

*Electromagnetic Emissions 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
on the
RedOctane, Inc.
Transmitter
Model: Wireless Drum Set (95519.805)*

UPN: 7196A-95519805
FCC ID: VFI95519805

GRANTEE: RedOctane, Inc.
955 Benecia Avenue
Sunnyvale, CA 94805

TEST SITE: Elliott Laboratories
684 W. Maude Ave
Sunnyvale, CA 94086

REPORT DATE: August 7, 2008

FINAL TEST DATE: August 1 and August 4, 2008

AUTHORIZED SIGNATORY:



Mark E. Hill
Staff Engineer



Testing Cert #2016-01

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REVISION HISTORY

Rev #	Date	Comments	Modified By
1	August 28, 2008	Initial Release	-

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SCOPE

An electromagnetic emissions test has been performed on the RedOctane, Inc. model Wireless Drum Set (95519.805) 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

Conducted and radiated 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.

The test results recorded herein are based on a single type test of the RedOctane, Inc. model Wireless Drum Set (95519.805) and therefore apply only to the tested sample. The sample was selected and prepared by Jack McCauley of RedOctane, Inc.

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 Wireless Drum Set (95519.805) 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 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.).

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	1425 kHz	Channel spacing > 20dB BW	Complies
		Channel Separation	2076 kHz		Complies
	RSS GEN	99% Bandwidth	1409 kHz	-	-
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)	0.68 ms per 4 seconds	<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	11 dBm (0.0125 Watts) Note 1	0.125 W	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	46 dBuV/m @ 2387.52 MHz	15.207 in restricted bands, all others < -20dBc	Complies (- 8.2dB)
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 a 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	35.4dB μ V/m @ 7321.1MHz		Complies
15.207	RSS GEN Table 2	AC Conducted Emissions	NA-Battery operated		
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 Wireless Drum Set (95519.805) is a wireless Xbox 360 drum set that designed as a musical instrument with wireless connection capability for a video game controller. 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 uses non-rechargeable batteries. The electrical rating of the EUT is 3 V DC 80mA.

The sample was received on July 29, 2008 and tested on August 1 and August 4, 2008. The EUT consisted of the following component(s):

Manufacturer	Model	Description	Serial Number	FCC ID
ROR3	95519.805	wireless Xbox 360 drum se	-	VFI95519805

ANTENNA SYSTEM

The antenna is integral to the device.

ENCLOSURE

The EUT enclosure is primarily constructed of Plastic. It measures approximately 68 cm wide by 40 cm deep by 29 cm high.

MODIFICATIONS

The EUT did not require modifications during testing in order to comply with emissions specifications.

SUPPORT EQUIPMENT

No local support equipment was used during emissions testing.

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

Manufacturer	Model	Description	Serial Number
Gateway	SA3	Laptop	N/A
Microsoft	Xbox 360 - Receiver for Window	Xbox 360 - Receiver	-

EUT INTERFACE PORTS

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

Port	Connected To	Cable(s)		
		Description	Shielded or Unshielded	Length(m)
Headphones	Not Connected	-	-	-
Foot Pedal	Not Connected	-	-	-
Microphone	Not Connected	-	-	-

Note: Preliminary testing showed that the addition of the interface cables did not cause a change in the radio related emissions.

EUT OPERATION

During testing, the EUT was configured to continuously transmit at a specific frequency or hop, as needed by a particular test.

TEST SITE

GENERAL INFORMATION

Final test measurements were taken on August 1 and August 4, 2008 at the Elliott Laboratories Open Area Test Site #2 located at 684 West Maude Avenue, Sunnyvale, California. 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.

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 of predictable local TV, radio, and mobile communications traffic. The test site contains 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.

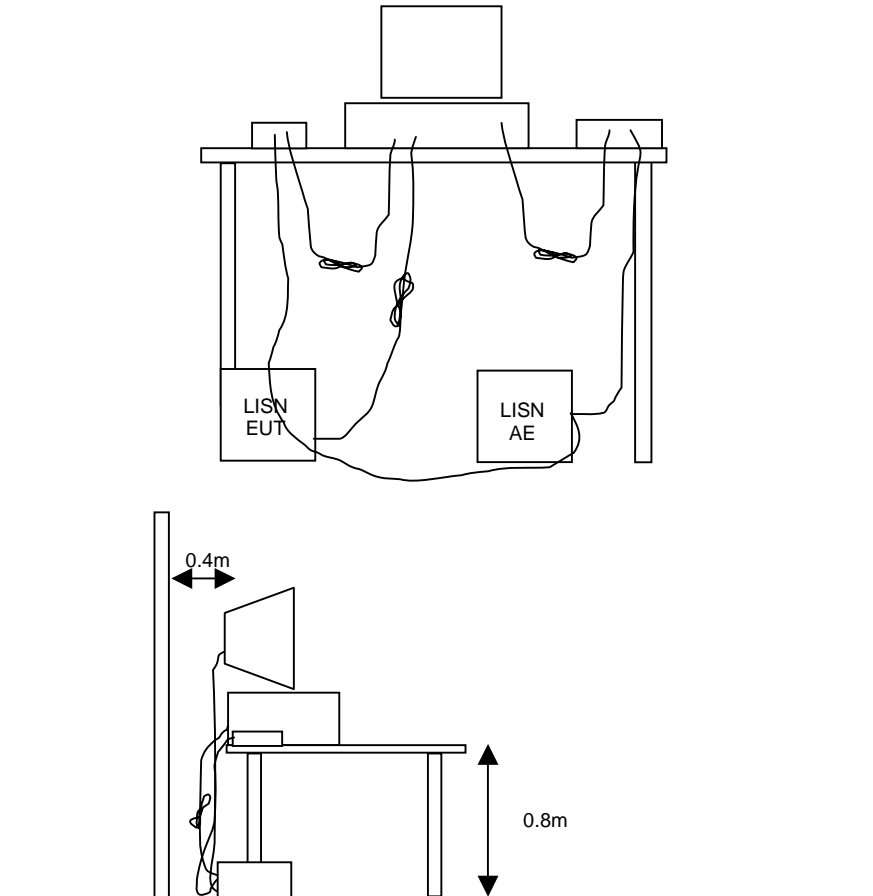
ANSI C63.4:2003 specifies that the test height above ground for table mounted devices shall be 80 centimeters. Floor mounted equipment shall be placed on the ground plane if the device is normally used on a conductive floor or separated from the ground plane by insulating material from 3 to 12 mm if 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.



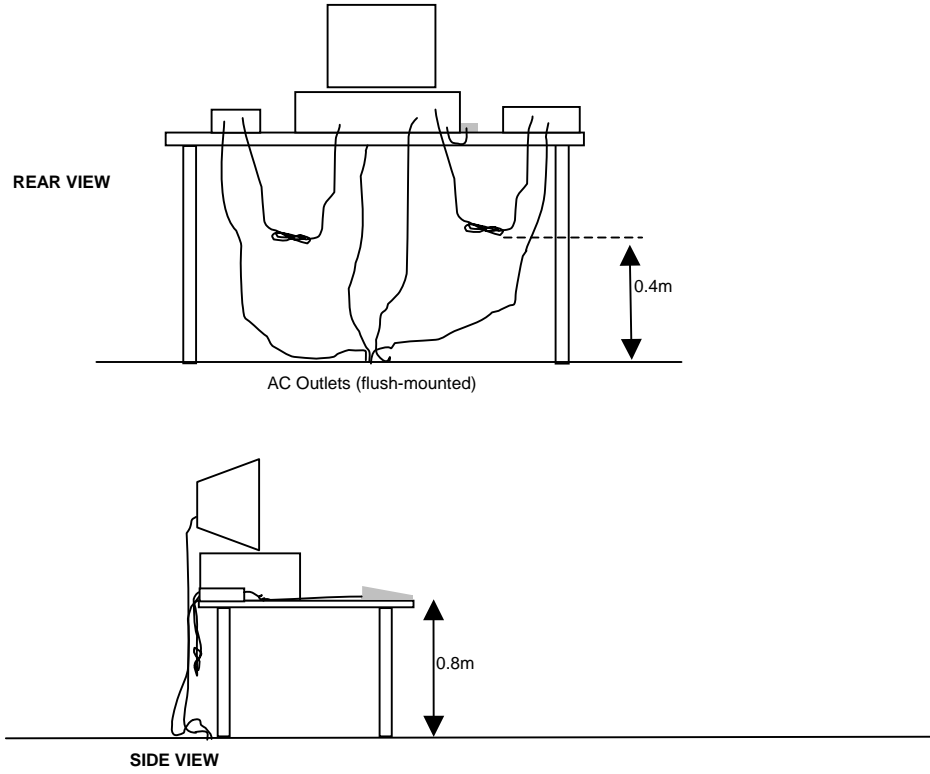
RADIATED EMISSIONS

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.

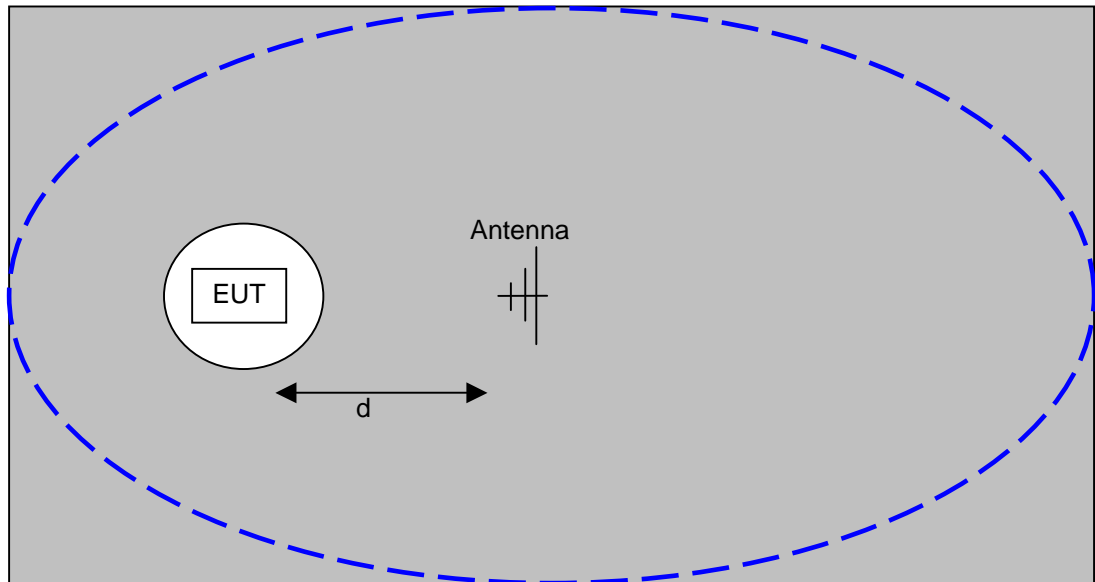
A speaker is provided in the receiver to aid in discriminating between EUT and ambient emissions. Other methods used during the preliminary scan for EUT emissions involve scanning with near field magnetic loops, monitoring I/O cables with RF current clamps, and cycling power to the EUT.

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.

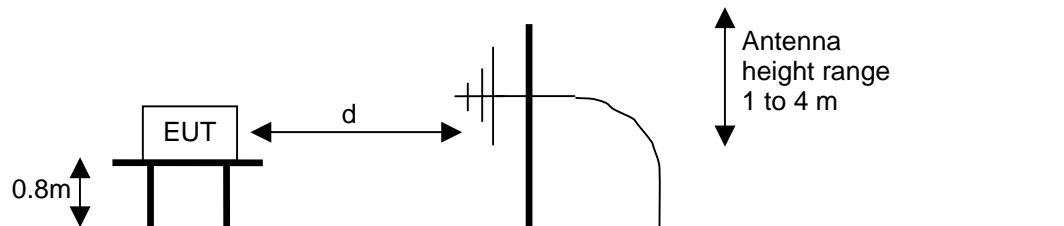
When testing above 18 GHz, the receive antenna is located at 1meter from the EUT and the antenna height is restricted to a maximum of 2.5 meters.



