Modular Approval
Certification Test Report

FCC ID: SDBFXZIG210
IC: 2220A-FXZIG210

FCC Rule Part: 15.247
ISED Canada's Radio Standards Specification: RSS-247

TÜV SÜD Report Number: RD72127191.200

Manufacturer: Sensus Metering Systems, Inc.
Model: FXZIG210

Test Begin Date: 5/16/2017
Test End Date: 7/21/2017

Report Issue Date: July 21, 2017

FOR THE SCOPE OF ACCREDITATION UNDER LAB Code AT-1921

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

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This report contains 23 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 Innovation, Science and Economic Development Canada Radio Standards Specification: RSS-247 Certification.

1.2 Product Description

The FXZIG210 is a transceiver module that incorporates a Sensus FLEXNET 900MHz transceiver and a Zigbee 2.4GHz transceiver. The current evaluation covers the Zigbee transceiver and the Flexnet is addressed in a separate report.

The FXZIG210 is meant as an endpoint state-of-the-art supporting communications WAN and HAN communication. The electronics package is designed to be installed in the Aclara I210+c meter. The Aclara I210+c meter is Aclara's flagship residential meter product supporting Demand, TOU, LP as well as a service switch.

Technical Information:

Detail	Description
Frequency Range	2405-2480
Number of Channels	26
Modulation Format	O-QPSK
Data Rates	N/A
Number of Inputs/Outputs	1T/1R
Operating Voltage	4VDC
Antenna Type / Gain	PCB Inverted F Antenna (PIFA) / 2.24dBi

Manufacturer Information:
Sensus Metering Systems, Inc.
639 Davis Drive
Morrisville, NC 27560

EUT Serial Numbers: RE: 7000816, CE: 9995310

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

1.3 Test Methodology and Considerations

The Zigbee transceiver was configured using a proprietary communication interface provided by the client. The interface allows power level and channel control required to support the evaluation. The power level settings in the table below were used for the evaluation.

Mode	Power settings (dBm)
LCH	-13
MCH	-12
H(-1)CH	-10
HCH	-21

For radiated emissions, the EUT was programmed to generate a continuously modulated signal on each channel investigated. The EUT was evaluated in the three orthogonal orientations (X,Y, and Z planes). The final results presented in this report are based on the Y-plane which was determined to be worst case.

For RF conducted measurements, a SMA connecter was installed on the output of the transmitter to facilitate connection to the test equipment

2 TEST FACILITIES

2.1 Location

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

TÜV SÜD America Inc.
2320 Presidential Drive, Suite 101
Durham, NC 27703
Phone: (919) 381-4235

2.2 Laboratory Accreditations/Recognitions/Certifications

TÜV SÜD America Inc. is accredited to ISO/IEC 17025 by ANSI-ASQ National Accreditation Board under their ANAB program and has been issued certificate number AT-1921 in recognition of this accreditation. Unless otherwise specified, all test methods described within this report are covered under the ISO/IEC 17025 scope of accreditation.

FCC Registered Test Site Number: 637011
ISED Canada Test Site Registration Number: 4175A

2.3 Radiated Emissions Test Site Description

2.3.1 Semi-Anechoic Chamber Test Site

The Semi-Anechoic Chamber Test Site consists of a 18' x 28' x 18' shielded enclosure. The chamber is lined with Samwha Electronics Co. LTD Ferrite Absorber, model number SFA300 (HSN-1). The ferrite tile is 10cm x 10 cm and weighs approximately 1.4lbs. These tiles are mounted on steel panels and installed directly on the inner walls of the chamber. On top of the ferrite tiles is DMAS HT-45 (Dutch Microwave Absorber Solutions) hybrid absorber on all walls except the wall behind the antenna mast which has a shorter DMAS HT-25 absorber.

The turntable is 1.50m in diameter and is located 150cm 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 short #6 copper wire. 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 turntable. 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.

Behind the turntable is a 2' x 6' x 1.5' deep shielded pit used for support equipment if necessary. The pit is equipped with 2 - 4" PVC chase 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:

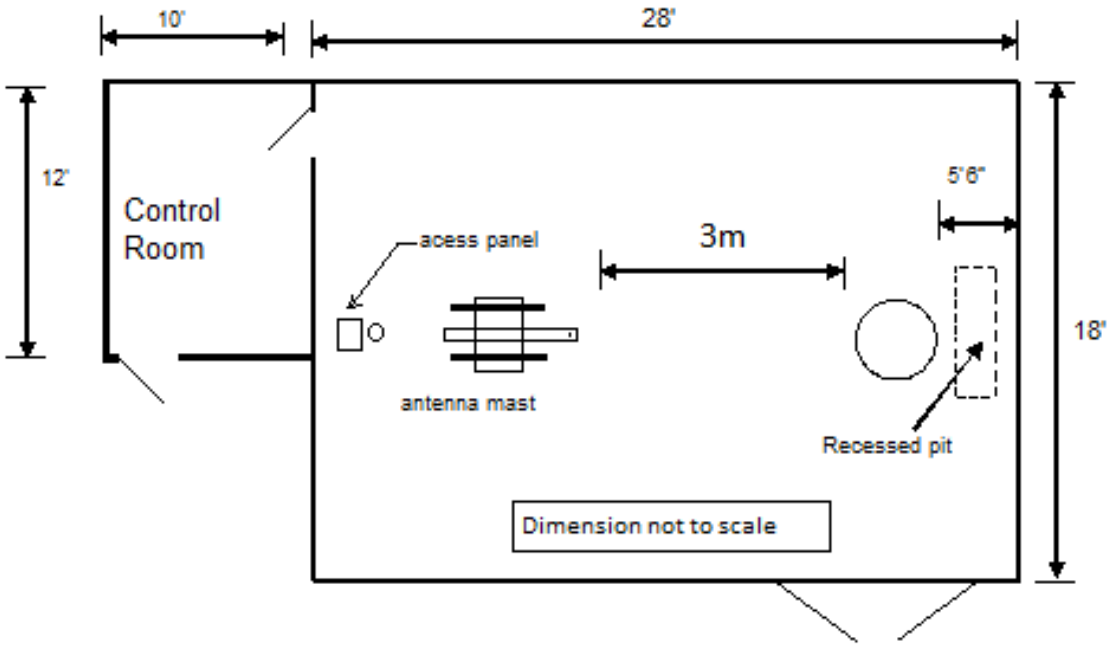

Figure 2.3-1: Semi-Anechoic Chamber Test Site

2.4 Conducted Emissions Test Site Description

The AC mains conducted EMI site is located in the main EMC lab. It consists of an 8’ x 10’ sheet galvanized steel horizontal ground reference plane (GRP) bonded every 6” to an 8’ X 8’ aluminum vertical ground plane.

A diagram of the room is shown below in figure 2.4-1:

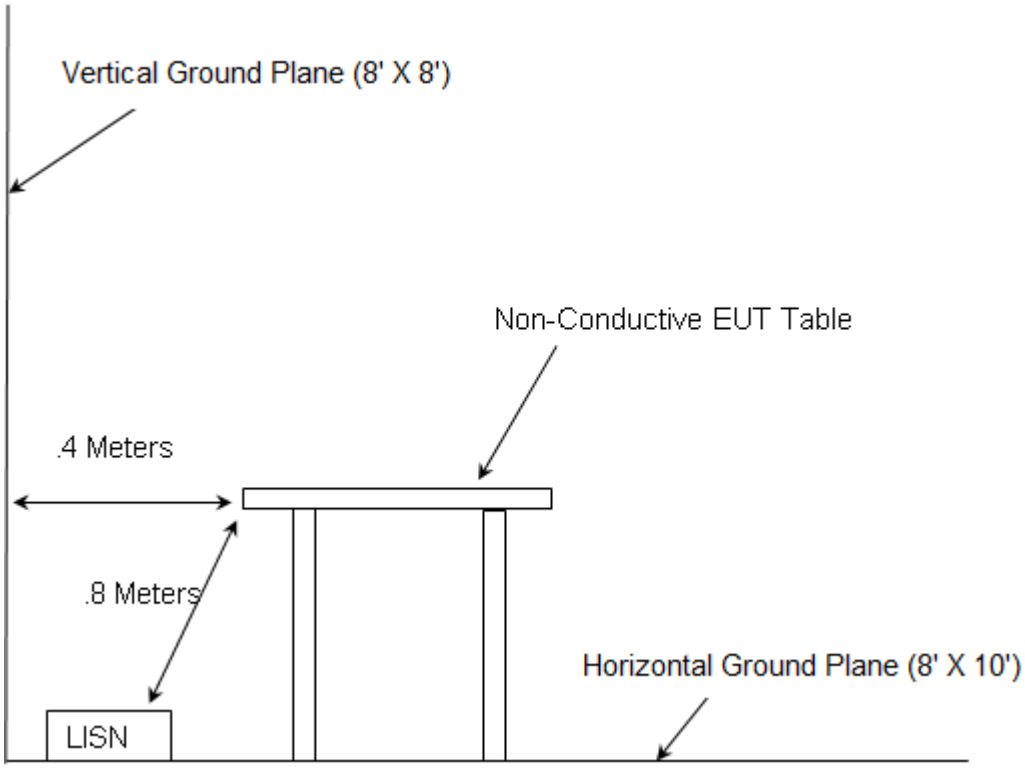

Figure 2.4-1: AC Mains Conducted EMI Site

3 APPLICABLE STANDARD REFERENCES

The following standards were used:

- ANSI C63.4-2014: American National Standard for Methods of Measurement of Radio-Noise Emissions from low-voltage electrical and electronic equipment in the range of 9kHz to 40 GHz.
- 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, 2017
- US Code of Federal Regulations (CFR): Title 47, Part 15, Subpart C: Radio Frequency Devices, Intentional Radiators, 2017
- FCC KDB 558074 D01 DTS Meas Guidance v04 - Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247, April 5, 2017
- ISED Canada Radio Standards Specification: RSS-247, Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices, Issue 2, February 2017
- ISED Canada Radio Standards Specification: RSS-GEN – General Requirements for Compliance of Radio Apparatus, 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

