FCC PART 15.407

TEST REPORT

For

X2 Computing Ltd.

Bond Industrial Estate, Wickhamford, EVESHAM, Worcestershire, WR11 7RL, UK

FCC ID: RGCCARBONX2206300

Report Type:	Product Type:
Original Report	Tablet

Test Engineer:	Gardon Zhang
Report Number:	RSZ130621007-00C
Report Date:	2013-08-02
Reviewed By:	Alvin Huang RF Leader
Prepared By:	Bay Area Compliance Laboratories Corp. (Shenzhen) 6/F, the 3rd Phase of WanLi Industrial Building ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China Tel: +86-755-33320018 Fax: +86-755-33320008 www.baclcorp.com.cn

TABLE OF CONTENTS

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *X2 Computing Ltd.*'s product, model number: *X220 Carbon (FCC ID: RGCCARBONX2206300)* or the "EUT" as referred to in this report was a *Tablet*, which was measured approximately: 325 mm (L) x 197.3 mm (W) x 27.8 mm (H), rated input voltage: DC 7.4V battery and DC 12V charging from adapter.

Adapter information: AC ADAPTER
Model: ADA12400ZA00
Input: AC 100-240V, 50/60Hz, 2A
Output: DC 12V, 4A

Note: the model X220 Carbon has different LCD screens, top covers, batteries capacity, pins, storages, halo LED, cameras and plastic & rubber I/O cover optional, the details information refer to the attached declaration letter which provided and guaranteed by the applicant.

Tested sample information: capacitive touch panel, black top cover, 16000mAh battery, 16pin, 32G storage, halo LED, front & rear camera both and without plastic & rubber I/O cover

** All measurement and test data in this report was gathered from production sample serial number: 1306067 (Assigned by the BACL, Shenzhen). The EUT supplied by the applicant was received on 2013-06-21.*

Objective

This type approval report is prepared on behalf of *X2 Computing Ltd.* in accordance with Part 2-Subpart J, Part 15-Subparts A, B and E of the Federal Communication Commissions rules.

The tests were performed in order to determine compliance with FCC Part 15, Subpart E, section 15.203, 15.205, 15.207, 15.209 and 15.407 rules.

Related Submittal(s)/Grant(s)

FCC Part 15B JBP and 15.247 DTS submissions with FCC ID: RGCCARBONX2206300.

Test Methodology

All emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Shenzhen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Measurement uncertainty with radiated emission is 5.91 dB for 30MHz-1GHz.and 4.92 dB for above 1GHz, 1.95dB for conducted measurement.

Test Facility

The test site used by Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located in the 6/F, the 3rd Phase of WanLi Industrial Building, Shihua Road, Futian Free Trade Zone Shenzhen, Guangdong, China.

Test site at Bay Area Compliance Laboratories Corp. (Shenzhen) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on December 06, 2010. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2009.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 382179. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in an engineering mode, which was provided by manufacture.
For the operating frequency range 5150MHz~5250MHz, the test frequencies are 5180MHz, 5200MHz 5240MHz, those are requested by the applicant.

EUT Exercise Software

The test was performed under "DRTU version 1.5.4-0364".

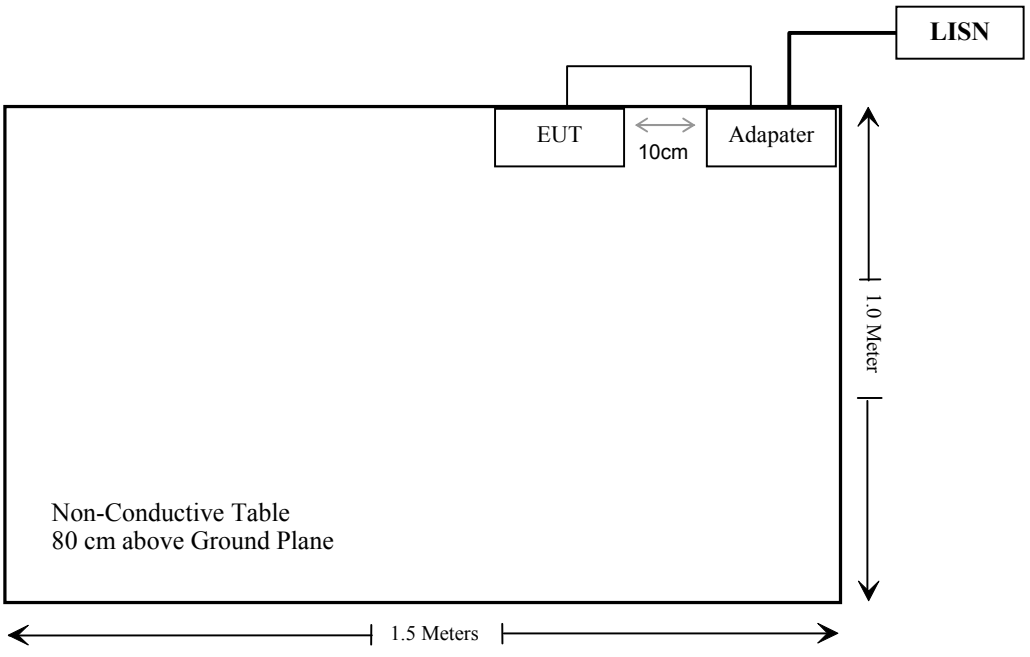
Equipment Modifications

No modification was made to the unit tested.

