

Nemko Test Report: 4L0041RUS1

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

**Equipment Under Test:
(E.U.T.)** WLAN6090SD

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:



Tom Tidwell, Frontline Manager

Date: 4/27/04

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Section 1. Summary of Test Results

Manufacturer: Sychip, Inc.

Model No.: WLAN6090SD

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.



New Submission



Production Unit



Class II Permissive Change



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. NONE
See "Summary of Test Data".

**NVLAP LAB CODE: 100426-0**

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Summary Of Test Data

NAME OF TEST	PARA. NO.	SPEC.	RESULT
Powerline Conducted Emissions	15.207(a)	48 dB μ V	Complies
Minimum 6 dB Bandwidth	15.247(a)(2)	>500 kHz	Complies
Maximum Peak Power Output	15.247(b)(1)	<1 Watt	Complies
Spurious Emissions (Antenna Conducted)	15.247(c)	-20 dBc/100kHz	Complies
Spurious Emissions (Restricted Bands)	15.247(c)	< 74 dBuV/m Peak < 54 dBuV/m Avg	Complies
Peak Power Spectral Density	15.247(d)	+8 dBm/3kHz	Complies

Footnotes:

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

General Equipment Information

Frequency Band:

- ☐ 902 – 928 MHz
☒ 2400 – 2483.5 MHz
☐ 5725 – 5850 MHz

Channel Spacing:

5 MHz

User Frequency Adjustment:

Software controlled

Description of EUT

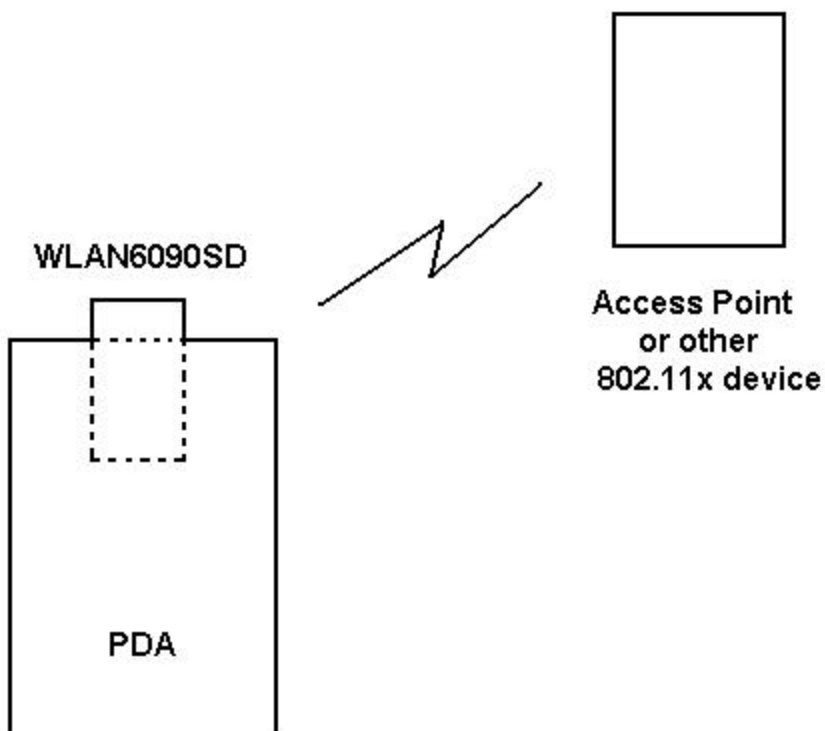
The WLAN6090SD is an SDIO card with an 802.11b radio integrated for wireless LAN communication. It is designed for use in PDA type devices. The radio has an integral antenna.

All testing was performed at 11 Mbps as this was found to be the worst-case emission configuration. Emission levels were checked at 1 Mbps, 2 Mbps, and 5.5 Mbps as well and found to be the same or less than emission levels in 11 Mbps mode. A software test mode was used to operate the equipment in the required channels and at the required power levels.

EMC testing was performed with the device installed in a PDA (Compaq iPAQ 3955, s/n. 4G29KUL190MX)

Testing was performed with fully charged batteries in the host device.

System Diagram



Nemko Dallas

FCC PART 15, SUBPART C
DIRECT SEQUENCE SPREAD SPECTRUM TRANSMITTER

EQUIPMENT: [WLAN6090SD](#)

REPORT NO.: [4L0041RUS1](#)

Section 3. Powerline Conducted Emissions

NAME OF TEST: Powerline Conducted Emissions	PARA. NO.: 15.207(a)
TESTED BY: Arturo Ruvalcaba	DATE: 2/12/04

Test Results: Complies.

Measurement Data: See attached plots.

Measurement Uncertainty: +/- 1.7 dB

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Complete	<u>X</u>	Job # : <u>4L0041E</u>	Test # : <u>CEPV-01</u>
Preliminary	<u> </u>	Page <u>1</u>	of <u>1</u>
Client Name :	<u>SyChip, Inc.</u>		
EUT Name :	<u>SDIO 802.11b Radio</u>		
EUT Model # :	<u>WLAN6090SD</u>		
EUT Part # :	<u>N/A</u>		
EUT Serial # :	<u>N/A</u>		
EUT Config. :	<u>Installed in PDA</u>		
	<u>Tx Full Power</u>		
Specification :	<u>CFR 47 Part 15 Subpart C, 15.207</u>		Reference : <u>15.247</u>
Transducer # :	<u>1258</u>	Temp. (deg. C) : <u>21</u>	Date : <u>02/12/04</u>
HP Filter # :	<u>1433</u>	Humidity (%) : <u>38</u>	Time : <u>13:10</u>
Cable 1 # :	<u>1988</u>	EUT Voltage : <u>115VAC</u>	Staff : <u>Art Ruvalcaba</u>
Cable 2 # :	<u>1998</u>	EUT Frequency : <u>60Hz</u>	Location : <u>Lab 2</u>
Detector 1 # :	<u>785</u>	Peak Bandwidth: <u>10kHz</u>	Photo ID: <u>4L0041E CEPV-01</u>
Detector 2 # :	<u>NA</u>	QP Bandwidth <u>10kHz</u>	
Limiter # :	<u>NA</u>	Avg. Bandwidth <u>10kHz</u>	

