1601 North A.W. Grimes Blvd., Suite B
Round Rock, TX 78665
e-mail: info@ptitest.com
(512) 244-3371 Fax: (512) 244-1846

February 9, 2015

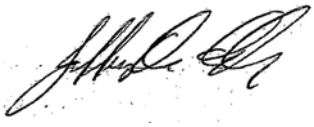
John Weber
Long Range Systems, LLC
4550 Excel Parkway Suite 200
Addison TX 75001

Dear John:

Thank you for allowing Professional Testing (EMI), Inc. an opportunity to perform testing for Long Range Systems, LLC. Enclosed is the Wireless Certification Report for the RX-CS7 Pager. This report can be used to demonstrate compliance with wireless regulatory requirements for wireless devices in North America.

If you have any questions, please contact me.

Sincerely,



Jeffrey A. Lenk
President

Attachment

Project 16179-15

RX-CS7, RX-CS6, RX-AT9
Wireless Pager

Wireless Certification Report

Prepared for:

Long Range Systems, LLC
4550 Excel Parkway Suite 200
Addison TX 75001

By

Professional Testing (EMI), Inc.
1601 North A.W. Grimes Blvd., Suite B
Round Rock, Texas 78665

February 9, 2015

Reviewed by	Written by
	
Larry Finn	Eric Lifsey
Chief Technology Officer	Test Engineer

Revision History

Revision Number	Description	Date
01	Initial draft.	2014-10-07
02	Revised per client comments; added new data.	2015-02-09
03	Revised per client comments.	2015-02-09

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NOTICE: (1) This Report must not be used to claim product endorsement, by NVLAP, NIST, the FCC or any other Agency. This report also does not warrant certification by NVLAP or NIST. (2) This report shall not be reproduced except in full, without the written approval of Professional Testing (EMI), Inc. (3) The significance of this report is dependent on the representative character of the test sample submitted for evaluation and the results apply only in reference to the sample tested. The manufacturer must continuously implement the changes shown herein to attain and maintain the required degree of compliance.

Certificate of Compliance

Applicant	Device & Test Identification	
Long Range Systems LLC (John Weber) 4550 Excel Parkway Suite 200 Addison TX 75001 Certificate Date: February 9, 2015	FCC ID: Industry Canada ID: Model(s): Laboratory Project ID:	2AB6ORXCS7 5501A-RXCS7 RX-CS7, RX-CS6, RX-AT9 16179-15

The device model(s) listed above were tested utilizing the following documents and found to be in compliance with the required criteria.

47 CFR (USA) | Industry Canada RSS-210 & RSS-Gen	
Section Reference FCC | IC	**Parameter**
15.231(a) | RSS-210 Is. 8 A1.1, Table A	Fundamental Field Strength
15.231(a) | RSS-210 Is. 8 A1.1, Table A	Harmonic & Spurious Emissions
15.231(a)(1) | RSS-210 Is. 8 A1.1.1	Maximum Transmit Time
15.231(c) | RSS-210 Is. 8 A1.1.3	Bandwidth
15.203 | RSS-Gen Issue 4	Antenna Requirements
15.207 | RSS-210 Issue 8	Mains Conducted Emissions

I, Eric Lifsey, for Professional Testing (EMI), Inc., being familiar with the above rules and test procedures have reviewed the test setup, measured data, and this report. I believe them to be true and accurate.

Eric Lifsey
EMC Engineer

This report has been reviewed and accepted by the Applicant. The undersigned is responsible for ensuring that this device will continue to comply with the rules listed above.

_____
Representative of Applicant

1.0 Introduction

1.1 Scope

This report describes the extent to which the equipment under test (EUT) conformed to the intentional radiator requirements of North America.

Professional Testing (EMI), Inc., (PTI) follows the guidelines of National Institute of Standards and Technology (NIST) for all uncertainty calculations, estimates, and expressions thereof for electromagnetic compatibility testing. The procedures of ANSI C63.4: 2009 were used for making all radiated enclosure and mains emission measurements.

1.2 EUT Description

This device is a wireless pager for restaurant use in paging patrons for service.

Table 1.2.1: Equipment Under Test

Manufacturer	Model	Serial #	Description
Long Range Systems LLC	RX-CS7	123970, 123972	Wireless pager
Tested in the maximum configuration of the model RX-CS7 and covering sub-models: RX-CS6, RX-AT9.			

The device is composed of an approximately square circuit board in a rigid plastic case approximately 10 x 10 cm in size and 1.5 cm in height. It is designed such that it presents as a drink coaster.

In operation the device is alerted by a signal from a base unit. It then flashes a set of LED indicators and vibrates to get the patrons attention. Other sub-models, composed of the same RF and logic circuitry, have different LEDs populated in number and color.

EUT Appearance – Top Cover Removed

1.3 EUT Operation

The EUT was exercised in a manner consistent with normal operations.

1.4 Modifications to Equipment

The EUT circuit board was revised from Rev 4 to Rev 5 to incorporate changes to non-RF circuits and to replace the 30 MHz crystal with one of a slightly smaller package size and greater frequency accuracy.

The entire list of Rev 4 to Rev 5 changes are:

- Solder mask color changed from Green to White
- Break-away mechanical tabs were added to the PCB inside the battery cavity to contain a smaller battery (for CS6)
- Added D8, D9 TVS diodes between charge pin nodes for additional ESD immunity
- R4 went from 1K to 100 to improve charge pin communication
- R30 went from 5.6 to 4.7 to increase battery charging current
- R10, R7, R9, R12, C2 were all removed from LED communication RX circuit; moved from comparator to direct UART implementation
- Changed RF crystal from 2-pin/30ppm to 4-pin/10ppm in a smaller package
- Added 2 interconnecting traces between IO on the RF transceiver and the MCU

Since tests were originally conducted, the model numbering format was refined using the RX- prefix. So the data sheets with references to models AT-9, CS-6, and CS-7 remain valid.

1.5 Test Site

Measurements were made at the PTI semi-anechoic facility designated Site 45 (FCC 459644, IC 3036B-1) in Austin, Texas. The site is registered with the FCC under Section 2.948 and Industry Canada per RSS-GEN, and is subsequently confirmed by laboratory accreditation (NVLAP). The test site is located at 11400 Burnet Road, Austin, Texas 78758, while the main office is located at 1601 North A.W. Grimes Boulevard, Suite B, Round Rock, Texas, 78665.

1.6 Radiated Measurements

Radiated levels are determined as follows:

Raw Measured Level + Antenna Factor + Cable Losses – Amplifier Gain = Corrected Level

2.0 Applicable Documents and Clauses

Table 2.0.1: Applicable Documents	
Document	**Title/Description**
47 CFR (USA)	Part 15 – Section 15.231
ANSI C63.4 2009	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low Voltage Electrical and Electronic Equipment
RSS-Gen Issue 4	General Requirements and Information for the Certification of Radio Apparatus
RSS-210 Issue 8	Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipment

Table 2.0.2: Applicable Clauses	
47 CFR (USA) | Industry Canada RSS-210 & RSS-Gen	
Section Reference FCC | IC	**Parameter**
15.231(a) | RSS-210 A1.1, Table A	Fundamental Field Strength
15.231(a) | RSS-210 A1.1, Table A	Harmonic & Spurious Emissions
15.231(a)(1) | RSS-210 A1.1.1	Maximum Transmit Time
15.231(c) | RSS-210 A1.1.3	Bandwidth
15.203 | RSS-Gen	Antenna Requirements
15.207 | RSS-210 Issue 8	Mains Conducted Emissions

Table 2.0.3: Supplemental Statements		
Section Number FCC / **Section Number IC**	**Clause Subject**	**Statement**
FCC 15.231(a)(3)	Periodic Transmissions	The EUT receives a periodic transmission from a base station (a licensed device) but the EUT does not reply; if the signal is lost then the EUT goes into an alarm condition. Consequently, there is no transmission by the EUT that is subject to the 2 seconds per hour periodic transmission requirement.
RSS-210 A1.1.1(c)		

3.0 Fundamental Field Strength

3.1 Test Procedure

EUT is placed on a non-conductive surface 80 cm above a reference plane and measurements of emissions are made to find maximum emission level.

3.2 Test Criteria

Section Reference FCC | IC	Parameter	Date(s)
15.231(a) | RSS210 A1.1	Radiated Output Power, 12,406.25 µV/m @ 3 m Restated as 81.87 dBµV/m @ 3 m Or extrapolated as 71.41 dBµV/m @ 10 m	2014-08-05

3.3 Test Results

Table 3.3.1: Field Strength at 10 Meters

Frequency MHz	Antenna Polarity	Corrected Level (Measured Peak Level) dBµV/m	Detector Mode
467.75	V	55.9	Peak
467.75	H	69.5	Peak

Resolution bandwidth 120 kHz. Video bandwidth 120 kHz. Detector mode is peak.

Duty cycle is assumed to be 100% as the transmit on-time exceeds 100 ms.

Table 3.3.2: Corrected Field Strength

Limit At **10** meters dBµV/m	Corrected Level (Measured Peak Level) dBµV/m	Duty Cycle Factor dB	Corrected Level dBµV/m	Margin dB
71.41	69.5	0	69.5	-1.9

The EUT was found to be in compliance with the applicable criteria.

4.0 Transmitter Duty Cycle and Shutoff Time

4.1 Test Procedure

EUT is placed into normal transmit operation to observe and record transmitter time domain performance.

4.2 Test Criteria

Measurement is based on intervals not to exceed 100 msec. Maximum transmitter on time is divided by the lesser of 100 msec or the actual measured minimum transmitter interval time. The result is converted to dB and applied as needed to peak measurements of transmitter artifacts to determine average power. This is not a pass/fail measurement.

