15.247(b)(3) Peak Conducted Power

Test Conditions / Setup
Comments
The EUT was setup on the bench and connected to a spectrum analyzer via an RF cable and 6 dB attenuator. The EUT was cycled though the different channels and modes by test software on a support laptop, connected to the EUT by an Ethernet cable. For this requirement, only one model was tested; CCU100B (SRR+WWAN+WIFI+GPS RX Internal WWAN & GPS Antenna). The manufacturer declares that, with regards to this particular test, all models are electrically identical and therefore meet the level of testing equivalent to the tested model. **Requirement: The maximum peak conducted output power of the intentional radiator shall not exceed the following: 1 Watt**

Test Equipment					
Asset/Serial #	**Description**	**Model**	**Manufacturer**	**Cal Date**	**Cal Due**
02872	Spectrum Analyzer	E4440A	Agilent	08/25/2009	08/25/2011
P05513	Attenuator	BW-S6W2	Mini-Circuits	10/12/2009	10/12/2011
03122	Cable	32026-2-29801-36	Astrolab	12/23/2010	12/23/2012

Test Data

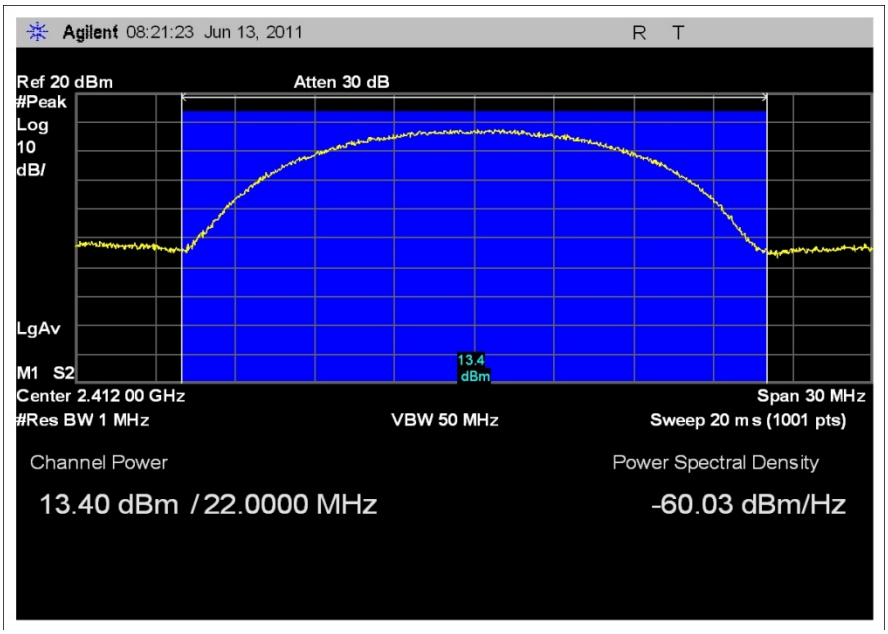
Engineer: A. del Angel

Results Table			
6 dB BW Spec 802.11b			**DTS**
2412 MHz	**2437 MHz**	**2462 MHz**	**Spec = 30 dBm**
dBm/22MHz	dBm/22MHz	dBm/22MHz	
20.20	20.60	21.00	**Pass**

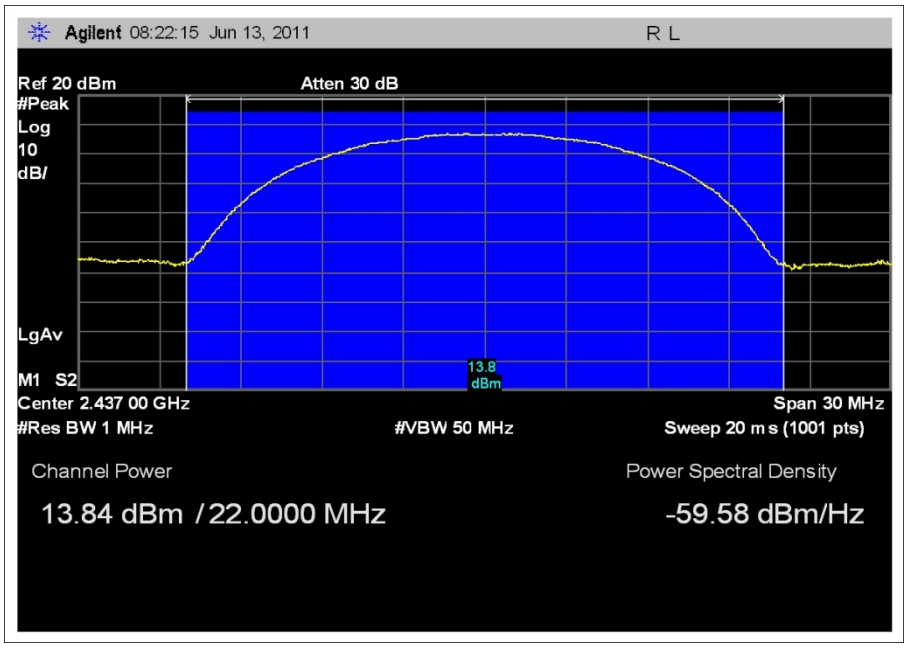
Results Table			
6 dB BW Spec 802.11g			**DTS**
2412 MHz	**2437 MHz**	**2462 MHz**	**Spec = 30 dBm**
dBm/22MHz	dBm/22MHz	dBm/22MHz	
16.30	16.60	17.10	**Pass**

Note: Plots shown on next page are raw measurements. Data above includes correction factors for attenuator and cable.

