



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-TB2166**  
**Model: X31**

<b>Report Type:</b> Original Report	<b>Product Type:</b> X31 Wireless RF Transmitter
<b>Test Engineer:</b> <u>Weir Zhong</u>	<i>Weir Zhong</i>
<b>Report Number:</b> <u>RSZ09060103</u>	
<b>Report Date:</b> <u>2009-07-13</u>	
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**Note:** This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. (Shenzhen). This report **must not** be used by the customer to claim product certification, approval, or endorsement by NVLAP\*, NIST, or any agency of the Federal Government.

\* This report may contain data that are not covered by the NVLAP accreditation and are marked with an asterisk “\*”

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## GENERAL INFORMATION

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### Product Description for Equipment under Test (EUT)

The *Voyetra Turtle Beach, Inc.* 's product, model *X31* (FCC ID: *XGB-TB2166*), or the "EUT" as referred to in this report is a *X31 Wireless RF Transmitter* which measures approximately 6.00 cm L x 6.7 cm W x 2.0 cm H, rated input voltage: DC 5V From USB.

*\* All measurement and test data in this report was gathered from production sample serial number: 0906003 (Assigned by BAEL, 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).



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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.

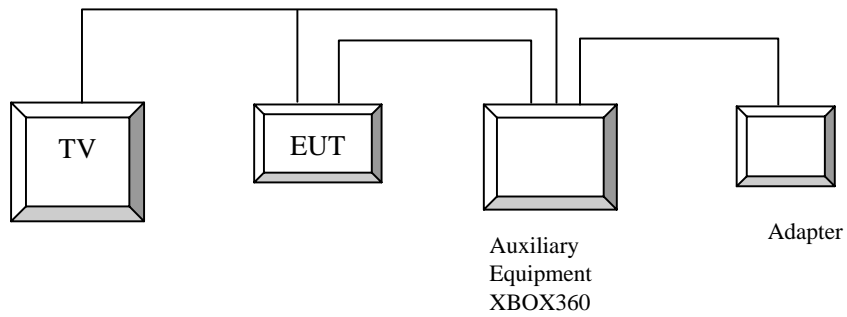
### Local Support Equipment List and Details

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

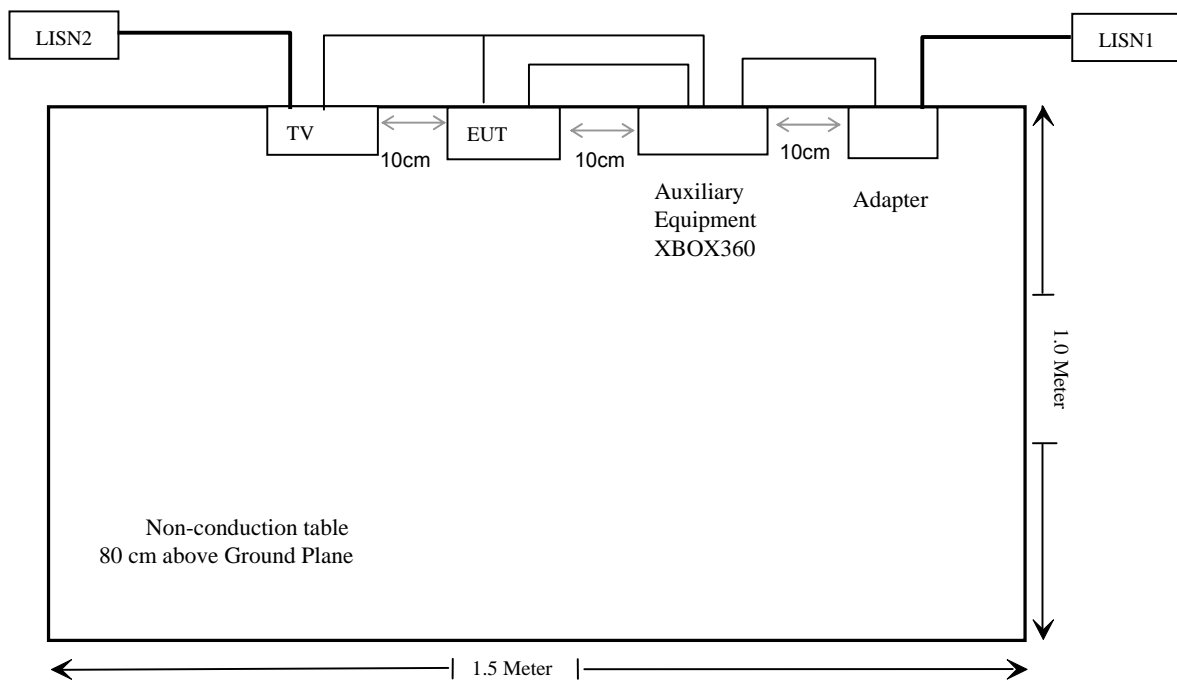
### External I/O Cable

Cable Description	Length (m)	From/Port	To
Shielded Detachable HD AV Cable	2.5	Audio Port/XBOX360	EUT
Unshielded Detachable USB 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