[illegible]

..\EMCShare\AUTOMATE\DATASHTS\CEP Voltage Rev C.xls Document Control #EMC DS EM COND VOLT

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: David Light

DATE: 2/19/04

Test Results: Complies.**Measurement Data:** See 6 dB BW plot

Measured 6 dB bandwidth:	10.17 MHz
Channel Separation:	5 MHz

Equipment Used: 1464-1463-1621**Measurement Uncertainty:** $\pm 1 \times 10^{-7}$ ppm**Temperature:** 22 °C**Relative Humidity:** 40 %

EQUIPMENT: **WLAN6090SD**REPORT NO.: **4L0041RUS1**

Test Data – Occupied Bandwidth



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Data Plot

Page 1 of 6

Job No.: 4L0041R

Date: 2/19/2004

Specification: 15.247

Temperature(°C): 22

Tested By: David Light

Relative Humidity(%) 40

E.U.T.: WLAN6090SD

Configuration: TX FULL POWER

Sample Number: 1

Location: Lab 2

RBW: Refer to plots

Measurement

Detector Type: Peak

VBW: Refer to plots

Distance: NA m

Test Equipment Used

Antenna: _____

Directional Coupler: _____

Pre-Amp: _____

Cable #1: 1621

Filter: _____

Cable #2: _____

Receiver: 1464

Cable #3: _____

Attenuator #1: 1469

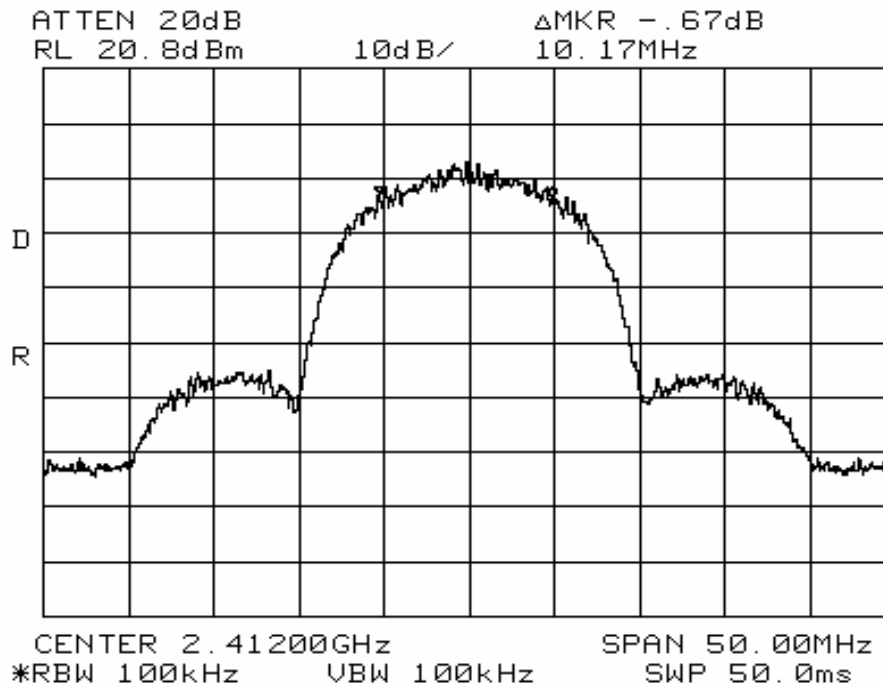
Cable #4: _____

Attenuator #2: _____

Mixer: _____

Additional equipment used: _____

Measurement Uncertainty: +/-1.7 dB



Notes: 6 dB BW Channel 1

EQUIPMENT: WLAN6090SD

REPORT NO.: 4L0041RUS1

Test Data – Occupied Bandwidth



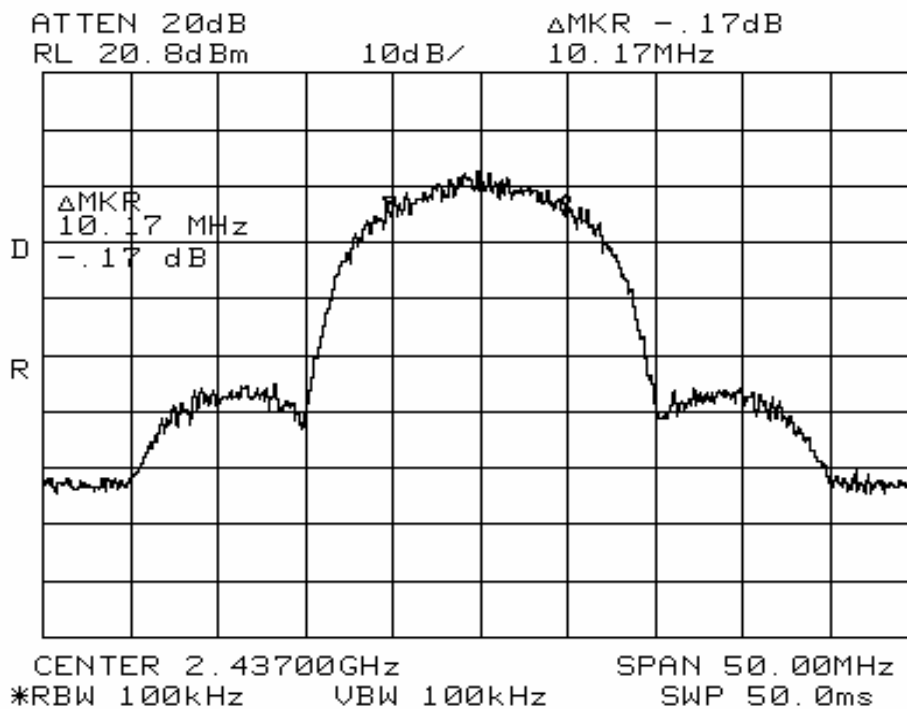
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Page 2 of 6

Job No.: 4L0041R Date: 2/19/2004
Specification: 15.2 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 40
E.U.T.: WLAN6090SD
Configuration: TX FULL POWER



