FCC Report (5G)

Applicant:	CanDo International, Inc.
Address of Applicant:	138 E Lemon Ave, Monrovia, CA 91016
Equipment Under Test (EUT)	
Product Name:	HD DIAGNOSTIC TABLET
Model No.:	HD Pro Tab
Trade Mark:	CanDo
FCC ID:	2AKNY-IDSPROTAB
Applicable standards:	FCC CFR Title 47 Part 15 Subpart C Section 15.407:2016
Date of sample receipt:	December 16, 2016
Date of Test:	December 16-23, 2016
Date of report issue:	December 23, 2016
Test Result :	PASS *

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

Authorized Signature:

Robinson Lo
Laboratory Manager

2 Version

Version No.	Date	Description
00	*December 23, 2016*	*Original*

Prepared By: Edward.Pan ***Date:*** *December 23, 2016*

Project Engineer

Check By: Andy.Wu ***Date:*** *December 23, 2016*

Reviewer

3 Contents

Page

1 COVER PAGE 1

2 VERSION 2

3 CONTENTS 3

4 TEST SUMMARY 4

4.1 MEASUREMENT UNCERTAINTY 4

5 GENERAL INFORMATION 5

5.1 CLIENT INFORMATION 5
5.2 GENERAL DESCRIPTION OF EUT 5
5.3 TEST MODE 6
5.4 TEST FACILITY 6
5.5 TEST LOCATION 6
5.6 DESCRIPTION OF SUPPORT UNITS 6
5.7 DEVIATION FROM STANDARDS 6
5.8 ABNORMALITIES FROM STANDARD CONDITIONS 6
5.9 OTHER INFORMATION REQUESTED BY THE CUSTOMER 6
5.10 TEST INSTRUMENTS LIST 7

5 TEST RESULTS AND MEASUREMENT DATA 9

5.1 ANTENNA REQUIREMENT 9
5.2 CONDUCTED EMISSIONS 10
5.3 EMISSION BANDWIDTH AND 99% OCCUPIED BANDWIDTH 13
5.4 PEAK TRANSMIT POWER 17
5.5 PEAK POWER SPECTRAL DENSITY 19
5.6 BAND EDGE 24
5.7 RADIATED EMISSION 28
5.8 FREQUENCY STABILITY 33

6 TEST SETUP PHOTO 36

7 EUT CONSTRUCTIONAL DETAILS 37

4 Test Summary

Test Item	Section in CFR 47	Result
Antenna requirement	15.203	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)(6), 15.205/15.209	PASS
Radiated Emission	15.205/15.209	PASS
Band Edge	15.205	PASS
Frequency Stability	15.407(f)	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	9kHz ~ 30MHz	± 4.34dB	(1)
Radiated Emission	30MHz ~ 1000MHz	± 4.24dB	(1)
Radiated Emission	1GHz ~ 40GHz	± 4.68dB	(1)
AC Power Line Conducted Emission	0.15MHz ~ 30MHz	± 3.45dB	(1)
Note (1): The measurement uncertainty is for coverage factor of k=2 and a level of confidence of 95%. Remark: Test according to ANSI C63.10:2013 and ANSI C63.4:2014			

5 General Information

5.1 Client Information

Applicant:	CanDo International, Inc.
Address of Applicant:	138 E Lemon Ave, Monrovia, CA 91016
Manufacturer:	SHENZHEN FCAR TECHNOLOGY CO., LTD.
Address of Manufacturer:	8F, Chuangyi Bldg., No. 3025, Nanhai Ave., Nanshan, Shenzhen, China
Factory:	SHENZHEN FCAR TECHNOLOGY CO.,LTD
Address of Factory:	West 1F, Bldg. B, Hengchao Industrial Park, Tangtou North Ave., Bao'an, Shenzhen, China

5.2 General Description of EUT

Product Name:	HD DIAGNOSTIC TABLET
Model No.:	HD Pro Tab
Operation Frequency:	802.11a/802.11n(HT20): 5180MHz ~ 5240MHz; 802.11n(HT40): 5190MHz ~ 5230MHz
Channel numbers:	802.11a/802.11n(HT20): 4; 802.11n(HT40): 2
Channel separation:	802.11a/802.11n(HT20): 20MHz; 802.11n(HT40): 40MHz
Modulation technology:	OFDM(64QAM, 16QAM, QPSK, BPSK)
Antenna Type:	FPCB antenna
Antenna gain:	1dBi
Power supply:	Adapter Model No.:HNSC050300WX Input: AC 100-240V, 50/60Hz, 0.45A MAX Output: DC 5V, 3A Or DC 3.7V 10000mAh Li-ion Battery

5.3 Test mode

Transmitting mode	Keep the EUT in transmitting with modulation. EUT was test with 99% duty cycle at its maximum power control level.
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.	

5.4 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

● **FCC —Registration No.: 600491**

Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fuly described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files. Registration 600491, June 22, 2016.

● **Industry Canada (IC) —Registration No.: 9079A-2**

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 with Registration No.: 9079A-2, August 15, 2016.

5.5 Test Location

All tests were performed at:

Global United Technology Services Co., Ltd.

Address: No. 301-309, 3/F., Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, sBaoan District, Shenzhen, Guangdong, China 518102

Tel: 0755-27798480

Fax: 0755-27798960

5.6 Description of Support Units

None.

5.7 Deviation from Standards

None.

5.8 Abnormalities from Standard Conditions

None.

5.9 Other Information Requested by the Customer

None.

5.10 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. 03 2015	July. 02 2020
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. 29 2016	June. 28 2017
4	Spectrum analyzer	Agilent	E4447A	GTS516	June. 29 2016	June. 28 2017
5	Spectrum Analyzer	Agilent	E4440A	GTS533	June. 29 2016	June. 28 2017
6	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	June. 29 2016	June. 28 2017
7	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	9120D-829	GTS208	June. 29 2016	June. 28 2017
8	Horn Antenna	ETS-LINDGREN	3160	GTS217	June. 29 2016	June. 28 2017
9	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
10	Coaxial Cable	GTS	N/A	GTS213	June. 29 2016	June. 28 2017
11	Coaxial Cable	GTS	N/A	GTS211	June. 29 2016	June. 28 2017
12	Coaxial cable	GTS	N/A	GTS210	June. 29 2016	June. 28 2017
13	Coaxial Cable	GTS	N/A	GTS212	June. 29 2016	June. 28 2017
14	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	June. 29 2016	June. 28 2017
15	Amplifier(2GHz-20GHz)	HP	8349B	GTS206	June. 29 2016	June. 28 2017
16	Amplifier (18-40GHz)	MITEQ	AMF-6F-18004000-29-8P	GTS534	June. 29 2016	June. 28 2017
17	Band filter	Amindeon	82346	GTS219	June. 29 2016	June. 28 2017
18	Constant temperature and humidity box	Oregon Scientific	BA-888	GTS248	June. 29 2016	June. 28 2017
19	D.C. Power Supply	Instek	PS-3030	GTS232	June. 29 2016	June. 28 2017
20	Universal radio communication tester	Rohde & Schwarz	CMU200	GTS235	June. 29 2016	June. 28 2017
21	Splitter	Agilent	11636B	GTS237	June. 29 2016	June. 28 2017
22	Power Meter	Anritsu	ML2495A	GTS540	June. 29 2016	June. 28 2017
23	Power Sensor	Anritsu	MA2411B	GTS541	June. 29 2016	June. 28 2017

