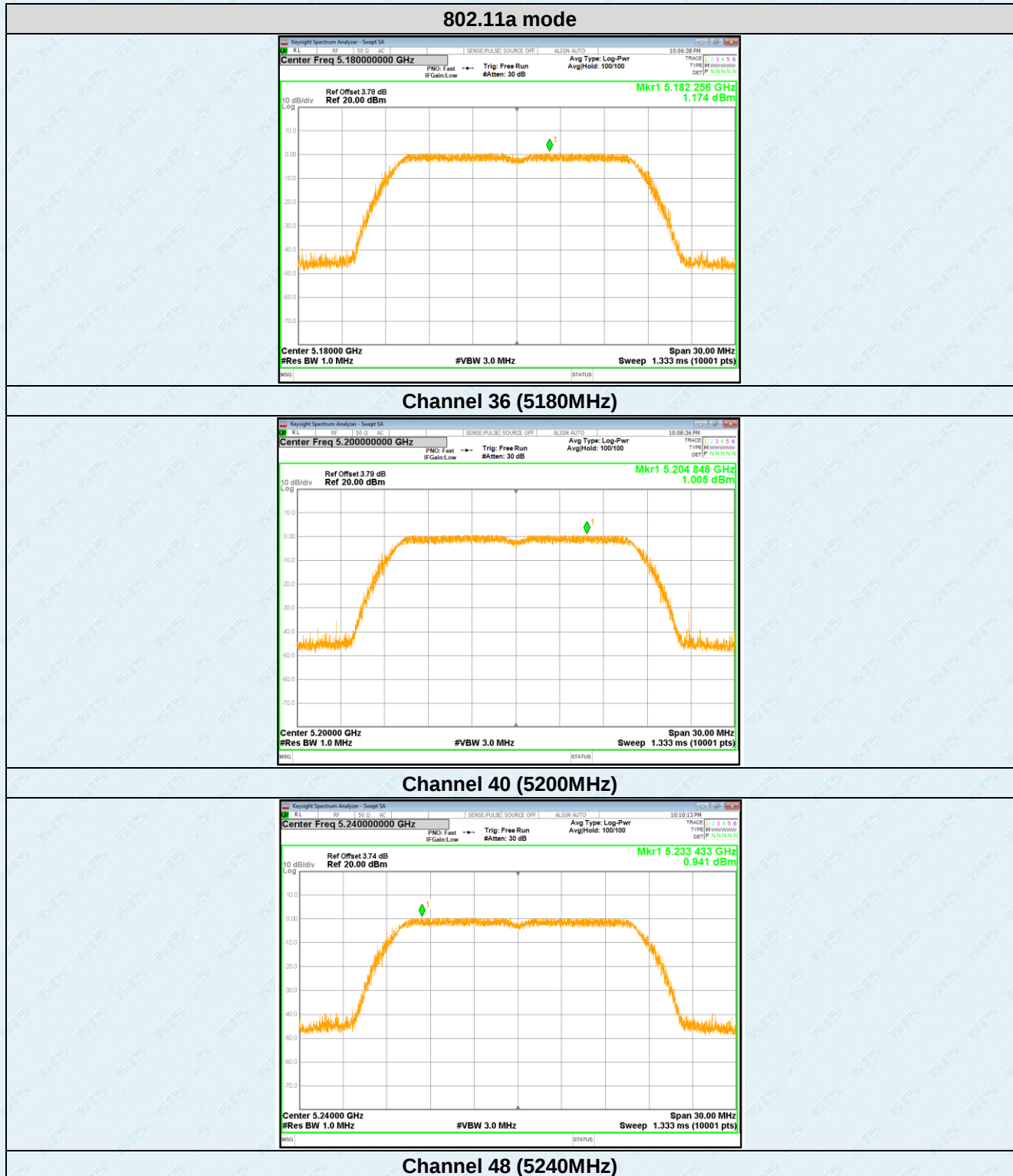
U-NII Band I

802.11a mode						
Channel No.	Frequency (MHz)	Measured PSD (dBm/MHz)	Duty Factor	Total PSD (dBm/MHz)	Limit (dBm/MHz)	Result
36	5180.00	1.174	0	1.174	11.00	Pass
40	5200.00	1.005	0	1.005	11.00	Pass
48	5240.00	0.941	0	0.941	11.00	Pass
802.11n(HT20) mode						
Channel No.	Frequency (MHz)	Measured PSD (dBm/MHz)	Duty Factor	Total PSD (dBm/MHz)	Limit (dBm/MHz)	Result
36	5180.00	1.615	0	1.615	11.00	Pass
40	5200.00	1.744	0	1.744	11.00	Pass
48	5240.00	1.089	0	1.089	11.00	Pass
802.11ac(HT20) mode						
Channel No.	Frequency (MHz)	Measured PSD (dBm/MHz)	Duty Factor	Total PSD (dBm/MHz)	Limit (dBm/MHz)	Result
36	5180.00	1.213	0	1.213	11.00	Pass
40	5200.00	2.028	0	2.028	11.00	Pass
48	5240.00	0.756	0	0.756	11.00	Pass
802.11n(HT40) mode						
Channel No.	Frequency (MHz)	Measured PSD (dBm/MHz)	Duty Factor	Total PSD (dBm/MHz)	Limit (dBm/MHz)	Result
38	5190.00	-3.488	0	-3.488	11.00	Pass
46	5230.00	-3.528	0	-3.528	11.00	Pass
802.11ac(HT40) mode						
Channel No.	Frequency (MHz)	Measured PSD (dBm/MHz)	Duty Factor	Total PSD (dBm/MHz)	Limit (dBm/MHz)	Result
38	5190.00	-3.648	0	-3.648	11.00	Pass
46	5230.00	-3.571	0	-3.571	11.00	Pass
802.11ac(HT80) mode						
Channel No.	Frequency (MHz)	Measured PSD (dBm/MHz)	Duty Factor	Total PSD (dBm/MHz)	Limit (dBm/MHz)	Result
42	5210.00	-6.481	0	-6.481	11.00	Pass

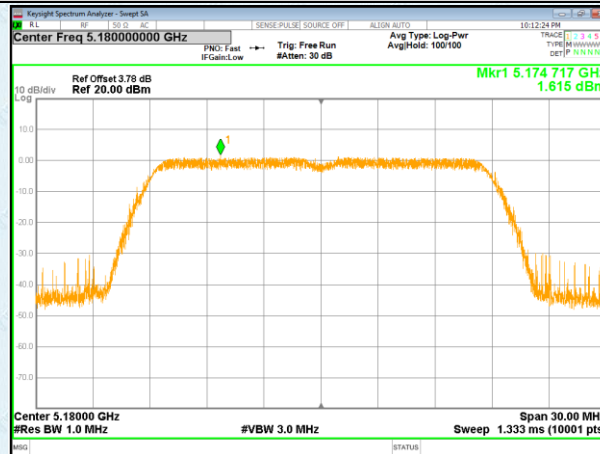
Note: Total PSD = Measured PSD + Duty Factor

Duty Factor = 10 log (1/Duty Cycle)

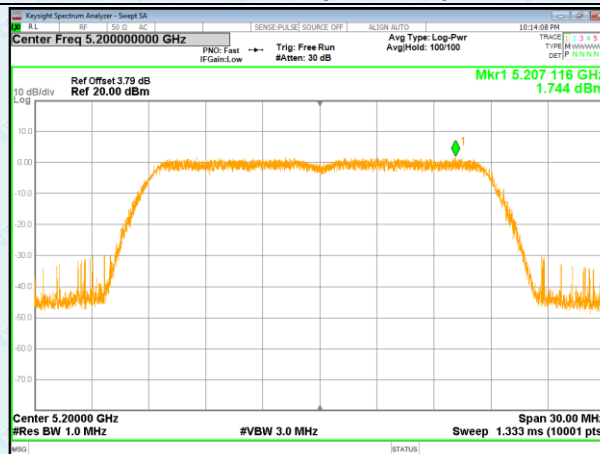
Test plots as followed:



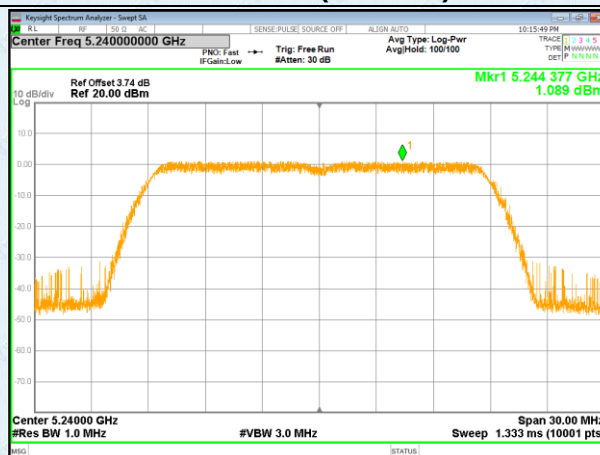
802.11n(HT20) mode



Channel 36 (5180MHz)

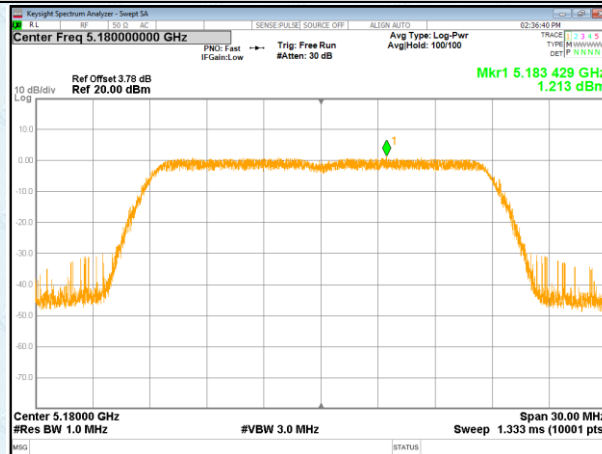


Channel 40 (5200MHz)

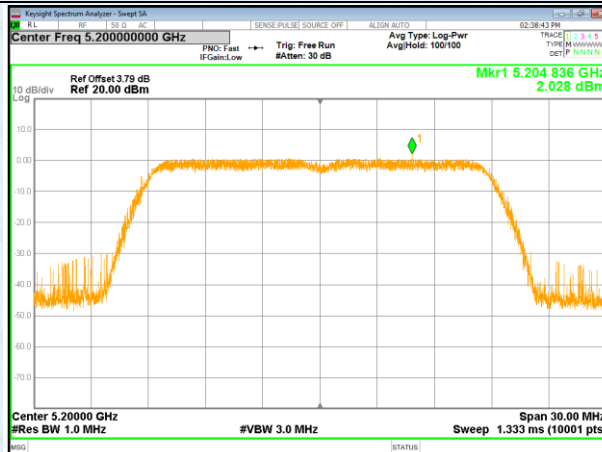


Channel 48 (5240MHz)

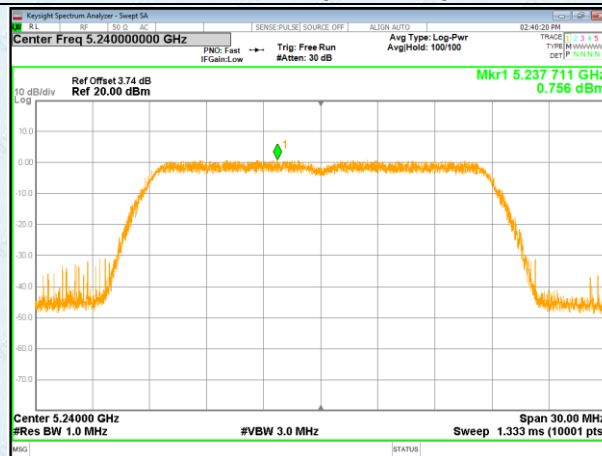
802.11ac(HT20) mode



Channel 36 (5180MHz)

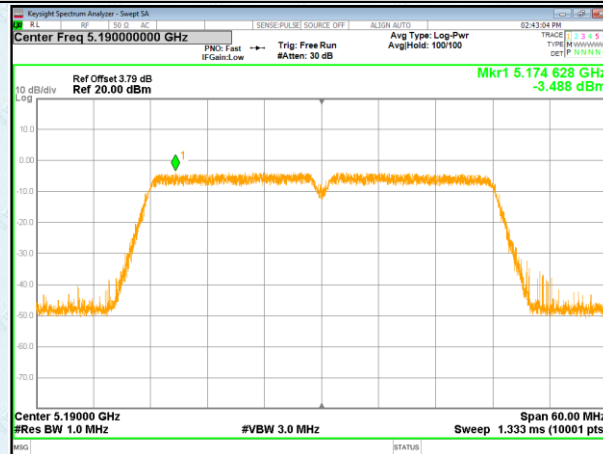


Channel 40 (5200MHz)

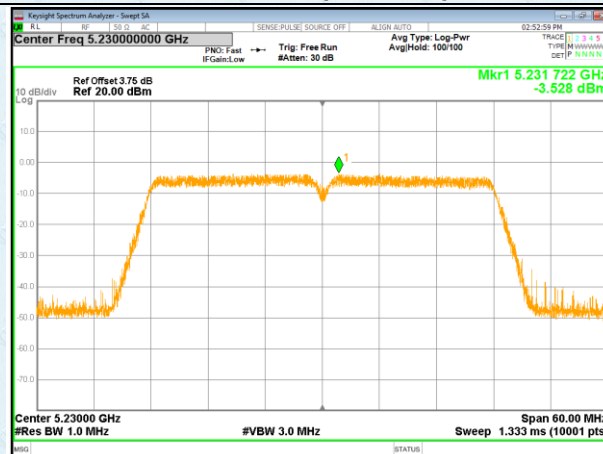


Channel 48 (5240MHz)

802.11n(HT40) mode

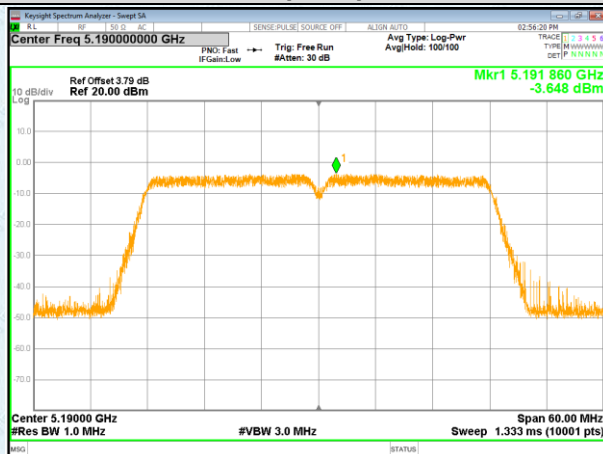


Channel 38 (5190MHz)

