

15.247(d) Spurious Emissions – Radiated

Summary

Comments

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. In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

Result: PASS

Test Data Sheets

Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • (425) 402-1717
 Customer: **Itron, Inc.**
 Specification: **15.247(d) Radiated Spurious Emissions**
 Work Order #: **91909** Date: 4/28/2011
 Test Type: **Radiated Scan** Time: 8:36:24 AM
 Equipment: **SRR+WWAN+WIFI+GPS RX (internal WWAN & GPS antenna)** Sequence#: 7
 Manufacturer: Itron, Inc. Tested By: Jeff Gilbert
 Model: CCU100A
 S/N: 74045190

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN00052	Loop Antenna	6502	6/8/2010	6/8/2012
T2	ANP05360	Cable	RG214	11/8/2010	11/8/2012
T3	ANP06009	Cable	Heliac	8/5/2010	8/5/2012
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.	CCU100A	74045190
V-Pol Omni	Antenna Products	AMR3-91657 T0	0818

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Dell	E6400	H4CSTK1

Test Conditions / Notes:

Frequency Range Investigated: 30 kHz - 30 MHz
 Temp: 24° C
 Humidity: 33%
 Pressure: 102.6 kPa
 The EUT is transmitting; 903, 915, & 926.8 MHz investigated.

Ext Attn: 0 dB

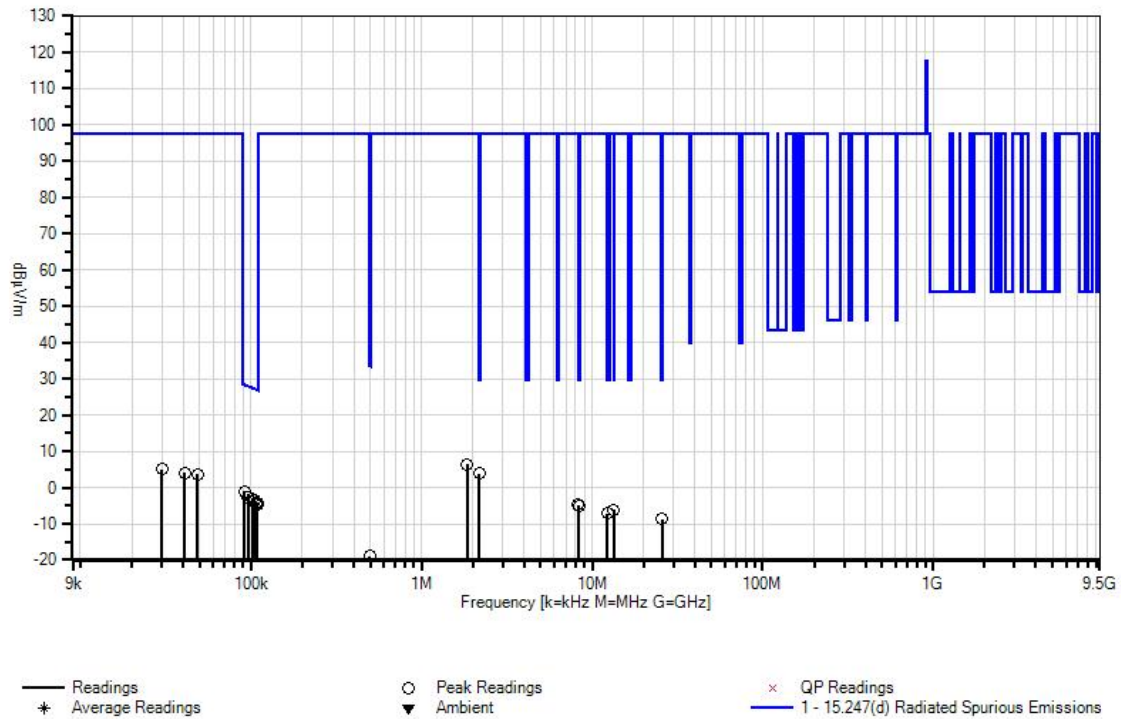
Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

#	Freq MHz	Rdng dB μ V	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dB μ V/m	Spec dB μ V/m	Margin dB	Polar Ant
1	2.176M	34.1	+9.7	+0.0	+0.0	+0.0	-40.0	3.8	29.5	-25.7	Verti 100
2	91.320k	69.1	+9.7	+0.0	+0.0	+0.1	-80.0	-1.1	28.4	-29.5	Verti 100
3	101.640k	67.2	+9.7	+0.0	+0.0	+0.1	-80.0	-3.0	27.5	-30.5	Verti 100
4	95.880k	67.6	+9.7	+0.0	+0.0	+0.1	-80.0	-2.6	28.0	-30.6	Verti 100
5	105.840k	66.5	+9.7	+0.0	+0.0	+0.1	-80.0	-3.7	27.1	-30.8	Verti 100
6	108.360k	66.0	+9.7	+0.0	+0.0	+0.1	-80.0	-4.2	26.9	-31.1	Verti 100
7	106.320k	65.9	+9.7	+0.0	+0.0	+0.1	-80.0	-4.3	27.1	-31.4	Verti 100
8	109.200k	65.7	+9.7	+0.0	+0.0	+0.1	-80.0	-4.5	26.9	-31.4	Verti 100
9	107.280k	65.6	+9.7	+0.0	+0.0	+0.1	-80.0	-4.6	27.0	-31.6	Verti 100
10	8.293M	25.5	+9.5	+0.1	+0.0	+0.1	-40.0	-4.8	29.5	-34.3	Verti 100
11	8.365M	25.4	+9.5	+0.1	+0.0	+0.1	-40.0	-4.9	29.5	-34.4	Verti 100
12	8.383M	25.3	+9.5	+0.1	+0.0	+0.1	-40.0	-5.0	29.5	-34.5	Verti 100
13	13.365M	24.2	+9.3	+0.1	+0.1	+0.1	-40.0	-6.2	29.5	-35.7	Verti 100
14	12.293M	23.2	+9.3	+0.1	+0.1	+0.1	-40.0	-7.2	29.5	-36.7	Verti 100
15	25.626M	24.5	+6.3	+0.2	+0.1	+0.1	-40.0	-8.8	29.5	-38.3	Verti 100
16	498.300k	51.5	+9.4	+0.0	+0.0	+0.1	-80.0	-19.0	33.6	-52.6	Verti 100
17	1.851M	36.8	+9.7	+0.0	+0.0	+0.0	-40.0	6.5	97.8	-91.3	Verti 100
18	30.000k	73.6	+11.4	+0.0	+0.0	+0.1	-80.0	5.1	97.8	-92.7	Verti 100
19	40.920k	73.4	+10.5	+0.0	+0.0	+0.1	-80.0	4.0	97.8	-93.8	Verti 100
20	48.480k	73.1	+10.4	+0.0	+0.0	+0.1	-80.0	3.6	97.8	-94.2	Verti 100

CKC Laboratories, Inc. Date: 4/28/2011 Time: 8:36:24 AM Itron, Inc. WO#: 91909
 15.247(d) Radiated Spurious Emissions Test Distance: 3 Meters Vertical Sequence#: 7 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 #: **91909**
 Test Type: **Radiated Scan**
 Equipment: **SRR+WWAN+WIFI+GPS RX**
(internal WWAN & GPS antenna)
 Manufacturer: Itron, Inc.
 Model: CCU100A
 S/N: 74045190

Date: 4/28/2011
 Time: 8:44:13 AM
 Sequence#: 8
 Tested By: Jeff Gilbert

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN00052	Loop Antenna	6502	6/8/2010	6/8/2012
T2	ANP05360	Cable	RG214	11/8/2010	11/8/2012
T3	ANP06009	Cable	Heliac	8/5/2010	8/5/2012
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.	CCU100A	74045190
V-Pol Omni	Antenna Products	AMR3-91657 T0	0818

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Dell	E6400	H4CSTK1

Test Conditions / Notes:

Frequency Range Investigated: 30 kHz - 30 MHz
 Temp: 24° C
 Humidity: 33%
 Pressure: 102.6 kPa
 The EUT is transmitting; 903, 915, & 926.8 MHz investigated.

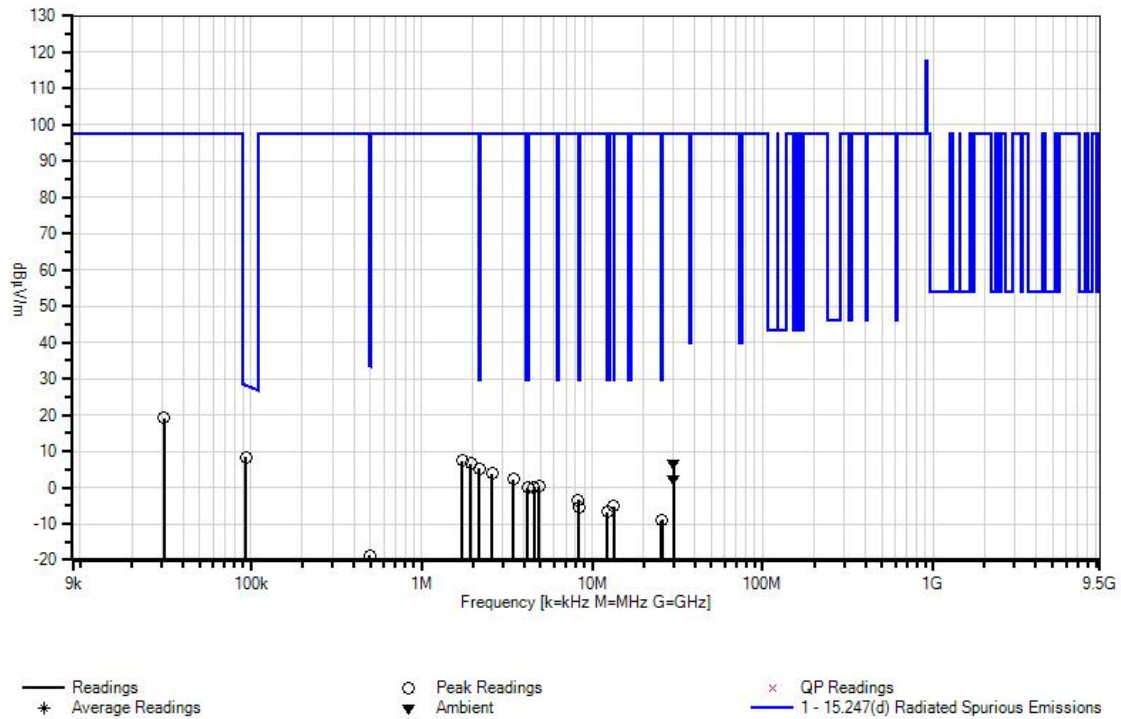
Ext Attn: 0 dB

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	93.120k	78.5	+9.7	+0.0	+0.0	+0.1	-80.0 360	8.3	28.2	-19.9	Verti 100
2	2.185M	35.5	+9.7	+0.0	+0.0	+0.0	-40.0 360	5.2	29.5	-24.3	Verti 100
3	8.293M	26.8	+9.5	+0.1	+0.0	+0.1	-40.0 360	-3.5	29.5	-33.0	Verti 100
4	13.401M	25.2	+9.3	+0.1	+0.1	+0.1	-40.0 360	-5.2	29.5	-34.7	Verti 100
5	8.383M	24.8	+9.5	+0.1	+0.0	+0.1	-40.0 360	-5.5	29.5	-35.0	Verti 100
6	8.365M	24.7	+9.5	+0.1	+0.0	+0.1	-40.0 360	-5.6	29.5	-35.1	Verti 100

7	12.293M	23.6	+9.3	+0.1	+0.1	+0.1	-40.0 360	-6.8	29.5	-36.3	Verti 100
8	25.608M	24.3	+6.3	+0.2	+0.1	+0.1	-40.0 360	-9.0	29.5	-38.5	Verti 100
9	25.509M	24.2	+6.3	+0.2	+0.1	+0.1	-40.0 360	-9.1	29.5	-38.6	Verti 100
10	495.600k	51.8	+9.4	+0.0	+0.0	+0.1	-80.0 360	-18.7	33.7	-52.4	Verti 100
11	30.840k	87.7	+11.3	+0.0	+0.0	+0.1	-80.0 360	19.1	97.8	-78.7	Verti 100
12	1.725M	37.8	+9.6	+0.0	+0.0	+0.0	-40.0 360	7.4	97.8	-90.4	Verti 100
13	29.957M Ambient	41.5	+4.9	+0.2	+0.1	+0.1	-40.0 360	6.8	97.8 turntable	-91.0	Verti 100
14	1.932M	36.9	+9.7	+0.0	+0.0	+0.0	-40.0 360	6.6	97.8	-91.2	Verti 100
15	2.590M	34.2	+9.7	+0.0	+0.0	+0.0	-40.0 360	3.9	97.8	-93.9	Verti 100
16	29.900M Ambient	37.0	+4.9	+0.2	+0.1	+0.1	-40.0 360	2.3	97.8 turntable	-95.5	Verti 100
17	3.446M	32.3	+9.7	+0.1	+0.0	+0.1	-40.0 360	2.2	97.8	-95.6	Verti 100
18	4.869M	30.5	+9.6	+0.1	+0.0	+0.1	-40.0 360	0.3	97.8	-97.5	Verti 100
19	4.572M	30.3	+9.6	+0.1	+0.0	+0.1	-40.0 360	0.1	97.8	-97.7	Verti 100
20	4.176M	30.3	+9.6	+0.1	+0.0	+0.0	-40.0 360	0.0	97.8	-97.8	Verti 100

