

Ittron, Inc.

ADDENDUM TEST REPORT FOR 90893-10B

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 Issue 8

Report No.: 90893-10D

Date of issue: March 8, 2011



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:

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

Representative: Jay Holcomb
Customer Reference Number: 23603

DATE OF EQUIPMENT RECEIPT:**DATE(S) OF TESTING:****REPORT PREPARED BY:**

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

Project Number: 90893

December 6, 2010

December 6, 2010 - February 2, 2011

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.

Addendum B: Testing of the CCU100 & CCU100R, (SRR+WWAN+WIFI+GPS RX-Internal WWAN & GPS Antenna) to Part 15 Subpart C Section 15.247 (FHSS) and RSS-210 Version 8 in accordance with Class II Permissive Change requirements in order to add a 3 dB vertically polarized antenna.

Addendum C: This addendum is to amend incorrect Peak Power data reported in 90893-10A, which was the original test data. Also corrected was the addition of a 10 dB attenuator that was actually used during testing but was accidentally left out of the reporting information for 15.31, 15.241(a)(1) and 15.241(a)(1)(i).

Addendum D: This addendum is to correct the reason for the data reported in 90893-10B, which is the data for a Class II Permissive Change (PC II). The PC II explanation was incorrectly worded as a 3dB instead of a 3 dBd (5.15 dBi) vertically polarized antenna.

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)

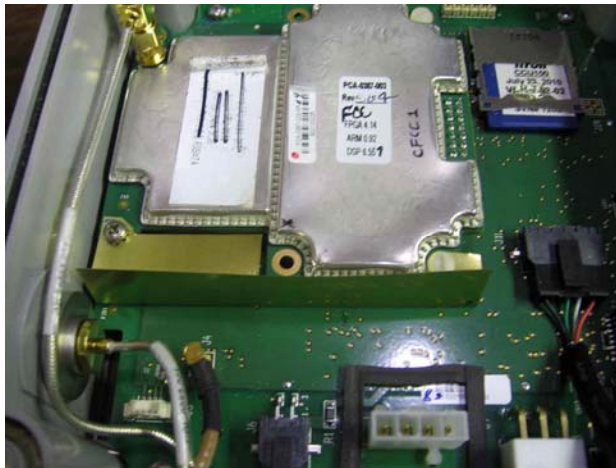
Description	Test Procedure/Method	Results
Peak Conducted Power	FCC Part 15 Subpart C Section 15.247(b)(2)/ DA00-705	Pass
Radiated Spurious	FCC Part 15 Subpart C Section 15.247(d)/ DA00-705	Pass

Conditions During Testing

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

Summary of Conditions

Brass shim stock was added to the EUT in order to pass radiated spurious emissions above 1GHz. See photos for location of shim stock.



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: 7404FCC1

V-Pol omni ISM antenna

Manuf: Antenna Products

Model: AMR360-902-5-T0-N

Serial: 0852

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

Manuf: Itron, Inc.

Model: CCU100R

Serial: 7404FCC3

PERIPHERAL DEVICES

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

Laptop

Manuf: Dell

Model: Latitude E6400

Serial: H4CSTK1

Laptop

Manuf: Dell

Model: Latitude D630

Serial: H4CSTK1

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.

15.247(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: 12/6/2010

Test Type: **Maximized Emissions**

Time: 07:42:02

Equipment: **SRR+WWAN+WIFI+GPS RX
(external WWAN & GPS antenna)**

Sequence#: 4

Manufacturer: Itron, Inc

Tested By: Jeff Gilbert

Model: CCU100R

S/N: 7404FCC3

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	9/8/2010	9/8/2012
	AN02872	Spectrum Analyzer	E4440A	8/25/2009	8/25/2011

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
SRR+WWAN+WIFI+GPS RX (external WWAN & GPS antenna)*	Itron, Inc	CCU100R	7404FCC3

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Dell	Latitude E6400	H4CSTK1

Test Conditions / Notes:

Frequency Range Investigated: 902 - 928 MHz
 Temp: 19° C
 Humidity: 28%
 Pressure: 102.1 kPa
 EUT is a FHSS radio operating in the 902 - 928 MHz ISM band.
 AM Modulation
 240VAC / 60 Hz
 Peak RF Output power tested per DA-00-705.
 RBW: 100 kHz, VBW: 300 kHz, Span: 500 kHz, Peak Det.
 This is a verification of conducted RF power for a Class II permissive change to the antenna.

Ext Attn: 0 dB

Measurement Data:

Reading listed by margin.

Test Distance: None

#	Freq MHz	Rdng dBμV	T1 dB	T2 dB		Dist Table	Corr dBm	Spec dBm	Margin dB	Polar Ant
1	915.001M	17.5	+0.8	+9.7		+0.0	28.0	30.0	-2.0	Condu 101
2	903.003M	15.3	+0.8	+9.7		+0.0	25.8	30.0	-4.2	Condu 101
3	926.798M	12.8	+0.8	+9.7		+0.0	23.3	30.0	-6.7	Condu 101

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: 12/6/2010
 Test Type: **Maximized Emissions** Time: 07:49:17
 Equipment: **SRR+WWAN+WIFI+GPS RX** Sequence#: 5
(external WWAN & GPS antenna)
 Manufacturer: Itron, Inc. Tested By: Jeff Gilbert
 Model: CCU100R
 S/N: 7404FCC3

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	9/8/2010	9/8/2012
	AN02872	Spectrum Analyzer	E4440A	8/25/2009	8/25/2011

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
SRR+WWAN+WIFI+GPS RX (external WWAN & GPS antenna)*	Itron, Inc	CCU100R	7404FCC3

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Dell	Latitude E6400	H4CSTK1

Test Conditions / Notes:

Frequency Range Investigated: 902 - 928 MHz
 Temp: 19° C
 Humidity: 28%
 Pressure: 102.1 kPa
 EUT is a FHSS radio operating in the 902 - 928 MHz ISM band.
 FM Modulation - 12.5 kBaud
 240VAC / 60 Hz
 Peak RF Output power tested per DA-00-705.
 RBW: 150 kHz, VBW: 430 kHz, Span: 1 MHz, Peak Det.
 This is a verification of conducted RF power for a Class II permissive change to the antenna.

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	915.063M	17.3	+0.8	+9.7			+0.0	27.8	30.0	-2.2	Condu 101
2	903.054M	15.2	+0.8	+9.7			+0.0	25.7	30.0	-4.3	Condu 101
3	926.743M	12.1	+0.8	+9.7			+0.0	22.6	30.0	-7.4	Condu 101

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: 12/6/2010
 Test Type: **Maximized Emissions** Time: 07:53:05
 Equipment: **SRR+WWAN+WIFI+GPS RX** Sequence#: 6
(external WWAN & GPS antenna)
 Manufacturer: Itron, Inc Tested By: Jeff Gilbert
 Model: CCU100R
 S/N: 7404FCC3

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	9/8/2010	9/8/2012
	AN02872	Spectrum Analyzer	E4440A	8/25/2009	8/25/2011

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
SRR+WWAN+WIFI+GPS RX (external WWAN & GPS antenna)*	Itron, Inc	CCU100R	7404FCC3

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Dell	Latitude E6400	H4CSTK1

Test Conditions / Notes:

Frequency Range Investigated: 902 - 928 MHz
 Temp: 19° C
 Humidity: 28%
 Pressure: 102.1 kPa
 EUT is a FHSS radio operating in the 902 - 928 MHz ISM band.
 FM Modulation - 37.5 kBaud
 240VAC / 60 Hz
 Peak RF Output power tested per DA-00-705.
 RBW: 100 kHz, VBW: 300 kHz, Span: 500 kHz, Peak Det.

This is a verification of conducted RF power for a Class II permissive change to the antenna.

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	915.021M	17.2	+0.8	+9.7			+0.0	27.7	30.0	-2.3	Condu 101
2	903.019M	15.2	+0.8	+9.7			+0.0	25.7	30.0	-4.3	Condu 101
3	926.781M	11.7	+0.8	+9.7			+0.0	22.2	30.0	-7.8	Condu 101

Test Setup Photos



PEAK CONDUCTED POWER

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: 12/7/2010

Test Type: **Radiated Scan**

Time: 11:20:39 AM

Equipment: **SRR+WWAN+WIFI+GPS RX
(internal WWAN & GPS antenna)**

Sequence#: 20

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	ANP05360	Cable	RG214	11/8/2010	11/8/2012
T4	AN03121	Cable	32026-2-29080-84	10/23/2009	10/23/2011
T5	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
V-Pol omni ISM antenna	Antenna Products	AMR360-902-5-T0-N	0852
SRR+WWAN+WIFI+GPS RX (internal WWAN & GPS antenna)*	Itron, Inc.	CCU100	7404FCC1

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Dell	Latitude D630	H4CSTK1

Test Conditions / Notes:

Frequency Range Investigated: 30 kHz - 30 MHz

Temp: 21° C

Humidity: 38%

Pressure: 100.6 kPa

FHSS radio is transmitting on 903 MHz, AM Modulation, 915 MHz, FM Modulation, 12.5 kBaud, 926.8 MHz, FM Modulation, 12.5 kBaud.

The PA voltage on the Wi-Fi radio is off.

The Cell radio is off.

GPS receiver is on.

Ext Attn: 0 dB

Measurement Data:

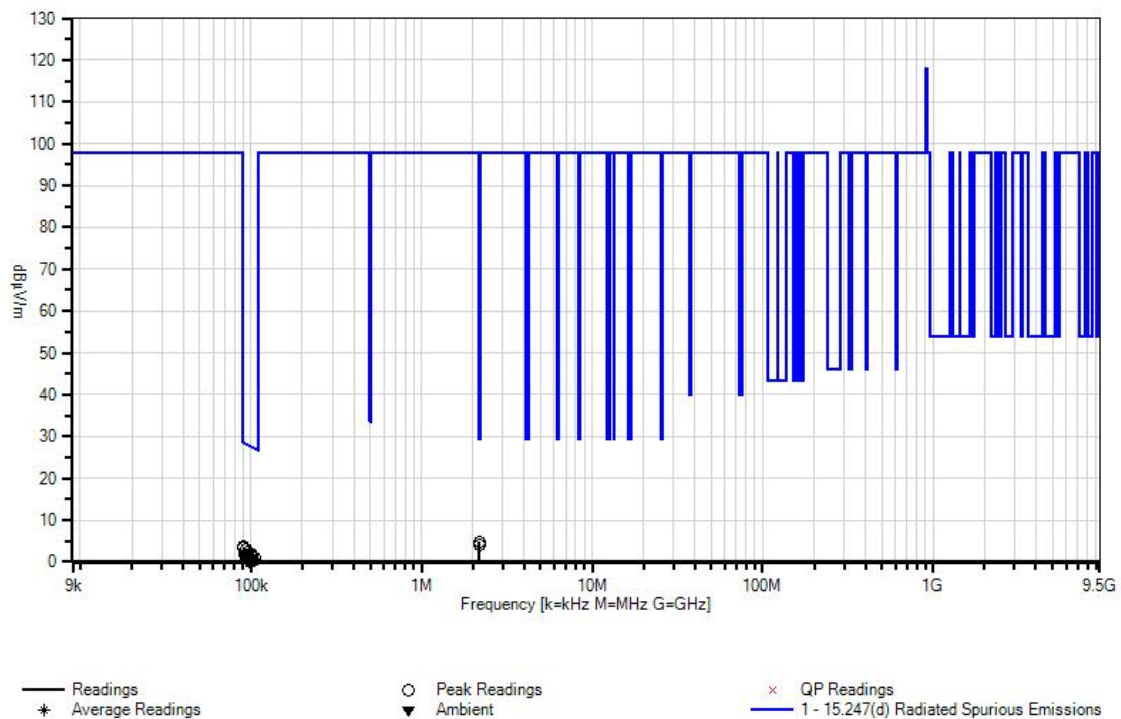
Reading listed by margin.