External I/O Cabling List and Details

Cable Description	Length (m)	From Port	To
Unshielded Undetachable AC Cable	2.0	Adapter	LISN
Unshielded Undetachable DC Cable	1.7	EUT	Adapter

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.407 (f), §2.1093	RF Exposure	Compliance**
§15.203	Antenna Requirement	Compliance
§15.407(b)(6)& §15.207(a)	Conducted Emissions	Compliance
§15.205& §15.209 &§15.407(b) (1),(6),(7)	Undesirable Emission& Restricted Bands	Compliance
§15.407(b) (1) (2) (3) (4)	OUT Of Band Emissions	Compliance*
§15.407(a) (1)	26 dB Bandwidth	Compliance*
§15.407(a)(1),	Conducted Transmitter Output Power	Compliance*
§15.407 (a)(1),(5)	Power Spectral Density	Compliance*
§15.407(a)(6)	Peak Excursion Ratio	Compliance*

Note: Compliance*: The RF module was test in AEGIS with FCC ID: PD9633ANH granted on 2009-08-10.
Compliance**: Please refer to SAR report released by BACL, report number: R1308226-FCC-SAR.

FCC §15.407 (f) & & §2.1093 – RF EXPOSURE

Applicable Standard

FCC§1.1307 and §2.1093.

Test Result

Compliance, please refer to the SAR report: R1308226-FCC-SAR.

FCC §15.203 – ANTENNA REQUIREMENT

Applicable Standard

According to § 15.203, 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 shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the user of a standard antenna jack or electrical connector is prohibited. The structure and application of the EUT were analyzed to determine compliance with section §15.203 of the rules. §15.203 state that the subject device must meet the following criteria:

a. Antenna must be permanently attached to the unit.
b. Antenna must use a unique type of connector to attach to the EUT.

Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.

And according to FCC 47 CFR section 15.407 (a), if the transmitting antennas of directional gain greater than 6dBi are used, the transmit power and power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Antenna Connector Construction

The EUT have three PCB antennas arrangement for Wi-Fi, which was permanently attached and the gain was 1.78 dBi, fulfill the requirement of this section. Please refer to the internal photos.

Result: Compliance.

FCC §15.407 (b) (6) §15.207 (a) – CONDUCTED EMISSIONS

Applicable Standard

FCC §15.207, §15.407(b) (6)

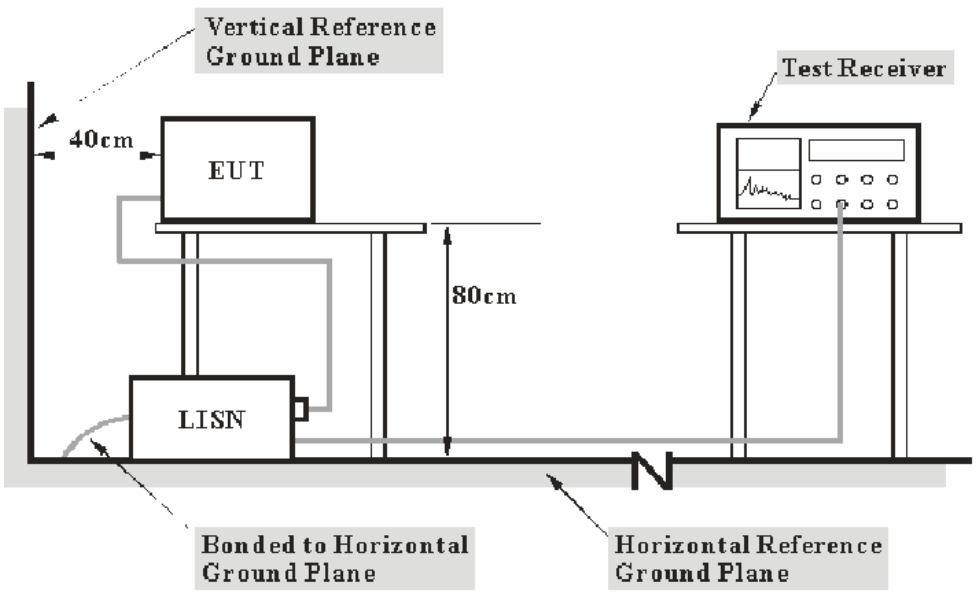
Measurement Uncertainty

Input quantities to be considered for conducted disturbance measurements maybe receiver reading, attenuation of the connection between AMN/ISN and receiver, AMN/ISN voltage division factor, AMN/ISN VDF frequency interpolation and receiver related input quantities, etc.

