Itron, Inc.

ADDENDUM TEST REPORT FOR 90893-10

CCU100
(SRR+WWAN+WIFI+GPS RX-Internal WWAN & GPS Antenna)

CCU100R
(SRR+WWAN+WIFI+GPS RX-External WWAN & GPS Antenna)

Tested To The Following Standards:

FCC Part 15 Subpart C Section 15.247 (FHSS)
and
RSS-210 Version 7

Report No.: 90893-10A

Date of issue: October 22, 2010

ACCREDITED

TESTING
CERT #803.01, 803.02, 803.05, 803.06

This test report bears the accreditation symbol indicating that the testing performed herein meets the test and reporting requirements of ISO/IEC 17025 under the applicable scope of EMC testing for CKC Laboratories, Inc.

We strive to create long-term, trust based relationships by providing sound, adaptive, customer first testing services. We embrace each of our customers' unique EMC challenges, not as an interruption to set processes, but rather as the reason we are in business.

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ADMINISTRATIVE INFORMATION

Test Report Information

REPORT PREPARED FOR:

Itron, Inc.
2111 N. Molter Rd.
Liberty Lake, WA 99019

Representative: Jay Holcomb
Customer Reference Number: 19103

REPORT PREPARED BY:

Joyce Walker
CKC Laboratories, Inc.
5046 Sierra Pines Drive
Mariposa, CA 95338

Project Number: 90893

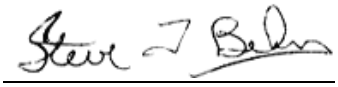
DATE OF EQUIPMENT RECEIPT: August 2,, 2010
DATE(S) OF TESTING: August 2-13, 2010

Revision History

Original: Testing of the CCU100 & CCU100R, (SRR+WWAN+WIFI+GPS RX-Internal WWAN & GPS Antenna) to FCC Part 15 Subpart C Section 15.247 (FHSS) and RSS-210 Version 7.
Addendum A: Removed a note in Radiated Spurious Emissions regarding bandwidth settings.

Report Authorization

The test data contained in this report documents the observed testing parameters pertaining to and are relevant for only the sample equipment tested in the agreed upon operational mode(s) and configuration(s) as identified herein. Compliance assessment remains the client's responsibility. This report may not be used to claim product endorsement by A2LA or any government agencies. This test report has been authorized for release under quality control from CKC Laboratories, Inc.



Steve Behm
Director of Quality Assurance & Engineering Services
CKC Laboratories, Inc.

Test Facility Information

Our laboratories are configured to effectively test a wide variety of product types. CKC utilizes first class test equipment, anechoic chambers, data acquisition and information services to create accurate, repeatable and affordable test results.

TEST LOCATION(S):
CKC Laboratories, Inc.
22116 23rd Drive S.E., Suite A
Bothell, WA 98021-4413

Site Registration & Accreditation Information

Location	Japan	Canada	FCC
Bothell	R-2296, C-2506 & T-1489	3082C-1	318736

SUMMARY OF RESULTS

Standard / Specification: FCC Part 15 Subpart C 15.247 (FHSS)

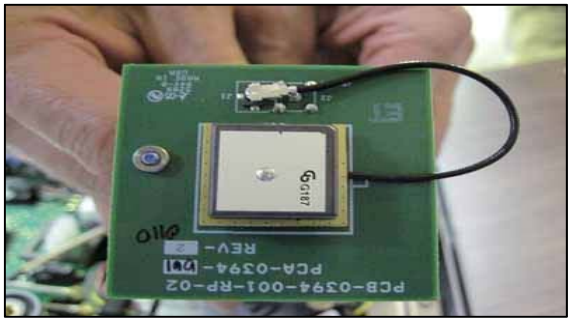
Description	Test Procedure/Method	Results
Voltage Variation	FCC Part 15 Subpart C Section 15.31(e) / ANSI C63.4 (2003)	Pass
AC Conducted Emissions	FCC Part 15 Subpart C Section 15.207 / ANSI C63.4 (2003)	Pass
Carrier Frequency Separation	FCC Part 15 Subpart C Section 15.247 (a)(1) / DA00-705	Pass
20dB Bandwidth	FCC Part 15 Subpart C Section 15.247(a)(1)(i) / DA00-705	Pass
Number of Hopping Frequencies	FCC Part 15 Subpart C Section 15.247(a)(1)(i) / DA00-705	Pass
Time of Occupancy	FCC Part 15 Subpart C Section 15.247(a)(1)(i) / DA00-705	Pass
Peak Conducted Power	FCC Part 15 Subpart C Section 15.247(b)(2)/ DA00-705	Pass
Antenna Conducted Spurious	FCC Part 15 Subpart C Section 15.247(d)/ DA00-705	Pass
Radiated Spurious	FCC Part 15 Subpart C Section 15.247(d)/ DA00-705	Pass
99% Bandwidth	RSS-210 Version 7/RSS-GEN	Pass

Conditions During Testing

This list is a summary of the conditions noted for or modifications made to the equipment during testing.

Summary of Conditions
The changes required to pass radiated spurious emissions were to add ferrites to both the incoming AC power line and the internal power line to the cellular modem, as well as re-routing the internal RF cable from the Active GPS antenna to the on-board GPS receiver and attaching a 16 AWG ground wire from the cellular modem mounting plate to the ground lug on the main enclosure. Ferrite Part numbers used: Laird ferrite 28A2432-0A2 (AC input power line). Laird ferrite 28A0392-0A2 (cell modem power line).

ACTIVE GPS ANTENNA CABLE ROUTING (FAIL)



ACTIVE GPS ANTENNA CABLE ROUTING (PASS)

GROUND WIRE

EQUIPMENT UNDER TEST (EUT)

CKC Laboratories tested the following devices:
CCU100 (SRR+WWAN+WIFI+GPS RX Internal WWAN & GPS Antenna)
CCU100R (SRR+WWAN+WIFI+GPS RX External WWAN & GPS Antenna)

During testing it was found that the two devices above with either the AT&T or Verizon cellular modems had a much worse emissions profile than without either cellular modem in the device. The difference between the repeater versions of these devices and the non-repeater versions is that the repeater versions do not have a cellular modem in them. Therefore, the manufacturer claims that any differences between the following devices without modems in them do not affect their EMC characteristics, and therefore meet the level of testing equivalent to the tested models:
CCU100 Repeater (SRR+WIFI+GPS RX Internal GPS Antenna)
CCU100R Repeater (SRR+WIFI+GPS RX External GPS Antenna)

EQUIPMENT UNDER TEST

(SRR+WWAN+WIFI+GPS RX Internal WWAN & GPS Antenna)
Manuf: Itron, Inc.
Model: CCU100
Serial: 7404FCC5

(SRR+WWAN+WIFI+GPS RX External WWAN & GPS Antenna)
Manuf: Itron, Inc.
Model: CCU100R
Serial: 7404FCC5

External GPS Antenna
Manuf: Trimble
Model: 57861-00
Serial: 213100323

H-Pol Omni Antenna
Manuf: Taoglas
Model: TIC.95.2F11
Serial: NA

External WWAN Antenna
Manuf: Laird Technologies
Model: FG821/18503
Serial: 40353

PERIPHERAL DEVICES

The EUT was tested with the following peripheral device(s):

Laptop
Manuf: Dell
Model: Latitude D630
Serial: 9JQRJH1

FCC PART 15 SUBPART C

This report contains EMC emissions test results under United States Federal Communications Commission (FCC) 47 CFR 15C requirements for Unlicensed Radio Frequency Devices, Subpart C - Intentional Radiators.

15.31(e) Voltage Variation

Test Set up

The EUT was setup on the bench and connected to a spectrum analyzer via an RF cable. The EUT was cycled though the different channels and modes by test software on a support laptop, connected to the EUT by an Ethernet cable. For this testing, all models (CCU100, CCU100-Repeater, CCU100R, and CCU100R-Repeater) are identical.

Engineer Name: J. Gilbert

Test Equipment				
Equipment	**Serial**	**Cal Date**	**Cal Due**	**Asset**
Spectrum Analyzer	MY46186330	08/25/2009	08/25/2011	02872
Cable 10k-18G	NA	10/23/2009	10/23/2011	03121
Programmable Power Source	9999-0190	05/27/2010	05/27/2012	01314

Test Data

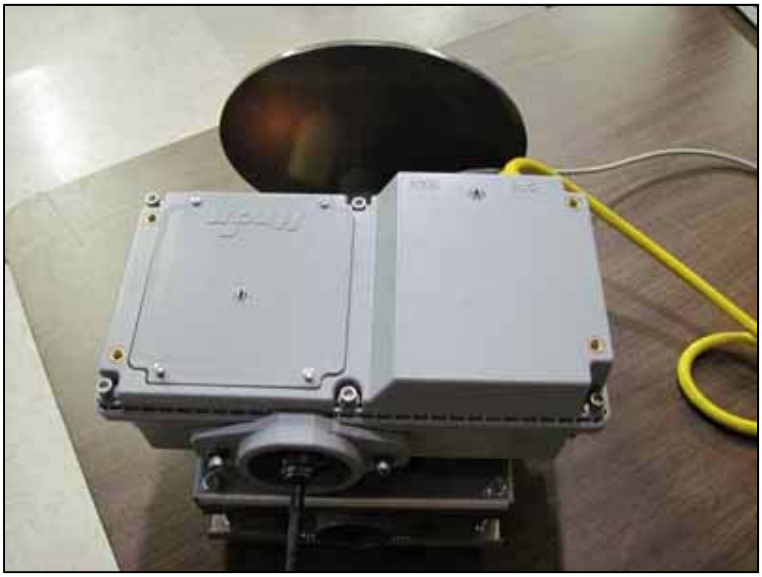
FHSS-AM 16 kBaud	**903 MHz**	**915 MHz**	**926.8 MHz**
Voltage	**dBm**	**dBm**	**dBm**
102	25.9	27.8	11.5
120	26.0	27.9	11.3
138	26.0	27.8	11.3
204	25.9	27.8	11.4
240	26.0	27.9	11.4
265	25.9	27.8	11.3

FHSS-FM 12.5 kBaud	903 MHz	915 MHz	926.8 MHz
Voltage	**dBm**	**dBm**	**dBm**
102	24.7	26.5	12.0
120	24.7	26.5	11.9
138	24.8	26.6	12.0
204	24.8	26.6	11.9
240	24.9	26.6	11.8
265	24.8	26.6	11.8

FHSS-FM 37.5 kBaud	903 MHz	915 MHz	926.8 MHz
Voltage	**dBm**	**dBm**	**dBm**
102	24.6	26.4	11.5
120	24.6	25.9	11.5
138	24.6	26.4	11.6
204	24.6	26.5	11.4
240	24.6	26.5	11.5
265	24.6	26.5	11.4

Note: The maximum voltage tested (265VAC) is less than 240 +15% because the EUT power supply is only spec'd to 265VAC.

Test Setup Photos



VOLTAGE VARIATION

15.207 AC Conducted Emissions

For this requirement, only one model was tested; **CCU100 (SRR+WWAN+WIFI+GPS RX Internal WWAN & GPS Antenna).** The manufacturer declares that, with regards to this particular test, all models are electrically identical and therefore meet the level of testing equivalent to the tested model.

Test Data Sheets

Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • (425) 402-1717

Customer:	**Itron, Inc.**		
Specification:	**15.207 AC Mains - Average**		
Work Order #:	**90893**	Date:	8/3/2010
Test Type:	**Conducted Emissions**	Time:	3:19:53 PM
Equipment:	**(SRR+WWAN+WIFI+GPS RX internal WWAN & GPS antenna)**	Sequence#:	1
Manufacturer:	Itron, Inc.	Tested By:	Jeff Gilbert
Model:	CCU100		240V 60Hz
S/N:	7404FCC5		

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN01492	50uH LISN-Line (dB)	3816/2NM	6/2/2009	6/2/2011
	AN01492	50uH LISN-Neutral (dB)	3816/2NM	6/2/2009	6/2/2011
T2	ANP05435	Attenuator	PE7015-10	9/5/2008	9/5/2010
T3	ANP05366	Cable	RG-214	10/20/2009	10/20/2011
T4	ANP05360	Cable	RG214	11/10/2008	11/10/2010
T5	AN03121	Cable	32026-2-29080-84	10/23/2009	10/23/2011
T6	AN01717	High Pass Filter	F3440-P005	5/27/2010	5/27/2012
	AN02872	Spectrum Analyzer	E4440A	8/25/2009	8/25/2011

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
(SRR+WWAN+WIFI+GPS RX Internal WWAN & GPS Antenna)*	Itron, Inc.	CCU100	7404FCC5
H-pol omni antenna	Taoglas	TIC.95.2F11	NA

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Dell	Latitude D630	9JQRJH1

Test Conditions / Notes:

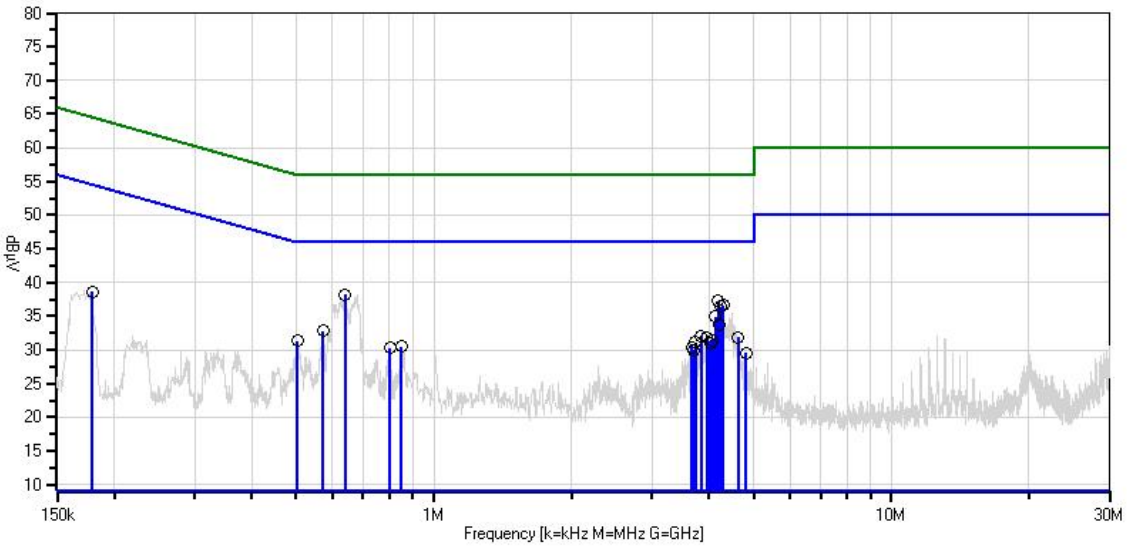
Frequency Range Investigated: 150 kHz - 30 MHz
Temp: 24° C
Humidity: 39%
Pressure: 102.3 kPa
EUT has the Cell modem, Wi-Fi radio, and ISM radio transmitting continuously.
GPS receiver is active.

Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Lead: Line

#	Freq	Rdng	T1 T5	T2 T6	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV	dBµV	dB	Ant
1	638.682k	28.3	+0.1 +0.0	+9.6 +0.0	+0.1	+0.1	+0.0	38.2	46.0	-7.8	Line
2	4.182M	27.2	+0.2 +0.0	+9.5 +0.0	+0.2	+0.2	+0.0	37.3	46.0	-8.7	Line
3	4.296M	26.5	+0.2 +0.0	+9.5 +0.0	+0.2	+0.2	+0.0	36.6	46.0	-9.4	Line
4	4.241M	26.3	+0.2 +0.0	+9.5 +0.0	+0.2	+0.2	+0.0	36.4	46.0	-9.6	Line
5	4.126M	24.8	+0.2 +0.0	+9.5 +0.0	+0.2	+0.2	+0.0	34.9	46.0	-11.1	Line
6	4.220M	23.7	+0.2 +0.0	+9.5 +0.0	+0.2	+0.2	+0.0	33.8	46.0	-12.2	Line
7	571.779k	22.9	+0.1 +0.0	+9.6 +0.0	+0.1	+0.1	+0.0	32.8	46.0	-13.2	Line
8	3.846M	22.0	+0.2 +0.0	+9.5 +0.0	+0.2	+0.2	+0.0	32.1	46.0	-13.9	Line
9	4.620M	21.6	+0.3 +0.0	+9.5 +0.1	+0.2	+0.2	+0.0	31.9	46.0	-14.1	Line
10	3.952M	21.7	+0.2 +0.0	+9.5 +0.0	+0.2	+0.2	+0.0	31.8	46.0	-14.2	Line
11	4.067M	21.4	+0.2 +0.0	+9.5 +0.0	+0.2	+0.2	+0.0	31.5	46.0	-14.5	Line
12	502.695k	21.3	+0.1 +0.0	+9.6 +0.1	+0.1	+0.1	+0.0	31.3	46.0	-14.7	Line
13	3.731M	21.0	+0.2 +0.0	+9.5 +0.0	+0.2	+0.2	+0.0	31.1	46.0	-14.9	Line
14	4.020M	20.9	+0.2 +0.0	+9.5 +0.0	+0.2	+0.2	+0.0	31.0	46.0	-15.0	Line
15	847.391k	20.7	+0.1 +0.0	+9.6 +0.0	+0.0	+0.1	+0.0	30.5	46.0	-15.5	Line
16	3.667M	20.3	+0.2 +0.0	+9.5 +0.0	+0.2	+0.2	+0.0	30.4	46.0	-15.6	Line
17	801.577k	20.5	+0.1 +0.0	+9.6 +0.0	+0.0	+0.1	+0.0	30.3	46.0	-15.7	Line
18	179.088k	28.6	+0.1 +0.0	+9.6 +0.1	+0.2	+0.0	+0.0	38.6	54.5	-15.9	Line
19	3.701M	19.9	+0.2 +0.0	+9.5 +0.0	+0.2	+0.2	+0.0	30.0	46.0	-16.0	Line
20	4.819M	19.2	+0.3 +0.0	+9.5 +0.1	+0.2	+0.2	+0.0	29.5	46.0	-16.5	Line

CKC Laboratories, Inc. Date: 8/3/2010 Time: 3:19:53 PM Itron, Inc. WO#: 90893
15.207 AC Mains - Average Test Lead: Line Line Sequence#: 1 Ext ATTN: 0 dB



Sweep Data
Peak Readings
Average Readings
1 - 15.207 AC Mains - Average
Readings
QP Readings
Ambient
2 - 15.207 AC Mains - Quasi-peak

Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • (425) 402-1717

Customer: **Itron, Inc.**
Specification: **15.207 AC Mains - Average**
Work Order #: **90893** Date: 8/3/2010
Test Type: **Conducted Emissions** Time: 3:28:49 PM
Equipment: **(SRR+WWAN+WIFI+GPS RX Internal WWAN & GPS Antenna)** Sequence#: 2
Manufacturer: Itron, Inc. Tested By: Jeff Gilbert
Model: CCU100 240V 60Hz
S/N: 7404FCC5

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN01492	50uH LISN-Line (dB)	3816/2NM	6/2/2009	6/2/2011
T1	AN01492	50uH LISN-Neutral (dB)	3816/2NM	6/2/2009	6/2/2011
T2	ANP05435	Attenuator	PE7015-10	9/5/2008	9/5/2010
T3	ANP05366	Cable	RG-214	10/20/2009	10/20/2011
T4	ANP05360	Cable	RG214	11/10/2008	11/10/2010
T5	AN03121	Cable	32026-2-29080-84	10/23/2009	10/23/2011
T6	AN01717	High Pass Filter	F3440-P005	5/27/2010	5/27/2012
	AN02872	Spectrum Analyzer	E4440A	8/25/2009	8/25/2011

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
(SRR+WWAN+WIFI+GPS RX Internal WWAN & GPS Antenna)*	Itron, Inc.	CCU100	7404FCC5
H-pol omni antenna	Taoglas	TIC.95.2F11	NA

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Dell	Latitude D630	9JQRJH1

Test Conditions / Notes:

Frequency Range Investigated: 150 kHz - 30 MHz
Temp: 24° C
Humidity: 39%
Pressure: 102.3 kPa
EUT has the Cell modem, Wi-Fi radio, and ISM radio transmitting continuously.
GPS receiver is active.

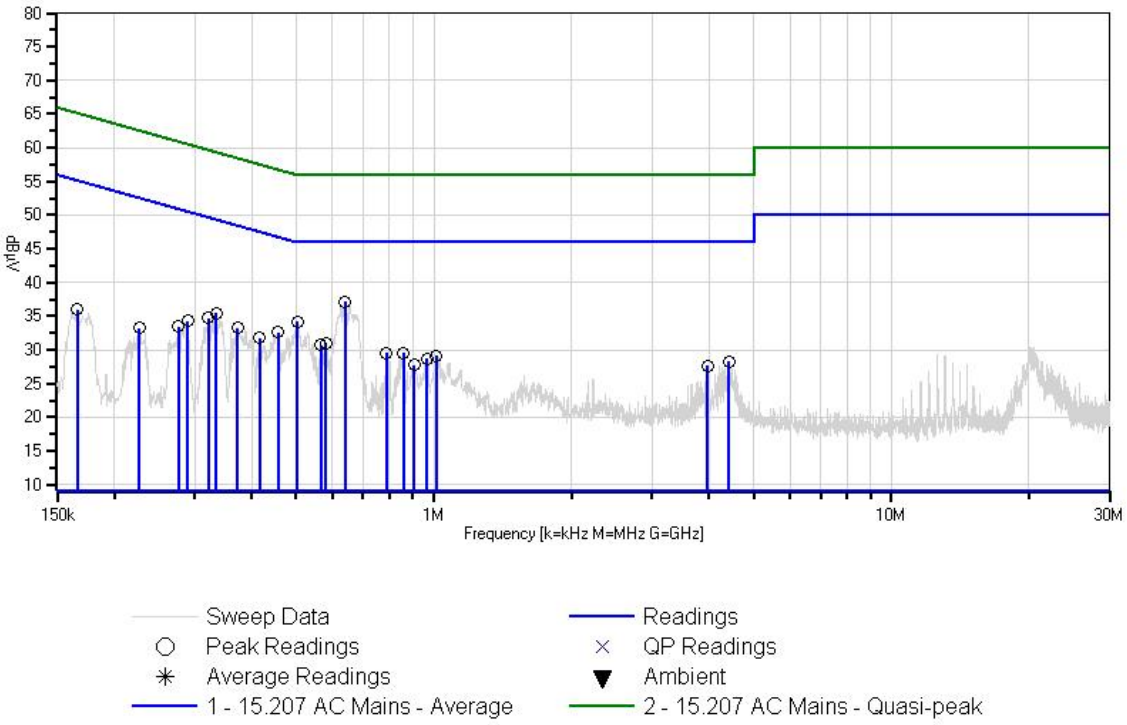
Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Lead: Neutral

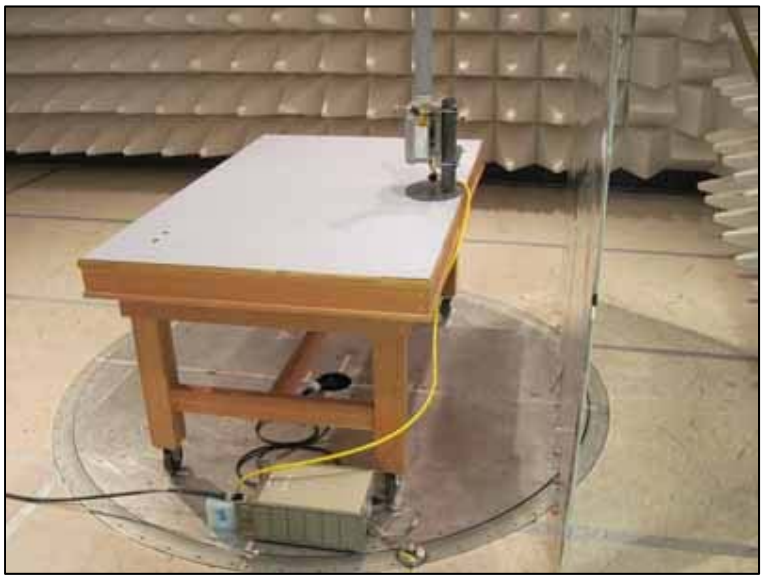
#	Freq	Rdng	T1 T5	T2 T6	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV	dBµV	dB	Ant
1	638.682k	27.4	+0.0 +0.0	+9.6 +0.0	+0.1	+0.1	+0.0	37.2	46.0	-8.8	Neutr
2	503.422k	24.3	+0.0 +0.0	+9.6 +0.1	+0.1	+0.1	+0.0	34.2	46.0	-11.8	Neutr
3	334.710k	25.6	+0.0 +0.0	+9.6 +0.1	+0.1	+0.1	+0.0	35.5	49.3	-13.8	Neutr
4	456.881k	22.7	+0.0 +0.0	+9.6 +0.1	+0.1	+0.1	+0.0	32.6	46.7	-14.1	Neutr

5	320.893k	24.8	+0.0 +0.0	+9.6 +0.1	+0.1	+0.1	+0.0	34.7	49.7	-15.0	Neutr
6	581.233k	21.2	+0.0 +0.0	+9.6 +0.0	+0.1	+0.1	+0.0	31.0	46.0	-15.0	Neutr
7	372.525k	23.4	+0.0 +0.0	+9.6 +0.1	+0.1	+0.1	+0.0	33.3	48.4	-15.1	Neutr
8	565.235k	20.9	+0.0 +0.0	+9.6 +0.0	+0.1	+0.1	+0.0	30.7	46.0	-15.3	Neutr
9	415.430k	21.9	+0.0 +0.0	+9.6 +0.1	+0.1	+0.1	+0.0	31.8	47.5	-15.7	Neutr
10	289.624k	24.4	+0.0 +0.0	+9.6 +0.1	+0.2	+0.0	+0.0	34.3	50.5	-16.2	Neutr
11	788.487k	19.9	+0.0 +0.0	+9.6 +0.0	+0.0	+0.1	+0.0	29.6	46.0	-16.4	Neutr
12	858.299k	19.9	+0.0 +0.0	+9.6 +0.0	+0.0	+0.1	+0.0	29.6	46.0	-16.4	Neutr
13	1.013M	19.4	+0.0 +0.0	+9.6 +0.0	+0.0	+0.1	+0.0	29.1	46.0	-16.9	Neutr
14	966.512k	19.0	+0.0 +0.0	+9.6 +0.0	+0.0	+0.1	+0.0	28.7	46.0	-17.3	Neutr
15	276.534k	23.6	+0.0 +0.0	+9.6 +0.1	+0.2	+0.0	+0.0	33.5	50.9	-17.4	Neutr
16	4.420M	18.3	+0.1 +0.0	+9.5 +0.0	+0.2	+0.2	+0.0	28.3	46.0	-17.7	Neutr
17	906.974k	18.1	+0.0 +0.0	+9.6 +0.0	+0.0	+0.1	+0.0	27.8	46.0	-18.2	Neutr
18	3.969M	17.7	+0.1 +0.0	+9.5 +0.0	+0.2	+0.2	+0.0	27.7	46.0	-18.3	Neutr
19	165.999k	26.0	+0.1 +0.0	+9.6 +0.1	+0.2	+0.0	+0.0	36.0	55.2	-19.2	Neutr
20	227.084k	23.3	+0.0 +0.0	+9.6 +0.1	+0.2	+0.0	+0.0	33.2	52.6	-19.4	Neutr

CKC Laboratories, Inc. Date: 8/3/2010 Time: 3:28:49 PM Itron, Inc. WO#: 90893
15.207 AC Mains - Average Test Lead: Neutral Neutral Sequence#: 2 Ext ATTN: 0 dB



Test Setup Photos



15.247(a)(1) Carrier Frequency Separation

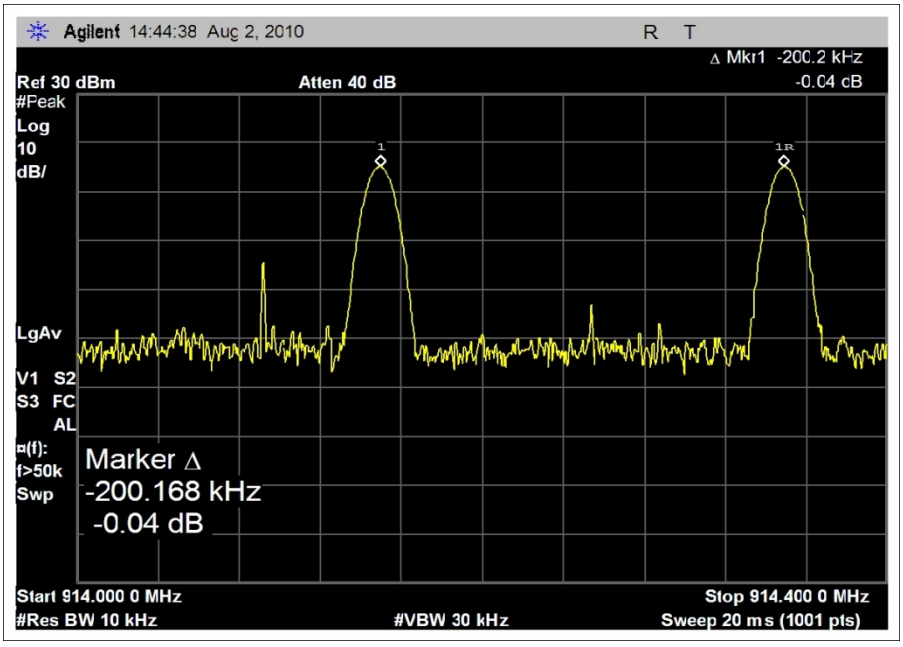
Test Set up

The EUT was setup on the bench and connected to a spectrum analyzer via an RF cable. The EUT was cycled though the different channels and modes by test software on a support laptop, connected to the EUT by an Ethernet cable. For this testing, all models (CCU100, CCU100-Repeater, CCU100R, and CCU100R-Repeater) are identical.

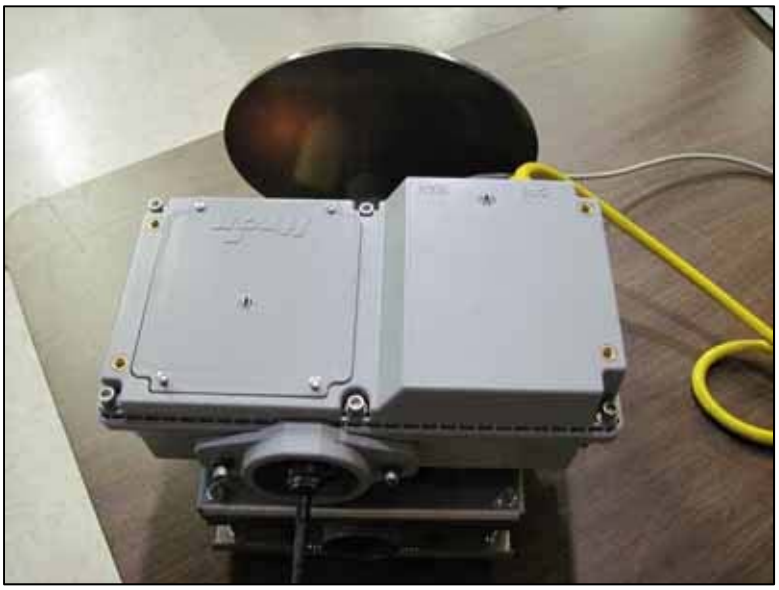
Engineer Name: J. Gilbert

Test Equipment				
Equipment	**Serial**	**Cal Date**	**Cal Due**	**Asset**
Spectrum Analyzer	MY46186330	08/25/2009	08/25/2011	02872
Cable 10k-18G	NA	10/23/2009	10/23/2011	03121

Test Data



Test Setup Photos



CARRIER FREQUENCY SEPARATION

15.247(a)(1)(i) 20dB Bandwidth

Test Set up

The EUT was setup on the bench and connected to a spectrum analyzer via an RF cable. The EUT was cycled though the different channels and modes by test software on a support laptop, connected to the EUT by an Ethernet cable. For this testing, all models (CCU100, CCU100-Repeater, CCU100R, and CCU100R-Repeater) are identical.