Test Distance: 3 Meters

#	Freq MHz	Rdng dB μ V	T1 T5 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dB μ V/m	Spec dB μ V/m	Margin dB	Polar Ant
1	2.185M	35.0	+9.7 +0.0	+0.1	+0.0	+0.0	-40.0	4.8	29.5	-24.7	Verti 100
2	2.185M	35.0	+9.7 +0.0	+0.1	+0.0	+0.0	-40.0	4.8	29.5	-24.7	Verti 100
3	90.600k	73.7	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	3.6	28.4	-24.8	Verti 100
4	90.480k	73.6	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0 360	3.5	28.5	-25.0	Verti 101
5	93.120k	73.2	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0 360	3.1	28.2	-25.1	Verti 101
6	2.176M	34.3	+9.7 +0.0	+0.1	+0.0	+0.0	-40.0 360	4.1	29.5	-25.4	Verti 101
7	94.920k	72.6	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0 360	2.5	28.0	-25.5	Verti 101
8	98.880k	72.0	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0 360	1.9	27.7	-25.8	Verti 101
9	100.560k	71.8	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0 360	1.7	27.6	-25.9	Verti 101
10	105.840k	71.2	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0 360	1.1	27.1	-26.0	Verti 101
11	98.400k	71.7	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0 360	1.6	27.7	-26.1	Verti 101
12	93.600k	71.9	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0 360	1.8	28.2	-26.4	Verti 101
13	94.800k	71.8	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	1.7	28.1	-26.4	Verti 100
14	92.400k	71.9	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	1.8	28.3	-26.5	Verti 100
15	93.720k	71.7	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	1.6	28.2	-26.6	Verti 100
16	100.800k	70.9	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	0.8	27.5	-26.7	Verti 100
17	96.840k	71.1	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	1.0	27.9	-26.9	Verti 100
18	95.880k	71.1	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	1.0	28.0	-27.0	Verti 100
19	101.640k	70.5	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	0.4	27.5	-27.1	Verti 100
20	102.960k	70.4	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	0.3	27.4	-27.1	Verti 100
21	104.160k	70.3	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	0.2	27.3	-27.1	Verti 100
22	98.880k	70.5	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	0.4	27.7	-27.3	Verti 100
23	99.360k	70.4	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	0.3	27.7	-27.4	Verti 100

24	107.400k	69.5	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	-0.6	27.0	-27.6	Verti 100
25	98.400k	70.2	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	0.1	27.7	-27.6	Verti 100
26	107.160k	69.3	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	-0.8	27.0	-27.8	Verti 100
27	106.680k	69.3	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	-0.8	27.1	-27.9	Verti 100

CKC Laboratories, Inc. Date: 12/7/2010 Time: 11:20:39 AM Itron, Inc. WO#: 90893
 15.247(d) Radiated Spurious Emissions Test Distance: 3 Meters Vertical Sequence#: 20 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: 12/6/2010
 Test Type: **Maximized Emissions** Time: 09:38:08
 Equipment: **SRR+WWAN+WIFI+GPS RX** Sequence#: 2
(internal WWAN & GPS antenna)
 Manufacturer: Itron, Inc. Tested By: Jeff Gilbert
 Model: CCU100
 S/N: 7404FCC1

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	11/8/2010	11/8/2012
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 (internal WWAN & GPS antenna)*	Itron, Inc.	CCU100	7404FCC1
V-Pol omni ISM antenna	Antenna Products	AMR360-902-5-T0-N	0852

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Dell	Latitude D630	H4CSTK1

Test Conditions / Notes:

Frequency Range Investigated: 30 - 1000 MHz
 Temp: 20° C
 Humidity: 27%
 Pressure: 102.3 kPa
 FHSS radio transmitting on 903 MHz; AM modulation, 915 MHz; AM modulation, 926.8 MHz; AM modulation.
 The PA voltage on the Wi-Fi radio is off.
 The Cell radio is off.
 Testing per DA 00-705.
 Vertical data represents worst case polarization

Ext Attn: 0 dB

Measurement Data:

Reading listed by margin.

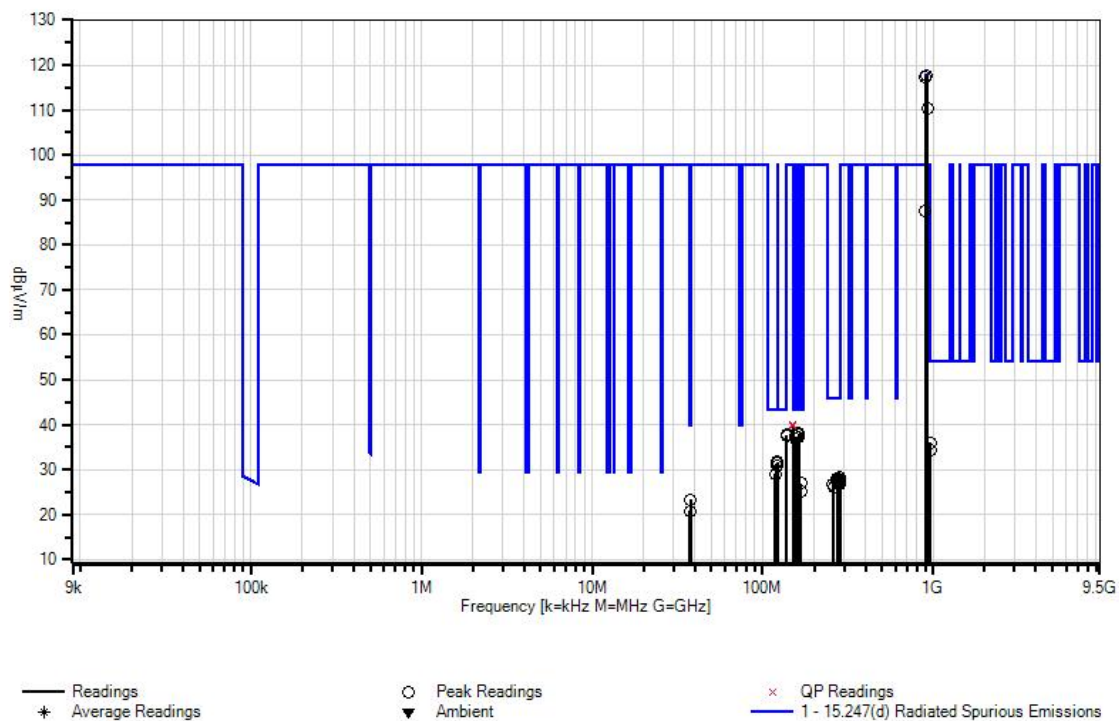
Test Distance: 3 Meters

#	Freq MHz	Rdng dB μ V	T1 T5 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dB μ V/m	Spec dB μ V/m	Margin dB	Polar Ant
1	915.047M	118.5	+23.3 +0.8	+2.3	-29.1	+2.0	+0.0 360	117.8	117.8	+0.0	Verti 130
2	903.035M	118.4	+23.1 +0.8	+2.3	-29.1	+1.9	+0.0 360	117.4	117.8	-0.4	Verti 130
3	149.906M QP	54.8	+12.1 +0.3	+0.9	-28.7	+0.7	+0.0 75	40.1	43.5	-3.4	Verti 100
4	149.954M QP	54.8	+12.1 +0.3	+0.9	-28.7	+0.7	+0.0 75	40.1	43.5	-3.4	Verti 100
5	149.906M QP	54.4	+12.1 +0.3	+0.9	-28.7	+0.7	+0.0 75	39.7	43.5	-3.8	Verti 101
^	149.905M	57.4	+12.1 +0.3	+0.9	-28.7	+0.7	+0.0 75	42.7	43.5	-0.8	Verti 100
^	149.916M	57.3	+12.1 +0.3	+0.9	-28.7	+0.7	+0.0 75	42.6	43.5	-0.9	Verti 101
^	149.906M	57.1	+12.1 +0.3	+0.9	-28.7	+0.7	+0.0 75	42.4	43.5	-1.1	Verti 100
^	150.002M	56.2	+12.1 +0.3	+0.9	-28.7	+0.7	+0.0 360	41.5	43.5	-2.0	Verti 130
^	150.002M	56.1	+12.1 +0.3	+0.9	-28.7	+0.7	+0.0 360	41.4	43.5	-2.1	Verti 130
^	150.002M	54.9	+12.1 +0.3	+0.9	-28.7	+0.7	+0.0 360	40.2	43.5	-3.3	Verti 130
12	162.735M	53.7	+11.1 +0.3	+0.9	-28.6	+0.7	+0.0 360	38.1	43.5	-5.4	Verti 130
13	137.990M	52.7	+12.1 +0.3	+0.8	-28.7	+0.6	+0.0 360	37.8	43.5	-5.7	Verti 130
14	162.255M	53.2	+11.2 +0.3	+0.9	-28.6	+0.7	+0.0 360	37.7	43.5	-5.8	Verti 130
15	137.750M	52.5	+12.1 +0.3	+0.8	-28.7	+0.6	+0.0 360	37.6	43.5	-5.9	Verti 130
16	137.990M	52.4	+12.1 +0.3	+0.8	-28.7	+0.6	+0.0 360	37.5	43.5	-6.0	Verti 130
17	156.849M	52.5	+11.6 +0.3	+0.9	-28.6	+0.7	+0.0 360	37.4	43.5	-6.1	Verti 130
18	162.855M	52.8	+11.1 +0.3	+0.9	-28.6	+0.7	+0.0 360	37.2	43.5	-6.3	Verti 130
19	156.849M	52.0	+11.6 +0.3	+0.9	-28.6	+0.7	+0.0 360	36.9	43.5	-6.6	Verti 130
20	156.849M	52.0	+11.6 +0.3	+0.9	-28.6	+0.7	+0.0 360	36.9	43.5	-6.6	Verti 130
21	926.818M	110.9	+23.5 +0.8	+2.4	-29.1	+2.0	+0.0 360	110.5	117.8	-7.3	Verti 130
22	901.713M	88.4	+23.1 +0.8	+2.3	-29.1	+1.9	+0.0 360	87.4	97.8	-10.4	Verti 130
23	121.414M	47.5	+11.5 +0.2	+0.8	-28.8	+0.6	+0.0 360	31.8	43.5	-11.7	Verti 130

