EMC Test Report No:
EMC00050

FOR

Video King Gaming Systems, Inc.
100-1475 Chevrier Blvd.
Winnipeg, MB R3T 1Y7

Power Bingo King
RF REMOTE TRANSMITTER

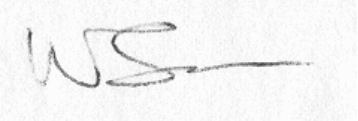
Model: 12RFREMO

FCC ID:
SKCTRANS-1

DATED:
FEBRUARY 6, 2006

IN ACCORDANCE WITH
FCC CFR 47 PART 15, SUBPART C

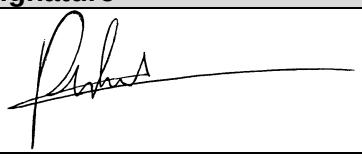
Test Lab Personnel:

Test Performed by:	Date	Signature
Paul Eberling, CNA Electronic Technologist	**February 6, 2006**	
Wayne Schellekens; Senior Engineer	**February 6, 2006**	

Document Template Revision History:

Date	Name	Revision	Description
01/31/2002	Elwood Friesen	1.0	Initial Release
04/15/2002	Paul Eberling	1.2	Reviewed

Approvals:

Date	Name	Title	Signature
February 6, 2006	Roman Wroczynski	Director; Development & Test	

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1. Arrista PCT Facility

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1.1. General

This document details the results of CFR 47, FCC part 15 tests performed by Arrista Technologies, Inc. The tests were performed from December 2005 through February 2006 on the Video King Gaming Systems, Inc. RF Remote Transmitter model number 12RFREMO

1.2. Test Facilities Description

1.2.1. Internal Facilities

Arrista Technologies Product Compliance & Test (PCT) laboratory facility has test equipment for Electromagnetic Compatibility (EMC) testing i.e. RF susceptibility and radiated emissions. The laboratory is located at 5-55 Henlow Bay, Winnipeg, Manitoba, Canada at Arrista Technologies main facility. The PCT Laboratory is registered with the FCC and has submitted the information required by Section 2.948 of the FCC Rules for measuring devices subject to Certification under Parts 15 & 18. Test equipment used to perform all measurements listed in Section 1.7 Subsection 1.7.2 and 1.7.4.

Article 01-Letter of Certification

FEDERAL COMMUNICATIONS COMMISSION

Laboratory Division
7435 Oakland Mills Road
Columbia, MD 21046

AUG - 1 2003

July 25, 2003

Registration Number: 97780

Arrista Technologies
5-55 Henlow Bay
Winnipeg, MB, R3Y 1G4
Canada
Attention: Elwood Friesen

Re: Measurement facility located at Winnipeg
Anechoic chamber (3 meters)
Date of Renewal: July 25, 2003

Dear Sir or Madam:

Your request for renewal of the registration of the subject measurement facility has been received. The information submitted has been placed in your file and the registration has been renewed. The name of your organization will remain on the list of facilities whose measurement data will be accepted in conjunction with applications for Certification under Parts 15 or 18 of the Commission's Rules. Please note that the file must be updated for any changes made to the facility and the registration must be renewed at least every three years.

Measurement facilities that have indicated that they are available to the public to perform measurement services on a fee basis may be found on the FCC website www.fcc.gov under E-Filing, OET Equipment Authorization Electronic Filing, Test Firms.

Sincerely,

Phyllis Parrish
Information Technician

1.2.2. Radiated Emissions Test Site

Radiated Emissions testing is performed in Arrista Technologies semi-anechoic 3m test chamber. The site consists of a 28' X 20' X 20' shielded chamber with absorptive materials on the walls and ceiling. The floor of the chamber is a raised conductive ground plane and includes a 2 m conductive top turntable. The measuring antenna is mounted on a non-conductive mast, which can be raised between 1 to 4 meters. Measurement equipment is located in the adjacent control room which is a 12' X 12' X 8' shielded structure.

