Certification Test Report

FCC ID: SK9SNIC1
IC: 864G-SNIC1

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

Report Number: AT72133597-1P0

Manufacturer: Itron, Inc.
Model: SNIC1

Test Begin Date: August 29, 2017
Test End Date: December 6, 2017

Report Issue Date: February 22, 2018

FOR THE SCOPE OF ACCREDITATION UNDER Certificate Number: AT-2021

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

Prepared by:

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This report contains 16 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's Radio Standards Specification RSS-247 Certification for a Class II Permissive Change.

The purpose of this Class II Permissive Change is to add a new antenna and host combination.

1.2 Product description

The Itron Smart Network Interface Card (model: SNIC1) module is built on Itron's IPv6 OpenWay platform, and includes the Adaptive Communications Technology (ACT). It can process, analyze, communicate and react in real-time. Adaptive communications enable devices to interact with each other while dynamically switching between Radio Frequency (RF) and Power Line Carrier (PLC) to ensure the fastest and most reliable communications path. The communication module utilizes 900 MHz radio frequency (RF), power line carrier (carrier current system) and 2.4 GHz Wi-Fi operation bands.

This Class II Permissive Change addresses the SNIC1 integrated into the Itron, Inc. RN-ERT Gateway STAR (FCC ID: EO9ORRNA).

This test report documents the compliance of the 900 MHz transceiver frequency hopping spread spectrum mode of operation.

Technical Details:

Detail	Description
Frequency Range	902.2 – 927.8 MHz
Number of Channels	FSK 10kbps: 513 FSK 50kbps: 64 FSK 150kbps: 64 OFDM: 64 DSSS: 64
Modulation Format	FSK, OFDM, DSSS
Data Rates (kbps)	FSK: 10, 50, 150 OFDM: 200, 600 DSSS: 6.25, 12.5
Operating Voltage	24Vdc
Antenna Type(s) / Gain(s)	Micro Strip Patch Antenna / 2.5 dBi PCTEL BOA9022NM-ITR / 2.6 dBi (new)

Manufacturer Information:
Itron, Inc.
313 N Hwy 11
West Union, SC 29696

EUT Serial Numbers: Radiated Emissions (FSK 10k, OFDM, DSSS): 630000C419
Radiated Emissions (FSK 150k): 630000C42E
Radiated Emissions (FSK 50k): 630000C423
Power Line Conducted Emissions: 630000C423

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

1.3 Test Methodology and Considerations

All modes of operation, including all available data rates, were evaluated for each mode. The data presented in this report represents the worst case where applicable. A single test sample was not capable of supporting all modulation formats for test mode, therefore multiple samples were used to evaluate the compliance of all available modulation formats.

The purpose of this Class II Permissive Change is to add a new antenna and host to the originally certified module, therefore this evaluation is limited to Radiated Emissions testing and AC Power Line Conducted Emissions testing only. This test report corresponds to the data collected on a previous version of the host device. Modifications were made to the host device that warranted a new FCC ID for the host device. The data presented in this test report has been verified with the host device listed in Section 1.2 of this test report, and deemed equivalent to the previously certified host device.

For radiated emissions, the EUT was evaluated in a typical host. The worst-case data rates from the original certification were FSK 10kbps, FSK 50kbps, FSK 150kbps, OFDM 600kbps, and DSSS 6.25kbps.

For AC power line conducted emissions the EUT was evaluated with a typical host power supply.

Radiated inter-modulation testing was performed for all combinations of simultaneous transmission and found to comply.

Power setting during test – FSK 10kbps: -3
Power setting during test – FSK 50kbps: -4
Power setting during test – FSK 150kbps: -3
Power setting during test – OFDM: -2
Power setting during test – DSSS: -2

2 TEST FACILITIES

2.1 Location

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

TÜV SÜD America, Inc.
5015 B.U. Bowman Drive
Buford, GA 30518
Phone: (770) 831-8048
Fax: (770) 831-8598

2.2 Laboratory Accreditations/Recognitions/Certifications

TÜV SÜD America, Inc. is accredited to ISO/IEC 17025 by the ANSI-ASQ National Accreditation Board/ANAB accreditation program, and has been issued certificate number AT-2021 in recognition of this accreditation. 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, Innovation, Science, and Economic Development Canada and the Japanese Voluntary Control Council for Interference by information technology equipment.

