NVLAP Lab Code 200087-0

# Application For
# Grant of Certification

FOR

## Model: **Speedster III (101921)**

## Field Disturbance Sensor (24,110.0 MHz)

## FCC ID: YEQ1019210

## IC: 5830A-1019210

FOR

## BUSHNELL INC.

9200 Cody

Overland Park, Kansas, 66214

Test Report Number 100615A

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 of Field Disturbance Sensor Transmitter

For

## BUSHNELL INC.

9200 Cody
Overland Park, Kansas, 66214

Phone: (913) 752-3470

Mr. Brian Marquess
Engineering Manager

## Model: Speedster III (101921)
## Low Power Transmitter

Frequency Range: 24,110.0 MHz

FCC ID: YEQ1019210
IC: 5830A-1019210

Test Report Number: 100615A

Test Date: June 29, 2010

Authorized Signatory: Scot D Rogers


Scot D. Rogers
Rogers Labs, Inc.
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## Forward

The following information in this document is submitted for consideration in obtaining Grant of Certification for low power intentional radiator per CFR 47 Paragraph 15.245, and Industry Canada RSS-210, operation in the 24,110.0 MHz band.

Name of Applicant: Bushnell Inc.
9200 Cody
Overland Park, Kansas, 66214
Model: Speedster III (101921)

FCC ID: YEQ1019210 Industry Canada ID: 5830A-1019210

Frequency Range: 24,110.0 MHz

Operating Power: measured average power 118.0 dBµV/m @ 3 meters and peak 118.8 dBµV/m @ 3 meters)

## Applicable Standards & Test Procedures

In accordance with the Federal Communications Commission and Code of Federal Regulations CFR 47, dated October 1, 2009, 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 15.245, 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.

## Opinion / Interpretation of Results

| Test Performed | Minimum Margin (dB) | Results |
|---|---|---|
| Antenna requirement per CFR 47 15.203 | NA | Complies |
| Restricted Bands Emissions as per CFR 47 15.205 | 17.1 | Complies |
| AC Line Conducted Emissions as per CFR 47 15.207 | N/A | Complies |
| Radiated Emissions as per CFR 47 15.209 | 15.4 | Complies |
| Antenna Power conduction for Receivers per CFR 47 15.111 | N/A | Complies |
| Emissions per CFR 47 15.245 (Transmitter Average) | 10.0 | Complies |
| Transmitter Harmonic Emissions per CFR 47 15.245 | 17.1 | Complies |
| Emissions per RSS-210 | As Documented | Complies |

## Statement of Modifications and Deviations

No modifications to the EUT were required for the equipment to demonstrate compliance with CFR 47 Part 15C, 15.245, or RSS-210 Emissions Requirements. There were no deviations or modification to the specifications.

## Environmental Conditions

| | |
|---|---|
| Ambient Temperature | 22.1° C |
| Relative Humidity | 56% |
| Atmospheric Pressure | 1011.6 mb |

## 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 taken for this report was taken at a distance of 3 meters.

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

## Test Site Locations

| | |
|---|---|
| Conducted EMI | Rogers Labs, Inc. located at 4405 W. 259th Terrace, Louisburg, KS. |
| Radiated EMI | Performed at Rogers Labs, Inc. 3 meters Open Area Test Site (OATS) located at 4405 W. 259th Terrace, Louisburg, KS. |
| Site Registration | Refer to Annex for FCC Site Registration Letter, Reference 90910, Industry Canada Site Registration Reference 3041A-1 |
| Accreditation | NVLAP Accreditation Lab Code 200087-0 |

## List of Test Equipment

A Rohde and Schwarz ESU40, Hewlett Packard 8591EM and or 8562A Spectrum Analyzer was used as the measuring equipment for emissions testing. The analyzer settings used are described in the following table. Refer to the annex for a complete list of Test Equipment.

| Spectrum Analyzer Settings | | |
|---|---|---|
| AC Line 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 |
| 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 | Manufacturer | Model | Calibration Date | Due |
|---|---|---|---|---|
| LISN | Comp. Design | FCC-LISN-2-MOD.CD | 10/09 | 10/10 |
| Antenna | ARA | BCD-235-B | 10/09 | 10/10 |
| Antenna | EMCO | 3147 | 10/09 | 10/10 |
| Antenna | EMCO | 3143 | 5/10 | 5/11 |
| Analyzer | HP | 8591EM | 5/10 | 5/11 |
| Analyzer | HP | 8562A | 5/10 | 5/11 |
| Analyzer | Rohde & Schwarz | ESU40 | 5/10 | 5/11 |

## Application for Certification

(1) Manufacturer: Bushnell Inc.
9200 Cody
Overland Park, Kansas, 66214
Telephone: (913) 752-3470

(2) Identification: FCC I.D.: YEQ1019210 IC: 5830A-1019210

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

(4) Description of Circuit Functions, Device Operation: The Speedster III is a low power field disturbance sensor used to measure velocity of objects in field. The composite design incorporates additional circuitry offering ability to send wirelessly to compliant receiver equipment. This device features low power field disturbance sensor operation in frequency band of 24,075-24,175 MHz.

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

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

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

(8) Peripheral equipment or accessories for the equipment. No optional equipment is available or required for the EUT. The available configuration options were investigated for this and other reports in compliance with required standards with worst-case data presented.

(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 Tested

| Equipment | Model/GPN | Serial Number | FCC ID |
|---|---|---|---|
| EUT | Speedster III | ENG1 | YEQ1019210 |

## Equipment and Cable Configuration

### *Test Setup*

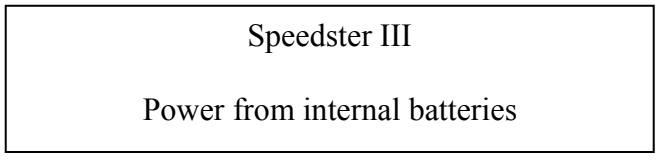
The Speedster III is a field disturbance sensor operating in the 24,075-24,175 MHz band offer ability to monitor velocity of objects in the field and incorporates a second low power transmitter offering ability to wirelessly send data to compliant receiver equipment in the 902-928 MHz band. The design allows a user to operate the field disturbance sensor measuring device collecting speed of object in the field and wirelessly transmitting the information to other compliant equipment. The EUT was arranged as typical user equipment configurations for testing purposes. The transmitter offers no other interface connections than those in the configuration options shown below. The EUT is powered from internal batteries only (2 C-cell batteries) and offers no other power input option. 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 Function and Testing Procedures*

The EUT is low power transmitter with transmitter operation capability in the 24,075-24,175 MHz frequency band (CFR 47 15.245 and RSS-210).

