CKC LABORATORIES, INC. Testing the Future

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EMC

ADDENDUM TO RGIS LLC TEST REPORT FC07-041

FOR THE

HANDHELD BARCODE SCANNER, RM-1

**FCC PART 15 SUBPART C SECTIONS 15.247 & 15.209,
CISPR 22 (1997) CLASS A AND RSS-210 ISSUE 7**

TESTING

DATE OF ISSUE: JANUARY 29, 2008

PREPARED FOR:

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2000 East Taylor Road
Aubrun Hills, MI 48326

PREPARED BY:

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W.O. No.: 86165

Date of test: March 28 – June 21, 2007

Report No.: FC07-041A

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ADMINISTRATIVE INFORMATION

DATE OF TEST: March 28 – June 21, 2007

DATE OF RECEIPT: March 28, 2007

REPRESENTATIVE: Rick Buck,
Safety Engineering Laboratories

Mike Lodewyk, RGIS

MANUFACTURER:
RGIS LLC
2000 East Taylor Road
Aubrun Hills, MI 48326

TEST LOCATION:
CKC Laboratories, Inc.
1120 Fulton Place
Fremont, CA 94539

TEST METHOD: ANSI C63.4 (2003), RSS-GEN Issue 2 and RSS-210 Issue 7

PURPOSE OF TEST:
Original Report: To perform the testing of the Handheld Barcode Scanner, RM-1 with the requirements for FCC Part 15 Subpart C Sections 15.247 & 15.209, Subpart B Section 15.109 Class A and RSS-210 devices.
Addendum A: To revise the band edge table on page 44 and the plots on pages 49 and 50 with no new testing.

APPROVALS

Steve Behm, Director of Engineering Services

QUALITY ASSURANCE:

Joyce Walker, Quality Assurance Administrative Manager

Amrinder Brar,
EMC Engineer/Lab Manager

TEST PERSONNEL:

Art Rice,
EMC Engineer

Benny Lován,
Test Technologist

Christine Nicklas, Senior EMC Engineer/Consultant

FCC TO CANADA STANDARD CORRELATION MATRIX

Canadian Standard	Canadian Section	FCC Standard	FCC Section	Test Description
RSS GEN	7.1.4	47CFR	15.203	Antenna Connector Requirements
RSS GEN	7.2.1	47CFR	15.35(c)	Pulsed Operation
RSS GEN	7.2.2	47CFR	15.207	AC Mains Conducted Emissions Requirement
RSS 210	2.1	47CFR	15.215(c)	Frequency Stability Recommendation
RSS 210	2.6	47CFR	15.209	General Radiated Emissions Requirement
RSS 210	A8.2(1)	47CFR	15.247(a)(2)	Minimum 6dB Bandwidth
RSS 210	A8.2(2)	47CFR	15.247(e)	Peak Power Spectral Density
RSS 210	A8.4(4)	47CFR	15.247(b)(3)	RF Power Output
RSS 210	A8.4(5)	47CFR	15.247(c)(1)	Directional Gain Requirements
RSS 210	A8.4(6)	47CFR	15.247(c)(2)	Beam Steering Antennas
RSS 210	A8.5	47CFR	15.247(d)	Spurious Emissions
	5933		958979	Site File No.

Notes: Rule Sections for RSS 210 are taken from RSS 210 Issue 7

CONDITIONS DURING TESTING

Notes: 1) Flooded all layers around U19 (the WI-FI module) and provided via at 0.1 inch spacing to tie all layers together. 2) On U19, separate power delivery to each power pin. 3) Removed component pads for U20, L8, C106, & C107. 4) Added three 10 pf and one 1.5 pf capacitors on power to U19. 5) Added an R-divider on an enable signal to the memory power supply. 6) REVISED New antenna with matching network.. 7) Additional filtering on chip power supply.

FCC 15.31(e) Voltage Variations
Not applicable to this device because it is battery powered and fresh batteries were used during testing.

FCC 15.31(m) Number Of Channels
This device was tested on three channels.

FCC 15.33(a) Frequency Ranges Tested
15.209 Radiated Emissions: 9 kHz – 40 GHz
15.247 Radiated Emissions: 0.2 MHz – 25 GHz

FCC SECTION 15.35: ANALYZER BANDWIDTH SETTINGS PER FREQUENCY RANGE			
TEST	BEGINNING FREQUENCY	ENDING FREQUENCY	BANDWIDTH SETTING
CONDUCTED EMISSIONS	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	9 kHz	150 kHz	200 Hz
RADIATED EMISSIONS	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	30 MHz	1000 MHz	120 kHz
RADIATED EMISSIONS	1000 MHz	40 GHz	1 MHz

FCC 15.203 Antenna Requirements
The antenna is uses an MMCX connector and it is unique; therefore the EUT complies with Section 15.203 of the FCC rules.

EUT Operating Frequency
The EUT was operating at CH 1=2412 MHz, CH6=2437 MHz, CH11=2462 MHz.

EQUIPMENT UNDER TEST (EUT) DESCRIPTION

The customer declares the EUT tested by CKC Laboratories was representative of a production unit.

EQUIPMENT UNDER TEST

Handheld Barcode Scanner
Manuf: RGIS
Model: RM-1
Serial: 658, 9010023015 & 9010023013
FCC ID: pending

Finger Scanner
Manuf: Symbol
Model: RM-1
Serial: 810000031

Ear Piece
Manuf: Hello Direct
Model: NA
Serial: NA

Vibrator
Manuf: RGIS
Model: NA
Serial: NA

PERIPHERAL DEVICES

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

USB Memory Stick
Manuf: SanDisk
Model: Cruzer micro 512MB
Serial: NA

Ring Scanner
Manuf: Symbol Tech Inc.
Model: RS409-SR2000ZLA
Serial: MXA1RK73

Headset/Mike
Manuf: NA
Model: NA
Serial: NA

External Antenna
Manuf: NA
Model: NA
Serial: NA

Micro SD Memory Card
Manuf: LG
Model: TransFlash 64MB
Serial: NA

Micro SD to SD Adapter
Manuf: SanDisk
Model: NA
Serial: NA

REPORT OF EMISSIONS MEASUREMENTS

TESTING PARAMETERS

TEMPERATURE AND HUMIDITY DURING TESTING

The temperature during testing was within +15°C and + 35°C.
The relative humidity was between 20% and 75%.

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. When conducted emissions testing was performed, a 10 dB external attenuator was used with internal offset correction in the analyzer.

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 were 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.

CISPR 22 RADIATED EMISSIONS

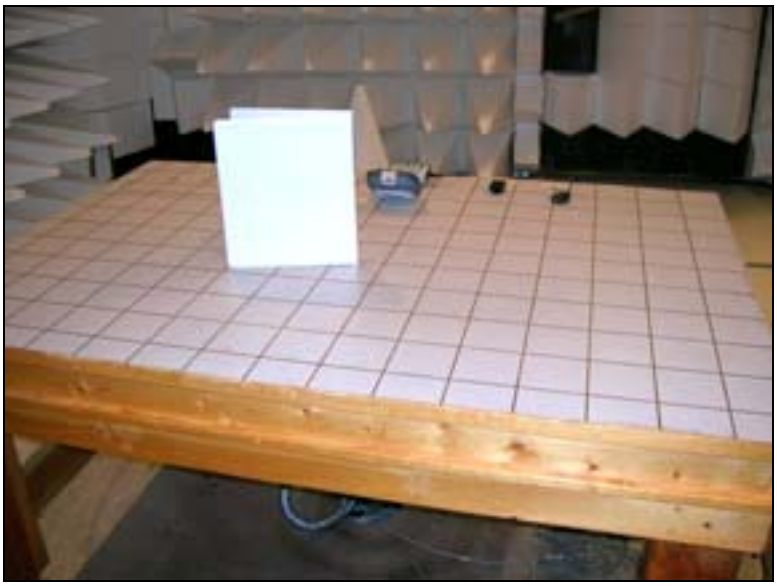
Test Setup Photos

with memory stick

with memory stick

with memory stick

with peripherals



with peripherals

Test Data Sheets

Test Location: CKC Laboratories, Inc. •1120 Fulton Place • Fremont, CA 94539 • 510-249-1170

Customer: **SEL**
Specification: **CISPR 22 A RADIATED**
Work Order #: **86165** Date: 4/10/2007
Test Type: **Maximized Emissions** Time: 15:46:52
Equipment: **Handheld Scanner** Sequence#: 6
Manufacturer: RGIS Tested By: Art Rice
Model: RM-1
S/N: 658

***Test Equipment*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
Antenna	2630	12/30/2006	12/30/2008	00852
Pre-amp	2944A03850	01/02/2007	01/02/2009	00501
E4446A Spectrum Analyzer	US44300408	03/05/2007	03/05/2009	02668
Cable	None	04/05/2007	04/05/2009	P05300
Cable	None	04/02/2007	04/02/2009	P05296
Cable	None	04/02/2007	04/02/2009	P05299

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

Function	Manufacturer	Model #	S/N
Handheld Scanner*	RGIS	RM-1	658

Support Devices:

Function	Manufacturer	Model #	S/N
USB memory stick	SanDisk	Cruzer micro 512MB	none
Ring Scanner	Symbol Tech Inc.	RS409-SR2000ZLA	MXA1RK73
Headset/Mike	n/a	n/a	none
Micro SD memory card	LG	TransFlash 64MB	none
Micro SD to SD adapter	SanDisk	n/a	none
Vibrator	n/a	n/a	none

Test Conditions / Notes:

The EUT is a handheld barcode scanner with an internal Bluetooth transceiver, intended for use in a non-residential/commercial environment. The 802.11b transceiver is continuously pinging for a device. NOTES: 1) The EUT is continuously scanning a bar code. 2) Idle mode: No 802.11b peripheral is near the EUT. 3) Testing radiated emissions on the digital portion only. 4) USB memory stick is plugged into the EUT. 5) Ring Scanner, Headset/Mike, and Vibrator are connected to the EUT. 6) Micro SD card is in an adapter which is plugged into the EUT. Radiated emissions 30-1000 MHz.

Transducer Legend:

T1=AMP-ANP00501-010207 Top Portion	T2=ANT AN00852 25-1000MHz
T3=Cable Calibration ANP05296	T4=Cable Calibration ANP05299
T5=Cable Calibration ANP05300	

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	221.175M	63.0	-26.2	+10.9	+0.9	+0.1	-10.0	39.1	40.0	-0.9	Horiz
	QP		+0.4				286				129
^	221.165M	63.9	-26.2	+10.9	+0.9	+0.1	-10.0	40.0	40.0	+0.0	Horiz
			+0.4				286				129
3	233.460M	68.5	-26.1	+11.8	+1.0	+0.1	-10.0	45.7	47.0	-1.3	Horiz
	QP		+0.4				282				120
^	233.455M	69.4	-26.1	+11.8	+1.0	+0.1	-10.0	46.6	47.0	-0.4	Horiz
			+0.4				282				120
5	221.178M	61.6	-26.2	+10.9	+0.9	+0.1	-10.0	37.7	40.0	-2.3	Vert
	QP		+0.4				361				99
^	221.178M	62.8	-26.2	+10.9	+0.9	+0.1	-10.0	38.9	40.0	-1.1	Vert
			+0.4				361				99
7	245.737M	62.4	-26.2	+12.7	+1.1	+0.1	-10.0	40.5	47.0	-6.5	Horiz
			+0.4				282				138
8	245.733M	61.2	-26.2	+12.7	+1.1	+0.1	-10.0	39.3	47.0	-7.7	Vert
			+0.4				8				101
9	233.451M	61.1	-26.1	+11.8	+1.0	+0.1	-10.0	38.3	47.0	-8.7	Vert
			+0.4				13				99
10	258.031M	59.0	-26.1	+13.1	+1.1	+0.1	-10.0	37.6	47.0	-9.4	Horiz
			+0.4				275				103
11	154.622M	54.3	-26.5	+11.2	+0.8	+0.2	-10.0	30.2	40.0	-9.8	Vert
			+0.2				109				103
12	208.867M	54.4	-26.2	+9.9	+0.9	+0.1	-10.0	29.4	40.0	-10.6	Vert
			+0.3				-10				98

Test Location: CKC Laboratories, Inc. •1120 Fulton Place • Fremont, CA 94539 • 510-249-1170

Customer: **SEL**
Specification: **CISPR 22 A RADIATED**
Work Order #: **86165** Date: 3/28/2007
Test Type: **Maximized Emissions** Time: 11:06:30
Equipment: **Handheld Scanner** Sequence#: 3
Manufacturer: RGIS Tested By: Art Rice
Model: RM-1
S/N: 658

***Test Equipment*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
Cable	None	06/21/2005	06/21/2007	P05299
Cable	None	06/21/2005	06/21/2007	P05300
Cable	None	06/21/2005	06/21/2007	P05296
Antenna	2630	12/30/2006	12/30/2008	00852
Pre-amp	2944A03850	01/02/2007	01/02/2009	00501
E4446A Spectrum Analyzer	US44300408	03/05/2007	03/05/2009	02668

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

Function	Manufacturer	Model #	S/N
Handheld Scanner*	RGIS	RM-1	658

Support Devices:

Function	Manufacturer	Model #	S/N
USB memory stick	SanDisk	Cruzer micro 512MB	none

Test Conditions / Notes:

The EUT is a handheld barcode scanner with an internal Bluetooth transceiver, intended for use in a non-residential/commercial environment. The 802.11b transceiver is continuously pinging for a device. NOTES: 1) The EUT is continuously scanning a bar code. 2) Idle mode: No 802.11b peripheral is near the EUT. 3) Testing radiated emissions on the digital portion only. 4) USB memory stick is plugged into the EUT. Radiated emissions 30-1000 MHz.