24	121.294M	47.2	+11.4 +0.2	+0.8	-28.8	+0.6	+0.0 360	31.4	43.5	-12.1	Verti 130
25	121.894M	46.5	+11.6 +0.2	+0.8	-28.8	+0.6	+0.0 360	30.9	43.5	-12.6	Verti 130
26	117.930M	45.4	+11.0 +0.2	+0.7	-28.8	+0.6	+0.0 360	29.1	43.5	-14.4	Verti 130
27	167.780M	43.0	+10.6 +0.3	+0.9	-28.6	+0.7	+0.0 360	26.9	43.5	-16.6	Verti 130
28	37.653M	38.9	+12.4 +0.1	+0.5	-28.9	+0.3	+0.0 360	23.3	40.0	-16.7	Verti 130
29	283.095M	40.8	+13.2 +0.4	+1.1	-28.2	+0.9	+0.0 360	28.2	46.0	-17.8	Verti 130
30	961.995M	36.2	+23.9 +0.8	+2.2	-29.1	+2.0	+0.0 360	36.0	54.0	-18.0	Verti 130
31	273.726M	40.7	+13.1 +0.4	+1.1	-28.2	+0.9	+0.0 360	28.0	46.0	-18.0	Verti 130
32	275.888M	40.7	+13.1 +0.4	+1.1	-28.2	+0.9	+0.0 360	28.0	46.0	-18.0	Verti 130
33	167.900M	41.5	+10.5 +0.3	+0.9	-28.6	+0.7	+0.0 360	25.3	43.5	-18.2	Verti 130
34	284.777M	40.2	+13.3 +0.4	+1.1	-28.2	+0.9	+0.0 360	27.7	46.0	-18.3	Verti 130
35	167.900M	41.4	+10.5 +0.3	+0.9	-28.6	+0.7	+0.0 360	25.2	43.5	-18.3	Verti 130
36	273.366M	40.4	+13.1 +0.4	+1.1	-28.2	+0.9	+0.0 360	27.7	46.0	-18.3	Verti 130
37	280.693M	40.1	+13.2 +0.4	+1.1	-28.2	+0.9	+0.0 360	27.5	46.0	-18.5	Verti 130
38	277.209M	40.0	+13.2 +0.4	+1.1	-28.2	+0.9	+0.0 360	27.4	46.0	-18.6	Verti 130
39	279.251M	39.9	+13.2 +0.4	+1.1	-28.2	+0.9	+0.0 360	27.3	46.0	-18.7	Verti 130
40	284.176M	39.6	+13.3 +0.4	+1.1	-28.2	+0.9	+0.0 360	27.1	46.0	-18.9	Verti 130
41	274.927M	39.8	+13.1 +0.4	+1.1	-28.2	+0.9	+0.0 360	27.1	46.0	-18.9	Verti 130
42	282.495M	39.6	+13.2 +0.4	+1.1	-28.2	+0.9	+0.0 360	27.0	46.0	-19.0	Verti 130
43	276.729M	39.7	+13.1 +0.4	+1.1	-28.2	+0.9	+0.0 360	27.0	46.0	-19.0	Verti 130
44	277.450M	39.6	+13.2 +0.4	+1.1	-28.2	+0.9	+0.0 360	27.0	46.0	-19.0	Verti 130
45	278.771M	39.5	+13.2 +0.4	+1.1	-28.2	+0.9	+0.0 360	26.9	46.0	-19.1	Verti 130
46	280.333M	39.4	+13.2 +0.4	+1.1	-28.2	+0.9	+0.0 360	26.8	46.0	-19.2	Verti 130
47	258.711M	39.7	+12.9 +0.4	+1.1	-28.2	+0.9	+0.0 360	26.8	46.0	-19.2	Verti 130

48	37.520M	36.4	+12.4 +0.1	+0.5	-28.9	+0.3	+0.0 360	20.8	40.0	-19.2	Verti 130
49	276.369M	39.5	+13.1 +0.4	+1.1	-28.2	+0.9	+0.0 360	26.8	46.0	-19.2	Verti 130
50	961.995M	34.6	+23.9 +0.8	+2.2	-29.1	+2.0	+0.0 360	34.4	54.0	-19.6	Verti 130
51	259.432M	39.0	+12.9 +0.4	+1.1	-28.2	+0.9	+0.0 360	26.1	46.0	-19.9	Verti 130

CKC Laboratories, Inc. Date: 12/6/2010 Time: 09:38:08 Iron, Inc. WO#: 90893
15.247(d) Radiated Spurious Emissions Test Distance: 3 Meters Vertical Sequence#: 2 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: 2/2/2011
 Test Type: **Radiated Scan** Time: 09:00:38
 Equipment: **SRR+WWAN+WIFI+GPS RX** Sequence#: 31
(internal WWAN & GPS antenna)
 Manufacturer: Itron, Inc. Tested By: Jeff Gilbert
 Model: CCU100
 S/N: 7404FCC1

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN01467	Horn Antenna-ANSI C63.5 Calibration	3115	5/7/2010	5/7/2012
T2	AN03170	High Pass Filter	HM1155-11SS	9/14/2009	9/14/2011
T3	AN03123	Cable	32026-2-29801-12	10/23/2009	10/23/2011
T4	AN01271	Preamp	83017A	9/17/2009	9/17/2011
T5	ANP05542	Cable	Heliac	10/23/2009	10/23/2011
T6	AN03121	Cable	32026-2-29080-84	10/23/2009	10/23/2011
T7	ANCOR-WO90893-20100811	Duty Cycle Correction Factor		8/11/2010	8/11/2011
	AN02872	Spectrum Analyzer	E4440A	8/25/2009	8/25/2011

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
V-Pol omni ISM antenna	Antenna Products	AMR360-902-5-T0-N	0852
SRR+WWAN+WIFI+GPS RX (internal WWAN & GPS antenna)*	Itron, Inc.	CCU100	7404FCC1

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Dell	Latitude D630	H4CSTK1

Test Conditions / Notes:

Frequency Range Investigated: 1000 - 9300 MHz
 Temp: 17° C
 Humidity: 31%
 Pressure: 103.8 kPa

FHSS radio is transmitting on 903, 915, 926.8 MHz, FM Modulation, 12.5 kBaud.
 Investigation has shown this modulation to produce worst case emissions.
 The PA voltage on the Wi-Fi radio is off.
 The Cell radio is off.
 GPS receiver is on.

Ext Attn: 0 dB

Measurement Data:

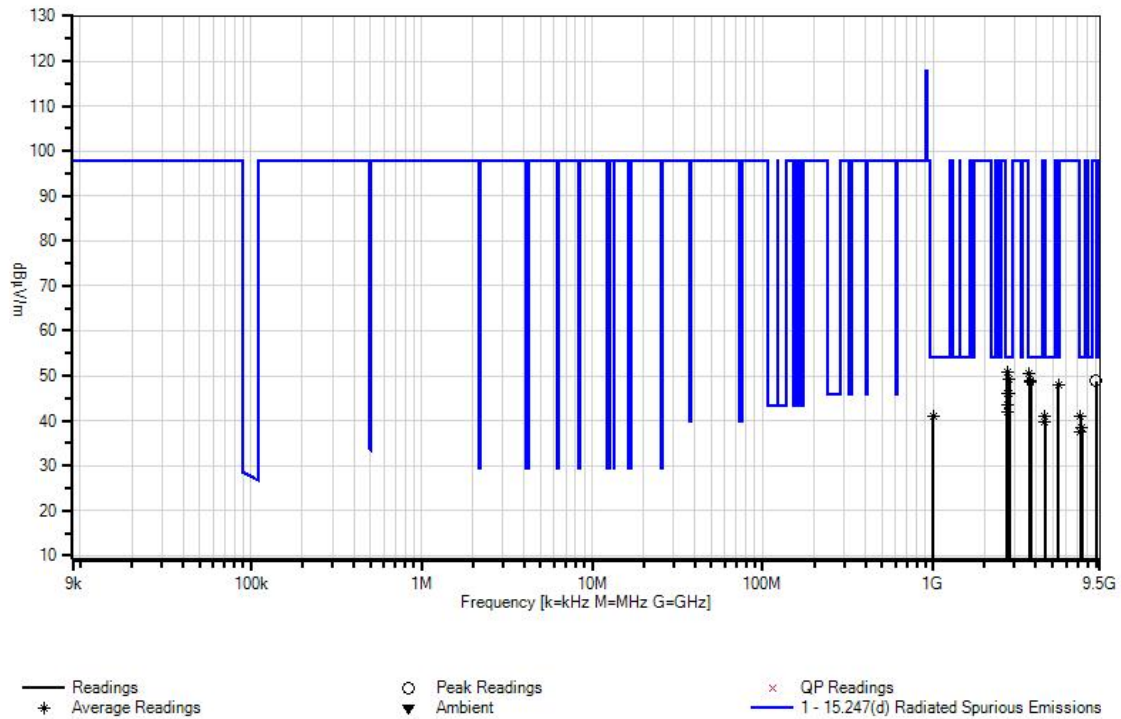
Reading listed by margin.

Test Distance: 3 Meters

#	Freq MHz	Rdng dBμV	T1 T5 dB	T2 T6 dB	T3 T7 dB	T4 dB	Dist Table	Corr dBμV/m	Spec dBμV/m	Margin dB	Polar Ant
1	2708.967M Ave	65.8	+28.4 +3.0	+0.2 +1.5	+0.3 -14.0	-34.3	+0.0 30	50.9	54.0 Duty Cycle Corr.	-3.1	Horiz 105
^	2708.900M	69.8	+28.4 +3.0	+0.2 +1.5	+0.3 +0.0	-34.3	+0.0 30	68.9	54.0	+14.9	Horiz 105
3	3660.030M Ave	47.6	+30.8 +3.6	+0.2 +1.8	+0.3 +0.0	-33.8	+0.0 320	50.5	54.0	-3.5	Horiz 104
^	3660.100M	50.8	+30.8 +3.6	+0.2 +1.8	+0.3 +0.0	-33.8	+0.0 320	53.7	54.0	-0.3	Horiz 104
5	2780.406M Ave	63.6	+28.6 +3.1	+0.2 +1.6	+0.3 -14.0	-34.3	+0.0 25	49.1	54.0 Duty Cycle Corr.	-4.9	Verti 105
^	2780.460M	65.9	+28.6 +3.1	+0.2 +1.6	+0.3 +0.0	-34.3	+0.0 25	65.4	54.0	+11.4	Verti 105
7	9029.608M	37.8	+36.6 +5.7	+0.2 +2.6	+0.3 +0.0	-34.3	+0.0 360	48.9	54.0	-5.1	Verti 130
8	3707.212M Ave	45.7	+30.9 +3.7	+0.2 +1.8	+0.3 +0.0	-33.8	+0.0	48.8	54.0	-5.2	Verti 100
^	3707.200M	49.3	+30.9 +3.7	+0.2 +1.8	+0.3 +0.0	-33.8	+0.0	52.4	54.0	-1.6	Verti 100
10	3707.188M Ave	45.4	+30.9 +3.7	+0.2 +1.8	+0.3 +0.0	-33.8	+0.0 38	48.5	54.0	-5.5	Horiz 155
^	3707.100M	49.3	+30.9 +3.7	+0.2 +1.8	+0.3 +0.0	-33.8	+0.0 38	52.4	54.0	-1.6	Horiz 155
12	5418.018M Ave	40.6	+33.9 +4.6	+0.2 +2.1	+0.5 +0.0	-33.9	+0.0 7	48.0	54.0	-6.0	Horiz 128
^	5418.024M	47.2	+33.9 +4.6	+0.2 +2.1	+0.5 -14.0	-33.9	+0.0 7	40.6	54.0	-13.4	Horiz 128
14	2780.418M Ave	60.5	+28.6 +3.1	+0.2 +1.6	+0.3 -14.0	-34.3	+0.0 47	46.0	54.0 Duty Cycle Corr.	-8.0	Horiz 161
^	2780.450M	61.9	+28.6 +3.1	+0.2 +1.6	+0.3 +0.0	-34.3	+0.0 47	61.4	54.0	+7.4	Horiz 161
16	2744.961M Ave	60.6	+28.5 +3.1	+0.2 +1.5	+0.3 -14.0	-34.3	+0.0 20	45.9	54.0 Duty Cycle Corr.	-8.1	Verti 110
^	2744.961M	67.3	+28.5 +3.1	+0.2 +1.5	+0.3 +0.0	-34.3	+0.0 20	66.6	54.0	+12.6	Verti 110
18	2709.060M Ave	58.3	+28.4 +3.0	+0.2 +1.5	+0.3 -14.0	-34.3	+0.0 40	43.4	54.0 Duty Cycle Corr.	-10.6	Verti 135
^	2709.065M	67.2	+28.4 +3.0	+0.2 +1.5	+0.3 +0.0	-34.3	+0.0 40	66.3	54.0	+12.3	Verti 135
^	2709.100M	65.7	+28.4 +3.0	+0.2 +1.5	+0.3 +0.0	-34.3	+0.0 360	64.8	54.0	+10.8	Verti 130
21	2745.006M Ave	56.7	+28.5 +3.1	+0.2 +1.5	+0.3 -14.0	-34.3	+0.0 355	42.0	54.0 Duty Cycle Corr.	-12.0	Horiz 170
^	2745.010M	63.0	+28.5 +3.1	+0.2 +1.5	+0.3 +0.0	-34.3	+0.0 355	62.3	54.0	+8.3	Horiz 170
23	7320.261M Ave	45.1	+36.1 +5.2	+0.2 +2.4	+0.5 -14.0	-34.6	+0.0 95	40.9	54.0 Duty Cycle Corr.	-13.1	Horiz 205

