Excellence in Compliance Testing

Certification Test Report

FCC ID: QZC-REXU
IC: 4557A-REXU

FCC Rule Part: 15.247
IC Radio Standards Specification: RSS-210

ACS Report Number: 12-0259.W06.2A

Manufacturer: Elster Solutions, LLC
Model: REXU

Test Begin Date: July 16, 2012
Test End Date: July 24, 2012

Report Issue Date: August 9, 2012

FOR THE SCOPE OF ACCREDITATION UNDER LAB Code 200612-0

This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

Reviewed by:

Kirby Munroe
Director, Wireless Certifications
ACS, Inc.

This report contains 21 pages

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1 GENERAL

1.1 Purpose

The purpose of this report is to demonstrate compliance with Part 15 Subpart C of the FCC's Code of Federal Regulations and Industry Canada's Radio Standards Specification RSS-210 for Certification.

1.2 General

The REXU module is a Printed Circuit Board Assembly (PCBA) that forms a complete electricity meter when installed in a housing and meter base.

The REXU contains (1) 900 MHz LAN frequency hopping spread spectrum radio and (1) 2.4 GHz direct sequence spread spectrum Zigbee radio. This report addresses the 2.4 GHz Zigbee radio only.

Technical Details:
Band of Operation: 2405 – 2470 MHz
Number of Channels: 14
Modulation Format: O-QPSK
Antenna Type/Gain: Printed Inverted F Antenna; 3.82dBi gain
Operating Voltage: 18 Vdc

Manufacturer Information:
Elster Solutions, LLC
208 S. Rogers Lane
Raleigh, NC 27610

Test Sample Serial Number: 0079 (conducted), 0009 (radiated)

Test Sample Condition: The test samples were provided in good working order with no visible defects.

1.3 Test Methodology and Considerations

For radiated and AC power line conducted emissions, the EUT was placed on the test table in an orientation representative of final installation.

Both the 900 MHz LAN radio and the 2.4 GHz Zigbee radio can transmit simultaneously therefore radiated inter-modulation products were evaluated and found to be in compliance.

2 TEST FACILITIES

2.1 Location

The radiated and conducted emissions test sites are located at the following address:

Advanced Compliance Solutions
5015 B.U. Bowman Drive
Buford, GA 30518
Phone: (770) 831-8048
Fax: (770) 831-8598

2.2 Laboratory Accreditations/Recognitions/Certifications

ACS is accredited to ISO/IEC 17025 by the National Institute of Standards and Technology under their National Voluntary Laboratory Accreditation Program (NVLAP), Lab Code 200612-0. Unless otherwise specified, all tests methods described within this report are covered under the ISO/IEC 17025 scope of accreditation.

The Semi-Anechoic Chamber Test Site, Open Area Test Site (OATS) and Conducted Emissions Site have been fully described, submitted to, and accepted by the FCC, Industry Canada and the Japanese Voluntary Control Council for Interference by information technology equipment.

FCC Registration Number: 511277
Industry Canada Lab Code: IC 4175A-1
VCCI Member Number: 1831

- VCCI OATS Registration Number R-1526
- VCCI Conducted Emissions Site Registration Number: C-1608

2.3 Radiated Emissions Test Site Description

2.3.1 Semi-Anechoic Chamber Test Site

The Semi-Anechoic Chamber Test Site consists of a 20' x 30' x 18' shielded enclosure. The chamber is lined with Toyo Ferrite Grid Absorber, model number FFG-1000. The ferrite tile grid is 101 x 101 x 19mm thick and weighs approximately 550 grams. These tiles are mounted on steel panels and installed directly on the inner walls of the chamber.

The turntable is 150cm in diameter and is located 160cm from the back wall of the chamber. The chamber is grounded via 1 - 8' copper ground rod, installed at the center of the back wall, it is bound to the ground plane using 3/4" stainless steel braided cable.

The turntable is all steel, flush mounted table installed in an all steel frame. The table is remotely operated from inside the control room located 25' from the range. The turntable is electrically bonded to the surrounding ground plane via steel fingers installed on the edge of the turn table. The steel fingers make constant contact with the ground plane during operation.

Behind the turntable is a 3' x 6' x 4' deep shielded pit used for support equipment if necessary. The pit is equipped with 1 - 4" PVC chases from the turntable to the pit that allow for cabling to the EUT if necessary. The underside of the turntable can be accessed from the pit so cables can be supplied to the EUT from the pit.

A diagram of the Semi-Anechoic Chamber Test Site is shown in Figure 2.3-1 below:

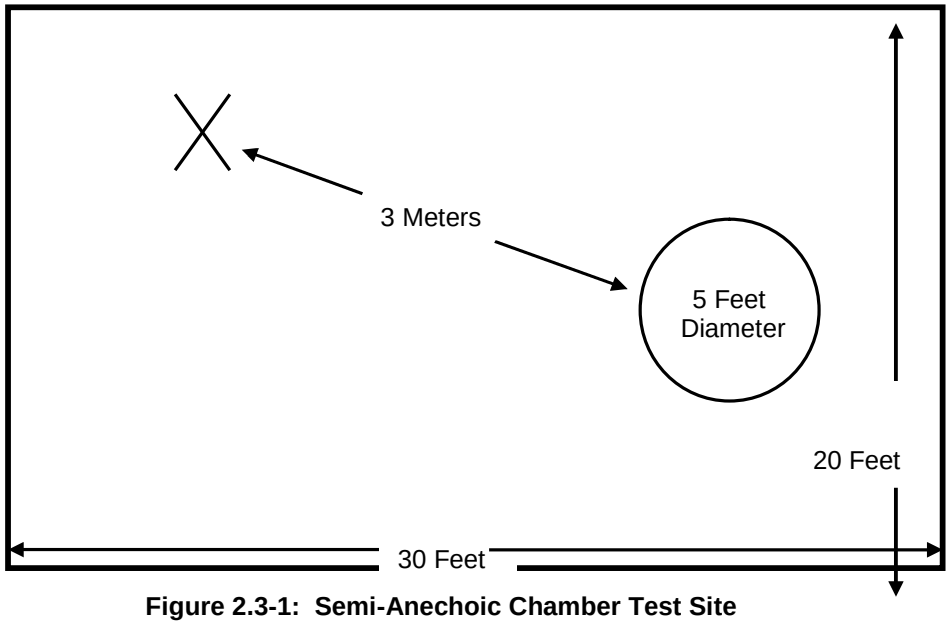

Figure 2.3-1: Semi-Anechoic Chamber Test Site

2.3.2 Open Area Tests Site (OATS)

The open area test site consists of a 40' x 66' concrete pad covered with a perforated electro-plated galvanized sheet metal. The perforations in the sheet metal are 1/8" holes that are staggered every 3/16". The individual sheets are placed to overlap each other by 1/4" and are riveted together to provide a continuous seam. Rivets are spaced every 3" in a 3 x 20 meter perimeter around the antenna mast and EUT area. Rivets in the remaining area are spaced as necessary to properly secure the ground plane and maintain the electrical continuity.