CKC Laboratories, Inc. Date: 4/28/2011 Time: 8:44:13 AM Itron, Inc. WO#: 91909
 15.247(d) Radiated Spurious Emissions Test Distance: 3 Meters Vertical Sequence#: 8 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 #: **91909** Date: 4/27/2011
 Test Type: **Radiated Scan** Time: 14:39:21
 Equipment: **SRR+WWAN+WIFI+GPS RX** Sequence#: 4
(internal WWAN & GPS antenna)
 Manufacturer: Itron, Inc. Tested By: Jeff Gilbert
 Model: CCU100A
 S/N: 74045190

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN01993	Biconilog Antenna	CBL6111C	10/9/2009	10/9/2011
T2	ANP05360	Cable	RG214	11/8/2010	11/8/2012
T3	AN01316	Preamp	8447D	5/21/2010	5/21/2012
T4	ANP05547	Cable	Heliastax	5/18/2010	5/18/2012
T5	ANP05337	Cable	RG-214	4/11/2011	4/11/2013
	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.	CCU100A	74045190
V-Pol Omni	Antenna Products	AMR3-91657 T0	0818

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Dell	E6400	H4CSTK1

Test Conditions / Notes:

Frequency Range Investigated: 30 - 1000 MHz
 Temp: 24° C
 Humidity: 33%
 Pressure: 102.4 kPa
 The EUT is transmitting; 903, 915, & 926.8 MHz investigated.
 AM Modulation is worst case.

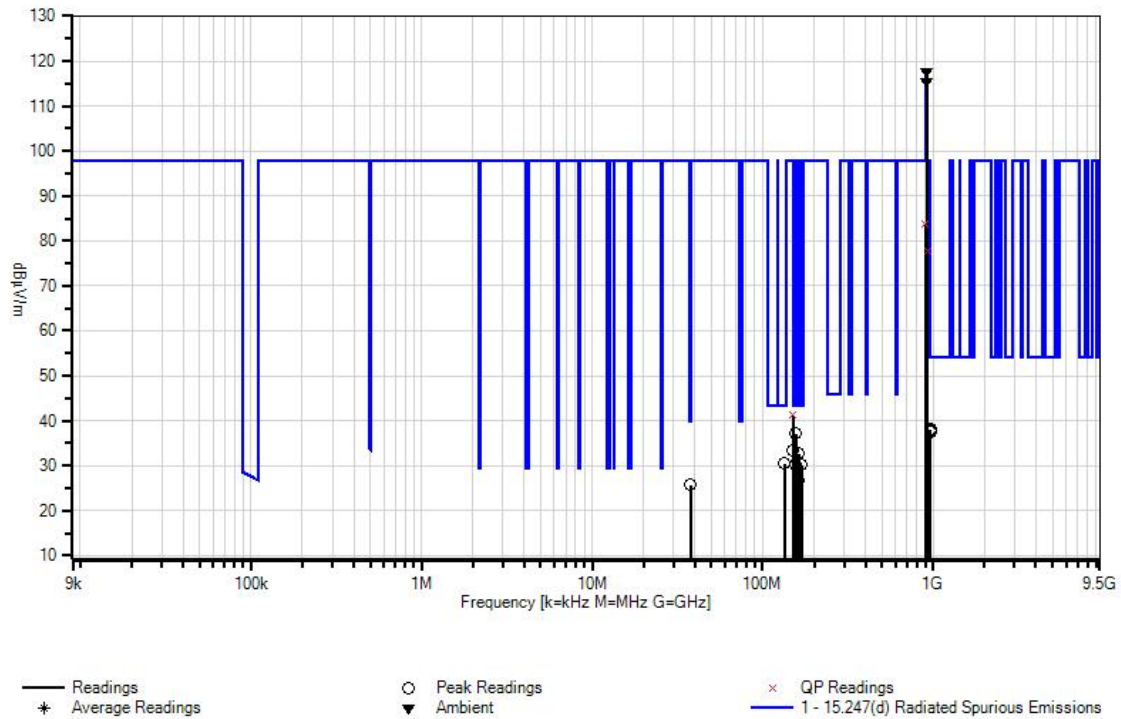
Ext Attn: 0 dB

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	915.047M	119.3	+23.3 +0.9	+2.0	-29.2	+1.5	+0.0	117.8	117.8	+0.0	Verti 130
	Ambient								Fundamental		
2	150.050M	56.6	+12.1 +0.4	+0.7	-29.1	+0.6	+0.0	41.3	43.5	-2.2	Verti 100
	QP						65				
^	150.002M	58.9	+12.1 +0.4	+0.7	-29.1	+0.6	+0.0	43.6	43.5	+0.1	Verti 100
							65				
^	150.002M	57.9	+12.1 +0.4	+0.7	-29.1	+0.6	+0.0	42.6	43.5	-0.9	Verti 130
5	915.047M	117.0	+23.3 +0.9	+2.0	-29.2	+1.5	+0.0	115.5	117.8	-2.3	Horiz 130
	Ambient								Fundamental		

6	156.729M	52.8	+11.6 +0.4	+0.7	-29.0	+0.6	+0.0	37.1	43.5	-6.4	Verti 130
7	150.002M	48.8	+12.1 +0.4	+0.7	-29.1	+0.6	+0.0	33.5	43.5	-10.0	Horiz 130
8	162.855M	48.9	+11.1 +0.4	+0.7	-29.0	+0.6	+0.0	32.7	43.5	-10.8	Verti 130
9	134.146M	46.0	+12.2 +0.4	+0.6	-29.2	+0.5	+0.0	30.5	43.5	-13.0	Verti 130
10	169.462M	46.9	+10.4 +0.4	+0.7	-28.9	+0.6	+0.0	30.1	43.5	-13.4	Verti 130
11	156.849M	45.8	+11.6 +0.4	+0.7	-29.0	+0.6	+0.0	30.1	43.5	-13.4	Horiz 130
12	902.000M QP	85.7	+23.1 +0.9	+1.9	-29.2	+1.5	+0.0 194	83.9	97.8 Bandedge	-13.9	Verti 100
^	902.000M	88.9	+23.1 +0.9	+1.9	-29.2	+1.5	+0.0 194	87.1	97.8 Bandedge	-10.7	Verti 100
14	37.853M	42.0	+12.3 +0.2	+0.3	-29.4	+0.3	+0.0	25.7	40.0	-14.3	Verti 130
15	960.054M	38.9	+23.9 +0.9	+2.0	-29.1	+1.5	+0.0	38.1	54.0	-15.9	Verti 130
16	962.997M	38.5	+23.9 +0.9	+2.0	-29.0	+1.5	+0.0	37.8	54.0	-16.2	Verti 130
17	960.743M	38.4	+23.9 +0.9	+2.0	-29.1	+1.5	+0.0	37.6	54.0	-16.4	Verti 130
18	162.134M	42.7	+11.2 +0.4	+0.7	-29.0	+0.6	+0.0	26.6	43.5	-16.9	Horiz 130
19	928.001M QP	79.0	+23.5 +0.9	+2.0	-29.1	+1.5	+0.0 194	77.8	97.8 Bandedge	-20.0	Verti 100
^	928.000M	83.8	+23.5 +0.9	+2.0	-29.1	+1.5	+0.0 194	82.6	97.8 Bandedge	-15.2	Verti 100

CKC Laboratories, Inc. Date: 4/27/2011 Time: 14:39:21 Itron, Inc. WO#: 91909
 15.247(d) Radiated Spurious Emissions Test Distance: 3 Meters H & V 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 #: **91909** Date: 4/28/2011
 Test Type: **Radiated Scan** Time: 07:46:45
 Equipment: **SRR+WWAN+WIFI+GPS RX** Sequence#: 6
(internal WWAN & GPS antenna)
 Manufacturer: Itron, Inc. Tested By: Jeff Gilbert
 Model: CCU100A
 S/N: 74045190

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	Preamplifier	83017A	9/17/2009	9/17/2011
T5	ANP05542	Cable	Helix	10/23/2009	10/23/2011
T6	ANP06009	Cable	Helix	8/5/2010	8/5/2012
T7	ANCOR-WO91909-20110428	Duty Cycle Correction Factor		4/28/2011	4/28/2012
	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.	CCU100A	74045190
V-Pol Omni	Antenna Products	AMR3-91657 T0	0818

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Dell	E6400	H4CSTK1

Test Conditions / Notes:

Frequency Range Investigated: 1 - 9.3 GHz
 Temp: 24° C
 Humidity: 33%
 Pressure: 102.4 kPa
 The EUT is transmitting; 903, 915, & 926.8 MHz investigated.
 FM37.5 Modulation is worst case.
 Duty Cycle Correction Factor:
 Max possible on time is 20mS, therefore, $20\log(0.02/0.1) = -14$ dB.

Ext Attn: 0 dB

Measurement Data:

Reading listed by margin.

