FCC REPORT

Applicant:	SHENZHEN FCAR TECHNOLOGY CO.,LTD
Address of Applicant:	8th floor, Chuangyi Building, No. 3025 Nanhai Ave., Nanshan, Shenzhen, Guangdong, China 518060

Equipment Under Test (EUT)

Product Name:	AUTO DIAGNOSTIC SYSTEM
Model No.:	F7S-W, F7S-D, F7S-G, F7S-E, F7S-R, F7S-M, F7S-P, F7S-N
Trade Mark:	FCAR
FCC ID:	2AJDD-IDIAGSF7S
Applicable standards:	FCC CFR Title 47 Part 15 Subpart C Section 15.407:2015
Date of sample receipt:	August 24, 2016
Date of Test:	August 25-September 02, 2016
Date of report issue:	September 05, 2016
Test Result :	PASS *

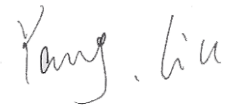
* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

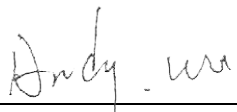
Robinson Lo
Laboratory Manager

2 Version

Version No.	Date	Description
00	*September 05, 2016*	*Original*

Prepared By:  ***Date:*** *September 05, 2016*

Project Engineer

Check By:  ***Date:*** *September 05, 2016*

Reviewer

3 Contents

Page

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:	SHENZHEN FCAR TECHNOLOGY CO.,LTD
Address of Applicant:	8th floor, Chuangyi Building, No. 3025 Nanhai Ave., Nanshan, Shenzhen, Guangdong, China 518060
Manufacturer/ Factory:	SHENZHEN FCAR TECHNOLOGY CO.,LTD
Address of Manufacturer/ Factory:	8th floor, Chuangyi Building, No. 3025 Nanhai Ave., Nanshan, Shenzhen, Guangdong, China 518060

5.2 General Description of EUT

Product Name:	AUTO DIAGNOSTIC SYSTEM
Model No.:	F7S-W, F7S-D, F7S-G, F7S-E, F7S-R, F7S-M, F7S-P, F7S-N
Operation Frequency:	802.11a/802.11n(HT20)/802.11ac(HT20): 5180MHz ~ 5240MHz
Channel numbers:	802.11a/802.11n(HT20)/802.11ac(HT20): 4
Channel separation:	802.11a/802.11n(HT20)/802.11ac(HT20): 20MHz
Modulation technology:	OFDM(64QAM, 16QAM, QPSK, BPSK)
Antenna Type:	Integral Antenna
Antenna gain:	2.0dBi (declare by Applicant)
Power supply:	SWITCHING POWER ADAPTER Model No.:GME36A-120300FDS Input: AC 100~240V, 50/60Hz, 1.2A Output: DC 12V, 3A Or DC 3.7V, 10000mAh, 37Wh

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:

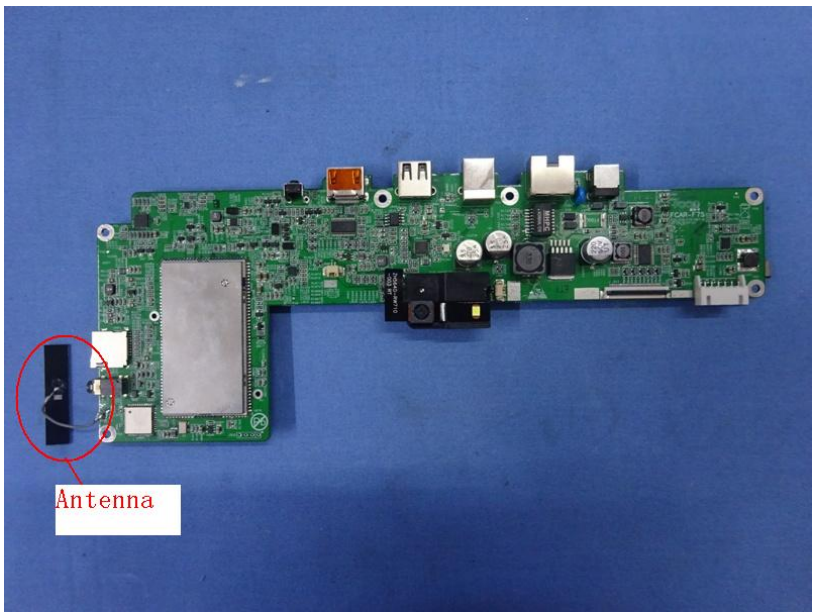
Standard requirement:	FCC Part15 C Section 15.203

15.203 requirement:

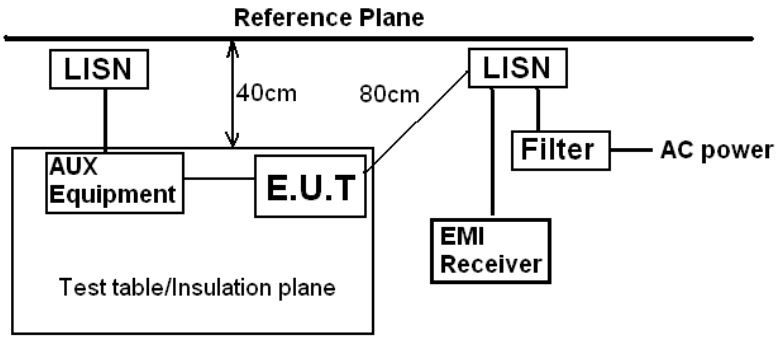
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit 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 Integral antenna. The best case gain of the antenna is 2.0dBi.



5.2 Conducted Emissions

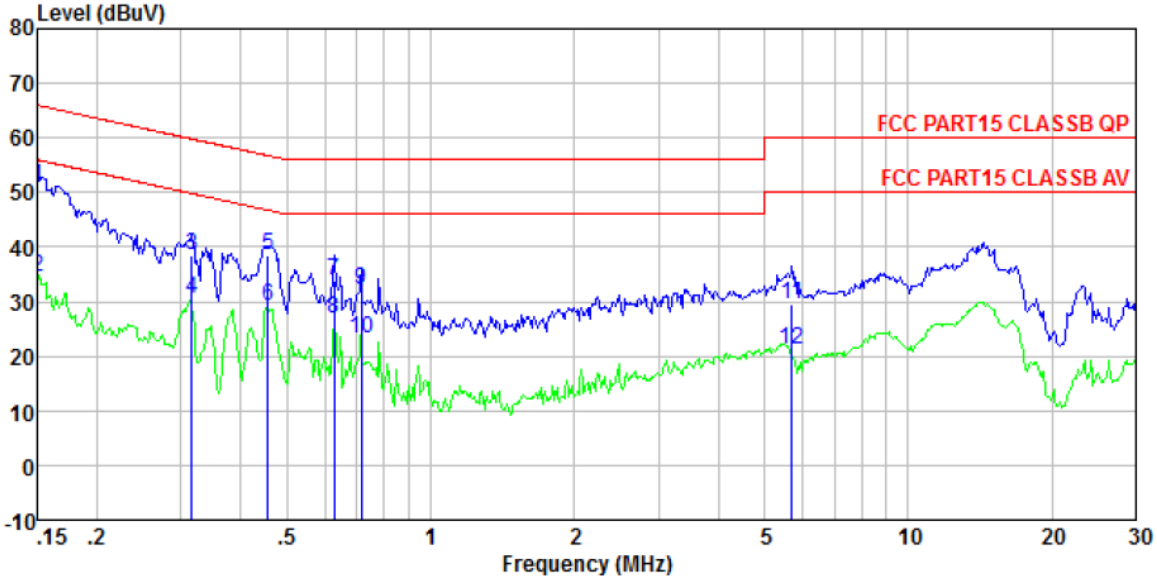
<table>
<tr><td>Test Requirement:</td><td>FCC Part15 C Section 15.207</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.10:2013</td></tr>
<tr><td>Test Frequency Range:</td><td>150KHz to 30MHz</td></tr>
<tr><td>Class / Severity:</td><td>Class B</td></tr>
<tr><td>Receiver setup:</td><td>RBW=9KHz, VBW=30KHz</td></tr>
<tr><td>Limit:</td><td>
<table>
<tr><td rowspan="2">Frequency range (MHz)</td><td colspan="2">Limit (dBuV)</td></tr>
<tr><td>Quasi-peak</td><td>Average</td></tr>
<tr><td>0.15-0.5</td><td>66 to 56*</td><td>56 to 46*</td></tr>
<tr><td>0.5-5</td><td>56</td><td>46</td></tr>
<tr><td>5-30</td><td>60</td><td>50</td></tr>
</table>
* Decreases with the logarithm of the frequency.
</td></tr>
<tr><td>Test procedure</td><td>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.</td></tr>
<tr><td>Test setup:</td><td> 

Remark:
E.U.T: Equipment Under Test
LISN: Line Impedence Stabilization Network
Test table height=0.8m</td></tr>
<tr><td>Test Instruments:</td><td>Refer to section 5.10 for details</td></tr>
<tr><td>Test mode:</td><td>Refer to section 5.3 for details</td></tr>
<tr><td>Test results:</td><td>Pass</td></tr>
</table>

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.

