NVLAP LAB CODE 200707-0

FCC PART 15.249

MEASUREMENT AND TEST REPORT

For

Voyetra Turtle Beach, Inc.

150 Clearbrook Road, Ste 162, Elmsford, NY 10523, USA

FCC ID: XGB-TB2171
Model: X41

Report Type:	**Product Type:**
Original Report	X41 Wireless RF Transmitter

Test Engineer:	Weir Zhong
Report Number:	RSZ09060104
Report Date:	2009-07-13
Reviewed By:	Merry Zhao EMC Engineer
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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Voyetra Turtle Beach, Inc.*'s product, model *X41 (FCC ID: XGB-TB2171)*, or the "EUT" as referred to in this report is a *X41 Wireless RF Transmitter* which measures approximately 11 cm L x 11 cm W x 22 cm H, rated input voltage: DC 5V From USB.

** All measurement and test data in this report was gathered from production sample serial number: 0906004 (Assigned by BACL, Shenzhen). The EUT was received on 2009-06-01.*

Objective

This Type approval report is prepared on behalf of *Voyetra Turtle Beach, Inc.* in accordance with Part 2, Subpart J, and Part 15, Subparts A, B and C of the Federal Communication Commissions rules.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.207, 15.209, 15.109 and 15.249 rules.

Related Submittal(s)/Grant(s)

No Related Submittals.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

All radiated and conducted 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.

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 November 21, 2007. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2003.

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.

Additionally, Bay Area Compliance Laboratories Corp. (Shenzhen) is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200707-0).

NVLAP LAB CODE 200707-0

The current scope of accreditations can be found at http://ts.nist.gov/Standards/scopes/2007070.htm

SYSTEM TEST CONFIGURATION

Justification

The system was configured for testing in a typical fashion (as normally used by a typical user).

Equipment Modifications

No modifications were made to the unit tested.

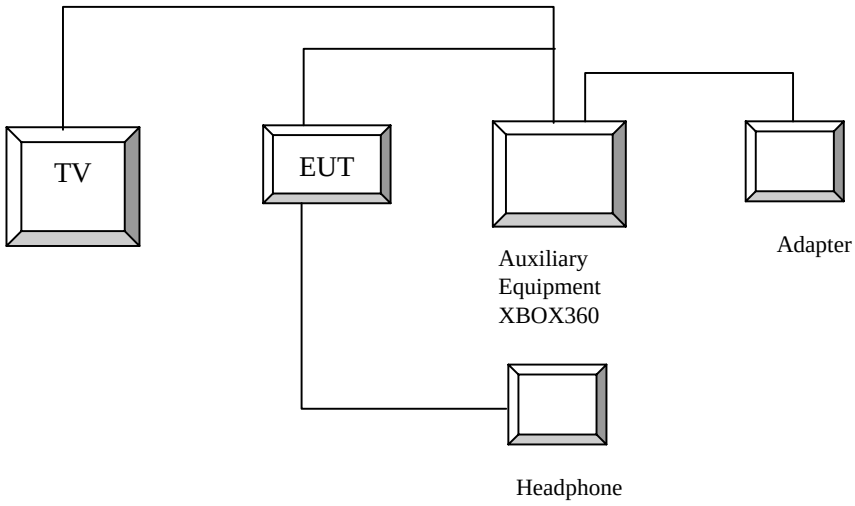
Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
KONKA	TV	T14FA073	AQX337YY5029056	DOC
Microsoft	X BOX	XBOX360	504706661306	N/A
Microsoft	AC Adapter	DSP-186CB-1A	9902B013806613	N/A