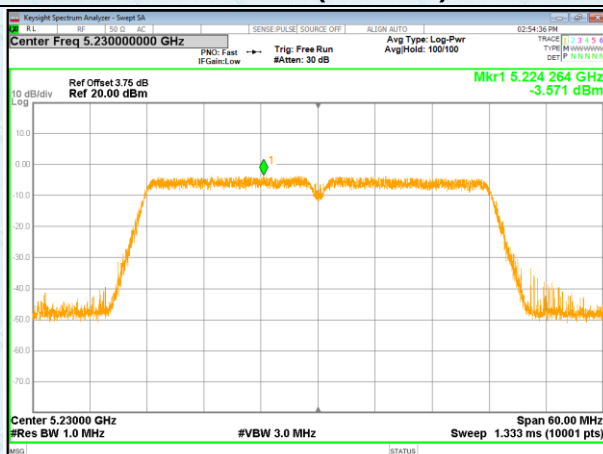


Channel 46 (5230MHz)

802.11ac(HT40) mode

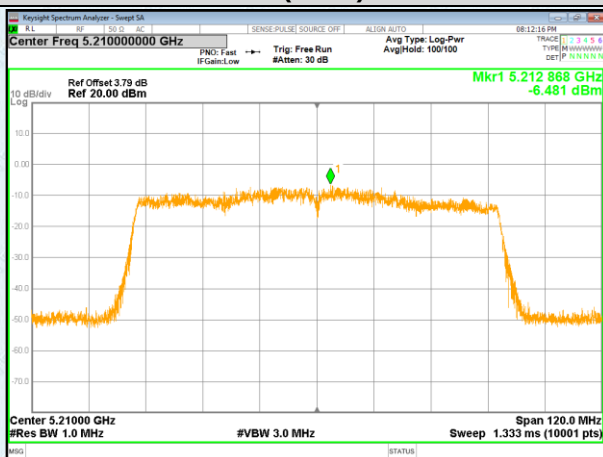


Channel 38 (5190MHz)



Channel 46 (5230MHz)

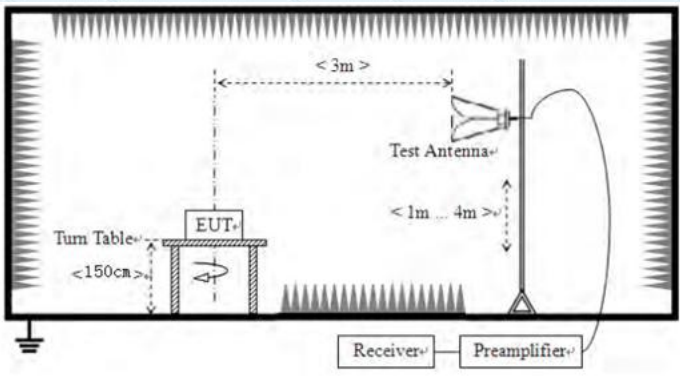
802.11ac(HT80) mode



Channel 42 (5210MHz)

7.6 Band Edge

Test Requirement:	FCC Part15 E Section 15.407 and 5.205																								
Test Method:	ANSI C63.10:2013																								
Test site:	Measurement Distance: 3m (Semi-Anechoic Chamber)																								
Receiver setup:	<table><tr><td>Frequency</td><td>Detector</td><td>RBW</td><td>VBW</td><td>Remark</td></tr><tr><td>30MHz-1GHz</td><td>Quasi-peak</td><td>100KHz</td><td>300KHz</td><td>Quasi-peak Value</td></tr><tr><td rowspan="2">Above 1GHz</td><td>Peak</td><td>1MHz</td><td>3MHz</td><td>Peak Value</td></tr><tr><td>AV</td><td>1MHz</td><td>3MHz</td><td>Average Value</td></tr></table>					Frequency	Detector	RBW	VBW	Remark	30MHz-1GHz	Quasi-peak	100KHz	300KHz	Quasi-peak Value	Above 1GHz	Peak	1MHz	3MHz	Peak Value	AV	1MHz	3MHz	Average Value	
Frequency	Detector	RBW	VBW	Remark																					
30MHz-1GHz	Quasi-peak	100KHz	300KHz	Quasi-peak Value																					
Above 1GHz	Peak	1MHz	3MHz	Peak Value																					
	AV	1MHz	3MHz	Average Value																					
Limit:	<table><tr><td>Frequency</td><td>Limit (dBuV/m @3m)</td><td>Remark</td></tr><tr><td>30MHz-88MHz</td><td>40.0</td><td>Quasi-peak Value</td></tr><tr><td>88MHz-216MHz</td><td>43.5</td><td>Quasi-peak Value</td></tr><tr><td>216MHz-960MHz</td><td>46.0</td><td>Quasi-peak Value</td></tr><tr><td>960MHz-1GHz</td><td>54.0</td><td>Quasi-peak Value</td></tr><tr><td rowspan="2">Above 1GHz</td><td>54.0</td><td>Average Value</td></tr><tr><td>68.2</td><td>Peak Value</td></tr></table> Undesirable emission limits: (1) For transmitters operating in the 5.15-5.25 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz. (2) For transmitters operating in the 5.25-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz. Devices operating in the 5.25-5.35 GHz band that generate emissions in the 5.15-5.25 GHz band must meet all applicable technical requirements for operation in the 5.15-5.25 GHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27 dBm/MHz in the 5.15-5.25 GHz band. (3) For transmitters operating in the 5.47-5.725 GHz band: all emissions outside of the 5.47-5.725 GHz band shall not exceed an EIRP of -27 dBm/MHz.					Frequency	Limit (dBuV/m @3m)	Remark	30MHz-88MHz	40.0	Quasi-peak Value	88MHz-216MHz	43.5	Quasi-peak Value	216MHz-960MHz	46.0	Quasi-peak Value	960MHz-1GHz	54.0	Quasi-peak Value	Above 1GHz	54.0	Average Value	68.2	Peak Value
Frequency	Limit (dBuV/m @3m)	Remark																							
30MHz-88MHz	40.0	Quasi-peak Value																							
88MHz-216MHz	43.5	Quasi-peak Value																							
216MHz-960MHz	46.0	Quasi-peak Value																							
960MHz-1GHz	54.0	Quasi-peak Value																							
Above 1GHz	54.0	Average Value																							
	68.2	Peak Value																							
Test Procedure:	a. The EUT was placed on the top of a rotating table 1.5 m above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation. b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. c. 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. d. 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 rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. f. 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.
Test setup:	Above 1GHz 
Test Instruments:	Refer to section 5.10 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Remark:

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. Two antennas are tested, only the worst case's data was showed.
4. The pre-test were performed on lowest, middle and highest frequencies, only the worst case's (lowest and highest frequencies) data was showed.
5. According to KDB 789033 D02v02r01 section G) 1) d), for measurements above 1000 MHz @3m distance, the limit of field strength is computed as follows:

$$E[\text{dBuV/m}] = \text{EIRP}[\text{dBm}] + 95.2;$$
For example, if $\text{EIRP} = -27\text{dBm}$

$$E[\text{dBuV/m}] = -27 + 95.2 = 68.2\text{dBuV/m}.$$

Measurement Data:

Band I

<i>IEEE 802.11a</i>								
Peak value:								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	53.49	32.07	8.99	37.49	57.06	74.00	-16.94	Horizontal
5350.00	49.62	31.75	9.29	37.20	53.46	74.00	-20.54	Horizontal
5150.00	51.44	32.07	8.99	37.49	55.01	74.00	-18.99	Vertical
5350.00	50.68	31.75	9.29	37.20	54.52	74.00	-19.48	Vertical

<i>IEEE 802.11a</i>								
Average value:								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	42.37	32.07	8.99	37.49	45.94	54.00	-8.06	Horizontal
5350.00	36.69	31.75	9.29	37.20	40.53	54.00	-13.47	Horizontal
5150.00	39.62	32.07	8.99	37.49	43.19	54.00	-10.81	Vertical
5350.00	35.18	31.75	9.29	37.20	39.02	54.00	-14.98	Vertical