Based on CISPR 16-4-2:2011, the expended combined standard uncertainty of conducted disturbance test at Bay Area Compliance Laboratories Corp. (Shenzhen) is shown as below. And the uncertainty will not be taken into consideration for the test data recorded in the report

Port	Measurement uncertainty
AC Mains	3.26 dB (k=2, 95% level of confidence)
CAT 3	3.70 dB (k=2, 95% level of confidence)
CAT 5	3.86 dB (k=2, 95% level of confidence)
CAT 6	4.64 dB (k=2, 95% level of confidence)

EUT Setup



Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per ANSI C63.4-2009 measurement procedure. The specification used was with the FCC Part 15.207 limits.

The adapter was connected to a 120 VAC/60 Hz power source,

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
& Schwarz	EMI Test Receiver	ESCS30	100176	2013-06-17	2014-06-17
Rohde & Schwarz	L.I.S.N.	ESH2-Z5	892107/021	2012-08-22	2013-08-22
Rohde & Schwarz	Transient Limiter	ESH3Z2	DE25985	2012-08-09	2013-08-09
Rohde & Schwarz	CE Test software	EMC 32	8.95	-	-

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

Test Procedure

During the conducted emission test, the adapter was connected to the LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and average detection mode.

Corrected Factor & Margin Calculation

The Corrected factor is calculated by adding LISN/ISN VDF (Voltage Division Factor), Cable Loss and Pulse Limiter Attenuation. The basic equation is as follows:

Correction Factor = LISN VDF + Cable Loss + Pulse Limiter Attenuation

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7 dB below the limit. The equation for margin calculation is as follows:

Margin = Limit – Corrected Amplitude

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 15.207, with the worst margin reading of:

12.3 dB at **0.254000 MHz** in the **Neutral** conducted mode

Refer to CISPR16-4-2:2011 and CISPR 16-4-1:2009, the measured level is in compliance with the limit if

$$L_m + U_{(Lm)} \leq L_{lim} + U_{cispr}$$

in BACL, $U_{(Lm)}$ is less than U_{cispr}, if L_m is less than L_{lim}, it implies that the EUT complies with the limit.

Test Data

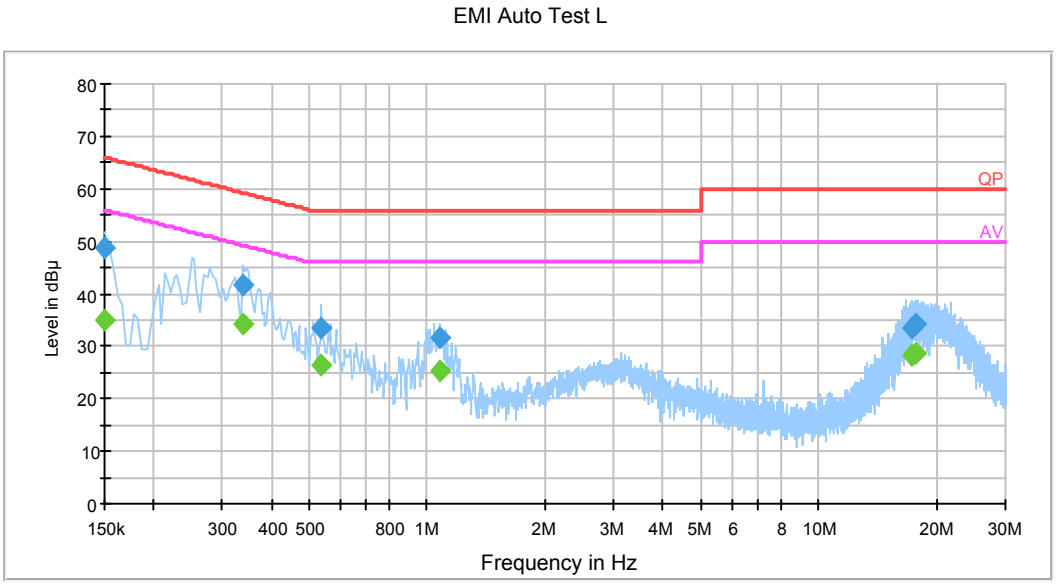
Environmental Conditions

Temperature:	25 ℃
Relative Humidity:	56 %
ATM Pressure:	100.1 kPa

The testing was performed by Gardon Zhang on 2013-07-06.

