

Application Submittal Report For Grant of Certification FOR Model: CU-01 916 MHz Low Power License Exempt Transmitter

**FCC ID: 2AFH3-1333101
IC: 20819-3591**

FOR

rfCycle, LLC
903 San Lorenzo Ave NW
Albuquerque, NM 87107

Test Report Number: 150930
IC Test Site Registration: 3041A-1

Authorized Signatory: *Scot D Rogers*
Scot D. Rogers

Rogers Labs, Inc.
4405 W. 259th Terrace
Louisburg, KS 66053
Phone/Fax: (913) 837-3214
Revision 2

rfCycle, LLC
Model: CU-01
Test #: 150930
Test to: 47CFR (15.2479, RSS-210
File: rfCycle CU01 TstRpt 150930 r2

FCC ID: 2AFH3-1333101
IC: 20819-3591
SN: FCC
Date: March 21, 2016
Page 1 of 25



ROGERS LABS, INC.

4405 West 259th Terrace
Louisburg, KS 66053
Phone / Fax (913) 837-3214

Engineering Test Report For Grant of Certification Application

FOR
47CFR, PART 15C - Paragraph 15.249,
Industry Canada RSS-GEN Issue 4, and RSS-210
Low Power License Exempt Intentional Radiator

For

rfCycle, LLC

903 San Lorenzo Ave NW
Archie, Mo. 64725

Model: CU-01
Low Power License Exempt Transmitter
Frequency Range 916 MHz
FCC ID#: 2AFH3-1333101
IC: 20819-3591

Test Date: September 30, 2015

Certifying Engineer:

Scot D. Rogers

Scot D. Rogers
Rogers Labs, Inc.
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Page 2 of 25

Table Of Contents

TABLE OF CONTENTS.....	3
REVISIONS.....	4
FORWARD	5
OPINION / INTERPRETATION OF RESULTS	5
EQUIPMENT TESTED.....	5
EQUIPMENT FUNCTION AND CONFIGURATION.....	6
Equipment Configuration.....	6
APPLICATION FOR CERTIFICATION.....	7
APPLICABLE STANDARDS & TEST PROCEDURES	8
EQUIPMENT TESTING PROCEDURES	8
AC Line Conducted Emission Test Procedure	8
Radiated Emission Test Procedure.....	8
Diagram 1 Test arrangement for radiated emissions of tabletop equipment.....	9
Diagram 2 Test arrangement for radiated emissions tested on Open Area Test Site (OATS)	10
TEST SITE LOCATIONS	10
LIST OF TEST EQUIPMENT	11
ENVIRONMENTAL CONDITIONS.....	12
UNITS OF MEASUREMENTS	12
STATEMENT OF MODIFICATIONS AND DEVIATIONS	12
INTENTIONAL RADIATORS.....	12
Antenna Requirements	12
Restricted Bands of Operation.....	13
Table 1 Radiated Emissions in Restricted Bands	13
Summary of Results for Radiated Emissions in Restricted Bands	13

General Radiated EMI Testing Procedure	14
Table 2 General Radiated Emissions Data (worst-case)	15
Summary of Results for General Radiated Emissions	15
Operation in the Band 902 – 928 MHz	16
Figure 1 Plot of Transmitter Emissions (In 902-928 MHz Frequency Band).....	17
Figure 2 Plot of Transmitter Emissions (902-928 MHz, 99% Occupied Bandwidth)	17
Figure 3 Plot of Transmitter Emissions (Low Band Edge).....	18
Figure 4 Plot of Transmitter Emissions (High Band Edge)	18
Transmitter Emissions Data.....	19
Table 3 Transmitter Radiated Emission Data	19
Summary of Results for Radiated Emissions of Intentional Radiator	19
ANNEX.....	20
Annex A Measurement Uncertainty Calculations.....	21
Annex B Rogers Labs Test Equipment List.....	22
Annex C Rogers Qualifications	23
Annex D FCC Site Registration Letter.....	24
Annex E Industry Canada Site Registration Letter	25

Revisions

Revision 2 Issued March 21, 2016 – added reference to RSS-GEN Issue 4, corrected type error
 page 19

Revision 1 Issued March 2, 2016

Forward

The following information is submitted for consideration in obtaining Grant of Certification for Low Power License Exempt Intentional Radiator operating under 47CFR Paragraph 15.249 and Industry Canada RSS-GEN, issue 4, and RSS-210, issue 8, operations in the 902 – 928 MHz frequency band.

Name of Applicant: rfCycle, LLC
 903 San Lorenzo Ave NW
 Archie, Mo. 64725

Model: CU-01
 FCC I.D.: 2AFH3-1333101 IC: 20819-3591
 Frequency Range: 916MHz
 Operating Power: Average power 82.9 dB μ V/m @ 3 meters (and peak 83.0 dB μ V/m)
 269.0 kHz (99% OBW) kHz

Opinion / Interpretation of Results

Test Performed per 47CFR	Minimum Margin (dB)	Results
Antenna requirement per 47CFR 15.203	N/A	Complies
Radiated Emissions Restricted Bands (Tx)	-4.9	Complies
AC Line Conducted Emissions	N/A	Complies
Radiated Emissions (General Out-of-Band)	-4.9	Complies
Radiated Emissions per (harmonics)	-4.9	Complies

Equipment Tested

Equipment	Model / PN	Serial Number	FCC Identifier	IC Identifier
EUT	CU-01	FCC	2AFH3-1333101	20819-3591

Test results in this report relate only to the items tested

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 Date: March 21, 2016
 Page 5 of 25

Equipment Function and Configuration

The EUT is a 916 MHz frequency Low Power Transmitter. The design provides remote activation of circuitry provided in the associated remote located receiver. The system is designed to provide cyclists with stop and turn signal indicators for use on bicycle applications. The design utilizes permanently attached internal antenna system and offers no provision for alternate antenna system. EUT operates from internal replaceable button cell battery only and offers no provision for alternate power supply. The manufacturer provided test sample and configuration which allowed testing personnel operational control of the transmitter for testing purposes. The EUT was arranged as described by the manufacturer ensuring worst-case emissions configuration for testing. The EUT offers no other interface connections than those documented in the configuration options presented. As requested by the manufacturer and required by regulations, the equipment was tested for emissions compliance using the available configurations with the worst-case data presented. Test results in this report relate only to the products described in this report.