The entire ground plane extends 12' beyond the turntable edge and 16' beyond the antenna mast when set to a 10 meter measurement distance. The ground plane is grounded via 4 - 8' copper ground rods, each installed at a corner of the ground plane and bound to the ground plane using 3/4" stainless steel braided cable.

The turntable is an all aluminum 10' flush mounted table installed in an all aluminum frame. The table is remotely operated from inside the control room located 40' from the range. The turntable is electrically bonded to the surrounding ground plane via steel fingers installed on the edge of the turn table. The steel fingers make constant contact with the ground plane during operation.

Adjacent to the turntable is a 7' x 7' square and 4' deep concrete pit used for support equipment if necessary. The pit is equipped with 5 - 4" PVC chases from the pit to the control room that allow for cabling to the EUT if necessary. The underside of the turntable can be accessed from the pit so cables can be supplied to the EUT from the pit. The pit is covered with 2 sheets of 1/4" diamond style re-enforced steel sheets. The sheets are painted to match the perforated steel ground plane; however the underside edges have been masked off to maintain the electrical continuity of the ground plane. All reflecting objects are located outside of the ellipse defined in ANSI C63.4.

A diagram of the Open Area Test Site is shown in Figure 2.3-2 below:

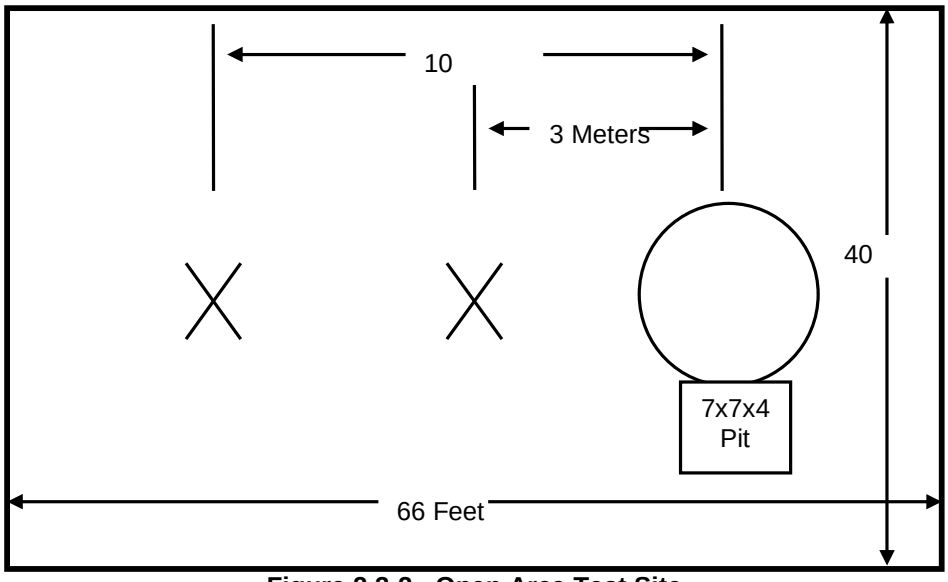

Figure 2.3-2: Open Area Test Site

2.4 Conducted Emissions Test Site Description

The AC mains conducted EMI site is located in the main EMC lab. It consists of an 8' x 8' solid aluminum horizontal ground reference plane (GRP) bonded every 3" to an 8' X 8' vertical ground plane.

The site is of sufficient size to test table top and floor standing equipment in accordance with section 6.1.4 of ANSI C63.4.

A diagram of the room is shown below in figure 4.1.3-1:

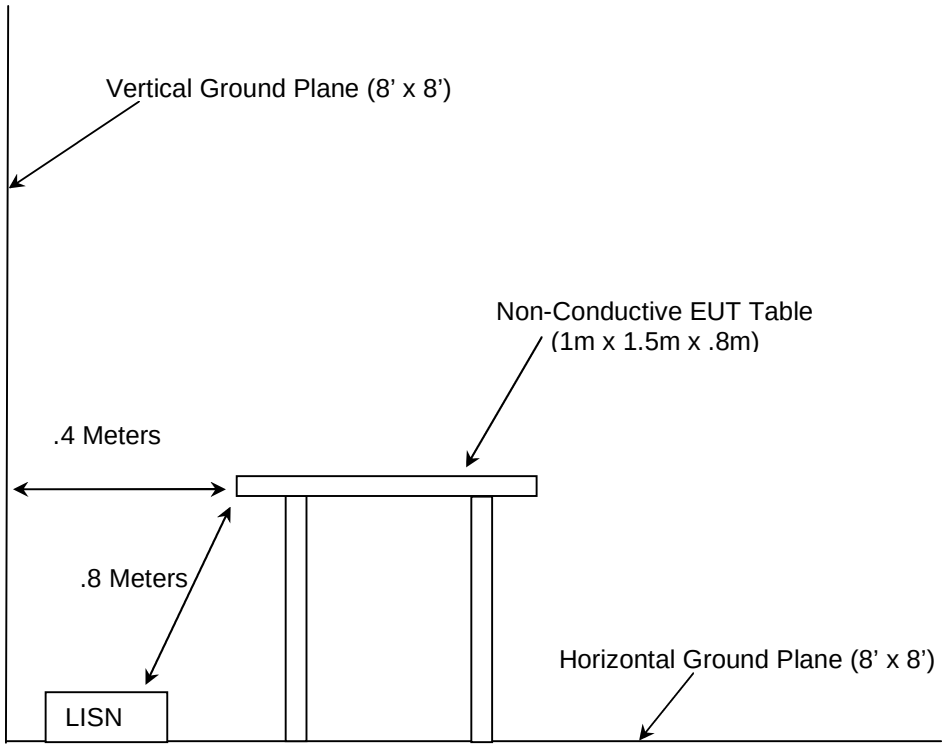

Figure 2.4-1: AC Mains Conducted EMI Site

3 APPLICABLE STANDARD REFERENCES

The following standards were used:

- ANSI C63.4-2003: Method of Measurements of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the 9KHz to 40GHz
- US Code of Federal Regulations (CFR): Title 47, Part 2, Subpart J: Equipment Authorization Procedures, 2012
- US Code of Federal Regulations (CFR): Title 47, Part 15, Subpart C: Radio Frequency Devices, Intentional Radiators, 2012
- FCC KDB 558074 D01 DTS Meas Guidance v01 - Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under 15.247, January 18, 2012
- Industry Canada Radio Standards Specification: RSS-210 - Low-power License-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment, Issue 8, Dec 2010
- Industry Canada Radio Standards Specification: RSS-GEN – General Requirements and Information for the Certification of Radiocommunication Equipment, Issue 3, Dec 2010.

4 LIST OF TEST EQUIPMENT

The calibration interval of test equipment is annually or the manufacturer's recommendations. Where the calibration interval deviates from the annual cycle based on the instrument manufacturer's recommendations, it shall be stated below.