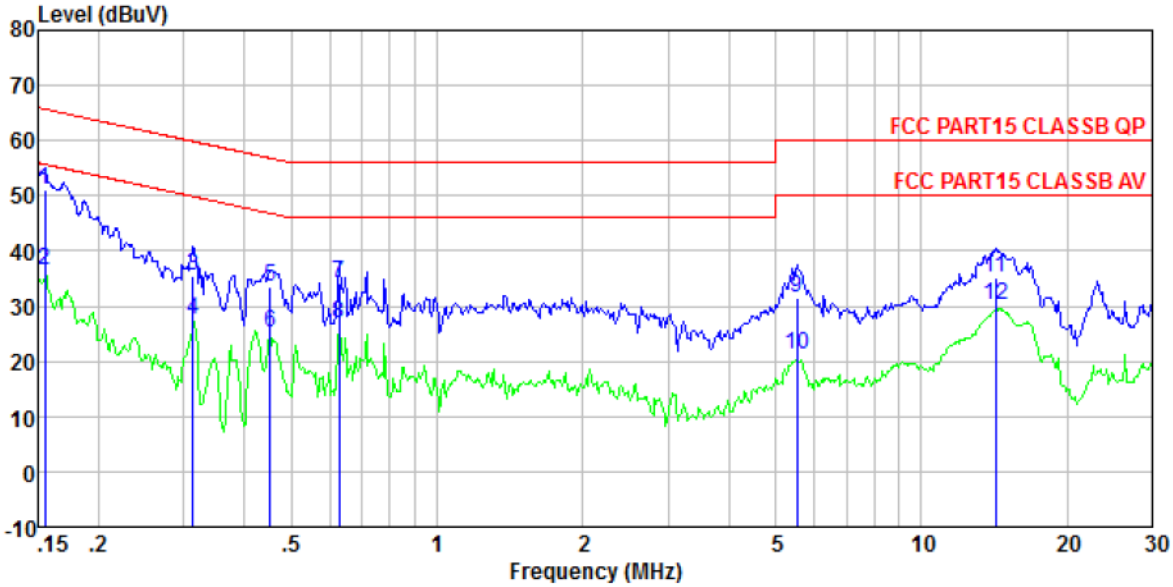
Line:



Site : Shielded room
Condition : FCC PART15 CLASSB QP LISN-2013 LINE
Job No. : 0197
Test Mode : Wifi 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	0.150	50.81	0.15	0.12	51.08	66.00	-14.92	QP
2	0.150	34.26	0.15	0.12	34.53	56.00	-21.47	Average
3	0.317	38.40	0.11	0.10	38.61	59.80	-21.19	QP
4	0.317	30.33	0.11	0.10	30.54	49.80	-19.26	Average
5	0.456	38.15	0.12	0.11	38.38	56.76	-18.38	QP
6	0.456	29.08	0.12	0.11	29.31	46.76	-17.45	Average
7	0.627	33.57	0.13	0.12	33.82	56.00	-22.18	QP
8	0.627	26.63	0.13	0.12	26.88	46.00	-19.12	Average
9	0.716	32.07	0.14	0.13	32.34	56.00	-23.66	QP
10	0.716	22.78	0.14	0.13	23.05	46.00	-22.95	Average
11	5.713	29.01	0.22	0.15	29.38	60.00	-30.62	QP
12	5.713	21.00	0.22	0.15	21.37	50.00	-28.63	Average

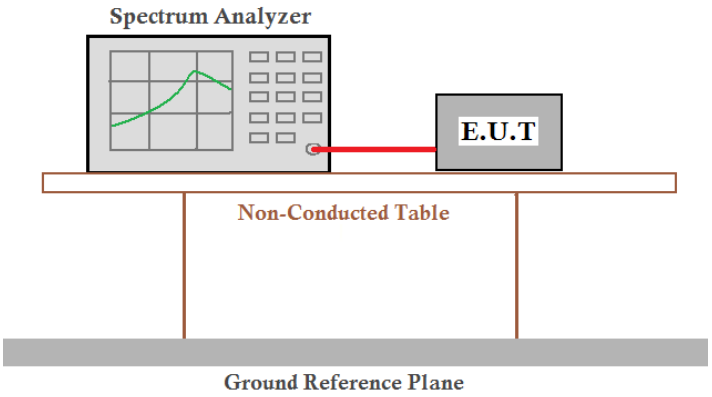
Neutral:



Site : Shielded room
Condition : FCC PART15 CLASSB QP LISN-2013 NEUTRAL
Job No. : 0197
Test Mode : Wifi 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	0.155	50.82	0.07	0.12	51.01	65.74	-14.73	QP
2	0.155	36.28	0.07	0.12	36.47	55.74	-19.27	Average
3	0.313	35.21	0.06	0.10	35.37	59.88	-24.51	QP
4	0.313	27.42	0.06	0.10	27.58	49.88	-22.30	Average
5	0.452	33.24	0.06	0.11	33.41	56.85	-23.44	QP
6	0.452	24.91	0.06	0.11	25.08	46.85	-21.77	Average
7	0.627	33.90	0.07	0.12	34.09	56.00	-21.91	QP
8	0.627	26.68	0.07	0.12	26.87	46.00	-19.13	Average
9	5.535	31.19	0.16	0.15	31.50	60.00	-28.50	QP
10	5.535	20.99	0.16	0.15	21.30	50.00	-28.70	Average
11	14.213	34.55	0.33	0.22	35.10	60.00	-24.90	QP
12	14.213	29.60	0.33	0.22	30.15	50.00	-19.85	Average

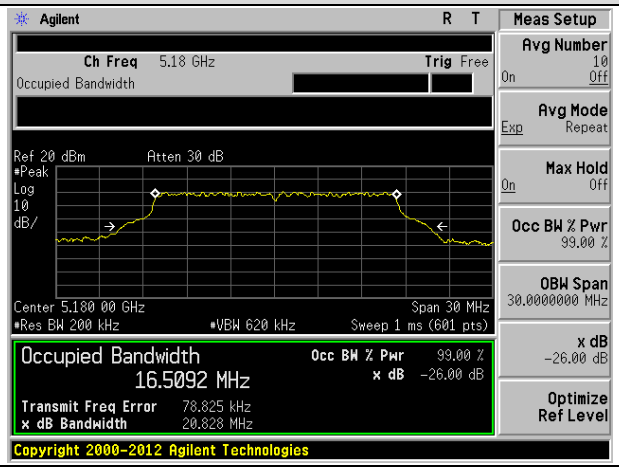
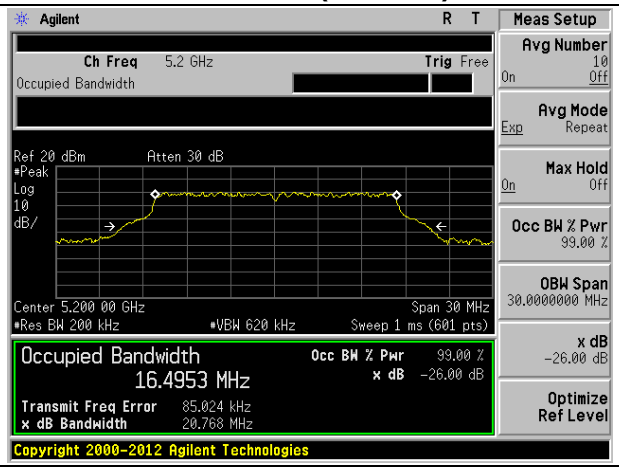
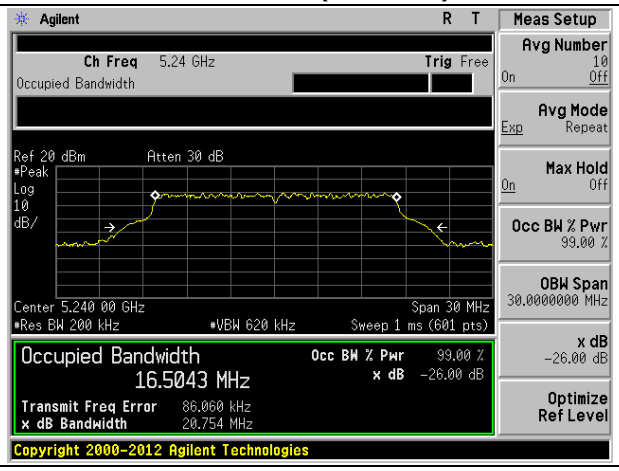
5.3 Emission Bandwidth and 99% Occupied Bandwidth