^ 7320.300M	51.6	+36.1	+0.2	+0.5	-34.6	+0.0	61.4	54.0	+7.4	Horiz
		+5.2	+2.4	+0.0		95				205
25 1000.729M	31.6	+23.4	+20.4	+0.1	-37.2	+0.0	40.9	54.0	-13.1	Verti
Ave		+1.8	+0.8	+0.0						100
^ 1000.729M	43.1	+23.4	+20.4	+0.1	-37.2	+0.0	52.4	54.0	-1.6	Verti
		+1.8	+0.8	+0.0		360				130
27 4515.003M	49.5	+32.6	+0.3	+0.4	-33.9	+0.0	40.9	54.0	-13.1	Horiz
Ave		+4.1	+1.9	-14.0		85		Duty Cycle Corr.		131
^ 4515.010M	52.6	+32.6	+0.3	+0.4	-33.9	+0.0	58.0	54.0	+4.0	Horiz
		+4.1	+1.9	+0.0		85				131
29 4515.036M	48.2	+32.6	+0.3	+0.4	-33.9	+0.0	39.6	54.0	-14.4	Verti
Ave		+4.1	+1.9	-14.0		345		Duty Cycle Corr.		110
^ 4515.040M	51.6	+32.6	+0.3	+0.4	-33.9	+0.0	57.0	54.0	+3.0	Verti
		+4.1	+1.9	+0.0		345				110
^ 4515.011M	49.1	+32.6	+0.3	+0.4	-33.9	+0.0	54.5	54.0	+0.5	Verti
		+4.1	+1.9	+0.0		360				130
32 7414.718M	42.4	+36.2	+0.2	+0.5	-34.6	+0.0	38.3	54.0	-15.7	Horiz
Ave		+5.3	+2.3	-14.0		30		Duty Cycle Corr.		115
^ 7414.800M	51.3	+36.2	+0.2	+0.5	-34.6	+0.0	61.2	54.0	+7.2	Horiz
		+5.3	+2.3	+0.0		30				115
34 7320.327M	41.8	+36.1	+0.2	+0.5	-34.6	+0.0	37.6	54.0	-16.4	Verti
Ave		+5.2	+2.4	-14.0		12		Duty Cycle Corr.		155
^ 7320.400M	49.5	+36.1	+0.2	+0.5	-34.6	+0.0	59.3	54.0	+5.3	Verti
		+5.2	+2.4	+0.0		12				155

CKC Laboratories, Inc. Date: 2/2/2011 Time: 09:00:38 Itron, Inc. WO#: 90893
 15.247(d) Radiated Spurious Emissions Test Distance: 3 Meters H & V Sequence#: 31 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: 12/14/2010
 Test Type: **Maximized Emissions** Time: 12:22:51 PM
 Equipment: **SRR+WWAN+WIFI+GPS RX** Sequence#: 38
(external WWAN & GPS antenna)
 Manufacturer: Itron, Inc Tested By: Jeff Gilbert
 Model: CCU100R
 S/N: 7404FCC3

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	ANP05360	Cable	RG214	11/8/2010	11/8/2012
T4	AN03121	Cable	32026-2-29080-84	10/23/2009	10/23/2011
T5	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 (external WWAN & GPS antenna)*	Itron, Inc	CCU100R	7404FCC3
V-Pol omni ISM antenna	Antenna Products	AMR360-902-5-T0-N	0852

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Dell	Latitude D630	H4CSTK1

Test Conditions / Notes:

Frequency Range Investigated: 30 kHz - 30 MHz
 Temp: 22° C
 Humidity: 38%
 Pressure: 100.5 kPa
 FHSS radio transmitting on 903 MHz; AM modulation, 915 MHz; FM modulation, 37.5 kBaud, 926.8 MHz; FM modulation, 37.5 kBaud.
 The PA voltage on the Wi-Fi radio is off.
 The Cell radio is off.

Ext Attn: 0 dB

Measurement Data:

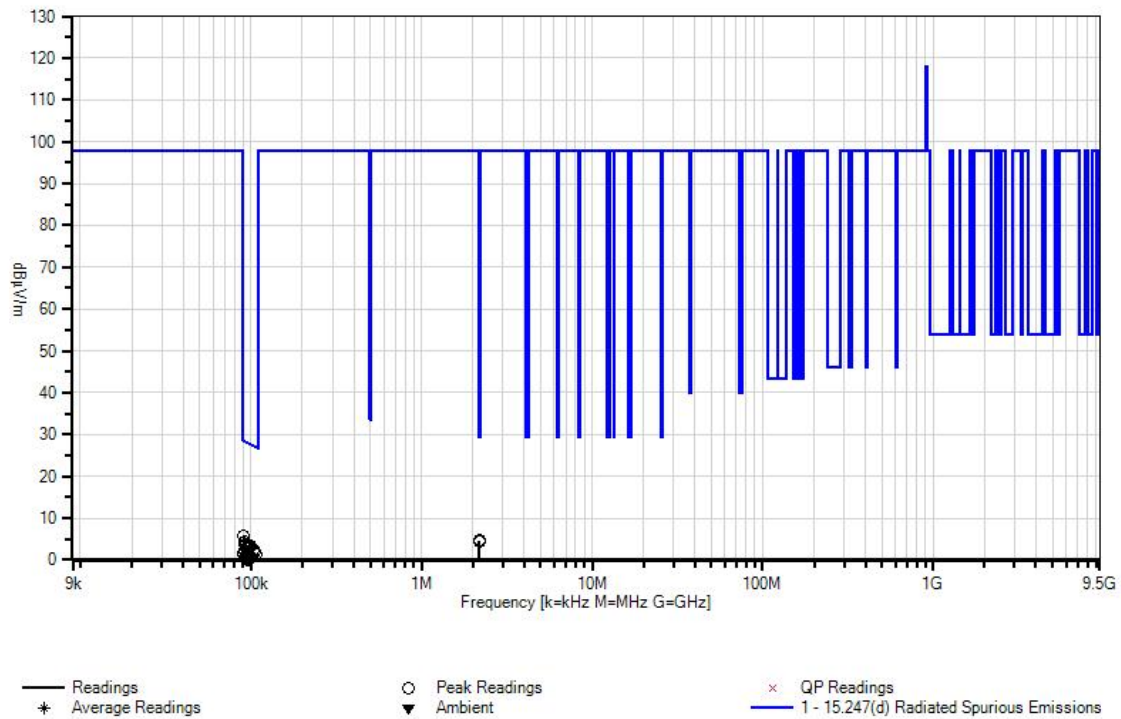
Reading listed by margin.

Test Distance: 3 Meters

#	Freq MHz	Rdng dB μ V	T1 T5 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dB μ V/m	Spec dB μ V/m	Margin dB	Polar Ant
1	90.360k	76.0	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	5.9	28.5	-22.6	Verti 100
2	92.280k	74.5	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	4.4	28.3	-23.9	Verti 100
3	99.360k	73.4	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	3.3	27.7	-24.4	Verti 100
4	93.120k	73.8	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	3.7	28.2	-24.5	Verti 100
5	91.560k	74.0	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	3.9	28.4	-24.5	Verti 100
6	98.280k	73.4	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	3.3	27.8	-24.5	Verti 100
7	94.920k	73.6	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	3.5	28.0	-24.5	Verti 100
8	95.880k	73.4	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	3.3	28.0	-24.7	Verti 100
9	97.080k	73.1	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	3.0	27.9	-24.9	Verti 100
10	102.360k	72.6	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	2.5	27.4	-24.9	Verti 100
11	2.176M	34.8	+9.7 +0.0	+0.1	+0.0	+0.0	-40.0	4.6	29.5	-24.9	Verti 100
12	2.176M	34.6	+9.7 +0.0	+0.1	+0.0	+0.0	-40.0	4.4	29.5	-25.1	Verti 100
13	2.176M	34.6	+9.7 +0.0	+0.1	+0.0	+0.0	-40.0	4.4	29.5	-25.1	Verti 100
14	97.560k	72.7	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	2.6	27.8	-25.2	Verti 100
15	104.280k	72.1	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	2.0	27.3	-25.3	Verti 100
16	107.520k	71.5	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	1.4	27.0	-25.6	Verti 100
17	91.320k	72.3	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	2.2	28.4	-26.2	Verti 100
18	90.960k	71.9	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	1.8	28.4	-26.6	Verti 100
19	91.080k	71.7	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	1.6	28.4	-26.8	Verti 100
20	95.160k	71.3	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	1.2	28.0	-26.8	Verti 100
21	93.960k	71.3	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	1.2	28.1	-26.9	Verti 100
22	96.840k	70.9	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	0.8	27.9	-27.1	Verti 100
23	109.440k	69.8	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	-0.3	26.8	-27.1	Verti 100

