

Nemko Test Report: 3L0117RUS1

Applicant: Sychip, Inc
2805 North Dallas Parkway
Suite 400
Plano, TX 75093

**Equipment Under Test:
(E.U.T.)** WLAN 6060 BGAEVK

In Accordance With: **FCC Part 15, Subpart C, 15.247**
Direct Sequence Spread Spectrum Transmitters

Tested By: Nemko Dallas Inc.
802 N. Kealy
Lewisville, Texas 75057-3136

Authorized By:



David Light, Resource Manager

Date: April 3, 2003

Total Number of Pages: 42

Table of Contents

Section 1. Summary of Test Results	3
Section 2. Equipment Under Test (E.U.T.)	5
Section 3. Powerline Conducted Emissions	7
Section 4. Minimum 6 dB Bandwidth	10
Section 5. Maximum Peak Output Power	14
Section 6. RF Exposure.....	15
Section 7. Spurious Emissions (conducted)	17
Section 8. Spurious Emissions (radiated).....	22
Section 9. Peak Power Spectral Density	26
Section 10. Test Equipment List	30
ANNEX A - TEST DETAILS	31
ANNEX B - TEST DIAGRAMS	40

Section 1. Summary of Test Results

Manufacturer: Sychip, Inc.

Model No.: WLAN 6060 BGAEVK

Serial No.: None

General: **All measurements are traceable to national standards.**

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15, Subpart C, Paragraph 15.247 for Direct Sequence Spread Spectrum devices. Radiated tests were conducted in accordance with ANSI C63.4-1992. Radiated emissions are made on an open area test site. A description of the test facility is on file with the FCC.

- | | | | |
|-------------------------------------|----------------------------|-------------------------------------|---------------------|
| <input type="checkbox"/> | New Submission | <input type="checkbox"/> | Production Unit |
| <input checked="" type="checkbox"/> | Class II Permissive Change | <input checked="" type="checkbox"/> | Pre-Production Unit |

THIS TEST REPORT RELATES ONLY TO THE ITEM(S) TESTED.

THE FOLLOWING DEVIATIONS FROM, ADDITIONS TO, OR EXCLUSIONS FROM THE TEST SPECIFICATIONS HAVE BEEN MADE.



NVLAP LAB CODE: 100426-0

Nemko Dallas Inc. authorizes the above named company to reproduce this report provided it is reproduced in its entirety and for use by the company's employees only.

Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. Nemko Dallas Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report. This report applies only to the items tested.

Summary Of Test Data

NAME OF TEST	PARA. NO.	RESULT
Powerline Conducted Emissions	15.207(a)	Complies
Minimum 6 dB Bandwidth	15.247(a)(2)	Complies
Maximum Peak Power Output	15.247(b)(1)	Complies
Spurious Emissions (Antenna Conducted)	15.247(c)	Complies
Spurious Emissions (Restricted Bands)	15.247(c)	Complies
Peak Power Spectral Density	15.247(d)	Complies

Footnotes:

Section 2. Equipment Under Test (E.U.T.)

General Equipment Information

Tuning Range: 2412 – 2462 MHz

Channel Spacing: 5 MHz

User Frequency Adjustment: Software controlled

Description of EUT

WLAN6060 EVK from SyChip Inc provides a platform for testing SyChip WLAN embedded modules (WLAN6060BB for BGA version and WLAN6060EB for 60-pin connector version).

Changes to the EUT

Transmitter chip U206 was changed from BiCMOS to SiGe. The part number of the new chip is ISL3684A. The part number of the old chip is ISL3684.

System Diagram

Refer to separate exhibit.

Section 3. Powerline Conducted Emissions

NAME OF TEST: Powerline Conducted Emissions	PARA. NO.: 15.207(a)
TESTED BY: Art Ruvalcaba	DATE: 3/25/03

Test Results: Complies.

Measurement Data: See attached plots.

Measurement Uncertainty: +/- 1.7 dB

Photos – Powerline Conducted Emissions

Front



Side



Section 4. Minimum 6 dB Bandwidth

NAME OF TEST: Minimum 6 dB Bandwidth	PARA. NO.: 15.247(a)(2)
TESTED BY: Tom Tidwell	DATE: 3/24/03

Test Results: Complies.

