Report No.: GTSE14090167502

FCC REPORT

Applicant:	Autel Intelligent Tech. Corp., Ltd.
Address of Applicant:	6th - 10th Floor, Building B1, Zhiyuan, xueyuan road, Xili, Nanshan, Shenzhen, China

Equipment Under Test (EUT)

Product Name:	AUTOMOTIVE DIAGNOSTIC &ANALYSIS SYSTEM
Model No.:	MaxiSys Elite
Trade mark:	AUTEL
FCC ID:	WQ8MAXISYSELITE
Applicable standards:	FCC CFR Title 47 Part 15 Subpart C Section 15.407:2013
Date of sample receipt:	September 30, 2014
Date of Test:	October 10-29, 2014
Date of report issue:	October 31, 2014
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	*October 31, 2014*	*Original*

Prepared By: Edward.Pan ***Date:*** *October 31, 2014*

Project Engineer

Check By: hank.yan ***Date:*** *October 31, 2014*

Reviewer

3 Contents

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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
Peak Excursion	15.407(a)(6)	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.

Fail: The EUT does not comply with the essential requirements in the standard.

5 General Information

5.1 Client Information

Applicant:	Autel Intelligent Tech. Corp., Ltd.
Address of Applicant:	6th - 10th Floor, Building B1, Zhiyuan, xueyuan road, Xili, Nanshan, Shenzhen, China
Manufacturer/ Factory:	Autel Intelligent Tech. Corp., Ltd.
Address of Manufacturer	6th - 10th Floor, Building B1, Zhiyuan, xueyuan road, Xili, Nanshan, Shenzhen, China

5.2 General Description of EUT

Product Name:	AUTOMOTIVE DIAGNOSTIC &ANALYSIS SYSTEM
Model No.:	MaxiSys Elite
Operation Frequency:	802.11a/802.11n(HT20)/802.11ac(HT20): 5180MHz ~ 5240MHz; 802.11n(HT40)/ 802.11ac(HT40): 5190MHz ~ 5230MHz 802.11ac(HT80): 5210MHz
Channel numbers:	802.11a/802.11n(HT20)/802.11ac(HT20): 4; 802.11n(HT40)/ 802.11ac(HT40): 2 802.11ac(HT80): 1
Channel separation:	802.11a/802.11n(HT20)/802.11ac(HT20): 20MHz; 802.11n(HT40)/ 802.11ac(HT40): 40MHz 802.11ac(HT80): 80MHz
Modulation technology:	OFDM
Antenna Type:	Integral Antenna
Antenna gain:	0.85dBi (declare by Applicant)
Power supply:	AC-DC Power Supply: Model No.:EGTSA36-120300T6I Input: AC 100~240V~50/60Hz 1.0A Output: DC 12.0V 3.0A Or DC 3.7V 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:

● **CNAS —Registration No.: CNAS L5775**

CNAS has accredited Global United Technology Services Co., Ltd. To ISO/IEC 17025 General Requirements for the competence of testing and calibration laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

● **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 28, 2013.

● **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, June 26, 2013.

5.5 Test Location

All tests were performed at:

Global United Technology Services Co., Ltd.

Address: 2nd Floor, Block No.2, Laodong Industrial Zone, Xixiang Road Baoan District, Shenzhen, China

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	Mar. 29 2013	Mar. 28 2015
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	July 01 2014	June 30 2015
4	Spectrum analyzer	Agilent	E4447A	GTS516	July 01 2014	June 30 2015
5	Spectrum Analyzer	Agilent	E4440A	GTS533	Nov. 20 2013	Nov. 19 2014
6	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	Feb. 23 2014	Feb. 22 2015
7	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	9120D-829	GTS208	July 01 2014	June 30 2015
8	Horn Antenna	ETS-LINDGREN	3160	GTS217	Mar. 29 2014	Mar. 28 2015
9	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
10	Coaxial Cable	GTS	N/A	GTS213	Mar. 29 2014	Mar. 28 2015
11	Coaxial Cable	GTS	N/A	GTS211	Mar. 29 2014	Mar. 28 2015
12	Coaxial cable	GTS	N/A	GTS210	Mar. 29 2014	Mar. 28 2015
13	Coaxial Cable	GTS	N/A	GTS212	Mar. 29 2014	Mar. 28 2015
14	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	July 01 2014	June 30 2015
15	Amplifier(2GHz-20GHz)	HP	8349B	GTS206	July 01 2014	June 30 2015
16	Amplifier (18-40GHz)	MITEQ	AMF-6F-18004000-29-8P	GTS534	July 01 2014	June 30 2015
17	Band filter	Amindeon	82346	GTS219	Mar. 29 2014	Mar. 28 2015
18	Constant temperature and humidity box	Oregon Scientific	BA-888	GTS248	Mar. 29 2014	Mar. 28 2015
19	D.C. Power Supply	Instek	PS-3030	GTS232	Mar. 29 2014	Mar. 28 2015
20	Universal radio communication tester	Rohde & Schwarz	CMU200	GTS235	Mar. 29 2014	Mar. 28 2015
21	Splitter	Agilent	11636B	GTS237	Mar. 29 2014	Mar. 28 2015
22	Power Meter	Anritsu	ML2495A	GTS540	July 01 2014	June 30 2015
23	Power Sensor	Anritsu	MA2411B	GTS541	July 01 2014	June 30 2015

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	7.0(L)x3.0(W)x3.0(H)	GTS264	July 01 2014	June 30 2015
2	EMI Test Receiver	Rohde & Schwarz	ESCS30	GTS223	July 01 2014	June 30 2015
3	10dB Pulse Limita	Rohde & Schwarz	N/A	GTS224	July 01 2014	June 30 2015
4	Coaxial Switch	ANRITSU CORP	MP59B	GTS225	July 01 2014	June 30 2015
5	LISN	SCHWARZBECK MESS-ELEKTRONIK	NSLK 8127	GTS226	July 01 2014	June 30 2015
6	Coaxial Cable	GTS	N/A	GTS227	July 01 2014	June 30 2015
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A

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	July 08 2014	July 07 2015

5 Test results and Measurement Data

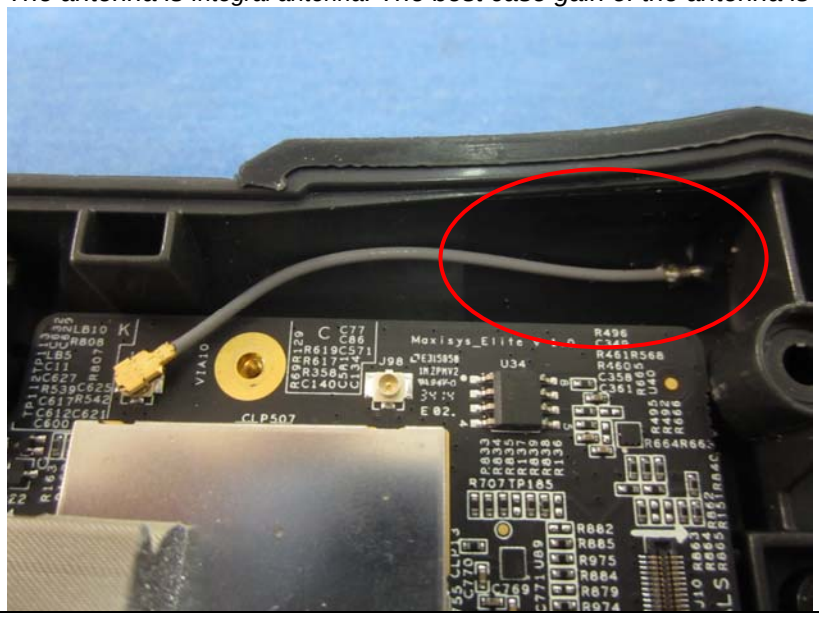
5.1 Antenna requirement:

Standard requirement:	FCC Part15 C Section 15.203

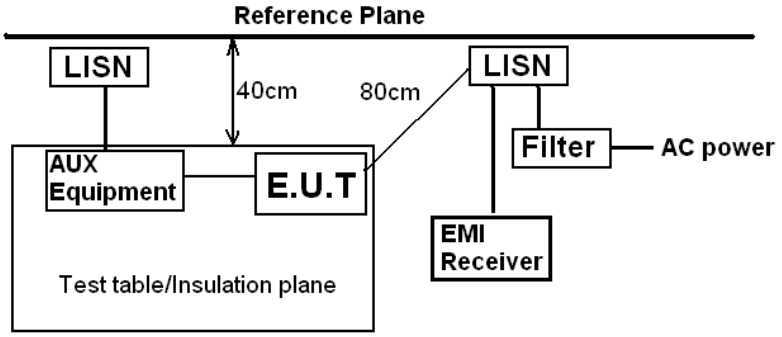
15.203 requirement:
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer 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 0.85dBi.



5.2 Conducted Emissions

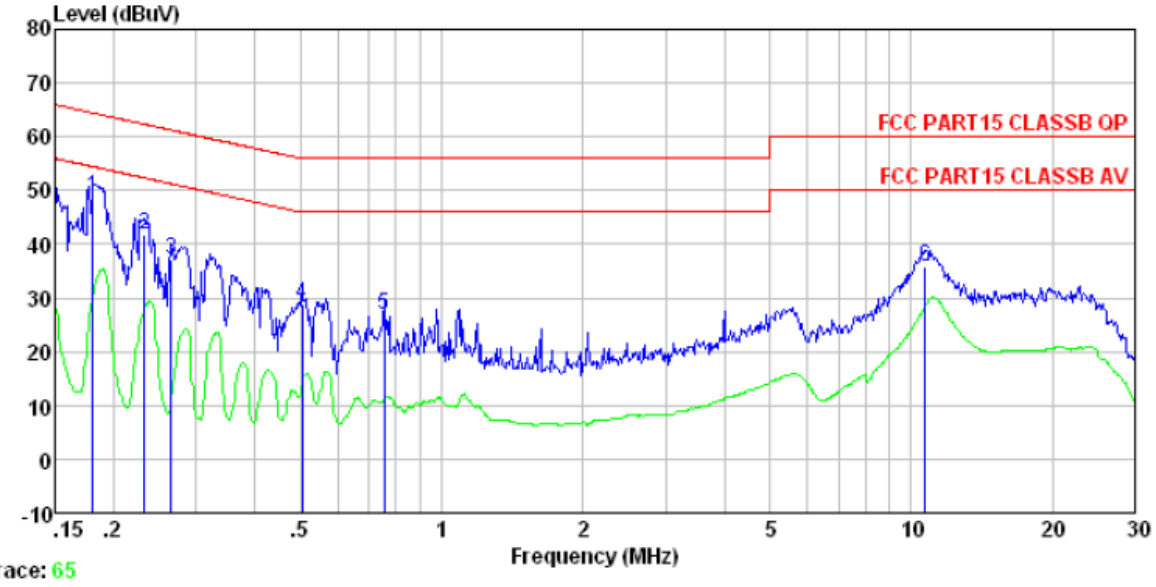
<table>
<tr><td>Test Requirement:</td><td>FCC Part15 C Section 15.207</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.4: 2003</td></tr>
<tr><td>Test Frequency Range:</td><td>150KHz to 30MHz</td></tr>
<tr><td>Class / Severity:</td><td>Class B</td></tr>
<tr><td>Receiver setup:</td><td>RBW=9KHz, VBW=30KHz</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 C63.4: 2003 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 4.7 for details</td></tr>
<tr><td>Test mode:</td><td>Refer to section 4.3 for details. All of list mode were tested, and found the 802.11n(HT40) mode as the worst case. Only the data of worst case is reported.</td></tr>
<tr><td>Test results:</td><td>Pass</td></tr>
</table>

Measurement Data

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

Line:

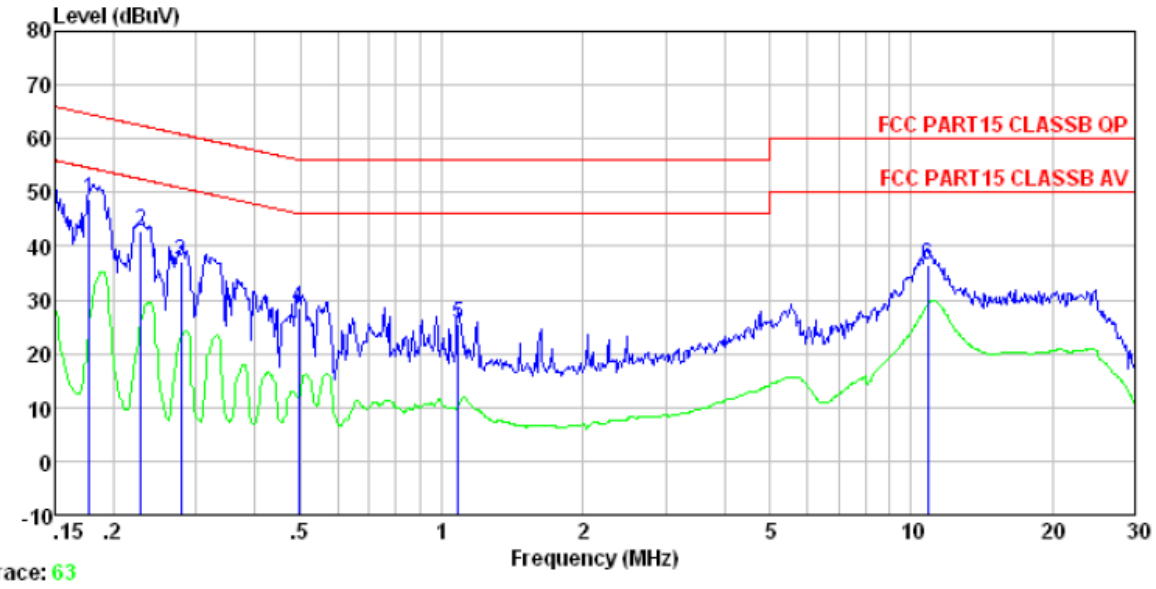


Trace: 65

Condition : FCC PART15 CLASSB QP LISN-2013 LINE
Job No. : 1675RF
Test mode : WiFi mode(5G)
Test Engineer: Mike