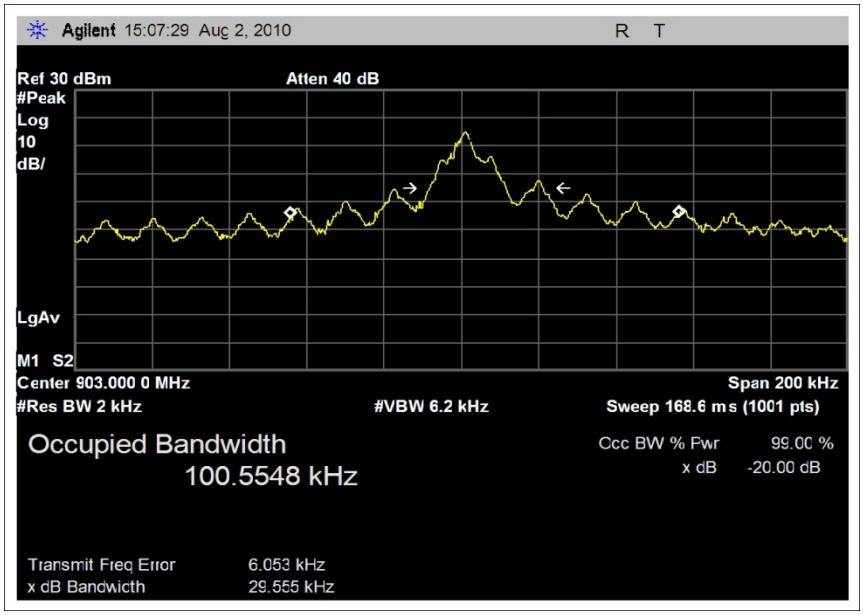
Engineer Name: J. Gilbert

Test Equipment				
Equipment	**Serial**	**Cal Date**	**Cal Due**	**Asset**
Spectrum Analyzer	MY46186330	08/25/2009	08/25/2011	02872
Cable 10k-18G	NA	10/23/2009	10/23/2011	03121

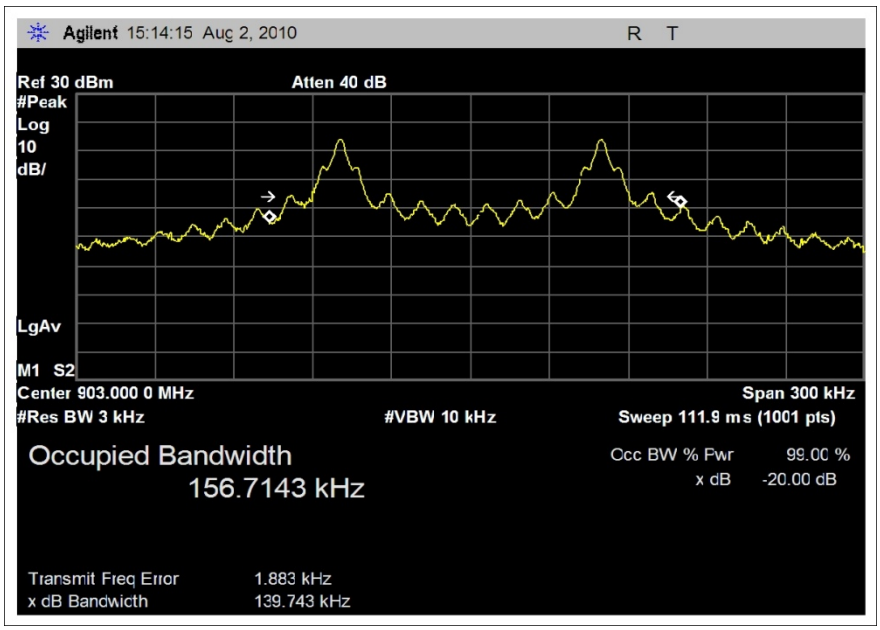
Test Data

903 MHz	**AM**	**FM-12.5 kBaud**	**FM-37.5 kBaud**
	29.56 kHz	139.74 kHz	53.95 kHz
915 MHz	**AM**	**FM-12.5 kBaud**	**FM-37.5 kBaud**
	29.69 kHz	139.91 kHz	54.25 kHz
926.8 MHz	**AM**	**FM-12.5 kBaud**	**FM-37.5 kBaud**
	29.07 kHz	129.50 kHz	53.03 kHz

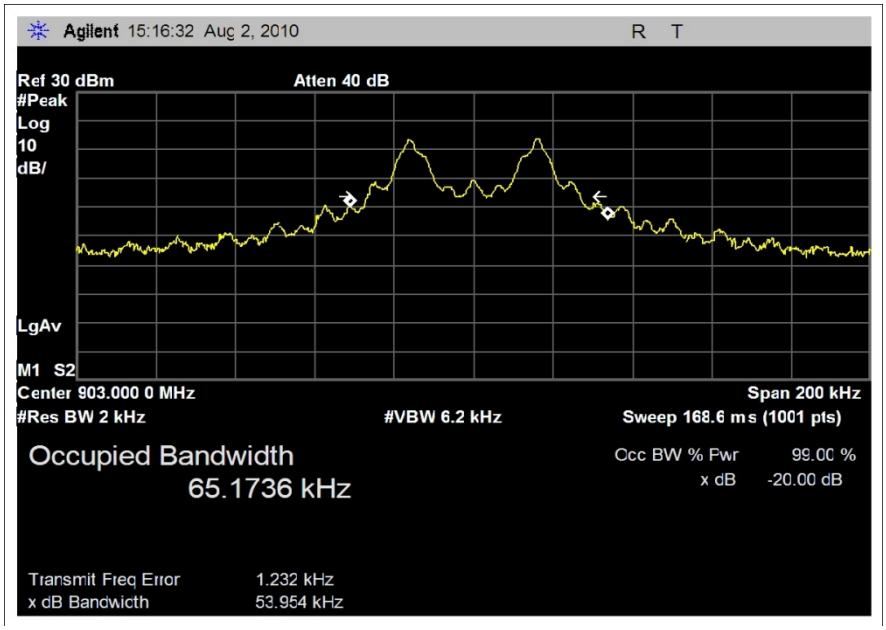
Requirement: The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.



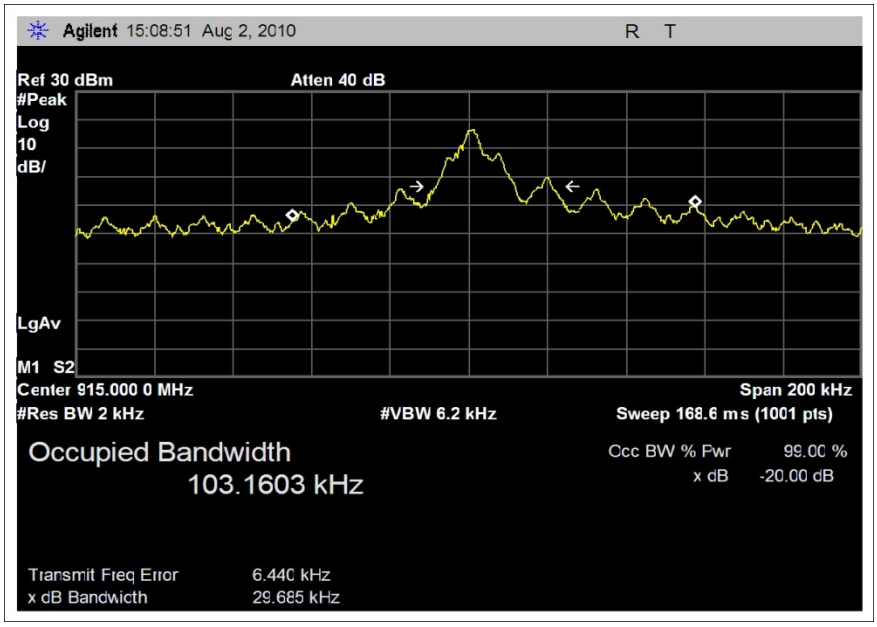
903-AM



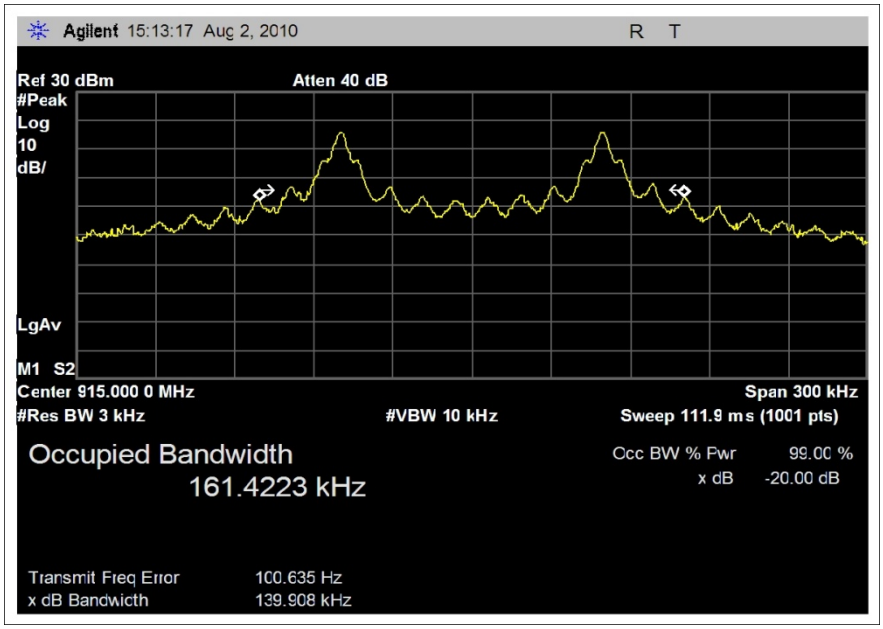
903-FM-12.5



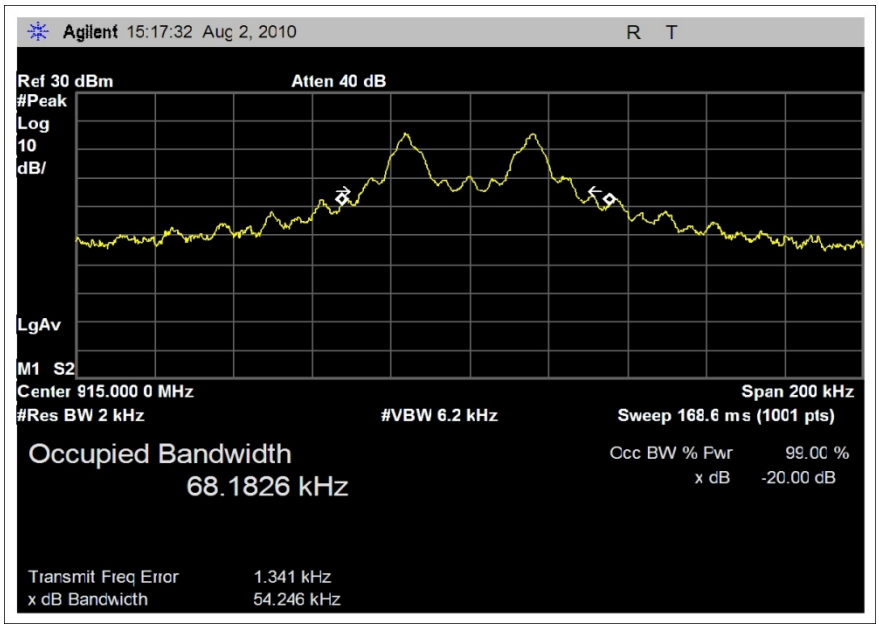
903-FM-37.5



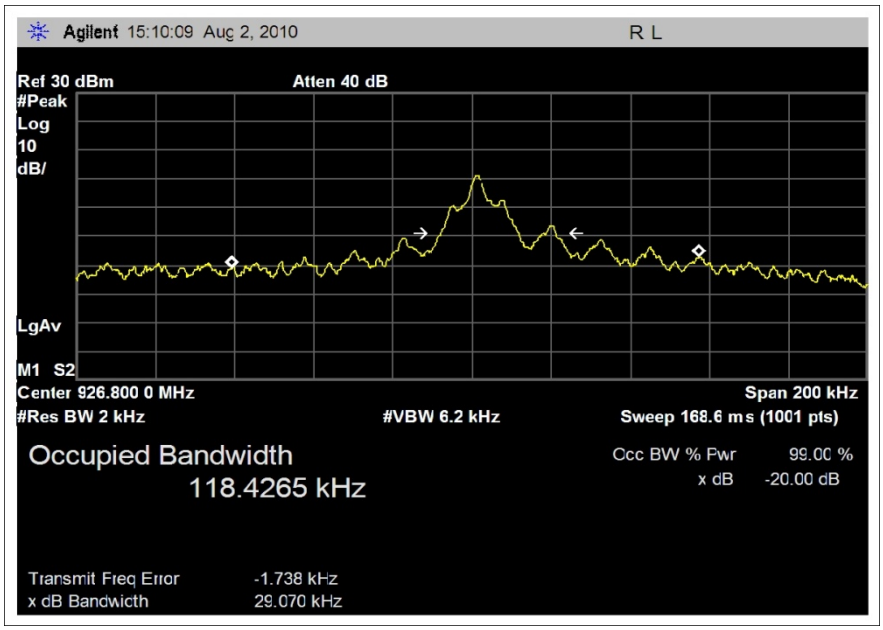
915-AM



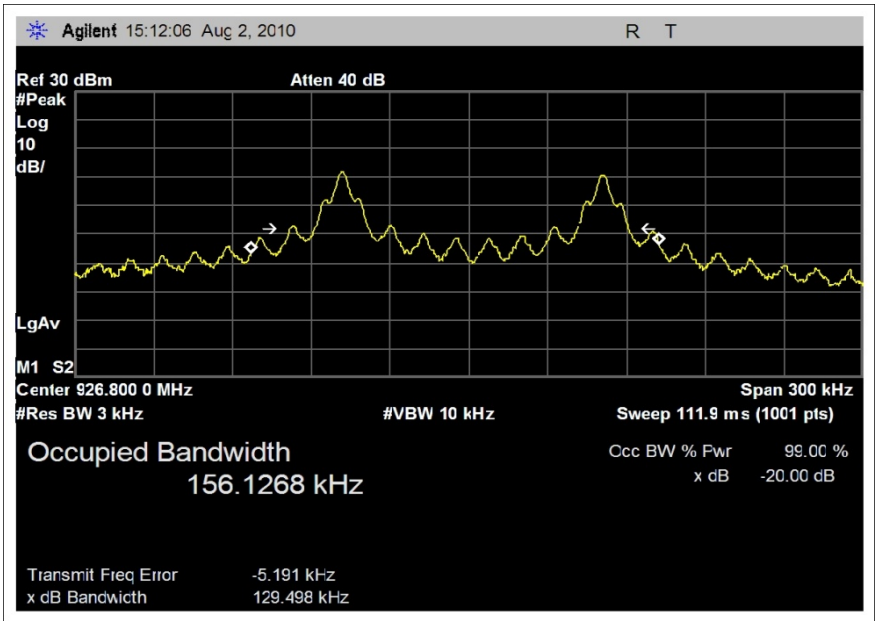
915-FM-12.5



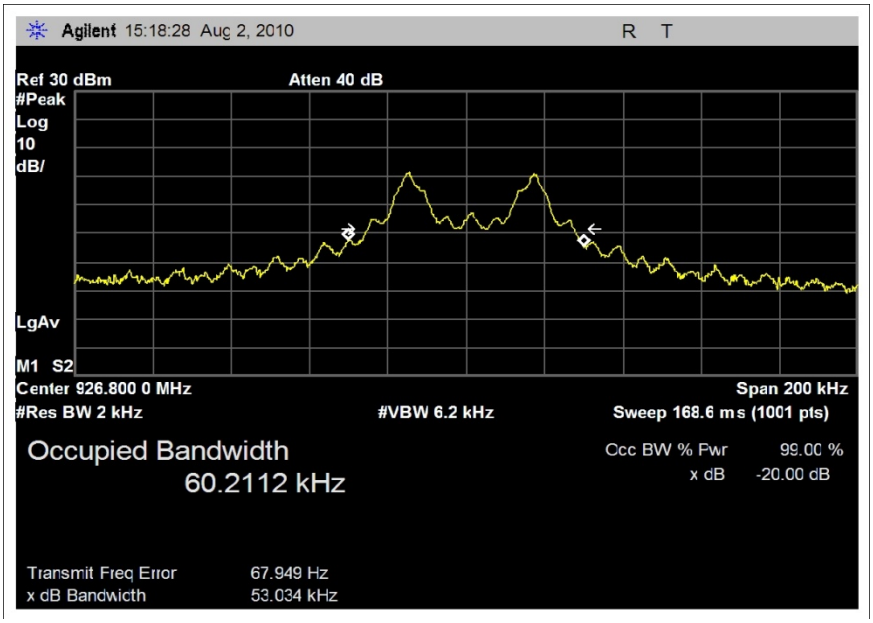
915-FM-37.5



926.8-AM

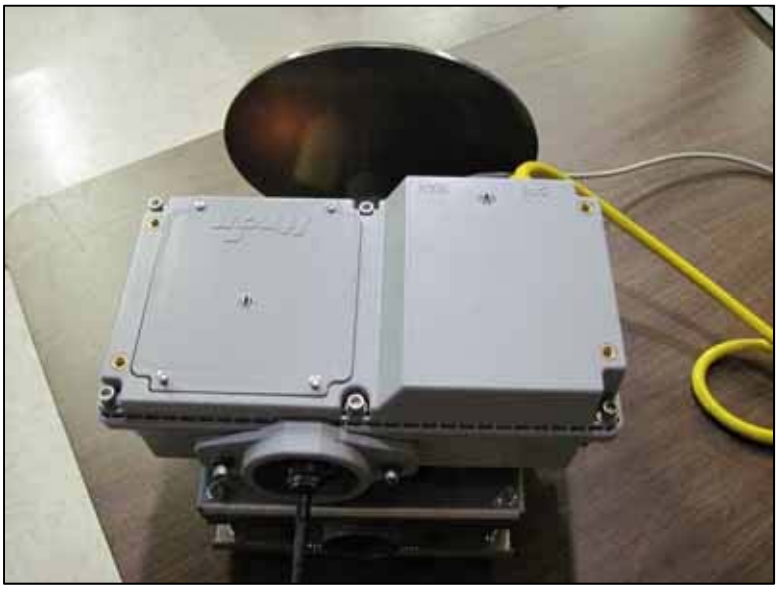


926.8-FM-12.5



926.8-FM-37.5

Test Setup Photos



20dB BANDWIDTH

15.247(a)(1)(i) Number of Hopping Frequencies

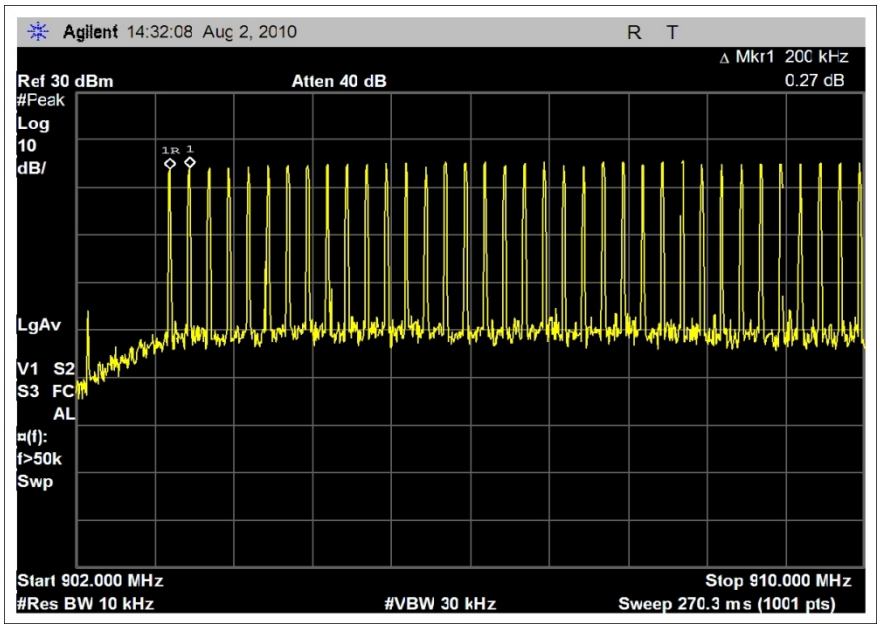
Test Set up

The EUT was setup on the bench and connected to a spectrum analyzer via an RF cable. The EUT was cycled though the different channels and modes by test software on a support laptop, connected to the EUT by an Ethernet cable. For this testing, all models (CCU100, CCU100-Repeater, CCU100R, and CCU100R-Repeater) are identical.