Notes: 6 dB BW - Channel 6

EQUIPMENT: WLAN6090SD

REPORT NO.: 4L0041RUS1

Test Data – Occupied Bandwidth



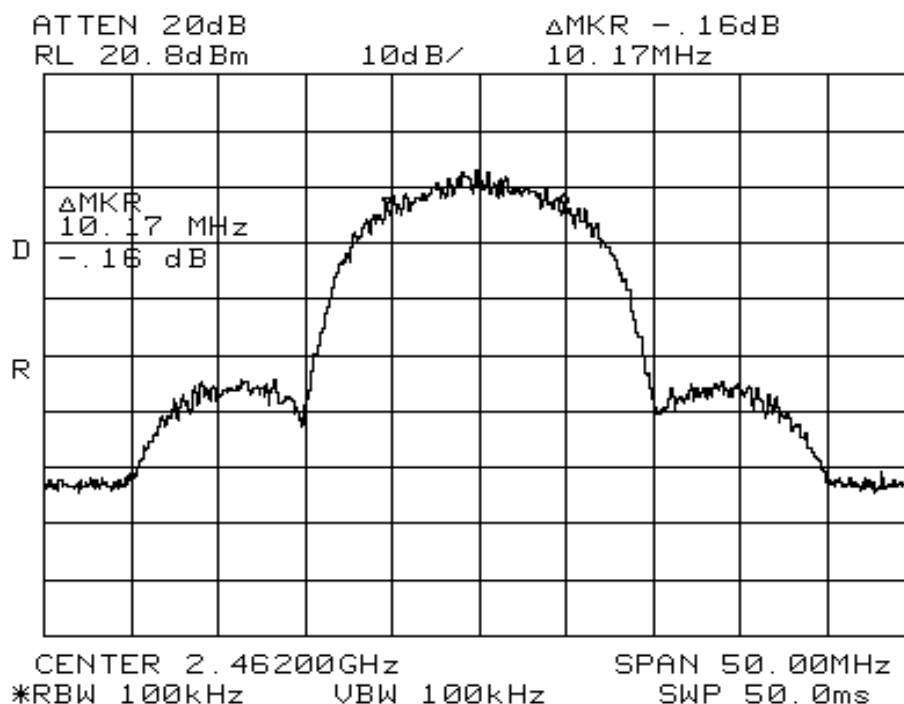
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Page 3 of 6

Job No.: 4L0041R Date: 2/19/2004
Specification: 15.247 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 40
E.U.T.: WLAN6090SD
Configuration: TX FULL POWER



Notes: 6 dB - Channel 11

Section 5. Maximum Peak Output Power

NAME OF TEST: Maximum Peak Output power

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

TESTED BY: David Light

DATE: 2/19/04

Test Results: Complies.**Measurement Data:****Antennas:** Integral (3dBi max gain)

Frequency MHz	Type	Conducted Power (dBm)	Gain (dBi)	E.I.R.P. (dBm)
2412	Integral	15	3	18
2437	Integral	15	3	18
2462	Integral	15	3	18
Peak power output at antenna port(dBm): 18 dBm / 63.1 mW				

All measurements made with fully charged batteries.

Equipment Used: 1029-1030Measurement Uncertainty: +/- 0.7 dB

Temperature: 22 °C

Relative Humidity: 40 %

Section 6. RF Exposure

NAME OF TEST: RF Exposure	PARA. NO.: 15.247(b)(4)
TESTED BY:	DATE:

Test Results:

Complies.

Measurement Data:

[Please refer to SAR report.](#)

Section 7. Spurious Emissions (conducted)

NAME OF TEST: Spurious Emissions (conducted)	PARA. NO.: 15.247(c)
TESTED BY: David Light	DATE: 2/19/04

Test Results: Complies.

Measurement Data: See attached plots.

EQUIPMENT: WLAN6090SDREPORT NO.: 4L0041RUS1

Test Data – Spurious Emissions at Antenna Port



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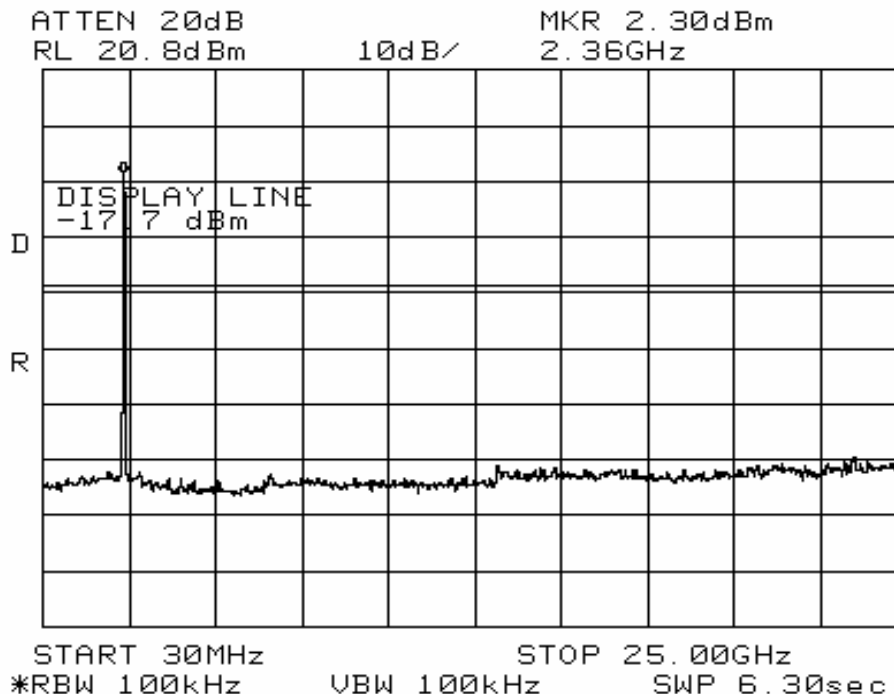
Data Plot

Spurious Emissions at Antenna Terminals

Page 1 of 6
 Job No.: 4L0041R Date: 2/19/2004 Complete X
 Specification: 15.247 Temperature(°C): 22 Preliminary:
 Tested By: David Light Relative Humidity(%) 40
 E.U.T.: WLAN6090SD
 Configuration: TX FULL POWER
 Sample Number: 1
 Location: Lab 2 RBW: Refer to plots Measurement
 Detector Type: Peak VBW: Refer to plots Distance: NA m