	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.181	48.40	0.14	0.13	48.67	64.46	-15.79	QP
2	0.233	41.45	0.12	0.12	41.69	62.35	-20.66	QP
3	0.266	37.03	0.11	0.11	37.25	61.25	-24.00	QP
4	0.505	28.66	0.12	0.11	28.89	56.00	-27.11	QP
5	0.755	26.73	0.14	0.13	27.00	56.00	-29.00	QP
6	10.733	35.26	0.32	0.19	35.77	60.00	-24.23	QP

Neutral:

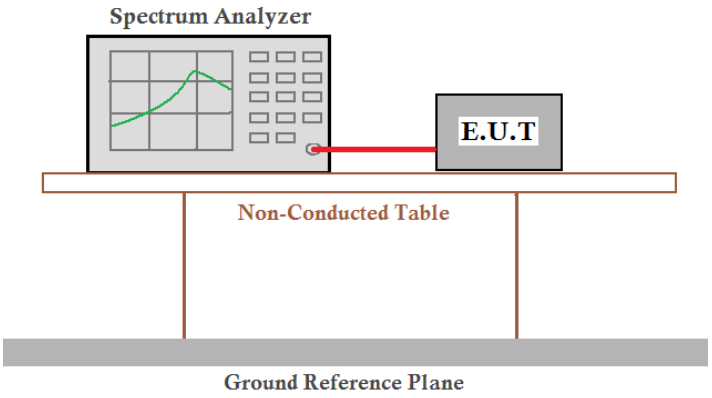


Trace: 63

Condition : FCC PART15 CLASSB QP LISN-2013 NEUTRAL
Job No. : 1675RF
Test mode : WiFi mode(5G)
Test Engineer: Mike

	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.178	48.72	0.07	0.13	48.92	64.59	-15.67	QP
2	0.229	42.65	0.06	0.12	42.83	62.48	-19.65	QP
3	0.279	36.89	0.06	0.10	37.05	60.85	-23.80	QP
4	0.497	28.41	0.06	0.11	28.58	56.05	-27.47	QP
5	1.082	25.43	0.08	0.13	25.64	56.00	-30.36	QP
6	10.847	35.99	0.27	0.19	36.45	60.00	-23.55	QP

5.3 Emission Bandwidth and 99% Occupied Bandwidth

Test Requirement:	FCC Part15 E Section 15.407
Test Method:	KDB 789033 D01 General UNII Test Procedures Old Rules v01r04
Limit:	N/A
Test setup:	
Test procedure:	According to KDB 789033 D01 General UNII Test Procedures Old Rules v01r04 section C and D.
Test Instruments:	Refer to section 4.7 for details
Test mode:	Refer to section 4.3 for details
Test results:	Pass

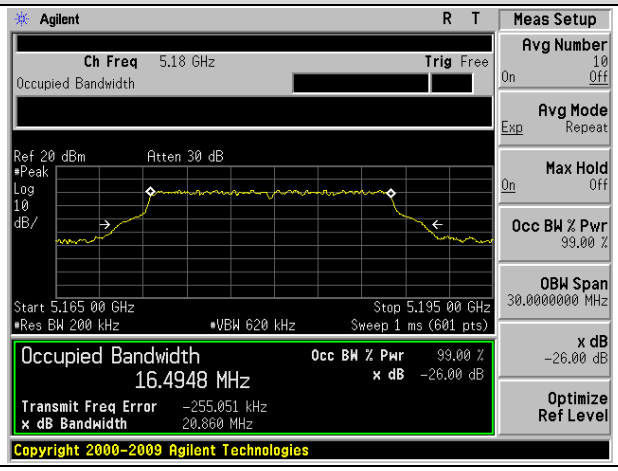
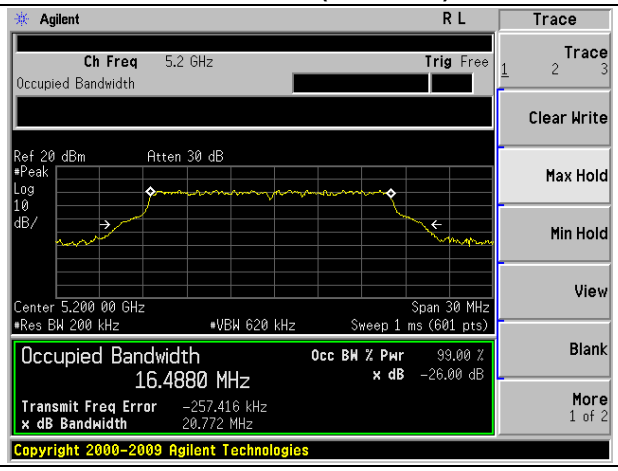
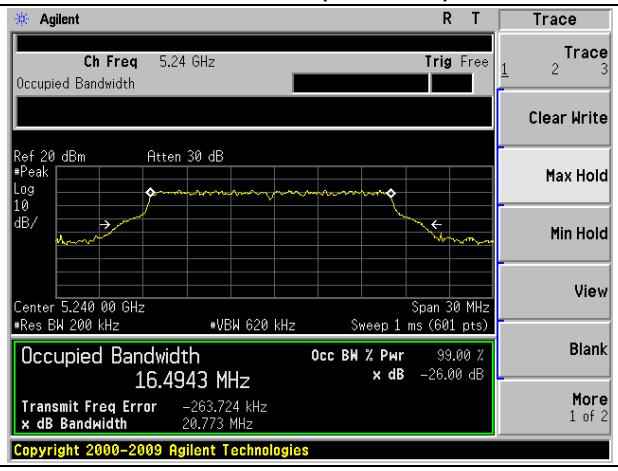
Measurement Data:

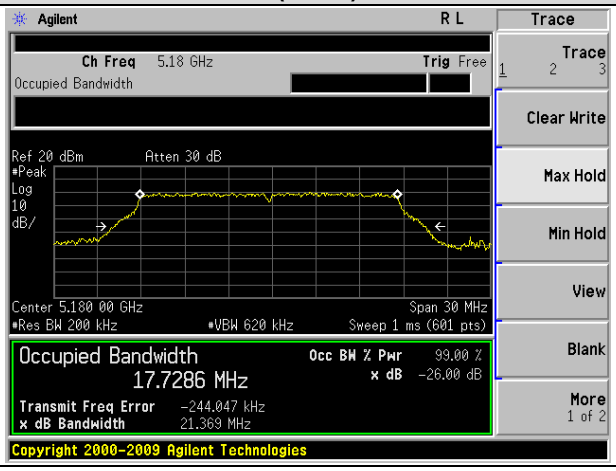
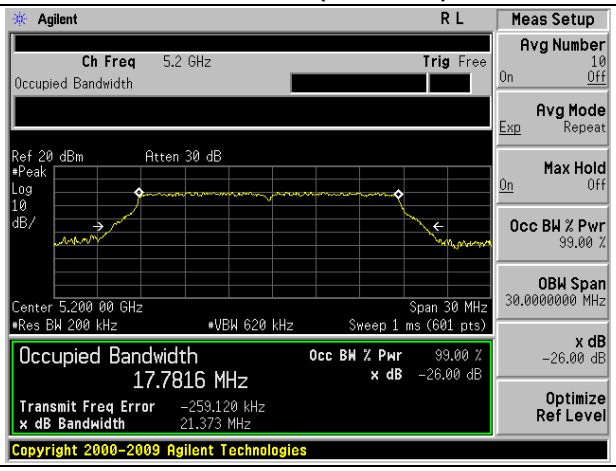
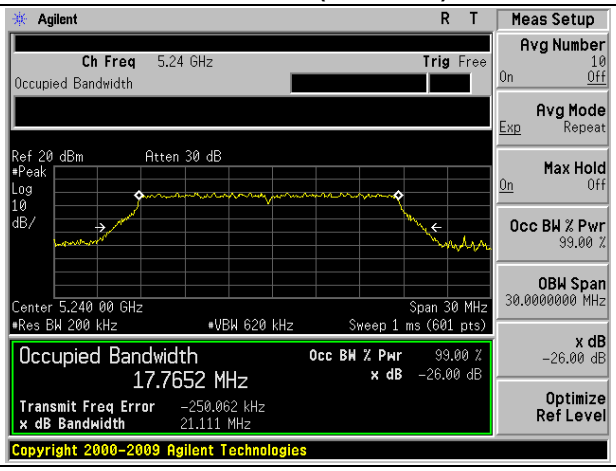
CH. No.	Frequency (MHz)	26dB Occupied Bandwidth (MHz)			99% Occupied Bandwidth (MHz)		
		802.11a	802.11n(HT 20)	802.11ac(HT20)	802.11a	802.11n(HT 20)	802.11ac(HT20)
36	5180.00	20.860	21.369	21.303	16.4948	17.7286	17.7975
40	5200.00	20.772	21.373	21.260	16.4880	17.7816	17.7779
48	5240.00	20.773	21.111	21.348	16.4943	17.7652	17.7918

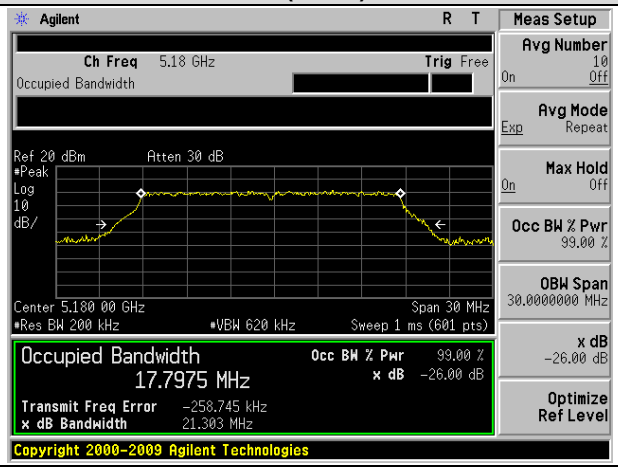
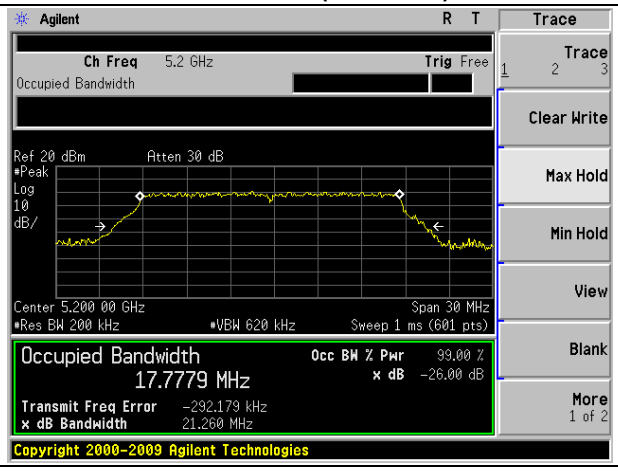
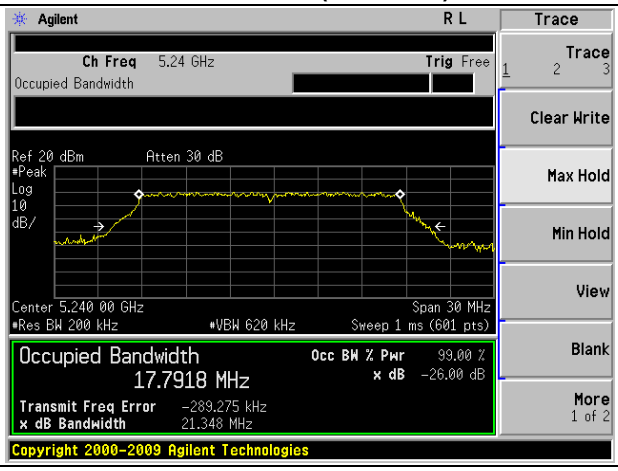
CH. No.	Frequency (MHz)	26dB Occupied Bandwidth (MHz)		99% Occupied Bandwidth (MHz)	
		802.11n(HT40)	802.11ac(HT40)	802.11n(HT40)	802.11ac(HT40)
38	5190.00	39.502	39.966	36.2523	36.3659
46	5230.00	39.834	39.943	36.2625	36.4189

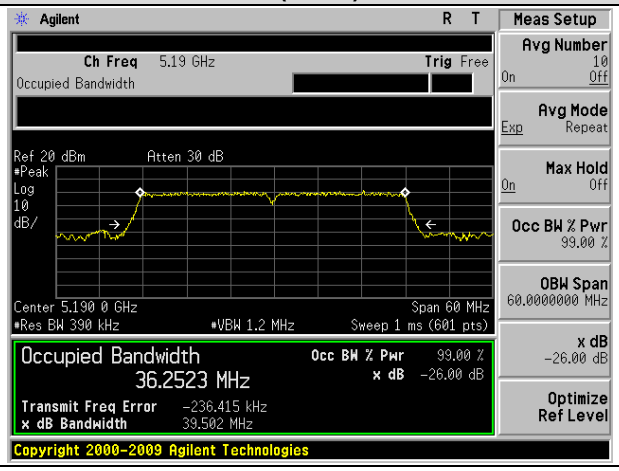
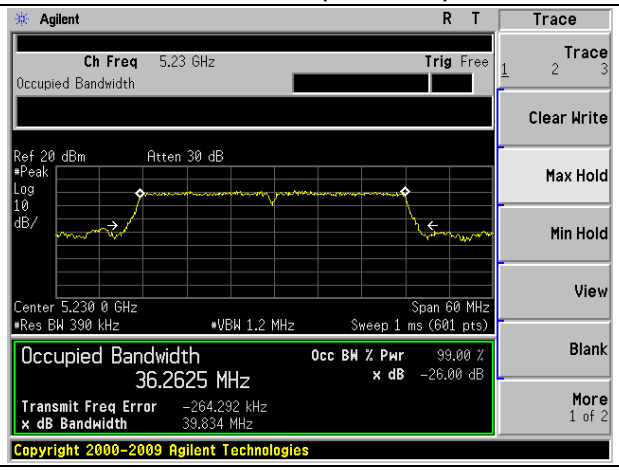
CH. No.	Frequency (MHz)	26dB Occupied Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
		802.11ac(HT80)	802.11ac(HT80)
42	5210.00	80.641	75.6747

