

Application For Grant of Certification

FOR

Model: SDM4

Low Power Device (2400-2483.5 MHz)

IC: 3797A-SDM4

FCC ID: O6RSDM4

FOR

DYNASTREAM INNOVATIONS, INC.

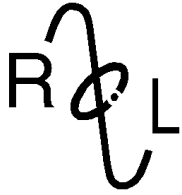
228 River Avenue

Cochrane, Alberta T4C 2C1

Test Report Number 100602

Authorized Signatory: *Scot D Rogers*

Scot D. Rogers



ROGERS LABS, INC.

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

Test Report for Application of Certification

For

Dynastream Innovations, Inc.

228 River Avenue
Cochrane, Alberta T4C 2C1

Phone: (403) 932-9292

Mr. Jim Rooney
President

Model: SDM4
Low Power Device (2400-2483.5 MHz)

Frequency Range: 2,403-2,480 MHz

IC: 3797A-SDM4
FCC ID: O6RSDM4

Test Report Number: 100602

Test Date: June 2, 2010

Authorized Signatory: *Scot D Rogers*

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Forward

The following information is submitted for consideration in obtaining Grant of Certification for Class 2 permissible change of low power intentional radiator per CFR 47 Paragraph 15.249 and Industry Canada RSS-210 operation in the 2400 – 2483.5 MHz band. This equipment has been issued Grants of certification for operation at 2457 MHz. The current documentation and submittal request increase of operational frequency band to include 2403 through 2480 MHz. The change required to implement this frequency band increase requires only software change controlling the existing circuitry implemented by manufacturer. No hardware modification has been performed or required and original documentation continues to represent current emissions profile for operation at 2457 MHz. Documentation included in this report support demonstration of compliance across operational band (2403-2480 MHz). This Class 2 permissible change request demonstrates compliance with KDB 178919 for software change for non-SDR approved devices.

Name of Applicant: Dynastream Innovations, Inc.
 228 River Avenue
 Cochrane, Alberta T4C 2C1

Model: SDM4
 FCC ID: O6RSMD4 IC: 3797A-SDM4
 Frequency Range: 2403-2480 MHz

Operating Power: Less than 1 mW (measured peak power of 91.9 dB μ V/m @ 3 meters),
 Occupied band width 1,250.0 kHz, and worst-case receiver radiated
 emission 32.3 dB μ V/m @ 3 meters

Applicable Standards & Test Procedures

The following information is submitted in accordance with the Federal Communications Commission (FCC), Code of Federal Regulations Title 47 (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, and applicable parts of Part 15C paragraph 15.249 and Industry Canada RSS-210. 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	N/A	Complies
Restricted Bands Emissions as per CFR 47 15.205	23.6	Complies
AC Line Conducted Emissions as per CFR 47 15.207	N/A	Complies
Receiver emissions	24.6	Complies
Emissions per CFR 47 15.249 (Transmitter Peak)	3.1	Complies

Statement of Modifications and Deviations

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

Environmental Conditions

Ambient Temperature	22.0° C
Relative Humidity	53%
Atmospheric Pressure	1008.0 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.

Radiated Emissions Calculations:

Note: The limit is expressed for a measurement in dB μ V/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.

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



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



<u>Equipment</u>	<u>Manufacturer</u>	<u>Model</u>	<u>Calibration Date</u>	<u>Due</u>
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

Class 2 Permissible Change Information

Per KDB 178919 paragraph 4 the following points are addressed.

KDB 178919

4. **Software changes:** Class I and Class II software changes for non-SDR approved devices - the following software only changes are allowed:

a) Additional frequencies may be added to an approved device under the following conditions; however, a new test report must be submitted for the new frequencies:

i. Additional frequencies are allowed with a Class II permissive change if:

1. No hardware changes have been made to the design.
2. There is no increase in output power rating on new frequencies as demonstrated in report.
3. The Equipment Class remains the same as previously certified.
4. RF exposure changes are addressed in MPE exposure calculation exhibit.
5. Only the Original Equipment Manufacturer may implement the new frequencies.
6. There are no other changes to the device that indicate a need for a new FCC ID.

ii. End user software implementation for new frequencies is not allowed unless the device was approved as a software-defined radio. (Class III permissive change rules for software defined radios are in Section 2.1043(b)(3)).

b) No new line items are required. Adding new line items on the Form 731 is allowed under a Class II permissive change. Additional data rates (both higher and lower rates) under existing modulations that are consistent with a Form 731 line item/emission designator may be either a Class I or Class II, depending on emissions. A Class II permissive change is required if degradation occurs; if no degradation occurs a Class I permissive change is acceptable.

c) Output power remains as previously authorized. A Class II permissive change for a device with a decrease in output power, or with a different field strength, is allowed under the following conditions:

The maximum output power rating of the original authorization does not change.

There is no design change that increases or decreases the output power. A decrease in the power setting configuration is acceptable.

In no case, may a power limit be exceeded.