Test Equipment Used

Antenna: Directional Coupler:
 Pre-Amp: Cable #1: 1621
 Filter: Cable #2:
 Receiver: 1464 Cable #3:
 Attenuator #1: 1469 Cable #4:
 Attenuator #2: Mixer:
 Additional equipment used:
 Measurement Uncertainty: +/-1.7 dB



Notes: Channel 1
Display line = -20 dBc

EQUIPMENT: WLAN6090SD

REPORT NO.: 4L0041RUS1

Test Data – Spurious Emissions at Antenna Port



Dallas Headquarters:

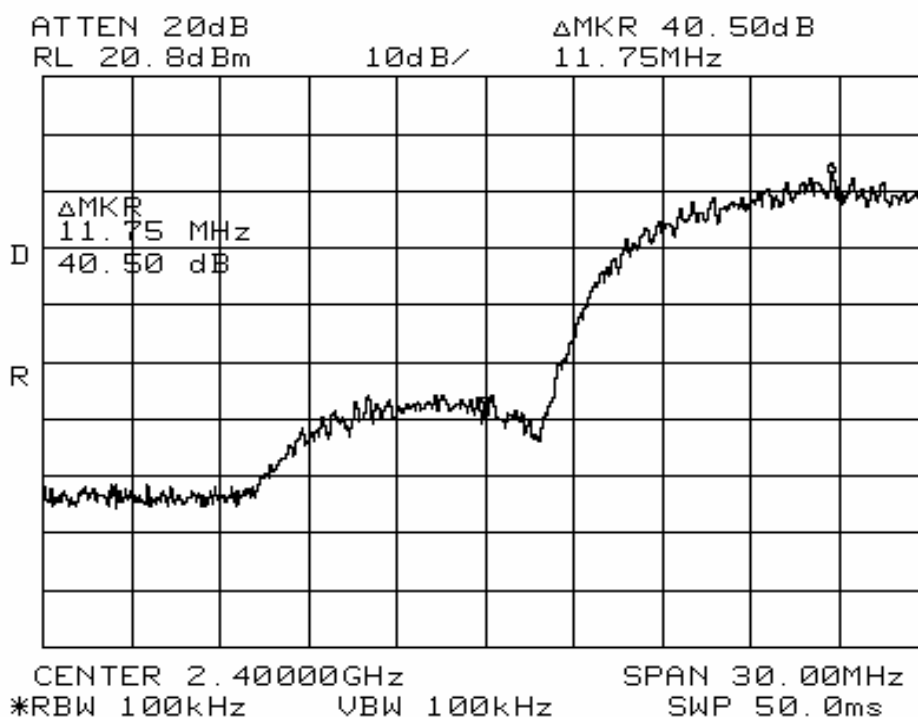
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Data Plot**Spurious Emissions at Antenna Terminals**

Page 2 of 6

Job No.: 4L0041R Date: 2/19/2004
Specification: 15.2 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 40
E.U.T.: WLAN6090SD
Configuration: TX FULL POWER



Notes: Lower Band Edge - Channel 1

EQUIPMENT: WLAN6090SD

REPORT NO.: 4L0041RUS1

Test Data – Spurious Emissions at Antenna Port



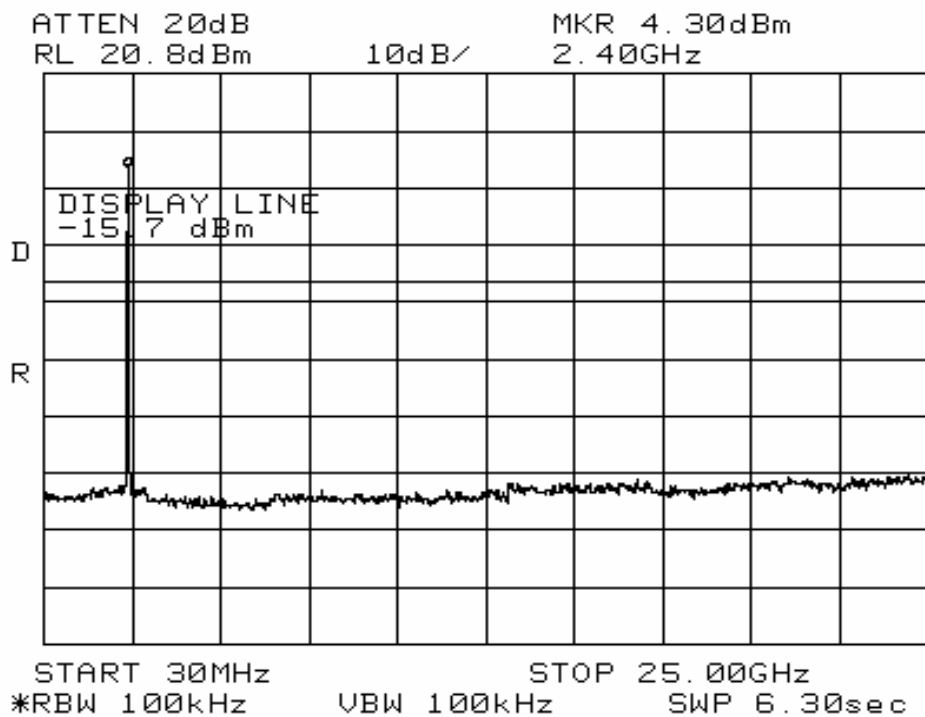
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Page 3 of 6

Job No.: 4L0041R Date: 2/19/2004
Specification: 15.247 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 40
E.U.T.: WLAN6090SD
Configuration: TX FULL POWER