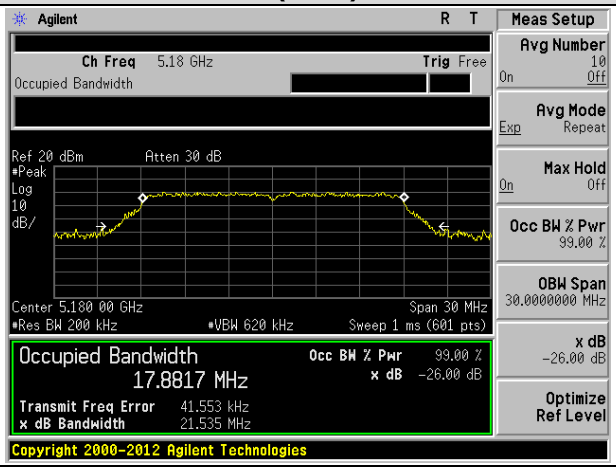
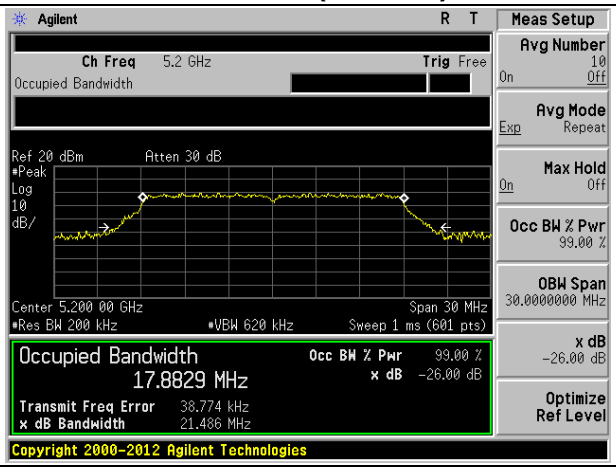
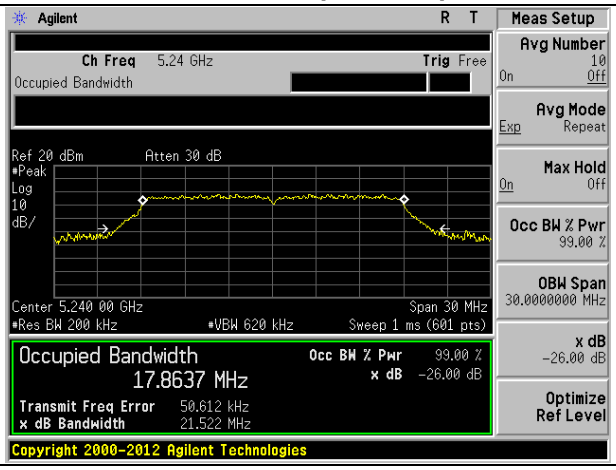
Test Requirement:	FCC Part15 E Section 15.407
Test Method:	KDB 789033 D02 General UNII Test Procedures New Rules v01
Limit:	N/A
Test setup:	
Test procedure:	According to KDB 789033 D02 General UNII Test Procedures New Rules v01.
Test Instruments:	Refer to section 5.10 for details
Test mode:	Refer to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

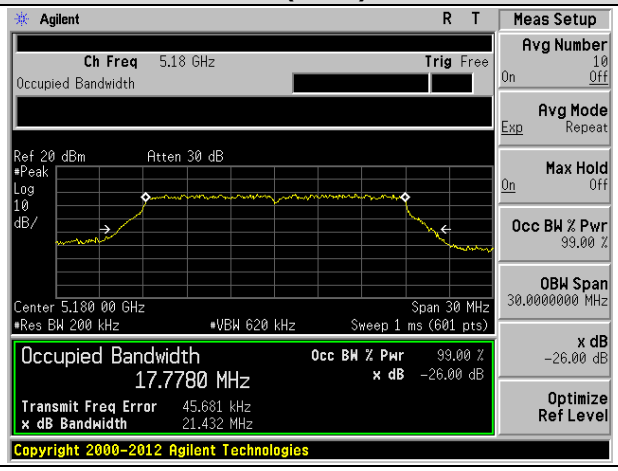
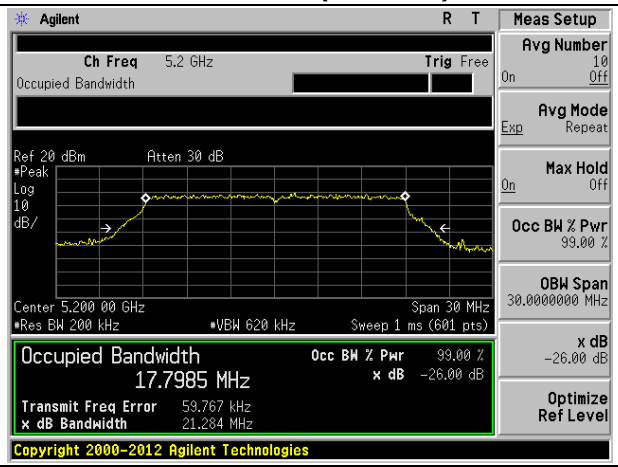
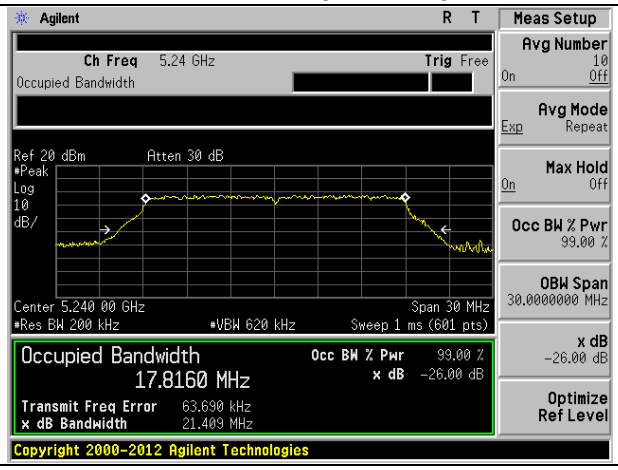
Measurement Data:

CH. No.	Frequency (MHz)	99% Occupied Bandwidth (MHz)			26dB Occupied Bandwidth (MHz)		
		802.11a	802.11n(HT 20)	802.11ac(HT20)	802.11a	802.11n(HT 20)	802.11ac(HT20)
36	5180.00	16.509	17.882	17.778	20.828	21.535	21.432
40	5200.00	16.495	17.883	17.799	20.768	21.486	21.284
48	5240.00	16.504	17.864	17.816	20.754	21.522	21.409

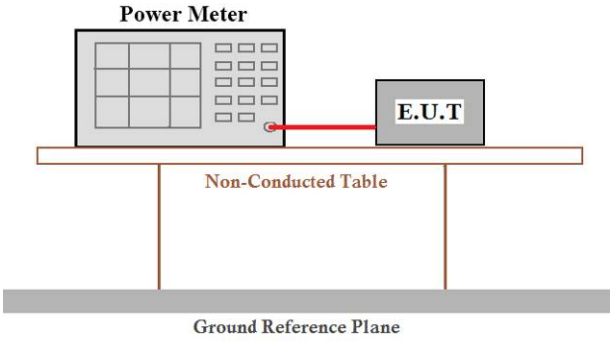
Test plots as followed:

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)

802.11ac(HT20) mode

Channel 36 (5180MHz)

Channel 40 (5200MHz)

Channel 48 (5240MHz)

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

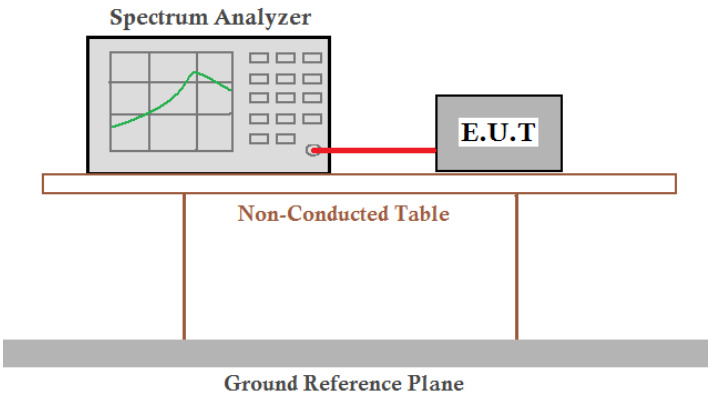
802.11a mode						
CH No.	Frequency (MHz)	Measured Power (dBm)	Duty Factor	Output Power (dBm)	Limit (dBm)	Result
36	5180.00	15.35	0.04	15.39	24	Pass
40	5200.00	15.31	0.04	15.35	24	Pass
48	5240.00	14.42	0.04	14.46	24	Pass

802.11n(HT20) mode						
CH No.	Frequency (MHz)	Measured Power (dBm)	Duty Factor	Output Power (dBm)	Limit (dBm)	Result
36	5180.00	14.02	0.04	14.06	24	Pass
40	5200.00	13.48	0.04	13.52	24	Pass
48	5240.00	11.86	0.04	11.90	24	Pass

802.11ac(HT20) mode						
CH No.	Frequency (MHz)	Measured Power (dBm)	Duty Factor	Output Power (dBm)	Limit (dBm)	Result
36	5180.00	15.50	0.04	15.54	24	Pass
40	5200.00	15.28	0.04	15.32	24	Pass
48	5240.00	14.69	0.04	14.73	24	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

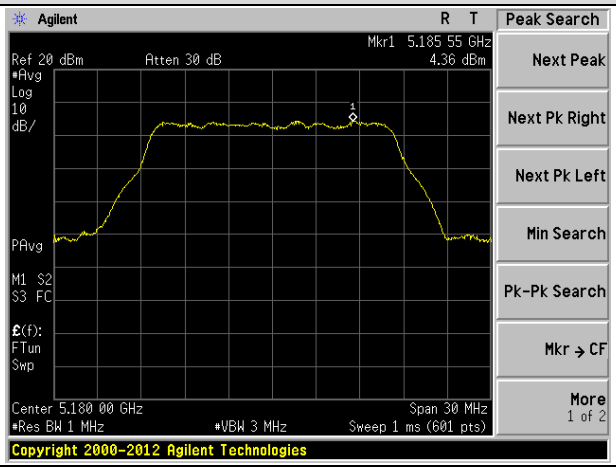
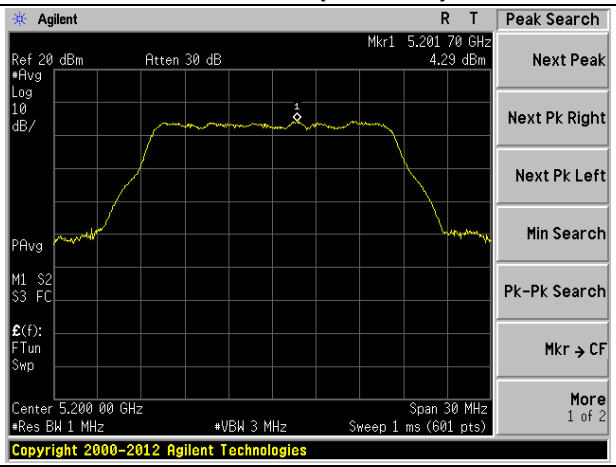
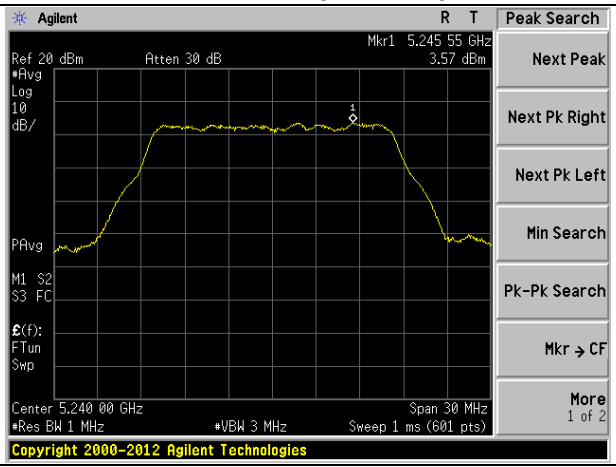
802.11a mode						
Channel No.	Frequency (MHz)	Measured PPSD (dBm/MHz)	Duty Factor	Total PPSD (dBm/MHz)	Limit (dBm/MHz)	Result
36	5180.00	4.36	0.04	4.40	11	Pass
40	5200.00	4.29	0.04	4.33	11	Pass
48	5240.00	3.57	0.04	3.61	11	Pass

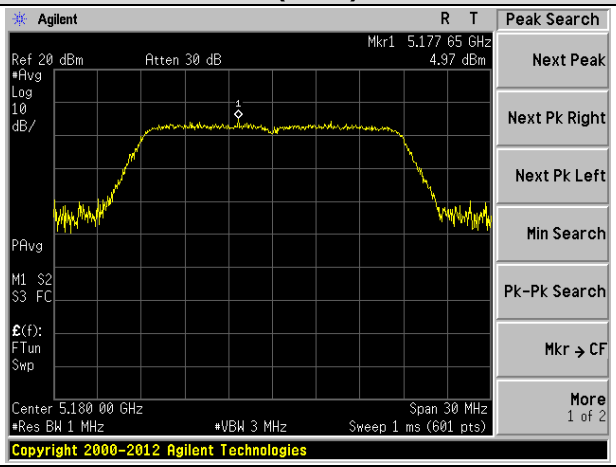
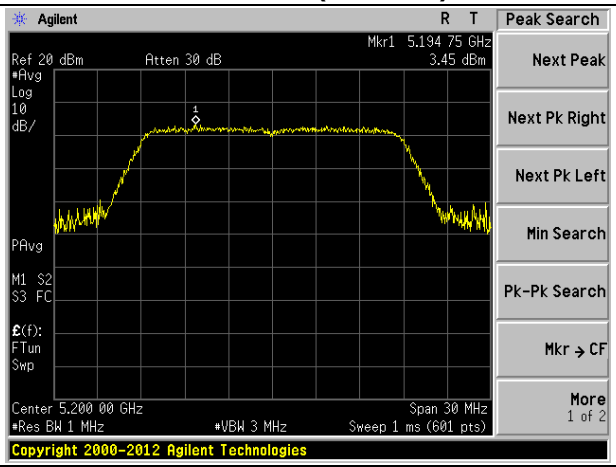
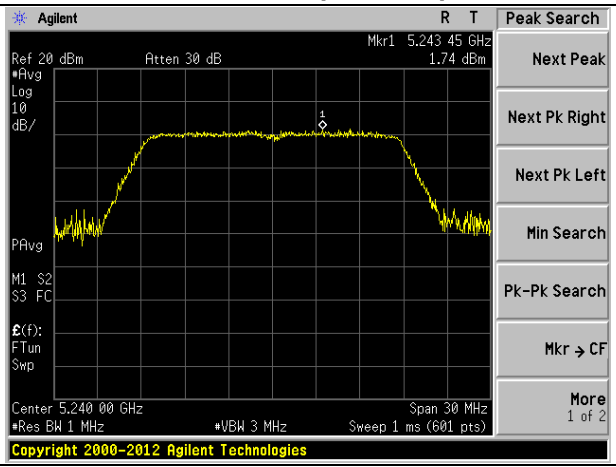
802.11n(HT20) mode						
Channel No.	Frequency (MHz)	Measured PPSD (dBm/MHz)	Duty Factor	Total PPSD (dBm/MHz)	Limit (dBm/MHz)	Result
36	5180.00	4.97	0.04	5.01	11	Pass
40	5200.00	3.45	0.04	3.49	11	Pass
48	5240.00	1.74	0.04	1.78	11	Pass