Transducer Legend:

T1=AMP-ANP00501-010207 Top Portion	T2=ANT AN00852 25-1000MHz
T3=Cable P05296 25' RG214 N-N	T4=Cable P05299 2' RG214 N-N
T5=Cable P05300 12' RG214 N-N	

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	221.174M	60.4	-26.2	+10.9	+0.8	+0.1	-10.0	36.4	40.0	-3.6	Horiz
	QP		+0.4				270				133
^	221.167M	61.2	-26.2	+10.9	+0.8	+0.1	-10.0	37.2	40.0	-2.8	Horiz
			+0.4				270				133
3	319.473M	62.9	-26.4	+14.1	+1.0	+0.1	-10.0	42.2	47.0	-4.8	Horiz
	QP		+0.5				115				100
^	319.452M	63.3	-26.4	+14.1	+1.0	+0.1	-10.0	42.6	47.0	-4.4	Horiz
			+0.5				115				100

5	331.760M QP	62.2	-26.5 +0.5	+14.5	+1.0	+0.1	-10.0 274	41.8	47.0	-5.2	Horiz 98
^	331.784M	62.1	-26.5 +0.5	+14.5	+1.0	+0.1	-10.0 274	41.7	47.0	-5.3	Horiz 98
7	307.186M QP	62.2	-26.3 +0.6	+13.7	+1.0	+0.1	-10.0 90	41.3	47.0	-5.7	Horiz 99
^	307.172M	63.5	-26.3 +0.6	+13.7	+1.0	+0.1	-10.0 90	42.6	47.0	-4.4	Horiz 99
9	311.961M	61.8	-26.4 +0.6	+13.9	+1.0	+0.1	-10.0 297	41.0	47.0	-6.0	Horiz 105
10	294.901M	61.5	-26.2 +0.6	+13.5	+1.0	+0.1	-10.0 303	40.5	47.0	-6.5	Horiz 99
11	270.325M	60.7	-26.2 +0.4	+13.2	+0.9	+0.1	-10.0 98	39.1	47.0	-7.9	Horiz 99
12	282.611M	60.2	-26.1 +0.5	+13.3	+0.9	+0.1	-10.0 88	38.9	47.0	-8.1	Horiz 105
13	62.075M	59.1	-26.9 +0.3	+6.4	+0.5	+0.1	-10.0 42	29.5	40.0	-10.5	Vert 101

FCC 15.209 RADIATED EMISSIONS

Test Setup Photos

Test Data Sheets

Test Location: CKC Laboratories, Inc. •1120 Fulton Place • Fremont, CA 94539 • 510-249-1170

Customer: **RGIS**
Specification: **FCC 15.209**
Work Order #: **86165** Date: 6/8/2007
Test Type: **Maximized Emissions** Time: 16:30:02
Equipment: **Handheld Barcode Scanner** Sequence#: 47
Manufacturer: RGIS Tested By: Benny Lovan
Model: RM-1
S/N: 9010023013

***Test Equipment*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
E4446A Spectrum Analyzer	US44300408	03/05/2007	03/05/2009	02668
Mag Loop - 6502	2078	06/11/2007	06/11/2009	00432
Antenna, Bilog	2630	12/30/2006	12/30/2008	00852
Cable	None	04/05/2007	04/05/2009	P05300
Cable	None	04/02/2007	04/02/2009	P05296
Cable	None	04/02/2007	04/02/2009	P05299
HP8447F opt H64 preamp	2944A03850	01/02/2007	01/02/2009	00501

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

Function	Manufacturer	Model #	S/N
Finger Scanner	Symbol	None	810000031
EarPiece	Hello Direct	None	None
Vibrator	RGIS	None	None
Handheld Barcode Scanner*	RGIS	RM-1	9010023013

Support Devices:

Function	Manufacturer	Model #	S/N

Test Conditions / Notes:

EUT is in Continuous Transmit mode with modulation. Testing is done on Channels 1, 6 and 11 (LO, MID, HI). Maximized emissions from 9kHz-1GHz. EUT is in worst case orthogonality. External ports filled with external devices. Unit tested with new batteries in place. Used CISPR bandwidths 9 kHz-1 GHz. CH 1=2412 MHz, CH6=2437 MHz, CH11=2462 MHz. Notes: 1) Flooded all layers around U19 (the WI-FI module) and provided via at 0.1 inch spacing to tie all layers together. 2) On U19, separate power delivery to each power pin. 3) Removed component pads for U20, L8, C106, & C107. 4) Added three 10 pf and one 1.5 pf capacitors on power to U19. 5) Added an R-divider on an enable signal to the memory power supply. 6) REVISED New antenna with matching network. 7) Additional filtering on chip power supply. 8) Channel 1, 1mbps. No signals seen from 9kHz-30MHz in either the Parallel or Perpendicular antenna polarization.

Transducer Legend:

T1=AMP-ANP00501-010207 Top Portion	T2=ANT AN00852 25-1000MHz
T3=Cable Calibration ANP05296	T4=Cable Calibration ANP05299
T5=Cable Calibration ANP05300	

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	73.723M QP	57.6	-26.8 +0.2	+7.1	+0.7	+0.1	+0.0 21	38.9	40.0	-1.1	Horiz 270
^	73.723M	59.2	-26.8 +0.2	+7.1	+0.7	+0.1	+0.0 21	40.5	40.0	+0.5	Horiz 270
3	493.906M QP	52.1	-27.8 +0.6	+18.3	+1.5	+0.2	+0.0 106	44.9	46.0	-1.1	Vert 115
4	526.458M QP	51.2	-27.9 +0.5	+18.9	+1.5	+0.2	+0.0 78	44.4	46.0	-1.6	Vert 114
^	526.458M	52.3	-27.9 +0.5	+18.9	+1.5	+0.2	+0.0 78	45.5	46.0	-0.5	Vert 114
6	156.008M QP	55.3	-26.4 +0.2	+11.2	+0.8	+0.2	+0.0 38	41.3	43.5	-2.2	Vert 98
^	156.008M	57.7	-26.4 +0.2	+11.2	+0.8	+0.2	+0.0 38	43.7	43.5	+0.2	Vert 98
8	65.005M QP	56.8	-26.8 +0.2	+6.5	+0.6	+0.1	+0.0	37.4	40.0	-2.6	Horiz 270
^	65.005M	58.0	-26.8 +0.2	+6.5	+0.6	+0.1	+0.0	38.6	40.0	-1.4	Horiz 270
10	493.906M QP	50.3	-27.8 +0.6	+18.3	+1.5	+0.2	+0.0 106	43.1	46.0	-2.9	Vert 115
11	161.414M QP	54.2	-26.4 +0.2	+10.9	+0.8	+0.2	+0.0 234	39.9	43.5	-3.6	Vert 98
12	61.411M QP	55.3	-26.9 +0.2	+6.4	+0.5	+0.1	+0.0 38	35.6	40.0	-4.4	Horiz 270
^	61.411M	56.0	-26.9 +0.2	+6.4	+0.5	+0.1	+0.0 38	36.3	40.0	-3.7	Horiz 270
14	214.507M QP	52.8	-26.2 +0.4	+10.3	+0.9	+0.1	+0.0 256	38.3	43.5	-5.2	Horiz 270
^	214.507M	54.5	-26.2 +0.4	+10.3	+0.9	+0.1	+0.0 256	40.0	43.5	-3.5	Horiz 270

16	38.984M QP	46.0	-26.9	+15.0	+0.5	+0.1	+0.0	34.8	40.0	-5.2	Vert
			+0.1				218				98
^	38.984M	47.0	-26.9	+15.0	+0.5	+0.1	+0.0	35.8	40.0	-4.2	Vert
			+0.1				218				98
18	65.005M QP	54.0	-26.8	+6.5	+0.6	+0.1	+0.0	34.6	40.0	-5.4	Vert
			+0.2				118				99
^	65.005M	55.0	-26.8	+6.5	+0.6	+0.1	+0.0	35.6	40.0	-4.4	Vert
			+0.2				118				99
20	61.411M QP	54.2	-26.9	+6.4	+0.5	+0.1	+0.0	34.5	40.0	-5.5	Vert
			+0.2				88				99
^	61.411M	54.9	-26.9	+6.4	+0.5	+0.1	+0.0	35.2	40.0	-4.8	Vert
			+0.2				88				99
22	643.455M QP	45.2	-27.9	+20.5	+1.7	+0.2	+0.0	40.3	46.0	-5.7	Vert
			+0.6				276				98
^	643.455M	46.4	-27.9	+20.5	+1.7	+0.2	+0.0	41.5	46.0	-4.5	Vert
			+0.6				276				98
24	331.504M QP	50.2	-26.5	+14.5	+1.2	+0.1	+0.0	39.9	46.0	-6.1	Vert
			+0.4				-7				200
^	331.504M	50.8	-26.5	+14.5	+1.2	+0.1	+0.0	40.5	46.0	-5.5	Vert
			+0.4				-7				200
26	311.924M QP	50.6	-26.4	+13.9	+1.1	+0.1	+0.0	39.8	46.0	-6.2	Vert
			+0.5				155				199
^	311.924M	52.6	-26.4	+13.9	+1.1	+0.1	+0.0	41.8	46.0	-4.2	Vert
			+0.5				155				199
28	154.567M QP	51.4	-26.5	+11.2	+0.8	+0.2	+0.0	37.3	43.5	-6.2	Vert
			+0.2				45				98
^	154.567M	56.1	-26.5	+11.2	+0.8	+0.2	+0.0	42.0	43.5	-1.5	Vert
			+0.2				45				98
30	135.107M QP	50.6	-26.5	+11.9	+0.7	+0.1	+0.0	37.1	43.5	-6.4	Vert
			+0.3				149				98
^	135.107M	54.5	-26.5	+11.9	+0.7	+0.1	+0.0	41.0	43.5	-2.5	Vert
			+0.3				149				98
32	448.501M QP	47.5	-27.5	+17.4	+1.4	+0.2	+0.0	39.5	46.0	-6.5	Vert
			+0.5				165				139
^	448.501M	50.1	-27.5	+17.4	+1.4	+0.2	+0.0	42.1	46.0	-3.9	Vert
			+0.5				165				139
34	214.507M QP	51.5	-26.2	+10.3	+0.9	+0.1	+0.0	37.0	43.5	-6.5	Vert
			+0.4				4				98
^	214.507M	53.2	-26.2	+10.3	+0.9	+0.1	+0.0	38.7	43.5	-4.8	Vert
			+0.4				4				98
36	877.449M QP	41.3	-27.6	+22.7	+2.1	+0.2	+0.0	39.4	46.0	-6.6	Vert
			+0.7				138				139
^	877.449M	43.1	-27.6	+22.7	+2.1	+0.2	+0.0	41.2	46.0	-4.8	Vert
			+0.7				138				139
38	519.972M	46.2	-27.9	+18.8	+1.5	+0.2	+0.0	39.3	46.0	-6.7	Horiz
			+0.5				279				180
39	175.468M QP	52.2	-26.4	+9.5	+0.9	+0.2	+0.0	36.7	43.5	-6.8	Horiz
			+0.3				329				169
^	175.468M	53.5	-26.4	+9.5	+0.9	+0.2	+0.0	38.0	43.5	-5.5	Horiz
			+0.3				329				169

41	157.570M QP	50.8	-26.4	+11.1	+0.8	+0.2	+0.0	36.7	43.5	-6.8	Vert
			+0.2				26				98
^	157.570M	57.8	-26.4	+11.1	+0.8	+0.2	+0.0	43.7	43.5	+0.2	Vert
			+0.2				26				98
43	150.483M QP	50.4	-26.5	+11.4	+0.8	+0.2	+0.0	36.5	43.5	-7.0	Vert
			+0.2				216				98
^	150.483M	57.0	-26.5	+11.4	+0.8	+0.2	+0.0	43.1	43.5	-0.4	Vert
			+0.2				216				98
45	331.504M	49.0	-26.5	+14.5	+1.2	+0.1	+0.0	38.7	46.0	-7.3	Horiz
			+0.4				97				270
46	257.990M QP	49.3	-26.1	+13.1	+1.1	+0.1	+0.0	37.9	46.0	-8.1	Horiz
			+0.4				250				119
^	257.990M	53.6	-26.1	+13.1	+1.1	+0.1	+0.0	42.2	46.0	-3.8	Horiz
			+0.4				250				119
48	257.990M	48.1	-26.1	+13.1	+1.1	+0.1	+0.0	36.7	46.0	-9.3	Vert
			+0.4				75				200
49	152.164M QP	48.2	-26.5	+11.3	+0.8	+0.2	+0.0	34.2	43.5	-9.3	Vert
			+0.2								139
^	152.164M	55.0	-26.5	+11.3	+0.8	+0.2	+0.0	41.0	43.5	-2.5	Vert
			+0.2								139
51	168.381M	48.7	-26.4	+10.1	+0.9	+0.2	+0.0	33.8	43.5	-9.7	Vert
			+0.3				37				115
52	171.264M	48.8	-26.4	+9.9	+0.9	+0.2	+0.0	33.7	43.5	-9.8	Vert
			+0.3				284				98
53	161.414M QP	47.7	-26.4	+10.9	+0.8	+0.2	+0.0	33.4	43.5	-10.1	Vert
			+0.2				234				98
54	159.972M QP	47.1	-26.4	+11.0	+0.8	+0.2	+0.0	32.9	43.5	-10.6	Vert
			+0.2				135				99
^	159.972M	53.9	-26.4	+11.0	+0.8	+0.2	+0.0	39.7	43.5	-3.8	Vert
			+0.2				135				99
56	165.498M QP	47.2	-26.4	+10.4	+0.9	+0.2	+0.0	32.6	43.5	-10.9	Vert
			+0.3				244				98