Measurement Data: See 6 dB BW plot

Measured 6 dB bandwidth: 12.3 MHz
Channel Separation: 5 MHz

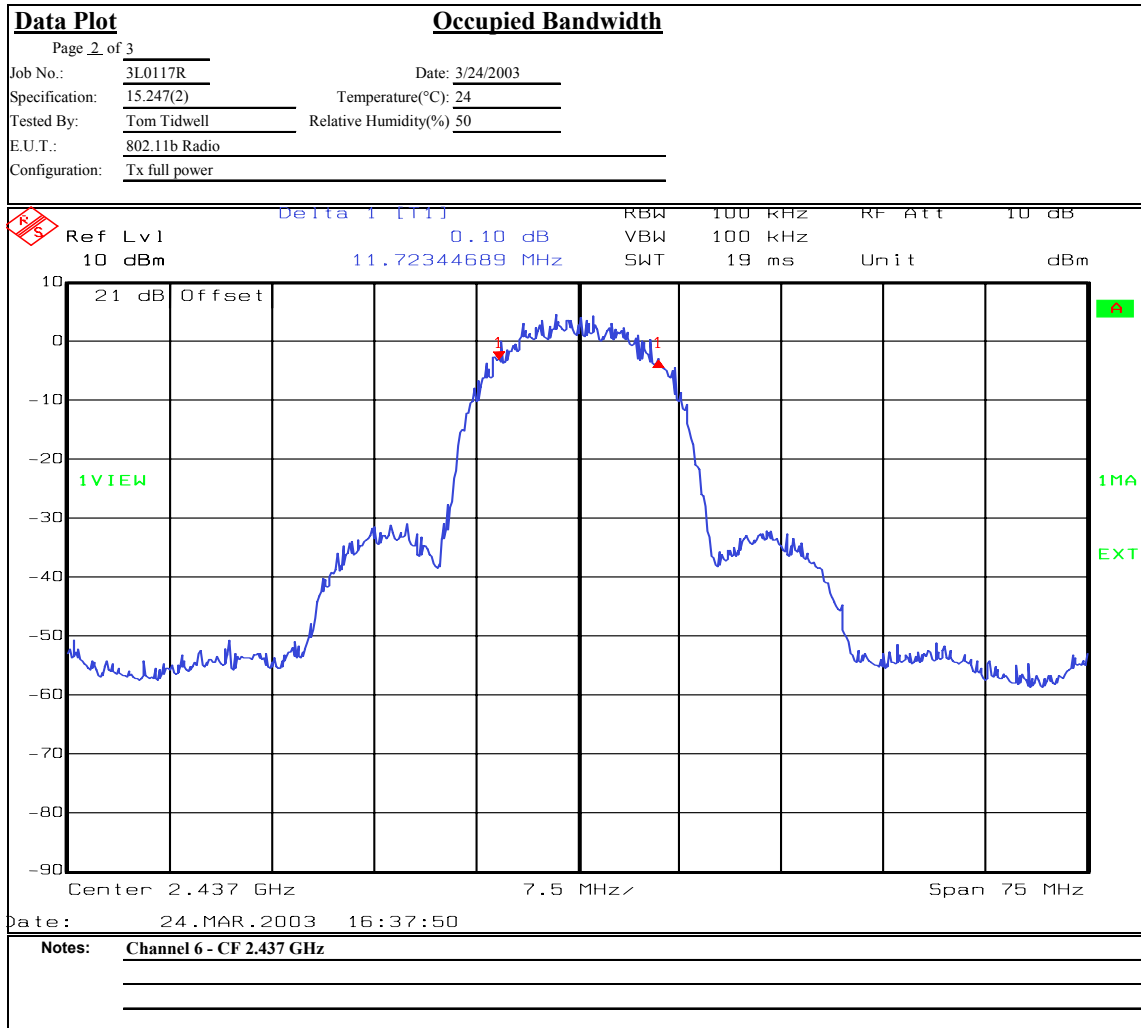
EQUIPMENT: WLAN 6060 BGAEVK

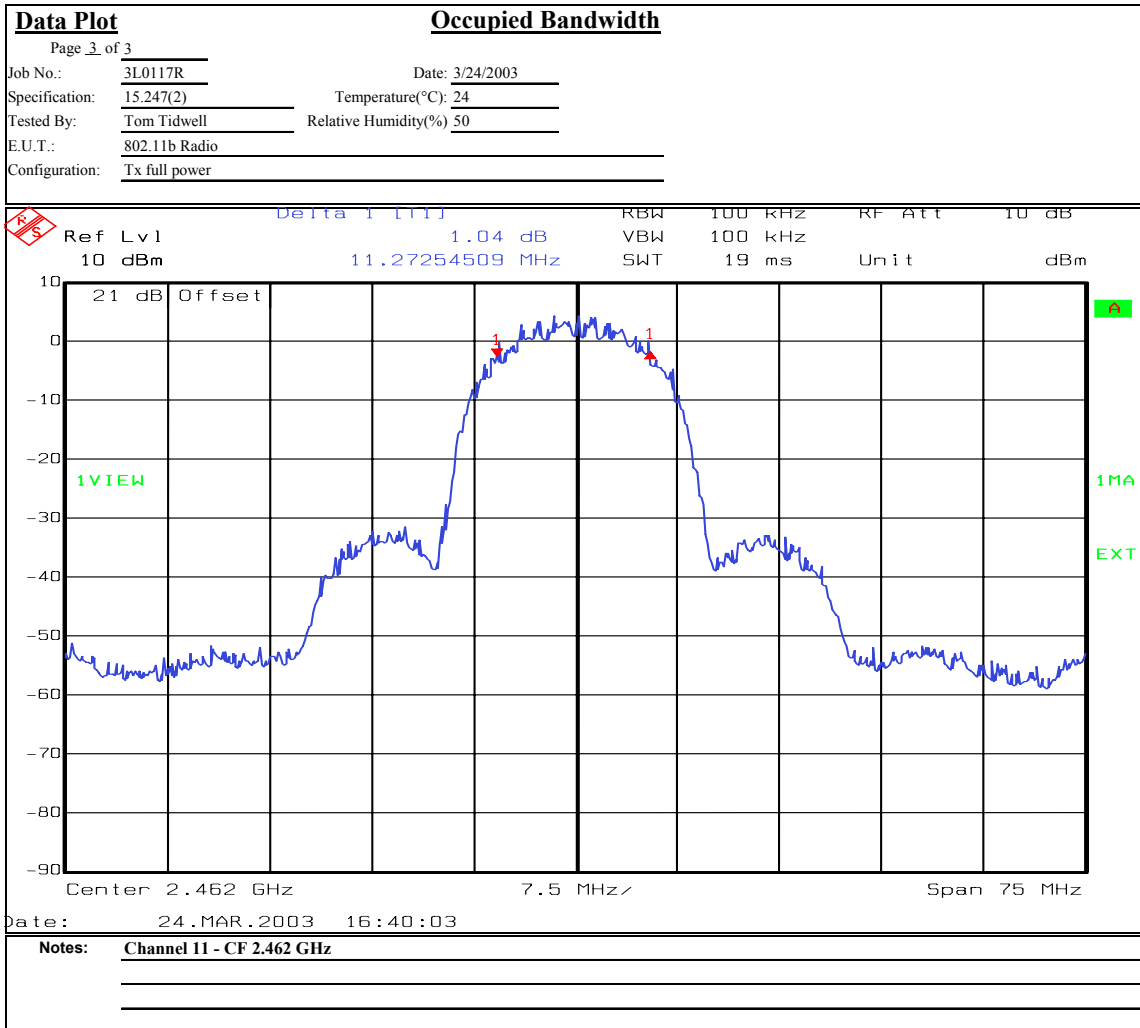
PROJECT NO.: 3L0117RUS1

Data Plot		Occupied Bandwidth																					
Page 1 of 3				Complete <input checked="" type="checkbox"/>																			
Job No.:	3L0117R	Date:	3/24/2003	Preliminary:	<input type="checkbox"/>																		
Specification:	15.247(2)	Temperature(°C):	24																				
Tested By:	Tom Tidwell	Relative Humidity(%)	50																				
E.U.T.:	802.11b Radio																						
Configuration:	Tx full power																						
Sample Number:	1																						
Location:	Lab 1	RBW:	100 kHz	Measurement																			
Detector Type:	Peak	VBW:	100 kHz	Distance:	NA m																		
Test Equipment Used																							
Antenna:		Directional Coupler:																					
Pre-Amp:		Cable #1:	1046																				
Filter:		Cable #2:																					
Receiver:	1036	Cable #3:																					
Attenuator #1:	1477	Cable #4:																					
Attenuator #2:		Mixer:																					
Additional equipment used:																							
Measurement Uncertainty:	+/-1.7 dB																						
<table border="0" style="width: 100%; font-size: small;"> <tr> <td style="text-align: left;">Ref Lvl</td> <td style="text-align: center;">Delta 1 [11]</td> <td style="text-align: right;">RBW</td> <td>100 kHz</td> <td style="text-align: right;">RF Att</td> <td>10 dB</td> </tr> <tr> <td style="text-align: left;">10 dBm</td> <td style="text-align: center;">1.01 dB</td> <td style="text-align: right;">VBW</td> <td>100 kHz</td> <td></td> <td></td> </tr> <tr> <td></td> <td style="text-align: center;">11.27254509 MHz</td> <td style="text-align: right;">SWT</td> <td>19 ms</td> <td style="text-align: right;">Unit</td> <td>dBm</td> </tr> </table>						Ref Lvl	Delta 1 [11]	RBW	100 kHz	RF Att	10 dB	10 dBm	1.01 dB	VBW	100 kHz				11.27254509 MHz	SWT	19 ms	Unit	dBm
Ref Lvl	Delta 1 [11]	RBW	100 kHz	RF Att	10 dB																		
10 dBm	1.01 dB	VBW	100 kHz																				
	11.27254509 MHz	SWT	19 ms	Unit	dBm																		
<table border="0" style="width: 100%; font-size: small;"> <tr> <td style="text-align: left;">Center</td> <td>2.412 GHz</td> <td style="text-align: center;">7.5 MHz</td> <td style="text-align: right;">Span</td> <td>75 MHz</td> </tr> </table>						Center	2.412 GHz	7.5 MHz	Span	75 MHz													
Center	2.412 GHz	7.5 MHz	Span	75 MHz																			
Date: 24.MAR.2003 16:35:14																							
Notes: Channel 1 - CF 2.412 GHz																							

EQUIPMENT: WLAN 6060 BGAEVK

PROJECT NO.: 3L0117RUS1





Section 5. Maximum Peak Output Power

NAME OF TEST: Maximum Peak Output power	PARA. NO.: 15.247(b)(1)
TESTED BY: Tom Tidwell	DATE: 3/24/03

Test Results: Complies.

Measurement Data:

Antennas: 2.45 GHz Chip Antenna

Center Frequency (GHz)	Conducted Power (dBm)	Conducted Power (mW)	Gain (dBi)	E.I.R.P. (dBm)
2.412 (Vnom)	15.6	36.3	3	18.6
2.437 (Vnom)	16.1	40.7	3	19.1
2.462 (Vnom)	16.1	40.7	3	19.1

Equipment Used: 1029-1030

Measurement Uncertainty: +/- 0.7 dB

Temperature: 24 °C

Relative Humidity: 50 %

EQUIPMENT: [WLAN 6060 BGAEVK](#)

PROJECT NO.: [3L0117RUS1](#)

Section 6. RF Exposure

NAME OF TEST: RF Exposure	PARA. NO.: 15.247(b)(4)
PREPARED BY: Tom Tidwell	DATE: 3/24/03

Test Results: Complies.

Measurement Data: See attached data.



Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = \frac{PG}{4\pi R^2}$$

where: S = power density
 P = power input to the antenna
 G = power gain of the antenna in the direction of interest relative to an isotropic radi
 R = distance to the center of radiation of the antenna

Maximum peak output power at antenna input terminal:	<u>16.10</u> (dBm)
Maximum peak output power at antenna input terminal:	<u>40.73802778</u> (mW)
Antenna gain(typical):	<u>3</u> (dBi)
Maximum antenna gain:	<u>1.995262315</u> (numeric)
Prediction distance:	<u>20</u> (cm)
Prediction frequency:	<u>2400</u> (MHz)
MPE limit for uncontrolled exposure at prediction frequency:	<u>1</u> (mW/cm ²)
Power density at prediction frequency:	0.016171 (mW/cm ²)
Margin of compliance:	-17.9 (dB)

Average RF Power Output:

2412 MHz: 13.7 dBm
 2437 MHz: 14.0 dBm
 2462 MHz: 13.8 dBm

Section 7. Spurious Emissions (conducted)

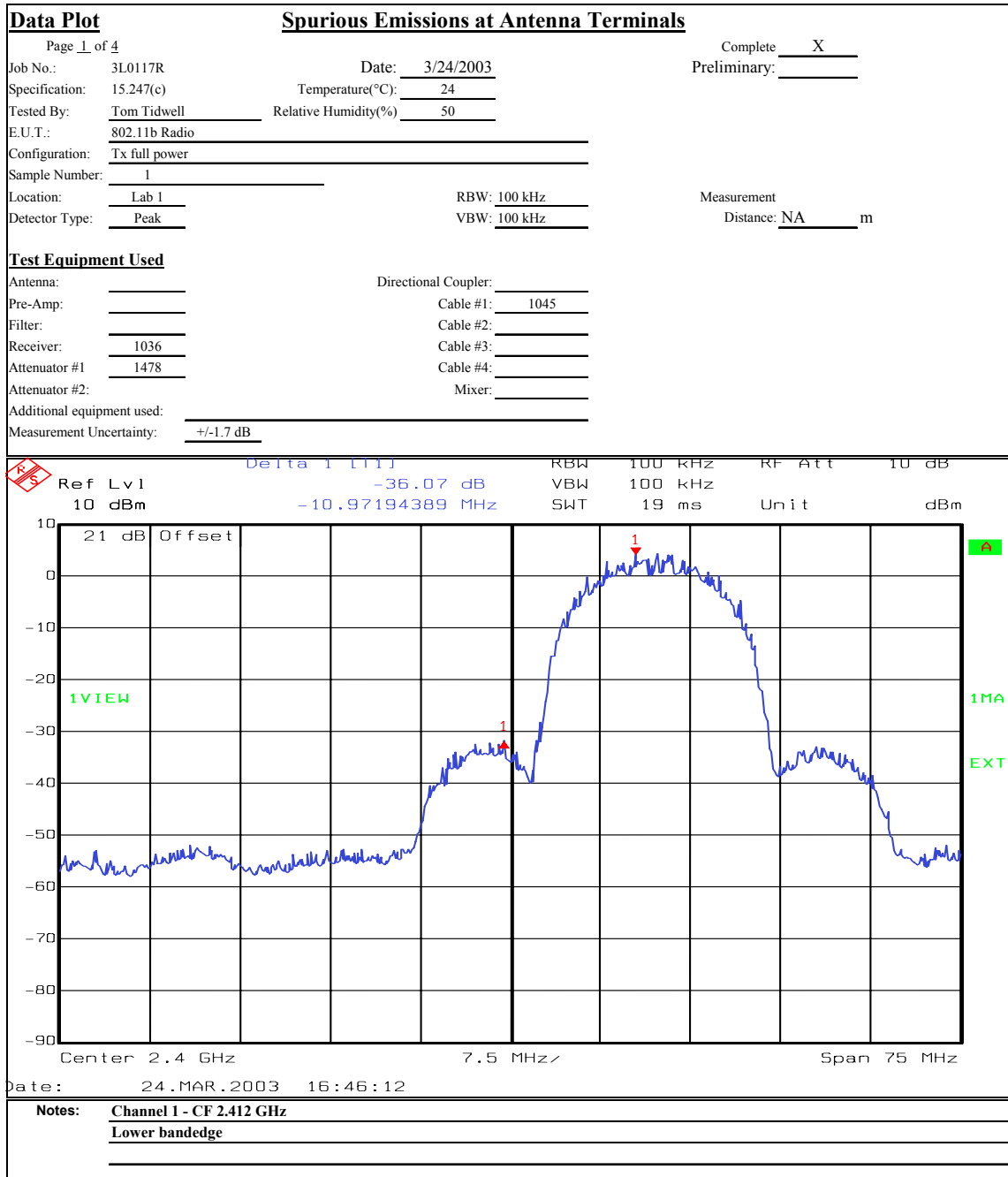
NAME OF TEST: Spurious Emissions (conducted)	PARA. NO.: 15.247(c)
TESTED BY: Tom Tidwell	DATE: 3/24/03

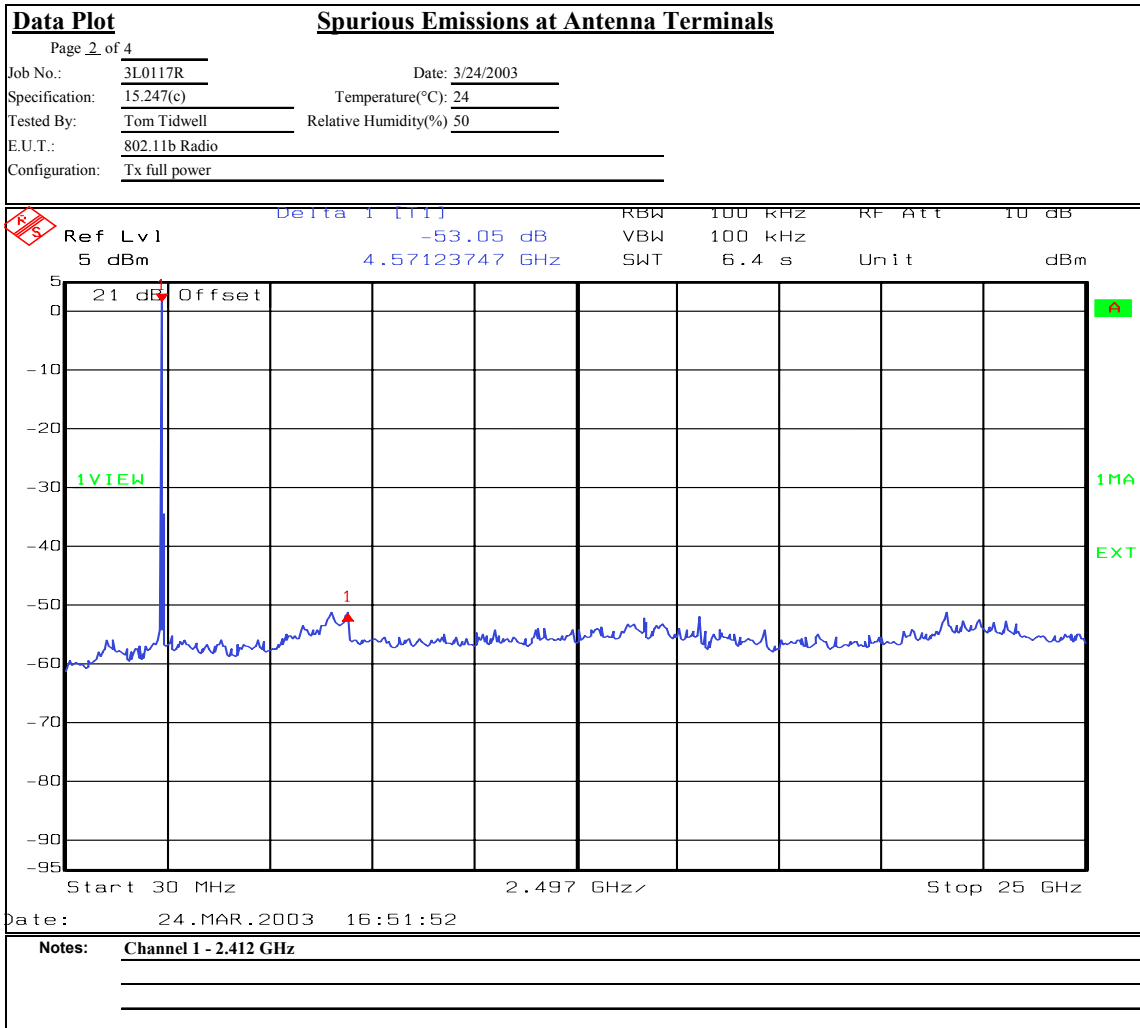
Test Results: Complies.