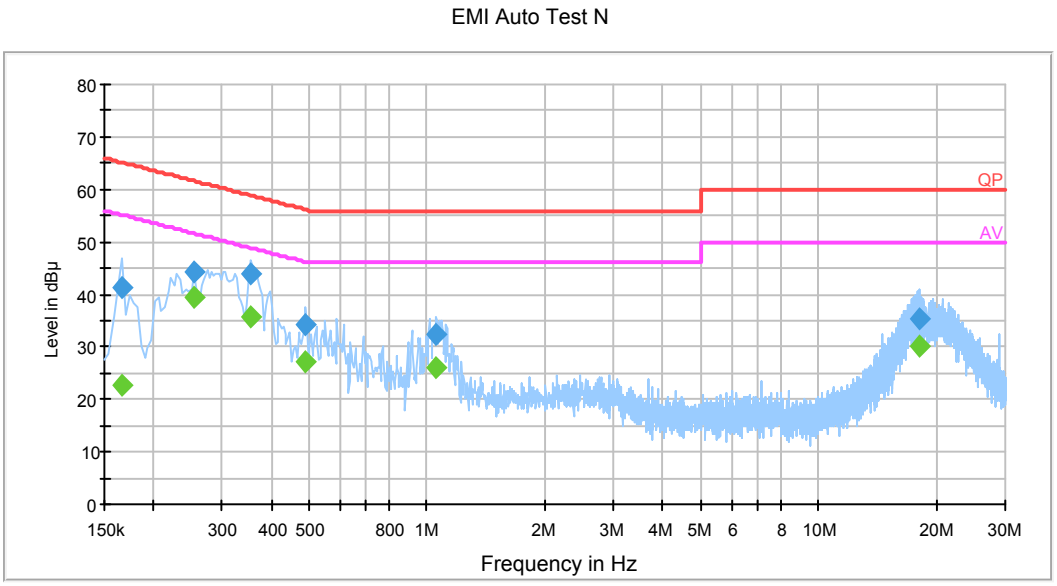
EUT operation mode: Charging & Transmitting

AC 120 V, 60 Hz, Line:



Frequency (MHz)	Corrected Amplitude (dBµV)	Correction Factor (dB)	Limit (dBµV)	Margin (dB)	Detector (PK/Ave./QP)
0.338000	34.1	19.5	49.3	15.2	Ave.
0.150000	48.6	19.5	66.0	17.4	QP
0.338000	41.6	19.5	59.3	17.6	QP
0.538000	26.5	19.5	46.0	19.5	Ave.
0.150000	35.1	19.5	56.0	20.9	Ave.
1.074000	25.1	19.5	46.0	20.9	Ave.
17.666000	28.8	20.0	50.0	21.2	Ave.
17.378000	28.4	20.0	50.0	21.6	Ave.
0.538000	33.5	19.5	56.0	22.5	QP
1.074000	31.6	19.5	56.0	24.4	QP
17.666000	34.2	20.0	60.0	25.8	QP
17.378000	33.6	20.0	60.0	26.4	QP

AC120V, 60 Hz, Neutral:



Frequency (MHz)	Corrected Amplitude (dBµV)	Correction Factor (dB)	Limit (dBµV)	Margin (dB)	Detector (PK/Ave./QP)
0.254000	39.3	19.5	51.6	12.3	Ave.
0.354000	35.6	19.5	48.9	13.2	Ave.
0.354000	44.0	19.5	58.9	14.9	QP
0.254000	44.2	19.5	61.6	17.4	QP
0.490000	27.0	19.5	46.2	19.2	Ave.
1.058000	26.0	19.5	46.0	20.0	Ave.
18.066000	30.0	20.1	50.0	20.0	Ave.
0.490000	34.4	19.5	56.2	21.8	QP
1.058000	32.2	19.5	56.0	23.8	QP
0.166000	41.2	19.5	65.2	24.0	QP
18.066000	35.3	20.1	60.0	24.7	QP
0.166000	22.7	19.5	55.2	32.5	Ave.

Note:
1) Corrected Amplitude = Reading + Correction Factor + Pulse Limiter Attenuation
2) Correction Factor = LISN VDF + Cable Loss
The corrected factor has been input into the transducer of the test software.
3) Margin = Limit – Corrected Amplitude

§15.205 & §15.209 & §15.407(B) (1),(6),(7) – UNDESIRABLE EMISSION & RESTRICTED BANDS

Applicable Standard

FCC §15.407 (b) (1), (2), (3), (6), (7); §15.209; §15.205;

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 –27dBm/MHz.

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.

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.

For transmitters operating in the 5.725–5.825 GHz band: all emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an EIRP of –17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an EIRP of –27 dBm/MHz。

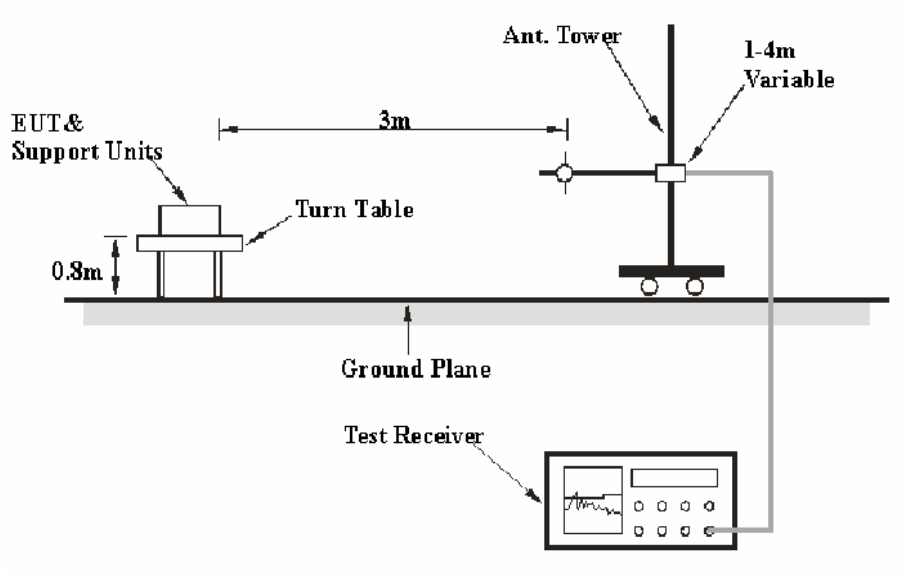
Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209.