IEEE 802.11n HT20								
Peak value:								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	54.48	32.07	8.99	37.49	58.05	74.00	-15.95	Horizontal
5350.00	47.68	31.75	9.29	37.20	51.52	74.00	-22.48	Horizontal
5150.00	52.69	32.07	8.99	37.49	56.26	74.00	-17.74	Vertical
5350.00	49.43	31.75	9.29	37.20	53.27	74.00	-20.73	Vertical

IEEE 802.11n HT20								
Average value:								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	38.53	32.07	8.99	37.49	42.10	54.00	-11.90	Horizontal
5350.00	37.42	31.75	9.29	37.20	41.26	54.00	-12.74	Horizontal
5150.00	39.19	32.07	8.99	37.49	42.76	54.00	-11.24	Vertical
5350.00	36.83	31.75	9.29	37.20	40.67	54.00	-13.33	Vertical

IEEE 802.11ac HT20								
Peak value:								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	55.23	32.07	8.99	37.49	58.80	74.00	-15.20	Horizontal
5350.00	53.48	31.75	9.29	37.20	57.32	74.00	-16.68	Horizontal
5150.00	56.52	32.07	8.99	37.49	60.09	74.00	-13.91	Vertical
5350.00	52.09	31.75	9.29	37.20	55.93	74.00	-18.07	Vertical

IEEE 802.11ac HT20								
Average value:								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	38.67	32.07	8.99	37.49	42.24	54.00	-11.76	Horizontal
5350.00	37.54	31.75	9.29	37.2	41.38	54.00	-12.62	Horizontal
5150.00	39.14	32.07	8.99	37.49	42.71	54.00	-11.29	Vertical
5350.00	37.73	31.75	9.29	37.2	41.57	54.00	-12.43	Vertical

<i>IEEE 802.11n HT40</i>								
Peak value:								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	55.25	32.07	8.99	37.49	58.82	74.00	-15.18	Horizontal
5350.00	51.48	31.75	9.29	37.2	55.32	74.00	-18.68	Horizontal
5150.00	49.26	32.07	8.99	37.49	52.83	74.00	-21.17	Vertical
5350.00	52.32	31.75	9.29	37.2	56.16	74.00	-17.84	Vertical

<i>IEEE 802.11n HT40</i>								
Average value:								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	36.43	32.07	8.99	37.49	40.00	54.00	-14.00	Horizontal
5350.00	37.82	31.75	9.29	37.20	41.66	54.00	-12.34	Horizontal
5150.00	36.66	32.07	8.99	37.49	40.23	54.00	-13.77	Vertical
5350.00	39.72	31.75	9.29	37.20	43.56	54.00	-10.44	Vertical

<i>IEEE 802.11ac HT40</i>								
Peak value:								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	49.76	32.07	8.99	37.49	53.33	74.00	-20.67	Horizontal
5350.00	52.39	31.75	9.29	37.20	56.23	74.00	-17.77	Horizontal
5150.00	48.32	32.07	8.99	37.49	51.89	74.00	-22.11	Vertical
5350.00	47.47	31.75	9.29	37.20	51.31	74.00	-22.69	Vertical

<i>IEEE 802.11ac HT40</i>								
Average value:								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	39.85	32.07	8.99	37.49	43.42	54.00	-10.58	Horizontal
5350.00	37.53	31.75	9.29	37.20	41.37	54.00	-12.63	Horizontal
5150.00	40.82	32.07	8.99	37.49	44.39	54.00	-9.61	Vertical
5350.00	38.84	31.75	9.29	37.20	42.68	54.00	-11.32	Vertical

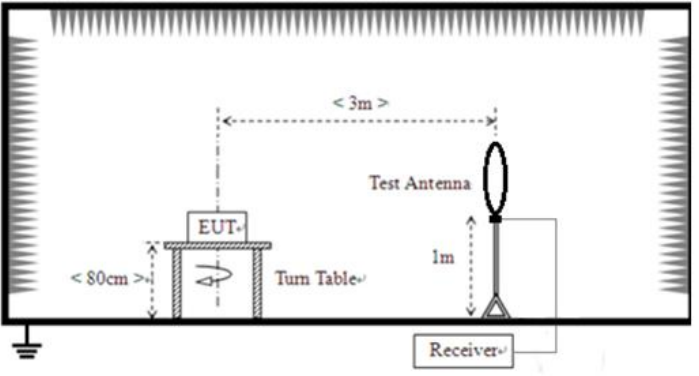
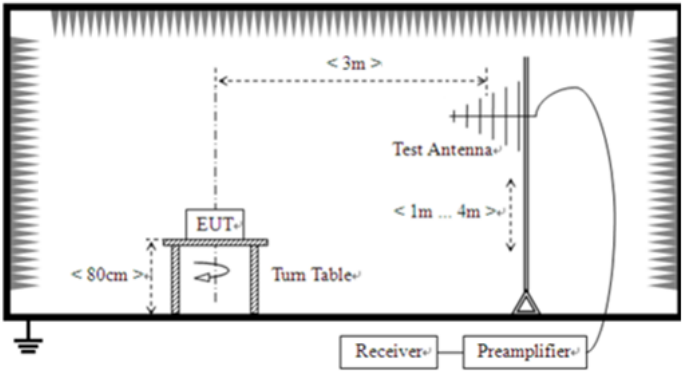
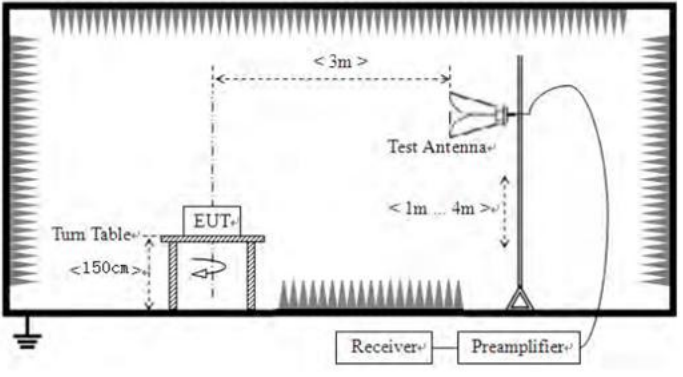
IEEE 802.11ac HT80								
Peak value:								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	45.54	32.07	8.99	37.49	49.11	74.00	-24.89	Horizontal
5350.00	44.83	31.75	9.29	37.20	48.67	74.00	-25.33	Horizontal
5150.00	44.15	32.07	8.99	37.49	47.72	74.00	-26.28	Vertical
5350.00	43.65	31.75	9.29	37.20	47.49	74.00	-26.51	Vertical

IEEE 802.11ac HT80								
Average value:								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	34.14	32.07	8.99	37.49	37.71	54.00	-16.29	Horizontal
5350.00	35.37	31.75	9.29	37.20	39.21	54.00	-14.79	Horizontal
5150.00	34.62	32.07	8.99	37.49	38.19	54.00	-15.81	Vertical
5350.00	36.14	31.75	9.29	37.20	39.98	54.00	-14.02	Vertical