### 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

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## **§15.203 - ANTENNA REQUIREMENT**

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### **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 an 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

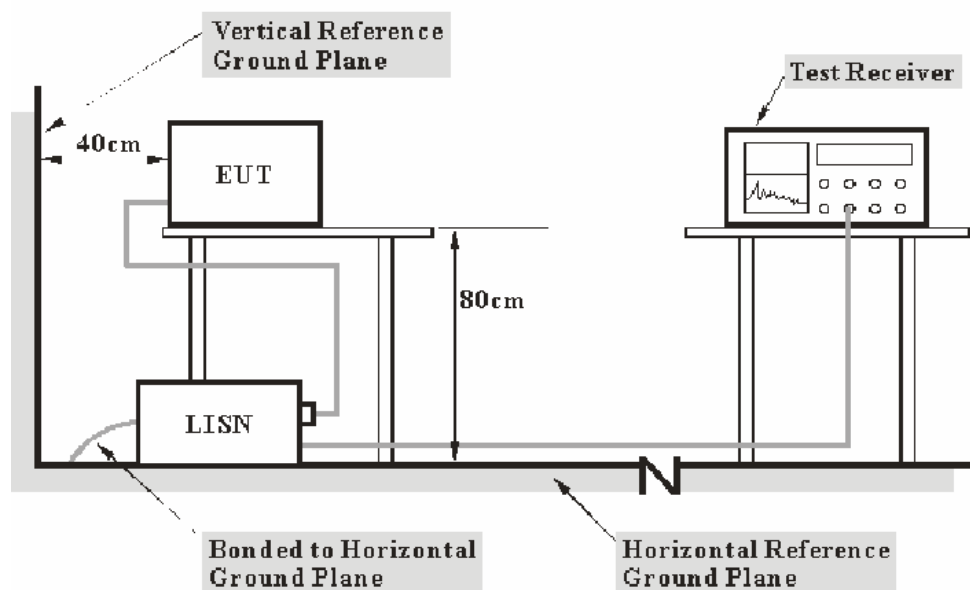
CFR47 §15.207.

### 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  $\pm 2.4$  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 15.207 and §15.107 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:

<b><i>Frequency Range</i></b>	<b><i>IF B/W</i></b>
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: 15.70 dB at 2.970 MHz in the Line conductor mode**

**Receiving Mode: 0.807 dB at 16.90 MHz in the Neutral conductor mode**

**Test Data****Environmental Conditions**

<b>Temperature:</b>	25 °C
<b>Relative Humidity:</b>	50 %
<b>ATM Pressure:</b>	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 (dB $\mu$ V)	Detector (QP/AV)	Conductor (Line/Neutral)	Limit (dB $\mu$ V)	Margin (dB)
2.970	30.30	AV	Line	46.00	15.70
0.790	29.20	AV	Neutral	46.00	16.80
15.020	43.10	QP	Neutral	60.00	16.90
0.180	36.80	AV	Neutral	54.50	17.70
0.365	29.30	AV	Neutral	48.60	19.30
2.970	34.70	QP	Line	56.00	21.30
12.820	38.20	QP	Line	60.00	21.80
15.070	28.00	AV	Neutral	50.00	22.00
2.425	23.30	AV	Neutral	46.00	22.70
0.790	32.80	QP	Neutral	56.00	23.20
6.605	26.70	AV	Line	50.00	23.30
6.605	35.90	QP	Line	60.00	24.10
0.460	22.50	AV	Line	46.70	24.20
12.830	25.70	AV	Line	50.00	24.30
6.850	35.10	QP	Neutral	60.00	24.90
0.180	39.10	QP	Neutral	64.50	25.40
2.425	29.90	QP	Neutral	56.00	26.10
0.850	23.50	AV	Neutral	50.00	26.50
0.180	27.90	AV	Line	54.50	26.60
0.365	31.80	QP	Neutral	58.60	26.80
0.460	28.70	QP	Line	56.70	28.00
0.305	21.60	AV	Line	50.10	28.50
0.305	30.40	QP	Line	60.10	29.70
0.180	34.60	QP	Line	64.50	29.90