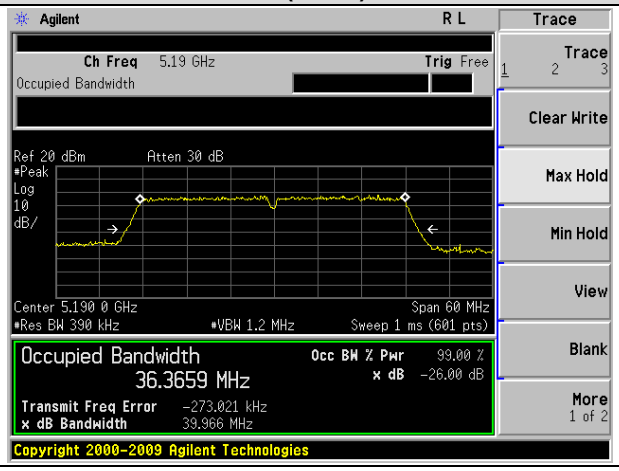
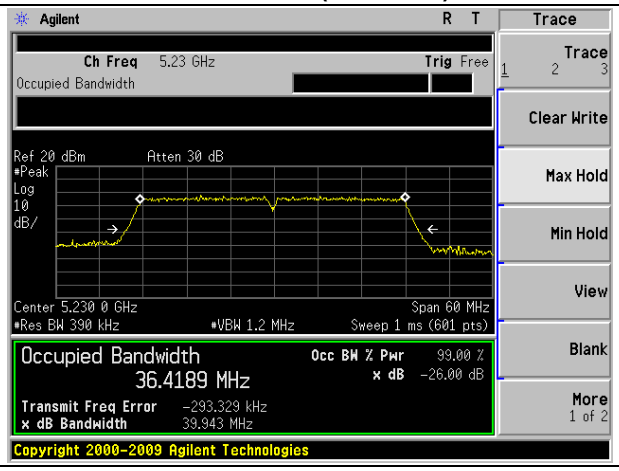
Test plots as followed:

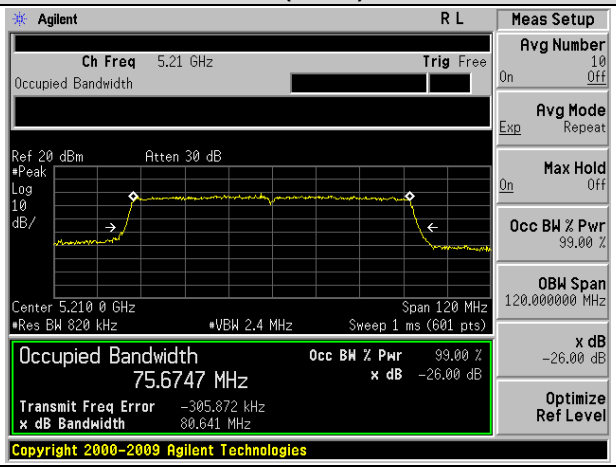
802.11a mode

Channel 36 (5180MHz)

Channel 40 (5200MHz)

Channel 48 (5240MHz)

802.11n(HT20) mode

Channel 36 (5180MHz)

Channel 40 (5200MHz)

Channel 48 (5240MHz)

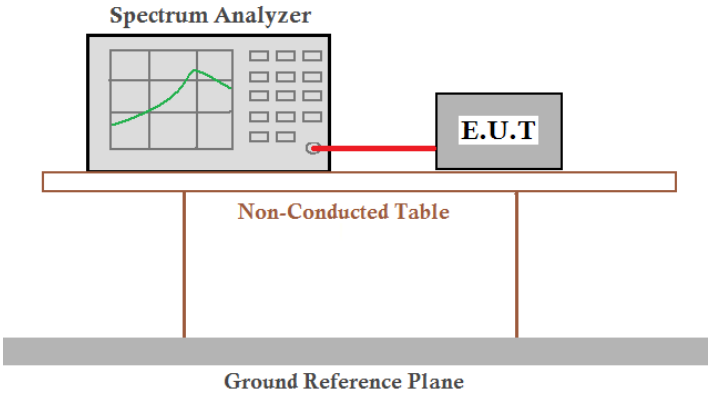
802.11ac(HT20) mode

Channel 36 (5180MHz)

Channel 40 (5200MHz)

Channel 48 (5240MHz)

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 40 (5210MHz)

5.4 Peak Transmit Power

Test Requirement:	FCC Part15 E Section 15.407
Test Method:	ANSI C63.4: 2003 and KDB 789033 D01 General UNII Test Procedures Old Rules v01r04
Limit:	For the band 5.15-5.25 GHz, the peak transmit power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10log B, where B is the -26dB emission bandwidth in MHz.
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 4.7 for details
Test mode:	Refer to section 4.3 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	13.27	0.04	13.31	16.00	Pass
40	5200.00	13.26	0.04	13.30	16.00	Pass
48	5240.00	12.84	0.04	12.88	16.00	Pass

802.11n(HT20) mode						
CH No.	Frequency (MHz)	Measured Power (dBm)	Duty Factor	Output Power (dBm)	Limit (dBm)	Result
36	5180.00	13.40	0.04	13.44	16.00	Pass
40	5200.00	13.23	0.04	13.27	16.00	Pass
48	5240.00	12.97	0.04	13.01	16.00	Pass

802.11ac(HT20) mode						
CH No.	Frequency (MHz)	Measured Power (dBm)	Duty Factor	Output Power (dBm)	Limit (dBm)	Result
36	5180.00	13.24	0.04	13.28	16.00	Pass
40	5200.00	13.17	0.04	13.21	16.00	Pass
48	5240.00	12.81	0.04	12.85	16.00	Pass

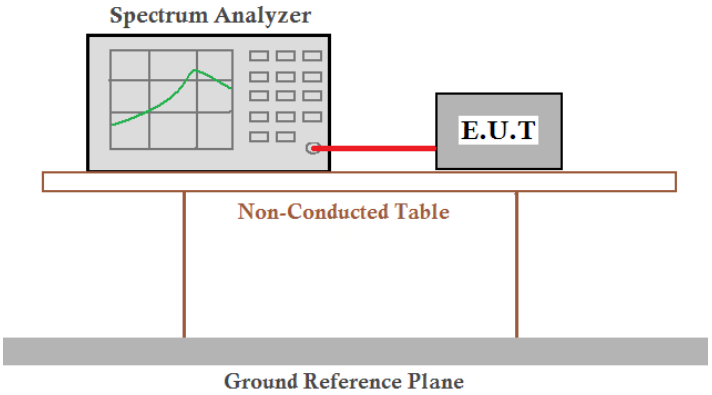
802.11n(HT40) mode						
CH No.	Frequency (MHz)	Measured Power (dBm)	Duty Factor	Output Power (dBm)	Limit (dBm)	Result
38	5190.00	13.90	0.04	13.94	16.00	Pass
46	5230.00	13.56	0.04	13.60	16.00	Pass

802.11ac(HT40) mode						
CH No.	Frequency (MHz)	Measured Power (dBm)	Duty Factor	Output Power (dBm)	Limit (dBm)	Result
38	5190.00	13.57	0.04	13.61	16.00	Pass
46	5230.00	13.45	0.04	13.49	16.00	Pass

802.11ac(HT80) mode						
CH No.	Frequency (MHz)	Measured Power (dBm)	Duty Factor	Output Power (dBm)	Limit (dBm)	Result
42	5210.00	13.25	0.04	13.29	16.00	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:	ANSI C63.4: 2003 and KDB 789033 D01 General UNII Test Procedures Old Rules v01r04
Limit:	4dBm
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 4.7 for details
Test mode:	Refer to section 4.3 for details
Test results:	Pass

Measurement Data

802.11a mode					
Channel No.	Frequency (MHz)	Measured PPSD (dBm/MHz)	Total PPSD (dBm/MHz)	Limit (dBm/MHz)	Result
36	5180.00	0.327	0.367	3.00	Pass
40	5200.00	0.442	0.482	3.00	Pass
48	5240.00	0.062	0.102	3.00	Pass

802.11n(HT20) mode					
Channel No.	Frequency (MHz)	Measured PPSD (dBm/MHz)	Total PPSD (dBm/MHz)	Limit (dBm/MHz)	Result
36	5180.00	-1.988	-1.948	3.00	Pass
40	5200.00	-1.866	-1.826	3.00	Pass
48	5240.00	-2.186	-2.146	3.00	Pass

802.11ac(HT20) mode					
Channel No.	Frequency (MHz)	Measured PPSD (dBm/MHz)	Total PPSD (dBm/MHz)	Limit (dBm/MHz)	Result
36	5180.00	-1.542	-1.502	3.00	Pass
40	5200.00	-1.533	-1.493	3.00	Pass
48	5240.00	-1.674	-1.634	3.00	Pass

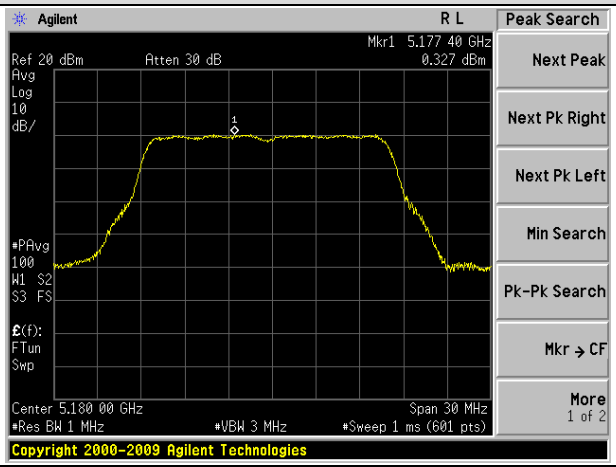
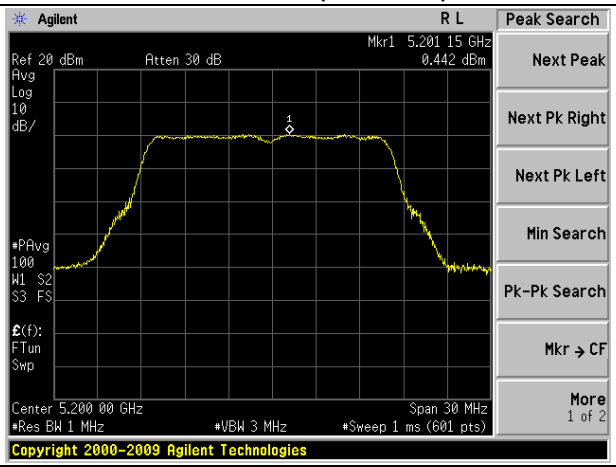
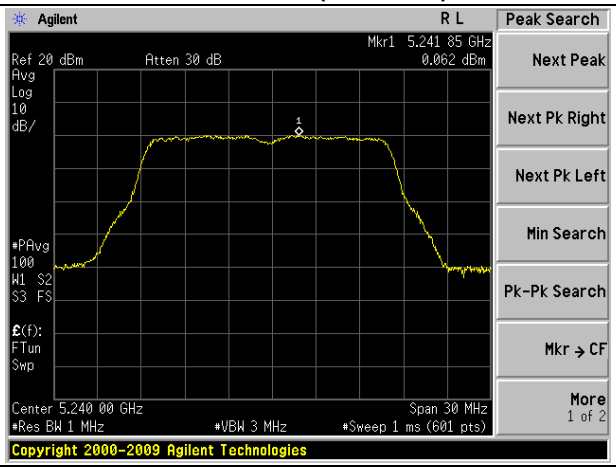
802.11n(HT40) mode					
Channel No.	Frequency (MHz)	Measured PPSD (dBm/MHz)	Total PPSD (dBm/MHz)	Limit (dBm/MHz)	Result
38	5190.00	-4.154	-4.114	3.00	Pass
46	5230.00	-4.430	-4.390	3.00	Pass

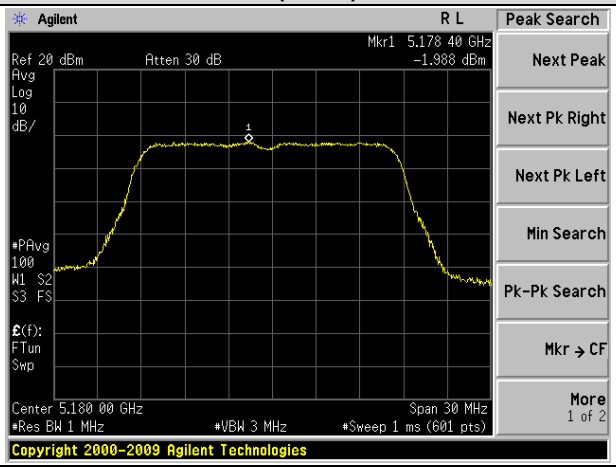
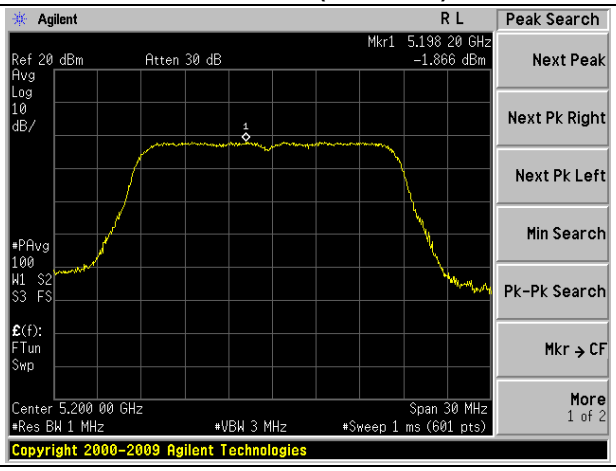
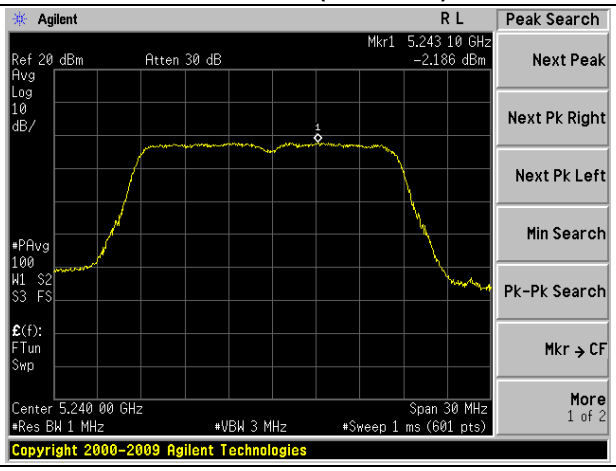
802.11ac(HT40) mode					
Channel No.	Frequency (MHz)	Measured PPSD (dBm/MHz)	Total PPSD (dBm/MHz)	Limit (dBm/MHz)	Result
38	5190.00	-7.981	-7.941	3.00	Pass
46	5230.00	-8.215	-8.175	3.00	Pass