Section Reference FCC | IC	Parameter	Date(s)
15.231(a)(1) | RSS210 A1.1.1	Maximum Transmit Time	2014-08-06

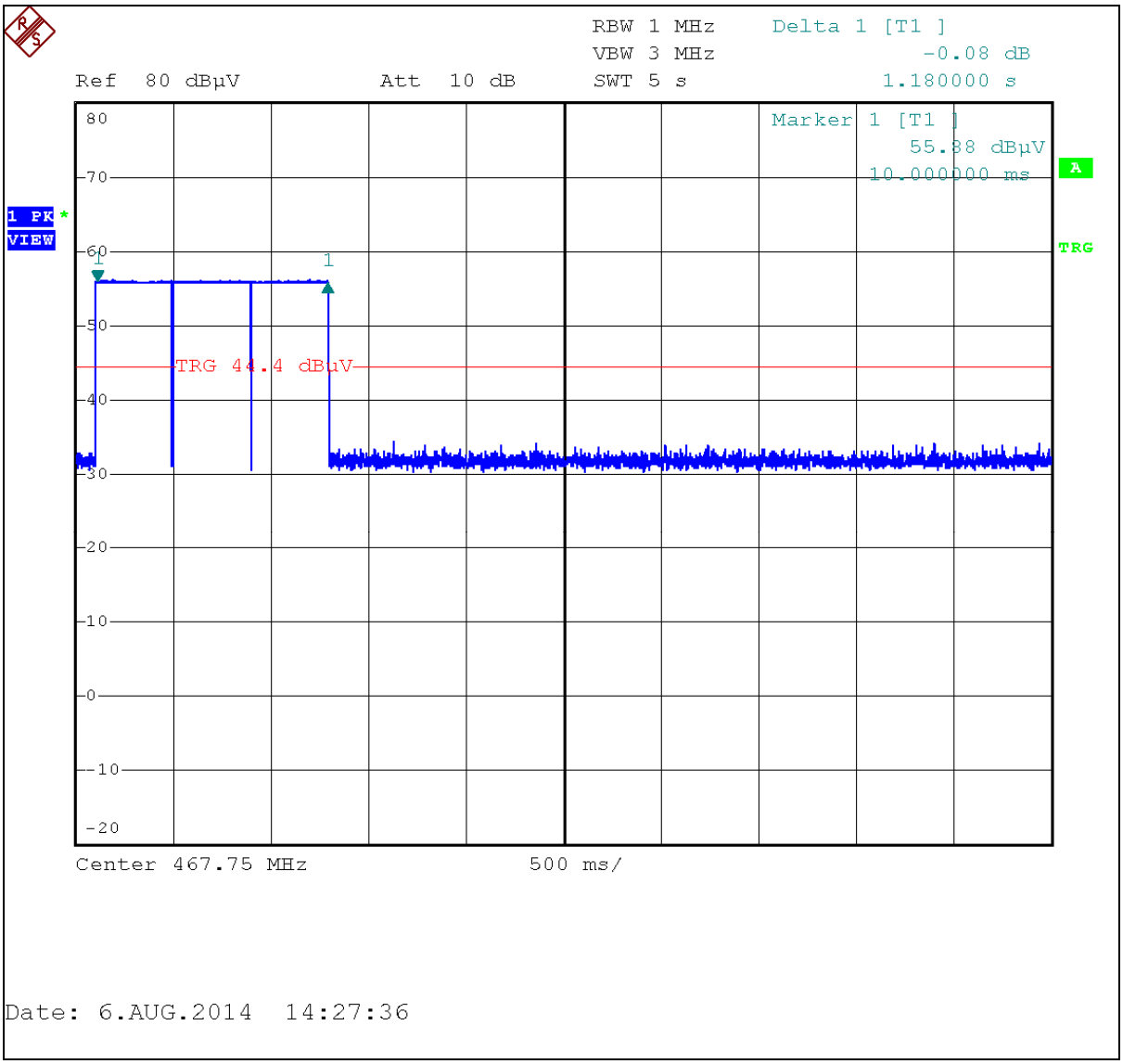
4.3 Test Results

Table 4.3.1: Duty Cycle
The transmit on-time exceeds 100 ms, therefore no measurement of duty cycle applies. When average measurements or limits are indicated then only the peak measurement will apply.

Table 4.3.2: Maximum Transmit Shutoff Time, Limit and Measured	
Limit Transmit Time	**Maximum Measured Transmit Time**
5 seconds	1.18 seconds

See plotted results of transmit time below.

4.3.1 Shut Off Timing Measurement



The measurement above represents three un-acknowledged packets of data as worse-case longest transmit mode.

5.0 Occupied Bandwidth

5.1 Test Procedure

The EUT is configured for best signal/power and the bandwidth then is measured. A recording of the results is included.

5.2 Test Criteria

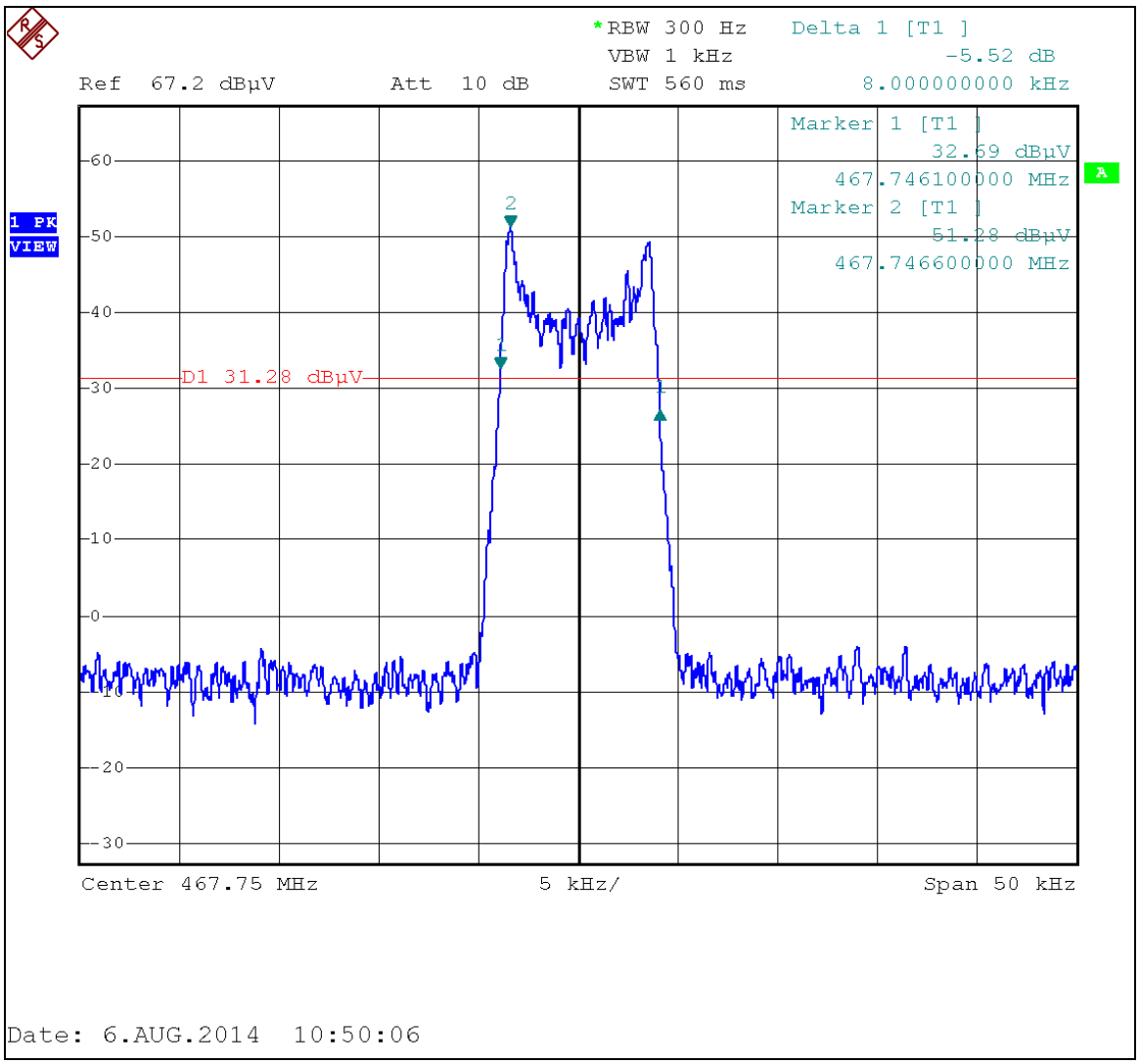
Section Reference FCC|IC	Parameter	Date(s)
15.231(c), 2.1049 | RSS210 A1.1.3	Bandwidth, 20 dB	2014-08-06

5.3 Test Results

Table 5.3.1: Bandwidth Limit and Measurement	
Limit 15.231(c) 20 dB BW For Fundamental = 467.75 MHz 0.25% of Fundamental kHz	**Measured BW 20 dB kHz**
1169.375	8.0

EUT was found to be in compliance with applicable requirements.

5.3.1 Bandwidth Plot

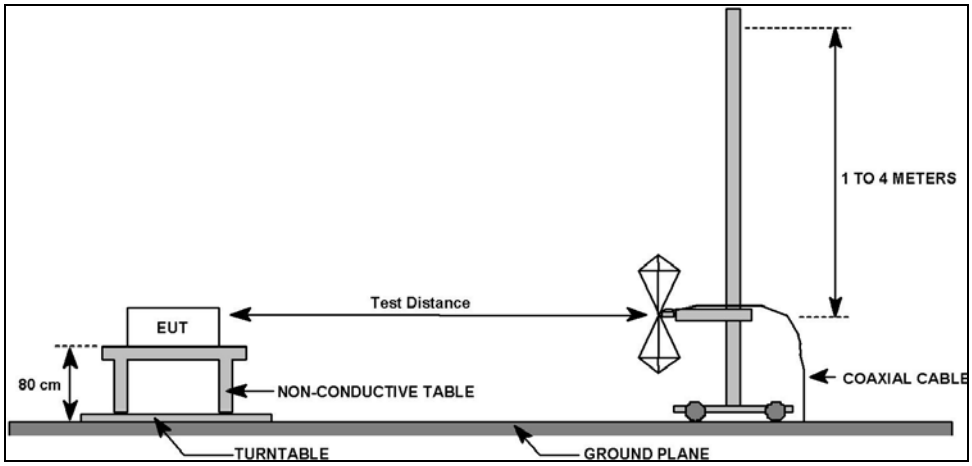


6.0 Radiated Spurious Emissions Below 1 GHz

6.1 Test Procedure

The EUT was placed on a non-conductive table 0.8 meters above the ground plane. The table was centered on a rotating turntable at a distance of 10 meters from the measurement antenna.

Spurious emissions below 1 GHz were measured with quasi-peak detection with a resolution bandwidth of 120 kHz. A diagram showing the test setup is given in the figure below.



Field Strength of Spurious Emissions Test Setup

6.2 Test Criteria

Section Number FCC | IC	Clause Subject	Date
15.231(a), 15.209 | RSS-210 A1.1 Table A	Field Strength of Radiated Spurious/Harmonic Emissions	2014-08-04 2014-08-06

6.3 Test Results

Additional receive/unintentional mode emission data was measured to verify compliance of the Rev 5 edition of the circuit board. The additional measurements were done while on battery power (charger powered down) and while charging. All differences observed remained more than 10 dB below the limit.