Test Location: CKC Laboratories, Inc. •1120 Fulton Place • Fremont, CA 94539 • 510-249-1170

Customer: **RGIS**
Specification: **FCC 15.209**
Work Order #: **86165** Date: 6/9/2007
Test Type: **Maximized Emissions** Time: 14:45:11
Equipment: **Handheld Barcode Scanner** Sequence#: 50
Manufacturer: RGIS Tested By: C. Nicklas
Model: RM-1
S/N: 9010023013

***Test Equipment*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
E4446A Spectrum Analyzer	US44300408	03/05/2007	03/05/2009	02668
HF Cable		03/22/2007	03/22/2009	01956
Cable HF	n/a	02/20/2006	02/20/2008	P05138
Cable, 6'	n/a	06/07/2006	06/07/2008	P04241
Antenna, Horn 1-18 GHz	1064	03/19/2007	03/19/2009	02061
Preamp, HP83017A	3123A00283	05/16/2007	05/16/2009	00785
Attenuator, 54A-6	N7612	03/01/2006	03/01/2008	P05413
Active Horn 12-18GHz	1088714	09/22/2005	09/22/2007	02693
Active Horn 18-26GHz	1087835	10/25/2005	10/25/2007	02694
Active Horn 26-40GHz	1097854	10/25/2005	10/25/2007	02695
Cable, HF 36"	n/a	05/16/2007	05/16/2009	P05200

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

Function	Manufacturer	Model #	S/N
Finger Scanner	Symbol	None	810000031
EarPiece	Hello Direct	None	None
Vibrator	RGIS	None	None
Handheld Barcode Scanner*	RGIS	RM-1	9010023013

Support Devices:

Function	Manufacturer	Model #	S/N

Test Conditions / Notes:

EUT is in Continuous Transmit mode with modulation. Testing is done on Channels 1, 6 and 11 (LO, MID, HI). Maximized spurious emissions from 1GHz - 40GHz. EUT is in worst case orthogonality. External ports filled with external devices. Unit tested with new batteries in place. RBW=1 MHz . CH 1=2412 MHz, CH6=2437 MHz, CH11=2462 MHz. Notes: 1) Flooded all layers around U19 (the WI-FI module) and provided via at 0.1 inch spacing to tie all layers together. 2) On U19, separate power delivery to each power pin. 3) Removed component pads for U20, L8, C106, & C107. 4) Added three 10 pf and one 1.5 pf capacitors on power to U19. 5) Added an R-divider on an enable signal to the memory power supply. 6) REVISED New antenna with matching network. 7) Additional filtering on chip power supply. No emissions seen above 5GHz on Channels 1, 6 and 11.

Transducer Legend:

T1=ANP04241 HF-Heliax Cable	T2=P05138 HF Cable 25ft
T3=Cable P01956 2' HF	T4=ANT AN02061 900MHz-18.5GHz
T5=HPF 3.5 GHz High Pass	T6=AMP-AN00785-051607
T7=PAD ANP05413 6dB	

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	4824.000M	47.4	+0.7	+3.4	+0.3	+33.2	+0.0	50.5	54.0	-3.5	Horiz
	Ave		+0.4	-34.9			66		Channel 1		143
^	4824.000M	50.8	+0.7	+3.4	+0.3	+33.2	+0.0	53.9	54.0	-0.1	Horiz
			+0.4	-34.9			66		Channel 1		143
3	4874.000M	46.7	+0.6	+3.4	+0.3	+33.3	+0.0	49.7	54.0	-4.3	Horiz
	Ave		+0.4	-35.0			78		Channel 6		124
^	4874.000M	50.2	+0.6	+3.4	+0.3	+33.3	+0.0	53.2	54.0	-0.8	Horiz
			+0.4	-35.0			78		Channel 6		124
5	4924.000M	45.8	+0.5	+3.4	+0.3	+33.4	+0.0	48.8	54.0	-5.2	Horiz
	Ave		+0.4	-35.0			86		Channel 11		140
^	4924.000M	49.3	+0.5	+3.4	+0.3	+33.4	+0.0	52.3	54.0	-1.7	Horiz
			+0.4	-35.0			86		Channel 11		140
7	4874.000M	44.2	+0.6	+3.4	+0.3	+33.3	+0.0	47.2	54.0	-6.8	Vert
	Ave		+0.4	-35.0			31		Channel 6		113
^	4874.000M	48.5	+0.6	+3.4	+0.3	+33.3	+0.0	51.5	54.0	-2.5	Vert
			+0.4	-35.0			31		Channel 6		113
9	4924.000M	44.0	+0.5	+3.4	+0.3	+33.4	+0.0	47.0	54.0	-7.0	Vert
	Ave		+0.4	-35.0			30		Channel 11		138
^	4924.000M	48.5	+0.5	+3.4	+0.3	+33.4	+0.0	51.5	54.0	-2.5	Vert
			+0.4	-35.0			30		Channel 11		138
11	4824.000M	41.9	+0.7	+3.4	+0.3	+33.2	+0.0	45.0	54.0	-9.0	Vert
	Ave		+0.4	-34.9			21		Channel 1		128
^	4824.000M	47.3	+0.7	+3.4	+0.3	+33.2	+0.0	50.4	54.0	-3.6	Vert
			+0.4	-34.9			21		Channel 1		128
13	1111.430M	50.6	+0.4	+1.6	+0.3	+23.3	+0.0	43.1	54.0	-10.9	Horiz
			+0.0	-38.8	+5.7		361		Channel 1		110
14	1111.455M	50.5	+0.4	+1.6	+0.3	+23.3	+0.0	43.0	54.0	-11.0	Horiz
			+0.0	-38.8	+5.7		2		Channel 6		114
15	1111.436M	50.4	+0.4	+1.6	+0.3	+23.3	+0.0	42.9	54.0	-11.1	Horiz
			+0.0	-38.8	+5.7		364		Channel 11		108
16	1111.401M	50.2	+0.4	+1.6	+0.3	+23.3	+0.0	42.7	54.0	-11.3	Vert
			+0.0	-38.8	+5.7		196		Channel 6		177
17	1111.390M	50.1	+0.4	+1.6	+0.3	+23.3	+0.0	42.6	54.0	-11.4	Vert
			+0.0	-38.8	+5.7		193		Channel 11		170
18	1072.444M	50.5	+0.4	+1.5	+0.2	+23.2	+0.0	42.4	54.0	-11.6	Vert
			+0.0	-39.1	+5.7		38		Channel 1		98
19	1072.392M	50.5	+0.4	+1.5	+0.2	+23.2	+0.0	42.4	54.0	-11.6	Horiz
			+0.0	-39.1	+5.7		357		Channel 6		128

20	1072.406M	50.5	+0.4 +0.0	+1.5 -39.1	+0.2 +5.7	+23.2	+0.0 36	42.4	54.0 Channel 6	-11.6	Vert 98
21	1033.372M	50.8	+0.4 +0.0	+1.5 -39.4	+0.3 +5.7	+23.1	+0.0 56	42.4	54.0 Channel 6	-11.6	Vert 98
22	1072.432M	50.4	+0.4 +0.0	+1.5 -39.1	+0.2 +5.7	+23.2	+0.0 16	42.3	54.0 Channel 1	-11.7	Horiz 112
23	1072.405M	50.4	+0.4 +0.0	+1.5 -39.1	+0.2 +5.7	+23.2	+0.0 62	42.3	54.0 Channel 11	-11.7	Vert 142
24	1111.444M	49.7	+0.4 +0.0	+1.6 -38.8	+0.3 +5.7	+23.3	+0.0	42.2	54.0 Channel 1	-11.8	Vert 99
25	1033.405M	49.9	+0.4 +0.0	+1.5 -39.4	+0.3 +5.7	+23.1	+0.0 25	41.5	54.0 Channel 11	-12.5	Vert 153

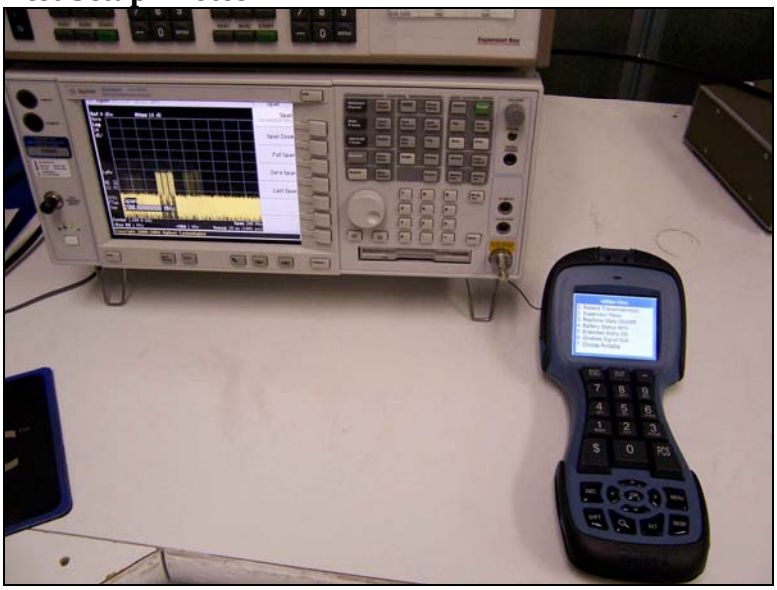
FCC Part 15.247(a)(2) 6dB BANDWIDTH

Test Equipment

Function	S/N	Calibration Date	Cal Due Date	Asset #
E4446A Spectrum Analyzer	US44300408	03/05/2007	03/05/2009	02668

Test Conditions: Configuration 1: Transmit continuously with modulation on selected channel. This is a conducted measurement on antenna port.

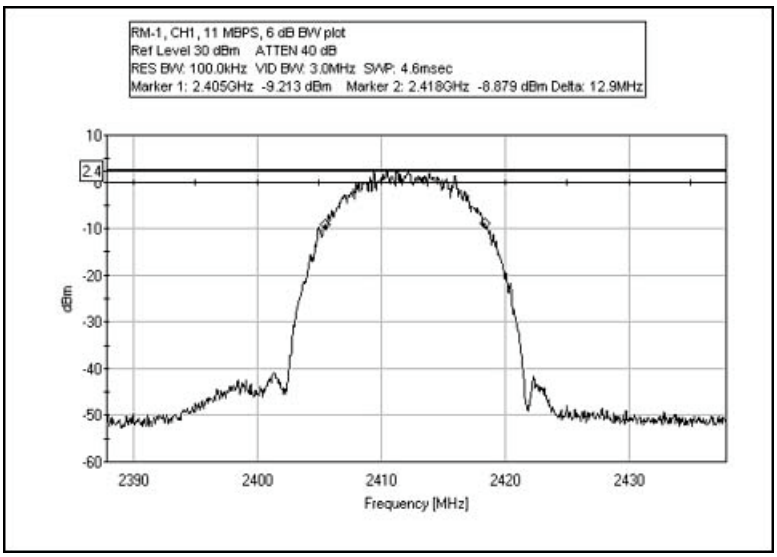
Test Setup Photos



6 dB Bandwidth Table-FCC 15.247(a)(2)
802.11b used 1-11 MBPS.
802.11g used 54 MBPS.

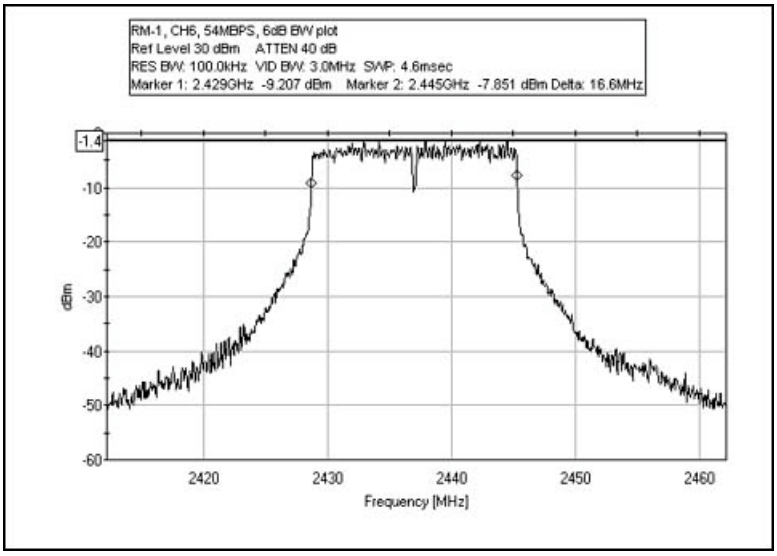
Channel	Data Rate MBPS	6 dB BW MHz
1	1	12.0
1	11	10.34
1	54	16.6
6	1	11.95
6	11	10.35
6	54	16.6
11	1	12.0
11	11	10.24
11	54	16.6