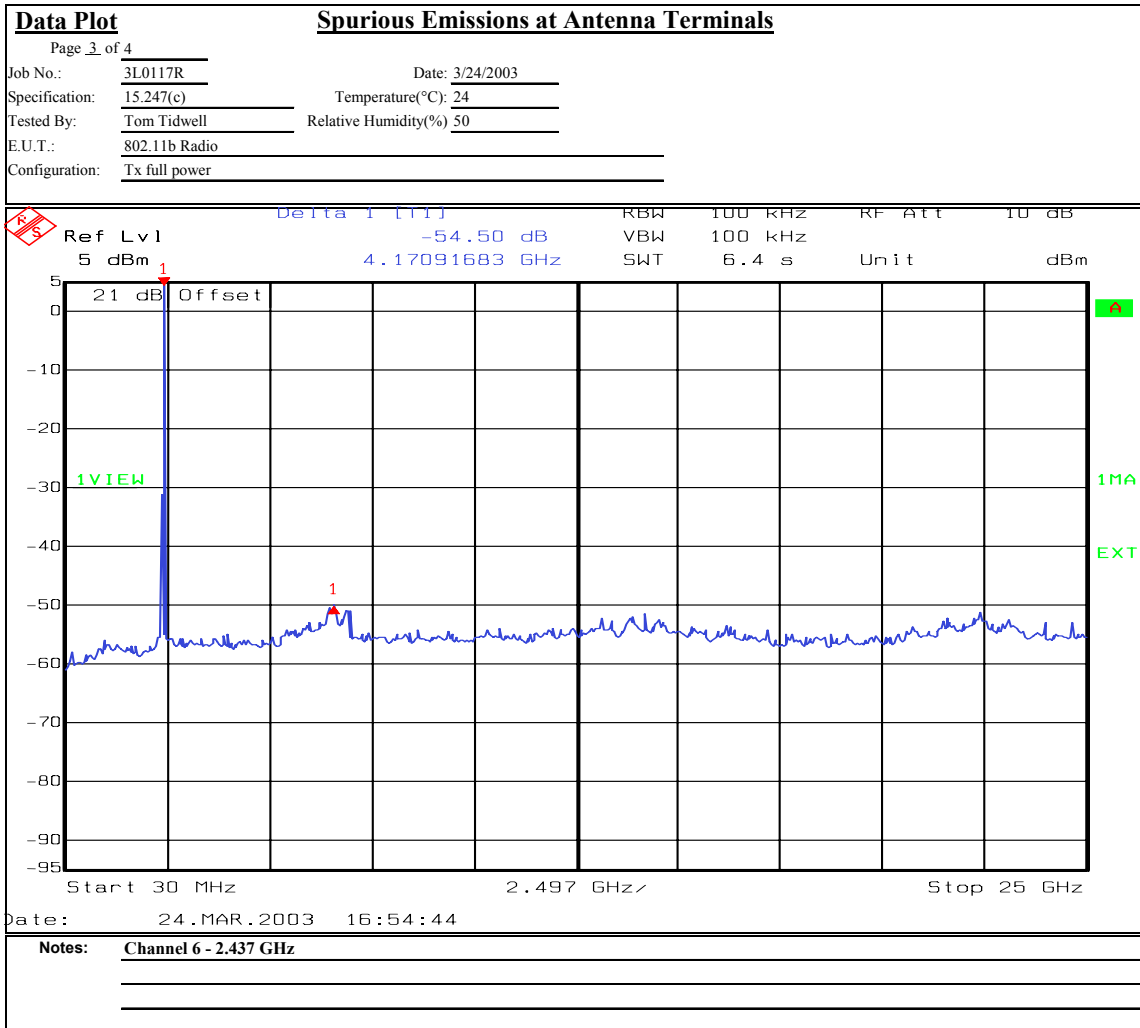
Measurement Data: See attached plots.

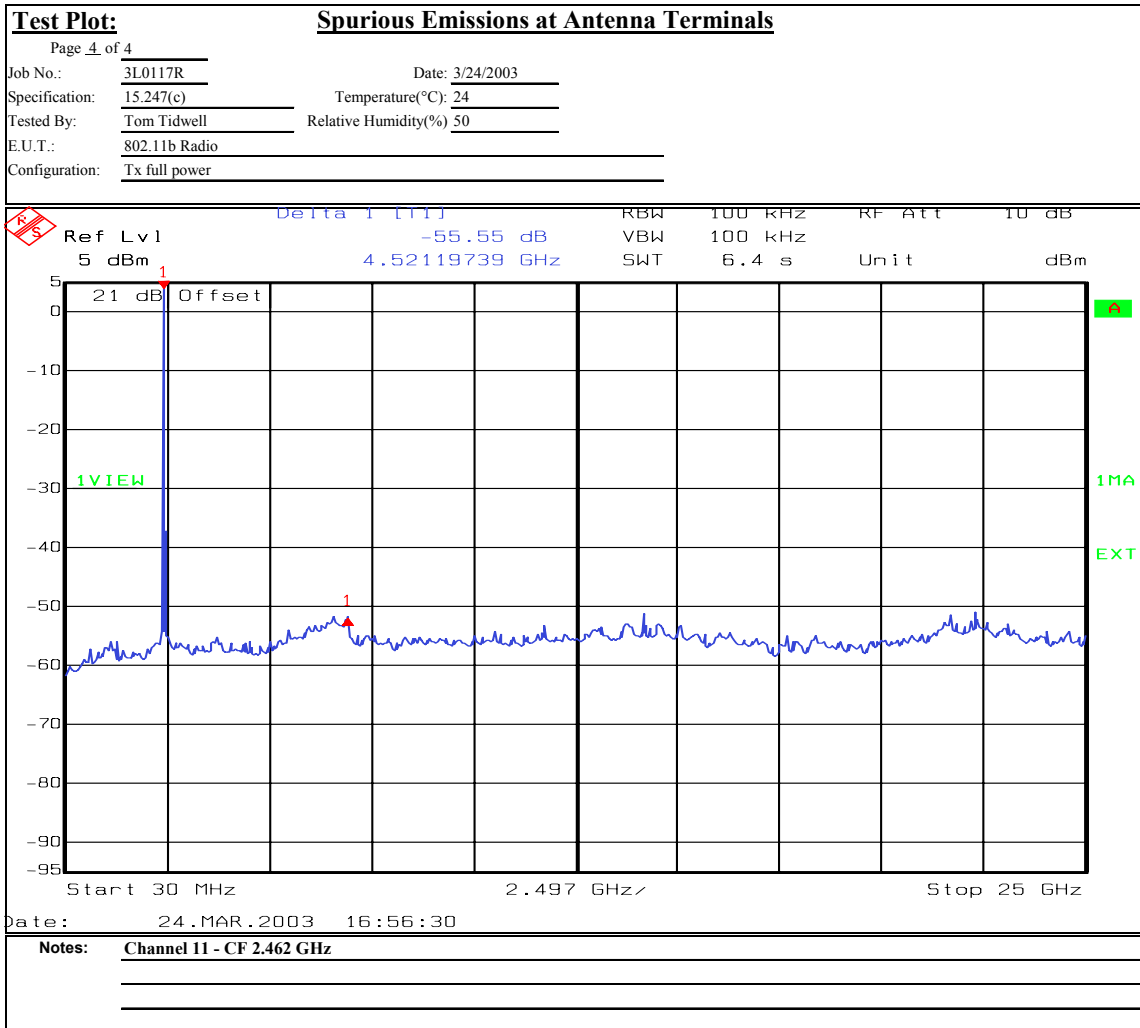
EQUIPMENT: WLAN 6060 BGAEVK

PROJECT NO.: 3L0117RUS1









Section 8. Spurious Emissions (radiated)

NAME OF TEST: Radiated Spurious Emissions	PARA. NO.: 15.247 (c)
TESTED BY:	DATE: 3/25/03

Test Results: Complies.