*Test Mode: Receiving*

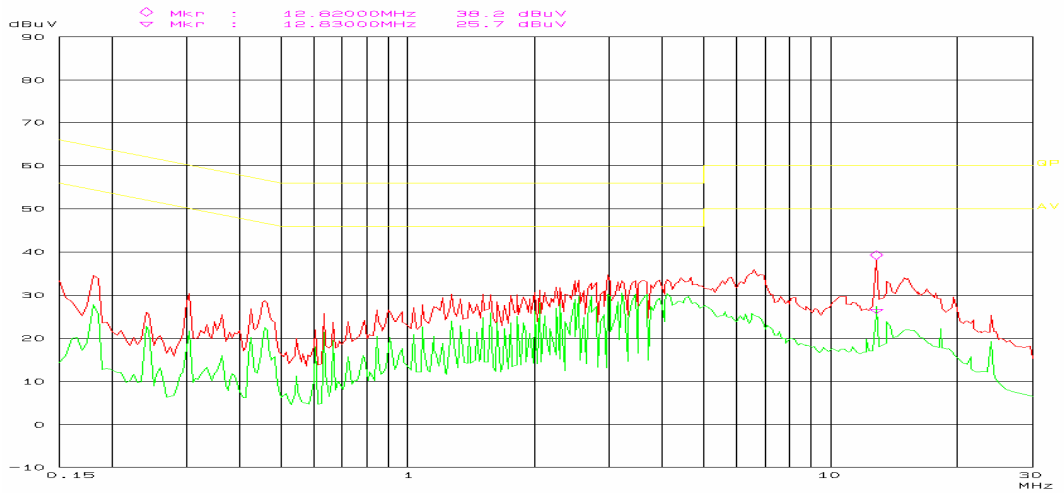
Line Conducted Emissions				FCC Part 15.207	
Frequency (MHz)	Amplitude (dB $\mu$ V)	Detector (QP/AV)	Conductor (Line/ Neutral)	Limit (dB $\mu$ V)	Margin (dB)
0.807	29.10	AV	Neutral	46.00	16.90
5.100	42.80	QP	Neutral	60.00	17.20
0.180	36.10	AV	Neutral	54.50	18.40
0.306	29.00	AV	Neutral	48.60	19.60
0.911	25.40	AV	Line	46.00	20.60
0.807	35.10	QP	Neutral	56.00	20.90
15.080	28.10	AV	Neutral	50.00	21.90
2.501	23.50	AV	Neutral	46.00	22.50
12.810	37.00	QP	Line	60.00	23.00
6.996	26.80	AV	Line	50.00	23.20
0.801	22.70	AV	Line	46.00	23.30
6.996	36.20	QP	Neutral	60.00	23.80
6.998	36.20	QP	Line	60.00	23.80
12.820	25.30	AV	Line	50.00	24.70
2.501	31.20	QP	Neutral	56.00	24.80
0.910	31.10	QP	Line	56.00	24.90
0.802	30.70	QP	Line	56.00	25.30
0.180	38.90	QP	Neutral	64.50	25.60
6.997	23.80	AV	Neutral	50.00	26.20
0.366	31.50	QP	Neutral	58.60	27.10
0.180	27.00	AV	Line	54.50	27.50
0.303	21.50	AV	Line	50.10	28.60
0.303	30.80	QP	Line	60.10	29.30
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.

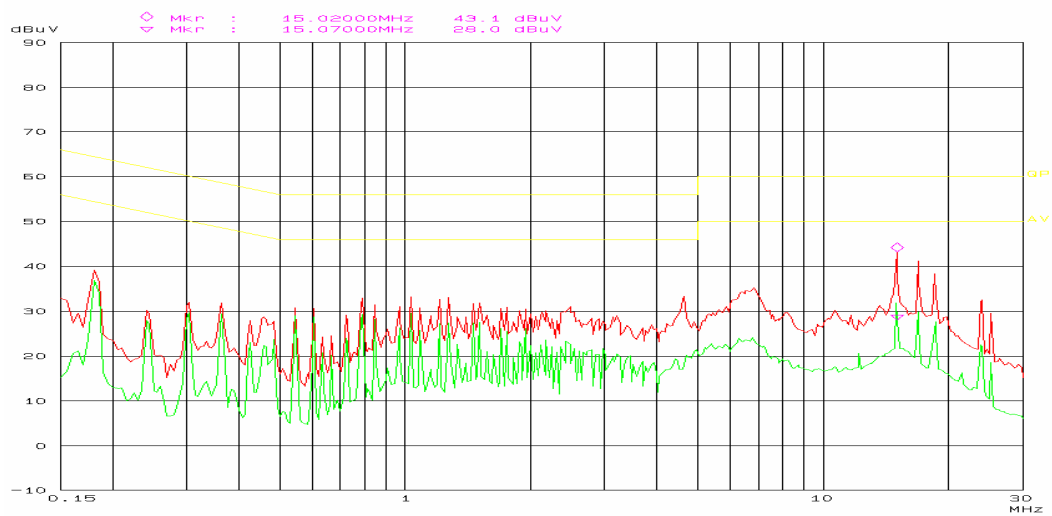
Conducted Emission  
FCC PART 15

EUT: X31 Wireless RF Transmitter M/N: X31  
 Manuf: Voyetra  
 Op Cond: Transmitting  
 Operator: Weir  
 Test Spec: Input: AC120V 60HZ L  
 Comment: Temp: 25 Hum: 50%  
 BACL



