Excellence in Compliance Testing

Certification Test Report

FCC ID: QHC-OW355SE
IC: 4393B-OW35SE

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

ACS Report Number: 14-0309.W06.1B

Manufacturer: Itron, Inc.
Model: 574023

Test Begin Date: March 9, 2015
Test End Date: March 12, 2015

Report Issue Date: April 22, 2015

FOR THE SCOPE OF ACCREDITATION UNDER LAB Code 200612-0

This report is not be used to claim certification, approval, or endorsement by NVLAP, NIST or any government agency.

Reviewed by:

Kirby Munroe
Director, Wireless Certifications
ACS, Inc.

This report contains 25 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 Certification for limited modular approval (LMA) certification.

1.2 Product description

The 574023 is a module that is integrated in a variety of electricity meter form factors. The 574023 includes (1) 900 MHz FHSS radio and an on-board Sierra Wireless LTE modem HL7518, FCC ID: N7NHL7518. The Sierra Wireless CDMA modem HL7518 is modular approved and not covered under the scope of this report. The Sierra Wireless CDMA modem HL7518 is not available for use in Canada.

The 574023 is designed to be integrated into 1S, 2S and 12S electric utility meter forms and be collocated and transmit simultaneously with the on-board Sierra Wireless LTE modem HL7518, FCC ID: N7NHL7518 and separate Itron module ITR24 FCC ID: SK9ITR24 / IC: 864G-ITR24.

Technical Information:

Detail	Description
Frequency Range	910.0 - 921.8 MHz
Number of Channels	50
Modulation Format	FSK
Operating Voltage	4 VDC (Via supply of host meter)
Antenna Type / Gain	Inverted F Antenna; 2.4dBi

Manufacturer Information:
Itron Inc.
4400 Old Canton Road
Suite 300
Jackson, MS 39211

EUT Serial Numbers: 8790000807 (Radiated), 8790001039 (RF Conducted)

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

1.3 Test Methodology and Considerations

The 574023 is designed to be integrated into 1S, 2S, and 12S electric utility meter host forms and be collocated and transmit simultaneously with an on-board Sierra Wireless LTE modem HL7518, FCC ID: N7NHL7518 and separate Itron module ITR24 FCC ID: SK9ITR24 / IC: 864G-ITR24. The EUT was tested for radiated emissions in each host and worst case data presented where applicable. Radiated inter-modulation testing was performed for all combinations of simultaneous transmission and found to be in compliance.

Software power setting during test: 60

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
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:

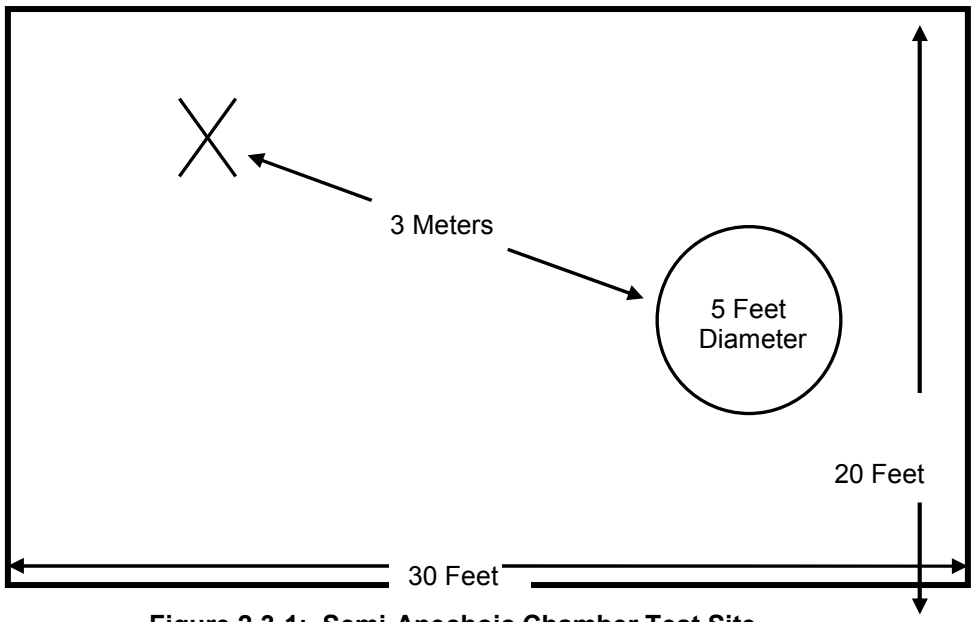

Figure 2.3-1: Semi-Anechoic Chamber Test Site

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:

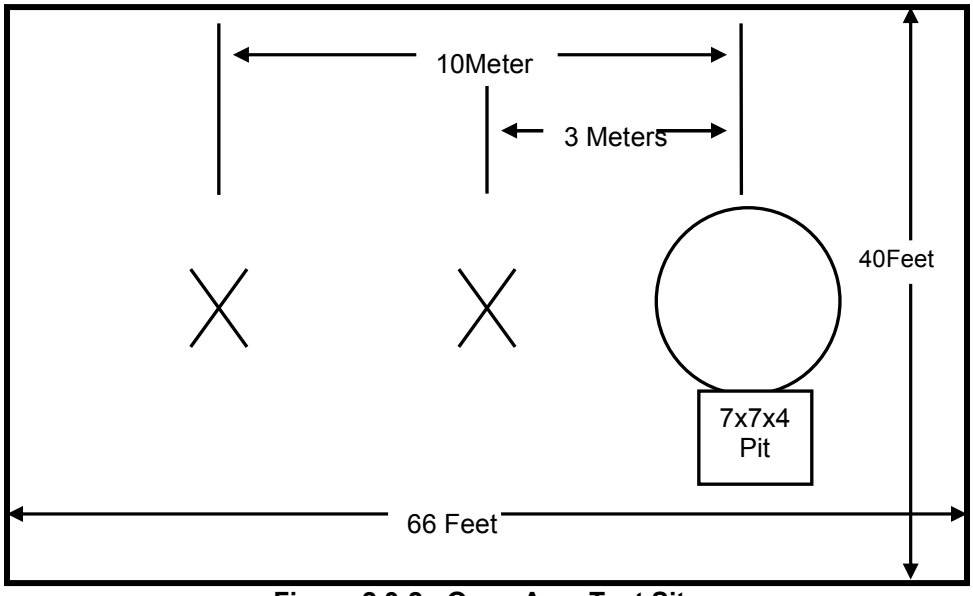

Figure 2.3-2: Open Area Test Site

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 2.4-1:

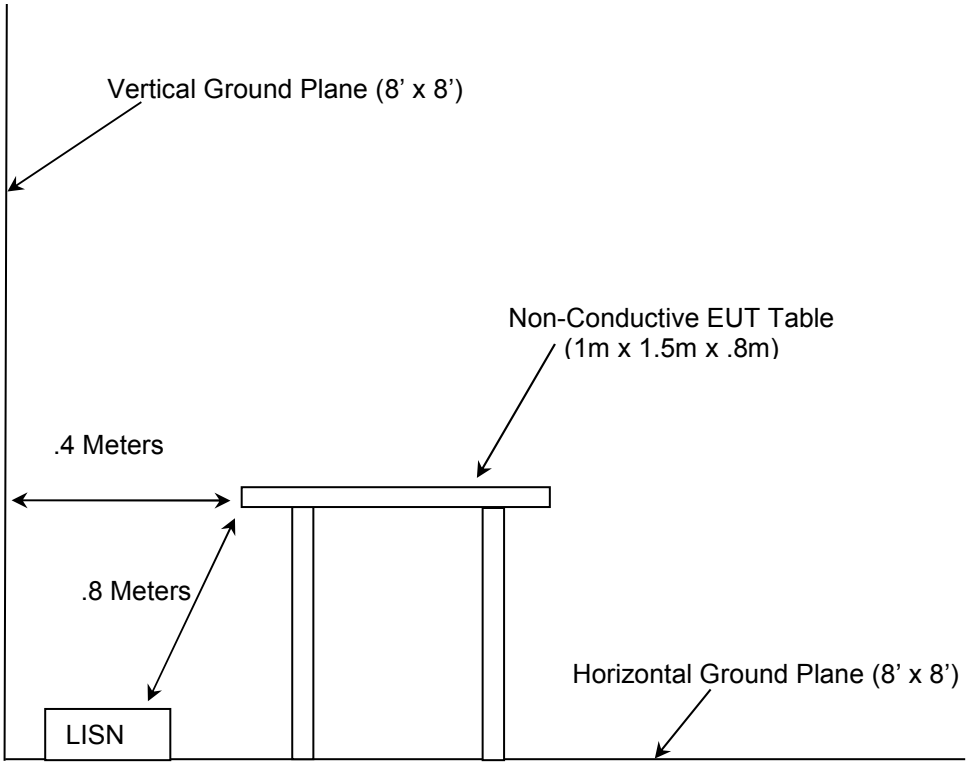

Figure 2.4-1: AC Mains Conducted EMI Site

3 APPLICABLE STANDARD REFERENCES

The following standards were used:

- ANSI C63.10-2013: American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
- US Code of Federal Regulations (CFR): Title 47, Part 2, Subpart J: Equipment Authorization Procedures, 2015
- US Code of Federal Regulations (CFR): Title 47, Part 15, Subpart C: Radio Frequency Devices, Intentional Radiators, 2015
- Industry Canada Radio Standards Specification: RSS-210 – Low-power License-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment, Issue 8, December 2010
- Industry Canada Radio Standards Specification: RSS-GEN – General Requirements and Information for the Certification of Radiocommunication Equipment, Issue 4, Nov 2014.

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	7/11/2014	7/11/2015
2	Rohde & Schwarz	ESMI-Receiver	Spectrum Analyzers	839587/003	7/11/2014	7/11/2015
30	Spectrum Technologies	DRH-0118	Antennas	970102	4/23/2013	4/23/2015
40	EMCO	3104	Antennas	3211	2/10/2015	2/10/2017
73	Agilent	8447D	Amplifiers	2727A05624	7/15/2014	7/15/2015
167	ACS	Chamber EMI Cable Set	Cable Set	167	10/28/2014	10/28/2015
168	Hewlett Packard	11947A	Attenuators	44829	1/19/2015	1/19/2016
267	Agilent	N1911A	Meters	MY45100129	7/30/2013	7/30/2015
268	Agilent	N1921A	Sensors	MY45240184	7/30/2013	7/30/2015
292	Florida RF Cables	SMR-290AW-480.0-SMR	Cables	None	3/17/2014	3/17/2015
316	Rohde Schwarz	ESH3-Z5	LISN	861189-010	10/30/2014	10/30/2015
324	ACS	Belden	Cables	8214	6/4/2014	6/4/2015
331	Microwave Circuits	H1G513G1	Filters	31417	6/2/2014	6/2/2015
338	Hewlett Packard	8449B	Amplifiers	3008A01111	7/30/2013	7/30/2015
340	Aeroflex/Weinschel	AS-20	Attenuators	7136	7/14/2014	7/14/2015
412	Electro Metrics	LPA-25	Antennas	1241	7/24/2014	7/24/2016
422	Florida RF	SMS-200AW-72.0-SMR	Cables	805	11/5/2014	11/5/2015
616	Florida RF Cables	SMRE-200W-12.0-SMRE	Cables	N/A	9/10/2014	9/10/2015
622	Rohde & Schwarz	FSV40	Analyzers	101338	7/12/2014	7/12/2015
RE112	Rohde & Schwarz	ESIB26	Receiver	836119/012	10/30/2014	10/30/2015

5 SUPPORT EQUIPMENT

Table 5-1: Support Equipment

Item	Equipment Type	Manufacturer	Model Number	Serial Number
1	Form 1S, 2S, 12S Electric Utility Meters	General Electric	1S 2S 12S	1S: N/A (RF Conducted) 1S: 313 429 433 2S: 313 429 441 12S: 313 511 584
2	Isolation Transformer	Hammond Manufacturing	171B	N/A
3	Step-Up Transformer	Federal Pacific	SB16N1.5F	N/A