Article 02-Test Equipment

Test Equipment				
Description	**Model**	**Serial Number**	**Last Cal Date**	**Cal Interval**
EMI Receiver	Dynamic Sciences DSI-2020	603	05/28/2005	Annual
Turntable and Mast Controller	EMCO 2090	9812-1384	N/A	N/A
Antenna Mast	EMCO 2075-2 Mini-Mast	9812-2208	N/A	N/A
Bilog EMC Antenna	Schaffner-Chase CBL6112A	2308	08/28/2005	Annual
Dbl-Ridged Horn Antenna	EMCO 3115	9711-5345	05/05/2005	Annual
22 GHz Spectrum Analyzer	HP 8593E	3249A00377	06/23/2005	Annual
3GHz Spectrum Analyzer	U3641	J003710	07/18/2005	Annual
Agilent Spectrum Analyzer	8594E	3619A02944	04/23/2005	Annual
Metal Top Turntable	EMCO 2081-2.03	N/A	N/A	N/A
Microwave Coaxial Cable	Sucoflex Blue	498	02/21/2004	Bi-Annual
6 dB Attenuator	Hewlett-Packard	6dB	N/A	N/A
LISN	FCC-LISN-50/250	9708	04/18/2005	Annual
LISN	Wayne Kerr IXLSN30B	000343	N/A	N/A

2. Description

2.1. Equipment Under Test Description

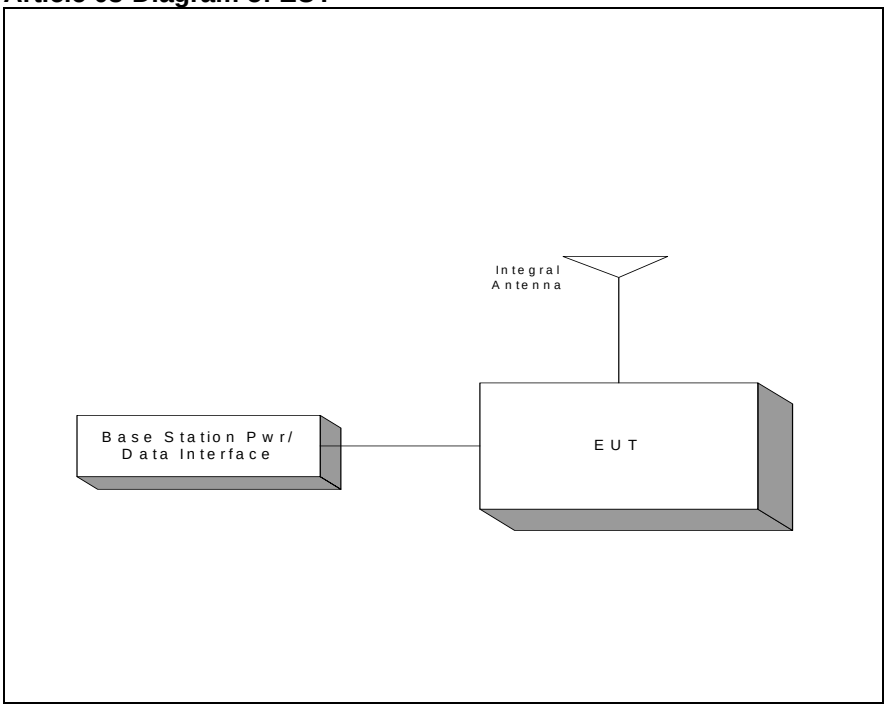
The RF Base Transmitter provides wireless communications in the 902-928 MHz band. The EUT is sold under the following trade names:

Power Bingo King RF Remote Transmitter

The system consists of a one-piece transmitter configured as per typical installation, the product is configured with a permanently mounted antenna. This version is the only version that is marketed to the public.

Note: A test unit was provided with a RF test port interface allowing Arrista Technologies PCT to perform RF conducted testing directly without the antenna. The EUT deign of both versions are identical.

Article 03-Diagram of EUT



2.2. Application and Exceptions

All tests were performed using ANSI C63.4-1992 as the measurement standard, and following guidelines as required in FCC CFR 47 Part 15.31 and DA 00-705, “Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems”, March 2000.