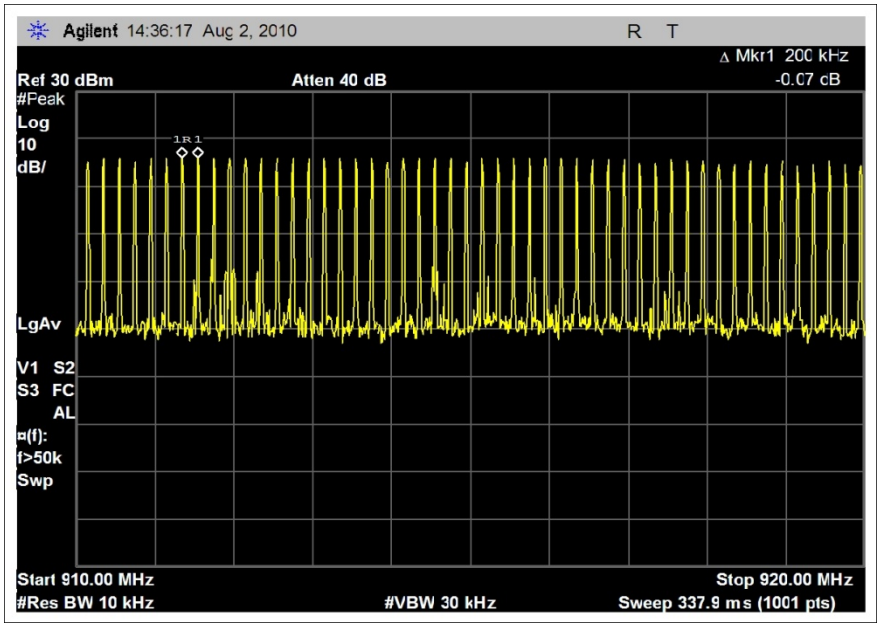
Engineer Name: J. Gilbert

Test Equipment				
Equipment	**Serial**	**Cal Date**	**Cal Due**	**Asset**
Spectrum Analyzer	MY46186330	08/25/2009	08/25/2011	02872
Cable 10k-18G	NA	10/23/2009	10/23/2011	03121

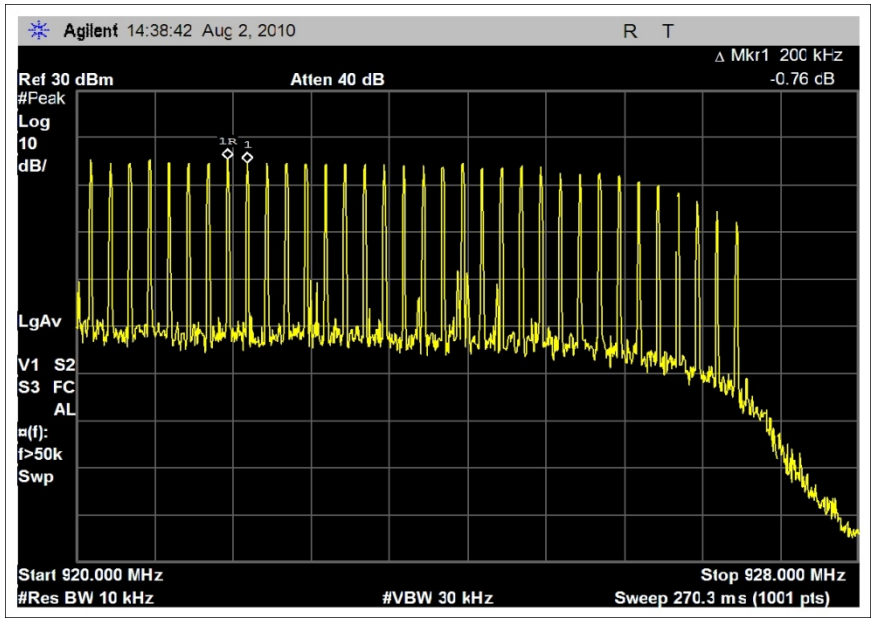
Test Data



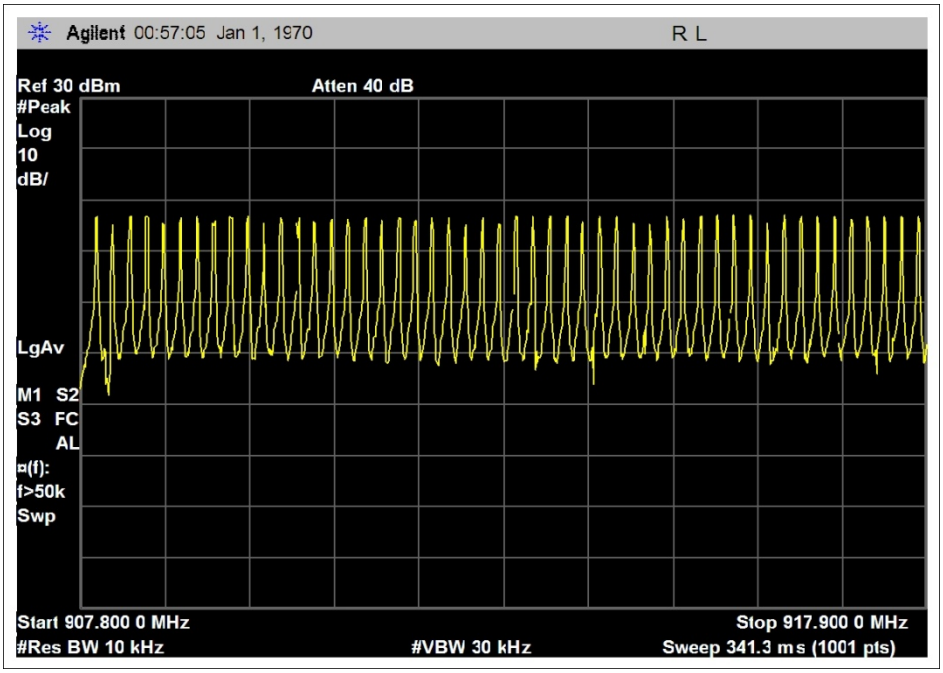
902M-910M - FM



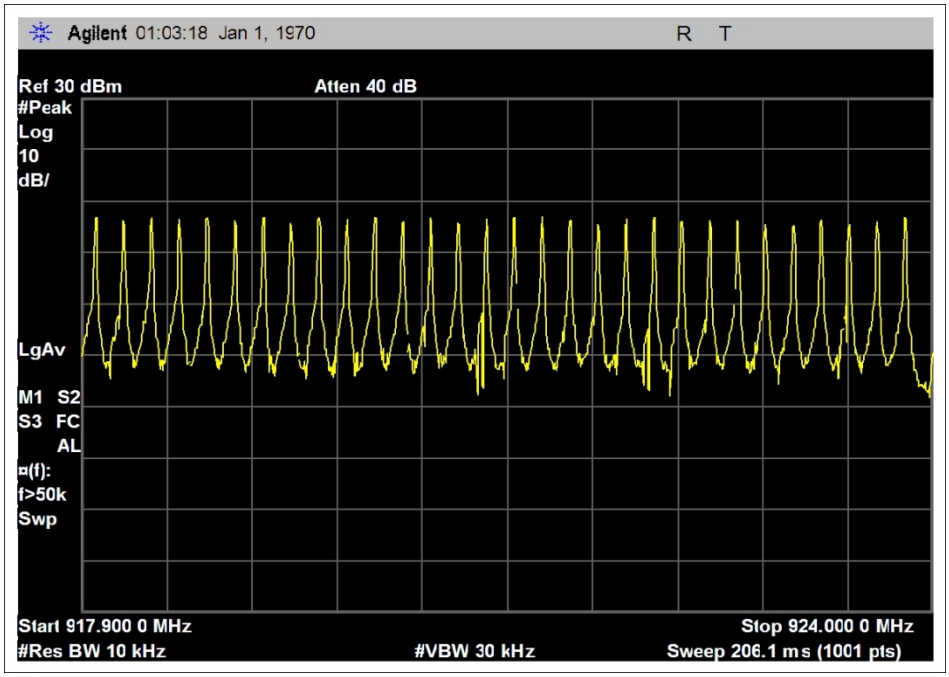
910M-920M - FM



920M-928M - FM



908 – 917.8 MHz – AM

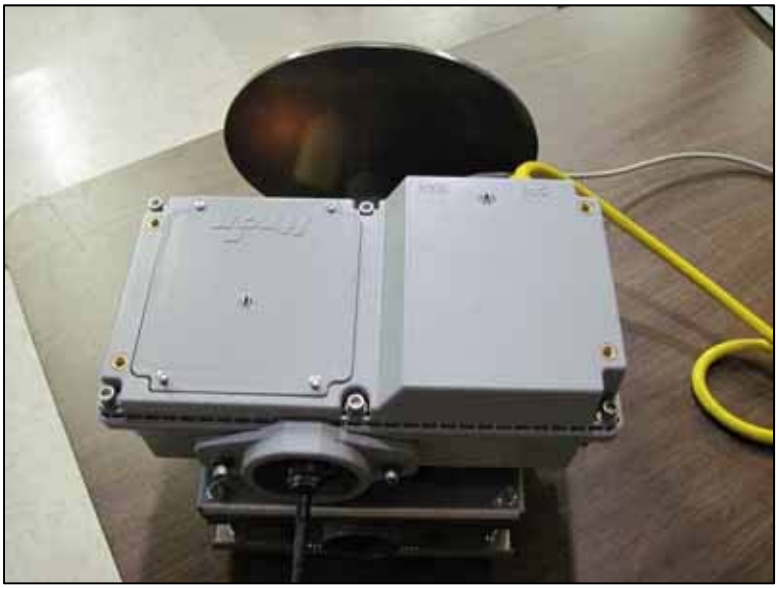


<u>918 – 923.8 MHz - AM</u>

<u>Requirement:</u> If the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies.

<u>Result:</u> The manufacturer declares that the system uses from 50 to 120 hopping frequencies for FM and 80 hopping frequencies for AM. PASS

Test Setup Photos



NUMBER OF HOPPING FREQUENCIES

15.247(a)(1)(i) Time of Occupancy

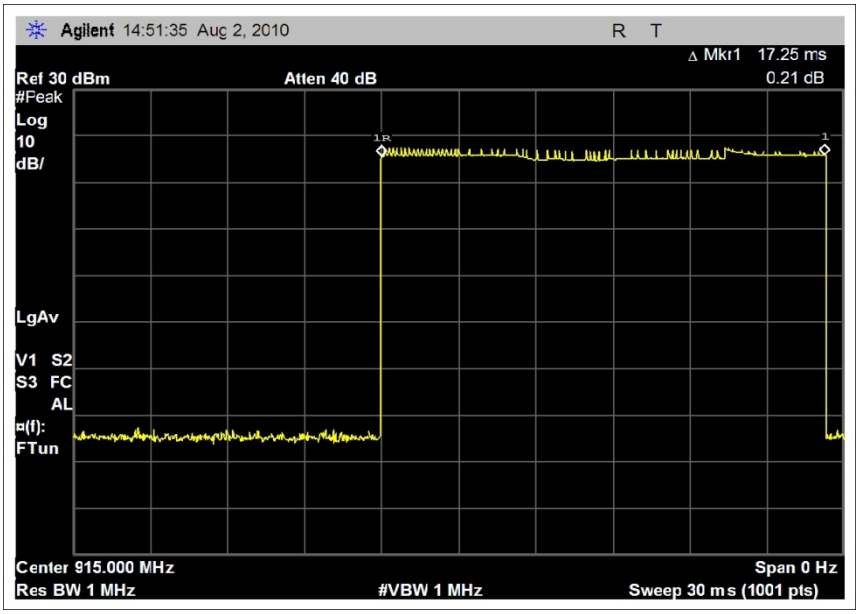
Test Set up

The EUT was setup on the bench and connected to a spectrum analyzer via an RF cable. The EUT was cycled though the different channels and modes by test software on a support laptop, connected to the EUT by an Ethernet cable. For this testing, all models (CCU100, CCU100-Repeater, CCU100R, and CCU100R-Repeater) are identical.

Engineer Name: J. Gilbert

Test Equipment				
Equipment	**Serial**	**Cal Date**	**Cal Due**	**Asset**
Spectrum Analyzer	MY46186330	08/25/2009	08/25/2011	02872
Cable 10k-18G	NA	10/23/2009	10/23/2011	03121

Test Data

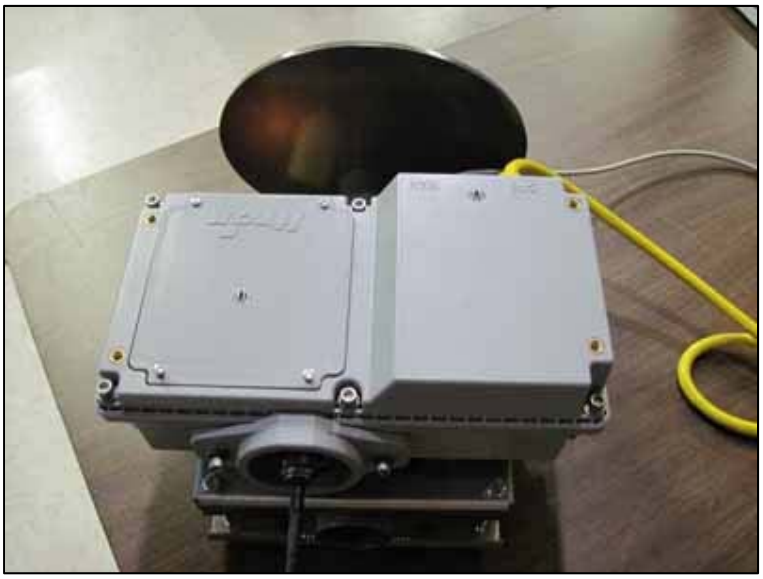


TIME OF OCCUPANCY

Requirement: If the 20 dB bandwidth of the hopping channel is less than 250 kHz, the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period.

