Excellence in Compliance Testing

Certification Test Report

FCC ID: SK9AMI6
IC: 864G-AMI6

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

ACS Report Number: 10-0219.W06.22.A

Manufacturer: Itron Electricity Metering, Inc.
Model: AMI6

Test Begin Date: July 1, 2010
Test End Date: July 1, 2010

Report Issue Date: July 8, 2010

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 17 pages

TABLE OF CONTENTS

1 GENERAL 3

1.1 PURPOSE 3
1.2 PRODUCT DESCRIPTION 3
1.3 TEST METHODOLOGY AND CONSIDERATIONS 3

2 TEST FACILITIES 4

2.1 LOCATION 4
2.2 LABORATORY ACCREDITATIONS/RECOGNITIONS/CERTIFICATIONS 4
2.3 RADIATED EMISSIONS TEST SITE DESCRIPTION 5
2.3.1 Semi-Anechoic Chamber Test Site 5
2.3.2 Open Area Tests Site (OATS) 6
2.4 CONDUCTED EMISSIONS TEST SITE DESCRIPTION 7

3 APPLICABLE STANDARD REFERENCES 7

4 LIST OF TEST EQUIPMENT 8

5 SUPPORT EQUIPMENT 9

6 EQUIPMENT UNDER TEST SETUP BLOCK DIAGRAM 9

7 SUMMARY OF TESTS 10

7.1 ANTENNA REQUIREMENT – FCC: SECTION 15.203 10
7.2 POWER LINE CONDUCTED EMISSIONS – FCC: SECTION 15.207 IC: RSS-GEN 7.2.2 10
7.2.1 Measurement Procedure 10
7.2.2 Measurement Results 10
7.3 RADIATED EMISSIONS – FCC: SECTION 15.109 (UNINTENTIONAL RADIATION) IC: RSS-210 2.6 . 13
7.3.1 Measurement Procedure 13
7.3.2 Measurement Results 13
7.4 BAND-EDGE COMPLIANCE AND SPURIOUS EMISSIONS-FCC 15.247D IC:RSS-210 2.6, A8.5 14
7.4.1 Band-Edge Compliance of RF Conducted Emissions 14
7.4.1.1 Measurement Procedure 14
7.4.1.2 Measurement Results 14
7.4.2 Radiated Spurious Emissions (Restricted Bands) - FCC Sec. 15.205 IC: RSS-210 2.6 15
7.4.2.1 Measurement Procedure 15
7.4.2.2 Duty Cycle Correction 15
7.4.2.3 Measurement Results 16
7.4.2.4 Sample Calculation: 17

8 CONCLUSION 17

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 a Class 2 Permissive Change.

1.2 Product description

The AMI6 module is a utility meter register board designed to be integrated into a variety of electric meter form factors. The AMI6 contains (1) 900 MHz LAN frequency hopping spread spectrum radio and (1) 2.4 GHz direct sequence spread spectrum Zigbee radio.

Manufacturer Information:
Itron Electricity Metering, Inc.
313 North Highway 11
West Union, SC 29696

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

1.3 Test Methodology and Considerations

This AMI6 is a composite device by definition. The 900 MHz LAN radio and the 2.4 GHz Zigbee radio operate under CFR 47 Part 15.247 and IC RSS-210. This report addresses the 2.4 GHz Zigbee radio only. A separate report, 10-0219.W06.12.A, will be issued to address the 900 MHz LAN radio.

The AMI6 was integrated into the 3S and 4S meter forms for AC power line conducted emissions and radiated emissions.

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: 894540
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:

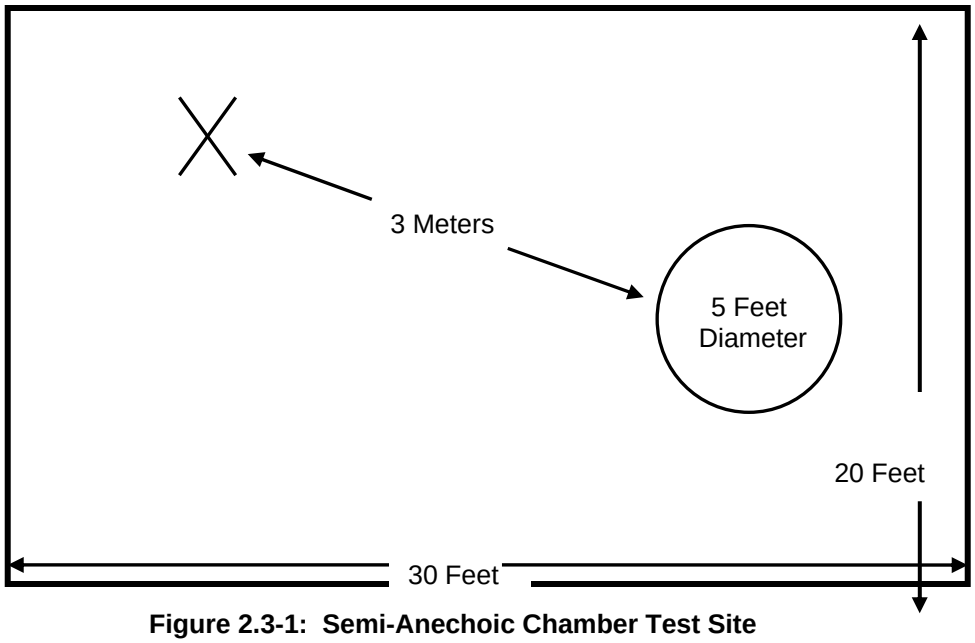

Figure 2.3-1: Semi-Anechoic Chamber Test Site

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:

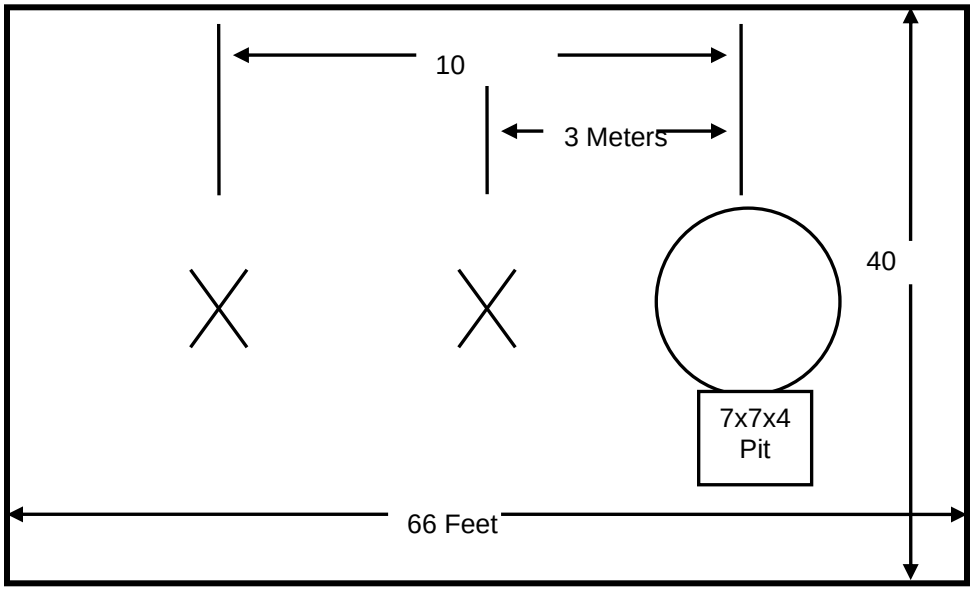

Figure 2.3-2: Open Area Test Site

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 group 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:

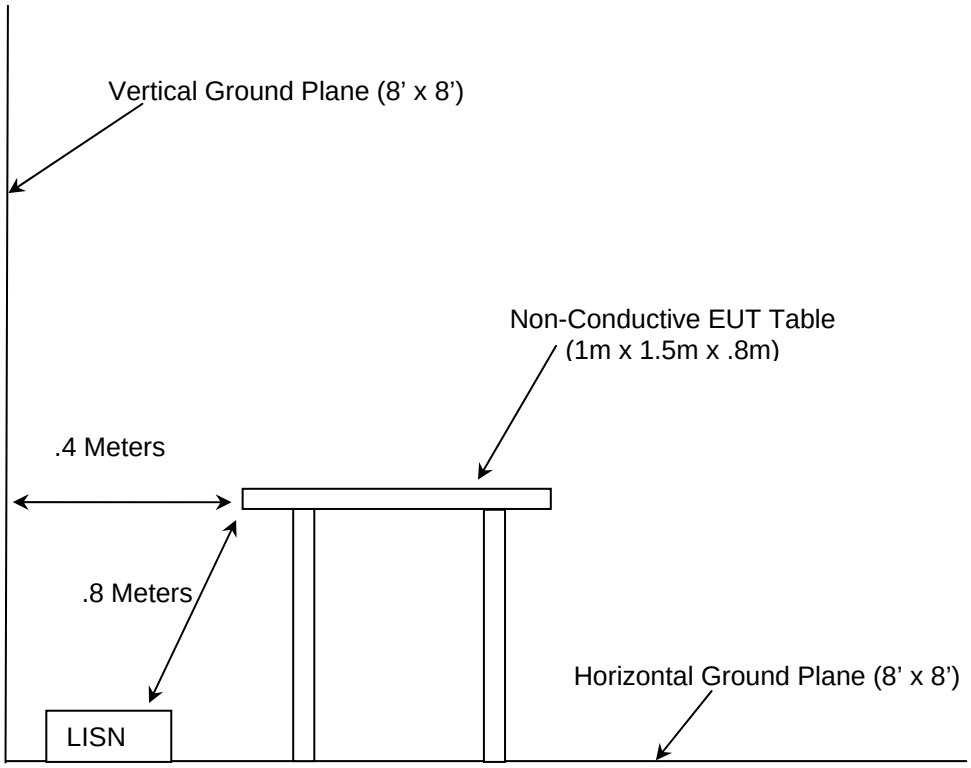

Figure 2.4-1: AC Mains Conducted EMI Site

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, 2010
- US Code of Federal Regulations (CFR): Title 47, Part 15, Subpart C: Radio Frequency Devices, Intentional Radiators, 2010
- Industry Canada Radio Standards Specification: RSS-210 - Low-power License-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment, Issue 7 June 2007
- Industry Canada Radio Standards Specification: RSS-GEN – General Requirements and Information for the Certification of Radiocommunication Equipment, Issue2, June 2007.

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

Equipment Calibration Information					
ACS#	**Mfg.**	**Eq. type**	**Model**	**S/N**	**Cal. Due**
1	Rohde & Schwarz	Spectrum Analyzers	ESMI - Display	833771/007	09-21-2010
2	Rohde & Schwarz	Spectrum Analyzers	ESMI - Receiver	839587/003	09-21-2010
3	Rohde & Schwarz	Spectrum Analyzers	ESMI - Display	839379/011	02-02-2011
4	Rohde & Schwarz	Spectrum Analyzers	ESMI - Receiver	833827/003	02-02-2011
22	Agilent	Amplifiers	8449B	3008A00526	09-21-2010
25	Chase	Antennas	CBL6111	1043	09-02-2010
30	Spectrum Technologies	Antennas	DRH-0118	970102	05-08-2011
73	Agilent	Amplifier	8447D	2727A05624	05-26-2011
153	EMCO	LISN	Feb-25	9411-2268	01-11-2011
167	ACS	Cable Set	Chamber EMI Cable Set	167	01-25-2011 (See Note1)
168	Hewlett Packard	Attenuators	11947A	44829	02-04-2011 (See Note2)
283	Rohde & Schwarz	Spectrum Analyzers	FSP40	1000033	09-21-2010
291	Florida RF Cables	Cables	SMRE-200W-12.0-SMRE	None	11-24-2010 (See Note1)
292	Florida RF Cables	Cables	SMR-290AW-480.0-SMR	None	11-24-2010 (See Note1)
324	ACS	Cables	Belden	8214	07-15-2010 (See Note1)
329	A.H. Systems	Antennas	SAS-571	721	08-04-2011
340	Aeroflex/Weinschel	Attenuators	AS-20	7136	10-16-2010 (See Note2)
343	Florida RF Cables	Cables	SMRE-200W-12.0-SMRE	N/A	04-27-2011 (See Note1)
422	Florida RF	Cables	SMS-200AW-72.0-SMR	805	01-26-2011 (See Note1)
432	Microwave Circuits	Filters	H3G020G4	264066	07-17-2010 (See Note1)

Note1: Items characterized on an annual cycle. The date shown indicates the next characterization due date.
Note2: Items verified on an annual cycle. The date shown indicates the next verification due date.