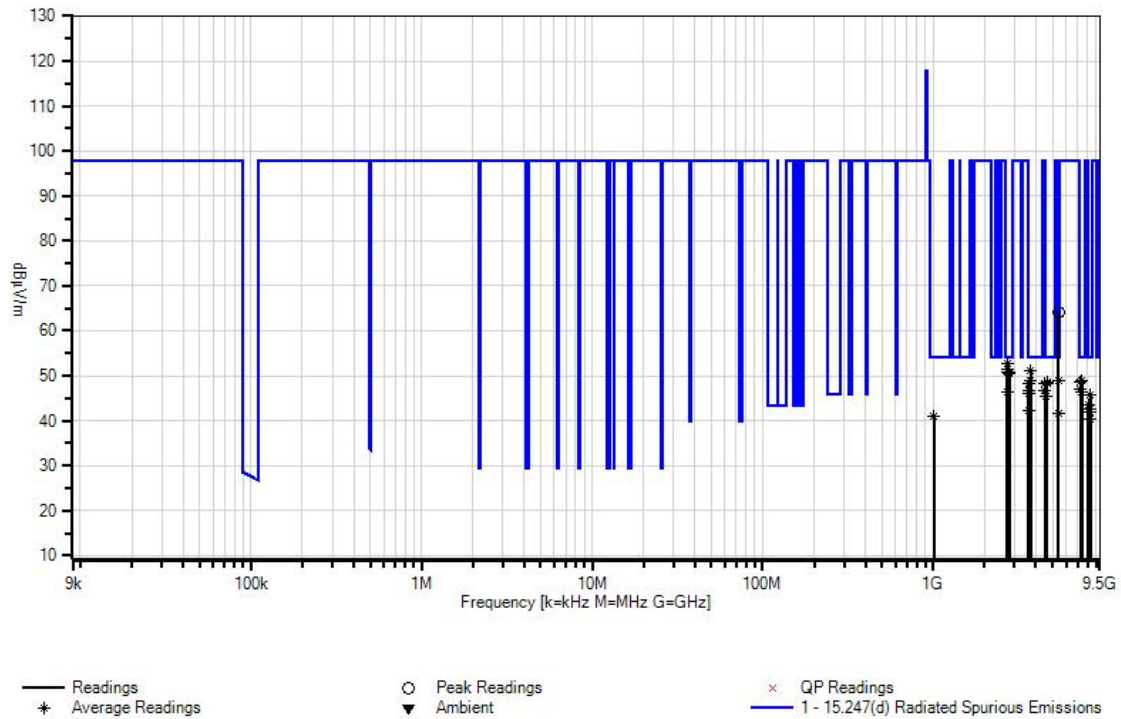
Test Distance: 3 Meters

#	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	5418.101M	56.4	+33.9 +4.6	+0.2 +2.5	+0.5 +0.0	-33.9	+0.0 83	64.2	54.0	+10.2	Horiz 160
2	2708.999M Ave	53.7	+28.4 +3.0	+0.2 +1.5	+0.3 +0.0	-34.3	+0.0 340	52.8	54.0	-1.2	Horiz 130
^	2709.050M	56.8	+28.4 +3.0	+0.2 +1.5	+0.3 +0.0	-34.3	+0.0 340	55.9	54.0	+1.9	Horiz 130
4	2709.007M Ave	52.4	+28.4 +3.0	+0.2 +1.5	+0.3 +0.0	-34.3	+0.0 75	51.5	54.0	-2.5	Verti 115
^	2709.082M	55.5	+28.4 +3.0	+0.2 +1.5	+0.3 +0.0	-34.3	+0.0 75	54.6	54.0	+0.6	Verti 115
6	3707.199M Ave	61.9	+30.9 +3.7	+0.2 +1.9	+0.3 -14.0	-33.8	+0.0 65	51.1	54.0 Duty Cycle Corr.	-2.9	Verti 119
^	3707.134M	62.5	+30.9 +3.7	+0.2 +1.9	+0.3 +0.0	-33.8	+0.0 65	65.7	54.0	+11.7	Verti 119
8	2745.003M Ave	51.4	+28.5 +3.1	+0.2 +1.5	+0.3 +0.0	-34.3	+0.0 334	50.7	54.0	-3.3	Verti 132
^	2745.056M	54.7	+28.5 +3.1	+0.2 +1.5	+0.3 +0.0	-34.3	+0.0 334	54.0	54.0	+0.0	Verti 132
10	2780.402M Ave	51.3	+28.6 +3.1	+0.2 +1.5	+0.3 +0.0	-34.3	+0.0 333	50.7	54.0	-3.3	Verti 110
^	2780.362M	52.9	+28.6 +3.1	+0.2 +1.5	+0.3 +0.0	-34.3	+0.0 333	52.3	54.0	-1.7	Verti 110
12	2780.403M Ave	51.1	+28.6 +3.1	+0.2 +1.5	+0.3 +0.0	-34.3	+0.0 295	50.5	54.0	-3.5	Horiz 125
^	2780.405M	52.9	+28.6 +3.1	+0.2 +1.5	+0.3 +0.0	-34.3	+0.0 295	52.3	54.0	-1.7	Horiz 125
14	7414.403M Ave	52.2	+36.2 +5.3	+0.2 +3.0	+0.5 -14.0	-34.6	+0.0 116	48.8	54.0 Duty Cycle Corr.	-5.2	Verti 193
^	7414.459M	54.6	+36.2 +5.3	+0.2 +3.0	+0.5 +0.0	-34.6	+0.0 116	65.2	54.0	+11.2	Verti 193
16	5418.001M Ave	55.0	+33.9 +4.6	+0.2 +2.5	+0.5 -14.0	-33.9	+0.0 83	48.8	54.0 Duty Cycle Corr.	-5.2	Horiz 160
17	3707.199M Ave	59.6	+30.9 +3.7	+0.2 +1.9	+0.3 -14.0	-33.8	+0.0 315	48.8	54.0 Duty Cycle Corr.	-5.2	Horiz 100
^	3707.105M	60.4	+30.9 +3.7	+0.2 +1.9	+0.3 +0.0	-33.8	+0.0 315	63.6	54.0	+9.6	Horiz 100
19	7319.998M Ave	52.2	+36.1 +5.2	+0.2 +2.9	+0.5 -14.0	-34.6	+0.0 3	48.5	54.0 Duty Cycle Corr.	-5.5	Horiz 168
^	7320.050M	54.5	+36.1 +5.2	+0.2 +2.9	+0.5 +0.0	-34.6	+0.0 3	64.8	54.0	+10.8	Horiz 168
21	4633.999M Ave	56.7	+32.7 +4.2	+0.3 +2.0	+0.4 -14.0	-33.8	+0.0 110	48.5	54.0 Duty Cycle Corr.	-5.5	Verti 125
^	4634.082M	59.4	+32.7 +4.2	+0.3 +2.0	+0.4 +0.0	-33.8	+0.0 110	65.2	54.0	+11.2	Verti 125
23	3611.999M Ave	59.8	+30.6 +3.6	+0.2 +1.8	+0.3 -14.0	-33.9	+0.0 325	48.4	54.0 Duty Cycle Corr.	-5.6	Horiz 105

^ 3612.080M	60.8	+30.6	+0.2	+0.3	-33.9	+0.0	63.4	54.0	+9.4	Horiz
		+3.6	+1.8	+0.0		325				105
25 4634.002M	56.5	+32.7	+0.3	+0.4	-33.8	+0.0	48.3	54.0	-5.7	Horiz
Ave		+4.2	+2.0	-14.0		60		Duty Cycle Corr.		130
^ 4634.092M	59.3	+32.7	+0.3	+0.4	-33.8	+0.0	65.1	54.0	+11.1	Horiz
		+4.2	+2.0	+0.0		60				130
27 4514.999M	56.7	+32.6	+0.3	+0.4	-33.9	+0.0	48.2	54.0	-5.8	Horiz
Ave		+4.1	+2.0	-14.0		322		Duty Cycle Corr.		120
^ 4514.999M	59.1	+32.6	+0.3	+0.4	-33.9	+0.0	64.6	54.0	+10.6	Horiz
		+4.1	+2.0	+0.0		322				120
29 7319.994M	50.8	+36.1	+0.2	+0.5	-34.6	+0.0	47.1	54.0	-6.9	Verti
Ave		+5.2	+2.9	-14.0		118		Duty Cycle Corr.		130
^ 7320.060M	53.4	+36.1	+0.2	+0.5	-34.6	+0.0	63.7	54.0	+9.7	Verti
		+5.2	+2.9	+0.0		118				130
^ 7320.060M	52.1	+36.1	+0.2	+0.5	-34.6	+0.0	62.4	54.0	+8.4	Verti
		+5.2	+2.9	+0.0		360				130
32 3659.996M	57.9	+30.8	+0.2	+0.3	-33.8	+0.0	46.8	54.0	-7.2	Horiz
Ave		+3.6	+1.8	-14.0		310		Duty Cycle Corr.		155
^ 3660.074M	59.7	+30.8	+0.2	+0.3	-33.8	+0.0	62.6	54.0	+8.6	Horiz
		+3.6	+1.8	+0.0		310				155
34 4515.007M	55.1	+32.6	+0.3	+0.4	-33.9	+0.0	46.6	54.0	-7.4	Verti
Ave		+4.1	+2.0	-14.0		118		Duty Cycle Corr.		117
^ 4515.021M	57.6	+32.6	+0.3	+0.4	-33.9	+0.0	63.1	54.0	+9.1	Verti
		+4.1	+2.0	+0.0		118				117
36 2745.005M	47.2	+28.5	+0.2	+0.3	-34.3	+0.0	46.5	54.0	-7.5	Horiz
Ave		+3.1	+1.5	+0.0		332				185
^ 2744.971M	49.8	+28.5	+0.2	+0.3	-34.3	+0.0	49.1	54.0	-4.9	Horiz
		+3.1	+1.5	+0.0		332				185
38 7414.401M	49.9	+36.2	+0.2	+0.5	-34.6	+0.0	46.5	54.0	-7.5	Horiz
Ave		+5.3	+3.0	-14.0		326		Duty Cycle Corr.		174
^ 7414.454M	52.9	+36.2	+0.2	+0.5	-34.6	+0.0	63.5	54.0	+9.5	Horiz
		+5.3	+3.0	+0.0		326				174
40 3660.000M	57.2	+30.8	+0.2	+0.3	-33.8	+0.0	46.1	54.0	-7.9	Verti
Ave		+3.6	+1.8	-14.0		352		Duty Cycle Corr.		120
^ 3660.000M	58.1	+30.8	+0.2	+0.3	-33.8	+0.0	61.0	54.0	+7.0	Verti
		+3.6	+1.8	+0.0		352				120
^ 3660.023M	54.9	+30.8	+0.2	+0.3	-33.8	+0.0	57.8	54.0	+3.8	Verti
		+3.6	+1.8	+0.0		360				130
43 8341.198M	35.4	+36.0	+0.3	+0.4	-34.7	+0.0	45.8	54.0	-8.2	Horiz
Ave		+5.5	+2.9	+0.0		45				155
^ 8341.194M	42.0	+36.0	+0.3	+0.4	-34.7	+0.0	52.4	54.0	-1.6	Horiz
		+5.5	+2.9	+0.0		45				155
45 4575.005M	53.9	+32.6	+0.3	+0.4	-33.8	+0.0	45.5	54.0	-8.5	Verti
Ave		+4.1	+2.0	-14.0		98		Duty Cycle Corr.		120
^ 4575.012M	55.8	+32.6	+0.3	+0.4	-33.8	+0.0	61.4	54.0	+7.4	Verti
		+4.1	+2.0	+0.0		98				120
^ 4575.012M	54.5	+32.6	+0.3	+0.4	-33.8	+0.0	60.1	54.0	+6.1	Verti
		+4.1	+2.0	+0.0		360				130
48 4575.003M	53.7	+32.6	+0.3	+0.4	-33.8	+0.0	45.3	54.0	-8.7	Horiz
Ave		+4.1	+2.0	-14.0		95		Duty Cycle Corr.		170
^ 4575.076M	55.3	+32.6	+0.3	+0.4	-33.8	+0.0	60.9	54.0	+6.9	Horiz
		+4.1	+2.0	+0.0		95				170

50	8127.010M Ave	33.2	+36.1 +5.5	+0.2 +2.8	+0.4 +0.0	-34.7 10	+0.0	43.5	54.0	-10.5	Verti 160
^	8126.967M	41.4	+36.1 +5.5	+0.2 +2.8	+0.4 +0.0	-34.7 10	+0.0	51.7	54.0	-2.3	Verti 160
52	8127.001M Ave	33.1	+36.1 +5.5	+0.2 +2.8	+0.4 +0.0	-34.7 70	+0.0	43.4	54.0	-10.6	Horiz 155
^	8126.971M	41.9	+36.1 +5.5	+0.2 +2.8	+0.4 +0.0	-34.7 70	+0.0	52.2	54.0	-1.8	Horiz 155
54	8235.002M Ave	32.2	+36.0 +5.5	+0.3 +2.8	+0.4 +0.0	-34.7 10	+0.0	42.5	54.0	-11.5	Horiz 130
^	8234.907M	40.8	+36.0 +5.5	+0.3 +2.8	+0.4 +0.0	-34.7 10	+0.0	51.1	54.0	-2.9	Horiz 130
56	3611.999M Ave	53.8	+30.6 +3.6	+0.2 +1.8	+0.3 -14.0	-33.9 65	+0.0	42.4	54.0	-11.6	Verti 127
^	3612.092M	55.7	+30.6 +3.6	+0.2 +1.8	+0.3 +0.0	-33.9 65	+0.0	58.3	54.0	+4.3	Verti 127
58	8234.998M Ave	31.7	+36.0 +5.5	+0.3 +2.8	+0.4 +0.0	-34.7 150	+0.0	42.0	54.0	-12.0	Verti 140
^	8234.998M	40.7	+36.0 +5.5	+0.3 +2.8	+0.4 +0.0	-34.7 150	+0.0	51.0	54.0	-3.0	Verti 140
^	8234.998M	39.2	+36.0 +5.5	+0.3 +2.8	+0.4 +0.0	-34.7 360	+0.0	49.5	54.0	-4.5	Verti 130
61	5417.997M Ave	47.9	+33.9 +4.6	+0.2 +2.5	+0.5 -14.0	-33.9 60	+0.0	41.7	54.0	-12.3	Verti 210
^	5417.990M	50.2	+33.9 +4.6	+0.2 +2.5	+0.5 +0.0	-33.9 60	+0.0	58.0	54.0	+4.0	Verti 210
63	1004.326M Ave	32.1	+23.5 +1.8	+19.7 +0.9	+0.1 +0.0	-37.2 360	+0.0	40.9	54.0	-13.1	Verti 130
^	1004.326M	44.8	+23.5 +1.8	+19.7 +0.9	+0.1 +0.0	-37.2 360	+0.0	53.6	54.0	-0.4	Verti 130
65	8341.205M Ave	30.1	+36.0 +5.5	+0.3 +2.9	+0.4 +0.0	-34.7 75	+0.0	40.5	54.0	-13.5	Verti 155
^	8341.239M	40.5	+36.0 +5.5	+0.3 +2.9	+0.4 +0.0	-34.7 75	+0.0	50.9	54.0	-3.1	Verti 155

CKC Laboratories, Inc. Date: 4/28/2011 Time: 07:46:45 Itron, Inc. WO#: 91909
 15.247(d) Radiated Spurious Emissions Test Distance: 3 Meters H & V 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 #: **91909** Date: 4/28/2011
 Test Type: **Radiated Scan** Time: 4:23:02 PM
 Equipment: **SRR+WWAN+WIFI+GPS RX** Sequence#: 22
(external WWAN & GPS antenna)
 Manufacturer: Itron, Inc. Tested By: Jeff Gilbert
 Model: CCU100RA
 S/N: 74045189

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN00052	Loop Antenna	6502	6/8/2010	6/8/2012
T2	ANP05360	Cable	RG214	11/8/2010	11/8/2012
T3	ANP06009	Cable	Heliac	8/5/2010	8/5/2012
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 (external WWAN & GPS antenna)*	Itron, Inc.	CCU100RA	74045189
V-Pol Omni	Antenna Products	AMR3-91657 T0	0818
External WWAN Antenna	Laird Technologies	FG821/18503	40353
External GPS Antenna	Trimble	57861-00	213100323

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Dell	E6400	H4CSTK1

Test Conditions / Notes:

Frequency Range Investigated: 30kHz - 30 MHz
 Temp: 23° C
 Humidity: 35%
 Pressure: 102.7 kPa

The EUT is transmitting; 903, 915, & 926.8 MHz were investigated.