FCC Registration Number: 391271
Innovation, Science, and Economic Development Canada Lab Code: IC 23597
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:

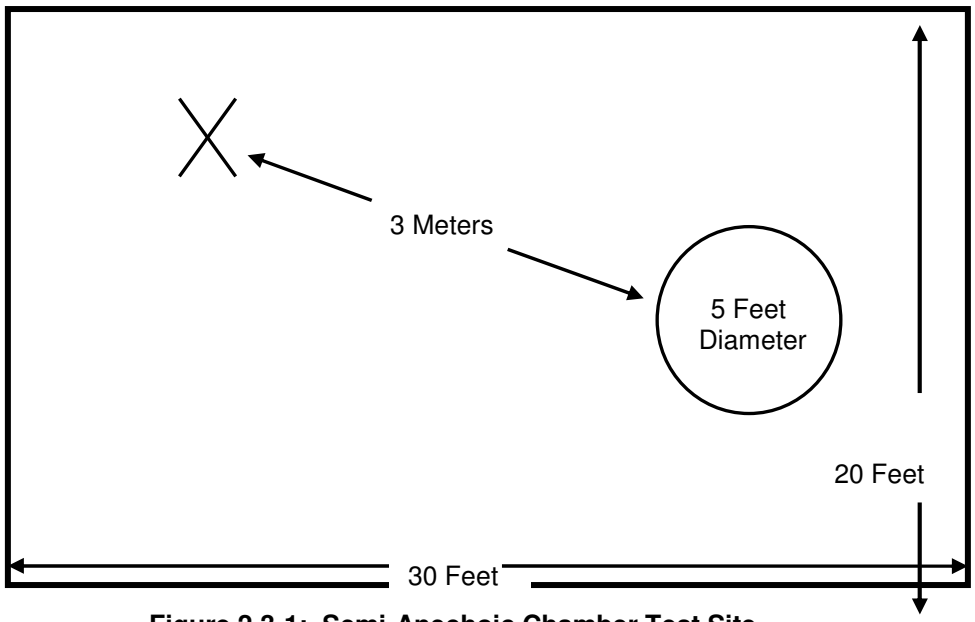

Figure 2.3-1: Semi-Anechoic Chamber Test Site

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 referenced in ANSI C63.10.

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

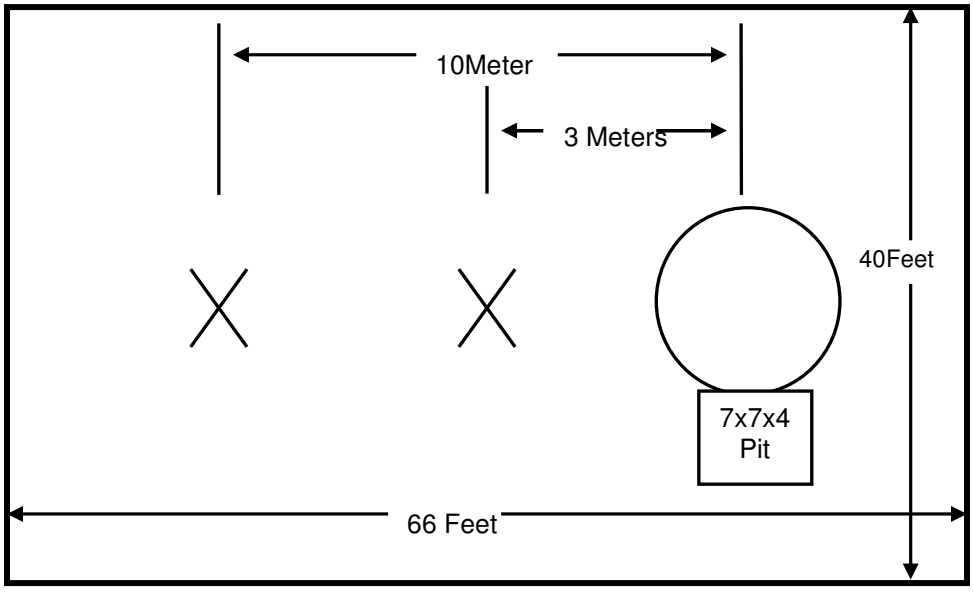

Figure 2.3-2: Open Area Test Site

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 12' solid aluminum horizontal ground reference plane (GRP) bonded every 3" to an 8' X 12' vertical ground plane.