Application for Certification

- (1) Manufacturer: Dynastream Innovations, Inc.
228 River Avenue
Cochrane, Alberta T4C 2C1
Telephone: (403) 932-9292
- (2) Identification: FCC I.D.: O6RSDM4 IC: 3797A-SDM4
- (3) Copy of the installation and operating manual: Refer to original exhibit for Instruction Manual.
- (4) Description of Circuit Functions, Device Operation: This device features low power communications transmitter operation in frequency band of 2403-2480 MHz. The transceiver section of the design offers short range data communications with compliant equipment.
- (5) Block Diagram with Frequencies: Refer to original exhibit for Block Diagram
- (6) Report of measurements demonstrating compliance with the pertinent FCC and Industry Canada technical requirements is provided in this report.
- (7) Photographs of equipment are provided in original exhibits.
- (8) Peripheral equipment or accessories for the equipment. No additional peripheral equipment required.
- (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

<u>Equipment</u>	<u>Serial Number/Model</u>	<u>FCC ID</u>	<u>I.C. ID</u>
SDM4 (EUT)	2255343	O6RSDM4	3797A-SDM4

Equipment and Cable Configuration

Test Setup

The EUT was arranged as a test sample emulating typical user equipment configurations for testing purposes. The transmitter offers no interface connection and operates solely from replaceable internal button battery. The test sample was set to transmit in non-typical operating mode of continuous wave (CW) for power and harmonic emissions testing. The CW mode of operation offered worst-case emissions to be measured. 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 a low power transmitter operating in the 2400-2483.5 MHz frequency band (CFR 47 15.249 and RSS-210). The design functions as a remote speed and distance measuring device allowing information to be transmitted to compliant remote equipment. The transmitter offers no other interface connections than those in the configuration option shown below. The EUT receives power from internal batteries only and offers no alternative power source options. 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.

Configuration options for the EUT

EUT

AC Line Conducted Emission Test Procedure

The equipment operates solely from direct current power and offers no provision to connect to utility AC power. Therefore, no AC power line conducted emissions testing were performed for this report..

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 paragraph 15.249 and RSS-210 the following information is submitted for consideration in obtaining Class 2 permissible change 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 spectrum analyzer/receiver. 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. (dB μ V)	FSM Vert. (dB μ V)	Ant. Factor (dB)	Amp. Gain (dB)	RFS Horz. @ 3m (dB μ V/m)	RFS Vert. @ 3m (dB μ V/m)	Limit @ 3m (dB μ V/m)
2390.0	15.0	14.9	32.8	25.0	22.8	22.7	54.0
2483.5	18.0	18.0	33.3	25.0	26.3	26.3	54.0
4806.0	22.5	18.7	32.8	25.0	30.3	26.5	54.0
4914.0	20.8	18.1	32.8	25.0	28.6	25.9	54.0
4960.0	18.0	17.7	32.9	25.0	25.9	25.6	54.0
7209.0	14.5	15.6	36.4	25.0	25.9	27.0	54.0
7371.0	11.0	11.4	36.5	25.0	22.5	22.9	54.0
7440.0	14.2	15.0	36.7	25.0	25.9	26.7	54.0
16821.0	11.8	11.7	43.6	25.0	30.4	30.3	54.0
12285.0	11.9	11.9	40.4	25.0	27.3	27.3	54.0
12400.0	11.3	11.3	40.6	25.0	26.9	26.9	54.0

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 23.6 dB below the 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 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 radiated emission frequency spectrum from 30 MHz to 25,000 MHz for preliminary transmitter testing. Refer to figures one through seven representing the worst-case radiated emission spectrum as displayed on the spectrum analyzer of EUT taken in screen room. Each emission was then re-maximized with the test setup located on 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 for transmitter testing. 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 25,000 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 25 GHz, and amplification stages.