7.7 Radiated Emission

Test Requirement:	FCC Part15 C Section 15.209 and 15.205				
Test Method:	ANSI C63.10:2013				
Test Frequency Range:	9kHz to 40GHz				
Test site:	Measurement Distance: 3m (Semi-Anechoic Chamber)				
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	100KHz	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	
	Above 1GHz	500	Average		
		5000	Peak		
Test Procedure:	Substitution method was performed to determine the actual ERP emission levels of the EUT. The following test procedure as below: 1>.Below 1GHz test procedure: - 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. - The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. - 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. - 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 rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. - The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. - 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. 2>.Above 1GHz test procedure: 1. On the test site as test setup graph above,the EUT shall be placed at the 0.8m support on the turntable and in the position closest to normal use as declared by the provider. 2. The test antenna shall be oriented initially for vertical polarization and shall be chosen to correspond to the frequency of the transmitter.The output of the test antenna shall be connected to the measuring receiver. 3. The transmitter shall be switched on, if possible, without modulation and the measuring receiver shall be tuned to the frequency of the transmitter under test. 4. The test antenna shall be raised and lowered from 1m to 4m until a maximum signal level is detected by the measuring receiver. Then the turntable should be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver. 5. Repeat step 4 for test frequency with the test antenna polarized horizontally. 6. Remove the transmitter and replace it with a substitution antenna 7. Feed the substitution antenna at the transmitter end with a signal generator connected to the antenna by means of a nonradiating cable. With the antennas at both ends vertically polarized, and with the signal generator tuned to a particular test frequency, raise and lower the test antenna to obtain a maximum reading at the spectrum analyzer. Adjust the level of the signal generator output until the previously recorded maximum reading for this set of conditions is obtained. This should be done carefully repeating the adjustment of the test antenna and generator output. 8. Repeat step 7 with both antennas horizontally polarized for each test frequency. 9. Calculate power in dBm into a reference ideal half-wave dipole antenna by reducing the readings obtained in steps 7 and 8 by the power loss in the cable between the generator and the antenna, and further corrected for the gain of the substitution antenna used relative to an ideal half-wave dipole antenna by the following formula: $\text{EIRP(dBm)} = \text{Pg(dBm)} - \text{cable loss (dB)} + \text{antenna gain (dBi)}$ where: Pg is the generator output power into the substitution antenna.
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Test setup:	Below 30MHz  Below 1GHz  Above 1GHz 
Test Instruments:	Refer to section 5.10 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Remark:

Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis which it is worse case.

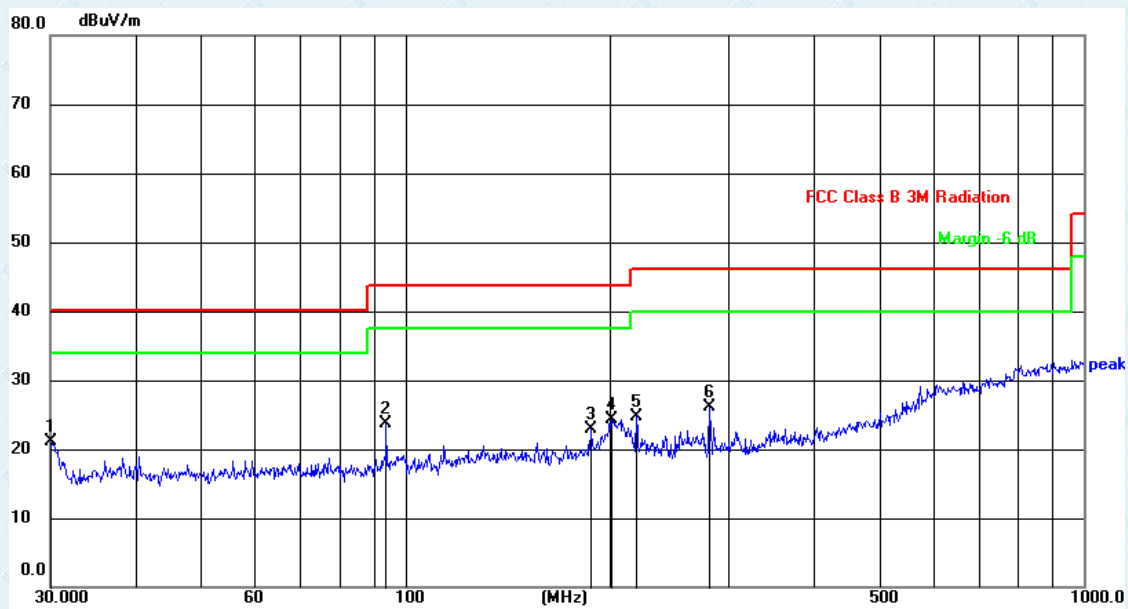
Measurement Data:

9 kHz ~ 30 MHz

The low frequency, which started from 9 kHz to 30 MHz, was pre-scanned and the result which was 20 dB lower than the limit line per 15.31(o) was not reported.

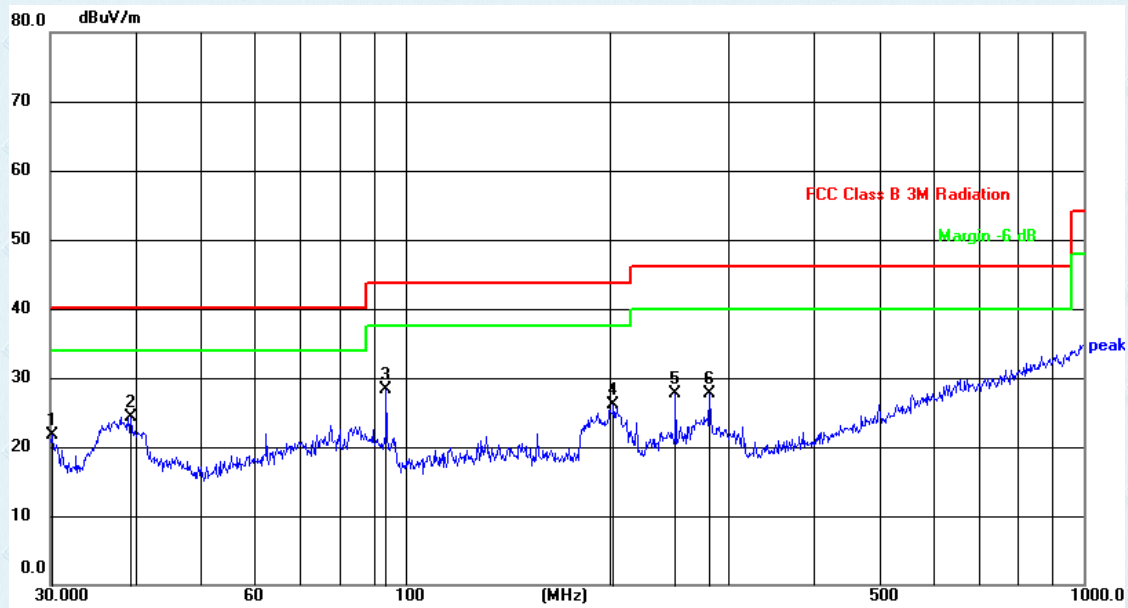
Below 1GHz

Horizontal:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	30.0000	42.70	-21.52	21.18	40.00	-18.82	QP
2	93.7682	43.92	-20.17	23.75	43.50	-19.75	QP
3	187.7529	40.84	-17.98	22.86	43.50	-20.64	QP
4	201.3930	42.93	-18.55	24.38	43.50	-19.12	QP
5	219.0751	43.26	-18.46	24.80	46.00	-21.20	QP
6	281.0074	44.56	-18.44	26.12	46.00	-19.88	QP

Vertical:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	30.2109	43.30	-21.51	21.79	40.00	-18.21	QP
2	39.4371	45.04	-20.67	24.37	40.00	-15.63	QP
3	93.7682	48.25	-20.03	28.22	43.50	-15.28	QP
4	202.8103	45.01	-18.81	26.20	43.50	-17.30	QP
5	250.3009	45.91	-18.20	27.71	46.00	-18.29	QP
6	281.0074	45.57	-17.91	27.66	46.00	-18.34	QP

Above 1GHz:

802.11a 5180MHz

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10360.00	36.14	39.67	14.62	32.65	57.78	68.20	-10.42	Vertical
15540.00	35.48	38.60	17.66	34.46	57.28	74.00	-16.72	Vertical
10360.00	38.72	39.67	14.62	32.65	60.36	68.20	-7.84	Horizontal
15540.00	34.81	38.60	17.66	34.46	56.61	74.00	-17.39	Horizontal

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10360.00	22.47	39.67	14.62	32.65	44.11	54.00	-9.89	Vertical
15540.00	21.09	38.60	17.66	34.46	42.89	54.00	-11.11	Vertical
10360.00	23.14	39.67	14.62	32.65	44.78	54.00	-9.22	Horizontal
15540.00	20.43	38.60	17.66	34.46	42.23	54.00	-11.77	Horizontal

802.11a 5200MHz

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10400.00	32.66	39.75	14.63	32.71	54.33	68.20	-13.87	Vertical
15600.00	30.09	38.33	17.67	34.17	51.92	74.00	-22.08	Vertical
10400.00	33.15	39.75	14.63	32.71	54.82	68.20	-13.38	Horizontal
15600.00	31.48	38.33	17.67	34.17	53.31	74.00	-20.69	Horizontal

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10400.00	22.65	39.75	14.63	32.71	44.32	54.00	-9.68	Vertical
15600.00	23.46	38.33	17.67	34.17	45.29	54.00	-8.71	Vertical
10400.00	21.03	39.75	14.63	32.71	42.70	54.00	-11.30	Horizontal
15600.00	23.14	38.33	17.67	34.17	44.97	54.00	-9.03	Horizontal

802.11a 5240MHz

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10480.00	33.72	39.82	14.68	32.86	55.36	68.20	-12.84	Vertical
15720.00	35.45	38.09	17.73	33.66	57.61	74.00	-16.39	Vertical
10480.00	35.41	39.82	14.68	32.86	57.05	68.20	-11.15	Horizontal
15720.00	34.25	38.09	17.73	33.66	56.41	74.00	-17.59	Horizontal

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10480.00	21.45	39.82	14.68	32.86	43.09	54.00	-10.91	Vertical
15720.00	22.67	38.09	17.73	33.66	44.83	54.00	-9.17	Vertical
10480.00	20.82	39.82	14.68	32.86	42.46	54.00	-11.54	Horizontal
15720.00	19.87	38.09	17.73	33.66	42.03	54.00	-11.97	Horizontal

802.11n(HT20) 5180MHz

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10360.00	33.54	39.67	14.62	32.65	55.18	68.20	-13.02	Vertical
15540.00	32.37	38.60	17.66	34.46	54.17	74.00	-19.83	Vertical
10360.00	30.94	39.67	14.62	32.65	52.58	68.20	-15.62	Horizontal
15540.00	29.17	38.60	17.66	34.46	50.97	74.00	-23.03	Horizontal

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10360.00	20.24	39.67	14.62	32.65	41.88	54.00	-12.12	Vertical
15540.00	21.69	38.60	17.66	34.46	43.49	54.00	-10.51	Vertical
10360.00	21.38	39.67	14.62	32.65	43.02	54.00	-10.98	Horizontal
15540.00	19.39	38.60	17.66	34.46	41.19	54.00	-12.81	Horizontal

802.11n(HT20) 5200MHz

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10400.00	33.46	39.75	14.63	32.71	55.13	68.20	-13.07	Vertical
15600.00	32.47	38.33	17.67	34.17	54.30	74.00	-19.70	Vertical
10400.00	31.09	39.75	14.63	32.71	52.76	68.20	-15.44	Horizontal
15600.00	30.44	38.33	17.67	34.17	52.27	74.00	-21.73	Horizontal

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10400.00	23.15	39.75	14.63	32.71	44.82	54.00	-9.18	Vertical
15600.00	20.47	38.33	17.67	34.17	42.30	54.00	-11.70	Vertical
10400.00	24.69	39.75	14.63	32.71	46.36	54.00	-7.64	Horizontal
15600.00	20.84	38.33	17.67	34.17	42.67	54.00	-11.33	Horizontal

802.11n(HT20) 5240MHz

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10480.00	34.63	39.82	14.68	32.86	56.27	68.20	-11.93	Vertical
15720.00	33.58	38.09	17.73	33.66	55.74	74.00	-18.26	Vertical
10480.00	31.09	39.82	14.68	32.86	52.73	68.20	-15.47	Horizontal
15720.00	32.47	38.09	17.73	33.66	54.63	74.00	-19.37	Horizontal

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10480.00	22.81	39.82	14.68	32.86	44.45	54.00	-9.55	Vertical
15720.00	20.49	38.09	17.73	33.66	42.65	54.00	-11.35	Vertical
10480.00	23.18	39.82	14.68	32.86	44.82	54.00	-9.18	Horizontal
15720.00	22.82	38.09	17.73	33.66	44.98	54.00	-9.02	Horizontal

802.11ac(HT20) 5180MHz

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10360.00	36.92	39.67	14.62	32.65	58.56	68.20	-9.64	Vertical
15540.00	35.47	38.60	17.66	34.46	57.27	74.00	-16.73	Vertical
10360.00	36.14	39.67	14.62	32.65	57.78	68.20	-10.42	Horizontal
15540.00	33.49	38.60	17.66	34.46	55.29	74.00	-18.71	Horizontal

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10360.00	24.39	39.67	14.62	32.65	46.03	54.00	-7.97	Vertical
15540.00	25.44	38.60	17.66	34.46	47.24	54.00	-6.76	Vertical
10360.00	24.61	39.67	14.62	32.65	46.25	54.00	-7.75	Horizontal
15540.00	21.32	38.60	17.66	34.46	43.12	54.00	-10.88	Horizontal

802.11ac(HT20) 5200MHz

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10400.00	35.17	39.75	14.63	32.71	56.84	68.20	-11.36	Vertical
15600.00	35.03	38.33	17.67	34.17	56.86	74.00	-17.14	Vertical
15600.00	34.63	38.33	17.67	34.17	56.46	68.20	-11.74	Horizontal
10400.00	32.68	39.75	14.63	32.71	54.35	74.00	-19.65	Horizontal

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10400.00	24.30	39.75	14.63	32.71	45.97	54.00	-8.03	Vertical
15600.00	23.92	38.33	17.67	34.17	45.75	54.00	-8.25	Vertical
10400.00	25.58	39.75	14.63	32.71	47.25	54.00	-6.75	Horizontal
15600.00	21.49	38.33	17.67	34.17	43.32	54.00	-10.68	Horizontal

802.11ac(HT20) 5240MHz

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10480.00	36.22	39.82	14.68	32.86	57.86	68.20	-10.34	Vertical
15720.00	37.16	38.09	17.73	33.66	59.32	74.00	-14.68	Vertical
10480.00	35.79	39.82	14.68	32.86	57.43	68.20	-10.77	Horizontal
15720.00	33.17	38.09	17.73	33.66	55.33	74.00	-18.67	Horizontal

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10480.00	23.18	39.82	14.68	32.86	44.82	54.00	-9.18	Vertical
15720.00	23.07	38.09	17.73	33.66	45.23	54.00	-8.77	Vertical
10480.00	24.21	39.82	14.68	32.86	45.85	54.00	-8.15	Horizontal
15720.00	22.37	38.09	17.73	33.66	44.53	54.00	-9.47	Horizontal

802.11n(HT40) 5190MHz

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10380.00	30.67	39.71	14.63	32.68	52.33	68.20	-15.87	Vertical
15570.00	33.19	38.46	17.67	34.32	55.00	74.00	-19.00	Vertical
10380.00	30.65	39.71	14.63	32.68	52.31	68.20	-15.89	Horizontal
15570.00	32.98	38.46	17.67	34.32	54.79	74.00	-19.21	Horizontal