If measurements cannot be made at the antenna port, the alternative procedures as outlined in FCC Public Notice DA 00-705 must be followed. Seeing that a version of the EUT was provided with a RF test port, the alternative procedure outlined in FCC Public Notice DA 00-705 was not used.

The following change was instituted to allow the EUT meet requirements:
None

The EUT was operated under the following conditions:
120 Vac supply through a power adapter

This mode of operation was chosen by the client to simulate normal use of this device.

2.3. Deviations

The following deviations from, additions to, or exclusions from the test specifications have been made:

None.

2.4. Test Requirements and Results

Testing was performed using procedures or criteria contained in the regulatory documents and standards specified below. The 915 MHz RF transmitter has been found to conform to the following parts of 47 CFR as detailed below:

Article 04-Test Requirements & Results Summary

Test Reference	Comments	Results
ANSI C63.4-1992 Methods of measurement of radio-noise emissions	N/A	**PASS See Section 3**
FCC CFR 47 Part 15.15(b); General Technical Requirements	The product contains no user accessible controls that would increase transmission power above allowable limits	**PASS See Section 3**
FCC CFR 47 Part 2.925, 15.19; Labelling Requirements	The label is shown in the exhibit	**See Label Exhibit**
FCC CFR 47 Part 15.21; Information to User	Information to the user is shown in the RF Install Guide	**See User Manual Exhibit**
FCC CFR 47 Part 15.27; Special Accessories	No Special Accessories are required for compliance.	**PASS**
FCC CFR 47 Part 15.203; Antenna Power Conduction	Antenna is permanently fixed	**PASS See Section 3**
FCC CFR 47 Part 15.204; Ext. Antenna Modifications	None	**PASS See Section 3**
FCC CFR 47 Part 15.205, 15.209; Emission in Restricted Bands	The fundamental is not located in a Restricted Band and the spurious emissions in the Restricted Band comply with limits of 15.209	**PASS See Section 3**
FCC CFR 47 Part 15.109, 15.209; 15.247 (c) Radiated Emissions	Data is provided in Report	**PASS See Appendix A**
FCC CFR 47 Part 15.107, 15.207 Conducted Emissions	Data is provided in Report	**PASS See Appendix A**
FCC CFR 47 Part 15.247 (a) Intentional Radiators	Carrier Frequency Separation	**PASS See Appendix B**

Test Reference	Comments	Results
FCC CFR 47 Part 15.247 (a0	Number of Hopping Frequencies	**Pass See Appendix B**
FCC CFR 47 Part 15.247 (a)	Time of Occupancy (Dwell Time)	**Pass See Appnedix B**
FCC CFR 47 Part 15.247 (a)	Time of Occupancy (Dwell Time)	**Pass See Appnedix B**
FCC CFR 47 Part 15.247 (a)	20dB Bandwidth	**Pass See Appnedix B**
FCC CFR 47 Part 15.247 (a)	Pseudorandom Frequency Hopping Sequence	**Section 3.11.5 of this document**
FCC CFR 47 Part 15.247 (a)	Equal hopping Frequency Use	**Section 3.11.6 of this document**
FCC CFR 47 Part 15.247 (a)	System Receiver Input Bandwidth	**Section 3.11.7 of this document**
FCC CFR 47 Part 15.247 (a)	System Receiver Hopping Capability	**Section 3.11.8 of this document**
FCC CFR 47 Part 15.247(b); Operation in the Band 902-928 MHz	Peak Output Power is less than 1W. See Appendix B	**PASS See Appendix B**
FCC CFR 47 Part 15.247(4); Operation in the Band 902-928 MHz	EUT antenna gain is less than 6dBi	**PASS See Section 3.2 of this document**
FCC CFR 47 Part 15.247(4)(i),(ii),(iii); Operation in the Band 902-928 MHz	EUT does not operate in specified frequency bands	**PASS**
FCC CFR 47 Part 15.247(2); Operation in the Band 902-928 MHz	Meets RF Exposure Guidelines	**See RF Exposure Limits**