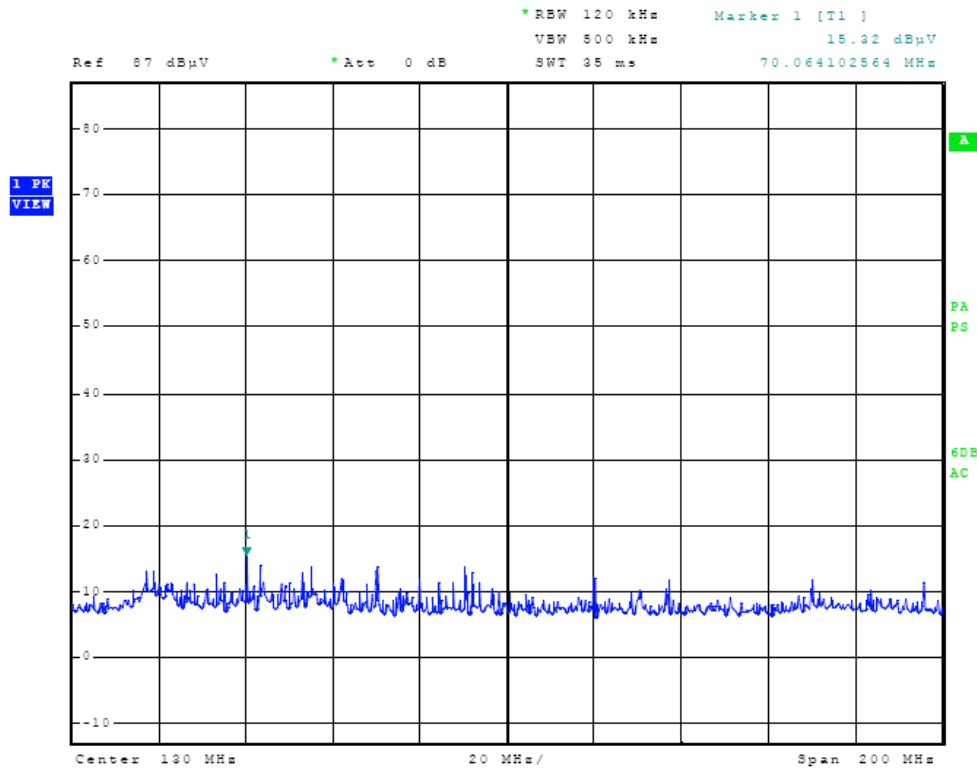


Figure One Radiated Emissions in screen room

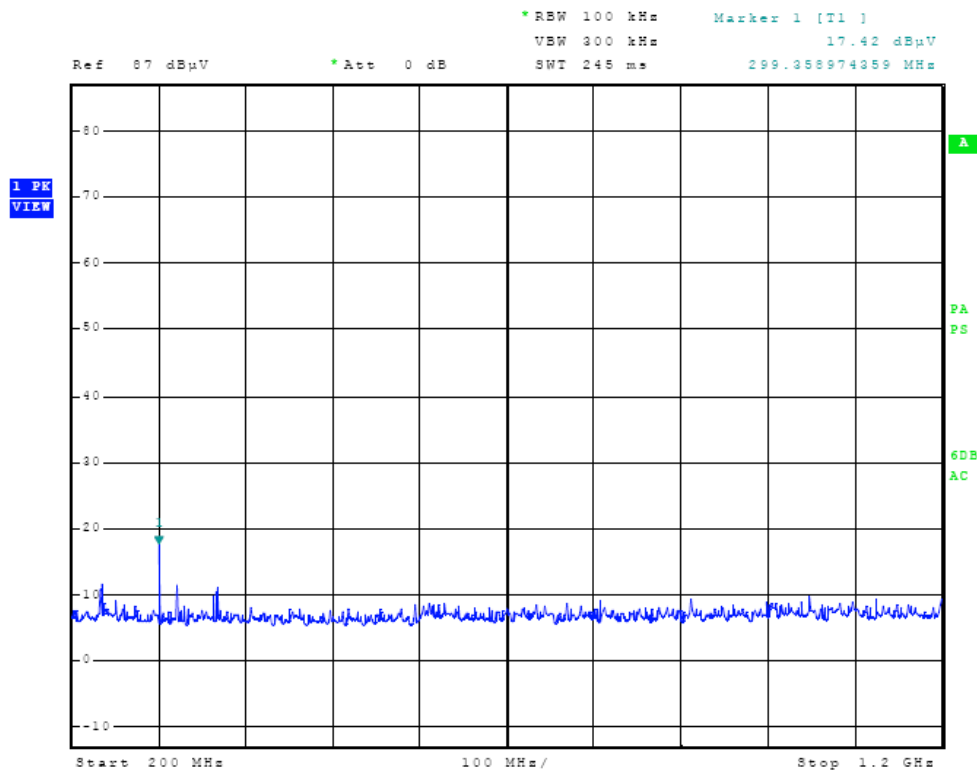


Figure Two Radiated Emissions in screen room

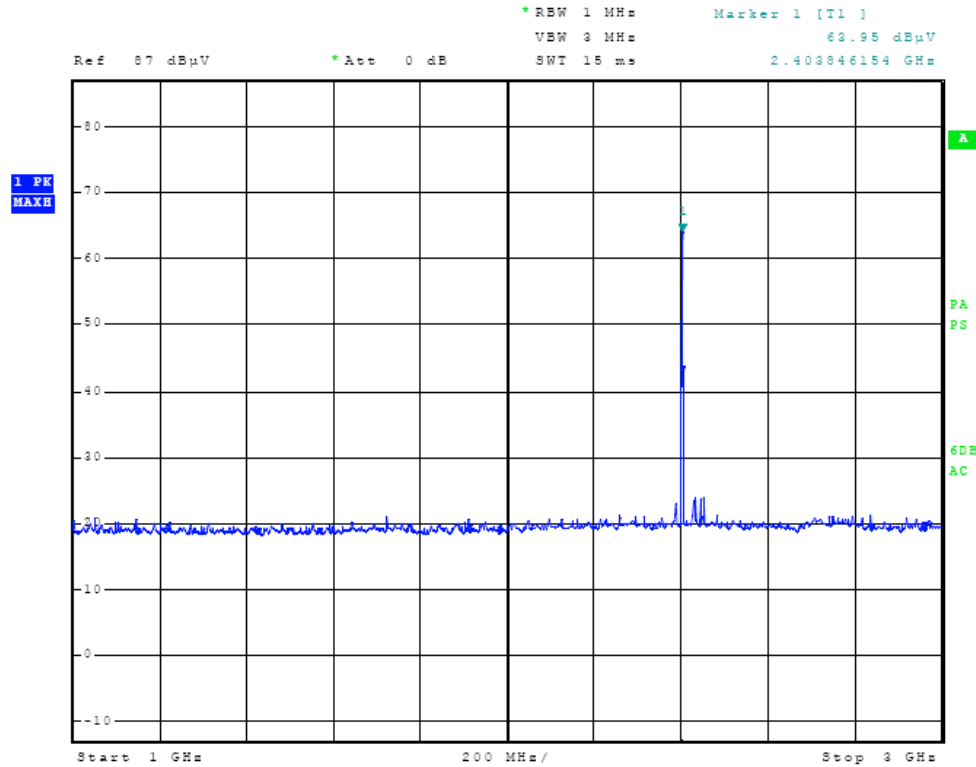


Figure Three Radiated Emissions in screen room

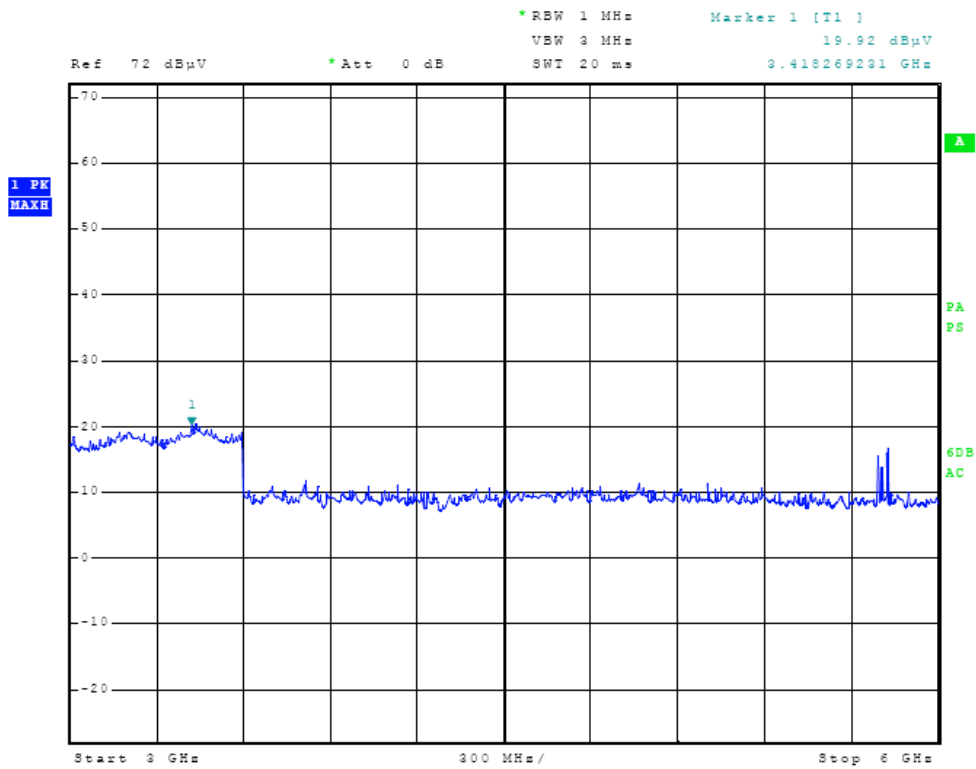


Figure Four Radiated Emissions in screen room

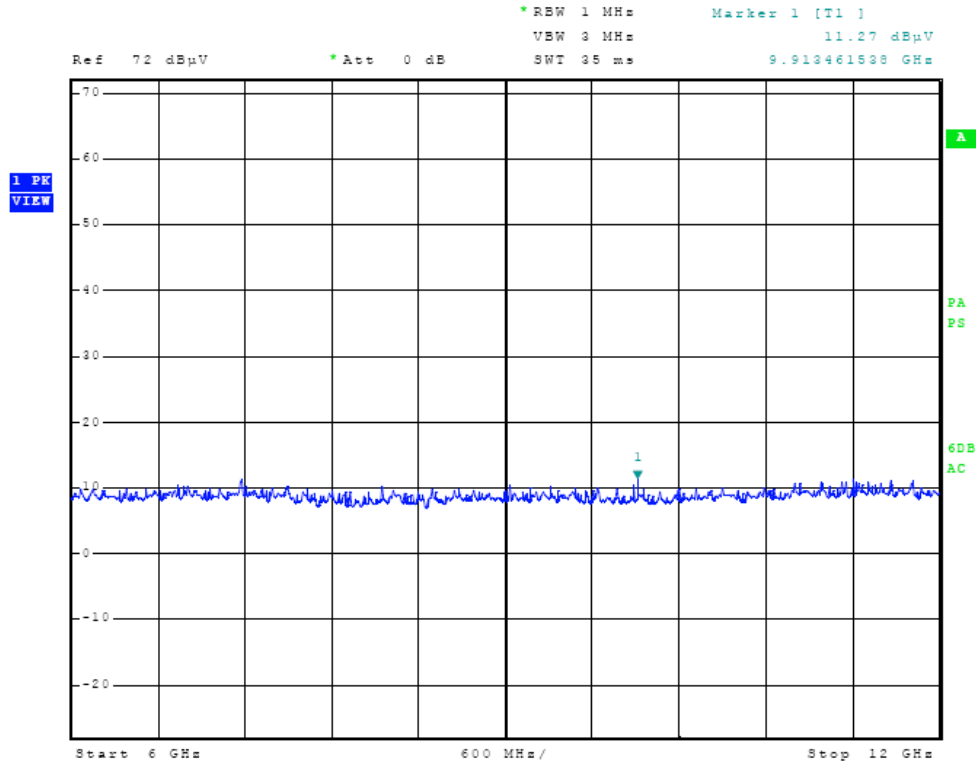


Figure Five Radiated Emissions in screen room