Result: The average time of occupancy is 0.01725 seconds. The manufacturer declares that the maximum individual transmission is < 20mS as shown in this report, however, there could be up to 10 transmissions on a channel within a 20 second period. Therefore, the maximum on channel time in a 20 second period would be < 200mS. PASS

Test Setup Photos



TIME OF OCCUPANCY

15.247(b)(2) Peak Conducted Power

Test Data

Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • (425) 402-1717

Customer: **Itron, Inc.**
Specification: **15.247(b) Power Output (902-928 MHz FHSS >50 Channels)**
Work Order #: **90893** Date: 8/2/2010
Test Type: **Maximized Emissions** Time: 13:38:35
Equipment: **(SRR+WWAN+WIFI+GPS RX Internal WWAN & GPS Antenna)** Sequence#: 2
Manufacturer: Itron, Inc. Tested By: Jeff Gilbert
Model: CCU100
S/N: 7404FCC1

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN03121	Cable	32026-2-29080-84	10/23/2009	10/23/2011
T2	ANP05435	Attenuator	PE7015-10	9/5/2008	9/5/2010
	AN02872	Spectrum Analyzer	E4440A	8/25/2009	8/25/2011

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
(SRR+WWAN+WIFI+GPS RX Internal WWAN & GPS Antenna)*	Itron, Inc.	CCU100	7404FCC1

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Dell	Latitude D630	9JQRJH1

Test Conditions / Notes:

Frequency Range Investigated: 902 - 928 MHz
Temp: 23° C, Humidity: 44%
Pressure: 102.4 kPa
EUT is a FHSS radio operating in the 902 - 928 MHz ISM band.
Peak RF Output power tested per DA-00-705.
AM Modulation 240VAC / 60 Hz

Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Distance: None

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBm	Spec dBm	Margin dB	Polar Ant
1	915.057M	16.4	+0.8	+9.6			+0.0	26.8	30.0	-3.2	Condu 100
2	903.055M	14.5	+0.8	+9.6			+0.0	24.9	30.0	-5.1	Condu 100
3	926.725M	2.3	+0.8	+9.6			+0.0	12.7	30.0	-17.3	Condu 100

Customer:	**Itron, Inc.**		
Specification:	**15.247(b) Power Output (902-928 MHz FHSS >50 Channels)**		
Work Order #:	**90893**	Date:	8/2/2010
Test Type:	**Maximized Emissions**	Time:	13:38:35
Equipment:	**(SRR+WWAN+WIFI+GPS RX Internal WWAN & GPS Antenna)**	Sequence#:	3
Manufacturer:	Itron, Inc.	Tested By:	Jeff Gilbert
Model:	CCU100		
S/N:	7404FCC1		

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN03121	Cable	32026-2-29080-84	10/23/2009	10/23/2011
T2	ANP05435	Attenuator	PE7015-10	9/5/2008	9/5/2010
	AN02872	Spectrum Analyzer	E4440A	8/25/2009	8/25/2011

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
(SRR+WWAN+WIFI+GPS RX Internal WWAN & GPS Antenna)*	Itron, Inc.	CCU100	7404FCC1

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Dell	Latitude D630	9JQRJH1

Test Conditions / Notes:

Frequency Range Investigated: 902 - 928 MHz
Temp: 23° C
Humidity: 44%
Pressure: 102.4 kPa
EUT is a FHSS radio operating in the 902 - 928 MHz ISM band.
Peak RF Output power tested per DA-00-705.
FM Modulation - 12.5 kBaud
240VAC / 60 Hz

Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Distance: None

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBm	Spec dBm	Margin dB	Polar Ant
1	915.057M	16.4	+0.8	+9.6			+0.0	26.8	30.0	-3.2	Condu 100
2	903.055M	14.5	+0.8	+9.6			+0.0	24.9	30.0	-5.1	Condu 100
3	926.725M	2.3	+0.8	+9.6			+0.0	12.7	30.0	-17.3	Condu 100

Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • (425) 402-1717

Customer: **Itron, Inc.**
Specification: **15.247(b) Power Output (902-928 MHz FHSS >50 Channels)**
Work Order #: **90893** Date: 8/2/2010
Test Type: **Maximized Emissions** Time: 13:42:48
Equipment: **(SRR+WWAN+WIFI+GPS RX Internal WWAN & GPS antenna)** Sequence#: 4
Manufacturer: Itron, Inc. Tested By: Jeff Gilbert
Model: CCU100
S/N: 7404FCC1

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN03121	Cable	32026-2-29080-84	10/23/2009	10/23/2011
T2	ANP05435	Attenuator	PE7015-10	9/5/2008	9/5/2010
	AN02872	Spectrum Analyzer	E4440A	8/25/2009	8/25/2011

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
SRR+WWAN+WIFI+GPS RX Internal WWAN & GPS Antenna)*	Itron, Inc.	CCU100	7404FCC1

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Dell	Latitude D630	9JQRJH1

Test Conditions / Notes:

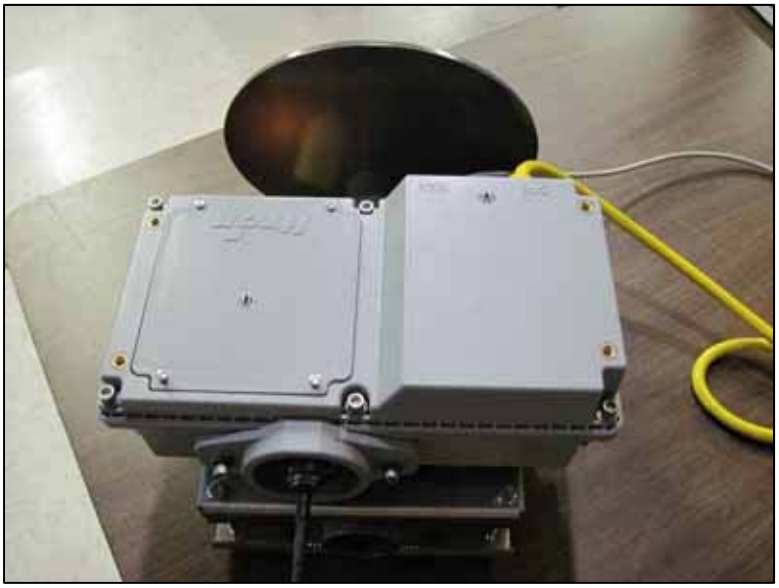
Frequency Range Investigated: 902 - 928 MHz
Temp: 23° C
Humidity: 44%
Pressure: 102.4 kPa
EUT is a FHSS radio operating in the 902 - 928 MHz ISM band.
Peak RF Output power tested per DA-00-705.
FM Modulation - 37.5 kBaud
240VAC / 60 Hz

Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Distance: None

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBm	Spec dBm	Margin dB	Polar Ant
1	915.014M	16.3	+0.8	+9.6			+0.0	26.7	30.0	-3.3	Condu 100
2	903.013M	14.4	+0.8	+9.6			+0.0	24.8	30.0	-5.2	Condu 100
3	926.779M	1.7	+0.8	+9.6			+0.0	12.1	30.0	-17.9	Condu 100

Test Setup Photos



PEAK CONDUCTED POWER

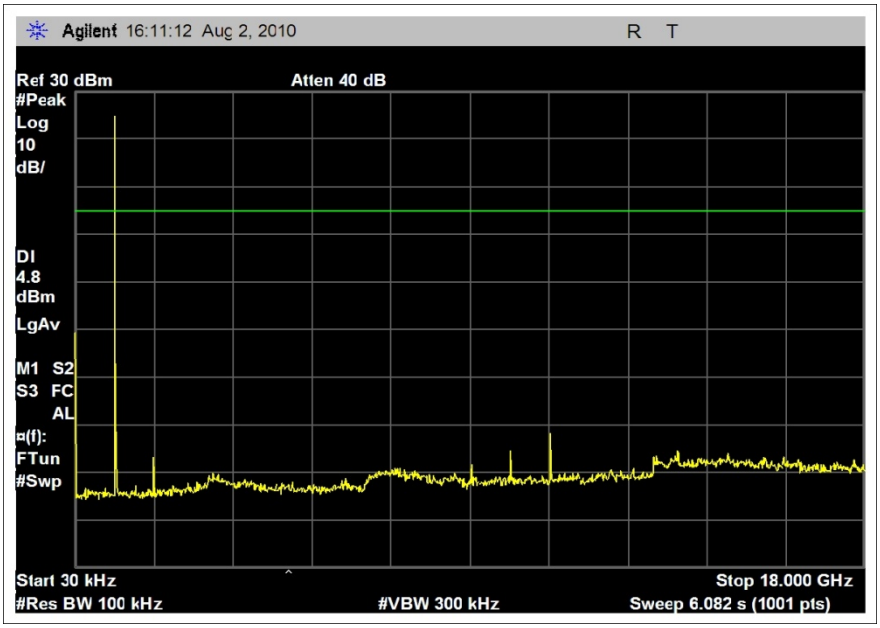
15.247(d) Antenna Conducted Spurious

The EUT was setup on the bench and connected to a spectrum analyzer via an RF cable. The EUT was cycled though the different channels and modes by test software on a support laptop, connected to the EUT by an Ethernet cable. For this testing, all models (CCU100, CCU100-Repeater, CCU100R, and CCU100R-Repeater) are identical.

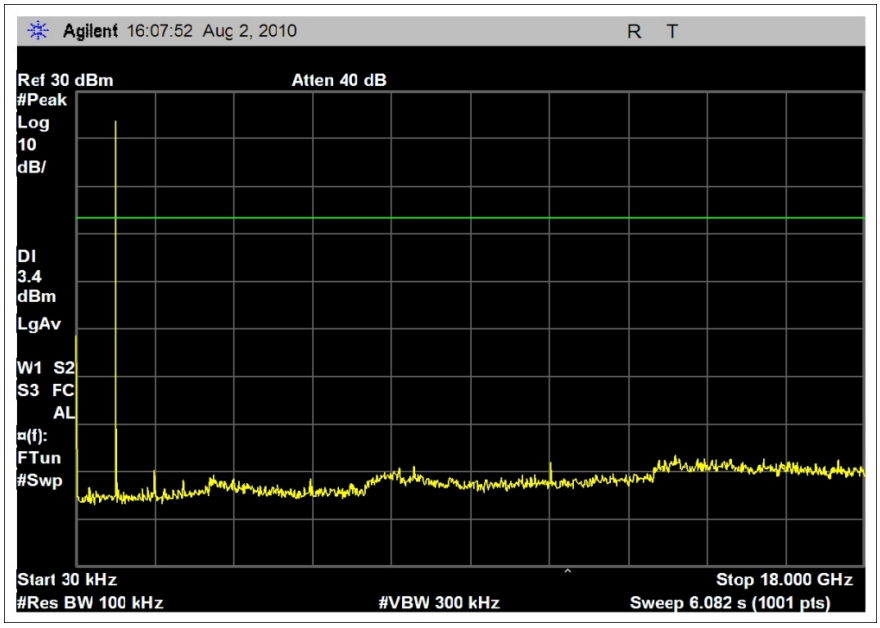
Engineer Name: J. Gilbert

Test Equipment				
Equipment	**Serial**	**Cal Date**	**Cal Due**	**Asset**
Spectrum Analyzer	MY46186330	08/25/2009	08/25/2011	02872
Cable 10k-18G	NA	10/23/2009	10/23/2011	03121

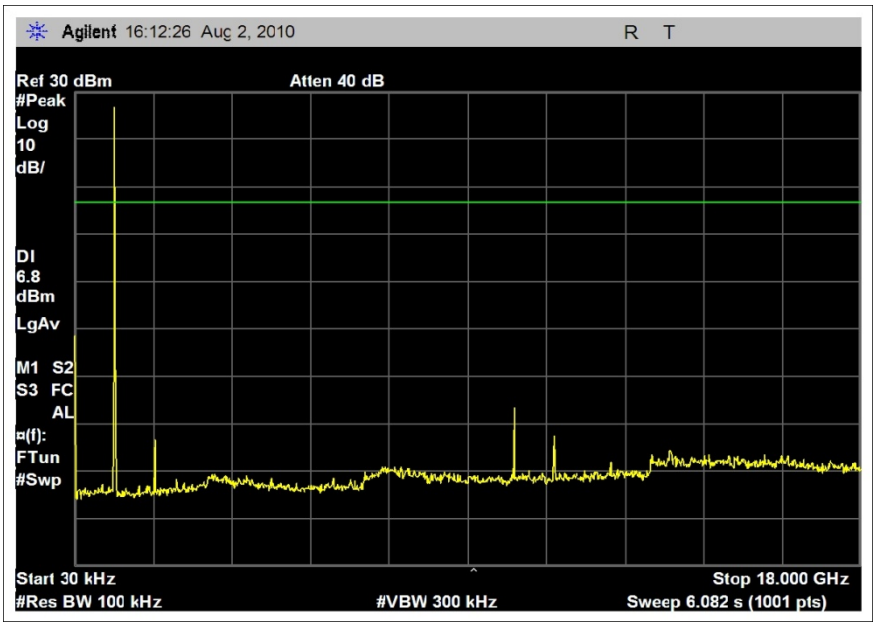
Test Data



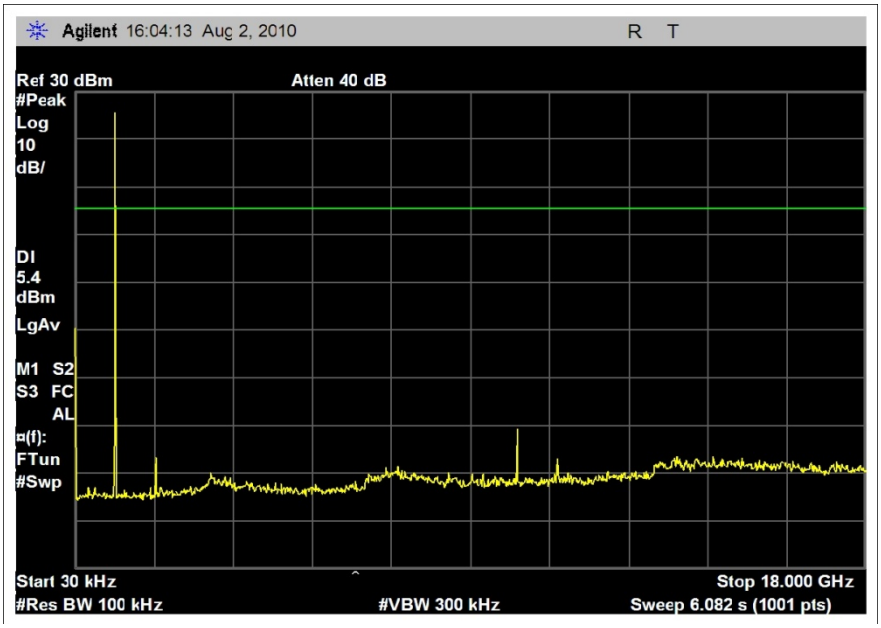
30k-18G-903-AM



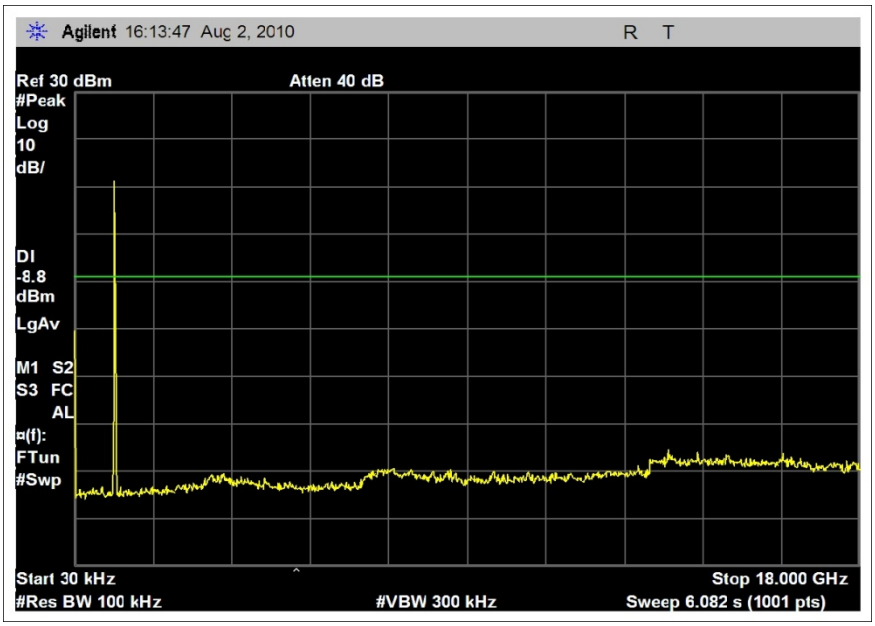
30k-18G-903-FM



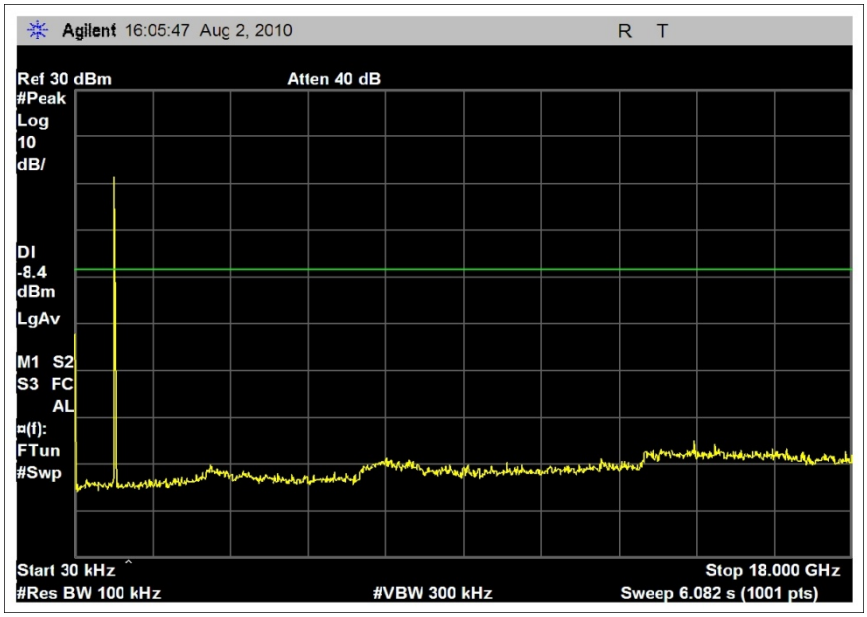
30k-18G-915-AM



30k-18G-915-FM



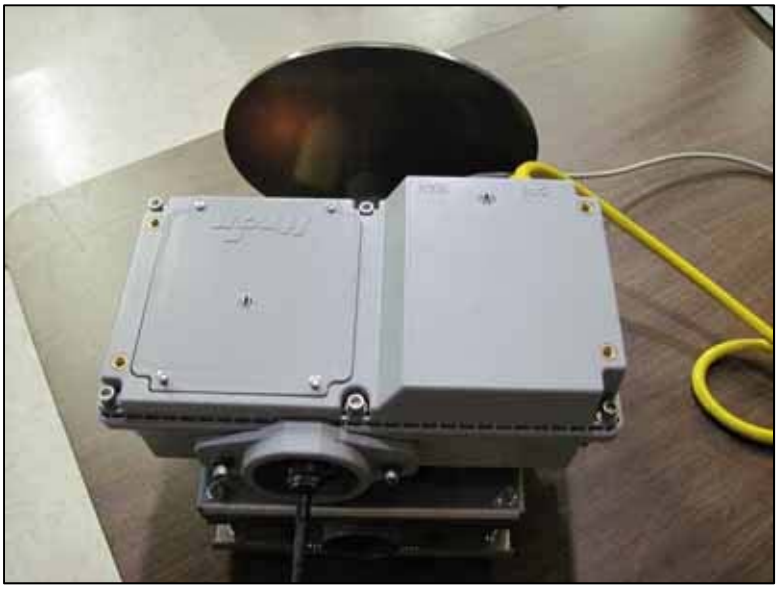
30k-18G-926.8-AM



30k-18G-926.8-FM

Requirement: Spurious emissions in a 100 kHz bandwidth outside the band of operation shall be at least 20 dB below the level of the carrier.
Result: The system produces no spurious emissions within 50 dB of the carrier, as measured at the antenna port.
PASS