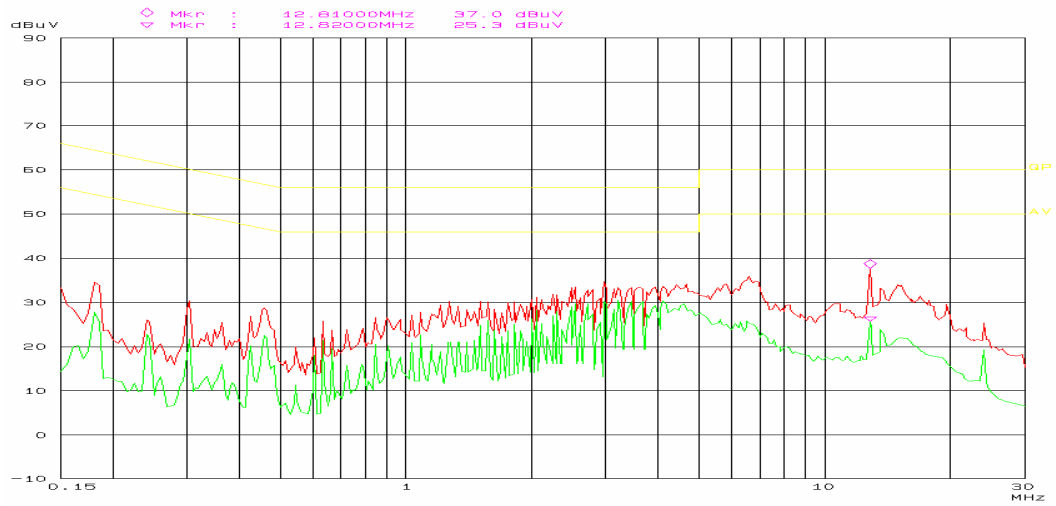
Conducted Emission  
FCC PART 15

EUT: X31 Wireless RF Transmitter M/N: X31  
 Manuf: Voyetra  
 Op Cond: Transmitting  
 Operator: Weir  
 Test Spec: Input: AC120V 60HZ N  
 Comment: Temp: 25 Hum: 50%  
 BACL



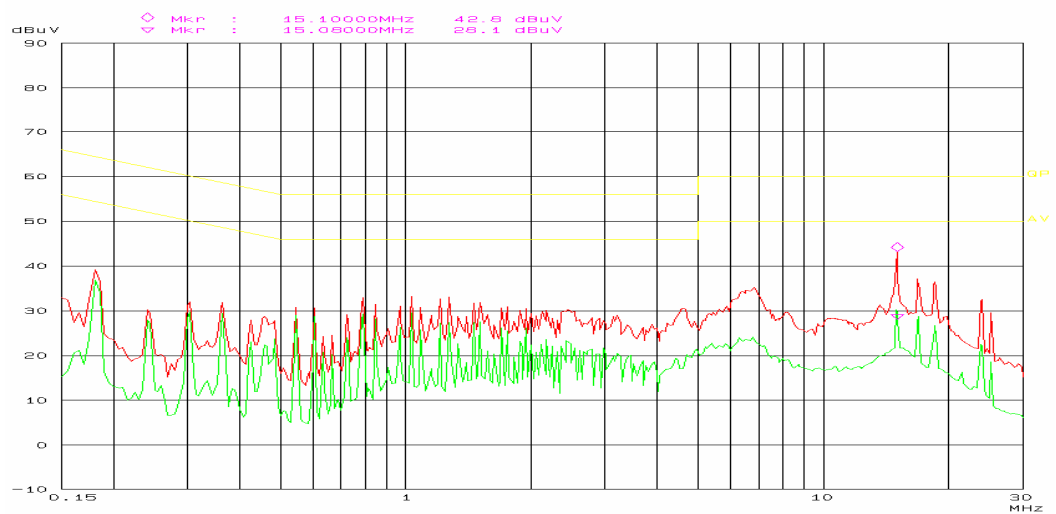
Conducted Emission  
FCC PART 15

EUT: X31 Wireless RF Transmitter M/N: X31  
 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: X31 Wireless RF Transmitter M/N: X31  
 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:

<b>Fundamental Frequency</b>	<b>Field Strength of Fundamental (millivolts/meter)</b>	<b>Field Strength of Harmonics (microvolts/meter)</b>
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  $\pm 4.0$  dB.