Equipment Configuration



Application for Certification

(1) Manufacturer: rfCycle, LLC
903 San Lorenzo Ave NW
Archie, Mo. 64725

(2) Identification: Model: CU-01
FCC I.D.: 2AFH3-1333101
IC: 20819-3591

(3) Instruction Book:
Refer to Exhibit for Instruction Manual.

(4) Description of Circuit Functions:
Refer to Exhibit of Operational Description.

(5) Block Diagram with Frequencies:
Refer to Exhibit of Operational Description.

(6) Report of Measurements:
Report of measurements follows in this Report.

(7) Photographs: Construction, Component Placement, etc.:
Refer to Exhibit for photographs of equipment.

(8) List of Peripheral Equipment Necessary for operation. The equipment operates from power received from replaceable internal button cell battery. The design incorporates internal permanently attached antenna system with no provision for replacement as documented in this report. The EUT offers no other connection ports than those presented in this filing

(9) Transition Provisions of 15.37 are not being requested.

(10) Not Applicable. The unit is not a scanning receiver.

(11) Not Applicable. The EUT does not operate in the 59 – 64 GHz frequency band.

(12) The equipment is not software defined and this section is not applicable.

Applicable Standards & Test Procedures

In accordance with the 47CFR, dated October 1, 2014, Part 2, Subpart J, Paragraphs 2.907, 2.911, 2.913, 2.925, 2.926, 2.1031 through 2.1057, and applicable parts of paragraph 15, Part 15C Paragraph 15.249 and Industry Canada standard RSS-GEN Issue 4, and RSS-210 Issue 8 the following information is submitted. Test procedures used are the established Methods of Measurement of Radio-Noise Emissions as described in the ANSI C63.10-2013.

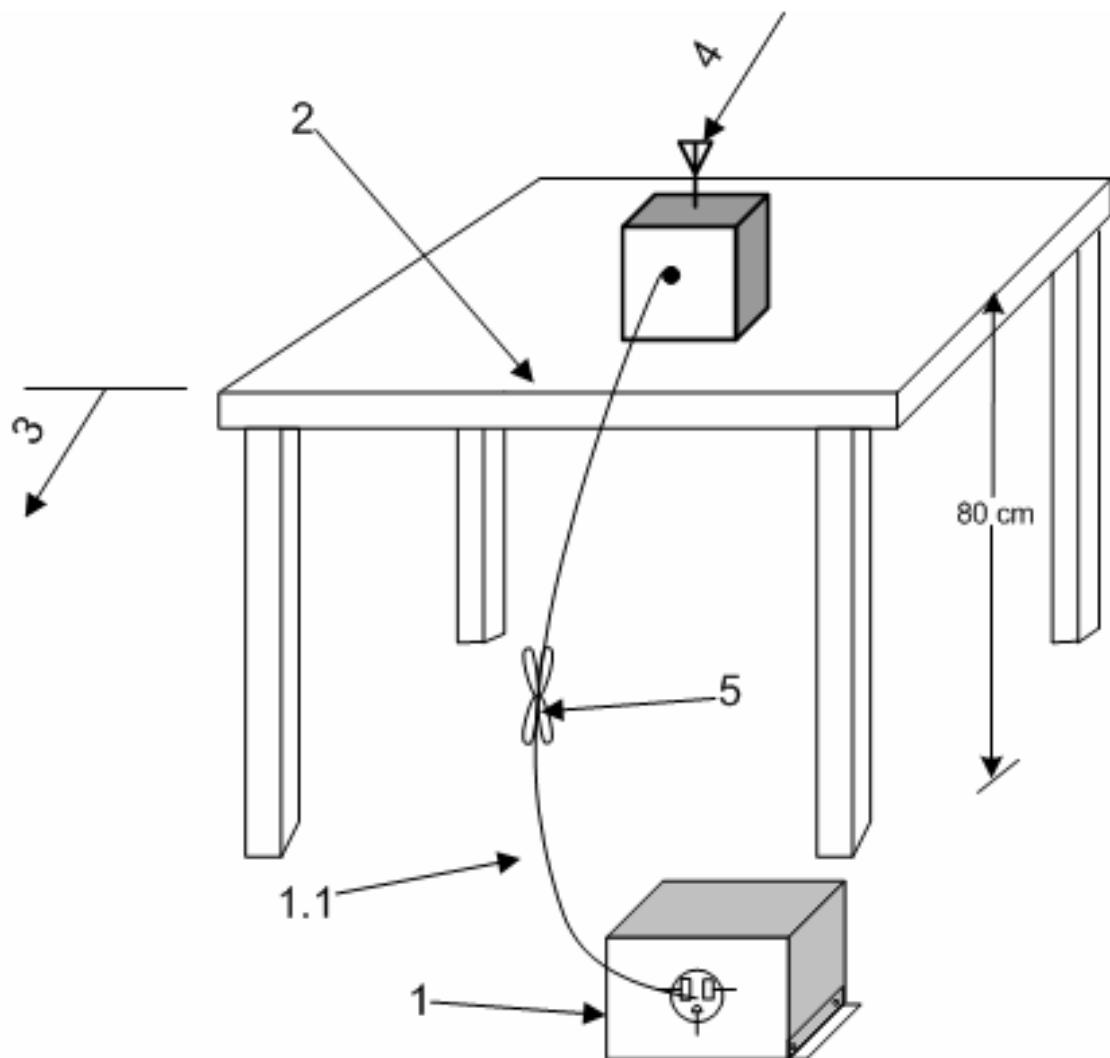
Equipment Testing Procedures

AC Line Conducted Emission Test Procedure

The equipment operates solely from Direct Current (DC) Power and offers no provision for connection to utility AC power systems. Therefore, no AC power line conducted emissions test is required or performed.