Measurement Data: See attached table.

Note: The frequency spectrum was searched from the lowest frequency in the device up to the 10th harmonic of the fundamental transmission.

EQUIPMENT: WLAN 6060 BGAEVK

PROJECT NO.: 3L0117RUS1

Radiated Emissions								
Page 1 of 2								
Job No.:	3L0117R			Date:		3/25/2003		
Specification:	15.247			Temperature(°C):		22		
Tested By:	Art Ruvalcaba			Relative Humidity(%)		55		
E.U.T.:	802.11b Radio							
Configuration:	Tabletop in laptop host							
Sample Number:	1							
Location:	AC 3			RBW:		1 MHz		
Detector Type:	Peak			VBW:		1 MHz		
Test Equipment Used								
Antenna:	993			Directional Coupler:				
Pre-Amp:	1016			Cable #1:		1484		
Filter:	1482			Cable #2:		1485		
Receiver:	1464			Cable #3:				
Attenuator #1				Cable #4:				
Attenuator #2:				Mixer:				
Note:	If PEAK measurement met the AVERAGE limit, then an AVERAGE measurement was not made.							
Measurement Uncertainty:	+/-3.7 dB							
Frequency (GHz)	Meter Reading (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Pre-Amp Gain (dB)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Delta (dB)	Comment
								Channel 11 - CF 2.437
2.4835	34.2	29.0	3.1	0.0	66.3	74	-7.7	H - PEAK
2.4835	20.3	29.0	3.1	0.0	52.4	54	-1.6	H - AVERAGE
4.9240	42.3	33.5	4.3	29.7	50.4	54	-3.6	H - PEAK
7.3860	41.5	35.9	5.2	34.1	48.5	54	-5.5	H - PEAK
12.3100	41.7	40.0	7.3	32.8	56.2	74	-17.8	H - PEAK
12.3100	30.3	40.0	7.3	32.8	44.8	54	-9.2	H - AVERAGE
2.4835	33.0	29.0	3.1	0.0	65.1	74	-8.9	V - PEAK
2.4835	20.5	29.0	3.1	0.0	52.6	54	-1.4	V - AVERAGE
4.9240	45.8	33.5	4.3	29.7	53.9	74	-20.1	V - PEAK
4.9240	32.2	33.5	4.3	29.7	40.3	54	-13.7	V - AVERAGE
7.3860	41.7	35.9	5.2	34.1	48.7	54	-5.3	V - PEAK
12.3100	42.8	40.0	7.3	32.8	57.3	74	-16.7	V - PEAK
12.3100	30.3	40.0	7.3	32.8	44.8	54	-9.2	V - AVERAGE
Notes: Peak measurements are 1 MHz RBW/1 MHz VBW								
Average measurements 1 MHz RBW/10 Hz VBW								

EQUIPMENT: WLAN 6060 BGAEVK

PROJECT NO.: 3L0117RUS1

Radiated Spurious Emissions								
Page <u>2</u> of <u>2</u>		Continuation Page						
Job No.:	3L0117R			Date:		4/3/2003		
Specification:	CFR 47, Part 15			Temperature(°F):		72		
Tested By:	Art Ruvalcaba			Relative Humidity(%)		50		
E.U.T.:	802.11b Radio							
Configuration:	Tabletop in laptop host							
Frequency (GHz)	Meter Reading (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Pre-Amp Gain (dB)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Delta (dB)	Comment
								Channel 1
4.824	47.2	33.2	4.2	30.1	54.5	74	-19.5	V - PEAK
4.824	38.7	33.2	4.2	30.1	46.0	54	-8.0	V - AVERAGE
7.236	46.7	35.8	5.1	34	53.6	74	-20.4	V - PEAK
7.236	33.5	35.8	5.1	34	40.4	54	-13.6	V - AVERAGE
12.06	45.5	39.7	7.3	33.4	59.1	74	-14.9	V - PEAK
4.824	44.5	33.2	4.2	30.1	51.8	54	-2.2	H - PEAK
7.236	45.0	35.8	5.1	34	51.9	54	-2.1	H - PEAK
12.06	45.0	39.7	7.3	33.4	58.6	74	-15.4	H - PEAK
								Channel 6
4.874	43.8	33.2	4.2	30.1	51.1	54	-2.9	H - PEAK
7.311	44.3	35.8	5.1	34	51.2	54	-2.8	H - PEAK
12.185	45.8	39.7	7.3	33.4	59.4	74	-14.6	H - PEAK
12.185	33.7	39.7	7.3	33.4	47.3	54	-6.7	H - AVERAGE
4.874	46.8	33.2	4.2	30.1	54.1	74	-19.9	V - PEAK
4.874	41.0	33.2	4.2	30.1	48.3	54	-5.7	V - AVERAGE
7.311	45.2	35.8	5.1	34	52.1	54	-1.9	V - PEAK
12.185	45.5	39.7	7.3	33.4	59.1	74	-14.9	V - PEAK
12.185	33.5	39.7	7.3	33.4	47.1	54	-6.9	V - AVERAGE
Notes:	Searched spectrum from lowest frequency in device to the 10th harmonic of carrier frequency.							
	All emissions within 20 dB of the spec limit were reported							

Radiated Photographs (Worst Case Configuration)



Section 9. Peak Power Spectral Density

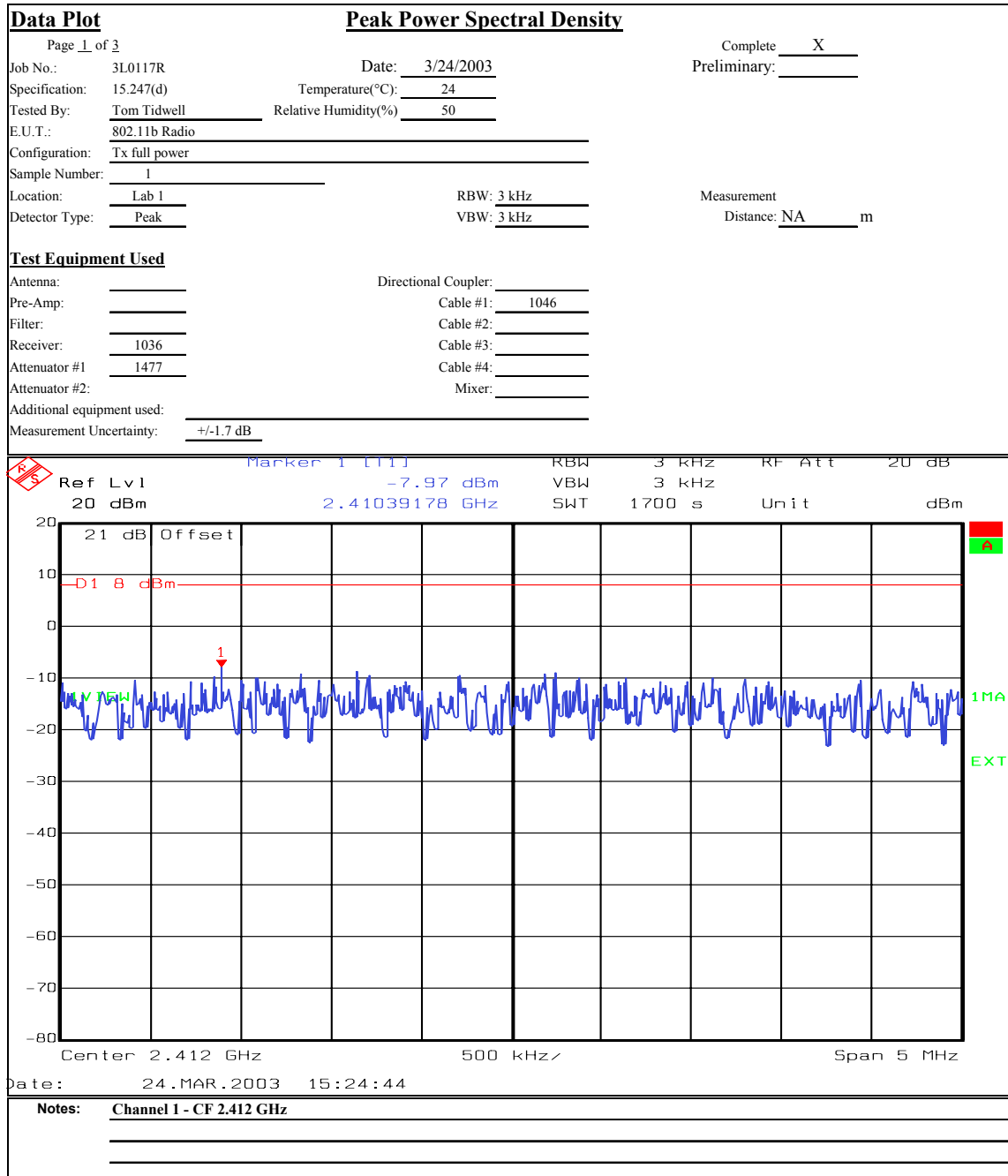
NAME OF TEST: Peak Power Spectral Density	PARA. NO.: 15.247(d)
TESTED BY: Tom Tidwell	DATE: 3/24/03