### *Configuration options for the EUT*

1. Speedster III (101921)



### *AC Line Conducted Emission Test Procedure*

Testing for the AC line-conducted emissions was performed as defined in sections 7.2.4 and 13 of ANSI C63.4. The test setup, including the EUT, was arranged in the test configurations as shown above and placed on a 1 x 1.5-meter wooden bench, 0.8 meters high located in a screen room. The power lines of the system were isolated from the power source using a standard LISN with a 50-μHy choke. EMI was coupled to the spectrum analyzer through a 0.1 μF capacitor internal to the LISN. The LISN was positioned on the floor beneath the wooden bench supporting the EUT. The power lines and cables were draped over the back edge of the table. Refer to photographs in exhibits for EUT placement used during testing. Note the design operates from internal replaceable battery power only and offers no provision to connect to utility power systems. Therefore no AC line conducted emissions testing was required or performed.

### *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.

## Subpart C - Intentional Radiators

As per CFR 47 Part 15, Subpart C and RSS-210 the following information is submitted for consideration in obtaining grant of certification for unlicensed intentional radiators.

## Antenna Requirements

The unit is produced with permanently attached transmitter antenna located inside the sealed case. No provisions for modification or alterations of the antenna configuration are available to the end user. The requirements of 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 or 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.

### *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) |
|---|---|---|---|---|---|---|---|
| 241.5 | 37.7 | 37.1 | 11.8 | 30 | 19.5 | 18.9 | 43.5 |
| 48,230.0 | 30.0 | 28.8 | 23.0 | 0 | 53.0 | 51.8 | 77.5 |
| 72,345.0 | 21.1 | 21.0 | 35.0 | 0 | 56.1 | 56.0 | 77.5 |
| 96,460.0 | 20.6 | 20.4 | 39.8 | 0 | 60.4 | 60.2 | 77.5 |

Other emissions found in the restricted bands were at least 20 dB below the limits.

### *Summary of Results for Radiated Emissions in Restricted Bands*

The EUT demonstrated compliance with the radiated emissions requirements of FCC CFR 47 Part 15.205 and RSS-210 restricted bands of operation. The EUT worst-case configuration demonstrated minimum margin of 17.1 dB below the CFR 47 and RSS-210 limits. Other emissions were present with amplitudes at least 20 dB below the required limits.

## Radiated emissions limits; general requirements

### *General Radiated EMI Testing Procedure*

The EUT was tested and investigated while arranged in all typical equipment configurations and operated through all applicable 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. Plots were made of the worst-case radiated emission frequency spectrum from 30 MHz to 24,000 MHz for preliminary transmitter testing. Refer to figures one through eight representing the worst-case general radiated emission spectrum as displayed on the spectrum analyzer of EUT powered from new internal batteries taken in screen room. Each emission was then re-maximized at the OATS site before final radiated emissions measurements were performed. Final data was taken with the EUT located at the open field test site at a distance of 3 meters between the EUT and the receiving antenna. Test procedures of ANSI 63.4-2003 paragraphs 13.1 and 8.3.1.2 were used during radiated emissions testing. The frequency spectrum from 30 MHz to 110,000 MHz was searched for radiated emissions of the EUT. 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 40 GHz, amplification stages and external mixers for frequencies above 40 GHz.