The site is of sufficient size to test table top and floor standing equipment in accordance with ANSI C63.10.

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

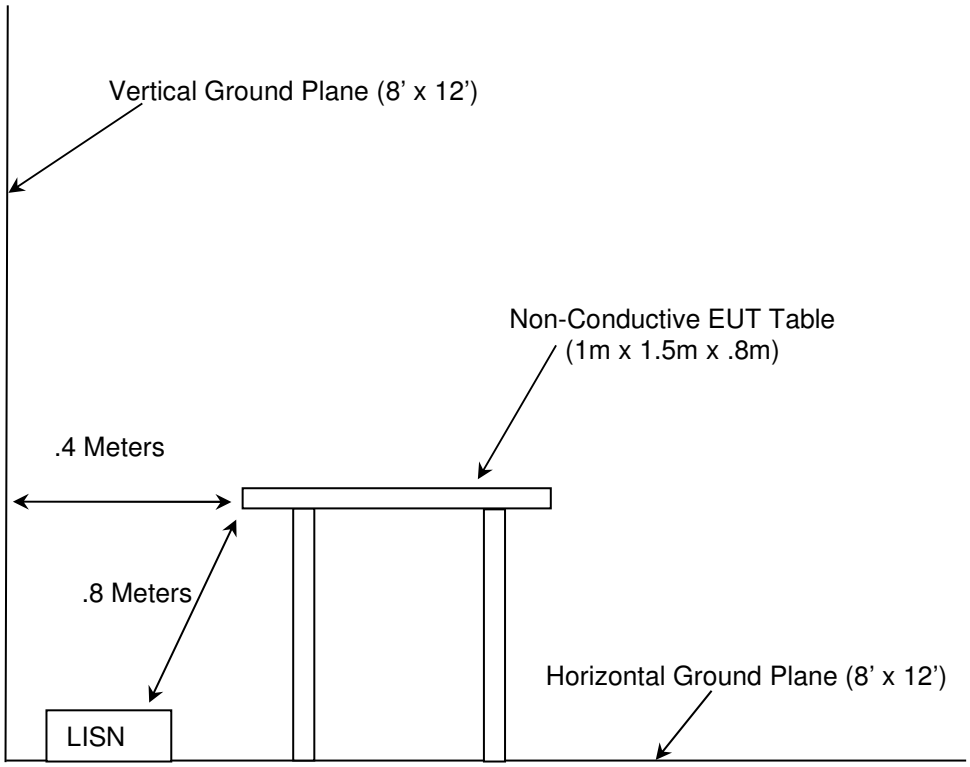

Figure 2.4-1: AC Mains Conducted EMI Site

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, 2018
- US Code of Federal Regulations (CFR): Title 47, Part 15, Subpart C: Radio Frequency Devices, Intentional Radiators, 2018
- ISED Canada Radio Standards Specification: RSS-247 – Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and License-Exempt Local Area Network (LE-LAN) Devices, Issue 2, Feb 2017
- ISED 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
30	Spectrum Technologies	DRH-0118	Antennas	970102	5/9/2017	5/9/2019
40	EMCO	3104	Antennas	3211	6/8/2016	6/8/2018
73	Agilent	8447D	Amplifiers	2727A05624	7/24/2017	7/24/2018
167	ACS	Chamber EMI Cable Set	Cable Set	167	9/30/2016	9/30/2017
167	ACS	Chamber EMI Cable Set	Cable Set	167	9/29/2017	9/29/2018
324	ACS	Belden	Cables	8214	3/21/2017	3/21/2018
338	Hewlett Packard	8449B	Amplifiers	3008A01111	8/21/2015	8/21/2017
338	Hewlett Packard	8449B	Amplifiers	3008A01111	7/11/2017	7/11/2019
412	Electro Metrics	LPA-25	Antennas	1241	8/8/2016	8/8/2018
422	Florida RF	SMS-200AW-72.0-SMR	Cables	805	10/27/2016	11/27/2017
422	Florida RF	SMS-200AW-72.0-SMR	Cables	805	11/27/2017	11/27/2018
432	Microwave Circuits	H3G020G4	Filters	264066	5/13/2017	5/13/2018
616	Florida RF Cables	SMRE-200W-12.0-SMRE	Cables	N/A	9/2/2016	9/2/2017