Test Results: Complies.

Measurement Data: See attached plots.

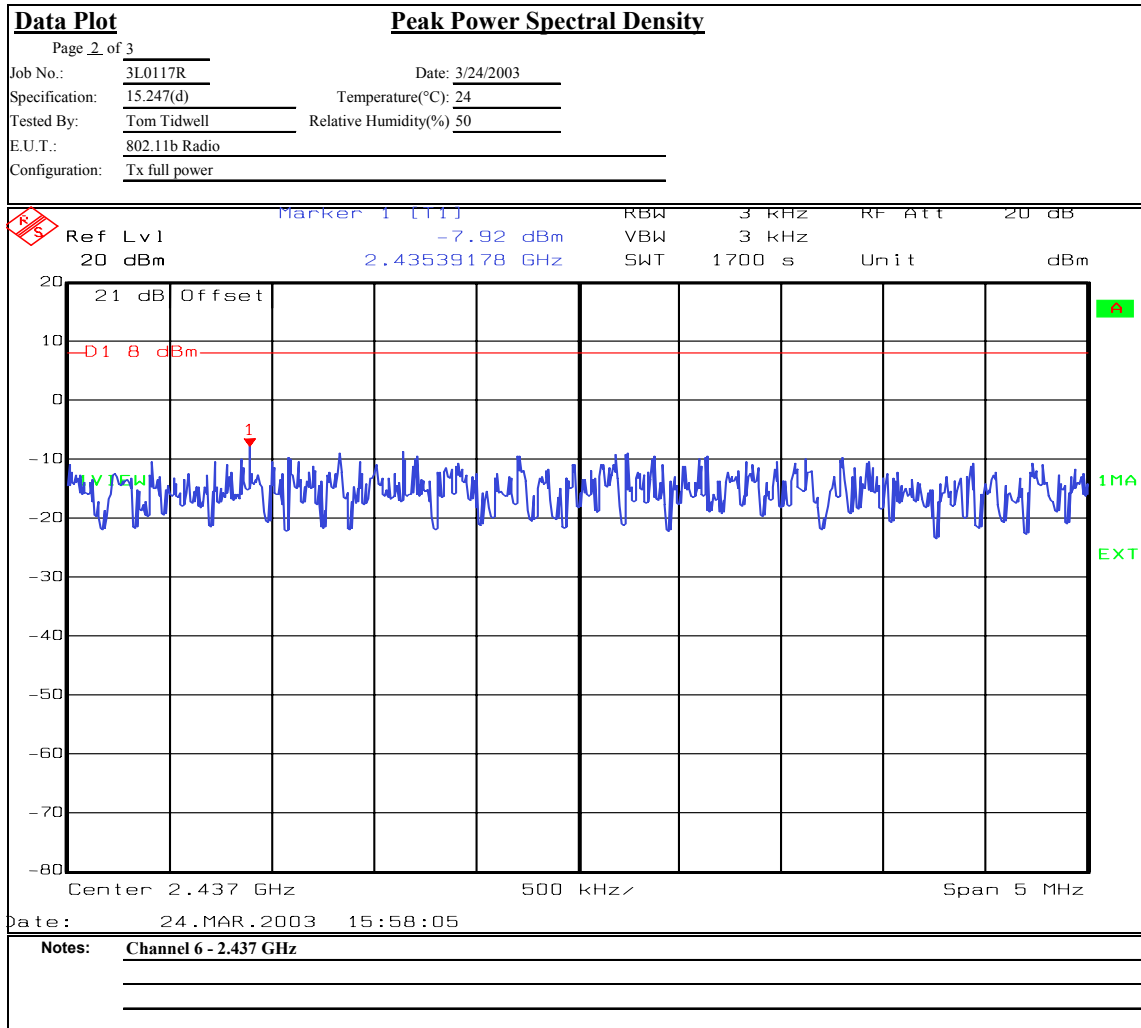
EQUIPMENT: WLAN 6060 BGAEVK

PROJECT NO.: 3L0117RUS1



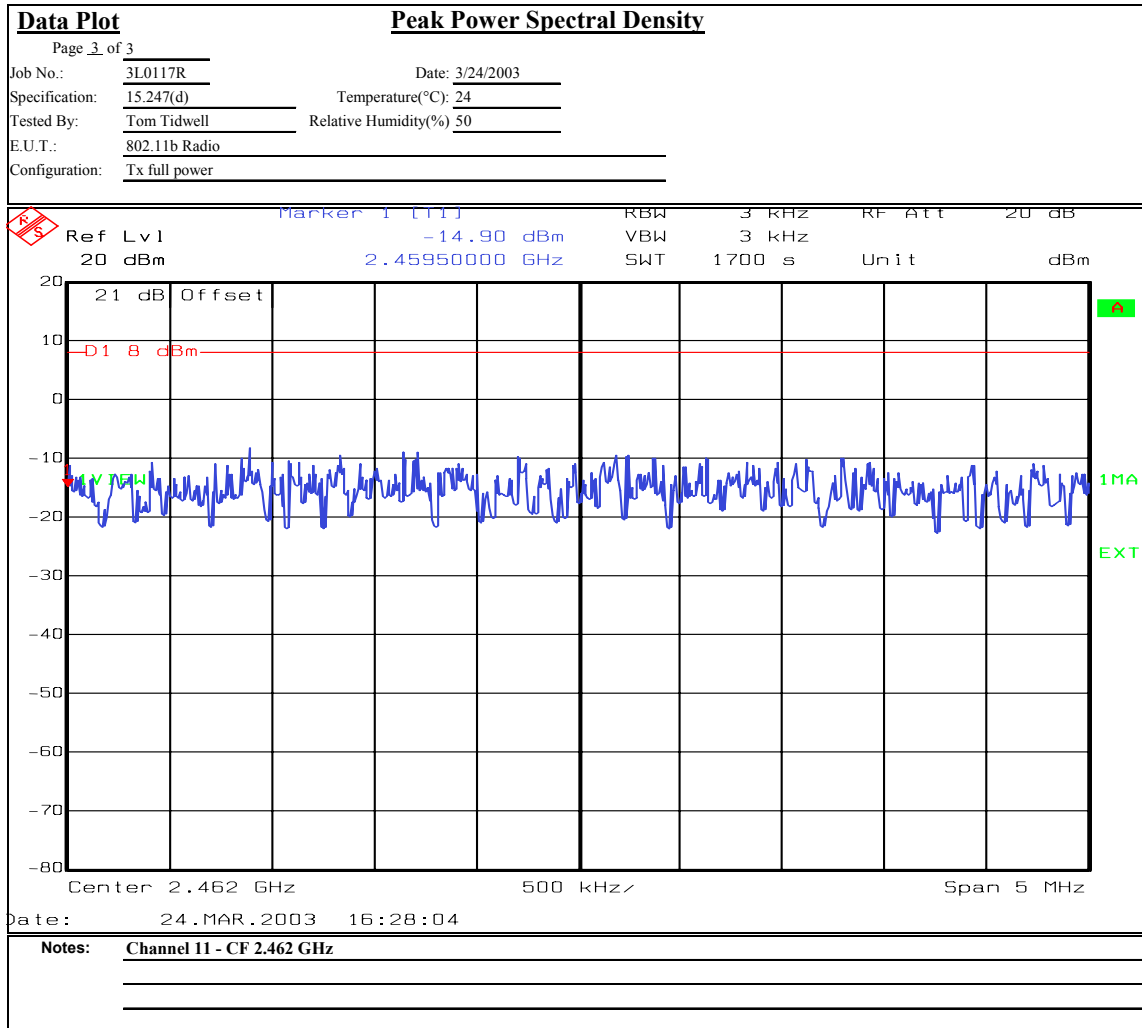
EQUIPMENT: WLAN 6060 BGAEVK

PROJECT NO.: 3L0117RUS1



EQUIPMENT: WLAN 6060 BGAEVK

PROJECT NO.: 3L0117RUS1



EQUIPMENT: [WLAN 6060 BGAEVK](#)PROJECT NO.: [3L0117RUS1](#)**Section 10. Test Equipment List**

Nemko ID	Description	Manufacturer Model Number	Serial Number	Calibration Date	Calibration Due
1464	Spectrum analyzer	Hewlett Packard 8563E	3551A04428	02/11/03	02/11/05
1016	Pre-Amp	HEWLETT PACKARD 8449A	2749A00159	07/15/02	07/15/03
1482	Band Pass Filter	K & L 11SH10-4000/T12000-0/0	2	Cal B4 Use	N/A
1484	Cable 2.0-18.0 GHz	Storm PR90-010-072	N/A	07/15/02	07/15/03
1485	Cable 2.0-18.0 GHz	Storm PR90-010-216	N/A	07/15/02	07/15/03
993	Horn Antenna	A.H. Systems SAS-200/571	XXX	01/08/02	01/09/04
1547	CABLE .6m	KTL RG223	N/A	08/06/02	08/06/03
1030	PEAK POWER SENSOR	HP 84811A	2539A03573	08/13/02	08/13/03
1029	PEAK POWER METER	HP 8900D	3303U0012	08/13/02	08/13/03
1045	CABLE 2m	Astrolab Inc. 32027-2-29094-72TC	N/A	CBU	N/A
1988	CABLE, 6.8m	KTL RG223	N/A	10/01/02	10/01/03
1478	20db Attenuator DC 18 GHz	MCL Inc. BW-S20W6	NONE	CBU	N/A
1036	SPECTRUM ANALYZER	ROHDE & SCHWARZ FSEK30	830844/006	12/18/01	12/19/03
1555	Filter high pass 5 kHz	Solar Electronics 7930-5.0	933125	06/06/02	06/06/03
1258	LISN .15MHz-30MHz	EMCO 0	1305	07/09/02	07/09/03

ANNEX A - TEST DETAILS

EQUIPMENT: WLAN 6060 BGAEVK

PROJECT NO.: 3L0117RUS1

NAME OF TEST: Powerline Conducted Emissions

PARA. NO.: 15.207(a)

Minimum Standard: The R.F. that is conducted back onto the AC power line on any frequency within the band 0.45 to 30 MHz shall not exceed 250 μ V (48 dB μ V) across 50 ohms.

EQUIPMENT: [WLAN 6060 BGAEVK](#)

PROJECT NO.: [3L0117RUS1](#)

NAME OF TEST: Minimum 6 dB bandwidth

PARA. NO.: 15.247(a)(2)

Minimum Standard:
kHz.

The minimum 6 dB bandwidth shall be at least 500

NAME OF TEST: Maximum Peak Output Power

PARA. NO.: 15.247(b)(1)

Minimum Standard: The maximum peak output power shall not exceed 1 watt.

If transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Systems operating in the 2400-2483.5 MHz band that are used exclusively for fixed, point to point operation may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum peak output power is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceed 6 dBi.

Systems operating in the 5725 – 5850 MHz band that are used exclusively for fixed, point-to-point operation may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter peak output power.

Direct Measurement Method For Detachable Antennas:

If the antenna is detachable, a peak power meter is used to measure the power output with the transmitter operating into a 50 ohm load. The dBi gain of the antenna(s) employed shall be reported.

Calculation Of EIRP For Integral Antenna:

If the antenna is not detachable from the circuit then the Peak Power Output is derived from the peak radiated field strength of the fundamental emission by using the plane wave relation $GP/4\pi R^2 = E^2/120\pi$ and proceeding as follows:

$$P = \frac{E^2 R^2}{30G} = \frac{E^2 3^2}{30G}$$

where,

P = the equivalent isotropic radiated power in watts

E = the maximum measured field strength in V/m

R = the measurement range (3 meters)

G = the numeric gain of the transmit antenna in relation to an isotropic radiator

The RBW of the spectrum analyzer shall be set to a value greater than the measured 6 dB occupied bandwidth of the E.U.T.