### **Test Equipment Setup**

The spectrum analyzer or receiver is set as:

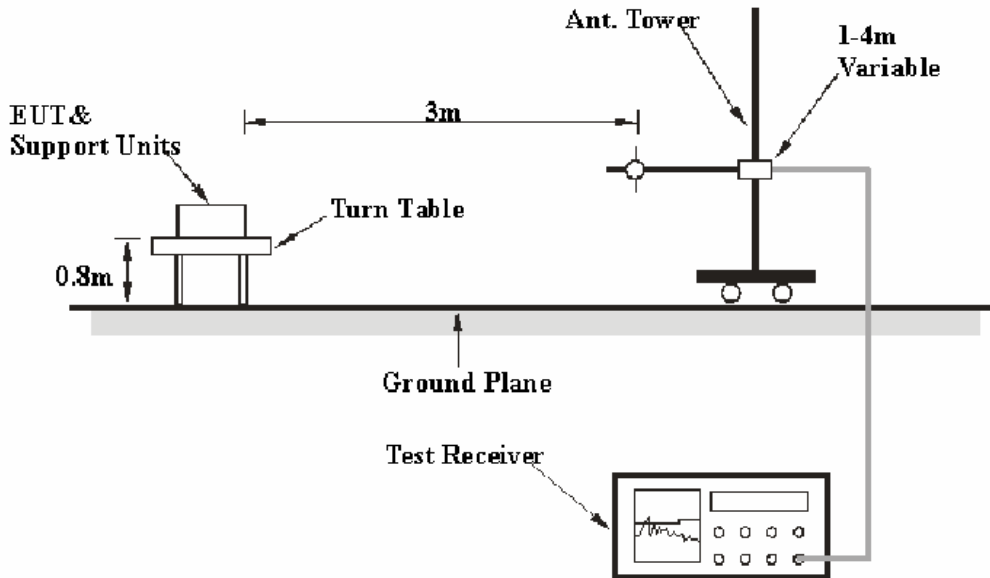
Below 1000 MHz:

$$\text{RBW} = 100 \text{ kHz} / \text{VBW} = 300 \text{ kHz} / \text{Sweep} = \text{Auto}$$

Above 1000MHz:

$$\begin{aligned} \text{Peak: RBW} &= 1\text{MHz} / \text{VBW} = 1\text{MHz} / \text{Sweep} = \text{Auto} \\ \text{Average: RBW} &= 1\text{MHz} / \text{VBW} = 10\text{Hz} / \text{Sweep} = \text{Auto} \end{aligned}$$

### 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, §15.109 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 adapter and TV were 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:

$$\text{Corrected Amplitude} = \text{Meter Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

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:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

## Test Results Summary

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

### Below 1 GHz:

Transmitting Mode: **2.1 dB** at **368.633775 MHz** in the **Horizontal** polarization.

Receiving Mode: **6.1 dB** at **264.192625 MHz** in the **Horizontal** polarization

### Above 1 GHz:

Transmitting Mode: **11.85 dB** at **2404.00 MHz** in the **Vertical** polarization, Low Channel

Transmitting Mode: **10.73 dB** at **2963.92 MHz** in the **Horizontal** polarization, Middle channel

Transmitting Mode: **10.58 dB** at **2476.00 MHz** in the **Vertical** polarization, High channel