Table 4-1: Test Equipment

AssetID	Manufacturer	Model #	Equipment Type	Serial #	Last Calibration Date	Calibration Due Date
1	Rohde & Schwarz	ESMI - Display	Spectrum Analyzers	833771/007	9/23/2011	9/23/2012
2	Rohde & Schwarz	ESMI-Receiver	Spectrum Analyzers	839587/003	9/23/2011	9/23/2012
3	Rohde & Schwarz	ESMI - Display	Spectrum Analyzers	839379/011	5/26/2011	5/26/2013
4	Rohde & Schwarz	ESMI - Receiver	Spectrum Analyzers	833827/003	5/26/2011	5/26/2013
30	Spectrum Technologies	DRH-0118	Antennas	970102	4/27/2011	4/27/2013
40	EMCO	3104	Antennas	3211	2/11/2011	2/11/2013
73	Agilent	8447D	Amplifiers	2727A05624	9/30/2011	9/30/2012
153	EMCO	3825/2	LISN	9411-2268	1/13/2011	1/13/2013
167	ACS	Chamber EMI Cable Set	Cable Set	167	12/21/2011	12/21/2012
168	Hewlett Packard	11947A	Attenuators	44829	2/1/2012	2/1/2013
283	Rohde & Schwarz	FSP40	Spectrum Analyzers	1000033	8/26/2011	8/26/2012
291	Florida RF Cables	SMRE	Cables	None	12/2/2011	12/2/2012
292	Florida RF Cables	480.0-SMR	Cables	None	4/2/2012	4/2/2013
324	ACS	Belden	Cables	8214	6/26/2012	6/26/2013
334	Rohde&Schwarz	3160-10	Antennas	45576	11/4/2010	NCR
335	Suhner	SF-102A	Cables	882/2A	8/29/2011	8/29/2012
338	Hewlett Packard	8449B	Amplifiers	3008A01111	3/1/2012	8/31/2012
340	Aeroflex/Weinschel	AS-20	Attenuators	7136	8/29/2011	8/29/2012
345	Suhner Sucoflex	102A	Cables	1077/2A	8/29/2011	8/29/2012
412	Electro Metrics	LPA-25	Antennas	1241	7/28/2010	7/28/2012
422	Florida RF	SMS-200AW-72.0-SMR	Cables	805	12/2/2011	12/2/2012
432	Microwave Circuits	H3G020G4	Filters	264066	7/2/2012	7/2/2013

5 SUPPORT EQUIPMENT

Table 5-1: Support Equipment

Item #	Type Device	Manufacturer	Model/Part #	Serial #
1	Power Supply	Agilent	E3630A	MY40015581

6 EQUIPMENT UNDER TEST SETUP BLOCK DIAGRAM

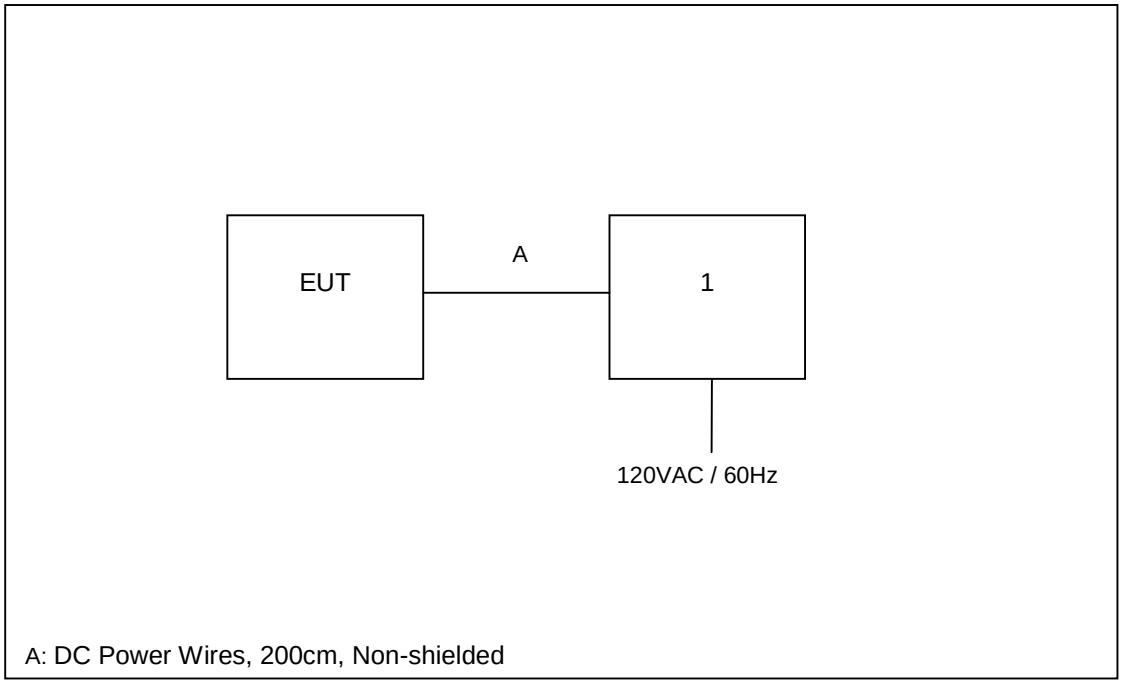

Figure 6-1: Test Setup Block Diagram

7 SUMMARY OF TESTS

Along with the tabular data shown below, plots were taken of all signals deemed important enough to document.

7.1 Antenna Requirement – FCC: Section 15.203

The antenna is an embedded printed inverted F antenna with a maximum gain of +3.82 dBi.

7.2 Power Line Conducted Emissions – FCC: Section 15.207 IC: RSS-Gen 7.2.4

7.2.1 Measurement Procedure

ANSI C63.4 sections 6 and 7 were the guiding documents for this evaluation. Conducted emissions were performed from 150kHz to 30MHz with the spectrum analyzer's resolution bandwidth set to 9kHz and the video bandwidth set to 30kHz. The calculation for the conducted emissions is as follows:

Corrected Reading = Analyzer Reading + LISN Loss + Cable Loss
Margin = Applicable Limit - Corrected Reading

7.2.2 Measurement Results

Results of the test are shown below in and Tables 7.2.2-1 to 7.2.2-2.