5 SUPPORT EQUIPMENT

Table 5-1: Support Equipment

Item	Equipment Type	Manufacturer	Model Number	Serial Number
1	Electric Meter	Itron Electricity Metering	C2SOD (3S)	N/A
2	Electric Meter	Itron Electricity Metering	C2SOD (4S)	N/A
3	Transformer	Sagamo Weston	Type T-6A	325827 002

6 EQUIPMENT UNDER TEST SETUP BLOCK DIAGRAM

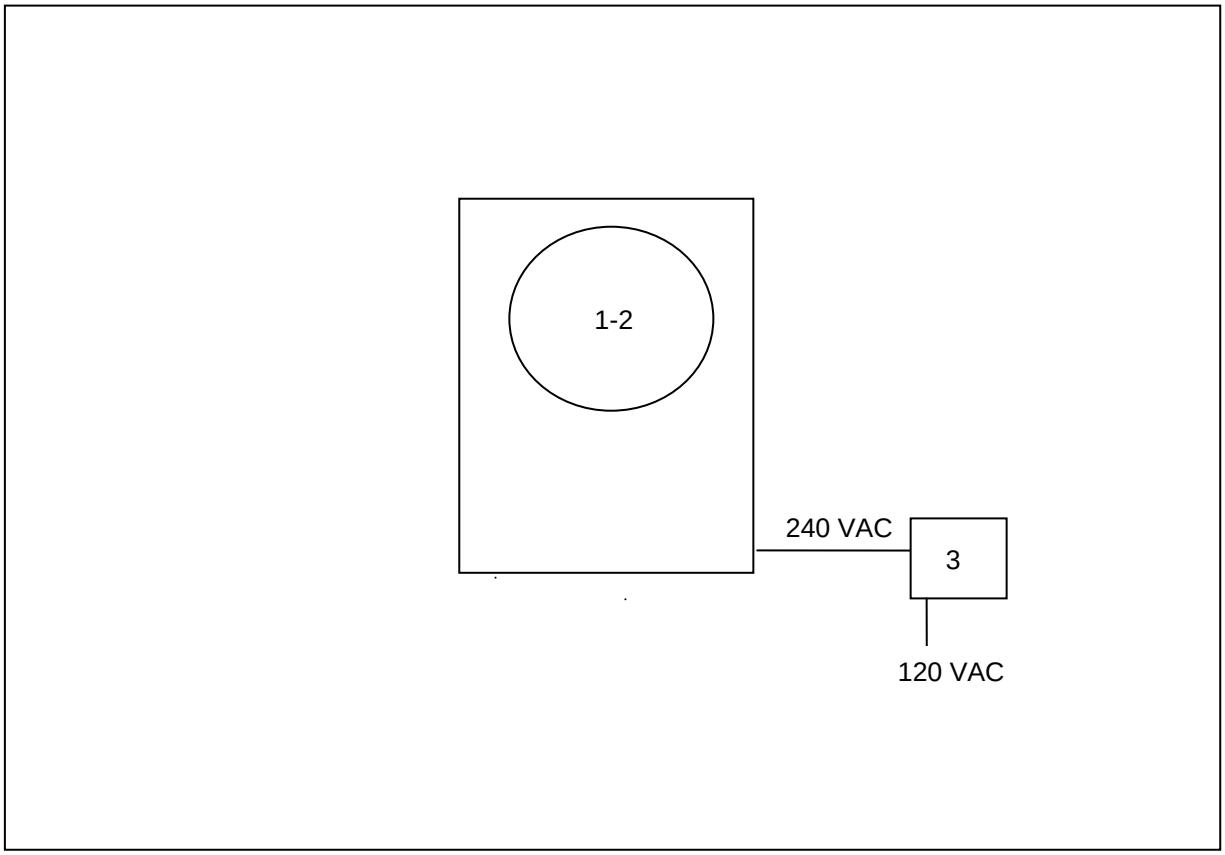

Figure 6-1: EUT Test Setup

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 a quarter wave embedded slot antenna in the PWB ground plane with a measured gain of ~3.8dBi

7.2 Power Line Conducted Emissions – FCC: Section 15.207 IC: RSS-Gen 7.2.2

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 7.2.2-4.