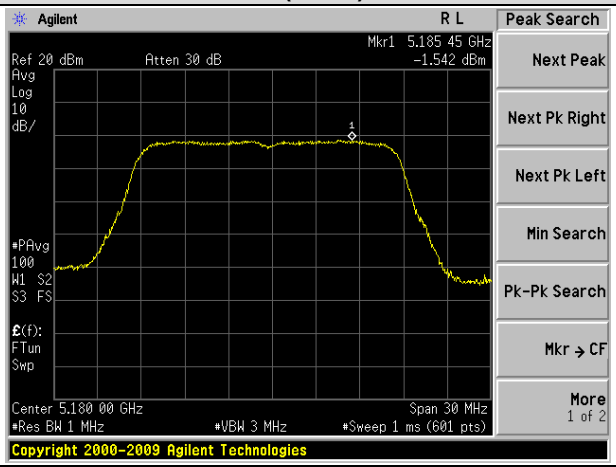
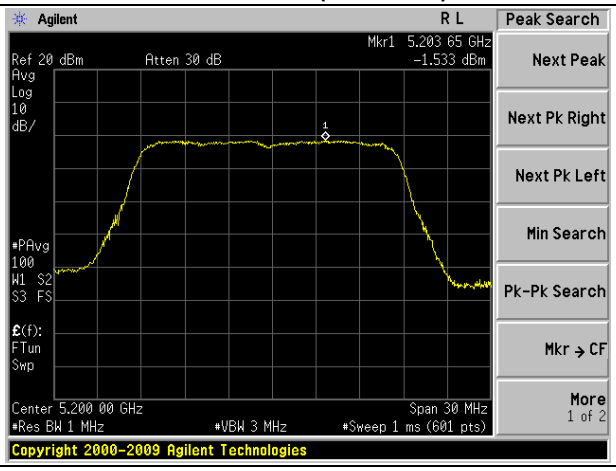
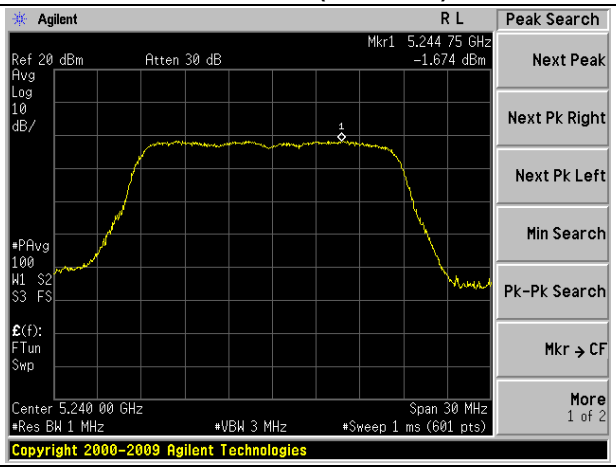
802.11ac(HT80) mode					
Channel No.	Frequency (MHz)	Measured PPSD (dBm/MHz)	Total PPSD (dBm/MHz)	Limit (dBm/MHz)	Result
42	5210.00	-11.546	-11.506	3.00	Pass

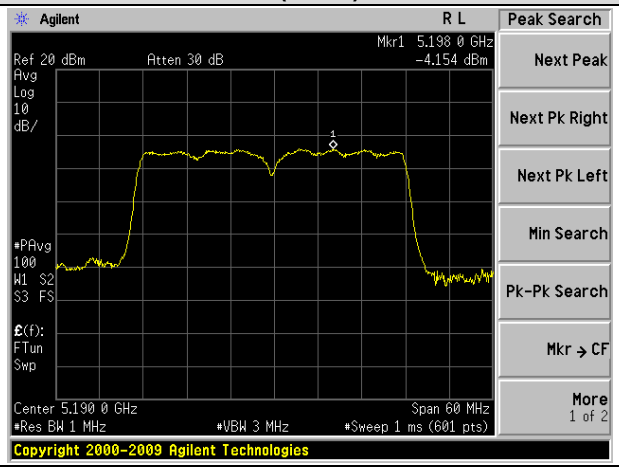
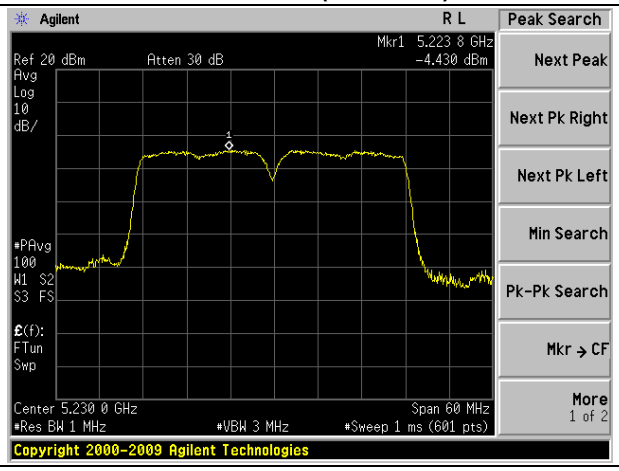
Note: Total PPSD = Measured PPSD + 10 log (1/Duty Cycle)

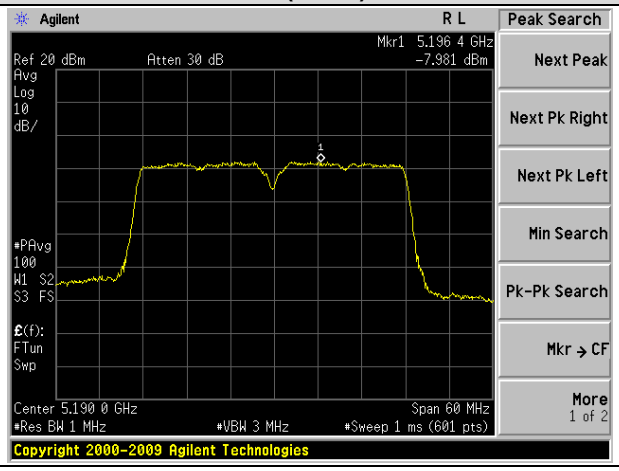
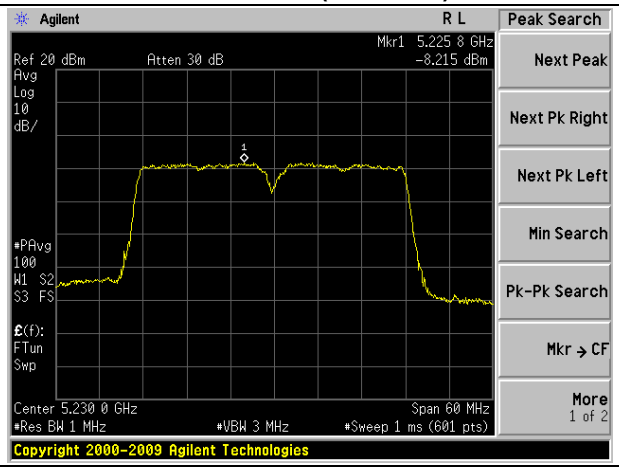
Test plots as followed:

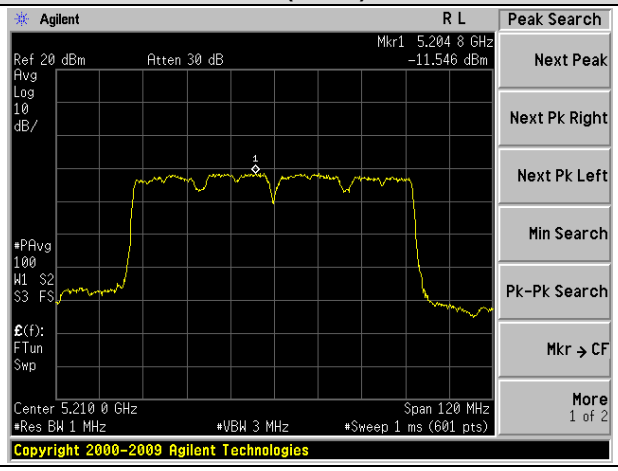
802.11a mode

Channel 36 (5180MHz)

Channel 40 (5200MHz)

Channel 48 (5240MHz)

802.11n(HT20) mode

Channel 36 (5180MHz)

Channel 40 (5200MHz)

Channel 48 (5240MHz)

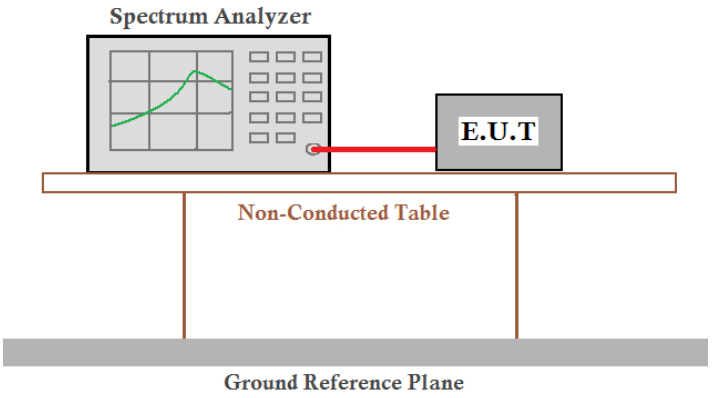
802.11ac(HT20) mode

Channel 36 (5180MHz)

Channel 40 (5200MHz)

Channel 48 (5240MHz)

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 40 (5210MHz)

5.6 Peak Excursion

Test Requirement:	FCC Part15 E Section 15.407
Test Method:	ANSI C63.4: 2003 and KDB 789033 D01 General UNII Test Procedures Old Rules v01r04
Limit:	The ratio of the peak excursion of the modulation envelope (measured suing a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.
Test setup:	
Test procedure:	1) Set the spectrum analyzer or EMI receiver span to view the entire emission bandwidth. 2) Find the maximum of the peak-max-hold spectrum. a) Set RBW = 1 MHz. b) VBW ≥ 3 MHz. c) Detector = peak. d) Trace mode = max-hold. e) Allow the sweeps to continue until the trace stabilizes. f) Use the peak search function to find the peak of the spectrum. 3) Use the procedure found under F) to measure the PPSD. 4) Compute the ratio of the maximum of the peak-max-hold spectrum to the PPSD.
Test Instruments:	Refer to section 4.7 for details
Test mode:	Refer to section 4.3 for details
Test results:	Pass

Measurement Data

802.11a mode							
Channel No.	Frequency (MHz)	Peak Level(dB)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Result
36	5180.00	9.66	0.327	0.04	9.333	13.00	Pass
40	5200.00	9.53	0.442	0.04	9.088	13.00	Pass
48	5240.00	9.03	0.062	0.04	8.968	13.00	Pass

802.11n(HT20) mode							
Channel No.	Frequency (MHz)	Peak Level(dB)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Result
36	5180.00	8.13	-1.988	0.04	10.118	13.00	Pass
40	5200.00	7.51	-1.866	0.04	9.376	13.00	Pass
48	5240.00	7.74	-2.186	0.04	9.926	13.00	Pass