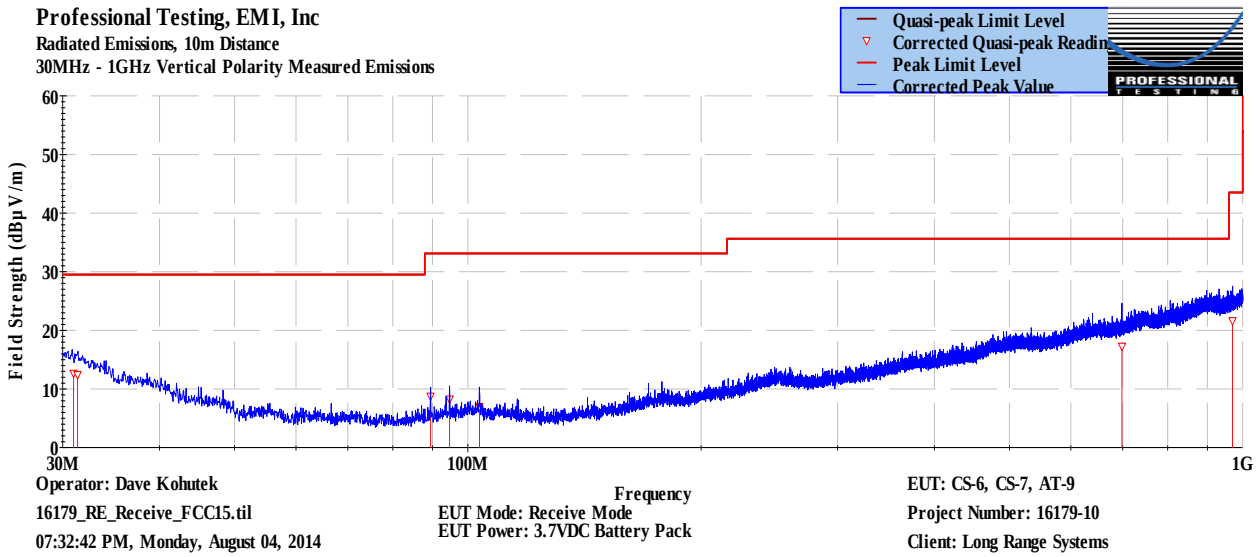
The EUT satisfied the criteria. Recorded data is presented below.

6.4 Test Results – Receive Mode

Professional Testing, EMI, Inc.			
Test Method:	ANSI C63.4–2003: "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz" (incorporated by reference, see §15.38).		
In accordance with:	FCC Part 15.109 - Code of Federal Regulations Part 47, Subpart B - Unintentional Radiators, Radiated Emissions Limits		
Section:	15.109		
Test Date(s):	8/4/2014	EUT Serial #:	None
Customer:	Long Range Systems	EUT Part #:	None
Project Number:	16179-10	Test Technician:	Dave Kohutek
Purchase Order #:	PO12465	Supervisor:	Rob McCollough
Equip. Under Test:	CS-6, CS-7, AT-9	Witness' Name:	Jason Gossiaux

Radiated Emissions Test Results Data Sheet			Page: 1 of 1
EUT Line Voltage:	3.7 VDC	EUT Power Frequency:	N/A Hz
Antenna Orientation:	Vertical	Frequency Range:	30MHz to 1GHz
EUT Mode of Operation:		Receive Mode	

Frequency Measured (MHz)	Test Distance (Meters)	EUT Direction (Degrees)	Antenna Height (Meters)	Detector Function	Recorded Amplitude (dBµV)	Corrected Level (dBµV/m)	Limit Level (dBµV/m)	Margin (dB)	Test Results
30.9845	10	289	3.33	Quasi-peak	24.2	12.644	29.5	-16.9	Pass
31.3592	10	289	1.82	Quasi-peak	24.2	12.422	29.5	-17.1	Pass
89.4847	10	68	2.48	Quasi-peak	29.8	8.745	33.1	-24.4	Pass
94.7407	10	125	1.66	Quasi-peak	28.8	8.243	33.1	-24.9	Pass
103.496	10	318	2.24	Quasi-peak	27	6.934	33.1	-26.2	Pass
698.459	10	329	2.61	Quasi-peak	21.8	17.249	35.6	-18.4	Pass
970.085	10	7	3.63	Quasi-peak	21.1	21.649	43.5	-21.9	Pass



≤ 1GHz Vertical Antenna Polarity Measured Emissions

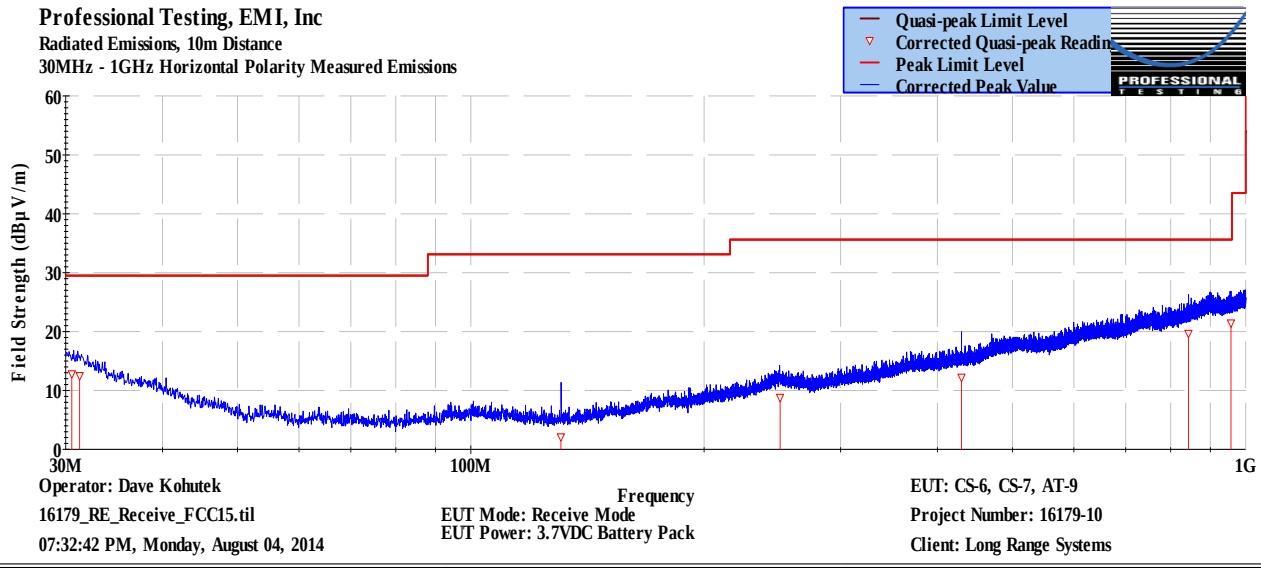
Professional Testing, EMI, Inc.

Test Method:	ANSI C63.4–2003: "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz" (incorporated by reference, see §15.38).		
In accordance with:	FCC Part 15.109 - Code of Federal Regulations Part 47, Subpart B - Unintentional Radiators, Radiated Emissions Limits		
Section:	15.109		
Test Date(s):	8/4/2014	**EUT Serial #:**	None
Customer:	Long Range Systems	**EUT Part #:**	None
Project Number:	16179-10	**Test Technician:**	Dave Kohutek
Purchase Order #:	PO12465	**Supervisor:**	Rob McCollough
Equip. Under Test:	CS-6, CS-7, AT-9	**Witness' Name:**	Jason Gossiaux

Radiated Emissions Test Results Data Sheet — **Page: 1 of 1**

EUT Line Voltage:	3.7 VDC	**EUT Power Frequency:**	N/A Hz
Antenna Orientation:	Horizontal	**Frequency Range:**	30MHz to 1GHz
EUT Mode of Operation:		Receive Mode	

Frequency Measured (MHz)	Test Distance (Meters)	EUT Direction (Degrees)	Antenna Height (Meters)	Detector Function	Recorded Amplitude (dBµV)	Corrected Level (dBµV/m)	Limit Level (dBµV/m)	Margin (dB)	Test Results
30.5498	10	228	1.34	Quasi-peak	24.1	12.792	29.5	-16.7	Pass
31.2761	10	241	3.51	Quasi-peak	24.2	12.489	29.5	-17.0	Pass
130.646	10	27	3.33	Quasi-peak	23.1	2.097	33.1	-31.0	Pass
250.625	10	129	2.09	Quasi-peak	22.2	8.788	35.6	-26.8	Pass
429.704	10	193	3.05	Quasi-peak	22.3	12.221	35.6	-23.4	Pass
843.485	10	182	1.31	Quasi-peak	21.4	19.678	35.6	-15.9	Pass
956.88	10	204	2.16	Quasi-peak	21.1	21.429	35.6	-14.2	Pass



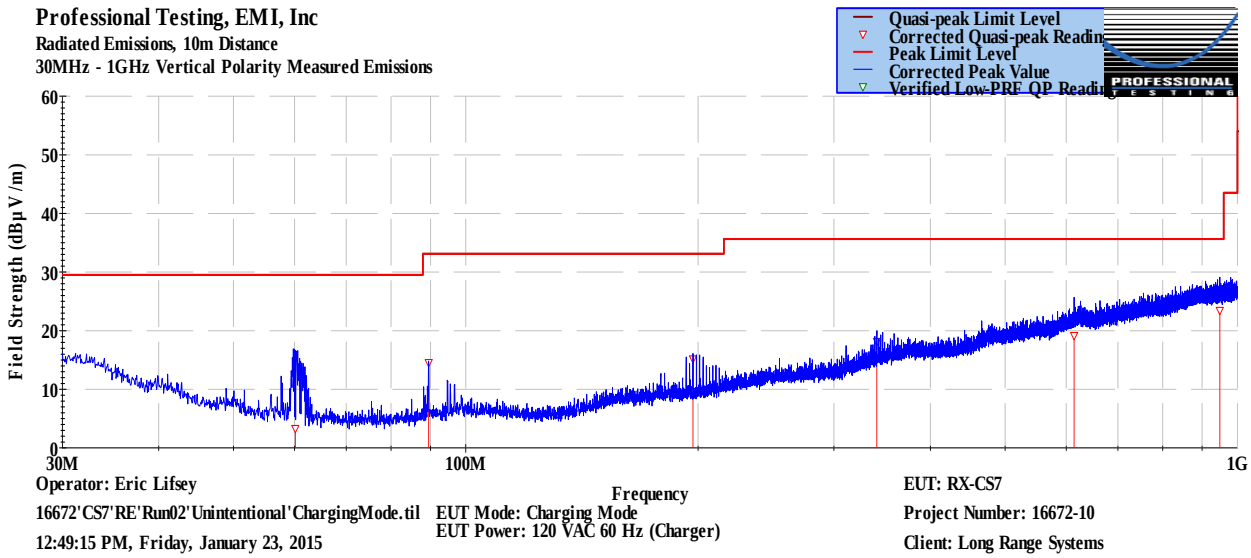
≤ 1GHz Horizontal Antenna Polarity Measured Emissions

6.5 Test Results – Receive Mode – Rev 5, Charging Mode

Professional Testing, EMI, Inc.			
Test Method:	ANSI C63.4–2003: "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz" (incorporated by reference, see §15.38).		
In accordance with:	FCC Part 15.109 - Code of Federal Regulations Part 47, Subpart B - Unintentional Radiators, Radiated Emissions Limits		
Section:	15.109		
Test Date(s):	1/23/2015	EUT Serial #:	R1_16 MBB1
Customer:	Long Range Systems	EUT Part #:	NA
Project Number:	16672-10	Test Technician:	Eric Lifsey
Purchase Order #:	NA	Supervisor:	Lisa Arndt
Equip. Under Test:	RX-CS7	Witness' Name:	NA

Radiated Emissions Test Results Data Sheet			Page: 1 of 1
EUT Line Voltage:	120 VAC	EUT Power Frequency:	60 Hz
Antenna Orientation:	Vertical	Frequency Range:	30MHz to 1GHz
EUT Mode of Operation:		Charging Mode	

Frequency Measured (MHz)	Test Distance (Meters)	EUT Direction (Degrees)	Antenna Height (Meters)	Detector Function	Recorded Amplitude (dBµV)	Corrected Level (dBµV/m)	Limit Level (dBµV/m)	Margin (dB)	Test Results
60.1332	10	6	3.63	Quasi-peak	24.1	3.281	29.5	-26.2	Pass
89.5003	10	203	1.54	Quasi-peak	34.7	14.538	33.1	-18.6	Pass
196.973	10	319	1.46	Quasi-peak	31.1	15.148	33.1	-18.0	Pass
340.965	10	95	1.57	Quasi-peak	27.8	18.127	35.6	-17.5	Pass
614.306	10	237	3.81	Quasi-peak	22.1	19.137	35.6	-16.5	Pass
948.839	10	308	3.78	Quasi-peak	21	23.433	35.6	-12.2	Pass



≤ 1GHz Vertical Antenna Polarity Measured Emissions

Note – the 60 MHz noise is sourced by the chambers video monitor which was left turned on after being used to remotely check that the EUT was not transmitting.