Table 7.2.2-1: Line 1 Conducted EMI Results – 3S Meter

Frequency (MHz)	Level (dBuV)	Transducer (dB)	Limit (dBuV)	Margin (dB)	Line	PE	Detector
0.150	45.00	9.9	66	21.0	L1	GND	QP
0.354	24.40	10.0	59	34.4	L1	GND	QP
0.462	21.80	10.0	57	34.8	L1	GND	QP
0.492	20.20	10.0	56	35.9	L1	GND	QP
0.780	11.30	10.1	56	44.7	L1	GND	QP
4.272	9.20	9.9	56	46.8	L1	GND	QP
22.128	26.50	9.4	60	33.5	L1	GND	QP
28.764	11.40	9.2	60	48.6	L1	GND	QP
29.058	11.60	9.2	60	48.4	L1	GND	QP
29.364	12.20	9.2	60	47.8	L1	GND	QP
0.198	13.90	9.9	54	39.8	L1	GND	AVG
0.348	8.30	10.0	49	40.7	L1	GND	AVG
0.462	7.90	10.0	47	38.8	L1	GND	AVG
0.492	8.20	10.0	46	37.9	L1	GND	AVG
0.852	7.10	10.0	46	38.9	L1	GND	AVG
4.248	6.60	9.9	46	39.4	L1	GND	AVG
22.146	6.20	9.4	50	43.8	L1	GND	AVG
28.932	10.50	9.2	50	39.5	L1	GND	AVG
29.10	8.20	9.2	50	41.8	L1	GND	AVG
29.244	9.60	9.2	50	40.4	L1	GND	AVG

Table 7.2.2-2: Line 2 Conducted EMI Results - 3S Meter

Frequency (MHz)	Level (dBuV)	Transducer (dB)	Limit (dBuV)	Margin (dB)	Line	PE	Detector
0.150	44.50	9.9	66	21.5	L2	GND	QP
0.324	25.30	10.0	60	34.3	L2	GND	QP
0.396	24.80	10.1	58	33.2	L2	GND	QP
0.492	20.20	10.0	56	36.0	L2	GND	QP
0.504	19.70	10.0	56	36.3	L2	GND	QP
0.792	11.60	10.1	56	44.4	L2	GND	QP
19.416	9.00	9.8	60	51.0	L2	GND	QP
22.128	28.40	9.4	60	31.6	L2	GND	QP
28.740	11.90	9.2	60	48.1	L2	GND	QP
29.700	12.60	9.2	60	47.4	L2	GND	QP
0.198	14.00	9.9	54	39.7	L2	GND	AVG
0.330	8.60	10.0	50	40.8	L2	GND	AVG
0.396	8.30	10.1	48	39.7	L2	GND	AVG
0.486	7.80	10.0	46	38.4	L2	GND	AVG
0.570	7.30	10.0	46	38.7	L2	GND	AVG
0.756	7.30	10.1	46	38.7	L2	GND	AVG
19.338	6.30	9.8	50	43.7	L2	GND	AVG
22.074	6.50	9.4	50	43.5	L2	GND	AVG
28.842	8.00	9.2	50	42.0	L2	GND	AVG
29.634	8.40	9.2	50	41.6	L2	GND	AVG

