NVLAP Lab Code 200087-0

APPLICATION

For

GRANT OF CERTIFICATION

FOR

MODEL:
ASR Remote 01101650
Low Power Transmitter

FCC ID: IPH-01129
IC: 1792A-01129

FOR

GARMIN INTERNATIONAL, INC.

1200 East 151st Street
Olathe, KS 66062

Test Report number 071012

Authorized Signatory: Scot D Rogers
Scot D. Rogers

NVLAP Lab Code 200087-0

ROGERS LABS, INC.

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

TEST REPORT

For

APPLICATION of CERTIFICATION

For

GARMIN INTERNATIONAL, INC.

1200 East 151st Street
Olathe, KS 66062
Phone: (913) 397-8200

Mr. Van Ruggles
Director of Quality Assurance

Model: ASR Remote 01101650

Low Power Transmitter
Frequency: 2460 MHz

FCC ID: IPH-01129
IC: 1792A-01129

Test Report Number: 071012

Test Date: October 12, 2007

Authorized Signatory: Scot D Rogers

Scot D. Rogers
ROGERS LABS, INC.
4405 West 259th Terrace
Louisburg, KS 66053
Telephone: (913) 837-3214
FAX: (913) 837-3214

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FORWARD

The following information is submitted for consideration in obtaining Grant of Certification for low power intentional radiator per CFR47 Paragraph 15.249, and Industry Canada RSS-210 Low Power Transmitter, operation in the 2400 – 2483.5 MHz band.

Name of Applicant: Garmin International, Inc.
1200 East 151st Street
Olathe, KS 66062

Model: ASR Remote 01101650
FCC ID: IPH-01129
Industry Canada ID: 1792A-01129
Frequency Range: 2460 MHz.

Operating Power: Less than 94 dBµV/m @ 3 meters required, measured 79.3 dBµV/m @ 3 meters), for operation in the 2400-2483.5 MHz.

Opinion / Interpretation of Results

Emissions Testing Standard Referenced	Results
Emissions per CFR47, 15C and RSS-210	Complies

Applicable Standards & Test Procedures

In accordance with the Federal Communications Commission, Code of Federal Regulations CFR47, dated October 1, 2006, Part 2, Subpart J, Paragraphs 2.907, 2.911, 2.913, 2.925, 2.926, 2.1031 through 2.1057, applicable parts of paragraph 15, Part 15C paragraph 15.249, and Industry Canada RSS-210, the following information is submitted.

Test procedures used are the established Methods of Measurement of Radio-Noise Emissions as described in the ANSI 63.4-2003 Document.

Equipment Tested

Equipment	Serial Number	FCC I.D.#	IC#
ASR Remote 01101650 (EUT)	2469CW/MOD	IPH-01129	1792A-01129

List of Test Equipment

A Hewlett Packard 8591EM and or 8562A Spectrum Analyzer was used as the measuring device for the emissions testing. The analyzer settings used are described in the following table. Refer to the Appendix for a complete list of Test Equipment.

HP 8591EM SPECTRUM ANALYZER SETTINGS		
CONDUCTED EMISSIONS		
RBW	AVG. BW	DETECTOR FUNCTION
9 kHz	30 kHz	Peak/Quasi Peak
RADIATED EMISSIONS (30 – 1000 MHz)		
RBW	AVG. BW	DETECTOR FUNCTION
120 kHz	300 kHz	Peak/Quasi Peak
HP 8562A SPECTRUM ANALYZER SETTINGS		
RADIATED EMISSIONS (1 – 40 GHz)		
RBW	AVG. BW	DETECTOR FUNCTION
1 MHz	1 MHz	Peak/Average
ANTENNA CONDUCTED EMISSIONS		
RBW	AVG. BW	DETECTOR FUNCTION
120 kHz	300 kHz	Peak

EQUIPMENT	MFG.	MODEL	CAL. DATE	DUE.
LISN	Comp. Design	FCC-LISN-2-MOD.CD	10/06	10/07
LISN	Comp. Design	1762	2/07	2/08
Antenna	ARA	BCD-235-B	10/06	10/07
Antenna	EMCO	3147	10/06	10/07
Antenna	EMCO	3143	5/07	5/08
Analyzer	HP	8591EM	5/07	5/08
Analyzer	HP	8562A	2/07	2/08

Environmental Conditions

Ambient Temperature	22.3° C
Relative Humidity	55%
Atmospheric Pressure	30.02 in Hg

2.1033(b) Application for Certification

(1) Manufacturer: GARMIN INTERNATIONAL, INC.
1200 East 151st Street
Olathe, KS 66062
Telephone: (913) 397-8200

(2) Identification: FCC I.D.: IPH-01129 IC: 1792A-01129

(3) Copy of the installation and operating manual: Refer to exhibit for Draft Instruction Manual.

(4) Description of Circuit Functions, Device Operation: The ASR Remote 01101650 is a low power Transmitter. This device features operation in the 2400-2483.5 MHz frequency band. Refer to exhibits for detailed circuit information.

(5) Block Diagram with Frequencies: Refer to exhibit for the Block Diagram

(6) Report of measurements showing compliance with the pertinent FCC/IC technical requires are provided in this report.

(7) Photographs of equipment are provided in application exhibits.

(8) Peripheral equipment or accessories for the equipment. No optional equipment required or available for the EUT to function as designed.

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

(10) The equipment is not a scanning receiver.

(11) The equipment is not a transmitter operating in the 59-64 GHz frequency range.

Equipment and Cable Configuration

Test Setup

The ASR Remote 01101650 is a data transmitter sending control code to remote receivers allowing short-range communications in the 2400-2483.5 MHz band. The device was designing to be mounted allowing for single-handed operation. The EUT was arranged in all typical user equipment configurations during testing. The transmitter offers no other interface connections than those in the configuration options shown below. The EUT is powered from internal batteries only. As requested by the manufacturer and required by the regulations, the unit 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 Function and Testing Procedures

The EUT is a low power transmitter with operation capability in the 2400-2483.5 MHz frequency band (CFR47 15.249 and RSS-210). The unit allows communications to other compliant receivers.

Configuration options for the EUT

Configuration options for the EUT

1. ASR Remote 01101650 Transmitter functioning using test software

EUT

AC Line Conducted Emission Test Procedure

The equipment operates from internal batteries only and offers no other interfacing option for power. Therefore, no AC line conducted emissions was required for certification. The equipment complies with AC Line conducted emission requirements as presented.