Test Plots



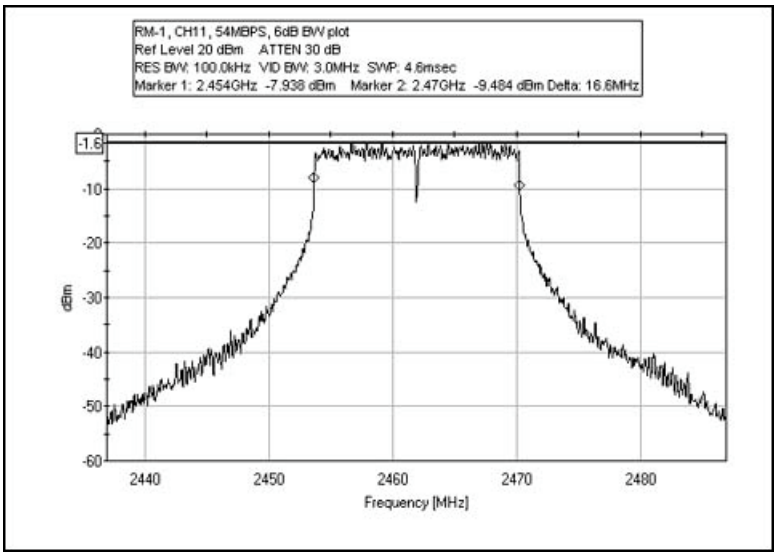
Tested By: Art Rice

Channel 1, 54 MBPS



Tested By: Art Rice

Channel 6, 54 MBPS



Tested By: Art Rice

Channel 11, 54 MBPS

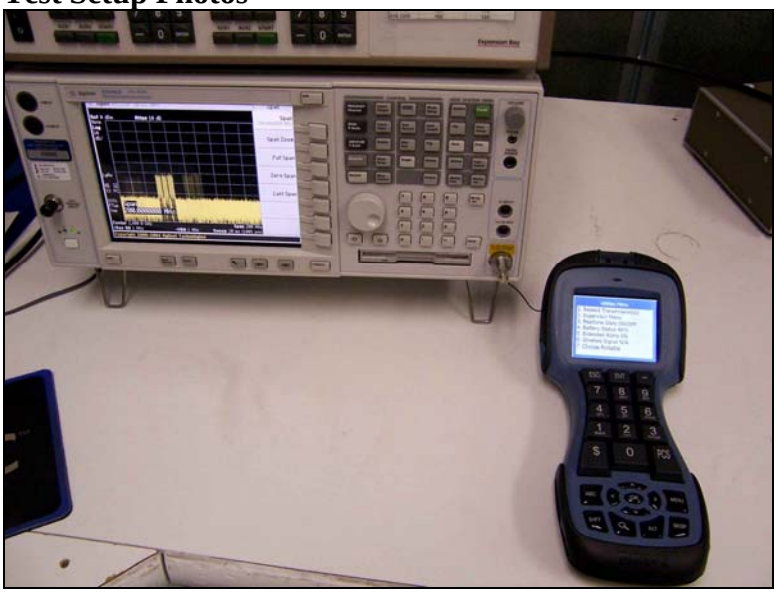
FCC Part 15.247(b) POWER OUTPUT

Test Equipment

Function	S/N	Calibration Date	Cal Due Date	Asset #
E4446A Spectrum Analyzer	US44300408	03/05/2007	03/05/2009	02668

Test Conditions: Configuration 1: Transmit continuously with modulation on selected channel. This is a conducted measurement on antenna port. Power Spectral Density option 2 method was used in KDB 558074. RBW=VBW=1 MHz. Use Channel Power function on E4446A. Integration BW is set to the 99% BW result.

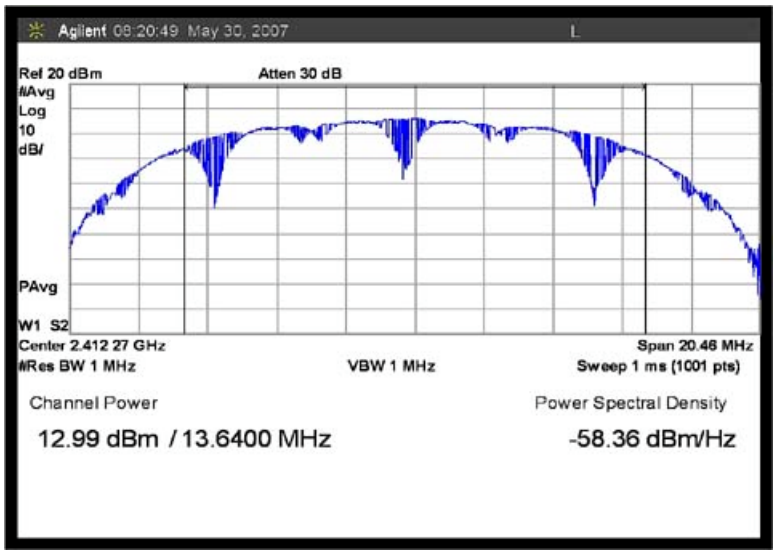
Test Setup Photos



Power Output Table-FCC 15.247(b)(3)
802.11b used 1-11 MBPS.
802.11g used 48-54 MBPS.

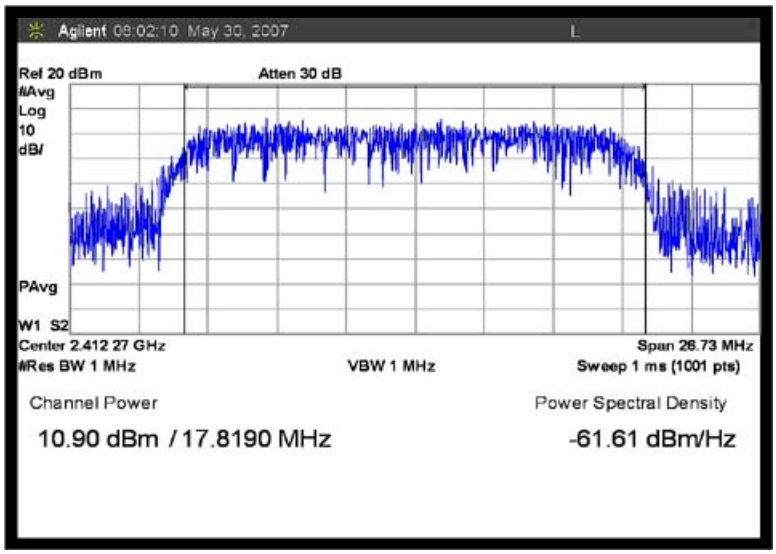
Channel	Data Rate MBPS	Power Output dBm
1	1	12.99
1	6	10.99
1	11	12.57
1	48	10.46
1	54	10.10
6	1	13.60
6	6	11.96
6	11	13.39
6	48	10.62
6	54	10.52
11	1	13.61
11	6	11.74
11	11	13.13
11	48	10.15
11	54	10.73