Table 7.2.2-3: Line 1 Conducted EMI Results – 4S Meter

Frequency (MHz)	Level (dBuV)	Transducer (dB)	Limit (dBuV)	Margin (dB)	Line	PE	Detector
0.150	48.10	9.9	66	17.9	L1	GND	QP
0.360	25.90	10.0	59	32.8	L1	GND	QP
0.462	25.30	10.0	57	31.4	L1	GND	QP
0.492	23.80	10.0	56	32.3	L1	GND	QP
0.558	19.20	10.0	56	36.8	L1	GND	QP
22.128	27.40	9.4	60	32.6	L1	GND	QP
25.740	18.90	9.3	60	41.1	L1	GND	QP
26.574	15.10	9.4	60	44.9	L1	GND	QP
26.610	25.00	9.4	60	35.0	L1	GND	QP
27.348	18.80	9.4	60	41.2	L1	GND	QP
0.228	11.90	9.9	53	40.6	L1	GND	AVG
0.360	8.70	10.0	49	40.0	L1	GND	AVG
0.450	8.30	10.0	47	38.5	L1	GND	AVG
0.486	8.30	10.0	46	37.9	L1	GND	AVG
0.600	7.40	10.0	46	38.6	L1	GND	AVG
22.284	7.30	9.4	50	42.7	L1	GND	AVG
25.674	11.90	9.3	50	38.1	L1	GND	AVG
26.352	13.70	9.4	50	36.3	L1	GND	AVG
26.472	14.30	9.4	50	35.7	L1	GND	AVG
27.336	10.70	9.4	50	39.3	L1	GND	AVG

Table 7.2.2-4: Line 2 Conducted EMI Results - 4S Meter

Frequency (MHz)	Level (dBuV)	Transducer (dB)	Limit (dBuV)	Margin (dB)	Line	PE	Detector
0.150	48.30	9.9	66	17.8	L2	GND	QP
0.426	26.00	10.0	57	31.4	L2	GND	QP
0.492	23.50	10.0	56	32.7	L2	GND	QP
0.594	13.80	10.0	56	42.2	L2	GND	QP
22.104	9.10	9.4	60	50.9	L2	GND	QP
26.808	13.30	9.4	60	46.7	L2	GND	QP
26.922	14.50	9.4	60	45.5	L2	GND	QP
27.378	14.40	9.4	60	45.6	L2	GND	QP
28.890	11.70	9.2	60	48.3	L2	GND	QP
29.628	10.80	9.2	60	49.2	L2	GND	QP
0.192	16.50	9.9	54	37.4	L2	GND	AVG
0.426	8.40	10.0	47	38.9	L2	GND	AVG
0.486	8.10	10.0	46	38.1	L2	GND	AVG
0.582	7.40	10.0	46	38.6	L2	GND	AVG
22.344	6.40	9.4	50	43.6	L2	GND	AVG
26.520	10.20	9.4	50	39.8	L2	GND	AVG
27.156	14.30	9.4	50	35.7	L2	GND	AVG
27.516	9.60	9.3	50	40.4	L2	GND	AVG
28.470	9.10	9.2	50	40.9	L2	GND	AVG
29.610	7.60	9.2	50	42.4	L2	GND	AVG

7.3 Radiated Emissions – FCC: Section 15.109 (Unintentional Radiation) IC: RSS-210 2.6

7.3.1 Measurement Procedure

Radiated emissions tests were performed over the frequency range of 30MHz to 12.5GHz. Measurements of the radiated field strength were made at a distance of 3m from the boundary of the equipment under test (EUT) and the receiving antenna. The antenna height was varied from 1m to 4m so that the maximum radiated emissions level would be detected. Radiated measurements above 30MHz and below 1GHz were made with the Spectrum Analyzer's resolution bandwidth set to 120 KHz using a Quasi-peak detector. Above 1GHz, peak and average measurements are taken with the RBW and VBW were set to 1MHz and 3MHz respectively.

7.3.2 Measurement Results

Results of the test are given in Tables 7.3.2-1 to 7.3.2-3 below:

Table 7.3.2-1: Radiated Emissions Tabulated Data – 3S Meter

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
40.78	---------	17.93	V	-11.91	---------	6.02	--------	40.0	---------	34.0
46.17	---------	19.22	V	-14.66	---------	4.56	--------	40.0	---------	35.4
61.824	---------	25.04	V	-19.54	---------	5.50	--------	40.0	---------	34.5
65.741	---------	26.03	V	-19.54	---------	6.49	--------	40.0	---------	33.5
244.353	---------	32.17	H	-12.36	---------	19.81	--------	46.0	---------	26.2
383.978	---------	40.37	H	-8.36	---------	32.01	--------	46.0	---------	14.0
701.45	44.46	20.42	V	-1.27	---------	19.15	--------	46.0	---------	26.9