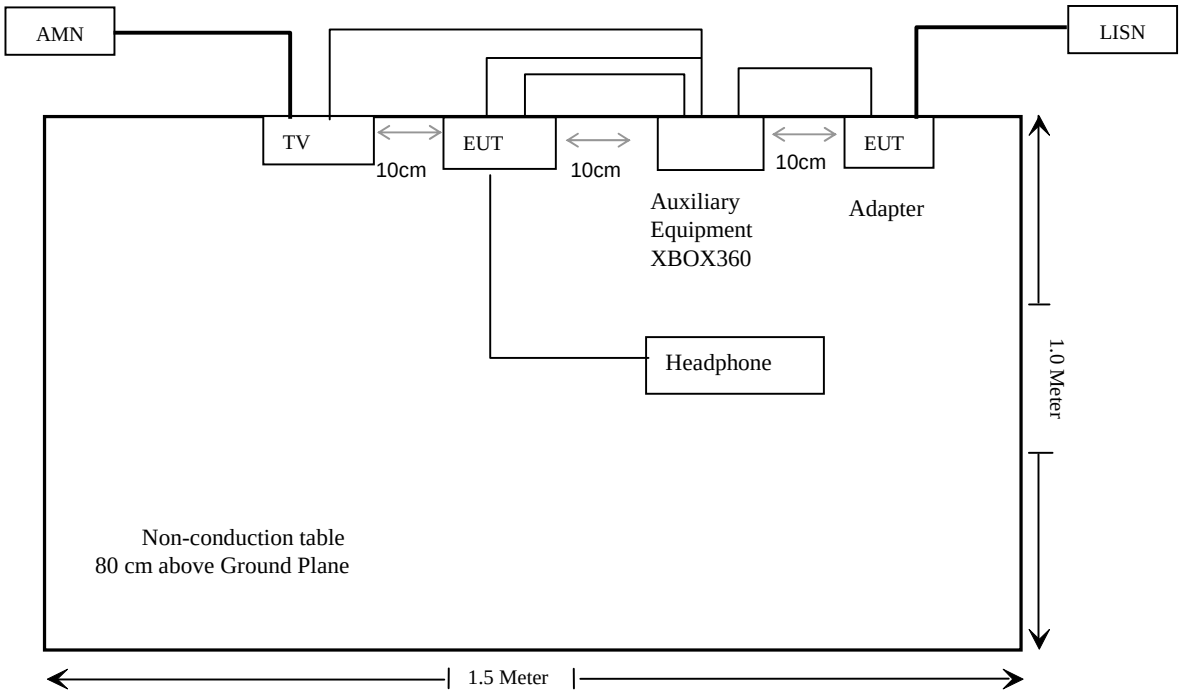
External I/O Cable

Cable Description	Length (m)	From/Port	To
Shielded Detachable HD AV Cable	2.5	Fiber Port/XBOX360	EUT
Unshielded Detachable Fiber Cable	3.0	USB Port/ XBOX360	EUT
Shielded Detachable DC Cable	1.2	DC Port/Adapter	XBOX360
Shielded Detachable AC Cable	1.8	AC Port/Adapter	AC Mains
Unshielded Detachable Headphone Cable	1.2	Headphone Port/EUT	AC Mains

Configuration of Test Setup



Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.203	Antenna Requirement	Compliant
§15.207(a)	Conduction Emissions	Compliant
§15.109, §15.205(a), §15.209(a), 15.249(a), §15.249(c), §15.35	Radiated Emissions	Compliant*
§15.249(d)	Out of Band Emissions	Compliant

*Within measurement uncertainty

§15.203 - ANTENNA REQUIREMENT

Applicable Standard

For intentional device, 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.

Antenna Connector Construction

The EUT has a Printed antenna on PCB, which in accordance to section 15.203, is considered sufficient to comply with the provisions of this section.

Result: Compliant.

Please refer to the EUT photos.

§15.207 (a) - CONDUCTED EMISSIONS

Applicable Standard

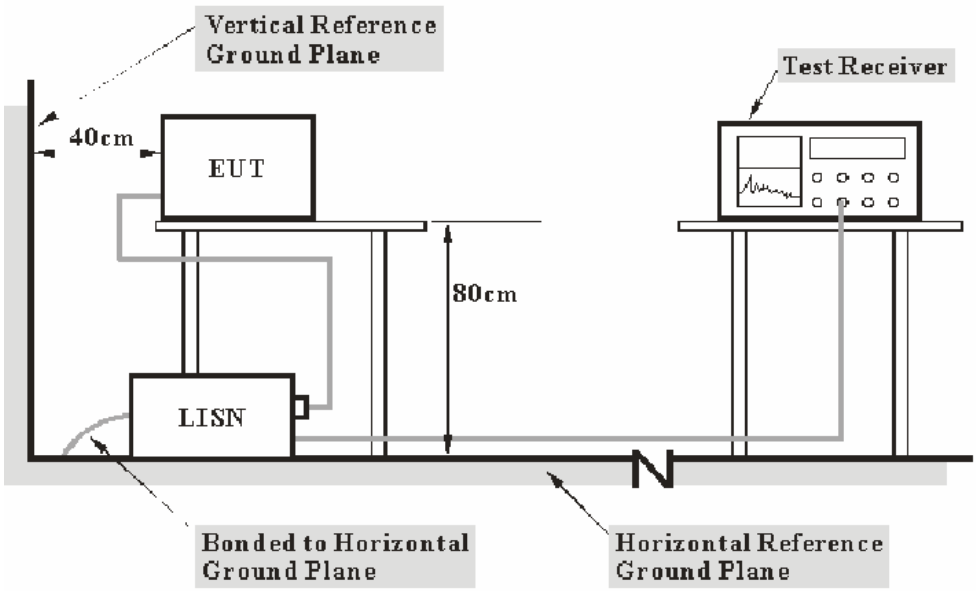
CFR47 §15.207, §15.207

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, and LISN.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement at Bay Area Compliance Laboratory Corp. (Shenzhen) is ±2.4 dB.

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 C63.4-2003 measurement procedure. The specification used was with the FCC Part 15.107 and 15.207 limits.

The spacing between the peripherals was 10 cm.

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
Rohde & Schwarz	EMI Test Receiver	ESCS30	830245/006	2009-04-28	2010-04-27
Rohde & Schwarz	L.I.S.N.	ESH2-Z5	892107/021	2009-04-28	2010-04-27

*** Statement of Traceability:** Bay Area Compliance Laboratory Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Procedure

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.

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:

Transmitting Mode: 15.60 dB at **2.990 MHz** in the **Line** conductor mode

Receiving Mode: 15.50 dB at **3.010 MHz** in the **Line** conductor mode

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0 kPa

** The testing was performed by Weir Zhong on 2009-07-01.*

Test Mode: Transmitting

Line Conducted Emissions				FCC Part 15.207	
Frequency (MHz)	**Amplitude (dBµV)**	**Detector (QP/AV)**	**Conductor (Line/Neutral)**	**Limit (dBµV)**	**Margin (dB)**
2.990	30.40	AV	Line	46.00	15.60
0.792	29.50	AV	Neutral	46.00	16.50
15.020	43.30	QP	Neutral	60.00	16.70
0.365	29.40	AV	Neutral	48.60	19.20
2.990	34.50	QP	Line	56.00	21.50
12.820	38.30	QP	Line	60.00	21.70
15.020	28.20	AV	Neutral	50.00	21.80
2.430	23.50	AV	Neutral	46.00	22.50
0.294	33.00	QP	Neutral	56.00	23.00
6.610	26.80	AV	Line	50.00	23.20
6.610	36.00	QP	Line	60.00	24.00
0.180	30.50	AV	Neutral	54.50	24.00
12.850	25.80	AV	Line	50.00	24.20
0.461	22.40	AV	Line	46.70	24.30
6.900	35.20	QP	Neutral	60.00	24.80
0.180	39.50	QP	Neutral	64.50	25.00
2.430	30.00	QP	Neutral	56.00	26.00
6.900	23.40	AV	Neutral	50.00	26.60
0.180	27.90	AV	Line	54.50	26.60
0.366	31.80	QP	Neutral	58.60	26.80
0.461	28.70	QP	Line	56.70	28.00
0.304	21.50	AV	Line	50.10	28.60
0.304	30.50	QP	Line	60.10	29.60
0.181	34.40	QP	Line	64.50	30.10

Test Mode: Receiving

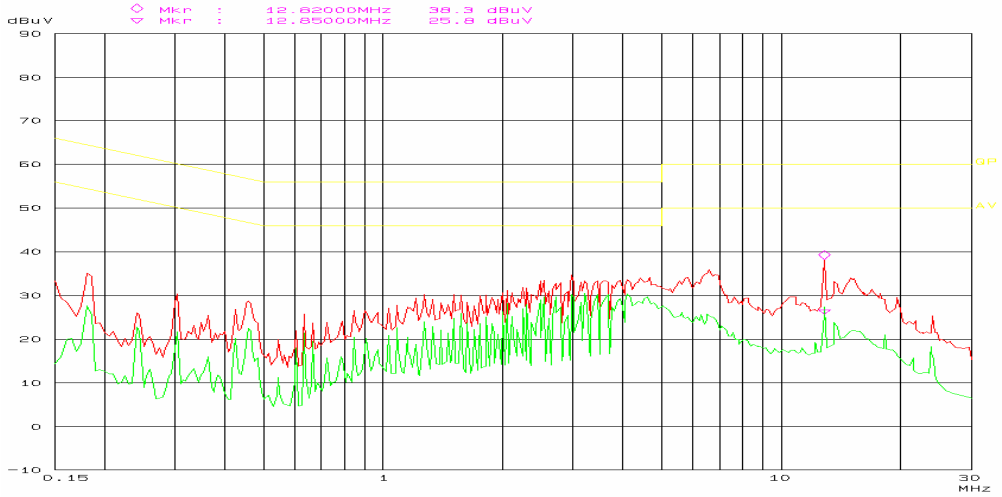
Line Conducted Emissions				FCC Part 15.207	
Frequency (MHz)	**Amplitude (dBµV)**	**Detector (QP/AV)**	**Conductor (Line/ Neutral)**	**Limit (dBµV)**	**Margin (dB)**
3.010	30.50	AV	Line	46.00	15.50
14.880	43.40	QP	Neutral	60.00	16.60
0.801	28.90	AV	Neutral	46.00	17.10
0.180	35.90	AV	Neutral	54.50	18.60
0.365	29.10	AV	Neutral	48.60	19.50
3.010	35.10	QP	Line	56.00	20.90
12.850	38.30	QP	Line	60.00	21.70
0.801	34.00	QP	Neutral	56.00	22.00
2.440	24.00	AV	Neutral	46.00	22.00
14.870	27.80	AV	Neutral	50.00	22.20
6.610	26.70	AV	Line	50.00	23.30
6.909	36.20	QP	Line	60.00	23.80
0.461	22.50	AV	Line	46.70	24.20
6.905	35.20	QP	Neutral	60.00	24.80
12.870	25.20	AV	Line	50.00	24.80
0.180	39.60	QP	Neutral	64.50	24.90
2.440	30.10	QP	Neutral	56.00	25.90
6.905	24.10	AV	Neutral	50.00	25.90
0.365	31.70	QP	Neutral	58.00	26.30
0.180	27.90	AV	Line	54.50	26.60
0.462	28.80	QP	Line	56.70	27.90
0.304	21.60	AV	Line	50.10	28.50
0.303	30.70	QP	Line	60.10	29.40
0.180	34.50	QP	Line	64.50	30.00

Plot(s) of Test Data

Plot(s) of Test Data is presented hereinafter as reference.