Test Plots



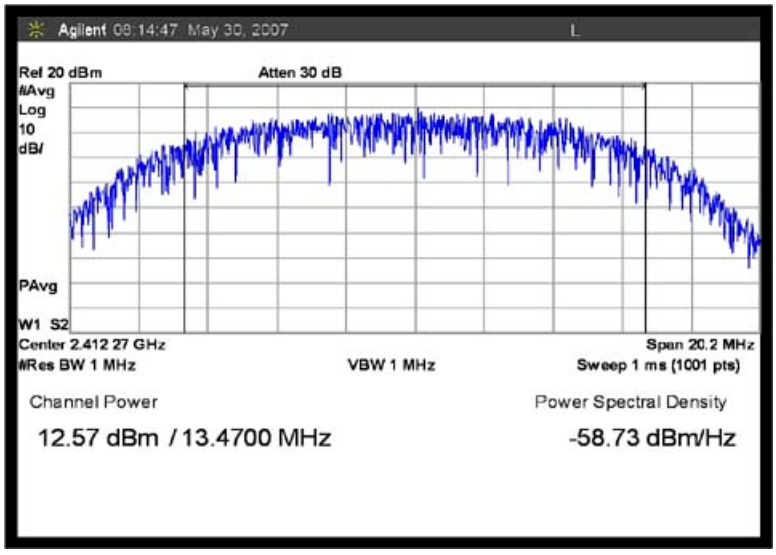
Tested By: Art Rice

Channel 1, 1MBPS



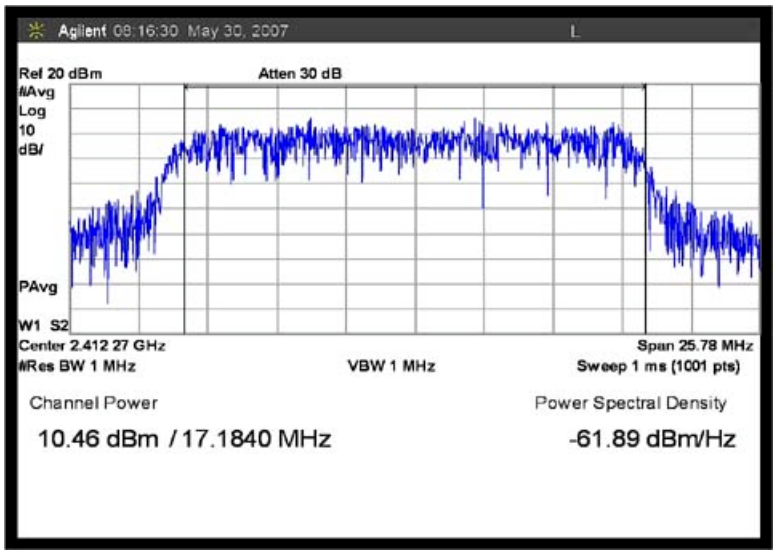
Tested By: Art Rice

Channel 1, 6 MBPS



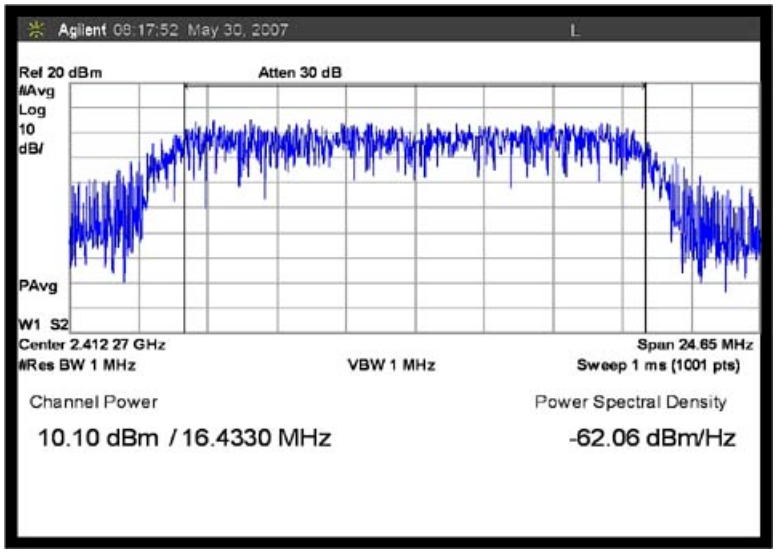
Tested By: Art Rice

Channel 1, 11MBPS



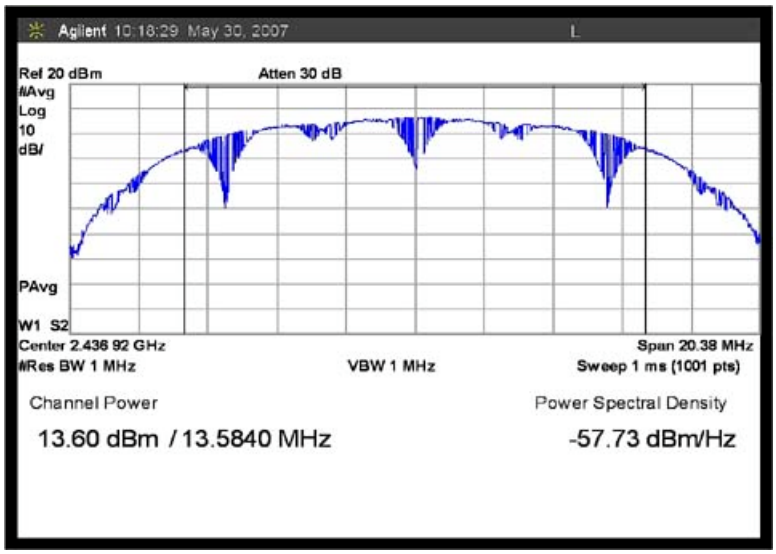
Tested By: Art Rice

Channel 1, 48MBPS



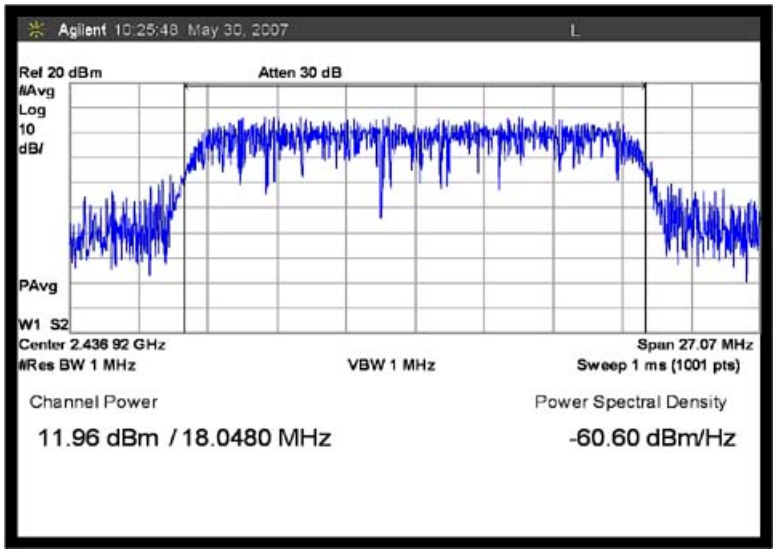
Tested By: Art Rice

Channel 1, 54MBPS



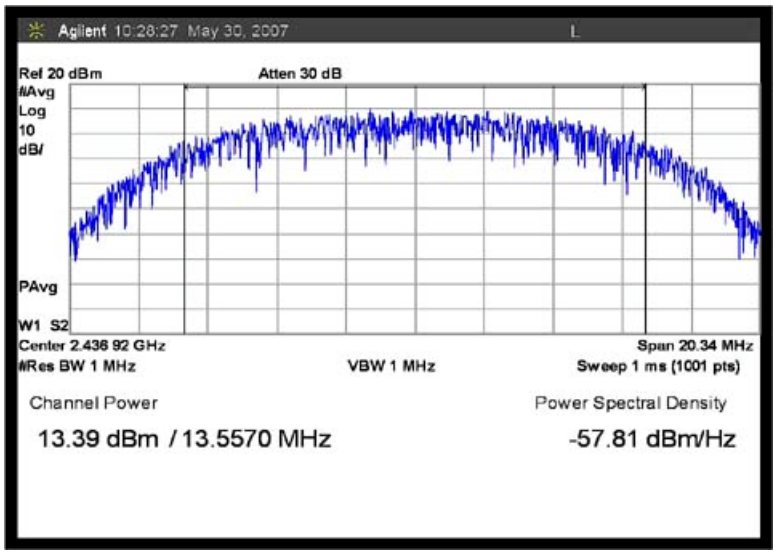
Tested By: Art Rice

Channel 6, 1 MBPS



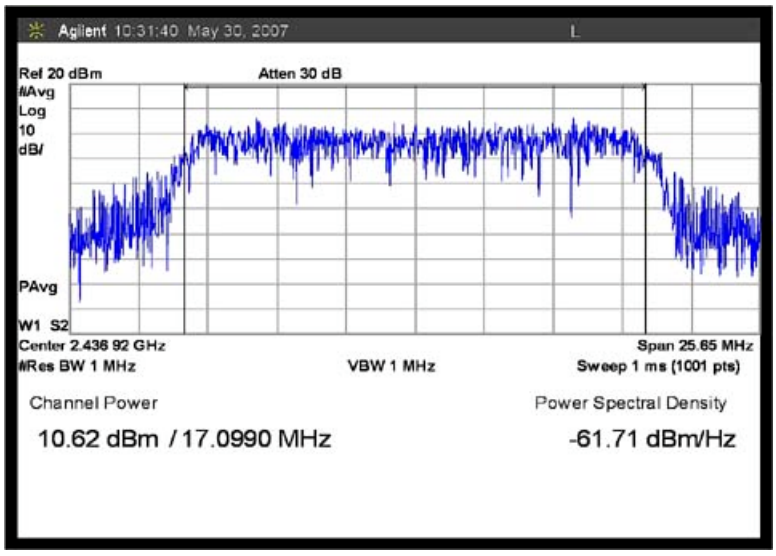
Tested By: Art Rice

Channel 6, 6 MBPS



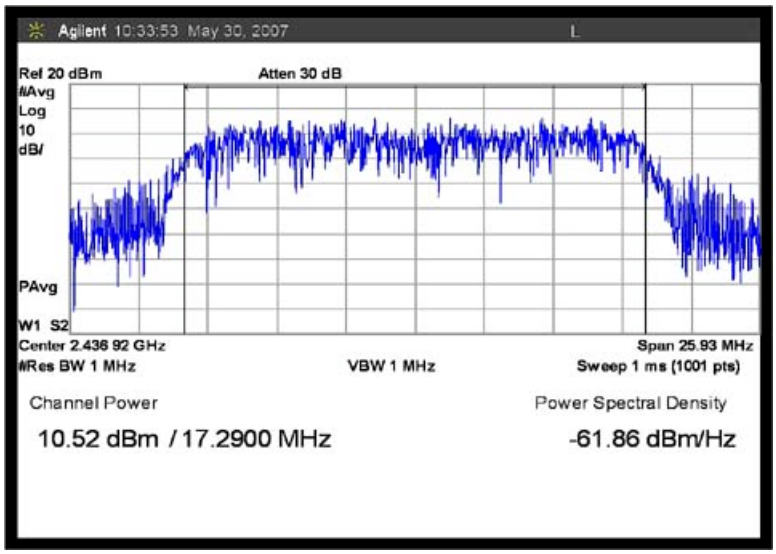
Tested By: Art Rice

Channel 6, 11 MBPS



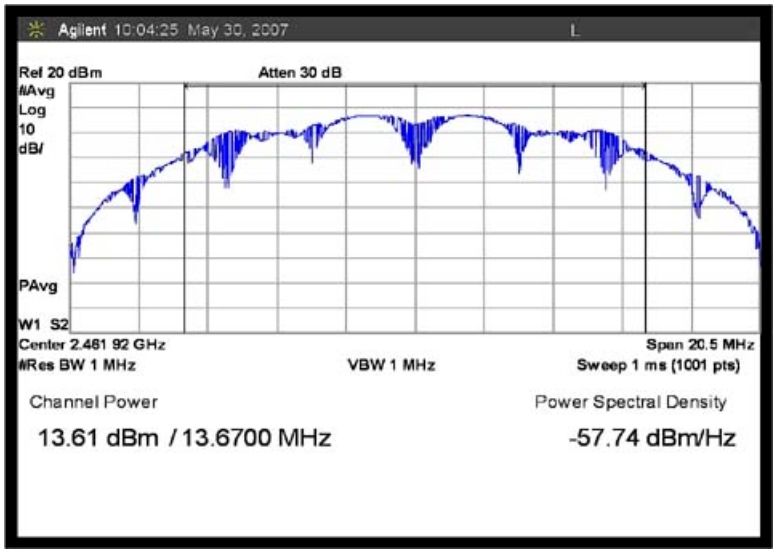
Tested By: Art Rice

Channel 6, 48 MBPS



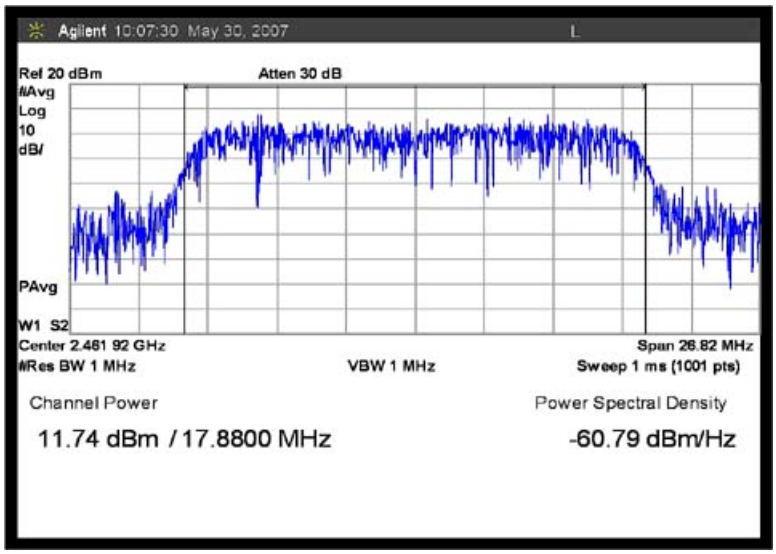
Tested By: Art Rice

Channel 6, 54 MBPS



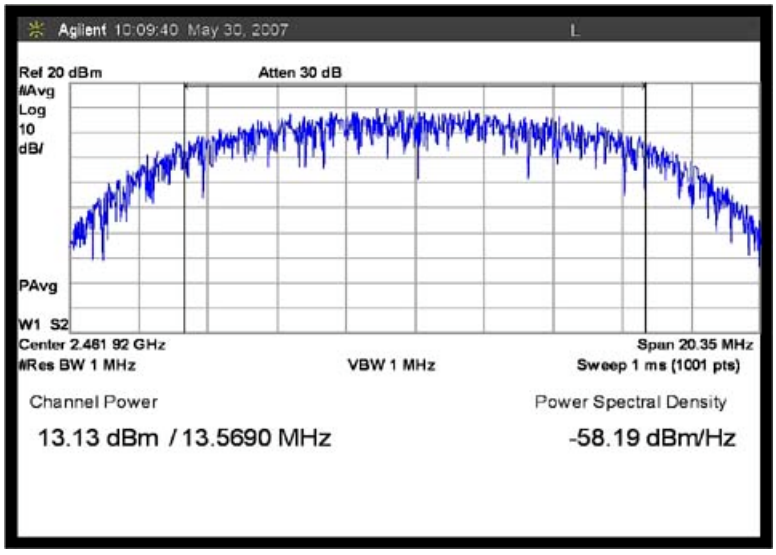
Tested By: Art Rice

Channel 11, 1 MBPS



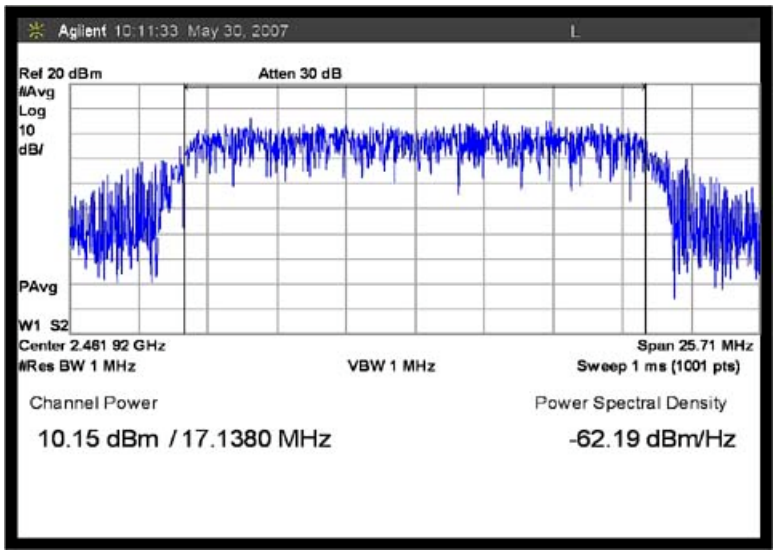
Tested By: Art Rice

Channel 11, 6 MBPS



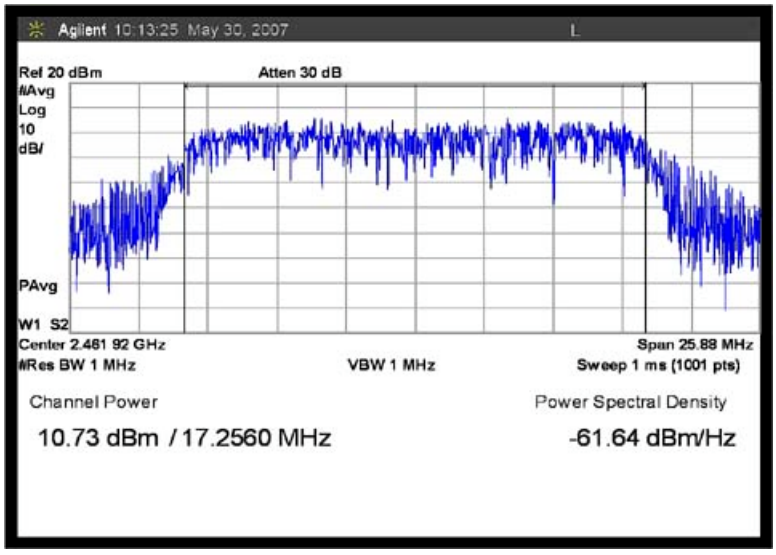
Tested By: Art Rice

Channel 11, 11 MBPS



Tested By: Art Rice

Channel 11, 48 MBPS

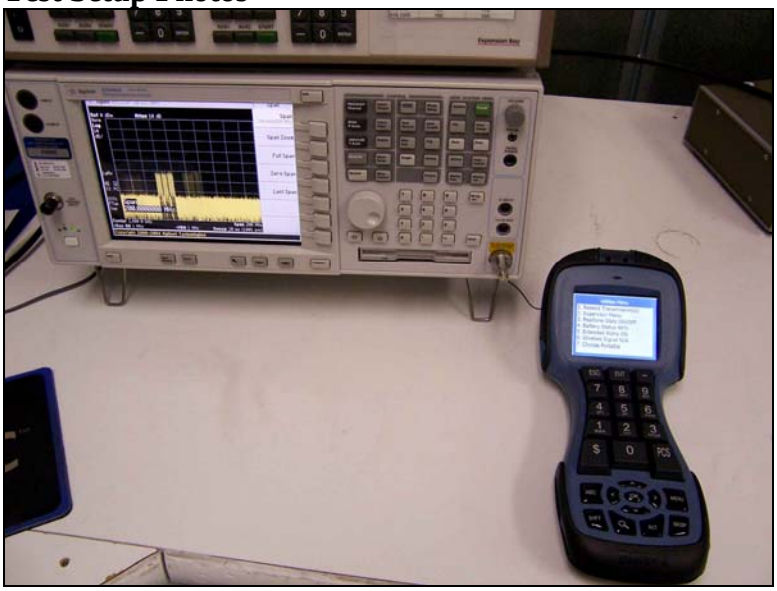


Tested By: Art Rice

Channel 11, 54 MBPS

FCC 15.247(d) ANTENNA CONDUCTED SPURIOUS EMISSIONS

Test Setup Photos



Test Data Sheets

Test Location: CKC Laboratories, Inc. •1120 Fulton Place • Fremont, CA 94539 • 510-249-1170

Customer:	**RGIS**		
Specification:	**FCC 15.247 Spurious Conducted 802.11b**		
Work Order #:	**86165**	Date:	5/30/2007
Test Type:	**Radiated Scan**	Time:	17:20:20
Equipment:	**Handheld Barcode Scanner**	Sequence#:	35
Manufacturer:	RGIS	Tested By:	Art Rice
Model:	RM-1		
S/N:	9010023015		

***Test Equipment*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
E4446A Spectrum Analyzer	US44300408	03/05/2007	03/05/2009	02668

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

Function	Manufacturer	Model #	S/N
Handheld Barcode Scanner*	RGIS	RM-1	9010023015

Support Devices:

Function	Manufacturer	Model #	S/N

Test Conditions / Notes:

Notes: Located on wireless bench. External ports NOT filled with external devices. EUT is in Continuous Transmit mode with modulation. Transmitting on channel as noted. Testing is done on Channels 1, 6, 11 (LO, MID, HI). Direct to spectrum analyzer. Unit tested with new battery in place. CH 1=2412 MHz, CH6=2437 MHz, CH11=2462 MHz. RBW=100 kHz. CH1 spurious emissions scan 802.11b Worst case output with 1 MBPS data rate, as previously determined. Radiated emissions 0.2 MHz-25 GHz.