Professional Testing, EMI, Inc.

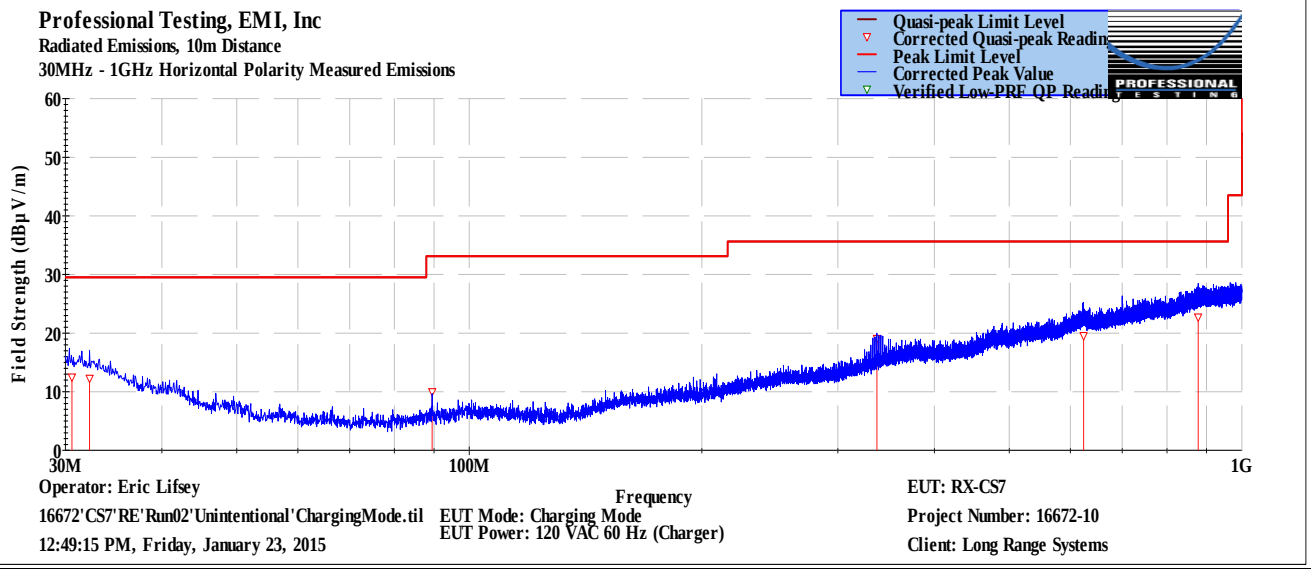
Test Method:	ANSI C63.4–2003: "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz" (incorporated by reference, see §15.38).
In accordance with:	FCC Part 15.109 - Code of Federal Regulations Part 47, Subpart B - Unintentional Radiators, Radiated Emissions Limits
Section:	15.109

Test Date(s):	1/23/2015	**EUT Serial #:**	R1_16 MBB1
Customer:	Long Range Systems	**EUT Part #:**	NA
Project Number:	16672-10	**Test Technician:**	Eric Lifsey
Purchase Order #:	NA	**Supervisor:**	Lisa Arndt
Equip. Under Test:	RX-CS7	**Witness' Name:**	NA

Radiated Emissions Test Results Data Sheet — **Page: 1 of 1**

EUT Line Voltage:	120 VAC	**EUT Power Frequency:**	60 Hz
Antenna Orientation:	Horizontal	**Frequency Range:**	30MHz to 1GHz
EUT Mode of Operation:		Charging Mode	

Frequency Measured (MHz)	Test Distance (Meters)	EUT Direction (Degrees)	Antenna Height (Meters)	Detector Function	Recorded Amplitude (dBµV)	Corrected Level (dBµV/m)	Limit Level (dBµV/m)	Margin (dB)	Test Results
30.5904	10	225	1.27	Quasi-peak	23.4	12.477	29.5	-17.0	Pass
32.2456	10	107	2.37	Quasi-peak	24.1	12.278	29.5	-17.2	Pass
89.5194	10	282	3.93	Quasi-peak	30.2	9.992	33.1	-23.1	Pass
336.98	10	129	3.24	Quasi-peak	28.9	19.049	35.6	-16.6	Pass
623.932	10	297	2.33	Quasi-peak	22.1	19.539	35.6	-16.1	Pass
878.115	10	319	1.07	Quasi-peak	21.1	22.708	35.6	-12.9	Pass



≤ 1GHz Horizontal Antenna Polarity Measured Emissions

6.6 Test Results – Receive Mode – Rev 5, Receiving

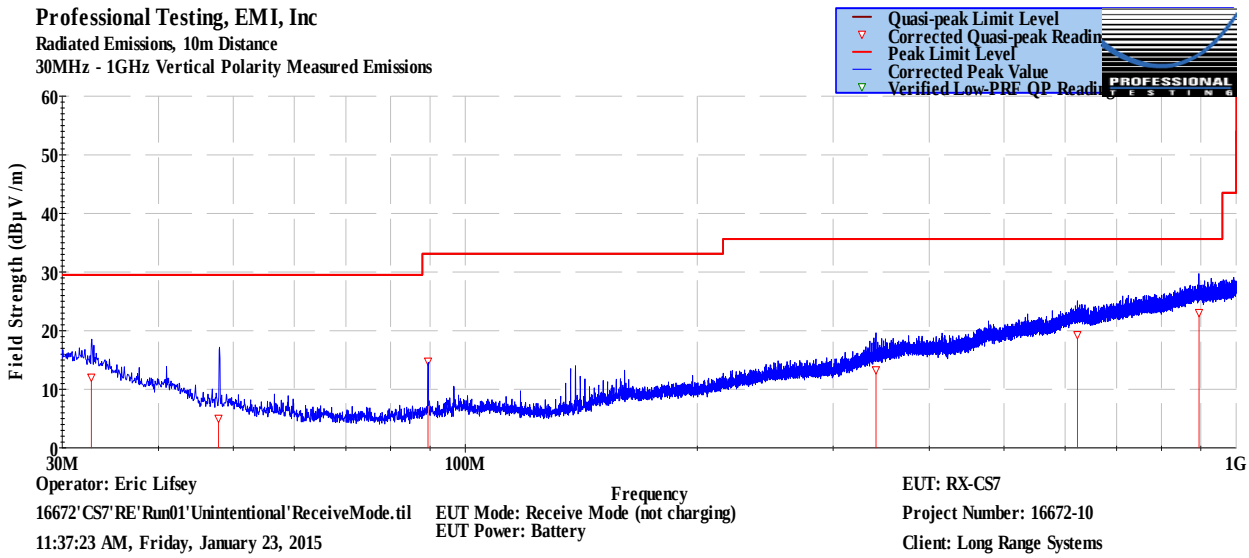
Professional Testing, EMI, Inc.

Test Method:	ANSI C63.4–2003: "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz" (incorporated by reference, see §15.38).		
In accordance with:	FCC Part 15.109 - Code of Federal Regulations Part 47, Subpart B - Unintentional Radiators, Radiated Emissions Limits		
Section:	15.109		
Test Date(s):	1/23/2015	**EUT Serial #:**	R1_16 MBB1
Customer:	Long Range Systems	**EUT Part #:**	NA
Project Number:	16672-10	**Test Technician:**	Eric Lifsey
Purchase Order #:	NA	**Supervisor:**	Lisa Arndt
Equip. Under Test:	RX-CS7	**Witness' Name:**	NA

Radiated Emissions Test Results Data Sheet — Page: 1 of 1

EUT Line Voltage:	120 VAC	**EUT Power Frequency:**	60 Hz
Antenna Orientation:	Vertical	**Frequency Range:**	30MHz to 1GHz
EUT Mode of Operation:		Receive Mode	

Frequency Measured (MHz)	Test Distance (Meters)	EUT Direction (Degrees)	Antenna Height (Meters)	Detector Function	Recorded Amplitude (dBµV)	Corrected Level (dBµV/m)	Limit Level (dBµV/m)	Margin (dB)	Test Results
32.7242	10	177	4.09	Quasi-peak	24.1	12.052	29.5	-17.4	Pass
47.8487	10	269	1.23	Quasi-peak	23.7	5.038	29.5	-24.5	Pass
89.4965	10	39	2.38	Quasi-peak	34.9	14.764	33.1	-18.3	Pass
341.001	10	317	2.21	Quasi-peak	23	13.313	35.6	-22.3	Pass
622.483	10	50	1.65	Quasi-peak	22	19.314	35.6	-16.3	Pass
895.027	10	17	3.02	Quasi-peak	21.2	23.078	35.6	-12.5	Pass



≤ 1GHz Vertical Antenna Polarity Measured Emissions

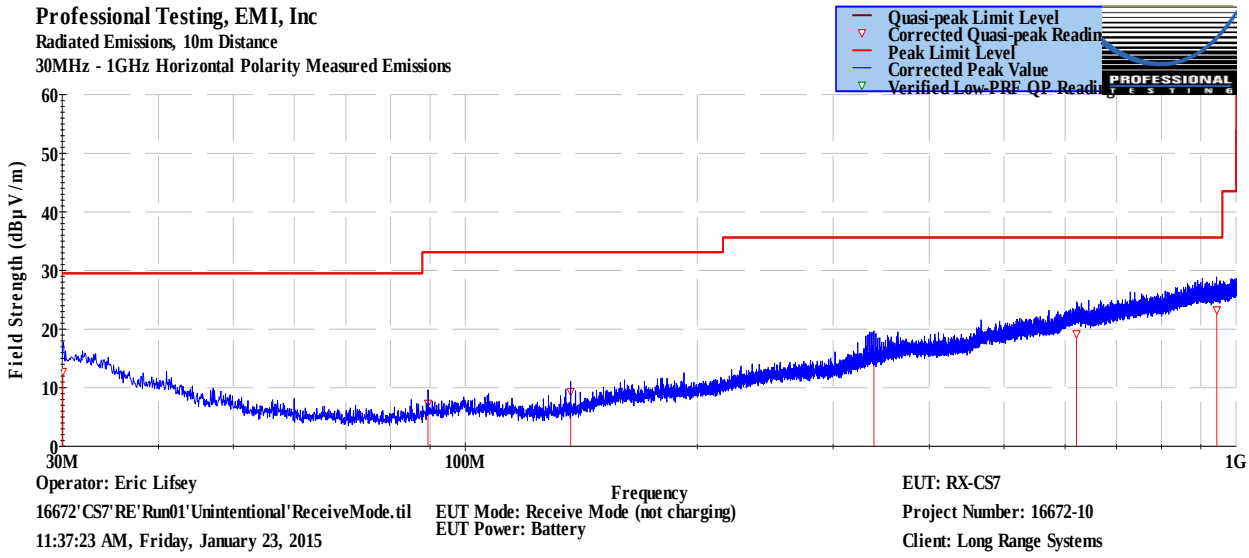
Professional Testing, EMI, Inc.