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on CISPR 16-4-2:2011, the expended combined standard uncertainty of radiation emissions at Bay Area Compliance Laboratories Corp. (Shenzhen) will not be taken into consideration for the test data recorded in the report

EUT Setup



The radiated emission tests were performed in the 1.5 meters chamber test site, using the setup accordance with the ANSI C63.4-2009. The specification used was the FCC 15.209, and FCC 15.407 limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The adapter was connected to a 120 VAC/60 Hz power source,

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 40 GHz.

During the radiated emission test, the EMI test receiver & Spectrum Analyzer Setup were set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Detector
30 MHz – 1000 MHz	100 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1 MHz	3 MHz	/	PK
	1 MHz	10 Hz	/	Ave.

Test Procedure

Radiated Spurious Emission

During the radiated emission test, the adapter of laptop was connected to the AC floor outlet.

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all the installation combinations.

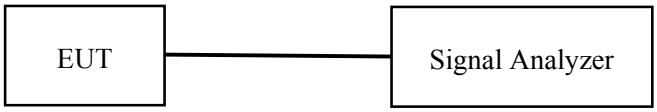
Data was recorded in Quasi-peak detection mode for frequency range of 30 MHz-1GHz, peak and Average detection modes for frequencies above 1GHz.

The EUT is set 1.5 meter away from the testing antenna, which is varied from 1-4 mete, and the EUT is placed on a turntable, which is 0.8 meter above ground plane, the table shall be rotated for 360 degrees to find out the highest emission. The receiving antenna should be changed the polarization both of horizontal and vertical.

According to C63.4, the above 1G test result shall be extrapolated to the specified distance using an extrapolation factor of 20dB/decade from 3m to 1.5m
Distance extrapolation factor =20 log (3m/1.5m) dB
Extrapolation result = Corrected Amplitude (dBμV/m) -6dB

Conducted Spurious Emission at Antenna Port

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. The Resolution bandwidth is set to 1MHz, The Video bandwidth is set to ≥ 1MHz, report the peak value out of the oprating band.
3. Repeat above procedures until all frequencies measured were complete.



Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

Corrected Amplitude = Meter Reading + Antenna Factor + Cable Loss - Amplifier Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

Margin = Limit – Corrected Amplitude

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Amplifier	8447E	1937A01046	2012-11-24	2013-11-23
Rohde & Schwarz	EMI Test Receiver	ESCI	101122	2013-05-09	2014-05-09
Sunol Sciences	Broadband Antenna	JB1	A040904-2	2011-11-28	2014-11-27
SUPER ULTRA	Amplifier	ZVA-213+	N/A	2012-11-24	2013-11-23
Sunol Sciences	Horn Antenna	DRH-118	A052304	2011-12-01	2014-11-30
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2012-11-24	2013-11-23
Electro-Mechanics	Horn antenna	3116	9510-2270	2011-10-14	2013-11-13
Agilent	Spectrum Analyzer	8564E	3943A01781	2013-05-09	2014-05-09

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

Test Results Summary

According to the data in the following table, with the worst margin reading of:

5.42 dB at **10400.0 MHz** in the **Vertical** polarization

Refer to CISPR16-4-2:2011 and CISPR 16-4-1:2009, the measured level is in compliance with the limit if

$$L_m + U_{(Lm)} \leq L_{lim} + U_{cispr}$$

in BACL, $U_{(Lm)}$ is less than U_{cispr}, if L_m is less than L_{lim}, it implies that the EUT complies with the limit.

Test Data

Environmental Conditions

Temperature:	25 ℃
Relative Humidity:	56 %
ATM Pressure:	100.1 kPa

The testing was performed by Gardon Zhang on 2013-07-03.