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 bands¹ (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	$2400/F_{\text{KHz}} @ 300\text{m}$	$67.6-20*\log_{10}(F_{\text{KHz}}) @ 300\text{m}$
0.490-1.705	$24000/F_{\text{KHz}} @ 30\text{m}$	$87.6-20*\log_{10}(F_{\text{KHz}}) @ 30\text{m}$
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
2400 – 2483.5	< 75	0.125 Watts (21 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:

$$F_d = 20 * \text{LOG}_{10} (D_m/D_s)$$

where:

$$F_d = \text{Distance Factor in dB}$$

$$D_m = \text{Measurement Distance in meters}$$

$$D_s = \text{Specification Distance in meters}$$

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:

$$F_d = 40 * \text{LOG}_{10} (D_m/D_s)$$

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:

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

where P is the eirp (Watts)

EXHIBIT 1: Test Equipment Calibration Data

1 Page

Radiated Emissions, 30 - 1,000 MHz, 29-Jul-08

Engineer: Jack Plotner

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
Sunol Sciences	Biconilog, 30-3000 MHz	JB3	1549	23-May-09
Com-Power Corp.	Preamplifier, 30-1000 MHz	PA-103	1633	08-Aug-08
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1756	04-Dec-08

Radiated Emissions, 30 - 26,500 MHz, 01-Aug-08

Engineer: Rafael Varelas

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	870	08-Nov-08
EMCO	Antenna, Horn, 1-18 GHz (SA40-Blu)	3115	1386	11-Aug-08
Hewlett Packard	High Pass filter, 3.5 GHz (Red System)	P/N 84300-80038 (84125C)	1403	24-Aug-08
Hewlett Packard	SpecAn 9 kHz - 40 GHz, (SA40)	8564E	CH5273	20-Sep-08

EXHIBIT 2: Test Measurement Data

32 Pages



EMC Test Data

Client:	R0R3 Devices (ROR3)	Job Number:	J72495
Model:	Wireless Drum Set	T-Log Number:	T72513
		Account Manager:	Sheareen Washington
Contact:	Jack McCauley		
Emissions Standard(s):	FCC Part 15B FCC 15.247, EN 55022, VCCI-V3, EN301-489	Class:	B
Immunity Standard(s):	EN 55024 & EN301 489-17	Environment:	Residential

EMC Test Data

For The

R0R3 Devices (ROR3)

Model

Wireless Drum Set

Date of Last Test: 8/4/2008

Client:	ROR3 Devices (ROR3)	Job Number:	J72495
Model:	Wireless Drum Set	T-Log Number:	T72513
Contact:	Jack McCauley	Account Manger:	Sheareen Washington
Emissions Standard(s):	FCC Part 15B FCC 15.247, EN 55022, VCCI-V3,	Class:	B
Immunity Standard(s):	EN 55024 & EN301 489-17	Environment:	Residential

EUT INFORMATION

*The following information was collected during the test session(s).
The client agreed to provide the following information after the test session(s).*

General Description

The EUT is a wireless XBox 360 drum set that designed as a musical instrument with wireless connection capability for a video game controller. 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 electrical rating of the EUT is 3 V DC 80mA.

Equipment Under Test

Manufacturer	Model	Description	Serial Number	FCC ID
ROR3	95519.805	wireless XBox 360 drum	-	VFI95519805

EUT Antenna (Intentional Radiators Only)

The antenna is integral to the device.

EUT Enclosure

The EUT enclosure is primarily constructed of Plastic . It measures approximately 68 cm wide by 40 cm deep by 29 cm high.

Modification History

Mod. #	Test	Date	Modification
1			
2			
3			

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

Client: ROR3 Devices (ROR3)	Job Number: J72495
Model: Wireless Drum Set	T-Log Number: T72513
Contact: Jack McCauley	Account Manger: Sheareen Washington
Emissions Standard(s): FCC Part 15B FCC 15.247, EN 55022, VCCI-V3, EN301488	Class: B
Immunity Standard(s): EN 55024 & EN301 489-17	Environment: Residential

Test Configuration #1

The client agreed to provide the following information after the test session(s).

Local Support Equipment

Manufacturer	Model	Description	Serial Number	FCC ID
-	-	-	-	-

Remote Support Equipment

Manufacturer	Model	Description	Serial Number	FCC ID
Gateway	SA3	Laptop	N/A	-
Microsoft	Xbox 360 - Receiver for Window	Xbox 360 - Receiver	-	-

Cabling and Ports

Port	Connected To	Cable(s)		
		Description	Shielded or Unshielded	Length(m)
Headphones	Not Connected	-	-	-
Foot Pedal	Not Connected	-	-	-
Microphone	Not Connected	-	-	-

Note: Preliminary testing showed that the addition of the interface cables did not cause a change in the radio related emissions.

EUT Operation During Emissions Tests

During testing, the EUT was configured to continuously transmit at a specific frequency or hop, as needed by a particular test.

Client:	R0R3 Devices (ROR3)	Job Number:	J72495
Model:	Wireless Drum Set	T-Log Number:	T72513
		Account Manager:	Sheareen Washington
Contact:	Jack McCauley		
Standard:	FCC Part 15B FCC 15.247, EN 55022, VCCI-V3, EN301-489	Class:	N/A

FCC 15.247 FHSS - Power and Bandwidth

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: 8/4/2008 19:35
 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.

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: 19 °C
 Rel. Humidity: 82 %

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1	Output Power	15.247(b)	Pass	11 dBm (0.0125 W)
2	20dB Bandwidth	15.247(a)	Pass	1425 kHz
2	99% bandwidth	15.247(a)	Pass	1409 kHz
2	Channel Occupancy	15.247(a)	Pass	11.55ms
2	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: ROR3 Devices (ROR3)	Job Number: J72495
Model: Wireless Drum Set	T-Log Number: T72513
	Account Manager: Sheareen Washington
Contact: Jack McCauley	
Standard: FCC Part 15B FCC 15.247, EN 55022, VCCI-V3, EN301-489	Class: N/A

Run #1: Output Power

Channel	Frequency (MHz)	Field Strength at 3m (dBuV/m)	Antenna Pol. (H/V)	Res BW	Signal Bandwidth	Bandwidth Correction	Power (dBm)	Power (Watts)
Low	2402	101.8	H	1MHz	-	0	6.5	0.0044668
Mid	2442	106.3	H	1MHz	-	0	11	0.0125893
High	2482	104.7	H	1MHz	-	0	9.4	0.0087096
Low	2402	98.8	V	1MHz	-	0	3.5	0.0022387
Mid	2442	101.6	V	1MHz	-	0	6.3	0.0042658
High	2482	101.5	V	1MHz	-	0	6.2	0.0041687

Note 1: Output power calculated from field strength at 3m based on free space path loss formula $E = \sqrt{(30PG) / d}$, 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.

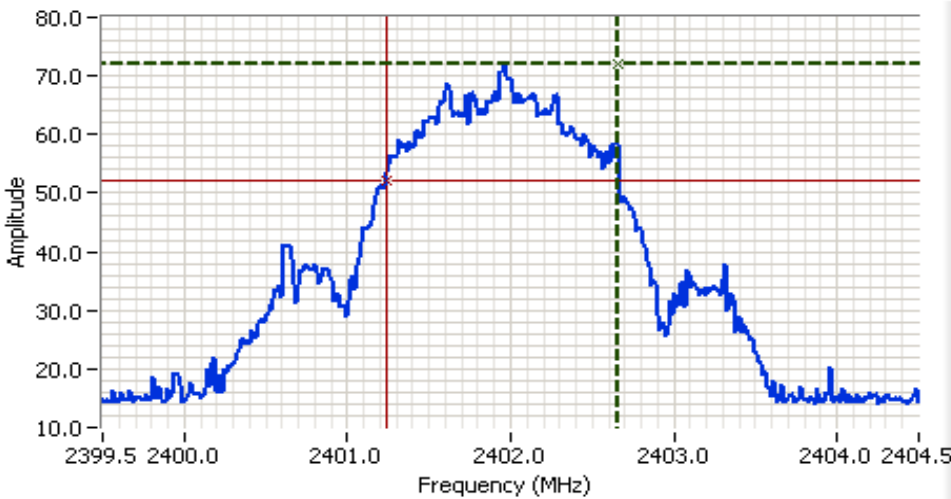
Run #2: Bandwidth, Channel Occupancy, Spacing and Number of Channels

Channel	Frequency (MHz)	Resolution Bandwidth	20dB Bandwidth (kHz)	Resolution Bandwidth	99% Bandwidth (kHz)
Low	2402	30kHz	1425	30kHz	1409
Mid	2442	30kHz	1412	30kHz	1397
High	2482	30kHz	1400	30kHz	1397

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: ROR3 Devices (ROR3)	Job Number: J72495
Model: Wireless Drum Set	T-Log Number: T72513
Contact: Jack McCauley	Account Manager: Sheareen Washington
Standard: FCC Part 15B FCC 15.247, EN 55022, VCCI-V3, EN301-489	Class: N/A



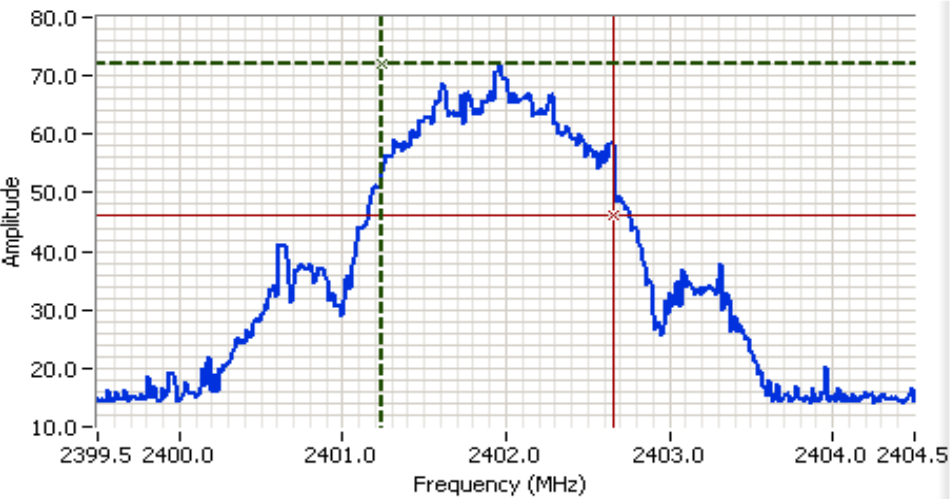
Analyzer Settings
HP8595EM

CF: 2402.000 MHz
SPAN: 5.000 MHz
RB 30.0 kHz
VB 100 kHz
Detector POS
Att 0
RL Offset 0.00
Sweep Time 20.0ms
Ref Lvl: 91.00DBUV

Comments
20dB BW: 1.425 MHz
Low Channel

Cursor 1	2402.6625	72.02	
Cursor 2	2401.2375	52.02	

Delta Freq. 1.425
Delta Amplitude 20.00



Analyzer Settings
HP8595EM

CF: 2402.000 MHz
SPAN: 5.000 MHz
RB 30.0 kHz
VB 100 kHz
Detector POS
Att 0
RL Offset 0.00
Sweep Time 20.0ms
Ref Lvl: 91.00DBUV

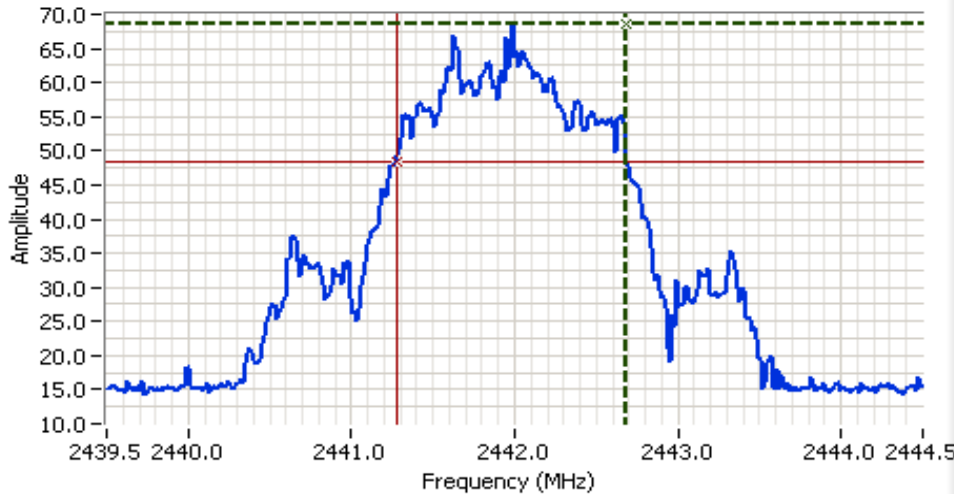
Comments
99% BW: 1.409 MHz
Low Channel

Cursor 1	2401.2456	72.02	
Cursor 2	2402.6546	46.02	

Delta Freq. 1.409
Delta Amplitude 26.00



Client: ROR3 Devices (ROR3)	Job Number: J72495
Model: Wireless Drum Set	T-Log Number: T72513
	Account Manager: Sheareen Washington
Contact: Jack McCauley	
Standard: FCC Part 15B FCC 15.247, EN 55022, VCCI-V3, EN301-489	Class: N/A



Analyzer Settings
HP8595EM

CF: 2442.000 MHz
SPAN: 5.000 MHz
RB 30.0 kHz
VB 100 kHz
Detector POS
Att 0
RL Offset 0.00
Sweep Time 20.0ms
Ref Lvl: 91.00DBU

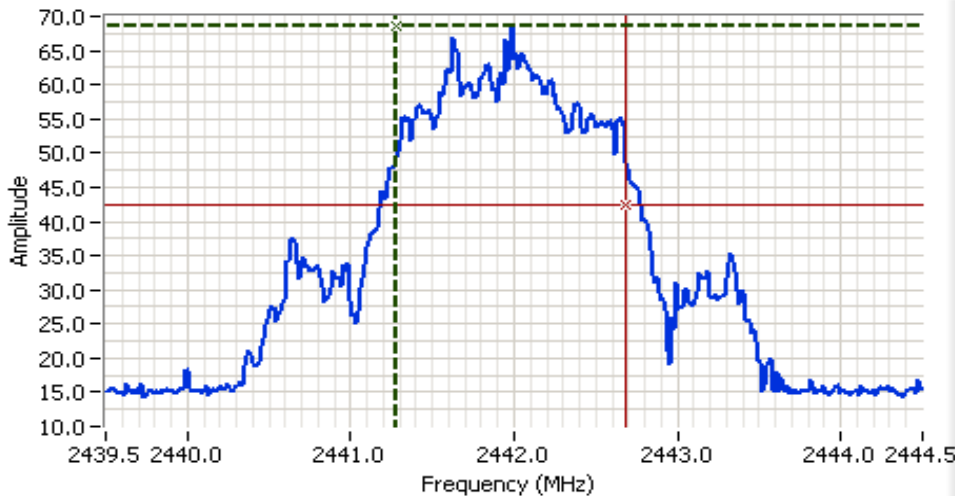
Comments
20dB BW: 1.412 MHz
Middle Channel