Radiated Emission Test Procedure

Testing for the radiated emissions was performed as defined in sections 8.3 and 13.1 of ANSI C63.4. The EUT was arranged in the test configurations as shown above and placed on a rotating 1 x 1.5-meter wooden platform 0.8 meters above the ground plane at a distance of 3 meters from the FSM antenna. 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 final data was taken using a spectrum analyzer. Refer to photographs in exhibits for EUT placement used during testing.

Units of Measurements

Conducted EMI: Data is in dBµV; dB referenced to one microvolt.

Radiated EMI: Data is in dBµV/m; dB/m referenced to one microvolt per meter.

Radiated Emissions Calculations:

Note: The limit is expressed for a measurement in dBµV/m when the measurement is taken at a distance of 3 meters. Data was taken for this report at a distance of 3 meters. Radiated Field Strength was then calculated using the equation below

$$\text{dBµV/m @ 3m} = \text{FSM(dBµV)} + \text{A.F.(dB/m)} - \text{Amp Gain(dB)}$$

$$\text{dBµV/m @ 3m} = 27.6 + 32.7 - 30$$

$$= 30.3$$

Test Site Locations

Conducted EMI: ROGERS LABS, INC. located at 4405 W. 259th Terrace, Louisburg, KS.

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

Site Approval: Refer to Appendix for FCC Site Registration Letter, Reference 90910, and Industry Canada Site Registration Letter Reference IC 3041-1.

Intentional Radiators

As per CFR47 Part 15, Subpart C and RSS-210 the following information is submitted for consideration in obtaining a grant of certification for unlicensed intentional radiators.

Antenna Requirements

The unit is produced with a permanently attached antenna inside the sealed plastic case. No provisions for modification or alterations of the antenna configuration are available to the end user. A manufacturer supplied test sample with modified software allowing specific emissions testing of the transmitter was used for this and other compliance testing. The requirements of CFR47 15.203 are met there are no deviations or exceptions to the specification.

Restricted Bands of Operation

Spurious emissions falling in the restricted frequency bands of operation were measured at the OATS. The EUT utilizes frequency, determining circuitry, which generates harmonics falling in the restricted bands. Emissions were investigated at the OATS, using appropriate antennas, pyramidal horns, amplification stages, and a spectrum analyzer. Peak and average amplitudes of frequencies above 1000 MHz were compared to the required limits with worst-case data presented below. Test procedures of ANSI 63.4-2003 paragraphs 13.1 and 8.3.1.2 were used during testing. No other significant emission was observed which fell into the restricted bands of operation. Computed emission values take into account the received radiated field strength, receive antenna correction factor, amplifier gain stage, and test system cable losses.

Sample Calculations:

Radiated Field Strength (dBµV/m @ 3m) = FSM (dBµV) + A.F. (dB) - Gain (dB)

RFS = 27.6 + 32.7 - 30

RFS = 30.3

Radiated Emissions in Restricted Bands Data

Emission Frequency (MHz)	FSM Horz. (dBµV)	FSM Vert. (dBµV)	Ant. Factor (dB)	Amp. Gain (dB)	RFS Horz. @ 3m (dBµV/m)	RFS Vert. @ 3m (dBµV/m)	Limit @ 3m (dBµV/m)
2390.0	27.6	27.8	32.7	30	30.3	30.5	54.0
2483.5	27.5	28.0	33.3	30	30.8	31.3	54.0
4920.0	27.5	34.1	32.9	30	30.4	37.0	54.0
7380.0	27.8	28.0	36.7	30	34.5	34.7	54.0
12300.0	28.5	27.5	40.0	30	38.5	37.5	54.0

No other emissions found in the restricted bands.

Summary of Results for Radiated Emissions in Restricted Bands

The radiated emissions for the EUT meet the requirements for CFR47 Part 15.205 and RSS-210 restricted bands of operation. The EUT had a 12.2 dB minimum margin below the limits. Other emissions were present with amplitudes at least 20 dB below the required limits.

General Radiated emissions limits

General Radiated EMI Procedure

Test procedures of ANSI 63.4-2003 paragraphs 13.1 and 8.3.1.2 were used during radiated emissions testing. The EUT was arranged in all typical equipment configurations and operated through all of its various modes. Preliminary testing was performed in a screen room with the EUT positioned 1 meter from the FSM. Radiated emissions investigations were performed to identify the frequencies, which produced the highest emissions. Plots were made of the radiated emission frequency spectrum from 30 MHz to 22,000 MHz for the preliminary FM transmitter testing. Refer to figures one through seven showing the worst-case radiated emission spectrum displayed on the spectrum analyzer taken in a screen room. The each radiated emission measured was then maximized at the OATS site (open area test site) before final radiated emissions measurements were performed. Final data was taken with the EUT located at the OATS test site at a distance of 3 meters between the EUT and the receiving antenna. The frequency spectrum from 30 MHz to 25,000 MHz was searched for radiated emissions. 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 Broadband Biconical from 30 MHz to 200 MHz, Log Periodic from 200 MHz to 5 GHz, and/or Biconilog from 30 MHz to 1000 MHz, Double-Ridge horn and/or Pyramidal Horns from 5 GHz to 25 GHz, and amplification stages.