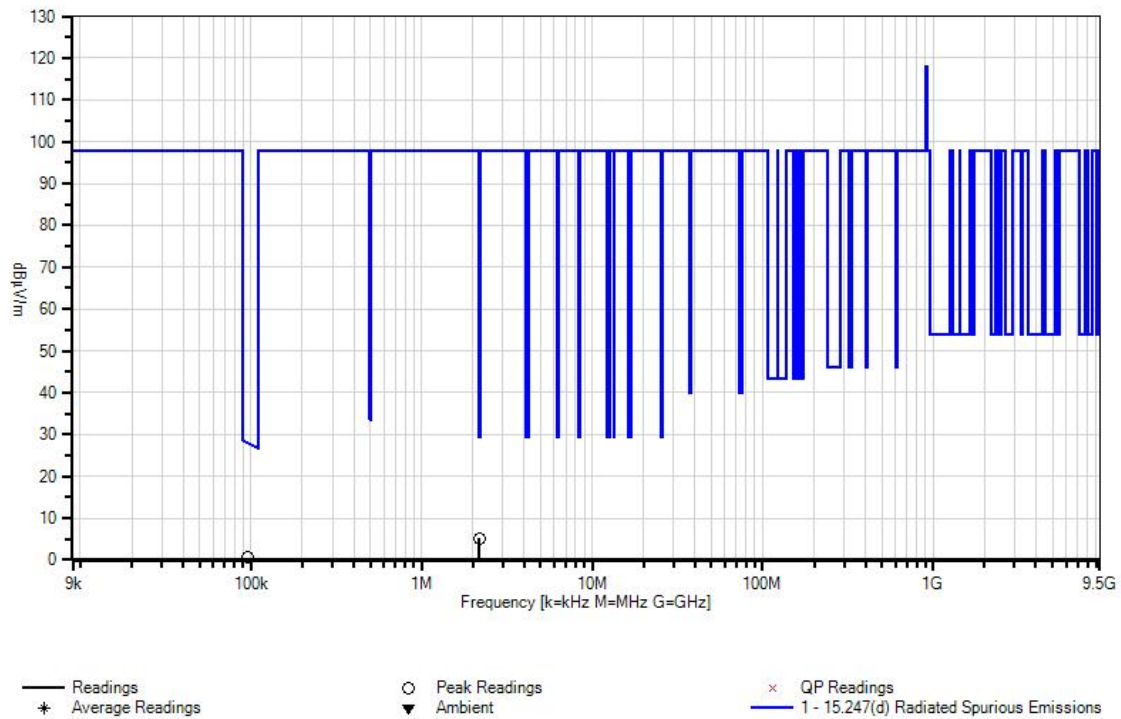
Ext Attn: 0 dB

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	35.5	+9.7	+0.0	+0.0	+0.0	-40.0	5.2	29.5	-24.3	Verti 100
2	96.360k	70.8	+9.7	+0.0	+0.0	+0.1	-80.0	0.6	27.9	-27.3	Verti 100
3	100.800k	69.6	+9.7	+0.0	+0.0	+0.1	-80.0	-0.6	27.5	-28.1	Verti 100
4	92.280k	69.6	+9.7	+0.0	+0.0	+0.1	-80.0	-0.6	28.3	-28.9	Verti 100
5	99.960k	68.7	+9.7	+0.0	+0.0	+0.1	-80.0	-1.5	27.6	-29.1	Verti 100

6	90.000k	69.5	+9.7	+0.0	+0.0	+0.1	-80.0	-0.7	28.5	-29.2	Verti 100
7	91.920k	69.3	+9.7	+0.0	+0.0	+0.1	-80.0	-0.9	28.3	-29.2	Verti 100
8	93.000k	69.2	+9.7	+0.0	+0.0	+0.1	-80.0	-1.0	28.2	-29.2	Verti 100
9	99.600k	68.4	+9.7	+0.0	+0.0	+0.1	-80.0	-1.8	27.6	-29.4	Verti 100
10	104.520k	68.0	+9.7	+0.0	+0.0	+0.1	-80.0	-2.2	27.2	-29.4	Verti 100
11	90.600k	69.2	+9.7	+0.0	+0.0	+0.1	-80.0	-1.0	28.4	-29.4	Verti 100
12	99.360k	68.5	+9.7	+0.0	+0.0	+0.1	-80.0	-1.7	27.7	-29.4	Verti 100
13	94.680k	68.7	+9.7	+0.0	+0.0	+0.1	-80.0	-1.5	28.1	-29.6	Verti 100
14	94.080k	68.6	+9.7	+0.0	+0.0	+0.1	-80.0	-1.6	28.1	-29.7	Verti 100
15	105.840k	67.5	+9.7	+0.0	+0.0	+0.1	-80.0	-2.7	27.1	-29.8	Verti 100
16	109.200k	67.2	+9.7	+0.0	+0.0	+0.1	-80.0	-3.0	26.9	-29.9	Verti 100
17	97.680k	67.9	+9.7	+0.0	+0.0	+0.1	-80.0	-2.3	27.8	-30.1	Verti 100
18	98.280k	67.8	+9.7	+0.0	+0.0	+0.1	-80.0	-2.4	27.8	-30.2	Verti 100
19	108.480k	66.8	+9.7	+0.0	+0.0	+0.1	-80.0	-3.4	26.9	-30.3	Verti 100
20	107.760k	66.7	+9.7	+0.0	+0.0	+0.1	-80.0	-3.5	27.0	-30.5	Verti 100

CKC Laboratories, Inc. Date: 4/28/2011 Time: 4:23:02 PM Itron, Inc. WO#: 91909
 15.247(d) Radiated Spurious Emissions Test Distance: 3 Meters Vertical Sequence#: 22 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 #: **91909** Date: 4/28/2011
 Test Type: **Radiated Scan** Time: 4:33:09 PM
 Equipment: **SRR+WWAN+WIFI+GPS RX** Sequence#: 23
(external WWAN & GPS antenna)
 Manufacturer: Itron, Inc. Tested By: Jeff Gilbert
 Model: CCU100RA
 S/N: 74045189

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN00052	Loop Antenna	6502	6/8/2010	6/8/2012
T2	ANP05360	Cable	RG214	11/8/2010	11/8/2012
T3	ANP06009	Cable	Heliac	8/5/2010	8/5/2012
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 (external WWAN & GPS antenna)*	Itron, Inc.	CCU100RA	74045189
V-Pol Omni	Antenna Products	AMR3-91657 T0	0818
External WWAN Antenna	Laird Technologies	FG821/18503	40353
External GPS Antenna	Trimble	57861-00	213100323

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Dell	E6400	H4CSTK1

Test Conditions / Notes:

Frequency Range Investigated: 30kHz - 30 MHz
Temp: 23° C
Humidity: 35%
Pressure: 102.7 kPa
The EUT is transmitting; 903, 915, & 926.8 MHz were investigated.

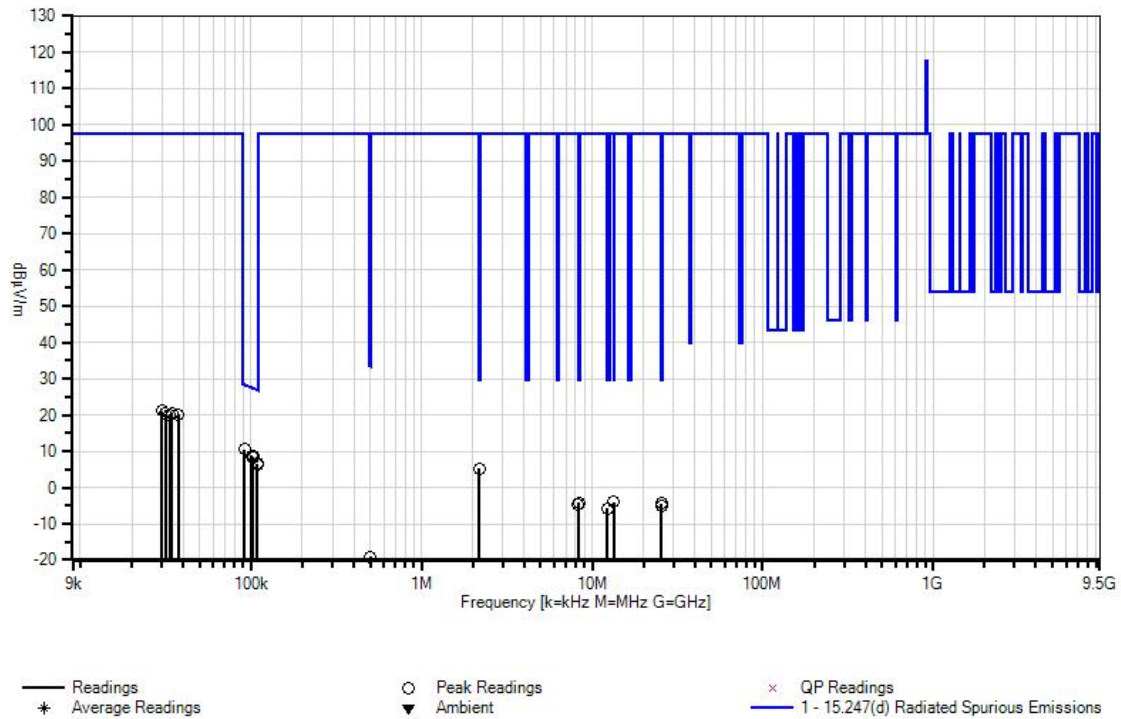
Ext Attn: 0 dB

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	91.680k	80.7	+9.7	+0.0	+0.0	+0.1	-80.0	10.5	28.3	-17.8	Verti 100
2	100.440k	79.0	+9.7	+0.0	+0.0	+0.1	-80.0	8.8	27.6	-18.8	Verti 100
3	102.600k	78.7	+9.7	+0.0	+0.0	+0.1	-80.0	8.5	27.4	-18.9	Verti 100
4	103.080k	78.4	+9.7	+0.0	+0.0	+0.1	-80.0	8.2	27.4	-19.2	Verti 100
5	108.960k	76.8	+9.7	+0.0	+0.0	+0.1	-80.0	6.6	26.9	-20.3	Verti 100

6	108.480k	76.7	+9.7	+0.0	+0.0	+0.1	-80.0	6.5	26.9	-20.4	Verti 100
7	2.176M	35.5	+9.7	+0.0	+0.0	+0.0	-40.0	5.2	29.5	-24.3	Verti 100
8	13.410M	26.4	+9.3	+0.1	+0.1	+0.1	-40.0	-4.0	29.5	-33.5	Verti 100
9	8.383M	26.2	+9.5	+0.1	+0.0	+0.1	-40.0	-4.1	29.5	-33.6	Verti 100
10	25.581M	29.0	+6.3	+0.2	+0.1	+0.1	-40.0	-4.3	29.5	-33.8	Verti 100
11	8.365M	25.9	+9.5	+0.1	+0.0	+0.1	-40.0	-4.4	29.5	-33.9	Verti 100
12	8.293M	25.6	+9.5	+0.1	+0.0	+0.1	-40.0	-4.7	29.5	-34.2	Verti 100
13	25.563M	28.3	+6.3	+0.2	+0.1	+0.1	-40.0	-5.0	29.5	-34.5	Verti 100
14	12.293M	24.6	+9.3	+0.1	+0.1	+0.1	-40.0	-5.8	29.5	-35.3	Verti 100
15	501.000k	51.4	+9.4	+0.0	+0.0	+0.1	-80.0	-19.1	33.6	-52.7	Verti 100
16	30.000k	89.6	+11.4	+0.0	+0.0	+0.1	-80.0	21.1	97.8	-76.7	Verti 100
17	34.440k	89.4	+11.0	+0.0	+0.0	+0.1	-80.0	20.5	97.8	-77.3	Verti 100
18	31.440k	88.9	+11.3	+0.0	+0.0	+0.1	-80.0	20.3	97.8	-77.5	Verti 100
19	33.480k	89.0	+11.1	+0.0	+0.0	+0.1	-80.0	20.2	97.8	-77.6	Verti 100
20	37.560k	89.4	+10.7	+0.0	+0.0	+0.1	-80.0	20.2	97.8	-77.6	Verti 100