616	Florida RF Cables	SMRE-200W-12.0-SMRE	Cables	N/A	10/7/2017	10/7/2018
622	Rohde & Schwarz	FSV40	Spectrum Analyzer	101338	7/15/2016	7/15/2018
676	Florida RF Labs	SMS-290AW-480.0-SMS	Cables	MFR2Y194	11/4/2016	12/4/2017
676	Florida RF Labs	SMS-290AW-480.0-SMS	Cables	MFR2Y194	12/4/2017	12/4/2018
813	PMM	9010	Receiver	697WW30606	2/6/2017	2/6/2018
3010	Rohde & Schwarz	ENV216	LISN	3010	7/11/2017	7/11/2018
RE135	Rohde & Schwarz	FSP30	Spectrum Analyzer	835618/031	10/31/2016	10/31/2017

NCR = No Calibration Required
NOTE: All test equipment was used only during active calibration cycles.

5 SUPPORT EQUIPMENT

Table 5-1: Support Equipment – Radiated Emissions

Item	Equipment Type	Manufacturer	Model/Part Number	Serial Number
1	Host Device	Itron, Inc.	RN-ERT Gateway STAR	320483111

Table 5-2: Cable Description – Radiated Emissions

Cable	Cable Type	Length	Shield	Termination
A	AC Power Cable	1.75 m	No	Host Device to AC Mains
B	Ground Braid	1.75 m	No	Host Device – Reference Ground Plane

6 EQUIPMENT UNDER TEST SETUP BLOCK DIAGRAM

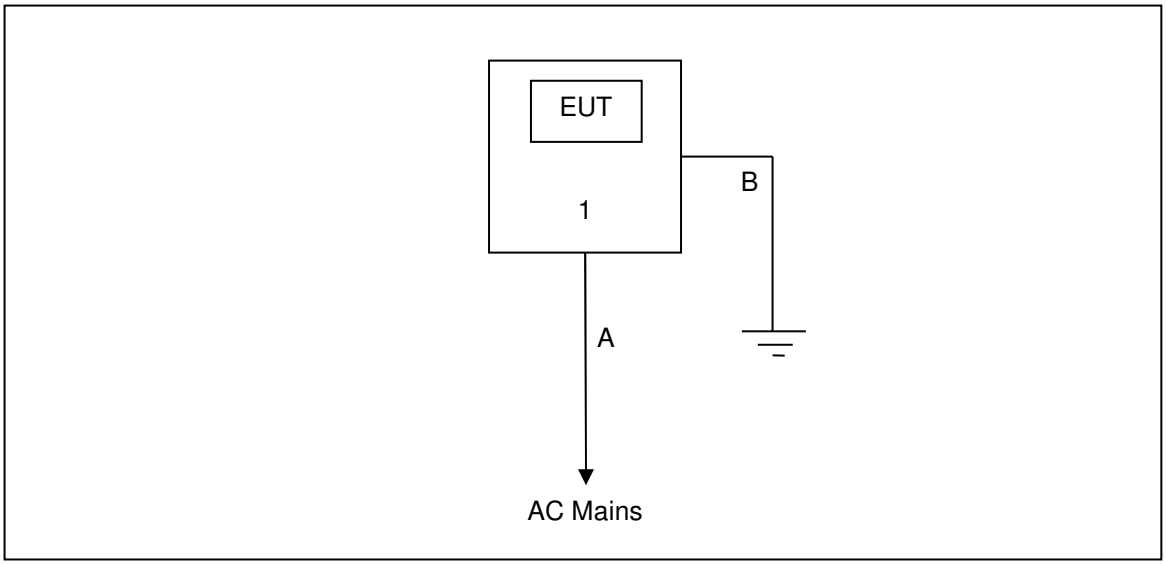

Figure 6-1: Test Setup Block Diagram

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 PCTEL BOA9022NM-ITR antenna. The antenna is coupled to the host device via N-Type connector to a SMA connector on the switch board. The EUT has spring fingers contacting traces on the switch board. The EUT is press fit onto the switch board. The gain of the antenna is 2.6 dBi. The EUT and host device require professional installation, therefore meeting the requirements of Section 15.203.