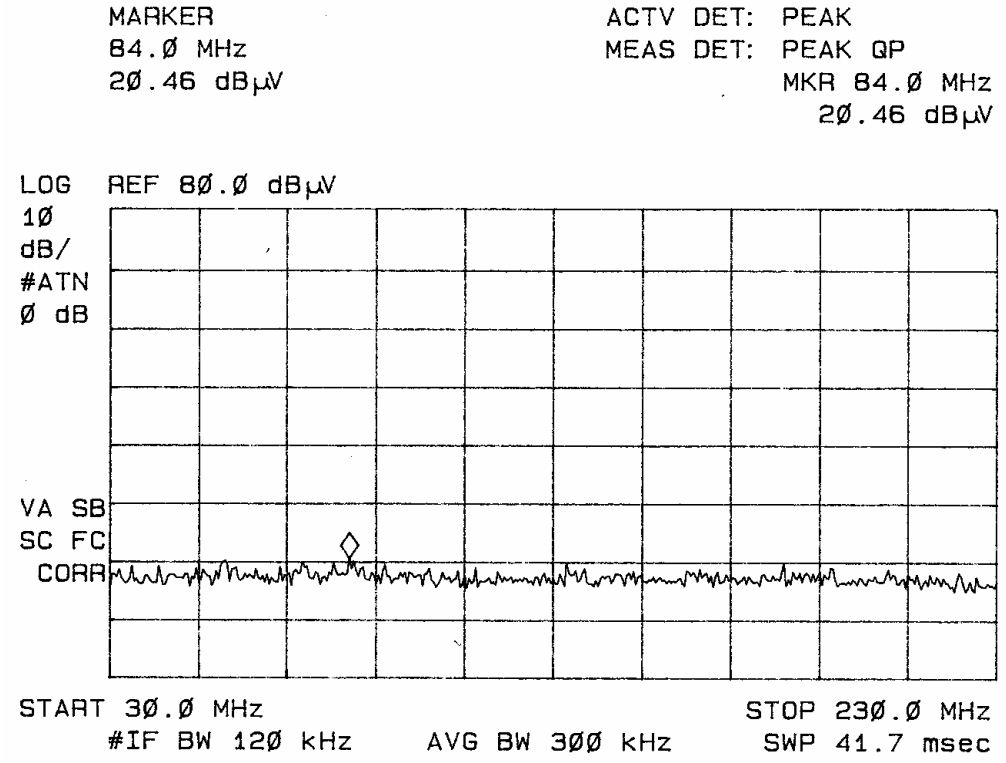


Figure one Radiated Emissions in screen room.

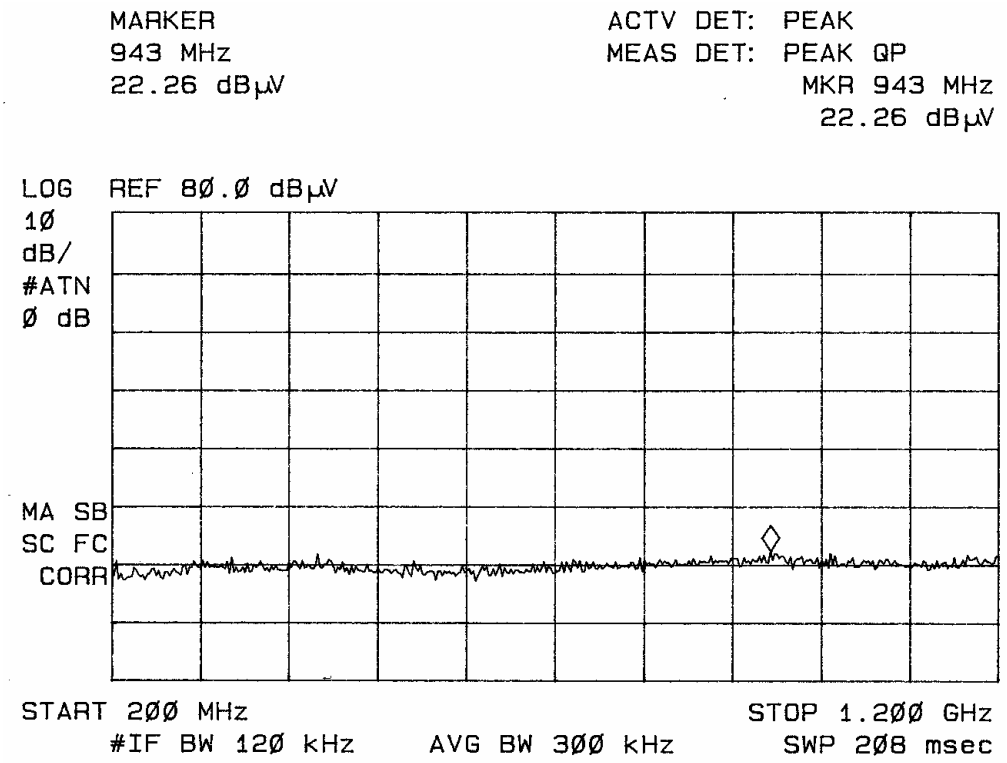


Figure two Radiated Emissions in screen room.

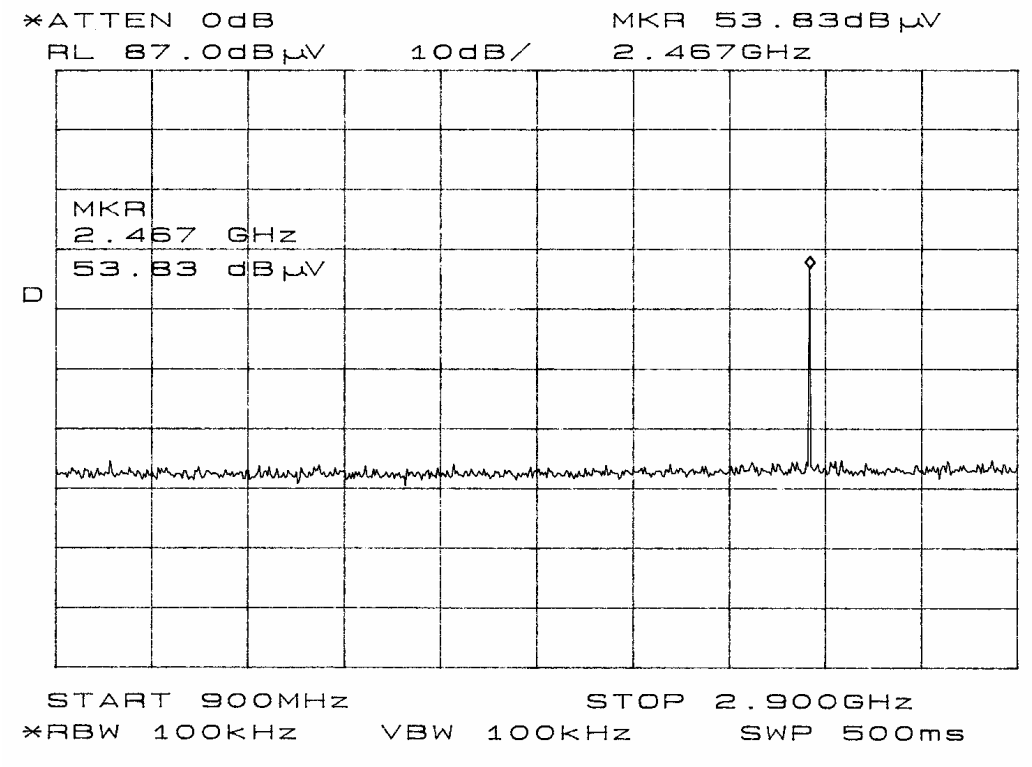


Figure three Radiated Emissions in screen room.