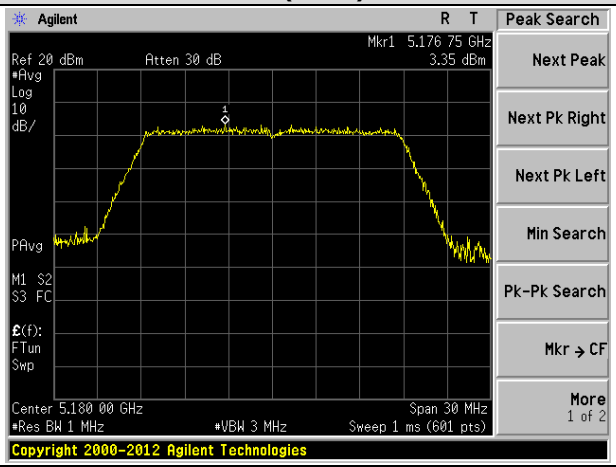
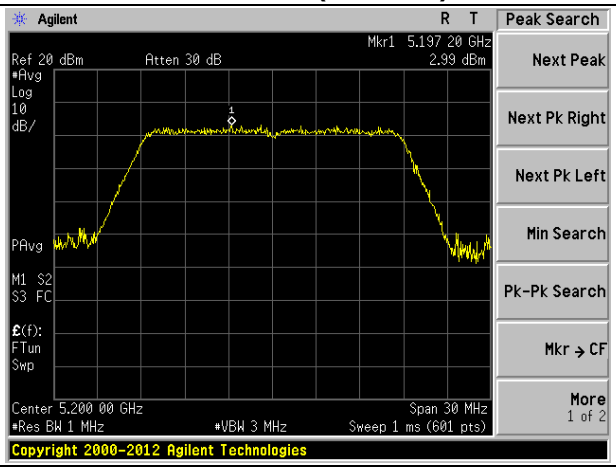
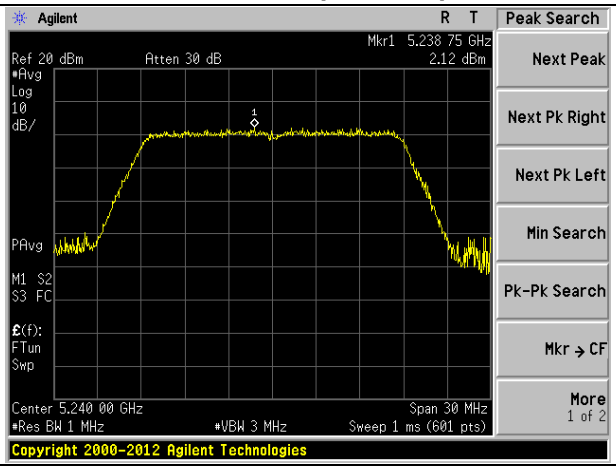
802.11ac(HT20) mode						
Channel No.	Frequency (MHz)	Measured PPSD (dBm/MHz)	Duty Factor	Total PPSD (dBm/MHz)	Limit (dBm/MHz)	Result
36	5180.00	3.35	0.04	3.39	11	Pass
40	5200.00	2.99	0.04	3.03	11	Pass
48	5240.00	2.12	0.04	2.16	11	Pass

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

Test plots as followed:

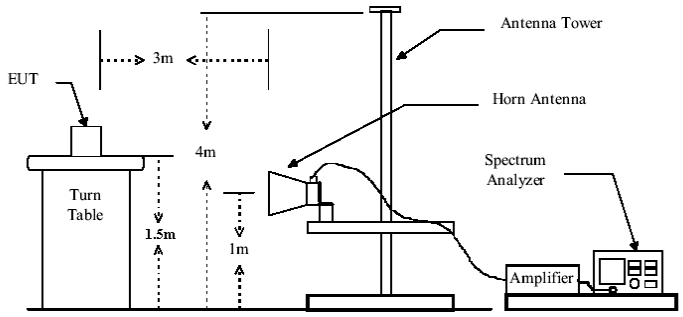
802.11a mode

Channel 36 (5180MHz)

Channel 40 (5200MHz)

Channel 48 (5240MHz)

802.11n(HT20) mode

Channel 36 (5180MHz)

Channel 40 (5200MHz)

Channel 48 (5240MHz)

802.11ac(HT20) mode

Channel 36 (5180MHz)

Channel 40 (5200MHz)

Channel 48 (5240MHz)

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	33.82	17.18	51.00	68.20	-17.20	PK
V	5150.00	35.72	17.18	52.90	68.20	-15.30	PK

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	30.80	17.18	47.98	54.00	-6.02	AV
V	5150.00	28.76	17.18	45.94	54.00	-8.06	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	36.66	17.20	53.86	68.20	-14.34	PK
V	5350.00	40.21	17.20	57.41	68.20	-10.79	PK

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	29.77	17.20	46.97	54.00	-7.03	AV
V	5350.00	26.73	17.20	43.93	54.00	-10.07	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	40.13	17.18	57.31	68.20	-10.89	PK
V	5150.00	41.33	17.18	58.51	68.20	-9.69	PK

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	30.06	17.18	47.24	54.00	-6.76	AV
V	5150.00	30.86	17.18	48.04	54.00	-5.96	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	34.35	17.20	51.55	68.20	-16.65	PK
V	5350.00	39.42	17.20	56.62	68.20	-11.58	PK

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	29.13	17.20	46.33	54.00	-7.67	AV
V	5350.00	26.99	17.20	44.19	54.00	-9.81	AV

Mode:		802.11ac		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	33.41	17.18	50.59	68.20	-17.61	PK
V	5150.00	36.55	17.18	53.73	68.20	-14.47	PK

Mode:		802.11ac		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	31.47	17.18	48.65	54.00	-5.35	AV
V	5150.00	27.80	17.18	44.98	54.00	-9.02	AV

Mode:		802.11ac		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	35.26	17.20	52.46	68.20	-15.74	PK
V	5350.00	37.47	17.20	54.67	68.20	-13.53	PK

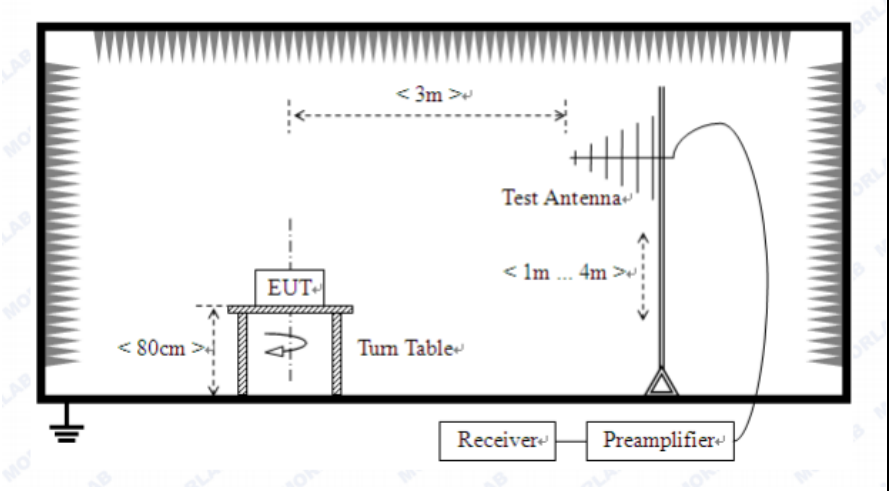
Mode:		802.11ac		Frequency:		5240MHz	
Antenna Pol.	Frequency (MHz)	Reading Level (dBuV)	Factor (dB/m)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over limit(dB)	Detector
H	5350.00	27.93	17.20	45.13	54.00	-8.87	AV
V	5350.00	26.34	17.20	43.54	54.00	-10.46	AV