Table 7.2.2-1: Conducted EMI Results – Line 1

Frequency (MHz)	Level (dBuV)	Transducer (dB)	Limit (dBuV)	Margin (dB)	PE	Detector
0.192000	46.00	9.9	64	18.0	FLO	QP
0.336000	43.10	10.0	59	16.2	FLO	QP
0.534000	42.90	10.0	56	13.1	FLO	QP
0.774000	28.50	10.1	56	27.5	FLO	QP
1.068000	39.40	10.0	56	16.6	FLO	QP
1.602000	38.50	10.0	56	17.5	FLO	QP
13.890000	35.10	9.9	60	24.9	FLO	QP
14.424000	36.50	9.8	60	23.5	FLO	QP
14.958000	33.70	9.8	60	26.3	FLO	QP
27.144000	15.10	9.4	60	44.9	FLO	QP
0.192000	32.20	9.9	54	21.7	FLO	AVG
0.372000	25.30	10.0	49	23.2	FLO	AVG
0.534000	42.30	10.0	46	3.7	FLO	AVG
0.792000	19.10	10.1	46	26.9	FLO	AVG
1.068000	39.30	10.0	46	6.7	FLO	AVG
1.602000	38.10	10.0	46	7.9	FLO	AVG
13.890000	34.00	9.9	50	16.0	FLO	AVG
14.424000	35.60	9.8	50	14.4	FLO	AVG
14.958000	32.80	9.8	50	17.2	FLO	AVG
26.988000	9.40	9.4	50	40.6	FLO	AVG

Table 7.2.2-2: Conducted EMI Results – Line 2

Frequency (MHz)	Level (dBuV)	Transducer (dB)	Limit (dBuV)	Margin (dB)	PE	Detector
0.186000	46.80	10.0	64	17.4	FLO	QP
0.342000	43.30	10.0	59	15.9	FLO	QP
0.534000	42.40	10.0	56	13.6	FLO	QP
0.690000	26.80	10.1	56	29.2	FLO	QP
0.744000	29.00	10.1	56	27.0	FLO	QP
1.068000	38.80	10.0	56	17.2	FLO	QP
1.602000	36.10	10.0	56	19.9	FLO	QP
13.890000	34.40	9.9	60	25.6	FLO	QP
14.424000	35.50	9.8	60	24.5	FLO	QP
0.228000	26.60	9.9	53	25.9	FLO	AVG
0.360000	26.70	10.0	49	22.0	FLO	AVG
0.534000	41.50	10.0	46	4.5	FLO	AVG
0.672000	16.90	10.0	46	29.1	FLO	AVG
0.756000	19.60	10.1	46	26.4	FLO	AVG
1.068000	38.50	10.0	46	7.5	FLO	AVG
1.602000	35.70	10.0	46	10.3	FLO	AVG
13.896000	22.10	9.9	50	27.9	FLO	AVG
14.424000	31.90	9.8	50	18.1	FLO	AVG

7.3 6dB / 99% Bandwidth – FCC: Section 15.247(a)(2) IC: RSS-210 A8.2(a)

7.3.1 Measurement Procedure

The 6dB bandwidth was measured in accordance with the FCC KDB 558074 D01 DTS Meas Guidance v01. The Resolution Bandwidth (RBW) of the spectrum analyzer was set to approximately 1% to 5% of the Emission Bandwidth (EBW). The Video Bandwidth (VBW) was set to ≥ 3 times the RBW. The trace was set to max hold with a peak detector active. The Delta function of the analyzer was utilized to determine the 6 dB bandwidth of the emission.

The 99% occupied bandwidth was measured with the spectrum analyzer span set to fully display the emission and side bands. The RBW was to ~ 1% of the span. The trace was set to max hold with a sample detector. The occupied bandwidth measurement function of the analyzer was used for the 99% bandwidth.

7.3.2 Measurement Results

Results are shown below in Table 7.3.2-1 and Figures 7.3.2-1 to 7.3.2-6:

Table 7.3.2-1: 6dB / 99% Bandwidth

Frequency [MHz]	6dB Bandwidth [MHz]	99% Bandwidth [MHz]
2405	1.848	2.496
2440	1.812	2.460
2470	1.812	2.436