Test Setup Photos



ANTENNA CONDUCTED SPURIOUS

15.247(d) Radiated Spurious Emissions

Test Data

Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • (425) 402-1717

Customer:	**Itron, Inc.**		
Specification:	**15.247(d) Radiated Spurious Emissions**		
Work Order #:	**90893**	Date:	8/4/2010
Test Type:	**Maximized Emissions**	Time:	1:59:22 PM
Equipment:	**(SRR+WWAN+WIFI+GPS RX Internal WWAN & GPS Antenna)**	Sequence#:	3
Manufacturer:	Itron, Inc.	Tested By:	Jeff Gilbert
Model:	CCU100		
S/N:	7404FCC1		

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN00052	Loop Antenna	6502	6/8/2010	6/8/2012
T2	ANP05366	Cable	RG-214	10/20/2009	10/20/2011
T3	AN03121	Cable	32026-2-29080-84	10/23/2009	10/23/2011
T4	AN01717	High Pass Filter	F3440-P005	5/27/2010	5/27/2012
	AN02872	Spectrum Analyzer	E4440A	8/25/2009	8/25/2011

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
(SRR+WWAN+WIFI+GPS RX Internal WWAN & GPS Antenna)*	Itron, Inc.	CCU100	7404FCC1
H-pol omni antenna	Taoglas	TIC.95.2F11	NA

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Dell	Latitude D630	9JQRJH1

Test Conditions / Notes:

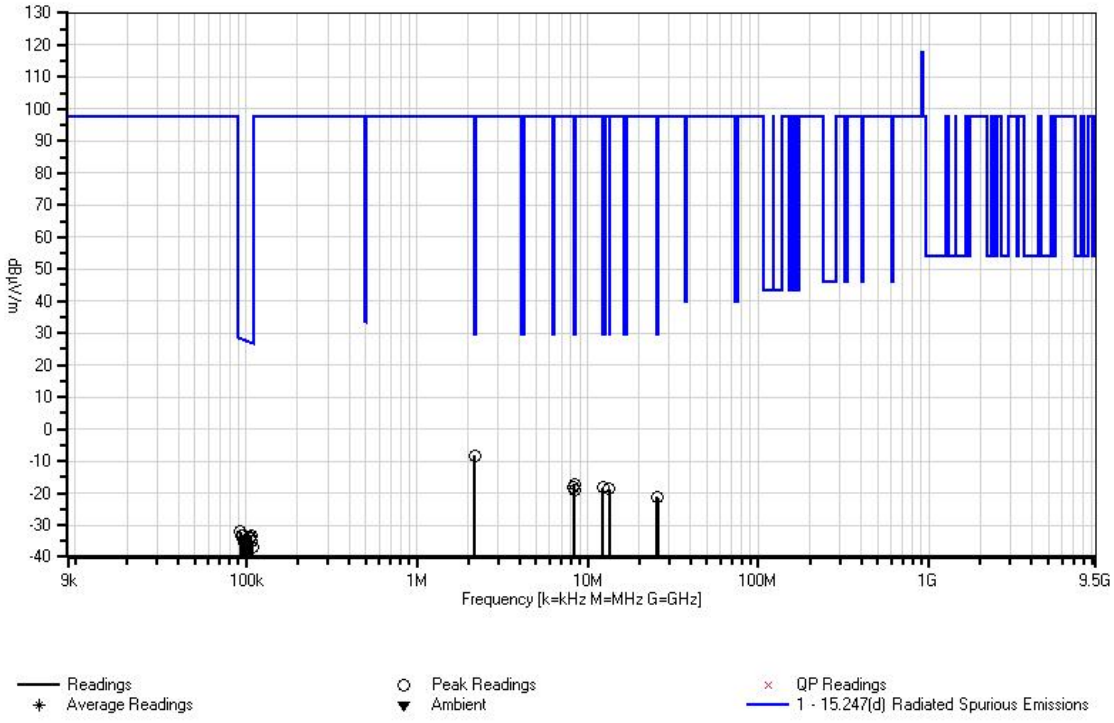
Frequency Range Investigated: 30 kHz - 30 MHz
Temp: 24° C
Humidity: 40%
Pressure: 102.1 kPa
FHSS radio transmitting on 903 MHz; AM modulation.

Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	2.176M	22.0	+9.7	+0.1	+0.0	+0.0	-40.0	-8.2	29.5	-37.7	Verti 109
2	8.383M	13.0	+9.5	+0.2	+0.0	+0.1	-40.0	-17.2	29.5	-46.7	Verti 109
3	8.293M	12.2	+9.5	+0.2	+0.0	+0.1	-40.0	-18.0	29.5	-47.5	Verti 109
4	12.293M	12.1	+9.3	+0.2	+0.0	+0.1	-40.0	-18.3	29.5	-47.8	Verti 109
5	13.365M	11.5	+9.3	+0.3	+0.0	+0.1	-40.0	-18.8	29.5	-48.3	Verti 109
6	8.365M	11.2	+9.5	+0.2	+0.0	+0.1	-40.0	-19.0	29.5	-48.5	Verti 109
7	25.509M	12.0	+6.3	+0.4	+0.1	+0.1	-40.0	-21.1	29.5	-50.6	Verti 109
8	25.653M	11.7	+6.3	+0.4	+0.1	+0.1	-40.0	-21.4	29.5	-50.9	Verti 109
9	25.545M	11.6	+6.3	+0.4	+0.1	+0.1	-40.0	-21.5	29.5	-51.0	Verti 109
10	106.440k	36.8	+9.7	+0.1	+0.0	+0.1	-80.0	-33.3	27.1	-60.4	Verti 109
11	92.520k	37.9	+9.7	+0.1	+0.0	+0.1	-80.0	-32.2	28.3	-60.5	Verti 109
12	105.120k	36.4	+9.7	+0.1	+0.0	+0.1	-80.0	-33.7	27.2	-60.9	Verti 109
13	95.520k	36.9	+9.7	+0.1	+0.0	+0.1	-80.0	-33.2	28.0	-61.2	Verti 109
14	104.640k	36.0	+9.7	+0.1	+0.0	+0.1	-80.0	-34.1	27.2	-61.3	Verti 109
15	93.720k	36.8	+9.7	+0.1	+0.0	+0.1	-80.0	-33.3	28.2	-61.5	Verti 109
16	107.880k	35.2	+9.7	+0.1	+0.0	+0.1	-80.0	-34.9	27.0	-61.9	Verti 109
17	97.800k	34.7	+9.7	+0.1	+0.0	+0.1	-80.0	-35.4	27.8	-63.2	Verti 109
18	102.120k	34.1	+9.7	+0.1	+0.0	+0.1	-80.0	-36.0	27.4	-63.4	Verti 109
19	101.400k	34.0	+9.7	+0.1	+0.0	+0.1	-80.0	-36.1	27.5	-63.6	Verti 109
20	108.480k	33.4	+9.7	+0.1	+0.0	+0.1	-80.0	-36.7	26.9	-63.6	Verti 109

CKC Laboratories, Inc. Date: 8/4/2010 Time: 1:59:22 PM Itron, Inc. WO#: 90893
15.247(d) Radiated Spurious Emissions Test Distance: 3 Meters Vertical Sequence#: 3 Ext ATTN: 0 dB



Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • (425) 402-1717

Customer: **Itron, Inc.**
Specification: **15.247(d) Radiated Spurious Emissions**
Work Order #: **90893** Date: 8/4/2010
Test Type: **Maximized Emissions** Time: 2:13:29 PM
Equipment: **(SRR+WWAN+WIFI+GPS RX Internal WWAN & GPS Antenna)** Sequence#: 4
Manufacturer: Itron, Inc. Tested By: Jeff Gilbert
Model: CCU100
S/N: 7404FCC1

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN00052	Loop Antenna	6502	6/8/2010	6/8/2012
T2	ANP05366	Cable	RG-214	10/20/2009	10/20/2011
T3	AN03121	Cable	32026-2-29080-84	10/23/2009	10/23/2011
T4	AN01717	High Pass Filter	F3440-P005	5/27/2010	5/27/2012
	AN02872	Spectrum Analyzer	E4440A	8/25/2009	8/25/2011

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
(SRR+WWAN+WIFI+GPS RX Internal WWAN & GPS Antenna)*	Itron, Inc.	CCU100	7404FCC1
H-pol omni antenna	Taoglas	TIC.95.2F11	NA

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Dell	Latitude D630	9JQRJH1

Test Conditions / Notes:

Frequency Range Investigated: 30 kHz - 30 MHz
Temp: 24° C
Humidity: 40%
Pressure: 102.1 kPa
FHSS radio transmitting on 903 MHz; FM modulation.

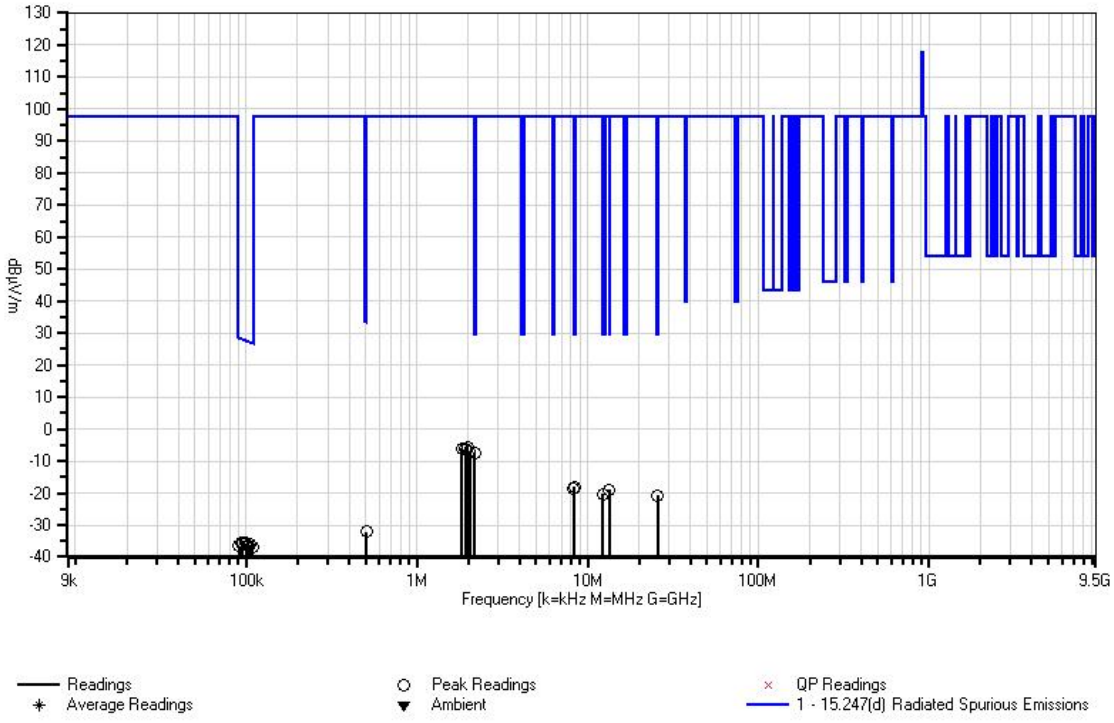
Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	2.185M	22.9	+9.7	+0.1	+0.0	+0.0	-40.0 360	-7.3	29.5	-36.8	Verti 109
2	8.365M	12.2	+9.5	+0.2	+0.0	+0.1	-40.0 360	-18.0	29.5	-47.5	Verti 109
3	8.383M	12.1	+9.5	+0.2	+0.0	+0.1	-40.0 360	-18.1	29.5	-47.6	Verti 109
4	8.293M	11.6	+9.5	+0.2	+0.0	+0.1	-40.0 360	-18.6	29.5	-48.1	Verti 109
5	13.401M	11.4	+9.3	+0.3	+0.0	+0.1	-40.0 360	-18.9	29.5	-48.4	Verti 109
6	12.293M	10.1	+9.3	+0.2	+0.0	+0.1	-40.0 360	-20.3	29.5	-49.8	Verti 109
7	25.644M	12.3	+6.3	+0.4	+0.1	+0.1	-40.0 360	-20.8	29.5	-50.3	Verti 109

8	105.600k	34.0	+9.7	+0.1	+0.0	+0.1	-80.0 360	-36.1	27.1	-63.2	Verti 109
9	99.480k	34.5	+9.7	+0.1	+0.0	+0.1	-80.0 360	-35.6	27.7	-63.3	Verti 109
10	95.520k	34.7	+9.7	+0.1	+0.0	+0.1	-80.0 360	-35.4	28.0	-63.4	Verti 109
11	93.840k	34.6	+9.7	+0.1	+0.0	+0.1	-80.0 360	-35.5	28.1	-63.6	Verti 109
12	103.440k	33.8	+9.7	+0.1	+0.0	+0.1	-80.0 360	-36.3	27.3	-63.6	Verti 109
13	101.760k	33.7	+9.7	+0.1	+0.0	+0.1	-80.0 360	-36.4	27.5	-63.9	Verti 109
14	109.080k	33.1	+9.7	+0.1	+0.0	+0.1	-80.0 360	-37.0	26.9	-63.9	Verti 109
15	91.080k	33.6	+9.7	+0.1	+0.0	+0.1	-80.0 360	-36.5	28.4	-64.9	Verti 109
16	503.700k	38.2	+9.4	+0.1	+0.0	+0.1	-80.0 360	-32.2	33.5	-65.7	Verti 109
17	1.977M	24.3	+9.7	+0.1	+0.0	+0.0	-40.0 360	-5.9	97.7	-103.6	Verti 109
18	1.824M	24.2	+9.7	+0.1	+0.0	+0.0	-40.0 360	-6.0	97.7	-103.7	Verti 109
19	1.914M	23.8	+9.7	+0.1	+0.0	+0.0	-40.0 360	-6.4	97.7	-104.1	Verti 109
20	2.032M	23.1	+9.7	+0.1	+0.0	+0.0	-40.0 360	-7.1	97.7	-104.8	Verti 109

CKC Laboratories, Inc. Date: 8/4/2010 Time: 2:13:29 PM Itron, Inc. WO#: 90893
15.247(d) Radiated Spurious Emissions Test Distance: 3 Meters Vertical Sequence#: 4 Ext ATTN: 0 dB



Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • (425) 402-1717

Customer: **Itron, Inc.**
Specification: **15.247(d) Radiated Spurious Emissions**
Work Order #: **90893** Date: 8/4/2010
Test Type: **Maximized Emissions** Time: 2:32:20 PM
Equipment: **(SRR+WWAN+WIFI+GPS RX Internal WWAN & GPS antenna)** Sequence#: 6
Manufacturer: Itron, Inc. Tested By: Jeff Gilbert
Model: CCU100
S/N: 7404FCC1

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN00052	Loop Antenna	6502	6/8/2010	6/8/2012
T2	ANP05366	Cable	RG-214	10/20/2009	10/20/2011
T3	AN03121	Cable	32026-2-29080-84	10/23/2009	10/23/2011
T4	AN01717	High Pass Filter	F3440-P005	5/27/2010	5/27/2012
	AN02872	Spectrum Analyzer	E4440A	8/25/2009	8/25/2011

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
(SRR+WWAN+WIFI+GPS RX Internal WWAN & GPS Antenna)*	Itron, Inc.	CCU100	7404FCC1
H-pol omni antenna	Taoglas	TIC.95.2F11	NA

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Dell	Latitude D630	9JQRJH1

Test Conditions / Notes:

Frequency Range Investigated: 30 kHz - 30 MHz
Temp: 24° C
Humidity: 40%
Pressure: 102.1 kPa
FHSS radio transmitting on 915 MHz; AM modulation.