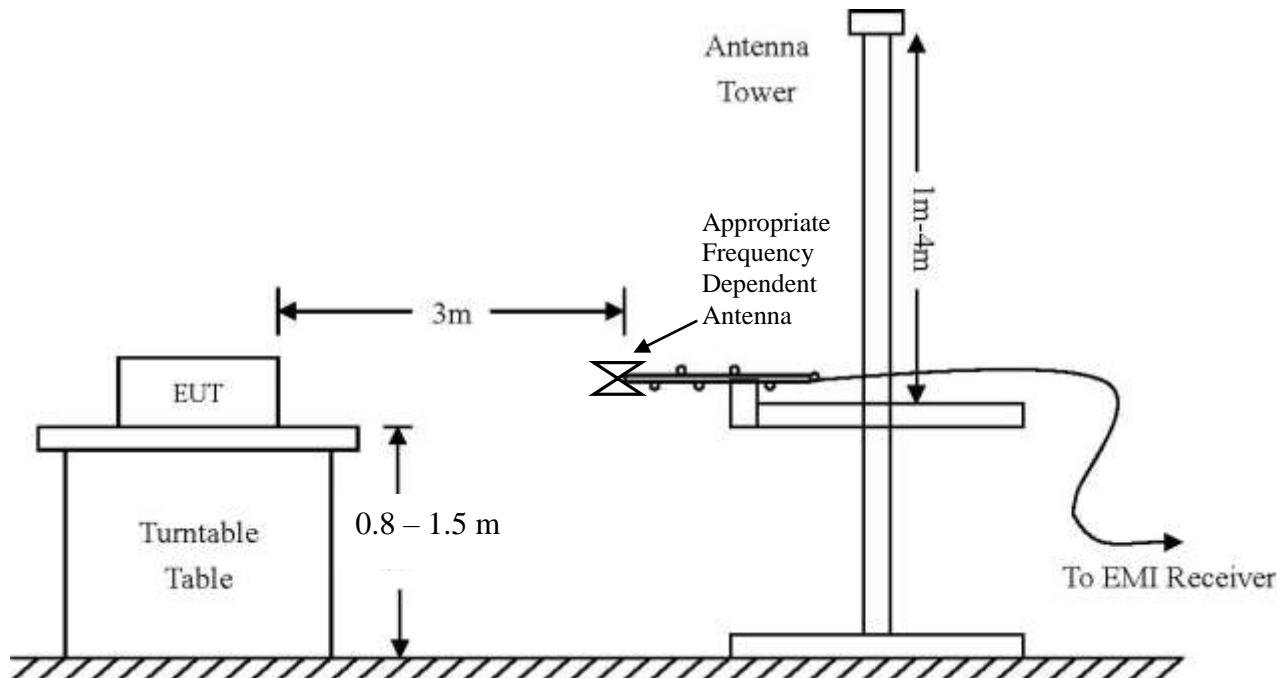
Radiated Emission Test Procedure

The EUT was placed on a rotating 0.9 x 1.2-meter platform, elevated as required above the ground plane at a distance of 3 meters from the FSM antenna. Radiated emissions testing were performed as specified in ANSI C63.10-2013. EMI energy was maximized by equipment placement, raising and lowering the FSM antenna, changing the antenna polarization, and by rotating the turntable. Each emission was maximized before data was taken using a spectrum analyzer. The frequency spectrum from 9 kHz to 10,000 MHz was searched for during preliminary investigation. Refer to diagrams one and two showing typical test arrangement and photographs in the test setup exhibits for specific EUT placement during testing.



1. A LISN is optional for radiated measurements between 30 MHz to 1000 MHz, but not allowed for measurements below 30 MHz and above 1000 MHz (See 6.4.3, 6.5.1, and 6.6.3). If used, connect EUT to one LISN. Unused LISN measuring port connectors shall be terminated in 50Ω . LISN can be placed on top of, or immediately beneath, reference ground plane (see 6.2.2 and 6.2.3.1).
- 1.1 LISN spaced at least 80 cm from nearest part of EUT chassis.
2. The EUT shall be placed in the center of the table to the extent possible (See 6.2.3.1 and 6.3.4).
3. A vertical conducting plane, if used for conducted tests per 6.2.2, shall be removed for radiated emission tests.
4. Antenna may be integral or detachable, depending on the EUT.
5. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 cm to 40 cm long.

Diagram 1 Test arrangement for radiated emissions of tabletop equipment



Frequency: 9 kHz-30 MHz	Frequency: 30 MHz- 1 GHZ	Frequency: Above 1 GHz
Loop Antenna	Broadband Biconilog	Horn
RBW = 9 kHz	RBW = 120 kHz	RBW = 1 MHz
VBW = 30 kHz	VBW = 500 kHz	VBW = 3 MHz
Sweep time = Auto	Sweep time = Auto	Sweep time = Auto
Detector = PK, QP	Detector = PK, QP	Detector = PK, AV
Antenna Height 1m	Antenna Height 1-4m	Antenna Height 1-4m

Diagram 2 Test arrangement for radiated emissions tested on Open Area Test Site (OATS)

Test Site Locations

Conducted EMI The AC power line conducted emissions testing performed in a shielded screen room located at Rogers Labs, Inc., 4405 W. 259th Terrace, Louisburg, KS

Radiated EMI The radiated emissions tests were performed at the 3 meters, Open Area Test Site (OATS) located at Rogers Labs, Inc., 4405 W. 259th Terrace, Louisburg, KS

Site Registration Refer to Annex for Site Registration Letters

NVLAP Accreditation Lab code 200087-0

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IC: 20819-3591
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Date: March 21, 2016
Page 10 of 25

List of Test Equipment

A Rohde and Schwarz ESU40 and/or Hewlett Packard 8591EM was used as the measuring device for the emissions testing of frequencies below 1 GHz. A Rohde and Schwarz ESU40 and/or Hewlett Packard 8562A Spectrum Analyzer was used as the measuring device for testing the emissions at frequencies above 1 GHz. The analyzer settings used are described in the following table. Refer to the appendix for a complete list of test equipment.