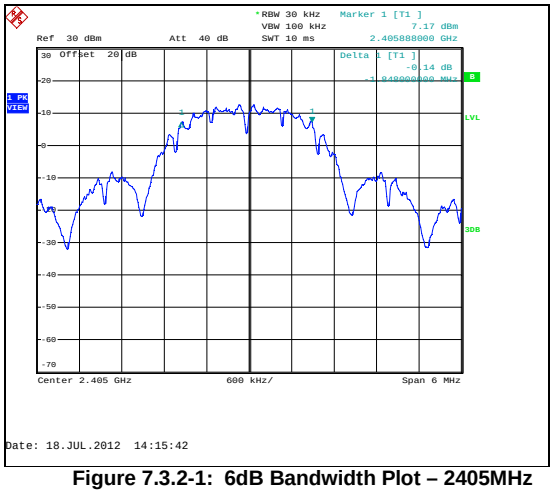

Figure 7.3.2-1: 6dB Bandwidth Plot – 2405MHz

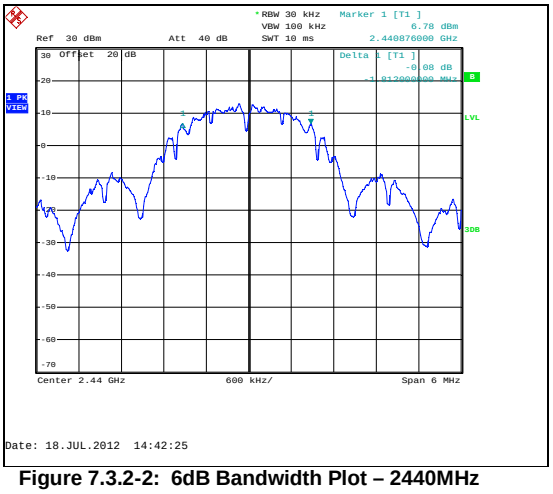

Figure 7.3.2-2: 6dB Bandwidth Plot – 2440MHz

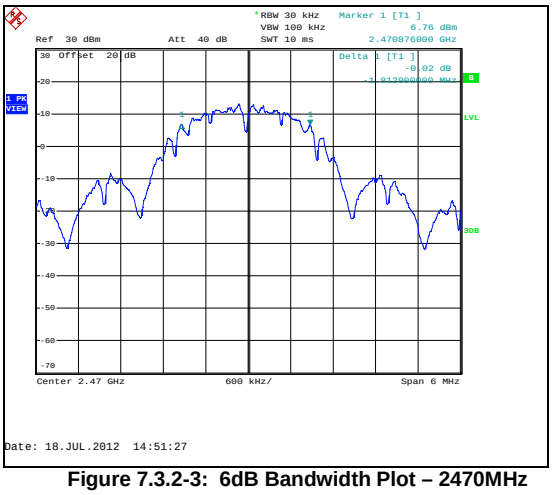

Figure 7.3.2-3: 6dB Bandwidth Plot – 2470MHz

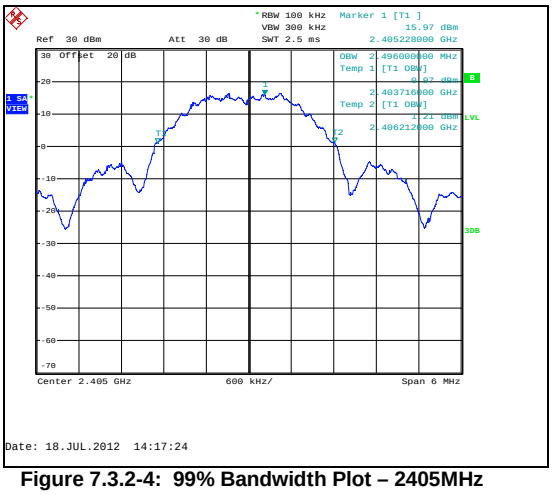

Figure 7.3.2-4: 99% Bandwidth Plot – 2405MHz

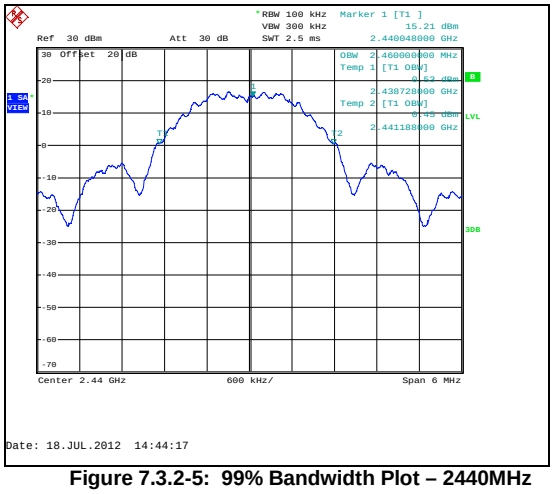

Figure 7.3.2-5: 99% Bandwidth Plot – 2440MHz

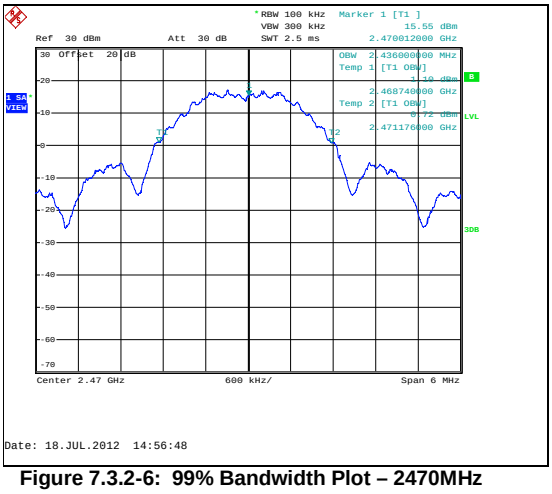

Figure 7.3.2-6: 99% Bandwidth Plot – 2470MHz

7.4 Peak Output Power Requirement - FCC Section 15.247(b)(3) IC: RSS-210 A8.4(4)

7.4.1 Measurement Procedure

The Peak Output Power was measured in accordance with the FCC KDB 558074 D01 DTS Meas Guidance v01 Measurement Procedure PK1. The RF output of the equipment under test was directly connected to the input of the Spectrum Analyzer applying suitable attenuation. The Resolution Bandwidth (RBW) of the spectrum analyzer was set >> than the Emission Bandwidth (EBW). The Video Bandwidth (VBW) was set to ≥ 3 times the RBW. Span was set to 0 Hz. The trace was set to max hold with a peak detector active.

7.4.2 Measurement Results

Results are shown below in Tables 7.4.2-1 and Figures 7.4.2-1 to 7.4.2-3.

Table 7.4.2-1: Peak Output Power

Frequency (MHz)	Output Power (dBm)
2405	20.27
2440	20.09
2470	19.78

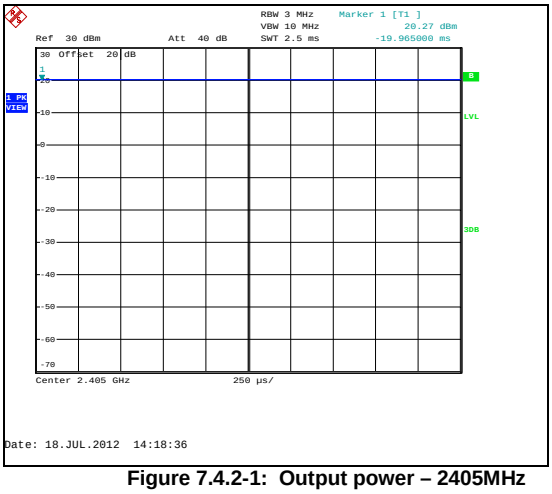

Figure 7.4.2-1: Output power – 2405MHz

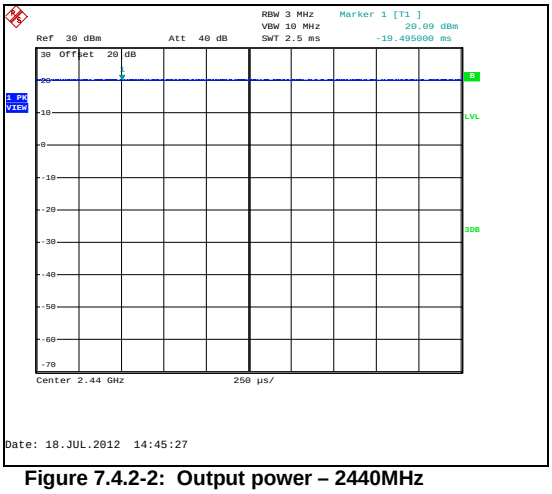

Figure 7.4.2-2: Output power – 2440MHz

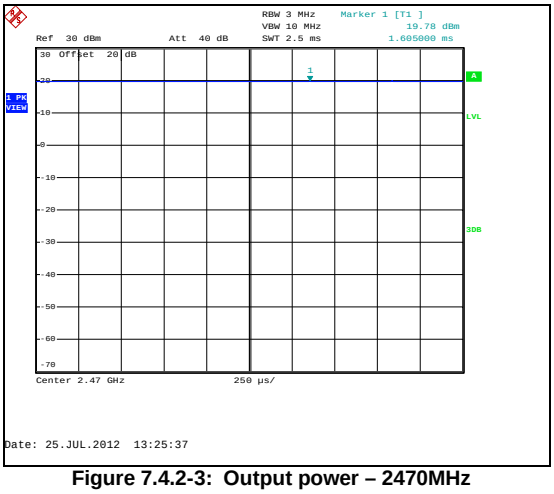

Figure 7.4.2-3: Output power – 2470MHz

7.5 Band-Edge Compliance and Spurious Emissions-FCC 15.247(d) IC:RSS-210 2.2, A8.5

7.5.1 Band-Edge Compliance

7.5.1.1 Measurement Procedure

The EUT was investigated at the low and high channels of operation to determine band-edge compliance.

Radiated band-edge compliance at the restricted bands was determined based on the measurement of the absolute field strength.

The lower and upper band-edges were also evaluated using the conducted marker-delta method in which the radio frequency power that is produced by the EUT is at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of desired power.

7.5.1.2 Measurement Results

Band-edge compliance is displayed in Table 7.5.1.2-1and Figures 7.5.1.2-1 to 7.5.1.2-2.