2.4.1. Correction Factors

The DSI-2020.exe and EMI_Receiver.vi software used to capture the data apply correction factors automatically. The following formula illustrates the application of correction factors to obtain a corrected measurement:

$Voltage_{dBuV/m}$ = Measured $Voltage_{dBuV}$ + Cable $Attenuation_{dB}$ + Additional $Attenuation_{dB}$ + Antenna $Factor_{dB/m}$

2.4.2. Conducted Emissions Test Site

Conducted emissions tests were performed in the shielded control room utilizing a Line Impedance Stabilization Network (LISN). The metal wall of the control room is used as the vertical conducting plane and the two LISN's are bonded to the ground plane. Measurements from the FCC-LISN-50/250 LISN are taken using the EMI receiver in the control room. The second LISN is used to power peripheral equipment and is not used for measurements.

3. Test Results

3.1. 15.203 Antenna Power Conduction

The marketed unit is produced with a permanently attached antenna and has no provision for user service, replacement or antenna modification. The requirements of 15.203 are fulfilled and there are no deviations or exceptions to the specification.

3.2. 15.204 External Antenna Modifications

The antenna utilized on the marketed version, is permanently attached and consists of the following specifications;

Manufacturer: Linx Technologies
Type: Monopole antenna
Gain: 2.7dBi maximum

3.3. 15.205; Emissions in Restricted Bands

Spurious emissions falling in the restricted bands of operation were measured at a distance of 3 meters. The EUT utilizes frequency-determining circuitry, which generates harmonics falling in the restricted bands. Emissions were checked using appropriate antennas or pyramidal horns and a spectrum analyzer. No significant emission was observed which fell into the restricted bands of operation.

Complies

See tables of Article 01, 02 and 03 (low to high channel) of EMC0050 Appendix A

3.4. 15.107, 15.207 Conducted Emissions Out of Power Lines

Equipment Under Test is configured as per Fig 9(c) Test Configuration – Tabletop Equipment in ANSI C63.4-1992. See Appendix C

Conducted Emission limits for FCC compliance are listed below.

Article 05-Conducted Test Limits

Frequency of emission (MHz)	Conducted limit (dBμV)	
	Quasi-peak	Average
0.15–0.5	66 to 56*	56 to 46*
0.5–5	56	46
5–30	60	50

*Decreases with the logarithm of the frequency.

Pre-scan measurements are taken using a peak detector sweep of each Line-to-Ground. Sample time is optimized for sweep speed. Final measurements are taken at emission frequencies discovered in the pre-scans. Average, Peak and quasi-peak readings are recorded.

Complies: See Article 04 and 05 of EMC00050 Appendix A for Plots.

3.4.1. Final Measurements: Conducted Emissions

Conducted emission peaks were located above a delta of 20 dB from the FCC limit line during the pre-scan of the EUT. The noise-floor of the measuring device, with correction factors applied is displayed in the pre-scan test results. Due to the low emissions of the EUT, final quasi-peak measurement results are shown for only those peaks, which the peak value is above the 20 dB delta from the FCC limit line.

The top 6 emissions within the 20dB limit have been recorded.

Article 06-Top Conducted Emissions within 20dB

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Arrista Technologies Product Compliance Lab
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Datalog file: TEST EUT - DATA1.DL
Measurement Units: dBµV