CKC Laboratories, Inc. Date: 4/28/2011 Time: 4:33:09 PM Itron, Inc. WO#: 91909
 15.247(d) Radiated Spurious Emissions Test Distance: 3 Meters Vertical Sequence#: 23 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 #: **91909** Date: 4/28/2011
 Test Type: **Radiated Scan** Time: 5:10:14 PM
 Equipment: **SRR+WWAN+WIFI+GPS RX** Sequence#: 25
(external WWAN & GPS antenna)
 Manufacturer: Itron, Inc. Tested By: Jeff Gilbert
 Model: CCU100RA
 S/N: 74045189

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN01993	Biconilog Antenna	CBL6111C	10/9/2009	10/9/2011
T2	ANP05360	Cable	RG214	11/8/2010	11/8/2012
T3	AN01316	Preamp	8447D	5/21/2010	5/21/2012
T4	ANP05547	Cable	Heliastax	5/18/2010	5/18/2012
T5	ANP05337	Cable	RG-214	4/11/2011	4/11/2013
	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.	CCU100RA	74045189
V-Pol Omni	Antenna Products	AMR3-91657 T0	0818
External WWAN Antenna	Laird Technologies	FG821/18503	40353
External GPS Antenna	Trimble	57861-00	213100323

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Dell	E6400	H4CSTK1

Test Conditions / Notes:

Frequency Range Investigated: 30 - 1000 MHz
 Temp: 23° C
 Humidity: 35%
 Pressure: 102.7 kPa

 The EUT is transmitting; 903, 915, & 926.8 MHz were investigated.
 AM16 modulation is the worst case.

Ext Attn: 0 dB

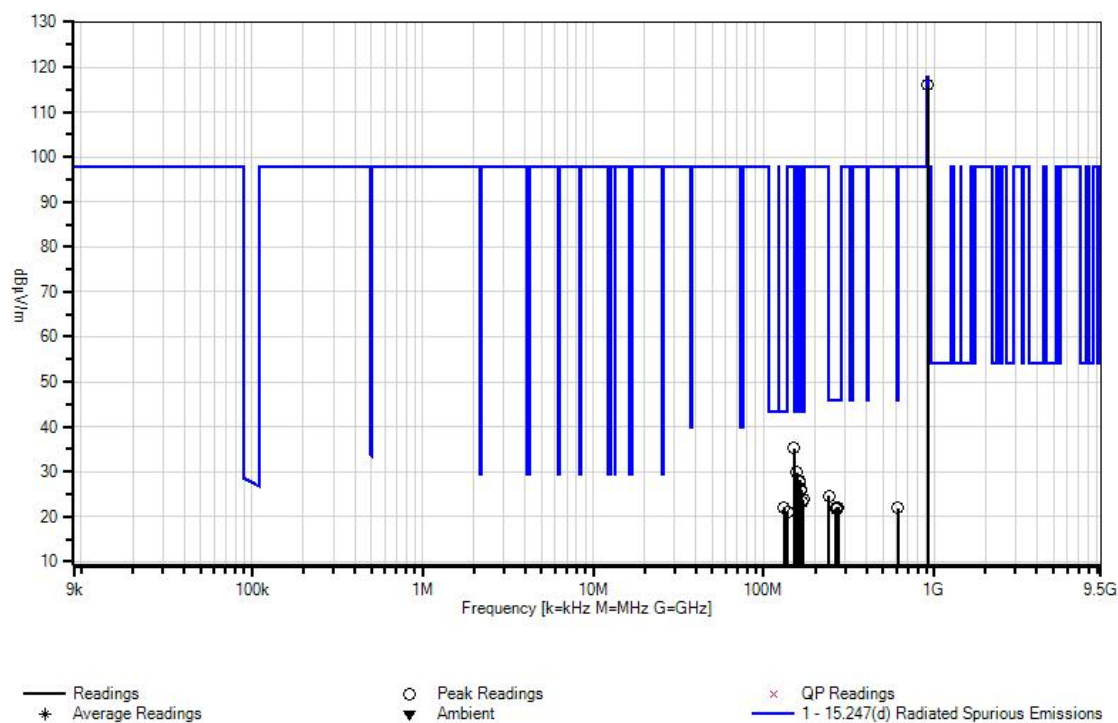
Measurement Data:

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	117.5	+23.3 +0.9	+2.0	-29.2	+1.5	+0.0	116.0	117.8	-1.8	Horiz 130
2	150.002M	50.5	+12.1 +0.4	+0.7	-29.1	+0.6	+0.0	35.2	43.5	-8.3	Horiz 130
3	156.849M	45.6	+11.6 +0.4	+0.7	-29.0	+0.6	+0.0	29.9	43.5	-13.6	Horiz 130
4	163.216M	44.4	+11.0 +0.4	+0.7	-29.0	+0.6	+0.0	28.1	43.5	-15.4	Horiz 130
5	162.375M	43.9	+11.1 +0.4	+0.7	-29.0	+0.6	+0.0	27.7	43.5	-15.8	Horiz 130
6	163.936M	42.3	+11.0 +0.4	+0.7	-29.0	+0.6	+0.0	26.0	43.5	-17.5	Horiz 130
7	164.417M	42.2	+10.9 +0.4	+0.7	-29.0	+0.6	+0.0	25.8	43.5	-17.7	Horiz 130
8	165.378M	42.3	+10.8 +0.4	+0.7	-29.0	+0.6	+0.0	25.8	43.5	-17.7	Horiz 130
9	170.783M	40.8	+10.2 +0.4	+0.7	-28.9	+0.6	+0.0	23.8	43.5	-19.7	Horiz 130
10	167.900M	40.1	+10.5 +0.4	+0.7	-29.0	+0.6	+0.0	23.3	43.5	-20.2	Horiz 130
11	169.101M	39.9	+10.4 +0.4	+0.7	-28.9	+0.6	+0.0	23.1	43.5	-20.4	Horiz 130
12	241.053M	38.9	+12.2 +0.4	+0.9	-28.6	+0.8	+0.0	24.6	46.0	-21.4	Horiz 130
13	132.225M	37.4	+12.2 +0.4	+0.6	-29.2	+0.5	+0.0	21.9	43.5	-21.6	Horiz 130
14	137.990M	36.5	+12.1 +0.4	+0.6	-29.1	+0.6	+0.0	21.1	43.5	-22.4	Horiz 130
15	272.525M	35.3	+13.1 +0.5	+0.9	-28.5	+0.8	+0.0	22.1	46.0	-23.9	Horiz 130
16	273.366M	35.3	+13.1 +0.5	+0.9	-28.5	+0.8	+0.0	22.1	46.0	-23.9	Horiz 130
17	266.999M	35.3	+13.0 +0.5	+0.9	-28.5	+0.8	+0.0	22.0	46.0	-24.0	Horiz 130
18	611.263M	28.3	+20.0 +0.7	+1.5	-29.8	+1.2	+0.0	21.9	46.0	-24.1	Horiz 130
19	266.278M	35.1	+13.0 +0.5	+0.9	-28.5	+0.8	+0.0	21.8	46.0	-24.2	Horiz 130
20	264.717M	34.9	+13.0 +0.5	+0.9	-28.5	+0.8	+0.0	21.6	46.0	-24.4	Horiz 130

CKC Laboratories, Inc. Date: 4/28/2011 Time: 5:10:14 PM Itron, Inc. WO#: 91909
 15.247(d) Radiated Spurious Emissions Test Distance: 3 Meters Horizontal Sequence#: 25 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 #: **91909** Date: 4/28/2011
 Test Type: **Radiated Scan** Time: 17:08:25
 Equipment: **SRR+WWAN+WIFI+GPS RX** Sequence#: 24
(external WWAN & GPS antenna)
 Manufacturer: Itron, Inc. Tested By: Jeff Gilbert
 Model: CCU100RA
 S/N: 74045189

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN01993	Biconilog Antenna	CBL6111C	10/9/2009	10/9/2011
T2	ANP05360	Cable	RG214	11/8/2010	11/8/2012
T3	AN01316	Preamp	8447D	5/21/2010	5/21/2012
T4	ANP05547	Cable	Heliastax	5/18/2010	5/18/2012
T5	ANP05337	Cable	RG-214	4/11/2011	4/11/2013
	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.	CCU100RA	74045189
V-Pol Omni	Antenna Products	AMR3-91657 T0	0818
External WWAN Antenna	Laird Technologies	FG821/18503	40353
External GPS Antenna	Trimble	57861-00	213100323

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Dell	E6400	H4CSTK1

Test Conditions / Notes:

Frequency Range Investigated: 30 - 1000 MHz
 Temp: 23° C
 Humidity: 35%
 Pressure: 102.7 kPa

 The EUT is transmitting; 903, 915, & 926.8 MHz were investigated.
 AM16 modulation is the worst case.

Ext Attn: 0 dB

Measurement Data:

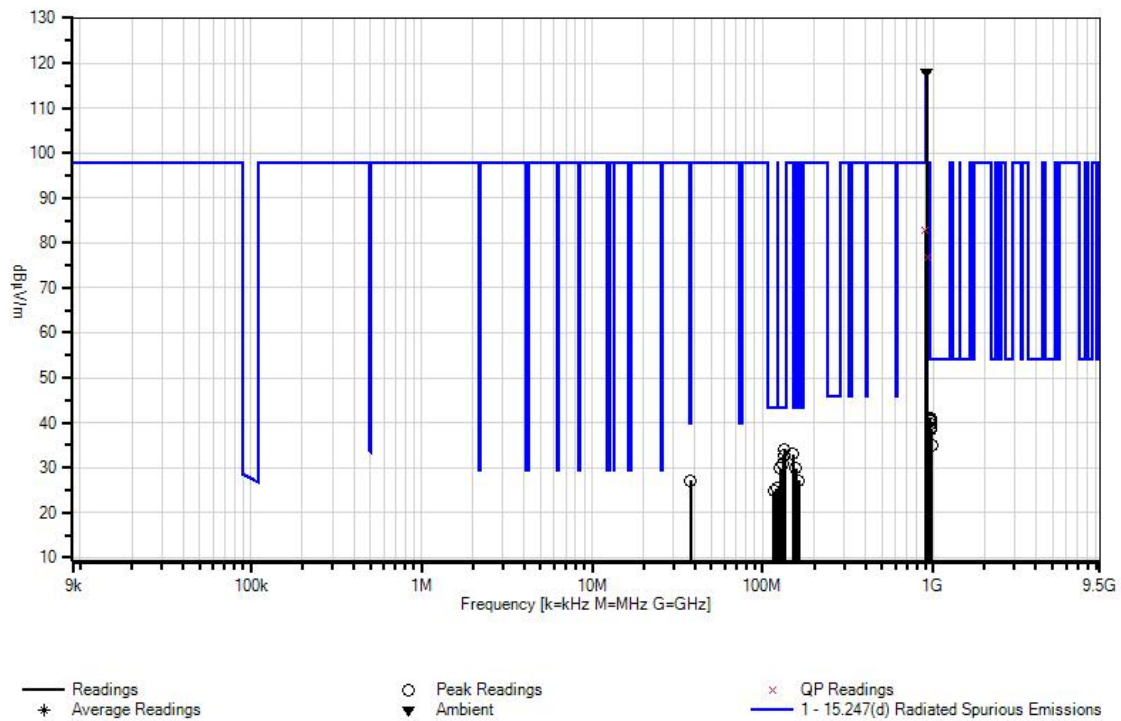
Reading listed by margin.