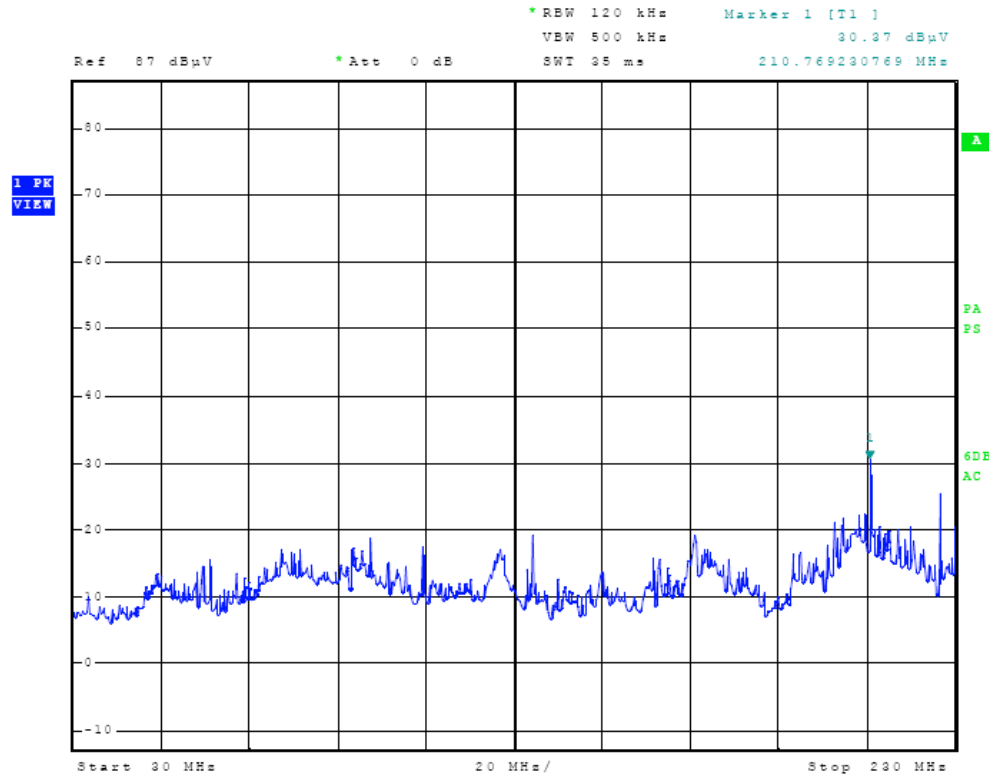



**Figure One General Radiated Emissions in screen room**

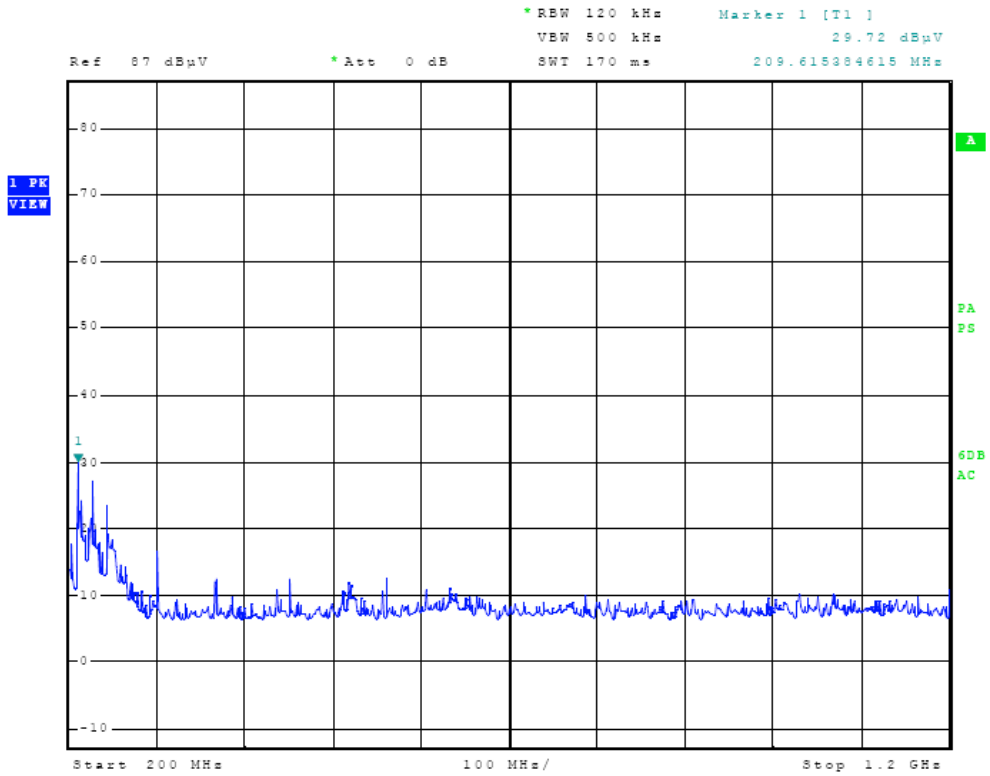



**Figure Two General Radiated Emissions in screen room**

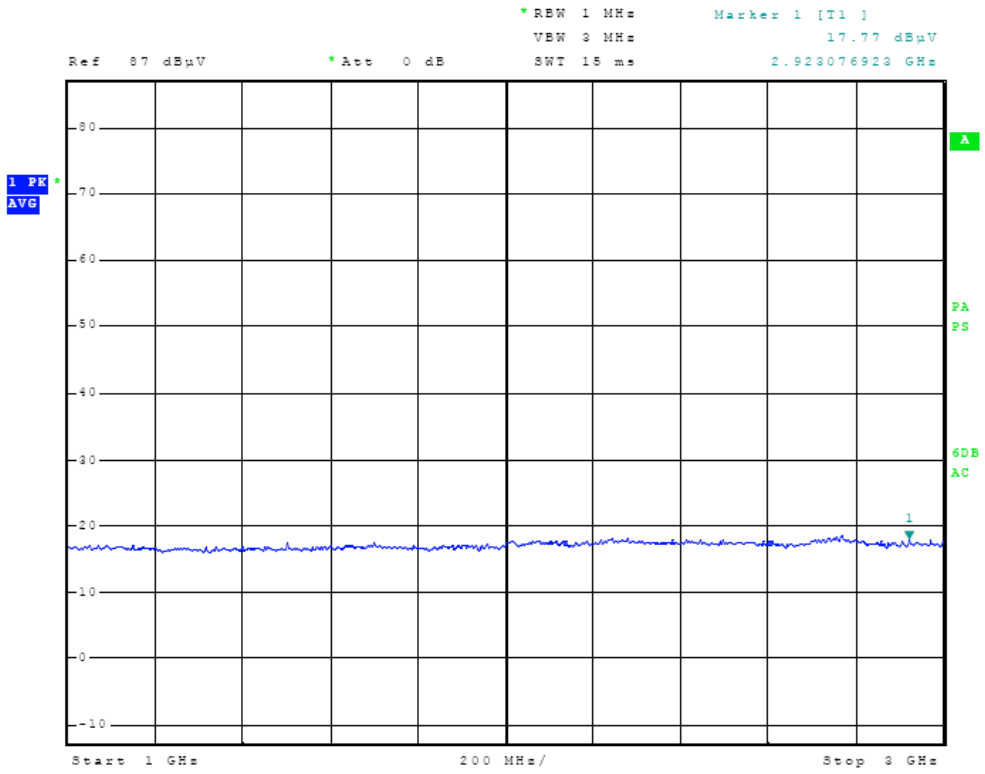



**Figure Three General Radiated Emissions in screen room**

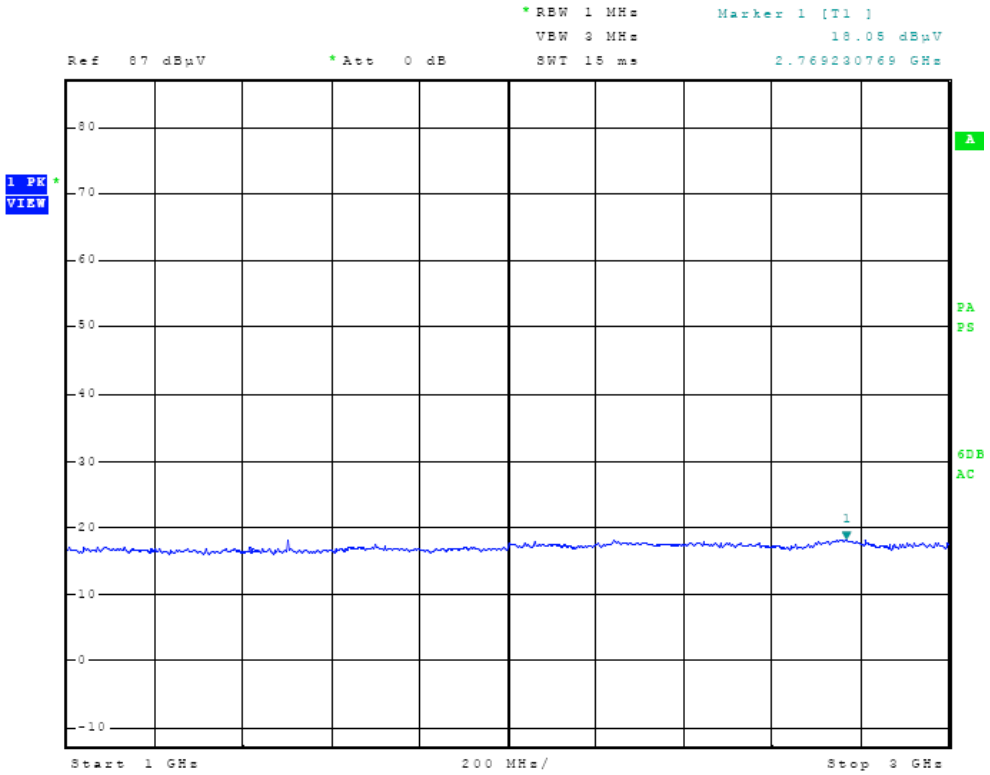



**Figure Four General Radiated Emissions in screen room**

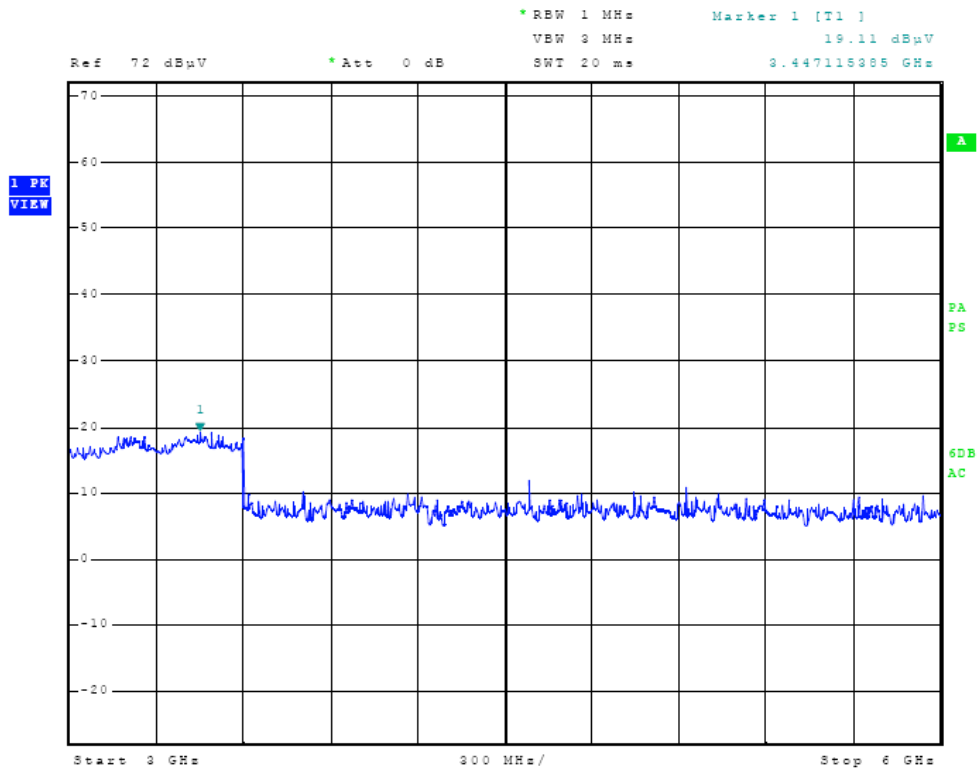



**Figure Five General Radiated Emissions in screen room**

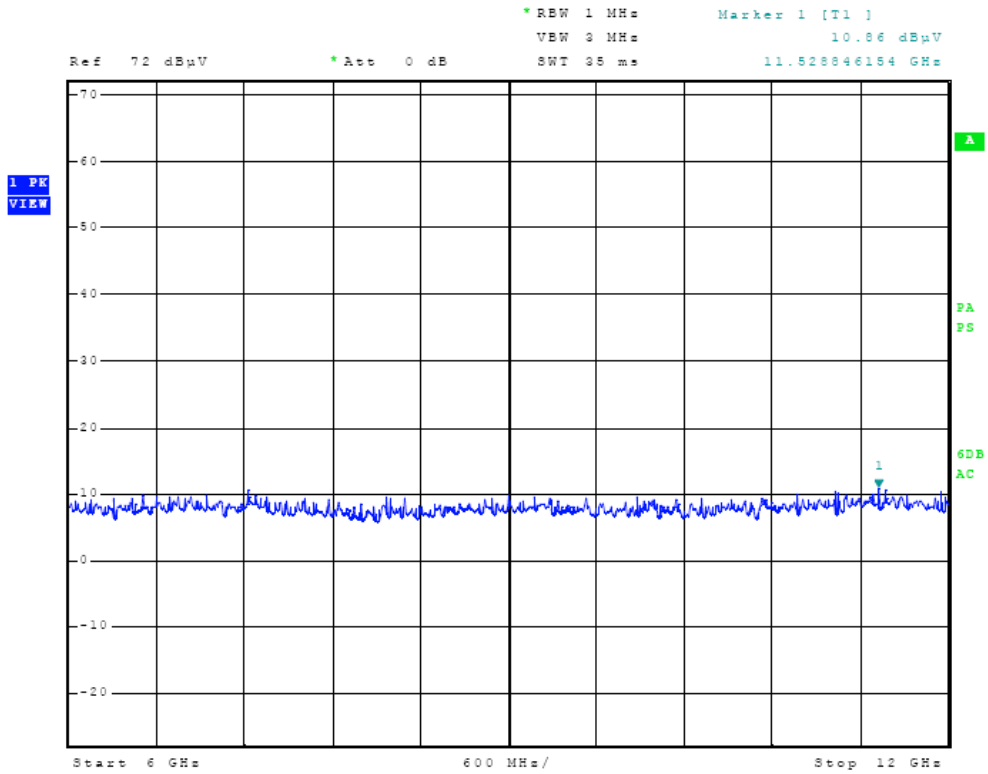



**Figure Six General Radiated Emissions in screen room**

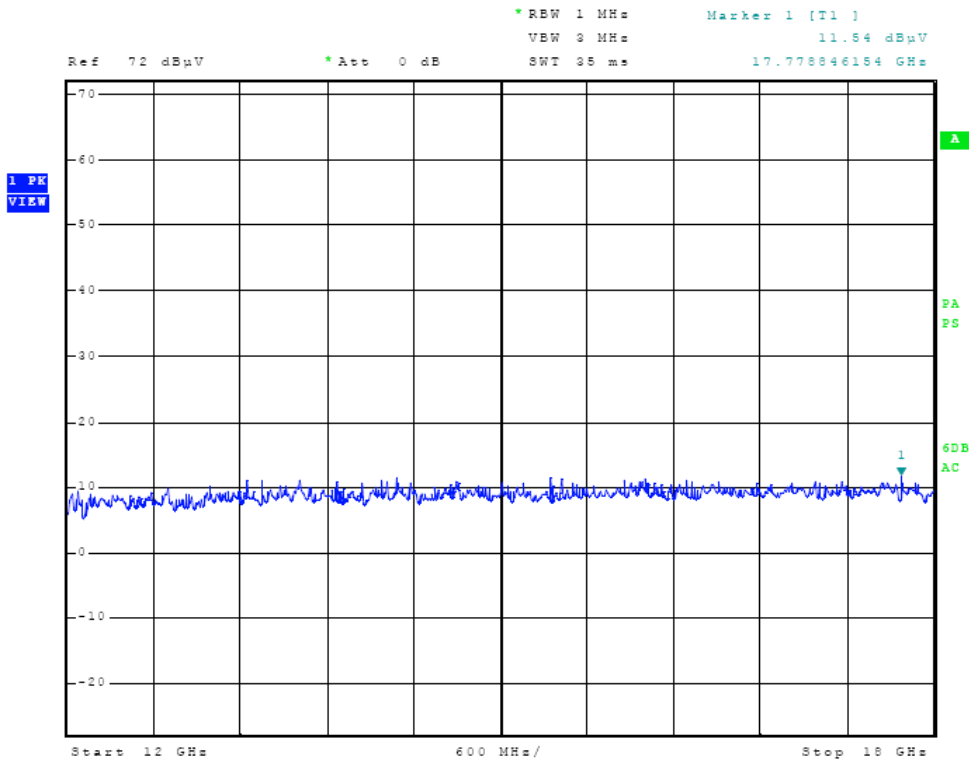



**Figure Seven General Radiated Emissions in screen room**

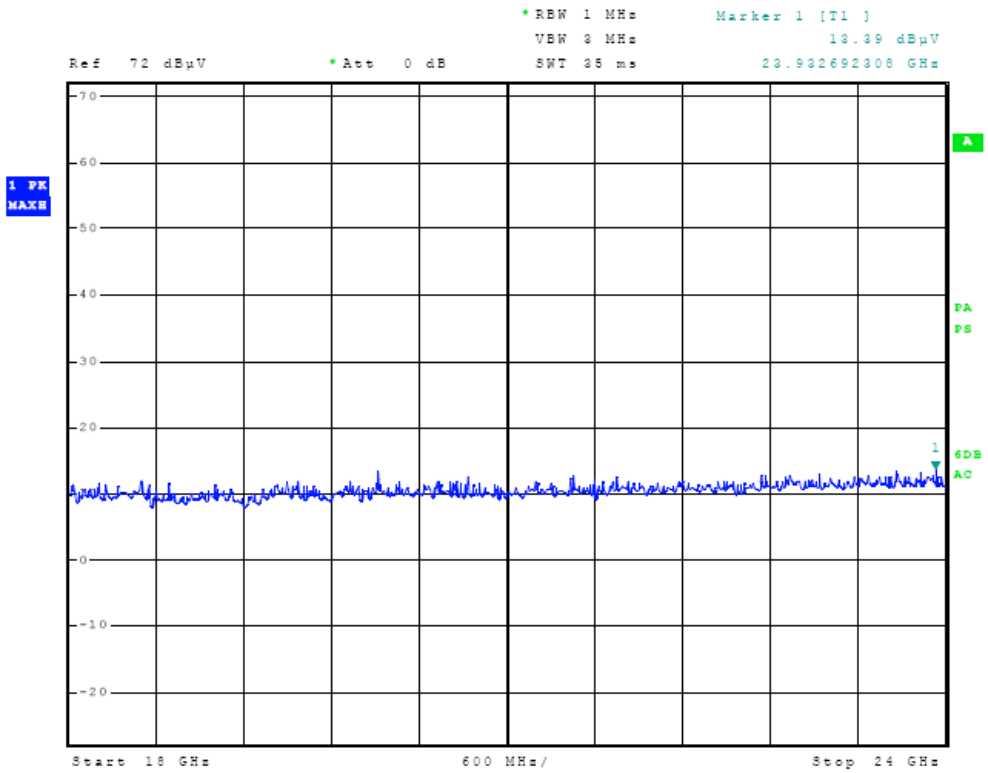



**Figure Eight General Radiated Emissions in screen room**

### *General Radiated Emissions Data*

EUT

| 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) |
|---|---|---|---|---|---|---|---|
| 209.7 | 38.7 | 37.3 | 11.0 | 30 | 19.7 | 18.3 | 43.5 |
| 217.7 | 40.9 | 37.9 | 11.1 | 30 | 22.0 | 19.0 | 43.5 |