Num	Frequency	Bandwidth	Corr	Avg	Peak	QPeak	Limit	Delta	Date	Time
1	170.736 kHz	9 kHz	1.8	46.9	55.0	53.5	54.8	-7.9	08/05/04	15:22:10
	Notes: L2; Average Limit									
2	170.736 kHz	9 kHz	1.8	46.9	54.6	53.0	64.9	-11.6	08/05/04	15:26:55
	Notes: L2;Quasi-peak Limit									
3	176.975 kHz	9 kHz	1.8	44.5	54.0	49.8	54.6	-10.0	08/05/04	15:24:04
	Notes: L2; Average Limit									
4	176.975 kHz	9 kHz	1.8	46.0	54.5	52.4	64.5	-12.1	08/05/04	15:27:26
	Notes: L2;Quasi-peak Limit									
5	240.238 kHz	9 kHz	1.3	16.6	38.0	30.4	52.1	-35.5	08/05/04	15:24:46
	Notes: L2; Average Limit									
6	240.238 kHz	9 kHz	1.3	18.4	38.6	30.4	62.1	-31.6	08/05/04	15:27:49
	Notes: L2;Quasi-peak Limit									
7	1.008659 MHz	9 kHz	0.6	38.1	44.6	44.1	46.0	-7.7	08/05/04	15:25:17
	Notes: L2; Average Limit									
8	1.008659 MHz	9 kHz	0.6	37.3	44.6	44.3	56.0	-11.5	08/05/04	15:28:01
	Notes: L2;Quasi-peak Limit									
9	1.531087 MHz	9 kHz	0.6	32.6	41.7	40.8	46.0	-13.3	08/05/04	15:25:55
	Notes: L2; Average Limit									
10	1.531087 MHz	9 kHz	0.6	30.6	41.9	41.4	56.0	-14.4	08/05/04	15:28:28
	Notes: L2;Quasi-peak Limit									
11	3.187215 MHz	9 kHz	0.6	30.2	41.8	41.3	46.0	-15.6	08/05/04	15:26:22
	Notes: L2; Average Limit									
12	3.187215 MHz	9 kHz	0.6	29.9	41.8	41.3	56.0	-14.5	08/05/04	15:28:47
	Notes: L2;Quasi-peak Limit									

3.5. 15.109, 15.209 Radiated Emissions: 30MHz to 2GHz

Radiated Emission limits for FCC compliance are listed in the tables below. Frequency was investigated up to 10th harmonic (9.280 GHz).

Article 07-Limits of Radiated Emission Measurement (uV/m)

Frequency of emission (MHz)	Field strength (microvolts/meter)
30–88	100
88–216	150
216–960	200
Above 960	500

Article 08-Limits of Radiated Emission Measurement (dBuV/m)

Frequency (MHz)	Class B (at 3m) dBuV/m
30 – 88	40.0
88 – 216	43.5
216 - 960	46.0
Above 960	54.0

3.6. EUT Orientations

Pre-scans of the product are taken using peak detector sweeps in four EUT orientations and using both vertical and horizontal polarization of the measuring antenna. Azimuth angles are spaced by 90 degrees of turntable rotation, more specifically 0, 90, 180, 270 Degrees respectively. See Appendix A; Equipment Setup for Radiated Emissions. Sampling time is optimized for maximum speed.

Equipment Under Test is configured as per **Fig 9(c) Test Configuration – Tabletop Equipment Radiated Emissions** in **ANSI C63.4-1992**. See Appendix C

Complies: See Articles 06 to 13 of EMC00050 Appendix A for Plots for 30 to 2000MHz.

3.7. Final Measurements: Radiated Emissions; 30 MHz – 2GHz

Final Measurements are made by measuring emissions observed in the pre-scan results. At each frequency of measurement, the antenna height and polarity and EUT azimuth are varied to obtain the maximum emission. The measurements are recorded using the antenna polarization that produces the highest emissions. Peak, quasi-peak and average detector readings are recorded.

The top 6 emissions within the 20 dB limit have been recorded.

Article 09-Peak; Quasi-Peak Emission Measurement; Final Readings

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Arrista Technologies Product Compliance Lab
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Datalog file: TEST EUT - DATAV.DL
Measurement Units: dBµV/m

