EMC Test Report
Application for Grant of Equipment Authorization
pursuant to
Industry Canada RSS-Gen Issue 2 / RSS 210 Issue 7
FCC Part 15 Subpart C

Model: 95905.805 (Guitar Hero/Band Hero Guitar)

UPN:	7196A-95905805
FCC ID:	VFI95905805
APPLICANT:	RedOctane Inc. 444 Castro Street Mountain View, CA
TEST SITE(S):	Elliott Laboratories 684 W. Maude Avenue Sunnyvale, CA 94085
IC Site Registration #:	IC 2845A-2
REPORT DATE:	June 15, 2009
FINAL TEST DATES:	June 2 and June 3, 2009

AUTHORIZED SIGNATORY:

Mark E. Hill
Staff Engineer
Elliott Laboratories.

ACCREDITED

Testing Cert #2016-01

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REVISION HISTORY

Rev#	Date	Comments	Modified By
1	August 13, 2009	First release	

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SCOPE

An electromagnetic emissions test has been performed on the RedOctane Inc. model 95905.805 (Guitar Hero/Band Hero Guitar), pursuant to the following rules:

Industry Canada RSS-Gen Issue 2
RSS 210 Issue 7 "Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment"
FCC Part 15 Subpart C

Emissions data has been collected, reduced, and analyzed within this report in accordance with measurement guidelines set forth in the following reference standards and as outlined in Elliott Laboratories test procedures:

ANSI C63.4:2003
FHSS test procedure DA 00-0705A1, March 2000

The intentional radiator above has been tested in a simulated typical installation to demonstrate compliance with the relevant Industry Canada performance and procedural standards.

Final system data was gathered in a mode that tended to maximize emissions by varying orientation of EUT, orientation of power and I/O cabling, antenna search height, and antenna polarization.

Every practical effort was made to perform an impartial test using appropriate test equipment of known calibration. All pertinent factors have been applied to reach the determination of compliance.

OBJECTIVE

The primary objective of the manufacturer is compliance with the regulations outlined in the previous section.

Prior to marketing in the USA, all unlicensed transmitters and transceivers require certification. Receive-only devices operating between 30 MHz and 960 MHz are subject to either certification or a manufacturer's declaration of conformity, with all other receive-only devices exempt from the technical requirements.

Prior to marketing in Canada, Class I transmitters, receivers and transceivers require certification. Class II devices are required to meet the appropriate technical requirements but are exempt from certification requirements.

Certification is a procedure where the manufacturer submits test data and technical information to a certification body and receives a certificate or grant of equipment authorization upon successful completion of the certification body's review of the submitted documents. Once the equipment authorization has been obtained, the label indicating compliance must be attached to all identical units, which are subsequently manufactured.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product which may result in increased emissions should be checked to ensure compliance has been maintained (i.e., printed circuit board layout changes, different line filter, different power supply, harnessing or I/O cable changes, etc.).

STATEMENT OF COMPLIANCE

The tested sample of RedOctane Inc. model 95905.805 (Guitar Hero/Band Hero Guitar) complied with the requirements of the following regulations:

Industry Canada RSS-Gen Issue 2
RSS 210 Issue 7 "Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment"
FCC Part 15 Subpart C

Maintenance of compliance is the responsibility of the manufacturer. Any modifications to the product should be assessed to determine their potential impact on the compliance status of the device with respect to the standards detailed in this test report.

The test results recorded herein are based on a single type test of RedOctane Inc. model 95905.805 (Guitar Hero/Band Hero Guitar) and therefore apply only to the tested sample. The sample was selected and prepared by Stephen Withers of RedOctane Inc.

DEVIATIONS FROM THE STANDARDS

No deviations were made from the published requirements listed in the scope of this report.

TEST RESULTS SUMMARY

FREQUENCY HOPPING SPREAD SPECTRUM (2400 – 2483.5 MHz, less than 75 channels)

FCC Rule Part	RSS Rule Part	Description	Measured Value / Comments	Limit / Requirement	Result
15.247 (a) (1)	RSS 210 A8.1 (1)	20dB Bandwidth	1575 kHz	Channel spacing > 20dB BW, BW < 1MHz	Complies
		Channel Separation	2046 kHz		Complies
15.247 (a) (1) (ii)	RSS 210 A8.1 (4)	Number of Channels	41	15 or more	Complies
15.247 (a) (1) (ii)	RSS 210 A8.1 (4)	Channel Dwell Time (*average time of occupancy)*	14.58mS	<0.4 second within a period of 0.4 x number of channels	Complies
15.247 (a) (1)	RSS 210 A8.1 (1)	Channel Utilization	All channels are used equally - refer to the operational description for full explanation	All channels shall, on average, be used equally	Complies
15.247 (b) (3)	RSS 210 A8.4 (2)	Output Power	8.3 dBm (0.007 W)[Note 1]	0.125 Watts	Complies
15.247(c)	RSS 210 A8.5	Spurious Emissions – 30MHz – 25GHz	All spurious emissions < -20dBc	< -20dBc	Complies
15.247(c) / 15.209	RSS 210 A8.5 Table 2, 3	Radiated Spurious Emissions 30MHz – 25GHz	53.5dBµV/m @ 2483.5MHz (-0.5dB)	15.207 in restricted bands, all others < -20dBc	Complies
15.247 (a) (1)	RSS 210 A8.1(2)	Receiver bandwidth	Refer to operational description	Shall match the channel bandwidth	Complies

Note 1: Output power calculated from field strength measurement.

GENERAL REQUIREMENTS APPLICABLE TO ALL BANDS

FCC Rule Part	RSS Rule part	Description	Measured Value / Comments	Limit / Requirement	Result (margin)
15.203	-	RF Connector	Integral antenna	Integral or unique antenna connector	Complies
15.109	RSS GEN 7.2.3 Table 1	Receiver spurious emissions	36.1dBµV/m @ 336.000MHz (-9.9dB)	Refer to standard	Complies
15.207	RSS GEN Table 2	AC Conducted Emissions	N/A – EUT is battery powered and does not provide for battery charging		
15.247 (b) (5) 15.407 (f)	RSS 102	RF Exposure Requirements	Power is below the FCC's 25mW low threshold for SAR for a portable device and below RSS-102's low threshold of 100mW	Refer to OET 65, FCC Part 1 and RSS 102	Complies

MEASUREMENT UNCERTAINTIES

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level and were calculated in accordance with UKAS document LAB 34.

Measurement Type	Frequency Range (MHz)	Calculated Uncertainty (dB)
Conducted Emissions	0.15 to 30	± 2.4
Radiated Emissions	0.015 to 30	± 3.0
Radiated Emissions	30 to 1000	± 3.6
Radiated Emissions	1000 to 40000	± 6.0

EQUIPMENT UNDER TEST (EUT) DETAILS

GENERAL

The RedOctane Inc. model 95905.805 (Guitar Hero/Band Hero Guitar) is a wireless guitar controller for the XBox 360. It uses a 2.4GHz FHSS radio. Since the EUT would be placed on a table top during operation, the EUT was treated as table-top equipment during testing to simulate the end-user environment. The EUT is battery powered and does not provide a means to recharge the batteries.

The sample was received on June 2, 2009 and tested on June 2 and June 3, 2009. The EUT consisted of the following component(s):

Company	Model	Description	Serial Number	FCC ID
RedOctane	95905.805	Wireless Guitar Controller	Prototype	VFI95905805

ANTENNA SYSTEM

The antenna is integral to the device.

ENCLOSURE

The EUT has a plastic enclosure in the shape of a guitar. It approximately measures 80cm x 30cm x 6cm and weights approximately 1kg.

MODIFICATIONS

The EUT did not require modifications in order to comply with the emission specifications.

SUPPORT EQUIPMENT

The following equipment was used as local support equipment for testing:

Company	Model	Description	Serial Number	FCC ID
DELL	Inspiron 2200	Laptop	-	-

The following equipment was used as remote support equipment for testing:

Company	Model	Description	Serial Number	FCC ID
DELL	Inspiron 2200	Laptop	-	-
Microsoft		Gamecontroller Wireless Interface dongle	-	-

EUT INTERFACE PORTS

The I/O cabling configuration during testing was as follows:

Port	Connected To	Cable(s)		
		Description	Shielded or Unshielded	Length(m)
Head Phone	Headset	Laptop	Un-shielded	2.0
foot paddle	Load	RJ11	Un-shielded	2.0

EUT OPERATION

The EUT was configured to transmit on a single channel, hopping at maximum output power. For some tests, the EUT was configured to hop across all channels used during normal operation.

TEST SITE

GENERAL INFORMATION

Final test measurements were taken on June 2 and June 3, 2009 at the test sites listed below. Pursuant to section 2.948 of the FCC's Rules and section 3.3 of RSP-100, construction, calibration, and equipment data has been filed with the Commission and with industry Canada.

Site	Registration Numbers		Location
	FCC	Canada	
SVOATS #2	90593	IC 2845A-2	684 West Maude Ave, Sunnyvale CA 94085-3518

ANSI C63.4:2003 recommends that ambient noise at the test site be at least 6 dB below the allowable limits. Ambient levels are below this requirement with the exception, on OATS sites, of predictable local TV, radio, and mobile communications traffic. The test site(s) contain separate areas for radiated and conducted emissions testing. Considerable engineering effort has been expended to ensure that the facilities conform to all pertinent requirements of ANSI C63.4:2003.