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 16 2014	May 15 2019
2	EMI Test Receiver	R&S	ESCI 7	GTS552	June 29 2016	June 28 2017
3	Pulse Limiter	R&S	ESH3-Z2	GTS224	June 29 2016	June 28 2017
4	Coaxial Switch	ANRITSU CORP	MP59B	GTS225	June 29 2016	June 28 2017
5	Artificial Mains Network	SCHWARZBECK MESS	NSLK8127	GTS226	June 29 2016	June 28 2017
6	Coaxial Cable	GTS	N/A	GTS227	June 29 2016	June 28 2017
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
8	Thermo meter	KTJ	TA328	GTS233	June 29 2016	June 28 2017

General used equipment:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	Barometer	ChangChun	DYM3	GTS257	June 29 2016	June 28 2017

5 Test results and Measurement Data

5.1 Antenna requirement

Standard requirement:	FCC Part15 C Section 15.203

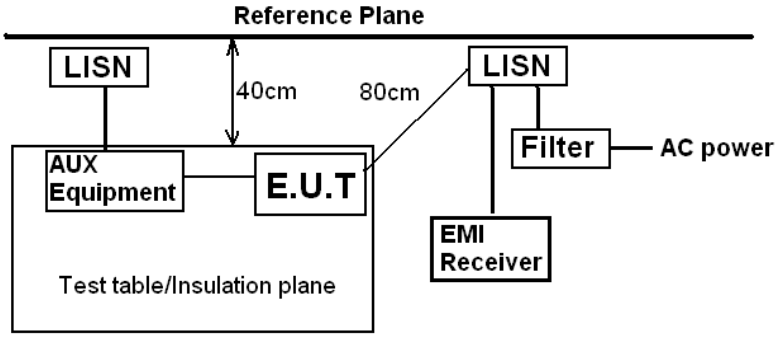
15.203 requirement:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

E.U.T Antenna:	

The antenna is FPCB antenna, the best case gain of the antenna is 1dBi

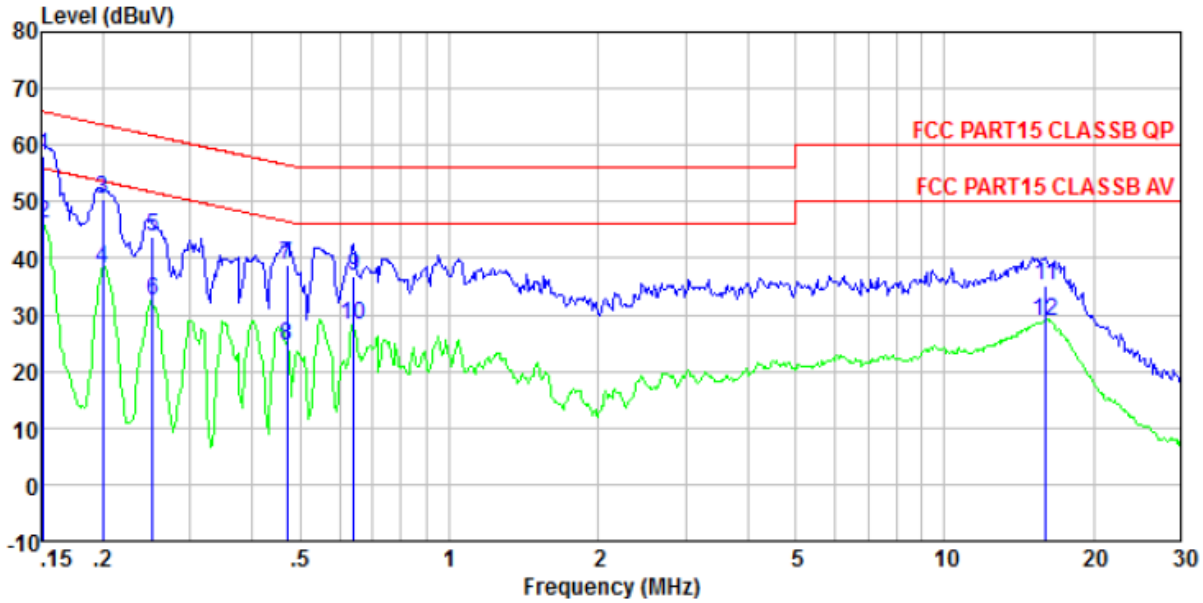
5.2 Conducted Emissions

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:	 *Remark:* *E.U.T: Equipment Under Test* *LISN: Line Impedence Stabilization Network* *Test table height=0.8m*
Test Instruments:	Refer to section 5.10 for details
Test mode:	Refer to section 5.3 for details
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.

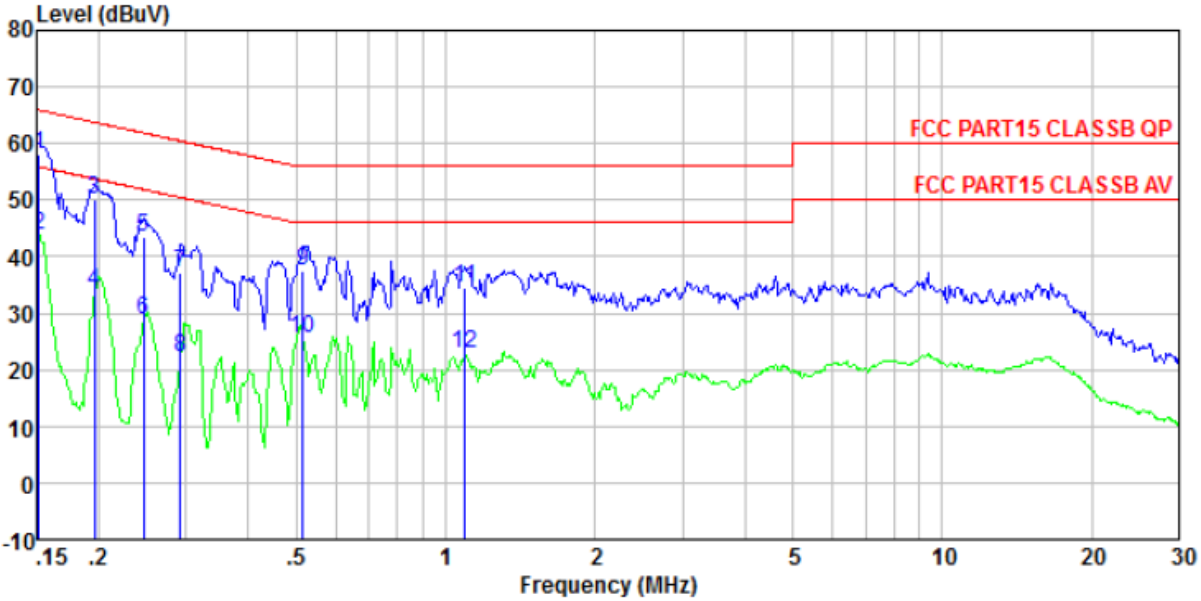
Line:



Site : Shielded room
Condition : FCC PART15 CLASSB QP LINE
Job.No : GTS201612000098
Test mode : 5G UNII mode
Test Engineer: Boy