6 EQUIPMENT UNDER TEST SETUP BLOCK DIAGRAM

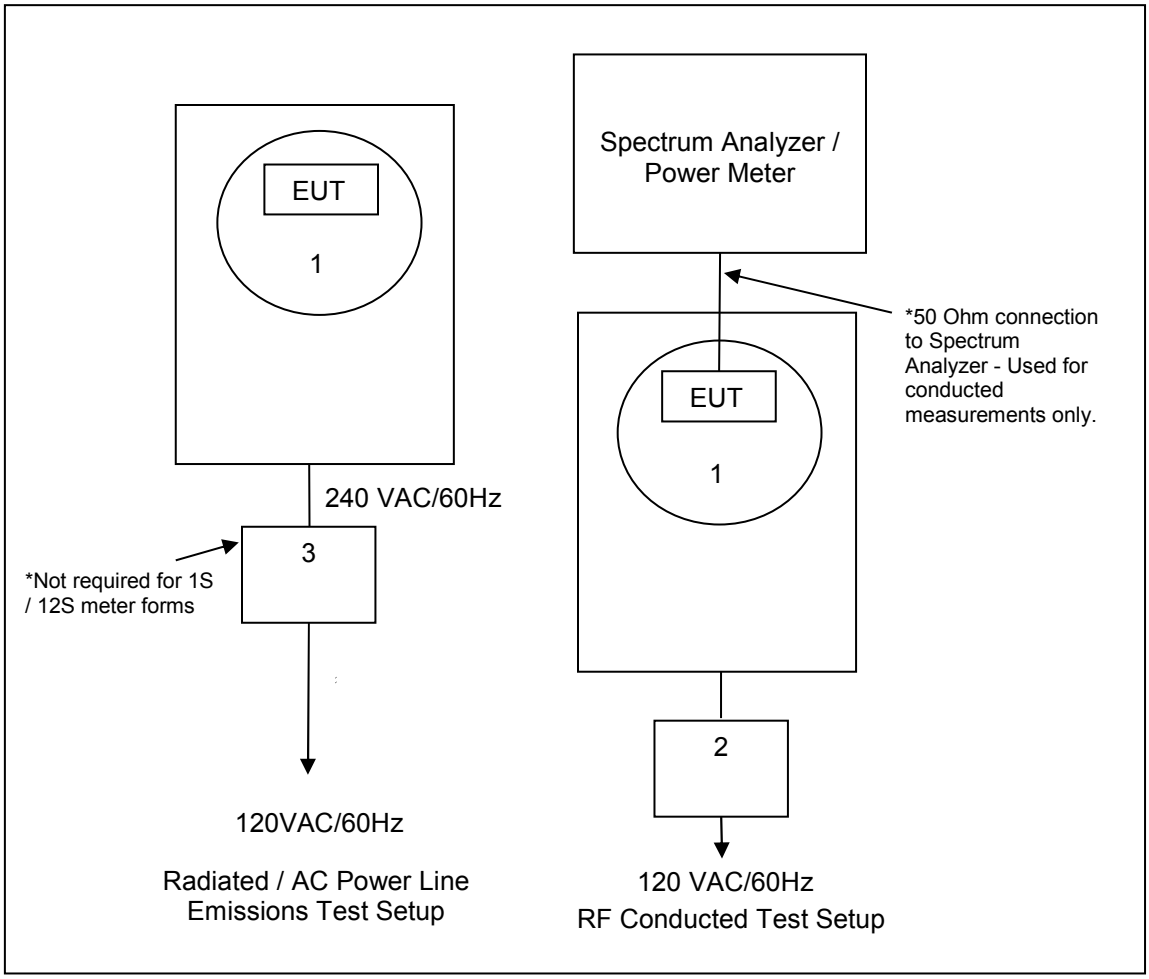

Figure 6-1: Test Setup Block Diagram

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 EUT utilizes a 2.4dBi integral Inverted F antenna which cannot be removed or replaced without damaging the device thus satisfying Part 15.203.

7.2 Power Line Conducted Emissions – FCC 15.207, IC: RSS-Gen 8.8

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 Tables 7.2.2-1 – 7.2.2-6.

Table 7.2.2-1: Conducted EMI Results – 1S Meter Host (120 VAC) – Line 1

Frequency (MHz)	Corrected Reading		Limit (dBuV)	Margin (dB)	Line	Correction (dB)
	Quasi-Peak (dBuV)	Average (dBuV)				
0.387976	---	26.76	47.95	21.19	L1	10.2
0.387976	31.90	---	57.97	26.07	L1	10.2
0.392986	---	26.23	47.85	21.62	L1	10.2
0.392986	30.52	---	57.87	27.35	L1	10.2
0.783467	---	23.09	46.00	22.91	L1	10.3
0.783467	30.82	---	56.00	25.18	L1	10.3
0.831964	---	29.82	46.00	16.18	L1	10.3
0.831964	38.31	---	56.00	17.69	L1	10.3
0.832766	---	31.06	46.00	14.94	L1	10.3
0.832766	38.84	---	56.00	17.16	L1	10.3
0.837274	---	33.86	46.00	12.14	L1	10.3
0.837274	38.90	---	56.00	17.10	L1	10.3

Table 7.2.2-2: Conducted EMI Results – 1S Meter Host (120 VAC) – Line 2

Frequency (MHz)	Corrected Reading		Limit (dBuV)	Margin (dB)	Line	Correction (dB)
	Quasi-Peak (dBuV)	Average (dBuV)				
0.161551	---	34.02	55.33	21.31	N	10.2
0.161551	41.07	---	65.34	24.27	N	10.2
0.187287	---	21.14	54.01	32.87	N	10.2
0.187287	27.80	---	64.03	36.23	N	10.2
0.292284	---	26.91	50.22	23.31	N	10.2
0.292284	32.82	---	60.26	27.44	N	10.2
0.388176	---	27.25	47.94	20.69	N	10.2
0.388176	32.03	---	57.97	25.94	N	10.2
0.421443	---	26.06	47.30	21.24	N	10.2
0.421443	31.15	---	57.32	26.17	N	10.2
0.830762	---	28.63	46.00	17.37	N	10.3
0.830762	37.86	---	56.00	18.14	N	10.3

Table 7.2.2-3: Conducted EMI Results – 2S Meter Host (240 VAC) – Line 1

Frequency (MHz)	Corrected Reading		Limit (dBuV)	Margin (dB)	Line	Correction (dB)
	Quasi-Peak (dBuV)	Average (dBuV)				
0.298297	---	37.97	50.05	12.08	L1	10.2
0.298297	42.86	---	60.09	17.23	L1	10.2
0.307515	---	30.48	49.80	19.32	L1	10.2
0.307515	41.03	---	59.84	18.81	L1	10.2
0.363928	---	34.36	48.45	14.09	L1	10.2
0.363928	39.45	---	58.48	19.03	L1	10.2
0.396793	---	32.76	47.77	15.01	L1	10.2
0.396793	37.85	---	57.79	19.94	L1	10.2
0.446093	---	23.08	46.87	23.79	L1	10.2
0.446093	35.03	---	56.88	21.85	L1	10.2
0.867936	---	28.34	46.00	17.66	L1	10.3
0.867936	36.72	---	56.00	19.28	L1	10.3