RADIATED EMISSIONS CONSIDERATIONS

The FCC has determined that radiation measurements made in a shielded enclosure are not suitable for determining levels of radiated emissions. Radiated measurements are performed in an open field environment or in a semi-anechoic chamber. The test sites are maintained free of conductive objects within the CISPR defined elliptical area incorporated in ANSI C63.4:2003 guidelines and meet the Normalized Site Attenuation (NSA) requirements of ANSI C63.4:2003.

MEASUREMENT INSTRUMENTATION

RECEIVER SYSTEM

An EMI receiver as specified in CISPR 16-1 is used for emissions measurements. The receivers used can measure over the frequency range of 9 kHz up to 2000 MHz. These receivers allow both ease of measurement and high accuracy to be achieved. The receivers have Peak, Average, and CISPR (Quasi-peak) detectors built into their design so no external adapters are necessary. The receiver automatically sets the required bandwidth for the CISPR detector used during measurements. If the repetition frequency of the signal being measured is below 20Hz, peak measurements are made in lieu of Quasi-Peak measurements.

For measurements above the frequency range of the receivers, a spectrum analyzer is utilized because it provides visibility of the entire spectrum along with the precision and versatility required to support engineering analysis. Average measurements above 1000MHz are performed on the spectrum analyzer using the linear-average method with a resolution bandwidth of 1 MHz and a video bandwidth of 10 Hz, unless the signal is pulsed in which case the average (or video) bandwidth of the measuring instrument is reduced to onset of pulse desensitization and then increased.

INSTRUMENT CONTROL COMPUTER

The receivers utilize either a Rohde & Schwarz EZM Spectrum Monitor/Controller or contain an internal Spectrum Monitor/Controller to view and convert the receiver measurements to the field strength at an antenna or voltage developed at the LISN measurement port, which is then compared directly with the appropriate specification limit. This provides faster, more accurate readings by performing the conversions described under Sample Calculations within the Test Procedures section of this report. Results are printed in a graphic and/or tabular format, as appropriate. A personal computer is used to record all measurements made with the receivers.

The Spectrum Monitor provides a visual display of the signal being measured. In addition, the controller or a personal computer run automated data collection programs which control the receivers. This provides added accuracy since all site correction factors, such as cable loss and antenna factors are added automatically.

FILTERS/ATTENUATORS

External filters and precision attenuators are often connected between the receiving antenna or LISN and the receiver. This eliminates saturation effects and non-linear operation due to high amplitude transient events.

ANTENNAS

A loop antenna is used below 30 MHz. For the measurement range 30 MHz to 1000 MHz either a combination of a biconical antenna and a log periodic or a bi-log antenna is used. Above 1000 MHz, horn antennas are used. The antenna calibration factors to convert the received voltage to an electric field strength are included with appropriate cable loss and amplifier gain factors to determine an overall site factor, which is then programmed into the test receivers or incorporated into the test software.

ANTENNA MAST AND EQUIPMENT TURNTABLE

The antennas used to measure the radiated electric field strength are mounted on a non-conductive antenna mast equipped with a motor-drive to vary the antenna height. Measurements below 30 MHz are made with the loop antenna at a fixed height of 1m above the ground plane.

ANSI C63.4:2003 specifies that the test height above ground for table mounted devices shall be 80 centimeters. Floor mounted equipment shall be placed on the ground plane if the device is normally used on a conductive floor or separated from the ground plane by insulating material from 3 to 12 mm if the device is normally used on a non-conductive floor. During radiated measurements, the EUT is positioned on a motorized turntable in conformance with this requirement.

INSTRUMENT CALIBRATION

All test equipment is regularly checked to ensure that performance is maintained in accordance with the manufacturer's specifications. All antennas are calibrated at regular intervals with respect to tuned half-wave dipoles. An exhibit of this report contains the list of test equipment used and calibration information.

TEST PROCEDURES

EUT AND CABLE PLACEMENT

The regulations require that interconnecting cables be connected to the available ports of the unit and that the placement of the unit and the attached cables simulate the worst case orientation that can be expected from a typical installation, so far as practicable. To this end, the position of the unit and associated cabling is varied within the guidelines of ANSI C63.4:2003, and the worst-case orientation is used for final measurements.

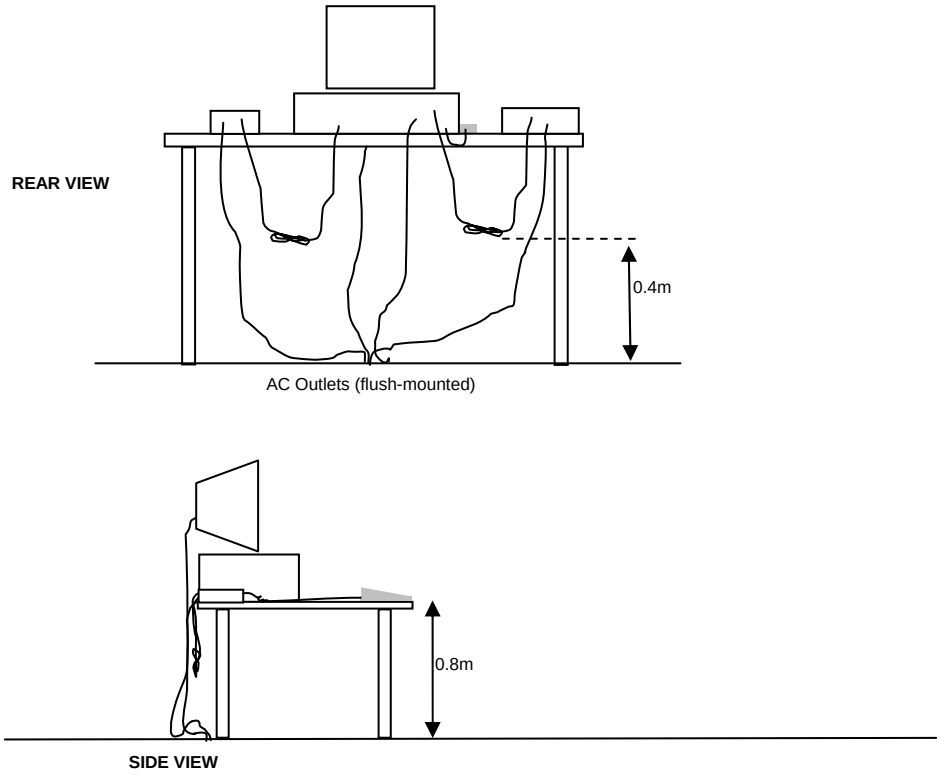
RADIATED EMISSIONS

A preliminary scan of the radiated emissions is performed in which all significant EUT frequencies are identified with the system in a nominal configuration. At least two scans are performed, one scan for each antenna polarization (horizontal and vertical; loop parallel and perpendicular to the EUT). During the preliminary scans, the EUT is rotated through 360˚, the antenna height is varied (for measurements above 30 MHz) and cable positions are varied to determine the highest emission relative to the limit. Preliminary scans may be performed in a fully anechoic chamber for the purposes of identifying the frequencies of the highest emissions from the EUT.

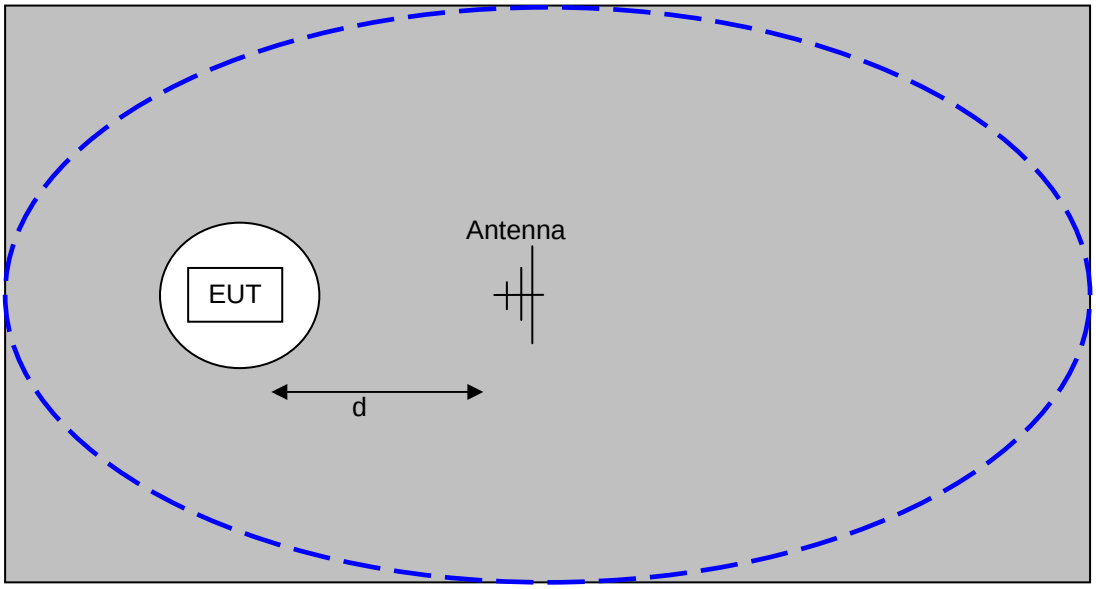
A speaker is provided in the receiver to aid in discriminating between EUT and ambient emissions. Other methods used during the preliminary scan for EUT emissions involve scanning with near field magnetic loops, monitoring I/O cables with RF current clamps, and cycling power to the EUT.