Table 7.3.2-2: Radiated Emissions Tabulated Data – 4S Meter

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
30	---------	17.93	V	-6.70	---------	11.23	--------	40.0	---------	28.8
134.5	---------	17.75	H	-13.41	---------	4.34	--------	43.5	---------	39.2
234.655	---------	36.77	H	-13.49	---------	23.28	--------	46.0	---------	22.7
255.983	---------	35.30	H	-11.08	---------	24.22	--------	46.0	---------	21.8
389.988	---------	39.03	H	-8.30	---------	30.73	--------	46.0	---------	15.3
702.5	---------	20.44	H	-1.25	---------	19.19	--------	46.0	---------	26.8

* Note: All emissions above 702.5 MHz were attenuated below the permissible limit.

7.4 Band-Edge Compliance and Spurious Emissions-FCC 15.247d IC:RSS-210 2.6, A8.5

7.4.1 Band-Edge Compliance of RF Conducted Emissions

7.4.1.1 Measurement Procedure

The EUT was investigated at the low and high channels of operation to determine band-edge compliance. Because the upper band-edge coincides with a restricted band, band-edge compliance for the upper band-edge was determined using the radiated mark-delta method. The radiated field strength of the fundamental emission was first determined and then the mark-delta method was used to determine the field strength of the band-edge emissions.

The lower band-edge compliance was determined using the 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.

7.4.1.2 Measurement Results

Band-edge data is displayed in Tables 7.4.1.2-1 - 7.4.1.2-2.

Table 7.4.1.2-1: Upper Band-edge Marker Delta Method – 3S Meter

Frequency (MHz)	Level (dBuV)		Antenna Polarity	Correction Factors	Fundamental Field Strength (dBuV/m)		Delta-Marker (dB)	Band-edge Field Strength (dBuV/m)		Margin to Limit (dBuV/m) 74	54
	pk	avg	(H/V)	(dB)	pk	avg		pk	avg	pk	avg
Fundamental Frequency											
2475	111.98	106.16	H	0.94	112.92	107.10	54.70	58.22	41.03	15.78	12.97
2475	112.90	107.03	V	0.94	113.84	107.97	55.10	58.74	41.50	15.26	12.50

Table 7.4.1.2-2: Upper Band-edge Marker Delta Method – 4S Meter

Frequency (MHz)	Level (dBuV)		Antenna Polarity	Correction Factors	Fundamental Field Strength (dBuV/m)		Delta-Marker (dB)	Band-edge Field Strength (dBuV/m)		Margin to Limit (dBuV/m) 74	54
	pk	avg	(H/V)	(dB)	pk	avg		pk	avg	pk	avg
Fundamental Frequency											
2475	111.96	103.55	H	0.94	112.90	104.49	55.09	57.81	38.03	16.19	15.97
2475	112.54	104.54	V	0.94	113.48	105.48	54.58	58.90	39.53	15.10	14.47

7.4.2 Radiated Spurious Emissions (Restricted Bands) - FCC Sec. 15.205 IC: RSS-210 2.6

7.4.2.1 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 as defined by section 15.205 was compared to the radiated emission limits as defined in section 15.209.

7.4.2.2 Duty Cycle Correction

The device operates with a 27% duty cycle, therefore for average radiated measurements the measured level was reduced by a factor 11.37dB. The duty cycle correction factor is determined using the formula: 20log (27/100) = -11.37dB.

7.4.2.3 Measurement Results

Radiated spurious emissions found in the band of 30MHz to 25GHz are reported in the table 7.4.2.3-1 to 7.4.2.3-2 below.