Table 7.2.2-4: Conducted EMI Results – 2S Meter Host (240 VAC) – Line 2

Frequency (MHz)	Corrected Reading		Limit (dBuV)	Margin (dB)	Line	Correction (dB)
	Quasi-Peak (dBuV)	Average (dBuV)				
0.161563	---	36.87	55.32	18.45	N	10.2
0.161563	44.89	---	65.33	20.44	N	10.2
0.165932	---	42.99	55.08	12.09	N	10.2
0.165932	49.39	---	65.10	15.71	N	10.2
0.205611	---	34.62	53.19	18.57	N	10.2
0.205611	44.52	---	63.22	18.70	N	10.2
0.239780	---	32.80	51.87	19.07	N	10.2
0.239780	42.85	---	61.91	19.06	N	10.2
0.307515	---	30.95	49.80	18.85	N	10.2
0.307515	41.29	---	59.84	18.55	N	10.2
0.308517	---	30.53	49.78	19.25	N	10.2
0.308517	41.13	---	59.81	18.68	N	10.2

Table 7.2.2-5: Conducted EMI Results – 12S Meter Host (120 VAC) – Line 1

Frequency (MHz)	Corrected Reading		Limit (dBuV)	Margin (dB)	Line	Correction (dB)
	Quasi-Peak (dBuV)	Average (dBuV)				
0.171138	---	36.58	54.81	18.23	L1	10.2
0.171138	40.68	---	64.82	24.14	L1	10.2
0.649900	---	26.17	46.00	19.83	L1	10.3
0.649900	29.28	---	56.00	26.72	L1	10.3
0.652505	---	25.81	46.00	20.19	L1	10.3
0.652505	29.33	---	56.00	26.67	L1	10.3
0.816032	---	31.27	46.00	14.73	L1	10.3
0.816032	37.89	---	56.00	18.11	L1	10.3
0.819539	---	34.38	46.00	11.62	L1	10.3
0.819539	38.47	---	56.00	17.53	L1	10.3
0.959118	---	24.99	46.00	21.01	L1	10.3
0.959118	28.49	---	56.00	27.51	L1	10.3

Table 7.2.2-6: Conducted EMI Results – 12S Meter Host (120 VAC) – Line 2

Frequency (MHz)	Corrected Reading		Limit (dBuV)	Margin (dB)	Line	Correction (dB)
	Quasi-Peak (dBuV)	Average (dBuV)				
0.171861	---	35.86	54.77	18.91	N	10.2
0.171861	39.88	---	64.79	24.91	N	10.2
0.511323	---	23.33	46.00	22.67	N	10.2
0.511323	28.28	---	56.00	27.72	N	10.2
0.819139	---	34.07	46.00	11.93	N	10.3
0.819139	38.44	---	56.00	17.56	N	10.3
0.819539	---	34.44	46.00	11.56	N	10.3
0.819539	38.51	---	56.00	17.49	N	10.3
0.956213	---	24.78	46.00	21.22	N	10.3
0.956213	28.70	---	56.00	27.30	N	10.3
0.958717	---	25.27	46.00	20.73	N	10.3
0.958717	28.26	---	56.00	27.74	N	10.3

7.3 Peak Output Power - FCC 15.247(b)(2) IC: RSS-210 A8.4(1)

7.3.1 Measurement Procedure (Conducted Method)

The RF output port of the EUT was directly connected to the input of a peak power meter. The device employs ≥ 50 channels therefore the power is limited to 1 Watt.

All data rates were evaluated and worst case reported.

7.3.2 Measurement Results

Table 7.3.2-1: RF Output Power

Frequency [MHz]	Level [dBm]
910.0	27.78
914.8	27.52
921.8	27.43

7.4 Channel Usage Requirements

7.4.1 Carrier Frequency Separation – FCC 15.247(a)(1) IC: RSS-210 A8.1(b)

7.4.1.1 Measurement Procedure

The RF output port of the EUT was directly connected to the input of the spectrum analyzer. The span of the spectrum analyzer was set wide enough to capture two adjacent peaks. The RBW and VBW were set to 50 kHz and 200 kHz respectively.

7.4.1.2 Measurement Results

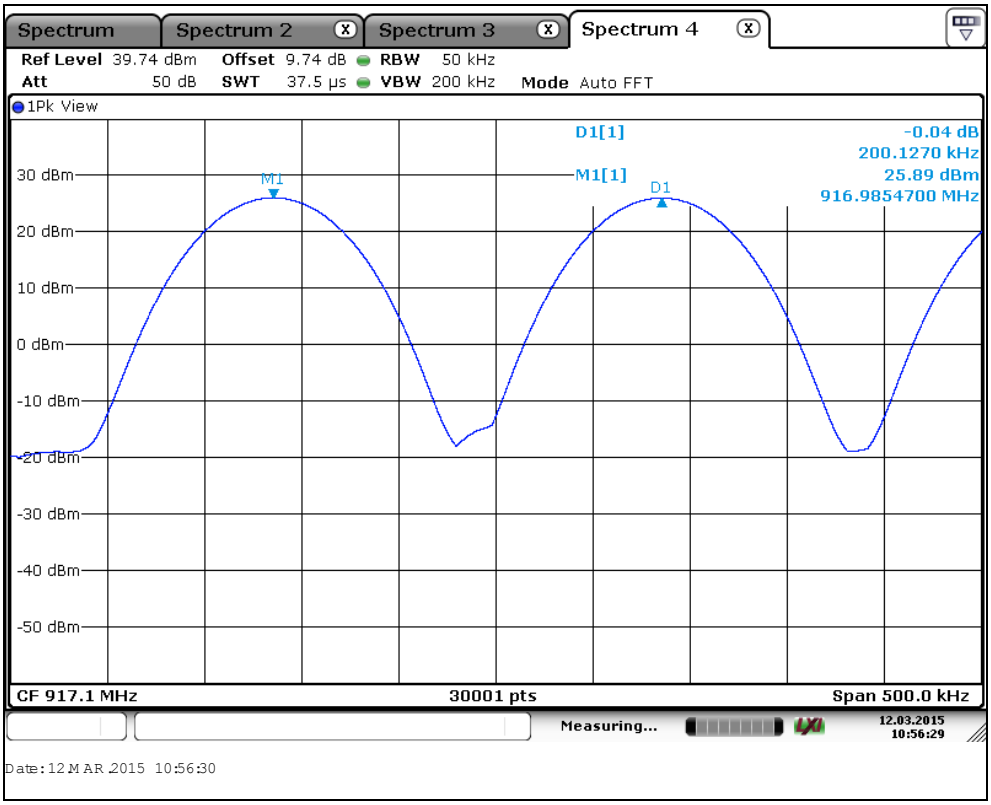

Figure 7.4.1.2-1: Carrier Frequency Separation

7.4.2 Number of Hopping Channels – FCC 15.247(a)(1)(i) IC: RSS-210 A8.1(c)

7.4.2.1 Measurement Procedure

The RF output port of the EUT was directly connected to the input of the spectrum analyzer. The span of the spectrum analyzer was set wide enough to capture the frequency band of operation. The RBW was set to less than 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller and VBW set to ≥ RBW.