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 Ambient	119.4	+23.3 +0.9	+2.0	-29.2	+1.5	+0.0 360	117.9	117.8 Fundamental	+0.1	Verti 130
2	134.026M	49.6	+12.2 +0.4	+0.6	-29.2	+0.5	+0.0 360	34.1	43.5	-9.4	Verti 130
3	150.002M	48.3	+12.1 +0.4	+0.7	-29.1	+0.6	+0.0 360	33.0	43.5	-10.5	Verti 130
4	132.585M	48.1	+12.2 +0.4	+0.6	-29.2	+0.5	+0.0 360	32.6	43.5	-10.9	Verti 130
5	131.023M	46.5	+12.2 +0.4	+0.6	-29.2	+0.5	+0.0 360	31.0	43.5	-12.5	Verti 130
6	37.587M	43.3	+12.4 +0.2	+0.3	-29.4	+0.3	+0.0 360	27.1	40.0	-12.9	Verti 130
7	961.244M	41.8	+23.9 +0.9	+2.0	-29.1	+1.5	+0.0 360	41.0	54.0	-13.0	Verti 130
8	960.555M	41.5	+23.9 +0.9	+2.0	-29.1	+1.5	+0.0 360	40.7	54.0	-13.3	Verti 130
9	126.098M	45.3	+12.4 +0.3	+0.6	-29.2	+0.5	+0.0 360	29.9	43.5	-13.6	Verti 130
10	962.809M	41.1	+23.9 +0.9	+2.0	-29.0	+1.5	+0.0 360	40.4	54.0	-13.6	Verti 130
11	156.729M	45.5	+11.6 +0.4	+0.7	-29.0	+0.6	+0.0 360	29.8	43.5	-13.7	Verti 130
12	965.564M	40.2	+24.0 +0.9	+2.0	-29.0	+1.5	+0.0 360	39.6	54.0	-14.4	Verti 130
13	901.716M QP	84.6	+23.1 +0.9	+1.9	-29.2	+1.5	+0.0 170	82.8	97.8 Bandedge	-15.0	Verti 140
^	901.732M	87.2	+23.1 +0.9	+1.9	-29.2	+1.5	+0.0 170	85.4	97.8 Bandedge	-12.4	Verti 140
15	966.378M	39.3	+24.0 +0.9	+2.0	-29.0	+1.5	+0.0 360	38.7	54.0	-15.3	Verti 130
16	967.192M	39.0	+24.0 +0.9	+2.0	-29.0	+1.5	+0.0 360	38.4	54.0	-15.6	Verti 130
17	162.014M	43.3	+11.2 +0.4	+0.7	-29.0	+0.6	+0.0 360	27.2	43.5	-16.3	Verti 130
18	120.933M	41.9	+11.3 +0.3	+0.6	-29.2	+0.5	+0.0 360	25.4	43.5	-18.1	Verti 130
19	121.894M	41.6	+11.6 +0.3	+0.6	-29.2	+0.5	+0.0 360	25.4	43.5	-18.1	Verti 130
20	116.369M	41.5	+11.0 +0.3	+0.6	-29.2	+0.5	+0.0 360	24.7	43.5	-18.8	Verti 130
21	978.274M	35.5	+24.1 +0.9	+2.0	-29.0	+1.6	+0.0 360	35.1	54.0	-18.9	Verti 130
22	977.585M	35.4	+24.1 +0.9	+2.0	-29.0	+1.6	+0.0 360	35.0	54.0	-19.0	Verti 130
23	928.002M QP	77.9	+23.5 +0.9	+2.0	-29.1	+1.5	+0.0 210	76.7	97.8 Bandedge	-21.1	Verti 140

^	928.005M	82.4	+23.5	+2.0	-29.1	+1.5	+0.0	81.2	97.8	-16.6	Verti
			+0.9				210		Bandedge		140

CKC Laboratories, Inc. Date: 4/28/2011 Time: 17:08:25 Itron, Inc. WO#: 91909
 15.247(d) Radiated Spurious Emissions Test Distance: 3 Meters Vertical Sequence#: 24 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 #: **91909** Date: 4/28/2011
 Test Type: **Radiated Scan** Time: 16:04:24
 Equipment: **SRR+WWAN+WIFI+GPS RX** Sequence#: 21
(external WWAN & GPS antenna)
 Manufacturer: Itron, Inc. Tested By: Jeff Gilbert
 Model: CCU100RA
 S/N: 74045189

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	Preamplifier	83017A	9/17/2009	9/17/2011
T5	ANP05542	Cable	Heliac	10/23/2009	10/23/2011
T6	ANP06009	Cable	Heliac	8/5/2010	8/5/2012
T7	ANCOR-WO91909-20110428	Duty Cycle Correction Factor		4/28/2011	4/28/2012
	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.	CCU100RA	74045189
V-Pol Omni	Antenna Products	AMR3-91657 T0	0818
External WWAN Antenna	Laird Technologies	FG821/18503	40353
External GPS Antenna	Trimble	57861-00	213100323

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Dell	E6400	H4CSTK1

Test Conditions / Notes:

Frequency Range Investigated: 1 – 9.3 GHz
 Temp: 23° C
 Humidity: 35%
 Pressure: 102.7 kPa

The EUT is transmitting; 903, 915, & 926.8 MHz were investigated.
 FM37.5 modulation is the worst case.
 Duty Cycle Correction Factor:
 Max possible on time is 20mS, therefore, $20\log(0.02/0.1) = -14$ dB.

Ext Attn: 0 dB

Measurement Data:

Reading listed by margin.

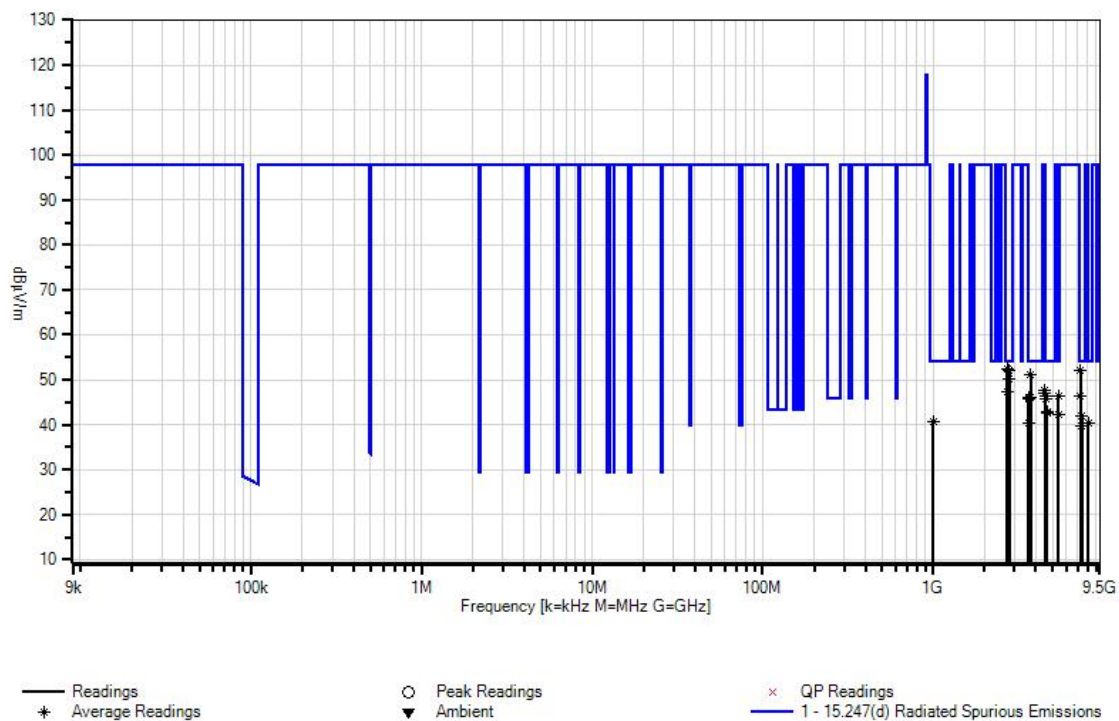
Test Distance: 3 Meters

#	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	2709.003M Ave	53.4	+28.4 +3.0	+0.2 +1.5	+0.3 +0.0	-34.3	+0.0 335	52.5	54.0	-1.5	Verti 135
^	2709.006M	55.6	+28.4 +3.0	+0.2 +1.5	+0.3 +0.0	-34.3	+0.0 335	54.7	54.0	+0.7	Verti 135
3	7320.007M Ave	55.8	+36.1 +5.2	+0.2 +2.9	+0.5 -14.0	-34.6	+0.0 122	52.1	54.0 Duty Cycle Corr.	-1.9	Verti 109
^	7319.993M	59.0	+36.1 +5.2	+0.2 +2.9	+0.5 +0.0	-34.6	+0.0 122	69.3	54.0	+15.3	Verti 109
^	7319.993M	56.0	+36.1 +5.2	+0.2 +2.9	+0.5 +0.0	-34.6	+0.0 360	66.3	54.0	+12.3	Verti 130
6	2780.402M Ave	52.6	+28.6 +3.1	+0.2 +1.5	+0.3 +0.0	-34.3	+0.0 296	52.0	54.0	-2.0	Horiz 123
^	2780.479M	54.0	+28.6 +3.1	+0.2 +1.5	+0.3 +0.0	-34.3	+0.0 296	53.4	54.0	-0.6	Horiz 123
8	3707.205M Ave	61.8	+30.9 +3.7	+0.2 +1.9	+0.3 -14.0	-33.8	+0.0 41	51.0	54.0 Duty Cycle Corr.	-3.0	Horiz 144
^	3707.205M	62.6	+30.9 +3.7	+0.2 +1.9	+0.3 +0.0	-33.8	+0.0 41	65.8	54.0	+11.8	Horiz 144
10	2780.403M Ave	50.9	+28.6 +3.1	+0.2 +1.5	+0.3 +0.0	-34.3	+0.0 48	50.3	54.0	-3.7	Verti 130
^	2780.400M	52.9	+28.6 +3.1	+0.2 +1.5	+0.3 +0.0	-34.3	+0.0 48	52.3	54.0	-1.7	Verti 130
12	4515.004M Ave	56.2	+32.6 +4.1	+0.3 +2.0	+0.4 -14.0	-33.9	+0.0 322	47.7	54.0 Duty Cycle Corr.	-6.3	Horiz 125
^	4515.089M	57.7	+32.6 +4.1	+0.3 +2.0	+0.4 +0.0	-33.9	+0.0 322	63.2	54.0	+9.2	Horiz 125
14	2709.008M Ave	48.2	+28.4 +3.0	+0.2 +1.5	+0.3 +0.0	-34.3	+0.0 310	47.3	54.0	-6.7	Horiz 118
^	2709.013M	52.5	+28.4 +3.0	+0.2 +1.5	+0.3 +0.0	-34.3	+0.0 310	51.6	54.0	-2.4	Horiz 118
16	4515.005M Ave	55.5	+32.6 +4.1	+0.3 +2.0	+0.4 -14.0	-33.9	+0.0 336	47.0	54.0 Duty Cycle Corr.	-7.0	Verti 115
^	4515.070M	57.0	+32.6 +4.1	+0.3 +2.0	+0.4 +0.0	-33.9	+0.0 336	62.5	54.0	+8.5	Verti 115
18	5418.001M Ave	52.7	+33.9 +4.6	+0.2 +2.5	+0.5 -14.0	-33.9	+0.0 77	46.5	54.0 Duty Cycle Corr.	-7.5	Horiz 130
^	5418.093M	54.4	+33.9 +4.6	+0.2 +2.5	+0.5 +0.0	-33.9	+0.0 77	62.2	54.0	+8.2	Horiz 130
20	4575.002M Ave	54.9	+32.6 +4.1	+0.3 +2.0	+0.4 -14.0	-33.8	+0.0 32	46.5	54.0 Duty Cycle Corr.	-7.5	Horiz 135
^	4575.059M	56.7	+32.6 +4.1	+0.3 +2.0	+0.4 +0.0	-33.8	+0.0 32	62.3	54.0	+8.3	Horiz 135
22	7320.005M Ave	50.0	+36.1 +5.2	+0.2 +2.9	+0.5 -14.0	-34.6	+0.0 7	46.3	54.0 Duty Cycle Corr.	-7.7	Horiz 103
^	7320.028M	53.4	+36.1 +5.2	+0.2 +2.9	+0.5 +0.0	-34.6	+0.0 7	63.7	54.0	+9.7	Horiz 103