Cursor 1 2442.6875 68.45 

Cursor 2 2441.2750 48.45 

Delta Freq. 1.412

Delta Amplitude 20.00



Analyzer Settings
HP8595EM

CF: 2442.000 MHz
SPAN: 5.000 MHz
RB 30.0 kHz
VB 100 kHz
Detector POS
Att 0
RL Offset 0.00
Sweep Time 20.0ms
Ref Lvl: 91.00DBU

Comments
99% BW: 1.397 MHz
Middle Channel

Cursor 1 2441.2830 68.45 

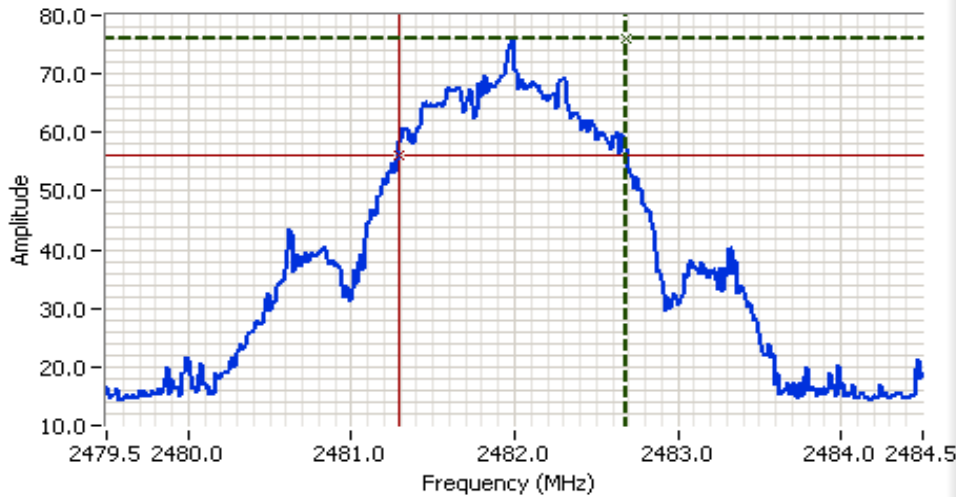
Cursor 2 2442.6796 42.45 

Delta Freq. 1.397

Delta Amplitude 26.00



Client: ROR3 Devices (ROR3)	Job Number: J72495
Model: Wireless Drum Set	T-Log Number: T72513
	Account Manager: Sheareen Washington
Contact: Jack McCauley	
Standard: FCC Part 15B FCC 15.247, EN 55022, VCCI-V3, EN301-489	Class: N/A



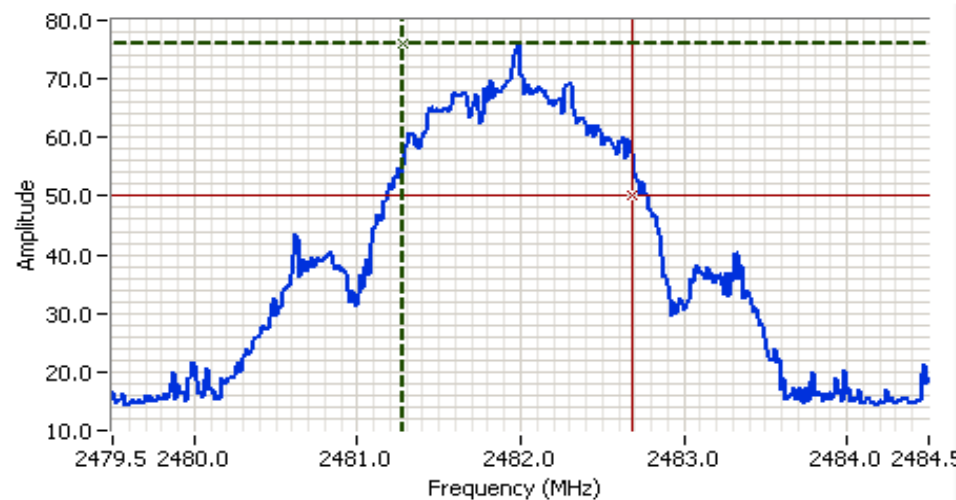
Analyzer Settings
HP8595EM

CF: 2482.000 MHz
SPAN: 5.000 MHz
RB 30.0 kHz
VB 100 kHz
Detector POS
Att 0
RL Offset 0.00
Sweep Time 20.0ms
Ref Lvl: 91.00DBUV

Comments
20dB BW: 1.400 MHz
High Channel

Cursor 1	2482.6875	76.08	
Cursor 2	2481.2875	56.08	

Delta Freq. 1.400
Delta Amplitude 20.00



Analyzer Settings
HP8595EM

CF: 2482.000 MHz
SPAN: 5.000 MHz
RB 30.0 kHz
VB 100 kHz
Detector POS
Att 0
RL Offset 0.00
Sweep Time 20.0ms
Ref Lvl: 91.00DBUV

Comments
99% BW: 1.397 MHz
High Channel

Cursor 1	2481.2830	76.08	
Cursor 2	2482.6796	50.08	

Delta Freq. 1.397
Delta Amplitude 26.00



Client: ROR3 Devices (ROR3)	Job Number: J72495
Model: Wireless Drum Set	T-Log Number: T72513
	Account Manager: Sheareen Washington
Contact: Jack McCauley	
Standard: FCC Part 15B FCC 15.247, EN 55022, VCCI-V3, EN301-489	Class: N/A

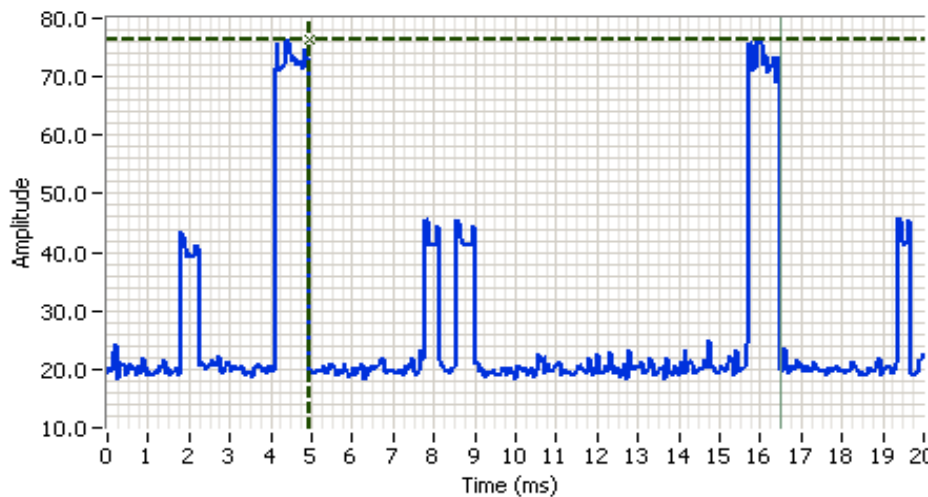
Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.

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 multiplied 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:	1425 kHz	Pass
Channel spacing:	2076 kHz	Pass
Transmission time per hop:	0.34 ms	
The time between successive hops on a channel:	11.55 ms	
Number of channels (N):	41	Pass
Channel dwell time in 16.4 seconds:	0.68 ms	Pass

Occupancy Time



Analyzer Settings

HP8595EM

CF: 2482.000 MHz
SPAN: 0.000 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 0
RL Offset 0.00
Sweep Time 20.0ms
Ref Lvl: 91.00DBUV

Comments

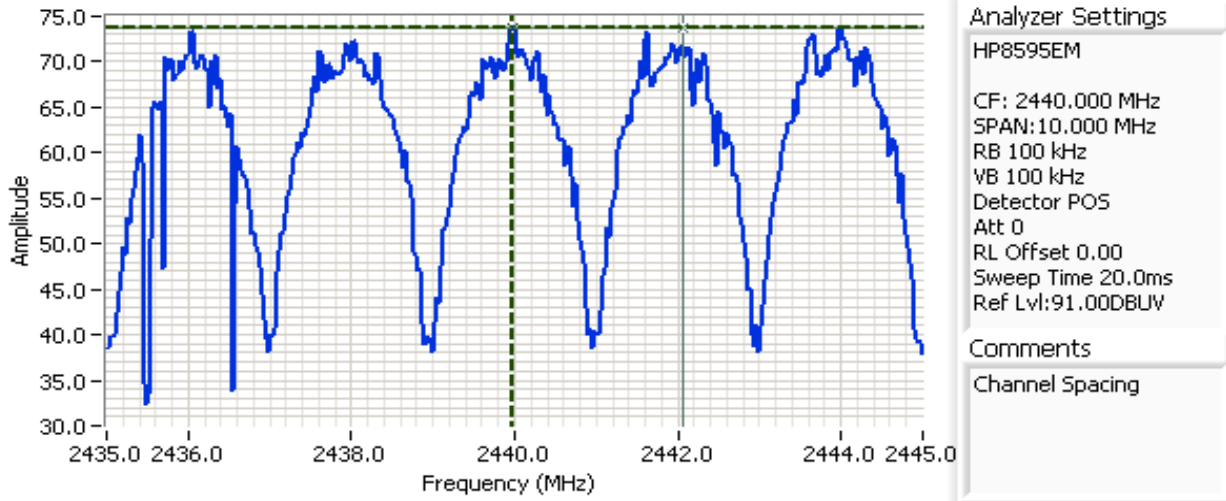
Occupancy Time

Cursor 1	4.9485	76.28	Delta Time (ms)	11.55
Cursor 1	16.4948	0.00	Delta Amplitude	76.28



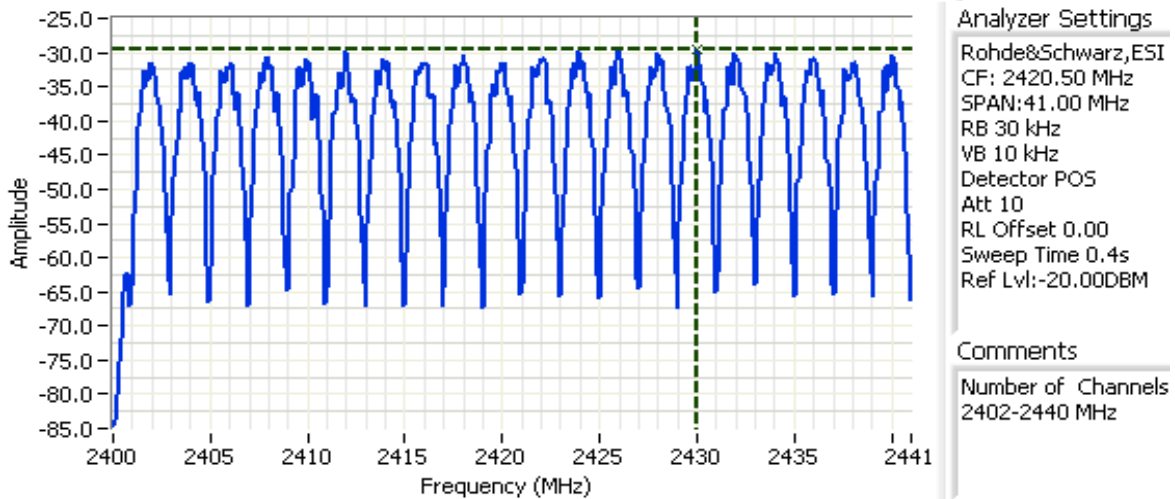
Client: ROR3 Devices (ROR3)	Job Number: J72495
Model: Wireless Drum Set	T-Log Number: T72513
Contact: Jack McCauley	Account Manager: Sheareen Washington
Standard: FCC Part 15B FCC 15.247, EN 55022, VCCI-V3, EN301-489	Class: N/A

Channel Separation



Cursor 1 2439.9742 73.72	Delta Freq. 2.076	
Cursor 1 2442.0500 73.72	Delta Amplitude 0.00	

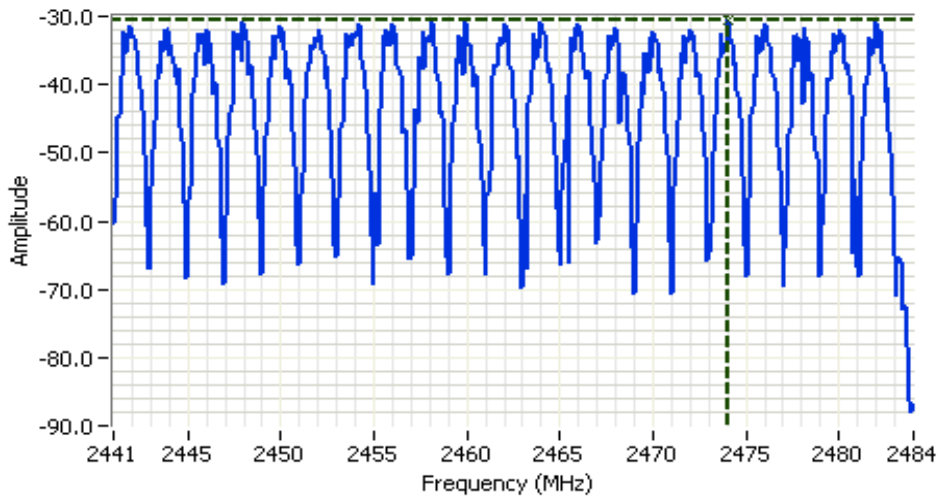
Hopping channels



Cursor 1 2429.991 -29.56	
0.000 0.00	

Client: ROR3 Devices (ROR3)	Job Number: J72495
Model: Wireless Drum Set	T-Log Number: T72513
	Account Manager: Sheereen Washington
Contact: Jack McCauley	
Standard: FCC Part 15B FCC 15.247, EN 55022, VCCI-V3, EN301-489	Class: N/A

Hopping channels





Analyzer Settings

Rohde&Schwarz,ESI
CF: 2462.50 MHz
SPAN: 43.00 MHz
RB 30 kHz
VB 10 kHz
Detector POS
Att 10
RL Offset 0.00
Sweep Time 0.4s
Ref Lvl: -20.00DBM

Comments

Number of Channels
2442-2482 MHz

Cursor 1 2474.00 -30.45 

0.000 0.00 



Client: R0R3 Devices (ROR3)	Job Number: J72495
Model: Wireless Drum Set	T-Log Number: T72513
	Account Manager: Sheareen Washington
Contact: Jack McCauley	
Standard: FCC Part 15B FCC 15.247, EN 55022, VCCI-V3, EN301-489	Class: N/A

FCC 15.247 FHSS - 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: 8/1/2008 19:05	Config. Used: 1
Test Engineer: Rafael Varelas	Config Change: None
Test Location: SVOATS #2	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 15 meters from the EUT.