Table 7.4.2.3-1: Radiated Spurious Emissions – 3S Meter

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										
2276.8	62.00	55.02	H	-0.12	61.88	43.53	74.0	54.0	12.1	10.5
2276.8	62.23	55.32	V	-0.12	62.11	43.83	74.0	54.0	11.9	10.2
2389	70.66	63.07	H	0.48	71.14	52.18	74.0	54.0	2.9	1.8
2389	70.83	63.01	V	0.48	71.31	52.12	74.0	54.0	2.7	1.9
4810	43.92	33.71	H	8.36	52.28	30.70	74.0	54.0	21.7	23.3
4810	47.25	39.47	V	8.36	55.61	36.46	74.0	54.0	18.4	17.5
Middle Channel										
4880	46.11	35.92	V	8.61	54.72	33.16	74.0	54.0	19.3	20.8
7320	45.06	34.52	H	13.19	58.25	36.34	74.0	54.0	15.7	17.7
7320	46.28	35.31	V	13.19	59.47	37.13	74.0	54.0	14.5	16.9
12200	47.91	38.00	H	23.73	71.64	50.36	83.5	63.5	11.9	13.1
12200	49.12	39.80	V	23.73	72.85	52.16	83.5	63.5	10.7	11.3
High Channel										
2491	64.33	56.26	H	1.02	65.35	45.91	74.0	54.0	8.6	8.1
2491	65.66	57.53	V	1.02	66.68	47.18	74.0	54.0	7.3	6.8
4950	45.55	35.49	V	8.87	54.42	32.98	74.0	54.0	19.6	21.0
7425	45.29	35.03	H	13.27	58.56	36.93	74.0	54.0	15.4	17.1
7425	43.92	33.34	V	13.27	57.19	35.24	74.0	54.0	16.8	18.8
12375	49.12	39.98	H	24.90	74.02	53.50	83.5	63.5	9.5	10.0
12375	50.11	40.57	V	24.90	75.01	54.09	83.5	63.5	8.5	9.4

Table 7.4.2.3-2: Radiated Spurious Emissions – 4S Meter

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										
2276.8	61.62	54.79	H	-0.12	61.50	43.30	74.0	54.0	12.5	10.7
2276.8	63.01	56.21	V	-0.12	62.89	44.72	74.0	54.0	11.1	9.3
2389	70.66	62.86	H	0.48	71.14	51.97	74.0	54.0	2.9	2.0
2389	68.93	61.16	V	0.48	69.41	50.27	74.0	54.0	4.6	3.7
4810	45.04	37.27	H	8.36	53.40	34.26	74.0	54.0	20.6	19.7
4810	46	37.85	V	8.36	54.36	34.84	74.0	54.0	19.6	19.2
Middle Channel										
4880	46.10	36.45	V	8.61	54.71	33.69	74.0	54.0	19.3	20.3
7320	44.32	33.68	H	13.19	57.51	35.50	74.0	54.0	16.5	18.5
7320	47.14	37.72	V	13.19	60.33	39.54	74.0	54.0	13.7	14.5
12200	46.07	36.17	H	23.73	69.80	48.53	83.5	63.5	13.7	15.0
12200	47.15	36.55	V	23.73	70.88	48.91	83.5	63.5	12.6	14.6
High Channel										
2491	64.46	56.21	H	1.02	65.48	45.86	74.0	54.0	8.5	8.1
2491	66.67	58.65	V	1.02	67.69	48.30	74.0	54.0	6.3	5.7
4950	45.82	35.08	H	8.87	54.69	32.57	74.0	54.0	19.3	21.4
4950	46.91	36.33	V	8.87	55.78	33.82	74.0	54.0	18.2	20.2
7425	45.01	34.57	H	13.27	58.28	36.47	74.0	54.0	15.7	17.5
7425	45.16	34.45	V	13.27	58.43	36.35	74.0	54.0	15.6	17.7
12375	50.06	41.43	H	24.90	74.96	54.95	83.5	63.5	8.5	8.5
12375	52.04	42.42	V	24.90	76.94	55.94	83.5	63.5	6.6	7.6

7.4.2.4 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: 62.00 - 0.12 = 61.88dBuV/m
Margin: 74dBuV/m – 61.88dBuV/m = 12.1dB

Example Calculation: Average

Corrected Level: 55.02 - 0.12 – 11.37 = 43.53dBuV
Margin: 54dBuV – 43.53dBuV = 10.5dB

8 CONCLUSION

In the opinion of ACS, Inc. the AMI6, manufactured by Itron Electricity Metering, Inc. meets the requirements of FCC Part 15 subpart C and Industry Canada's Radio Standards Specification RSS-210.

END REPORT