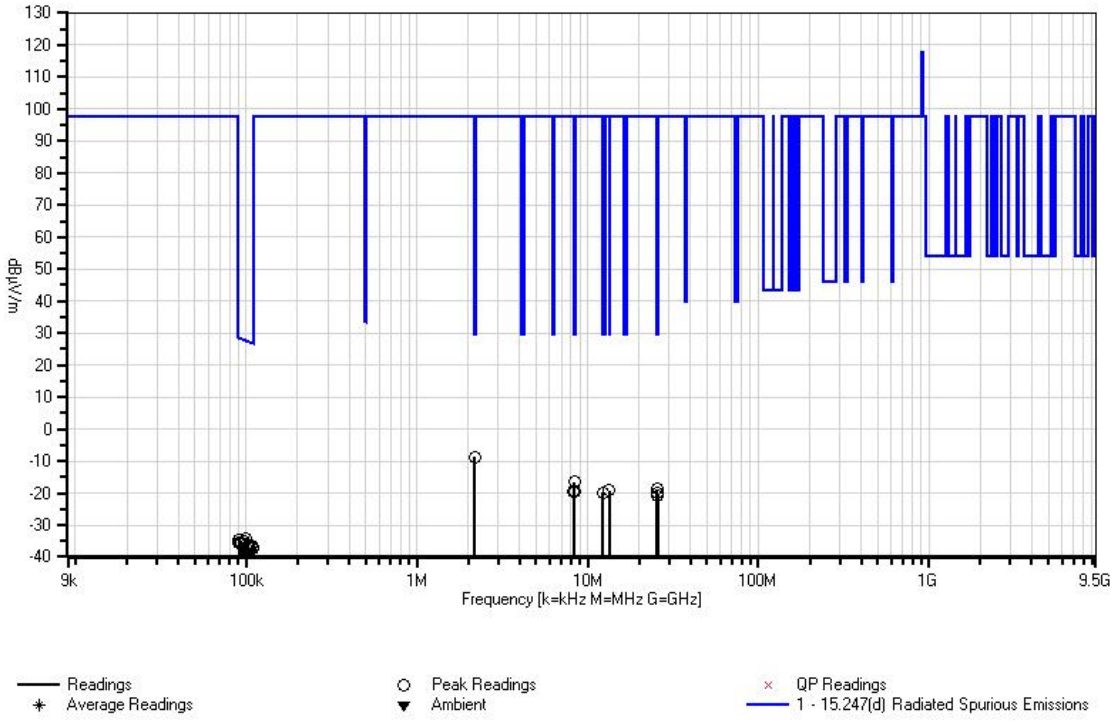
Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	2.185M	21.4	+9.7	+0.1	+0.0	+0.0	-40.0 360	-8.8	29.5	-38.3	Verti 109
2	8.365M	13.7	+9.5	+0.2	+0.0	+0.1	-40.0 360	-16.5	29.5	-46.0	Verti 109
3	25.554M	14.3	+6.3	+0.4	+0.1	+0.1	-40.0 360	-18.8	29.5	-48.3	Verti 109
4	13.383M	11.2	+9.3	+0.3	+0.0	+0.1	-40.0 360	-19.1	29.5	-48.6	Verti 109
5	8.293M	10.8	+9.5	+0.2	+0.0	+0.1	-40.0 360	-19.4	29.5	-48.9	Verti 109
6	8.383M	10.8	+9.5	+0.2	+0.0	+0.1	-40.0 360	-19.4	29.5	-48.9	Verti 109
7	12.293M	10.5	+9.3	+0.2	+0.0	+0.1	-40.0 360	-19.9	29.5	-49.4	Verti 109

8	25.644M	13.1	+6.3	+0.4	+0.1	+0.1	-40.0 360	-20.0	29.5	-49.5	Verti 109
9	25.599M	12.2	+6.3	+0.4	+0.1	+0.1	-40.0 360	-20.9	29.5	-50.4	Verti 109
10	100.200k	35.9	+9.7	+0.1	+0.0	+0.1	-80.0 360	-34.2	27.6	-61.8	Verti 109
11	90.360k	35.4	+9.7	+0.1	+0.0	+0.1	-80.0 360	-34.7	28.5	-63.2	Verti 109
12	96.960k	34.8	+9.7	+0.1	+0.0	+0.1	-80.0 360	-35.3	27.9	-63.2	Verti 109
13	108.240k	33.8	+9.7	+0.1	+0.0	+0.1	-80.0 360	-36.3	26.9	-63.2	Verti 109
14	93.240k	34.6	+9.7	+0.1	+0.0	+0.1	-80.0 360	-35.5	28.2	-63.7	Verti 109
15	108.960k	33.3	+9.7	+0.1	+0.0	+0.1	-80.0 360	-36.8	26.9	-63.7	Verti 109
16	92.280k	34.4	+9.7	+0.1	+0.0	+0.1	-80.0 360	-35.7	28.3	-64.0	Verti 109
17	90.840k	34.5	+9.7	+0.1	+0.0	+0.1	-80.0 360	-35.6	28.4	-64.0	Verti 109
18	109.560k	32.9	+9.7	+0.1	+0.0	+0.1	-80.0 360	-37.2	26.8	-64.0	Verti 109
19	102.840k	33.5	+9.7	+0.1	+0.0	+0.1	-80.0 360	-36.6	27.4	-64.0	Verti 109
20	106.200k	32.9	+9.7	+0.1	+0.0	+0.1	-80.0 360	-37.2	27.1	-64.3	Verti 109

CKC Laboratories, Inc. Date: 8/4/2010 Time: 2:32:20 PM Itron, Inc. WO#: 90893
15.247(d) Radiated Spurious Emissions Test Distance: 3 Meters Vertical Sequence#: 6 Ext ATTN: 0 dB



Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • (425) 402-1717

Customer: **Itron, Inc.**
Specification: **15.247(d) Radiated Spurious Emissions**
Work Order #: **90893** Date: 8/4/2010
Test Type: **Maximized Emissions** Time: 2:24:04 PM
Equipment: **(SRR+WWAN+WIFI+GPS RX Internal WWAN & GPS Antenna)** Sequence#: 5
Manufacturer: Itron, Inc. Tested By: Jeff Gilbert
Model: CCU100
S/N: 7404FCC1

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN00052	Loop Antenna	6502	6/8/2010	6/8/2012
T2	ANP05366	Cable	RG-214	10/20/2009	10/20/2011
T3	AN03121	Cable	32026-2-29080-84	10/23/2009	10/23/2011
T4	AN01717	High Pass Filter	F3440-P005	5/27/2010	5/27/2012
	AN02872	Spectrum Analyzer	E4440A	8/25/2009	8/25/2011

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
(SRR+WWAN+WIFI+GPS RX Internal WWAN & GPS Antenna)*	Itron, Inc.	CCU100	7404FCC1
H-pol omni antenna	Taoglas	TIC.95.2F11	NA

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Dell	Latitude D630	9JQRJH1

Test Conditions / Notes:

Frequency Range Investigated: 30 kHz - 30 MHz
Temp: 24° C
Humidity: 40%
Pressure: 102.1 kPa
FHSS radio transmitting on 915 MHz; FM modulation.

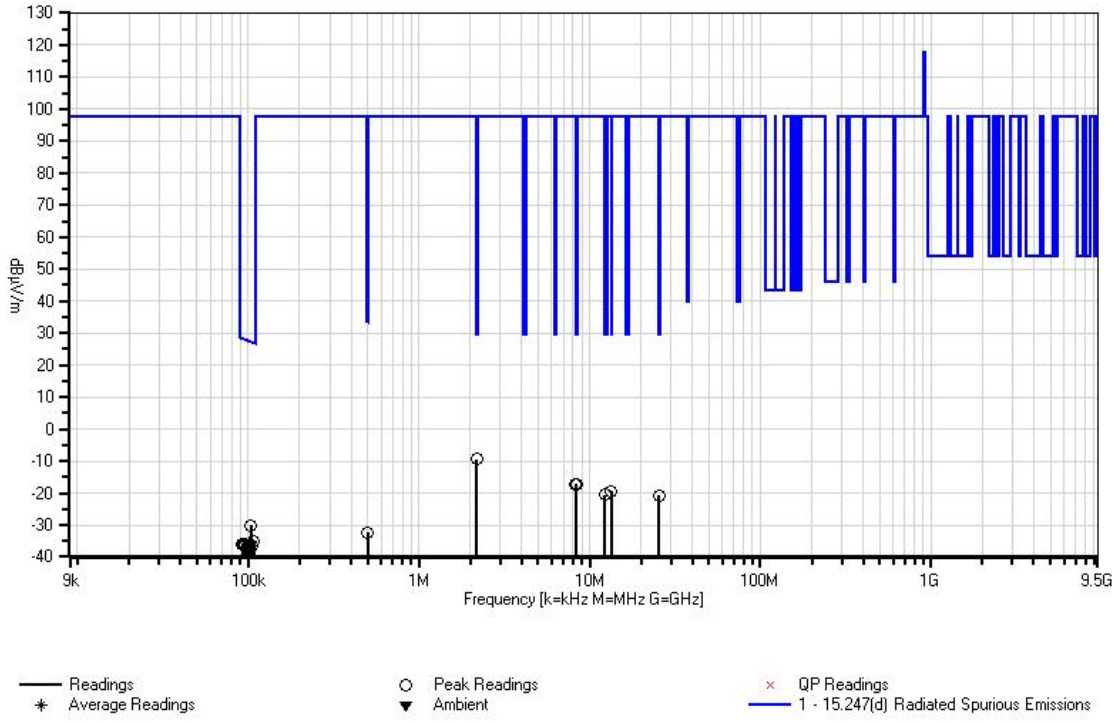
Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	2.176M	20.9	+9.7	+0.1	+0.0	+0.0	-40.0	-9.3	29.5	-38.8	Verti 109
2	8.365M	13.1	+9.5	+0.2	+0.0	+0.1	-40.0	-17.1	29.5	-46.6	Verti 109
3	8.293M	12.8	+9.5	+0.2	+0.0	+0.1	-40.0	-17.4	29.5	-46.9	Verti 109
4	8.383M	12.7	+9.5	+0.2	+0.0	+0.1	-40.0	-17.5	29.5	-47.0	Verti 109
5	13.401M	10.9	+9.3	+0.3	+0.0	+0.1	-40.0	-19.4	29.5	-48.9	Verti 109
6	12.293M	9.9	+9.3	+0.2	+0.0	+0.1	-40.0	-20.5	29.5	-50.0	Verti 109
7	25.563M	12.3	+6.3	+0.4	+0.1	+0.1	-40.0	-20.8	29.5	-50.3	Verti 109

8	103.320k	39.9	+9.7	+0.1	+0.0	+0.1	-80.0	-30.2	27.3	-57.5	Verti 109
9	107.280k	35.1	+9.7	+0.1	+0.0	+0.1	-80.0	-35.0	27.0	-62.0	Verti 109
10	105.720k	33.5	+9.7	+0.1	+0.0	+0.1	-80.0	-36.6	27.1	-63.7	Verti 109
11	105.120k	33.5	+9.7	+0.1	+0.0	+0.1	-80.0	-36.6	27.2	-63.8	Verti 109
12	93.840k	34.2	+9.7	+0.1	+0.0	+0.1	-80.0	-35.9	28.1	-64.0	Verti 109
13	92.040k	34.1	+9.7	+0.1	+0.0	+0.1	-80.0	-36.0	28.3	-64.3	Verti 109
14	94.680k	33.9	+9.7	+0.1	+0.0	+0.1	-80.0	-36.2	28.1	-64.3	Verti 109
15	98.880k	33.5	+9.7	+0.1	+0.0	+0.1	-80.0	-36.6	27.7	-64.3	Verti 109
16	96.360k	33.6	+9.7	+0.1	+0.0	+0.1	-80.0	-36.5	27.9	-64.4	Verti 109
17	101.400k	33.0	+9.7	+0.1	+0.0	+0.1	-80.0	-37.1	27.5	-64.6	Verti 109
18	99.960k	33.0	+9.7	+0.1	+0.0	+0.1	-80.0	-37.1	27.6	-64.7	Verti 109
19	100.680k	32.9	+9.7	+0.1	+0.0	+0.1	-80.0	-37.2	27.6	-64.8	Verti 109
20	499.650k	38.0	+9.4	+0.1	+0.0	+0.1	-80.0	-32.4	33.6	-66.0	Verti 109

CKC Laboratories, Inc. Date: 8/4/2010 Time: 2:24:04 PM Itron, Inc. WO#: 90893
15.247(d) Radiated Spurious Emissions Test Distance: 3 Meters Vertical Sequence#: 5 Ext ATTN: 0 dB



Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • (425) 402-1717

Customer: **Itron, Inc.**
Specification: **15.247(d) Radiated Spurious Emissions**
Work Order #: **90893** Date: 8/4/2010
Test Type: **Maximized Emissions** Time: 2:40:49 PM
Equipment: **(SRR+WWAN+WIFI+GPS RX Internal WWAN & GPS Antenna)** Sequence#: 7
Manufacturer: Itron, Inc. Tested By: Jeff Gilbert
Model: CCU100
S/N: 7404FCC1

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN00052	Loop Antenna	6502	6/8/2010	6/8/2012
T2	ANP05366	Cable	RG-214	10/20/2009	10/20/2011
T3	AN03121	Cable	32026-2-29080-84	10/23/2009	10/23/2011
T4	AN01717	High Pass Filter	F3440-P005	5/27/2010	5/27/2012
	AN02872	Spectrum Analyzer	E4440A	8/25/2009	8/25/2011

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
(SRR+WWAN+WIFI+GPS RX Internal WWAN & GPS Antenna)*	Itron, Inc.	CCU100	7404FCC1
H-pol omni antenna	Taoglas	TIC.95.2F11	NA

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Dell	Latitude D630	9JQRJH1

Test Conditions / Notes:

Frequency Range Investigated: 30 kHz - 30 MHz
Temp: 24° C
Humidity: 40%
Pressure: 102.1 kPa
FHSS radio transmitting on 926.8 MHz; AM modulation.