Num	Frequency	Bandwidth	Corr	Avg	Peak	QPeak	Limit	Delta	Date	Time
1	31.870255 MHz	120 kHz	23.3	15.9	27.3	21.8	40.0	-18.1	08/05/04	11:00:01
	Notes: Ant Vert @ 138cm; Azm @ 270 Degrees									
2	36.117746 MHz	120 kHz	20.8	14.3	26.3	20.9	40.0	-19.1	08/05/04	10:59:16
	Notes: Ant Vert @ 138cm; Azm @ 270 Degrees									
3	437.498348 MHz	120 kHz	24.3	33.8	36.8	35.3	46.0	-10.5	08/05/04	10:24:42
	Notes: Ant Horz @ 100cm; Azm 81 Degrees									
4	562.488380 MHz	120 kHz	26.1	44.1	45.9	44.7	46.0	-1.1	08/05/04	10:33:10
	Notes: Ant Horz @ 138cm; Azm @ 70 Degrees									
5	562.492046 MHz	120 kHz	26.3	40.1	42.8	41.2	46.0	-4.7	08/05/04	11:03:11
	Notes: Ant Vert @ 155cm; Azm @ 150 Degrees									
6	687.490050 MHz	120 kHz	26.6	41.9	44.4	42.6	46.0	-3.2	08/05/04	11:04:28
	Notes: Ant Vert @ 139cm; Azm @ 0 Degrees									
7	687.513971 MHz	120 kHz	26.8	38.8	42.1	40.2	46.0	-5.7	08/05/04	10:53:51
	Notes: Ant Horz @ 124cm; Azm @ 266 Degrees									
8	1.725757179 GHz	1 MHz	33.1	45.0	53.2	49.2	54.0	-4.7	08/09/04	14:57:31
	Notes: Ant Horz @ 100cm; Azm @ 0 Degrees									
9	1.774923940 GHz	1 MHz	33.1	44.4	52.9	48.6	54.0	-5.2	08/09/04	14:51:03
	Notes: Ant Vert @ 150cm; Azm @ 0 Degrees									
10	1.838356861 GHz	1 MHz	33.3	44.8	54.1	49.1	54.0	-4.7	08/09/04	14:57:10
	Notes: Ant Horz @ 100cm; Azm @ 0 Degrees									
11	1.944598459 GHz	1 MHz	34.2	45.8	55.0	50.2	54.0	-3.7	08/09/04	14:52:18
	Notes: Ant Vert @ 100cm; Azm @ 0 Degrees									

3.8. Radiated Emissions: 2.0GHz to 9.3GHz

Radiated Emission limits for FCC compliance are listed in the tables below. Frequency was investigated up to the 10th Harmonic (9.3 GHz) as per FCC rules and shown in the following plots.

3.9. EUT Orientations

Pre-scans of the product are taken using peak detector sweeps in four EUT orientations and using both vertical and horizontal polarization of the measuring antenna. Azimuth angles are spaced by 90 degrees of turntable rotation, more specifically 0, 90, 180, 270 Degrees respectively. See Appendix A; Equipment Setup for Radiated Emissions. Sampling time is optimized for maximum speed. Measurements were taken using low, mid and high frequency of operation. As stated previously, there were no emissions in the range of 2.0 – 9.3 GHz.

Equipment Under Test is configured as per **Fig 9(c) Test Configuration – Tabletop Equipment Radiated Emissions** in **ANSI C63.4-1992**. See Appendix C

Complies: See Article 14 to 19 of EMC00050 Appendix A for Plots for 30MHz to 9.3GHz.

3.10. Final Measurements: Radiated Emissions; 2GHz – 9.3 GHz

A final measurement of each frequency emission is extracted from the pre-scan results. At each frequency of measurement, the antenna height and polarity and EUT azimuth are varied to obtain the maximum emission. The measurements are recorded using the antenna polarization that produces the highest emission.