	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.152	57.59	0.42	0.12	58.13	65.91	-7.78	QP
2	0.152	45.42	0.42	0.12	45.96	55.91	-9.95	Average
3	0.200	49.81	0.43	0.13	50.37	63.62	-13.25	QP
4	0.200	37.66	0.43	0.13	38.22	53.62	-15.40	Average
5	0.252	43.10	0.44	0.11	43.65	61.69	-18.04	QP
6	0.252	31.86	0.44	0.11	32.41	51.69	-19.28	Average
7	0.471	38.18	0.39	0.11	38.68	56.49	-17.81	QP
8	0.471	24.12	0.39	0.11	24.62	46.49	-21.87	Average
9	0.641	36.52	0.30	0.13	36.95	56.00	-19.05	QP
10	0.641	27.89	0.30	0.13	28.32	46.00	-17.68	Average
11	16.055	34.77	0.23	0.22	35.22	60.00	-24.78	QP
12	16.055	28.51	0.23	0.22	28.96	50.00	-21.04	Average

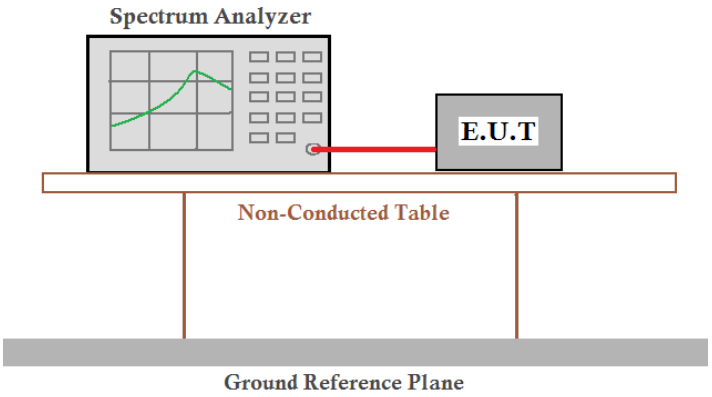
Neutral:



Site : Shielded room
Condition : FCC PART15 CLASSB QP NEUTRAL
Job.No : GTS201612000098
Test mode : 5G UNII mode
Test Engineer: Boy

	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.152	57.45	0.41	0.12	57.98	65.91	-7.93	QP
2	0.152	43.22	0.41	0.12	43.75	55.91	-12.16	Average
3	0.197	49.70	0.41	0.13	50.24	63.76	-13.52	QP
4	0.197	33.40	0.41	0.13	33.94	53.76	-19.82	Average
5	0.247	42.89	0.42	0.11	43.42	61.86	-18.44	QP
6	0.247	28.18	0.42	0.11	28.71	51.86	-23.15	Average
7	0.292	36.76	0.42	0.10	37.28	60.46	-23.18	QP
8	0.292	21.77	0.42	0.10	22.29	50.46	-28.17	Average
9	0.516	36.94	0.34	0.11	37.39	56.00	-18.61	QP
10	0.516	25.16	0.34	0.11	25.61	46.00	-20.39	Average
11	1.094	34.01	0.21	0.13	34.35	56.00	-21.65	QP
12	1.094	22.45	0.21	0.13	22.79	46.00	-23.21	Average

5.3 Emission Bandwidth and 99% Occupied Bandwidth

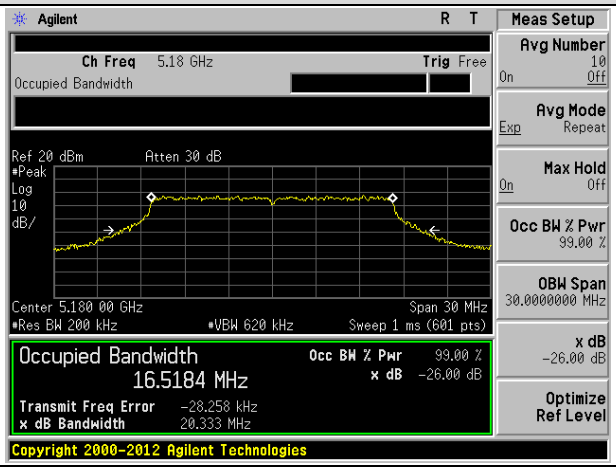
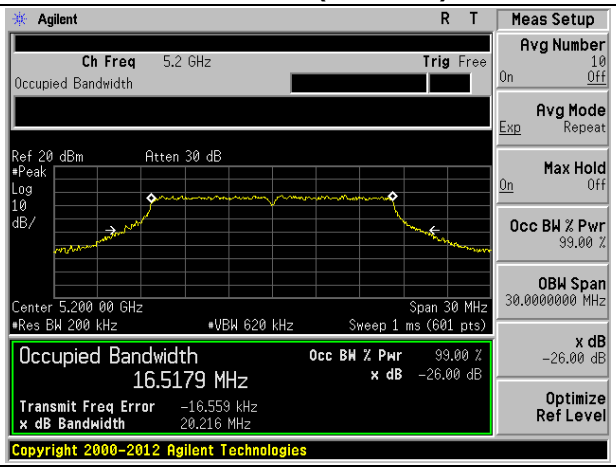
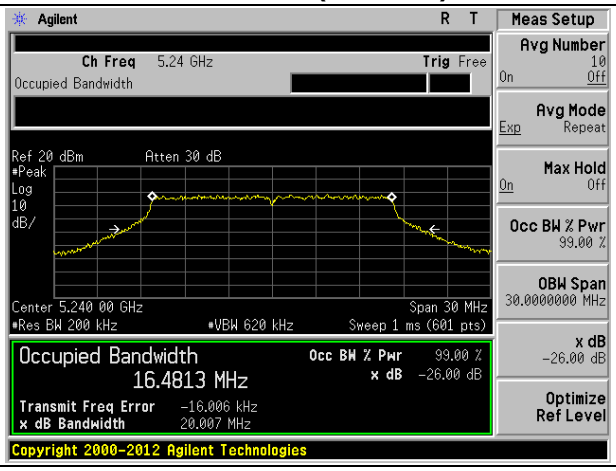
Test Requirement:	FCC Part15 E Section 15.407
Test Method:	KDB 789033 D02 General UNII Test Procedures New Rules v01
Limit:	N/A
Test setup:	
Test procedure:	According to KDB 789033 D02 General UNII Test Procedures New Rules v01.
Test Instruments:	Refer to section 5.10 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

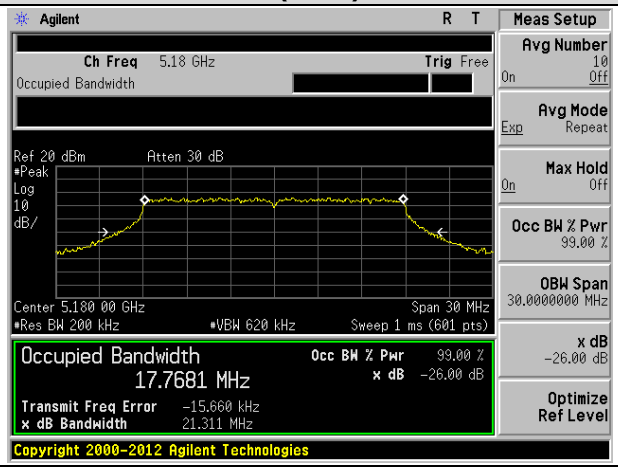
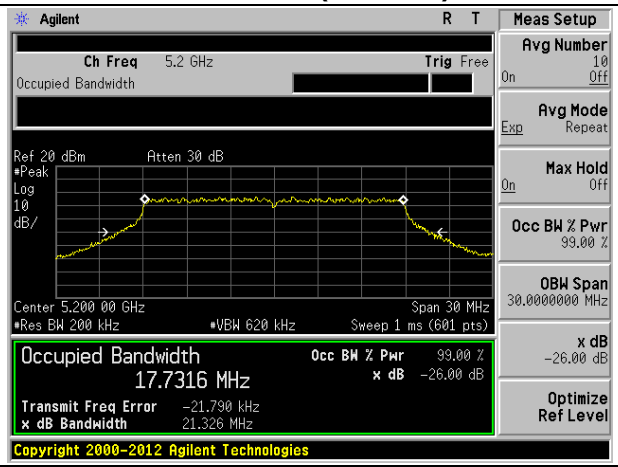
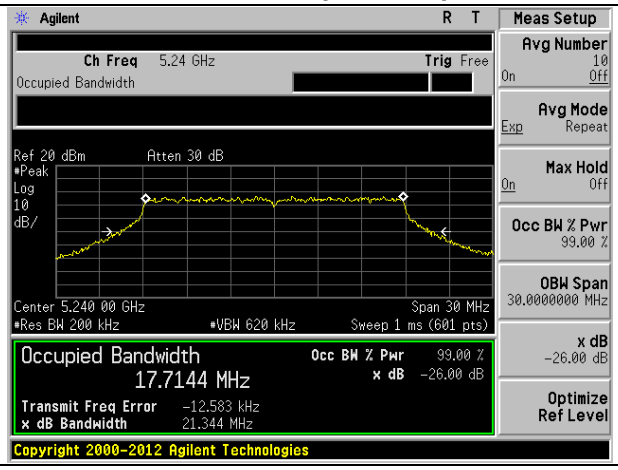
Measurement Data:

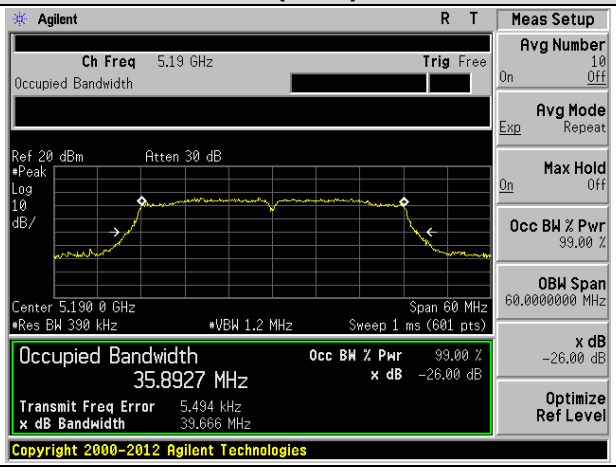
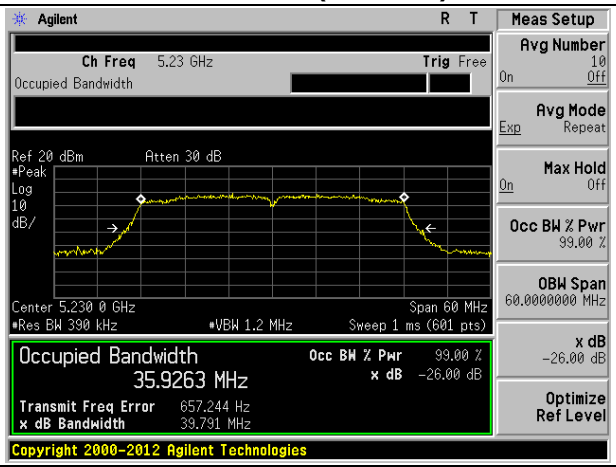
CH. No.	Frequency (MHz)	99% Occupied Bandwidth (MHz)		26dB Occupied Bandwidth (MHz)	
		802.11a	802.11n(HT20)	802.11a	802.11n(HT20)
36	5180.00	16.518	17.768	20.333	21.311
40	5200.00	16.518	17.732	20.216	21.326
48	5240.00	16.481	17.714	20.007	21.344

CH. No.	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26dB Occupied Bandwidth (MHz)
		802.11n(HT40)	802.11n(HT40)
38	5190.00	35.893	39.666
46	5230.00	35.926	39.791

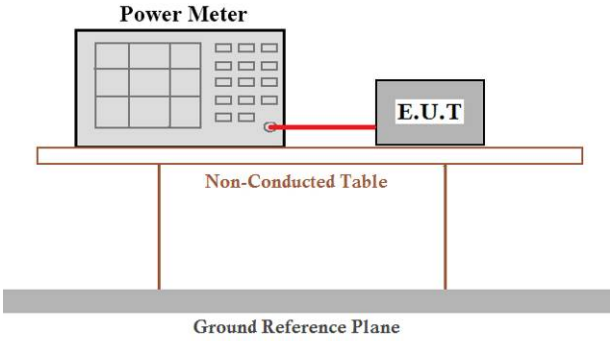
Test plots as followed:

802.11a mode

Channel 36 (5180MHz)

Channel 40 (5200MHz)

Channel 48 (5240MHz)

802.11n(HT20) mode

Channel 36 (5180MHz)

Channel 40 (5200MHz)

Channel 48 (5240MHz)

802.11n(HT40) mode

Channel 38 (5190MHz)

Channel 46 (5230MHz)

5.4 Peak Transmit Power

Test Requirement:	FCC Part15 E Section 15.407
Test Method:	KDB 789033 D02 General UNII Test Procedures New Rules v01
Limit:	For the band 5.15-5.25 GHz, the maximum conducted output power over the frequency bands of operation shall not exceed 250mW.
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., 10log(1/0.25) if the duty cycle is 25 percent).
Test Instruments:	Refer to section 5.10 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

Measurement Data

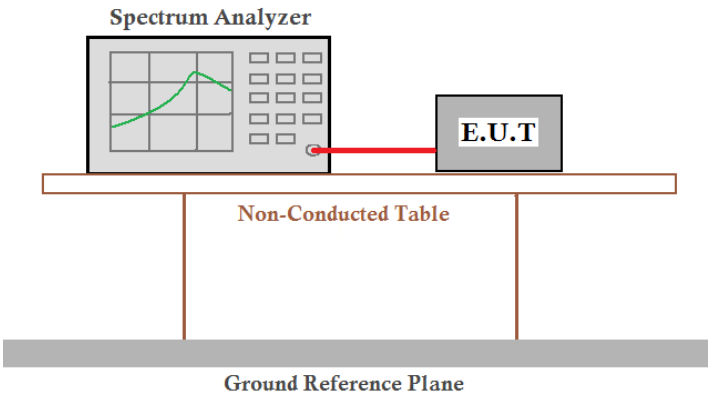
802.11a mode						
CH No.	Frequency (MHz)	Measured Power (dBm)	Duty Factor	Output Power (dBm)	Limit (dBm)	Result
36	5180.00	8.15	0.04	8.19	23.98	Pass
40	5200.00	8.25	0.04	8.29	23.98	Pass
48	5240.00	8.31	0.04	8.35	23.98	Pass

802.11n(HT20) mode						
CH No.	Frequency (MHz)	Measured Power (dBm)	Duty Factor	Output Power (dBm)	Limit (dBm)	Result
36	5180.00	7.74	0.04	7.78	23.98	Pass
40	5200.00	7.73	0.04	7.77	23.98	Pass
48	5240.00	7.77	0.04	7.81	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	5.83	0.04	5.87	23.98	Pass
46	5230.00	5.78	0.04	5.82	23.98	Pass

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

5.5 Peak Power Spectral Density

Test Requirement:	FCC Part15 E Section 15.407
Test Method:	KDB 789033 D02 General UNII Test Procedures New Rules v01
Limit:	11dBm/MHz
Test setup:	
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 PPSD.
Test Instruments:	Refer to section 5.10 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