Transducer Legend:

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

#	Freq MHz	Rdng dBµV	dB	dB	dB	dB	Dist Table	Corr dBm	Spec dBm	Margin dB	Polar Ant
1	2414.644M	107.2					+0.0	107.2	137.0	-29.8	None
2	2410.686M	106.0					+0.0	106.0	137.0	-31.0	None
3	2397.375M	58.8					+0.0	58.8	90.0	-31.2	None
4	2408.528M	104.8					+0.0	104.8	137.0	-32.2	None
5	2415.903M	104.6					+0.0	104.6	137.0	-32.4	None
6	2408.887M	104.3					+0.0	104.3	137.0	-32.7	None
7	2397.015M	57.1					+0.0	57.1	90.0	-32.9	None
8	2399.353M	57.1					+0.0	57.1	90.0	-32.9	None
9	2396.295M	56.7					+0.0	56.7	90.0	-33.3	None
10	4824.020M	56.2					+0.0	56.2	90.0	-33.8	None
11	2394.497M	53.5					+0.0	53.5	90.0	-36.5	None
12	2399.893M	53.5					+0.0	53.5	90.0	-36.5	None
13	2406.009M	99.3					+0.0	99.3	137.0	-37.7	None
14	2417.882M	96.6					+0.0	96.6	137.0	-40.4	None
15	2385.322M	48.2					+0.0	48.2	90.0	-41.8	None
16	2389.999M	48.0					+0.0	48.0	90.0	-42.0	None
17	2405.110M	94.0					+0.0	94.0	137.0	-43.0	None
18	2389.460M	46.2					+0.0	46.2	90.0	-43.8	None
19	2496.132M	46.1					+0.0	46.1	90.0	-43.9	None
20	2491.994M	45.9					+0.0	45.9	90.0	-44.1	None
21	2391.798M	45.8					+0.0	45.8	90.0	-44.2	None
22	2502.248M	45.8					+0.0	45.8	90.0	-44.2	None

23	2486.418M	45.7	+0.0	45.7	90.0	-44.3	None
24	2376.328M	45.6	+0.0	45.6	90.0	-44.4	None
25	2491.275M	45.6	+0.0	45.6	90.0	-44.4	None
26	2365.355M	45.4	+0.0	45.4	90.0	-44.6	None
27	2325.240M	45.3	+0.0	45.3	90.0	-44.7	None
28	2358.519M	45.3	+0.0	45.3	90.0	-44.7	None
29	2377.767M	45.3	+0.0	45.3	90.0	-44.7	None
30	24961.020M	45.1	+0.0	45.1	90.0	-44.9	None
31	2379.206M	45.0	+0.0	45.0	90.0	-45.0	None
32	2513.221M	45.0	+0.0	45.0	90.0	-45.0	None
33	2378.487M	44.9	+0.0	44.9	90.0	-45.1	None
34	2387.661M	44.9	+0.0	44.9	90.0	-45.1	None
35	2507.824M	44.9	+0.0	44.9	90.0	-45.1	None
36	24238.200M	44.8	+0.0	44.8	90.0	-45.2	None
37	2390.719M	44.6	+0.0	44.6	90.0	-45.4	None
38	2350.784M	44.5	+0.0	44.5	90.0	-45.5	None
39	2380.106M	44.5	+0.0	44.5	90.0	-45.5	None
40	2386.582M	44.5	+0.0	44.5	90.0	-45.5	None
41	2513.581M	44.5	+0.0	44.5	90.0	-45.5	None
42	24873.300M	44.5	+0.0	44.5	90.0	-45.5	None
43	2516.459M	44.4	+0.0	44.4	90.0	-45.6	None
44	2489.296M	44.3	+0.0	44.3	90.0	-45.7	None
45	2509.263M	44.3	+0.0	44.3	90.0	-45.7	None
46	2506.385M	44.2	+0.0	44.2	90.0	-45.8	None

47	24243.070M	44.2	+0.0	44.2	90.0	-45.8	None
48	24316.170M	44.2	+0.0	44.2	90.0	-45.8	None
49	2370.751M	44.1	+0.0	44.1	90.0	-45.9	None
50	2535.347M	44.0	+0.0	44.0	90.0	-46.0	None

Test Location: CKC Laboratories, Inc. •1120 Fulton Place • Fremont, CA 94539 • 510-249-1170

Customer: **RGIS**
Specification: **FCC 15.247 Spurious Conducted 802.11b**
Work Order #: **86165** Date: 5/30/2007
Test Type: **Radiated Scan** Time: 17:35:30
Equipment: **Handheld Barcode Scanner** Sequence#: 36
Manufacturer: RGIS Tested By: Art Rice
Model: RM-1
S/N: 9010023015

***Test Equipment*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
E4446A Spectrum Analyzer	US44300408	03/05/2007	03/05/2009	02668

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

Function	Manufacturer	Model #	S/N
Handheld Barcode Scanner*	RGIS	RM-1	9010023015

Support Devices:

Function	Manufacturer	Model #	S/N

Test Conditions / Notes:

Notes: Located on wireless bench. External ports NOT filled with external devices. EUT is in Continuous Transmit mode with modulation. Transmitting on channel as noted. Testing is done on Channels 1, 6, 11 (LO, MID, HI). Direct to spectrum analyzer. Unit tested with new battery in place. CH 1=2412 MHz, CH6=2437 MHz, CH11=2462 MHz RBW=100 kHz CH6 spurious emissions scan 802.11b Worst case output with 1 MBPS data rate, as previously determined. Radiated emissions 0.2 MHz-25 GHz.

Transducer Legend:

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

#	Freq MHz	Rdng dBµV	dB	dB	dB	dB	Dist Table	Corr dBm	Spec dBm	Margin dB	Polar Ant
1	4874.000M	57.6					+0.0	57.6	90.0	-32.4	None
2	476.300M	43.1					+0.0	43.1	90.0	-46.9	None

Test Location: CKC Laboratories, Inc. •1120 Fulton Place • Fremont, CA 94539 • 510-249-1170

Customer: **RGIS**
Specification: **FCC 15.247 Spurious Conducted 802.11b**
Work Order #: **86165** Date: 5/30/2007
Test Type: **Radiated Scan** Time: 17:42:29
Equipment: **Handheld Barcode Scanner** Sequence#: 37
Manufacturer: RGIS Tested By: Art Rice
Model: RM-1
S/N: 9010023015

***Test Equipment*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
E4446A Spectrum Analyzer	US44300408	03/05/2007	03/05/2009	02668

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

Function	Manufacturer	Model #	S/N
Handheld Barcode Scanner*	RGIS	RM-1	9010023015

Support Devices:

Function	Manufacturer	Model #	S/N

Test Conditions / Notes:

Notes: Located on wireless bench. External ports NOT filled with external devices. EUT is in Continuous Transmit mode with modulation. Transmitting on channel as noted. Testing is done on Channels 1, 6, 11 (LO, MID, HI). Direct to spectrum analyzer. Unit tested with new battery in place. CH 1=2412 MHz, CH6=2437 MHz, CH11=2462 MHz RBW=100 kHz CH11 spurious emissions scan 802.11b Worst case output with 1 MBPS data rate, as previously determined. Radiated emissions 0.2 MHz-25 GHz.

Transducer Legend:

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

#	Freq MHz	Rdng dBµV	dB	dB	dB	dB	Dist Table	Corr dBm	Spec dBm	Margin dB	Polar Ant
1	4924.000M	58.2					+0.0	58.2	90.0	-31.8	None
2	501.200M	38.4					+0.0	38.4	90.0	-51.6	None

Test Location: CKC Laboratories, Inc. •1120 Fulton Place • Fremont, CA 94539 • 510-249-1170

Customer: **RGIS**
Specification: **FCC 15.247 Spurious Conducted 802.11g**
Work Order #: **86165** Date: 5/30/2007
Test Type: **Radiated Scan** Time: 17:53:30
Equipment: **Handheld Barcode Scanner** Sequence#: 38
Manufacturer: RGIS Tested By: Art Rice
Model: RM-1
S/N: 9010023015

***Test Equipment*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
E4446A Spectrum Analyzer	US44300408	03/05/2007	03/05/2009	02668

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

Function	Manufacturer	Model #	S/N
Handheld Barcode Scanner*	RGIS	RM-1	9010023015

Support Devices:

Function	Manufacturer	Model #	S/N

Test Conditions / Notes:

Notes: Located on wireless bench. External ports NOT filled with external devices. EUT is in Continuous Transmit mode with modulation. Transmitting on channel as noted. Testing is done on Channels 1, 6, 11 (LO, MID, HI). Direct to spectrum analyzer. Unit tested with new battery in place. CH 1=2412 MHz, CH6=2437 MHz, CH11=2462 MHz RBW=100 kHz CH1 spurious emissions scan 802.11g Worst case output with 54 MBPS data rate, as previously determined. Radiated emissions 0.2 MHz-25 GHz.

Transducer Legend:

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

#	Freq MHz	Rdng dBµV	dB	dB	dB	dB	Dist Table	Corr dBm	Spec dBm	Margin dB	Polar Ant
1	4823.000M	42.8					+0.0	42.8	87.5	-44.7	None
2	3216.000M	42.0					+0.0	42.0	87.5	-45.5	None

Test Location: CKC Laboratories, Inc. •1120 Fulton Place • Fremont, CA 94539 • 510-249-1170

Customer: **RGIS**
Specification: **FCC 15.247 Spurious Conducted 802.11g**
Work Order #: **86165** Date: 5/30/2007
Test Type: **Radiated Scan** Time: 18:04:35
Equipment: **Handheld Barcode Scanner** Sequence#: 39
Manufacturer: RGIS Tested By: Art Rice
Model: RM-1
S/N: 9010023015

***Test Equipment*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
E4446A Spectrum Analyzer	US44300408	03/05/2007	03/05/2009	02668

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

Function	Manufacturer	Model #	S/N
Handheld Barcode Scanner*	RGIS	RM-1	9010023015

Support Devices:

Function	Manufacturer	Model #	S/N

Test Conditions / Notes:

Notes: Located on wireless bench. External ports NOT filled with external devices. EUT is in Continuous Transmit mode with modulation. Transmitting on channel as noted. Testing is done on Channels 1, 6, 11 (LO, MID, HI). Direct to spectrum analyzer. Unit tested with new battery in place. CH 1=2412 MHz, CH6=2437 MHz, CH11=2462 MHz RBW=100 kHz CH6 spurious emissions scan 802.11g Worst case output with 54 MBPS data rate, as previously determined. Radiated emissions 0.2 MHz-25 GHz.

Transducer Legend:

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

#	Freq MHz	Rdng dBµV	dB	dB	dB	dB	Dist Table	Corr dBm	Spec dBm	Margin dB	Polar Ant
1	24290.000 M	46.0					+0.0	46.0	87.5	-41.5	None
2	4875.000M	43.0					+0.0	43.0	87.5	-44.5	None
3	3249.000M	40.7					+0.0	40.7	87.5	-46.8	None

Test Location: CKC Laboratories, Inc. •1120 Fulton Place • Fremont, CA 94539 • 510-249-1170

Customer: **RGIS**
Specification: **FCC 15.247 Spurious Conducted 802.11g**
Work Order #: **86165** Date: 5/30/2007
Test Type: **Radiated Scan** Time: 18:08:50
Equipment: **Handheld Barcode Scanner** Sequence#: 40
Manufacturer: RGIS Tested By: Art Rice
Model: RM-1
S/N: 9010023015

***Test Equipment*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
E4446A Spectrum Analyzer	US44300408	03/05/2007	03/05/2009	02668

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

Function	Manufacturer	Model #	S/N
Handheld Barcode Scanner*	RGIS	RM-1	9010023015

Support Devices:

Function	Manufacturer	Model #	S/N

Test Conditions / Notes:

Notes: Located on wireless bench. External ports NOT filled with external devices. EUT is in Continuous Transmit mode with modulation. Transmitting on channel as noted. Testing is done on Channels 1, 6, 11 (LO, MID, HI). Direct to spectrum analyzer. Unit tested with new battery in place. CH 1=2412 MHz, CH6=2437 MHz, CH11=2462 MHz RBW=100 kHz CH11 spurious emissions scan 802.11g Worst case output with 54 MBPS data rate, as previously determined. Radiated emissions 0.2 MHz-25 GHz.