Final maximization is a phase in which the highest amplitude emissions identified in the spectral search are viewed while the EUT azimuth angle is varied from 0 to 360 degrees relative to the receiving antenna. The azimuth, which results in the highest emission is then maintained while varying the antenna height from one to four meters (for measurements above 30 MHz, measurements below 30 MHz are made with the loop antenna at a fixed height of 1m). The result is the identification of the highest amplitude for each of the highest peaks. Each recorded level is corrected in the receiver using appropriate factors for cables, connectors, antennas, and preamplifier gain.

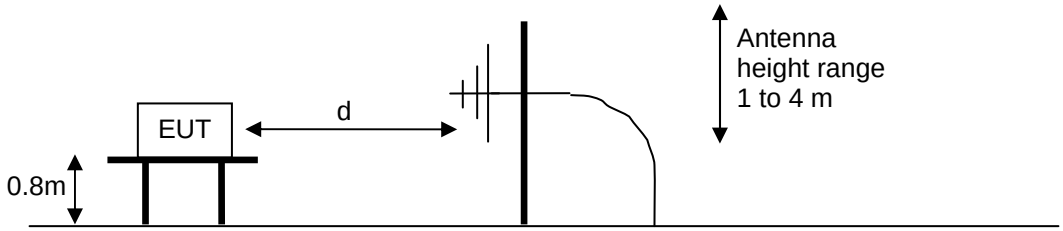
When testing above 18 GHz, the receive antenna is located at 1meter from the EUT and the antenna height is restricted to a maximum of 2.5 meters.



Typical Test Configuration for Radiated Field Strength Measurements



The ground plane extends beyond the ellipse defined in CISPR 16 / CISPR 22 / ANSI C63.4 and is large enough to accommodate test distances (d) of 3m and 10m. Refer to the test data tables for the actual measurement distance.



Test Configuration for Radiated Field Strength Measurements
OATS- Plan and Side Views

BANDWIDTH MEASUREMENTS

The 6dB, 20dB and/or 26dB signal bandwidth is measured in using the bandwidths recommended by ANSI C63.4. When required, the 99% bandwidth is measured using the methods detailed in RSS GEN.

SPECIFICATION LIMITS AND SAMPLE CALCULATIONS

The limits for conducted emissions are given in units of microvolts, and the limits for radiated emissions are given in units of microvolts per meter at a specified test distance. Data is measured in the logarithmic form of decibels relative to one microvolt, or dB microvolts (dBuV). For radiated emissions, the measured data is converted to the field strength at the antenna in dB microvolts per meter (dBuV/m). The results are then converted to the linear forms of uV and uV/m for comparison to published specifications.

For reference, converting the specification limits from linear to decibel form is accomplished by taking the base ten logarithm, then multiplying by 20. These limits in both linear and logarithmic form are as follows:

GENERAL TRANSMITTER RADIATED EMISSIONS SPECIFICATION LIMITS

The table below shows the limits for the spurious emissions from transmitters that fall in restricted bands[1] (with the exception of transmitters operating under FCC Part 15 Subpart D and RSS 210 Annex 9), the limits for all emissions from a low power device operating under the general rules of RSS 310 (tables 3 and 4), RSS 210 (table 2) and FCC Part 15 Subpart C section 15.209.

Frequency Range (MHz)	Limit (uV/m)	Limit (dBuV/m @ 3m)
0.009-0.490	$2400/F_{KHz}$ @ 300m	$67.6-20*\log_{10}(F_{KHz})$ @ 300m
0.490-1.705	$24000/F_{KHz}$ @ 30m	$87.6-20*\log_{10}(F_{KHz})$ @ 30m
1.705 to 30	30 @ 30m	29.5 @ 30m
30 to 88	100 @ 3m	40 @ 3m
88 to 216	150 @ 3m	43.5 @ 3m
216 to 960	200 @ 3m	46.0 @ 3m
Above 960	500 @ 3m	54.0 @ 3m

[1] The restricted bands are detailed in FCC 15.203, RSS 210 Table 1 and RSS 310 Table 2

RECEIVER RADIATED SPURIOUS EMISSIONS SPECIFICATION LIMITS

The table below shows the limits for the spurious emissions from receivers as detailed in FCC Part 15.109, RSS 210 Table 2, RSS GEN Table 1 and RSS 310 Table 3. Note that receivers operating outside of the frequency range 30 MHz – 960 MHz are exempt from the requirements of 15.109.

Frequency Range (MHz)	Limit (uV/m @ 3m)	Limit (dBuV/m @ 3m)
30 to 88	100	40
88 to 216	150	43.5
216 to 960	200	46.0
Above 960	500	54.0

OUTPUT POWER LIMITS – FHSS SYSTEMS

The table below shows the limits for output power based on the number of channels available for the hopping system.

Operating Frequency (MHz)	Number of Channels	Output Power
902 – 928	≥ 50	1 Watt (30 dBm)
902 – 928	25 to 49	0.25 Watts (24 dBm)
2400 – 2483.5	≥ 75	1 Watt (30 dBm)
2400 – 2483.5	< 75	0.125 Watts (21 dBm)
5725 – 5850	75	1 Watt (30 dBm)

The maximum permitted output power is reduced by 1dB for every dB the antenna gain exceeds 6dBi. Fixed point-to-point applications using the 5725 – 5850 MHz band are not subject to this restriction.

TRANSMIT MODE SPURIOUS RADIATED EMISSIONS LIMITS – FHSS and DTS SYSTEMS

The limits for unwanted (spurious) emissions from the transmitter falling in the restricted bands are those specified in the general limits sections of FCC Part 15 and RSS 210. All other unwanted (spurious) emissions shall be at least 20dB below the level of the highest in-band signal level (30dB if the power is measured using the sample detector/power averaging method).

SAMPLE CALCULATIONS - RADIATED EMISSIONS

Receiver readings are compared directly to the specification limit (decibel form). The receiver internally corrects for cable loss, preamplifier gain, and antenna factor. The calculations are in the reverse direction of the actual signal flow, thus cable loss is added and the amplifier gain is subtracted. The Antenna Factor converts the voltage at the antenna coaxial connector to the field strength at the antenna elements.

A distance factor, when used for electric field measurements above 30MHz, is calculated by using the following formula:

$$F_d = 20*LOG_{10} (D_m/D_s)$$

where:

F_d = Distance Factor in dB

D_m = Measurement Distance in meters

D_s = Specification Distance in meters

For electric field measurements below 30MHz the extrapolation factor is either determined by making measurements at multiple distances or a theoretical value is calculated using the formula:

$$F_d = 40*LOG_{10} (D_m/D_s)$$

Measurement Distance is the distance at which the measurements were taken and Specification Distance is the distance at which the specification limits are based. The antenna factor converts the voltage at the antenna coaxial connector to the field strength at the antenna elements.

The margin of a given emission peak relative to the limit is calculated as follows:

$$R_c = R_r + F_d$$

and

$$M = R_c - L_s$$

where:

R_r = Receiver Reading in dBuV/m

F_d = Distance Factor in dB

R_c = Corrected Reading in dBuV/m

L_s = Specification Limit in dBuV/m

M = Margin in dB Relative to Spec

SAMPLE CALCULATIONS - FIELD STRENGTH TO EIRP CONVERSION

Where the radiated electric field strength is expressed in terms of the equivalent isotropic radiated power (eirp), or where a field strength measurement of output power is made in lieu of a direct measurement, the following formula is used to convert between eirp and field strength at a distance of 3m from the equipment under test:

$$E = \frac{1000000 \sqrt{30 P}}{3} \text{ microvolts per meter}$$

where P is the eirp (Watts)

Appendix A Test Equipment Calibration Data

1 Page

Radiated Emissions, 30 - 25,000 MHz, 03-Jun-09
Engineer: rvarelas

Manufacturer	Description	Model #	Asset #	Cal Due
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	870	09-Oct-09
EMCO	Antenna, Horn, 1-18 GHz (SA40-Red)	3115	1142	15-Jul-10
Hewlett Packard	SpecAn 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	12-Mar-10
Micro-Tronics	Band Reject Filter, 2400-2500 MHz	BRM50702-02	1683	05-Aug-09

Radiated Emissions, 30 - 10,000 MHz, 03-Jun-09
Engineer: rvarelas

Manufacturer	Description	Model #	Asset #	Cal Due
Elliott Laboratories	Biconical Antenna, 30-300 MHz	EL30.300	54	03-Apr-11
Elliott Laboratories	Log Periodic Antenna 300-1000 MHz	EL300.1000	55	03-Apr-10
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	870	09-Oct-09
EMCO	Antenna, Horn, 1-18 GHz (SA40-Red)	3115	1142	15-Jul-10
Hewlett Packard	SpecAn 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	12-Mar-10
Rohde & Schwarz	Test Receiver, 0.009-2750 MHz	ESN	1332	14-Apr-10

Radio Antenna Port (Power and Spurious Emissions), 09-Jun-09
Engineer: Rafael Varelas

Manufacturer	Description	Model #	Asset #	Cal Due
Hewlett Packard	SpecAn 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	12-Mar-10

Appendix B Test Data

T75558 17 Pages

Client:	RedOctane	Job Number:	J75534
Model:	95905.805 (Guitar Hero/Band Hero Guitar)	T-Log Number:	T75558
		Account Manager:	Sheareen Washington
Contact:	Stephen Withers		-
Emissions Standard(s):	FCC 15.247/RSS-210 (FHSS)	Class:	-
Immunity Standard(s):	-	Environment:	-

EMC Test Data

For The

RedOctane

Model

95905.805 (Guitar Hero/Band Hero Guitar)

Date of Last Test: 7/29/2009

Client:	RedOctane	Job Number:	J75534
Model:	95905.805 (Guitar Hero/Band Hero Guitar)	T-Log Number:	T75558
		Account Manger:	Sheareen Washington
Contact:	Stephen Withers		
Emissions Standard(s):	FCC 15.247/RSS-210 (FHSS)	Class:	-
Immunity Standard(s):	-	Environment:	-

EUT INFORMATION

The following information was collected during the test session(s).