Asset ID	Manufacturer	Model #	Equipment Type	Serial #	Last Calibration Date	Calibration Due Date
277	EMCO	93146	Antennas	9904-5199	9/12/2016	9/12/2018
626	EMCO	3110B	Antennas	9411-1945	3/21/2017	3/21/2019
3002	Rohde & Schwarz	ESU40	Receiver	100346	1/12/2017	1/12/2018
3006	Rohde & Schwarz	TS-PR18	Amplifiers	122006	1/11/2017	1/11/2018
3007	Rohde & Schwarz	TS-PR26	Amplifiers	100051	1/11/2017	1/11/2018
3008	Rohde & Schwarz	NRP2	Meter	103131	2/6/2017	2/6/2018
3009	Rohde & Schwarz	NRP-Z81	Meter	102397	2/6/2017	2/6/2018
3012	Rohde & Schwarz	EMC32-EB	Software	100731	NCR	NCR
3016	Fei Teng Wireless Technology	HA-07M18G-NF	Antennas	2013120203	1/26/2016	1/26/2018
3027	Micro-Tronics	BRM50702	Filter	175	1/13/2017	1/13/2018
3028	Micro-Tronics	HPM50111	Filter	122	1/13/2017	1/13/2018
3036	Hasco, Inc.	HLL142-S1-S1-24	Cables	2450	1/11/2017	1/11/2018
3038	Florida RF Labs	NMSE-290AW-60.0-NMSE	Cable Set	1448	1/3/2017	1/3/2018
3039	Florida RF Labs	NMSE-290AW-396.0-NMSE	Cable Set	1447	1/3/2017	1/3/2018
3042	Aeroflex Inmet	18N10W-10	Attenuator	1444	1/16/2017	1/16/2018
3045	Aeroflex Inmet	18N10W-20	Attenuator	1437	1/3/2017	1/3/2018
3049	Aeroflex Inmet	26AH-20	Attenuator	1443	1/11/2017	1/11/2018
3055	Rohde & Schwarz	3005	Cables	3055	1/3/2017	1/3/2018
3057	Advanced Technical Materials	42-441-6/BR	Antennas	R110602	NCR	NCR
3059	Mountain View Cable	A	Cables	3059	1/11/2017	1/11/2018
3085	Rohde & Schwarz	FSW43	Spectrum Analyzer	103997	8/9/2016	8/9/2017

NCR = No Calibration Required
DMAS MT-25 RF absorber material was used on the floor for all final measurements above 1 GHz.
Asset 3002: Firmware Version: ESU40 is 4.73 SP4
Asset 3012: Software Version: EMC32-B is 9.15
Asset 3085: Instrument Firmware 2.41 SP1

5 SUPPORT EQUIPMENT

Table 5-1: EUT and Support Equipment

Item #	Type Device	Manufacturer	Model/Part #	Serial #
1	EUT	Sensus	FXZIG210	RE: 7000816, CE: 9995310
2	Power Supply	Bk Precision	1694	258C12210

Table 5-2: Cable Description

Cable #	Cable Type	Length	Shield	Termination
A	Power	140cm	No	1 to 2

6 EQUIPMENT UNDER TEST SETUP BLOCK DIAGRAM

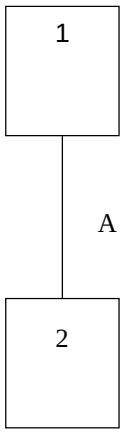

Figure 6-1: EUT Test Setup

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: 15.203

The antenna is integral to the device and cannot be removed or replaced by the end user. Therefore, the antenna requirement stated in section 15.203 is met.

7.2 Power Line Conducted Emissions – FCC: 15.207; ISED Canada: RSS-Gen 8.8

7.2.1 Measurement Procedure

ANSI C63.10-2013 section 6 was the guiding document 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

Performed by: Jean Tezil

Table 7.2.2-1: Conducted EMI Results – Line 1

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.150019	---	16.11	56.00	39.89	2000.0	9.000	L1	OFF	9.7
0.150019	38.46	---	66.00	27.54	2000.0	9.000	L1	OFF	9.7
0.375918	41.75	---	58.22	16.47	2000.0	9.000	L1	OFF	9.7
0.375918	---	41.33	48.19	6.86	2000.0	9.000	L1	OFF	9.7
0.377022	---	41.59	48.17	6.58	2000.0	9.000	L1	OFF	9.7
0.377022	41.78	---	58.20	16.42	2000.0	9.000	L1	OFF	9.7
0.426037	---	40.37	47.22	6.85	2000.0	9.000	L1	OFF	9.7
0.426037	41.00	---	57.24	16.24	2000.0	9.000	L1	OFF	9.7
0.429390	36.05	---	57.18	21.13	2000.0	9.000	L1	OFF	9.7
0.429390	---	33.82	47.16	13.34	2000.0	9.000	L1	OFF	9.7
0.683624	---	33.85	46.00	12.15	2000.0	9.000	L1	OFF	9.7
0.683624	34.07	---	56.00	21.93	2000.0	9.000	L1	OFF	9.7
1.558665	---	26.92	46.00	19.08	2000.0	9.000	L1	OFF	9.7
1.558665	28.10	---	56.00	27.90	2000.0	9.000	L1	OFF	9.7
2.481462	---	23.15	46.00	22.85	2000.0	9.000	L1	OFF	9.7
2.481462	26.56	---	56.00	29.44	2000.0	9.000	L1	OFF	9.7
4.406299	---	13.20	46.00	32.80	2000.0	9.000	L1	OFF	9.8
4.406299	18.09	---	56.00	37.91	2000.0	9.000	L1	OFF	9.8
22.963788	---	31.86	50.00	18.14	5000.0	9.000	L1	OFF	10.1
22.963788	39.69	---	60.00	20.31	5000.0	9.000	L1	OFF	10.1