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

7.2.1 Measurement Procedure

Conducted emissions were performed from 150 kHz to 30 MHz with the spectrum analyzer's resolution bandwidth set to 9 kHz and the video bandwidth set to 30 kHz. 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: Eugene Sello

Table 7.2.2-1: Conducted EMI Results – Line 1

Frequency (MHz)	Corrected Reading		Limit		Margin		
	Quasi-Peak (dBuV)	Average (dBuV)	Quasi-Peak (dBuV)	Average (dBuV)	Quasi-Peak (dB)	Average (dB)	Correction (dB)
0.15	25.05	16.9	66	56	-40.95	-39.1	9.59
0.154	25.66	19.54	65.78	55.78	-40.12	-36.24	9.58
0.178	25.51	14.86	64.58	54.58	-39.07	-39.72	9.58
2.534	19.03	10.69	56	46	-36.97	-35.31	9.72
2.626	19.06	10.72	56	46	-36.94	-35.28	9.72
2.666	19.07	10.73	56	46	-36.93	-35.27	9.72
2.702	19.08	10.74	56	46	-36.92	-35.26	9.72
2.962	19.17	10.83	56	46	-36.83	-35.17	9.72
2.99	19.18	10.84	56	46	-36.82	-35.16	9.72
29.986	21.73	13.39	60	50	-38.27	-36.61	9.91

Table 7.2.2-2: Conducted EMI Results – Line 2

Frequency (MHz)	Corrected Reading		Limit		Margin		
	Quasi-Peak (dBuV)	Average (dBuV)	Quasi-Peak (dBuV)	Average (dBuV)	Quasi-Peak (dB)	Average (dB)	Correction (dB)
0.15	25.05	17.07	66	56	-40.95	-38.93	9.59
0.154	25.66	19.19	65.78	55.78	-40.12	-36.59	9.58
11.734	29.35	13.8	60	50	-30.65	-36.2	9.81
11.914	30.76	13.77	60	50	-29.24	-36.23	9.81
12.102	31.27	13.43	60	50	-28.73	-36.57	9.81
12.286	31.38	13.78	60	50	-28.62	-36.22	9.81
12.478	31.12	14.91	60	50	-28.88	-35.09	9.81
12.666	30.75	13.59	60	50	-29.25	-36.41	9.82
12.846	29.78	14.09	60	50	-30.22	-35.91	9.82
29.954	29.25	13.65	60	50	-30.75	-36.35	10

7.3 Radiated Spurious Emissions – FCC: Sections 15.205, 15.209; ISED Canada: RSS-Gen 8.9/8.10

7.3.1 Measurement Procedure

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

The EUT was rotated through 360° and the receive antenna height was varied from 1 meter to 4 meters so that the maximum radiated emissions level would be detected. For frequencies below 1000 MHz, quasi-peak measurements were made using a resolution bandwidth RBW of 120 kHz and a video bandwidth VBW of 300 kHz. For frequencies above 1000 MHz, peak and average measurements were made with RBW and VBW of 1 MHz and 3 MHz 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.

7.3.2 Measurement Results

Performed by: Ryan McGann, Tyler Leeson, Mark Afroozi, Sean Vick, Arthur Sumner

Table 7.3.2-1: Radiated Spurious Emissions Tabulated Data – FSK Modulation 10kbps