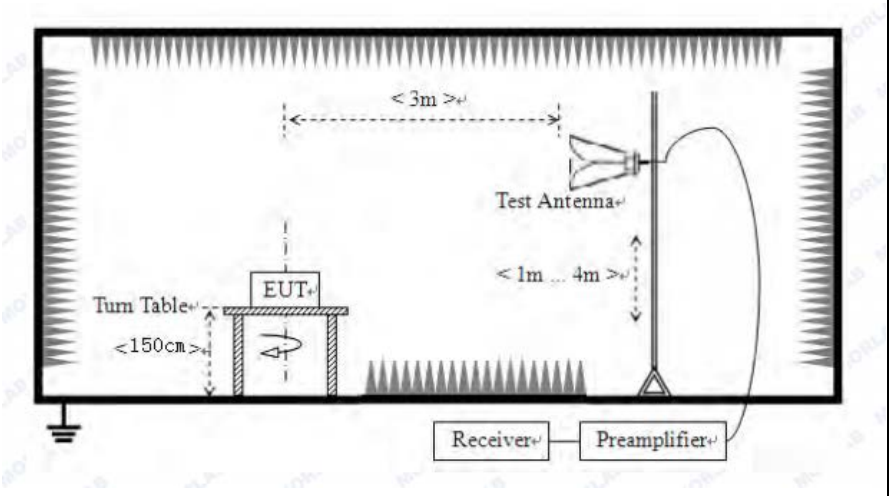
5.7 Radiated Emission

<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 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
</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
33.92	48.79	14.31	0.60	30.08	33.62	40.00	-6.38	Vertical
39.44	44.91	15.44	0.65	30.05	30.95	40.00	-9.05	Vertical
90.22	46.16	13.99	1.11	29.74	31.52	43.50	-11.98	Vertical
134.56	46.52	10.56	1.47	29.49	29.06	43.50	-14.44	Vertical
250.30	42.71	14.07	2.12	29.65	29.25	46.00	-16.75	Vertical
744.87	32.18	21.39	4.26	29.20	28.63	46.00	-17.37	Vertical
82.07	39.42	11.28	1.05	29.79	21.96	40.00	-18.04	Horizontal
125.01	42.35	11.70	1.40	29.54	25.91	43.50	-17.59	Horizontal
177.51	41.43	11.49	1.73	29.29	25.36	43.50	-18.14	Horizontal
250.30	42.22	14.07	2.12	29.65	28.76	46.00	-17.24	Horizontal
375.94	36.07	16.56	2.75	29.61	25.77	46.00	-20.23	Horizontal
729.36	32.92	21.19	4.19	29.20	29.10	46.00	-16.90	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	14.94	21.64	36.58	54(Note3)	-17.42	PK
	H	15540.00	18.30	21.80	40.10	54(Note3)	-13.90	PK
	V	10360.00	13.63	21.64	35.27	54(Note3)	-18.73	PK
	V	15540.00	14.51	21.80	36.31	54(Note3)	-17.69	PK
40	H	10400.00	20.54	21.67	42.21	54(Note3)	-11.79	PK
	H	15600.00	15.84	21.83	37.67	54(Note3)	-16.33	PK
	V	10400.00	19.00	21.67	40.67	54(Note3)	-13.33	PK
	V	15600.00	16.36	21.83	38.19	54(Note3)	-15.81	PK
48	H	10480.00	21.18	21.64	42.82	54(Note3)	-11.18	PK
	H	15720.00	20.35	22.16	42.51	54(Note3)	-11.49	PK
	V	10480.00	17.46	21.64	39.10	54(Note3)	-14.90	PK
	V	15720.00	17.78	22.16	39.94	54(Note3)	-14.06	PK

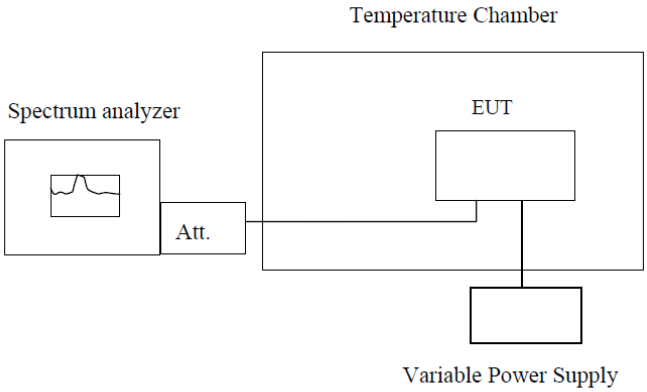
Note:

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

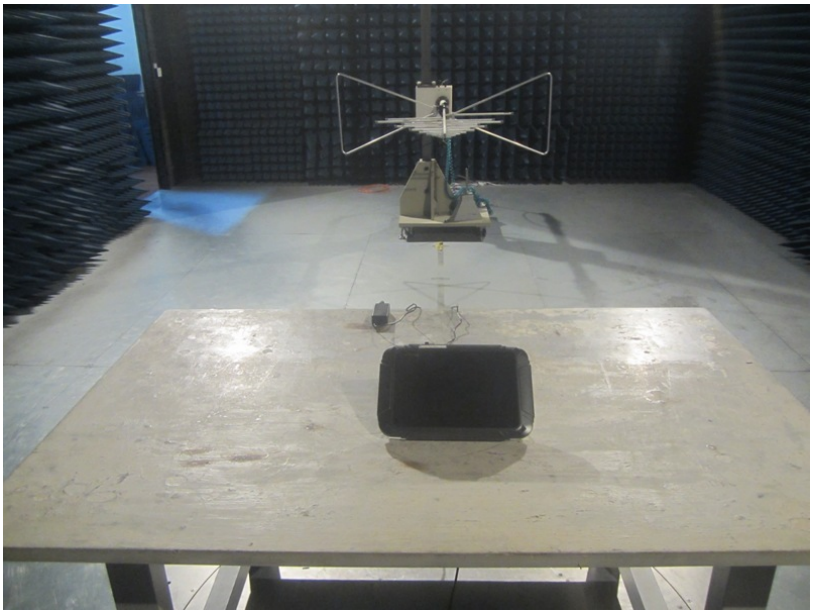
Measurement data:

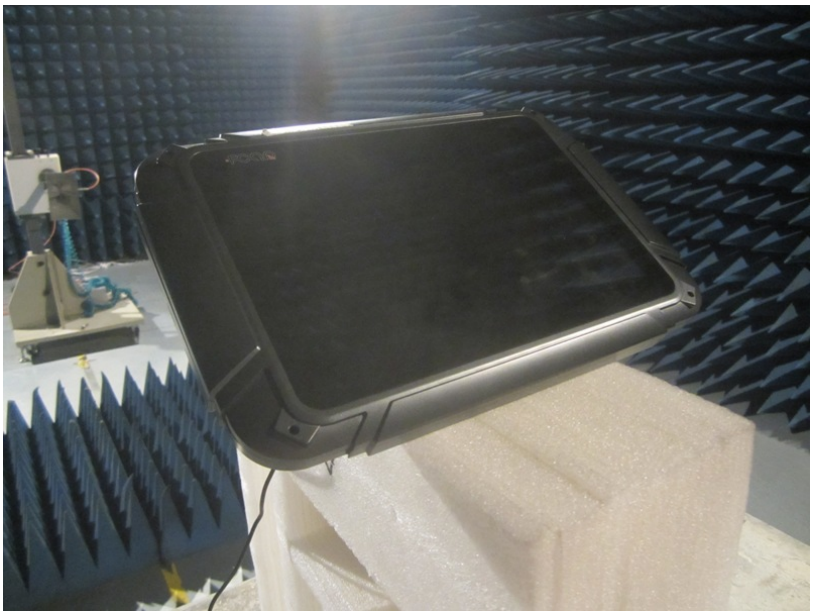
Frequency stability versus Temp.					
Power Supply: DC 3.7V					
Temp. (°C)	Operating Frequency (MHz)	0 minute	2 minute	5 minute	10 minute
		Measured Frequency (MHz)	Measured Frequency (MHz)	Measured Frequency (MHz)	Measured Frequency (MHz)
-30	5180	5177.1123	5180.0790	5183.3967	5179.7615
	5200	5197.5037	5202.3549	5201.3038	5199.0311
	5220	5219.0337	5222.0412	5221.0106	5218.1383
	5240	5239.4981	5240.9277	5240.3205	5239.9145
-20	5180	5179.7160	5180.2214	5180.0093	5179.7652
	5200	5199.8496	5200.5082	5200.1639	5199.2815
	5220	5219.0594	5220.5941	5220.0924	5219.6499
	5240	5239.9819	5240.5311	5240.1708	5239.2724
-10	5180	5179.6956	5180.0324	5180.1687	5179.7421
	5200	5199.6713	5200.9567	5200.6810	5199.1257
	5220	5219.0281	5220.5209	5220.9241	5219.5508
	5240	5239.4673	5240.8890	5240.1978	5239.2563
0	5180	5179.1778	5180.2469	5180.1335	5179.6166
	5200	5199.4964	5200.4607	5200.7379	5199.6923
	5220	5219.7545	5220.1243	5220.1441	5219.0988
	5240	5239.8939	5240.5167	5240.2641	5239.2915
10	5180	5179.9175	5180.3103	5180.7519	5179.6951
	5200	5199.9757	5200.2965	5200.3441	5199.7981
	5220	5219.1842	5220.5516	5220.9951	5219.6324
	5240	5239.7821	5240.4659	5240.6788	5239.6137
20	5180	5179.8757	5180.5933	5180.4354	5179.3937
	5200	5199.7600	5200.0951	5200.4070	5199.0719
	5220	5219.6470	5220.7424	5220.0644	5219.5326
	5240	5239.3845	5240.8903	5240.2966	5239.9464
30	5180	5179.4710	5180.3628	5180.9513	5179.2656
	5200	5199.2407	5200.8897	5200.0677	5199.3508
	5220	5219.1603	5220.6165	5220.2127	5219.5197
	5240	5239.8673	5240.8452	5240.6801	5239.1208
40	5180	5179.5048	5180.5264	5180.5499	5179.7747
	5200	5199.2760	5200.5898	5200.3332	5199.4975
	5220	5219.3765	5220.5453	5220.3284	5219.5965
	5240	5239.4021	5240.9842	5240.8549	5239.7327
50	5180	5179.5141	5180.6348	5180.4159	5179.9996
	5200	5199.7912	5200.7590	5200.1489	5199.1715
	5220	5219.5488	5220.5544	5220.2053	5219.7880
	5240	5239.6901	5240.8262	5240.0325	5239.7341