AC Line Conducted Emissions (0.150 -30 MHz)		
RBW	AVG. BW	Detector Function
9 kHz	30 kHz	Peak / Quasi Peak
Emissions (30-1000 MHz)		
RBW	AVG. BW	Detector Function
120 kHz	300 kHz	Peak / Quasi Peak
Emissions (Above 1000 MHz)		
RBW	Video BW	Detector Function
100 kHz	100 kHz	Peak
1 MHz	1 MHz	Peak / Average

Equipment	Manufacturer	Model (SN)	Band	Cal Date	Due
<input type="checkbox"/> LISN	FCC	FCC-LISN-50-2-10(1PA) (160611)	.15-30MHz	6/15	5/16
<input checked="" type="checkbox"/> Cable	Time Microwave	750HF290-750 (L10M)	9kHz-40 GHz	10/14	10/15
<input type="checkbox"/> Cable	Belden	RG-58 (L1-CAT3-11509)	9kHz-30 MHz	10/14	10/15
<input type="checkbox"/> Cable	Belden	RG-58 (L2-CAT3-11509)	9kHz-30 MHz	10/14	10/15
<input type="checkbox"/> Antenna	ARA	BCD-235-B (169)	20-350MHz	10/14	10/15
<input type="checkbox"/> Antenna	EMCO	3147 (40582)	200-1000MHz	10/14	10/15
<input checked="" type="checkbox"/> Antenna	ETS-Lindgren	3117 (200389)	1-18 GHz	5/15	5/17
<input type="checkbox"/> Antenna	Com Power	AH-118 (10110)	1-18 GHz	10/14	10/16
<input type="checkbox"/> Antenna	Com Power	AH-840 (101046)	18-40 GHz	5/15	5/17
<input checked="" type="checkbox"/> Antenna	EMCO	6509 (9502-1374)	.001-30 MHz	10/14	10/15
<input checked="" type="checkbox"/> Antenna	Sunol	JB-6 (A100709)	30-1000 MHz	10/14	10/15
<input type="checkbox"/> Antenna	EMCO	3143 (9607-1277)	20-1200 MHz	5/15	5/16
<input type="checkbox"/> Analyzer	HP	8591EM (3628A00871)	9kHz-1.8GHz	5/15	5/16
<input type="checkbox"/> Analyzer	HP	8562A (3051A05950)	9kHz-110GHz	5/15	5/16
<input type="checkbox"/> Analyzer	HP External Mixers	11571, 11970	25GHz-110GHz	5/15	5/16
<input checked="" type="checkbox"/> Analyzer	Rohde & Schwarz	ESU40 (100108)	20Hz-40GHz	5/15	5/16
<input checked="" type="checkbox"/> Amplifier	Com-Power	PA-010 (171003)	100Hz-30MHz	10/14	10/15
<input checked="" type="checkbox"/> Amplifier	Com-Power	CPPA-102 (01254)	1-1000 MHz	10/14	10/15
<input checked="" type="checkbox"/> Amplifier	Com-Power	PAM-118A (551014)	0.5-18 GHz	10/14	10/15

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 Page 11 of 25

Environmental Conditions

Ambient Temperature 22.6° C

Relative Humidity 36%

Atmospheric Pressure 1016.3 mb

Units of Measurements

Conducted EMI Data is in dB μ V; dB referenced to one microvolt

Radiated EMI Data is in dB μ V/m; dB/m referenced to one microvolt per meter

Sample Calculation:

RFS = Radiated Field Strength, FSM = Field Strength Measured

A.F. = Receive antenna factor, Gain = amplification gains and/or cable losses

RFS (dB μ V/m @ 3m) = FSM (dB μ V) + A.F. (dB/m) - Gain (dB)

Statement of Modifications and Deviations

No modifications to the EUT were required for the unit to demonstrate compliance with the 47CFR Part 15C and RSS-210 and Industry Canada RSS-GEN emission requirements. There were no deviations to the specifications.

Intentional Radiators

As per 47CFR, Subpart C, paragraph 15.249 and Industry Canada RSS-GEN Issue 4, and RSS-210 Issue 8 the following information is submitted.

Antenna Requirements

The EUT incorporates permanently attached internal antenna system and offers no provision for replacement. The antenna connection point complies with the unique antenna connection requirements.

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Page 12 of 25

Restricted Bands of Operation

Spurious emissions falling in the restricted frequency bands of operation were measured at a distance of three meters on the OATS. The EUT utilizes frequency determining circuitry, which generates harmonics falling in the restricted bands. Emissions were measured at the OATS, using appropriate antennas or pyramidal horns, amplification stages, and a spectrum analyzer. Emissions emanating from the support computer system in the restricted bands of operation are presented in Table 1. Emissions emanating from the transmitter module in restricted bands of operation are presented in Table 2. No other significant emission was observed which fell into the restricted bands of operation.

Table 1 Radiated Emissions in Restricted Bands

Frequency in MHz	Horizontal Peak (dB μ V/m)	Horizontal Quasi-Peak (dB μ V/m)	Horizontal Average (dB μ V/m)	Vertical Peak (dB μ V/m)	Vertical Quasi-Peak (dB μ V/m)	Vertical Average (dB μ V/m)	Limit @ 3m (dB μ V/m)
1833.9	52.7	N/A	49.1	51.1	N/A	44.6	54.0
2750.8	50.7	N/A	44.6	48.4	N/A	40.9	54.0
4584.7	42.7	N/A	29.5	42.7	N/A	29.5	54.0
5501.6	44.1	N/A	31.3	44.3	N/A	30.9	54.0

Other emissions present had amplitudes at least 20 dB below the limit.

Quasi-Peak amplitude emissions are recorded above for frequency range of 30-1000 MHz.
 Average amplitude emissions are recorded above for frequency range above 1000 MHz.

Summary of Results for Radiated Emissions in Restricted Bands

The EUT demonstrated compliance with the radiated emissions requirements of 47CFR Part 15C and RSS-210 Intentional Radiators. The EUT transmitter demonstrated a minimum margin of -4.9 dB below the requirements. Peak, Quasi-peak, and average amplitudes were checked for compliance with the regulations. Worst-case emissions are reported with other emissions found in the restricted frequency bands at least 20 dB below the requirements.