Article 10-Final Measurements

Antenna Horizontal						
Freq (MHz)	**SA Meas. (dBuV)**	**Ant Corr (dB)**	**Cable Corr (dB)**	**Final (dBuV)**	**Limit (dBuV)**	**Delta (dB)**
2090	18.33	27.40	2.17	47.90	54.00	-6.10
2541	18.17	28.30	2.50	48.97	54.00	-5.03
2953	17.30	30.00	2.67	49.97	54.00	-4.03
4280	15.50	32.20	3.34	51.04	54.00	-2.96
4990	15.00	33.20	3.67	51.87	54.00	-2.13

Antenna Vertical						
Freq (MHz)	**SA Meas. (dBuV)**	**Ant Corr (dB)**	**Cable Corr (dB)**	**Final (dBuV)**	**Limit (dBuV)**	**Delta (dB)**
2090	18.33	27.30	2.50	48.13	54.00	-5.87
2541	18.67	28.30	2.50	49.47	54.00	-4.53
2953	17.17	30.00	2.67	49.84	54.00	-4.16
4280	15.50	32.20	3.34	51.04	54.00	-2.96
4990	15.00	33.20	3.67	51.87	54.00	-2.13

3.11. 15.247 Operation in the Band 902-928 MHz; Test Procedures for Conducted Tests

Two versions of the EUT were provided, a version with a permanently attached antenna and the other, with an RF test port interface. The EUT design of both versions are identical.

The RF conducted test measurements were performed using the EUT with the RF test port. All radiated measurements and power line conducted measurements were performed using the EUT version with the permanently mounted antenna.

Note: The EUT with the permanently mounted antenna is the only version that is sold and/or marketed to the public.

3.11.1. 15.247(a) Carrier Frequency Separation

The EUT is a frequency hopping spread spectrum intentional radiator utilizing a minimum of 50 hopping channels. The 20dB separation has been met. See Plots in See Article 01 of EMC00050 Appendix B for Plot.

3.11.2. 15.247(a) Number of Hoping Frequencies

The EUT is a frequency hopping spread spectrum intentional radiator utilizing a minimum of 50 hopping channels. The 20dB separation has been met. See Article 02 to 07 of EMC00050 Appendix B for Plots.

3.11.3. 15.247(a) Time of Occupancy (Dwell Time)

The EUT time of occupancy was measured. See Article 08 to 09 of EMC00050 Appendix B for Plots

Complies: Measured dwell time is 84msec.

3.11.4. 15.247(a) 20dB Bandwidth

EUT was transmitting at its maximum data rate. Markers were set on each side of the carrier 20dB down from the peak level. Three separate carriers were measured, specifically low, mid and high channels. The measured 20dB bandwidth has been met. The bandwidths were recorded.

See Article 10 to 12 of EMC00050 Appendix B for Plots See Appendix B for plots.

Article 11-20dB Final Measurements

Meas. Channels	Center Frequency (MHz)	20dB Min. (MHz)	20 dB Max. (MHz)	20dB BW (kHz)
Low	902.7470	902.70275	902.79175	88.500
Mid	915.6495	915.60475	915.69425	89.500
High	928.4825	928.4380	928.5270	89.000

3.11.5. 15.247(a) Pseudorandom Frequency Hopping Sequence

The radio used has a total of 169 channels, 0 through 168. To create the set of 51 channels for hopping, channels 1, 4, 7, 10… through 151 were listed in order in an Excel spreadsheet. Excel's RAND function was then used to generate 51 random numbers from 0 to 50, with no repeats. This list was then used to reorder the channel numbers.

The list of hopping channels is shown in table this document section 3.11.8. Article 11

3.11.6. 15.247(a) Equal Hopping Frequency Use

The EUT passes through the channel list, as shown below, one channel after the other. A single transmission packet in our system consists of 3 phases, which is called Slot 0, Slot 1 and Slot 2. Each slot transmits a different class of message in our system.

Each slot is 104 milliseconds long, and the transmitter and receiver switch to the next channel at the end of each slot. This means that 3 different channels are used for each transmission packet, and a total of 17 packets are transmitted over the course of a single trip through the channel table's 51 channels. This also means that the end-to-end time to pass through the entire hopping sequence is 5.304 seconds.

3.11.7. 15.247(a) System Receiver Input Bandwidth

The exact same hardware is used in the receiver and transmitter, and the firmware is built from the same code base, but the receiver starts the "trafficReceiver" task instead of the "trafficSender" task once the firmware begins operating.

Part of the start-up task in the firmware is programming the Nordic nRF903 chip. Both transmitter and receiver use the same *nrf_program()* function in our code to program the chip, and the chip is always configured to use the 900MHz ISM band.