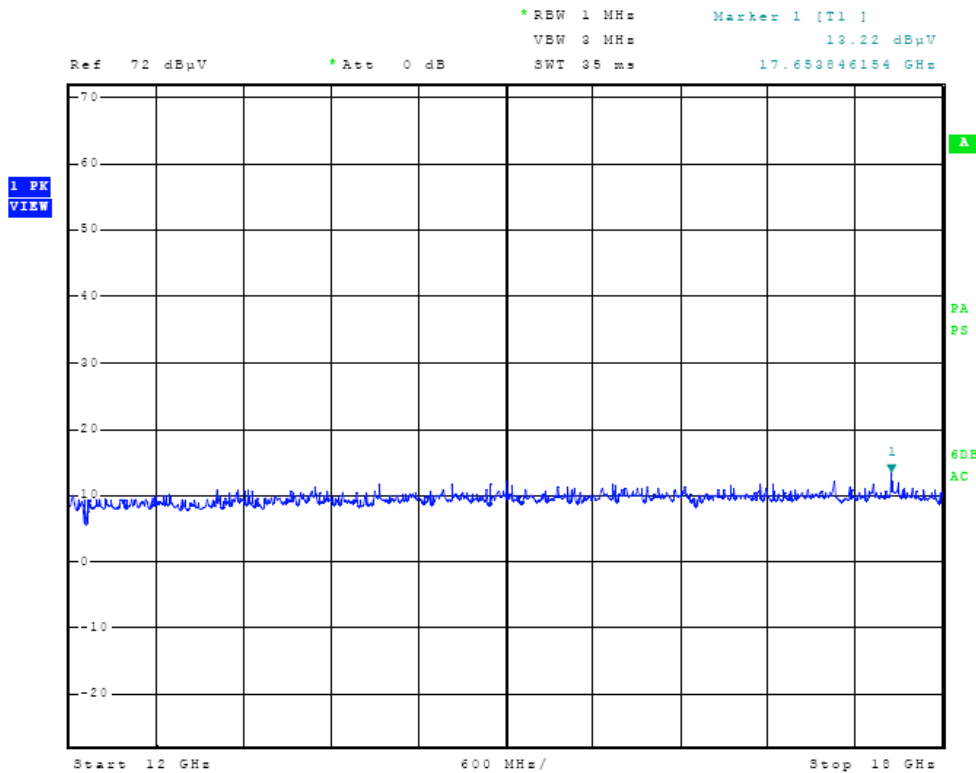


Figure Six Radiated Emissions in screen room

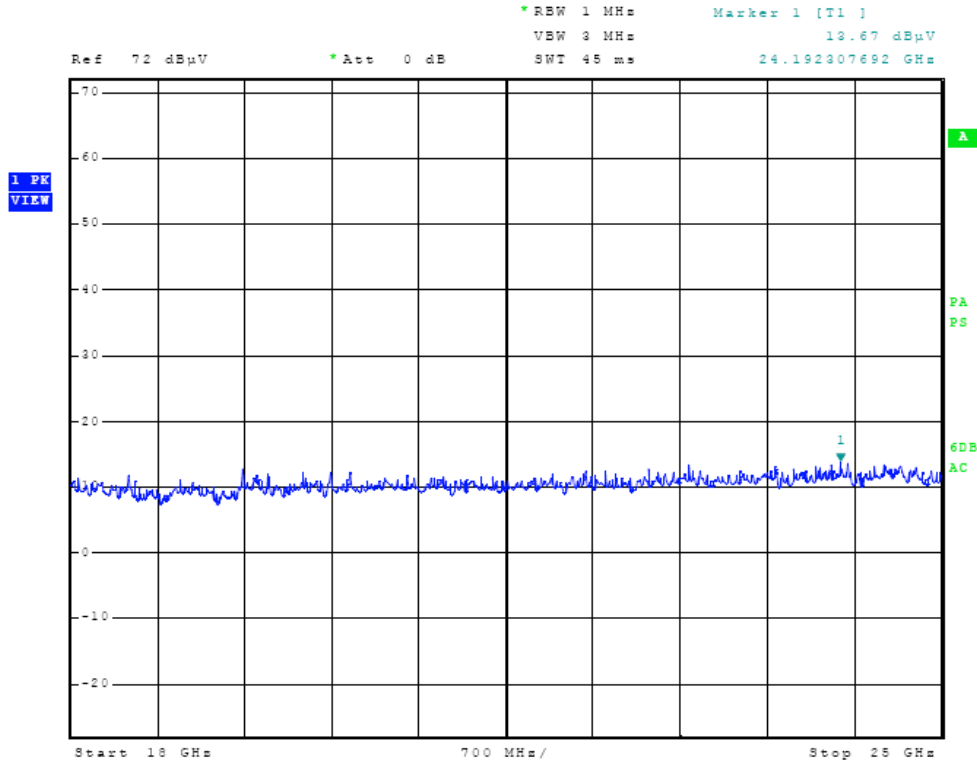


Figure Seven Radiated Emissions in screen room

General Radiated Emissions Data

Emission Freq. (MHz)	FSM Horz. (dBμV)	FSM Vert. (dBμV)	Ant. Factor (dB)	Amp. Gain (dB)	RFS Horz. @ 10m (dBμV/m)	RFS Vert. @ 10m (dBμV/m)	Limit @ 10m (dBμV/m)
2400.0	16.8	15.6	32.9	25.0	24.7	23.5	54.0
2483.5	22.4	22.4	33.3	25.0	30.7	30.7	54.0

Summary of Results for General Radiated Emissions

The EUT demonstrated compliance with the general radiated emissions requirements of FCC Part 15C and other applicable standards for Intentional Radiators. The EUT worst-case configuration demonstrated minimum margin of 23.3 dB below the limits. Other emissions were present with amplitudes at least 20 dB below the Limits.