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:	17 °C
	Rel. Humidity:	84 %

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1	30 - 25,000 MHz - Radiated Spurious Emissions	FCC Part 15.209 / 15.247(c)	Pass	46dBuV/m @ 2387.52MHz (-8.0dB)

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.

Note: No spurious emissions below 1GHz were observed

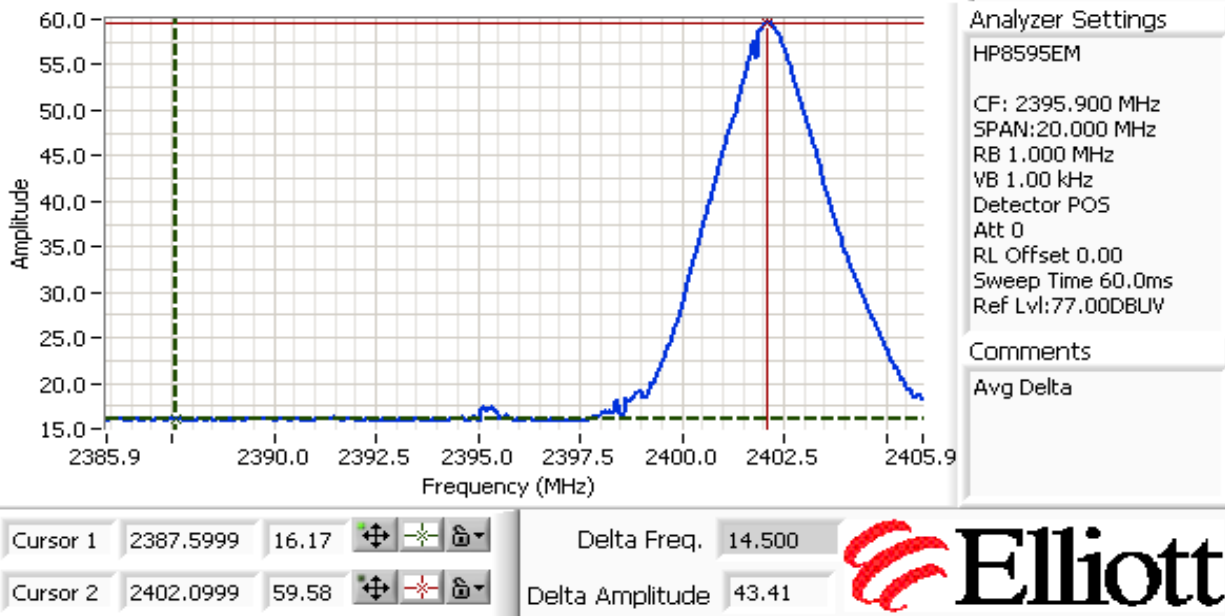
Client: ROR3 Devices (ROR3)	Job Number: J72495
Model: Wireless Drum Set	T-Log Number: T72513
	Account Manager: Sheareen Washington
Contact: Jack McCauley	
Standard: FCC Part 15B FCC 15.247, EN 55022, VCCI-V3, EN301-489	Class: N/A

Run #1a: Radiated Spurious Emissions, 30 - 25,000 MHz. Low Channel @ 2402 MHz

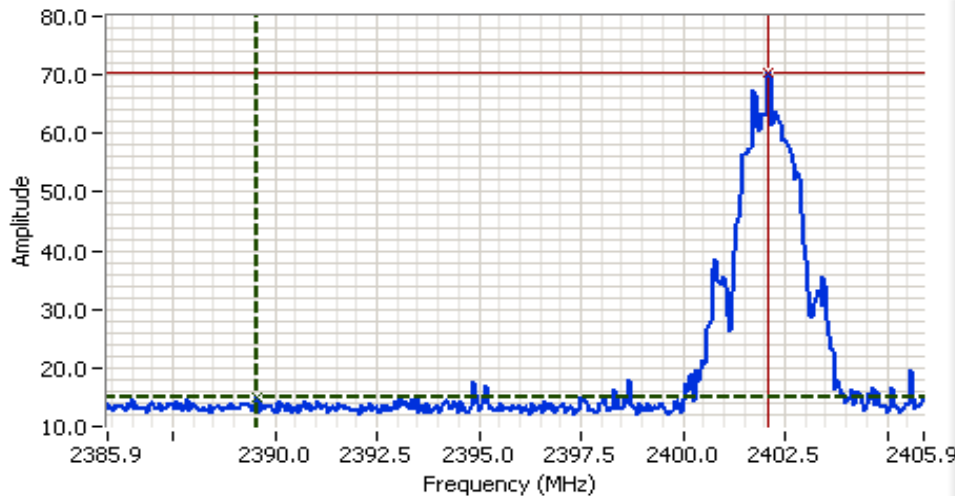
Fundamental Signal Field Strength: Peak and average values measured in 1 MHz, and peak value measured in 100kHz

Frequency MHz	Level dB μ V/m	Pol v/h	15.209 / 15.247		Detector Pk/QP/Avg	Azimuth degrees	Height meters	Comments
			Limit	Margin				
2401.580	72.5	V	120.0	-47.5	AVG	95	1.0	VBW=10Hz
2401.580	98.8	V	120.0	-21.2	PK	95	1.0	
2401.930	86.0	V	120.0	-34.0	Avg	94	1.0	VBW=1kHz
2402.060	71.7	H	120.0	-48.3	AVG	201	1.4	VBW=10Hz
2402.060	101.8	H	120.0	-18.2	PK	201	1.4	
2401.980	89.1	H	120.0	-30.9	Avg	201	1.4	VBW=1kHz

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.



Client: ROR3 Devices (ROR3)	Job Number: J72495
Model: Wireless Drum Set	T-Log Number: T72513
Contact: Jack McCauley	Account Manager: Sheareen Washington
Standard: FCC Part 15B FCC 15.247, EN 55022, VCCI-V3, EN301-489	Class: N/A



Analyzer Settings

HP8595EM

CF: 2395.900 MHz
 SPAN: 20.000 MHz
 RB 30.0 kHz
 VB 30.0 kHz
 Detector POS
 Att 0
 RL Offset 0.00
 Sweep Time 67.0ms
 Ref Lvl: 77.00DBUV

Comments

Avg Delta

Cursor 1	2389.5498	14.83	Delta Freq.	12.550
Cursor 2	2402.0999	70.49	Delta Amplitude	55.66



Delta - Band Edge Signal Field Strength

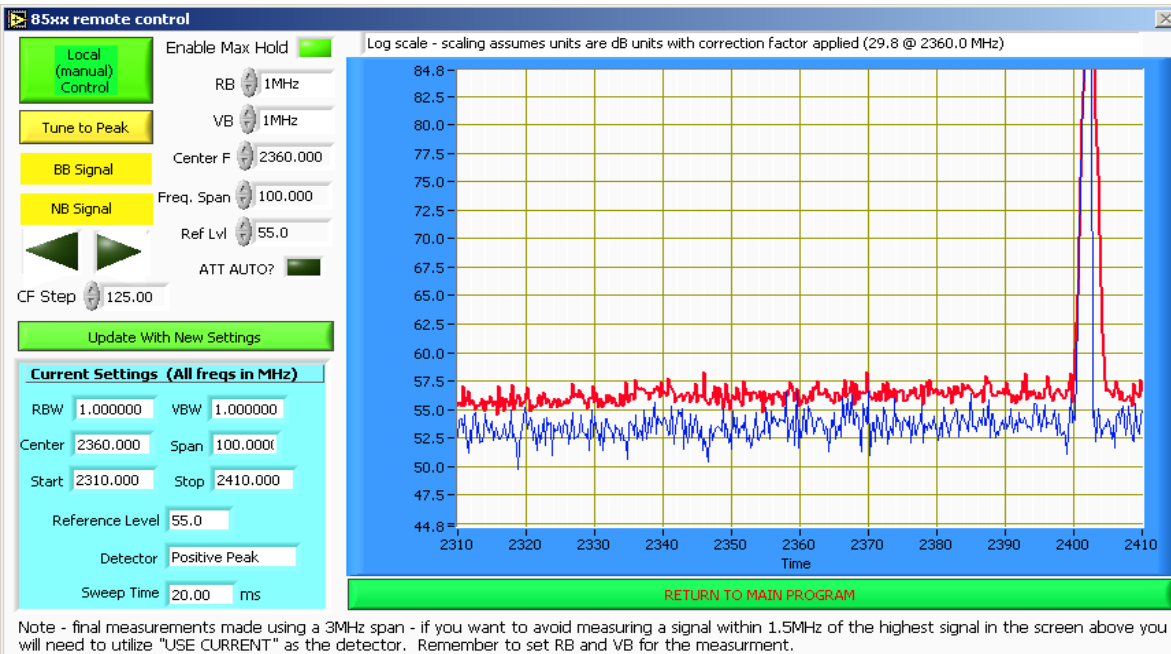
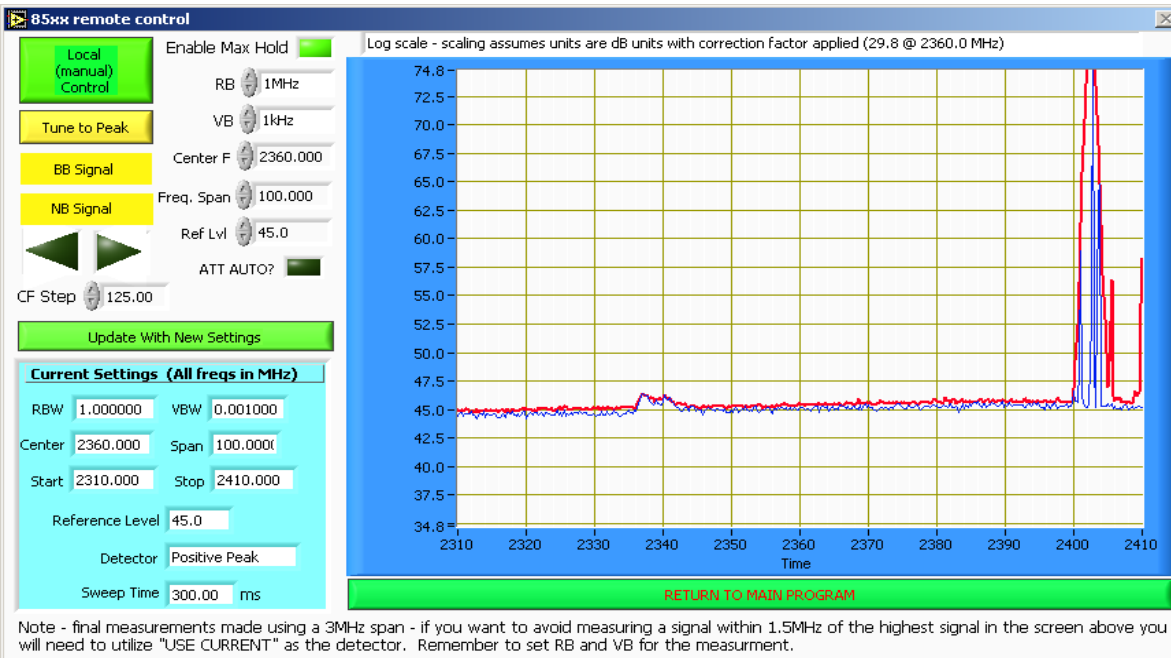
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2390.000	33.4	H	54.0	-20.6	Avg	-	-	