Mode: Transmitting

30 MHz ~ 40 GHz:

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	FCC Part 15.407/205/209	
	Reading (dBμV)	Detector (PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
802.11a, Low Channel (5180 MHz)									
5180.0	93.72	PK	254	1.5	H	11.92	105.64	/	/
5180.0	81.91	Ave.	254	1.5	H	11.92	93.83	/	/
5180.0	90.57	PK	333	1.5	V	11.92	102.49	/	/
5180.0	78.64	Ave.	333	1.5	V	11.92	90.56	/	/
10360.0	25.34	Ave.	166	1.6	V	20.38	45.72	54	8.28
10360.0	42.74	PK	166	1.6	V	20.38	63.12	74	10.88
298.7	48.48	QP	213	1.0	V	-14.0	34.48	46	11.52
8462.3	42.14	PK	172	1.2	V	17.54	59.68	74	14.32
8462.3	19.48	Ave.	172	1.2	V	17.54	37.02	54	16.98
5762.4	19.33	Ave.	34	1.7	H	13.87	33.20	54	20.80
2796.5	21.50	Ave.	106	1.6	V	8.62	30.12	54	23.88
5762.4	34.52	PK	34	1.7	H	13.87	48.39	74	25.61
2031.5	21.67	Ave.	205	1.2	H	3.23	24.90	54	29.10
2796.5	35.37	PK	106	1.6	V	8.62	43.99	74	30.01
1162.5	21.54	Ave.	228	1.6	H	0.13	21.67	54	32.33
2031.5	35.78	PK	205	1.2	H	3.23	39.01	74	34.99
1162.5	36.35	PK	228	1.6	H	0.13	36.48	74	37.52
802.11a, Middle Channel (5200 MHz)									
5200.0	94.78	PK	156	1.4	H	11.92	106.70	/	/
5200.0	83.14	Ave.	156	1.4	H	11.92	95.06	/	/
5200.0	91.45	PK	84	1.7	V	11.92	103.37	/	/
5200.0	79.79	Ave.	84	1.7	V	11.92	91.71	/	/
10400.0	28.17	Ave.	78	1.7	V	20.41	48.58	54	5.42
10400.0	43.15	PK	78	1.7	V	20.41	63.56	74	10.44
298.7	47.64	QP	42	1.1	V	-14.0	33.64	46	12.36
8462.3	42.48	PK	136	1.5	V	17.54	60.02	74	13.98
8462.3	21.03	Ave.	136	1.5	V	17.54	38.57	54	15.43
5762.4	20.48	Ave.	225	1.5	H	13.87	34.35	54	19.65
2796.5	22.35	Ave.	203	1.6	V	8.62	30.97	54	23.03
5762.4	35.88	PK	225	1.5	H	13.87	49.75	74	24.25
2031.5	22.34	Ave.	59	1.3	H	3.23	25.57	54	28.43
2796.5	36.58	PK	203	1.6	V	8.62	45.20	74	28.80
1162.5	22.15	Ave.	124	1.6	H	-0.66	21.49	54	32.51
2031.5	36.66	PK	59	1.3	H	3.23	39.89	74	34.11
1162.5	38.22	PK	124	1.6	H	-0.66	37.56	74	36.44

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	FCC Part 15.407/205/209	
	Reading (dBμV)	Detector (PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
802.11a, High Channel (5240 MHz)									
5240.0	92.75	PK	306	1.4	H	11.88	104.63	/	/
5240.0	80.48	Ave.	306	1.4	H	11.88	92.36	/	/
5240.0	91.42	PK	224	1.6	V	11.88	103.30	/	/
5240.0	78.69	Ave.	224	1.6	V	11.88	90.57	/	/
10480.0	26.22	Ave.	321	1.5	V	20.91	47.13	54	6.87
10480.0	43.08	PK	321	1.5	V	20.91	63.99	74	10.01
298.7	49.27	QP	148	1.0	V	-14.0	35.27	46	10.73
8462.3	41.40	PK	89	1.6	V	17.54	58.94	74	15.06
8462.3	20.71	Ave.	89	1.6	V	17.54	38.25	54	15.75
5762.4	20.49	Ave.	152	1.3	H	13.87	34.36	54	19.64
2796.5	22.16	Ave.	207	1.7	V	8.62	30.78	54	23.22
5762.4	35.32	PK	152	1.3	H	13.87	49.19	74	24.81
2031.5	22.35	Ave.	68	1.7	H	3.23	25.58	54	28.42
2796.5	36.14	PK	207	1.7	V	8.62	44.76	74	29.24
1162.5	23.42	Ave.	145	1.5	H	0.13	23.55	54	30.45
2031.5	36.17	PK	68	1.7	H	3.23	39.40	74	34.60
1162.5	37.25	PK	145	1.5	H	0.13	37.38	74	36.62
802.11n-HT20, Low Channel (5180 MHz)									
5180.0	95.33	PK	23	1.4	H	11.92	107.25	/	/
5180.0	85.79	Ave.	23	1.4	H	11.92	97.71	/	/
5180.0	92.61	PK	149	1.2	V	11.92	104.53	/	/
5180.0	83.11	Ave.	149	1.2	V	11.92	95.03	/	/
10360.0	26.38	Ave.	66	1.4	V	20.38	46.76	54	7.24
298.7	48.40	QP	79	1.2	V	-14.0	34.40	46	11.60
7817.2	24.54	Ave.	108	1.6	H	17.05	41.59	54	12.41
7817.2	42.20	PK	108	1.6	H	17.05	59.25	74	14.75
10360.0	37.15	PK	66	1.4	V	20.38	57.53	74	16.47
5036.2	21.66	Ave.	235	1.5	V	12.57	34.23	54	19.77
5036.2	37.05	PK	235	1.5	V	12.57	49.62	74	24.38
2345.6	21.29	Ave.	145	1.8	H	5.48	26.77	54	27.23
1563.2	20.77	Ave.	44	1.6	H	1.70	22.47	54	31.53
1206.6	21.43	Ave.	125	1.5	V	0.13	21.56	54	32.44
2354.6	35.19	PK	145	1.8	H	5.48	40.67	74	33.33
1563.2	34.78	PK	44	1.6	H	1.70	36.48	74	37.52
1206.5	35.92	PK	125	1.5	V	0.13	36.05	74	37.95