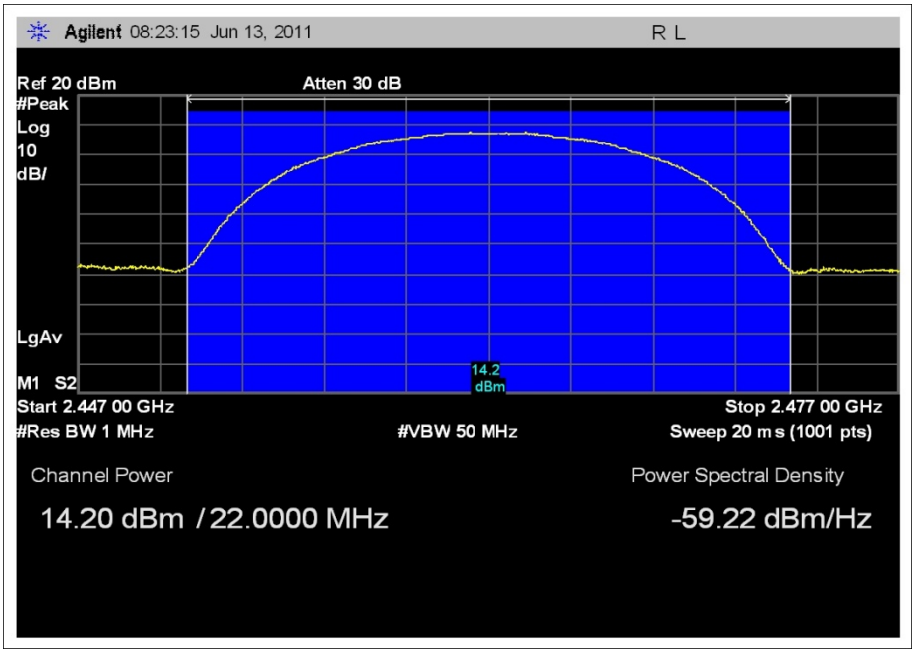
Test Data



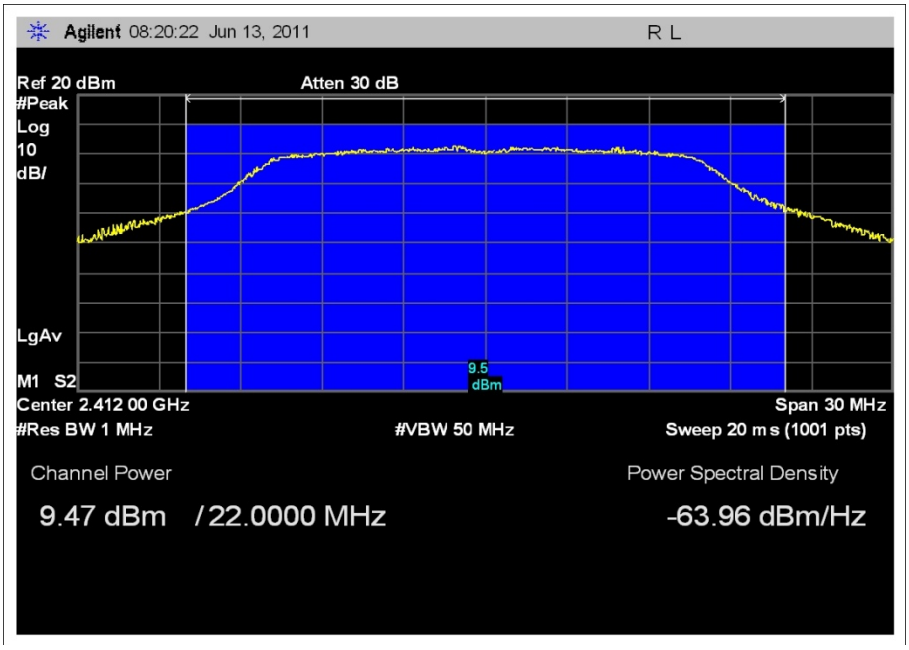
Peak Conducted Power Channel 01 802.11b



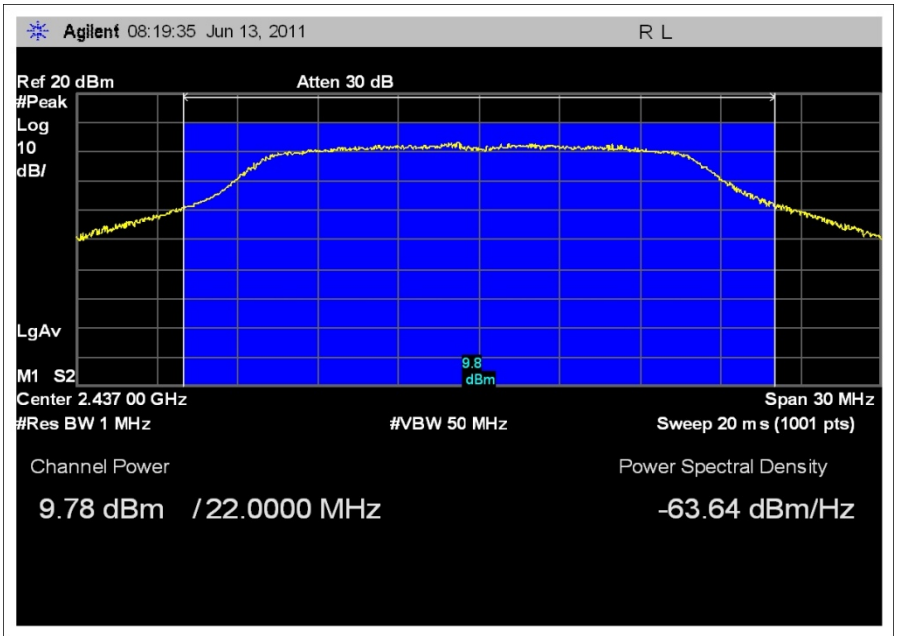
Peak Conducted Power Channel 06 802.11b



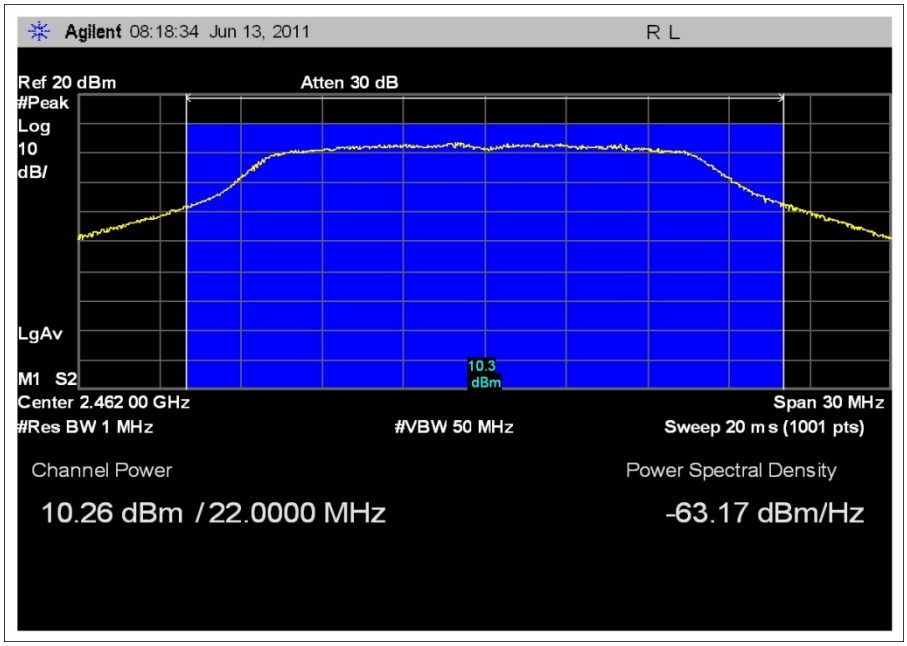
Peak Conducted Power Channel 11 802.11b



Peak Conducted Power Channel 01 802.11g



Peak Conducted Power Channel 06 802.11g



Peak Conducted Power Channel 11 802.11g

Test Setup Photos

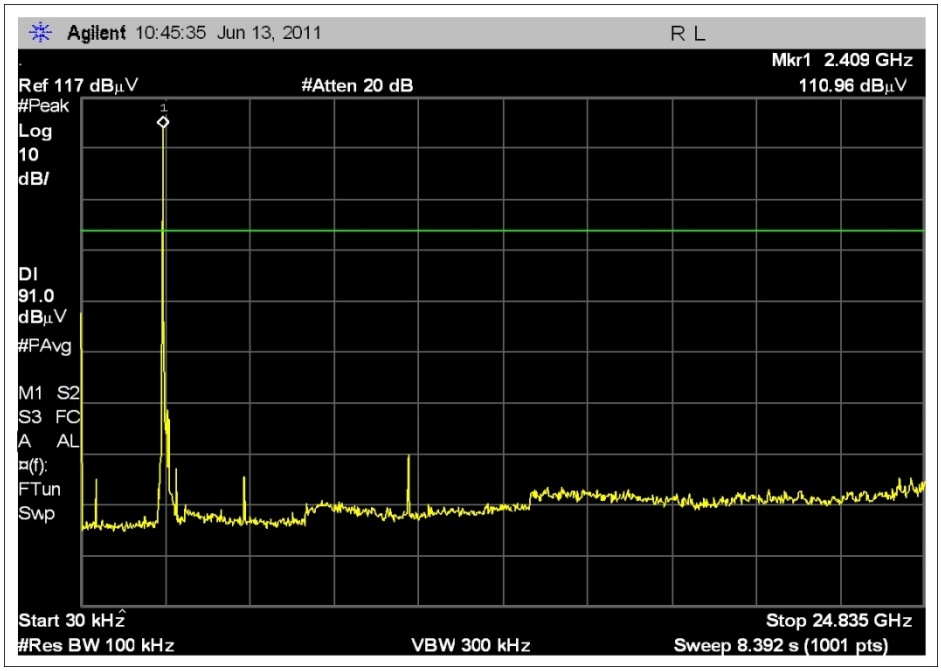
15.247(d) Spurious Emissions – Antenna Conducted

Summary
Comments
The EUT was setup on the bench and connected to a spectrum analyzer via an RF cable. The EUT was cycled though the different channels and modes by test software on a support laptop, connected to the EUT by an Ethernet cable. For this testing, all models (CCU100B, CCU100B-Repeater, CCU100RB, and CCU100RB-Repeater) are identical.

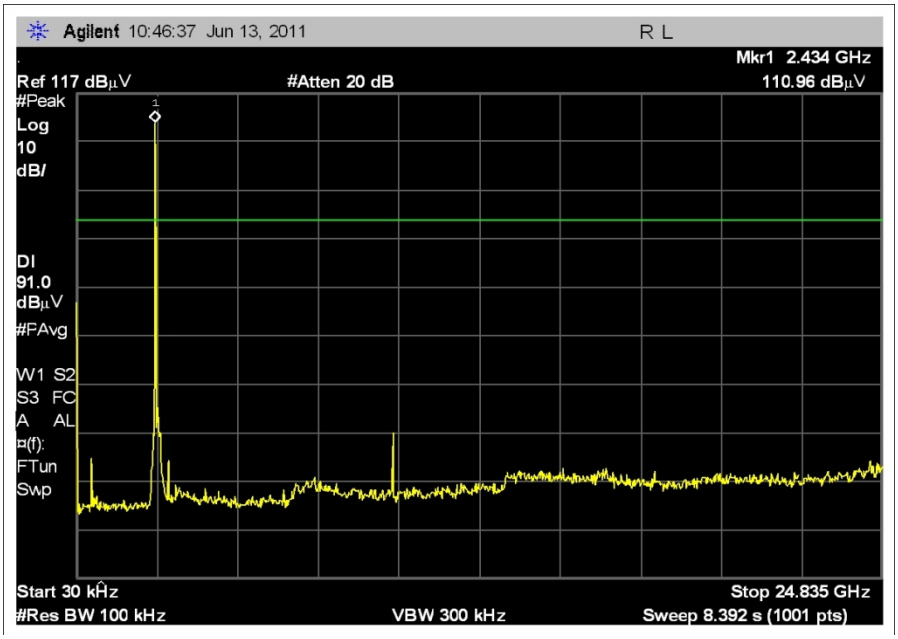
Test Equipment					
Asset/Serial #	**Description**	**Model**	**Manufacturer**	**Cal Date**	**Cal Due**
02872	Spectrum Analyzer	E4440A	Agilent	08/25/2009	08/25/2011
03122	Cable	32026-2-29801-36	Astrolab	12/23/2010	12/23/2012

Engineer: A. del Angel

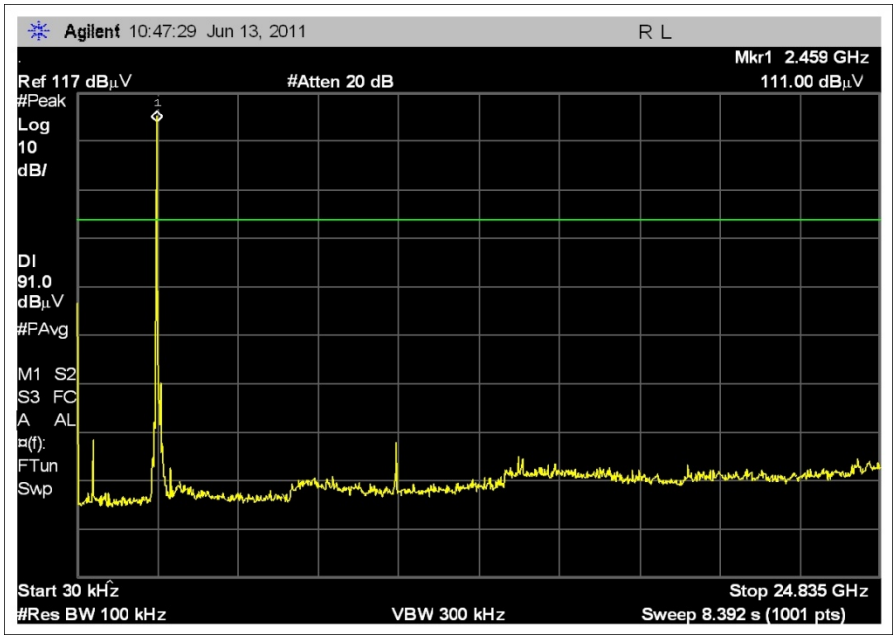
Test Data



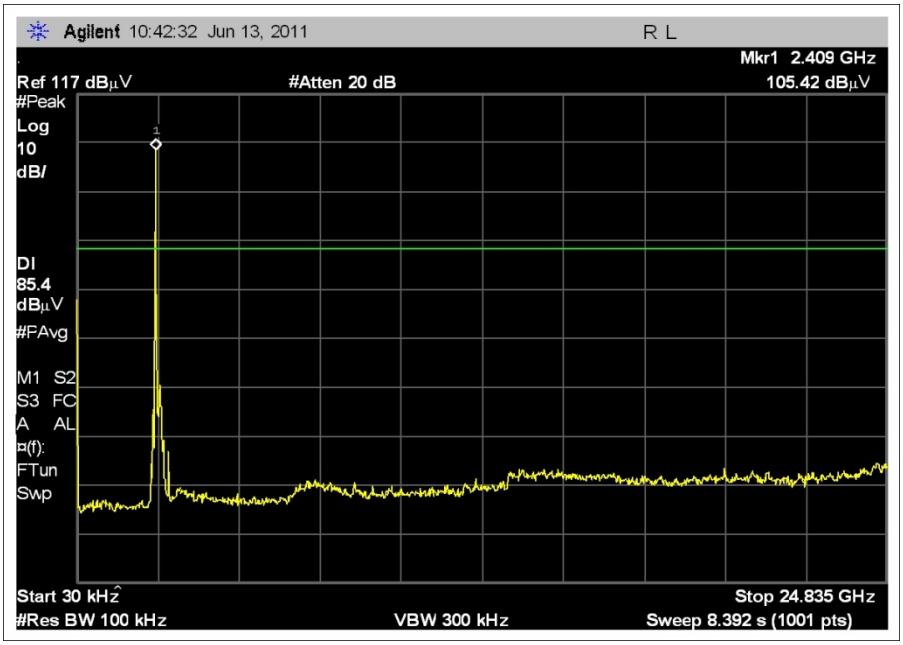
Antenna Conducted 802.11b



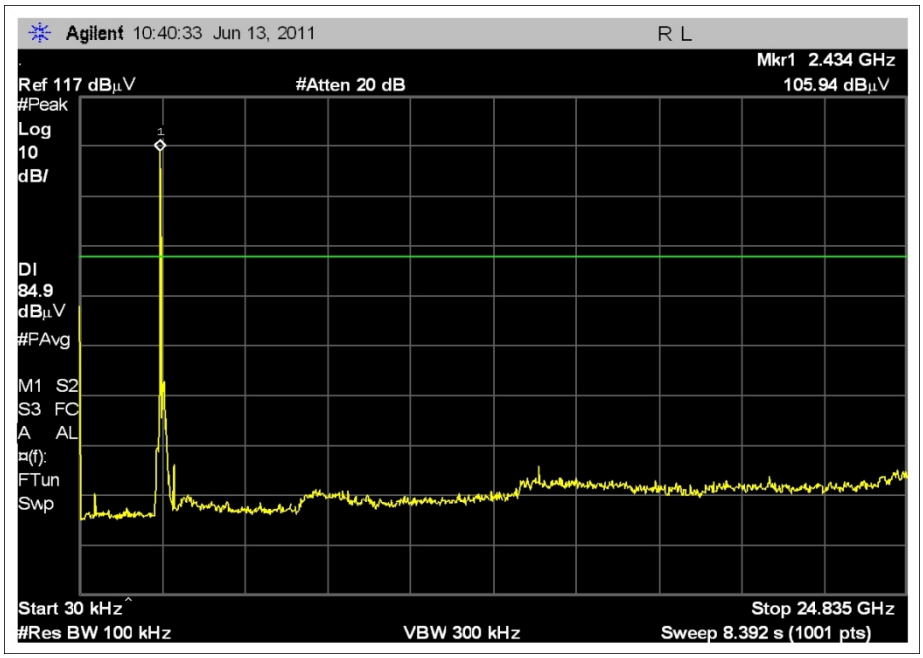
Antenna Conducted 802.11b



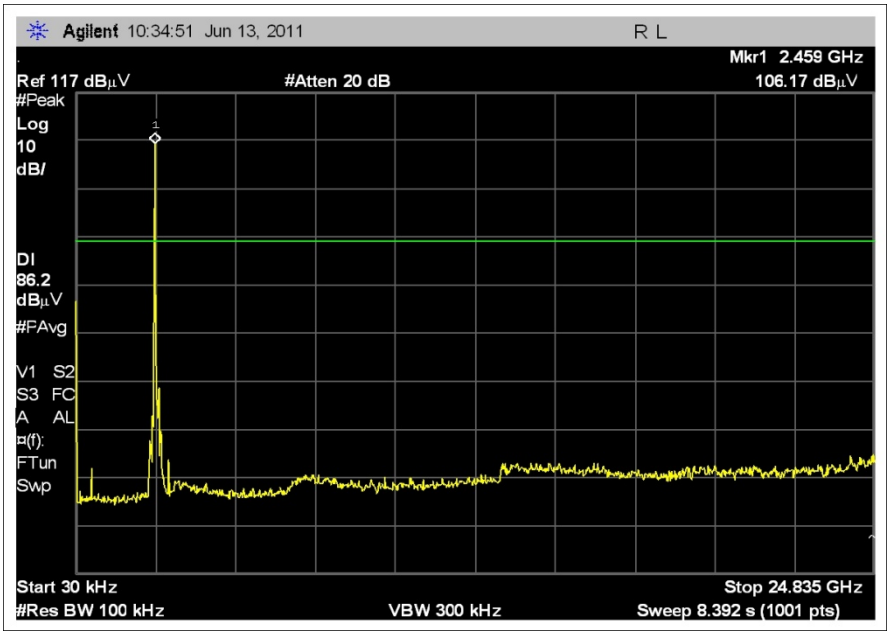
Antenna Conducted 802.11b



Antenna Conducted 802.11g

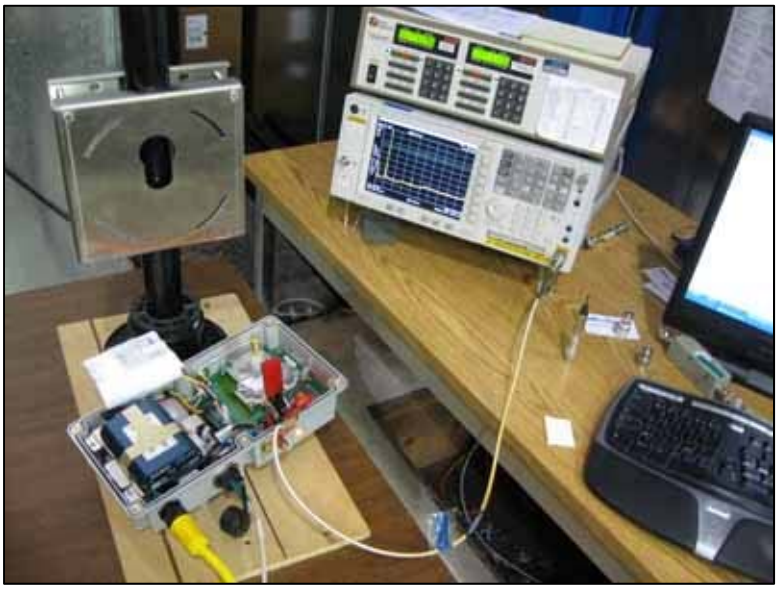


Antenna Conducted 802.11g



Antenna Conducted 802.11g

Test Setup Photos



15.247(d) Spurious Emissions – Radiated

Test Data Sheets

Model: CCU100B

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

Customer:	**Itron, Inc.**		
Specification:	**15.247(d) / 15.209 Radiated Spurious Emissions**		
Work Order #:	**92051**	Date:	6/15/2011
Test Type:	**Radiated Scan**	Time:	8:17:19 AM
Equipment:	**SRR+WWAN+WIFI+GPS RX (internal WWAN & GPS antenna)**	Sequence#:	43
Manufacturer:	Itron, Inc.	Tested By:	Armando del Angel
Model:	CCU100B		
S/N:	7404FCC5		