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

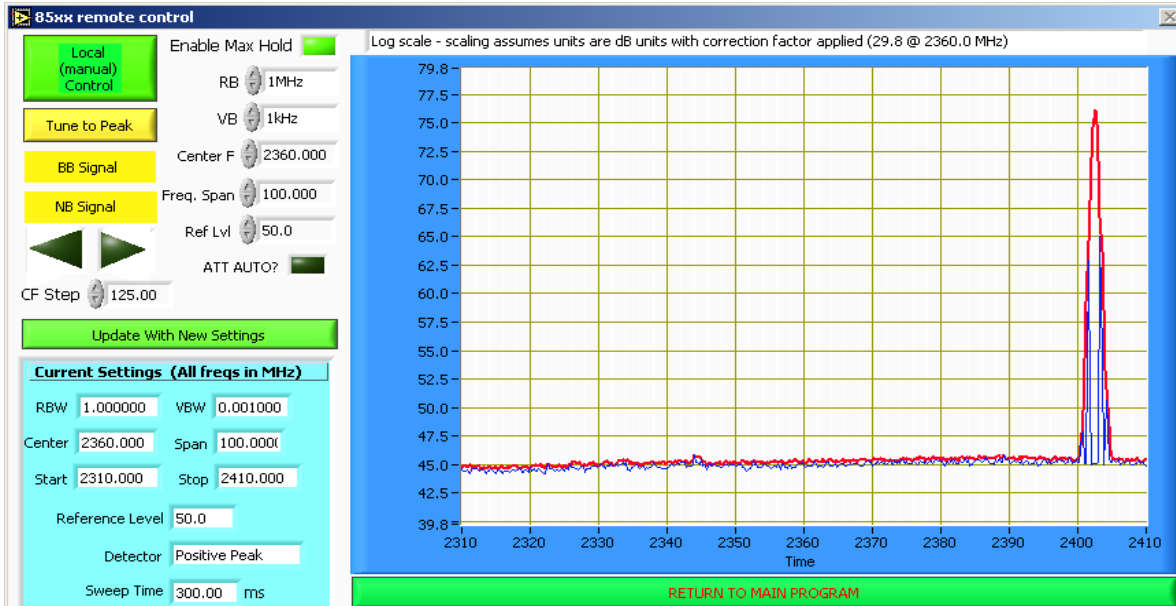
Band Edge Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2387.580	45.3	H	54.0	-8.7	Avg	201	1.4	VBW=10Hz
2388.270	45.2	V	54.0	-8.8	Avg	95	1.0	VBW=10Hz
2387.250	58.1	V	74.0	-15.9	PK	95	1.0	
2387.710	57.7	H	74.0	-16.3	PK	201	1.4	

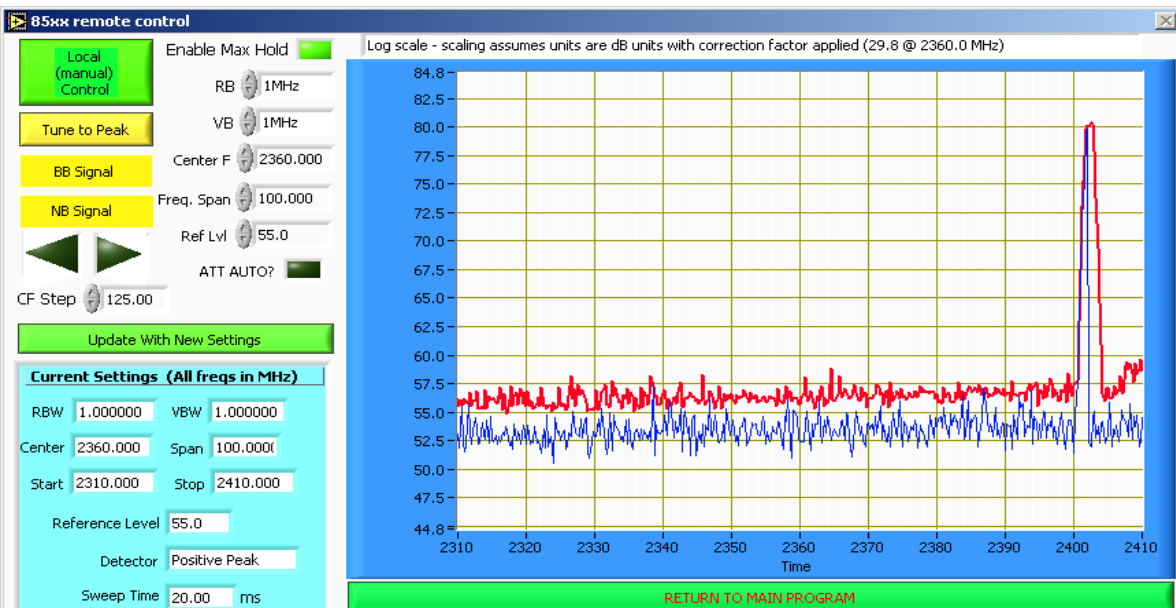
Client: ROR3 Devices (ROR3)	Job Number: J72495
Model: Wireless Drum Set	T-Log Number: T72513
	Account Manager: Sheareen Washington
Contact: Jack McCauley	
Standard: FCC Part 15B FCC 15.247, EN 55022, VCCI-V3, EN301-489	Class: N/A



Client: ROR3 Devices (ROR3)	Job Number: J72495
Model: Wireless Drum Set	T-Log Number: T72513
	Account Manager: Sheereen Washington
Contact: Jack McCauley	
Standard: FCC Part 15B FCC 15.247, EN 55022, VCCI-V3, EN301-489	Class: N/A



Note - final measurements made using a 3MHz span - if you want to avoid measuring a signal within 1.5MHz of the highest signal in the screen above you will need to utilize "USE CURRENT" as the detector. Remember to set RB and VB for the measurement.



Note - final measurements made using a 3MHz span - if you want to avoid measuring a signal within 1.5MHz of the highest signal in the screen above you will need to utilize "USE CURRENT" as the detector. Remember to set RB and VB for the measurement.

Client:	ROR3 Devices (ROR3)	Job Number:	J72495
Model:	Wireless Drum Set	T-Log Number:	T72513
Contact:	Jack McCauley	Account Manager:	Sheareen Washington
Standard:	FCC Part 15B FCC 15.247, EN 55022, VCCI-V3, EN301-489	Class:	N/A

Other Spurious Emissions

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
4804.150	32.9	V	54.0	-21.1	AVG	113	1.0	
4804.010	31.9	H	54.0	-22.1	AVG	217	1.0	
9607.580	51.0	V	74.0	-23.0	PK	15	1.0	
9608.080	49.6	H	74.0	-24.4	PK	184	1.0	
7206.190	47.7	H	74.0	-26.3	PK	231	1.0	
7204.650	47.6	V	74.0	-26.4	PK	97	1.0	
4804.150	46.9	V	74.0	-27.1	PK	113	1.0	
4804.010	43.1	H	74.0	-30.9	PK	217	1.0	
9607.580	37.9	V	74.0	-36.1	AVG	15	1.0	
9608.080	37.8	H	74.0	-36.2	AVG	184	1.0	
7204.650	36.2	V	74.0	-37.8	AVG	97	1.0	
7206.190	35.9	H	74.0	-38.1	AVG	231	1.0	

Run #1b: Radiated Spurious Emissions, 30 - 25,000 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	dB μ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2441.980	77.2	H	-	-	AVG	283	1.1	VBW=10Hz
2441.980	106.3	H	-	-	PK	283	1.1	
2441.960	92.5	H	-	-	Avg	283	1.1	VBW=1kHz
2441.990	71.7	V	-	-	AVG	242	1.0	VBW=10Hz
2441.990	101.6	V	-	-	PK	242	1.0	
2441.790	88.9	V	-	-	Avg	242	1.0	VBW=1kHz

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.

Client:	ROR3 Devices (ROR3)	Job Number:	J72495
Model:	Wireless Drum Set	T-Log Number:	T72513
Contact:	Jack McCauley	Account Manager:	Sheareen Washington
Standard:	FCC Part 15B FCC 15.247, EN 55022, VCCI-V3, EN301-489	Class:	N/A

Other Spurious Emissions

Frequency MHz	Level dB μ V/m	Pol v/h	15.209 / 15.247		Detector Pk/QP/Avg	Azimuth degrees	Height meters	Comments
			Limit	Margin				
7319.870	35.6	H	54.0	-18.4	AVG	42	1.0	
7321.100	35.4	V	54.0	-18.6	AVG	0	1.0	
4878.870	31.5	V	54.0	-22.5	AVG	62	1.0	
4879.650	31.5	H	54.0	-22.5	AVG	42	1.0	
9759.120	50.9	V	74.0	-23.1	PK	56	1.0	
9760.930	49.9	H	74.0	-24.1	PK	15	1.0	
7319.870	47.0	H	74.0	-27.0	PK	42	1.0	
7321.100	46.5	V	74.0	-27.5	PK	0	1.0	
4878.870	42.8	V	74.0	-31.2	PK	62	1.0	
4879.650	42.0	H	74.0	-32.0	PK	42	1.0	
9760.930	38.7	H	74.0	-35.3	AVG	15	1.0	
9759.120	38.4	V	74.0	-35.6	AVG	56	1.0	

Run #1c: Radiated Spurious Emissions, 30 - 25,000 MHz. High Channel @ 2482 MHz

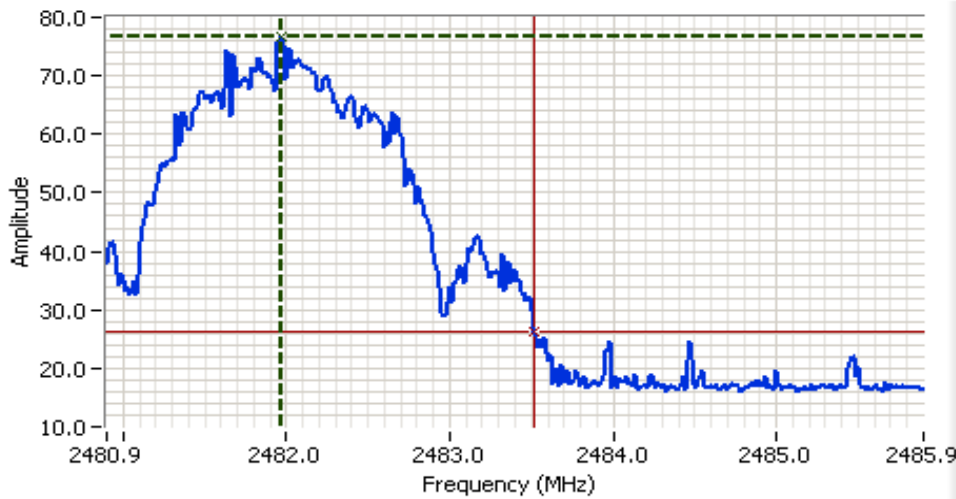
Fundamental Signal Field Strength: Peak and average values measured in 1 MHz, and peak value measured in 100kHz

Frequency MHz	Level dB μ V/m	Pol v/h	15.209 / 15.247		Detector Pk/QP/Avg	Azimuth degrees	Height meters	Comments
			Limit	Margin				
2482.440	73.4	H	120.0	-46.6	AVG	193	1.3	VBW=10Hz
2482.440	104.7	H	120.0	-15.3	PK	193	1.3	
2481.750	91.7	H	120.0	-28.3	Avg	193	1.3	VBW=1kHz
2482.110	73.1	V	120.0	-46.9	AVG	158	1.1	VBW=10Hz
2482.110	101.5	V	120.0	-18.5	PK	158	1.1	
2481.770	89.6	V	120.0	-30.4	Avg	158	1.1	VBW=1kHz

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.

Client: ROR3 Devices (ROR3)	Job Number: J72495
Model: Wireless Drum Set	T-Log Number: T72513
	Account Manager: Sheareen Washington
Contact: Jack McCauley	
Standard: FCC Part 15B FCC 15.247, EN 55022, VCCI-V3, EN301-489	Class: N/A

Delta (dB): 50.54 Measurement taken with a RBW: 30kHz and VBW: 30 kHz



Analyzer Settings

HP8595EM

CF: 2483.400 MHz
SPAN: 5.000 MHz
RB 30.0 kHz
VB 30.0 kHz
Detector POS
Att 0
RL Offset 0.00
Sweep Time 20.0ms
Ref Lvl: 93.00DBUV