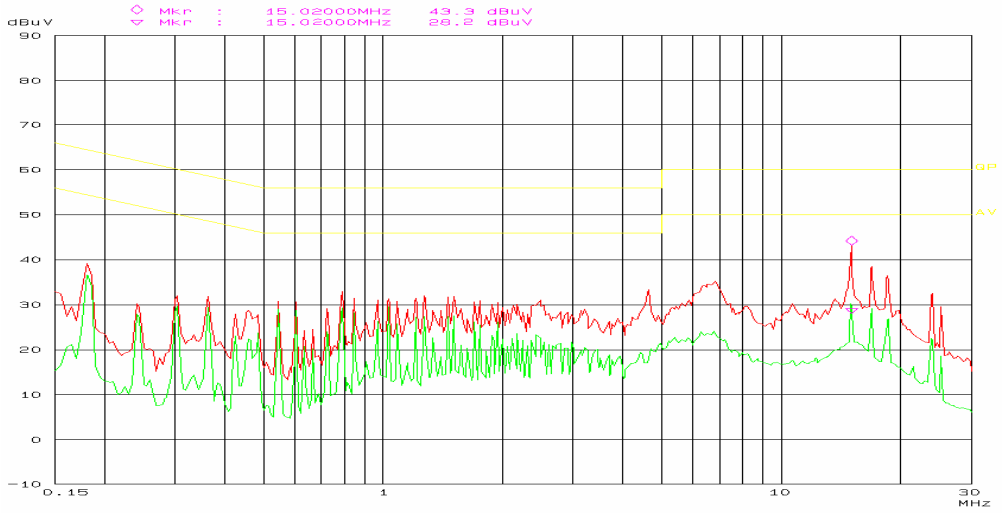
Conducted Emission
FCC PART 15

EUT:	X41 Wireless RF Transmitter M/N: X41
Manuf:	Voyetra
Op Cond:	Transmitting
Operator:	Weir
Test Spec:	Input: AC120V 60HZ L
Comment:	Temp: 25 Hum: 50% BACL



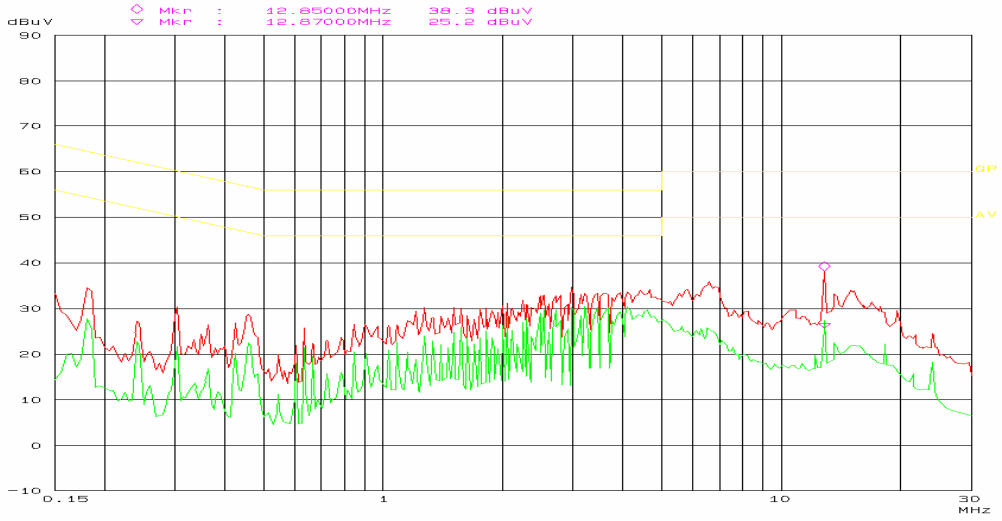
Conducted Emission
FCC PART 15

EUT:	X41 Wireless RF Transmitter M/N: X41
Manuf:	Voyetra
Op Cond:	Transmitting
Operator:	Weir
Test Spec:	Input: AC120V 60HZ N
Comment:	Temp: 25 Hum: 50% BACL



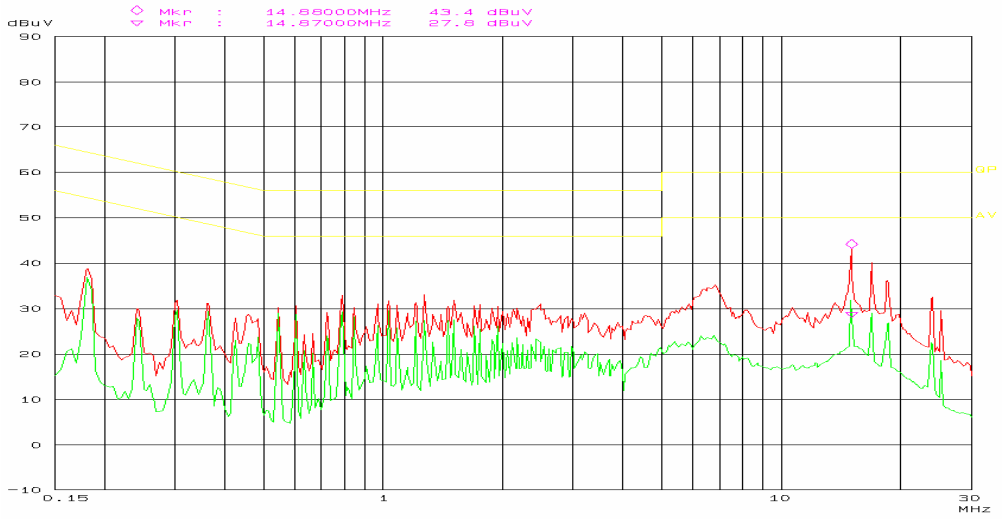
Conducted Emission
FCC PART 15

EUT: X41 Wireless RF Transmitter M/N: X41
Manuf: Voyetra
Op Cond: Receiving
Operator: Weir
Test Spec: Input: AC120V 60HZ L
Comment: Temp: 25 Hum: 50%
BACL



Conducted Emission
FCC PART 15

EUT: X41 Wireless RF Transmitter M/N: X41
Manuf: Voyetra
Op Cond: Receiving
Operator: Weir
Test Spec: Input: AC120V 60HZ N
Comment: Temp: 25 Hum: 50%
BACL



§15.109, §15.205(a) §15.209(a) & §15.249 - RADIATED EMISSIONS

Applicable Standard

As per §15.249 (a), except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental Frequency	Field Strength of Fundamental (millivolts/meter)	Field Strength of Harmonics (microvolts/meter)
902–928 MHz	50	500
2400–2483.5 MHz	50	500
5725–5875 MHz	50	500
24.0–24.25 GHz	250	2500

As per §15.249 (c), Field strength limits are specified at a distance of 3 meters.