General Description

The EUT is a wireless guitar controller for the XBox 360. It uses a 2.4GHz FHSS radio. Since the EUT would be placed on a table top during operation, the EUT was treated as table-top equipment during testing to simulate the end-user environment. The EUT is battery powered and does not provide a means to recharge the batteries.

Equipment Under Test

Manufacturer	Model	Description	Serial Number	FCC ID
RedOctane	95905.805	Wireless Guitar Controller	Prototype	VFI95905805

EUT Antenna (Intentional Radiators Only)

The antenna is integral to the device.

EUT Enclosure

The EUT has a plastic enclosure in the shape of a guitar. It approximately measures 80cm x 30cm x 6cm and weights approximately 1kg.

Modification History

Mod. #	Test	Date	Modification
1			No modifications were made to the EUT during testing.
2			
3			

Modifications applied are assumed to be used on subsequent tests unless otherwise stated as a further modification.

Client:	RedOctane	Job Number:	J75534
Model:	95905.805 (Guitar Hero/Band Hero Guitar)	T-Log Number:	T75558
		Account Manger:	Sheareen Washington
Contact:	Stephen Withers		
Emissions Standard(s):	FCC 15.247/RSS-210 (FHSS)	Class:	-
Immunity Standard(s):	-	Environment:	-

Test Configuration #1

The following information was collected during the test session(s).

Local Support Equipment

Manufacturer	Model	Description	Serial Number	FCC ID
DELL	Inspiron 2200	Laptop	-	-

Note: Laptop was connected at headset port only to setup the EUT, then disconnected and port was loaded with headset when testing

Remote Support Equipment

Manufacturer	Model	Description	Serial Number	FCC ID
DELL	Inspiron 2200	Laptop	-	-
Microsoft		Gamecontroller Wireless Interface dongle	-	-

Cabling and Ports

Port	Connected To	Cable(s)		
		Description	Shielded or Unshielded	Length(m)
Head Phone	Headset	Laptop	Un-shielded	2.0
foot paddle	Load	RJ11	Un-shielded	2.0

EUT Operation During Emissions Tests

The EUT was configured to transmit on a single channel, hopping at maximum output power. For some tests, the EUT was configured to hop across all channels used during normal operation.

Client:	RedOctane	Job Number:	J75534
Model:	95905.805 (Guitar Hero/Band Hero Guitar)	T-Log Number:	T75558
		Account Manager:	Sheareen Washington
Contact:	Stephen Withers		
Standard:	FCC 15.247/RSS-210 (FHSS)	Class:	N/A

FCC 15.247 FHSS - Power, Bandwidth and Spurious Emissions

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 6/2/2009
Test Engineer: Rafael Varelas
Test Location: SVOATS #2

Config. Used: 1
Config Change: None
EUT Voltage: Battery

General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing. All remote support equipment was located approximately 30 meters from the EUT with all I/O connections running on top of the groundplane or routed in overhead in the GR-1089 test configuration.

For radiated emissions testing the measurement antenna was located 3 meters from the EUT.

When measuring the conducted emissions from the EUT's antenna port, the antenna port of the EUT was connected to the spectrum analyzer or power meter via a suitable attenuator to prevent overloading the measurement system. All measurements are corrected to allow for the external attenuators used.

Unless stated otherwise the EUT was operating such that it constantly hopped on either the low, center or high channels.

Ambient Conditions:

Temperature: 12 °C
Rel. Humidity: 89 %

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1	30 - 25000 MHz - Radiated Spurious Emissions	FCC Part 15.209 / 15.247(c)	Pass	53.5dBµV/m @ 2483.5MHz (-0.5dB)
2	Output Power	15.247(b)	Pass	8.3 dBm (.007 W)
3	20dB Bandwidth	15.247(a)	Pass	1575 kHz
3	99% bandwidth	15.247(a)	Pass	1448 kHz
3	Channel Occupancy	15.247(a)	Pass	14.58mS
3	Number of Channels	15.247(a)	Pass	41 Channels

Modifications Made During Testing:

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	RedOctane	Job Number:	J75534
Model:	95905.805 (Guitar Hero/Band Hero Guitar)	T-Log Number:	T75558
		Account Manager:	Sheareen Washington
Contact:	Stephen Withers		
Standard:	FCC 15.247/RSS-210 (FHSS)	Class:	N/A

Run #1a: Radiated Spurious Emissions, 30 - 25000 MHz. Low Channel @ 2402 MHz

Fundamental Signal Field Strength: Peak and average values measured in 1 MHz, and peak value measured in 100kHz

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2402.340	102.0	H	-	-	PK	157	1.2	EUT Upright
2401.900	101.9	H	-	-	PK	157	1.2	EUT Upright, RB=VB: 100 kHz
2401.720	98.5	V	-	-	PK	341	1.2	EUT Upright
2401.630	96.4	V	-	-	PK	341	1.2	EUT Upright, RB=VB: 100 kHz

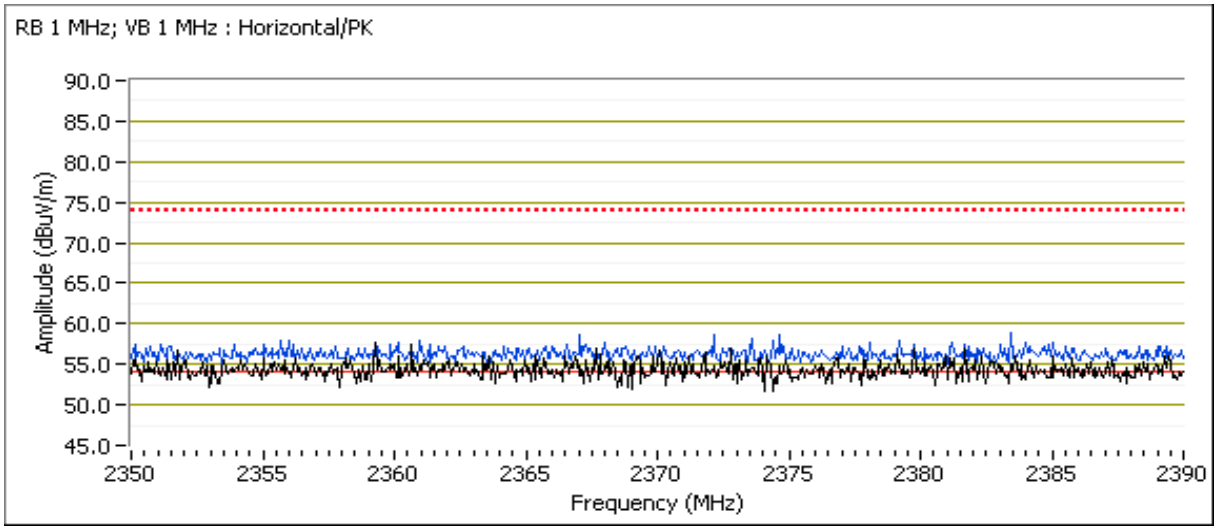
Fundamental emission level @ 3m in 100kHz RBW:	101.9	dBµV/m
Limit for emissions outside of restricted bands:	81.9	dBµV/m

Limit is -20dBc

Band Edge Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2388.760	45.9	H	54.0	-8.1	Avg	157	1.2	Note 1
2387.910	58.1	H	74.0	-15.9	PK	157	1.2	RB 1 MHz; VB: 1 MHz
2387.570	45.8	V	54.0	-8.2	Avg	341	1.2	Note 1
2389.540	57.9	V	74.0	-16.1	PK	341	1.2	RB 1 MHz; VB: 1 MHz

Note 1:	Due to the signal being pulse modulated could not use VBW of 10Hz as this will artificially drop signal level by 20dB. A 1kHz was used instead of the 10Hz to prevent pulse desensitization.