Test Method:	ANSI C63.4–2003: "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz" (incorporated by reference, see §15.38).		
In accordance with:	FCC Part 15.109 - Code of Federal Regulations Part 47, Subpart B - Unintentional Radiators, Radiated Emissions Limits		
Section:	15.109		
Test Date(s):	1/23/2015	**EUT Serial #:**	R1_16 MBB1
Customer:	Long Range Systems	**EUT Part #:**	NA
Project Number:	16672-10	**Test Technician:**	Eric Lifsey
Purchase Order #:	NA	**Supervisor:**	Lisa Arndt
Equip. Under Test:	RX-CS7	**Witness' Name:**	NA

Radiated Emissions Test Results Data Sheet — **Page: 1 of 1**

EUT Line Voltage:	120 VAC	**EUT Power Frequency:**	60 Hz
Antenna Orientation:	Horizontal	**Frequency Range:**	30MHz to 1GHz
EUT Mode of Operation:		Receive Mode	

Frequency Measured (MHz)	Test Distance (Meters)	EUT Direction (Degrees)	Antenna Height (Meters)	Detector Function	Recorded Amplitude (dBµV)	Corrected Level (dBµV/m)	Limit Level (dBµV/m)	Margin (dB)	Test Results
30.0577	10	8	1.73	Quasi-peak	23.4	12.753	29.5	-16.7	Pass
89.484	10	351	3.82	Quasi-peak	27.5	7.323	33.1	-25.8	Pass
137.011	10	84	2.51	Quasi-peak	28.8	9.337	33.1	-23.8	Pass
338.997	10	136	2.08	Quasi-peak	24.3	14.569	35.6	-21.0	Pass
620.893	10	143	1.26	Quasi-peak	21.9	19.157	35.6	-16.4	Pass
944.107	10	57	3.89	Quasi-peak	21	23.274	35.6	-12.3	Pass



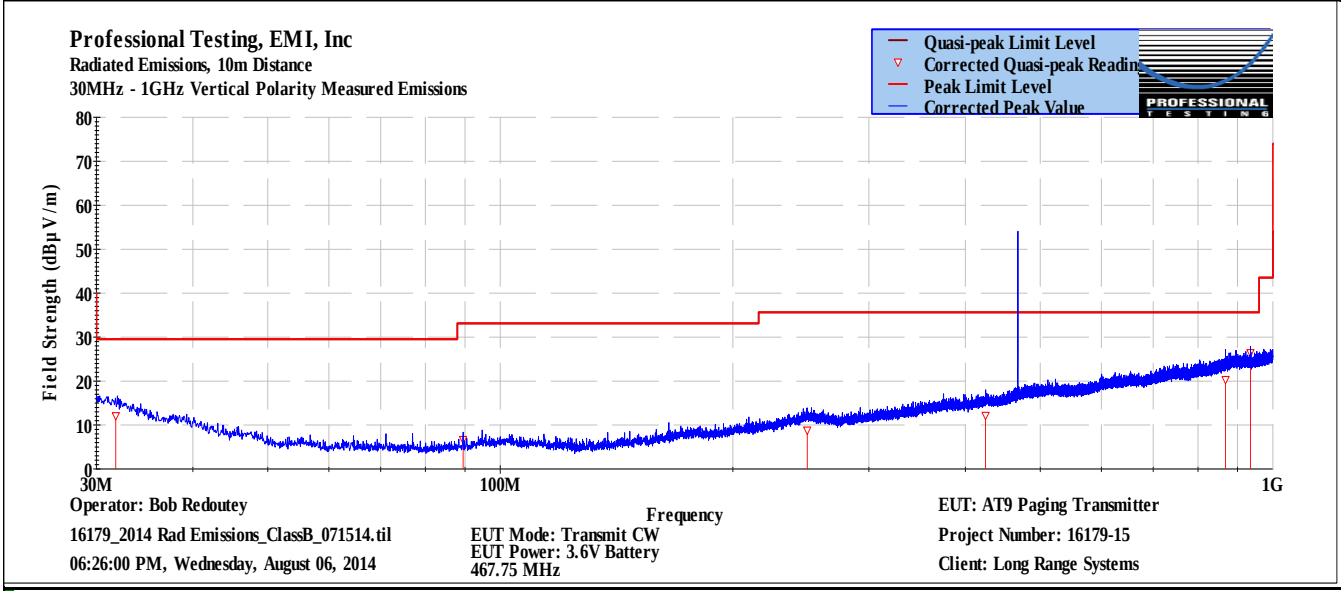
≤ 1GHz Horizontal Antenna Polarity Measured Emissions

6.7 Test Results – Transmit Mode

Professional Testing, EMI, Inc.			
Test Method:	ANSI C63.4–2003: "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz" (incorporated by reference, see §15.38).		
In accordance with:	FCC Part 15.209 - Code of Federal Regulations Part 47, Subpart C - Intentional Radiators, Radiated Emissions Limits		
Section:	15.209		
Test Date(s):	8/6/2014	EUT Serial #:	123972
Customer:	Long Range Systems	EUT Part #:	None
Project Number:	16179-15	Test Technician:	Bob Redoutey
Purchase Order #:	Not Listed	Supervisor:	Rob McCollough
Equip. Under Test:	AT9 Paging Transmitter	Witness' Name:	Jason Gossiaux

Radiated Emissions Test Results Data Sheet			Page: 1 of 1
EUT Line Voltage:	3.6 VDC	EUT Power Frequency:	- N/A
Antenna Orientation:	Vertical	Frequency Range:	30MHz to 1GHz
EUT Mode of Operation:		Transmit CW	

Frequency Measured (MHz)	Test Distance (Meters)	EUT Direction (Degrees)	Antenna Height (Meters)	Detector Function	Recorded Amplitude (dBµV)	Corrected Level (dBµV/m)	Limit Level (dBµV/m)	Margin (dB)	Test Results
31.7835	10	165	2.57	Quasi-peak	24.1	12.116	29.5	-17.4	Pass
89.4931	10	37	3.29	Quasi-peak	27.8	6.692	33.1	-26.4	Pass
249.6	10	106	3.76	Quasi-peak	22.2	8.795	35.6	-26.8	Pass
424.701	10	238	3.74	Quasi-peak	22.2	12.178	35.6	-23.4	Pass
868.558	10	26	3.97	Quasi-peak	21.4	20.319	35.6	-15.3	Pass
935.553	10	298	4.14	Quasi-peak	26.4	26.411	35.6	-9.2	Pass



≤ 1GHz Vertical Antenna Polarity Measured Emissions

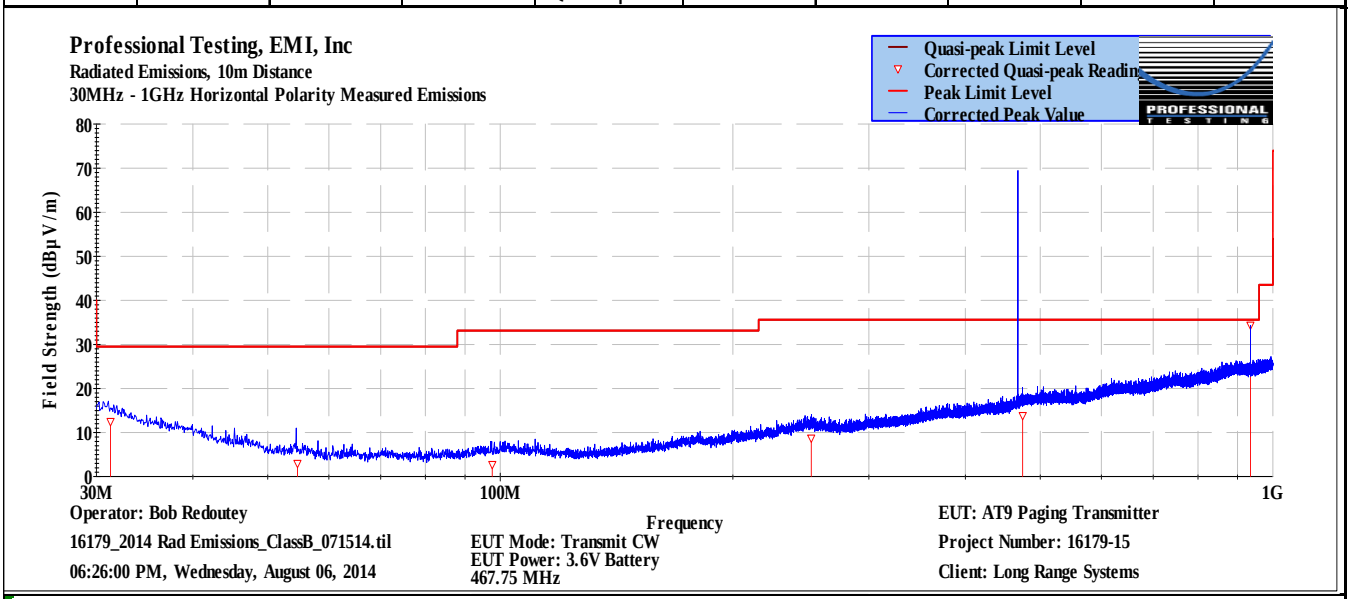
Professional Testing, EMI, Inc.