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										
2706.6	51.01	44.14	H	-3.83	47.18	40.31	74.0	54.0	26.8	13.7
2706.6	54.03	50.09	V	-3.83	50.20	46.26	74.0	54.0	23.8	7.7
3608.8	50.38	43.64	H	-0.69	49.69	42.95	74.0	54.0	24.3	11.1
3608.8	54.77	50.53	V	-0.69	54.08	49.84	74.0	54.0	19.9	4.2
Middle Channel										
2745.6	53.19	49.50	H	-3.70	49.49	45.80	74.0	54.0	24.5	8.2
2745.6	57.76	55.36	V	-3.70	54.06	51.66	74.0	54.0	19.9	2.3
3660.8	50.61	41.45	H	-0.49	50.12	40.96	74.0	54.0	23.9	13.0
3660.8	49.37	37.97	V	-0.49	48.88	37.48	74.0	54.0	25.1	16.5
4576	48.63	36.56	H	1.26	49.89	37.82	74.0	54.0	24.1	16.2
4576	48.17	36.04	V	1.26	49.43	37.30	74.0	54.0	24.6	16.7
High Channel										
2783.4	51.91	46.72	H	-3.58	48.33	43.14	74.0	54.0	25.7	10.9
2783.4	54.39	50.35	V	-3.58	50.81	46.77	74.0	54.0	23.2	7.2

Table 7.3.2-2: Radiated Spurious Emissions Tabulated Data – FSK Modulation 50kbps

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										
2707.2	50.15	42.81	H	-3.82	46.33	38.99	74.0	54.0	27.7	15.0
2707.2	51.62	45.60	V	-3.82	47.80	41.78	74.0	54.0	26.2	12.2
3609.6	49.12	36.47	H	-0.69	48.43	35.78	74.0	54.0	25.6	18.2
4512	54.67	50.54	H	1.02	55.69	51.56	74.0	54.0	18.3	2.4
4512	55.43	50.59	V	1.02	56.45	51.61	74.0	54.0	17.6	2.4
5414.4	49.02	38.60	H	3.87	52.89	42.47	74.0	54.0	21.1	11.5
5414.4	47.68	36.31	V	3.87	51.55	40.18	74.0	54.0	22.4	13.8
Middle Channel										
2745.6	55.20	50.42	H	-3.70	51.50	46.72	74.0	54.0	22.5	7.3
2745.6	55.11	51.70	V	-3.70	51.41	48.00	74.0	54.0	22.6	6.0
3660.8	50.82	42.25	H	-0.49	50.33	41.76	74.0	54.0	23.7	12.2
3660.8	50.47	40.04	V	-0.49	49.98	39.55	74.0	54.0	24.0	14.4
4576	54.77	51.45	H	1.26	56.03	52.71	74.0	54.0	18.0	1.3
4576	53.13	49.48	V	1.26	54.39	50.74	74.0	54.0	19.6	3.3
High Channel										
2782.8	49.92	39.82	H	-3.58	46.34	36.24	74.0	54.0	27.7	17.8
2782.8	50.42	43.08	V	-3.58	46.84	39.50	74.0	54.0	27.2	14.5
3710.4	51.59	41.61	H	-0.29	51.30	41.32	74.0	54.0	22.7	12.7
3710.4	49.94	39.84	V	-0.29	49.65	39.55	74.0	54.0	24.3	14.4
4638	54.48	47.53	H	1.50	55.98	49.03	74.0	54.0	18.0	5.0
4638	51.69	44.40	V	1.50	53.19	45.90	74.0	54.0	20.8	8.1

Table 7.3.2-3: Radiated Spurious Emissions Tabulated Data – FSK Modulation 150kbps

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										
2707.2	50.48	41.96	H	-4.00	46.48	37.96	74.0	54.0	27.5	16.0
2707.2	50.85	42.37	V	-4.00	46.85	38.37	74.0	54.0	27.2	15.6
4512	49.47	38.85	H	0.60	50.07	39.45	74.0	54.0	23.9	14.5
Middle Channel										
2745.6	51.64	43.97	H	-3.88	47.76	40.09	74.0	54.0	26.2	13.9
2745.6	50.23	41.10	V	-3.88	46.35	37.22	74.0	54.0	27.7	16.8
4576	47.88	37.32	H	0.83	48.71	38.15	74.0	54.0	25.3	15.8
High Channel										
2782.8	49.71	41.64	H	-3.77	45.94	37.87	74.0	54.0	28.1	16.1
2782.8	51.08	43.12	V	-3.77	47.31	39.35	74.0	54.0	26.7	14.7
3710.4	49.36	38.03	H	-0.65	48.71	37.38	74.0	54.0	25.3	16.6
3710.4	51.55	40.19	V	-0.65	50.90	39.54	74.0	54.0	23.1	14.5
4638	53.07	46.37	H	1.06	54.13	47.43	74.0	54.0	19.9	6.6
4638	53.01	45.27	V	1.06	54.07	46.33	74.0	54.0	19.9	7.7