Client:	RedOctane	Job Number:	J75534
Model:	95905.805 (Guitar Hero/Band Hero Guitar)	T-Log Number:	T75558
		Account Manager:	Sheareen Washington
Contact:	Stephen Withers		
Standard:	FCC 15.247/RSS-210 (FHSS)	Class:	N/A

Run #1a: Continued

Other Spurious Emissions

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
9607.990	51.4	H	54.0	-2.6	Avg	345	1.1	EUT Side, Note 2
9607.990	69.4	H	74.0	-4.6	PK	345	1.1	EUT Side
4803.290	49.4	H	54.0	-4.6	Avg	317	1.3	EUT Side, Note 2
4803.290	67.4	H	74.0	-6.6	PK	317	1.3	EUT Side
9607.620	47.2	V	54.0	-6.8	Avg	348	1.1	EUT Side, Note 2
4804.620	45.4	V	54.0	-8.6	Avg	8	1.0	EUT Side, Note 2
9607.620	65.2	V	74.0	-8.8	PK	348	1.1	EUT Side
4804.620	63.4	V	74.0	-10.6	PK	8	1.0	EUT Side
7206.920	42.4	V	54.0	-11.6	Avg	6	1.0	EUT Side, Note 2
7206.920	60.4	V	74.0	-13.6	PK	6	1.0	EUT Side
7204.820	40.1	H	54.0	-13.9	Avg	0	1.3	EUT Side, Note 2
7204.820	58.1	H	74.0	-15.9	PK	0	1.3	EUT Side
12011.300	37.8	V	54.0	-16.2	Avg	0	1.0	EUT Side, Note 2
12011.300	55.8	V	74.0	-18.2	PK	0	1.0	EUT Side
12009.710	34.7	H	54.0	-19.3	Avg	326	1.0	EUT Side, Note 2
12009.710	52.7	H	74.0	-21.3	PK	326	1.0	EUT Side

Note 2:	The average field strenght was determined by applying an average correction factor of -18dB to the peak value. This correction factor is based on a maximum transmit time of 972us in any 8ms period for the controller.

Run #1b: Radiated Spurious Emissions, 30 - 25000 MHz. Center Channel @ 2442 MHz

Fundamental Signal Field Strength: Peak and average values measured in 1 MHz, and peak value measured in 100kHz

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2442.360	99.8	H	-	-	PK	113	1.5	EUT Flat
2442.360	89.7	V	-	-	PK	94	1.0	EUT Flat
2441.640	100.2	V	-	-	PK	358	1.2	EUT Side
2441.710	100.0	H	-	-	PK	111	1.5	EUT Side
2442.010	101.5	H	-	-	PK	154	1.1	EUT Upright
2441.990	101.5	H	-	-	PK	154	1.1	EUT Upright, RB=VB: 100 kHz
2441.750	98.3	V	-	-	PK	338	1.2	EUT Upright
2441.700	97.3	V	-	-	PK	338	1.2	EUT Upright, RB=VB: 100 kHz

Client:	RedOctane	Job Number:	J75534
Model:	95905.805 (Guitar Hero/Band Hero Guitar)	T-Log Number:	T75558
		Account Manager:	Sheareen Washington
Contact:	Stephen Withers		
Standard:	FCC 15.247/RSS-210 (FHSS)	Class:	N/A

Run #1b: Continued

Fundamental emission level @ 3m in 100kHz RBW:	101.5	dBµV/m	
Limit for emissions outside of restricted bands:	81.5	dBµV/m	Limit is -20dBc

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
4883.730	45.8	V	54.0	-8.2	AVG	241	1.0	EUT Upright, Note 1
4883.310	63.8	H	74.0	-10.2	PK	309	1.6	EUT Upright
4883.690	43.2	H	54.0	-10.8	AVG	309	1.6	EUT Upright, Note 1
4883.250	61.2	V	74.0	-12.8	PK	241	1.0	EUT Upright
4883.810	48.3	H	54.0	-5.7	AVG	353	1.2	EUT Side, Note 1
4883.870	66.3	H	74.0	-7.7	PK	353	1.2	EUT Side
4883.910	43.5	V	54.0	-10.5	AVG	14	1.3	EUT Side, Note 1
4884.610	61.5	V	74.0	-12.5	PK	14	1.3	EUT Side
4883.770	45.5	V	54.0	-8.5	AVG	312	1.0	EUT Flat, Note 1
4883.200	63.5	V	74.0	-10.5	PK	312	1.0	EUT Flat
4884.090	36.7	H	54.0	-17.3	AVG	175	1.9	EUT Flat, Note 1
4883.270	54.7	H	74.0	-19.3	PK	175	1.9	EUT Flat

Note 1:	The average field strenght was determined by applying an average correction factor of -18dB to the peak value. This correction factor is based on a maximum transmit time of 972us in any 8ms period for the controller.

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
9766.590	50.6	H	54.0	-3.4	AVG	346	1.1	EUT Side
9766.510	68.6	H	74.0	-5.4	PK	346	1.1	EUT Side
9766.780	40.5	V	54.0	-13.5	AVG	177	1.1	EUT Side
9768.030	58.5	V	74.0	-15.5	PK	177	1.1	EUT Side
12211.220	36.9	V	54.0	-17.1	AVG	0	1.2	EUT Side
12211.360	54.9	V	74.0	-19.1	PK	0	1.2	EUT Side
12211.200	34.1	H	54.0	-19.9	AVG	128	1.0	EUT Side
12210.000	52.1	H	74.0	-21.9	PK	128	1.0	EUT Side
7236.870	29.9	V	54.0	-24.1	AVG	177	1.0	EUT Side
7236.770	29.2	H	54.0	-24.8	AVG	257	1.0	EUT Side
7236.000	47.9	V	74.0	-26.1	PK	177	1.0	EUT Side
7236.130	47.2	H	74.0	-26.8	PK	257	1.0	EUT Side

Note 1:	The average field strenght was determined by applying an average correction factor of -18dB to the peak value. This correction factor is based on a maximum transmit time of 972us in any 8ms period for the controller.

Client:	RedOctane	Job Number:	J75534
Model:	95905.805 (Guitar Hero/Band Hero Guitar)	T-Log Number:	T75558
		Account Manager:	Sheareen Washington
Contact:	Stephen Withers		
Standard:	FCC 15.247/RSS-210 (FHSS)	Class:	N/A

Run #1c: Radiated Spurious Emissions, 30 - 25000 MHz. High Channel @ 2482 MHz

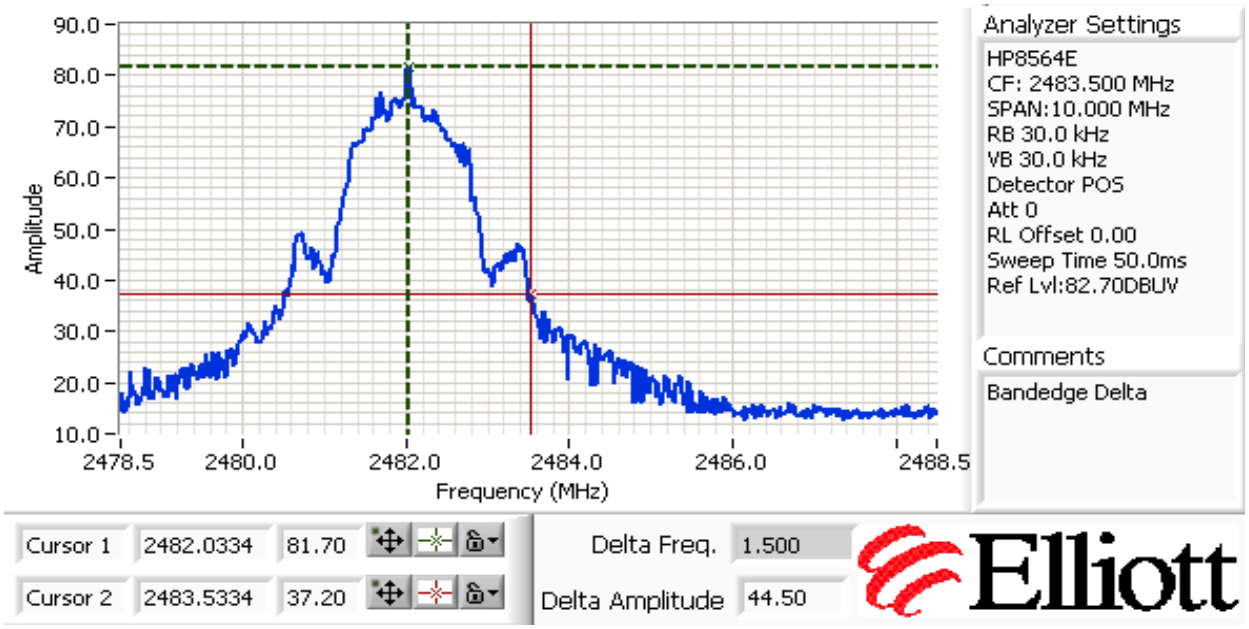
Fundamental Signal Field Strength: Peak and average values measured in 1 MHz, and peak value measured in 100kHz

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2481.740	98.0	H	-	-	Avg	14	1.3	RB 1 MHz; VB: 1 kHz
2482.180	99.3	H	-	-	PK	14	1.3	RB 1 MHz; VB: 1 MHz
2481.630	98.9	H	-	-	Pk	14	1.3	RB 100 kHz; VB: 100 kHz
2482.080	97.6	V	-	-	Avg	257	1.0	RB 1 MHz; VB: 1 kHz
2482.240	99.0	V	-	-	PK	257	1.0	RB 1 MHz; VB: 1 MHz
2482.030	98.2	V	-	-	Pk	256	1.0	RB 100 kHz; VB: 100 kHz

Note:	Due to the signal being pulse modulated could not use VBW of 10Hz as this will artificially drop signal level by 20dB. A 1kHz was used instead of the 10Hz to prevent pulse desensitization.