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 NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at Bay Area Compliance Laboratories Corp. (Shenzhen) is ±4.0 dB.

Test Equipment Setup

The spectrum analyzer or receiver is set as:

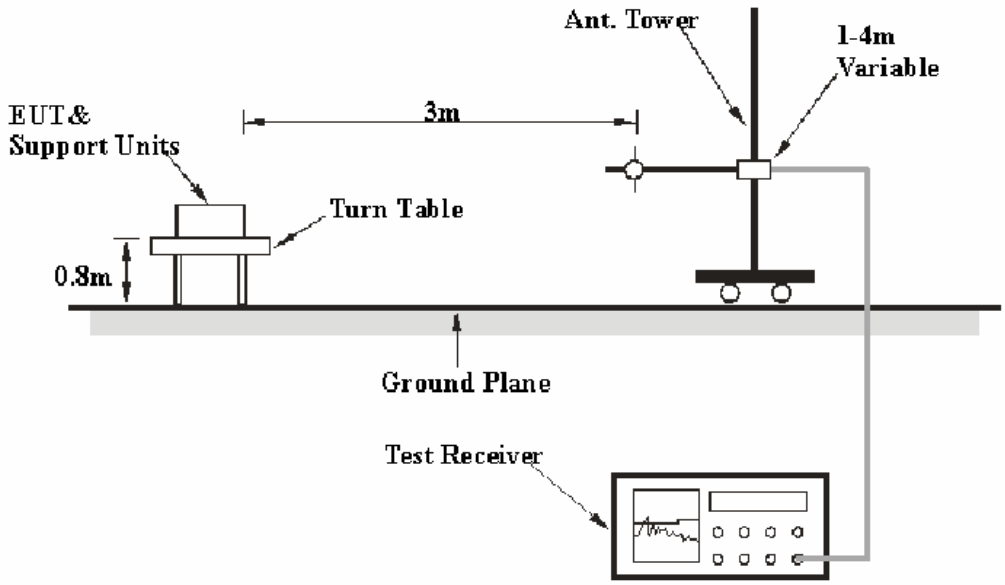
Below 1000 MHz:

RBW = 100 kHz / VBW = 300 kHz / Sweep = Auto

Above 1000MHz:

Peak: RBW = 1MHz / VBW = 1MHz / Sweep = Auto
Average: RBW = 1MHz / VBW = 10Hz / Sweep = Auto

EUT Setup



The radiated emission and out of band emission tests were performed in the 3 meters chamber B, using the setup accordance with the ANSI C63.4-2003. The specification used was the FCC 15.209, FCC 15.209 and FCC 15.249 limits.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Amplifier	8447E	1937A01046	2008-11-15	2009-11-15
Rohde & Schwarz	EMI Test Receiver	ESCI	100224	2008-10-16	2009-10-16
Sunol Sciences	Bilog Antenna	JB1	A040904-2	2009-04-12	2010-04-12
HP	Amplifier	8449B	3008A00277	2008-09-29	2009-09-29
Sunol Sciences	Horn Antenna	DRH-118	A052604	2008-09-25	2009-09-25
Rohde & Schwarz	Spectrum Analyzer	FSEM30	849720/019	2008-08-28	2009-08-27

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Procedure

For the radiated emissions test, the EUT, and all support equipment power cords was connected to the AC floor outlet.

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

The EUT is set 3 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.

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 Results Summary

According to the data in the following table, the EUT complied with the FCC Part 15.209, FCC Part 15.109 & 15.249, with the worst margin reading of:

Below 1 GHz:

Transmitting Mode: **2.3 dB** at **71.020900 MHz** in the **Vertical** polarization.
Receiving Mode: **2.3 dB** at **319.474150 MHz** in the **Horizontal** polarization for

Above 1 GHz:

Transmitting Mode: **7.86 dB** at **2404.00 MHz** in the **Horizontal** polarization, Low Channel
Transmitting Mode: **8.06 dB** at **2440.00 MHz** in the **Horizontal** polarization, Middle channel
Transmitting Mode: **7.93 dB** at **2476.00 MHz** in the **Horizontal** polarization, High channel