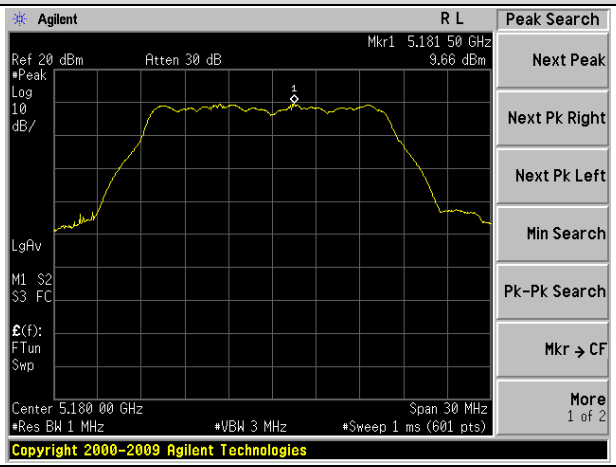
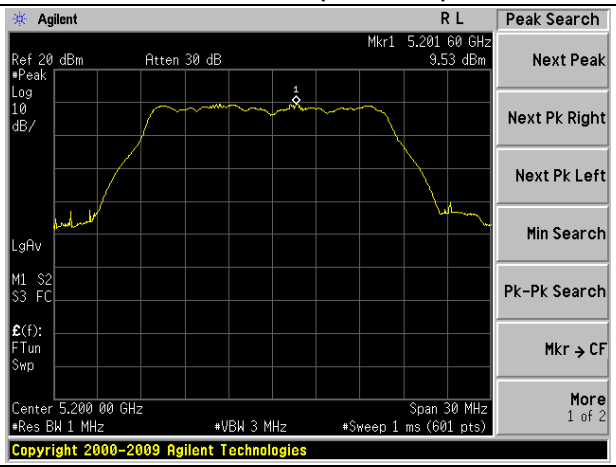
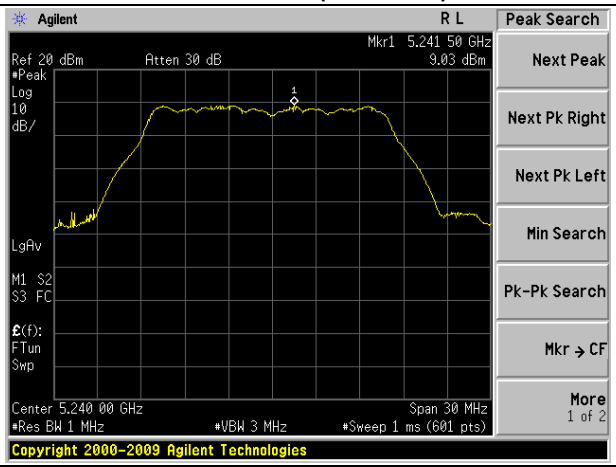
802.11n(HT20) mode							
Channel No.	Frequency (MHz)	Peak Level(dB)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Result
36	5180.00	8.76	-1.542	0.04	10.302	13.00	Pass
40	5200.00	8.73	-1.533	0.04	10.263	13.00	Pass
48	5240.00	8.27	-1.674	0.04	9.944	13.00	Pass

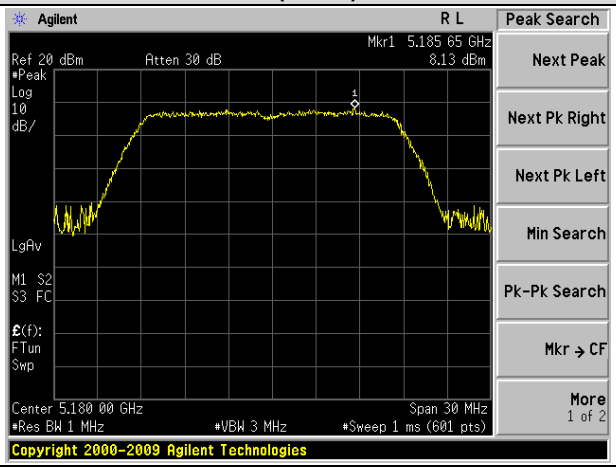
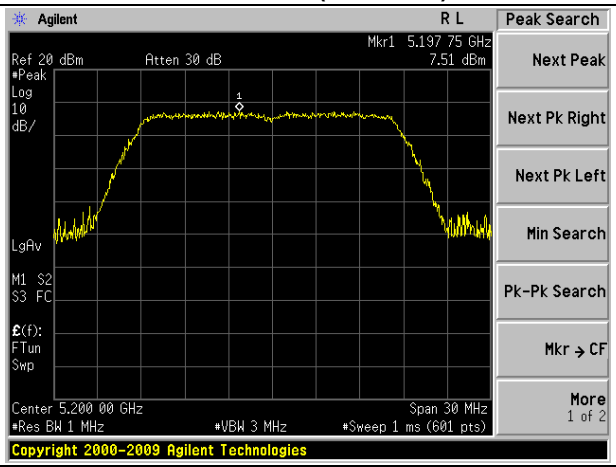
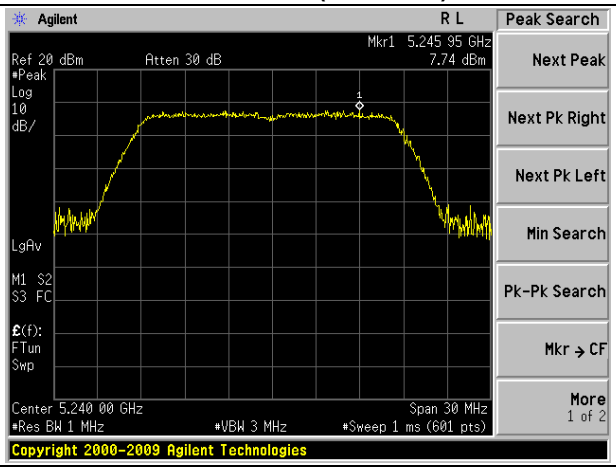
802.11n(HT40) mode							
Channel No.	Frequency (MHz)	Peak Level(dB)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Result
38	5190.00	6.71	-4.154	0.04	10.864	13.00	Pass
46	5230.00	5.08	-4.430	0.04	9.510	13.00	Pass

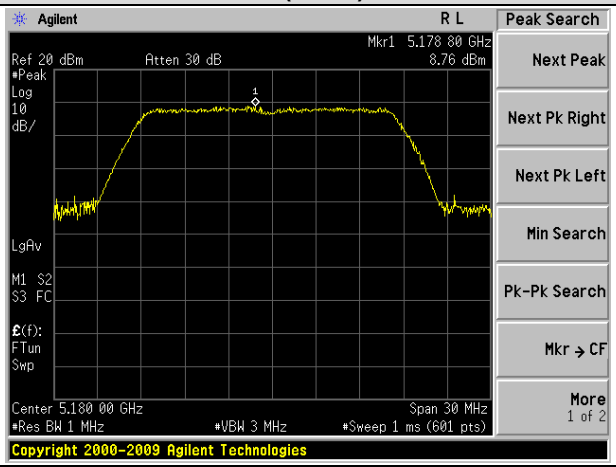
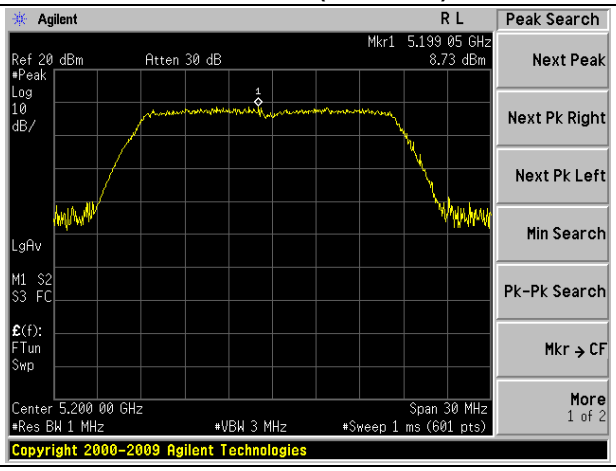
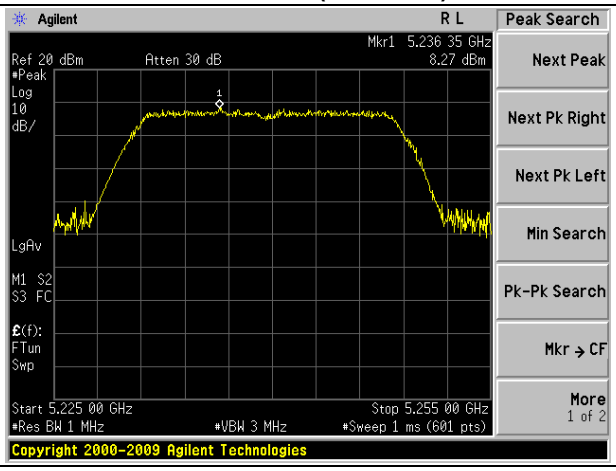
802.11n(HT40) mode							
Channel No.	Frequency (MHz)	Peak Level(dB)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Result
38	5190.00	3.20	-7.981	0.04	11.181	13.00	Pass
46	5230.00	2.40	-8.215	0.04	10.615	13.00	Pass

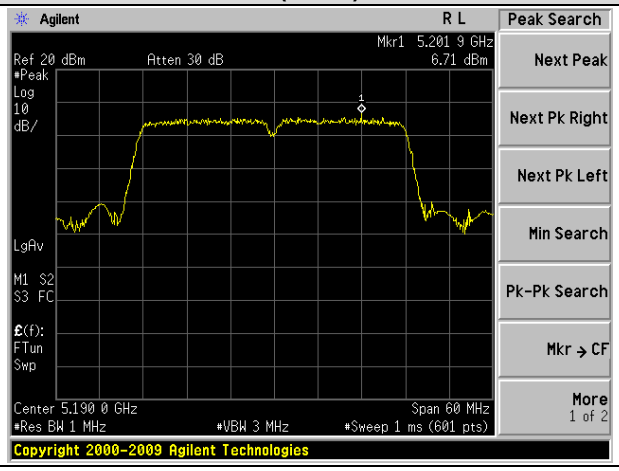
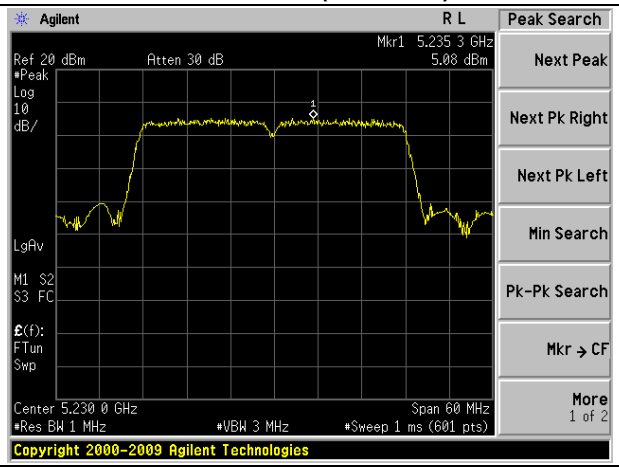
802.11n(HT40) mode							
Channel No.	Frequency (MHz)	Peak Level(dB)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Result
42	5210.00	-0.28	-11.546	0.04	11.266	13.00	Pass

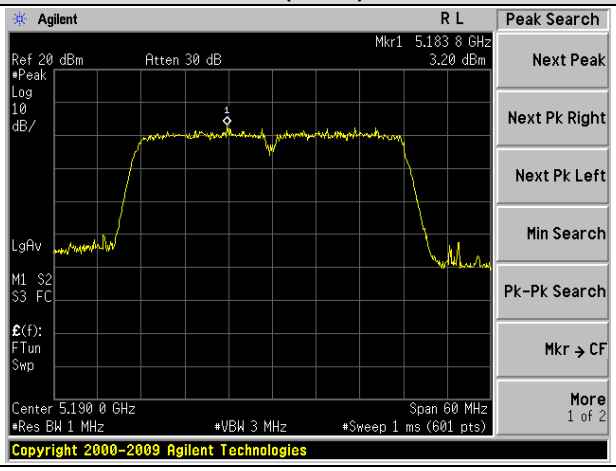
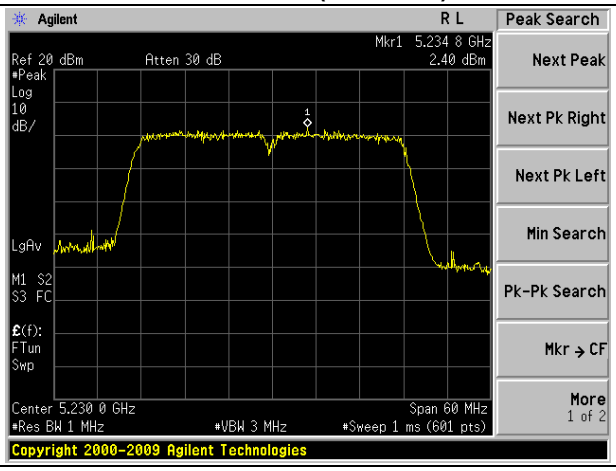
Test plots as followed:

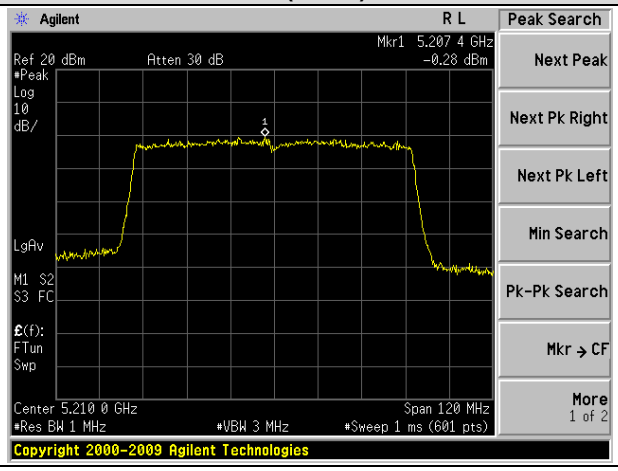
802.11a mode

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)

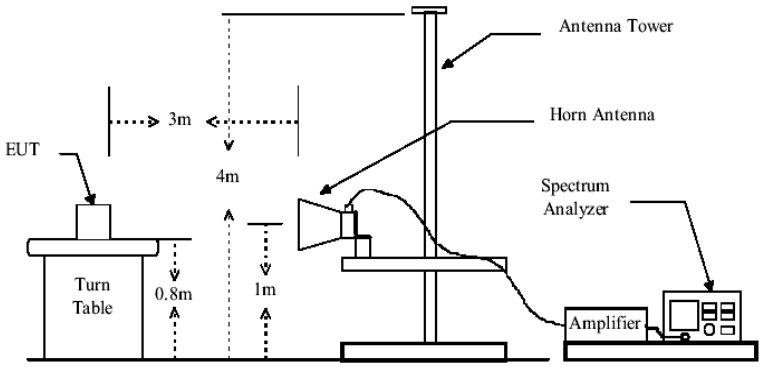
802.11n(HT40) mode

Channel 38 (5190MHz)

Channel 46 (5230MHz)

802.11ac(HT40) mode

Channel 38 (5190MHz)

Channel 46 (5230MHz)

802.11ac(HT80) mode

Channel 40 (5210MHz)

5.7 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 C63.4: 2003</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 0.8 meters above the ground at a 3 meter semi-anechoic 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
</td></tr>
</table>