Test Method:	ANSI C63.4–2003: "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz" (incorporated by reference, see §15.38).		
In accordance with:	FCC Part 15.209 - Code of Federal Regulations Part 47, Subpart C - Intentional Radiators, Radiated Emissions Limits		
Section:	15.209		
Test Date(s):	8/6/2014	**EUT Serial #:**	123972
Customer:	Long Range Systems	**EUT Part #:**	None
Project Number:	16179-15	**Test Technician:**	Bob Redoutey
Purchase Order #:	Not Listed	**Supervisor:**	Rob McCollough
Equip. Under Test:	AT9 Paging Transmitter	**Witness' Name:**	Jason Gossiaux

Radiated Emissions Test Results Data Sheet — **Page: 1 of 1**

EUT Line Voltage:	3.6 VDC	**EUT Power Frequency:**	- N/A
Antenna Orientation:	Horizontal	**Frequency Range:**	30MHz to 1GHz
EUT Mode of Operation:		Transmit CW	

Frequency Measured (MHz)	Test Distance (Meters)	EUT Direction (Degrees)	Antenna Height (Meters)	Detector Function	Recorded Amplitude (dBµV)	Corrected Level (dBµV/m)	Limit Level (dBµV/m)	Margin (dB)	Test Results
31.295	10	51	1.19	Quasi-peak	24.2	12.484	29.5	-17.0	Pass
54.6273	10	71	3.85	Quasi-peak	23.7	2.984	29.5	-26.5	Pass
97.616	10	190	2.86	Quasi-peak	23	2.732	33.1	-30.4	Pass
252.601	10	155	3.75	Quasi-peak	22.2	8.73	35.6	-26.9	Pass
474.419	10	36	3.59	Quasi-peak	22.4	13.845	35.6	-21.8	Pass
935.528	10	210	1.03	Quasi-peak	34.3	34.355	35.6	-1.2	Pass



≤ 1GHz Horizontal Antenna Polarity Measured Emissions

7.0 Radiated Spurious Emissions Above 1 GHz

7.1 Test Procedure

The EUT was placed on a non-conductive table 0.8 meters above the ground plane. The table was centered on a rotating turntable at a distance of 1 meter from the measurement antenna.

Harmonic emissions above 1 GHz peak were measured with peak detection, a resolution bandwidth of 3 MHz, and at a distance of 3 meters. If peak measurements exceeded average limits, the peak limit was applicable and duty cycle factor was then applied for average level calculation. However, in this test duty cycle is 100% and so no averaging can be applied. Emissions were investigated up to at least the 10^{th} harmonic of the transmitter fundamental.

Non-harmonic spurious emissions must satisfy the average limit and the peak limit (20 dB above average).

7.2 Test Criteria

Section Number FCC | IC	Clause Subject	Date
15.231(a), 15.209 | RSS-210 A1.1 Table A	Field Strength of Radiated Spurious/Harmonic Emissions	2014-08-06

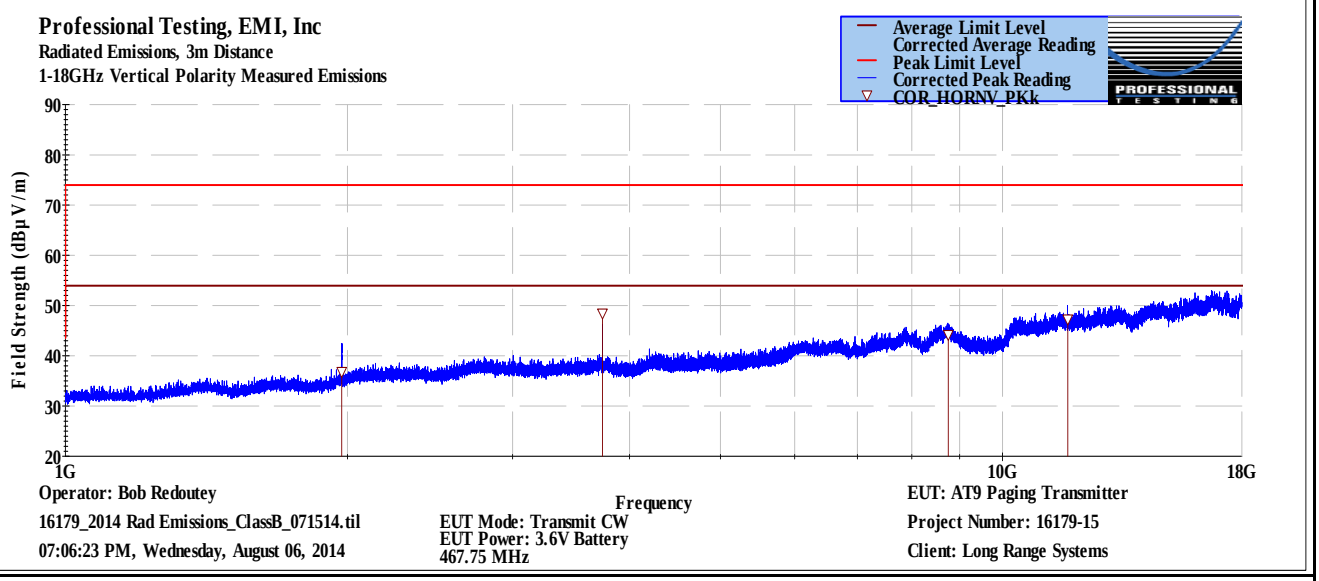
No emissions above 1 GHz were found attributable to the receiver. The data presented below is for transmit mode only.

7.3 Test Results – Transmit Mode

Professional Testing, EMI, Inc.			
Test Method:	ANSI C63.4–2003: "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz" (incorporated by reference, see §15.38).		
In accordance with:	FCC Part 15.209 - Code of Federal Regulations Part 47, Subpart C - Intentional Radiators, Radiated Emissions Limits		
Section:	15.209		
Test Date(s):	8/6/2014	EUT Serial #:	123972
Customer:	Long Range Systems	EUT Part #:	None
Project Number:	16179-15	Test Technician:	Bob Redoutey
Purchase Order #:	Not Listed	Supervisor:	Rob McCollough
Equip. Under Test:	AT9 Paging Transmitter	Witness' Name:	Jason Gossiaux

Radiated Emissions Test Results Data Sheet			Page: 1 of 1
EUT Line Voltage:	3.6 VDC	EUT Power Frequency:	- N/A
Antenna Orientation:	Vertical	Frequency Range:	Above 1GHz
EUT Mode of Operation:		Transmit CW	

Frequency Measured (MHz)	Test Distance (Meters)	EUT Direction (Degrees)	Antenna Height (Meters)	Detector Function	Recorded Amplitude (dBµV)	Corrected Level (dBµV/m)	Limit Level (dBµV/m)	Margin (dB)	Test Results
1972.07	3	221	1	Peak	47	36.822	74.0	-37.1	Pass
3741.86	3	327	1	Peak	55.3	48.457	74.0	-25.5	Pass
8751.66	3	32	1	Peak	35.7	44.194	74.0	-29.8	Pass
11737.9	3	136	1	Peak	37	47.277	74.0	-26.7	Pass



> 1GHz Vertical Antenna Polarity Measured Emissions

Detector mode peak. Resolution bandwidth 1 MHz. Video bandwidth 3 MHz.

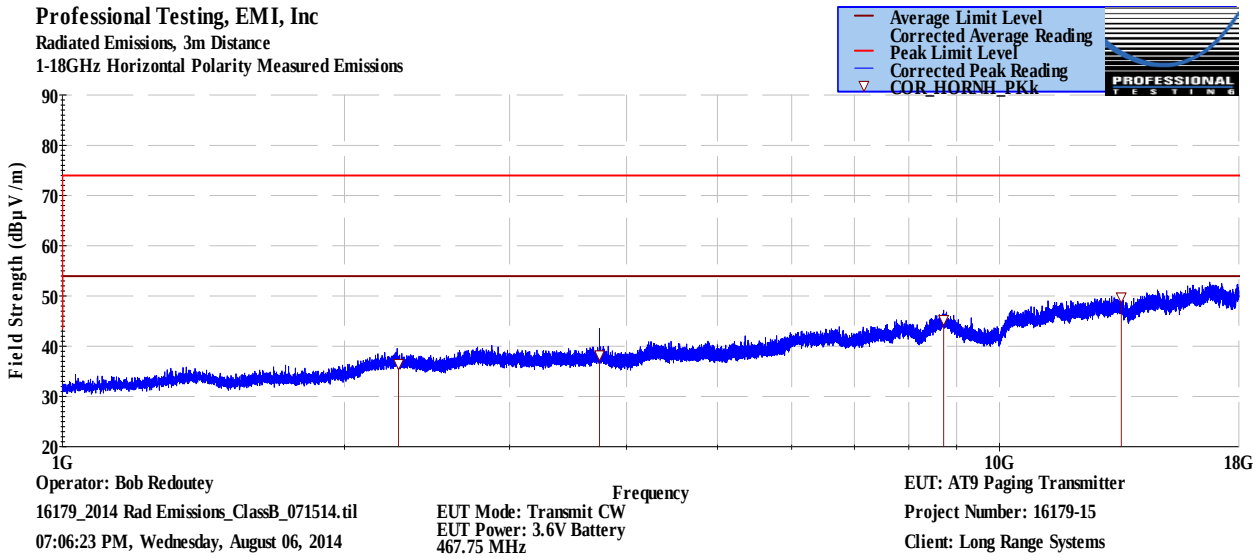
Professional Testing, EMI, Inc.

Test Method:	ANSI C63.4–2003: "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz" (incorporated by reference, see §15.38).		
In accordance with:	FCC Part 15.209 - Code of Federal Regulations Part 47, Subpart C - Intentional Radiators, Radiated Emissions Limits		
Section:	15.209		
Test Date(s):	8/6/2014	**EUT Serial #:**	123972
Customer:	Long Range Systems	**EUT Part #:**	None
Project Number:	16179-15	**Test Technician:**	Bob Redoutey
Purchase Order #:	Not Listed	**Supervisor:**	Rob McCollough
Equip. Under Test:	AT9 Paging Transmitter	**Witness' Name:**	Jason Gossiaux

Radiated Emissions Test Results Data Sheet — **Page: 1 of 1**

EUT Line Voltage:	3.6 VDC	**EUT Power Frequency:**	- N/A
Antenna Orientation:	Horizontal	**Frequency Range:**	Above 1GHz
EUT Mode of Operation:		Transmit CW	

Frequency Measured (MHz)	Test Distance (Meters)	EUT Direction (Degrees)	Antenna Height (Meters)	Detector Function	Recorded Amplitude (dBµV)	Corrected Level (dBµV/m)	Limit Level (dBµV/m)	Margin (dB)	Test Results
2284.34	3	147	1	Peak	45.4	36.49	74.0	-37.5	Pass
3742.62	3	175	1	Peak	45.1	38.252	74.0	-35.7	Pass
8715.78	3	149	1	Peak	36.8	45.283	74.0	-28.7	Pass
13482.4	3	91	1	Peak	39	49.749	74.0	-24.2	Pass



> 1GHz Horizontal Antenna Polarity Measured Emissions

Detector mode peak. Resolution bandwidth 1 MHz. Video bandwidth 3 MHz.