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	5181.9405	5183.6365	5176.4237	5176.4957
	5200	5200.2423	5201.8033	5196.0494	5198.0987
	5220	5220.5560	5220.4638	5219.6945	5218.2911
	5240	5240.1855	5240.8628	5239.3151	5238.8381
3.7	5180	5180.0602	5180.8091	5179.8900	5178.2300
	5200	5200.2859	5200.0410	5199.3260	5199.4867
	5220	5220.7053	5220.5787	5219.3038	5219.3808
	5240	5240.2872	5240.1609	5239.7310	5239.7550
4.1	5180	5180.6117	5180.5596	5179.7027	5179.1133
	5200	5200.7531	5200.1563	5199.9949	5199.1541
	5220	5220.6899	5220.9832	5219.6855	5219.6960
	5240	5240.8683	5240.0036	5239.7118	5239.4515

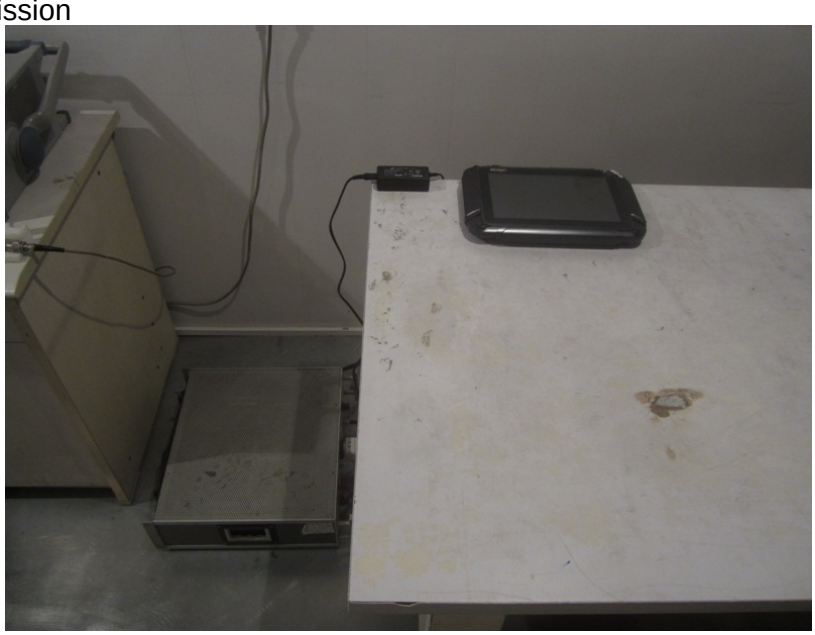
6 Test Setup Photo