7.4.2.2 Measurement Results

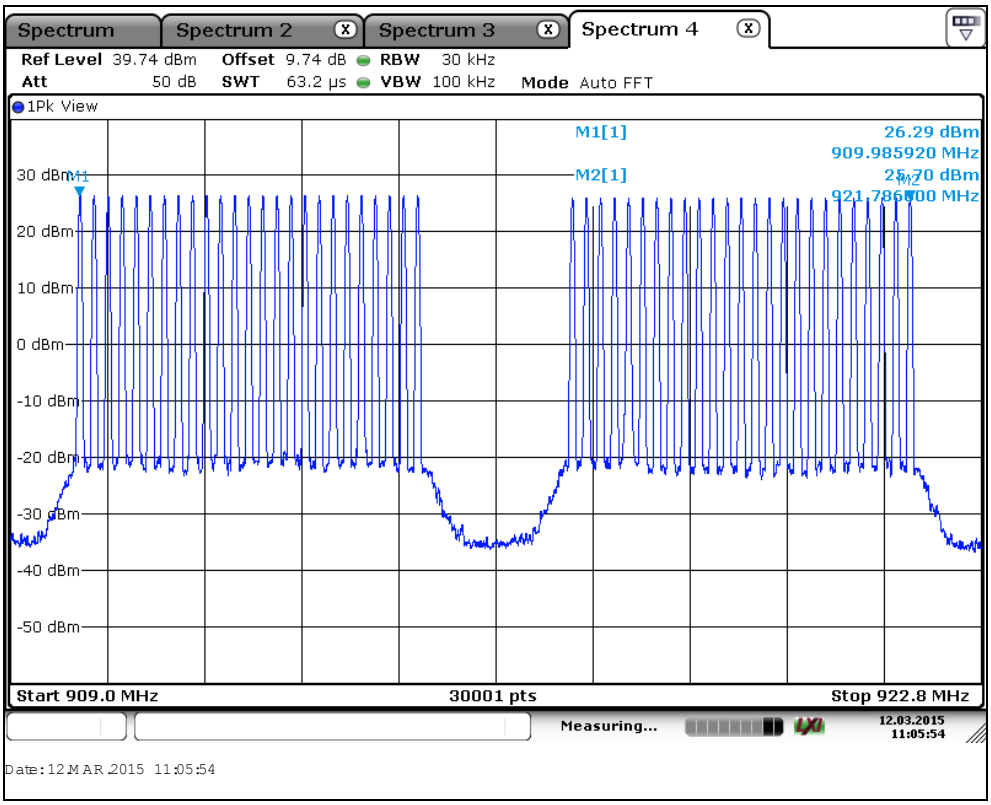

Figure 7.4.2.2-1: Number of Hopping Channels

7.4.3 Channel Dwell Time – FCC 15.247(a)(1)(i) IC: RSS-210 A8.1(c)

7.4.3.1 Measurement Procedure

The RF output port of the EUT was directly connected to the input of the spectrum analyzer. The span of the spectrum analyzer display was set 0 Hz centered on a hopping channel. The RBW of the spectrum analyzer was set to ≤ the EUT channel spacing and VBW set to ≥ RBW. The Marker Delta function of the analyzer was utilized to determine the dwell time.

7.4.3.2 Measurement Results

Table 7.4.3.2-1: Channel Dwell Time

Single Occurrence (ms)	Number of Occurrences / 20s	Total Dwell Time (ms)
56.87	1	56.87

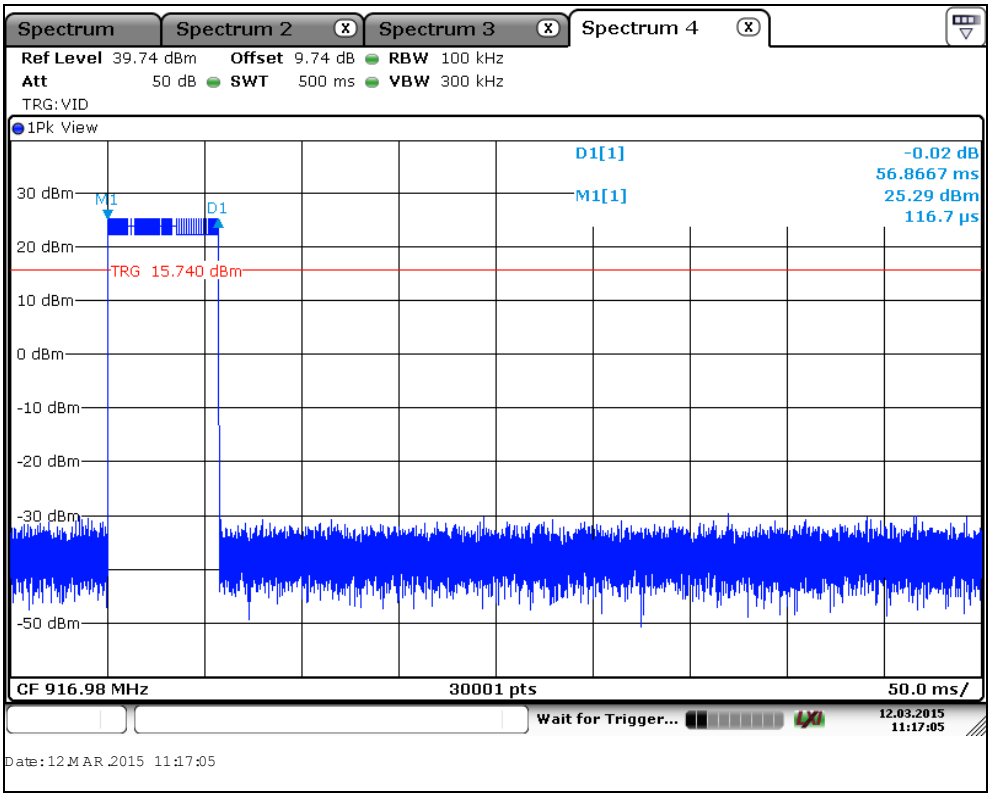

Figure 7.4.3.2-1: Dwell Time

Detailed description of timing provided in theory of operation.