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10380.00	23.15	39.71	14.63	32.68	44.81	54.00	-9.19	Vertical
15570.00	20.69	38.46	17.67	34.32	42.50	54.00	-11.50	Vertical
10380.00	22.83	39.71	14.63	32.68	44.49	54.00	-9.51	Horizontal
15570.00	21.26	38.46	17.67	34.32	43.07	54.00	-10.93	Horizontal

802.11n(HT40) 5230MHz

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10460.00	31.34	39.75	14.65	32.74	53.00	68.20	-15.20	Vertical
15690.00	32.18	38.33	17.69	34.03	54.17	74.00	-19.83	Vertical
10460.00	30.49	39.75	14.65	32.74	52.15	68.20	-16.05	Horizontal
15690.00	32.08	38.33	17.69	34.03	54.07	74.00	-19.93	Horizontal

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10460.00	20.35	39.75	14.65	32.74	42.01	54.00	-11.99	Vertical
15690.00	21.04	38.33	17.69	34.03	43.03	54.00	-10.97	Vertical
10460.00	20.78	39.75	14.65	32.74	42.44	54.00	-11.56	Horizontal
15690.00	19.65	38.33	17.69	34.03	41.64	54.00	-12.36	Horizontal

802.11ac(HT40) 5190MHz

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10380.00	34.68	39.71	14.63	32.68	56.34	68.20	-11.86	Vertical
15570.00	30.15	38.46	17.67	34.32	51.96	74.00	-22.04	Vertical
10380.00	30.44	39.71	14.63	32.68	52.10	68.20	-16.10	Horizontal
15570.00	31.38	38.46	17.67	34.32	53.19	74.00	-20.81	Horizontal

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10380.00	22.27	39.71	14.63	32.68	43.93	54.00	-10.07	Vertical
15570.00	20.17	38.46	17.67	34.32	41.98	54.00	-12.02	Vertical
10380.00	21.55	39.71	14.63	32.68	43.21	54.00	-10.79	Horizontal
15570.00	20.42	38.46	17.67	34.32	42.23	54.00	-11.77	Horizontal

802.11ac(HT40) 5230MHz

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10460.00	31.49	39.75	14.65	32.74	53.15	68.20	-15.05	Vertical
15690.00	32.53	38.33	17.69	34.03	54.52	74.00	-19.48	Vertical
10460.00	30.41	39.75	14.65	32.74	52.07	68.20	-16.13	Vertical
15690.00	31.73	38.33	17.69	34.03	53.72	74.00	-20.28	Horizontal

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10460.00	20.15	39.75	14.65	32.74	41.81	54.00	-12.19	Vertical
15690.00	20.56	38.33	17.69	34.03	42.55	54.00	-11.45	Vertical
10460.00	20.13	39.75	14.65	32.74	41.79	54.00	-12.21	Horizontal
15690.00	21.03	38.33	17.69	34.03	43.02	54.00	-10.98	Horizontal

802.11ac(HT80) 5210MHz

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10420.00	32.56	39.73	14.64	32.71	54.22	68.20	-13.98	Vertical
15630.00	31.47	38.80	17.68	34.18	53.77	74.00	-20.23	Vertical
10420.00	30.31	39.73	14.64	32.71	51.97	68.20	-16.23	Horizontal
15630.00	31.65	38.80	17.68	34.18	53.95	74.00	-20.05	Horizontal

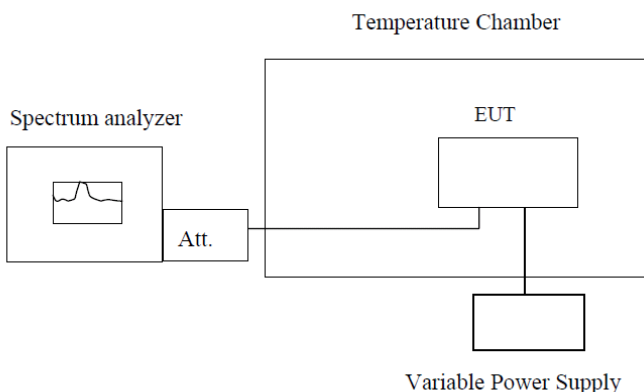
Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10420.00	20.11	39.73	14.64	32.71	41.77	54.00	-12.23	Vertical
15630.00	20.27	38.80	17.68	34.18	42.57	54.00	-11.43	Vertical
10420.00	20.16	39.73	14.64	32.71	41.82	54.00	-12.18	Horizontal
15630.00	20.42	38.80	17.68	34.18	42.72	54.00	-11.28	Horizontal

Note:

1. Level = Read Level + Antenna Factor+ Cable loss- Preamp Factor.
2. The test trace is same as the ambient noise (the test frequency range: 18GHz~40GHz), therefore no data appear in the report.
3. This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.

7.8 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 5.10 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Remark: Set the EUT transmits at un-modulation mode to test frequency stability.

Measurement data:

802.11a									
Frequency stability versus Temp.									
Worse Case Operating Frequency: 5180MHz									
Temp. (°C)	Power Supply (V _{dc})	0 minute		2 minute		5 minute		10 minute	
		Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail
-30	3.7	5180.00	Pass	5179.97	Pass	5179.98	Pass	5179.98	Pass
-20	3.7	5179.99	Pass	5179.99	Pass	5179.98	Pass	5179.98	Pass
-10	3.7	5179.98	Pass	5179.99	Pass	5179.98	Pass	5179.98	Pass
0	3.7	5179.98	Pass	5180.00	Pass	5179.99	Pass	5180.00	Pass
10	3.7	5179.99	Pass	5179.97	Pass	5180.00	Pass	5179.97	Pass
20	3.7	5179.98	Pass	5179.99	Pass	5179.97	Pass	5179.99	Pass
30	3.7	5179.98	Pass	5180.00	Pass	5179.99	Pass	5180.00	Pass
40	3.7	5179.98	Pass	5179.99	Pass	5180.00	Pass	5179.99	Pass
50	3.7	5179.99	Pass	5179.98	Pass	5179.99	Pass	5180.00	Pass
Frequency stability versus Temp.									
Worse Case Operating Frequency: 5180MHz									
Temp. (°C)	Power Supply (V _{dc})	5179.98		2 minute		5 minute		10 minute	
		5179.98	Pass /Fail	Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail
25	3.15	5179.98	Pass	5180.00	Pass	5180.00	Pass	5179.97	Pass
25	3.7	5179.99	Pass	5179.97	Pass	5179.97	Pass	5179.99	Pass
25	4.25	5180.00	Pass	5179.99	Pass	5179.99	Pass	5180.00	Pass

802.11n(HT20)									
Frequency stability versus Temp.									
Worse Case Operating Frequency: 5180MHz									
Temp. (°C)	Power Supply (V _{dc})	0 minute		2 minute		5 minute		10 minute	
		Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail
-30	3.7	5179.99	Pass	5179.98	Pass	5179.99	Pass	5179.99	Pass
-20	3.7	5180.00	Pass	5179.99	Pass	5180.00	Pass	5179.98	Pass
-10	3.7	5179.99	Pass	5179.99	Pass	5179.99	Pass	5179.97	Pass
0	3.7	5179.99	Pass	5179.98	Pass	5179.99	Pass	5179.99	Pass
10	3.7	5179.99	Pass	5179.98	Pass	5179.99	Pass	5179.99	Pass
20	3.7	5179.99	Pass	5180.00	Pass	5180.00	Pass	5179.99	Pass
30	3.7	5179.99	Pass	5179.99	Pass	5179.99	Pass	5179.99	Pass
40	3.7	5179.98	Pass	5179.97	Pass	5179.98	Pass	5179.98	Pass
50	3.7	5179.99	Pass	5179.97	Pass	5179.97	Pass	5179.99	Pass
Frequency stability versus Temp.									
Worse Case Operating Frequency: 5180MHz									
Temp. (°C)	Power Supply (V _{dc})	0 minute		2 minute		5 minute		10 minute	
		Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail
25	3.15	5179.99	Pass	5179.98	Pass	5179.99	Pass	5179.98	Pass
25	3.7	5179.98	Pass	5179.99	Pass	5179.98	Pass	5179.99	Pass
25	4.25	5179.98	Pass	5179.98	Pass	5179.98	Pass	5179.98	Pass