| 225.7 | 39.1 | 40.7 | 11.2 | 30 | 20.3 | 21.9 | 43.5 |
| 229.0 | 35.6 | 36.2 | 11.3 | 30 | 16.9 | 17.5 | 43.5 |
| 229.9 | 38.6 | 46.8 | 11.3 | 30 | 19.9 | 28.1 | 43.5 |
| 231.7 | 44.3 | 41.3 | 11.3 | 30 | 25.6 | 22.6 | 43.5 |
| 241.5 | 37.7 | 37.1 | 11.8 | 30 | 19.5 | 18.9 | 46.0 |

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

### *Summary of Results for General Radiated Emissions*

The EUT demonstrated compliance with the general radiated emissions requirements of FCC Part 15C, RSS-210 and other applicable standards for Intentional Radiators. The EUT worst-case configuration demonstrated minimum margin of 15.4 dB below the limits. Other emissions were present with amplitudes at least 20 dB below the Limits.

## Operation in the Band 24,075 – 24,175 MHz Band

The transmitter output power was measured on an open area test site @ 3 meters. Test procedures of ANSI 63.4-2003 paragraphs 13.1 and 8.3.1.2 were used during testing. 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 frequency spectrum from 30 MHz to 110,000 MHz was searched for radiated emissions of the EUT. The peak and quasi-peak amplitude of frequencies below 1000 MHz were measured using appropriate test equipment; receive antennas and a receiver/spectrum analyzer. The peak and average amplitude of frequencies above 1000 MHZ were measured using appropriate test equipment; receive antennas and a receiver/spectrum analyzer. The amplitude of each emission was then recorded from the receiver/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 15.209, whichever is the lesser attenuation. Refer to figures nine through fourteen showing the frequency spectrum, amplitude, and occupied bandwidth of emissions as displayed on the spectrum analyzer measured in the screen room. The amplitude of each radiated spurious emission was measured on 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. 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 40 GHz, amplification stages and external mixers for frequencies above 40 GHz. Emissions were measured in dBµV/m @ 3 meters.