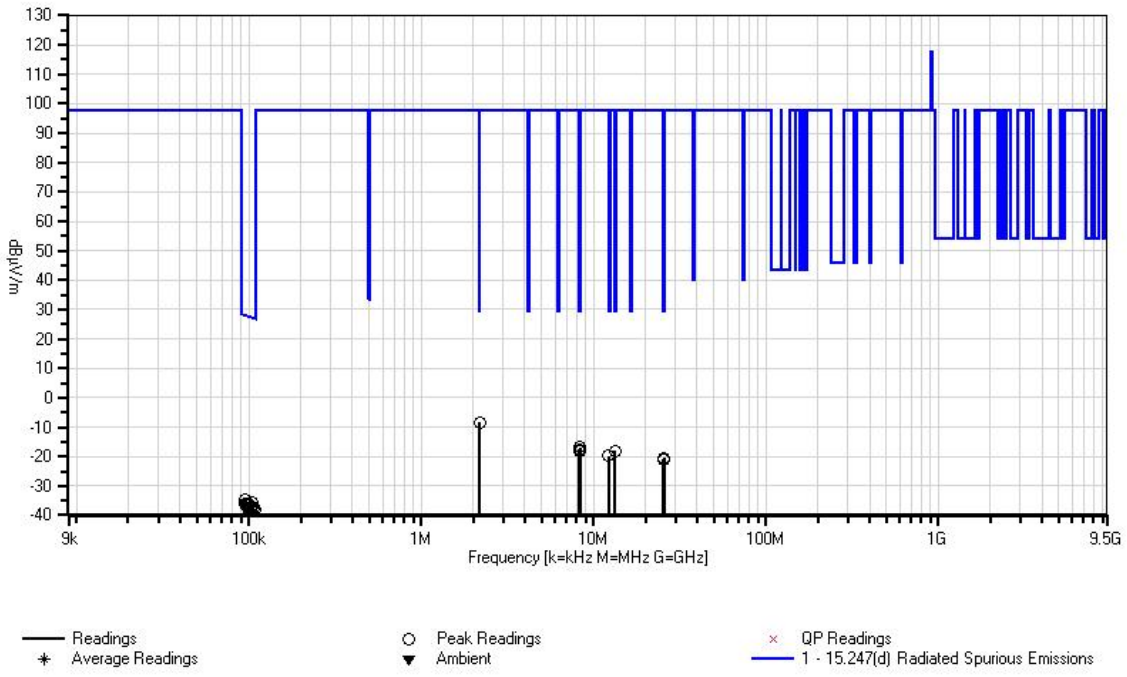
Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	2.185M	21.8	+9.7	+0.1	+0.0	+0.0	-40.0	-8.4	29.5	-37.9	Verti 109
2	8.365M	13.3	+9.5	+0.2	+0.0	+0.1	-40.0	-16.9	29.5	-46.4	Verti 109
3	8.293M	12.6	+9.5	+0.2	+0.0	+0.1	-40.0	-17.6	29.5	-47.1	Verti 109
4	13.383M	12.3	+9.3	+0.3	+0.0	+0.1	-40.0	-18.0	29.5	-47.5	Verti 109
5	8.383M	12.1	+9.5	+0.2	+0.0	+0.1	-40.0	-18.1	29.5	-47.6	Verti 109
6	12.293M	10.6	+9.3	+0.2	+0.0	+0.1	-40.0	-19.8	29.5	-49.3	Verti 109
7	25.662M	12.5	+6.3	+0.4	+0.1	+0.1	-40.0	-20.6	29.5	-50.1	Verti 109

8	25.563M	12.0	+6.3	+0.4	+0.1	+0.1	-40.0	-21.1	29.5	-50.6	Verti 109
9	94.920k	35.2	+9.7	+0.1	+0.0	+0.1	-80.0	-34.9	28.0	-62.9	Verti 109
10	104.640k	34.4	+9.7	+0.1	+0.0	+0.1	-80.0	-35.7	27.2	-62.9	Verti 109
11	98.400k	33.9	+9.7	+0.1	+0.0	+0.1	-80.0	-36.2	27.7	-63.9	Verti 109
12	100.320k	33.7	+9.7	+0.1	+0.0	+0.1	-80.0	-36.4	27.6	-64.0	Verti 109
13	95.280k	34.0	+9.7	+0.1	+0.0	+0.1	-80.0	-36.1	28.0	-64.1	Verti 109
14	105.480k	33.1	+9.7	+0.1	+0.0	+0.1	-80.0	-37.0	27.2	-64.2	Verti 109
15	98.040k	33.6	+9.7	+0.1	+0.0	+0.1	-80.0	-36.5	27.8	-64.3	Verti 109
16	102.600k	32.9	+9.7	+0.1	+0.0	+0.1	-80.0	-37.2	27.4	-64.6	Verti 109
17	97.200k	33.3	+9.7	+0.1	+0.0	+0.1	-80.0	-36.8	27.8	-64.6	Verti 109
18	104.040k	32.8	+9.7	+0.1	+0.0	+0.1	-80.0	-37.3	27.3	-64.6	Verti 109
19	106.320k	32.4	+9.7	+0.1	+0.0	+0.1	-80.0	-37.7	27.1	-64.8	Verti 109
20	109.680k	31.8	+9.7	+0.1	+0.0	+0.1	-80.0	-38.3	26.8	-65.1	Verti 109

CKC Laboratories, Inc. Date: 8/4/2010 Time: 2:40:49 PM Itron, Inc. WO#: 90893
15.247(d) Radiated Spurious Emissions Test Distance: 3 Meters Vertical Sequence#: 7 Ext ATTN: 0 dB
Frequency Range Investigated: 30 kHz - 30 MHz Temp: 24° C Humidity: 40% Pressure: 102.1 kPa FHSS radio transmitting on 926.8 MHz; AM modulation.



Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • (425) 402-1717

Customer: **Itron, Inc.**
Specification: **15.247(d) Radiated Spurious Emissions**
Work Order #: **90893** Date: 8/4/2010
Test Type: **Maximized Emissions** Time: 2:48:45 PM
Equipment: **(SRR+WWAN+WIFI+GPS RX Internal WWAN & GPS Antenna)** Sequence#: 8
Manufacturer: Itron, Inc. Tested By: Jeff Gilbert
Model: CCU100
S/N: 7404FCC1

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN00052	Loop Antenna	6502	6/8/2010	6/8/2012
T2	ANP05366	Cable	RG-214	10/20/2009	10/20/2011
T3	AN03121	Cable	32026-2-29080-84	10/23/2009	10/23/2011
T4	AN01717	High Pass Filter	F3440-P005	5/27/2010	5/27/2012
	AN02872	Spectrum Analyzer	E4440A	8/25/2009	8/25/2011

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
(SRR+WWAN+WIFI+GPS RX Internal WWAN & GPS Antenna)*	Itron, Inc.	CCU100	7404FCC1
H-pol omni antenna	Taoglas	TIC.95.2F11	NA

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Dell	Latitude D630	9JQRJH1

Test Conditions / Notes:

Frequency Range Investigated: 30 kHz - 30 MHz
Temp: 24° C
Humidity: 40%
Pressure: 102.1 kPa
FHSS radio transmitting on 926.8 MHz; FM modulation.

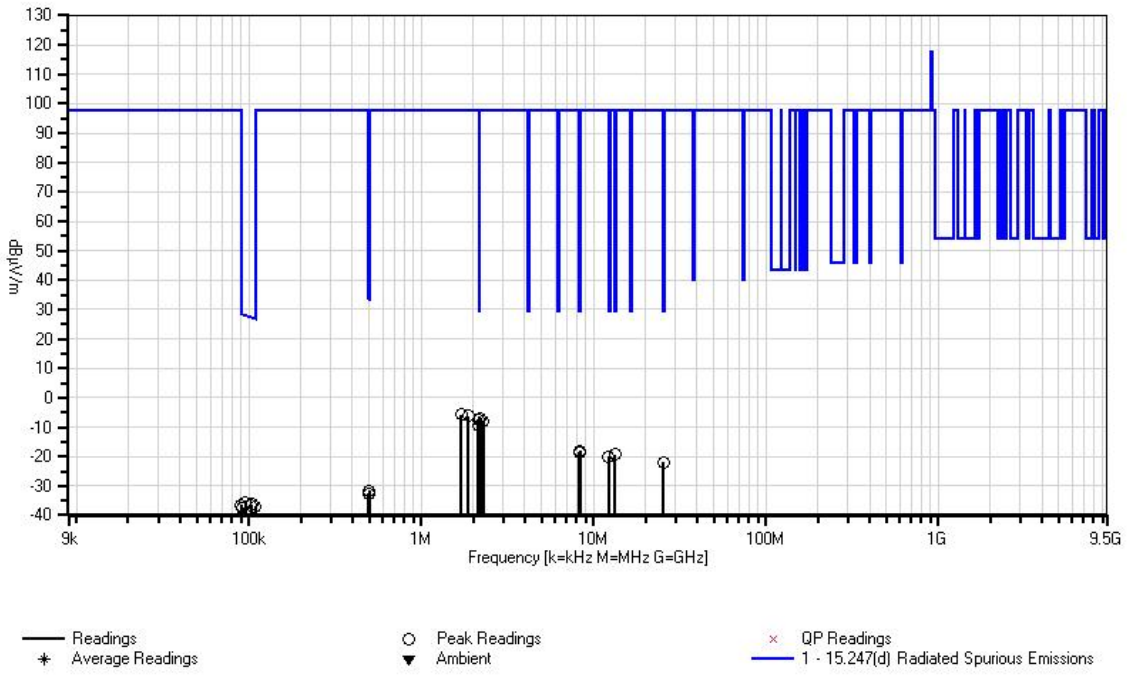
Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	2.176M	20.6	+9.7	+0.1	+0.0	+0.0	-40.0 360	-9.6	29.5	-39.1	Verti 109
2	8.365M	12.1	+9.5	+0.2	+0.0	+0.1	-40.0 360	-18.1	29.5	-47.6	Verti 109
3	8.293M	11.8	+9.5	+0.2	+0.0	+0.1	-40.0 360	-18.4	29.5	-47.9	Verti 109
4	8.383M	11.3	+9.5	+0.2	+0.0	+0.1	-40.0 360	-18.9	29.5	-48.4	Verti 109
5	13.365M	11.1	+9.3	+0.3	+0.0	+0.1	-40.0 360	-19.2	29.5	-48.7	Verti 109
6	12.293M	10.4	+9.3	+0.2	+0.0	+0.1	-40.0 360	-20.0	29.5	-49.5	Verti 109
7	25.509M	11.2	+6.3	+0.4	+0.1	+0.1	-40.0 360	-21.9	29.5	-51.4	Verti 109

8	95.280k	34.7	+9.7	+0.1	+0.0	+0.1	-80.0 360	-35.4	28.0	-63.4	Verti 109
9	104.040k	33.8	+9.7	+0.1	+0.0	+0.1	-80.0 360	-36.3	27.3	-63.6	Verti 109
10	109.440k	33.1	+9.7	+0.1	+0.0	+0.1	-80.0 360	-37.0	26.8	-63.8	Verti 109
11	103.680k	33.4	+9.7	+0.1	+0.0	+0.1	-80.0 360	-36.7	27.3	-64.0	Verti 109
12	90.480k	33.6	+9.7	+0.1	+0.0	+0.1	-80.0 360	-36.5	28.5	-65.0	Verti 109
13	499.650k	38.7	+9.4	+0.1	+0.0	+0.1	-80.0 360	-31.7	33.6	-65.3	Verti 109
14	92.040k	32.5	+9.7	+0.1	+0.0	+0.1	-80.0 360	-37.6	28.3	-65.9	Verti 109
15	495.600k	37.9	+9.4	+0.1	+0.0	+0.1	-80.0 360	-32.5	33.7	-66.2	Verti 109
16	1.707M	24.6	+9.6	+0.1	+0.0	+0.0	-40.0 360	-5.7	97.7	-103.4	Verti 109
17	1.878M	24.1	+9.7	+0.1	+0.0	+0.0	-40.0 360	-6.1	97.7	-103.8	Verti 109
18	2.212M	23.2	+9.7	+0.1	+0.0	+0.0	-40.0 360	-7.0	97.7	-104.7	Verti 109
19	2.140M	22.8	+9.7	+0.1	+0.0	+0.0	-40.0 360	-7.4	97.7	-105.1	Verti 109
20	2.302M	22.4	+9.7	+0.1	+0.0	+0.0	-40.0 360	-7.8	97.7	-105.5	Verti 109

CKC Laboratories, Inc. Date: 8/4/2010 Time: 2:48:45 PM Itron, Inc. WO#: 90893
15.247(d) Radiated Spurious Emissions Test Distance: 3 Meters Vertical Sequence#: 8 Ext ATTN: 0 dB
Frequency Range Investigated: 30 kHz - 30 MHz Temp: 24° C Humidity: 40% Pressure: 102.1 kPa FHSS radio transmitting on 926.8 MHz; FM modulation.



Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • (425) 402-1717

Customer: **Itron, Inc.**
Specification: **15.247(d) Radiated Spurious Emissions**
Work Order #: **90893** Date: 8/10/2010
Test Type: **Maximized Emissions** Time: 13:55:55
Equipment: **(SRR+WWAN+WIFI+GPS RX External WWAN & GPS Antenna)** Sequence#: 15
Manufacturer: Itron, Inc Tested By: Jeff Gilbert
Model: CCU100R
S/N: 7404FCC5

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN01993	Biconilog Antenna	CBL6111C	10/9/2009	10/9/2011
T2	ANP05366	Cable	RG-214	10/20/2009	10/20/2011
T3	AN01517	Preamp	8447D	5/21/2010	5/21/2012
T4	ANP05360	Cable	RG214	11/10/2008	11/10/2010
T5	AN03121	Cable	32026-2-29080-84	10/23/2009	10/23/2011
	AN02872	Spectrum Analyzer	E4440A	8/25/2009	8/25/2011

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
(SRR+WWAN+WIFI+GPS RX External WWAN & GPS Antenna)*	Itron, Inc	CCU100R	7404FCC5
H-pol omni antenna	Taoglas	TIC.95.2F11	
External GPS Antenna	Trimble	57861-00	213100323
External WWAN Antenna	Laird Technologies	FG821/18503	40353

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Dell	Latitude D630	9JQRJH1

Test Conditions / Notes:

Frequency Range Investigated: 30 - 1000 MHz
Temp: 24° C
Humidity: 45%
Pressure: 102.1 kPa
FHSS radio transmitting on 903 MHz; AM modulation.
Wi-Fi and Cell radios are in RX only mode.
Main power supply cable has Laird ferrite 28A2432-0A2.
Cell modem power cable has Laird ferrite 28A0392-0A2.

Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	903.035M	118.3	+23.1 +0.8	+2.3	-29.1	+1.9	+0.0	117.3	117.7 TX Frequency.	-0.4	Horiz 130
2	403.206M QP	52.6	+16.5 +0.5	+1.5	-28.8	+1.3	+0.0 190	43.6	46.0	-2.4	Horiz 185

^	403.180M	59.6	+16.5 +0.5	+1.5	-28.8	+1.3	+0.0 190	50.6	46.0	+4.6	Horiz 185
^	403.215M	52.8	+16.5 +0.5	+1.5	-28.8	+1.3	+0.0	43.8	46.0	-2.2	Horiz 130
5	150.002M QP	53.6	+12.1 +0.3	+0.9	-28.7	+0.8	+0.0 340	39.0	43.5	-4.5	Horiz 215
^	150.002M	56.7	+12.1 +0.3	+0.9	-28.7	+0.8	+0.0 340	42.1	43.5	-1.4	Horiz 215
^	150.002M	54.3	+12.1 +0.3	+0.9	-28.7	+0.8	+0.0	39.7	43.5	-3.8	Horiz 130
8	156.849M	51.9	+11.6 +0.3	+0.9	-28.6	+0.8	+0.0	36.9	43.5	-6.6	Horiz 130
9	322.134M	50.6	+14.2 +0.4	+1.3	-28.3	+1.2	+0.0	39.4	46.0	-6.6	Horiz 130
10	135.828M	51.6	+12.1 +0.3	+0.8	-28.8	+0.7	+0.0	36.7	43.5	-6.8	Horiz 130
11	137.750M	51.0	+12.1 +0.3	+0.8	-28.7	+0.7	+0.0	36.2	43.5	-7.3	Horiz 130
12	284.897M	50.9	+13.3 +0.4	+1.1	-28.2	+1.0	+0.0	38.5	46.0	-7.5	Horiz 130
13	322.855M	49.5	+14.2 +0.4	+1.3	-28.3	+1.2	+0.0	38.3	46.0	-7.7	Horiz 130
14	405.137M	47.1	+16.5 +0.5	+1.5	-28.8	+1.3	+0.0	38.1	46.0	-7.9	Horiz 130
15	613.185M	43.2	+20.0 +0.6	+1.8	-29.5	+1.6	+0.0	37.7	46.0	-8.3	Horiz 130
16	241.894M	51.2	+12.2 +0.4	+1.1	-28.2	+1.0	+0.0	37.7	46.0	-8.3	Horiz 130
17	401.413M	46.4	+16.4 +0.5	+1.5	-28.8	+1.3	+0.0	37.3	46.0	-8.7	Horiz 130
18	322.615M	48.3	+14.2 +0.4	+1.3	-28.3	+1.2	+0.0	37.1	46.0	-8.9	Horiz 130
19	404.657M	46.1	+16.5 +0.5	+1.5	-28.8	+1.3	+0.0	37.1	46.0	-8.9	Horiz 130
20	323.456M	47.1	+14.3 +0.4	+1.3	-28.3	+1.3	+0.0	36.1	46.0	-9.9	Horiz 130
21	162.855M	49.0	+11.1 +0.3	+0.9	-28.6	+0.8	+0.0	33.5	43.5	-10.0	Horiz 130
22	123.936M	47.9	+12.1 +0.2	+0.8	-28.8	+0.7	+0.0	32.9	43.5	-10.6	Horiz 130
23	406.338M	44.2	+16.5 +0.5	+1.5	-28.9	+1.3	+0.0	35.1	46.0	-10.9	Horiz 130
24	901.994M	87.3	+23.1 +0.8	+2.3	-29.1	+1.9	+0.0 100	86.3	97.7 Bandedge	-11.4	Horiz 110
25	902.000M	87.2	+23.1 +0.8	+2.3	-29.1	+1.9	+0.0 100	86.2	97.7 Bandedge	-11.5	Horiz 110
26	402.209M QP	43.2	+16.4 +0.5	+1.5	-28.8	+1.3	+0.0 170	34.1	46.0	-11.9	Horiz 186
^	402.134M	56.9	+16.4 +0.5	+1.5	-28.8	+1.3	+0.0 170	47.8	46.0	+1.8	Horiz 186
^	402.134M	54.8	+16.4 +0.5	+1.5	-28.8	+1.3	+0.0	45.7	46.0	-0.3	Horiz 130

CKC Laboratories, Inc. Date: 8/10/2010 Time: 13:55:55 Itron, Inc. WO#: 90893
15.247(d) Radiated Spurious Emissions Test Distance: 3 Meters Horizontal Sequence#: 15 Ext ATTN: 0 dB