Table 7.2.2-2: Conducted EMI Results – Line 2

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.151600	---	12.62	55.90	43.28	2000.0	9.000	N	OFF	9.6
0.151600	38.34	---	65.90	27.56	2000.0	9.000	N	OFF	9.6
0.376508	---	40.30	48.18	7.88	2000.0	9.000	N	OFF	9.7
0.376508	41.09	---	58.21	17.12	2000.0	9.000	N	OFF	9.7
0.376750	41.25	---	58.21	16.96	2000.0	9.000	N	OFF	9.7
0.376750	---	40.60	48.18	7.58	2000.0	9.000	N	OFF	9.7
0.378370	41.36	---	58.17	16.81	2000.0	9.000	N	OFF	9.7
0.378370	---	41.17	48.14	6.97	2000.0	9.000	N	OFF	9.7
0.426870	---	40.89	47.20	6.31	2000.0	9.000	N	OFF	9.7
0.426870	41.26	---	57.22	15.96	2000.0	9.000	N	OFF	9.7
0.685176	---	33.07	46.00	12.93	2000.0	9.000	N	OFF	9.7
0.685176	33.47	---	56.00	22.53	2000.0	9.000	N	OFF	9.7
1.490165	---	26.47	46.00	19.53	2000.0	9.000	N	OFF	9.7
1.490165	27.84	---	56.00	28.16	2000.0	9.000	N	OFF	9.7
2.487486	---	22.75	46.00	23.25	2000.0	9.000	N	OFF	9.7
2.487486	25.35	---	56.00	30.65	2000.0	9.000	N	OFF	9.7
4.470196	---	10.23	46.00	35.77	2000.0	9.000	N	OFF	9.8
4.470196	14.94	---	56.00	41.06	2000.0	9.000	N	OFF	9.8
22.922325	---	31.13	50.00	18.87	5000.0	9.000	N	OFF	10.1
22.922325	40.50	---	60.00	19.50	5000.0	9.000	N	OFF	10.1

7.3 6dB / 99% Bandwidth – FCC: 15.247(a)(2); ISED Canada: RSS-247 5.2(a)

7.3.1 Measurement Procedure

The 6dB bandwidth was measured in accordance with the FCC KDB 558074 D01 DTS Meas Guidance v04. The Resolution Bandwidth (RBW) of the spectrum analyzer was set to 100 kHz. The Video Bandwidth (VBW) was set to ≥ 3 times the RBW. The trace was set to max hold with a peak detector active. The marker-delta function of the spectrum analyzer was utilized to determine the 6 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.

The widest DTS (6dB) bandwidth was determined based on the worse case data rate, which is SF10.

7.3.2 Measurement Results

Performed by: Jean Tezil

Table 7.3.2-1: 6dB / 99% Bandwidth

Frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)
2405	1.605	2.447
2440	1.613	2.476
2475	1.614	2.484
2480	1.627	2.466