Test Data

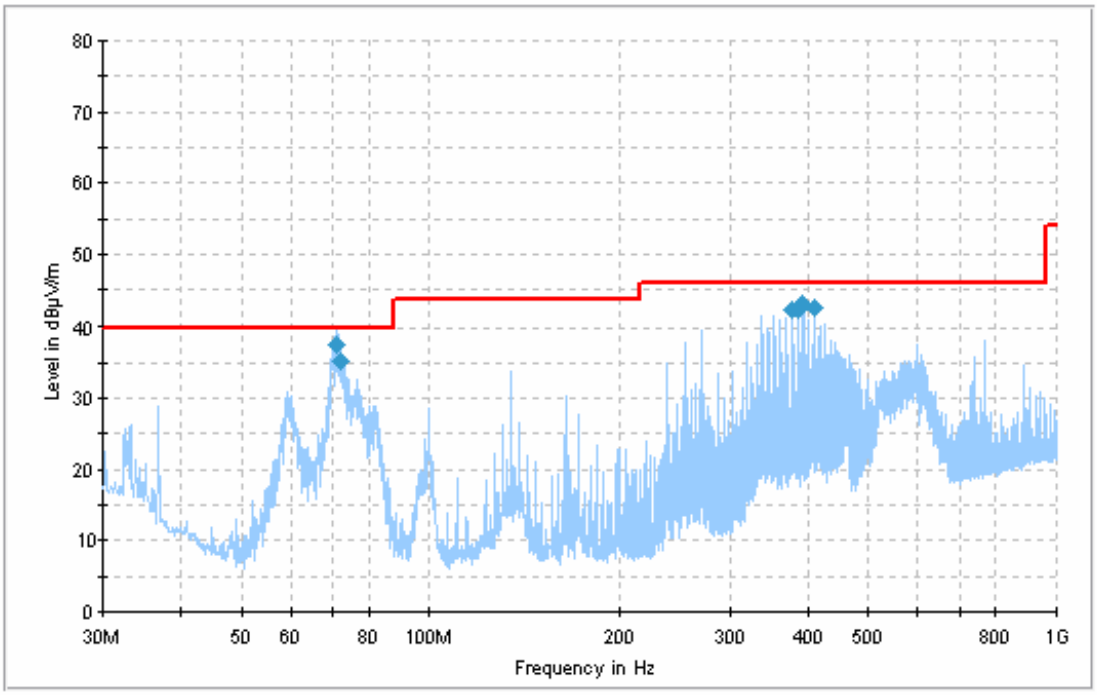
Environmental Conditions

Temperature:	25 ° C
Relative Humidity:	56%
ATM Pressure:	100.0 kPa

The testing was performed by Weir Zhong on 2009-07-05.

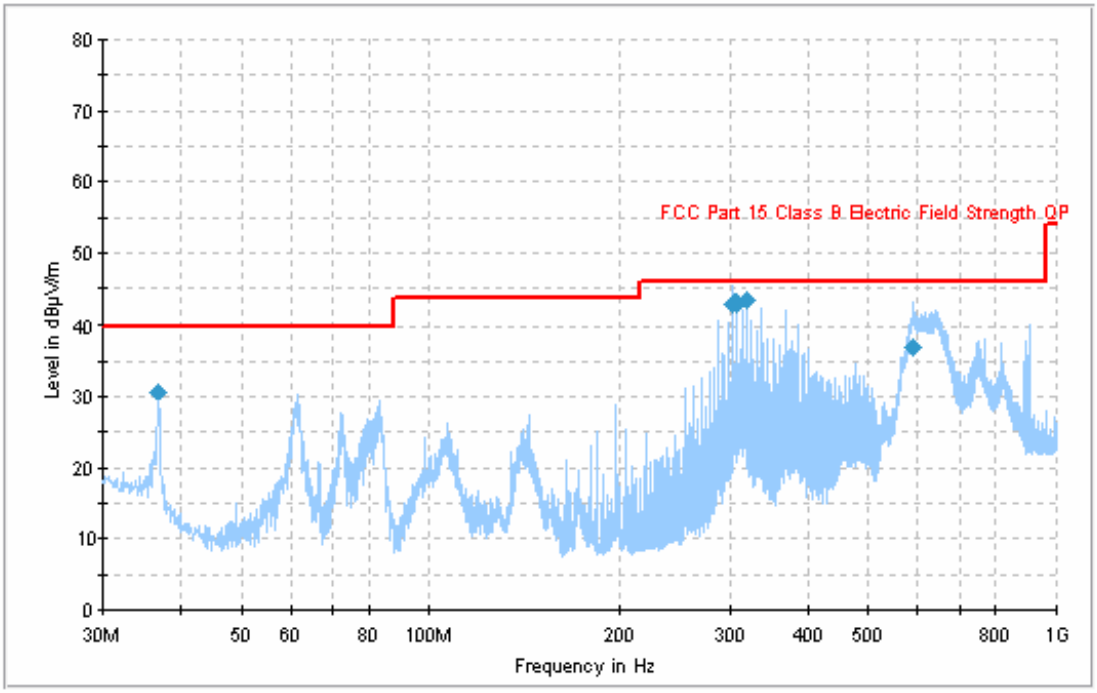
Below 1 GHz:

Test Mode: Transmitting



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Ant. Polarity (H/V)	Turntable Position (deg)	Correction Factor (dB)	Limit (dBµV/m)	Margin (dB)
71.020900	37.7	128.0	V	171.0	-22.1	40.0	2.3*
393.221425	43.1	106.0	H	178.0	-12.7	46.0	2.9*
376.839725	42.3	109.0	H	131.0	-12.9	46.0	3.7*
409.578475	42.3	108.0	H	176.0	-12.2	46.0	3.7*
385.015575	42.1	104.0	H	179.0	-12.8	46.0	3.9*
72.289475	35.3	133.0	V	193.0	-22.1	40.0	4.7

Test mode: Receiving



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Ant. Polarity (H/V)	Turntable Position (deg)	Correction Factor (dB)	Limit (dBµV/m)	Margin (dB)
319.474150	43.7	108.0	H	282.0	-13.8	46.0	2.3*
315.384550	43.5	118.0	H	276.0	-13.8	46.0	2.5*
307.201875	42.9	109.0	H	276.0	-14.1	46.0	3.1*
303.080800	42.7	109.0	H	285.0	-14.4	46.0	3.3*
589.954425	37.1	103.0	V	0.0	-8.8	46.0	8.9
36.873400	30.7	103.0	V	98.0	-13.3	40.0	9.3

Note: Radiated emission above 1GHz of receiving mode has not been detected, so there is no record about it.