Fundamental emission level @ 3m in 100kHz RBW:	98.9	dBµV/m	
Limit for emissions outside of restricted bands:	78.9	dBµV/m	Limit is -20dBc

Delta (dB): 44.5 Measurement taken with a RBW: 30kHz and VBW: 30 kHz



Client:	RedOctane	Job Number:	J75534
Model:	95905.805 (Guitar Hero/Band Hero Guitar)	T-Log Number:	T75558
		Account Manager:	Sheareen Washington
Contact:	Stephen Withers		
Standard:	FCC 15.247/RSS-210 (FHSS)	Class:	N/A

Run #1c: Continued

Band Edge Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2483.530	53.5	H	54.0	-0.5	Avg	70	1.3	RB 1 MHz; VB: 1 kHz
2483.530	54.8	H	74.0	-19.2	PK	165	1.1	RB 1 MHz; VB: 1 MHz

Note 1:	Calculated by subtracting the marker delta values from the fundamental field strength measurements.

Other Spurious Emissions

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
9926.660	50.2	H	54.0	-3.8	AVG	339	1.2	EUT Side, Note 1
9926.520	68.2	H	74.0	-5.8	PK	339	1.2	EUT Side
9926.510	47.4	V	54.0	-6.6	AVG	341	1.1	EUT Side, Note 1
7445.060	46.1	V	54.0	-7.9	AVG	6	1.0	EUT Side, Note 1
9929.190	65.4	V	74.0	-8.6	PK	341	1.1	EUT Side
7445.350	45.0	H	54.0	-9.0	AVG	0	1.3	EUT Side, Note 1
7444.840	64.1	V	74.0	-9.9	PK	6	1.0	EUT Side
7446.060	63.0	H	74.0	-11.0	PK	0	1.3	EUT Side
4964.230	41.9	H	54.0	-12.1	AVG	347	1.3	EUT Side, Note 1
4963.610	59.9	H	74.0	-14.1	PK	347	1.3	EUT Side
4963.770	38.3	V	54.0	-15.7	AVG	14	1.4	EUT Side, Note 1
4963.640	56.3	V	74.0	-17.7	PK	14	1.4	EUT Side
12408.550	35.1	V	54.0	-18.9	AVG	360	1.1	EUT Side, Note 1
12408.500	33.9	H	54.0	-20.1	AVG	287	1.0	EUT Side, Note 1
12411.300	53.1	V	74.0	-20.9	PK	360	1.1	EUT Side
12410.790	51.9	H	74.0	-22.1	PK	287	1.0	EUT Side

Note 1:	The average field strenght was determined by applying an average correction factor of -18dB to the peak value. This correction factor is based on a maximum transmit time of 972us in any 8ms period for the controller.

Client:	RedOctane	Job Number:	J75534
Model:	95905.805 (Guitar Hero/Band Hero Guitar)	T-Log Number:	T75558
		Account Manager:	Sheareen Washington
Contact:	Stephen Withers		
Standard:	FCC 15.247/RSS-210 (FHSS)	Class:	N/A

Run #2: Output Power

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

Maximum antenna gain: -0.84 dBi

Channel	Frequency (MHz)	Field Strength at 3m (dBuV/m)	Antenna Pol. (H/V)	Res BW	Signal Banwidth	Bandwidth Correction	Power (dBm)	Power (Watts)
Low	2402	102.0	H	1	1.458	1.6375752	8.3375752	0.0068196
Mid	2442	101.5	H	1	1.575	1.9728056	8.1728056	0.0065657
High	2482	99.3	H	1	1.533	1.8554215	5.8554215	0.0038507
Low	2402	98.5	V	1	1.458	1.6375752	4.8375752	0.0030462
Mid	2442	98.3	V	1	1.575	1.9728056	4.9728056	0.0031425
High	2482	99.0	V	1	1.533	1.8554215	5.5554215	0.0035937

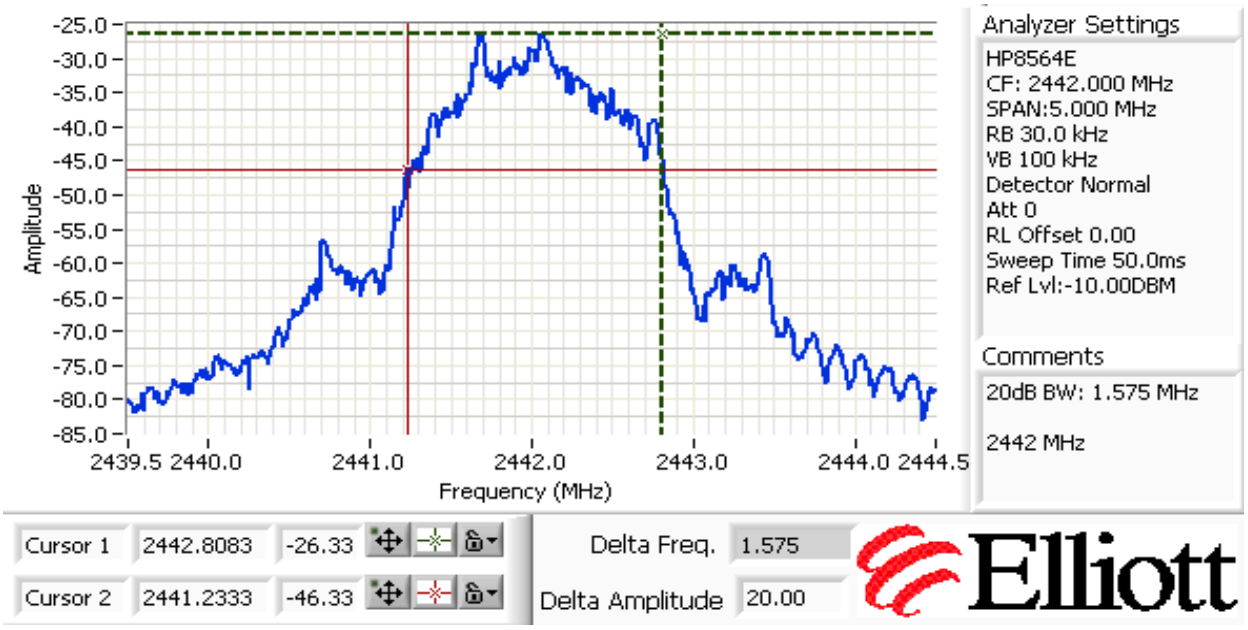
Note 1:	Output power calculated from field strength at 3m based on free space path loss formula E = √(30PG) / d, where E is the field strength (V/m), PG is the effective isotropic radiated power (W) and d is the distance (3m). Additional correction to the calculated power is made to account for the difference between the measurement bandwidth and signal bandwidth.

Client:	RedOctane	Job Number:	J75534
Model:	95905.805 (Guitar Hero/Band Hero Guitar)	T-Log Number:	T75558
		Account Manager:	Sheareen Washington
Contact:	Stephen Withers		
Standard:	FCC 15.247/RSS-210 (FHSS)	Class:	N/A

Run #3: Bandwidth, Channel Occupancy, Spacing and Number of Channels

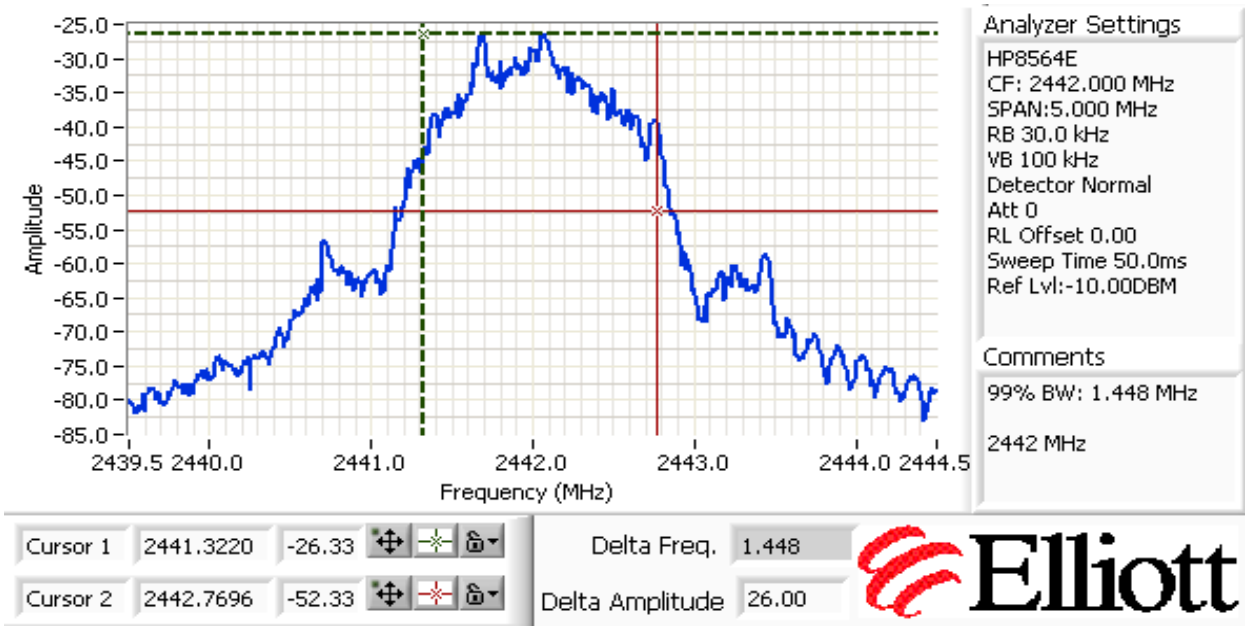
Channel	Frequency (MHz)	Resolution Bandwidth	20dB Bandwidth (kHz)	Resolution Bandwidth	99% Bandwidth (kHz)
Low	2402	30kHz	1458	30kHz	1406
Mid	2442	30kHz	1575	30kHz	1448
High	2482	30kHz	1533	30kHz	1431