	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 4.7 for details
Test mode:	Refer to section 4.3 for details
Test results:	Pass

Remark:

According to KDB 789033 v01r03 section H) d) (ii), 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	Factor	Measure Level	Limit (dBuV/m)	Margin (dB)	Detector
H	5150.00	40.77	17.18	57.95	68.20	-10.25	PK
H	5178.00	81.18	17.16	98.34	N/A	N/A	PK
V	5150.00	42.61	17.18	59.79	68.20	-8.41	PK
V	5178.00	88.06	17.16	105.22	N/A	N/A	PK

Mode:		802.11a		Frequency:		5180MHz	
Antenna Pol.	Frequency (MHz)	Reading Level	Factor	Measure Level	Limit (dBuV/m)	Margin (dB)	Detector
H	5150.00	30.70	17.18	47.88	54.00	-6.12	AV
H	5178.00	72.47	17.16	89.63	N/A	N/A	AV
V	5150.00	32.51	17.18	49.69	54.00	-4.31	AV
V	5178.00	79.84	17.16	97.00	N/A	N/A	AV

Mode:		802.11a		Frequency:		5240MHz	
Antenna Pol.	Frequency (MHz)	Reading Level	Factor	Measure Level	Limit (dBuV/m)	Margin (dB)	Detector
H	5237.94	80.43	17.11	97.54	N/A	N/A	PK
H	5350.00	37.56	17.20	54.76	68.20	-13.44	PK
V	5237.94	87.38	17.11	104.49	N/A	N/A	PK
V	5350.00	38.24	17.20	55.44	68.20	-12.76	PK

Mode:		802.11a		Frequency:		5240MHz	
Antenna Pol.	Frequency (MHz)	Reading Level	Factor	Measure Level	Limit (dBuV/m)	Margin (dB)	Detector
H	5237.94	72.03	17.11	89.14	N/A	N/A	AV
H	5350.00	28.37	17.20	45.57	54.00	-8.43	AV
V	5237.94	78.36	17.11	95.47	N/A	N/A	AV
V	5350.00	29.64	17.20	46.84	54.00	-7.16	AV

Mode:		802.11n(HT20)		Frequency:		5180MHz	
Antenna Pol.	Frequency (MHz)	Reading Level	Factor	Measure Level	Limit (dBuV/m)	Margin (dB)	Detector
H	5150.00	39.85	17.18	57.03	68.20	-11.17	PK
H	5178.00	81.42	17.16	98.58	N/A	N/A	PK
V	5150.00	41.78	17.18	58.96	68.20	-9.24	PK
V	5178.00	88.34	17.16	105.50	N/A	N/A	PK

Mode:		802.11n(HT20)		Frequency:		5180MHz	
Antenna Pol.	Frequency (MHz)	Reading Level	Factor	Measure Level	Limit (dBuV/m)	Margin (dB)	Detector
H	5150.00	29.71	17.18	46.89	54.00	-7.11	AV
H	5178.00	72.33	17.16	89.49	N/A	N/A	AV
V	5150.00	31.66	17.18	48.84	54.00	-5.16	AV
V	5178.00	79.74	17.16	96.90	N/A	N/A	AV

Mode:		802.11n(HT20)		Frequency:		5240MHz	
Antenna Pol.	Frequency (MHz)	Reading Level	Factor	Measure Level	Limit (dBuV/m)	Margin (dB)	Detector
H	5238.00	81.85	17.11	98.96	N/A	N/A	PK
H	5350.00	38.62	17.20	55.82	68.20	-12.38	PK
V	5238.00	88.24	17.11	105.35	N/A	N/A	PK
V	5350.00	39.56	17.20	56.76	68.20	-11.44	PK

Mode:		802.11n(HT20)		Frequency:		5240MHz	
Antenna Pol.	Frequency (MHz)	Reading Level	Factor	Measure Level	Limit (dBuV/m)	Margin (dB)	Detector
H	5238.00	72.47	17.11	89.58	N/A	N/A	AV
H	5350.00	29.39	17.20	46.59	54.00	-7.41	AV
V	5238.00	80.75	17.11	97.86	N/A	N/A	AV
V	5350.00	30.12	17.20	47.32	54.00	-6.68	AV

Mode:		802.11ac(HT20)		Frequency:		5180MHz	
Antenna Pol.	Frequency (MHz)	Reading Level	Factor	Measure Level	Limit (dBuV/m)	Margin (dB)	Detector
H	5150.00	40.53	17.18	57.71	68.20	-10.49	PK
H	5178.00	80.95	17.16	98.11	N/A	N/A	PK
V	5150.00	41.13	17.18	58.31	68.20	-9.89	PK
V	5178.00	87.74	17.16	104.90	N/A	N/A	PK

Mode:		802.11ac(HT20)		Frequency:		5180MHz	
Antenna Pol.	Frequency (MHz)	Reading Level	Factor	Measure Level	Limit (dBuV/m)	Margin (dB)	Detector
H	5150.00	31.20	17.18	48.38	54.00	-5.62	AV
H	5178.00	71.37	17.16	88.53	N/A	N/A	AV
V	5150.00	31.68	17.18	48.86	54.00	-5.14	AV
V	5178.00	78.96	17.16	96.12	N/A	N/A	AV

Mode:		802.11ac(HT20)		Frequency:		5240MHz	
Antenna Pol.	Frequency (MHz)	Reading Level	Factor	Measure Level	Limit (dBuV/m)	Margin (dB)	Detector
H	5238.00	79.50	17.11	96.61	N/A	N/A	PK
H	5350.00	37.14	17.20	54.34	68.20	-13.86	PK
V	5238.00	86.69	17.11	103.80	N/A	N/A	PK
V	5350.00	37.93	17.20	55.13	68.20	-13.07	PK

Mode:		802.11ac(HT20)		Frequency:		5240MHz	
Antenna Pol.	Frequency (MHz)	Reading Level	Factor	Measure Level	Limit (dBuV/m)	Margin (dB)	Detector
H	5238.00	70.43	17.11	87.54	N/A	N/A	AV
H	5350.00	28.46	17.20	45.66	54.00	-8.34	AV
V	5238.00	77.70	17.11	94.81	N/A	N/A	AV
V	5350.00	28.93	17.20	46.13	54.00	-7.87	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	42.10	17.18	59.28	68.20	-8.92	PK
H	5185.20	77.40	17.16	94.56	N/A	N/A	PK
V	5150.00	43.55	17.18	60.73	68.20	-7.47	PK
V	5185.20	85.20	17.16	102.36	N/A	N/A	PK

Mode:		802.11n(HT40)		Frequency:		5190MHz	
Antenna Pol.	Frequency (MHz)	Reading Level	Factor	Measure Level	Limit (dBuV/m)	Margin (dB)	Detector
H	5150.00	32.44	17.18	49.62	54.00	-4.38	AV
H	5185.20	68.51	17.16	85.67	N/A	N/A	AV
V	5150.00	33.17	17.18	50.35	54.00	-3.65	AV
V	5185.20	76.09	17.16	93.25	N/A	N/A	AV

Mode:		802.11n(HT40)		Frequency:		5230MHz	
Antenna Pol.	Frequency (MHz)	Reading Level	Factor	Measure Level	Limit (dBuV/m)	Margin (dB)	Detector
H	5226.25	77.83	17.12	94.95	N/A	N/A	PK
H	5350.00	43.32	17.20	60.52	68.20	-7.68	PK
V	5226.25	85.33	17.12	102.45	N/A	N/A	PK
V	5350.00	44.69	17.20	61.89	68.20	-6.31	PK

Mode:		802.11n(HT40)		Frequency:		5230MHz	
Antenna Pol.	Frequency (MHz)	Reading Level	Factor	Measure Level	Limit (dBuV/m)	Margin (dB)	Detector
H	5226.25	68.34	17.12	85.46	N/A	N/A	AV
H	5350.00	32.25	17.20	49.45	54.00	-4.55	AV
V	5226.25	76.19	17.12	93.31	N/A	N/A	AV
V	5350.00	33.28	17.20	50.48	54.00	-3.52	AV

Mode:		802.11ac(HT40)		Frequency:		5190MHz	
Antenna Pol.	Frequency (MHz)	Reading Level	Factor	Measure Level	Limit (dBuV/m)	Margin (dB)	Detector
H	5150.00	42.74	17.18	59.92	68.20	-8.28	PK
H	5185.20	77.83	17.16	94.99	N/A	N/A	PK
V	5150.00	43.81	17.18	60.99	68.20	-7.21	PK
V	5185.20	86.10	17.16	103.26	N/A	N/A	PK

Mode:		802.11ac(HT40)		Frequency:		5190MHz	
Antenna Pol.	Frequency (MHz)	Reading Level	Factor	Measure Level	Limit (dBuV/m)	Margin (dB)	Detector
H	5150.00	32.96	17.18	50.14	54.00	-3.86	AV
H	5185.20	69.13	17.16	86.29	N/A	N/A	AV
V	5150.00	33.87	17.18	51.05	54.00	-2.95	AV
V	5185.20	76.59	17.16	93.75	N/A	N/A	AV

Mode:		802.11ac(HT40)		Frequency:		5230MHz	
Antenna Pol.	Frequency (MHz)	Reading Level	Factor	Measure Level	Limit (dBuV/m)	Margin (dB)	Detector
H	5226.25	78.32	17.12	95.44	N/A	N/A	PK
H	5350.00	43.52	17.20	60.72	68.20	-7.48	PK
V	5226.25	85.89	17.12	103.01	N/A	N/A	PK
V	5350.00	44.87	17.20	62.07	68.20	-6.13	PK

Mode:		802.11ac(HT40)		Frequency:		5230MHz	
Antenna Pol.	Frequency (MHz)	Reading Level	Factor	Measure Level	Limit (dBuV/m)	Margin (dB)	Detector
H	5226.25	69.21	17.12	86.33	N/A	N/A	AV
H	5350.00	32.66	17.20	49.86	54.00	-4.14	AV
V	5226.25	76.75	17.12	93.87	N/A	N/A	AV
V	5350.00	33.94	17.20	51.14	54.00	-2.86	AV

Mode:		802.11ac(HT80)		Frequency:		5210MHz	
Antenna Pol.	Frequency (MHz)	Reading Level	Factor	Measure Level	Limit (dBuV/m)	Margin (dB)	Detector
H	5150.00	44.56	17.18	61.74	68.20	-6.46	PK
H	5204.00	72.78	17.18	89.96	N/A	N/A	PK
H	5350.00	39.08	17.20	56.28	68.20	-11.92	PK
V	5150.00	44.93	17.18	62.11	68.20	-6.09	PK
V	5204.00	81.92	17.18	99.10	N/A	N/A	PK
V	5350.00	39.29	17.20	56.49	68.20	-11.71	PK
Mode:		802.11ac(HT80)		Frequency:		5210MHz	
Antenna Pol.	Frequency (MHz)	Reading Level	Factor	Measure Level	Limit (dBuV/m)	Margin (dB)	Detector
H	5150.00	33.26	17.18	50.44	54.00	-3.56	AV
H	5204.00	63.98	17.18	81.16	N/A	N/A	AV
H	5350.00	30.14	17.20	47.34	54.00	-6.66	AV
V	5150.00	33.45	17.18	50.63	54.00	-3.37	AV
V	5204.00	72.26	17.18	89.44	N/A	N/A	AV
V	5350.00	30.88	17.20	48.08	54.00	-5.92	AV

5.8 Radiated Emission

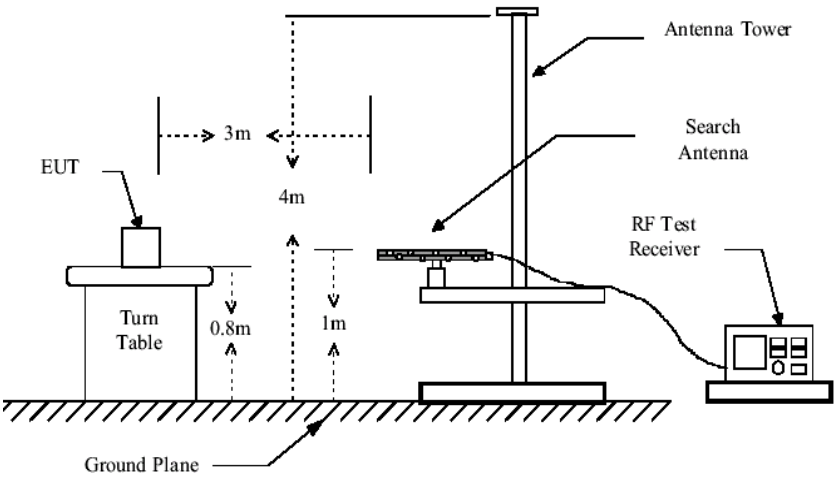
<table>
<tr><td>Test Requirement:</td><td>FCC Part15 C Section 15.209 and 15.205</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.4: 2003</td></tr>
<tr><td>Test Frequency Range:</td><td>30MHz to 40GHz</td></tr>
<tr><td>Test site:</td><td>Measurement Distance: 3m (Semi-Anechoic Chamber)</td></tr>
<tr><td>Receiver setup:</td><td>
<table>
<tr><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>Frequency</td><td>Limit (dBm/MHz)</td><td>Remark</td></tr>
<tr><td>Above 1GHz</td><td>-27.0</td><td>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 0.8 meters above the ground at a 3 meter semi-anechoic 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.