24	90.360k	71.5	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	1.4	28.5	-27.1	Verti 100
25	97.200k	70.6	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	0.5	27.8	-27.3	Verti 100
26	93.000k	70.9	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	0.8	28.2	-27.4	Verti 100
27	103.920k	69.8	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	-0.3	27.3	-27.6	Verti 100
28	100.680k	69.9	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	-0.2	27.6	-27.8	Verti 100
29	95.520k	70.3	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	0.2	28.0	-27.8	Verti 100
30	100.200k	69.9	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	-0.2	27.6	-27.8	Verti 100
31	101.760k	69.8	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	-0.3	27.5	-27.8	Verti 100
32	101.280k	69.8	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	-0.3	27.5	-27.8	Verti 100
33	95.280k	70.2	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	0.1	28.0	-27.9	Verti 100
34	104.160k	69.5	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	-0.6	27.3	-27.9	Verti 100
35	99.120k	69.9	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	-0.2	27.7	-27.9	Verti 100
36	106.680k	69.1	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	-1.0	27.1	-28.1	Verti 100
37	108.120k	68.9	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	-1.2	26.9	-28.1	Verti 100
38	106.080k	69.0	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	-1.1	27.1	-28.2	Verti 100
39	105.360k	68.9	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	-1.2	27.2	-28.4	Verti 100
40	106.920k	68.7	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	-1.4	27.0	-28.4	Verti 100
41	107.520k	68.6	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	-1.5	27.0	-28.5	Verti 100
42	104.880k	68.7	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	-1.4	27.2	-28.6	Verti 100
43	109.920k	68.0	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	-2.1	26.8	-28.9	Verti 100
44	109.440k	67.8	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	-2.3	26.8	-29.1	Verti 100
45	107.400k	67.8	+9.7 +0.1	+0.1	+0.0	+0.0	-80.0	-2.3	27.0	-29.3	Verti 100

CKC Laboratories, Inc. Date: 12/14/2010 Time: 12:22:51 PM Itron, Inc. WO#: 90893
 15.247(d) Radiated Spurious Emissions Test Distance: 3 Meters Vertical Sequence#: 38 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: 12/14/2010
 Test Type: **Maximized Emissions** Time: 07:48:40
 Equipment: **SRR+WWAN+WIFI+GPS RX** Sequence#: 20
(external WWAN & GPS antenna)
 Manufacturer: Itron, Inc. Tested By: Jeff Gilbert
 Model: CCU100R
 S/N: 7404FCC3

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	11/8/2010	11/8/2012
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	7404FCC3
V-Pol omni ISM antenna	Antenna Products	AMR360-902-5-T0-N	0852

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Dell	Latitude D630	H4CSTK1

Test Conditions / Notes:

Frequency Range Investigated: 30 - 1000 MHz
 Temp: 21° C
 Humidity: 38%
 Pressure: 100.3 kPa

 FHSS radio transmitting on 903 MHz; AM modulation (worst case modulation).
 The PA voltage on the Wi-Fi radio is off.
 The Cell radio is off.
 Testing per DA 00-705.

Ext Attn: 0 dB

Measurement Data:

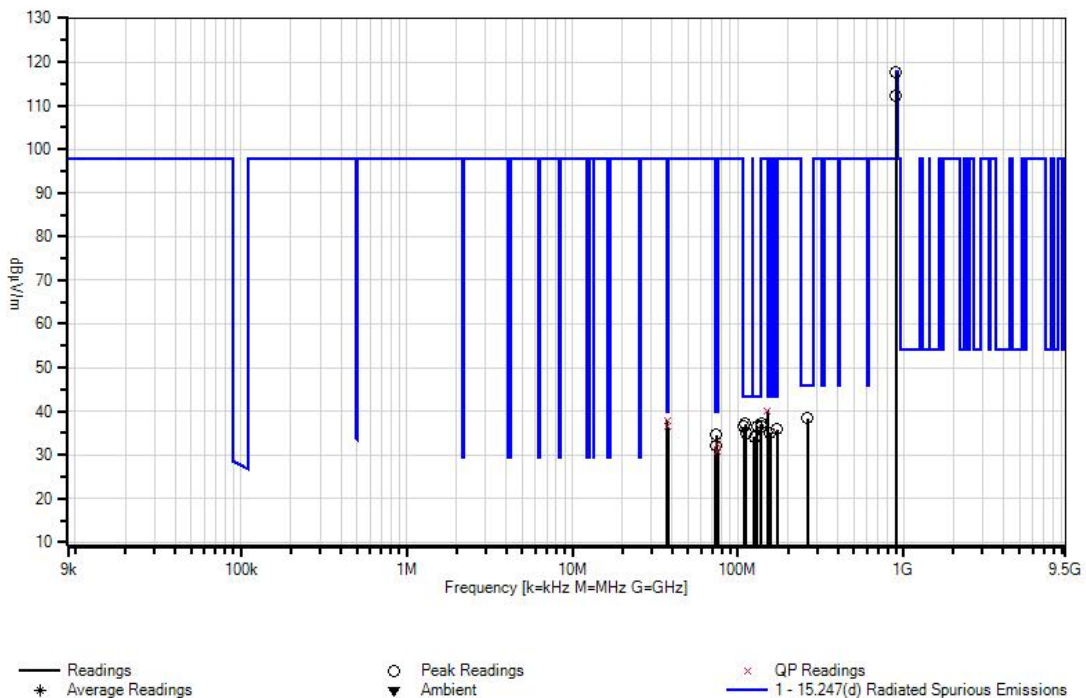
Reading listed by margin.

Test Distance: 3 Meters

#	Freq MHz	Rdng dBμV	T1 T5 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBμV/m	Spec dBμV/m	Margin dB	Polar Ant
1	903.035M	118.5	+23.1 +0.8	+2.3	-29.1	+1.9	+0.0 360	117.5	117.8 TX Carrier	-0.3	Verti 130
2	37.535M QP	53.5	+12.4 +0.1	+0.5	-28.9	+0.3	+0.0 202	37.9	40.0	-2.1	Verti 100
^	37.520M	55.5	+12.4 +0.1	+0.5	-28.9	+0.3	+0.0 360	39.9	40.0	-0.1	Verti 130
^	37.520M	55.4	+12.4 +0.1	+0.5	-28.9	+0.3	+0.0 202	39.8	40.0	-0.2	Verti 100
5	150.044M QP	54.9	+12.1 +0.3	+0.9	-28.7	+0.7	+0.0 260	40.2	43.5	-3.3	Verti 100
^	150.022M	58.9	+12.1 +0.3	+0.9	-28.7	+0.7	+0.0 260	44.2	43.5	+0.7	Verti 100
^	150.002M	56.9	+12.1 +0.3	+0.9	-28.7	+0.7	+0.0 360	42.2	43.5	-1.3	Verti 130
8	149.907M QP	54.9	+12.1 +0.3	+0.9	-28.7	+0.7	+0.0 319	40.2	43.5	-3.3	Horiz 170
^	149.915M	58.3	+12.1 +0.3	+0.9	-28.7	+0.7	+0.0 319	43.6	43.5	+0.1	Horiz 170
^	150.002M	56.9	+12.1 +0.3	+0.9	-28.7	+0.7	+0.0	42.2	43.5	-1.3	Horiz 130
11	37.801M QP	52.1	+12.3 +0.1	+0.5	-28.9	+0.3	+0.0 320	36.4	40.0	-3.6	Verti 100
^	37.786M	53.9	+12.3 +0.1	+0.5	-28.9	+0.3	+0.0 320	38.2	40.0	-1.8	Verti 100
^	37.786M	53.9	+12.3 +0.1	+0.5	-28.9	+0.3	+0.0 360	38.2	40.0	-1.8	Verti 130
14	73.922M	54.8	+7.5 +0.2	+0.6	-28.9	+0.4	+0.0 360	34.6	40.0	-5.4	Verti 130
15	903.035M	113.2	+23.1 +0.8	+2.3	-29.1	+1.9	+0.0	112.2	117.8 TX Carrier	-5.6	Horiz 130
16	110.843M	53.6	+10.8 +0.2	+0.7	-28.8	+0.6	+0.0 360	37.1	43.5	-6.4	Verti 130
17	137.990M	52.0	+12.1 +0.3	+0.8	-28.7	+0.6	+0.0 360	37.1	43.5	-6.4	Verti 130
18	137.750M	51.5	+12.1 +0.3	+0.8	-28.7	+0.6	+0.0	36.6	43.5	-6.9	Horiz 130
19	129.942M	51.3	+12.3 +0.3	+0.8	-28.8	+0.6	+0.0 360	36.5	43.5	-7.0	Verti 130
20	108.801M	53.0	+10.7 +0.2	+0.7	-28.8	+0.6	+0.0 360	36.4	43.5	-7.1	Verti 130
21	172.705M	52.5	+10.0 +0.3	+0.9	-28.5	+0.7	+0.0	35.9	43.5	-7.6	Horiz 130
22	74.549M QP	52.5	+7.6 +0.2	+0.6	-28.9	+0.4	+0.0 260	32.4	40.0	-7.6	Verti 100
^	74.588M	56.7	+7.7 +0.2	+0.6	-28.9	+0.4	+0.0 360	36.7	40.0	-3.3	Verti 130

^	74.554M	55.0	+7.6 +0.2	+0.6	-28.9	+0.4	+0.0 260	34.9	40.0	-5.1	Verti 100
25	263.396M	51.2	+12.9 +0.4	+1.1	-28.2	+0.9	+0.0	38.3	46.0	-7.7	Horiz 130
26	73.190M	52.3	+7.4 +0.2	+0.6	-28.9	+0.4	+0.0 360	32.0	40.0	-8.0	Verti 130
27	156.729M	50.2	+11.6 +0.3	+0.9	-28.6	+0.7	+0.0 360	35.1	43.5	-8.4	Verti 130
28	156.729M	50.2	+11.6 +0.3	+0.9	-28.6	+0.7	+0.0	35.1	43.5	-8.4	Horiz 130
29	111.564M	51.5	+10.8 +0.2	+0.7	-28.8	+0.6	+0.0 360	35.0	43.5	-8.5	Verti 130
30	75.149M	50.8	+7.8 +0.2	+0.6	-28.9	+0.4	+0.0 260	30.9	40.0	-9.1	Verti 100
QP											
^	75.187M	55.4	+7.8 +0.2	+0.6	-28.9	+0.4	+0.0 360	35.5	40.0	-4.5	Verti 130
^	75.147M	54.2	+7.8 +0.2	+0.6	-28.9	+0.4	+0.0 260	34.3	40.0	-5.7	Verti 100
33	125.017M	48.9	+12.4 +0.2	+0.8	-28.8	+0.6	+0.0	34.1	43.5	-9.4	Horiz 130
34	125.017M	48.7	+12.4 +0.2	+0.8	-28.8	+0.6	+0.0 360	33.9	43.5	-9.6	Verti 130

CKC Laboratories, Inc. Date: 12/14/2010 Time: 07:48:40 Itron, Inc. WO#: 90893
15.247(d) Radiated Spurious Emissions Test Distance: 3 Meters H & V Sequence#: 20 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: 12/14/2010
 Test Type: **Maximized Emissions** Time: 09:27:58
 Equipment: **SRR+WWAN+WIFI+GPS RX** Sequence#: 26
(external WWAN & GPS antenna)
 Manufacturer: Itron, Inc. Tested By: Jeff Gilbert
 Model: CCU100R
 S/N: 7404FCC3

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	11/8/2010	11/8/2012
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	7404FCC3
V-Pol omni ISM antenna	Antenna Products	AMR360-902-5-T0-N	0852

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Dell	Latitude D630	H4CSTK1

Test Conditions / Notes:

Frequency Range Investigated: 30 - 1000 MHz
 Temp: 21° C
 Humidity: 38%
 Pressure: 100.3 kPa

 FHSS radio transmitting on 915 MHz; AM modulation (worst case modulation).
 The PA voltage on the Wi-Fi radio is off.
 The Cell radio is off.
 Testing per DA 00-705.