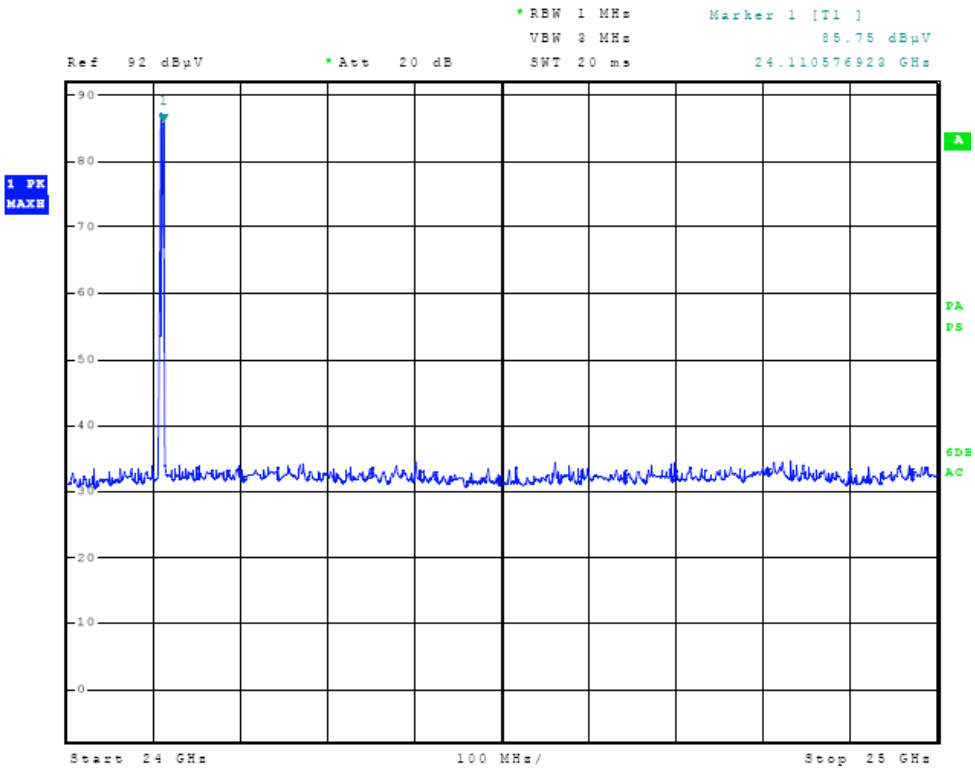



**Figure Nine Transmitter Radiated Emissions in screen room**

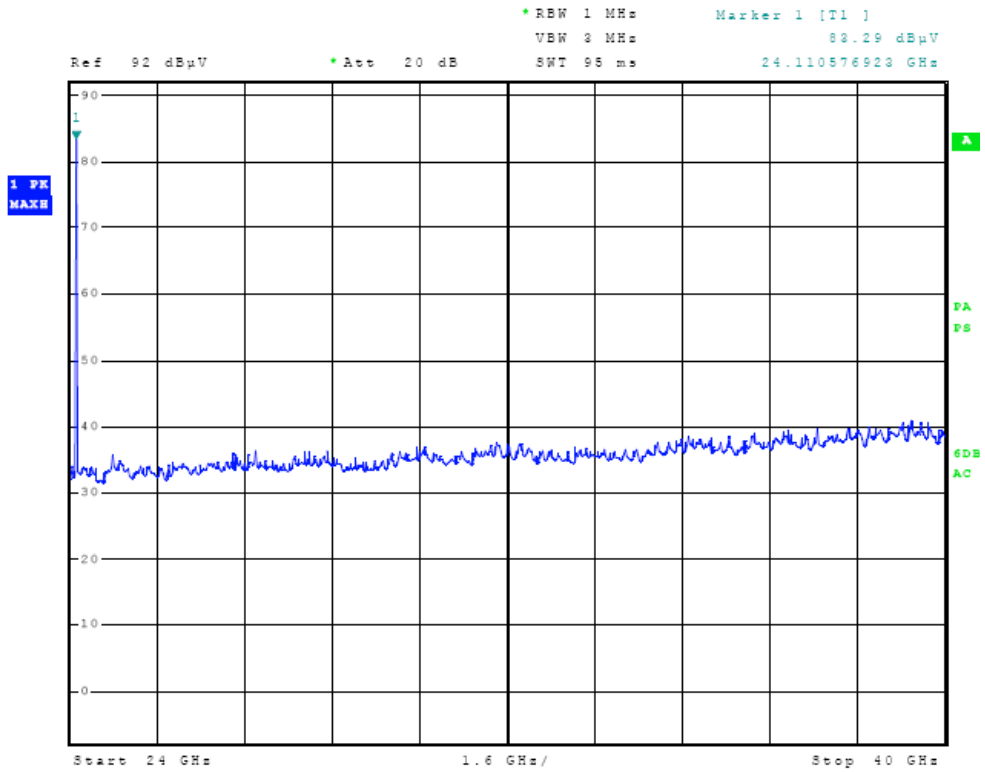



**Figure Ten Transmitter Radiated Emissions in screen room**

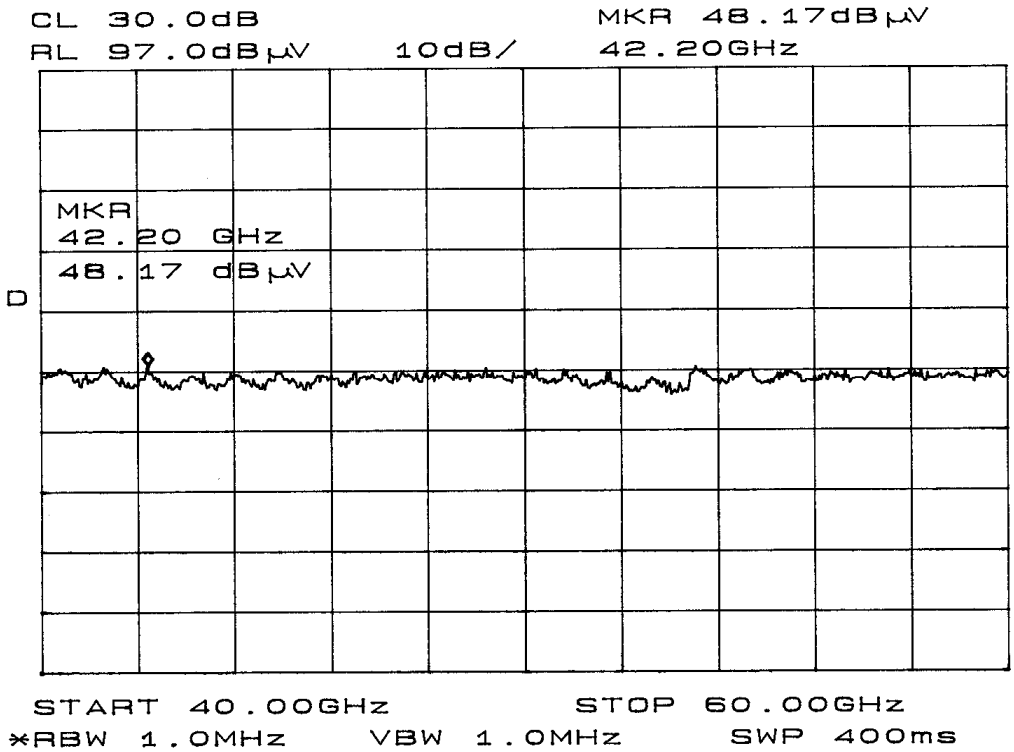



**Figure Eleven Transmitter Radiated Emissions in screen room**

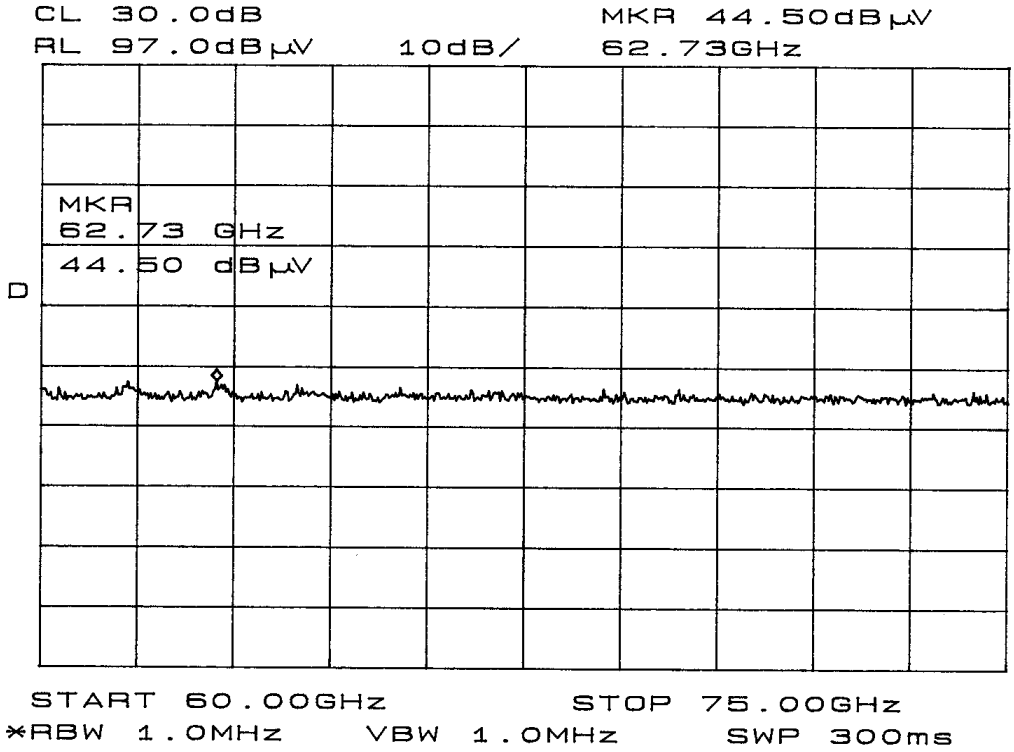



**Figure Twelve Transmitter Radiated Emissions in screen room**

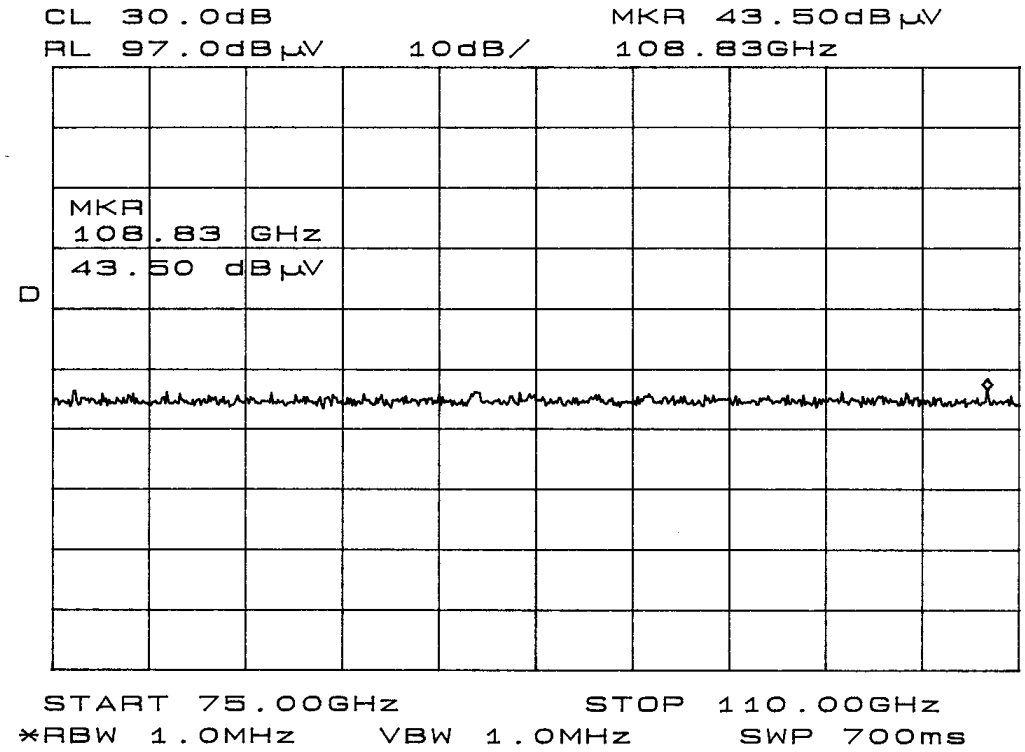



**Figure Thirteen Transmitter Radiated Emissions in screen room**

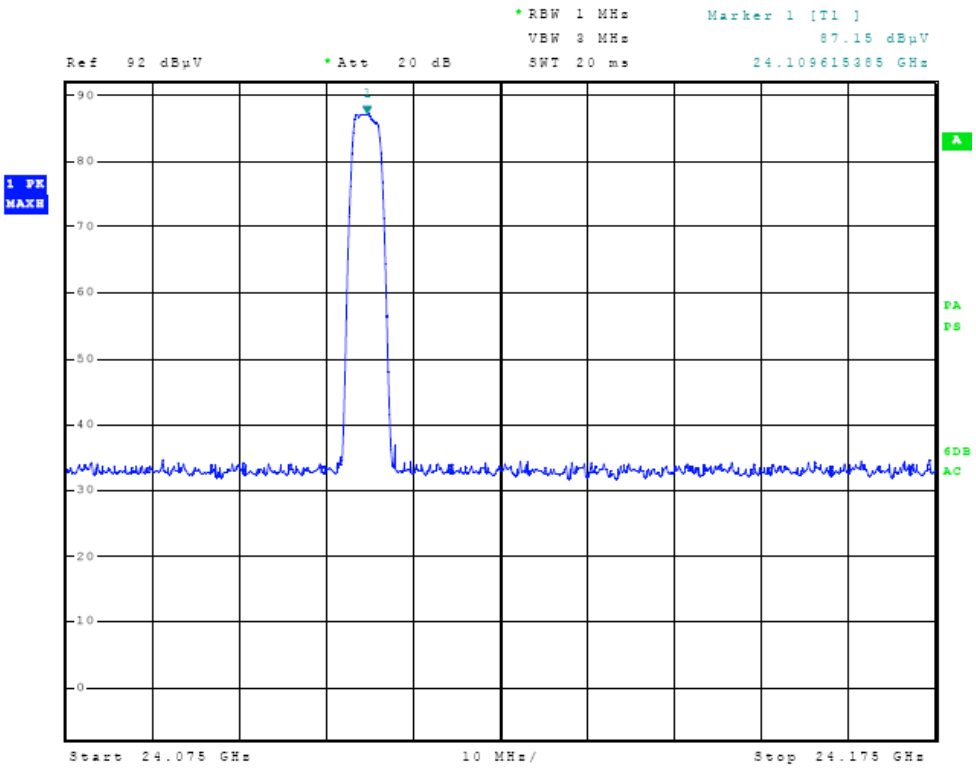



**Figure Fourteen Transmitter Emissions in Band**

### *Transmitter Radiated Emissions Data*

| Frequency | FSM Hor Peak | FSM Hor Ave | FSM Vert Peak | FSM Vert Ave | AF | Amp Gain | RFS @ 3 m Hor Peak | RFS @ 3 m Hor Ave | RFS @ 3 m Vert Peak | RFS @ 3 m Vert Ave | Ave Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 24.115 | 96.8 | 96.0 | 73.3 | 73.0 | 22.0 | 0 | 118.8 | 118.0 | 95.3 | 95.0 | 128.0 |
| 48.230 | 44.7 | 30.0 | 35.6 | 28.8 | 23.0 | 0 | 67.7 | 53.0 | 58.6 | 51.8 | 77.5 |
| 72.345 | 30.6 | 21.1 | 29.8 | 21.0 | 35.0 | 0 | 65.6 | 56.1 | 64.8 | 56.0 | 77.5 |
| 96.460 | 29.3 | 20.6 | 28.4 | 20.4 | 39.8 | 0 | 69.1 | 60.4 | 68.2 | 60.2 | 77.5 |

Note: Levels measured @ 3-meter OATS site. Other emissions were present with amplitudes at least 20 dB below limits.

### *Summary of Results for Transmitter Radiated Emissions*

The EUT demonstrated compliance with the radiated emissions requirements of FCC CFR 47 Part 15.245, RSS-210 and other applicable standards for Intentional Radiators. The EUT worst-case configuration demonstrated minimum average amplitude emission margin of 10.0 dB below the average limit. The EUT worst-case configuration demonstrated minimum radiated harmonic emission margin of 17.1 dB below the limits. No other radiated emissions were found in the restricted bands less than 20 dB below limits than those recorded in this report. Other emissions were present with amplitudes at least 20 dB below the Limits.

## Annex

- Annex A Measurement Uncertainty Calculations