Measurement Data

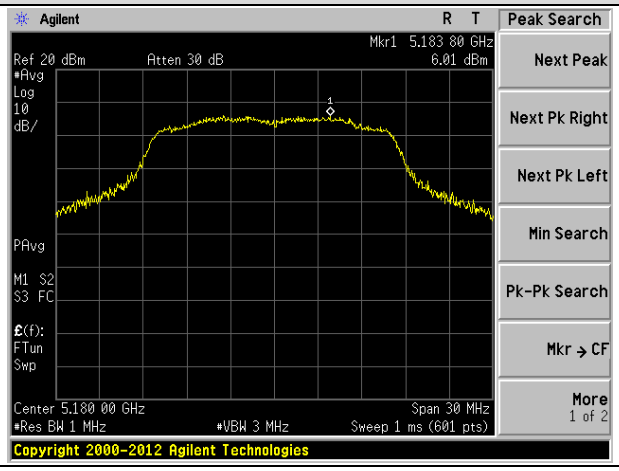
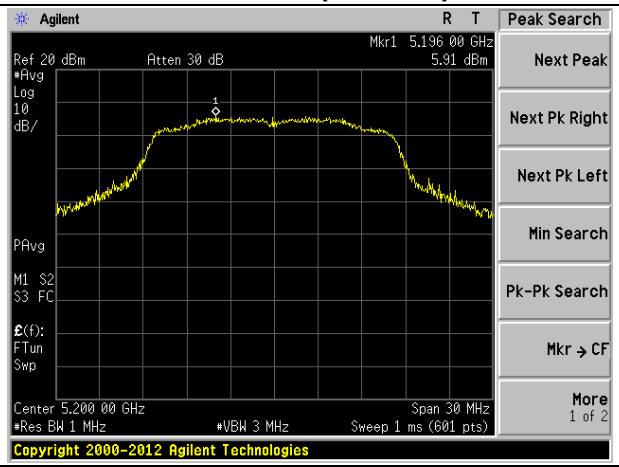
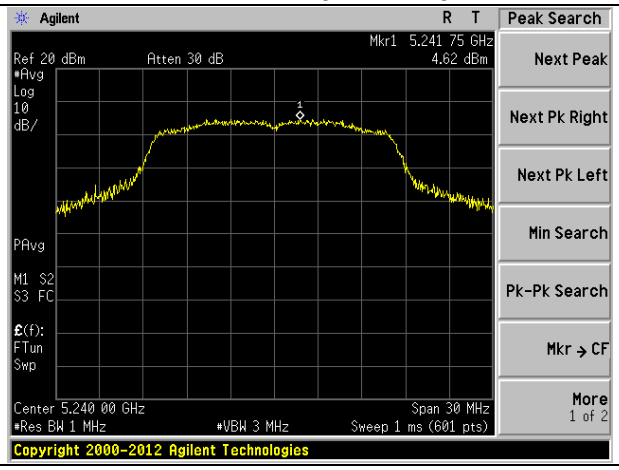
802.11a mode						
Channel No.	Frequency (MHz)	Measured PPSD (dBm/MHz)	Duty Factor	Total PPSD (dBm/MHz)	Limit (dBm/MHz)	Result
36	5180.00	6.01	0.04	6.05	11	Pass
40	5200.00	5.91	0.04	5.95	11	Pass
48	5240.00	4.62	0.04	4.66	11	Pass

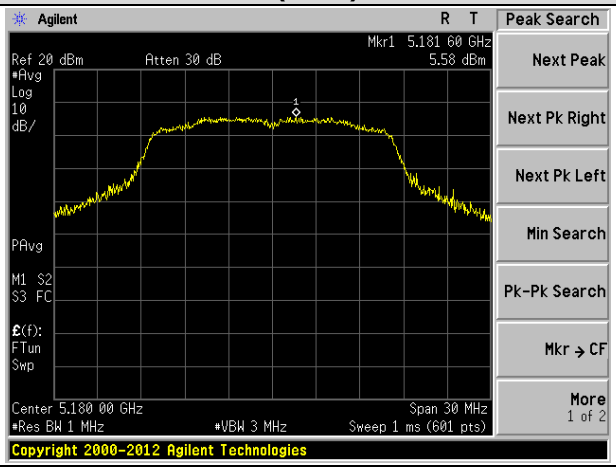
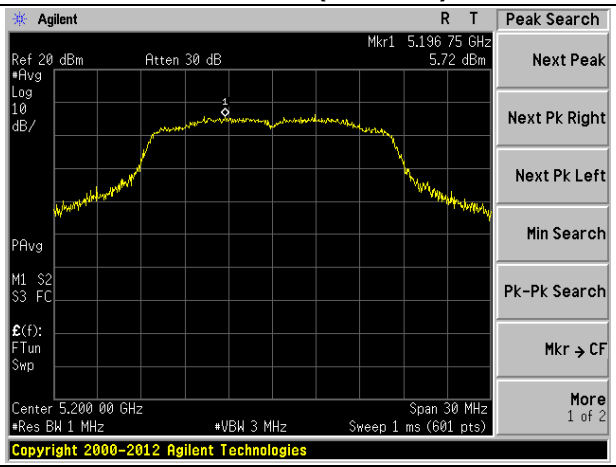
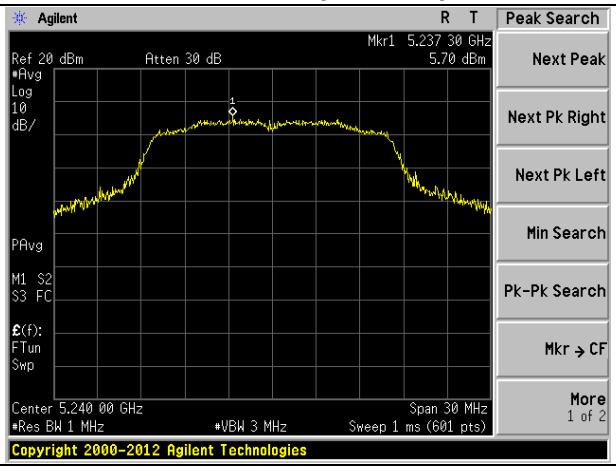
802.11n(HT20) mode						
Channel No.	Frequency (MHz)	Measured PPSD (dBm/MHz)	Duty Factor	Total PPSD (dBm/MHz)	Limit (dBm/MHz)	Result
36	5180.00	5.58	0.04	5.62	11	Pass
40	5200.00	5.72	0.04	5.76	11	Pass
48	5240.00	5.70	0.04	5.74	11	Pass