Ext Attn: 0 dB

Measurement Data:

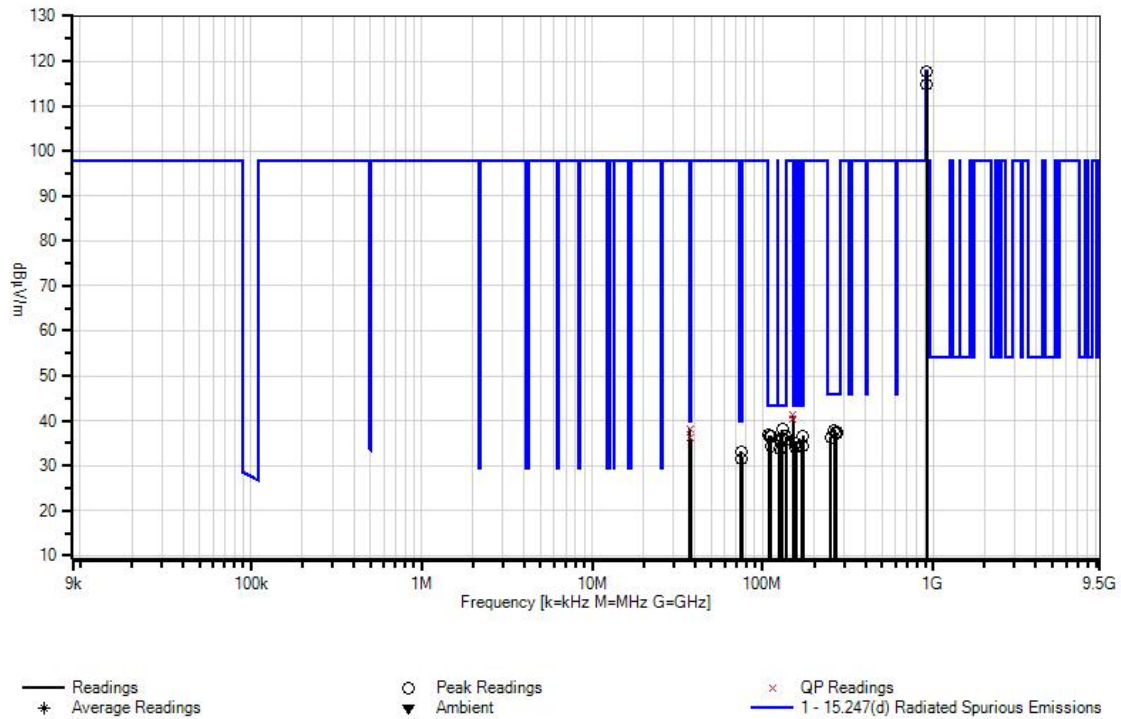
Reading listed by margin.

Test Distance: 3 Meters

#	Freq MHz	Rdng dBμV	T1 T5 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBμV/m	Spec dBμV/m	Margin dB	Polar Ant
1	915.047M	118.4	+23.3 +0.8	+2.3	-29.1	+2.0	+0.0 360	117.7	117.8 TX Carrier	-0.1	Verti 131
2	37.533M QP	53.8	+12.4 +0.1	+0.5	-28.9	+0.3	+0.0 290	38.2	40.0	-1.8	Verti 100
^	37.539M	55.6	+12.4 +0.1	+0.5	-28.9	+0.3	+0.0 290	40.0	40.0	+0.0	Verti 100
^	37.520M	55.1	+12.4 +0.1	+0.5	-28.9	+0.3	+0.0 360	39.5	40.0	-0.5	Verti 131
5	149.982M QP	55.9	+12.1 +0.3	+0.9	-28.7	+0.7	+0.0 250	41.2	43.5	-2.3	Verti 100
^	149.944M	58.8	+12.1 +0.3	+0.9	-28.7	+0.7	+0.0 250	44.1	43.5	+0.6	Verti 100
^	150.002M	57.3	+12.1 +0.3	+0.9	-28.7	+0.7	+0.0 360	42.6	43.5	-0.9	Verti 131
8	915.047M	115.6	+23.3 +0.8	+2.3	-29.1	+2.0	+0.0	114.9	117.8 TX Carrier	-2.9	Horiz 130
9	149.955M QP	55.0	+12.1 +0.3	+0.9	-28.7	+0.7	+0.0 335	40.3	43.5	-3.2	Horiz 170
^	149.931M	58.7	+12.1 +0.3	+0.9	-28.7	+0.7	+0.0 335	44.0	43.5	+0.5	Horiz 170
^	150.002M	57.5	+12.1 +0.3	+0.9	-28.7	+0.7	+0.0	42.8	43.5	-0.7	Horiz 130
12	37.796M QP	51.9	+12.3 +0.1	+0.5	-28.9	+0.3	+0.0 260	36.2	40.0	-3.8	Verti 100
^	37.790M	53.6	+12.3 +0.1	+0.5	-28.9	+0.3	+0.0 260	37.9	40.0	-2.1	Verti 100
^	37.786M	53.5	+12.3 +0.1	+0.5	-28.9	+0.3	+0.0 360	37.8	40.0	-2.2	Verti 131
15	130.062M	52.9	+12.3 +0.3	+0.8	-28.8	+0.6	+0.0 360	38.1	43.5	-5.4	Verti 131
16	108.801M	53.4	+10.7 +0.2	+0.7	-28.8	+0.6	+0.0 360	36.8	43.5	-6.7	Verti 131
17	111.564M	53.2	+10.8 +0.2	+0.7	-28.8	+0.6	+0.0 360	36.7	43.5	-6.8	Verti 131
18	110.723M	53.3	+10.7 +0.2	+0.7	-28.8	+0.6	+0.0 360	36.7	43.5	-6.8	Verti 131
19	74.588M	53.2	+7.7 +0.2	+0.6	-28.9	+0.4	+0.0 360	33.2	40.0	-6.8	Verti 131
20	172.585M	53.2	+10.0 +0.3	+0.9	-28.5	+0.7	+0.0	36.6	43.5	-6.9	Horiz 130
21	137.029M	51.3	+12.1 +0.3	+0.8	-28.7	+0.6	+0.0 360	36.4	43.5	-7.1	Verti 131
22	130.903M	50.8	+12.2 +0.3	+0.8	-28.8	+0.6	+0.0 360	35.9	43.5	-7.6	Verti 131
23	125.017M	50.7	+12.4 +0.2	+0.8	-28.8	+0.6	+0.0 360	35.9	43.5	-7.6	Verti 131

24	137.390M	50.6	+12.1 +0.3	+0.8	-28.7	+0.6	+0.0	35.7	43.5	-7.8	Horiz 130
25	262.315M	50.8	+12.9 +0.4	+1.1	-28.2	+0.9	+0.0	37.9	46.0	-8.1	Horiz 130
26	156.849M	50.2	+11.6 +0.3	+0.9	-28.6	+0.7	+0.0	35.1	43.5	-8.4	Horiz 130
27	75.120M	51.5	+7.8 +0.2	+0.6	-28.9	+0.4	+0.0 360	31.6	40.0	-8.4	Verti 131
28	269.642M	50.3	+13.0 +0.4	+1.1	-28.2	+0.9	+0.0	37.5	46.0	-8.5	Horiz 130
29	267.960M	50.0	+13.0 +0.4	+1.1	-28.2	+0.9	+0.0	37.2	46.0	-8.8	Horiz 130
30	270.363M	49.9	+13.0 +0.4	+1.1	-28.2	+0.9	+0.0	37.1	46.0	-8.9	Horiz 130
31	170.303M	50.7	+10.3 +0.3	+0.9	-28.5	+0.7	+0.0	34.4	43.5	-9.1	Horiz 130
32	112.285M	50.7	+10.8 +0.2	+0.7	-28.8	+0.6	+0.0 360	34.2	43.5	-9.3	Verti 131
33	156.729M	49.0	+11.6 +0.3	+0.9	-28.6	+0.7	+0.0 360	33.9	43.5	-9.6	Verti 131
34	125.017M	48.6	+12.4 +0.2	+0.8	-28.8	+0.6	+0.0	33.8	43.5	-9.7	Horiz 130
35	250.062M	49.4	+12.7 +0.4	+1.1	-28.2	+0.9	+0.0 360	36.3	46.0	-9.7	Verti 131

CKC Laboratories, Inc. Date: 12/14/2010 Time: 09:27:58 Iron, Inc. WO#: 90893
15.247(d) Radiated Spurious Emissions Test Distance: 3 Meters H & V Sequence#: 26 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: 12/14/2010
 Test Type: **Maximized Emissions** Time: 10:47:00
 Equipment: **SRR+WWAN+WIFI+GPS RX** Sequence#: 32
(external WWAN & GPS antenna)
 Manufacturer: Itron, Inc. Tested By: Jeff Gilbert
 Model: CCU100R
 S/N: 7404FCC3

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	11/8/2010	11/8/2012
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	7404FCC3
V-Pol omni ISM antenna	Antenna Products	AMR360-902-5-T0-N	0852

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Dell	Latitude D630	H4CSTK1

Test Conditions / Notes:

Frequency Range Investigated: 30 - 1000 MHz
 Temp: 21° C
 Humidity: 37%
 Pressure: 100.4 kPa

 FHSS radio transmitting on 926.8 MHz; AM modulation (worst case modulation).
 The PA voltage on the Wi-Fi radio is off.
 The Cell radio is off.
 Testing per DA 00-705.

Ext Attn: 0 dB

Measurement Data:

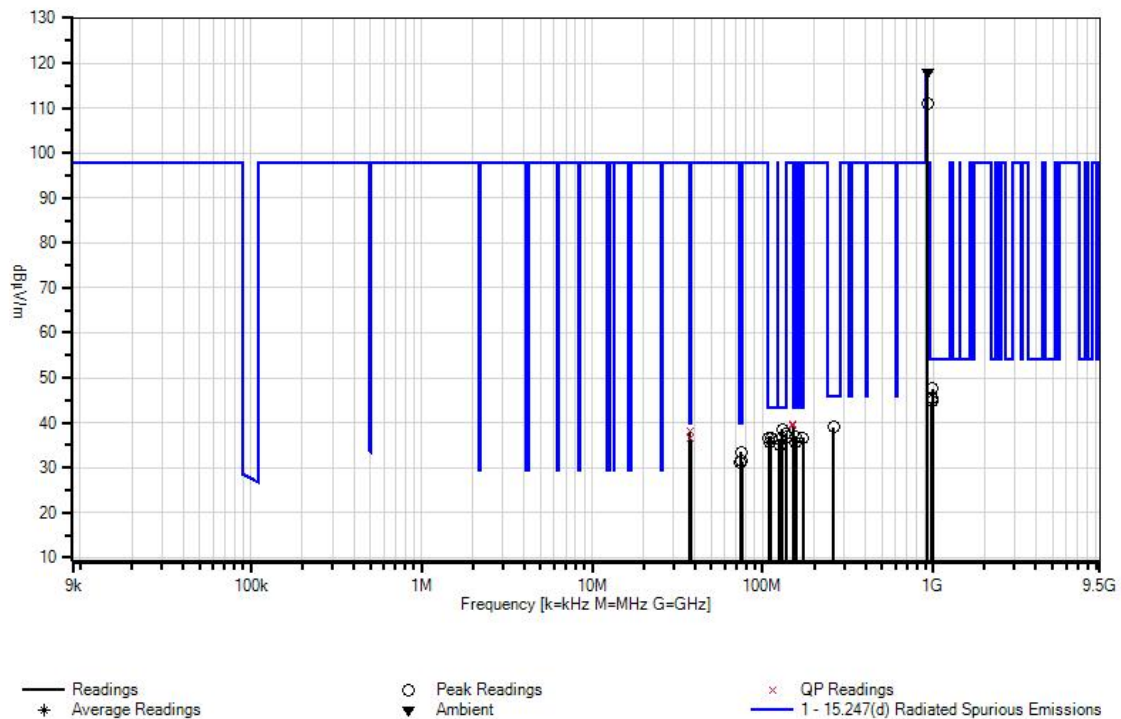
Reading listed by margin.