3.11.8. 15.247(a) System Receiver Hopping Capability

Slot 0 of each transmitted packet contains a SYNC mark that is used by the receiver to key to the proper point. Once the receiver is synced, Slots 1 and 2 of the packet occur at specified 120ms intervals. After Slot 2 is finished, the next packet is transmitted.

Thus, the receiver and transmitter operate in lock-step once they are successfully synced up.

Based on the first packet received, the receiver also knows the expected packet number it should see next, and calculates the expected packet number independently of the transmitter's calculation of the packet number to send.

If the receiver receives a different packet number than it expects, it will enter sync hunt mode again.

If the receiver fails to receive the expected slot for the given packet, it will assume it was lost, and shift to the next slot at the appropriate time. Failure to receive a slot or packet does not result in loss of sync, but reception of a packet that was not expected at that time will result in loss of sync.

While in SYNC_HUNT mode, the receiver will attempt to sync up 6 times on the current channel, and if it fails, it will jump to the next Slot 0 channel, skipping the current packet's Slot 1 and Slot 2 channels.

Article 12-Channel Hopping Table

Channel	Frequency	Channel	Frequency
94	916.6082	52	910.157
133	922.5986	148	924.9026
67	912.461	1	902.3234
49	909.6962	73	913.3826
4	902.7842	61	911.5394
121	920.7554	31	906.9314
55	910.6178	91	916.1474
124	921.2162	70	912.9218
112	919.373	16	904.6274
118	920.2946	85	915.2258
28	906.4706	40	908.3138
139	923.5202	10	903.7058
58	911.0786	64	912.0002
13	904.1666	145	924.4418
136	923.0594	100	917.5298
7	903.245	34	907.3922
37	907.853	103	917.9906
76	913.8434	46	909.2354
82	914.765	151	925.3634
115	919.8338	142	923.981
22	905.549	97	917.069
130	922.1378		
25	906.0098		
19	905.0882		
43	908.7746		
109	918.9122		
88	915.6866		
79	914.3042		
127	921.677		
106	918.4514		

3.11.9. 15.247(b) Peak Output Power

The measurement peak transmitter output level complies with the requirements of the referenced section above.

Complies: The measured peak power is +6.84dBm ERP @ 902.775MHz. The permanently antenna has a gain of 2.7dBi, which results in a calculated peak output power of +9.84dBm EIRP. See Article 13 of EMC00050 Appendix B for Plot.

3.11.10. 15.247(b)(5) RF Exposure Compliance

See separate MPE Exhibit (MPE0007).

3.11.11. 15.247(c) RF Spurious Emissions

To demonstrate compliance with the spurious RF conducted emission requirement of Section 15.247(c), use the following spectrum analyzer settings:

```
Span = wide enough to fully capture the emission being measured

RBW = 100 kHz
VBW ≥ RBW
Sweep = auto
Detector function = peak
Trace = max hold
```

Measure the field strength of both the fundamental emission and all spurious emissions with these settings. Follow the procedures in C63.4-1992 with respect to maximizing the emissions. The measured field strength of all spurious emissions must be below the measured field strength of the fundamental emission by the amount specified in Section 15.247(c). Note that if the emission falls in a Restricted Band, as defined in Section 15.205, the procedure for measuring spurious radiated emissions, listed above, must be followed.

Complies: See Article 14 to 19 of EMC00050 Appendix A for Plots for 30MHz to 9.3GHz.

3.11.12. 15.247(a) Pseudorandom Frequency Hopping Sequence

The radio used has a total of 169 channels, 0 through 168. To create the set of 51 channels for hopping, channels 1, 4, 7, 10… through 151 were listed in order in an Excel spreadsheet. Excel's RAND function was then used to generate 51 random numbers from 0 to 50, with no repeats. This list was then used to reorder the channel numbers.

See Article 12 of Section 3.11.8 of the this document.

4. Setup Photos

See EMC00050 Appendix A for test set-up photos.