8.0 Antenna Construction Requirements

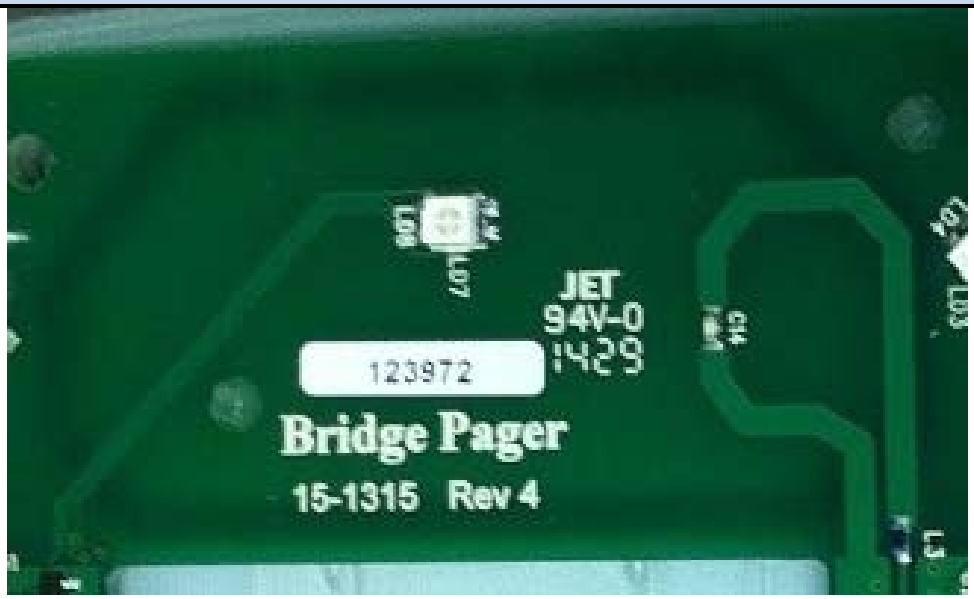
8.1 Procedure

A direct examination of the antenna construction is performed and compared to rule criteria that prevents wireless device antennas from being modified by end users in ways that would void their authorization to use the device.

8.2 Criteria

Section Number FCC | IC	Clause Subject	Date
15.203 | RSS-Gen	Antenna Construction	2014-10-06

8.3 Results

Antenna Manufacturer, Details	
Manufactured by Long Range Systems, LLC. Antenna is a printed circuit loop antenna (darker loop) on main board, coupled via a smaller internal loop on the top layer. See photograph, right. No external connector.	 **The Rev 4 PCB as shown above provides the best view of the actual antenna construction. The antenna was unchanged in the Rev 5 revision.**

The antenna design satisfies the requirements of the rules.

9.0 Mains Conducted Emissions

The EUT was placed on a non-conductive table 0.8 meters above the floor and 0.4 meters from the conductive reference plane (wall). The EUT is powered through a line impedance stabilization network (LISN) that provides a measurement tap and a termination approximating 50 Ohms in the measurement range of 150 kHz to 30 MHz. A spectrum analyzer is connected, in turn, to each mains line measurement tap and software is employed to measure the radio frequency noise generated by the EUT.

9.1 Test Criteria

47 CFR (USA) // IC (Canada)		
Section Reference	Parameter	Date(s)
15.207 // RSS-210 Issue 8	Mains conducted emissions	2014-08-04

9.2 Test Results

The EUT satisfied the criteria.

Tabular and plotted measurements appear on the following pages.

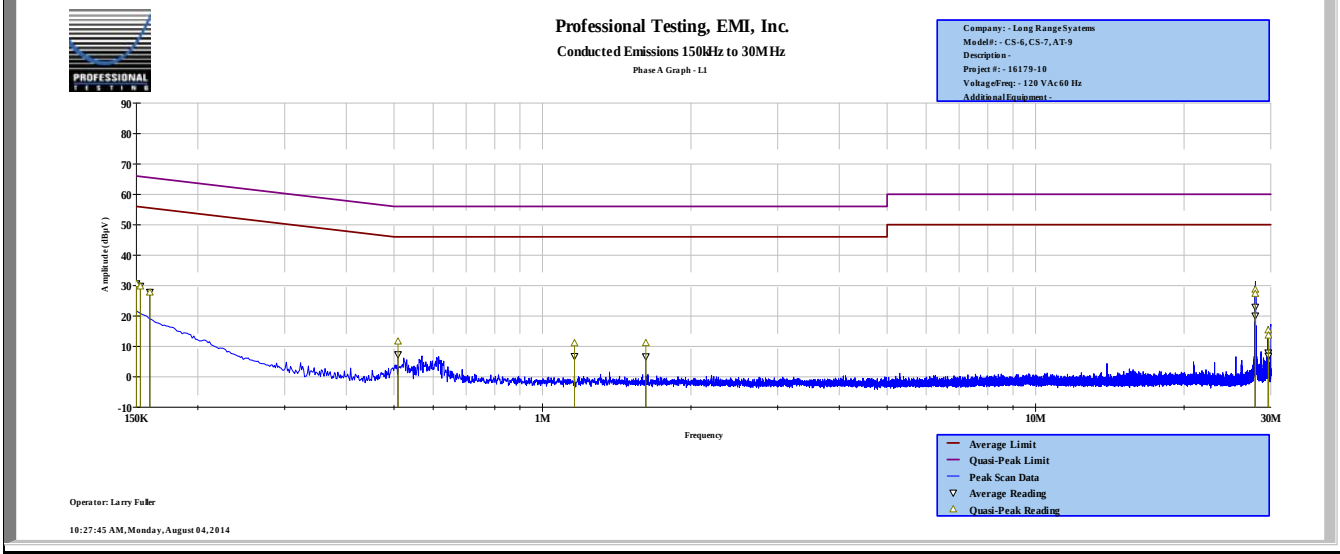
9.3 Phase Line

Professional Testing, EMI, Inc.			
Test Method:	ANSI C63.4–2009: Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz (incorporated by reference, see §15.38).		
In accordance with:	FCC Part 15.107 - Code of Federal Regulations Part 47, Subpart B - Unintentional Radiators, Conducted Emissions Limits		
Section:	15.107		
Test Date(s):	8/4/2014	**EUT Serial #:**	None
Customer:	Long Range Systems	**EUT Part #:**	None
Project Number:	16179-10	**Test Technician:**	Larry Fuller
Purchase Order #:		**Supervisor:**	Rob McCollough
Equip. Under Test:	CS-6, CS-7, AT-9	**Witness' Name:**	Jason Gossiaux

Conducted Emissions Test Results Data Sheet - Phase Lead (Line 1) **Page: 2 of 2**

EUT Line Voltage:	120	VAC	EUT Line Frequency:	60	Hz

Frequency Measured (MHz)	Peak Detector Reading (dBµV)	Quasi-peak Detector Reading (dBµV)	Quasi-peak Detector Limit (dBµV)	Quasi-peak Detector Margin (dB)	Quasi-peak Detector Test Results	Average Detector Reading (dBµV)	Average Detector Limit (dBµV)	Average Detector Margin (dB)	Average Detector Test Results
0.150037	32.6	30.5	66	-35.5	PASS	30.7	56	-25.3	PASS
0.1529	32.2	29.7	65.8	-36.1	PASS	29.9	55.8	-26	PASS
0.1598	29.3	27.7	65.5	-37.7	PASS	27.9	55.5	-27.6	PASS
0.50901	20	11.6	56	-44.4	PASS	7.4	46	-38.6	PASS
1.1609	18.5	11.1	56	-44.9	PASS	6.8	46	-39.2	PASS
1.62	18.8	11.1	56	-44.9	PASS	6.7	46	-39.3	PASS
27.8931	31.8	28.7	60	-31.3	PASS	20.1	50	-29.9	PASS
27.8986	31.5	27.3	60	-32.7	PASS	23	50	-27	PASS
29.6289	21.9	15.3	60	-44.7	PASS	8	50	-42	PASS
29.6728	21.3	13.6	60	-46.4	PASS	6.9	50	-43.1	PASS



Measured Conducted Emissions - Phase Lead (Line 1)

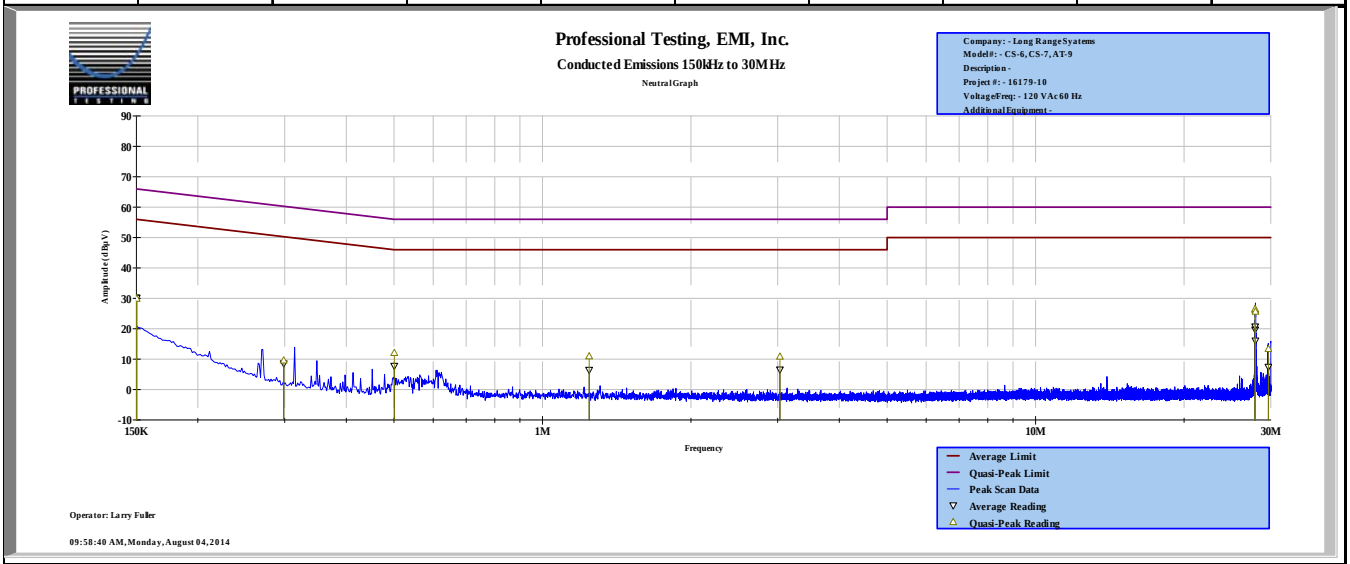
9.4 Neutral Line

Professional Testing, EMI, Inc.			
Test Method:	ANSI C63.4–2009: Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz (incorporated by reference, see §15.38).		
In accordance with:	FCC Part 15.107 - Code of Federal Regulations Part 47, Subpart B - Unintentional Radiators, Conducted Emissions Limits		
Section:	15.107		
Test Date(s):	8/4/2014	**EUT Serial #:**	None
Customer:	Long Range Systems	**EUT Part #:**	None
Project Number:	16179-10	**Test Technician:**	Larry Fuller
Purchase Order #:		**Supervisor:**	Rob McCollough
Equip. Under Test:	CS-6, CS-7, AT-9	**Witness' Name:**	Jason Gossiaux