7.4.4 20dB / 99% Bandwidth - FCC 15.247(a)(1)(i) IC: RSS-210 A8.1(c)

7.4.4.1 Measurement Procedure

The RF output port of the EUT was directly connected to the input of the spectrum analyzer. The span of the spectrum analyzer display was set between two times and five times the occupied bandwidth (OBW) of the emission. The RBW of the spectrum analyzer was set to approximately 1 % to 5 % of the OBW. The trace was set to max hold with a peak detector active. The marker delta measurement function of the analyzer was utilized to determine the 20 dB bandwidth of the emission.

The occupied bandwidth measurement function of the spectrum analyzer was used to measure the 99% bandwidth. The span of the analyzer was set to capture all products of the modulation process, including the emission sidebands. The resolution bandwidth was set to 1% to 5% of the occupied bandwidth. The video bandwidth was set to 3 times the resolution bandwidth. A peak detector was used.

7.4.4.2 Measurement Results

Table 7.4.4.2-1: 20dB / 99% Bandwidth

Frequency [MHz]	20dB Bandwidth [kHz]	99% Bandwidth [kHz]
910.0	161.25	162.63
914.8	161.23	163.08
921.8	161.20	163.36

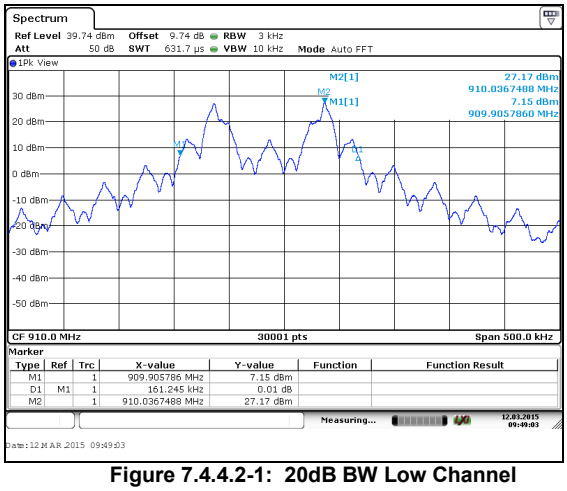

Figure 7.4.4.2-1: 20dB BW Low Channel

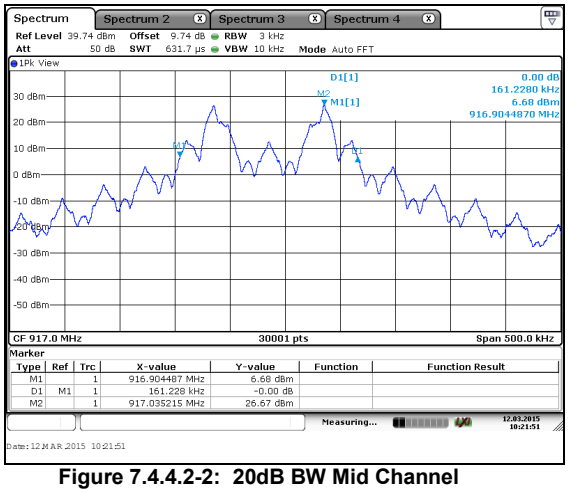

Figure 7.4.4.2-2: 20dB BW Mid Channel

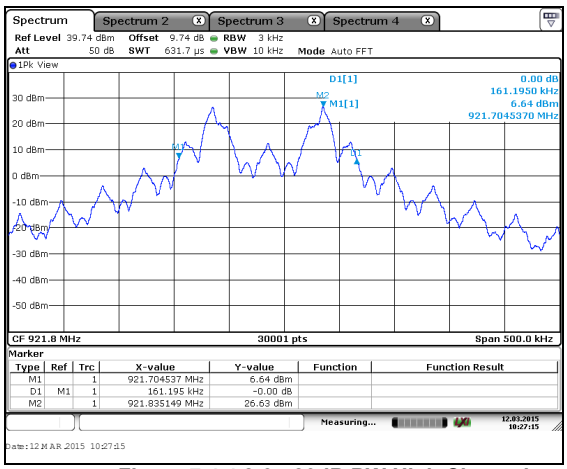

Figure 7.4.4.2-3: 20dB BW High Channel

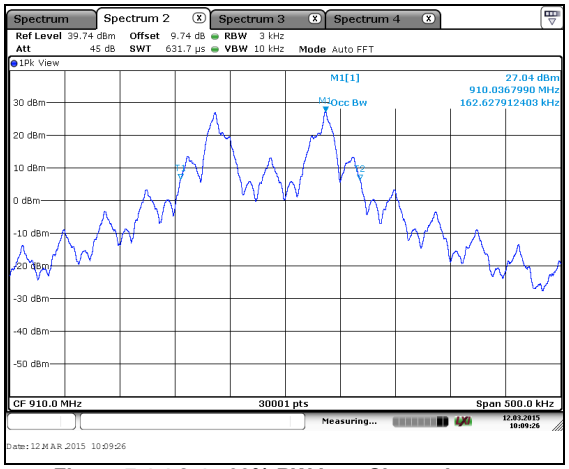

Figure 7.4.4.2-4: 99% BW Low Channel

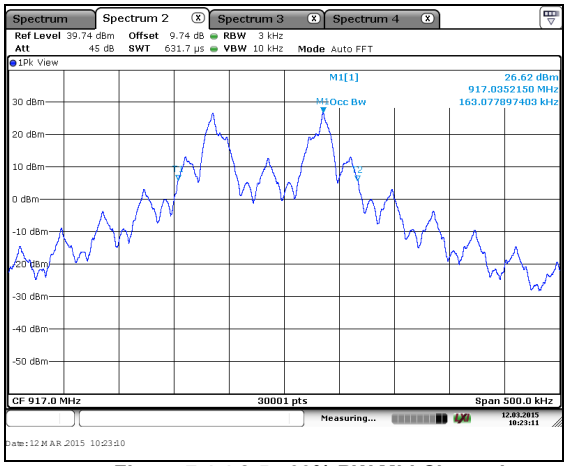