Notes: Channel 6

EQUIPMENT: WLAN6090SD

REPORT NO.: 4L0041RUS1

Test Data – Spurious Emissions at Antenna Port



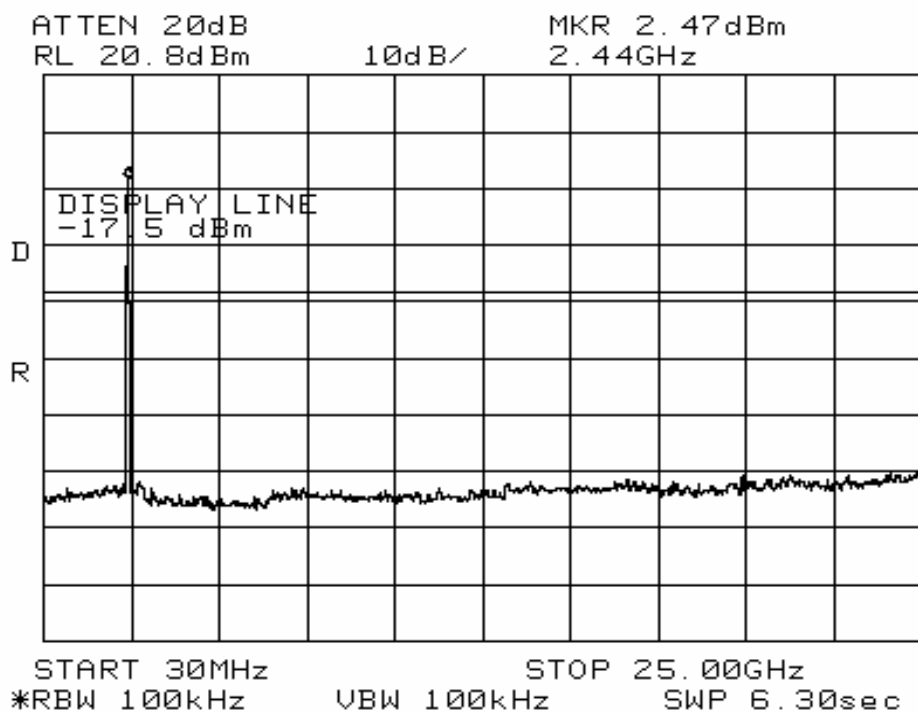
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Job No.: 4L0041R Date: 2/19/2004
Specification: 15.247 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 40
E.U.T.: WLAN6090SD
Configuration: TX FULL POWER



Notes: Channel 11

Section 8. Spurious Emissions (radiated)

NAME OF TEST: Radiated Spurious Emissions	PARA. NO.: 15.247 (c)
TESTED BY: David Light	DATE: 2/19/04

Test Results: Complies.

Measurement Data: See attached table.

[Note – The unit was tested on three orthogonal axis’.](#)

Test Data – Radiated Spurious Emissions (Restricted Bands of Operation)



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Radiated Emissions

Page 1 of 2

Job No.: 4L0041R Date: 2/19/2004
Specification: 15.15.247/15.205 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 40
E.U.T.: WLAN6090SD
Configuration: TX FULL POWER - LYING ON SIDE (WORST CASE)
Sample Number: 1
Location: AC 3 RBW: 1 MHz
Detector Type: Peak VBW: 1 MHz

Test Equipment Used

Antenna: 1304 Directional Coupler: #N/A
Pre-Amp: 1016 Cable #1: 1484
Filter: 1482 Cable #2: 1485
Receiver: 1464 Cable #3: #N/A
Attenuator #1: #N/A Cable #4: #N/A
Attenuator #2: #N/A Mixer: #N/A
Measurement
Uncertainty: +/-3.7 dB

The device was tested on 3 axis' with the worst case being reported.

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								
2483.5	29.5	28.2	3.1	0.0	60.8	74	-13.2	V - Peak
2483.5	20.5	28.2	3.1	0.0	51.8	54	-2.2	V - Avg
4924.0	46.8	33.9	4.3	32.7	52.3	54	-1.7	V - Peak
7386.0	42	36.3	5.3	32.8	50.8	54	-3.2	V - Peak
12310.0	45	39.9	7.3	34.4	57.8	74	-16.2	V - Peak
12310.0	33.7	39.9	7.3	34.4	46.5	54	-7.5	V - Avg
2483.5	31.5	28.2	3.1	0.0	62.8	74	-11.2	H - Peak
2483.5	21	28.2	3.1	0.0	52.3	54	-1.7	H - Avg
4924.0	46.2	33.9	4.3	32.7	51.7	54	-2.3	H - Peak
7386.0	42	36.3	5.3	32.8	50.8	54	-3.2	H - Peak
12310.0	43.5	39.9	7.3	34.4	56.3	74	-17.7	H - Peak
12310.0	33.3	39.9	7.3	34.4	46.1	54	-7.9	H - AHg
Channel 6								
Notes:								

EQUIPMENT: WLAN6090SD

REPORT NO.: 4L0041RUS1

Test Data – Radiated Spurious Emissions (Restricted Bands of Operation)