General Radiated EMI Testing Procedure

The EUT was arranged in the test configuration emulating worst-case equipment configuration and operated through available modes. Preliminary testing was performed in a screen room with the EUT positioned 1 meter from the FSM. Investigations were performed to identify the frequencies, which produced the highest radiated emissions. Radiated emission investigations were performed from 9 kHz to 10,000 MHz with the EUT positioned in three orthogonal axes per regulations. Frequencies of interest were recorded for use during testing on the OATS. Each investigated emission was then maximized at the OATS site before final radiated emissions measurements were performed. Final data was taken with the EUT located at the open area test site at a distance of 3 meters between the EUT and the receiving antenna. Peak and average amplitudes of frequencies above 1000 MHz were compared to the required limits with worst-case data presented below. Measured emission levels were maximized by EUT placement on the table, changing cable location, rotating the turntable through 360 degrees, varying the antenna height between 1 and 4 meters above the ground plane and changing antenna polarization between horizontal and vertical. Antennas used were Loop from 0.009 to 30 MHz, Broadband Biconical from 30 MHz to 200 MHz, Log Periodic from 200 MHz to 1 GHz, and/or Biconilog from 30 MHz to 1000 MHz, and above 1 GHz, Double Ridge or Pyramidal Horns, notch filters and appropriate amplifiers and mixers were utilized.

Table 2 General Radiated Emissions Data (worst-case)

Frequency in MHz	Horizontal Peak (dB μ V/m)	Horizontal Quasi-Peak (dB μ V/m)	Horizontal Average (dB μ V/m)	Vertical Peak (dB μ V/m)	Vertical Quasi-Peak (dB μ V/m)	Vertical Average (dB μ V/m)	Limit @ 3m (dB μ V/m)
1833.9	52.7	N/A	49.1	51.1	N/A	44.6	54.0
2750.8	50.7	N/A	44.6	48.4	N/A	40.9	54.0
4584.7	42.7	N/A	29.5	42.7	N/A	29.5	54.0
5501.6	44.1	N/A	31.3	44.3	N/A	30.9	54.0

Other emissions present had amplitudes at least 20 dB below the limit.

Quasi-Peak amplitude emissions are recorded above for frequency range of 30-1000 MHz.

Average amplitude emissions are recorded above for frequency range above 1000 MHz.

Summary of Results for General Radiated Emissions

The EUT demonstrated compliance with the general radiated emissions requirements of 47CFR Part 15C. The EUT demonstrated a minimum margin of -4.9 dB below general radiated emissions requirements. There are no other significantly measurable emissions in the restricted bands other than those recorded in this report. Other emissions were present with amplitudes at least 20 dB below the requirements.

Operation in the Band 902 – 928 MHz

The transmitter output power; harmonic and general emissions were measured on an open area test site @ 3 meters. The EUT was placed on a turntable elevated as required above the ground plane and at a distance of 3 meters from the FSM antenna. The table permitted orientation of the EUT in each of three orthogonal axis positions during testing. The peak and quasi-peak amplitude of frequencies below 1000 MHz were measured using a spectrum analyzer. The peak and average amplitude of frequencies above 1000 MHZ were measured using a spectrum analyzer. The amplitude of each emission was then recorded from the analyzer display. Emissions radiated outside of the specified bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits, whichever is the lesser attenuation. Plots were taken of transmitter performance for reference in this and other documentation. Refer to figures one through four showing plots taken of the 902-928 MHz performance displaying compliance with the specifications. The amplitude of each radiated emission was measured on the OATS at a distance of 3 meters from the FSM antenna. The amplitude of each radiated emission was maximized by equipment placement (orientation in three orthogonal axes), raising, and lowering the FSM antenna, changing the antenna polarization, and by rotating the turntable by varying the FSM antenna height, polarization, and by rotating the turntable. A Loop antenna was used for measuring emissions from 0.009 to 30 MHz, Biconilog Antenna for 30 to 1000 MHz, Double-Ridge, and/or Pyramidal Horn Antennas from 1 GHz to 25 GHz. Emissions were measured in dB μ V/m @ 3 meters.

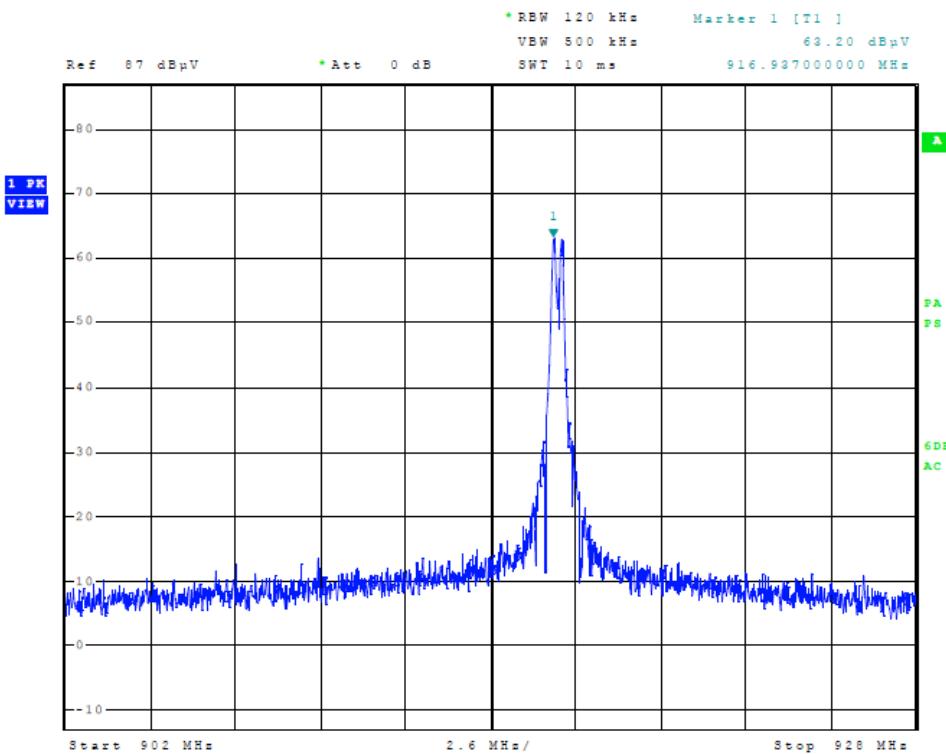


Figure 1 Plot of Transmitter Emissions (In 902-928 MHz Frequency Band)