Test Distance: 3 Meters

#	Freq MHz	Rdng dBμV	T1 T5 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBμV/m	Spec dBμV/m	Margin dB	Polar Ant
1	926.818M Ambient	118.3	+23.5 +0.8	+2.4	-29.1	+2.0	+0.0 360	117.9	117.8 TX Carrier	+0.1	Verti 130
2	37.521M QP	53.7	+12.4 +0.1	+0.5	-28.9	+0.3	+0.0 360	38.1	40.0	-1.9	Verti 100
^	37.519M	55.2	+12.4 +0.1	+0.5	-28.9	+0.3	+0.0 360	39.6	40.0	-0.4	Verti 100
^	37.520M	54.7	+12.4 +0.1	+0.5	-28.9	+0.3	+0.0 360	39.1	40.0	-0.9	Verti 130
5	37.798M QP	52.1	+12.3 +0.1	+0.5	-28.9	+0.3	+0.0 275	36.4	40.0	-3.6	Verti 100
^	37.790M	53.8	+12.3 +0.1	+0.5	-28.9	+0.3	+0.0 275	38.1	40.0	-1.9	Verti 100
^	37.786M	53.1	+12.3 +0.1	+0.5	-28.9	+0.3	+0.0 360	37.4	40.0	-2.6	Verti 130
8	150.050M QP	54.3	+12.1 +0.3	+0.9	-28.7	+0.7	+0.0 330	39.6	43.5	-3.9	Horiz 170
^	149.976M	58.2	+12.1 +0.3	+0.9	-28.7	+0.7	+0.0 330	43.5	43.5	+0.0	Horiz 170
^	150.002M	56.0	+12.1 +0.3	+0.9	-28.7	+0.7	+0.0	41.3	43.5	-2.2	Horiz 130
11	150.042M QP	54.1	+12.1 +0.3	+0.9	-28.7	+0.7	+0.0 275	39.4	43.5	-4.1	Verti 100
^	150.002M	57.9	+12.1 +0.3	+0.9	-28.7	+0.7	+0.0 275	43.2	43.5	-0.3	Verti 100
^	150.002M	55.1	+12.1 +0.3	+0.9	-28.7	+0.7	+0.0 360	40.4	43.5	-3.1	Verti 130
14	129.942M	53.1	+12.3 +0.3	+0.8	-28.8	+0.6	+0.0 360	38.3	43.5	-5.2	Verti 130
15	137.149M	52.4	+12.1 +0.3	+0.8	-28.7	+0.6	+0.0	37.5	43.5	-6.0	Horiz 130
16	985.537M	47.1	+24.2 +0.8	+2.4	-29.0	+2.1	+0.0 360	47.6	54.0	-6.4	Verti 130
17	74.588M	53.5	+7.7 +0.2	+0.6	-28.9	+0.4	+0.0 360	33.5	40.0	-6.5	Verti 130
18	137.630M	51.8	+12.1 +0.3	+0.8	-28.7	+0.6	+0.0 360	36.9	43.5	-6.6	Verti 130
19	926.818M	111.5	+23.5 +0.8	+2.4	-29.1	+2.0	+0.0	111.1	117.8 TX Carrier	-6.7	Horiz 130
20	156.849M	51.9	+11.6 +0.3	+0.9	-28.6	+0.7	+0.0	36.8	43.5	-6.7	Horiz 130
21	111.564M	53.2	+10.8 +0.2	+0.7	-28.8	+0.6	+0.0 360	36.7	43.5	-6.8	Verti 130
22	172.945M	53.3	+10.0 +0.3	+0.9	-28.5	+0.7	+0.0	36.7	43.5	-6.8	Horiz 130
23	108.801M	53.3	+10.7 +0.2	+0.7	-28.8	+0.6	+0.0 360	36.7	43.5	-6.8	Verti 130

24	261.113M	51.9	+12.9 +0.4	+1.1	-28.2	+0.9	+0.0	39.0	46.0	-7.0	Horiz 130
25	125.017M	50.9	+12.4 +0.2	+0.8	-28.8	+0.6	+0.0 360	36.1	43.5	-7.4	Verti 130
26	156.849M	50.7	+11.6 +0.3	+0.9	-28.6	+0.7	+0.0 360	35.6	43.5	-7.9	Verti 130
27	110.843M	52.1	+10.8 +0.2	+0.7	-28.8	+0.6	+0.0 360	35.6	43.5	-7.9	Verti 130
28	125.017M	49.8	+12.4 +0.2	+0.8	-28.8	+0.6	+0.0	35.0	43.5	-8.5	Horiz 130
29	75.187M	51.3	+7.8 +0.2	+0.6	-28.9	+0.4	+0.0 360	31.4	40.0	-8.6	Verti 130
30	987.040M	44.8	+24.2 +0.8	+2.4	-29.0	+2.1	+0.0 360	45.3	54.0	-8.7	Verti 130
31	73.922M	51.4	+7.5 +0.2	+0.6	-28.9	+0.4	+0.0 360	31.2	40.0	-8.8	Verti 130
32	977.210M	44.5	+24.1 +0.8	+2.3	-29.0	+2.0	+0.0 360	44.7	54.0	-9.3	Verti 130

CKC Laboratories, Inc. Date: 12/14/2010 Time: 10:47:00 Itron, Inc. WO#: 90893
15.247(d) Radiated Spurious Emissions Test Distance: 3 Meters H & V Sequence#: 32 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: 2/2/2011
 Test Type: **Radiated Scan** Time: 10:46:50
 Equipment: **SRR+WWAN+WIFI+GPS RX** Sequence#: 32
(external WWAN & GPS antenna)
 Manufacturer: Itron, Inc. Tested By: Jeff Gilbert
 Model: CCU100R
 S/N: 7404FCC3

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN01467	Horn Antenna-ANSI C63.5 Calibration	3115	5/7/2010	5/7/2012
T2	AN03170	High Pass Filter	HM1155-11SS	9/14/2009	9/14/2011
T3	AN03123	Cable	32026-2-29801-12	10/23/2009	10/23/2011
T4	AN01271	Preamp	83017A	9/17/2009	9/17/2011
T5	ANP05542	Cable	Heliac	10/23/2009	10/23/2011
T6	AN03121	Cable	32026-2-29080-84	10/23/2009	10/23/2011
T7	ANCOR-WO90893-20100811	Duty Cycle Correction Factor		8/11/2010	8/11/2011
	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	7404FCC3
V-Pol omni ISM antenna	Antenna Products	AMR360-902-5-T0-N	0852

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Dell	Latitude D630	H4CSTK1

Test Conditions / Notes:

Frequency Range Investigated: 1000 - 9300 MHz
 Temp: 17° C
 Humidity: 31%
 Pressure: 103.8 kPa

FHSS radio is transmitting on 903, 915, 926.8 MHz, FM Modulation, 12.5 kBaud.
 Investigation has shown this modulation to produce worst case emissions.
 The PA voltage on the Wi-Fi radio is off.
 The Cell radio is off.
 GPS receiver is on.

Ext Attn: 0 dB

Measurement Data:

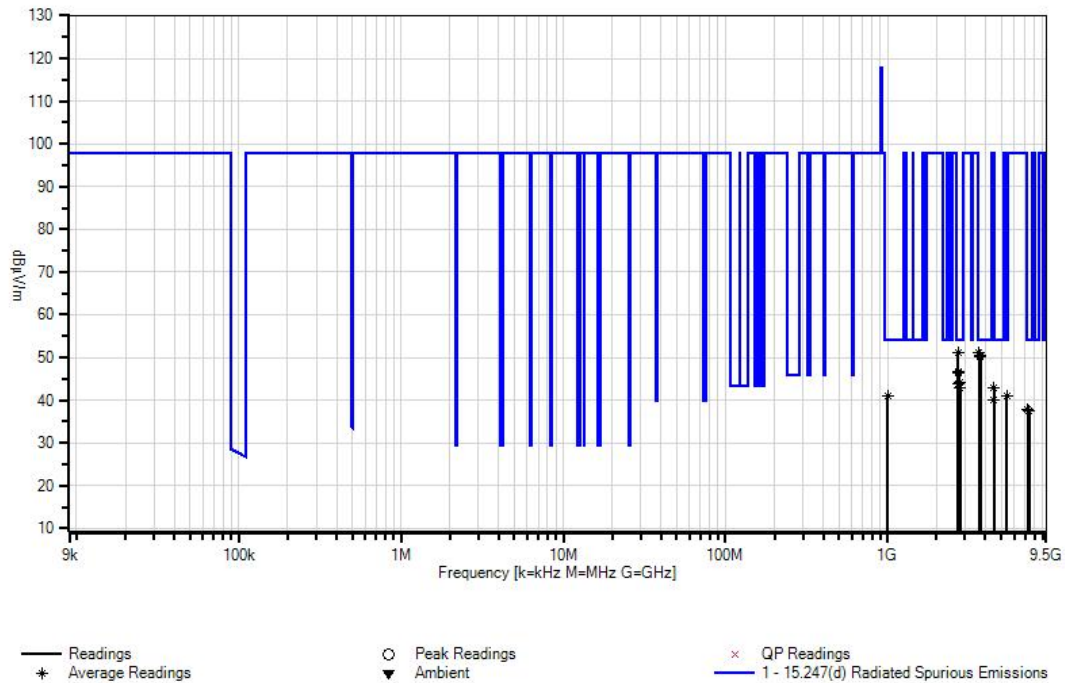
Reading listed by margin.