Above 1 GHz:

Frequency (MHz)	S.A. Reading (dBuV/m)	Detector (PK/AV)	Direction Degree	Test Antenna			Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBuV/m)	FCC Part 15.249/209		
				Height (m)	Polar H/V	Factor (dB/m)				Limit (dBuV/m)	Margin (dB)	Remarks
Low Channel (f = 2404 MHz)												
2404.00	81.24	AV	352	1.0	H	30.9	7.90	33.9	86.14	94	7.86	Fund.
4808.00	52.52	AV	360	1.5	H	36.3	7.76	33.7	62.88	74	11.12	harmonic
2404.00	77.80	AV	89	1.0	V	30.3	7.90	33.9	82.10	94	11.90	Fund.
2385.53	36.31	AV	233	1.5	H	30.3	7.80	33.9	40.51	54	13.49	spurious
2385.53	35.42	AV	78	1.3	V	30.8	7.80	33.9	40.12	54	13.88	spurious
7212.00	44.82	AV	251	1.0	H	39.2	9.12	33.6	59.54	74	14.46	harmonic
4808.00	49.82	AV	263	1.1	V	35.0	7.76	33.7	58.88	74	15.12	harmonic
7212.00	45.01	AV	163	1.1	V	38.0	9.12	33.6	58.53	74	15.47	harmonic
2385.53	46.54	PK	233	1.2	H	30.3	7.80	33.9	50.74	74	23.26	spurious
2404.00	85.16	PK	352	1.0	H	30.9	7.90	33.9	90.06	114	23.94	Fund.
2385.53	45.01	PK	78	1.3	V	30.8	7.80	33.9	49.71	74	24.29	spurious
4808.00	57.02	PK	360	1.3	H	36.3	7.76	33.7	67.38	94	26.62	harmonic
2404.00	82.50	PK	89	1.0	V	30.3	7.90	33.9	86.80	114	27.20	Fund.
7212.00	49.36	PK	251	1.0	H	39.2	9.12	33.6	64.08	94	29.92	harmonic
4808.00	54.68	PK	263	1.1	V	35.0	7.76	33.7	63.74	94	30.26	harmonic
7212.00	49.82	PK	163	1.1	V	38.0	9.12	33.6	63.34	94	30.66	harmonic

Frequency (MHz)	S.A. Reading (dBuV/m)	Detector (PK/AV)	Direction Degree	Test Antenna			Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBuV/m)	FCC Part 15.249/209		
				Height (m)	Polar H/V	Factor (dB/m)				Limit (dBuV/m)	Margin (dB)	Remarks
Middle Channel (f = 2440 MHz)												
2440.00	80.89	AV	166	1.0	H	31.0	7.95	33.9	85.94	94	8.06	Fund.
2955.91	37.19	AV	72	1.5	H	32.5	8.05	33.8	43.94	54	10.06	spurious
2440.00	79.46	AV	250	1.0	V	30.4	7.95	33.9	83.91	94	10.09	Fund.
2963.92	36.54	AV	25	1.5	V	31.0	8.05	33.8	41.79	54	12.21	spurious
4880.00	50.01	AV	156	1.3	H	36.6	7.92	33.7	60.83	74	13.17	harmonic
7320.00	44.68	AV	174	1.0	H	39.3	9.15	33.6	59.53	74	14.47	harmonic
4880.00	49.46	AV	342	1.1	V	35.4	7.92	33.7	59.08	74	14.92	harmonic
7320.00	44.11	AV	341	1.1	V	38.1	9.15	33.6	57.76	74	16.24	harmonic
2955.91	48.06	PK	72	1.2	H	32.5	8.05	33.8	54.81	74	19.19	spurious
2963..92	47.38	PK	25	1.0	V	31.0	8.05	33.8	52.63	74	21.37	spurious
2440.00	85.44	PK	166	1.3	H	31.0	7.95	33.9	90.49	114	23.51	Fund.
2440.00	83.05	PK	250	1.3	V	30.4	7.95	33.9	87.50	114	26.50	Fund.
4880.00	55.58	PK	156	1.0	H	36.6	7.92	33.7	66.40	94	27.60	harmonic
7320.00	50.01	PK	174	1.0	H	39.3	9.15	33.6	64.86	94	29.14	harmonic
4880.00	55.05	PK	342	1.1	V	35.4	7.92	33.7	64.67	94	29.33	harmonic
7320.00	49.30	PK	341	1.1	V	38.1	9.15	33.6	62.95	94	31.05	harmonic

Frequency (MHz)	S.A. Reading (dBuV/m)	Detector (PK/AV)	Direction Degree	Test Antenna			Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBuV/m)	FCC Part 15.249/209		
				Height (m)	Polar H/V	Factor (dB/m)				Limit (dBuV/m)	Margin (dB)	Remarks
High Channel (f = 2476 MHz)												
2476.00	80.90	AV	360	1.0	H	31.1	7.97	33.9	86.07	94	7.93	Fund.
2971.94	36.57	AV	123	1.0	H	32.5	8.05	33.8	43.32	54	10.68	spurious
2476.00	78.55	AV	43	1.1	V	30.5	7.97	33.9	83.12	94	10.88	Fund.
2971.94	37.11	AV	301	1.1	V	31.0	8.05	33.8	42.36	54	11.64	spurious
4952.00	50.20	AV	177	1.5	H	36.6	7.95	33.7	61.05	74	12.95	harmonic
7428.00	44.50	AV	166	1.5	H	39.4	9.18	33.6	59.48	74	14.52	harmonic
4952.00	48.10	AV	220	1.1	V	35.4	7.95	33.7	57.75	74	16.25	harmonic
7428.00	44.02	AV	273	1.0	V	38.1	9.18	33.6	57.70	74	16.30	harmonic
2971.94	48.94	PK	301	1.1	V	31.0	8.05	33.8	54.19	74	19.81	spurious
2971.94	47.33	PK	123	1.0	H	32.5	8.05	33.8	54.08	74	19.92	spurious
2476.00	85.16	PK	360	1.0	H	31.1	7.97	33.9	90.33	114	23.67	Fund.
4952.00	57.82	PK	177	1.3	H	36.6	7.95	33.7	68.67	94	25.33	harmonic
2476.00	83.48	PK	43	1.1	V	30.5	7.97	33.9	88.05	114	25.95	Fund.
4952.00	55.26	PK	220	1.5	V	35.4	7.95	33.7	64.91	94	29.09	harmonic
7428.00	49.31	PK	166	1.5	H	39.4	9.18	33.6	64.29	94	29.71	harmonic
7428.00	48.98	PK	273	1.0	V	38.1	9.18	33.6	62.66	94	31.34	harmonic