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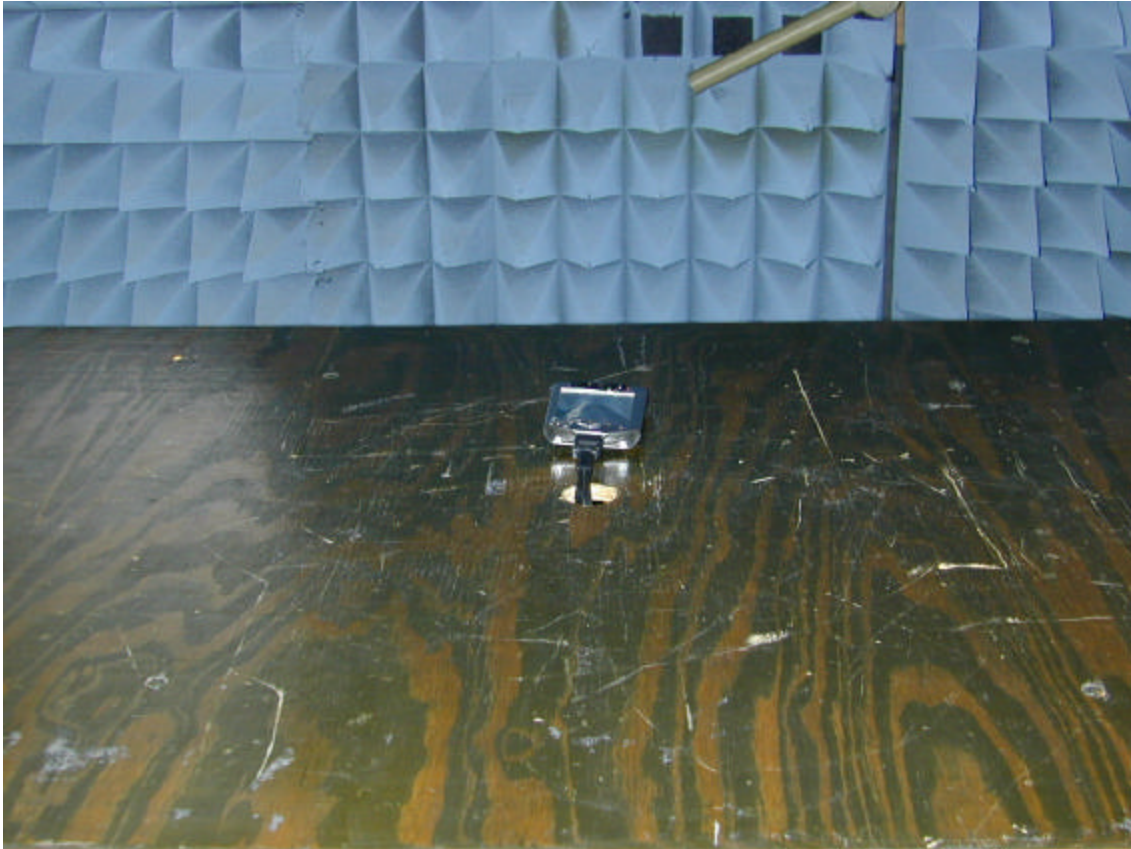
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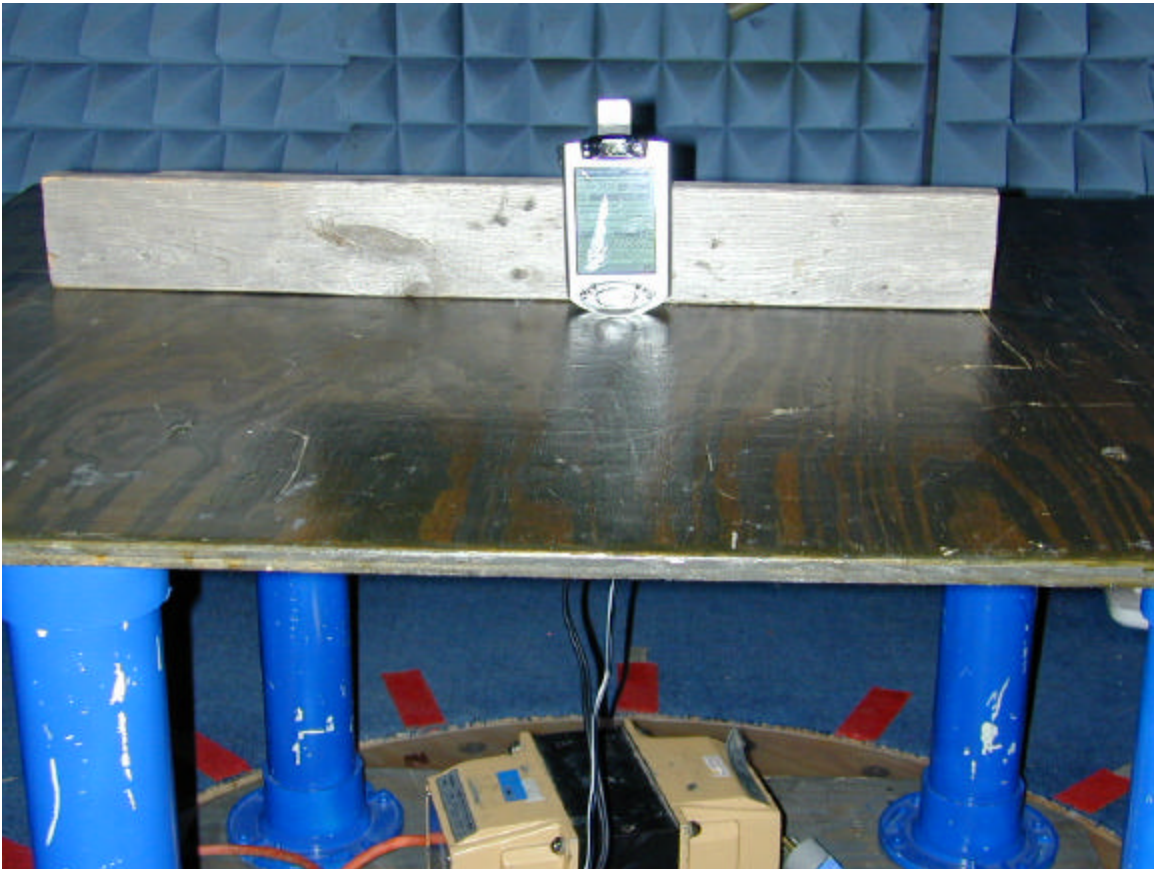
Page 2 of 2		Radiated Spurious Emissions	
Continuation Page		Date: 2/20/2004	
Job No.:	4L0041R	Temperature(°F):	22
Specification:	15.247/15.205	Relative Humidity(%)	40
Tested By:	#N/A		
E.U.T.:	WLAN6090SD		
Configuration:	TX FULL POWER - LYING ON SIDE (WORST CASE)		

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
4824.0	44.2	33.9	4.3	32.7	49.7	54	-4.3	H - Peak
7236.0	42	36.3	5.3	32.8	50.8	54	-3.2	H - Peak
12060.0	44.2	39.9	7.3	34.4	57.0	74	-17.0	H - Peak
12060.0	33.7	39.9	7.3	34.4	46.5	54	-7.5	H - AHg
4824.0	44.7	33.9	4.3	32.7	50.2	54	-3.8	V - Peak
7236.0	41.7	36.3	5.3	32.8	50.5	54	-3.5	V - Peak
12060.0	44.2	39.9	7.3	34.4	57.0	74	-17.0	V - Peak
12060.0	33.7	39.9	7.3	34.4	46.5	54	-7.5	V - Avg
								Channel 6
4874.0	43.8	33.9	4.3	32.7	49.3	54	-4.7	H - Peak
7311.0	42.7	36.3	5.3	32.8	51.5	54	-2.5	H - Peak
12185.0	44.2	39.9	7.3	34.4	57.0	74	-17.0	H - Peak
12185.0	33.3	39.9	7.3	34.4	46.1	54	-7.9	H - AHg
4874.0	45.5	33.9	4.3	32.7	51.0	54	-3.0	V - Peak
7311.0	42.2	36.3	5.3	32.8	51.0	54	-3.0	V - Peak
12185.0	44.8	39.9	7.3	34.4	57.6	74	-16.4	V - Peak
12185.0	33.5	39.9	7.3	34.4	46.3	54	-7.7	V - Avg
Notes:								

Setup Photos



Setup Photos



Setup Photos (Worst Case)



Section 9. Peak Power Spectral Density

NAME OF TEST: Peak Power Spectral Density	PARA. NO.: 15.247(d)
TESTED BY: David Light	DATE: 2/19/04

Test Results: Complies.