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN03227	Cable	32026-29080-29080-84	5/2/2011	5/2/2013
	AN02872	Spectrum Analyzer	E4440A	8/25/2009	8/25/2011
T2	ANP05360	Cable	RG214	11/8/2010	11/8/2012
T3	ANP05547	Cable	Heliax	5/18/2010	5/18/2012
T4	AN00052	Loop Antenna	6502	6/8/2010	6/8/2012
T5	AN01717	High Pass Filter	F3440-P005	5/27/2010	5/27/2012

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

Function	Manufacturer	Model #	S/N
SRR+WWAN+WIFI+GPS RX (internal WWAN & GPS antenna)*	Itron, Inc.	CCU100B	7404FCC5

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Dell	E6400	H4CSTK1

Test Conditions / Notes:

Temp: 23°C
Humidity: 43%
Pressure: 102.0kPa
Frequency: 0.03-30MHz

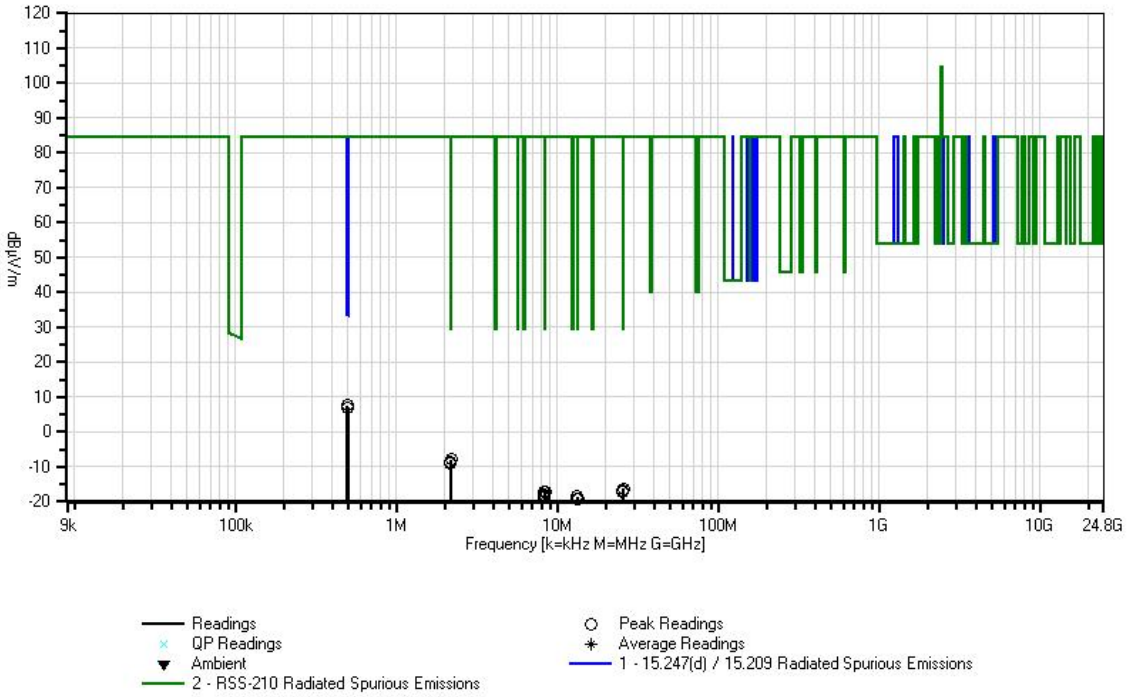
All three frequencies investigated, 2412M, 2437M, 2462M.
Two modulations investigated 802.11b and 802.11g.
Testing per KDB558074.
Worst case results reported.

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	495.600k	38.1	+0.0 +0.1	+0.0	+0.0	+9.4	-40.0	7.6	33.7	-26.1	Perpe 131
2	498.300k	37.5	+0.0 +0.1	+0.0	+0.0	+9.4	-40.0 360	7.0	33.6	-26.6	Perpe 131
3	496.950k	37.5	+0.0 +0.1	+0.0	+0.0	+9.4	-40.0	7.0	33.7	-26.7	Paral 131
4	2.185M	22.3	+0.0 +0.0	+0.0	+0.1	+9.7	-40.0	-7.9	29.5	-37.4	Paral 131
5	2.176M	21.6	+0.0 +0.0	+0.0	+0.1	+9.7	-40.0	-8.6	29.5	-38.1	Perpe 131
6	2.176M	21.1	+0.0 +0.0	+0.0	+0.1	+9.7	-40.0 360	-9.1	29.5	-38.6	Perpe 131
7	25.662M	16.8	+0.1 +0.1	+0.2	+0.3	+6.3	-40.0 360	-16.2	29.5	-45.7	Perpe 131
8	25.662M	16.6	+0.1 +0.1	+0.2	+0.3	+6.3	-40.0	-16.4	29.5	-45.9	Perpe 131
9	25.572M	16.1	+0.1 +0.1	+0.2	+0.3	+6.3	-40.0	-16.9	29.5	-46.4	Perpe 131
10	8.293M	12.9	+0.1 +0.1	+0.1	+0.2	+9.5	-40.0 360	-17.1	29.5	-46.6	Perpe 131
11	8.383M	12.9	+0.1 +0.1	+0.1	+0.2	+9.5	-40.0	-17.1	29.5	-46.6	Paral 131
12	25.572M	15.8	+0.1 +0.1	+0.2	+0.3	+6.3	-40.0 360	-17.2	29.5	-46.7	Perpe 131
13	8.365M	12.2	+0.1 +0.1	+0.1	+0.2	+9.5	-40.0 360	-17.8	29.5	-47.3	Perpe 131
14	8.365M	12.0	+0.1 +0.1	+0.1	+0.2	+9.5	-40.0	-18.0	29.5	-47.5	Perpe 131
15	8.293M	11.8	+0.1 +0.1	+0.1	+0.2	+9.5	-40.0	-18.2	29.5	-47.7	Perpe 131
16	8.293M	11.7	+0.1 +0.1	+0.1	+0.2	+9.5	-40.0	-18.3	29.5	-47.8	Paral 131
17	13.365M	11.8	+0.1 +0.1	+0.1	+0.2	+9.3	-40.0 360	-18.4	29.5	-47.9	Perpe 131
18	8.365M	11.2	+0.1 +0.1	+0.1	+0.2	+9.5	-40.0	-18.8	29.5	-48.3	Paral 131
19	13.383M	11.2	+0.1 +0.1	+0.1	+0.2	+9.3	-40.0	-19.0	29.5	-48.5	Paral 131
20	13.365M	11.2	+0.1 +0.1	+0.1	+0.2	+9.3	-40.0	-19.0	29.5	-48.5	Perpe 131

CKC Laboratories, Inc. Date: 6/15/2011 Time: 8:17:19 AM Itron, Inc. WO#: 92051
15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters Perpendicular Sequence#: 43 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) / 15.209 Radiated Spurious Emissions**
Work Order #: **92051** Date: 6/15/2011
Test Type: **Radiated Scan** Time: 7:13:55 AM
Equipment: **SRR+WWAN+WIFI+GPS RX (internal WWAN & GPS antenna)** Sequence#: 37
Manufacturer: Itron, Inc. Tested By: Armando del Angel
Model: CCU100B
S/N: 7404FCC5

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN03227	Cable	32026-29080-29080-84	5/2/2011	5/2/2013
	AN02872	Spectrum Analyzer	E4440A	8/25/2009	8/25/2011
T2	AN01316	Preamp	8447D	5/21/2010	5/21/2012
T3	AN01993	Biconilog Antenna	CBL6111C	10/9/2009	10/9/2011
T4	ANP05360	Cable	RG214	11/8/2010	11/8/2012
T5	ANP05547	Cable	Heliax	5/18/2010	5/18/2012

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

Function	Manufacturer	Model #	S/N
SRR+WWAN+WIFI+GPS RX (internal WWAN & GPS antenna)*	Itron, Inc.	CCU100B	7404FCC5

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Dell	E6400	H4CSTK1

Test Conditions / Notes:

Temp: 23°C
Humidity: 43%
Pressure: 102.0kPa
Frequency: 30-1000MHz

All three frequencies investigated, 2412M, 2437M, 2462M.
Two modulations investigated 802.11b and 802.11g.
Testing per KDB558074.
Worst case results reported.

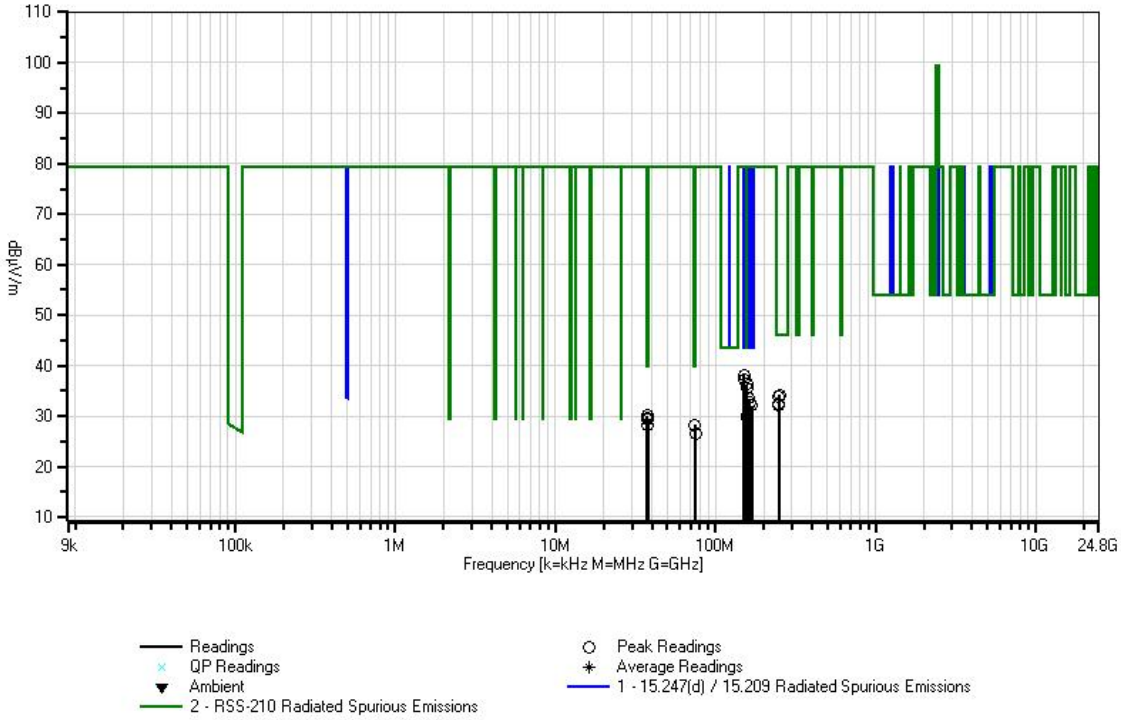
Ext Attn: 0 dB

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	150.002M	53.4	+0.4 +0.6	-29.1	+12.1	+0.7	+0.0 360	38.1	43.5	-5.4	Verti 130
2	150.002M	52.5	+0.4 +0.6	-29.1	+12.1	+0.7	+0.0	37.2	43.5	-6.3	Verti 131
3	156.729M	52.0	+0.4 +0.6	-29.0	+11.6	+0.7	+0.0	36.3	43.5	-7.2	Verti 131
4	156.849M	51.1	+0.4 +0.6	-29.0	+11.6	+0.7	+0.0 360	35.4	43.5	-8.1	Verti 130