**Test Data**

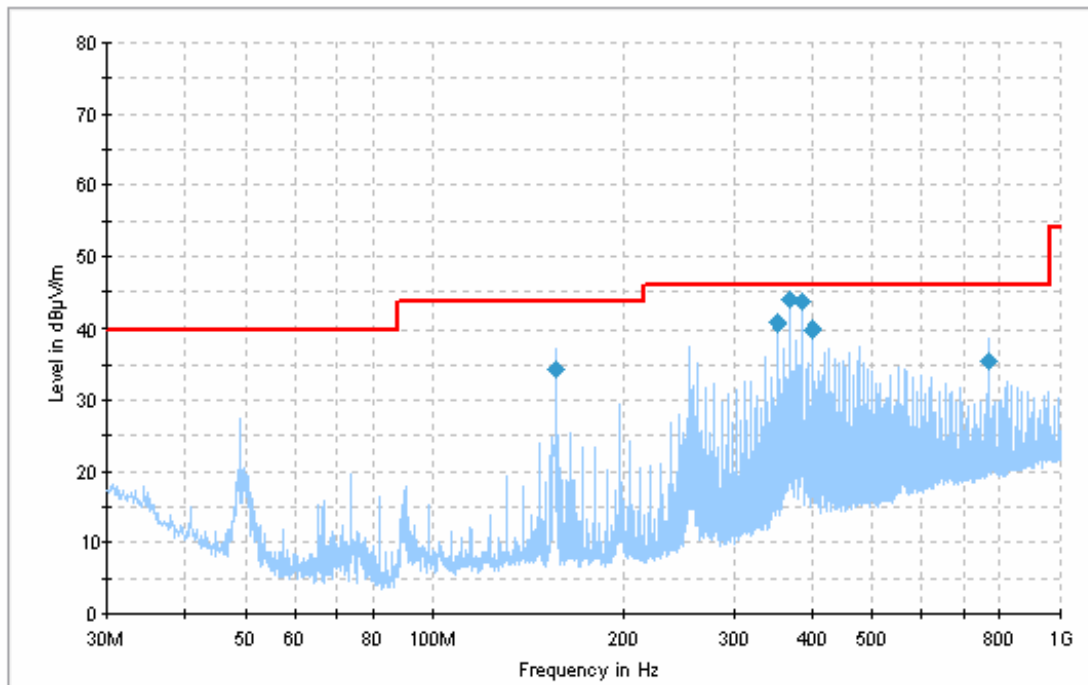
**Environmental Conditions**

<b>Temperature:</b>	25 ° C
<b>Relative Humidity:</b>	56%
<b>ATM Pressure:</b>	100.0 kPa

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

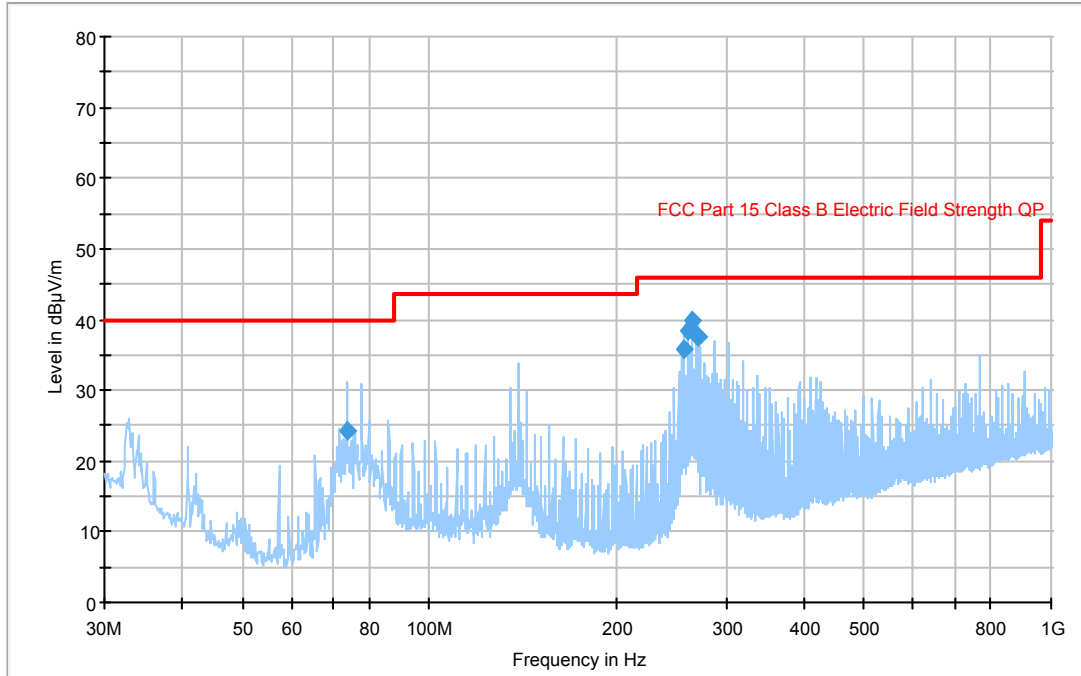
**Below 1 GHz:**

Test Mode: Transmitting



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Position (deg)	Correction Factor (dB)	Limit (dBµV/m)	Margin (dB)
368.633775	43.9	109.0	H	289.0	-12.9	46.0	2.1*
385.002975	43.6	108.0	H	300.0	-12.8	46.0	2.4*
352.241350	40.6	109.0	H	292.0	-13.1	46.0	5.4
401.393625	39.8	109.0	H	99.0	-12.4	46.0	6.2
155.652425	34.5	110.0	H	192.0	-18.2	43.5	9.0
768.079400	35.5	110.0	H	24.0	-5.8	46.0	10.5