Table 7.3.2-4: Radiated Spurious Emissions Tabulated Data – OFDM Modulation

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										
2707.2	60.56	52.30	H	-4.00	56.56	48.30	74.0	54.0	17.4	5.7
2707.2	59.00	50.32	V	-4.00	55.00	46.32	74.0	54.0	19.0	7.7
Middle Channel										
2745.6	56.33	50.62	H	-3.88	52.45	46.74	74.0	54.0	21.6	7.3
2745.6	60.21	53.60	V	-3.88	56.33	49.72	74.0	54.0	17.7	4.3
3660.8	52.65	42.75	V	-0.83	51.82	41.92	74.0	54.0	22.2	12.1
High Channel										
2782.8	55.79	45.52	H	-3.77	52.02	41.75	74.0	54.0	22.0	12.3
2782.8	59.35	51.28	V	-3.77	55.58	47.51	74.0	54.0	18.4	6.5

Table 7.3.2-5: Radiated Spurious Emissions Tabulated Data – DSSS Modulation

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										
2707.2	50.67	42.93	H	-3.82	46.85	39.11	74.0	54.0	27.2	14.9
2707.2	53.41	46.94	V	-3.82	49.59	43.12	74.0	54.0	24.4	10.9
4512	53.18	47.48	H	1.02	54.20	48.50	74.0	54.0	19.8	5.5
4512	52.66	46.17	V	1.02	53.68	47.19	74.0	54.0	20.3	6.8
Middle Channel										
2745.6	57.51	55.02	H	-3.70	53.81	51.32	74.0	54.0	20.2	2.7
2745.6	56.67	53.03	V	-3.70	52.97	49.33	74.0	54.0	21.0	4.7
3660.8	50.13	41.16	H	-0.49	49.64	40.67	74.0	54.0	24.4	13.3
3660.8	48.89	38.61	V	-0.49	48.40	38.12	74.0	54.0	25.6	15.9
4576	51.34	43.78	H	1.26	52.60	45.04	74.0	54.0	21.4	9.0
4576	51.42	43.80	V	1.26	52.68	45.06	74.0	54.0	21.3	8.9
High Channel										
2782.8	50.53	42.35	H	-3.58	46.95	38.77	74.0	54.0	27.0	15.2
2782.8	55.59	52.04	V	-3.58	52.01	48.46	74.0	54.0	22.0	5.5
4638	55.62	50.29	H	1.50	57.12	51.79	74.0	54.0	16.9	2.2
4638	54.15	48.34	V	1.50	55.65	49.84	74.0	54.0	18.4	4.2

7.3.3 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 – FSK Modulation 10kbps

Corrected Level: 51.01 - 3.83 = 47.18dBuV/m
Margin: 74dBuV/m – 47.18dBuV/m = 26.8dB

Example Calculation: Average – FSK Modulation 10kbps

Corrected Level: 44.14 - 3.83 - 0 = 40.31dBuV
Margin: 54dBuV – 40.31dBuV = 13.7dB

8 ESTIMATION OF 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	± 0.009 %
RF Conducted Output Power	± 0.349 dB
Power Spectral Density	± 0.372 dB
Antenna Port Conducted Emissions	± 1.264 dB
Radiated Emissions ≤ 1 GHz	± 5.814 dB
Radiated Emissions > 1 GHz	± 4.318 dB
Temperature	± 0.860 °C
Radio Frequency	± 2.832 x 10^{-8}
AC Power Line Conducted Emissions	± 3.360 dB

9 CONCLUSION

In the opinion of TÜV SÜD America, Inc. the SNIC1, manufactured by Itron, Inc. meets the requirements of FCC Part 15 subpart C and Innovation, Science, and Economic Development Canada's Radio Standards Specification RSS-247 for the tests documented in this test report.

END REPORT