5	37.520M	46.3	+0.2 +0.3	-29.4	+12.4	+0.3	+0.0 360	30.1	40.0	-9.9	Verti 130
6	162.255M	49.6	+0.4 +0.6	-29.0	+11.2	+0.7	+0.0	33.5	43.5	-10.0	Verti 131
7	37.520M	45.7	+0.2 +0.3	-29.4	+12.4	+0.3	+0.0	29.5	40.0	-10.5	Verti 131
8	164.056M	49.1	+0.4 +0.6	-29.0	+11.0	+0.7	+0.0 360	32.8	43.5	-10.7	Verti 130
9	37.786M	45.6	+0.2 +0.3	-29.4	+12.3	+0.3	+0.0 360	29.3	40.0	-10.7	Verti 130
10	167.900M	48.8	+0.4 +0.6	-29.0	+10.5	+0.7	+0.0 360	32.0	43.5	-11.5	Verti 130
11	167.780M	48.7	+0.4 +0.6	-29.0	+10.6	+0.7	+0.0	32.0	43.5	-11.5	Verti 131
12	37.786M	44.6	+0.2 +0.3	-29.4	+12.3	+0.3	+0.0	28.3	40.0	-11.7	Verti 131
13	74.588M	48.7	+0.3 +0.4	-29.3	+7.7	+0.4	+0.0 360	28.2	40.0	-11.8	Verti 130
14	250.062M	47.8	+0.5 +0.8	-28.5	+12.7	+0.9	+0.0	34.2	46.0	-11.8	Verti 131
15	249.942M	47.4	+0.5 +0.8	-28.5	+12.7	+0.9	+0.0 360	33.8	46.0	-12.2	Verti 130
16	156.729M	45.8	+0.4 +0.6	-29.0	+11.6	+0.7	+0.0	30.1	43.5	-13.4	Horiz 130
17	249.942M	46.0	+0.5 +0.8	-28.5	+12.7	+0.9	+0.0	32.4	46.0	-13.6	Horiz 130
18	75.120M	46.8	+0.3 +0.4	-29.3	+7.8	+0.4	+0.0 360	26.4	40.0	-13.6	Verti 130
19	249.942M	45.8	+0.5 +0.8	-28.5	+12.7	+0.9	+0.0 360	32.2	46.0	-13.8	Horiz 130
20	156.729M	45.3	+0.4 +0.6	-29.0	+11.6	+0.7	+0.0 360	29.6	43.5	-13.9	Horiz 130

CKC Laboratories, Inc. Date: 6/15/2011 Time: 7:13:55 AM Itron, Inc. WO#: 92051
15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters Vertical Sequence#: 37 Ext ATTN: 0 dB



Model: CCU100RB

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

Customer: **Itron, Inc.**
Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**
Work Order #: **92051** Date: 6/14/2011
Test Type: **Radiated Scan** Time: 11:33:44 AM
Equipment: **SRR+WWAN+WIFI+GPS RX (external WWAN & GPS antenna)** Sequence#: 23
Manufacturer: Itron, Inc. Tested By: Armando del Angel
Model: CCU100RB
S/N: 7404FCC3

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN03227	Cable	32026-29080-29080-84	5/2/2011	5/2/2013
	AN02872	Spectrum Analyzer	E4440A	8/25/2009	8/25/2011
T2	ANP05360	Cable	RG214	11/8/2010	11/8/2012
T3	ANP05547	Cable	Heliax	5/18/2010	5/18/2012
T4	AN00052	Loop Antenna	6502	6/8/2010	6/8/2012
T5	AN01717	High Pass Filter	F3440-P005	5/27/2010	5/27/2012

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

Function	Manufacturer	Model #	S/N
SRR+WWAN+WIFI+GPS RX (external WWAN & GPS antenna)*	Itron, Inc.	CCU100RB	7404FCC3

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Dell	E6400	H4CSTK1

Test Conditions / Notes:

Temp: 23°C
Humidity: 43%
Pressure: 102.0kPa
Frequency: 0.03-30MHz

All three frequencies investigated, 2412M, 2437M, 2462M.
Two modulations investigated 802.11b and 802.11g.
Testing per KDB558074.
Worst case results reported.

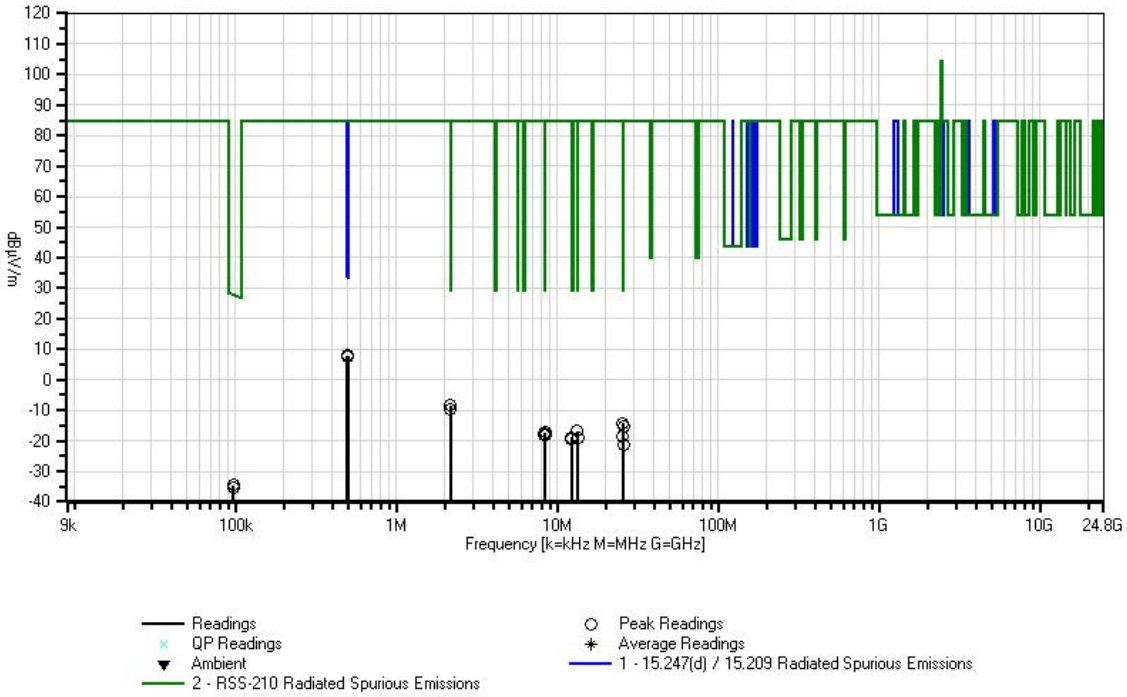
Ext Attn: 0 dB

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	502.350k	38.4	+0.0 +0.1	+0.0	+0.0	+9.4	-40.0	7.9	33.6	-25.7	Paral 150

2	495.600k	38.3	+0.0 +0.1	+0.0	+0.0	+9.4	-40.0	7.8	33.7	-25.9	Perpe 150
3	2.176M	21.9	+0.0 +0.0	+0.0	+0.1	+9.7	-40.0	-8.3	29.5	-37.8	Perpe 150
4	2.176M	20.6	+0.0 +0.0	+0.0	+0.1	+9.7	-40.0	-9.6	29.5	-39.1	Paral 150
5	25.572M	18.7	+0.1 +0.1	+0.2	+0.3	+6.3	-40.0	-14.3	29.5	-43.8	Perpe 150
6	25.662M	17.7	+0.1 +0.1	+0.2	+0.3	+6.3	-40.0	-15.3	29.5	-44.8	Perpe 150
7	13.365M	13.5	+0.1 +0.1	+0.1	+0.2	+9.3	-40.0	-16.7	29.5	-46.2	Perpe 150
8	8.383M	12.7	+0.1 +0.1	+0.1	+0.2	+9.5	-40.0	-17.3	29.5	-46.8	Perpe 150
9	8.293M	12.5	+0.1 +0.1	+0.1	+0.2	+9.5	-40.0	-17.5	29.5	-47.0	Perpe 150
10	8.365M	12.5	+0.1 +0.1	+0.1	+0.2	+9.5	-40.0	-17.5	29.5	-47.0	Perpe 150
11	8.293M	12.5	+0.1 +0.1	+0.1	+0.2	+9.5	-40.0	-17.5	29.5	-47.0	Paral 150
12	8.383M	12.1	+0.1 +0.1	+0.1	+0.2	+9.5	-40.0	-17.9	29.5	-47.4	Paral 150
13	8.365M	12.0	+0.1 +0.1	+0.1	+0.2	+9.5	-40.0	-18.0	29.5	-47.5	Paral 150
14	25.509M	14.4	+0.1 +0.1	+0.2	+0.3	+6.3	-40.0	-18.6	29.5	-48.1	Perpe 150
15	13.374M	11.4	+0.1 +0.1	+0.1	+0.2	+9.3	-40.0	-18.8	29.5	-48.3	Paral 150
16	12.293M	11.4	+0.1 +0.1	+0.1	+0.2	+9.3	-40.0	-18.8	29.5	-48.3	Perpe 150
17	12.293M	10.5	+0.1 +0.1	+0.1	+0.2	+9.3	-40.0	-19.7	29.5	-49.2	Paral 150
18	25.653M	11.5	+0.1 +0.1	+0.2	+0.3	+6.3	-40.0	-21.5	29.5	-51.0	Paral 150
19	96.720k	35.6	+0.0 +0.1	+0.0	+0.0	+9.7	-80.0	-34.6	27.9	-62.5	Perpe 150
20	97.200k	35.0	+0.0 +0.1	+0.0	+0.0	+9.7	-80.0	-35.2	27.8	-63.0	Paral 150

CKC Laboratories, Inc. Date: 6/14/2011 Time: 11:33:44 AM Itron, Inc. WO#: 92051
15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters Perpendicular 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) / 15.209 Radiated Spurious Emissions**
Work Order #: **92051** Date: 6/14/2011
Test Type: **Radiated Scan** Time: 10:28:41 AM
Equipment: **SRR+WWAN+WIFI+GPS RX (external WWAN & GPS antenna)** Sequence#: 18
Manufacturer: Itron, Inc. Tested By: Armando del Angel
Model: CCU100RB
S/N: 7404FCC3

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN03227	Cable	32026-29080-29080-84	5/2/2011	5/2/2013
	AN02872	Spectrum Analyzer	E4440A	8/25/2009	8/25/2011
T2	AN01316	Preamp	8447D	5/21/2010	5/21/2012
T3	AN01993	Biconilog Antenna	CBL6111C	10/9/2009	10/9/2011
T4	ANP05360	Cable	RG214	11/8/2010	11/8/2012
T5	ANP05547	Cable	Heliax	5/18/2010	5/18/2012

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

Function	Manufacturer	Model #	S/N
SRR+WWAN+WIFI+GPS RX (external WWAN & GPS antenna)*	Itron, Inc.	CCU100RB	7404FCC3

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Dell	E6400	H4CSTK1

Test Conditions / Notes:

Temp: 23°C
Humidity: 43%
Pressure: 102.0kPa
Frequency: 30-1000MHz

All three frequencies investigated, 2412M, 2437M, 2462M.
Two modulations investigated 802.11b and 802.11g.
Testing per KDB558074.
Worst case results reported.

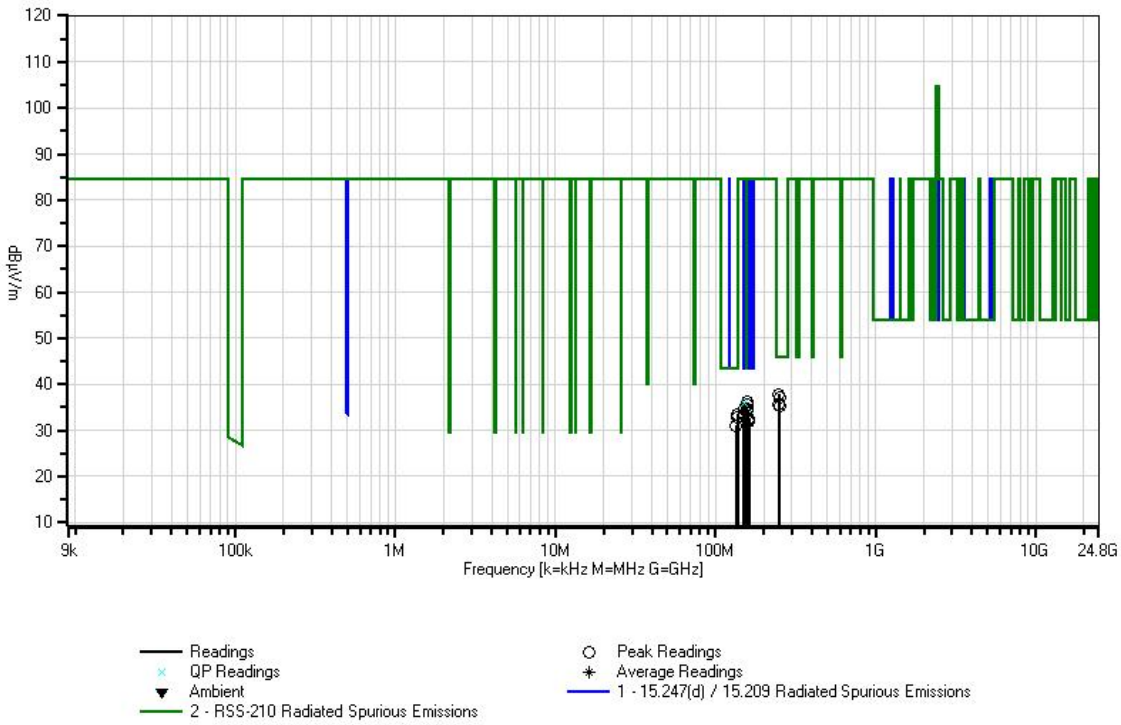
Ext Attn: 0 dB

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	156.729M	51.9	+0.4 +0.6	-29.0	+11.6	+0.7	+0.0 360	36.2	43.5	-7.3	Verti 130
2	150.002M QP	51.3	+0.4 +0.6	-29.1	+12.1	+0.7	+0.0 280	36.0	43.5	-7.5	Verti 250
^	150.002M	53.7	+0.4 +0.6	-29.1	+12.1	+0.7	+0.0 280	38.4	43.5	-5.1	Verti 250
^	150.002M	52.9	+0.4 +0.6	-29.1	+12.1	+0.7	+0.0 360	37.6	43.5	-5.9	Verti 130