Note 1:	20dB bandwidth measured using RB = 30kHz, VB = 100kHz (VB > RB)
Note 2:	99% bandwidth measured using RB = 30kHz, VB = 100kHz (VB >=3RB)



Client:	RedOctane	Job Number:	J75534
Model:	95905.805 (Guitar Hero/Band Hero Guitar)	T-Log Number:	T75558
		Account Manager:	Sheareen Washington
Contact:	Stephen Withers		
Standard:	FCC 15.247/RSS-210 (FHSS)	Class:	N/A

Run #3: Continued

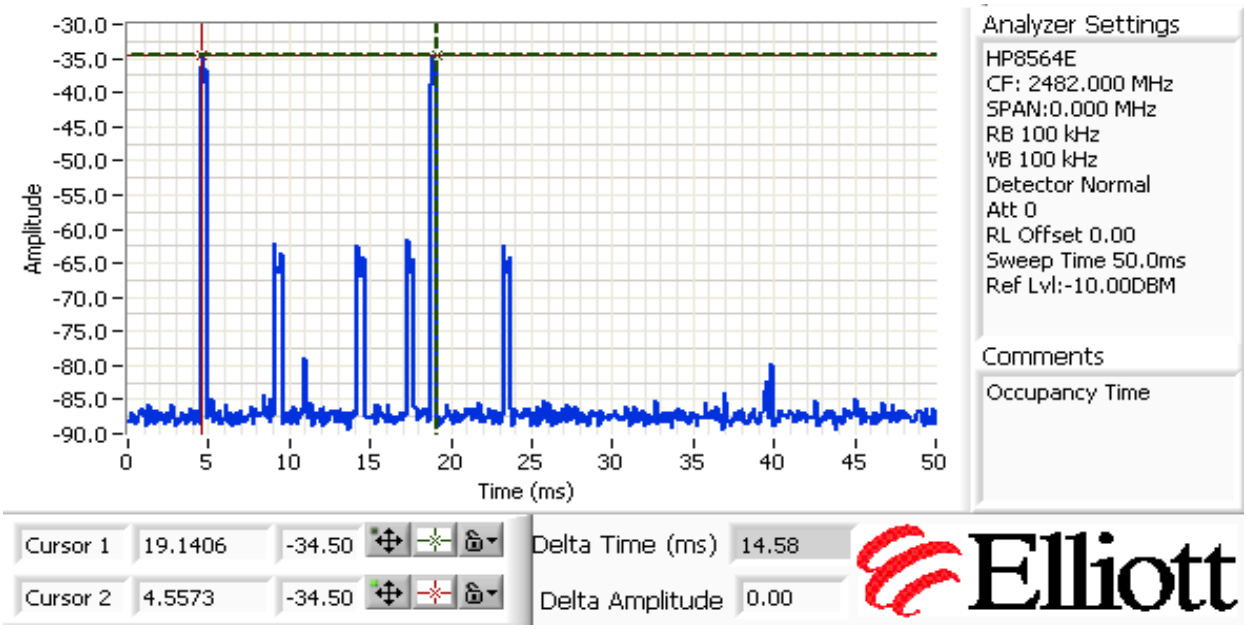


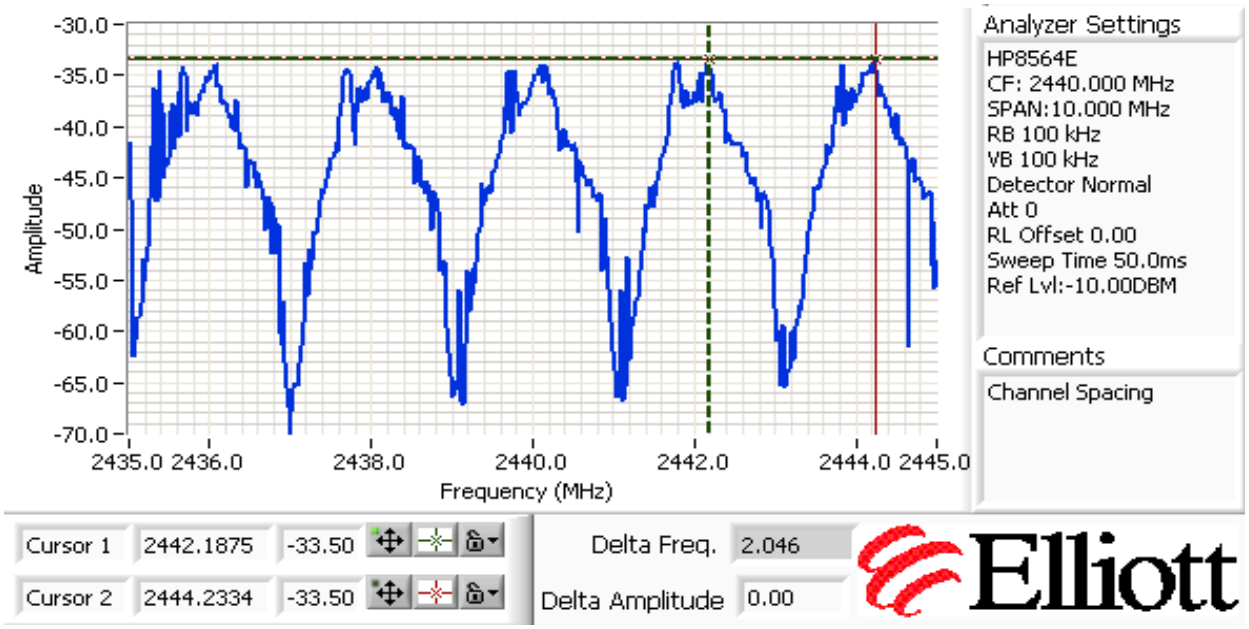
Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.
The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. (Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.)
The channel dwell time is calculated from the transmit time on a channel mulitplied by the number of times a channel could be used in a period of 0.4 times the number of channels, N (i.e. 0.4N divided by the time between successive hops, rounded up to the closest integer), unless the time between successive hops exceeds 0.4N, in which case the channel dwell time is the transmit time on a channel.

Maximum 20dB bandwidth:	1575	kHz	Pass
Channel spacing:	2046	kHz	Pass
Transmission time per hop:	0.34	ms	
The time between successive hops on a channel:	14.58	ms	
Number of channels (N):	41		Pass
Channel dwell time in 16.4 seconds:	0.68	ms	Pass

Client:	RedOctane	Job Number:	J75534
Model:	95905.805 (Guitar Hero/Band Hero Guitar)	T-Log Number:	T75558
		Account Manager:	Sheareen Washington
Contact:	Stephen Withers		
Standard:	FCC 15.247/RSS-210 (FHSS)	Class:	N/A