Conducted Emissions Test Results Data Sheet - Neutral Lead **Page: 1 of 2**

EUT Line Voltage:	120	VAC	EUT Line Frequency:	60	Hz

Frequency Measured (MHz)	Peak Detector Reading (dBµV)	Quasi-peak Detector Reading (dBµV)	Quasi-peak Detector Limit (dBµV)	Quasi-peak Detector Margin (dB)	Quasi-peak Detector Test Results	Average Detector Reading (dBµV)	Average Detector Limit (dBµV)	Average Detector Margin (dB)	Average Detector Test Results
0.150046	32.1	30	66	-36	PASS	30.2	56	-25.8	PASS
0.150226	32.1	29.9	66	-36.1	PASS	30.1	56	-25.9	PASS
0.29849	16.8	9.6	60.3	-50.7	PASS	8.5	50.3	-41.7	PASS
0.50036	19.2	12.1	56	-43.9	PASS	7.7	46	-38.3	PASS
1.2434	19.1	11	56	-45	PASS	6.4	46	-39.6	PASS
3.0306	18.6	10.8	56	-45.2	PASS	6.5	46	-39.5	PASS
27.8892	30.2	26.2	60	-33.8	PASS	19.7	50	-30.3	PASS
27.8906	30	26.5	60	-33.5	PASS	20.7	50	-29.3	PASS
27.92	29.9	25.6	60	-34.4	PASS	16	50	-34	PASS
29.6664	20.7	13.4	60	-46.6	PASS	7.5	50	-42.5	PASS



Measured Conducted Emissions - Neutral Lead

10.0 Equipment Lists

10.1 Equipment for Fundamental Power and Spurious Radiated Emissions

Professional Testing, EMI, Inc.			
Test Method:	**CISPR 16-1-4:2007, Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-4: Radio disturbance and immunity measuring apparatus – Ancillary**		
In accordance with:	**EN 55022:2010 Information technology equipment — Radio disturbance characteristics — Limits and methods of measurement**		
Section:	**Section 10 - Method of measurement of radiated disturbance**		
Test Date(s):	**8/4/2014**	**EUT Serial #:**	**None**
Customer:	**Long Range Systems**	**EUT Part #:**	**None**
Project Number:	**16179-10**	**Test Technician:**	**Dave Kohutek**
Purchase Order #:	**PO12465**	**Supervisor:**	**Rob McCollough**
Equip. Under Test:	**CS-6, CS-7, AT-9**	**Witness' Name:**	**Jason Gossiaux**

Radiated Emissions Test Equipment List	
Tile! Software Version:	**4.2.A, May 23, 2010, 08:38:52 AM**
Test Profile:	**Radiated Emissions_Profile Version October 12, 2011**

Asset #	Manufacturer	Model	Equipment Nomenclature	Serial Number	Calibration Due Date
1509A	Braden	N/A	TDK 10M Chamber, NSA < 1 GHz	DAC-012915-005	8/29/2014
1890	HP	8447F	Preamp/Amp, 9kHz-1300MHz, 28/25dB	3313A05298	1/22/2015
1937	Agilent	E4440A	Spectrum Analyzer, 3 Hz - 26.5 GHz	MY44303298	12/2/2015
1926	ETS-Lindgren	3142D	Antenna, Biconilog, 26 MHz - 6 GHz	00135454	8/29/2015
C027	N/A	RG214	Cable Coax, N-N, 25m	none	9/26/2014
1327	EMCO	1050	Controller, Antenna Mast	none	N/A
0942	EMCO	11968D	Turntable, 4ft.	9510-1835	N/A
1969	HP	11713A	Attenuator/Switch Driver	3748A04113	N/A
1509B	Braden	N/A	TDK 10M Chamber, VSWR > 1 GHz	DAC-012915-005	8/16/2014
2004	Miteq	AFS44-00101800-2S-10P-44	Amplifier, 40dB, .1-18GHz	0	11/19/2014
C030	N/A	0	Cable Coax, N-N, 30m	none	9/26/2014
1890	HP	8447F	Preamp/Amp, 9kHz-1300MHz, 28/25dB	3313A05298	1/22/2015
1325	EMCO	1050	Controller, Antenna Mast	9003-1461	N/A
1780	ETS-Lindgren	3117	Antenna, Double Ridged Guide Horn, 1 - 18 GHz	00110313	1/21/2015

10.2 Equipment for Radiated Emissions, Receive/Charge Modes, Rev 5

Professional Testing, EMI, Inc.			
Test Method:	**ANSI C63.4–2003: "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz" (incorporated by reference,**		
In accordance with:	**FCC Part 15.109 - Code of Federal Regulations Part 47, Subpart B - Unintentional Radiators, Radiated Emissions Limits**		
Section:	**15.109**		
Test Date(s):	**1/23/2015**	**EUT Serial #:**	**R1_16 MBB1**
Customer:	**Long Range Systems**	**EUT Part #:**	**NA**
Project Number:	**16672-10**	**Test Technician:**	**Eric Lifsey**
Purchase Order #:	**NA**	**Supervisor:**	**Lisa Arndt**
Equip. Under Test:	**RX-CS7**	**Witness' Name:**	**NA**

Radiated Emissions Test Equipment List	
Tile! Software Version:	**4.2.A, May 23, 2010, 08:38:52 AM**
Test Profile:	**Radiated Emissions_Profile Version October 12, 2011**

Asset #	Manufacturer	Model	Equipment Nomenclature	Serial Number	Calibration Due Date
1509A	Braden	N/A	TDK 10M Chamber, NSA < 1 GHz	DAC-012915-005	2/5/2016
1890	HP	8447F	Preamp/Amp, 9kHz-1300MHz, 28/25dB	3313A05298	2/6/2016
1937	Agilent	E4440A	Spectrum Analyzer, 3 Hz - 26.5 GHz	MY44303298	3/29/2015
2172	ETS-Lindgren	3142C	Antenna, Biconilog, 26 MHz-3GHz	49383	12/5/2015
C027	N/A	RG214	Cable Coax, N-N, 25m	none	10/22/2015
1327	EMCO	1050	Controller, Antenna Mast	none	N/A
0942	EMCO	11968D	Turntable, 4ft.	9510-1835	N/A
1969	HP	11713A	Attenuator/Switch Driver	3748A04113	N/A

10.3 Equipment for Timings and Bandwidth

Asset #	Manufacturer	Model #	Description	Calibration Due
1486	EMCO	3147	Log Periodic Antenna	Not Required
1342	Rohde & Schwarz	FSP-30	Spectrum Analyzer	2015-01-29
C059	Pasternack	-	Cable	Not Required
C249	Pasternack	-	Cable	Not Required
C250	Pasternack	-	Cable	Not Required

10.4 Equipment for Mains Conducted Emission

Professional Testing, EMI, Inc.			
Test Method:	**ANSI C63.4–2009: Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz (incorporated by reference,**		
In accordance with:	**FCC Part 15.107 - Code of Federal Regulations Part 47, Subpart B - Unintentional Radiators, Conducted Emissions Limits**		
Section:	**15.107**		
Test Date(s):	**8/4/2014**	**EUT Serial #:**	**None**
Customer:	**Long Range Systems**	**EUT Part #:**	**None**
Project Number:	**16179-10**	**Test Technician:**	**Larry Fuller**
Purchase Order #:		**Supervisor:**	**Rob McCollough**
Equip. Under Test:	**CS-6, CS-7, AT-9**	**Witness' Name:**	**Jason Gossiaux**

Conducted Emissions Test Equipment List	
Tile! Software Version:	**4.1.A.0, April 14, 2009, 11:01:00PM**
Test Profile:	**Profile#: CE_2014_R3.TIL, dated May 1, 2014**

Asset #	Manufacturer	Model	Equipment Nomenclature	Serial Number	Calibration Due Date
1842	HP	8568B	Spectrum Analyzer	2732A03633	10/1/2015
0045	HP	85662A	Spec Anal Dsply for AN1842	2816A16413	N/A
0990	HP	85685A	RF Preselector	3010A01119	9/30/2016
1281	HP	85650A	Quasi Peak Adapter	2043A00063	10/1/2015
1173	PTI	100k HPF	Filter, High Pass, 100kHz	none	1/15/2016
1086	PTI	PTI-ALF2	Attenuator Limiter Filter	none	5/7/2015
C107	Pomona	RG-223	Cable 9 ft BNC RG-223 (black)	none	8/11/2015
C108	HP	11170 C	Cable 5 ft BNC (Grey)	none	8/11/2015
0939	EMCO	3825/2	LISN, 10kHz-100MHz	9603-2521	10/7/2015
C109	HP	none	Cable 19 inch BNC (grey)	none	8/11/2015

Appendix: Policy, Rationale, and Evaluation of EMC Measurement Uncertainty

All uncertainty calculations, estimates and expressions thereof shall be in accordance with NIST policy. Since PTI operates in accordance with NIST (NVLAP) Handbook 150-11: 2007, all instrumentation having an effect on the accuracy or validity of tests shall be periodically calibrated or verified traceable to national standards by a competent calibration laboratory. The certificates of calibration or verification on this instrumentation shall include estimates of uncertainty as required by NIST Handbook 150-11.

1. Rationale and Summary of Expanded Uncertainty.

Each piece of instrumentation at PTI that is used in making measurements for determining conformance to a standard (or limit), shall be assessed to evaluate its contribution to the overall uncertainty of the measurement in which it is used. The assessment of each item will be based on either a type A evaluation or a type B evaluation. Most of the evaluations will be type B, since they will be based on the manufacturer's statements or specifications of the calibration tolerances, or uncertainty will be stated along with a brief rationale for the type of evaluation and the resulting stated uncertainties.

The individual uncertainties included in the combined standard uncertainty for a specific test result will depend on the configuration in which the item of instrumentation is used. The combination will always be based on the law of propagation of uncertainty. Any systematic effects will be accommodated by including their uncertainties, in the calculation of the combined standard uncertainty; except that if the direction and amount of the systematic effect cannot be determined and separated from its uncertainty, the whole effect will be treated as uncertainty and combined along with the other elements of the test setup.

Type A evaluations of standard uncertainty will usually be based on calculating the standard deviation of the mean of a series of independent observations, but may be based on a least-squares curve fit or the analysis of variance for unusual situations. Type B evaluations of standard uncertainty will usually be based on manufacturer's specifications, data provided in calibration reports, and experience. The type of probability distribution used (normal, rectangular, a priori, or u-shaped) will be stated for each Type B evaluation.

In the evaluation of the uncertainty of each type of measurement, the uncertainty caused by the operator will be estimated. One notable operator contribution to measurement uncertainty is the manipulation of cables to maximize the measured values of radiated emissions. The operator contribution to measurement uncertainty is evaluated by having several operators independently repeat the same test. This results in a Type A evaluation of operator-contributed measurement uncertainty.

A summary of the expanded uncertainties of PTI measurements is shown as Table 1. These are the worst-case uncertainties considering all operative influence factors.

Table 1: Summary of Measurement Uncertainties for Site 45

Type of Measurement	Frequency Range	Meas. Dist.	Expanded Uncertainty U, dB (k=2)
Mains Conducted Emissions	150 kHz to 30 MHz	N/A	2.9
Telecom Conducted Emissions	150 kHz to 30 MHz	N/A	2.8
Radiated Emissions	30 to 1,000 MHz	10 m	4.8
	1 to 18 GHz	3 m	5.7

End of Report

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