- Annex B Rogers Labs Test Equipment List
- Annex C Rogers Qualifications
- Annex D FCC Test Site Registration Letter
- Annex E Industry Canada Test Site Registration 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 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:

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

$U = 2\ U_c(y) = 2 \times \pm 1.6$ dB $= \pm 3.2$ 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

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

$U_c(y) = \pm 1.2$ 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:

$U = 2\ U_c(y) = 2 \times \pm 1.2$ dB $= \pm 2.4$ dB

## *Annex B Rogers Labs Test Equipment List*

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 | 2/10 |
| Wattmeter: Bird 43 with Load Bird 8085 | 2/10 |
| Power Supplies: Sorensen SRL 20-25, SRL 40-25, DCR 150, DCR 140 | 2/10 |
| H/V Power Supply: Fluke Model: 408B (SN: 573) | 2/10 |
| R.F. Generator: HP 606A | 2/10 |
| R.F. Generator: HP 8614A | 2/10 |
| R.F. Generator: HP 8640B | 2/10 |
| Spectrum Analyzer: Rohde & Schwarz ESU40 | 5/10 |
| Spectrum Analyzer: HP 8562A,<br>Mixers: 11517A, 11970A, 11970K, 11970U, 11970V, 11970W<br>HP Adapters: 11518, 11519, 11520 | 5/10 |
| Spectrum Analyzer: HP 8591EM | 5/10 |
| Frequency Counter: Leader LDC825 | 2/10 |
| Antenna: EMCO Biconilog Model: 3143 | 5/10 |
| Antenna: EMCO Log Periodic Model: 3147 | 10/09 |
| Antenna: Antenna Research Biconical Model: BCD 235 | 10/09 |
| Antenna: EMCO Dipole Set 3121C | 2/10 |
| Antenna: C.D. B-101 | 2/10 |
| Antenna: Solar 9229-1 & 9230-1 | 2/10 |
| Antenna: EMCO 6509 | 2/10 |
| Audio Oscillator: H.P. 201CD | 2/10 |
| R.F. Power Amp 65W Model: 470-A-1010 | 2/10 |
| R.F. Power Amp 50W M185- 10-501 | 2/10 |
| R.F. PreAmp CPPA-102 | 2/10 |
| LISN 50 µHy/50 ohm/0.1 µf | 10/09 |
| LISN Compliance Eng. 240/20 | 2/10 |
| LISN Fischer Custom Communications FCC-LISN-50-16-2-08 | 2/10 |
| Peavey Power Amp Model: IPS 801 | 2/10 |
| Power Amp A.R. Model: 10W 1010M7 | 2/10 |
| Power Amp EIN Model: A301 | 2/10 |
| ELGAR Model: 1751 | 2/10 |
| ELGAR Model: TG 704A-3D | 2/10 |