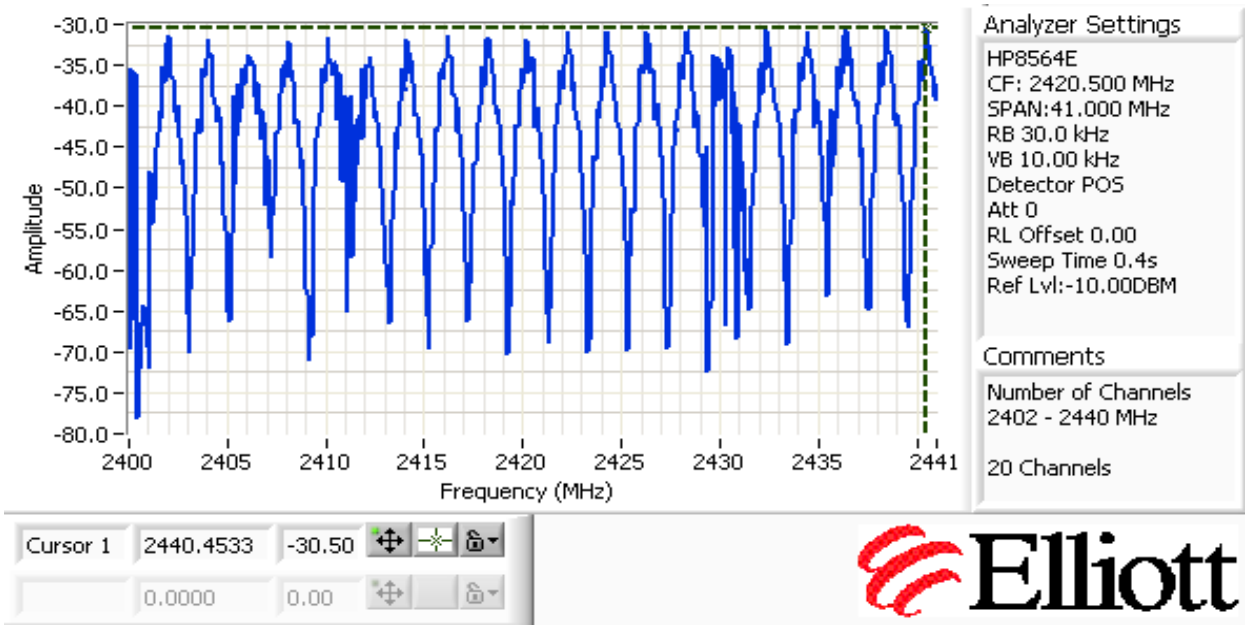
Run #3: Continued

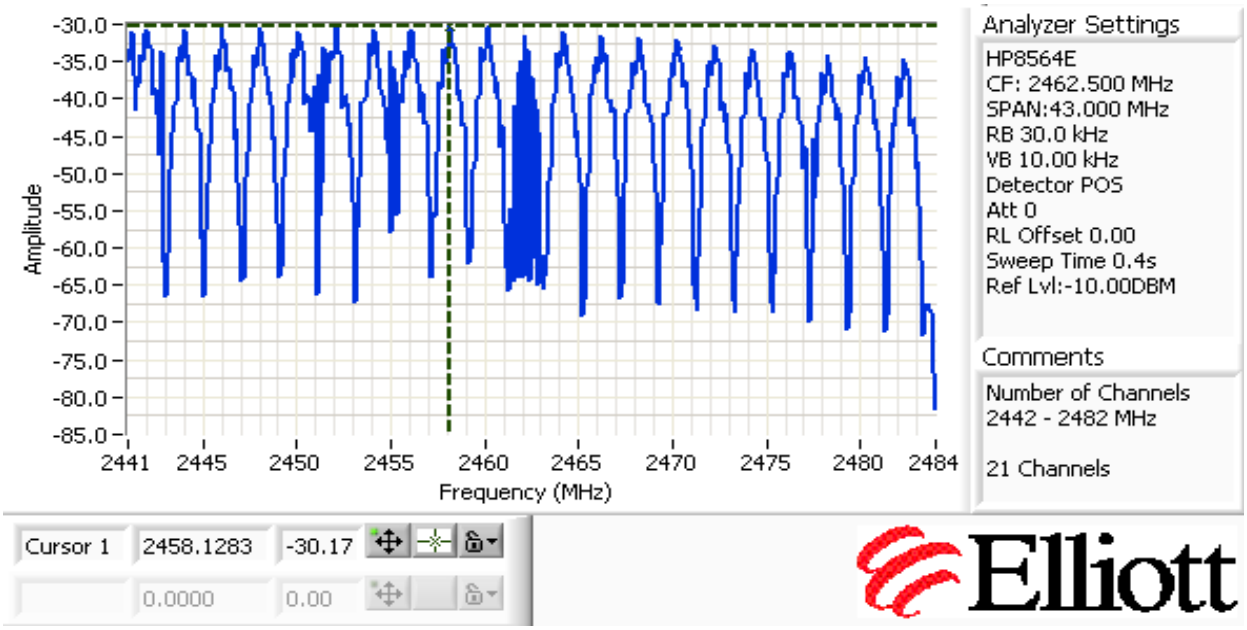




Client:	RedOctane	Job Number:	J75534
Model:	95905.805 (Guitar Hero/Band Hero Guitar)	T-Log Number:	T75558
		Account Manager:	Sheareen Washington
Contact:	Stephen Withers		
Standard:	FCC 15.247/RSS-210 (FHSS)	Class:	N/A

Run #3: Continued





Client:	RedOctane	Job Number:	J75534
Model:	95905.805 (Guitar Hero/Band Hero Guitar)	T-Log Number:	T75558
		Account Manager:	Sheareen Washington
Contact:	Stephen Withers		
Standard:	FCC 15.247/RSS-210 (FHSS)	Class:	-

Radiated Emissions - Receive Mode

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 6/3/2009
Test Engineer: Rafael Varelas
Test Location: SVOATS #2
Config. Used: 1
Config Change: None
EUT Voltage: Battery

General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated emissions testing.

The test distance and extrapolation factor (if applicable) are detailed under each run description.

Note, **preliminary** testing indicates that the emissions were maximized by orientation of the EUT and elevation of the measurement antenna. **Maximized** testing indicated that the emissions were maximized by orientation of the EUT, elevation of the measurement antenna, and manipulation of the EUT's interface cables.

Ambient Conditions:

Temperature: 14 °C
Rel. Humidity: 85 %

Summary of Results

Run #	Test Performed	Limit	Result	Margin
2	RE, 30 - 1000MHz, Maximized Emissions	RSS-GEN	Pass	36.1dBµV/m @ 336.000MHz (-9.9dB)
3	RE, 1000 - 10000 MHz, Maximized Emissions	RSS-GEN	Pass	37.9dBµV/m @ 1329.0MHz (-16.1dB)

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	RedOctane	Job Number:	J75534
Model:	95905.805 (Guitar Hero/Band Hero Guitar)	T-Log Number:	T75558
		Account Manager:	Sheareen Washington
Contact:	Stephen Withers		
Standard:	FCC 15.247/RSS-210 (FHSS)	Class:	-

Run #1: Preliminary Radiated Emissions, 30-1000 MHz
EUT Set to Receive Mode - Center Channel 2442 MHz

Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
30 - 1000 MHz	3	3	0.0

Frequency	Level	Pol	RSS-GEN		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
336.000	36.1	V	46.0	-9.9	QP	25	1.2	QP (1.00s)
456.000	34.8	V	46.0	-11.2	QP	281	1.0	QP (1.00s)
432.000	32.0	V	46.0	-14.0	QP	292	1.0	QP (1.00s)
480.000	30.6	V	46.0	-15.4	QP	0	1.1	QP (1.00s)
47.898	21.9	V	40.0	-18.1	QP	287	1.0	QP (1.00s)
216.000	24.7	V	43.5	-18.8	QP	108	1.0	QP (1.00s)
192.000	24.6	H	43.5	-18.9	QP	171	1.3	QP (1.00s)
600.000	26.0	H	46.0	-20.0	QP	226	1.0	QP (1.00s)
500.000	24.7	V	46.0	-21.3	QP	143	1.0	QP (1.00s)
240.000	24.2	H	46.0	-21.8	QP	159	1.0	QP (1.00s)
120.000	20.6	V	43.5	-22.9	QP	114	1.0	QP (1.00s)
384.100	23.1	H	46.0	-22.9	QP	322	1.0	QP (1.00s)
264.000	23.0	V	46.0	-23.0	QP	278	1.4	QP (1.00s)
33.800	16.4	V	40.0	-23.6	QP	360	1.0	QP (1.00s)
82.990	14.9	H	40.0	-25.1	QP	345	1.0	Random Spike
80.990	14.7	H	40.0	-25.3	QP	345	1.0	Random Spike
168.000	17.8	H	43.5	-25.7	QP	211	1.0	QP (1.00s)
162.499	16.4	H	43.5	-27.1	QP	360	1.0	QP (1.00s)
135.150	12.1	V	43.5	-31.4	QP	57	1.0	Random Spike

Run #2: Maximized Readings From Run #1

Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
30 - 1000 MHz	3	3	0.0

Frequency	Level	Pol	RSS-GEN		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
336.000	36.1	V	46.0	-9.9	QP	25	1.2	QP (1.00s)
456.000	34.8	V	46.0	-11.2	QP	281	1.0	QP (1.00s)
432.000	32.0	V	46.0	-14.0	QP	292	1.0	QP (1.00s)
480.000	30.6	V	46.0	-15.4	QP	0	1.1	QP (1.00s)
47.898	21.9	V	40.0	-18.1	QP	287	1.0	QP (1.00s)
216.000	24.7	V	43.5	-18.8	QP	108	1.0	QP (1.00s)

Client:	RedOctane	Job Number:	J75534
Model:	95905.805 (Guitar Hero/Band Hero Guitar)	T-Log Number:	T75558
		Account Manager:	Sheareen Washington
Contact:	Stephen Withers		
Standard:	FCC 15.247/RSS-210 (FHSS)	Class:	-

Run #3: Maximized readings, 1000 - 10000 MHz

Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
1000 - 10000 MHz	3	3	0.0

Frequency	Level	Pol	RSS-GEN		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1328.970	37.9	V	54.0	-16.1	AVG	253	1.0	RB 1 MHz; VB: 10 Hz
1330.430	56.7	V	74.0	-17.3	PK	253	1.0	RB 1 MHz; VB: 1 MHz
1329.390	33.0	H	54.0	-21.0	AVG	142	1.8	RB 1 MHz; VB: 10 Hz
1331.170	46.1	H	74.0	-27.9	PK	142	1.8	RB 1 MHz; VB: 1 MHz

Note 1:	Above 1 GHz, the FCC specifies the limit as an average measurement. In addition, the FCC states that the peak reading of any emission above 1 GHz, can not exceed the average limit by more than 20 dB.

Appendix C Photographs of Test Configurations

Uploaded as a separate exhibit

Appendix D Proposed FCC ID Label & Label Location

Uploaded as a separate exhibit

Appendix E Detailed Photographs

Uploaded as a separate exhibit

Appendix F Operator's Manual

Uploaded as a separate exhibit

Appendix G Block Diagram

Uploaded as a separate exhibit

Appendix H Schematic Diagrams

Uploaded as a separate exhibit

Appendix I Theory of Operation

Uploaded as a separate exhibit

Appendix J Advertising Literature

Uploaded as a separate exhibit

Appendix K RF Exposure Information

Uploaded as a separate exhibit