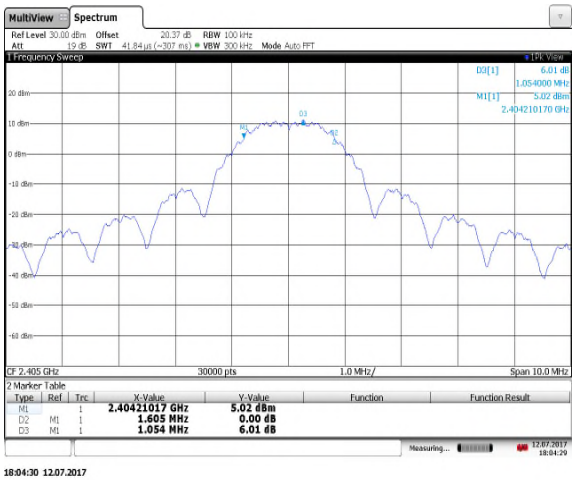

Figure 7.3.2-1: 6dB Bandwidth Low Channel

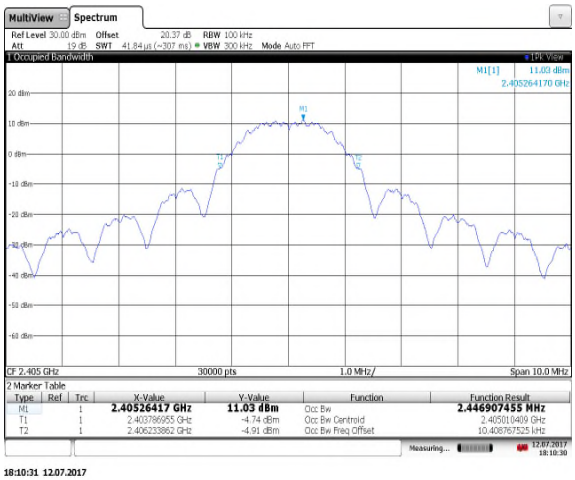

Figure 7.3.2-2: 99% Bandwidth Low Channel

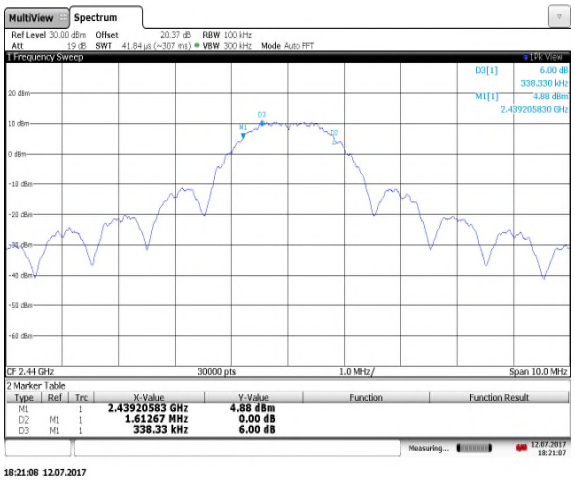

Figure 7.3.2-3: 6dB Bandwidth Mid Channel

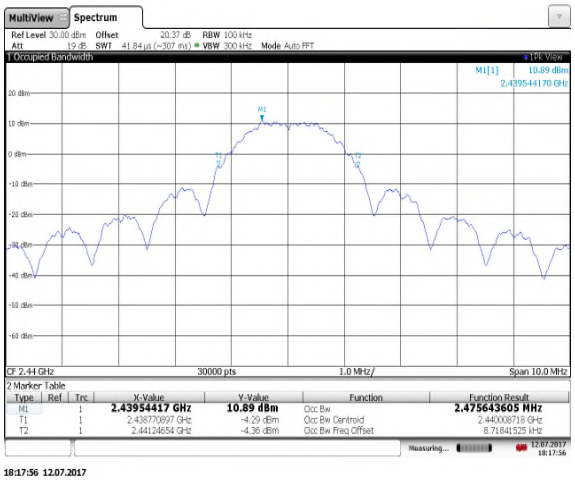

Figure 7.3.2-4: 99% Bandwidth Mid Channel

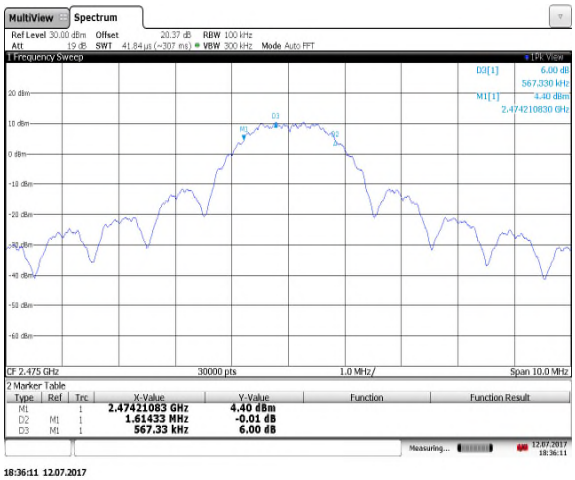

Figure 7.3.2-5: 6dB Bandwidth High adj. Channel

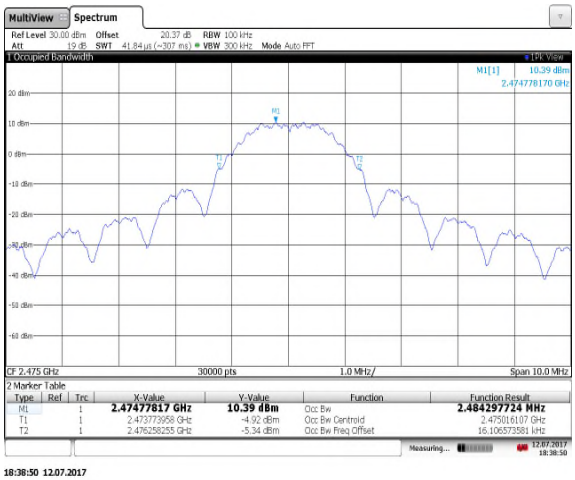

Figure 7.3.2-6: 99% Bandwidth High Adj. Channel

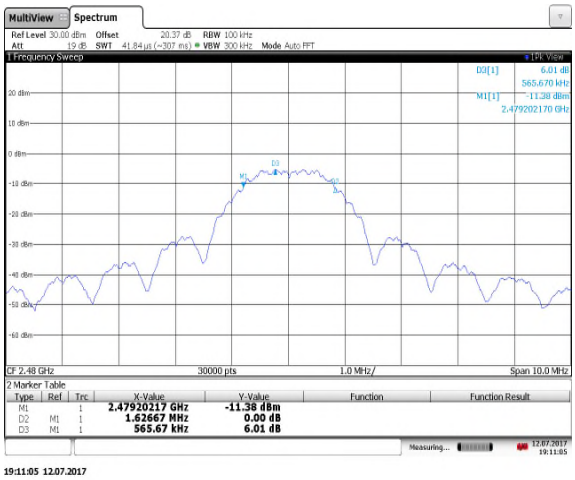

Figure 7.3.2-7: 6dB Bandwidth High Channel

Figure 7.3.2-8: 99% Bandwidth High Channel

7.4 Fundamental Emission Output Power – FCC: 15.247(b)(3); ISED Canada: RSS-247 5.4(d)

7.4.1 Maximum peak conducted output power - Measurement Procedure

The maximum peak conducted output power was measured in accordance with FCC KDB 558074 D01 DTS Measurement Guidance v04 utilizing the PKPM1 Peak power meter method. The RF output of the equipment under test was directly connected to the input of the peak power meter applying suitable attenuation.

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7.4.2 Measurement Results

Performed by: Jean Tezil

Table 7.4.2-1: Maximum Peak Conducted Output Power

Frequency (MHz)	Output Power (dBm)
2405	16.97
2440	16.83
2475	16.62
2480	1.98

7.5 Emission Levels – FCC: 15.247(d), 15.205, 15.209; ISED Canada RSS-247 5.5, RSS-Gen 8.9/8.10

7.5.1 Emissions into Non-restricted Frequency Bands

7.5.1.1 Measurement Procedure

The unwanted emissions into non-restricted bands were measured conducted in accordance with FCC KDB 558074 D01 DTS Measurement Guidance v04. 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 1.5 times the DTS bandwidth. 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 30 MHz to 25GHz, 10 times the highest fundamental frequency. Additionally, a prescan was performed from 9 kHz or the lowest frequency generated to 30 MHz.

Band-edge compliance was determined using the conducted marker-delta method in which the radio frequency power that is produced by the EUT is at least 20 dBc below that in the 100 kHz bandwidth within the band that contains the highest level of desired power.