Number of channels tested:

Tuning range	Number of channels tested	Channel location in band
1 MHz or less	1	middle
1 to 10 MHz	2	top and bottom
more than 10 MHz	3	top, middle, bottom

EQUIPMENT: [WLAN 6060 BGAEVK](#)

PROJECT NO.: [3L0117RUS1](#)

NAME OF TEST: RF Exposure	PARA. NO.: 15.247(b)(4)
---------------------------	-------------------------

Minimum Standard:

Systems operating under the provisions of this section shall be operated in a manner that ensures the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines stipulated in 1.1307(b)(1) of CFR 47.

NAME OF TEST: Spurious Emissions(conducted)	PARA. NO.: 15.247(c)
---	----------------------

Minimum Standard: In any 100kHz bandwidth outside the frequency band in which the transmitter is operating, emissions shall be at least 20 dB below the fundamental emission or shall not exceed the following field strength limits. Emissions falling in the restricted bands of 15.205 shall not exceed the following field strength limits:

Frequency (MHz)	Field Strength (µV/m @ 3m)	Field Strength (dB @ 3m)
30 - 88	100	40.0
88 - 216	150	43.5
216 - 960	200	46.0
Above 960	500	54.0

THE SPECTRUM IS SEARCHED TO THE 10th HARMONIC OF THE HIGHEST FREQUENCY GENERATED IN THE EUT.

Method Of Measurement:

30 MHz - 10th harmonic plot

RBW: 100 kHz

VBW: 300 kHz

Sweep: Auto

Display line: -20 dBc

Lower Band Edge

RBW: At least 1% of span/div.

VBW: >RBW

Span: As necessary to display any spurious at band edge.

Sweep: Auto

Center Frequency: 902 MHz, 2400 MHz, or 5725 MHz

Marker: Peak of fundamental emission

Marker Δ: Peak of highest spurious level below center frequency.

Upper Band Edge

RBW: At least 1% of span/div.

VBW: >RBW

Span: As necessary to display any spurious at band edge.

Sweep: Auto

Center Frequency: 928 MHz, 2483.5 MHz, or 5850 MHz

Marker: Peak of fundamental emission

Marker Δ: Peak of highest spurious level above center frequency.

Number of channels tested:

Tuning range	Number of channels tested	Channel location in band
1 MHz or less	1	middle
1 to 10 MHz	2	top and bottom
more than 10 MHz	3	top, middle, bottom

EQUIPMENT: WLAN 6060 BGAEVK

PROJECT NO.: 3L0117RUS1

NAME OF TEST: Radiated Spurious Emissions	PARA. NO.: 15.247(c)
---	----------------------

Minimum Standard: In any 100kHz bandwidth outside the frequency band in which the transmitter is operating, emissions shall be at least 20 dB below the fundamental emission or shall not exceed the following field strength limits:

Emissions falling in the restricted bands of 15.205 shall not exceed the following field strength limits:

Frequency (MHz)	Field Strength (µV/m @ 3m)	Field Strength (dB @ 3m)
30 - 88	100	40.0
88 - 216	150	43.5
216 - 960	200	46.0
Above 960	500	54.0

THE SPECTRUM WAS SEARCHED TO THE 10th HARMONIC

15.205 Restricted Bands

MHz	MHz	MHz	GHz
0.09-0.11	16.42-16.423	399.9-410	4.5-5.25
0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.125-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2655-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	Above 38.6
13.36-13.41	1718		

Number of channels tested:

Tuning range	Number of channels tested	Channel location in band
1 MHz or less	1	middle
1 to 10 MHz	2	top and bottom
more than 10 MHz	3	top, middle, bottom

NAME OF TEST: Transmitter Power Density	PARA. NO.: 15.247(d)
---	----------------------

Minimum Standard: The transmitted power density averaged over any 1 second interval shall not be greater than +8 dBm in any 3 kHz bandwidth.