Transducer Legend:

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

#	Freq MHz	Rdng dBµV	dB	dB	dB	dB	Dist Table	Corr dBm	Spec dBm	Margin dB	Polar Ant
1	4925.000M	43.8					+0.0	43.8	87.5	-43.7	None

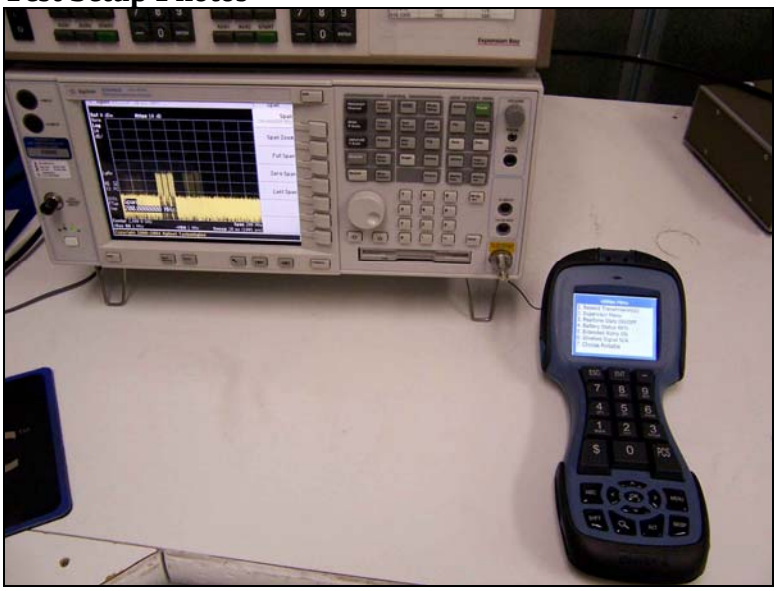
FCC Part 15.247(d) BAND EDGE CONDUCTED

Test Equipment

Function	S/N	Calibration Date	Cal Due Date	Asset #
E4446A Spectrum Analyzer	US44300408	03/05/2007	03/05/2009	02668

Test Conditions: Configuration 1: Transmit continuously with modulation on selected channel. This is a conducted measurement on antenna port. The display line is set to the peak of the signal. The marker is set at the band edge. Subtract the marker level from the display line level. The result shows how many dB down the signal is from the carrier at the band edge. See separate table for results.

Test Setup Photos

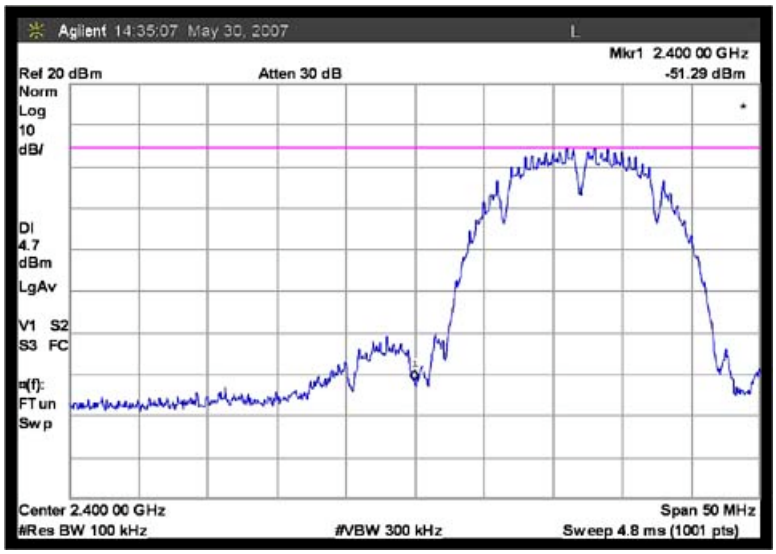


Test Conditions

Band Edge Table-FCC 15.247(d)
802.11b used 1 MBPS.
802.11g used 54 MBPS.

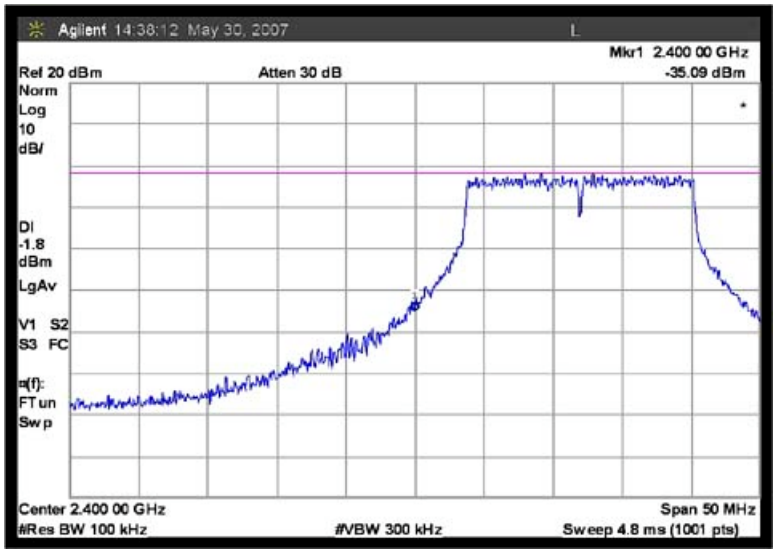
Channel	Data Rate MBPS	Low Edge 2400.0 MHz Level in dBm	High Edge 2483.5 MHz Level in dBm	Carrier Level dBm	dBc result
1	1	-51.29		4.7	-55.99
1	54	-35.09		-1.8	-33.29
11	1		-54.38	4.5	-58.88
11	54		-47.0	-1.2	-45.8

Test Plots



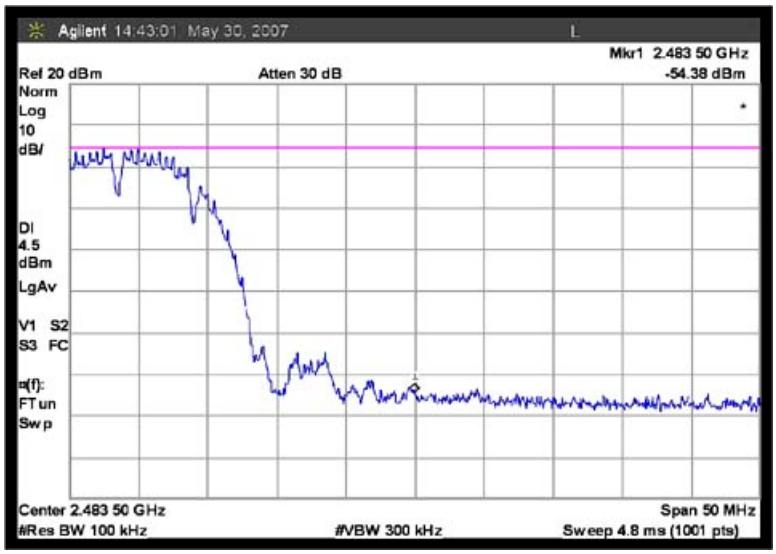
Tested By: Art Rice

Low, Channel 1, 802.11b



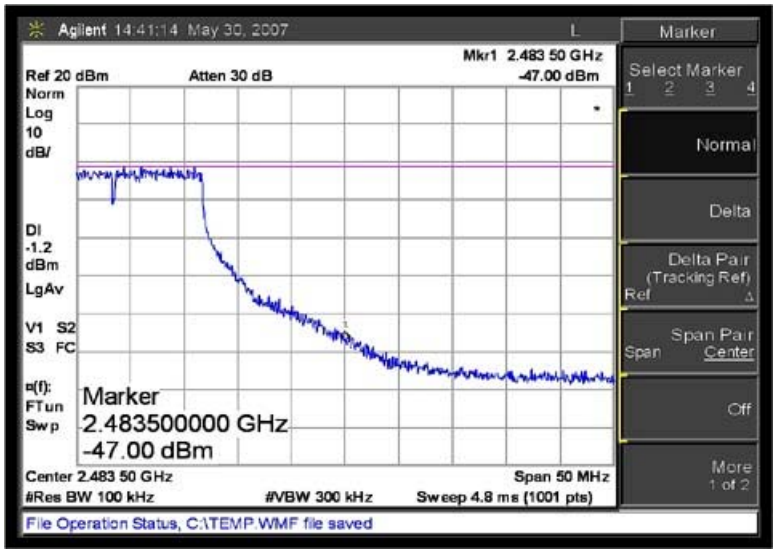
Tested By: Art Rice

Low, Channel 1, 802.11g



Tested By: Art Rice

High, Channel 11, 802.11b



Tested By: Art Rice

High, Channel 11, 802.11g

FCC Part 15.209/15.247(d) BAND EDGE RADIATED

Test Equipment

Function	S/N	Calibration Date	Cal Due Date	Asset #
E4446A Spectrum Analyzer	US44300408	03/05/2007	03/05/2009	02668
HF Cable	NA	03/22/2007	03/22/2009	1956
HF Cable	NA	03/20/2006	03/20/2008	5138
HF Cable	NA	06/07/2006	06/07/2008	4241
Horn Antenna 1-18GHz	2061	03/19/2007	03/19/2009	2061
Preamp	00323	02/27/2006	02/27/2008	2810

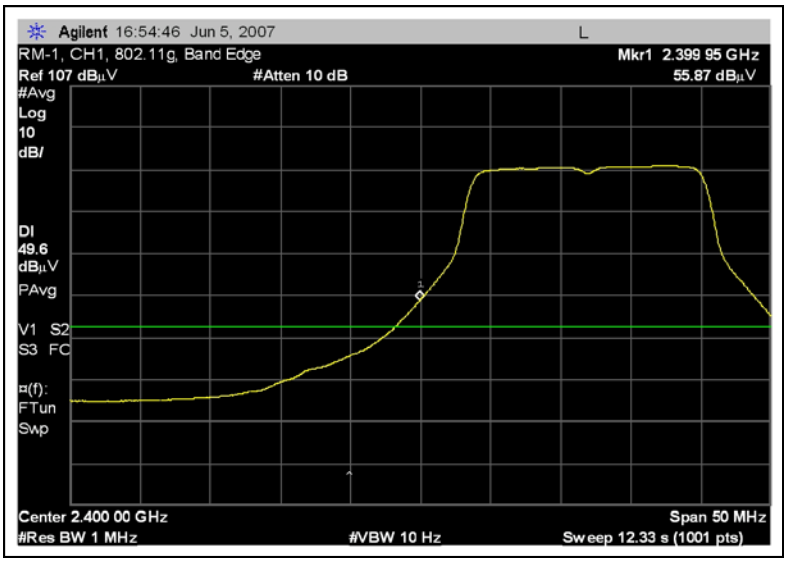
Test Conditions: Configuration 1: Transmit continuously with modulation on selected channel. This is a radiated measurement. The display line is set to the FCC 15.209 limit level. The marker is set at the band edge. Subtract the marker level from the display line level. The result shows how many dB the signal is from the 15.209 limit at the band edge. **NOTE: At the lower band edge, with 802.11g (54 MBPS) modulation, the marker is above the 15.209 limit. However, the 2390 MHz upper edge of the restricted band is 2 horizontal divisions to the left of the marker. Therefore, at or below 2390 MHz the level is passing the 15.209 limit. See associated data sheet: FCBRE040A-BAND EDGE15.209 CHN 1 11.DAT**

Test Setup Photos

Test Plots

Tested By: Art Rice

Channel 1, 802.11b Vertical

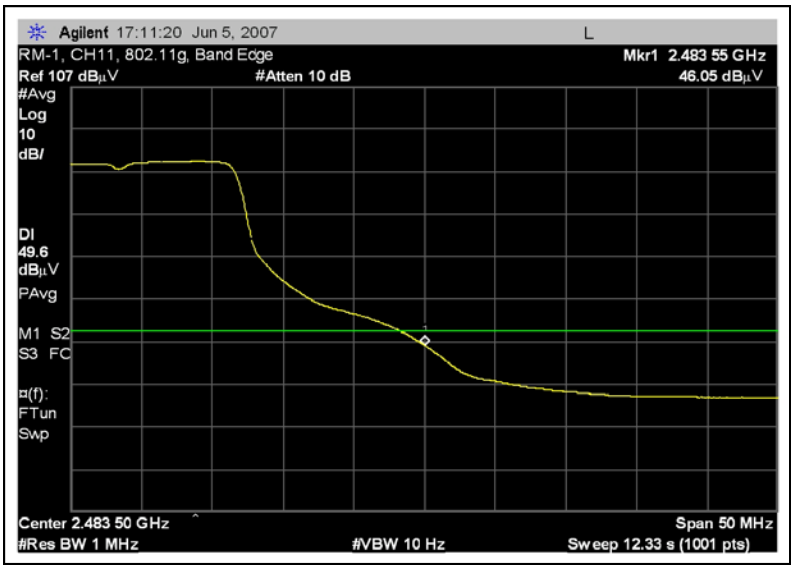


Tested By: Art Rice

Channel 1, 802.11g Vertical

Tested By: Art Rice

Channel 11, 802.11b Vertical



Tested By: Art Rice

Channel 11, 802.11g Vertical

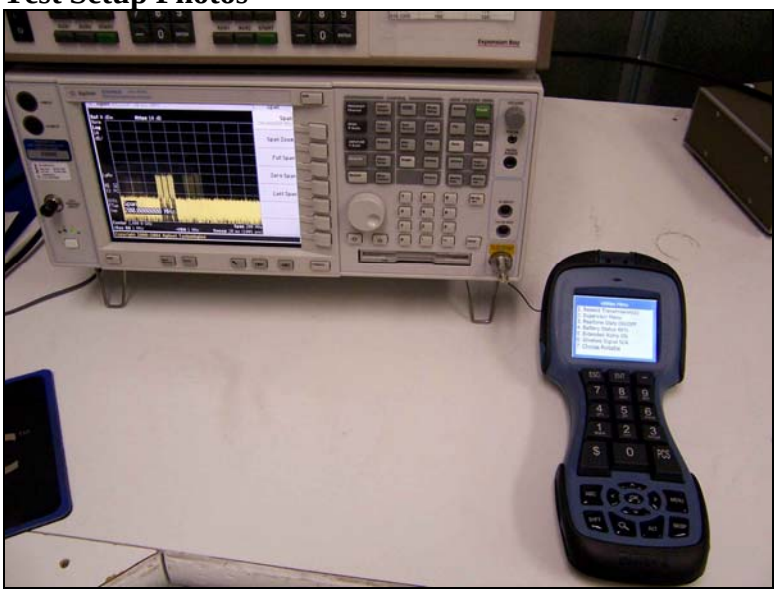
FCC Part 15.247(e) PEAK POWER SPECTRAL DENSITY