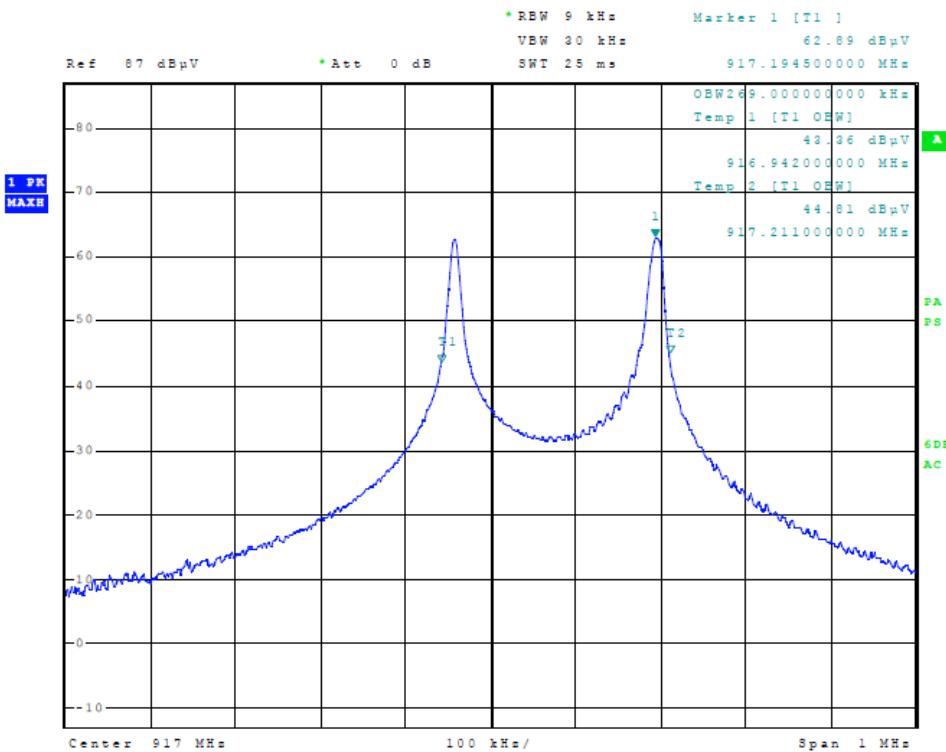


Figure 2 Plot of Transmitter Emissions (902-928 MHz, 99% Occupied Bandwidth)

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Page 17 of 25

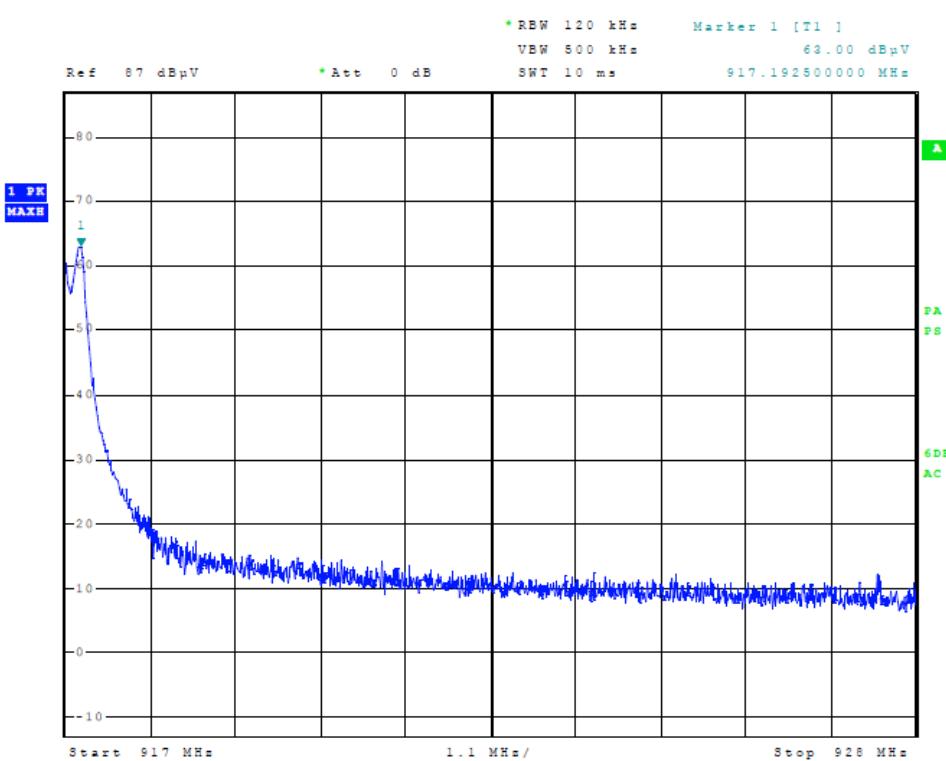
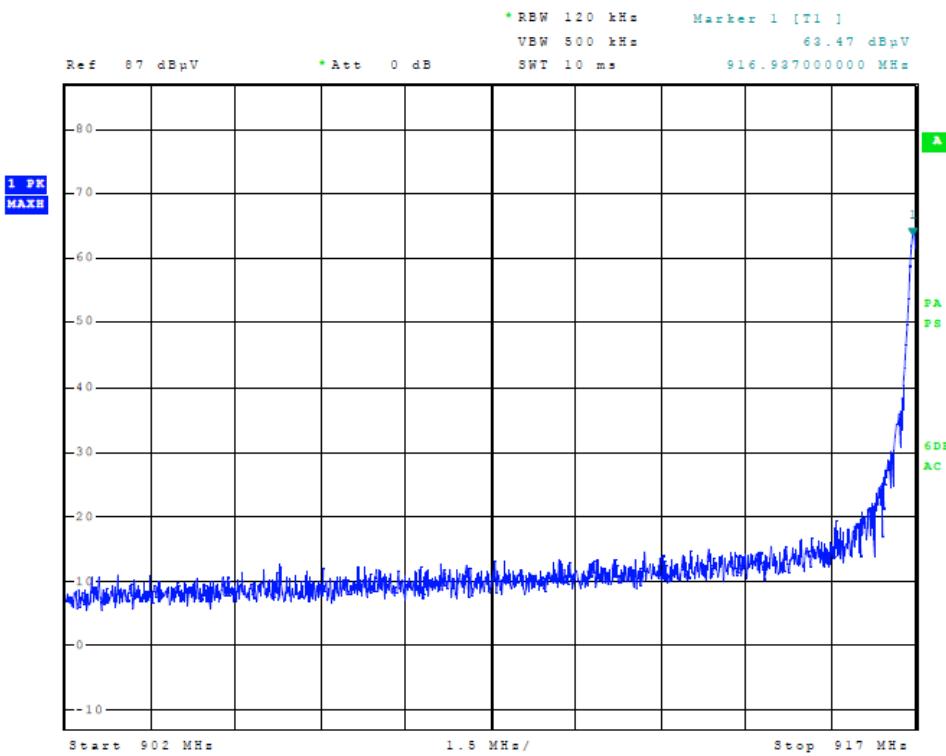