5	156.729M	51.4	+0.4 +0.6	-29.0	+11.6	+0.7	+0.0 360	35.7	43.5	-7.8	Horiz 130
6	249.942M	51.4	+0.5 +0.8	-28.5	+12.7	+0.9	+0.0 360	37.8	46.0	-8.2	Horiz 130
7	156.849M	50.4	+0.4 +0.6	-29.0	+11.6	+0.7	+0.0	34.7	43.5	-8.8	Verti 130
8	150.048M	49.9	+0.4 +0.6	-29.1	+12.1	+0.7	+0.0	34.6	43.5	-8.9	Horiz 150
9	249.985M	50.6	+0.5 +0.8	-28.5	+12.7	+0.9	+0.0	37.0	46.0	-9.0	Horiz 150
10	156.824M	50.2	+0.4 +0.6	-29.0	+11.6	+0.7	+0.0	34.5	43.5	-9.0	Horiz 150
11	150.002M	48.8	+0.4 +0.6	-29.1	+12.1	+0.7	+0.0 360	33.5	43.5	-10.0	Horiz 130
12	137.750M	49.0	+0.3 +0.6	-29.1	+12.1	+0.6	+0.0 360	33.5	43.5	-10.0	Verti 130
13	249.942M	49.1	+0.5 +0.8	-28.5	+12.7	+0.9	+0.0 360	35.5	46.0	-10.5	Verti 130
14	136.909M	48.4	+0.3 +0.5	-29.2	+12.1	+0.6	+0.0	32.7	43.5	-10.8	Verti 130
15	250.062M	48.8	+0.5 +0.8	-28.5	+12.7	+0.9	+0.0	35.2	46.0	-10.8	Verti 130
16	162.255M	48.7	+0.4 +0.6	-29.0	+11.2	+0.7	+0.0 360	32.6	43.5	-10.9	Horiz 130
17	162.134M	48.5	+0.4 +0.6	-29.0	+11.2	+0.7	+0.0 360	32.4	43.5	-11.1	Verti 130
18	162.385M	48.3	+0.4 +0.6	-29.0	+11.1	+0.7	+0.0	32.1	43.5	-11.4	Horiz 150
19	162.375M	48.0	+0.4 +0.6	-29.0	+11.1	+0.7	+0.0	31.8	43.5	-11.7	Verti 130
20	135.107M	46.7	+0.3 +0.5	-29.2	+12.1	+0.6	+0.0	31.0	43.5	-12.5	Verti 130

CKC Laboratories, Inc. Date: 6/14/2011 Time: 10:28:41 AM Itron, Inc. WO#: 92051
15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters Vertical Sequence#: 18 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) / 15.209 Radiated Spurious Emissions**
Work Order #: **92051** Date: 9/12/2011
Test Type: **Radiated Scan** Time: 16:10:15
Equipment: **SRR+WWAN+WIFI+GPS RX (internal WWAN & GPS antenna)** Sequence#: 51
Manufacturer: Itron, Inc. Tested By: Randy Clark
Model: CCU100B
S/N: 7404FCC5

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02872	Spectrum Analyzer	E4440A	7/23/2011	7/23/2013
T2	AN01271	Preamp	83017A	9/17/2009	9/17/2011
T3	AN01467	Horn Antenna-ANSI C63.5 Calibration	3115	5/7/2010	5/7/2012
	AN02742	Active Horn Antenna-ANSI C63.5 Antenna Factors (dB)	AMFW-5F-18002650-20-10P	11/10/2010	11/10/2012
T4	AN03123	Cable	32026-2-29801-12	10/23/2009	10/23/2011
T5	ANP05542	Cable	Heliax	10/23/2009	10/23/2011
T6	AN03227	Cable	32026-29080-29080-84	5/2/2011	5/2/2013
T7	AN03116	High Pass Filter	11SH10-00313	1/26/2011	1/26/2013

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

Function	Manufacturer	Model #	S/N
SRR+WWAN+WIFI+GPS RX (internal WWAN & GPS antenna)*	Itron, Inc.	CCU100B	7404FCC5

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Dell	E6400	H4CSTK1

Test Conditions / Notes:

Temp: 25°C
Humidity: 44%
Pressure: 102.4kPa
Frequency: 1-26GHz

Laptop used for configuration of the radio and is located outside the test area.

All three frequencies investigated, 2412M, 2437M, 2462M.
Testing per KDB558074.
Worst case results reported: 802.11b mode.
Data represents compliance for both CCU100B and CCU100RB configurations.

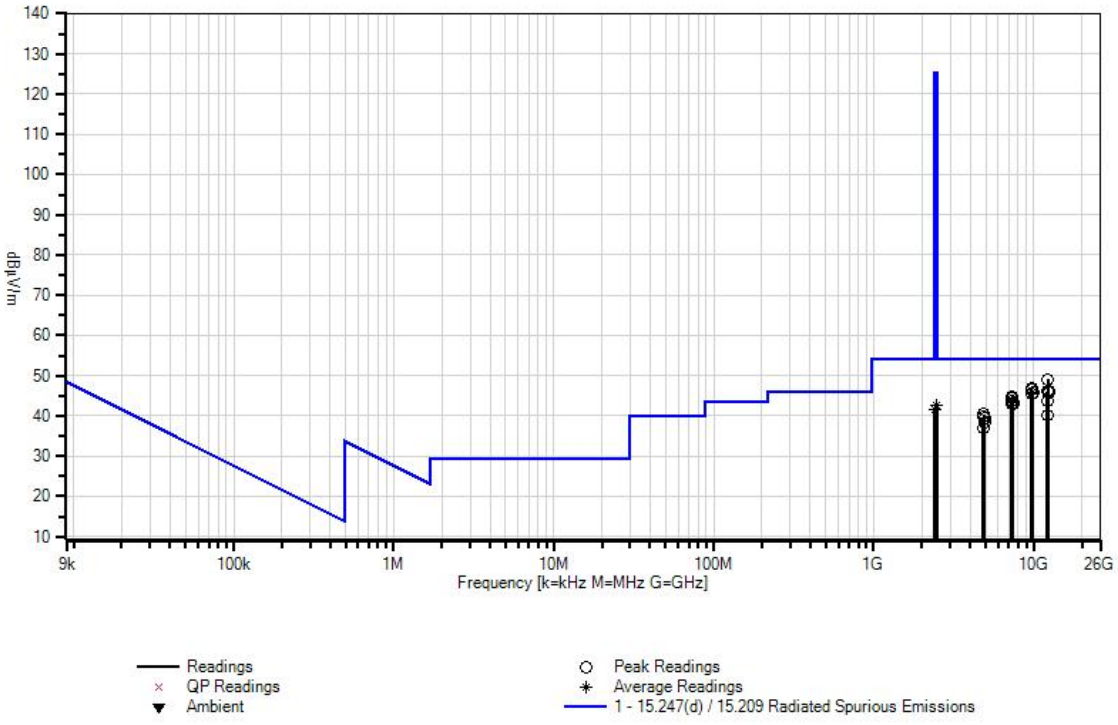
Ext Attn: 0 dB

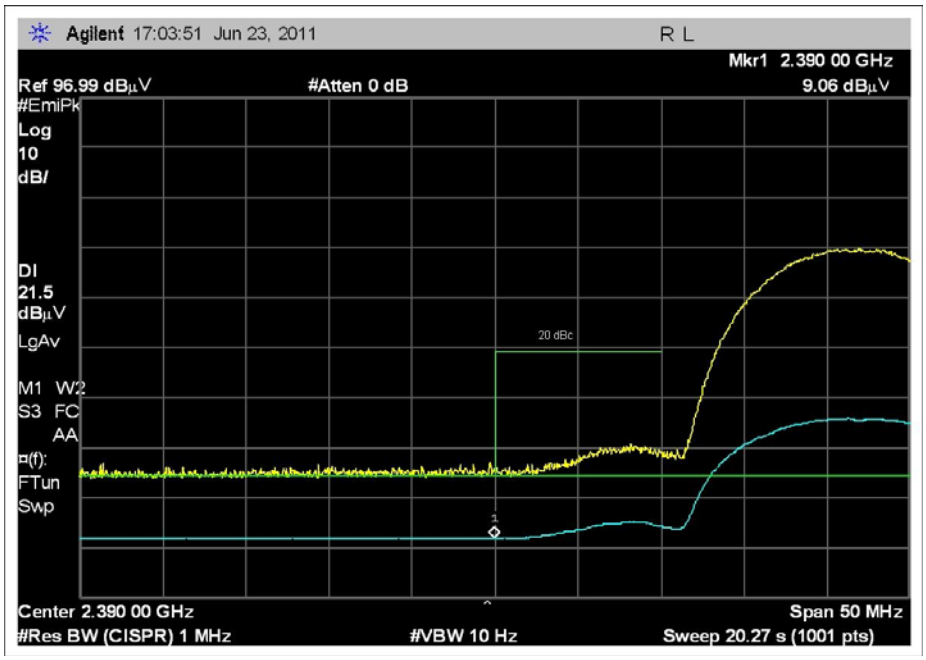
Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq	Rdng	T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
			T5	T6	T7						
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	12206.327 M	34.0	+0.0 +6.8	-35.0 +3.5	+38.8 +0.4	+0.6	+0.0	49.1	54.0 Mid Channel	-4.9	Vert 99
2	12206.327 M	34.0	+0.0 +6.8	-35.0 +3.5	+38.8 +0.4	+0.6	+0.0 288	49.1	54.0 Mid Channel	-4.9	Vert 99
3	9648.000M	32.4	+0.0 +5.8	-34.0 +4.4	+36.5 +1.6	+0.3	+0.0 167	47.0	54.0 Low Channel	-7.0	Vert 112
4	9764.327M	31.5	+0.0 +5.8	-33.9 +4.4	+36.8 +1.6	+0.3	+0.0 288	46.5	54.0 Mid Channel	-7.5	Vert 99
5	9764.327M	31.4	+0.0 +5.8	-33.9 +4.4	+36.8 +1.6	+0.3	+0.0 128	46.4	54.0 Mid Channel	-7.6	Horiz 101
6	12313.350 M	31.1	+0.0 +6.9	-35.0 +3.5	+38.8 +0.3	+0.6	+0.0 156	46.2	54.0 High Channel	-7.8	Vert 111
7	12060.000 M	31.2	+0.0 +6.7	-35.0 +3.5	+38.7 +0.4	+0.6	+0.0 167	46.1	54.0 Low Channel	-7.9	Vert 112
8	9850.500M	30.7	+0.0 +5.8	-33.9 +4.4	+36.9 +1.6	+0.3	+0.0 156	45.8	54.0 High Channel	-8.2	Vert 111
9	9851.400M	30.6	+0.0 +5.8	-33.9 +4.4	+36.9 +1.6	+0.3	+0.0 230	45.7	54.0 High Channel	-8.3	Horiz 126
10	12314.250 M	30.6	+0.0 +6.9	-35.0 +3.5	+38.8 +0.3	+0.6	+0.0 230	45.7	54.0 High Channel	-8.3	Horiz 126
11	9648.000M	30.9	+0.0 +5.8	-34.0 +4.4	+36.5 +1.6	+0.3	+0.0 316	45.5	54.0 Low Channel	-8.5	Horiz 142
12	7322.327M	33.4	+0.0 +5.2	-34.6 +3.2	+36.1 +0.9	+0.5	+0.0 288	44.7	54.0 Mid Channel	-9.3	Vert 99
13	7236.000M	33.1	+0.0 +5.2	-34.6 +3.2	+36.1 +1.0	+0.5	+0.0 167	44.5	54.0 Low Channel	-9.5	Vert 112
14	7322.327M	32.5	+0.0 +5.2	-34.6 +3.2	+36.1 +0.9	+0.5	+0.0 279	43.8	54.0 Mid Channel	-10.2	Horiz 101
15	12060.000 M	28.8	+0.0 +6.7	-35.0 +3.5	+38.7 +0.4	+0.6	+0.0 316	43.7	54.0 Low Channel	-10.3	Horiz 142
16	7388.550M	32.0	+0.0 +5.3	-34.6 +3.3	+36.1 +0.9	+0.5	+0.0 230	43.5	54.0 High Channel	-10.5	Horiz 126
17	7236.000M	31.7	+0.0 +5.2	-34.6 +3.2	+36.1 +1.0	+0.5	+0.0 316	43.1	54.0 Low Channel	-10.9	Horiz 142
18	7387.650M	31.6	+0.0 +5.3	-34.6 +3.3	+36.1 +0.9	+0.5	+0.0 156	43.1	54.0 High Channel	-10.9	Vert 111
19	2483.500M Ave	10.0	+0.0 +2.8	+0.0 +1.6	+27.9 +0.0	+0.2	+0.0 273	42.5	54.0 High Bandedge	-11.5	Vert 119
^	2483.500M	22.1	+0.0 +2.8	+0.0 +1.6	+27.9 +0.0	+0.2	+0.0 273	54.6	54.0 High Bandedge	+0.6	Vert 119