Test Equipment

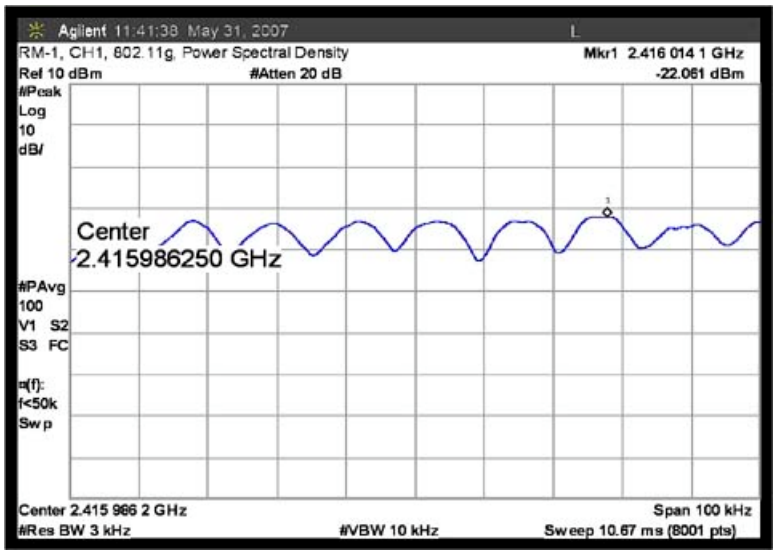
Function	S/N	Calibration Date	Cal Due Date	Asset #
E4446A Spectrum Analyzer	US44300408	03/05/2007	03/05/2009	02668

Test Conditions: Configuration 1: Transmit continuously with modulation on selected channel. This is a conducted measurement on antenna port. Power Spectral Density option 2 method was used in KDB 558074. Find the strongest peak of the signal, peak search, marker to CF, span=100kHz. RBW=3 kHz, VBW=10 kHz, sweep time=auto, use peak detector, trigger set to "free run", use **power** averaging, and average over 100 sweeps. Wait until 100 sweeps are completed (leave trace 1 in clear-write), then click on "view" for trace 1. Click on peak search. Capture the image from EMITest.

Test Setup Photos

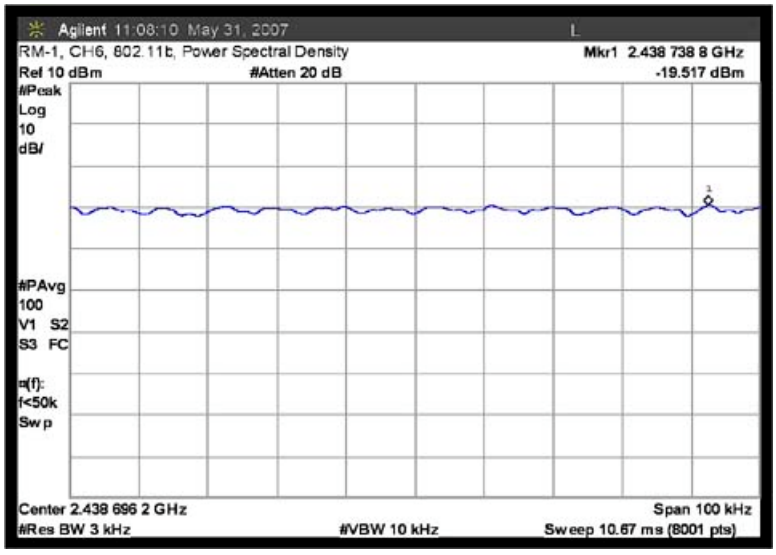


Test Plots



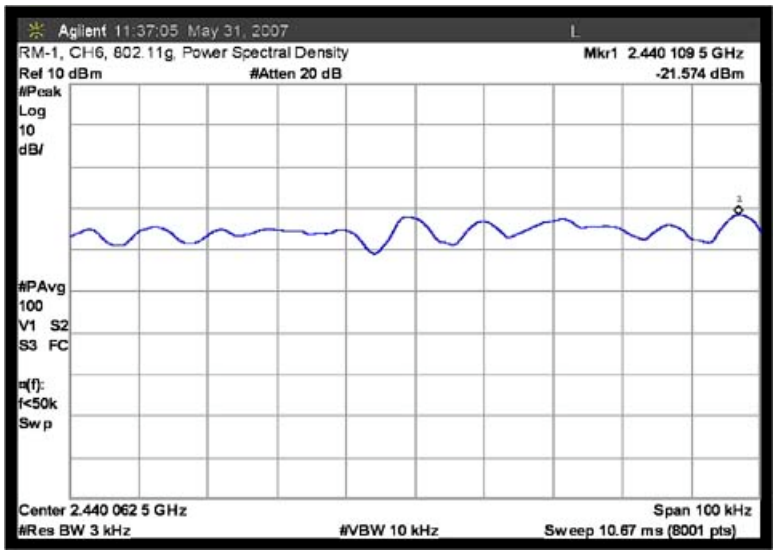
Tested By: Art Rice

Channel 1, 54 MPBS, 802.11g



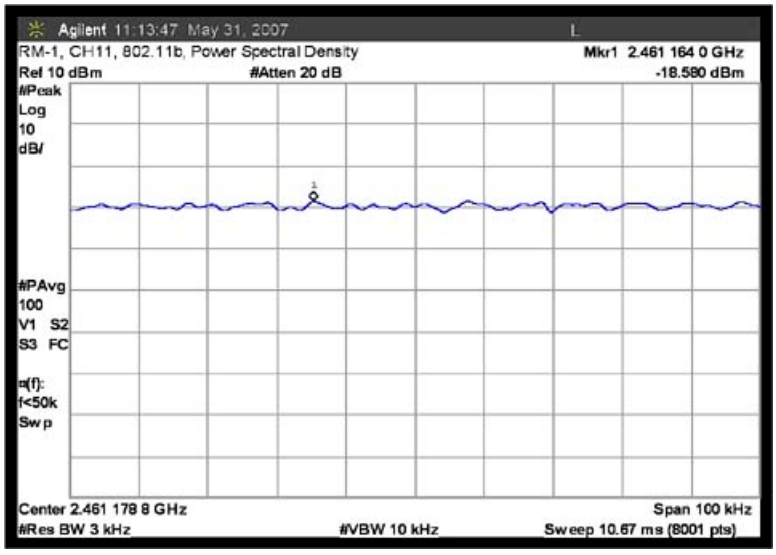
Tested By: Art Rice

Channel 6, 1 MBPS, 802.11b



Tested By: Art Rice

Channel 6, 54 MBPS, 802.11g



Tested By: Art Rice

Channel 11, 1 MPBS, 802.11b

Tested By: Art Rice

Channel 11, 54 MBPS, 802.11g

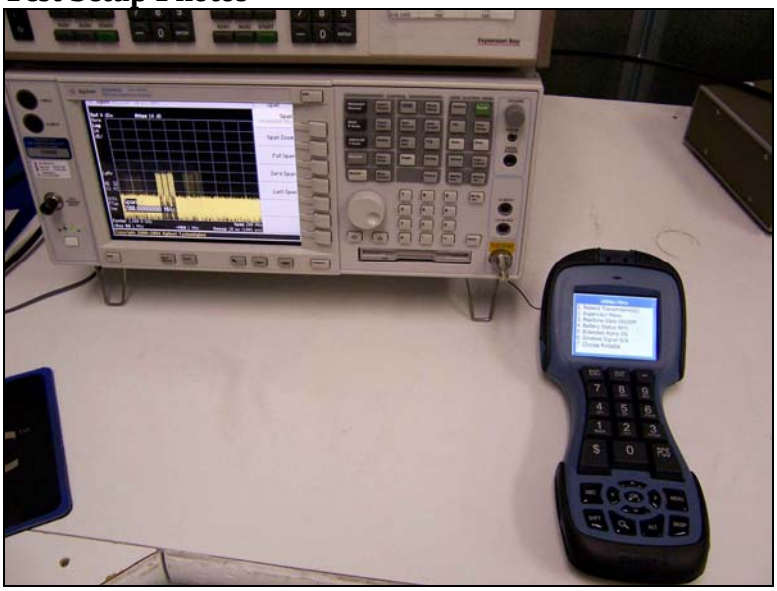
RSS-210 99% BANDWIDTH

Test Equipment

Function	S/N	Calibration Date	Cal Due Date	Asset #
E4446A Spectrum Analyzer	US44300408	03/05/2007	03/05/2009	02668

Test Conditions: Configuration 1: Transmit continuously with modulation on selected channel. This is a conducted measurement on antenna port.

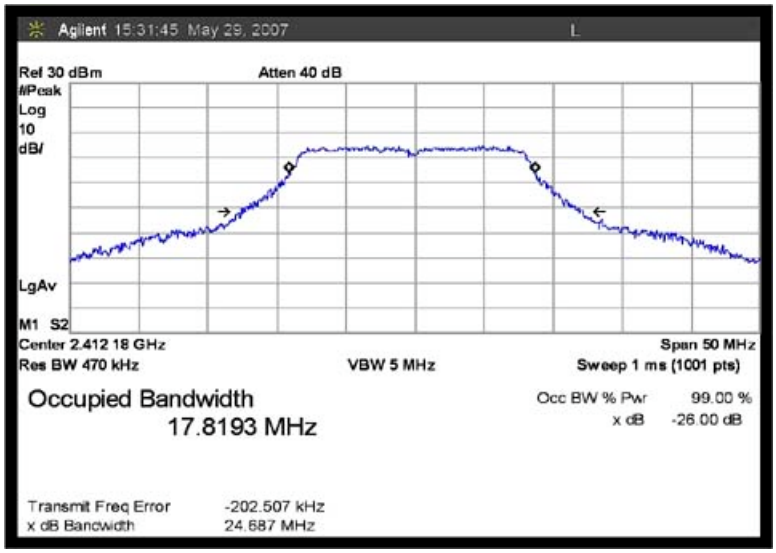
Test Setup Photos



99% Bandwidth Table RSS-210
802.11b used 1-11 MBPS.
802.11g used 48-54 MBPS.

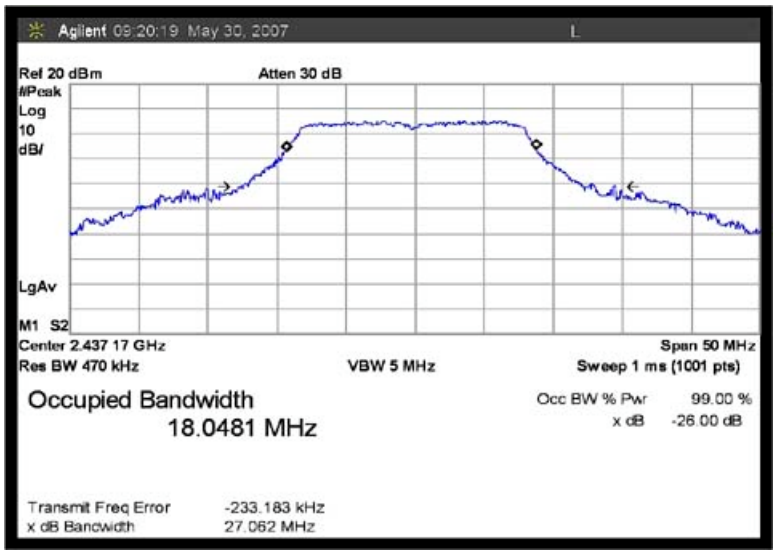
Channel	Data Rate MBPS	99% BW MHz
1	1	13.641
1	6	17.819
1	11	13.472
1	48	17.184
1	54	16.433
6	1	13.584
6	6	18.048
6	11	13.557
6	48	17.099
6	54	17.290
11	1	13.669
11	6	17.880
11	11	13.569
11	48	17.138
11	54	17.256

Test Plots



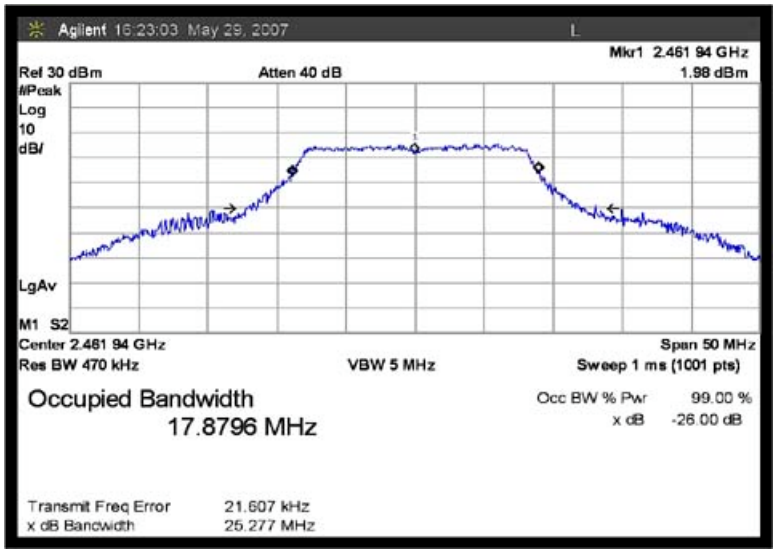
Tested By: Art Rice

Channel 1, 6 MPBS



Tested By: Art Rice

Channel 6, 6 MBPS



Tested By: Art Rice

Channel 11, 6 MBPS