24	3660.005M Ave	57.3	+30.8 +3.6	+0.2 +1.8	+0.3 -14.0	-33.8 42	+0.0	46.2	54.0 Duty Cycle Corr.	-7.8	Horiz 145
^	3660.029M	58.4	+30.8 +3.6	+0.2 +1.8	+0.3 +0.0	-33.8 42	+0.0	61.3	54.0	+7.3	Horiz 145
26	3707.209M Ave	56.7	+30.9 +3.7	+0.2 +1.9	+0.3 -14.0	-33.8 110	+0.0	45.9	54.0 Duty Cycle Corr.	-8.1	Verti 120
^	3707.239M	57.8	+30.9 +3.7	+0.2 +1.9	+0.3 +0.0	-33.8 110	+0.0	61.0	54.0	+7.0	Verti 120
28	3660.001M Ave	57.0	+30.8 +3.6	+0.2 +1.8	+0.3 -14.0	-33.8 327	+0.0	45.9	54.0 Duty Cycle Corr.	-8.1	Verti 100
^	3660.093M	58.1	+30.8 +3.6	+0.2 +1.8	+0.3 +0.0	-33.8 327	+0.0	61.0	54.0	+7.0	Verti 100
^	3660.093M	53.5	+30.8 +3.6	+0.2 +1.8	+0.3 +0.0	-33.8 360	+0.0	56.4	54.0	+2.4	Verti 130
31	4575.001M Ave	54.2	+32.6 +4.1	+0.3 +2.0	+0.4 -14.0	-33.8 12	+0.0	45.8	54.0 Duty Cycle Corr.	-8.2	Verti 130
^	4575.039M	56.3	+32.6 +4.1	+0.3 +2.0	+0.4 +0.0	-33.8 12	+0.0	61.9	54.0	+7.9	Verti 130
^	4575.039M	55.3	+32.6 +4.1	+0.3 +2.0	+0.4 +0.0	-33.8 360	+0.0	60.9	54.0	+6.9	Verti 130
34	3612.003M Ave	57.0	+30.6 +3.6	+0.2 +1.8	+0.3 -14.0	-33.9 70	+0.0	45.6	54.0 Duty Cycle Corr.	-8.4	Horiz 145
^	3612.000M	58.1	+30.6 +3.6	+0.2 +1.8	+0.3 +0.0	-33.9 70	+0.0	60.7	54.0	+6.7	Horiz 145
36	4633.998M Ave	51.1	+32.7 +4.2	+0.3 +2.0	+0.4 -14.0	-33.8 28	+0.0	42.9	54.0 Duty Cycle Corr.	-11.1	Horiz 130
^	4634.081M	54.6	+32.7 +4.2	+0.3 +2.0	+0.4 +0.0	-33.8 28	+0.0	60.4	54.0	+6.4	Horiz 130
38	4634.005M Ave	50.8	+32.7 +4.2	+0.3 +2.0	+0.4 -14.0	-33.8 110	+0.0	42.6	54.0 Duty Cycle Corr.	-11.4	Verti 105
^	4634.025M	53.2	+32.7 +4.2	+0.3 +2.0	+0.4 +0.0	-33.8 110	+0.0	59.0	54.0	+5.0	Verti 105
40	5418.004M Ave	48.5	+33.9 +4.6	+0.2 +2.5	+0.5 -14.0	-33.9 340	+0.0	42.3	54.0 Duty Cycle Corr.	-11.7	Verti 130
^	5418.052M	50.7	+33.9 +4.6	+0.2 +2.5	+0.5 +0.0	-33.9 340	+0.0	58.5	54.0	+4.5	Verti 130
42	7414.408M Ave	45.3	+36.2 +5.3	+0.2 +3.0	+0.5 -14.0	-34.6 130	+0.0	41.9	54.0 Duty Cycle Corr.	-12.1	Verti 101
^	7414.507M	48.5	+36.2 +5.3	+0.2 +3.0	+0.5 +0.0	-34.6 130	+0.0	59.1	54.0	+5.1	Verti 101
44	1003.432M Ave	31.7	+23.5 +1.8	+19.9 +0.9	+0.1 +0.0	-37.2 360	+0.0	40.7	54.0	-13.3	Verti 130
^	1003.400M	44.1	+23.5 +1.8	+19.9 +0.9	+0.1 +0.0	-37.2 360	+0.0	53.1	54.0	-0.9	Verti 130
46	8126.995M Ave	30.2	+36.1 +5.5	+0.2 +2.8	+0.4 +0.0	-34.7	+0.0	40.5	54.0	-13.5	Verti 130
^	8126.995M	40.4	+36.1 +5.5	+0.2 +2.8	+0.4 +0.0	-34.7	+0.0	50.7	54.0	-3.3	Verti 130

48	3612.003M	51.8	+30.6	+0.2	+0.3	-33.9	+0.0	40.4	54.0	-13.6	Verti
	Ave		+3.6	+1.8	-14.0		343		Duty Cycle Corr.		102
^	3611.992M	53.6	+30.6	+0.2	+0.3	-33.9	+0.0	56.2	54.0	+2.2	Verti
			+3.6	+1.8	+0.0		343				102
50	7414.405M	43.1	+36.2	+0.2	+0.5	-34.6	+0.0	39.7	54.0	-14.3	Horiz
	Ave		+5.3	+3.0	-14.0		95		Duty Cycle Corr.		131
^	7414.447M	47.0	+36.2	+0.2	+0.5	-34.6	+0.0	57.6	54.0	+3.6	Horiz
			+5.3	+3.0	+0.0		95				131

CKC Laboratories, Inc. Date: 4/28/2011 Time: 16:04:24 Itron, Inc. WO#: 91909
15.247(d) Radiated Spurious Emissions Test Distance: 3 Meters Horizontal Sequence#: 21 Ext ATTN: 0 dB



Test Setup Photos



CCU100A 30kHz – 30MHz – Position 1



CCU100A 30kHz – 30MHz – Position 2



CCU100A 30-1000MHz



CCU100A 1-9.3GHz



CCU100RA 30kHz – 30MHz Position 1



CCU100RA 30kHz – 30MHz Position 2



CCU100RA 30-1000MHz



CCU100RA 1-9.3GHz

99% Bandwidth

Test Conditions / Setup

Comments

The EUT (CCU100A) was setup on the bench and connected to a spectrum analyzer via an RF cable and a 10 dB attenuator. The EUT was cycled through the different channels and modes by test software on a support laptop, connected to the EUT by an Ethernet cable. For this set of tests, all models (CCU100A, CCU100A-Repeater, CCU100RA, and CCU100RA-Repeater) are identical.

Requirement: The transmitted signal bandwidth to be reported is to be its 99% emission bandwidth, as calculated or measured. PASS

Test Equipment

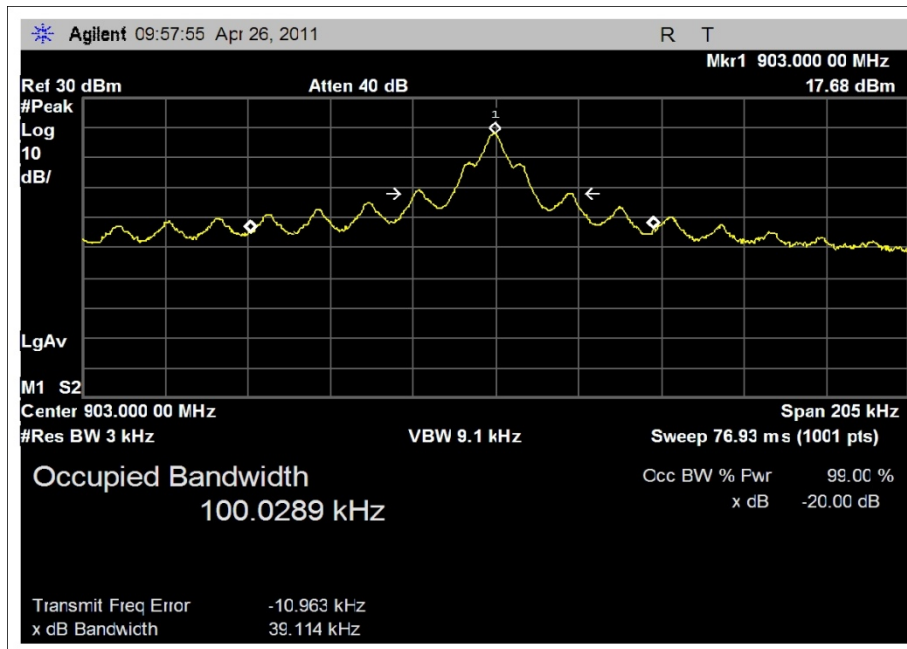
Asset/Serial #	Description	Model	Manufacturer	Cal Date	Cal Due
02872	Spectrum Analyzer	E4440A	Agilent	08/25/2009	08/25/2011
P05435	Attenuator	PE7015-10	Pasternack	09/08/2010	09/08/2012
03122	Cable 10k-18G	32026-2-29801-36	Astrolab	12/23/2010	12/23/2012

Engineer Name: J. Gilbert

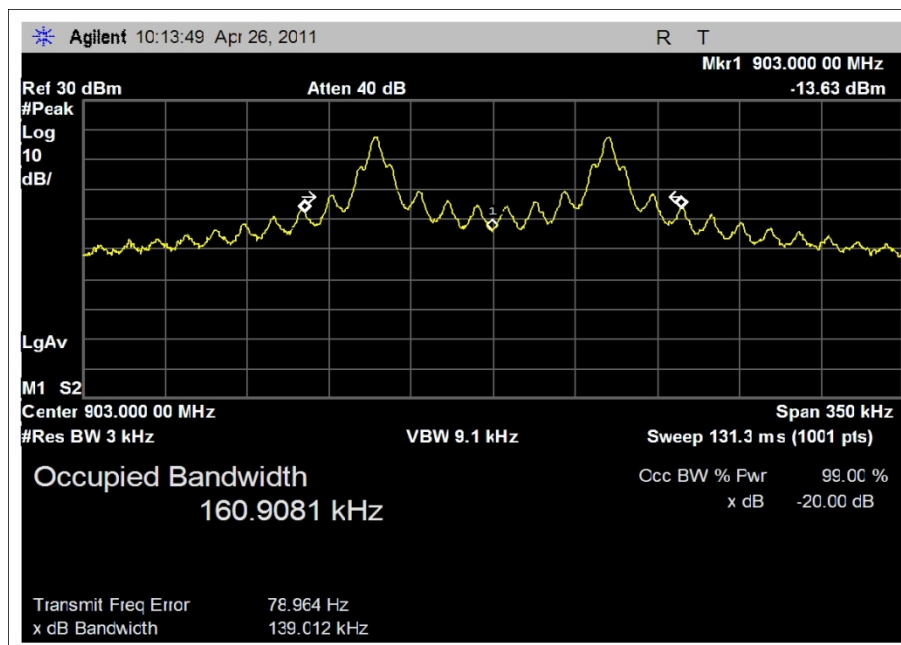
Results Table

903 MHz	AM	FM-12.5 kBaud	FM-37.5 kBaud
	100.0829 kHz	160.9081 kHz	58.2566 kHz
915 MHz	AM	FM-12.5 kBaud	FM-37.5 kBaud
	100.3185 kHz	162.8720 kHz	59.1296 kHz
926.8 MHz	AM	FM-12.5 kBaud	FM-37.5 kBaud
	100.2063 kHz	165.5248 kHz	60.9629 kHz