Radiated Emission



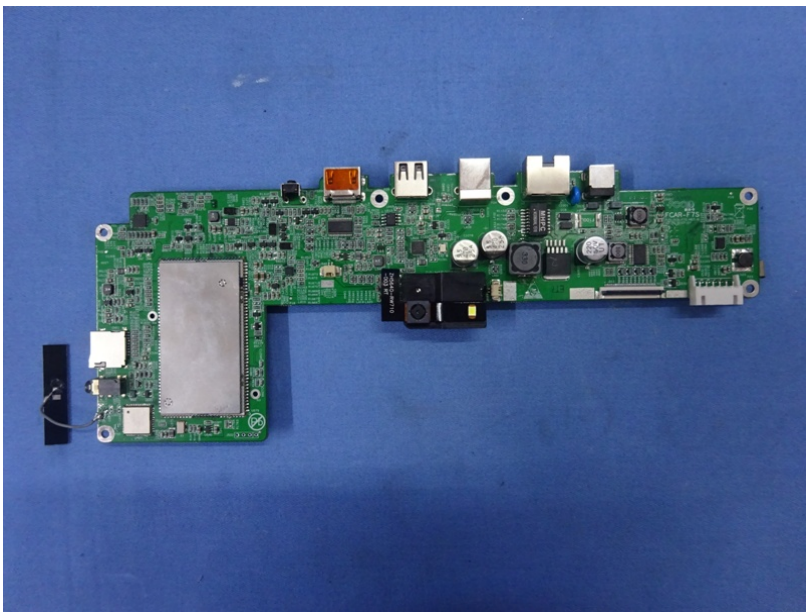


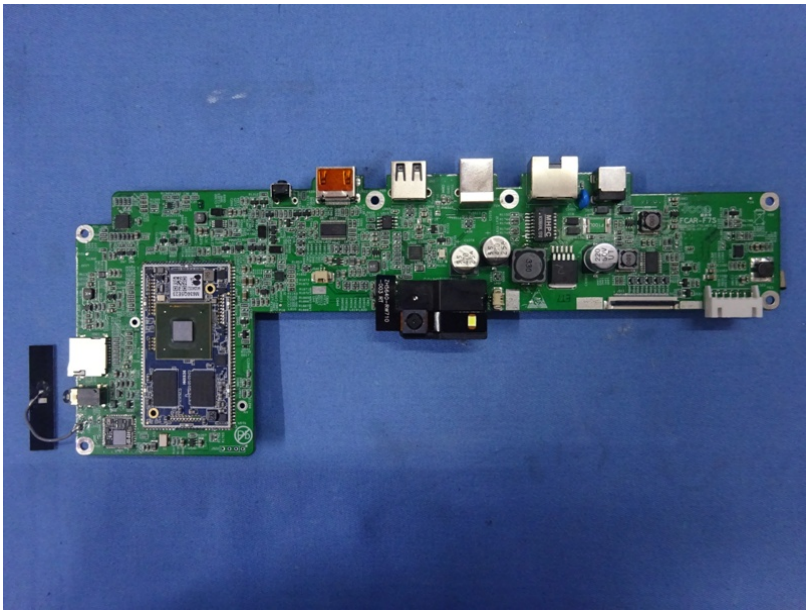
Conducted Emission

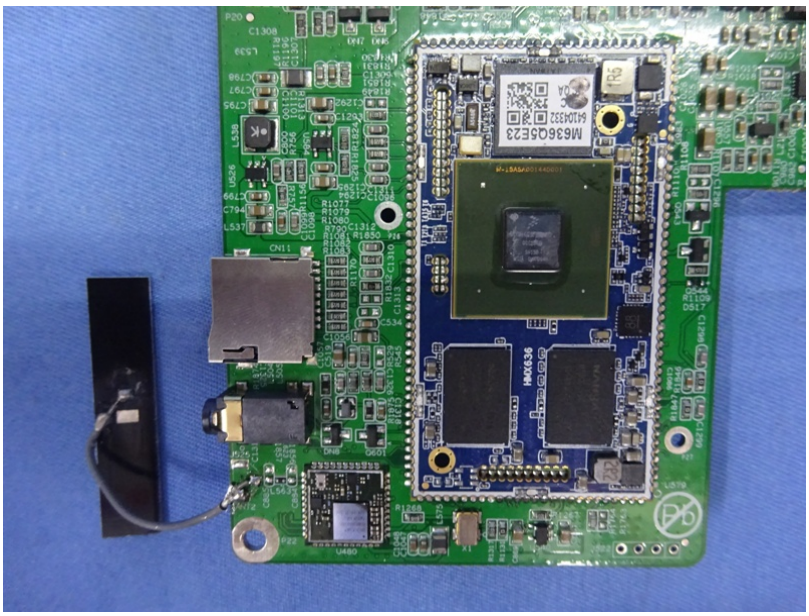


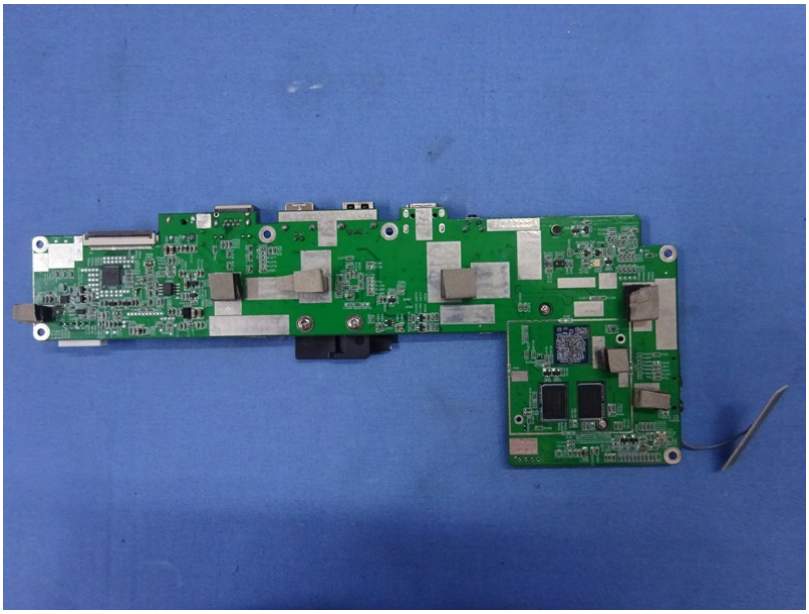
7 EUT Constructional Details

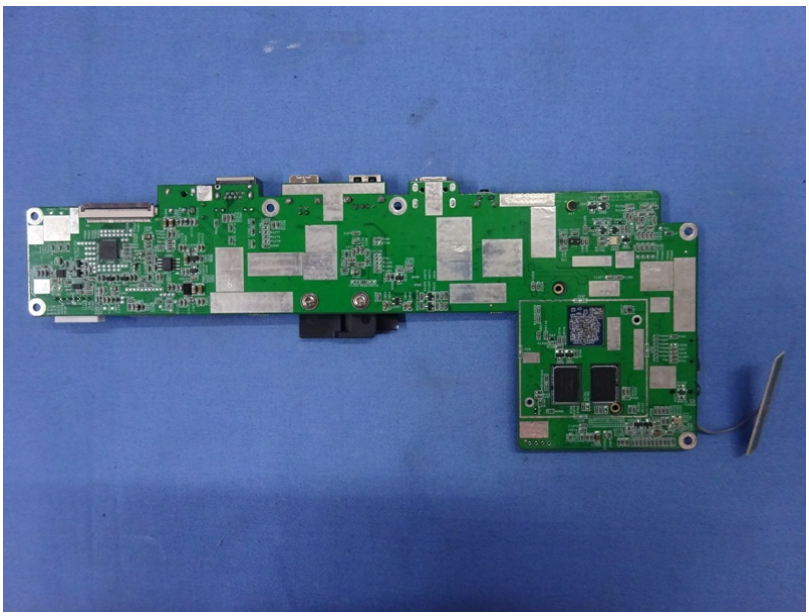

AUTO DIAGNOSTIC TOOL
MODEL
F7S series
S/N
Warning

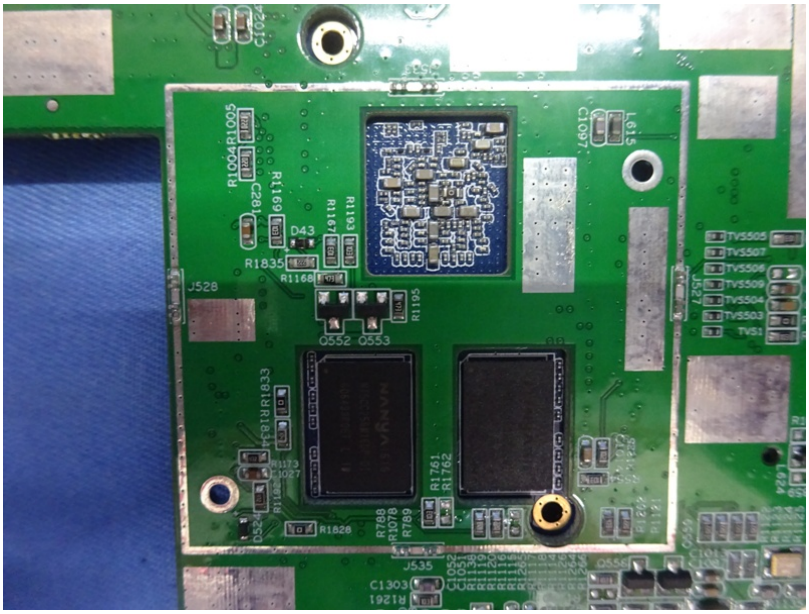


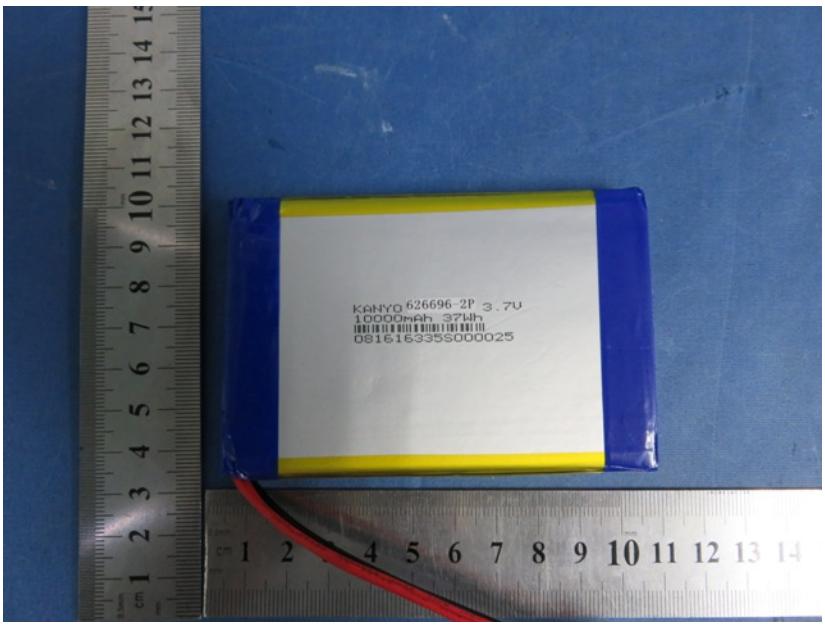











KANYO 626696-2P 3.7V
10000mAh 37Wh
0816163355000025


SWITCHING POWER ADAPTER
MODEL:GME36A-120300FDS
INPUT:100-240V~50-60Hz 1.2A
OUTPUT:12V 3A
A.V. POWER SUPPLY
Efficiency Level: VI
LISTED
E251844
23EZ
MADE IN CHINA
1605- 0002001

---END---