Table 7.5.1.2-1: Band-edge Radiated Emissions

Frequency (MHz)	Level (dBuV)		Antenna Polarity	Correction Factors	Corrected Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)	
	pk	Qpk/Avg	(H/V)	(dB)	pk	Qpk/Avg	pk	Qpk/Avg	pk	Qpk/Avg
2483.5	60.98	50.27	H	-5.07	55.91	41.59	74.0	54.0	18.1	12.4
2483.5	67.55	57.37	V	-5.07	62.48	48.69	74.0	54.0	11.5	5.3
2390	59.19	47.73	H	-5.47	53.72	38.66	74.0	54.0	20.3	15.3
2390	66.19	55.29	V	-5.47	60.72	46.22	74.0	54.0	13.3	7.8

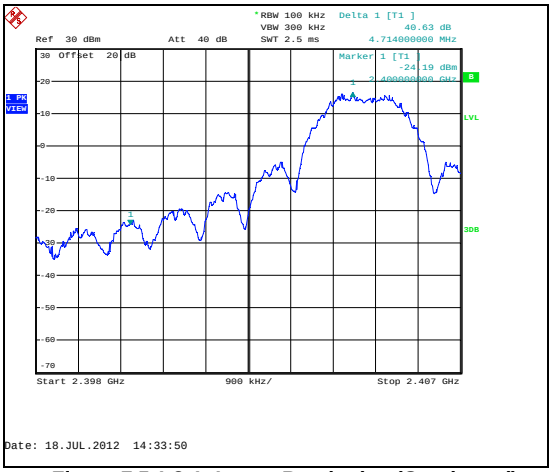

Figure 7.5.1.2-1: Lower Band-edge (Conducted)

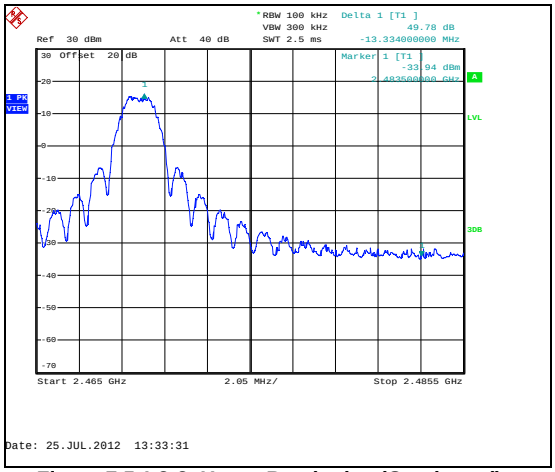

Figure 7.5.1.2-2: Upper Band-edge (Conducted)

7.5.2 RF Conducted Spurious Emissions

7.5.2.1 Measurement Procedure

The RF Conducted Spurious Emissions were measured in accordance with FCC KDB 558074 D01 DTS Meas Guidance v01. The RF output of the equipment under test was directly connected to the input of the spectrum analyzer applying suitable attenuation. The Resolution Bandwidth (RBW) of the spectrum analyzer was set to 100 kHz. The Video Bandwidth (VBW) was set to ≥ 300 kHz. Span was set to 5 – 30% greater the EBW. The trace was set to max hold with a peak detector active. The resulting spectrum analyzer peak level was used to determine the reference level with respect to the 20 dBc limit. The spectrum span was then adjusted for the measurement of spurious emissions from 30MHz to 25GHz, 10 times the highest fundamental frequency.

7.5.2.2 Measurement Results

RF Conducted Emissions are displayed in Figures 7.5.2.2-1 through 7.5.2.2-9.