Figure 7.4.4.2-5: 99% BW Mid Channel

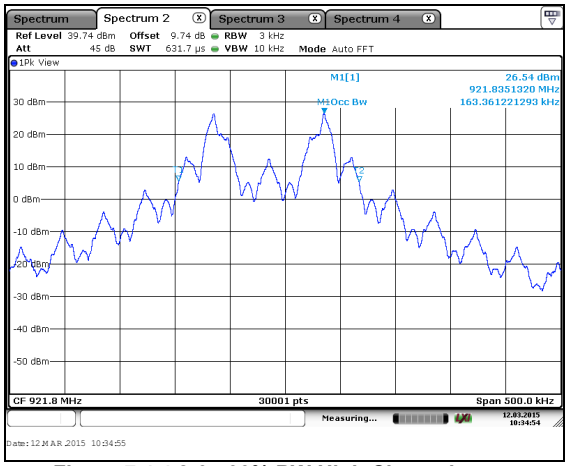

Figure 7.4.4.2-6: 99% BW High Channel

7.5 Band-Edge Compliance and Spurious Emissions

7.5.1 Band-Edge Compliance of RF Conducted Emissions - FCC 15.247(d); IC RSS-210 A8.5

7.5.1.1 Measurement Procedure

The RF output port of the EUT was directly connected to the input of the spectrum analyzer. The EUT was investigated at the lowest and highest channel available to determine band-edge compliance. For each measurement the spectrum analyzer's RBW was set to 100 kHz, and the VBW was set to 300 kHz.

7.5.1.2 Measurement Results

NON-HOPPING MODE:

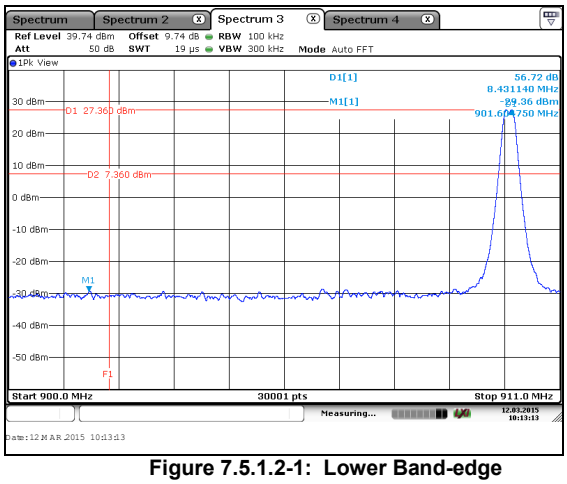

Figure 7.5.1.2-1: Lower Band-edge

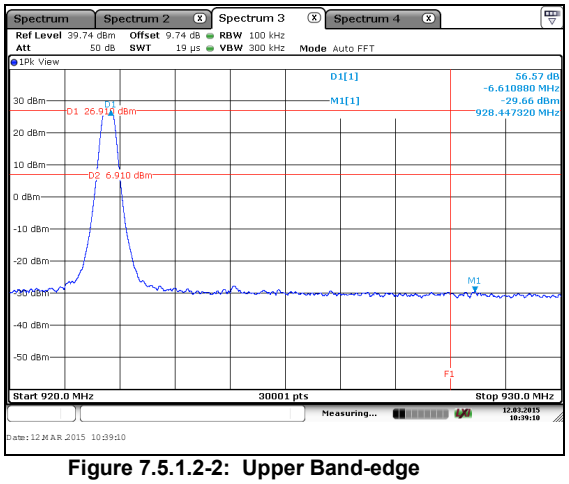

Figure 7.5.1.2-2: Upper Band-edge

HOPPING MODE:

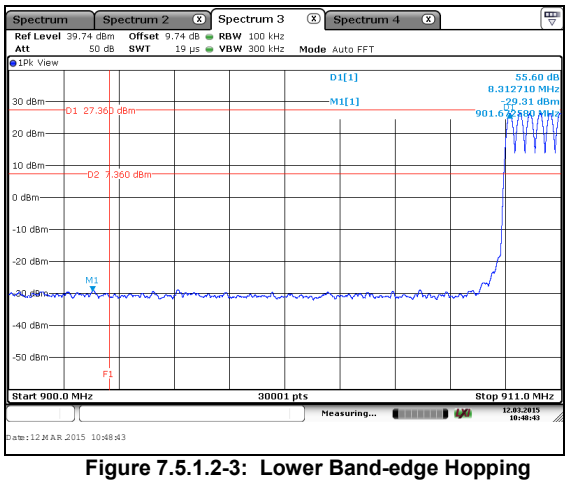

Figure 7.5.1.2-3: Lower Band-edge Hopping

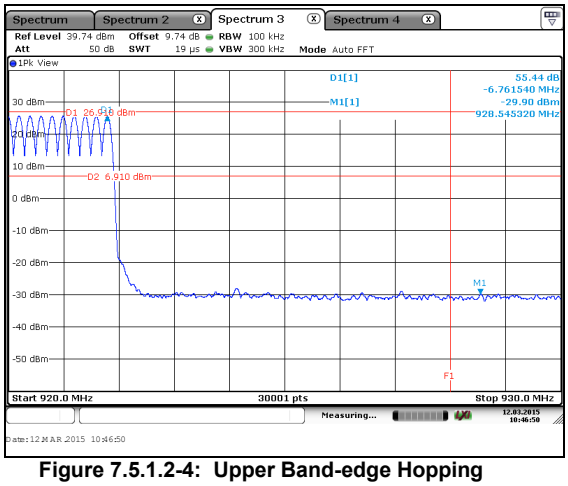

Figure 7.5.1.2-4: Upper Band-edge Hopping

7.5.2 RF Conducted Spurious Emissions - FCC 15.247(d); IC RSS-210 A8.5

7.5.2.1 Measurement Procedure

The RF output port of the EUT was directly connected to the input of the spectrum analyzer. The EUT was investigated for conducted spurious emissions from 30MHz to 10GHz, 10 times the highest fundamental frequency. Measurements were made at the low, center and high channels of the EUT. For each measurement, the spectrum analyzer's RBW was set to 100kHz. A peak detector function was used with the trace set to max hold.