*Within measurement uncertainty

§15.249(d) – OUT OF BAND EMISSIONS

Applicable Standard

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

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 NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at Bay Area Compliance Laboratories Corp. (Shenzhen) is $\pm$4.0 dB.

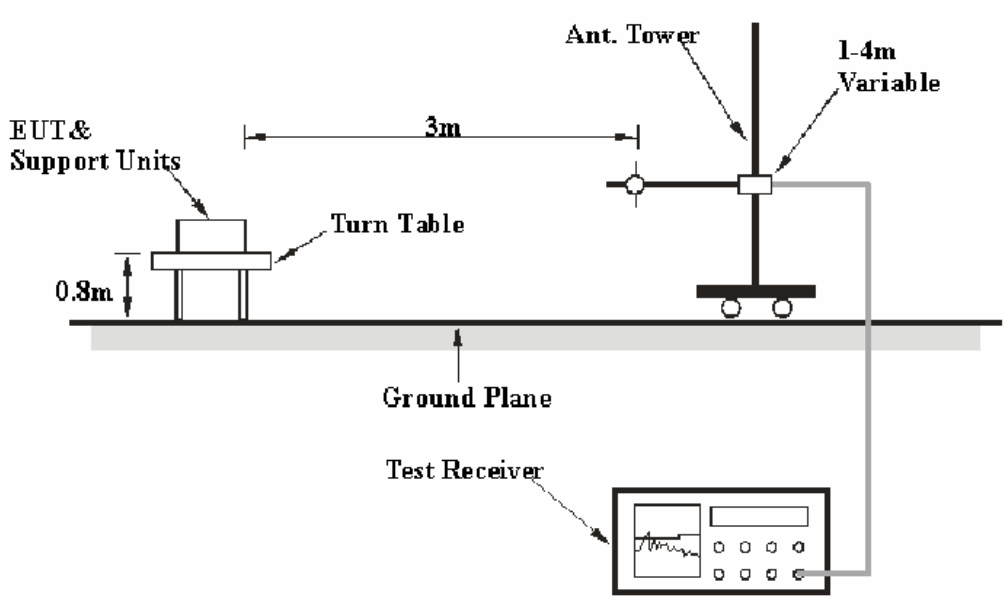
Test Equipment Setup

The spectrum analyzer or receiver is set as:

Above 1000MHz:

Peak: RBW = 1MHz / VBW = 1MHz / Sweep = Auto
Average: RBW = 1MHz / VBW = 10Hz / Sweep = Auto

EUT Setup



The radiated emission and out of band emission tests were performed in the 3 meters chamber B, using the setup accordance with the ANSI C63.4-2003. The specification used was the FCC 15.209 and FCC 15.249 limits.

Test Procedure

The EUT is set 3 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 at the band edge. The receiving antenna should be changed the polarization both of horizontal and vertical.

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

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100224	2008-11-07	2009-11-06
HP	Amplifier	8447E	1937A01046	2008-08-02	2009-08-02
Sunol Sciences	Horn Antenna	DRH-118	A052604	2008-09-25	2009-09-25

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) Corp. attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.2 kPa

**The testing was performed by Weir Zhong on 2009-07-07.*

Test Result: Compliant

Test Mode: Transmitting

Frequency (MHz)	S.A. Reading (dBuV/m)	Detector (PK/AV)	Direction Degree	Test Antenna			Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBuV/m)	FCC Part 15.249/209		
				Height (m)	Polar H/V	Factor (dB/m)				Limit (dBuV/m)	Margin (dB)	Remarks
Band Edge at Lowest CH												
2399.50	46.57	PK	360	1.5	H	30.9	7.9	33.9	51.47	74	22.53	/
2399.50	36.42	AV	360	1.5	H	30.9	7.9	33.9	41.32	54	12.68	/
2399.50	45.02	PK	155	1.0	V	30.3	7.9	33.9	49.32	74	24.68	/
2399.50	35.52	AV	155	1.0	V	30.3	7.9	33.9	39.82	54	14.18	/
Band Edge at Highest CH												
2483.57	47.80	PK	57	1.3	H	31.1	8.0	33.9	53.00	74	21.00	/
2483.57	36.85	AV	57	1.3	H	31.1	8.0	33.9	42.05	54	11.95	/
2483.57	47.03	PK	172	1.0	V	30.4	8.0	33.9	50.53	74	23.47	/
2483.57	36.25	AV	172	1	V	30.4	8.0	33.9	40.75	54	13.25	/

Note: The table is the worst case result.

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