| ESD Test Set 2010i | 2/10 |
| Fast Transient Burst Generator Model: EFT/B-101 | 2/10 |
| Current Probe: Singer CP-105 | 2/10 |
| Current Probe: Solar 9108-1N | 2/10 |
| Field Intensity Meter: EFM-018 | 2/10 |
| KEYTEK Ecat Surge Generator | 2/10 |
| 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. 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

Bachelor of Science Degree in Electrical Engineering from Kansas State University

Bachelor of Science Degree in Business Administration Kansas State University

Several Specialized Training courses and seminars pertaining to Microprocessors and Software programming

NVLAP Lab Code 200087-0

## *Annex D FCC Test Site Registration Letter*

# FEDERAL COMMUNICATIONS COMMISSION

**Laboratory Division**
**7435 Oakland Mills Road**
**Columbia, MD 21046**

May 18, 2010

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 18, 2010

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

NVLAP Lab Code 200087-0

## *Annex E Industry Canada Test Site Registration Letter*

Industry Canada Industrie Canada

May 26, 2010

OUR FILE: 46405-3041
Submission No: 140719

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

***Attention***: Mr. Scot D. Rogers

Dear Sir/Madame:

The Bureau has received your application for the renewal of a 3/10m 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 **( 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;

- Your primary code is: **3041**

- The company number 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 C63.4-2003 or later. A scope of accreditation indicating the accreditation by a recognized accreditation body to ANSI C63.4-2003 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 C63.4-2003 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 two 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,

Dalwinder Gill

Dalwinder Gill
For: Wireless Laboratory Manager
**Certification and Engineering Bureau**
3701 Carling Ave., Building 94
P.O. Box 11490, Station "H"
Ottawa, Ontario K2H 8S2
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