Comments

Cursor 1	2481.9749	76.81	
Cursor 2	2483.5125	26.27	

Delta Freq. 1.538
Delta Amplitude 50.54

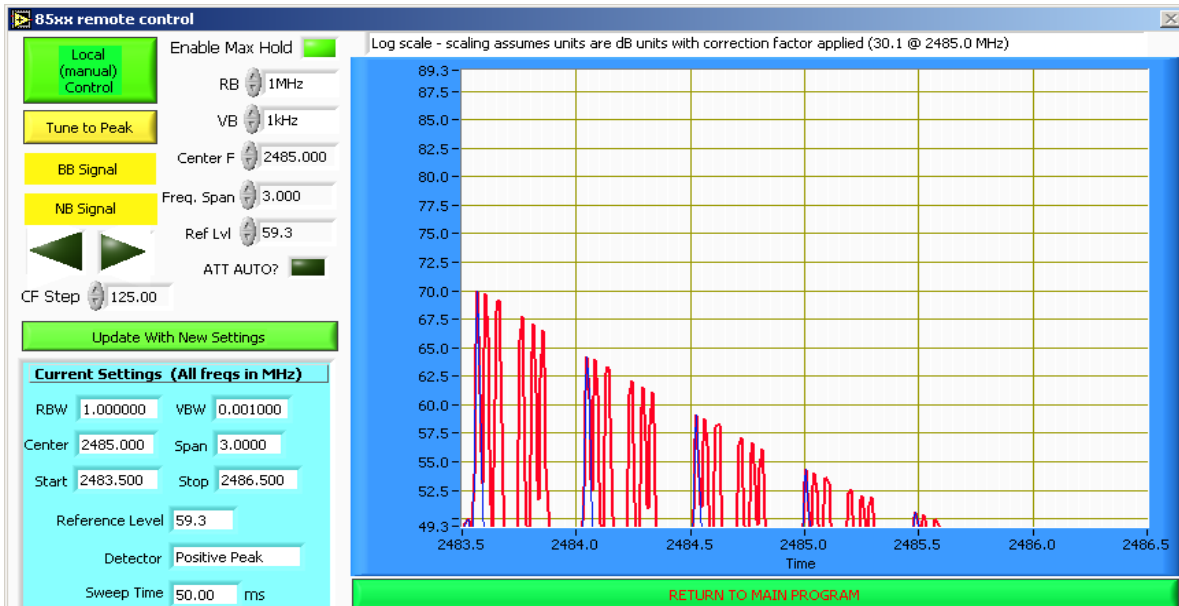


Band Edge Signal Field Strength

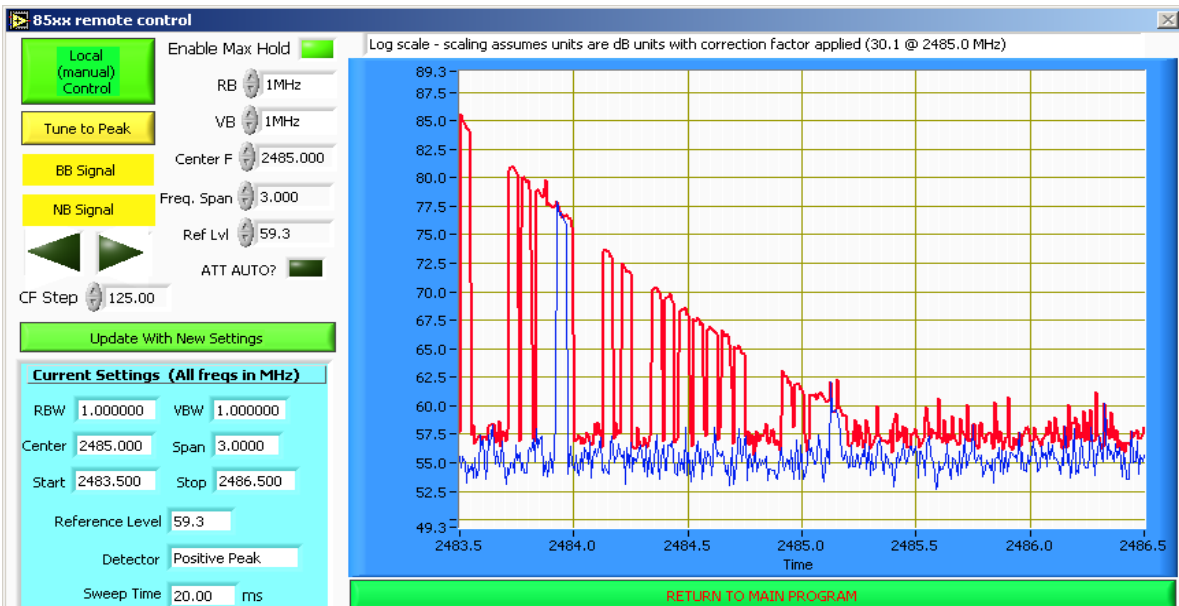
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2483.530	41.2	H	54.0	-12.8	Avg	193	1.3	RB = 1MHz, VB = 1kHz
2483.760	39.1	V	54.0	-14.9	Avg	158	1.1	RB = 1MHz, VB = 1kHz
2483.970	54.2	H	74.0	-19.8	PK	193	1.3	RB = VB = 1MHz
2484.380	51.0	V	74.0	-23.0	PK	158	1.1	RB = VB = 1MHz

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

Client: ROR3 Devices (ROR3)	Job Number: J72495
Model: Wireless Drum Set	T-Log Number: T72513
	Account Manager: Sheareen Washington
Contact: Jack McCauley	
Standard: FCC Part 15B FCC 15.247, EN 55022, VCCI-V3, EN301-489	Class: N/A

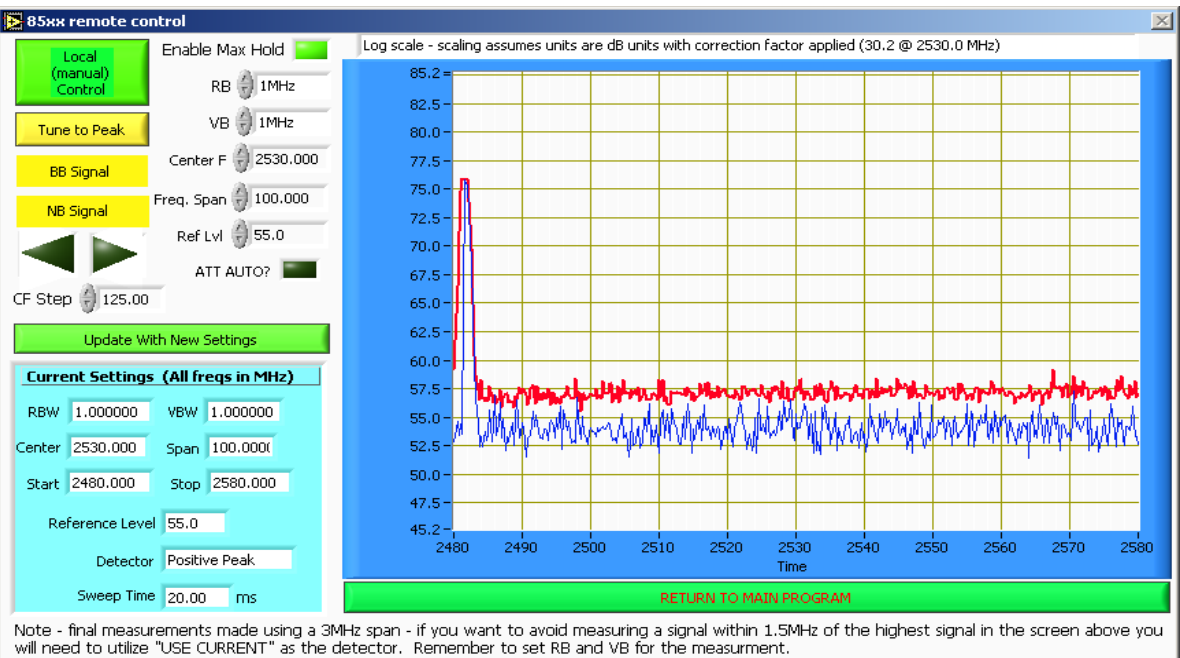
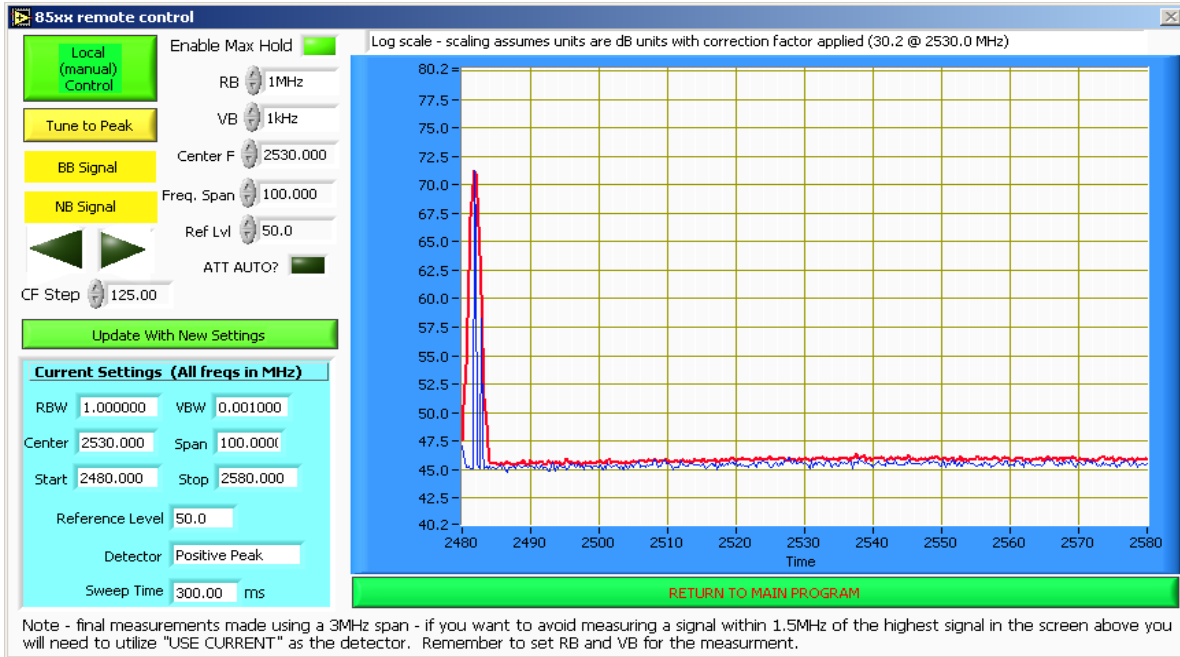


Note - final measurements made using a 3MHz span - if you want to avoid measuring a signal within 1.5MHz of the highest signal in the screen above you will need to utilize "USE CURRENT" as the detector. Remember to set RB and VB for the measurement.



Note - final measurements made using a 3MHz span - if you want to avoid measuring a signal within 1.5MHz of the highest signal in the screen above you will need to utilize "USE CURRENT" as the detector. Remember to set RB and VB for the measurement.

Client: ROR3 Devices (ROR3)	Job Number: J72495
Model: Wireless Drum Set	T-Log Number: T72513
	Account Manager: Sheareen Washington
Contact: Jack McCauley	
Standard: FCC Part 15B FCC 15.247, EN 55022, VCCI-V3, EN301-489	Class: N/A



Client:	ROR3 Devices (ROR3)	Job Number:	J72495
Model:	Wireless Drum Set	T-Log Number:	T72513
		Account Manager:	Sheareen Washington
Contact:	Jack McCauley		
Standard:	FCC Part 15B FCC 15.247, EN 55022, VCCI-V3, EN301-489	Class:	N/A

Other Spurious Emissions

Frequency MHz	Level dB μ V/m	Pol v/h	15.209 / 15.247		Detector Pk/QP/Avg	Azimuth degrees	Height meters	Comments
			Limit	Margin				
7446.370	37.0	V	54.0	-17.0	AVG	0	1.0	
7445.230	36.5	H	54.0	-17.5	AVG	161	1.0	
4963.400	32.4	V	54.0	-21.6	AVG	101	1.6	
4963.260	32.1	H	54.0	-21.9	AVG	360	1.0	
9927.170	50.3	H	74.0	-23.7	PK	360	1.0	
9929.180	49.9	V	74.0	-24.1	PK	69	1.4	
7446.370	48.2	V	74.0	-25.8	PK	0	1.0	
7445.230	48.1	H	74.0	-25.9	PK	161	1.0	
4963.400	44.9	V	74.0	-29.1	PK	101	1.6	
4963.260	43.0	H	74.0	-31.0	PK	360	1.0	
9929.180	38.6	V	74.0	-35.4	AVG	69	1.4	
9927.170	38.1	H	74.0	-35.9	AVG	360	1.0	

Client: ROR3 Devices (ROR3)	Job Number: J72495
Model: Wireless Drum Set	T-Log Number: T72513
	Account Manager: Sheareen Washington
Contact: Jack McCauley	
Standard: FCC Part 15B FCC 15.247, EN 55022, VCCI-V3, EN301-489	Class: B

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: 8/1/2008 19:05	Config. Used: 1
Test Engineer: Rafael Varelas	Config Change: None
Test Location: SVOATS #2	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: 17 °C
	Rel. Humidity: 84 %

Summary of Results

Run #	Test Performed	Limit	Result	Margin
1	RE, 30 - 10,000MHz, Maximized Emissions	15.209 / RSS-210	Pass	35.4dBµV/m @ 7321.1MHz (-18.6dB)

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.

Note: No emissions related to the receiver were detected below 1 GHz.

Client:	R0R3 Devices (ROR3)	Job Number:	J72495
Model:	Wireless Drum Set	T-Log Number:	T72513
		Account Manager:	Sheareen Washington
Contact:	Jack McCauley		
Standard:	FCC Part 15B FCC 15.247, EN 55022, VCCI-V3, EN301-489	Class:	B

Run #1: Maximized Radiated Emissions, 30-10,000 MHz

Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
30 - 10,000 MHz	3	3	0.0

Frequency MHz	Level dB μ V/m	Pol v/h	15.209 / RSS 210		Detector Pk/QP/Avg	Azimuth degrees	Height meters	Comments
			Limit	Margin				
7321.100	35.4	V	54.0	-18.6	AVG	0	1.0	
7320.900	35.3	H	54.0	-18.7	AVG	187	1.0	
4881.100	31.5	H	54.0	-22.5	AVG	0	1.0	
4878.870	31.5	V	54.0	-22.5	AVG	62	1.0	
9759.120	50.9	V	74.0	-23.1	PK	56	1.0	
9759.430	49.7	H	74.0	-24.3	PK	200	1.0	
7321.100	46.5	V	74.0	-27.5	PK	0	1.0	
7320.900	46.1	H	74.0	-27.9	PK	187	1.0	
4881.100	43.0	H	74.0	-31.0	PK	0	1.0	
4878.870	42.8	V	74.0	-31.2	PK	62	1.0	
9759.430	38.7	H	74.0	-35.3	AVG	200	1.0	
9759.120	38.4	V	74.0	-35.6	AVG	56	1.0	

Client:	R0R3 Devices (ROR3)	Job Number:	J72495
Model:	Wireless Drum Set	T-Log Number:	T72513
		Account Manager:	Sheareen Washington
Contact:	Jack McCauley		
Standard:	FCC Part 15B FCC 15.247, EN 55022, VCCI-V3, EN301-489	Class:	B

Radiated Emissions
(Elliott Laboratories Fremont Facility, Semi-Anechoic Chamber)

Test Specific Details

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

Date of Test: 7/30/2008	Config. Used: 1
Test Engineer: Joseph Cadigal	Config Change: none
Test Location: Fremont Chamber #5	EUT Voltage: Power by battery

General Test Configuration

The EUT and any local support equipment were located on the turntable for radiated emissions testing. Any remote support equipment was located outside the semi-anechoic chamber. Any cables running to remote support equipment were routed through metal conduit and when possible passed through a ferrite clamp upon exiting the chamber.