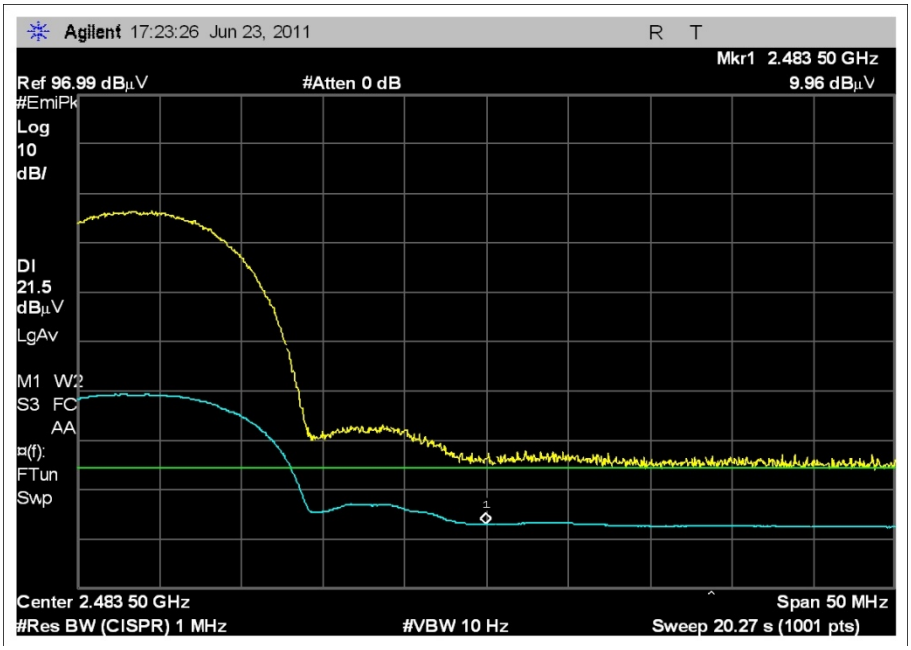
21	2390.000M Ave	9.1	+0.0 +2.7	+0.0 +1.5	+28.0 +0.0	+0.3	+0.0	41.6	54.0 Low Bandedge	-12.4	Vert 101
^	2390.000M	22.2	+0.0 +2.7	+0.0 +1.5	+28.0 +0.0	+0.3	+0.0	54.7	54.0 Low Bandedge	+0.7	Vert 101
23	4874.398M	33.5	+0.0 +4.2	-33.7 +2.2	+33.0 +0.8	+0.4	+0.0 288	40.4	54.0 Mid Channel	-13.6	Vert 99
24	12206.327 M	25.2	+0.0 +6.8	-35.0 +3.5	+38.8 +0.4	+0.6	+0.0 230	40.3	54.0 Mid Channel	-13.7	Horiz 101
25	4824.000M	33.1	+0.0 +4.2	-33.8 +2.2	+32.9 +0.8	+0.4	+0.0 167	39.8	54.0 Low Channel	-14.2	Vert 112
26	4824.000M	33.1	+0.0 +4.2	-33.8 +2.2	+32.9 +0.8	+0.4	+0.0 316	39.8	54.0 Low Channel	-14.2	Horiz 142
27	4925.700M	32.6	+0.0 +4.2	-33.7 +2.2	+33.1 +0.8	+0.4	+0.0 230	39.6	54.0 High Channel	-14.4	Horiz 126
28	4924.800M	31.3	+0.0 +4.2	-33.7 +2.2	+33.1 +0.8	+0.4	+0.0 156	38.3	54.0 High Channel	-15.7	Vert 111
29	4880.327M	30.1	+0.0 +4.2	-33.7 +2.2	+33.0 +0.8	+0.4	+0.0 86	37.0	54.0 Mid Channel	-17.0	Horiz 101

CKC Laboratories, Inc. Date: 9/12/2011 Time: 16:10:15 Itron, Inc. WO#: 92051
15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters Vert Sequence#: 51 Ext ATTN: 0 dB



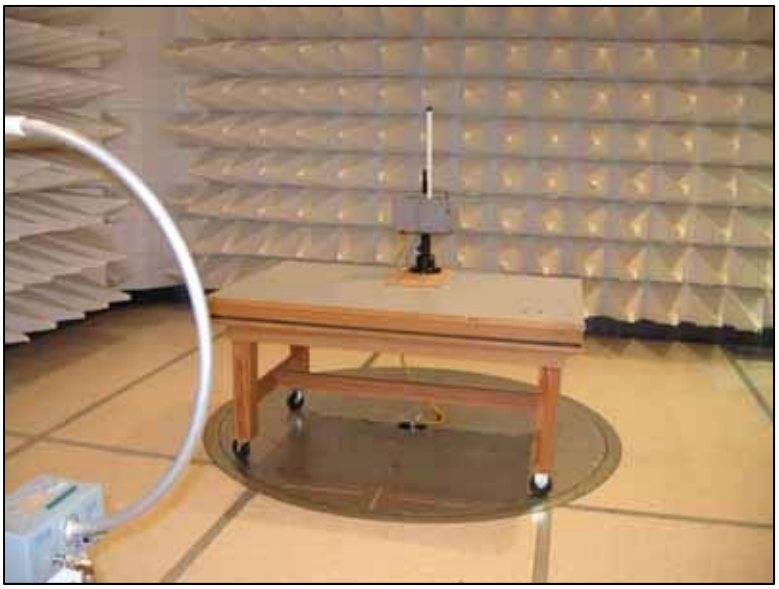


Low Bandege



High Bandedge

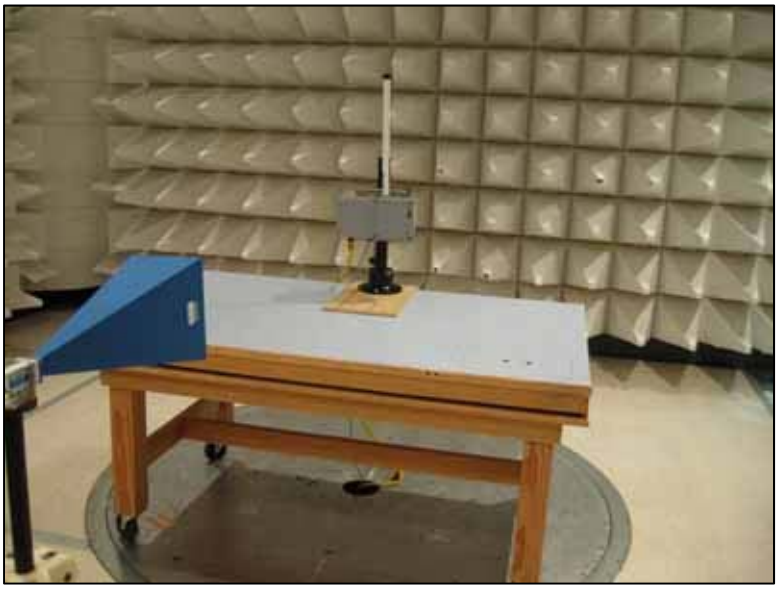
Test Setup Photos



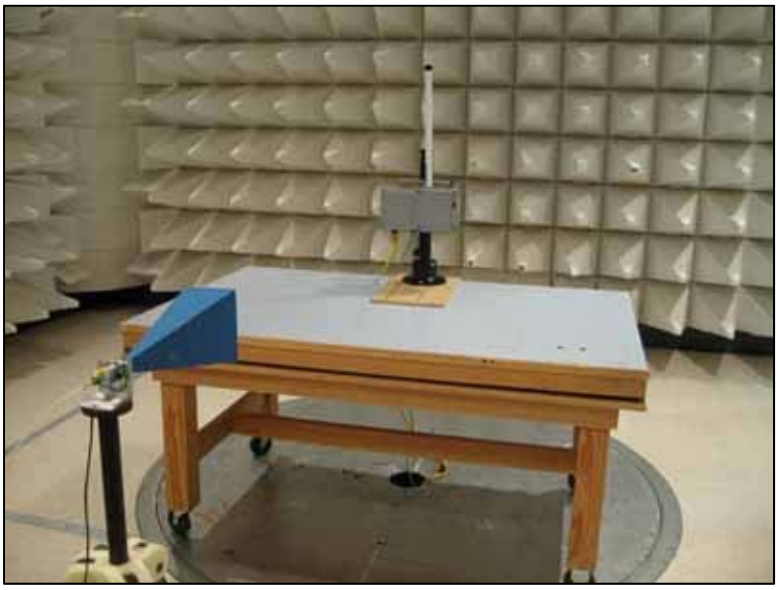
30kHz-30MHz CCU100B

30MHz-1GHz CCU100B

1-10GHz CCU100B

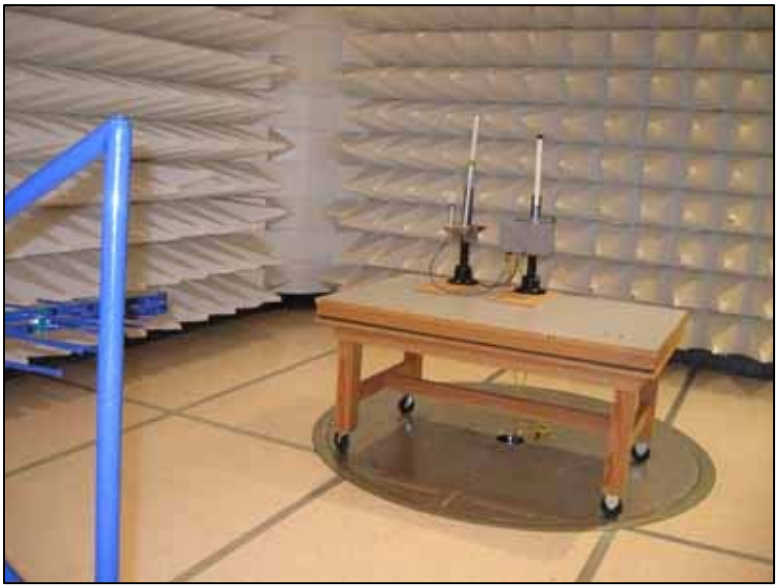


10-18GHz CCU100B



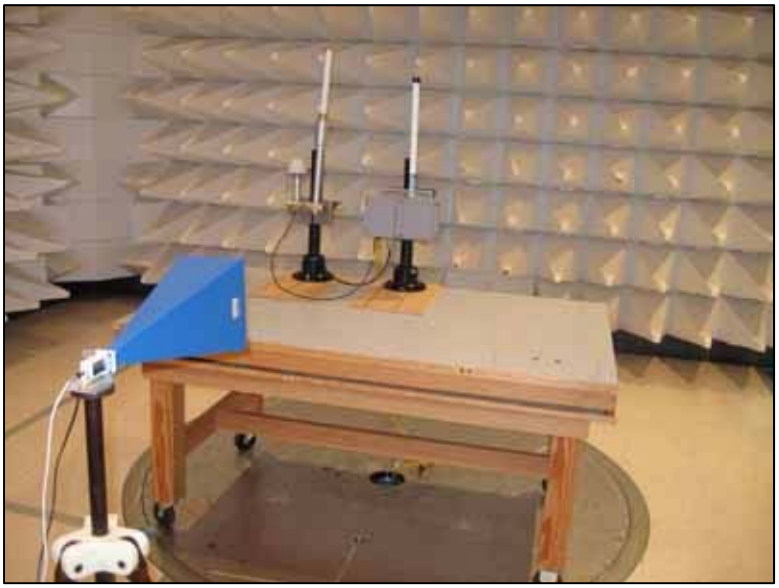
18-25GHz CCU100B

30kHz-30MHz CCU100RB

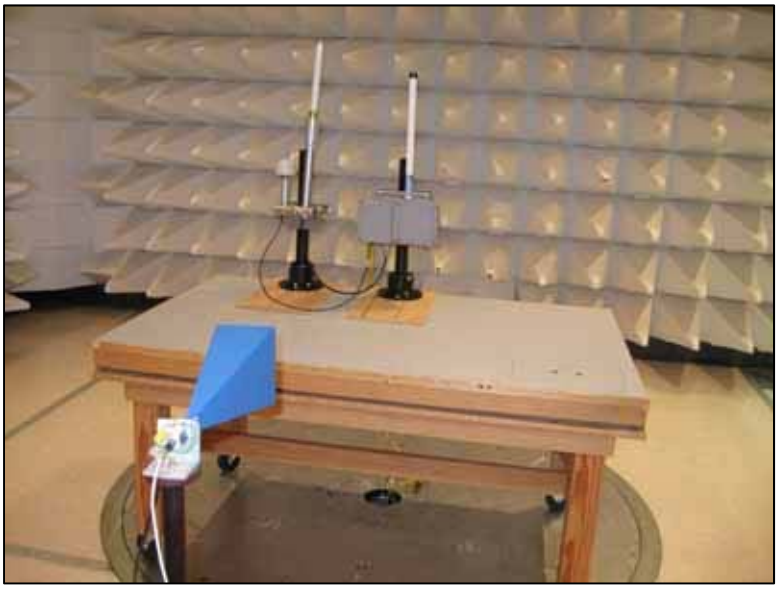


30MHz-1GHz CCU100RB

1GHz-10GHz CCU100RB



10GHz-18GHz CCU100RB



18GHz-25GHz CCU100RB

15.247(e) Power Spectral Density

Test Conditions / Setup

Comments

The EUT was setup on the bench and connected to a spectrum analyzer via an RF cable and 6 dB attenuator. The EUT was cycled though the different channels and modes by test software on a support laptop, connected to the EUT by an Ethernet cable. For this testing, all models (CCU100B, CCU100B-Repeater, CCU100RB, and CCU100RB-Repeater) are identical.