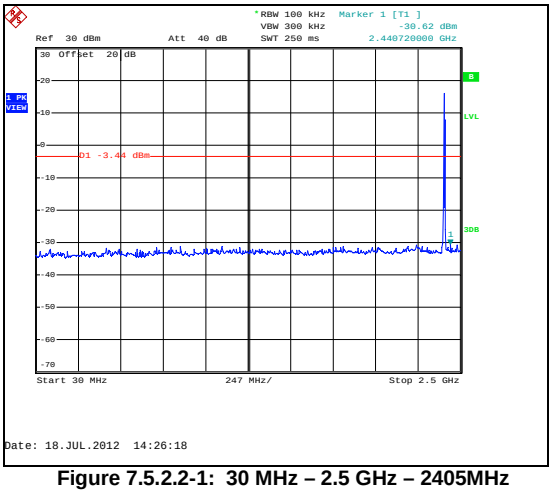

Figure 7.5.2.2-1: 30 MHz – 2.5 GHz – 2405MHz

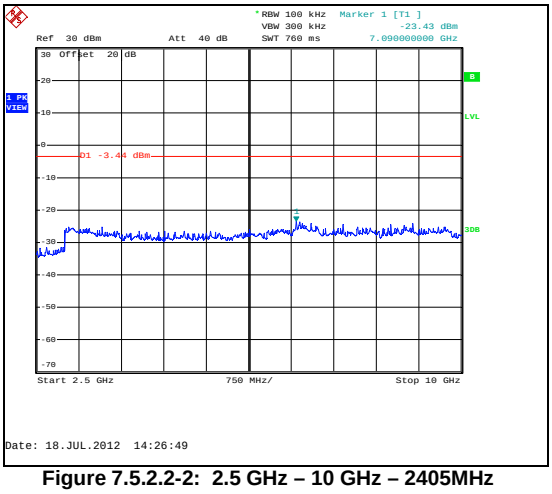

Figure 7.5.2.2-2: 2.5 GHz – 10 GHz – 2405MHz

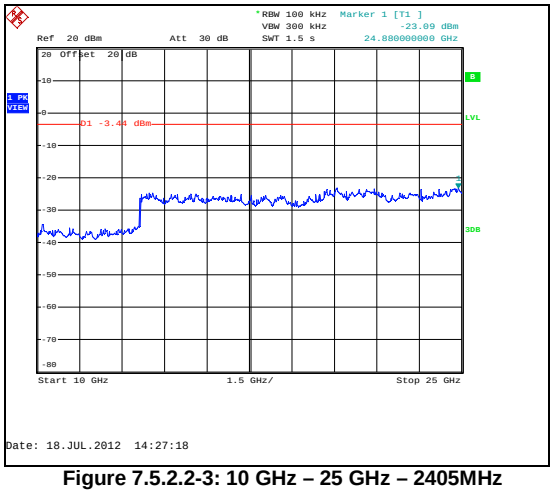

Figure 7.5.2.2-3: 10 GHz – 25 GHz – 2405MHz

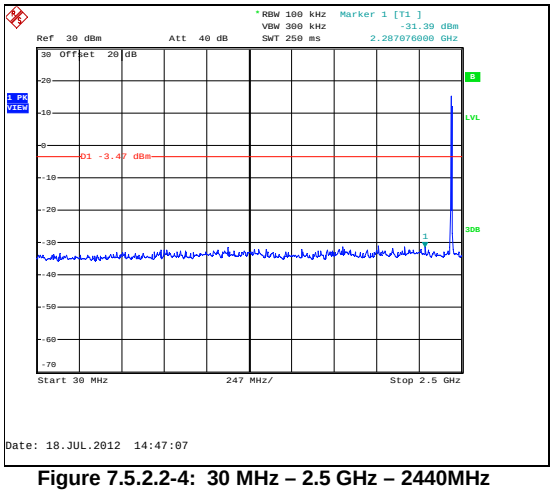

Figure 7.5.2.2-4: 30 MHz – 2.5 GHz – 2440MHz

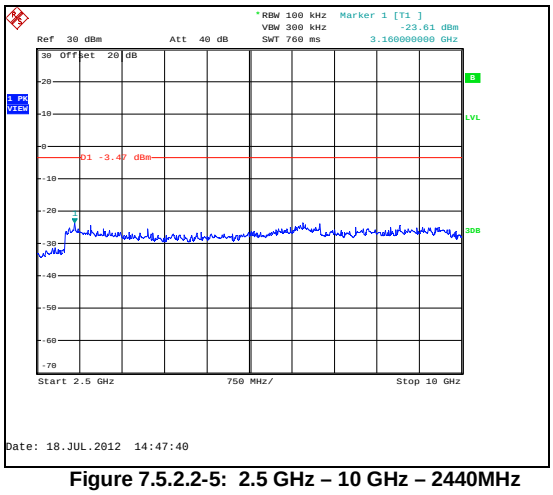

Figure 7.5.2.2-5: 2.5 GHz – 10 GHz – 2440MHz

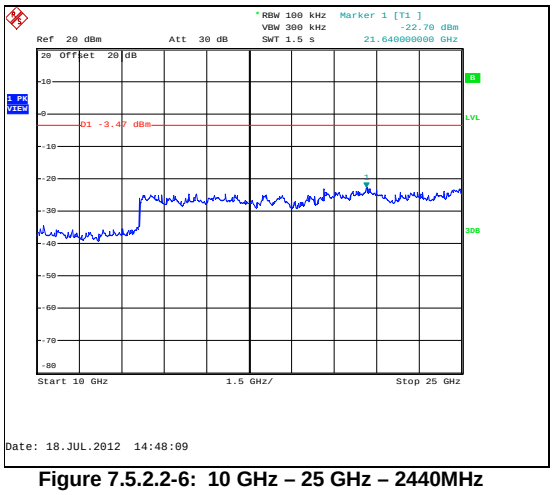

Figure 7.5.2.2-6: 10 GHz – 25 GHz – 2440MHz

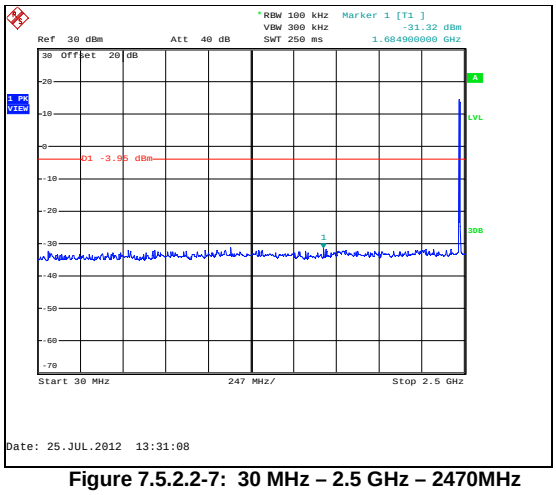

Figure 7.5.2.2-7: 30 MHz – 2.5 GHz – 2470MHz

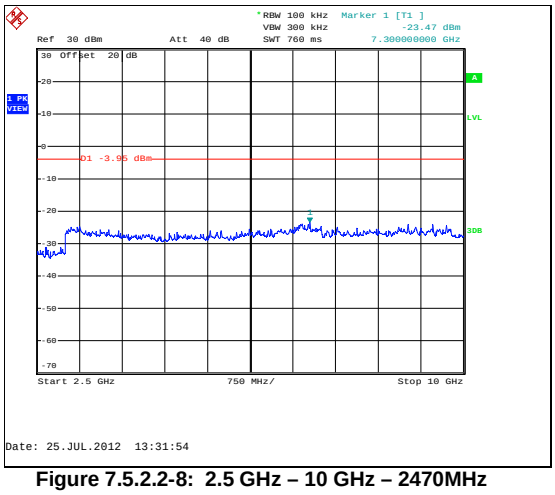

Figure 7.5.2.2-8: 2.5 GHz – 10 GHz – 2470MHz

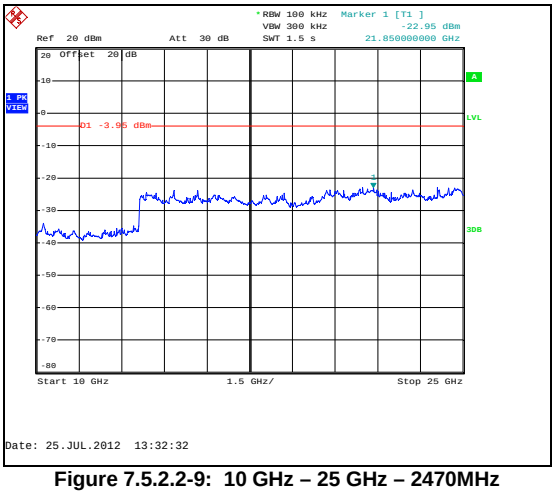

Figure 7.5.2.2-9: 10 GHz – 25 GHz – 2470MHz

7.5.3 Radiated Spurious Emissions (Restricted Bands)

7.5.3.1 Measurement Procedure

Radiated emissions tests were made over the frequency range of 30MHz to 25 GHz, 10 times the highest fundamental frequency.

The EUT was rotated through 360° and the receive antenna height was varied from 1m to 4m so that the maximum radiated emissions level would be detected. For frequencies below 1000MHz, quasi-peak measurements were made using a resolution bandwidth RBW of 120 kHz and a video bandwidth VBW of 300 kHz. For frequencies above 1000MHz, peak and average measurements were made with RBW and VBW of 1 MHz and 3 MHz respectively. The average emissions were further corrected by applying the duty cycle correction of the EUT for comparison to the average limit.

Each emission found to be in a restricted band was compared to the applicable radiated emission limits.

7.5.3.2 Duty Cycle Correction

For average radiated measurements, using a 66.1% duty cycle, the measured level was reduced by a factor 3.6dB. The duty cycle correction factor is determined using the formula: 20log (0.661/100) = 3.6dB.

A detailed analysis of the duty cycle timing is provided in the Theory of Operation accompanying this report.

7.5.3.3 Measurement Results

Radiated spurious emissions found in the band of 30MHz to 25GHz are reported in Table 7.5.3.3-1 below.