Receiver Antenna Power Conduction Limits

Receivers which provide terminals for the connection of an external receiving antenna may be tested to demonstrate compliance with the provisions of 15.109 with the antenna terminals shielded and terminated with a termination equal to the impedance specified for the antenna, provided these receivers also comply with the following: With the receiver antenna terminal connected to a resistive termination equal to the impedance specified or employed for the antenna, the power at the antenna terminal at any frequency within the range of measurements specified in 15.33 shall not exceed 2.0 nanowatts. The EUT incorporates an integral antenna system therefore no antenna port conducted emissions were performed. The receiver's frequency spectrum was investigated with the EUT placed on the OATS site and worst case data presented. Compliance to receiver radiated emissions requirements were tested at 3 meter OATS with data demonstrating compliance with requirements.

Receiver 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)
2403.0	17.5	18.4	32.9	25	25.4	26.3	54.0
4806.0	17.0	18.1	32.8	25	24.8	25.9	54.0
7209.0	17.5	17.6	36.4	25	28.9	29.0	54.0
2480.0	17.7	18.3	33.2	25	25.9	26.5	54.0
4960.0	17.2	17.9	32.9	25	25.1	25.8	54.0
7440.0	17.6	17.7	36.7	25	29.3	29.4	54.0

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

Summary of Results for Receiver Emissions

The EUT demonstrated compliance with the radiated emissions requirements of CFR 47 Part 15B and RSS-GEN with a minimum 24.6 dB margin below requirements. Other emissions were present with amplitudes at least 20 dB below the CFR 47 15B and RSS-GEN limits.

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

The transmitter output power was measured on an open area test site at 3 meters distance. Test procedures of ANSI 63.4-2003 paragraphs 13.1 and 8.3.1.2 were used during testing. 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 varying the FSM antenna height, polarization, and by rotating the turntable supporting the EUT. The amplitude of the emission was then recorded from the analyzer display. 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. 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. Plots of the EUT transmitting radiated emissions were taken in the screen room for reference. Refer to figures eight through eleven showing the frequency and amplitude of emission as displayed on the spectrum analyzer. 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 dB μ V/m @ 3 meters.

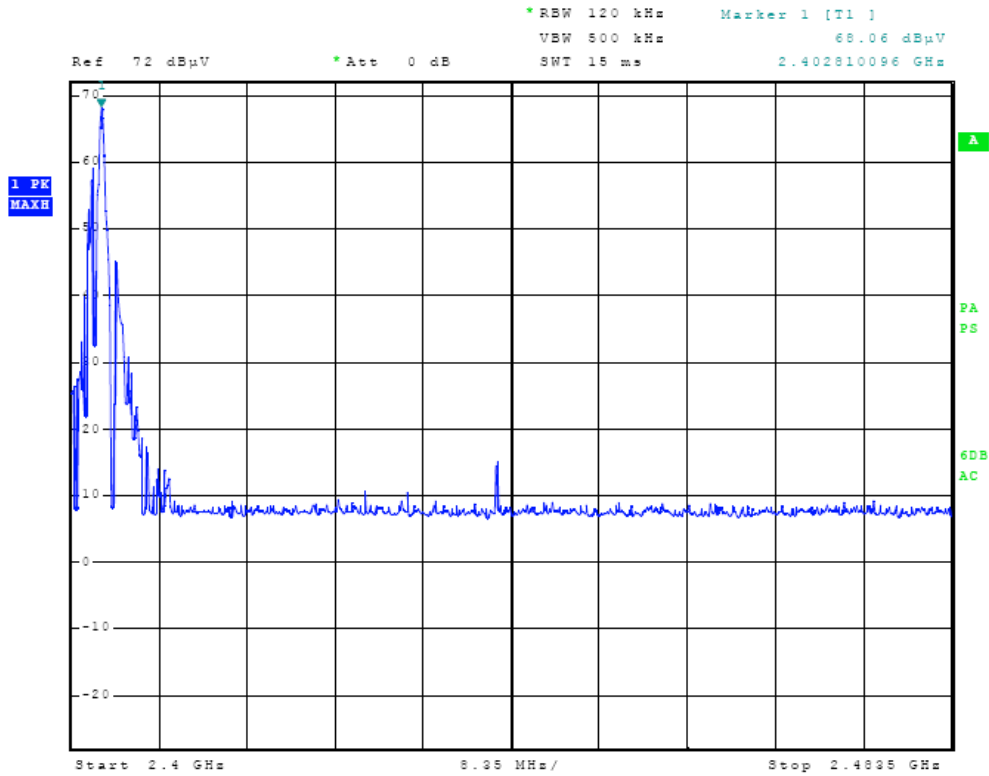


Figure Eight Transmitter Radiated Emissions Plot (Low channel)