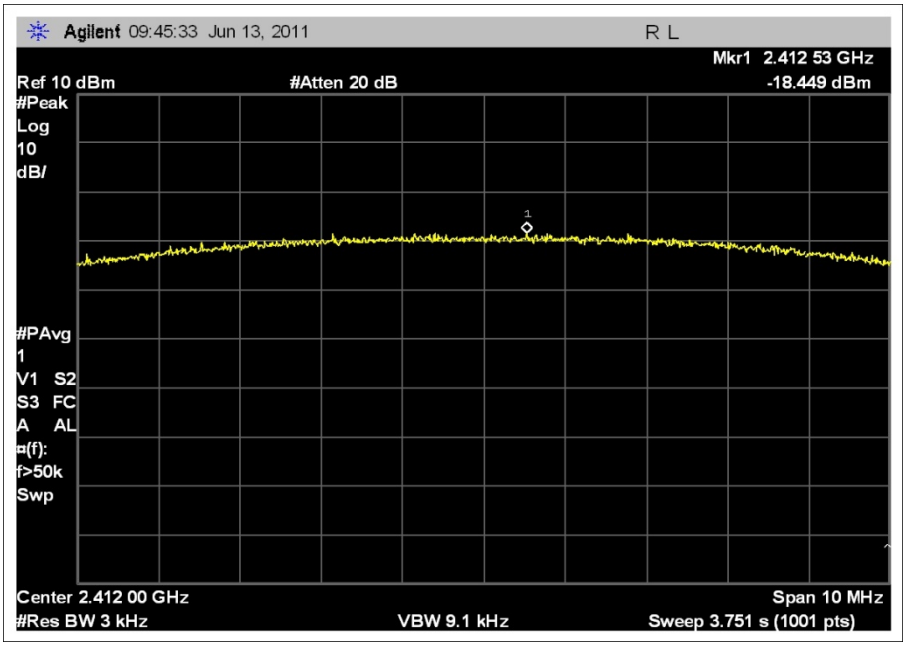
Requirement: The power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

Test Equipment

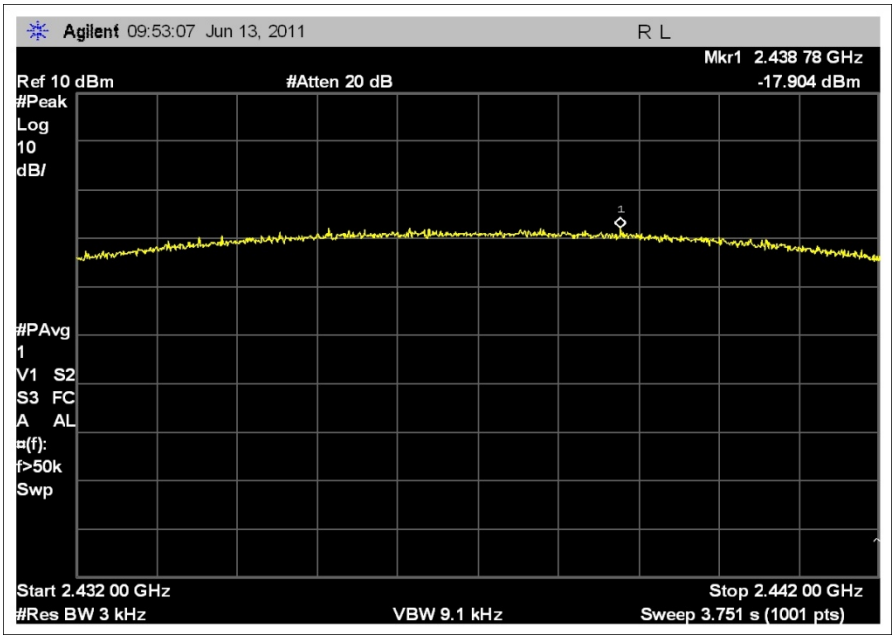
Asset/Serial #	Description	Model	Manufacturer	Cal Date	Cal Due
02872	Spectrum Analyzer	E4440A	Agilent	08/25/2009	08/25/2011
P05513	Attenuator	BW-S6W2	Mini-Circuits	10/12/2009	10/12/2011
03122	Cable	32026-2-29801-36	Astrolab	12/23/2010	12/23/2012

Test Results

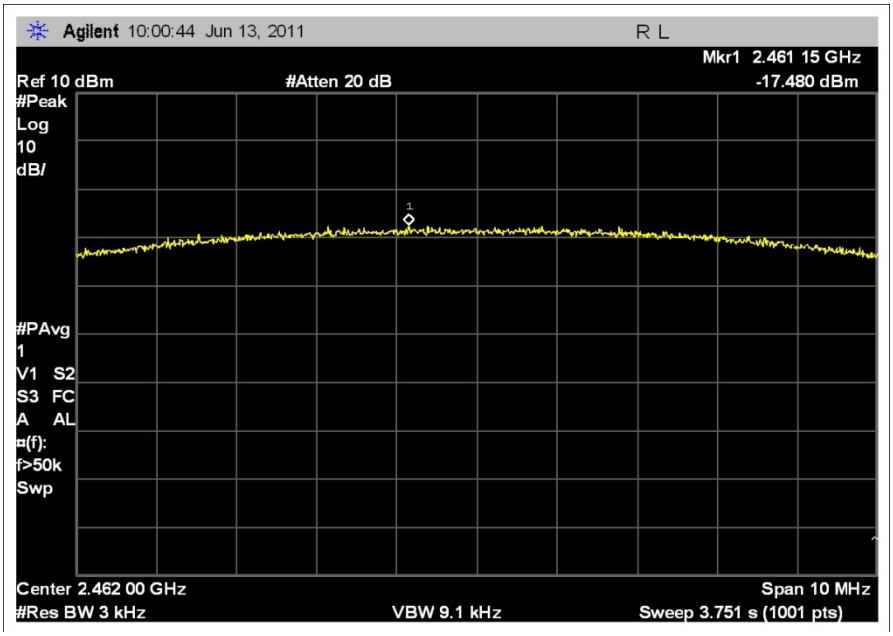
Freq in MHz	Meter dBm	Factors dB	Corr dBm	Spec dBm	Margin dBm	Result	Notes
2412.530	-18.45	6.8	-11.6	8	19.6	**Pass**	802.11b
2438.780	-17.90	6.8	-11.1	8	19.1	**Pass**	802.11b
2462.810	-17.48	6.8	-10.7	8	18.7	**Pass**	802.11b
2414.445	-23.68	6.8	-16.9	8	24.9	**Pass**	802.11g
2435.680	-23.31	6.8	-16.5	8	24.5	**Pass**	802.11g
2460.680	-22.91	6.8	-16.1	8	24.1	**Pass**	802.11g



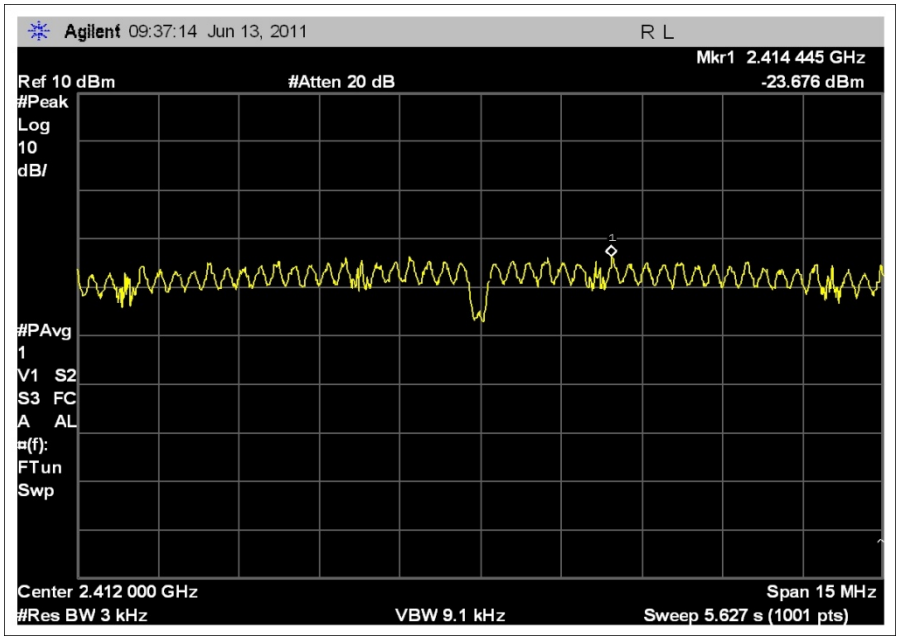
Power Spectral Density Channel 01 802.11b



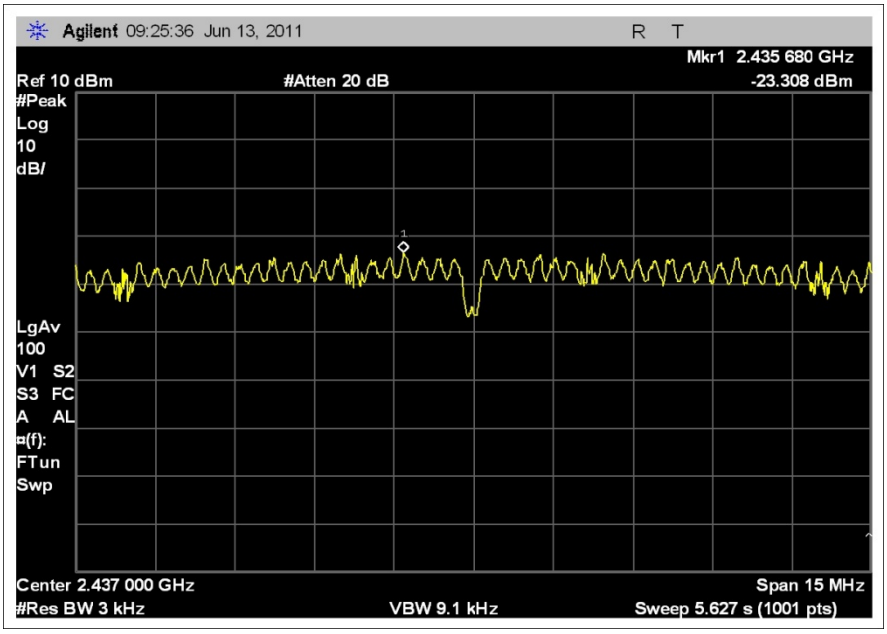
Power Spectral Density Channel 06 802.11b



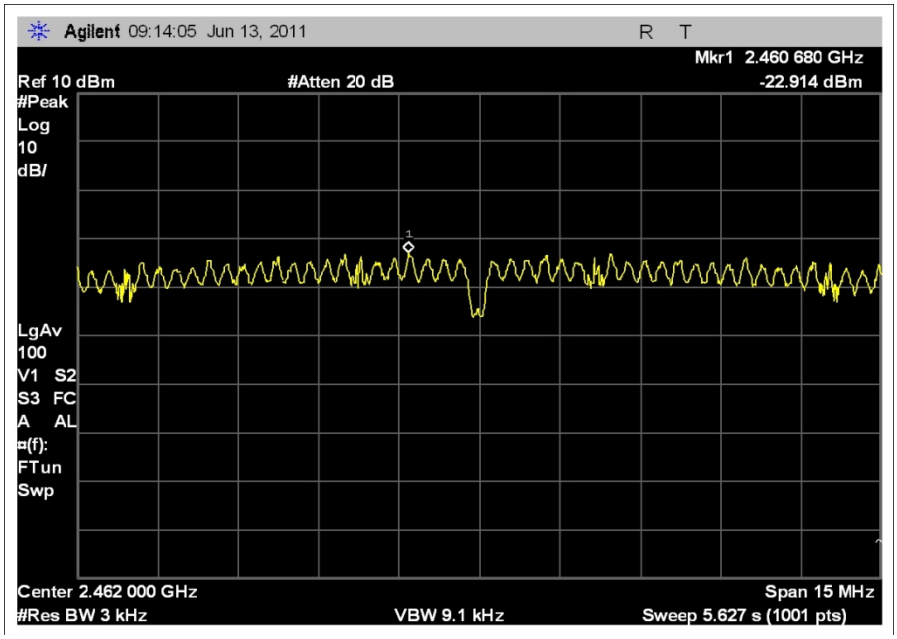
Power Spectral Density Channel 11 802.11b