Table 7.5.3.3-1: Radiated Spurious Emissions Tabulated Data

Frequency (MHz)	Level (dBuV)		Antenna Polarity	Correction Factors	Corrected Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)	
	pk	Qpk/Avg	(H/V)	(dB)	pk	Qpk/Avg	pk	Qpk/Avg	pk	Qpk/Avg
Low Channel										
4810	52.65	43.53	H	2.01	54.66	41.93	74.0	54.0	19.3	12.1
4810	53.13	44.27	V	2.01	55.14	42.67	74.0	54.0	18.9	11.3
12025	47.64	36.15	H	14.67	62.31	47.21	83.5	63.5	21.2	16.3
12025	49.11	36.98	V	14.67	63.78	48.04	83.5	63.5	19.7	15.5
Middle Channel										
4880	51.77	41.46	H	2.18	53.95	40.03	74.0	54.0	20.0	14.0
4880	51.56	42.59	V	2.18	53.74	41.16	74.0	54.0	20.3	12.8
7320	54.68	46.61	H	7.87	62.55	50.87	74.0	54.0	11.5	3.1
7320	49.39	38.81	V	7.87	57.26	43.07	74.0	54.0	16.7	10.9
12200	51.16	40.28	H	15.85	67.01	52.52	83.5	63.5	16.5	11.0
12200	51.62	41.23	V	15.85	67.47	53.47	83.5	63.5	16.0	10.1
High Channel										
4940	48.38	37.64	H	2.32	50.70	36.36	74.0	54.0	23.3	17.6
4940	50.32	40.67	V	2.32	52.64	39.39	74.0	54.0	21.4	14.6
7410	56.03	47.60	H	7.89	63.92	51.89	74.0	54.0	10.1	2.1
7410	50.17	39.85	V	7.89	58.06	44.14	74.0	54.0	15.9	9.9
12350	50.20	38.81	H	16.86	67.06	52.06	83.5	63.5	16.4	11.5
12350	50.26	39.98	V	16.86	67.12	53.23	83.5	63.5	16.4	10.3

7.5.3.4 Sample Calculation:

$R_C = R_U + CF_T$

Where:

CF_T	=	Total Correction Factor (AF+CA+AG)-DC (Average Measurements Only)
R_U	=	Uncorrected Reading
R_C	=	Corrected Level
AF	=	Antenna Factor
CA	=	Cable Attenuation
AG	=	Amplifier Gain
DC	=	Duty Cycle Correction Factor

Example Calculation: Peak – X Position

Corrected Level: 52.65 + 2.01 = 54.66dBuV/m
Margin: 74dBuV/m – 54.66dBuV/m = 19.3dB

Example Calculation: Average – X Position

Corrected Level: 43.53 + 2.01 - 3.6 = 41.93dBuV
Margin: 54dBuV – 41.93dBuV = 12.1dB

7.6 Peak Power Spectral Density- FCC Section 15.247(e) IC: RSS-210 A8.2(b)

7.6.1 Measurement Procedure

The power spectral density was measured in accordance with FCC KDB 558074 D01 DTS Meas Guidance v01 Measurement Procedure PKPSD. The RF output of the equipment under test was directly connected to the input of the spectrum analyzer applying suitable attenuation. The Resolution Bandwidth (RBW) of the spectrum analyzer was set to 100 kHz. The Video Bandwidth (VBW) was set to ≥ 300 kHz. Span was set to 5 – 30% greater the EBW. The trace was set to max hold with a peak detector active. An internal spectrum analyzer offset of -15.2 dB was applied to adjust the power to an equivalent value in a 3 kHz bandwidth. The bandwidth correction factor (BWCF) offset was determined as BWCF = 10log(3 kHz/100 kHz) = -15.2 dB). The resulting spectrum analyzer peak level is the power spectral density in a 3 kHz band.

7.6.2 Measurement Results

Results are shown below in Table 7.6.2-1 and Figures 7.6.2-1 – 7.6.2-3:

Table 7.6.2-1: Peak Power Spectral Density

Frequency (MHz)	PSD Level (dBm)
2405	1.50
2440	1.30
2470	0.93

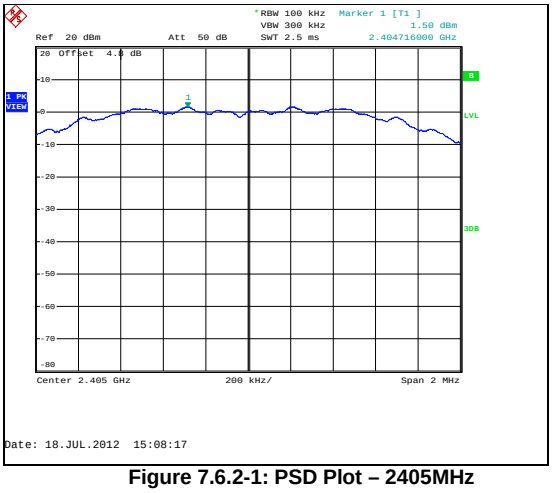

Figure 7.6.2-1: PSD Plot – 2405MHz

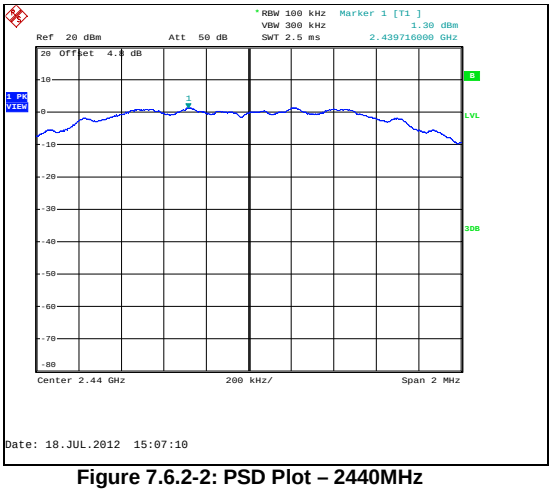

Figure 7.6.2-2: PSD Plot – 2440MHz

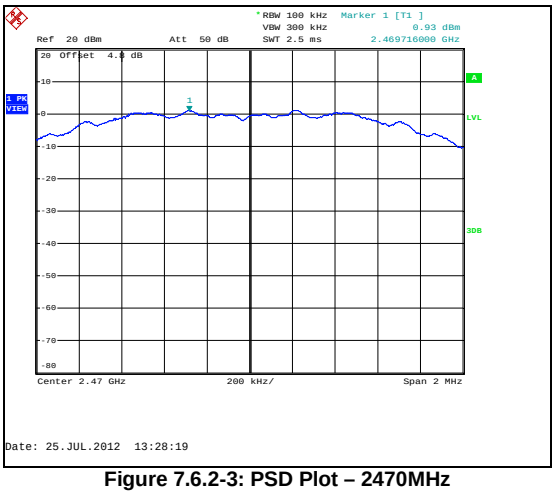

Figure 7.6.2-3: PSD Plot – 2470MHz

8 CONCLUSION

In the opinion of ACS, Inc. REXU, manufactured by Elster Solutions, LLC meets the requirements of FCC Part 15 subpart C and Industry Canada's Radio Standards Specification RSS-210.

END REPORT