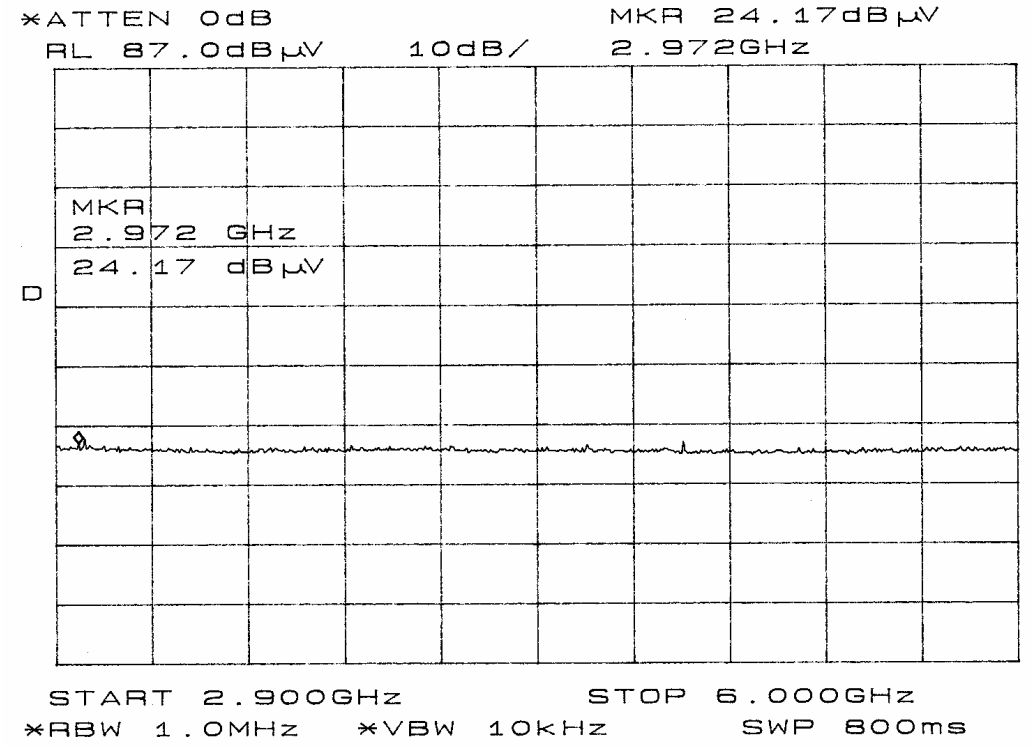


Figure four Radiated Emissions in screen room

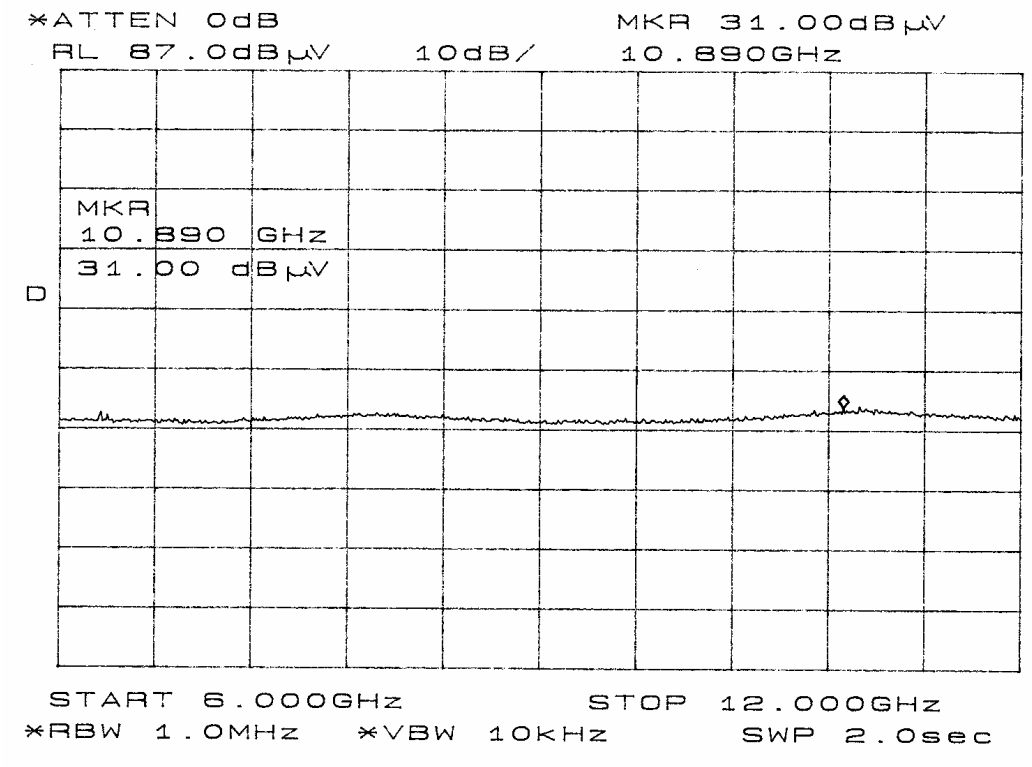


Figure five Radiated Emissions in screen room

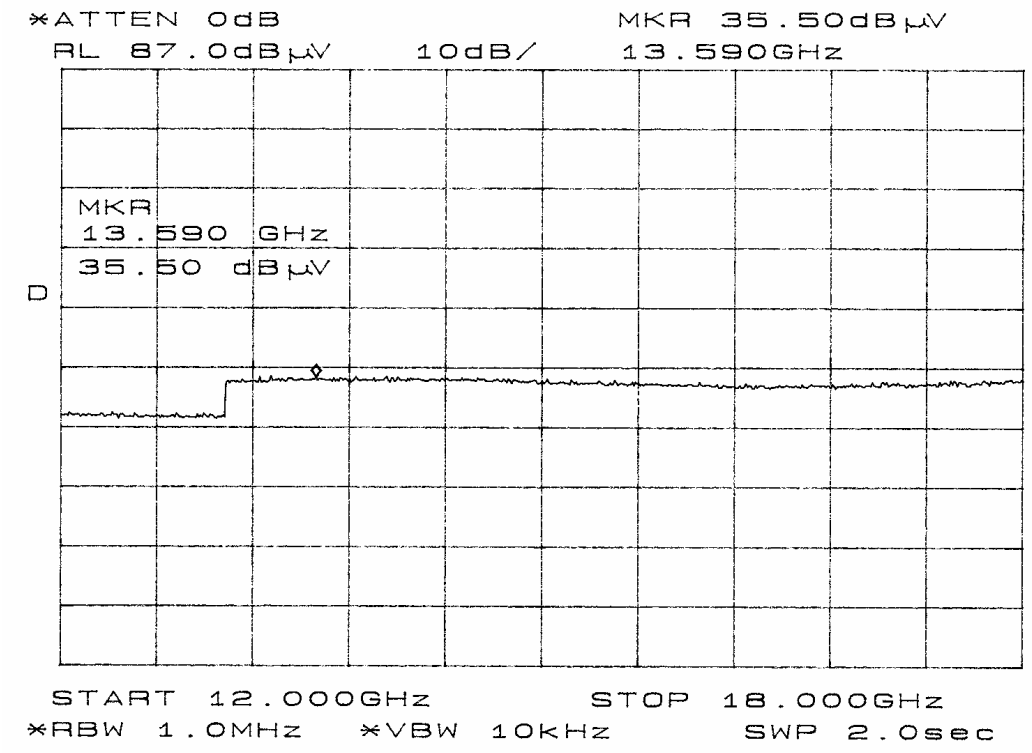


Figure six Radiated Emissions in screen room

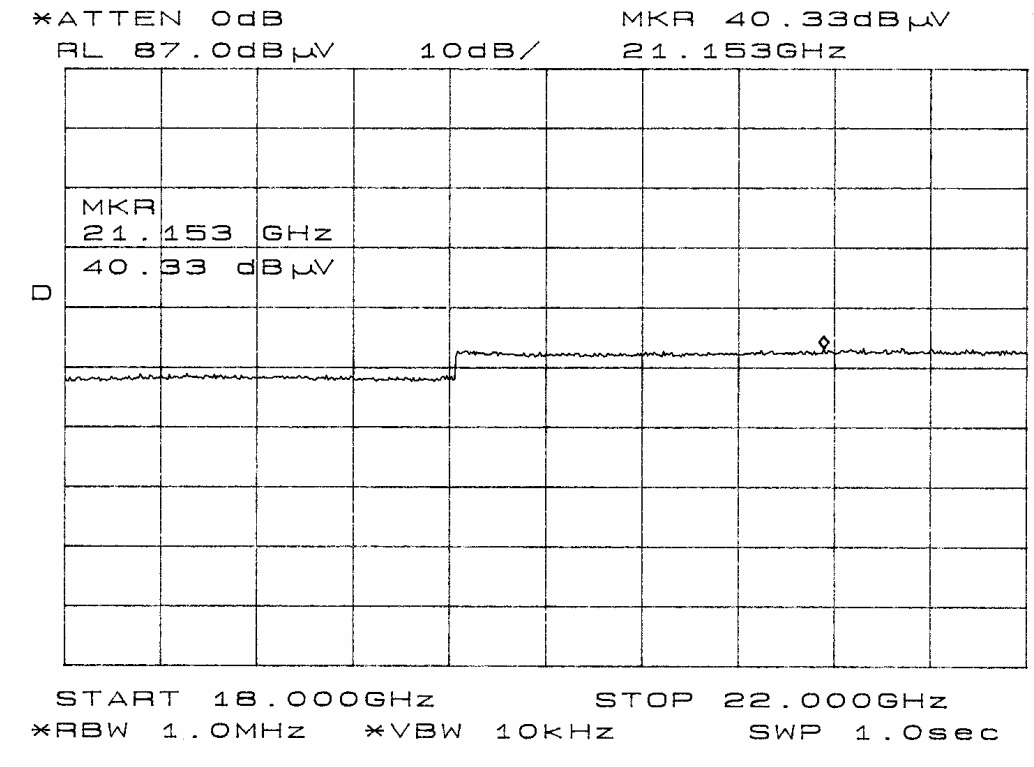


Figure seven Radiated Emissions in screen room

General Radiated Emissions Data

Emission Freq. (MHz)	FSM Horz. (dBµV)	FSM Vert. (dBµV)	Ant. Factor (dB)	Amp. Gain (dB)	RFS Horz. @ 3m (dBµV/m)	RFS Vert. @ 3m (dBµV/m)	Limit @ 3m (dBµV/m)

Other emissions were present with amplitudes at least 20 dB below limits.

Summary of Results for General Radiated Emissions

The radiated emissions for the EUT meet the requirements for CFR47 Part 15C, RSS-210, and other applicable standards for Intentional Radiators. No radiated emissions, other than those recorded, were found emanating from the EUT. The EUT had at least a 20 dB minimum margin below the limits. Other emissions present with amplitudes at least 20 dB below the FCC Limits.

Operation in the Band 2,400-2,483.5 MHz

Test procedures of ANSI 63.4-2003 paragraphs 13.1 and 8.3.1.2 were used during testing. The power output was measured on an open area test site @ 3 meters distance. The EUT was placed on a wooden turntable 0.8 meters above the ground plane and at a distance of 3 meters from the FSM antenna. 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 the 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 in CFR47 15.209 and/or Rss-210, whichever is the lesser attenuation. Refer to figures eight and nine showing the frequency and amplitude of emission displayed on the spectrum analyzer as taken in a screen room. The amplitude of each spurious emission was measured at the OATS at a distance of 3 meters from the FSM antenna. The amplitude of each radiated spurious emission was maximized by varying the FSM antenna height, polarization, and by rotating the turntable. A Biconilog Antenna was used for measuring emissions from 30 to 1000 MHz, a Log Periodic Antenna for 200 to 5000 MHz, and Double-ridge horn and/or Pyramidal Horn Antennas from 4 GHz to 25 GHz. Emissions were measured in dBµV/m @ 3 meters.