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:	23 °C
Rel. Humidity:	42 %

Summary of Results

Run #	Test Performed	Limit	Result	Margin
-	RE, 30 - 1000 MHz, Preliminary Scan	EN55022 B	Eval	Refer to individual runs

Modifications Made During Testing

Modifications are detailed under each run description.

Deviations From The Standard

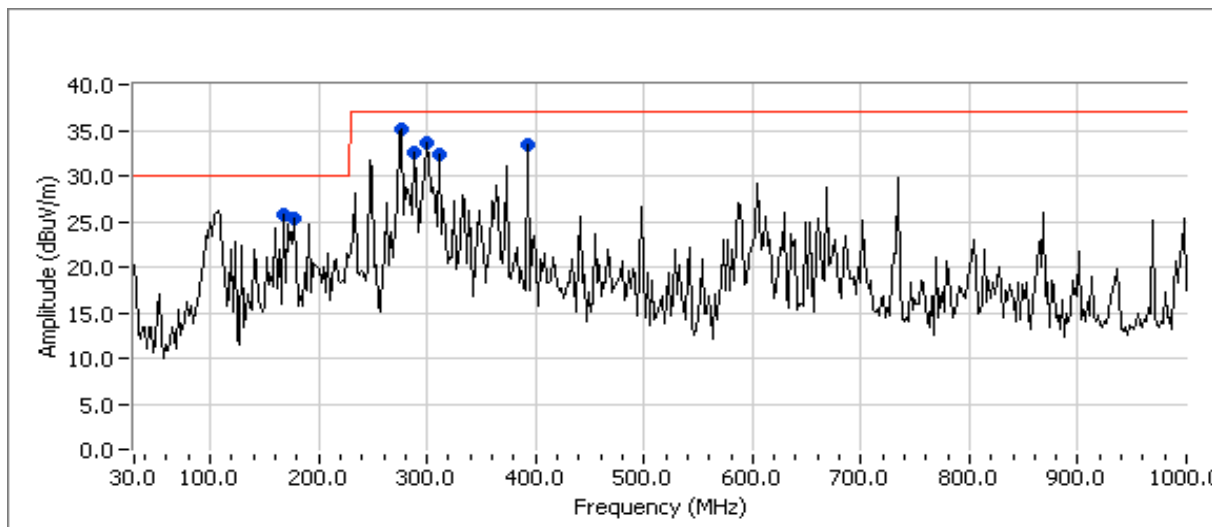
No deviations were made from the requirements of the standard.

Client: ROR3 Devices (ROR3)	Job Number: J72495
Model: Wireless Drum Set	T-Log Number: T72513
	Account Manager: Sheareen Washington
Contact: Jack McCauley	
Standard: FCC Part 15B FCC 15.247, EN 55022, VCCI-V3, EN301-489	Class: B

Run #1: Preliminary Radiated Emissions, 30 - 1000 MHz

Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
30 - 1000 MHz	5	10	-6.0

EUT and Test Configuration Details (Engineering Evaluation Tests Only): *Rear cover removed, Laptop on turntable*



Preliminary peak readings captured during pre-scan

Frequency MHz	Level dB μ V/m	Pol v/h	EN55022 B		Detector Pk/QP/Avg	Azimuth degrees	Height meters	Comments
			Limit	Margin				
312.010	32.3	H	37.0	-4.7	Peak	260	1.0	
178.302	25.4	H	30.0	-4.6	Peak	274	2.0	
287.993	32.6	H	37.0	-4.4	Peak	270	1.0	
168.011	25.7	H	30.0	-4.3	Peak	274	3.0	
393.210	33.4	H	37.0	-3.6	Peak	150	1.0	
301.722	33.7	H	37.0	-3.3	Peak	265	1.0	
276.992	35.2	H	37.0	-1.8	Peak	283	2.0	

Preliminary quasi-peak readings (no manipulation of EUT interface cables)

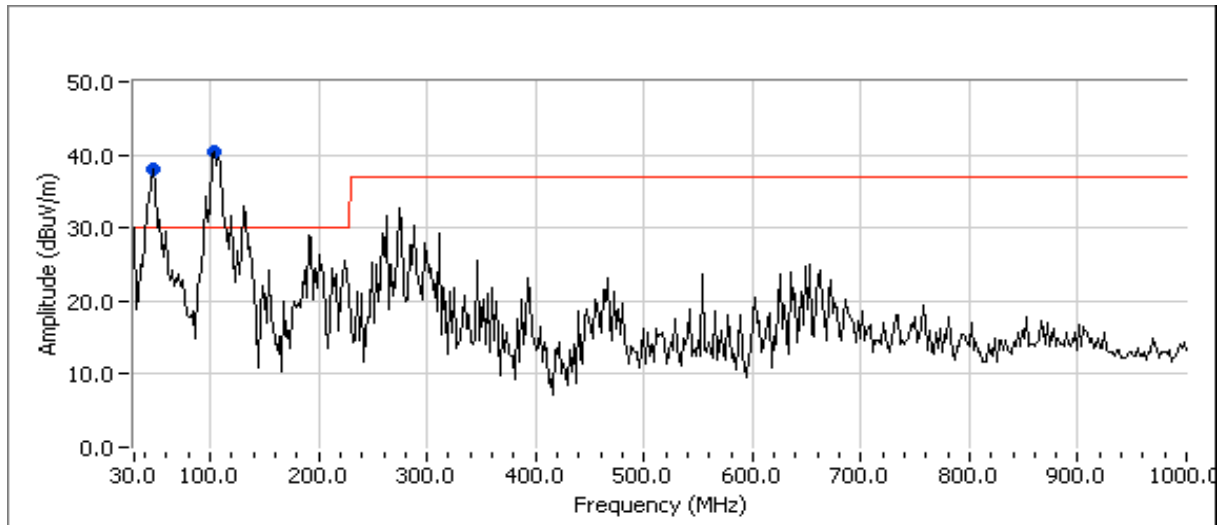
Frequency MHz	Level dB μ V/m	Pol v/h	EN55022 B		Detector Pk/QP/Avg	Azimuth degrees	Height meters	Comments
			Limit	Margin				
No measurements taken								

Client: ROR3 Devices (ROR3)	Job Number: J72495
Model: Wireless Drum Set	T-Log Number: T72513
	Account Manager: Sheareen Washington
Contact: Jack McCauley	
Standard: FCC Part 15B FCC 15.247, EN 55022, VCCI-V3, EN301-489	Class: B

Run #2: Preliminary Radiated Emissions, 30 - 1000 MHz

Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
30 - 1000 MHz	5	10	-6.0

EUT and Test Configuration Details (Engineering Evaluation Tests Only): *Rear cover removed, Laptop put in the floor pit*



Preliminary peak readings captured during pre-scan

Frequency MHz	Level dB μ V/m	Pol v/h	EN55022 B		Detector Pk/QP/Avg	Azimuth degrees	Height meters	Comments
			Limit	Margin				
103.868	40.5	V	30.0	10.5	Peak	289	1.0	
47.495	37.9	V	30.0	7.9	Peak	304	1.0	

Preliminary quasi-peak readings (no manipulation of EUT interface cables)

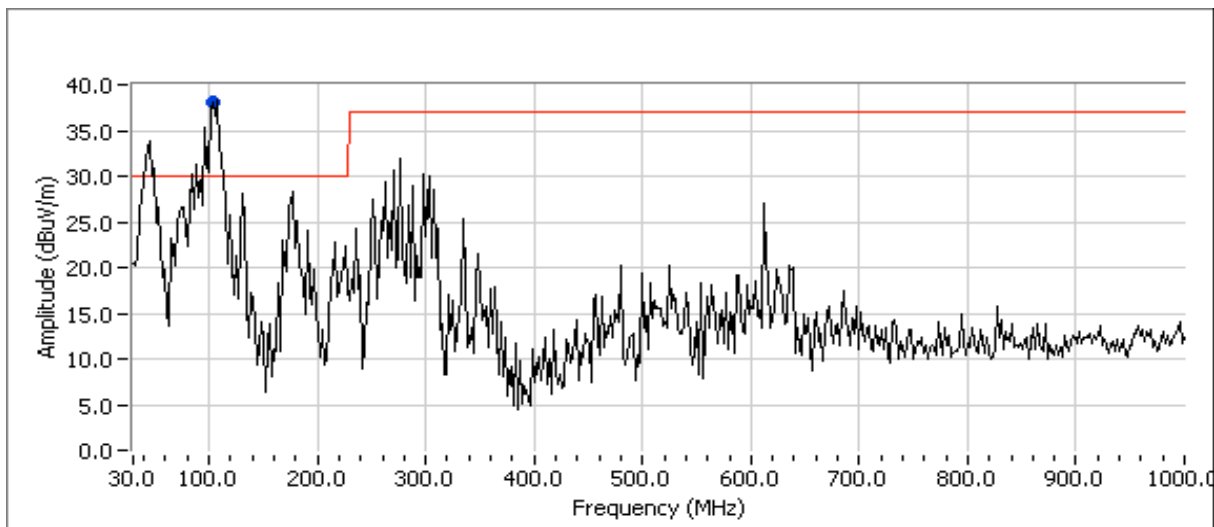
Frequency MHz	Level dB μ V/m	Pol v/h	EN55022 B		Detector Pk/QP/Avg	Azimuth degrees	Height meters	Comments
			Limit	Margin				
No measurements taken								

Client: ROR3 Devices (ROR3)	Job Number: J72495
Model: Wireless Drum Set	T-Log Number: T72513
	Account Manager: Sheareen Washington
Contact: Jack McCauley	
Standard: FCC Part 15B FCC 15.247, EN 55022, VCCI-V3, EN301-489	Class: B

Run #3: Preliminary Radiated Emissions, 30 - 1000 MHz

Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
30 - 1000 MHz	5	10	-6.0

EUT and Test Configuration Details (Engineering Evaluation Tests Only): *Rear cover removed, Laptop put in the floor pit, added ferrites to drum head wires*



Preliminary peak readings captured during pre-scan

Frequency	Level	Pol	EN55022 B		Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
Graph Only								

Preliminary quasi-peak readings (no manipulation of EUT interface cables)

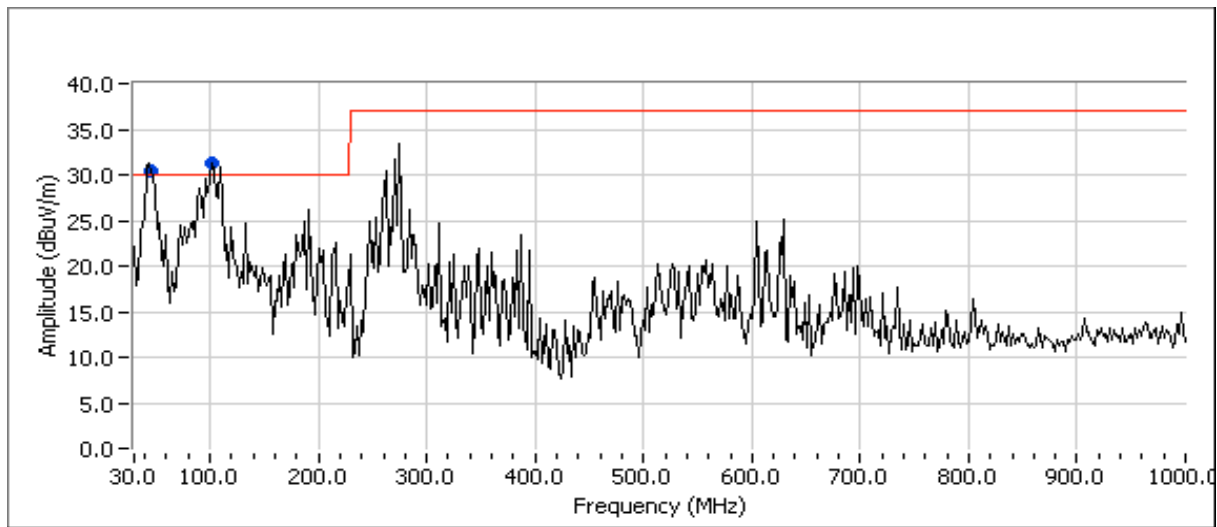
Frequency	Level	Pol	EN55022 B		Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
No measurements taken								

Client: ROR3 Devices (ROR3)	Job Number: J72495
Model: Wireless Drum Set	T-Log Number: T72513
Contact: Jack McCauley	Account Manager: Sheareen Washington
Standard: FCC Part 15B FCC 15.247, EN 55022, VCCI-V3, EN301-489	Class: B

Run #4: Preliminary Radiated Emissions, 30 - 1000 MHz

Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
30 - 1000 MHz	5	10	-6.0

EUT and Test Configuration Details (Engineering Evaluation Tests Only): *Rear cover removed, Laptop put in the floor pit, added ferrites to drum head wires*