Figure 4 Plot of Transmitter Emissions (High Band Edge)

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Page 18 of 25

Transmitter Emissions Data

Table 3 Transmitter Radiated Emission Data

Frequency in MHz	Horizontal Peak (dB μ V/m)	Horizontal Quasi-Peak (dB μ V/m)	Horizontal Average (dB μ V/m)	Vertical Peak (dB μ V/m)	Vertical Quasi-Peak (dB μ V/m)	Vertical Average (dB μ V/m)	Limit @ 3m (dB μ V/m)
916.9	83.0	82.9	N/A	79.3	79.1	N/A	94
1833.9	52.7	N/A	49.1	51.1	N/A	44.6	54.0
2750.8	50.7	N/A	44.6	48.4	N/A	40.9	54.0
3667.8	43.3	N/A	29.5	42.9	N/A	29.3	54.0
4584.7	42.7	N/A	29.5	42.7	N/A	29.5	54.0
5501.6	44.1	N/A	31.3	44.3	N/A	30.9	54.0
6418.6	43.9	N/A	30.9	44.3	N/A	30.9	54.0

Other emissions present had amplitudes at least 20 dB below the limit.

Quasi-Peak amplitude emissions are recorded above for frequency range of 30-1000 MHz.

Average amplitude emissions are recorded above for frequency range above 1000 MHz.

Summary of Results for Radiated Emissions of Intentional Radiator

The EUT demonstrated a minimum radiated emission margin of -4.9 dB below the restricted emissions requirements. The EUT tested was observed in compliance with the radiated emissions requirements of 47CFR Part 15.249 and Industry Canada RSS-210 Intentional Radiators. There were no other significantly measurable emissions observed in restricted bands other than those recorded in this report. Other emissions were present with amplitudes at least 20 dB below the requirements. There were no deviations or exceptions to the requirements.

Annex

- Annex A Measurement Uncertainty Calculations
- Annex B Rogers Labs Test Equipment List
- Annex C Rogers Qualifications
- Annex D FCC Site Registration Letter
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Page 20 of 25

Annex A Measurement Uncertainty Calculations

Measurement uncertainty calculations were made for the laboratory. Result of measurement uncertainty calculations are recorded below for AC line conducted and radiated emission measurements.

Measurement Uncertainty	U _(E)	U _(lab)
3 Meter Horizontal 30-200 MHz Measurements	2.08	4.16
3 Meter Vertical 30-200 MHz Measurements	2.16	4.33
3 Meter Vertical Measurements 200-1000 MHz	2.99	5.97
10 Meter Horizontal Measurements 30-200 MHz	2.07	4.15
10 Meter Vertical Measurements 30-200 MHz	2.06	4.13
10 Meter Horizontal Measurements 200-1000 MHz	2.32	4.64
10 Meter Vertical Measurements 200-1000 MHz	2.33	4.66
3 Meter Measurements 1-6 GHz	2.57	5.14
3 Meter Measurements 6-18 GHz	2.58	5.16
AC Line Conducted	1.72	3.43

Annex B Rogers Labs Test Equipment List

List of Test Equipment	Calibration	<u>Date</u>	<u>Due</u>
Spectrum Analyzer: Rohde & Schwarz ESU40		5/15	5/16
Spectrum Analyzer: HP 8562A, HP Adapters: 11518, 11519, and 11520		5/15	5/16
Mixers: 11517A, 11970A, 11970K, 11970U, 11970V, 11970W			
Spectrum Analyzer: HP 8591EM		5/15	5/16
Antenna: EMCO Biconilog Model: 3143		5/15	5/16
Antenna: Sunol Biconilog Model: JB6		10/14	10/15
Antenna: EMCO Log Periodic Model: 3147		10/14	10/15
Antenna: Com Power Model: AH-118		10/14	10/16
Antenna: Com Power Model: AH-840		5/15	5/17
Antenna: Antenna Research Biconical Model: BCD 235		10/14	10/15
Antenna: EMCO 6509		10/14	10/15
LISN: Compliance Design Model: FCC-LISN-2.Mod.cd, 50 μ Hy/50 ohm/0.1 μ f		10/14	10/15
R.F. Preamp CPPA-102		10/14	10/15
Attenuator: HP Model: HP11509A		10/14	10/15
Attenuator: Mini Circuits Model: CAT-3		10/14	10/15
Attenuator: Mini Circuits Model: CAT-3		10/14	10/15
Cable: Belden RG-58 (L1)		10/14	10/15
Cable: Belden RG-58 (L2)		10/14	10/15
Cable: Belden 8268 (L3)		10/14	10/15
Cable: Time Microwave: 4M-750HF290-750		10/14	10/15
Cable: Time Microwave: 10M-750HF290-750		10/14	10/15
Frequency Counter: Leader LDC825		2/15	2/16
Oscilloscope Scope: Tektronix 2230		2/15	2/16
Wattmeter: Bird 43 with Load Bird 8085		2/15	2/16
Power Supplies: Sorenson SRL 20-25, SRL 40-25, DCR 150, DCR 140		2/15	2/16
R.F. Generators: HP 606A, HP 8614A, HP 8640B		2/15	2/16
R.F. Power Amp 65W Model: 470-A-1010		2/15	2/16
R.F. Power Amp 50W M185- 10-501		2/15	2/16
R.F. Power Amp A.R. Model: 10W 1010M7		2/15	2/16
R.F. Power Amp EIN Model: A301		2/15	2/16
LISN: Compliance Eng. Model 240/20		2/15	2/16
LISN: Fischer Custom Communications Model: FCC-LISN-50-16-2-08		2/15	2/16
Antenna: EMCO Dipole Set 3121C		2/15	2/16
Antenna: C.D. B-101		2/15	2/16
Antenna: Solar 9229-1 & 9230-1		2/15	2/16
Audio Oscillator: H.P. 201CD		2/15	2/16
ELGAR Model: 1751		2/15	2/16
ELGAR Model: TG 704A-3D		2/15	2/16
ESD Test Set 2010i		2/15	2/16
Fast Transient Burst Generator Model: EFT/B-101		2/15	2/16
Field Intensity Meter: EFM-018		2/15	2/16
KEYTEK Ecat Surge Generator		2/15	2/16
Shielded Room 5 M x 3 M x 3.0 M			