Power Spectral Density Channel 01 802.11g



Power Spectral Density Channel 06 802.11g



Power Spectral Density Channel 11 802.11g

RSS-210

99% Bandwidth

Test Conditions / Setup
Comments
The EUT was setup on the bench and connected to a spectrum analyzer via an RF cable and 6 dB attenuator. The EUT was cycled though the different channels and modes by test software on a support laptop, connected to the EUT by an Ethernet cable. For this testing, all models (CCU100B, CCU100B-Repeater, CCU100RB, and CCU100RB-Repeater) are identical. **Requirement: The transmitted signal bandwidth to be reported is to be its 99% emission bandwidth, as calculated or measured.**

Test Equipment					
Asset/Serial #	**Description**	**Model**	**Manufacturer**	**Cal Date**	**Cal Due**
02872	Spectrum Analyzer	E4440A	Agilent	08/25/2009	08/25/2011
P05513	Attenuator	BW-S6W2	Mini-Circuits	10/12/2009	10/12/2011
03122	Cable	32026-2-29801-36	Astrolab	12/23/2010	12/23/2012

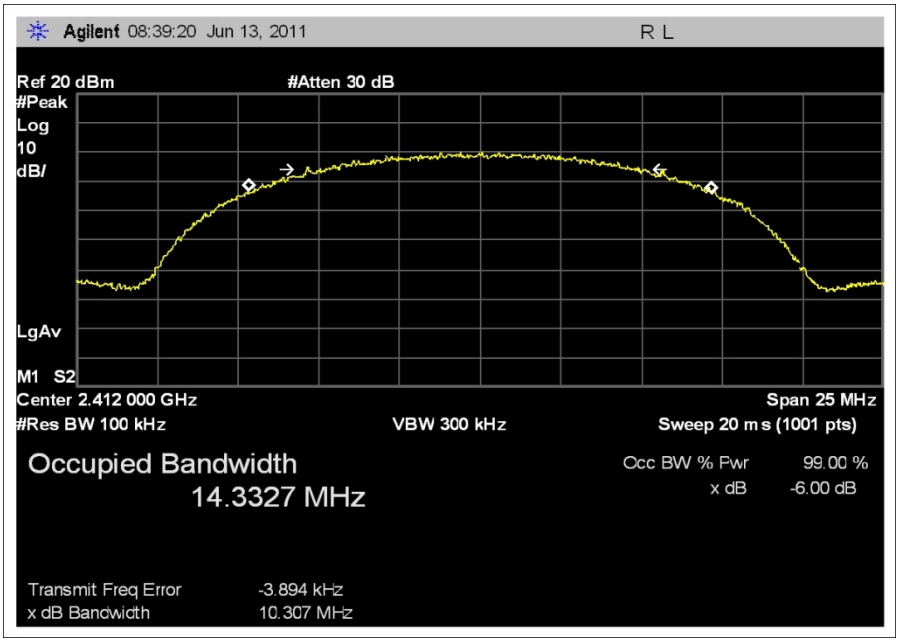
Test Data

Engineer Name: A. del Angel

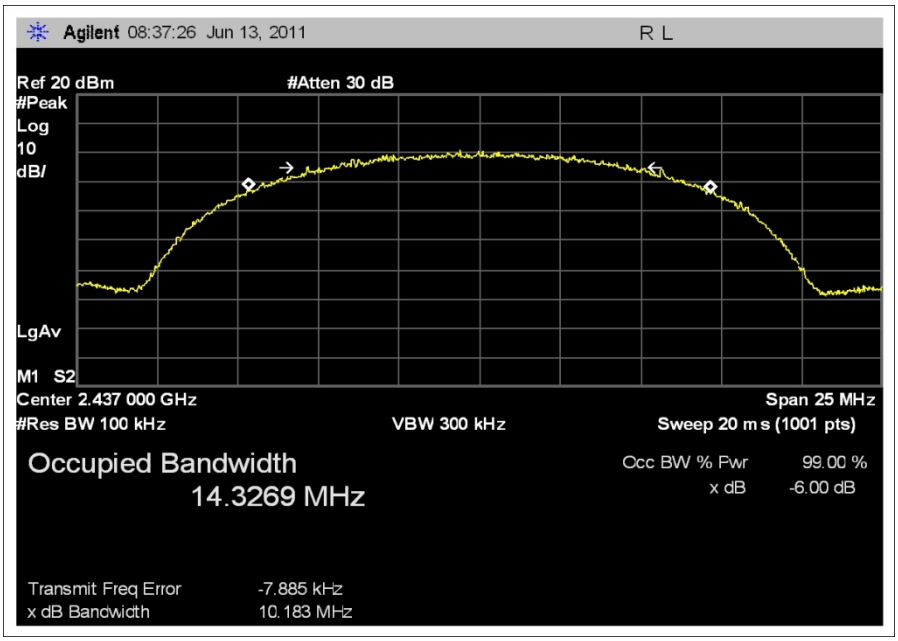
Results Table		
802.11b		
2412 MHz	**2437 MHz**	**2462 MHz**
14.33MHz	14.32MHz	14.32MHz

Results Table		
802.11g		
2412 MHz	**2437 MHz**	**2462 MHz**
16.35MHz	16.35MHz	16.34MHz

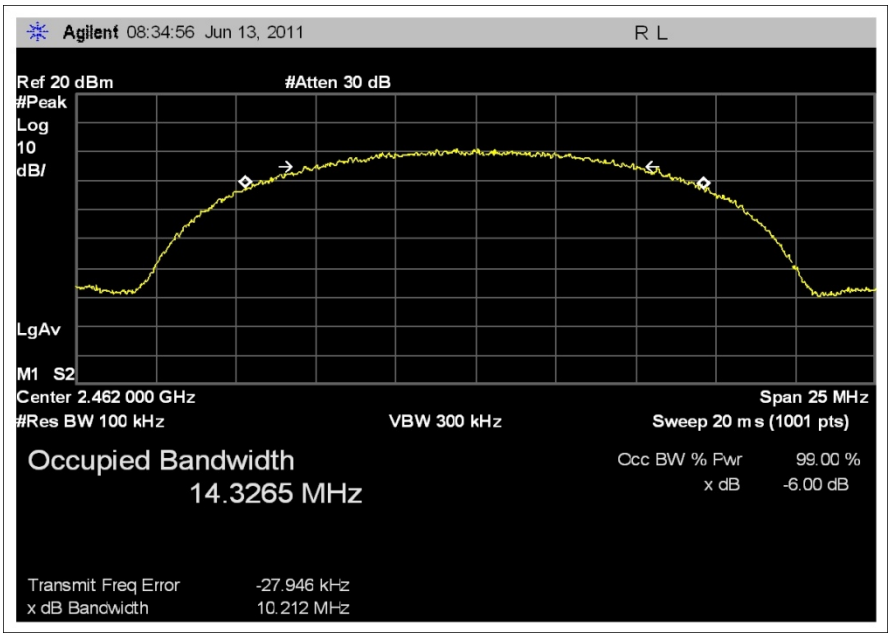
Test Data



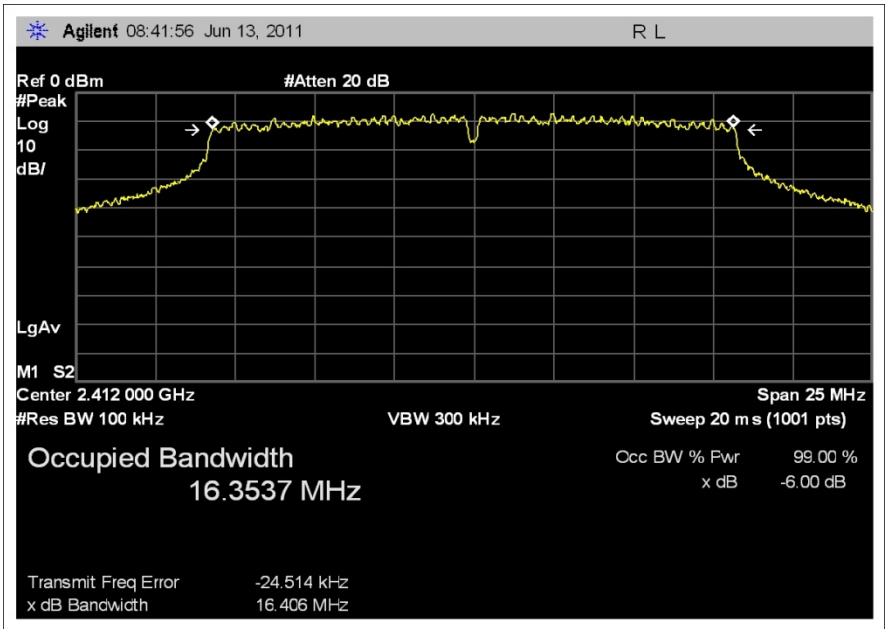
99% BW Channel 01 802.11b



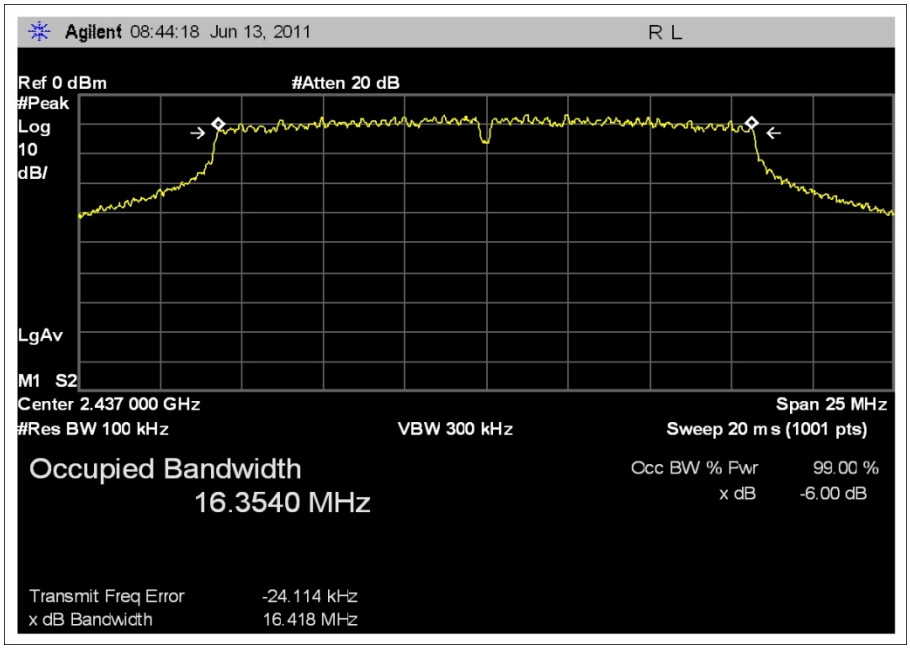
99% BW Channel 06 802.11b



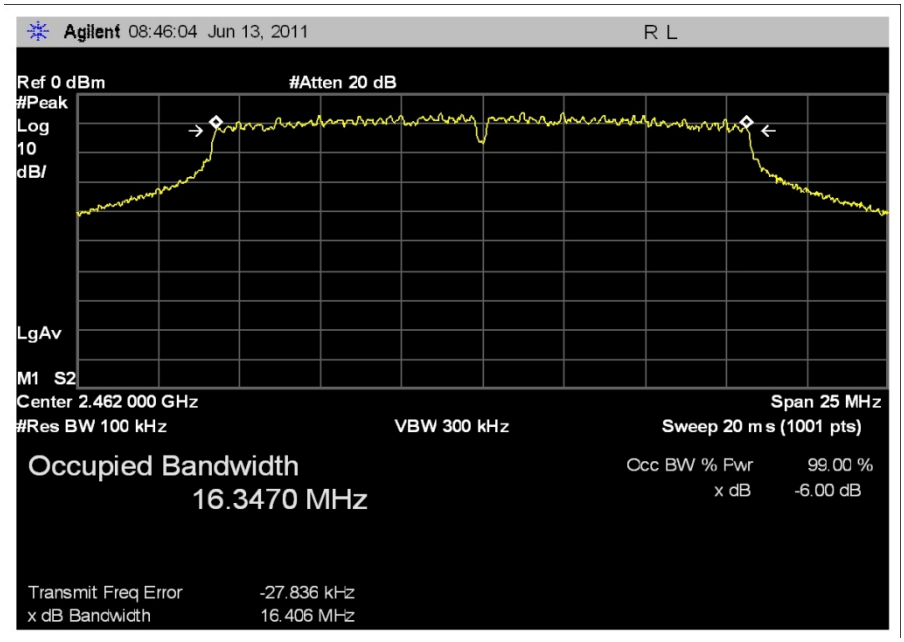
99% BW Channel 11 802.11b



99% BW Channel 01 802.11g



99% BW Channel 06 802.11g



99% BW Channel 11 802.11g

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 dBµV/m, the spectrum analyzer reading in dBµV was corrected by using the following formula. This reading was then compared to the applicable specification limit.

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