Test mode: Receiving



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Position (deg)	Correction Factor (dB)	Limit (dBµV/m)	Margin (dB)
264.192625	39.9	117.0	H	269.0	-15.2	46.0	6.1
260.098775	38.4	111.0	H	263.0	-15.5	46.0	7.6
268.282425	37.7	109.0	H	273.0	-14.9	46.0	8.3
270.335350	37.5	109.0	H	259.0	-14.7	46.0	8.5
255.998300	35.8	110.0	H	265.0	-15.7	46.0	10.2
73.741625	24.2	112.0	H	153.0	-22.1	40.0	15.8

**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	77.85	AV	155	1.00	V	30.3	7.90	33.9	82.15	94	11.85	Fund.
2404.00	76.10	AV	240	1.00	H	30.9	7.90	33.9	81.00	94	13.00	Fund.
7212.00	45.01	AV	155	1.60	H	39.2	9.12	33.6	59.73	74	14.27	harmonic
4808.00	49.24	AV	175	1.37	H	36.3	7.76	33.7	59.60	74	14.40	harmonic
2312.15	36.12	AV	146	1.	V	30.1	7.05	33.9	39.37	54	14.63	spurious
2312.15	35.06	AV	0	1.50	H	30.5	7.05	33.9	38.71	54	15.29	spurious
4808.00	49.37	AV	240	1.00	V	35.0	7.76	33.7	58.43	74	15.57	harmonic
7212.00	44.53	AV	323	1.00	V	38.0	9.12	33.6	58.05	74	15.95	harmonic
2312.15	46.90	PK	146	1.	V	30.1	7.05	33.9	50.15	74	23.85	spurious
2312.15	45.70	PK	0	1.50	H	30.5	7.05	33.9	49.35	74	24.65	spurious
2404.00	82.40	PK	155	1.00	V	30.3	7.90	33.9	86.70	114	27.30	Fund.
2404.00	80.73	PK	240	1.00	H	30.9	7.90	33.9	85.63	114	28.37	Fund.
4808.00	55.50	PK	240	1.00	V	35.0	7.76	33.7	64.56	94	29.44	harmonic
7212.00	49.67	PK	155	1.60	H	39.2	9.12	33.6	64.39	94	29.61	harmonic
4808.00	54.01	PK	175	1.37	H	36.3	7.76	33.7	64.37	94	29.63	harmonic
7212.00	48.89	PK	323	1.00	V	38.0	9.12	33.6	62.41	94	31.59	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)												
2963.92	36.52	AV	360	1.00	H	32.5	8.05	33.8	43.27	54	10.73	spurious
2947.89	37.23	AV	82	1.60	V	31.0	8.05	33.8	42.48	54	11.52	spurious
2440.00	77.50	AV	56	1.10	V	30.4	7.95	33.9	81.95	94	12.05	Fund.
2440.00	76.82	AV	321	1.00	H	31.0	7.95	33.9	81.87	94	12.13	Fund.
7320.00	45.24	AV	142	1.70	H	39.3	9.15	33.6	60.09	74	13.91	harmonic
4880.00	49.01	AV	152	1.50	H	36.6	7.92	33.7	59.83	74	14.17	harmonic
4880.00	49.40	AV	235	1.00	V	35.4	7.92	33.7	59.02	74	14.98	harmonic
7320.00	44.72	AV	46	1.10	V	38.1	9.15	33.6	58.37	74	15.63	harmonic
2963.92	45.80	PK	360	1.00	H	32.5	8.05	33.8	52.55	74	21.45	spurious
2947.89	47.09	PK	82	1.60	V	31.0	8.05	33.8	52.34	74	21.66	spurious
2440.00	82.74	PK	56	1.10	V	30.4	7.95	33.9	87.19	114	26.81	Fund.
2440.00	81.15	PK	321	1.00	H	31.0	7.95	33.9	86.2	114	27.80	Fund.
4880.00	54.52	PK	152	1.60	H	36.6	7.92	33.7	65.34	94	28.66	harmonic
7320.00	50.16	PK	142	1.50	H	39.3	9.15	33.6	65.01	94	28.99	harmonic
4880.00	55.08	PK	235	1.00	V	35.4	7.92	33.7	64.7	94	29.30	harmonic
7320.00	49.83	PK	46	1.10	V	38.1	9.15	33.6	63.48	94	30.52	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	78.85	AV	312	1.1	V	30.5	7.97	33.9	83.42	94	10.58	Fund.
2961.01	36.10	AV	52	1.3	H	32.5	8.05	33.8	42.85	54	11.15	Fund.
2476.00	77.58	AV	19	1.5	H	31.1	7.97	33.9	82.75	94	11.25	Fund.
2961.01	36.92	AV	146	1.4	V	31.0	8.05	33.8	42.17	54	11.83	Fund.
7428.00	45.68	AV	34	1.5	H	39.4	9.18	33.6	60.66	74	13.34	harmonic
4952.00	48.88	AV	201	1.0	H	36.6	7.95	33.7	59.73	74	14.27	harmonic
4952.00	49.14	AV	176	1.0	V	35.4	7.95	33.7	58.79	74	15.21	harmonic
7428.00	44.62	AV	182	1.3	V	38.1	9.18	33.6	58.30	74	15.7	harmonic
2961.01	46.89	PK	52	1.5	H	32.5	8.05	33.8	53.64	74	20.36	spurious
2961.01	47.53	PK	146	1.4	V	31.0	8.05	33.8	52.78	74	21.22	spurious
2476.00	83.18	PK	312	1.1	V	30.5	7.97	33.9	87.75	114	26.25	Fund.
2476.00	82.05	PK	19	1.4	H	31.1	7.97	33.9	87.22	114	26.78	Fund.
7428.00	50.30	PK	34	1.3	H	39.4	9.18	33.6	65.28	94	28.72	harmonic
4952.00	55.61	PK	176	1.0	V	35.4	7.95	33.7	65.26	94	28.74	harmonic
4952.00	53.03	PK	201	1.0	H	36.6	7.95	33.7	63.88	94	30.12	harmonic
7428.00	49.37	PK	182	1.3	V	38.1	9.18	33.6	63.05	94	30.95	harmonic