Annex C Rogers Qualifications

Scot D. Rogers, Engineer

Rogers Labs, Inc.

Mr. Rogers has approximately 17 years' experience in the field of electronics. Engineering experience includes six years in the automated controls industry and remaining years working with the design, development and testing of radio communications and electronic equipment.

Positions Held

Systems Engineer: A/C Controls Mfg. Co., Inc. 6 Years

Electrical Engineer: Rogers Consulting Labs, Inc. 5 Years

Electrical Engineer: Rogers Labs, Inc. Current

Educational Background

- 1) Bachelor of Science Degree in Electrical Engineering from Kansas State University.
- 2) Bachelor of Science Degree in Business Administration Kansas State University.
- 3) Several Specialized Training courses and seminars pertaining to Microprocessors and Software programming.

Scot D Rogers

Scot D. Rogers

Annex D FCC Site Registration Letter

FEDERAL COMMUNICATIONS COMMISSION

Laboratory Division

7435 Oakland Mills Road

Columbia, MD 21046

April 16, 2015

Registration Number: 90910

Rogers Labs, Inc.
4405 West 259th Terrace
Louisburg, KS 66053

Attention: Scot Rogers,

Re: Measurement facility located at Louisburg

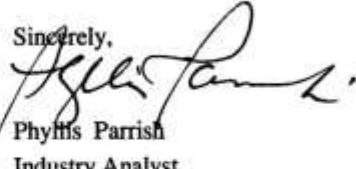
3 & 10 meter site

Date of Renewal: April 16, 2015

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.

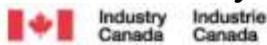
Measurement facilities that have indicated that they are available to the public to perform measurement services on a fee basis may be found on the FCC website www.fcc.gov under E-Filing, OET Equipment Authorization Electronic Filing, Test Firms.

Sincerely,

Phyllis Parrish
Industry Analyst

Rogers Labs, Inc.
4405 W. 259th Terrace
Louisburg, KS 66053
Phone/Fax: (913) 837-3214
Revision 2

rfCycle, LLC
Model: CU-01
Test #: 150930
Test to: 47CFR (15.2479, RSS-210
File: rfCycle CU01 TstRpt 150930 r2

FCC ID: 2AFH3-1333101
IC: 20819-3591
SN: FCC
Date: March 21, 2016
Page 24 of 25

Annex E Industry Canada Site Registration Letter

June 08, 2015

OUR FILE: 46405-3041
Authorization No: 010277847-001

Rogers Labs Inc.
4405 West 259th Terrace
Louisburg, KS
USA
66053

Attention: Mr. Scot D. Rogers

Dear Sir:

The Bureau has received your application for the renewal of 3m OATS. Be advised that the information received was satisfactory to Industry Canada. The following number(s) is now associated to the site(s) for which registration / renewal was sought (**Site# 3041A-1**). Please reference the appropriate site number in the body of test reports containing measurements performed on the site. In addition, please keep for your records the following information;

- The company address code associated to the site(s) located at the above address is: **3041A**

Furthermore, to obtain or renew a unique site number, the applicant shall demonstrate that the site has been accredited to ANSI C63.4-2009 or later. A scope of accreditation indicating the accreditation by a recognized accreditation body to ANSI C63.4-2009 or later shall be accepted. Please indicate in a letter the previous assigned site number if applicable and the type of site (example: 3 metre OATS or 3 metre chamber). If the test facility is not accredited to ANSI C63.4-2009 or later, the test facility shall submit test data demonstrating full compliance with the ANSI standard. The Bureau will evaluate the filing to determine if recognition shall be granted.

The frequency for re-validation of the test site and the information that is required to be filed or retained by the testing party shall comply with the requirements established by the accrediting organization. However, in all cases, test site re-validation shall occur on an interval not to exceed **three years**. There is no fee or form associated with an OATS filing. OATS submissions are encouraged to be submitted electronically to the Bureau using the following URL; http://strategis.ic.gc.ca/epic/internet/inceb-bhst.nsf/en/h_tt00052e.html.

If you have any questions, you may contact the Bureau by e-mail at certification.bureau@ic.gc.ca Please reference our file and submission number above for all correspondence.

Yours sincerely,

A handwritten signature in black ink that reads "Bill Payn".

Bill Payn
For: Wireless Laboratory Manager
Certification and Engineering Bureau
3701 Carling Ave., Building 94
P.O. Box 11490, Station AHE
Ottawa, Ontario K2H 8S2
Email: certification.bureau@ic.gc.ca

Rogers Labs, Inc.
4405 W. 259th Terrace
Louisburg, KS 66053
Phone/Fax: (913) 837-3214
Revision 2

rfCycle, LLC
Model: CU-01
Test #: 150930
Test to: 47CFR (15.2479, RSS-210
File: rfCycle CU01 TstRpt 150930 r2

FCC ID: 2AFH3-1333101
IC: 20819-3591
SN: FCC
Date: March 21, 2016
Page 25 of 25