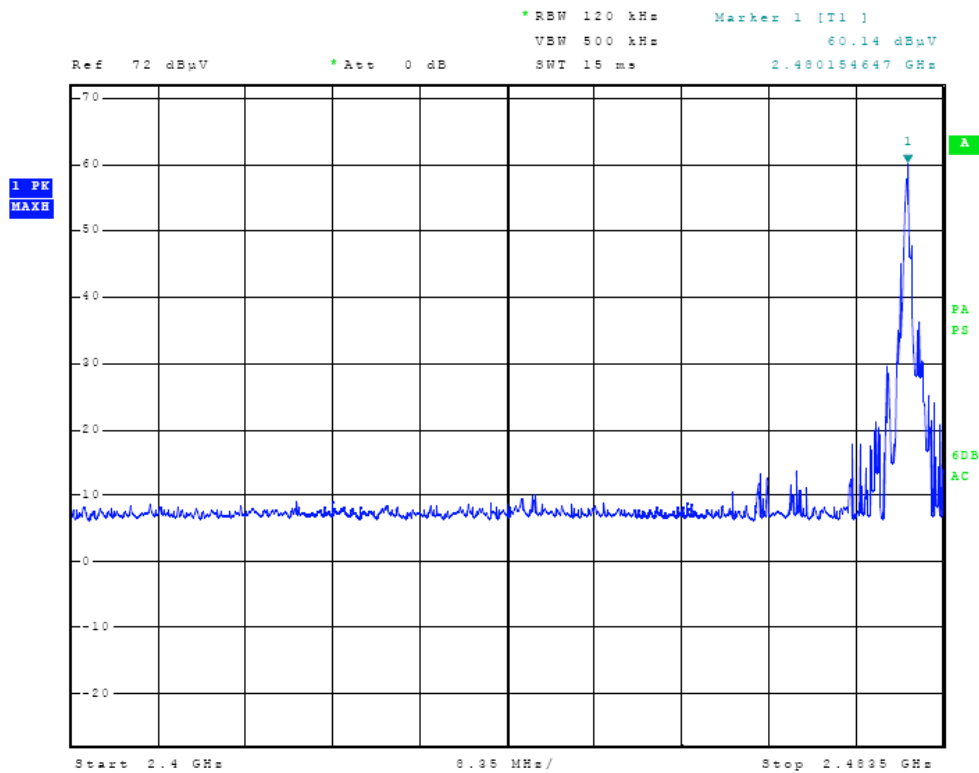


Figure Nine Transmitter Radiated Emissions Plot (High channel)

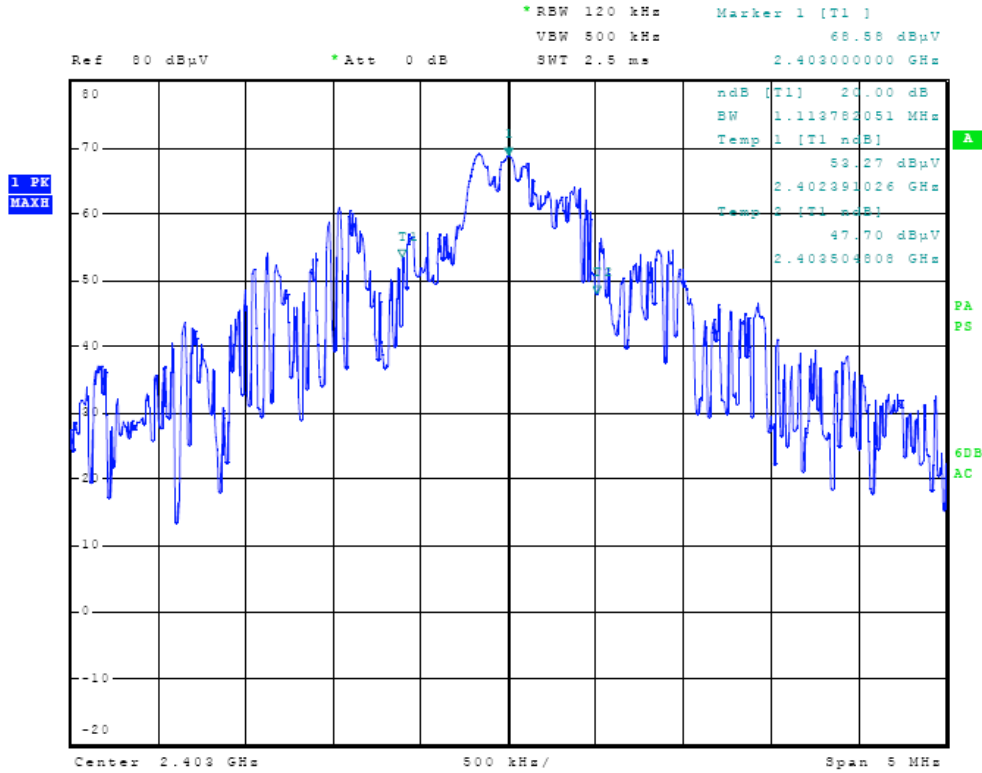


Figure Ten Transmitter Occupied Bandwidth (Low channel)