## **§15.249(d) – OUT OF BAND EMISSIONS**

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### **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.

### **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.

$$\text{Corrected Amplitude} = \text{Meter Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

### **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.

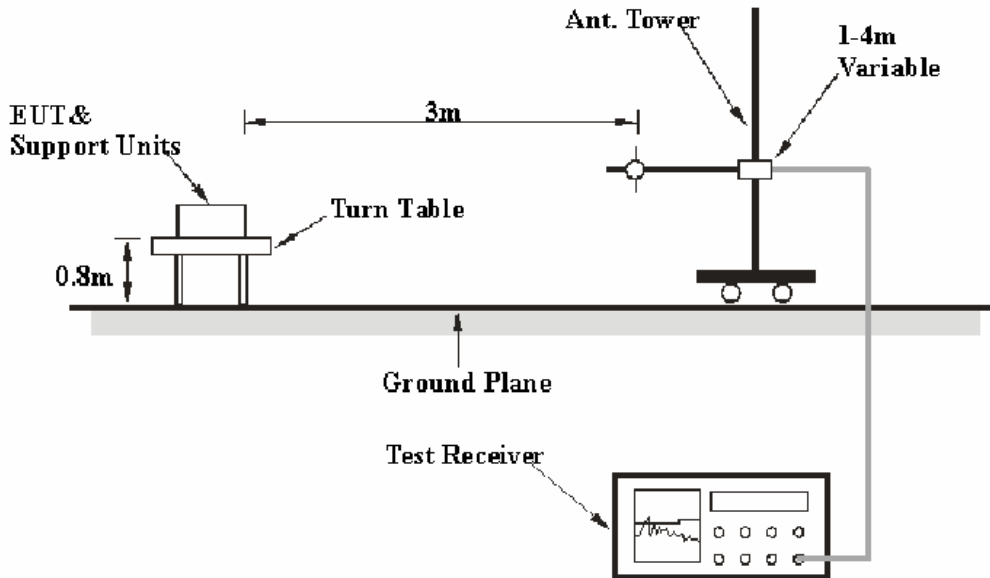
### **Test Equipment Setup**

The spectrum analyzer or receiver is set as:

Above 1000 MHz:

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 15.249 limits.

### 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**

<b>Temperature:</b>	25 °C
<b>Relative Humidity:</b>	56 %
<b>ATM Pressure:</b>	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												
2399.40	45.93	PK	175	1.0	H	30.9	7.9	33.9	50.83	74	23.17	/
2399.40	35.90	AV	175	1.0	H	30.9	7.9	33.9	40.80	54	13.20	/
2399.40	43.52	PK	240	1.1	V	30.3	7.9	33.9	47.82	74	26.18	/
2399.40	35.01	AV	240	1.1	V	30.3	7.9	33.9	39.31	54	14.69	/
Band Edge at Highest CH												
2483.57	45.18	PK	89	1.0	H	31.1	8.0	33.9	50.38	74	23.62	/
2483.57	35.10	AV	89	1.0	H	31.1	8.0	33.9	40.30	54	13.70	/
2483.57	43.54	PK	125	1.0	V	30.4	8.0	33.9	48.04	74	25.96	/
2483.57	35.10	AV	125	1.0	V	30.4	8.0	33.9	39.60	54	14.40	/

Note: The table is the worst case result.

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