Method Of Measurement: The spectrum analyzer is set as follows:

- RBW: 3 kHz
- VBW: >3 kHz
- Span: => measured 6 dB bandwidth
- Sweep: Span(kHz)/3 (i.e. for a span of 1.5 MHz the sweep rate is 1500/3 = 500 sec.
- LOG dB/div.: 2 dB

Note: For devices with spectrum line spacing =< 3 kHz, the RBW of the analyzer is reduced until the spectral lines are resolved. The measurement data is normalized to 3 kHz by summing the power of all the individual spectral lines within a 3 kHz band in linear power units.

For Devices With Integral Antenna:

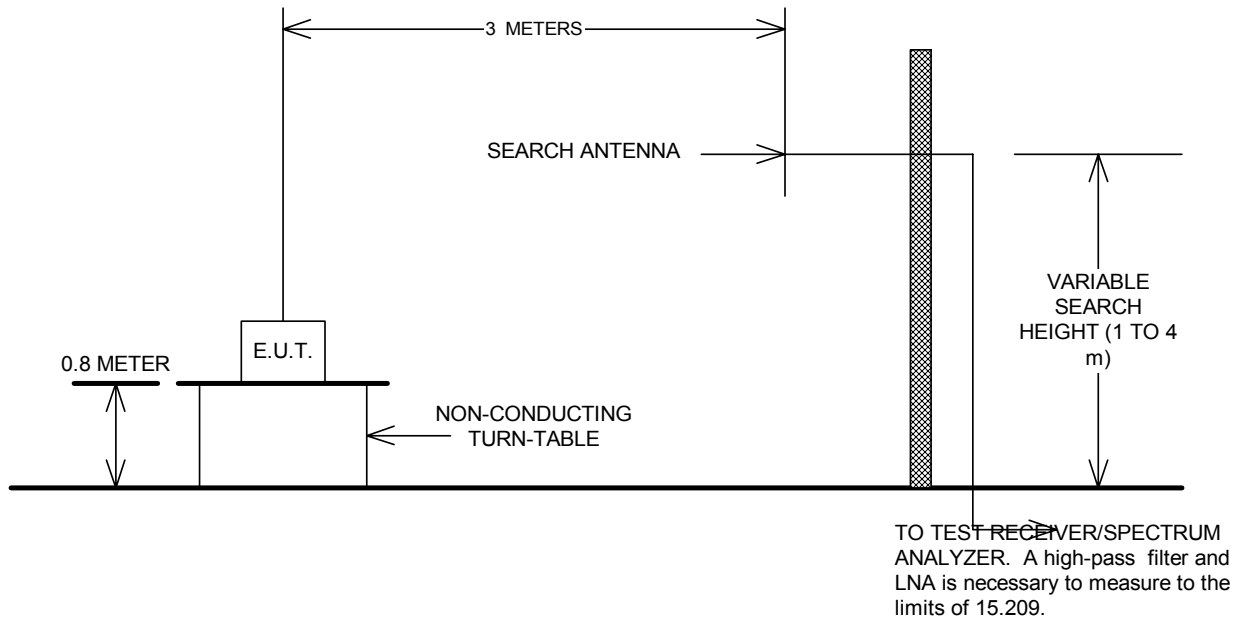
For devices with non-detachable antennas, the received field strength is peaked and the spectrum analyzer is set as above. The peak emission level is then measured and converted to a field strength by adding the appropriate antenna factor and cable loss. This field strength is then converted to an equivalent isotropic radiated power using the same method as described for Peak Power output.

Number of channels tested:

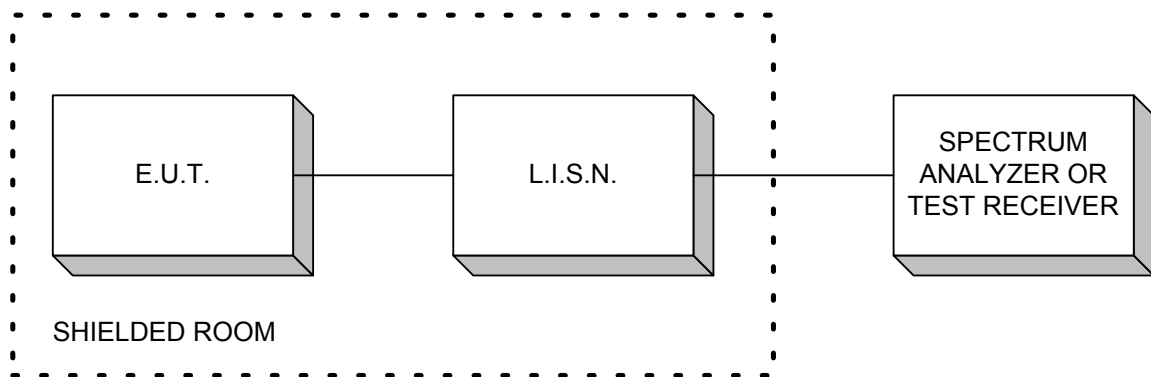
Tuning Range	Number Of Channels Tested	Channel Location In Band
1 MHz or Less	1	Middle
1 to 10 MHz	2	Top And Bottom
More Than 10 MHz	3	Top, Middle, Bottom

ANNEX B - TEST DIAGRAMS

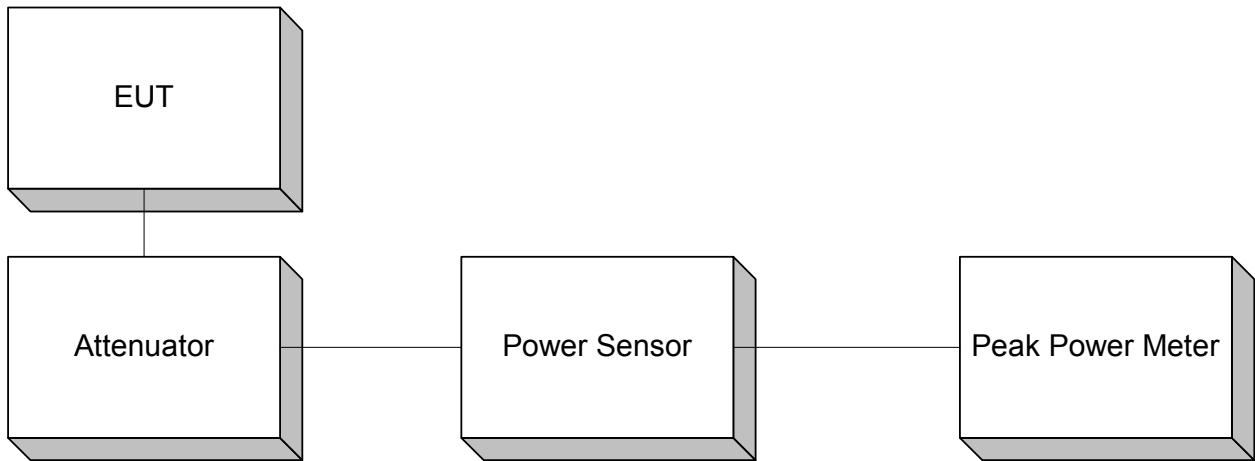
Test Site For Radiated Emissions



Conducted Emissions



Peak Power At Antenna Terminals



**Minimum 6 dB Bandwidth
Peak Power Spectral Density
Spurious Emissions (conducted)**