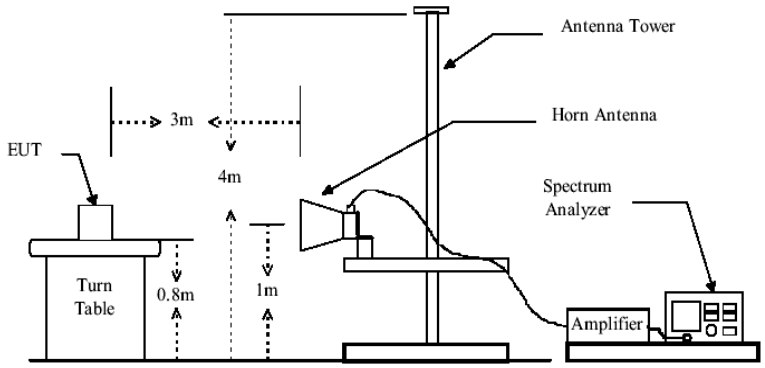
2>.Above 1GHz test procedure:
1. On the test site as test setup graph above,the EUT shall be placed at the 0.8m support on the turntable and in the position closest to normal use as declared by the provider.

2. The test antenna shall be oriented initially for vertical polarization and
</td></tr>
</table>

	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: 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 4.7 for details
Test mode:	Refer to section 4.3 for details
Test results:	Pass

Measurement Data:

Below 1GHz

Antenna Pol.	Frequency (MHz)	Reading Level	Factor	Measure Level	Limit (dBuV/m)	Margin (dB)	Detector
H	55.42	44.93	-16.15	28.78	40.00	-11.22	PK
H	152.13	46.20	-20.06	26.14	43.50	-17.36	PK
H	204.96	44.75	-17.53	27.22	43.50	-16.28	PK
H	324.46	46.15	-14.08	32.07	46.00	-13.93	PK
H	396.24	43.05	-12.10	30.95	46.00	-15.05	PK
H	638.37	37.64	-6.64	31.00	46.00	-15.00	PK
V	31.07	53.17	-17.18	35.99	40.00	-4.01	PK
V	38.62	48.99	-16.16	32.83	40.00	-7.17	PK
V	45.38	50.13	-15.74	34.39	40.00	-5.61	PK
V	54.26	49.52	-16.09	33.43	40.00	-6.57	PK
V	153.20	57.41	-20.01	37.40	43.50	-6.10	PK
V	400.43	40.18	-11.94	28.24	46.00	-17.76	PK

Above 1GHz:

Only the data of worst case at each channel plan (nominal bandwidth =20MHz, 40MHz, 80MHz) is reported.

802.11 n(HT20) mode								
CH. No.	Antenna Pol.	Frequency (MHz)	Reading Level	Factor	Measure Level	Limit (dBuV/m)	Margin (dB)	Detector
36	H	10360.00	27.58	21.64	49.22	54(Note3)	-4.78	PK
	H	15540.00	27.85	21.80	49.65	54(Note3)	-4.35	PK
	V	10360.00	29.40	21.64	51.04	54(Note3)	-2.96	PK
	V	15540.00	29.59	21.80	51.39	54(Note3)	-2.61	PK
40	H	10400.00	27.85	21.67	49.52	54(Note3)	-4.48	PK
	H	15600.00	28.92	21.83	50.75	54(Note3)	-3.25	PK
	V	10400.00	29.59	21.67	51.26	54(Note3)	-2.74	PK
	V	15600.00	27.74	21.83	49.57	54(Note3)	-4.43	PK
48	H	10480.00	28.02	21.64	49.66	54(Note3)	-4.34	PK
	H	15720.00	26.12	22.16	48.28	54(Note3)	-5.72	PK
	V	10480.00	27.69	21.64	49.33	54(Note3)	-4.67	PK
	V	15720.00	26.55	22.16	48.71	54(Note3)	-5.29	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	28.03	21.64	49.67	54(Note3)	-4.33	PK
	H	15570.00	28.41	21.80	50.21	54(Note3)	-3.79	PK
	V	10380.00	29.84	21.64	51.48	54(Note3)	-2.52	PK
	V	15570.00	29.98	21.80	51.78	54(Note3)	-2.22	PK
46	H	10460.00	28.24	21.67	49.91	54(Note3)	-4.09	PK
	H	15690.00	29.28	21.83	51.11	54(Note3)	-2.89	PK
	V	10460.00	30.08	21.67	51.75	54(Note3)	-2.25	PK
	V	15690.00	28.15	21.83	49.98	54(Note3)	-4.02	PK

802.11ac(HT80) mode								
CH. No.	Antenna Pol.	Frequency (MHz)	Reading Level	Factor	Measure Level	Limit (dBuV/m)	Margin (dB)	Detector
42	H	10420.00	29.89	21.65	51.54	54(Note3)	-2.46	PK
	H	15630.00	30.04	21.81	51.85	54(Note3)	-2.15	PK
	V	10420.00	28.41	21.65	50.06	54(Note3)	-3.94	PK
	V	15630.00	29.36	21.81	51.17	54(Note3)	-2.83	PK

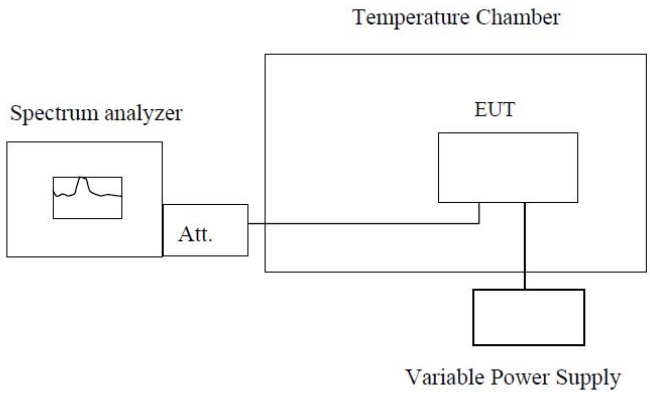
Note:

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.

5.9 Frequency stability

Test Requirement:	FCC Part15 C Section 15.407(g)
Test Method:	ANSI C63.4: 2003, 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, 2003; 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 4.7 for details
Test mode:	Refer to section 4.3 for details
Test results:	Pass

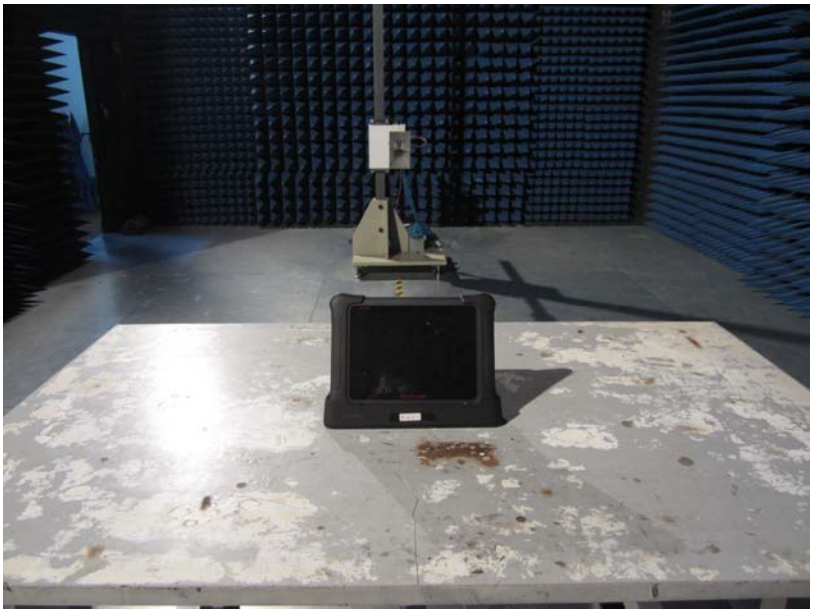
Measurement data:

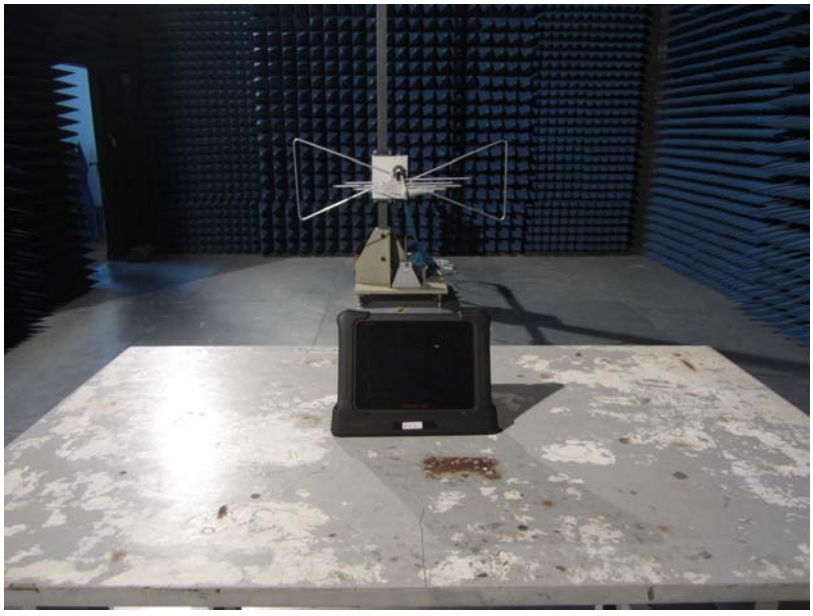
Frequency stability versus Temp.					
Power Supply: DC 3.7V					
Temp. (°C)	Operating Frequency (MHz)	0 minute	2 minute	5 minute	10 minute
		Measured Frequency (MHz)	Measured Frequency (MHz)	Measured Frequency (MHz)	Measured Frequency (MHz)
-30	5180	5179.9840	5179.9847	5179.9864	5179.9865
	5200	5199.9845	5199.9851	5199.9869	5199.9869
	5220	5219.9849	5219.9856	5219.9873	5219.9873
	5240	5239.9854	5239.9860	5239.9877	5239.9877
-20	5180	5179.9858	5179.9865	5179.9881	5179.9880
	5200	5199.9863	5199.9869	5199.9885	5199.9884
	5220	5219.9867	5219.9873	5219.9888	5219.9887
	5240	5239.9871	5239.9877	5239.9892	5239.9891
-10	5180	5179.9875	5179.9880	5179.9895	5179.9894
	5200	5199.9879	5199.9884	5199.9899	5199.9897
	5220	5219.9883	5219.9888	5219.9902	5219.9900
	5240	5239.9886	5239.9891	5239.9905	5239.9903
0	5180	5179.9845	5179.9851	5179.9869	5179.9869
	5200	5199.9849	5199.9856	5199.9873	5199.9873
	5220	5219.9854	5219.9860	5219.9877	5219.9877
	5240	5239.9858	5239.9864	5239.9881	5239.9880
10	5180	5179.9863	5179.9869	5179.9884	5179.9884
	5200	5199.9867	5199.9873	5199.9888	5199.9887
	5220	5219.9871	5219.9876	5219.9892	5219.9891
	5240	5239.9875	5239.9880	5239.9895	5239.9894
20	5180	5179.9879	5179.9884	5179.9899	5179.9897
	5200	5199.9883	5199.9887	5199.9902	5199.9900
	5220	5219.9886	5219.9891	5219.9905	5219.9903
	5240	5239.9890	5239.9894	5239.9908	5239.9906
30	5180	5179.9838	5179.9845	5179.9863	5179.9863
	5200	5199.9843	5199.9850	5199.9867	5199.9868
	5220	5219.9848	5219.9855	5219.9871	5219.9872
	5240	5239.9853	5239.9859	5239.9876	5239.9875
40	5180	5179.9857	5179.9863	5179.9879	5179.9879
	5200	5199.9861	5199.9867	5199.9883	5199.9883
	5220	5219.9866	5219.9871	5219.9887	5219.9886
	5240	5239.9870	5239.9875	5239.9891	5239.9890
50	5180	5179.9874	5179.9879	5179.9894	5179.9893
	5200	5199.9878	5199.9883	5199.9898	5199.9896
	5220	5219.9881	5219.9886	5219.9901	5219.9899
	5240	5239.9885	5239.9890	5239.9904	5239.9902

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	5179.9850	5179.9857	5179.9874	5179.9873
	5200	5199.9853	5199.9860	5199.9876	5199.9876
	5220	5219.9856	5219.9863	5219.9879	5219.9879
	5240	5239.9859	5239.9865	5239.9881	5239.9881
3.7	5180	5179.9862	5179.9868	5179.9884	5179.9883
	5200	5199.9865	5199.9871	5199.9886	5199.9886
	5220	5219.9868	5219.9873	5219.9889	5219.9888
	5240	5239.9871	5239.9876	5239.9891	5239.9890
4.1	5180	5179.9873	5179.9879	5179.9894	5179.9893
	5200	5199.9876	5199.9881	5199.9896	5199.9895
	5220	5219.9878	5219.9884	5219.9898	5219.9897
	5240	5239.9881	5239.9886	5239.9900	5239.9899