7.5.2.2 Measurement Results

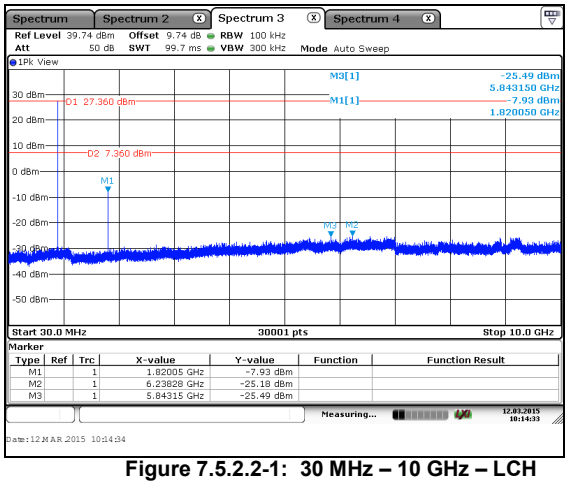

Figure 7.5.2.2-1: 30 MHz – 10 GHz – LCH

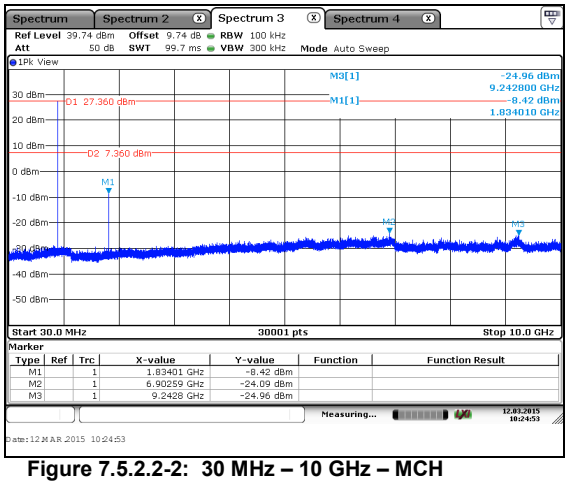

Figure 7.5.2.2-2: 30 MHz – 10 GHz – MCH

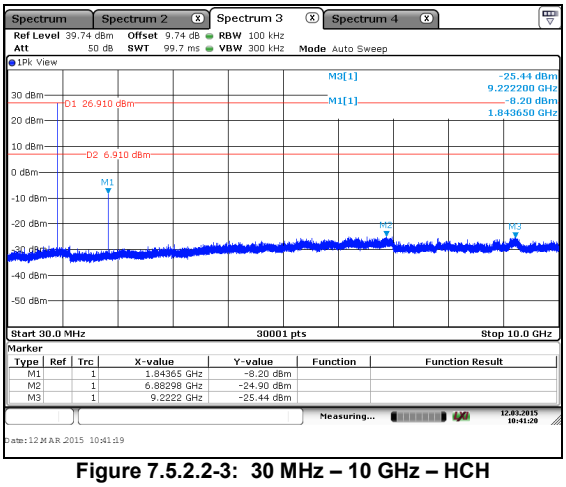

Figure 7.5.2.2-3: 30 MHz – 10 GHz – HCH

7.5.3 Radiated Spurious Emissions - FCC 15.205, 15.209; IC RSS-210 2.2, RSS-Gen 8.9/8.10

7.5.3.1 Measurement Procedure

Radiated emissions tests were made over the frequency range of 30MHz to 10GHz, 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 3MHz respectively.

The EUT was caused to generate a continuous modulated carrier on the hopping channel.

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 57.2% duty cycle, the measured level was reduced by a factor -4.85dB. The duty cycle correction factor is determined using the formula: 20log (57.2/100). The worst case duty cycle was 57.2% provided by the manufacturer. See the theory of operation.

7.5.3.3 Measurement Results

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										
2730	67.98	55.11	H	-4.69	63.29	45.57	74.0	54.0	10.7	8.4
2730	59.36	49.97	V	-4.69	54.67	40.43	74.0	54.0	19.3	13.6
3640	57.83	43.39	H	-1.40	56.43	37.14	74.0	54.0	17.6	16.9
3640	58.77	42.60	V	-1.40	57.37	36.35	74.0	54.0	16.6	17.7
4550	53.17	46.31	H	0.65	53.82	42.11	74.0	54.0	20.2	11.9
4550	58.77	53.64	V	0.65	59.42	49.44	74.0	54.0	14.6	4.6
7280	48.37	38.79	H	7.54	55.91	41.47	74.0	54.0	18.1	12.5
7280	46.36	35.81	V	7.54	53.90	38.49	74.0	54.0	20.1	15.5
Middle Channel										
2751	68.83	57.22	H	-4.61	64.22	47.76	74.0	54.0	9.8	6.2
2751	63.27	53.95	V	-4.61	58.66	44.49	74.0	54.0	15.3	9.5
3668	57.41	43.55	H	-1.30	56.11	37.40	74.0	54.0	17.9	16.6
3668	59.04	44.07	V	-1.30	57.74	37.92	74.0	54.0	16.3	16.1
4585	56.51	47.24	H	0.72	57.23	43.11	74.0	54.0	16.8	10.9
4585	56.82	51.84	V	0.72	57.54	47.71	74.0	54.0	16.5	6.3
7336	49.31	40.03	H	7.62	56.93	42.79	74.0	54.0	17.1	11.2
7336	47.46	37.54	V	7.62	55.08	40.30	74.0	54.0	18.9	13.7
High Channel										
2765.4	68.60	58.85	H	-4.55	64.05	49.45	74.0	54.0	9.9	4.5
2765.4	60.42	52.96	V	-4.55	55.87	43.56	74.0	54.0	18.1	10.4
3687.2	55.13	49.00	H	-1.23	53.90	42.91	74.0	54.0	20.1	11.1
3687.2	56.89	48.41	V	-1.23	55.66	42.32	74.0	54.0	18.3	11.7
4609	55.04	48.31	H	0.77	55.81	44.23	74.0	54.0	18.2	9.8
4609	60.07	55.24	V	0.77	60.84	51.16	74.0	54.0	13.2	2.8
7374.4	52.37	44.32	H	7.67	60.04	47.14	74.0	54.0	14.0	6.9
7374.4	48.18	38.91	V	7.67	55.85	41.73	74.0	54.0	18.1	12.3

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

Corrected Level: 67.98 - 4.69 = 63.29dBuV/m
Margin: 74dBuV/m – 63.29dBuV/m = 10.7dB

Example Calculation: Average

Corrected Level: 55.11 - 4.69 - 4.85 = 45.57dBuV
Margin: 54dBuV – 45.57dBuV = 8.4dB

8 CONCLUSION

In the opinion of ACS, Inc. the 574023, manufactured by Itron meets the requirements of FCC Part 15 subpart C and Industry Canada's Radio Standards Specification RSS-210.

END REPORT