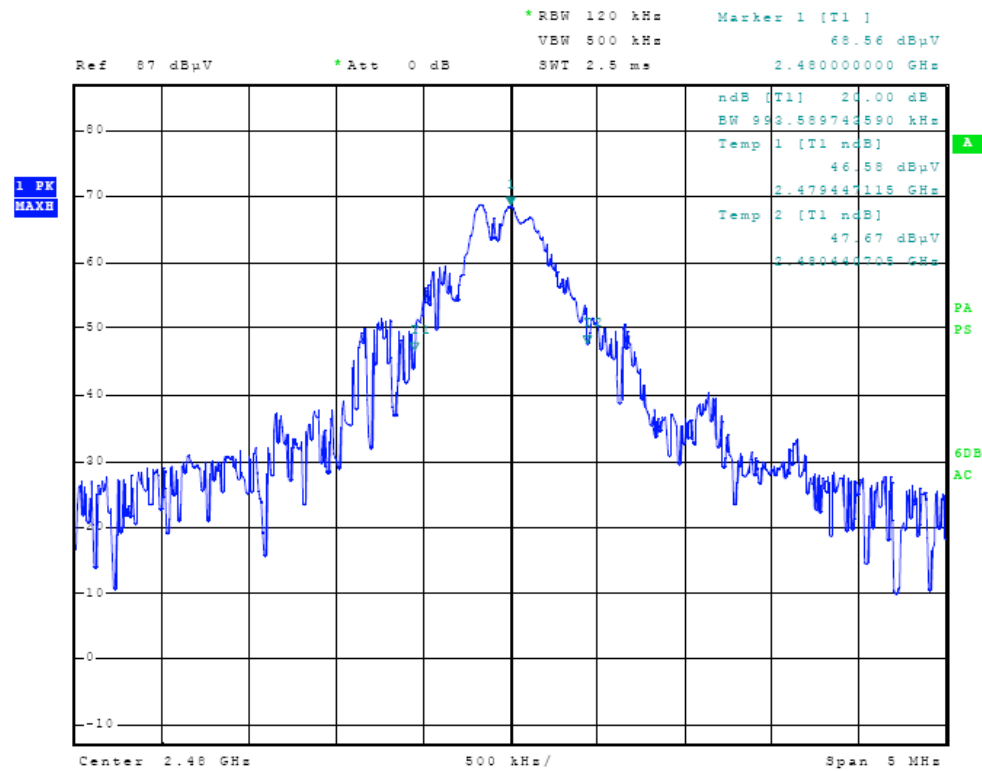


Figure Eleven Transmitter Occupied Bandwidth (High channel)

Transmitter Radiated Emissions Data

Transmitter Emissions Summary Data

Frequency MHz	Peak Radiated Output Power dB μ V/m	Occupied Bandwidth kHz
2403	90.8	1,113.8
2457	91.9	1,250.0
2480	90.9	993.6

Transmitter Radiated Emissions

Frequency MHz	FSM Hor Ave	FSM Vert Ave	AF	Amp Gain	RFS @ 3 m Hor Ave	RFS @ 3 m Vert Ave	Ave Limit
2403.0 (Peak)	82.9	73.4	32.9	25	90.8	81.3	94.0
4806.0	22.5	18.7	32.8	25	30.3	26.5	54.0
7209.0	14.5	15.6	36.4	25	25.9	27.0	54.0
9612.0	15.9	15.9	38.1	25	29.0	29.0	54.0
12015.0	12.0	13.6	40.0	25	27.0	28.6	54.0
14418.0	13.6	12.0	45.3	25	33.9	32.3	54.0
2480.0 (Peak)	82.7	75.4	33.2	25	90.9	83.6	94.0
4960.0	18.0	17.7	32.9	25	25.9	25.6	54.0
7440.0	14.2	15.0	36.7	25	25.9	26.7	54.0
9920.0	15.1	15.2	38.4	25	28.5	28.6	54.0
12400.0	11.3	11.3	40.6	25	26.9	26.9	54.0
14880.0	15.0	15.0	42.6	25	32.6	32.6	54.0

Note: Levels measured @ 3-meter OATS site.

Summary of Results for Transmitter Radiated Emissions

The EUT demonstrated compliance with the radiated emissions requirements of FCC CFR 47 Part 15.249, RSS-210 and other applicable standards for Intentional Radiators. The EUT worst-case configuration demonstrated minimum margin of peak emission of 3.1 dB below average limit. The EUT worst-case configuration demonstrated minimum margin of radiated harmonic emission of 20.1 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.



NVLAP Lab Code 200087-0

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

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

$$U_c(y) = \pm 1.6 \text{ dB}$$

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:

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

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

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 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,	5/10
Mixers: 11517A, 11970A, 11970K, 11970U, 11970V, 11970W	
HP Adapters: 11518, 11519, 11520	
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,

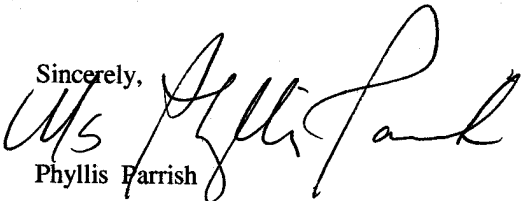
Re: Measurement facility located at Louisburg
~~3 & 10 meter site~~
Date of Renewal: May 18, 2010

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 Farrish
Industry Analyst

Rogers Labs, Inc.
4405 West 259th Terrace
Louisburg, KS 66053
Phone/Fax: (913) 837-3214
Revision 1

Dynastream Innovations, Inc.
Model: SDM4
Test #: 100602 SN: 2255343
Test to: FCC CFR 47 15.249, RSS-210
File: SDM4 2 Change TstRpt

IC: 3797A-SDM4
FCC ID: O6RSMD4
Date: June 10, 2010
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NVLAP Lab Code 200087-0

Annex E Industry Canada Test Site Registration Letter



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
For: Wireless Laboratory Manager
Certification and Engineering Bureau
3701 Carling Ave., Building 94
P.O. Box 11490, Station "H"
Ottawa, Ontario K2H 8S2
Email: dalwinder.gill@ic.gc.ca
Tel. No. (613) 998-8363
Fax. No. (613) 990-4752

Rogers Labs, Inc.
4405 West 259th Terrace
Louisburg, KS 66053
Phone/Fax: (913) 837-3214
Revision 1

Dynastream Innovations, Inc.
Model: SDM4
Test #: 100602 SN: 2255343
Test to: FCC CFR 47 15.249, RSS-210
File: SDM4 2 Change TstRpt

IC: 3797A-SDM4
FCC ID: O6RSDM4
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