Sample calculation.

dBµV/m@ 3m = FSM + A.F. + cable loss - amplifier Gain

= 74.0 + 33.6 – 30 = 77.6

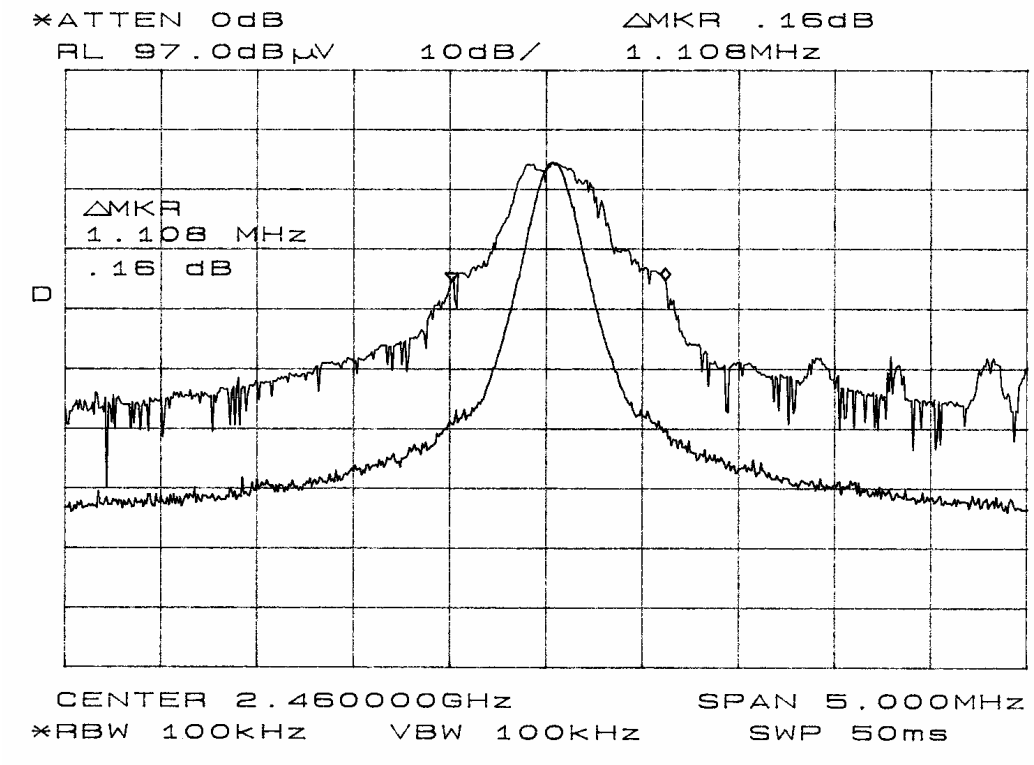


Figure eight 20-dB Occupied Bandwidth

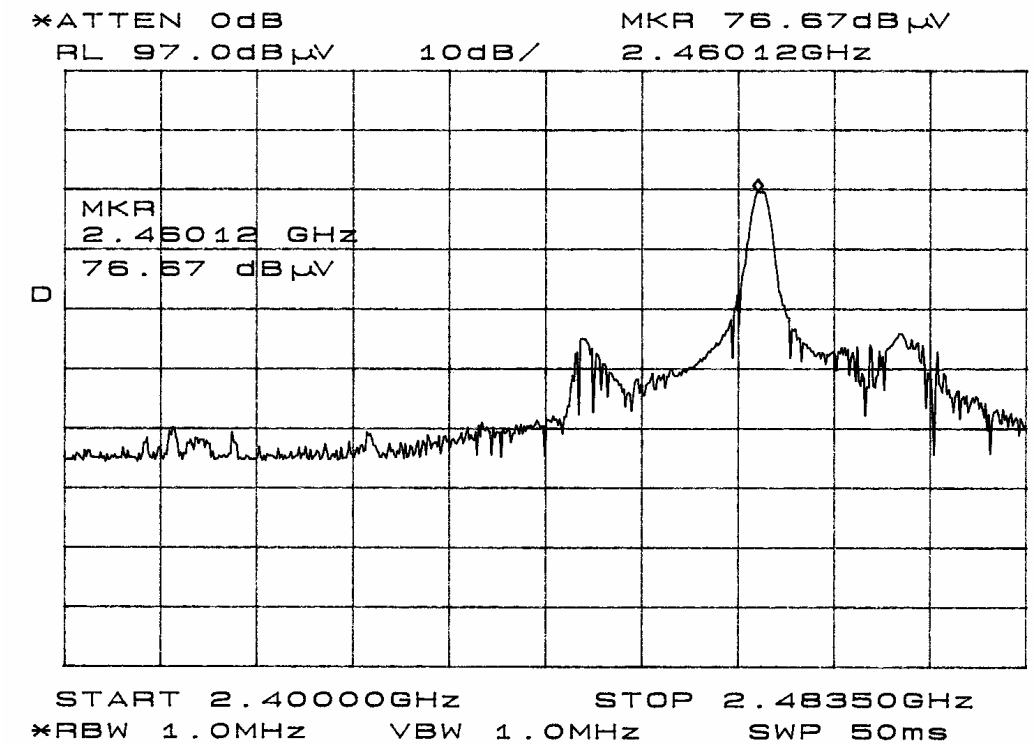


Figure nine in band Emissions

Transmitter Radiated Emissions Data

Emission Frequency (MHz) (polarization)	FSM Peak (dBµV)	FSM Average (dBµV)	Ant. Factor (dB)	Amp. Gain (dB)	RFS Peak @ 3m (dBµV/m)	RFS Average @ 3m (dBµV/m)	Limit @ 3m (ave) (dBµV/m)
2460.0 (Hor)	74.0	73.8	33.6	30	77.6	77.4	94.0
2460.0 (Vert)	75.7	75.5	33.6	30	79.3	79.1	94.0
4920.0 (Hor)	29.8	27.5	32.9	30	32.7	30.4	54.0
4920.0 (Vert)	35	34.1	32.9	30	37.9	37.0	54.0
7380.0 (Hor)	30.0	27.8	36.7	30	36.7	34.5	54.0
7380.0 (Vert)	29.8	28.0	36.7	30	36.5	34.7	54.0
9840.0 (Hor)	29.0	27.5	38.4	30	37.4	35.9	54.0
9840.0 (Vert)	28.8	27.7	38.4	30	37.2	36.1	54.0
12300.0 (Hor)	31.8	28.5	40.0	30	41.8	38.5	54.0
12010.0 (Vert)	29.3	27.5	40.0	30	39.3	37.5	54.0
14760.0 (Hor)	31.7	28.0	45.3	30	47.0	43.3	54.0
14760.0 (Vert)	30.2	28.7	45.3	30	45.5	44.0	54.0

Note: Levels measured @ 3-meter OATS site.