Test Distance: 3 Meters

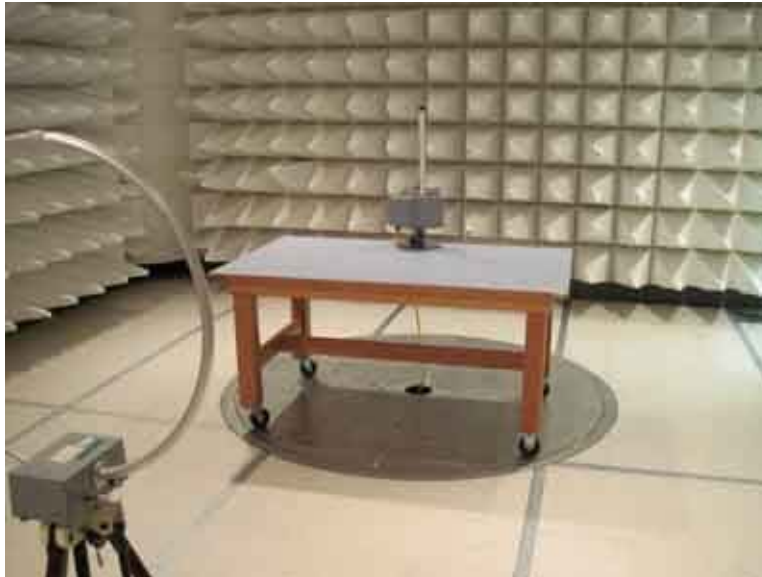
#	Freq MHz	Rdng dBμV	T1 T5 dB	T2 T6 dB	T3 T7 dB	T4 dB	Dist Table	Corr dBμV/m	Spec dBμV/m	Margin dB	Polar Ant
1	3660.006M Ave	62.2	+30.8 +3.6	+0.2 +1.8	+0.3 -14.0	-33.8	+0.0 25	51.1	54.0 Duty Cycle Corr.	-2.9	Horiz 147
^	3660.010M	64.3	+30.8 +3.6	+0.2 +1.8	+0.3 +0.0	-33.8	+0.0 25	67.2	54.0	+13.2	Horiz 147
3	2709.054M Ave	65.9	+28.4 +3.0	+0.2 +1.5	+0.3 -14.0	-34.3	+0.0 65	51.0	54.0 Duty Cycle Corr.	-3.0	Horiz 101
^	2709.054M	68.7	+28.4 +3.0	+0.2 +1.5	+0.3 +0.0	-34.3	+0.0 65	67.8	54.0	+13.8	Horiz 101
5	3707.189M Ave	61.2	+30.9 +3.7	+0.2 +1.8	+0.3 -14.0	-33.8	+0.0 20	50.3	54.0 Duty Cycle Corr.	-3.7	Horiz 145
^	3707.100M	65.5	+30.9 +3.7	+0.2 +1.8	+0.3 +0.0	-33.8	+0.0 20	68.6	54.0	+14.6	Horiz 145
7	3707.266M Ave	47.2	+30.9 +3.7	+0.2 +1.8	+0.3 +0.0	-33.8	+0.0 125	50.3	54.0	-3.7	Verti 115
^	3707.300M	50.4	+30.9 +3.7	+0.2 +1.8	+0.3 +0.0	-33.8	+0.0 125	53.5	54.0	-0.5	Verti 115
9	2745.042M Ave	61.5	+28.5 +3.1	+0.2 +1.5	+0.3 -14.0	-34.3	+0.0 26	46.8	54.0 Duty Cycle Corr.	-7.2	Verti 110
^	2744.997M	63.4	+28.5 +3.1	+0.2 +1.5	+0.3 +0.0	-34.3	+0.0 26	62.7	54.0	+8.7	Verti 110
11	2709.060M Ave	61.3	+28.4 +3.0	+0.2 +1.5	+0.3 -14.0	-34.3	+0.0	46.4	54.0 Duty Cycle Corr.	-7.6	Verti 103
^	2709.108M	64.4	+28.4 +3.0	+0.2 +1.5	+0.3 +0.0	-34.3	+0.0	63.5	54.0	+9.5	Verti 103
13	2780.412M Ave	58.6	+28.6 +3.1	+0.2 +1.6	+0.3 -14.0	-34.3	+0.0 6	44.1	54.0 Duty Cycle Corr.	-9.9	Horiz 136
^	2780.493M	64.5	+28.6 +3.1	+0.2 +1.6	+0.3 +0.0	-34.3	+0.0 6	64.0	54.0	+10.0	Horiz 136
15	2745.045M Ave	58.5	+28.5 +3.1	+0.2 +1.5	+0.3 -14.0	-34.3	+0.0 95	43.8	54.0 Duty Cycle Corr.	-10.2	Horiz 100
^	2745.010M	62.9	+28.5 +3.1	+0.2 +1.5	+0.3 +0.0	-34.3	+0.0 95	62.2	54.0	+8.2	Horiz 100
17	4515.063M Ave	51.6	+32.6 +4.1	+0.3 +1.9	+0.4 -14.0	-33.9	+0.0 354	43.0	54.0 Duty Cycle Corr.	-11.0	Verti 113
^	4515.010M	54.5	+32.6 +4.1	+0.3 +1.9	+0.4 +0.0	-33.9	+0.0 354	59.9	54.0	+5.9	Verti 113
19	2780.445M Ave	57.4	+28.6 +3.1	+0.2 +1.6	+0.3 -14.0	-34.3	+0.0 330	42.9	54.0 Duty Cycle Corr.	-11.1	Verti 120
^	2780.500M	59.0	+28.6 +3.1	+0.2 +1.6	+0.3 +0.0	-34.3	+0.0 330	58.5	54.0	+4.5	Verti 120
21	5417.979M Ave	47.6	+33.9 +4.6	+0.2 +2.1	+0.5 -14.0	-33.9	+0.0 15	41.0	54.0 Duty Cycle Corr.	-13.0	Horiz 122
^	5417.900M	53.7	+33.9 +4.6	+0.2 +2.1	+0.5 +0.0	-33.9	+0.0 15	61.1	54.0	+7.1	Horiz 122
23	1000.126M Ave	31.5	+23.4 +1.8	+20.5 +0.8	+0.1 +0.0	-37.2	+0.0	40.9	54.0	-13.1	Verti 130

^	1000.200M	44.5	+23.4	+20.5	+0.1	-37.2	+0.0	53.9	54.0	-0.1	Verti 130
			+1.8	+0.8	+0.0						
25	4515.066M Ave	48.5	+32.6	+0.3	+0.4	-33.9	+0.0	39.9	54.0	-14.1	Horiz 102
			+4.1	+1.9	-14.0		40		Duty Cycle Corr.		
^	4515.100M	51.8	+32.6	+0.3	+0.4	-33.9	+0.0	57.2	54.0	+3.2	Horiz 102
			+4.1	+1.9	+0.0		40				
27	7319.904M Ave	42.0	+36.1	+0.2	+0.5	-34.6	+0.0	37.8	54.0	-16.2	Horiz 140
			+5.2	+2.4	-14.0		90		Duty Cycle Corr.		
^	7319.900M	48.7	+36.1	+0.2	+0.5	-34.6	+0.0	58.5	54.0	+4.5	Horiz 140
			+5.2	+2.4	+0.0		90				
29	7320.036M Ave	42.0	+36.1	+0.2	+0.5	-34.6	+0.0	37.8	54.0	-16.2	Verti 105
			+5.2	+2.4	-14.0		338		Duty Cycle Corr.		
^	7320.010M	48.9	+36.1	+0.2	+0.5	-34.6	+0.0	58.7	54.0	+4.7	Verti 105
			+5.2	+2.4	+0.0		338				
31	7414.364M Ave	41.7	+36.2	+0.2	+0.5	-34.6	+0.0	37.6	54.0	-16.4	Horiz 150
			+5.3	+2.3	-14.0		22		Duty Cycle Corr.		
^	7414.300M	48.3	+36.2	+0.2	+0.5	-34.6	+0.0	58.2	54.0	+4.2	Horiz 150
			+5.3	+2.3	+0.0		22				

CKC Laboratories, Inc. Date: 2/2/2011 Time: 10:46:50 Itron, Inc. WO#: 90893
15.247(d) Radiated Spurious Emissions Test Distance: 3 Meters H & V Sequence#: 32 Ext ATTN: 0 dB



Test Setup Photos



CCU100 30kHz - 30MHz



CCU100 30MHz - 1GHz



CCU100 1GHz -9.3GHz



CCU100R 30kHz - 30MHz



CCU100R 30MHz -1GHz



CCU100R 1GHz-9.3GHz

SUPPLEMENTAL INFORMATION

Measurement Uncertainty

Uncertainty Value	Parameter
4.73 dB	Radiated Emissions
3.34 dB	Mains Conducted Emissions
3.30 dB	Disturbance Power

The reported measurement uncertainties are calculated based on the worst case of all laboratory environments from CKC Laboratories, Inc. test sites. Only those parameters which require estimation of measurement uncertainty are reported. The reported worst case measurement uncertainty is less than the maximum values derived in CISPR 16-4-2. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of $k=2$. Compliance is deemed to occur provided measurements are below the specified limits.

Emissions Test Details

TESTING PARAMETERS

The cables were routed consistent with the typical application by varying the configuration of the test sample. Interface cables were connected to the available ports of the test unit. The effect of varying the position of the cables was investigated to find the configuration that produced maximum emissions. Cables were of the type and length specified in the individual requirements. The length of cable that produced maximum emissions was selected.

The equipment under test (EUT) was set up in a manner that represented its normal use, as shown in the setup photographs. Any special conditions required for the EUT to operate normally are identified in the comments that accompany the emissions tables.

The emissions data was taken with a spectrum analyzer or receiver. Incorporating the applicable correction factors for distance, antenna, cable loss and amplifier gain, the data was reduced as shown in the table below. The corrected data was then compared to the applicable emission limits. Preliminary and final measurements were taken in order to ensure that all emissions from the EUT were found and maximized.

CORRECTION FACTORS

The basic spectrum analyzer reading was converted using correction factors as shown in the highest emissions readings in the tables. For radiated emissions in dB μ V/m, the spectrum analyzer reading in dB μ V was corrected by using the following formula. This reading was then compared to the applicable specification limit.

SAMPLE CALCULATIONS		
	Meter reading	(dB μ V)
+	Antenna Factor	(dB)
+	Cable Loss	(dB)
-	Distance Correction	(dB)
-	Preamplifier Gain	(dB)
=	Corrected Reading	(dB μ V/m)

TEST INSTRUMENTATION AND ANALYZER SETTINGS

The test instrumentation and equipment listed were used to collect the emissions data. A spectrum analyzer or receiver was used for all measurements. The following table shows the measuring equipment bandwidth settings that were used in designated frequency bands. For testing emissions, an appropriate reference level and a vertical scale size of 10 dB per division were used. A 10 dB attenuator is used, but it is figured in EMITest as a transducer, just like the cables and LISN. 10 dB of external attenuation is not manually inserted into the correction factor section of the PSA.

MEASURING EQUIPMENT BANDWIDTH SETTINGS PER FREQUENCY RANGE			
TEST	BEGINNING FREQUENCY	ENDING FREQUENCY	BANDWIDTH SETTING
CONDUCTED EMISSIONS	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	30 MHz	1000 MHz	120 kHz
RADIATED EMISSIONS	1000 MHz	>1 GHz	1 MHz

SPECTRUM ANALYZER/RECEIVER DETECTOR FUNCTIONS

The notes that accompany the measurements contained in the emissions tables indicate the type of detector function used to obtain the given readings. Unless otherwise noted, all readings were made in the "Peak" mode. Whenever a "Quasi-Peak" or "Average" reading is listed as one of the highest readings, this is indicated as a "QP" or an "Ave" on the appropriate rows of the data sheets. The following paragraphs describe in more detail the detector functions and when they were used to obtain the emissions data.

Peak

In this mode, the spectrum analyzer/receiver readings recorded all emissions at their peak value as the frequency band selected was scanned. By combining this function with another feature of the measuring device called "peak hold," the measuring device had the ability to measure transients or low duty cycle transient emission peak levels. In this mode the measuring device made a slow scan across the frequency band selected and measured the peak emission value found at each frequency across the band.

Quasi-Peak

When the true peak values exceeded or were within 2 dB of the specification limit, quasi-peak measurements were taken using the quasi-peak detector.

Average

For certain frequencies, average measurements may be made using the spectrum analyzer/receiver. To make these measurements, the test engineer reduces the video bandwidth on the measuring device until the modulation of the signal is filtered out. At this point the measuring device is set into the linear mode and the scan time is reduced.