802.11ac(HT20)									
Frequency stability versus Temp.									
Worse Case Operating Frequency: 5180MHz									
Temp. (°C)	Power Supply (V _{dc})	0 minute		2 minute		5 minute		10 minute	
		Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail
-30	3.7	5179.98	Pass	5180.00	Pass	5179.99	Pass	5179.99	Pass
-20	3.7	5179.99	Pass	5179.98	Pass	5179.96	Pass	5179.97	Pass
-10	3.7	5179.98	Pass	5180.01	Pass	5179.99	Pass	5179.99	Pass
0	3.7	5179.98	Pass	5179.99	Pass	5179.97	Pass	5179.99	Pass
10	3.7	5179.99	Pass	5179.98	Pass	5179.99	Pass	5179.99	Pass
20	3.7	5179.98	Pass	5179.98	Pass	5179.99	Pass	5179.98	Pass
30	3.7	5179.98	Pass	5179.99	Pass	5179.98	Pass	5179.99	Pass
40	3.7	5179.99	Pass	5179.98	Pass	5179.99	Pass	5179.98	Pass
50	3.7	5179.98	Pass	5179.99	Pass	5179.98	Pass	5179.96	Pass
Frequency stability versus Temp.									
Worse Case Operating Frequency: 5180MHz									
Temp. (°C)	Power Supply (V _{dc})	0 minute		2 minute		5 minute		10 minute	
		Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail
25	3.15	5179.99	Pass	5179.99	Pass	5179.98	Pass	5179.98	Pass
25	3.7	5179.97	Pass	5179.99	Pass	5179.98	Pass	5179.98	Pass
25	4.25	5179.99	Pass	5179.99	Pass	5179.98	Pass	5179.98	Pass

802.11n(HT40)									
Frequency stability versus Temp.									
Worse Case Operating Frequency: 5190MHz									
Temp. (°C)	Power Supply (V _{dc})	0 minute		2 minute		5 minute		10 minute	
		Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail
-30	3.7	5190.00	Pass	5189.98	Pass	5189.96	Pass	5189.99	Pass
-20	3.7	5189.99	Pass	5189.99	Pass	5189.98	Pass	5189.98	Pass
-10	3.7	5189.98	Pass	5189.99	Pass	5189.98	Pass	5189.99	Pass
0	3.7	5189.99	Pass	5189.98	Pass	5189.99	Pass	5189.98	Pass
10	3.7	5189.99	Pass	5189.99	Pass	5189.99	Pass	5189.98	Pass
20	3.7	5189.98	Pass	5189.98	Pass	5189.98	Pass	5189.99	Pass
30	3.7	5189.99	Pass	5189.98	Pass	5189.99	Pass	5189.98	Pass
40	3.7	5189.97	Pass	5189.98	Pass	5189.97	Pass	5189.97	Pass
50	3.7	5189.98	Pass	5189.98	Pass	5189.99	Pass	5189.99	Pass
Frequency stability versus Temp.									
Worse Case Operating Frequency: 5190MHz									
Temp. (°C)	Power Supply (V _{dc})	0 minute		2 minute		5 minute		10 minute	
		Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail
25	3.15	5189.99	Pass	5189.98	Pass	5189.99	Pass	5189.98	Pass
25	3.7	5189.99	Pass	5189.98	Pass	5189.99	Pass	5189.98	Pass
25	4.25	5189.97	Pass	5189.98	Pass	5189.97	Pass	5189.99	Pass

802.11ac(HT40)									
Frequency stability versus Temp.									
Worse Case Operating Frequency: 5190MHz									
Temp. (°C)	Power Supply (V _{dc})	0 minute		2 minute		5 minute		10 minute	
		Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail
-30	3.7	5189.99	Pass	5189.98	Pass	5189.99	Pass	5189.99	Pass
-20	3.7	5189.99	Pass	5190.00	Pass	5189.99	Pass	5189.99	Pass
-10	3.7	5189.98	Pass	5190.00	Pass	5189.99	Pass	5189.99	Pass
0	3.7	5189.99	Pass	5189.98	Pass	5189.98	Pass	5189.98	Pass
10	3.7	5189.97	Pass	5189.98	Pass	5189.99	Pass	5190.00	Pass
20	3.7	5189.99	Pass	5190.00	Pass	5189.97	Pass	5190.00	Pass
30	3.7	5189.97	Pass	5190.00	Pass	5189.97	Pass	5189.98	Pass
40	3.7	5189.96	Pass	5189.99	Pass	5189.96	Pass	5189.99	Pass
50	3.7	5189.95	Pass	5189.99	Pass	5189.99	Pass	5189.99	Pass
Frequency stability versus Temp.									
Worse Case Operating Frequency: 5190MHz									
Temp. (°C)	Power Supply (V _{dc})	0 minute		2 minute		5 minute		10 minute	
		Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail
25	3.15	5189.98	Pass	5189.99	Pass	5190.00	Pass	5189.98	Pass
25	3.7	5190.00	Pass	5189.99	Pass	5190.02	Pass	5190.00	Pass
25	4.25	5189.98	Pass	5189.98	Pass	5190.00	Pass	5190.02	Pass

802.11ac(HT80)									
Frequency stability versus Temp.									
Worse Case Operating Frequency: 5210MHz									
Temp. (°C)	Power Supply (V _{dc})	0 minute		2 minute		5 minute		10 minute	
		Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail
-30	3.7	5209.99	Pass	5209.98	Pass	5209.99	Pass	5209.99	Pass
-20	3.7	5209.99	Pass	5210.00	Pass	5209.99	Pass	5209.99	Pass
-10	3.7	5209.98	Pass	5210.00	Pass	5209.99	Pass	5209.99	Pass
0	3.7	5209.99	Pass	5209.98	Pass	5209.98	Pass	5209.98	Pass
10	3.7	5209.97	Pass	5209.98	Pass	5209.99	Pass	5210.00	Pass
20	3.7	5209.99	Pass	5209.00	Pass	5209.97	Pass	5210.00	Pass
30	3.7	5209.97	Pass	5209.00	Pass	5209.97	Pass	5209.98	Pass
40	3.7	5209.96	Pass	5209.99	Pass	5209.96	Pass	5209.99	Pass
50	3.7	5209.95	Pass	5209.99	Pass	5209.99	Pass	5209.99	Pass
Frequency stability versus Temp.									
Worse Case Operating Frequency: 5190MHz									
Temp. (°C)	Power Supply (V _{dc})	0 minute		2 minute		5 minute		10 minute	
		Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail
25	3.15	5209.98	Pass	5209.99	Pass	5210.00	Pass	5209.98	Pass
25	3.7	5210.00	Pass	5209.99	Pass	5210.02	Pass	5209.99	Pass
25	4.25	5209.98	Pass	5209.99	Pass	5210.00	Pass	5209.97	Pass

8 Test Setup Photo

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

9 EUT Constructional Details

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

---END---