Power Obtained from Antenna Substitution Method

Frequency of Emission	Measured Peak Amplitude of EUT emission		Signal level to substitution antenna required to reproduce	
	Horizontal	Vertical	Horizontal	Vertical
(MHz)	dBµV	dBµV	dBm	dBm
2460.0	74.0	75.7	0.017	0.026

Summary of Results for Transmitter Radiated Emissions

The EUT had a peak amplitude emission of 25.2 dB margin below the average limit of CFR47 15.249 and RSS-210. The EUT had Peak harmonic emission amplitude of 14.7 dB and 14.5 dB average amplitude margin below the average limit of 15.249, and RSS-210. The radiated emissions for the EUT meet the requirements for FCC CFR47 Part 15.249, RSS-210, and other applicable standards for this Intentional Radiator. There are no 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 FCC Limits.

Statement of Modifications and Deviations

No modifications to the EUT were required for the unit to meet the CFR47 part 15C and Industry Canada RSS-210 emissions standards. There were no deviations to the specifications.

Frequency Stability

Measurements Required

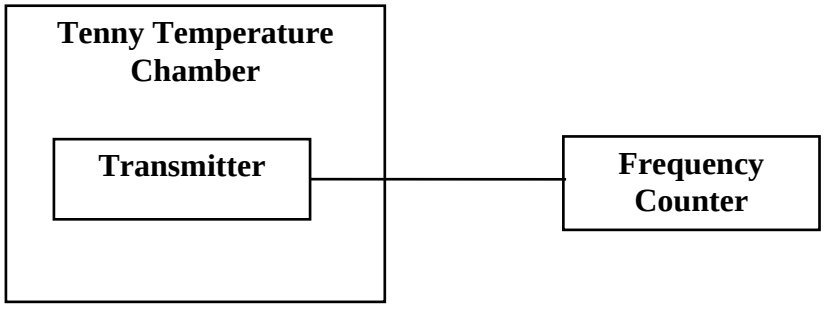
Temperature stability was measured for the operating temperature range and voltage variations of the unit and recorded. Test procedures used were those defined in ANSI 63.4-2003 paragraph 13.1.6.

(1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.

(2) For hand carried, batteries powered equipment, reduce primary supply voltage to the battery-operating end-point, which shall be specified by the manufacturer.

(3) The supply voltage shall be measured at the input to the cable normally provided with the equipment, or at the power supply terminals if cables are not normally provided.

Test Arrangement



The measurement procedure outlined below shall be followed:

Step 1: The transmitter shall be installed in an environmental test chamber whose temperature is controllable. Provision shall be made to measure the frequency of the transmitter.

Step 2: With the transmitter inoperative (power switched "OFF"), the temperature of the test chamber shall be adjusted to +25ºC. After a temperature stabilization period of one hour at +25ºC, the transmitter shall be switched "ON" with standard test voltage applied.

Step 3: The carrier shall be keyed "ON", and the transmitter shall be operated unmodulated at full radio frequency power output at the duty cycle for which it is rated,

for duration of at least 5 minutes. The radio frequency carrier frequency shall be monitored and measurements shall be recorded.

Step 4: The test procedures outlined in Steps 2 and 3, shall be repeated after stabilizing the transmitter at the environmental temperatures specified.

The frequency stability was measured with variations in the power supply voltage from 85 to 115 percent of the nominal value. A Sorenson DC Power Source was used to vary the dc voltage for the power input from 2.55 Vdc to 3.45 Vdc and 2.4 Vdc battery endpoint. The frequency was measured and the variation in parts per million was calculated.

Frequency Stability Data

Nominal frequency 2,460.00 MHz	Frequency Stability Vs Temperature In Parts Per Million (Ppm) And Percent								
Temperature in °C	-30	-20	-10	0	10	20	30	40	50
Change (Hz)	24500.0	24300.0	8600.0	1600.0	-2000.0	-700.0	300.0	3600.0	3600.0
PPM	9.96	9.88	3.50	0.65	-0.81	-0.28	0.12	1.46	1.46
%	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Nominal Frequency MHz 2460.0	Frequency Stability Vs Voltage Variation, Battery Endpoint and ±15%			
Input Voltage	2.40 V_{dc}	2.55 V_{dc}	3.0 V_{dc}	3.45 V_{dc}
Change (Hz)	0	0	0	0

Specifications of Paragraphs CFR47 15.249 are met. There are no deviations to the specifications.

Summary of Results for Frequency Stability

The EUT fulfills the requirements for CFR47 Part 15C and other applicable standards for Intentional Radiators frequency stability. The EUT transmitter had a 0.001% worst-case stability.

Statement of Modifications and Deviations

No modifications to the EUT were required for the unit to meet the FCC CFR47 Parts 15B & 15C, Industry Canada RSS-210, and other applicable Standards. There were no deviations to the specifications.

Annex

- Annex A, Measurement Uncertainty Calculations
- Annex B, Test Equipment List.
- Annex C, Rogers Qualifications.
- Annex D, FCC Site Approval Letter.
- Annex E, Industry Canada Approval Letter.

Annex A Measurement Uncertainty Calculations

Radiated Emissions Measurement Uncertainty Calculation

Measurement of vertically polarized radiated field strength over the frequency range 30 MHz to 1 GHz on an open area test site at 3m and 10m includes following uncertainty:

Contribution	Probability Distribution	Uncertainty (dB)
Antenna factor calibration	normal (k = 2)	±0.58
Cable loss calibration	normal (k = 2)	±0.2
Receiver specification	rectangular	±1.0
Antenna directivity	rectangular	±0.1
Antenna factor variation with height	rectangular	±2.0
Antenna factor frequency interpolation	rectangular	±0.1
Measurement distance variation	rectangular	±0.2
Site Imperfections	rectangular	±1.5

Combined standard uncertainty $u_c(y)$ is

$$U_c(y) = \pm \sqrt{\left[\frac{1.0}{2}\right]^2 + \left[\frac{0.2}{2}\right]^2 + \left[\frac{1.0^2 + 0.1^2 + 2.0^2 + 0.1^2 + 0.2^2 + 1.5^2}{3}\right]}$$

$U_c(y) = \pm 1.6$ dB

It is probable that $u_c(y) / s(q_k) > 3$, where $s(q_k)$ is estimated standard deviation from a sample of n readings

$$s(q_k) = \sqrt{\frac{1}{(n-1)} \sum_{k-1}^{n} (q_k - \bar{q})^2}$$

unless the repeatability of the EUT is particularly poor, and a coverage factor of k = 2 will ensure that the level of confidence will be approximately 95%, therefore:

$$U = 2\, U_c(y) = 2 \times \pm 1.6 \text{ dB} = \pm 3.2 \text{ dB}$$

Notes:

1.1 Uncertainties for the antenna and cable were estimated, based on a normal probability distribution with k = 2.

1.2 The receiver uncertainty was obtained from the manufacturer's specification for which a rectangular distribution was assumed.