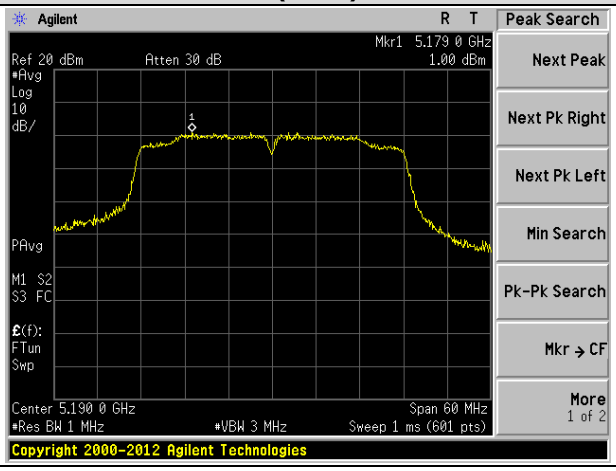
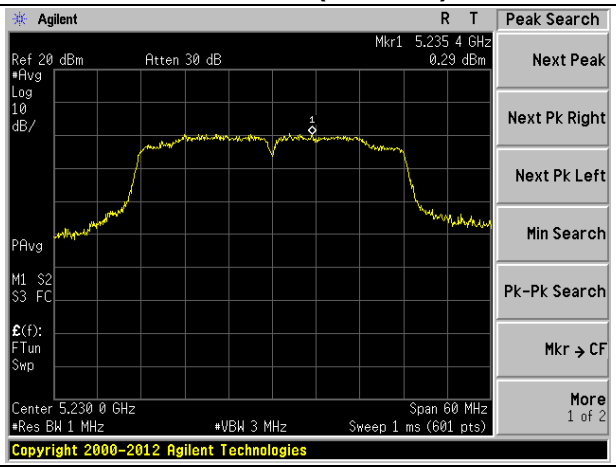
802.11n(HT40) mode						
Channel No.	Frequency (MHz)	Measured PPSD (dBm/MHz)	Duty Factor	Total PPSD (dBm/MHz)	Limit (dBm/MHz)	Result
38	5190.00	1.00	0.04	1.04	11	Pass
46	5230.00	0.29	0.04	0.33	11	Pass

Note: Total PPSD = Measured PPSD + Duty Factor
Duty Factor = 10 log (1/Duty Cycle)

Test plots as followed:

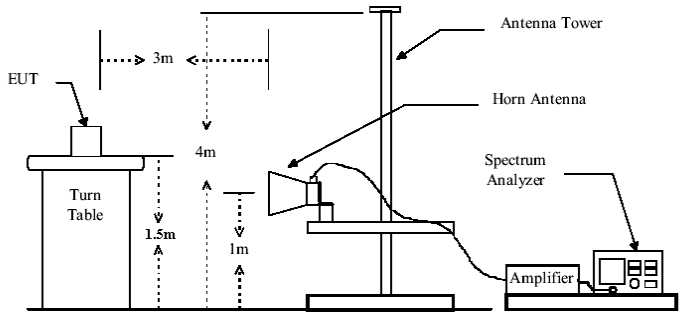
802.11a mode

Channel 36 (5180MHz)

Channel 40 (5200MHz)

Channel 48 (5240MHz)

802.11n(HT20) mode

Channel 36 (5180MHz)

Channel 40 (5200MHz)

Channel 48 (5240MHz)

802.11n(HT40) mode

Channel 38 (5190MHz)

Channel 46 (5230MHz)

5.6 Band Edge

<table>
<tr><td>Test Requirement:</td><td>FCC Part15 E Section 15.407 and 5.205</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.10:2013</td></tr>
<tr><td>Test site:</td><td>Measurement Distance: 3m (Semi-Anechoic Chamber)</td></tr>
<tr><td>Receiver setup:</td><td>
<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>
</td></tr>
<tr><td>Limit:</td><td>
<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>74.0</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.
</td></tr>
<tr><td>Test Procedure:</td><td>
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 rotable 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
</td></tr>
</table>

	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 5.3 for details
Test results:	Pass

Remark:

According to KDB 789033 D02V01 section G) 1) (d), for For measurements above 1000 MHz @ 3m distance, the limit of field strength is computed as follows:

E[dBuV/m] = EIRP[dBm] + 95.2;

For example, if EIRP = -27dBm

E[dBuV/m] = -27 + 95.2 = 68.2dBuV/m.

Measurement Data:

Mode:		802.11a		Frequency:		5180MHz	
Antenna Pol.	Frequency (MHz)	Reading Level (dBuV)	Factor (dB/m)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over limit(dB)	Detector
H	5150.00	34.85	17.18	52.03	68.20	-16.17	PK
H	5150.00	25.69	17.18	42.87	54.00	-11.13	AV
V	5150.00	33.80	17.18	50.98	68.20	-17.22	PK
V	5150.00	24.57	17.18	41.75	54.00	-12.25	AV
Mode:		802.11a		Frequency:		5240MHz	
Antenna Pol.	Frequency (MHz)	Reading Level (dBuV)	Factor (dB/m)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over limit(dB)	Detector
H	5350.00	33.42	17.20	50.62	68.20	-17.58	PK
H	5350.00	24.88	17.20	42.08	54.00	-11.92	AV
V	5350.00	38.54	17.20	55.74	68.20	-12.46	PK
V	5350.00	29.09	17.20	46.29	54.00	-7.71	AV

Mode:		802.11n(HT20)		Frequency:		5180MHz	
Antenna Pol.	Frequency (MHz)	Reading Level (dBuV)	Factor (dB/m)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over limit(dB)	Detector
H	5150.00	37.53	17.18	54.71	68.20	-13.49	PK
H	5150.00	29.57	17.18	46.75	54.00	-7.25	AV
V	5150.00	43.88	17.18	61.06	68.20	-7.14	PK
V	5150.00	33.09	17.18	50.27	54.00	-3.73	AV
Mode:		802.11n(HT20)		Frequency:		5240MHz	
Antenna Pol.	Frequency (MHz)	Reading Level (dBuV)	Factor (dB/m)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over limit(dB)	Detector
H	5350.00	33.46	17.20	50.66	68.20	-17.54	PK
H	5350.00	33.27	17.20	50.47	54.00	-3.53	AV
V	5350.00	40.82	17.20	58.02	68.20	-10.18	PK
V	5350.00	30.97	17.20	48.17	54.00	-5.83	AV

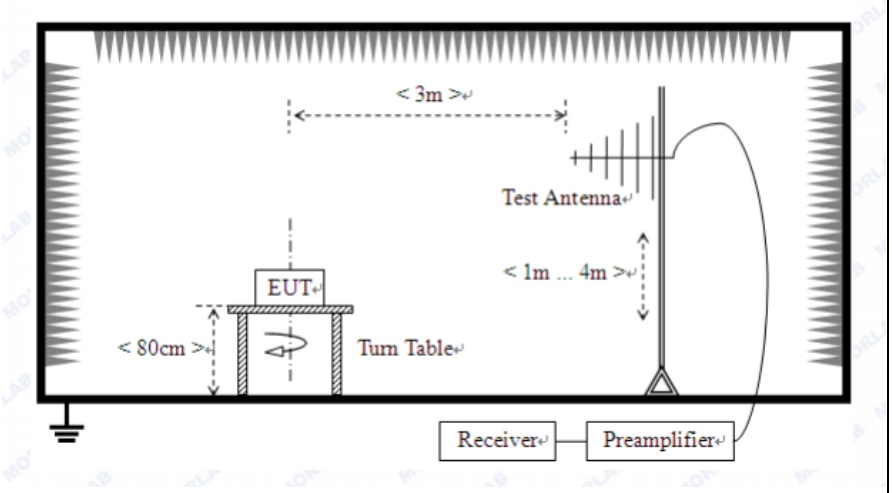
Mode:		802.11n(HT40)		Frequency:		5190MHz	
Antenna Pol.	Frequency (MHz)	Reading Level	Factor	Measure Level	Limit (dBuV/m)	Margin (dB)	Detector
H	5150.00	33.46	17.18	50.64	68.20	-17.56	PK
H	5150.00	24.53	17.18	41.71	54.00	-12.29	AV
V	5150.00	33.91	17.18	51.09	68.20	-17.11	PK
V	5150.00	24.67	17.18	41.85	54.00	-12.15	AV
Mode:		802.11n(HT40)		Frequency:		5230MHz	
Antenna Pol.	Frequency (MHz)	Reading Level	Factor	Measure Level	Limit (dBuV/m)	Margin (dB)	Detector
H	5350.00	34.74	17.20	51.94	68.20	-16.26	PK
H	5350.00	25.36	17.20	42.56	54.00	-11.44	AV
V	5350.00	37.69	17.20	54.89	68.20	-13.31	PK
V	5350.00	28.97	17.20	46.17	54.00	-7.83	AV