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	FCC Part 15.407/205/209	
	Reading (dBμV)	Detector (PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
802.11n-HT20, Middle Channel (5200 MHz)									
5200.0	92.62	PK	132	1.2	H	11.92	104.54	/	/
5200.0	80.17	Ave.	132	1.2	H	11.92	92.09	/	/
5200.0	89.37	PK	285	1.2	V	11.92	101.29	/	/
5200.0	77.97	Ave.	285	1.2	V	11.92	89.89	/	/
10400.0	25.63	Ave.	67	1.5	H	20.38	46.01	54	7.99
298.7	47.75	QP	92	1.3	V	-14.0	33.75	46	12.25
8626.4	24.50	Ave.	120	1.3	V	17.21	41.71	54	12.29
8626.4	44.21	PK	120	1.3	V	17.21	61.42	74	12.58
10400.0	36.16	PK	67	1.5	H	20.38	56.54	74	17.46
4993.5	22.19	Ave.	208	1.3	V	12.57	34.76	54	19.24
4993.5	37.90	PK	208	1.3	V	12.57	50.47	74	23.53
2765.8	21.26	Ave.	290	1.9	V	8.62	29.88	54	24.12
2765.8	36.11	PK	290	1.9	V	8.62	44.73	74	29.27
1726.8	22.15	Ave.	53	1.3	H	2.32	24.47	54	29.53
1036.0	21.48	Ave.	40	1.6	H	-0.66	20.82	54	33.18
1726.8	36.13	PK	53	1.3	H	2.32	38.45	74	35.55
1036.0	35.24	PK	40	1.6	H	-0.66	34.58	74	39.42
802.11n-HT20, High Channel (5240 MHz)									
5240.0	93.58	PK	113	1.5	H	11.92	105.50	/	/
5240.0	82.14	Ave.	113	1.5	H	11.92	94.06	/	/
5240.0	90.42	PK	56	1.7	V	11.92	102.34	/	/
5240.0	78.79	Ave.	56	1.7	V	11.92	90.71	/	/
10480.0	26.13	Ave.	47	1.5	H	20.38	46.51	54	7.49
8626.4	45.68	PK	211	1.6	V	17.21	62.89	74	11.11
298.7	49.12	QP	160	1.1	V	-14.0	33.75	46	12.25
8626.4	24.14	Ave.	211	1.6	V	17.21	41.35	54	12.65
10480.0	39.46	PK	47	1.5	H	20.38	59.84	74	14.16
4993.5	23.46	Ave.	160	1.3	V	12.57	36.03	54	17.97
2765.8	22.65	Ave.	39	1.8	V	8.62	31.27	54	22.73
4993.5	36.89	PK	160	1.3	V	12.57	49.46	74	24.54
2765.8	36.65	PK	39	1.8	V	8.62	45.27	74	28.73
1726.8	22.77	Ave.	214	1.4	H	2.24	25.01	54	28.99
1036.0	23.24	Ave.	307	1.4	H	-0.66	22.58	54	31.42
1726.8	35.48	PK	214	1.4	H	2.24	37.72	74	36.28
1036.0	36.22	PK	307	1.4	H	-0.66	35.56	74	38.44