7.5.1.2 Measurement Results

Performed by: Jean Tezil

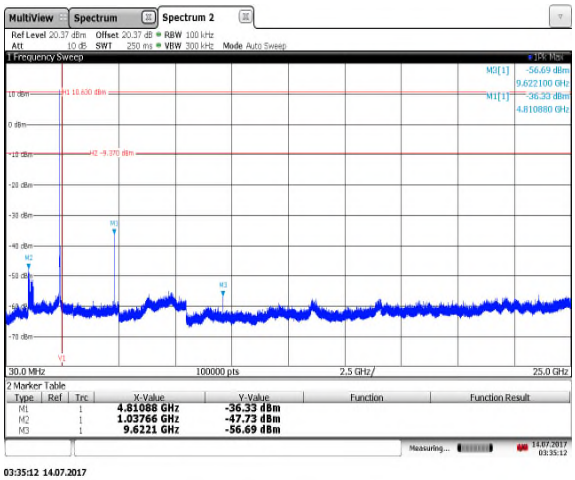

Figure 7.5.1.2-1: 30 MHz – 25 GHz – LCH

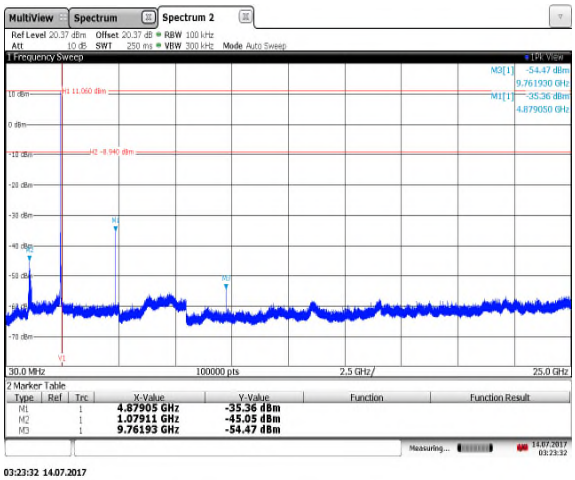

Figure 7.5.1.2-2: 30 MHz – 25 GHz – MCH

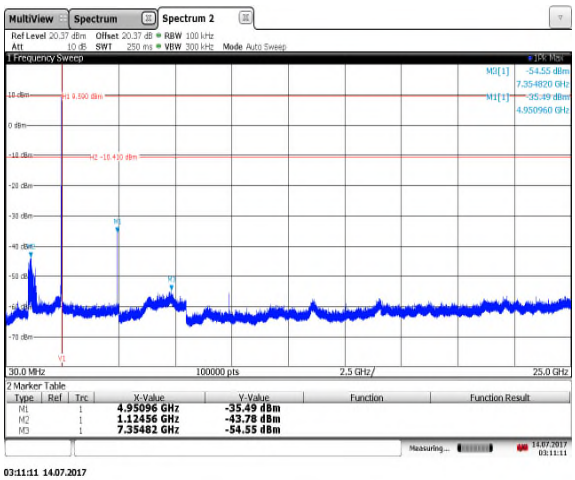

Figure 7.5.1.2-3: 30 MHz – 25 GHz – (H-1)CH

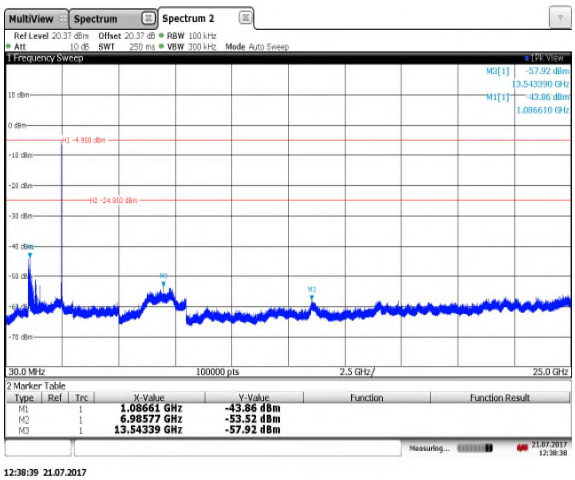

Figure 7.5.1.2-4: 30 MHz – 25 GHz – HCH

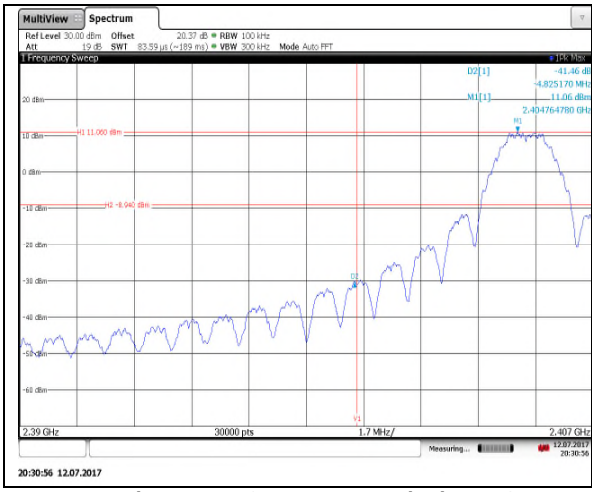

Figure 7.5.1.2-5: Lower Band-edge - LCH

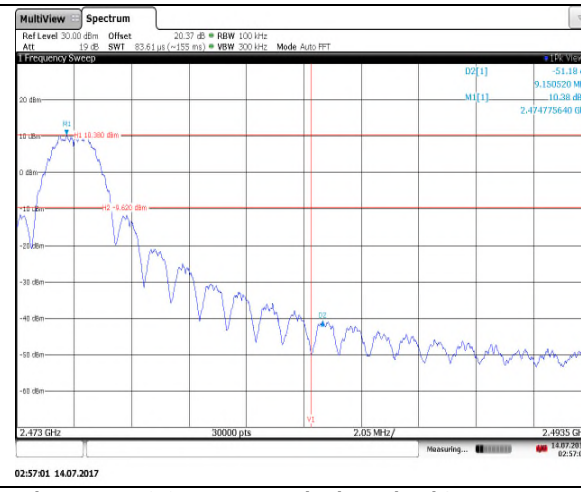

Figure 7.5.1.2-6: Upper Band-edge – (H-1)CH

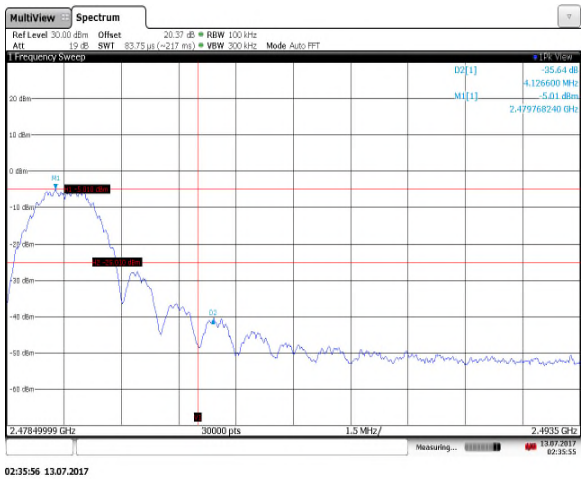

Figure 7.5.1.2-7: Upper Band-edge – HCH

7.6 Emissions into Restricted Frequency Bands

7.6.1.1 Measurement Procedure

The unwanted emissions into restricted bands were measured radiated over the frequency range of 30MHz to 25GHz, 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 RBW of 120 kHz and a 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.

Each emission found to be in a restricted band as defined by section 15.205, including any emission at the operational band-edge, was compared to the radiated emission limits as defined in section 15.209.

7.6.1.2 Duty Cycle Correction

For average radiated measurements, using a 66% duty cycle, the measured level was reduced by a factor 3.6 dB. The duty cycle correction factor is determined using the formula: 20log (66/100) = - 3.6 dB.

A detailed analysis of the duty cycle timing is provided in the Theory of Operation accompanying the application for certification.

7.6.1.3 Measurement Results

Performed by: Jean Tezil

Table 7.6.1.3-1: 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 = 2405 MHz										
2390	64.70	53.50	H	-3.70	61.00	46.19	74.0	54.0	13.0	7.8
2390	63.50	51.70	V	-3.70	59.80	44.39	74.0	54.0	14.2	9.6
4810	58.70	52.20	H	3.68	62.38	52.27	74.0	54.0	11.6	1.7
4810	59.50	53.00	V	3.68	63.18	53.07	74.0	54.0	10.8	0.9
12025	47.6	37.5	H	11.65	59.25	45.54	74.0	54.0	14.7	8.5
12025	49.10	39.80	V	11.65	60.75	47.84	74.0	54.0	13.2	6.2