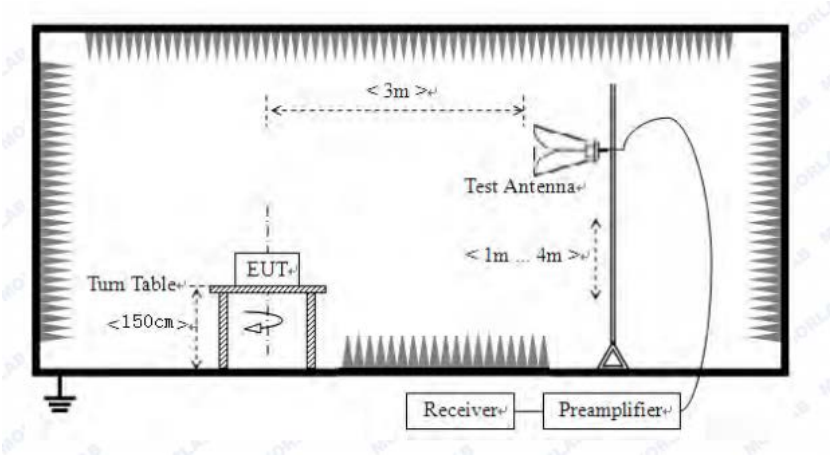
5.7 Radiated Emission

<table>
<tr><td>Test Requirement:</td><td>FCC Part15 C Section 15.209 and 15.205</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.10:2013</td></tr>
<tr><td>Test Frequency Range:</td><td>30MHz to 40GHz</td></tr>
<tr><td>Test site:</td><td>Measurement Distance: 3m (Semi-Anechoic Chamber)</td></tr>
<tr><td>Receiver setup:</td><td>
<table>
<tr><th>Frequency</th><th>Detector</th><th>RBW</th><th>VBW</th><th>Value</th></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>
</td></tr>
<tr><td>Limit:</td><td>
<table>
<tr><th>Frequency</th><th>Limit (dBuV/m @3m)</th><th>Remark</th></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>
</table>
</td></tr>
<tr><td>Test Procedure:</td><td>
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:
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 rotable 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.

2>.Above 1GHz test procedure:
1. On the test site as test setup graph above,the EUT shall be placed at the 1.5m 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
</td></tr>
</table>

	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: EIRP(dBm) = Pg(dBm) – cable loss (dB) + antenna gain (dBi) where: Pg is the generator output power into the substitution antenna.
Test setup:	Below 1GHz  Above 1GHz

	
Test Instruments:	Refer to section 5.10 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

Measurement Data:

Below 1GHz

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
51.12	49.62	15.20	0.78	29.99	35.61	40.00	-4.39	Vertical
144.34	49.60	10.22	1.53	29.44	31.91	43.50	-11.59	Vertical
161.47	52.59	10.72	1.64	29.35	35.60	43.50	-7.90	Vertical
198.59	54.32	12.57	1.83	29.20	39.52	43.50	-3.98	Vertical
233.35	50.61	13.78	2.04	29.50	36.93	46.00	-9.07	Vertical
261.98	49.74	14.13	2.18	29.74	36.31	46.00	-9.69	Vertical
48.16	45.54	15.36	0.75	30.01	31.64	40.00	-8.36	Horizontal
65.57	47.80	12.44	0.90	29.88	31.26	40.00	-8.74	Horizontal
143.83	47.50	10.22	1.53	29.44	29.81	43.50	-13.69	Horizontal
178.76	56.32	11.62	1.73	29.28	40.39	43.50	-3.11	Horizontal
233.35	50.32	13.78	2.04	29.50	36.64	46.00	-9.36	Horizontal
311.09	52.81	15.22	2.42	29.93	40.52	46.00	-5.48	Horizontal

Above 1GHz:

Only the data of worst case at each channel plan (nominal bandwidth =20MHz) is reported.

802.11 n(HT20) mode								
CH. No.	Antenna Pol.	Frequency (MHz)	Reading Level	Factor	Measure Level	Limit (dBuV/m)	Over limit(dB)	Detector
36	H	10360.00	14.22	21.64	35.86	54(Note3)	-18.14	PK
	H	15540.00	15.06	21.80	36.86	54(Note3)	-17.14	PK
	V	10360.00	22.19	21.64	43.83	54(Note3)	-10.17	PK
	V	15540.00	15.73	21.80	37.53	54(Note3)	-16.47	PK
40	H	10400.00	13.92	21.67	35.59	54(Note3)	-18.41	PK
	H	15600.00	19.98	21.83	41.81	54(Note3)	-12.19	PK
	V	10400.00	20.38	21.67	42.05	54(Note3)	-11.95	PK
	V	15600.00	18.23	21.83	40.06	54(Note3)	-13.94	PK
48	H	10480.00	13.42	21.64	35.06	54(Note3)	-18.94	PK
	H	15720.00	13.46	22.16	35.62	54(Note3)	-18.38	PK
	V	10480.00	20.31	21.64	41.95	54(Note3)	-12.05	PK
	V	15720.00	16.47	22.16	38.63	54(Note3)	-15.37	PK
802.11n(HT40) mode								
CH. No.	Antenna Pol.	Frequency (MHz)	Reading Level	Factor	Measure Level	Limit (dBuV/m)	Margin (dB)	Detector
38	H	10380.00	19.09	21.64	40.73	54(Note3)	-13.27	PK
	H	15570.00	19.88	21.80	41.68	54(Note3)	-12.32	PK
	V	10380.00	13.36	21.64	35.00	54(Note3)	-19.00	PK
	V	15570.00	18.89	21.80	40.69	54(Note3)	-13.31	PK
46	H	10460.00	14.38	21.67	36.05	54(Note3)	-17.95	PK
	H	15690.00	11.46	21.83	33.29	54(Note3)	-20.71	PK
	V	10460.00	18.76	21.67	40.43	54(Note3)	-13.57	PK
	V	15690.00	11.39	21.83	33.22	54(Note3)	-20.78	PK

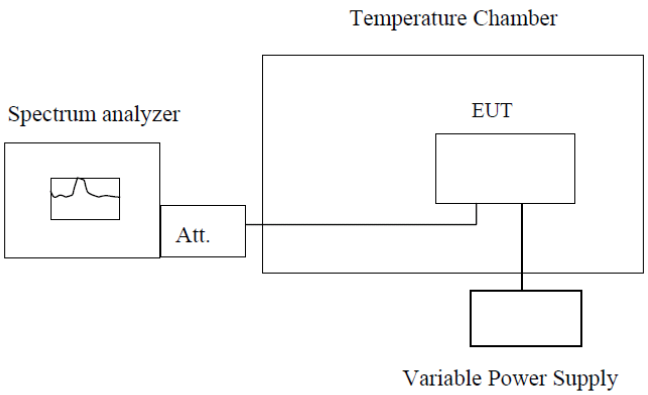
Note:

1. Measure Level = Reading Level + 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.

5.8 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:	The EUT was setup to ANSI C63.4, 2014; tested to 2.1055 for compliance to FCC Part 15.407(g) requirements.
Test setup:	 **Note :** Measurement setup for testing on Antenna connector
Test Instruments:	Refer to section 5.10 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

Measurement data:

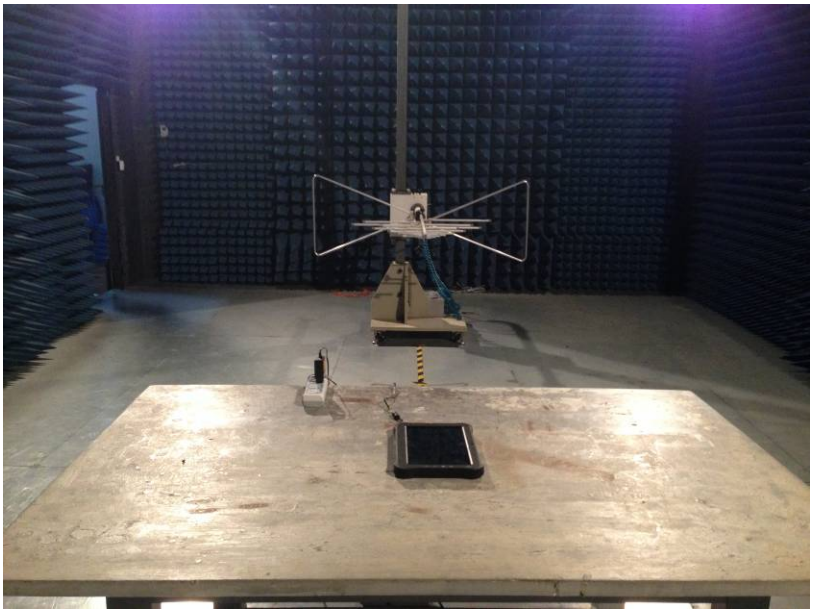
Frequency stability versus Temp.					
Power Supply: DC 3.7V					
Temp. (°C)	Operating Frequency (MHz)	0 minute	2 minute	5 minute	10 minute
		Measured Frequency (MHz)	Measured Frequency (MHz)	Measured Frequency (MHz)	Measured Frequency (MHz)
-30	5180	5179.3900	5180.4302	5181.2834	5179.3409
	5200	5199.7358	5200.8922	5200.4664	5199.6501
	5220	5219.8152	5220.9935	5220.0400	5219.5366
	5240	5239.0317	5240.8838	5240.6395	5239.0413
-20	5180	5179.8594	5180.5304	5180.9920	5179.6644
	5200	5199.2254	5200.9459	5200.3614	5199.2621
	5220	5219.6799	5220.4225	5220.3316	5219.7227
	5240	5239.8509	5240.6913	5240.4697	5239.3872
-10	5180	5179.4833	5180.9986	5180.7941	5179.6366
	5200	5199.1111	5200.7852	5200.4042	5199.7067
	5220	5219.5915	5220.4426	5220.8519	5219.6115
	5240	5239.8505	5240.2472	5240.8283	5239.6368
0	5180	5179.9053	5180.8093	5180.5005	5179.0738
	5200	5199.5049	5200.1406	5200.5802	5199.0456
	5220	5219.5402	5220.4818	5220.9114	5219.1127
	5240	5239.1087	5240.6540	5240.1344	5239.7148
10	5180	5179.7970	5180.1279	5180.6510	5179.5427
	5200	5199.7431	5200.1663	5200.7023	5199.2366
	5220	5219.4983	5220.1503	5220.8579	5219.5115
	5240	5239.6791	5240.3988	5240.6535	5239.1430
20	5180	5179.1699	5180.5235	5180.0540	5179.0170
	5200	5199.5293	5200.6272	5200.5161	5199.7583
	5220	5219.2271	5220.0538	5220.5960	5219.9666
	5240	5239.9081	5240.7387	5240.3496	5239.6423
30	5180	5179.9892	5180.9680	5180.8311	5179.2188
	5200	5199.0612	5200.8695	5200.9199	5199.8172
	5220	5219.1244	5220.9173	5220.7411	5219.3485
	5240	5239.4150	5240.7036	5240.6642	5239.0037
40	5180	5179.5698	5180.2898	5180.2626	5179.9924
	5200	5199.9012	5200.0612	5200.7691	5199.7898
	5220	5219.3615	5220.3309	5220.5997	5219.4002
	5240	5239.1021	5240.3280	5240.6689	5239.0056
50	5180	5179.6074	5180.9497	5180.8072	5179.8478
	5200	5199.8604	5200.7754	5200.4974	5199.8040
	5220	5219.0129	5220.3957	5220.9845	5219.9772
	5240	5239.5926	5240.5795	5240.2278	5239.5200

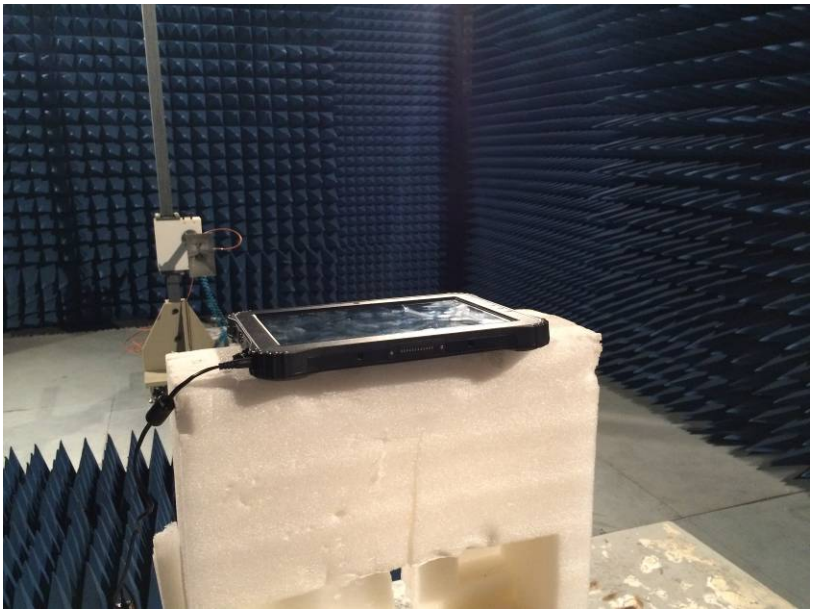
Frequency stability versus Voltage					
Temperature: 25°C					
Power Supply (VDC)	Operating Frequency (MHz)	0 minute	2 minute	5 minute	10 minute
		Measured Frequency (MHz)	Measured Frequency (MHz)	Measured Frequency (MHz)	Measured Frequency (MHz)
3.3	5180	5182.0173	5180.4796	5176.6915	5178.2778
	5200	5201.6467	5200.9769	5196.8010	5198.5261
	5220	5220.9301	5220.2484	5219.3765	5219.6535
	5240	5240.6515	5240.8189	5239.8425	5239.8743
3.7	5180	5180.6673	5180.5956	5179.5673	5179.5044
	5200	5200.7179	5200.5907	5199.0971	5199.5995
	5220	5220.9683	5220.8501	5219.8751	5219.3421
	5240	5240.9025	5240.5040	5239.7319	5239.3985
4.1	5180	5180.4227	5180.0247	5179.4972	5179.8079
	5200	5200.1771	5200.5086	5199.2319	5199.7188
	5220	5220.1390	5220.9114	5219.5367	5219.9357
	5240	5240.7299	5240.3372	5239.9980	5239.9725

Note: The worst case is FL=5176.6915MHz, FH=5240.9025MHz

6 Test Setup Photo

Radiated Emission





Conducted Emission

7 EUT Constructional Details

Reference to the test report No. GTS201612000098F01

---END---