Measurement Data: See attached plots.

EQUIPMENT: WLAN6090SDREPORT NO.: 4L0041RUS1

Test Data – Peak Power Spectral Density



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Data Plot

Peak Power Spectral Density

Page 1 of 6

Job No.: 4L0041R

Date: 2/19/2004Complete X

Specification: 15.247

Temperature(°C): 22

Preliminary: _____

Tested By: David LightRelative Humidity(%) 40E.U.T.: WLAN6090SDConfiguration: TX FULL POWERSample Number: 1Location: Lab 2RBW: Refer to plots

Measurement

Detector Type: PeakVBW: Refer to plotsDistance: NA m

Test Equipment Used

Antenna: _____

Directional Coupler: _____

Pre-Amp: _____

Cable #1: 1621

Filter: _____

Cable #2: _____

Receiver: 1464

Cable #3: _____

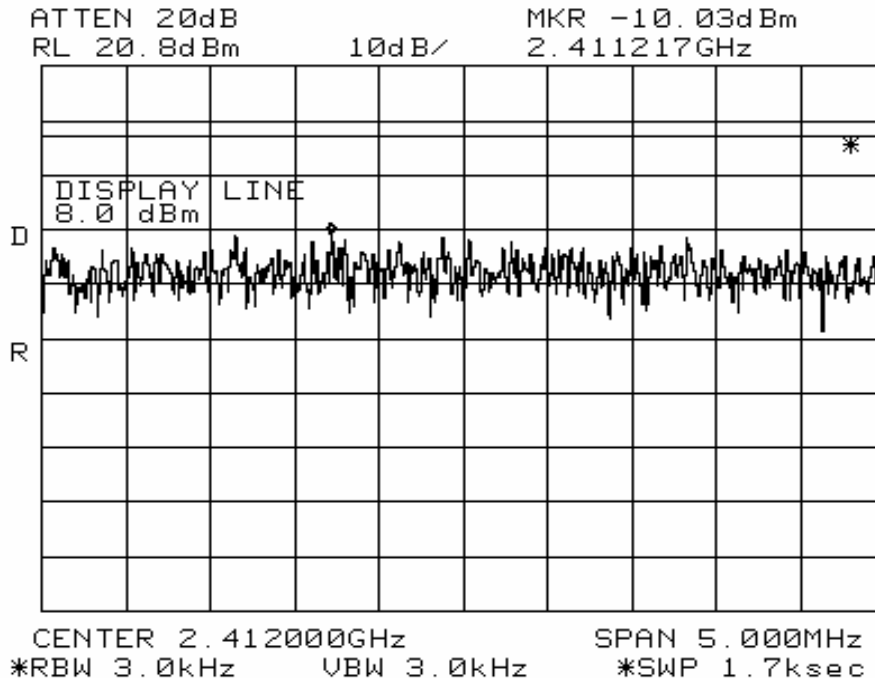
Attenuator #1: 1469

Cable #4: _____

Attenuator #2: _____

Mixer: _____

Additional equipment used: _____

Measurement Uncertainty: +/-1.7 dBNotes: Channel 1

EQUIPMENT: WLAN6090SDREPORT NO.: 4L0041RUS1

Test Data – Peak Power Spectral Density



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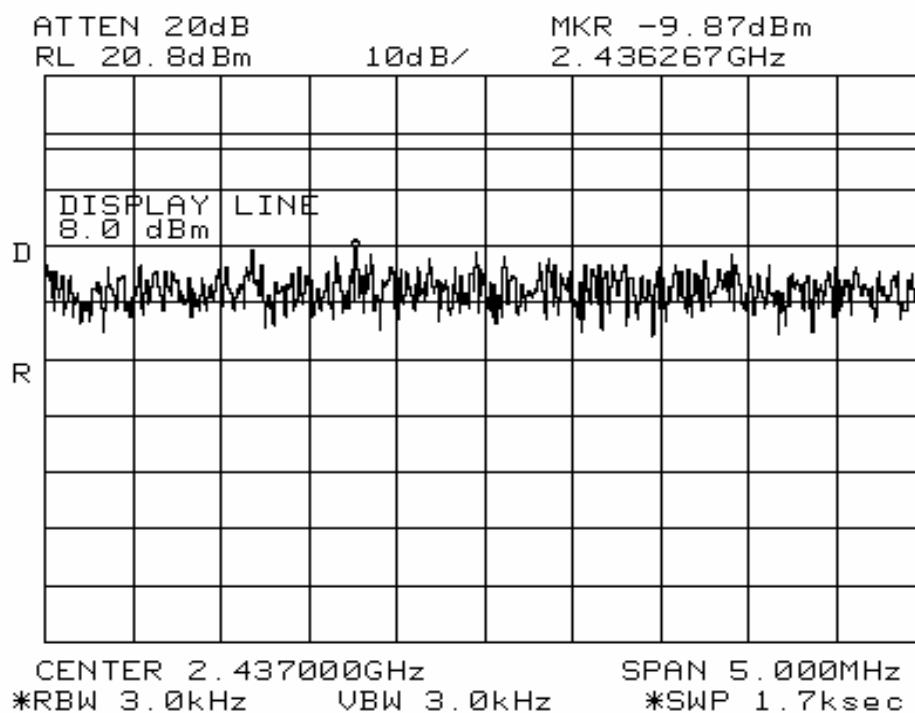
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Data Plot