19240	44.20	31.00	H	8.21	52.41	35.60	74.0	54.0	21.6	18.4
19240	43.50	31.20	V	8.21	51.71	35.80	74.0	54.0	22.3	18.2
Middle Channel = 2440 MHz										
4880	60.60	53.80	H	3.67	64.27	53.86	74.0	54.0	9.7	0.1
4880	58.10	51.60	V	3.67	61.77	51.66	74.0	54.0	12.2	2.3
7320	42.70	29.20	H	7.87	50.57	33.46	74.0	54.0	23.4	20.5
7320	42.50	28.40	V	7.87	50.37	32.66	74.0	54.0	23.6	21.3
Adj. High Channel = 2475 MHz										
2483.5	67.60	55.90	H	-3.46	64.14	48.83	74.0	54.0	9.9	5.2
2483.5	71.10	59.80	V	-3.46	67.64	52.73	74.0	54.0	6.4	1.3
4950	59.30	52.50	H	3.65	62.95	52.54	74.0	54.0	11.0	1.5
4950	55.70	48.50	V	3.65	59.35	48.54	74.0	54.0	14.6	5.5
7425	48.5	38.5	H	8.41	56.91	43.30	74.0	54.0	17.1	10.7
7425	47	36.6	V	8.41	55.41	41.40	74.0	54.0	18.6	12.6
12375	43.60	30.50	H	11.98	55.58	38.87	74.0	54.0	18.4	15.1
12375	43.70	31.40	V	11.98	55.68	39.77	74.0	54.0	18.3	14.2
19800	45.80	34.20	H	8.91	54.71	39.50	74.0	54.0	19.3	14.5
19800	45.10	32.70	V	8.91	54.01	38.00	74.0	54.0	20.0	16.0
High Channel = 2480 MHz										
2483.5	67.00	55.40	H	-3.46	63.54	48.33	74.0	54.0	10.5	5.7
2483.5	69.20	58.60	V	-3.46	65.74	51.53	74.0	54.0	8.3	2.5
4960	42.90	29.30	H	3.65	46.55	29.34	74.0	54.0	27.5	24.7
4960	42.50	29.00	V	3.65	46.15	29.04	74.0	54.0	27.9	25.0

Note: Duty Cycle correction factor used: 66%

7.6.1.4 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: 64.7 - 3.70 = 61.00 dBuV/m
Margin: 74dBuV/m – 61.00dBuV/m = 13.00dB

Example Calculation: Average

Corrected Level: 53.5 - 3.70 -3.6= 46.2dBuV
Margin: 54dBuV – 46.2dBuV = 7.8dB

7.7 Power Spectral Density – FCC: 15.247(e); ISED Canada: RSS-247 5.2(b)

7.7.1 Measurement Procedure

The power spectral density was measured in accordance with the FCC KDB 558074 D01 DTS Meas Guidance v04 utilizing the PKPSD (peak PSD) method. 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 3 kHz. The Video Bandwidth (VBW) was set to 10 kHz. Span was set to 1.5 times the DTS bandwidth. The trace was set to max hold with a peak detector active.