6 Test Setup Photo

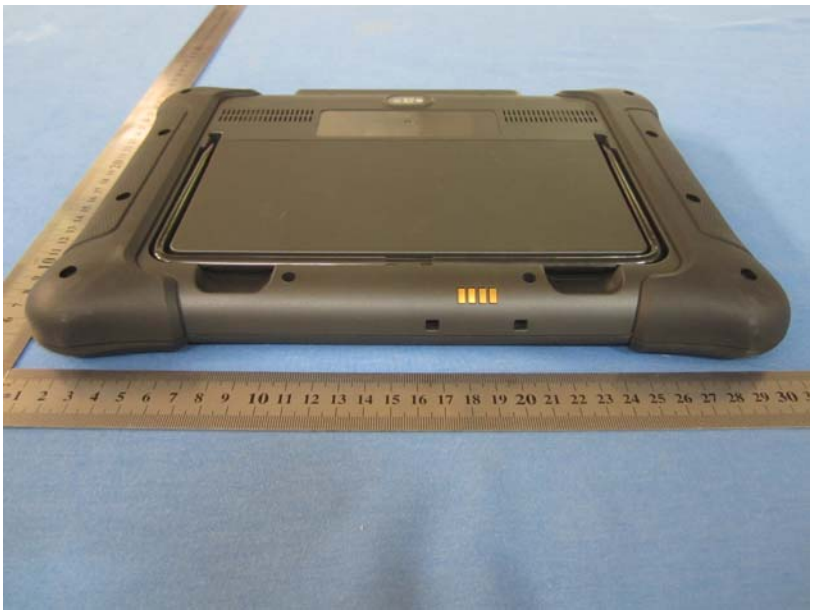
Radiated Emission

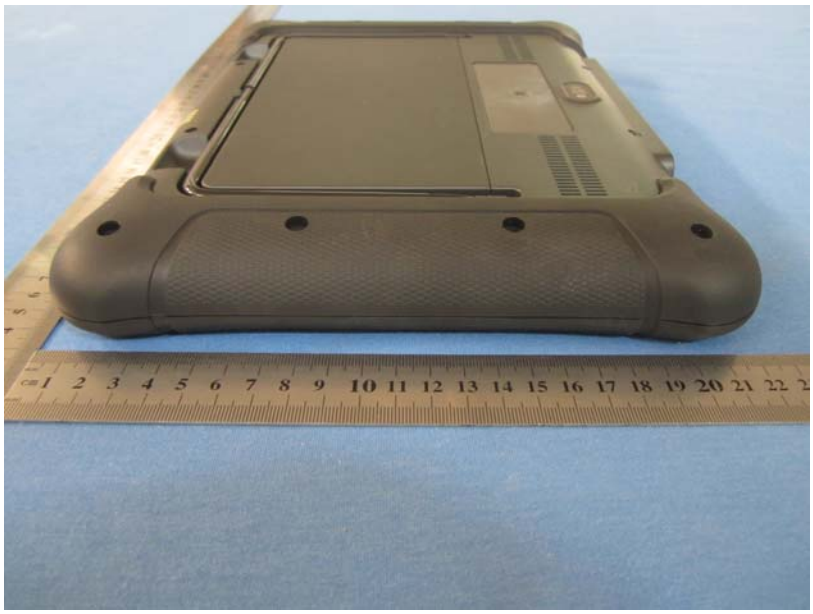


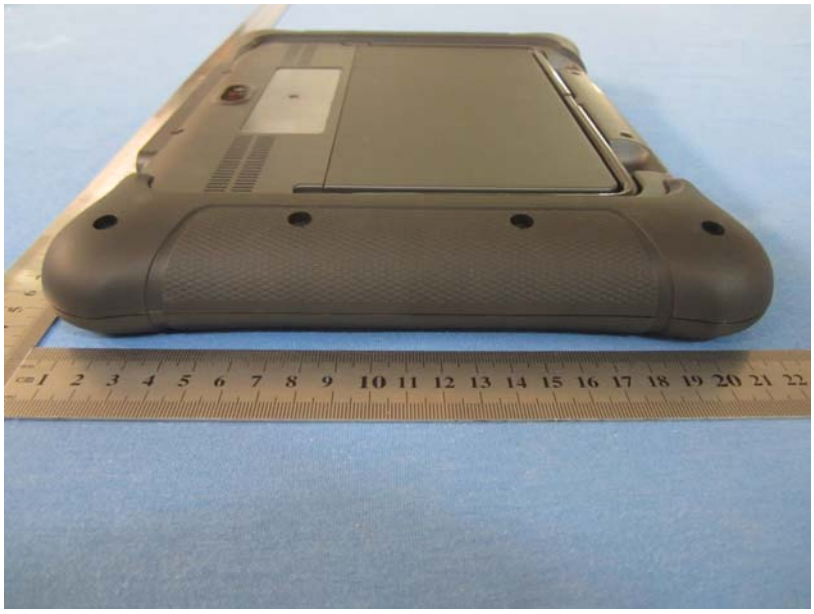


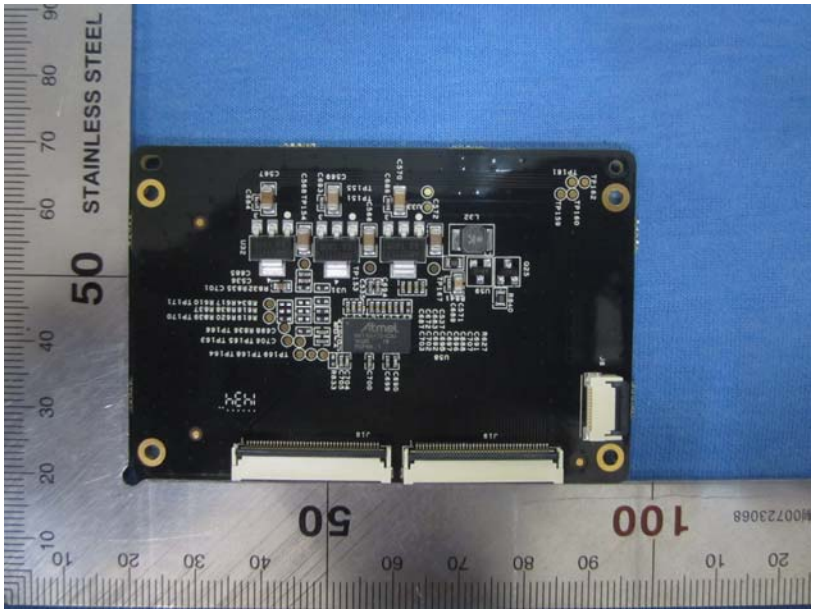
Conducted Emission

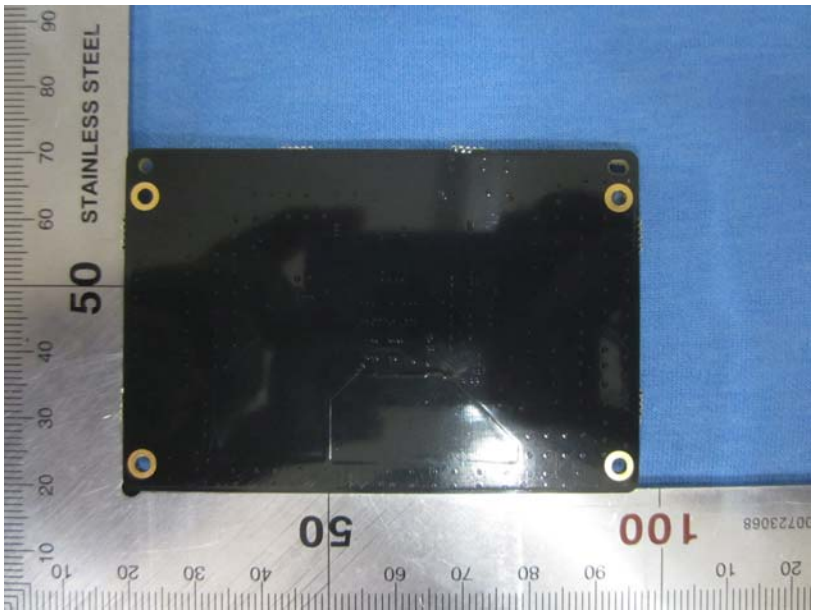
7 EUT Constructional Details

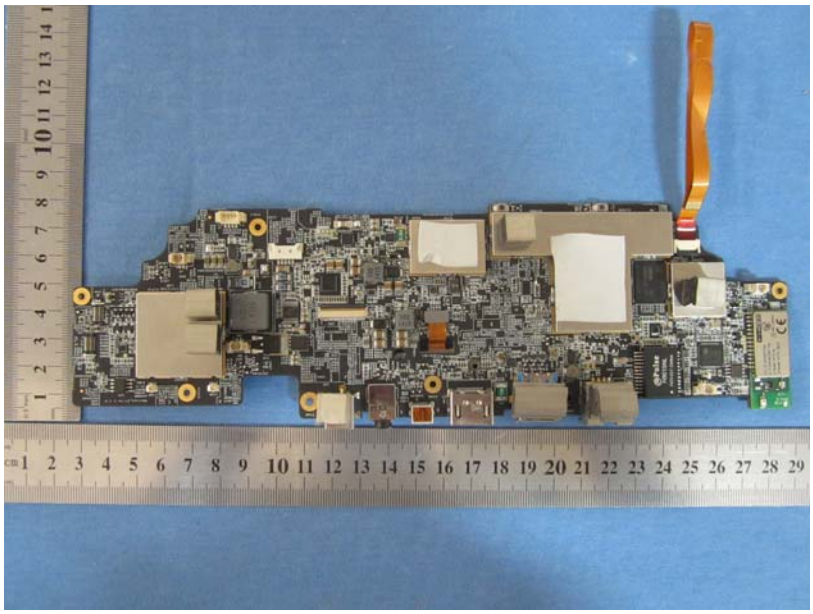


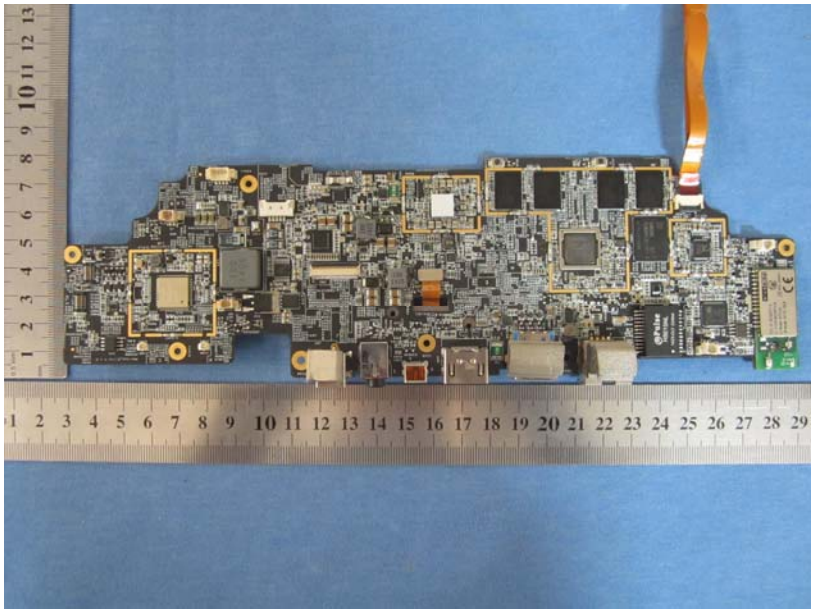


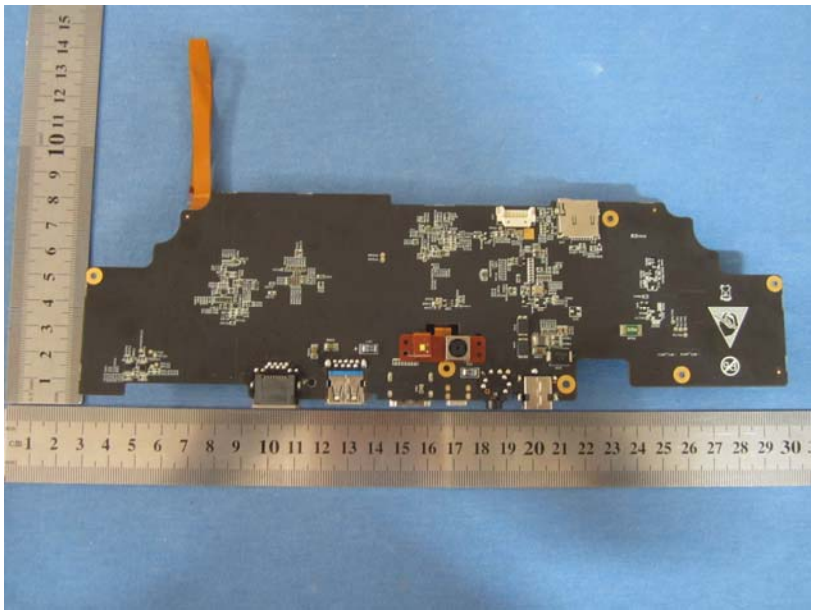



STAINLESS STEEL

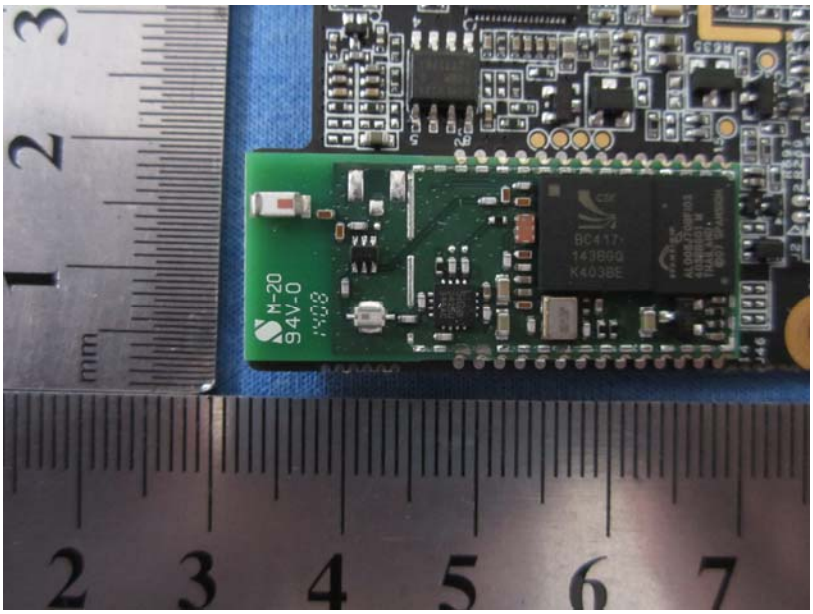

STAINLESS STEEL








bluegiga
FCC ID: QOQWT11IA
IC: 5123A-BGTWT11IA
IC Model: WT11i-A
JP Model: WT11i, Opt A
209-J00053
M-20
94V-0


M-20
94V-0


AUTEL
AUTEL BATTERY MODULE
RECHARGEABLE LI-ION BATTERY
Model No. : MaxiSys Elite
Rating: 3.7V ⎓ Capacity 50.32Wh
13600mAh
CAUTION / ATTENTION
/ ATTENZIONE / ACHTUNG
Li-ion

---END---