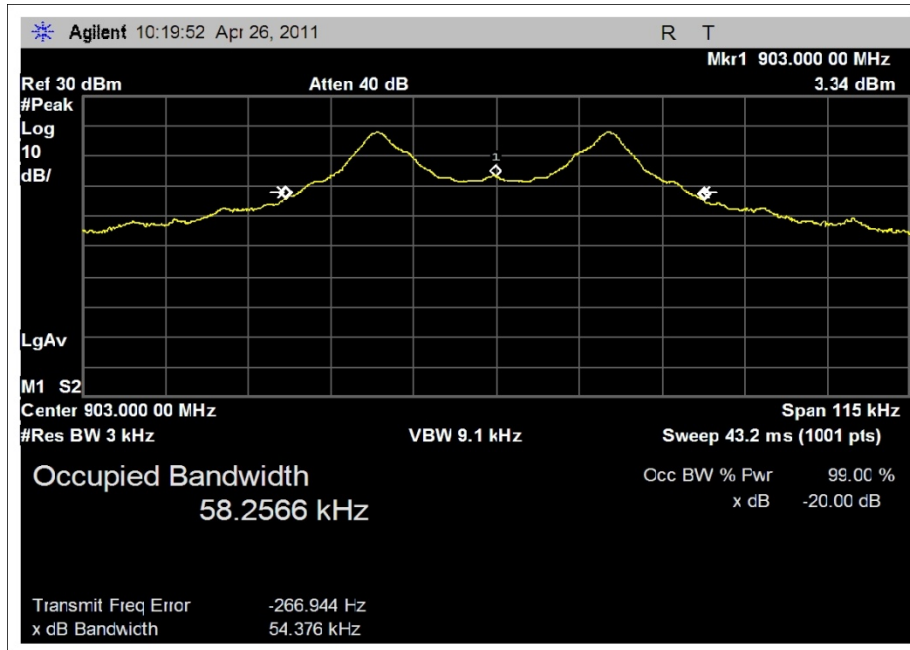
Test Data



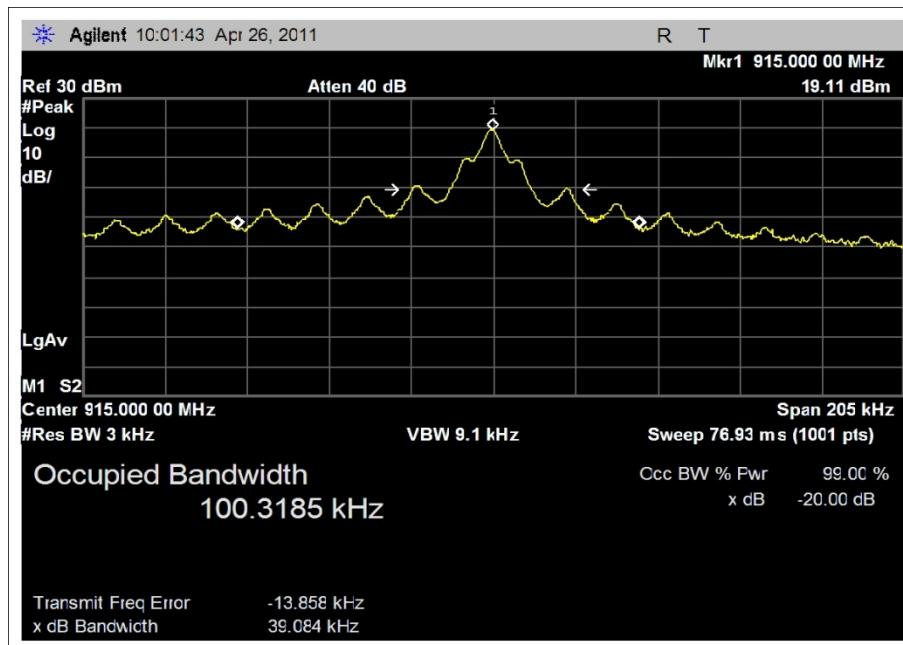
903 AM



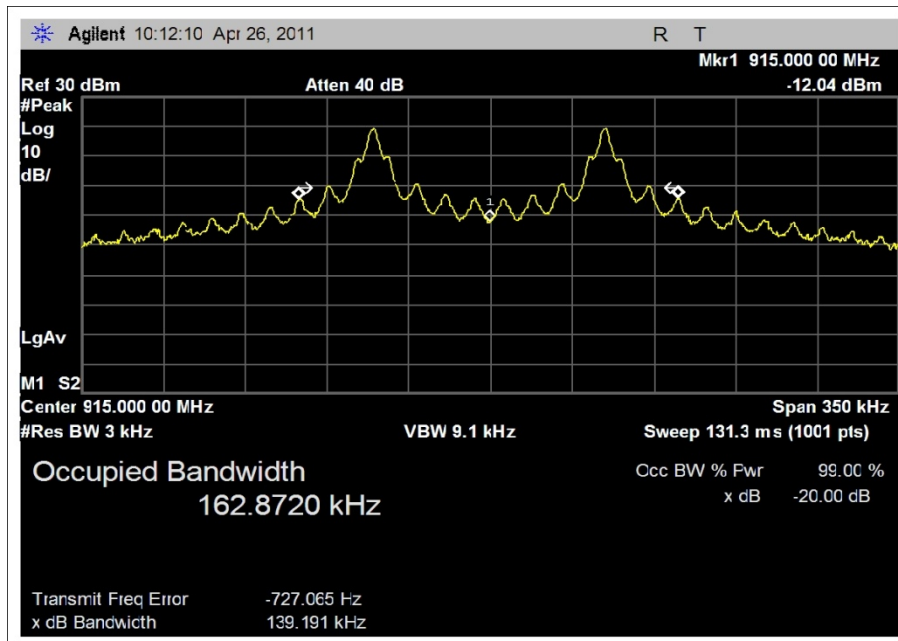
903 FM – 12.5kBaod



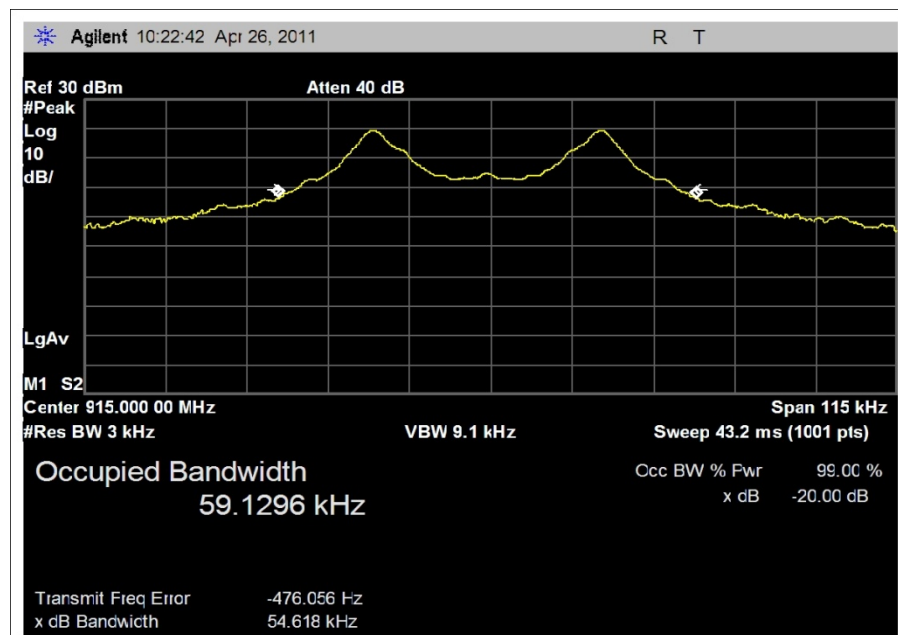
903 FM-37.5kBaund



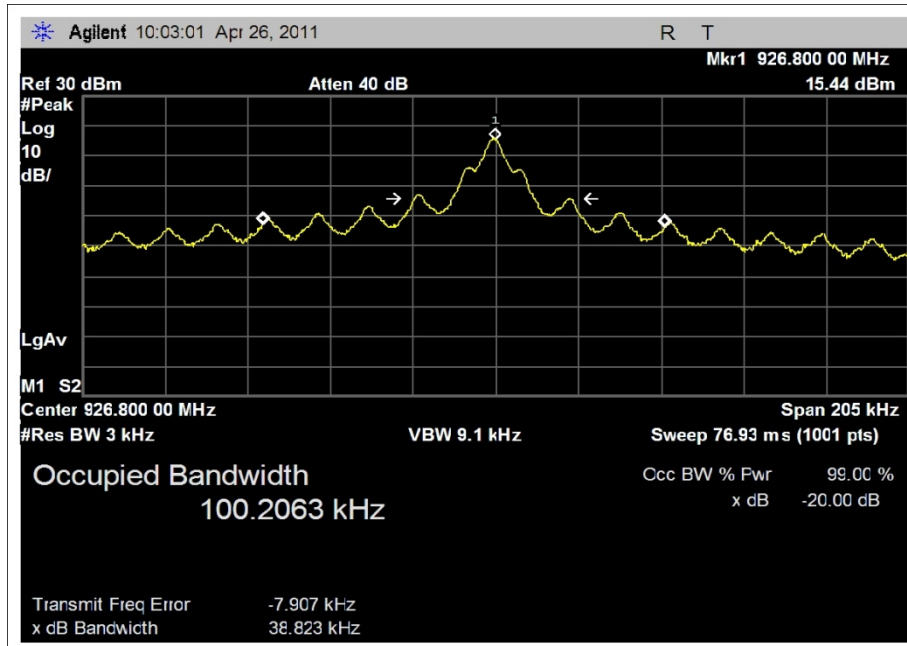
915 AM



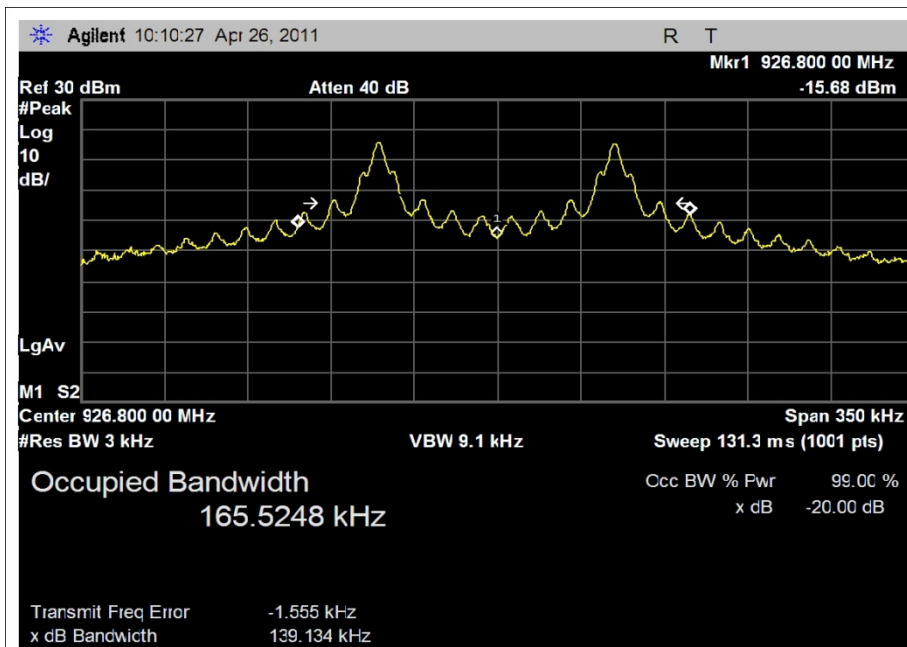
915 FM-12.5kBaud



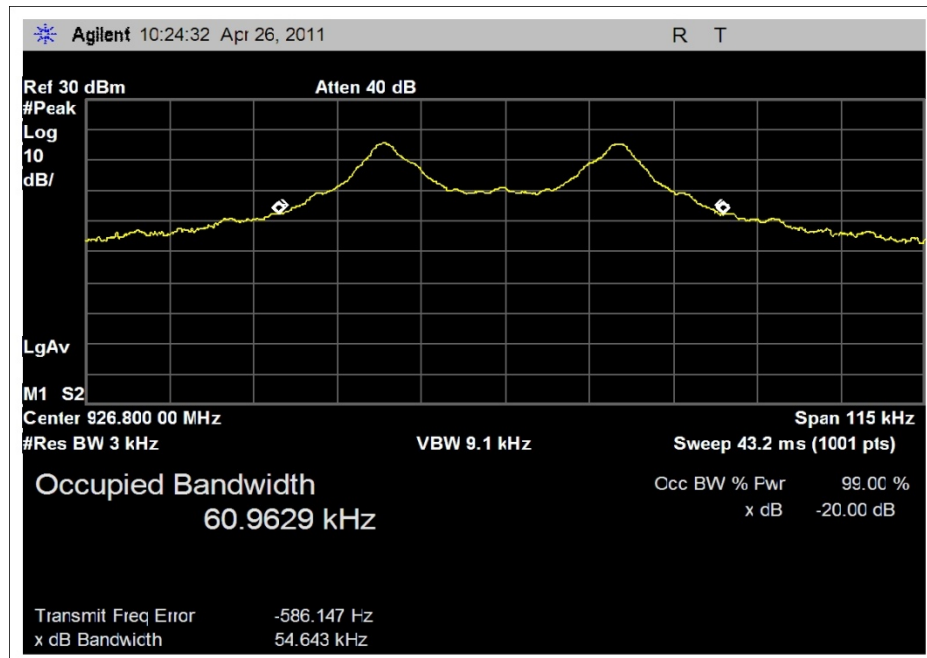
915 FM-37.5kBaud



926.8 AM



926.8 FM-12.5kbaud



926.8 FM-37.5kBaud

Test Setup Photos



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.

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.