7.7.2 Measurement Results

Performed by: Jean Tezil

Table 7.7.2-1: Peak Power Spectral Density

Frequency (MHz)	PSD Level (dBm)
2405	1.30
2440	0.58
2475	-0.07
2480	-15.55

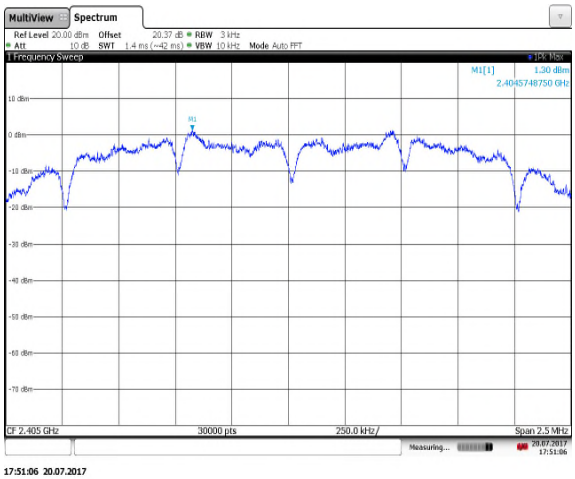

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Figure 7.7.2-1: PSD Plot –LCH

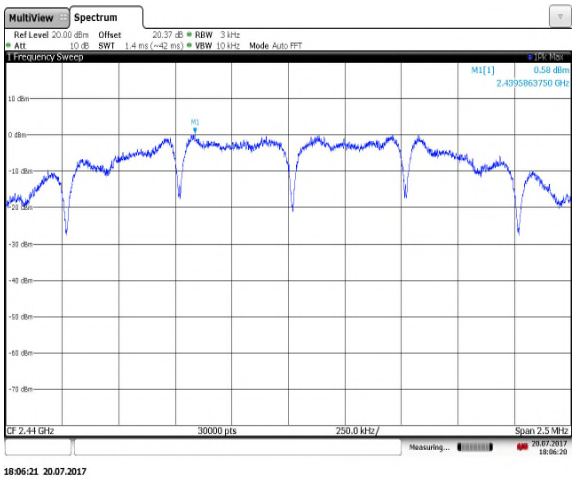

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Figure 7.7.2-2: PSD Plot – MCH

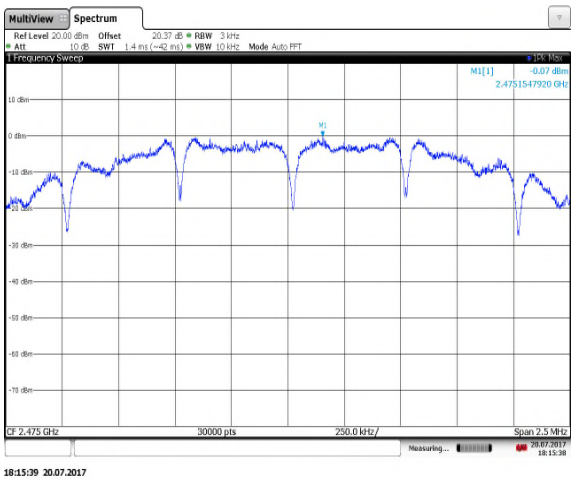

Figure 7.7.2-3: PSD Plot – (H-1)CH

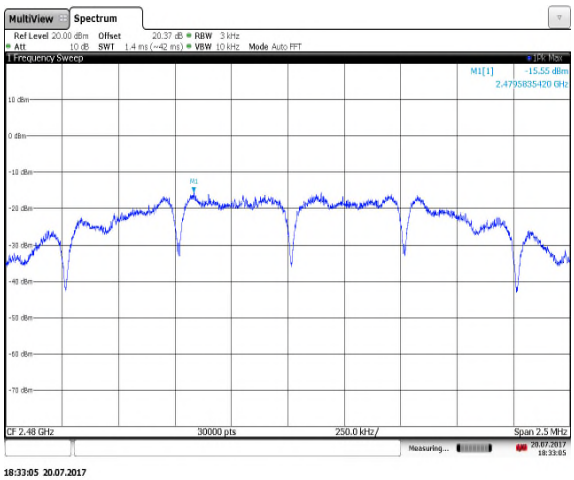

Figure 7.7.2-4: PSD Plot – HCH

8 MEASUREMENT UNCERTAINTY

The expanded laboratory measurement uncertainty figures (U_{Lab}) provided below correspond to an expansion factor (coverage factor) k = 1.96 which provide confidence levels of 95%.

Parameter	U_{lab}
Occupied Channel Bandwidth	**± 0.004%**
RF Conducted Output Power	**± 0.689 dB**
Power Spectral Density	**±0.5 dB**
Antenna Port Conducted Emissions	**± 2.717 dB**
Radiated Emissions	**± 5.877 dB**
Temperature	**± 0.860 °C**
Radio Frequency	**±2.832 x 10-8**
AC Power Line Conducted Emissions	**±2.85**

9 CONCLUSION

In the opinion of TÜV SÜD America Inc. the FXZIG210, manufactured by Sensus Metering Systems, Inc. meets the requirements of FCC Part 15 subpart C and ISED Canada Radio Standards Specification: RSS-247 for the tests documented herein.

END REPORT