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	FCC Part 15.407/205/209	
	Reading (dBμV)	Detector (PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
802.11n-HT40, Low Channel (5190 MHz)									
5190.0	91.28	PK	275	1.5	H	11.92	103.20	/	/
5190.0	80.23	Ave.	275	1.5	H	11.92	92.15	/	/
5190.0	88.35	PK	328	1.3	V	11.92	100.27	/	/
5190.0	77.01	Ave.	328	1.3	V	11.92	88.93	/	/
298.7	49.62	QP	147	1.2	V	-14.0	35.62	46	10.38
10380.0	23.07	Ave.	80	1.6	H	20.38	43.45	54	10.55
6572.5	24.50	Ave.	144	1.3	V	16.72	41.22	54	12.78
6572.5	44.21	PK	144	1.3	V	16.72	60.93	74	13.07
10380.0	36.26	PK	80	1.6	H	20.38	56.64	74	17.36
4963.2	22.19	Ave.	153	1.3	V	12.50	34.69	54	19.31
4963.2	37.90	PK	153	1.3	V	12.50	50.40	74	23.60
2395.4	21.26	Ave.	290	1.9	H	6.13	27.39	54	26.61
1865.2	22.15	Ave.	62	1.6	V	2.63	24.78	54	29.22
2395.6	36.11	PK	290	1.9	H	6.13	42.24	74	31.76
1362.5	21.48	Ave.	40	1.5	H	0.68	22.16	54	31.84
1865.3	36.13	PK	62	1.6	V	2.63	38.76	74	35.24
1362.5	35.24	PK	40	1.5	H	0.68	35.92	74	38.08
802.11n-HT40, High Channel (5230 MHz)									
5230.0	90.62	PK	157	1.6	H	11.92	102.54	/	/
5230.0	81.47	Ave.	157	1.6	H	11.92	93.39	/	/
5230.0	88.16	PK	201	1.6	V	11.92	100.08	/	/
5230.0	78.28	Ave.	201	1.6	V	11.92	90.20	/	/
6572.5	28.56	Ave.	156	1.4	V	16.72	45.28	54	8.72
10460.0	24.21	Ave.	77	1.7	H	20.38	44.59	54	9.41
298.7	49.62	QP	68	1.0	V	-14.0	35.62	46	10.38
6572.5	46.08	PK	156	1.4	V	16.72	62.80	74	11.20
10460.0	37.18	PK	77	1.7	H	20.38	57.56	74	16.44
4963.2	23.26	Ave.	231	1.5	V	12.50	35.76	54	18.24
4963.2	37.12	PK	231	1.5	V	12.50	49.62	74	24.38
2395.4	22.67	Ave.	117	1.6	H	6.13	28.80	54	25.20
1865.2	23.40	Ave.	46	1.2	V	2.63	26.03	54	27.97
1362.5	23.52	Ave.	130	1.7	H	0.68	24.20	54	29.80
2395.6	35.78	PK	117	1.6	H	6.13	41.91	74	32.09
1865.3	36.65	PK	46	1.2	V	2.63	39.28	74	34.72
1362.5	36.48	PK	130	1.7	H	0.68	37.16	74	36.84

Note：
Corrected Amplitude = Corrected Factor + Reading
Corrected Factor=Antenna factor (RX) + Cable Loss – Amplifier Factor
Margin = Limit- Corr. Amplitude

Conducted Spurious Emission at Antenna Port

Test data is referred to FCC ID: PD9633ANH granted on 2009-08-10, report No.: INTEL-090527F, which was tested by AEGIS Laboratories.

FCC §15.407(b) (1) (2) (3) (4) – OUT OF BAND EMISSIONS

Applicable Standard

FCC §15.407 (b) (1), (2), (3), (4);

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.

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.

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.

For transmitters operating in the 5.725–5.825 GHz band: all emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an EIRP of –17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an EIRP of –27 dBm/MHz.

Test Data

Test data is referred to FCC ID: PD9633ANH granted on 2009-08-10, report No.: INTEL-090527F, which was tested by AEGIS Laboratories.

FCC §15.407(a) (1) – 26 dB EMISSION BANDWIDTH

Applicable Standard

For the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the 5.25–5.35 GHz and 5.47–5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the peak power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the band 5.725–5.825 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 1 W or 17 dBm + 10 log B, where B is the 26-dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 17 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Test Data

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FCC §15.407(a) (1) – CONDUCTED TRANSMITTER OUTPUT POWER

Applicable Standard

For the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the 5.25–5.35 GHz and 5.47–5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the peak power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the band 5.725–5.825 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 1 W or 17 dBm + 10 log B, where B is the 26-dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 17 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Test Data

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FCC §15.407(a) (1) (5) - POWER SPECTRAL DENSITY

Applicable Standard

For the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the 5.25–5.35 GHz and 5.47–5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the peak power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the band 5.725–5.825 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 1 W or 17 dBm + 10 log B, where B is the 26-dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 17 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Test Data

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FCC §15.407(a) (6) – PEAK EXCURSION RATIO

Applicable Standard

According to §15.407(a) (6), the ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the maximum conducted output power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

Test Data

Test data is referred to FCC ID: PD9633ANH granted on 2009-08-10, report No.: INTEL-090527F, which was tested by AEGIS Laboratories.

DECLARATION LETTER

X2 Computing Ltd.
Bond Industrial Estate, Wickhamford, EVESHAM, Worcestershire, WR11 7RL, UK
Tel: +44 (0)1386 830082 Fax: +44 (0)1386 830032

Attestation Letter

August 1, 2013

To:
Bay Area Compliance Laboratories Corp.
1274 Anvilwood Avenue
Sunnyvale, CA 94089

Dear Sir or Madam:

We, X2 Computing Ltd. hereby declare that our Tablet, Model Number: X220 Carbon, FCC ID: RGCCARBONX2206300，with AUO & Chimei LCD screens；different top cover for Capacitive & Resistive touch panels: different battery cover each of 8000mAh and 160000mAh batteries; the PCBA with same PCB but with 8pin and 12pin pogo connector alternative; with 32G and 16G storage, different color for led lamp each of Halo LED or not; front camera and rear camera both are the optional part; Plastic and Rubber I/O cover is also optional on product.

Best Regards,

Signature:

Robin Daunter
Technical Director

******* END OF REPORT *******