Preliminary peak readings captured during pre-scan

Frequency MHz	Level dB μ V/m	Pol v/h	EN55022 B		Detector Pk/QP/Avg	Azimuth degrees	Height meters	Comments
			Limit	Margin				
45.551	30.4	V	30.0	0.4	Peak	326	1.0	
101.924	31.2	V	30.0	1.2	Peak	247	1.0	

Preliminary quasi-peak readings (no manipulation of EUT interface cables)

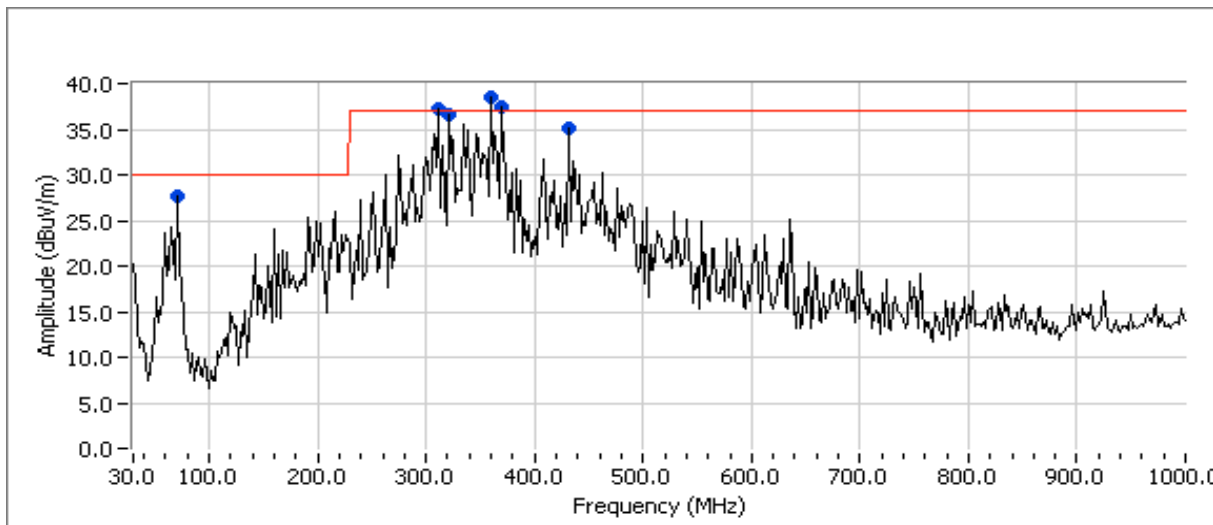
Frequency MHz	Level dB μ V/m	Pol v/h	EN55022 B		Detector Pk/QP/Avg	Azimuth degrees	Height meters	Comments
			Limit	Margin				
No measurements taken								

Client: ROR3 Devices (ROR3)	Job Number: J72495
Model: Wireless Drum Set	T-Log Number: T72513
	Account Manager: Sheareen Washington
Contact: Jack McCauley	
Standard: FCC Part 15B FCC 15.247, EN 55022, VCCI-V3, EN301-489	Class: B

Run #5: Preliminary Radiated Emissions, 30 - 1000 MHz

Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
30 - 1000 MHz	5	10	-6.0

EUT and Test Configuration Details (Engineering Evaluation Tests Only): *Rear cover removed, Laptop put in the floor pit, added ferrite to drum head wires (2 turns)*



Preliminary peak readings captured during pre-scan

Frequency MHz	Level dBuV/m	Pol v/h	EN55022 B		Detector Pk/QP/Avg	Azimuth degrees	Height meters	Comments
			Limit	Margin				
71.418	27.6	V	30.0	-2.4	Peak	6	1.0	
432.006	35.1	H	37.0	-1.9	Peak	94	1.0	
360.000	38.6	H	37.0	1.6	Peak	104	1.0	
370.279	37.4	H	37.0	0.4	Peak	108	1.0	
322.277	36.5	H	37.0	-0.5	Peak	152	1.0	
311.998	37.3	H	37.0	0.3	Peak	253	1.0	

Preliminary quasi-peak readings (no manipulation of EUT interface cables)

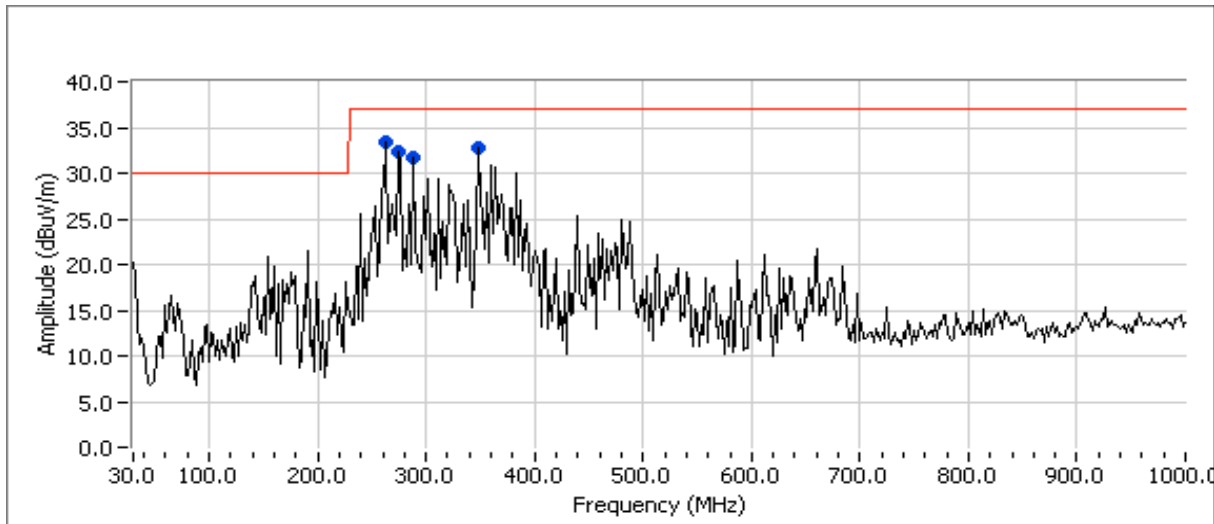
Frequency MHz	Level dBuV/m	Pol v/h	EN55022 B		Detector Pk/QP/Avg	Azimuth degrees	Height meters	Comments
			Limit	Margin				
360.000	40.2	H	37.0	3.2	QP	106	1.0	QP (1.00s)
370.279	36.8	H	37.0	-0.2	QP	112	1.0	QP (1.00s)
432.006	31.2	H	37.0	-5.8	QP	94	1.0	QP (1.00s)
71.418	17.2	V	30.0	-12.8	QP	6	1.0	QP (1.00s)
311.998	0.1	H	37.0	-36.9	QP	254	1.0	QP (1.00s)
322.277	-0.2	H	37.0	-37.2	QP	154	1.0	QP (1.00s)

Client: ROR3 Devices (ROR3)	Job Number: J72495
Model: Wireless Drum Set	T-Log Number: T72513
	Account Manager: Sheareen Washington
Contact: Jack McCauley	
Standard: FCC Part 15B FCC 15.247, EN 55022, VCCI-V3, EN301-489	Class: B

Run #6: Preliminary Radiated Emissions, 30 - 1000 MHz

Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
30 - 1000 MHz	5	10	-6.0

EUT and Test Configuration Details (Engineering Evaluation Tests Only): *Rear cover removed, Laptop put in the floor pit, added ferrite to drum head wires (2 turns), added second ferrite to drum head wire with (2 turns)*



Preliminary peak readings captured during pre-scan

Frequency MHz	Level dBµV/m	Pol v/h	EN55022 B		Detector Pk/QP/Avg	Azimuth degrees	Height meters	Comments
			Limit	Margin				
346.285	32.8	H	37.0	-4.2	Peak	85	1.0	
288.009	31.6	H	37.0	-5.4	Peak	238	1.0	
263.993	33.3	H	37.0	-3.7	Peak	239	2.0	
274.292	32.3	H	37.0	-4.7	Peak	339	1.0	

Preliminary quasi-peak readings (no manipulation of EUT interface cables)

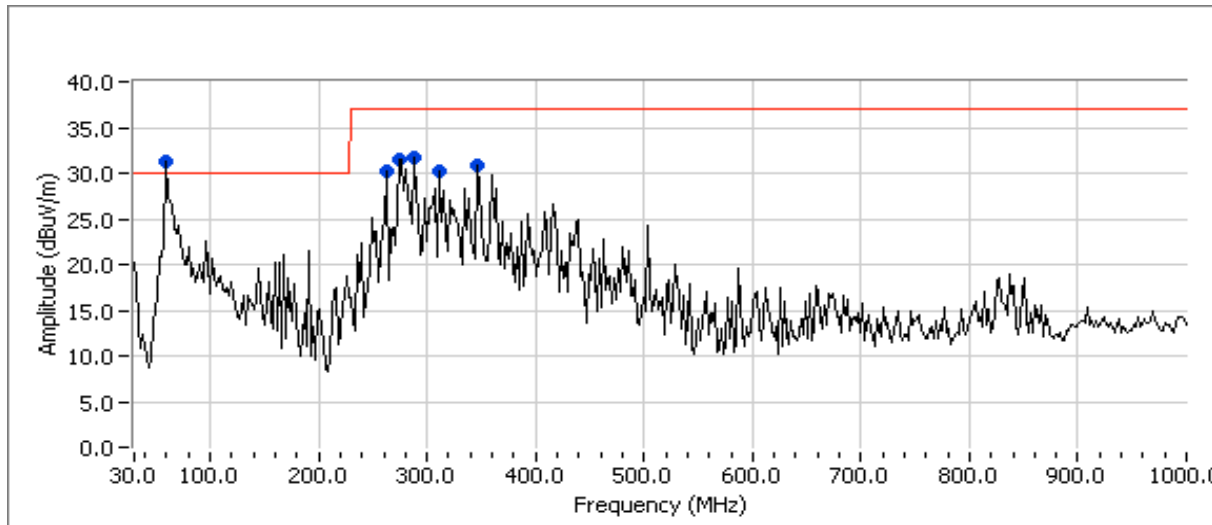
Frequency MHz	Level dBµV/m	Pol v/h	EN55022 B		Detector Pk/QP/Avg	Azimuth degrees	Height meters	Comments
			Limit	Margin				
263.993	33.2	H	37.0	-3.8	QP	240	2.0	QP (1.00s)
274.292	30.1	H	37.0	-6.9	QP	341	1.0	QP (1.00s)
346.285	29.3	H	37.0	-7.7	QP	82	1.0	QP (1.00s)
288.009	20.3	H	37.0	-16.7	QP	94	1.0	QP (1.00s)

Client: ROR3 Devices (ROR3)	Job Number: J72495
Model: Wireless Drum Set	T-Log Number: T72513
	Account Manager: Sheareen Washington
Contact: Jack McCauley	
Standard: FCC Part 15B FCC 15.247, EN 55022, VCCI-V3, EN301-489	Class: B

Run #7: Preliminary Radiated Emissions, 30 - 1000 MHz

Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
30 - 1000 MHz	5	10	-6.0

EUT and Test Configuration Details (Engineering Evaluation Tests Only): *Laptop put in the floor pit, added ferrites to drum head wires (2 turns) Steward 28A0350-082, 28A2432-0A2, LFB310190, 28A3039-0A2, 0443665-806, added second ferrites to drum head wire with (2 turns), re-assembly the EUT with ferrites added*



Preliminary peak readings captured during pre-scan

Frequency MHz	Level dB μ V/m	Pol v/h	EN55022 B		Detector Pk/QP/Avg	Azimuth degrees	Height meters	Comments
			Limit	Margin				
274.292	31.5	H	37.0	-5.5	Peak	34	2.0	
264.025	30.3	V	37.0	-6.7	Peak	231	3.0	
288.000	31.8	H	37.0	-5.2	Peak	233	2.0	
311.998	30.2	H	37.0	-6.8	Peak	249	1.0	
349.764	30.8	H	37.0	-6.2	Peak	259	1.0	
58.864	31.3	V	30.0	1.3	Peak	312	3.0	

Preliminary quasi-peak readings (no manipulation of EUT interface cables)

Frequency MHz	Level dB μ V/m	Pol v/h	EN55022 B		Detector Pk/QP/Avg	Azimuth degrees	Height meters	Comments
			Limit	Margin				
288.000	33.1	H	37.0	-3.9	QP	233	2.0	QP (1.00s)
311.998	32.9	H	37.0	-4.1	QP	249	1.0	QP (1.00s)
58.864	25.3	V	30.0	-4.7	QP	312	3.0	QP (1.00s)
264.025	28.6	V	37.0	-8.4	QP	228	3.0	QP (1.00s)
274.292	27.4	H	37.0	-9.6	QP	34	2.0	QP (1.00s)
349.764	24.4	H	37.0	-12.6	QP	258	1.0	QP (1.00s)

EXHIBIT 3: Photographs of Test Configurations

EXHIBIT 4: Proposed FCC ID Label & Label Location

*EXHIBIT 5: Detailed Photographs
of RedOctane, Inc. Model Wireless Drum Set (95519.805) Construction*

*EXHIBIT 6: Operator's Manual
for RedOctane, Inc. Model Wireless Drum Set (95519.805)*

***EXHIBIT 7: Block Diagram
of RedOctane, Inc. Model Wireless Drum Set (95519.805)***

*EXHIBIT 8: Schematic Diagrams
for RedOctane, Inc. Model Wireless Drum Set (95519.805)*

*EXHIBIT 9: Theory of Operation
for RedOctane, Inc. Model Wireless Drum Set (95519.805)*