1.3 The antenna factor uncertainty does not take account of antenna directivity.

1.4 The antenna factor varies with height and since the height was not always the same in use as when the antenna was calibrated an additional uncertainty is added.

1.5 The uncertainty in the measurement distance is relatively small but has some effect on the received signal strength. The increase in measurement distance as the antenna height is increased is an inevitable consequence of the test method and is therefore not considered a contribution to uncertainty.

1.6 Site imperfections are difficult to quantify but may include the following contributions:
-Unwanted reflections from adjacent objects.
-Ground plane imperfections: reflection coefficient, flatness, and edge effects.
-Losses or reflections from "transparent" cabins for the EUT or site coverings.
-Earth currents in antenna cable (mainly effect biconical antennas).

The specified limits for the difference between measured site attenuation and the theoretical value (± 4 dB) were not included in total since the measurement of site attenuation includes uncertainty contributions already allowed for in this budget, such as antenna factor.

Conducted Measurements Uncertainty Calculation

Measurement of conducted emissions over the frequency range 9 kHz to 30 MHz includes following uncertainty:

Contribution	Probability Distribution	Uncertainty (dB)
Receiver specification	rectangular	±1.5
LISN coupling specification	rectangular	±1.5
Cable and input attenuator calibration	normal (k=2)	±0.5

Combined standard uncertainty $u_C(y)$ is

$$U_c(y) = \pm \sqrt{\left[\frac{0.5}{2}\right]^2 + \frac{1.5^2 + 1.5^2}{3}}$$

$$U_C(y) = \pm 1.2 \text{ dB}$$

As with radiated field strength uncertainty, it is probable that $u_C(y) / s(q_k) > 3$ and a coverage factor of k = 2 will suffice, therefore:

$$U = 2\, U_C(y) = 2 \times \pm 1.2 \text{ dB} = \pm 2.4 \text{ dB}$$

Annex B Test Equipment List For Rogers Labs, Inc.

The test equipment used is maintained in calibration and good operating condition. Use of this calibrated equipment ensures measurements are traceable to national standards.

List of Test Equipment	Calibration Date
Oscilloscope Scope: Tektronix 2230	2/07
Wattmeter: Bird 43 with Load Bird 8085	2/07
Power Supplies: Sorensen SRL 20-25, SRL 40-25, DCR 150, DCR 140	2/07
H/V Power Supply: Fluke Model: 408B (SN: 573)	2/07
R.F. Generator: HP 606A	2/07
R.F. Generator: HP 8614A	2/07
R.F. Generator: HP 8640B	2/07
Spectrum Analyzer: HP 8562A, Mixers: 11517A, 11970A, 11970K, 11970U, 11970V, 11970W HP Adapters: 11518, 11519, 11520	2/07
Spectrum Analyzer: HP 8591EM	5/07
Frequency Counter: Leader LDC825	2/07
Antenna: EMCO Biconilog Model: 3143	5/07
Antenna: EMCO Log Periodic Model: 3147	10/06
Antenna: Antenna Research Biconical Model: BCD 235	10/06
Antenna: EMCO Dipole Set 3121C	2/07
Antenna: C.D. B-101	2/07
Antenna: Solar 9229-1 & 9230-1	2/07
Antenna: EMCO 6509	2/07
Audio Oscillator: H.P. 201CD	2/07
R.F. Power Amp 65W Model: 470-A-1010	2/07
R.F. Power Amp 50W M185- 10-501	2/07
R.F. PreAmp CPPA-102	2/07
LISN 50 µHy/50 ohm/0.1 µf	10/06
LISN Compliance Eng. 240/20	2/07
LISN Fischer Custom Communications FCC-LISN-50-16-2-08	2/07
Peavey Power Amp Model: IPS 801	2/07
Power Amp A.R. Model: 10W 1010M7	2/07
Power Amp EIN Model: A301	2/07
ELGAR Model: 1751	2/07
ELGAR Model: TG 704A-3D	2/07
ESD Test Set 2010i	2/07
Fast Transient Burst Generator Model: EFT/B-101	2/07
Current Probe: Singer CP-105	2/07
Current Probe: Solar 9108-1N	2/07
Field Intensity Meter: EFM-018	2/07
KEYTEK Ecat Surge Generator	2/07
Shielded Room 5 M x 3 M x 3.0 M	
5/2/2007	

Annex C Qualifications

SCOT D. ROGERS, ENGINEER

ROGERS LABS, INC.

Mr. Rogers has approximately 17 years experience in the field of electronics. Six years working in the automated controls industry and 6 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

October 12, 2007

Annex D FCC Test Site Registration Letter

FEDERAL COMMUNICATIONS COMMISSION

Laboratory Division
7435 Oakland Mills Road
Columbia, MD 21046

May 16, 2006

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: May 16, 2006

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

NVLAP Lab Code 200087-0

Annex E Industry Canada Test Site Registration Letter

Industry Canada Industrie Canada

May 23rd, 2006

OUR FILE: 46405-3041
Submission No: 115252

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

Dear Sir/Madame:

The Bureau has received your application for the Alternate Test Site or OATS and the filing is satisfactory to Industry Canada.

Please reference to the file number **(3041-1)** in the body of all test reports containing measurements performed on the site.

In the future, to obtain or renew a unique registration number, you may demonstrate that the site has been accredited to ANSI C63.4-2003 or later.

If the site is not accredited to ANSI C63.4-2003 or later, the test facility shall submit test data demonstrating conformance with the ANSI standard. The Department 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 two years.

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

Yours sincerely,

Robert Corey
Manager Certification
Certification and Engineering Bureau
3701 Carling Ave., Building 94
Ottawa, Ontario K2H 8S2

Canada