Peak Power Spectral Density

Page 2 of 6

Job No.: 4L0041R Date: 2/19/2004
Specification: 15.2 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 40
E.U.T.: WLAN6090SD
Configuration: TX FULL POWER

Notes: Channel 6

EQUIPMENT: WLAN6090SDREPORT NO.: 4L0041RUS1

Test Data – Peak Power Spectral Density



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Dallas Headquarters:

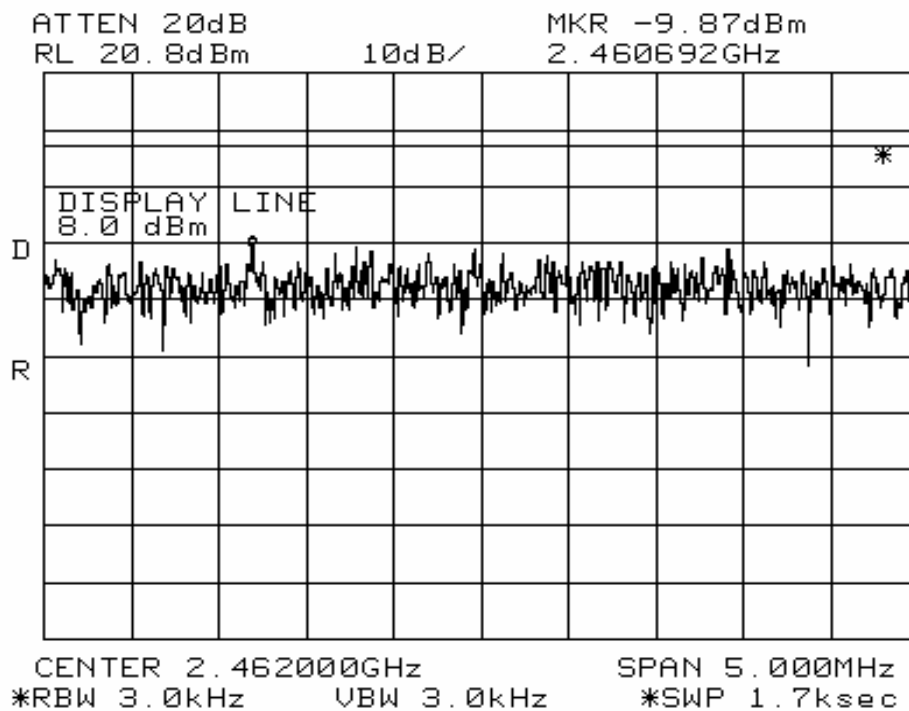
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Data Plot

Peak Power Spectral Density

Page 3 of 6

Job No.: 4L0041R Date: 2/19/2004
Specification: 15.247 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 40
E.U.T.: WLAN6090SD
Configuration: TX FULL POWER

Notes: Channel 11

EQUIPMENT: [WLAN6090SD](#)REPORT NO.: [4L0041RUS1](#)**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
1484	Cable 2.0-18.0 Ghz	Storm PR90-010-072	N/A	07/24/03	07/23/04
1485	Cable 2.0-18.0 Ghz	Storm PR90-010-216	N/A	07/24/03	07/23/04
1029	PEAK POWER METER	HP 8900D	3303U0012	12/23/03	12/22/04
1030	PEAK POWER SENSOR	HP 84811A	2539A03573	12/23/03	12/22/04
1469	10 db Attenuator DC 18 Ghz	MCL Inc. BW-S10W2 10db-2WDC	NONE	CBU	N/A
1628	CABLE, 6 ft	MEGAPHASE TM26 S1S5 72	N/A	03/05/03	03/04/04
1304	HORN ANTENNA	ELECTRO METRICS RGA-60	6151	09/22/03	09/22/05
1304	HORN ANTENNA	ELECTRO METRICS RGA-60	6151	09/22/03	09/22/05
1482	Band Pass Filter	K & L 11SH10-4000/T12000-0/0	2	Cal B4 Use	N/A
1258	LISN .15mhz-30mhz	EMCO 0	1305	09/15/03	09/14/04
1433	High pass filter	Solar 7930-5.0	933142	02/04/04	02/03/05
1988	CABLE, 6.8m	KTL RG223	N/A	07/02/03	07/01/04
785	ANALYZER, SPECTRUM	HP 8591E	3412A02996	04/09/03	04/08/04
480	Bilog Antenna, 30 MHz – 1 GHz	Schaffner CBL6111C	2572	5/10/03	5/10/04
791	Preamplifier	None	None	10/27/03	10/27/04

ANNEX A - TEST DETAILS

EQUIPMENT: WLAN6090SD

REPORT NO.: 4L0041RUS1

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:

Frequency of Emission (MHz)	Emission Limit (dBμV)	
	Quasi-peak	Average
0.15 – 0.5	66 – 56*	56 – 46
0.5 – 5.0	56	46
5.0 – 30.0	60	50

*Decreases with the logarithm of the frequency.

NAME OF TEST: Minimum 6 dB bandwidth

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

Minimum Standard: The minimum 6 dB bandwidth shall be at least
500 kHz

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.

EIRP Measurement for Non-Detachable Antennas:**Test Method:** TIA/EIA-603-1992, Section 2.2.12

The antenna substitution method was used to determine the equivalent radiated power at spurious frequencies. The spurious emissions were measured at a distance of 3 meters. The EUT was then replaced with a reference substitution antenna with a known gain referenced to a dipole. This antenna was fed with a signal at the spurious frequency. The level of the signal was adjusted to repeat the previously measured level. The resulting erp is the signal level fed to the reference antenna corrected for gain referenced to an isotropic radiator if required.

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

EQUIPMENT: [WLAN6090SD](#)

REPORT NO.: [4L0041RUS1](#)

more than 10 MHz	3	top, middle, bottom
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NAME OF TEST: RF Exposure	PARA. NO.: 15.247(b)(4)
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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 (? V/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 ?: 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 ?: 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: WLAN6090SD

REPORT NO.: 4L0041RUS1

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 (? V/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)
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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
Sweep: Span (kHz)/3 (i.e. for a span of 1.5 MHz the sweep rate is
1500/3 = 500 sec.

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:

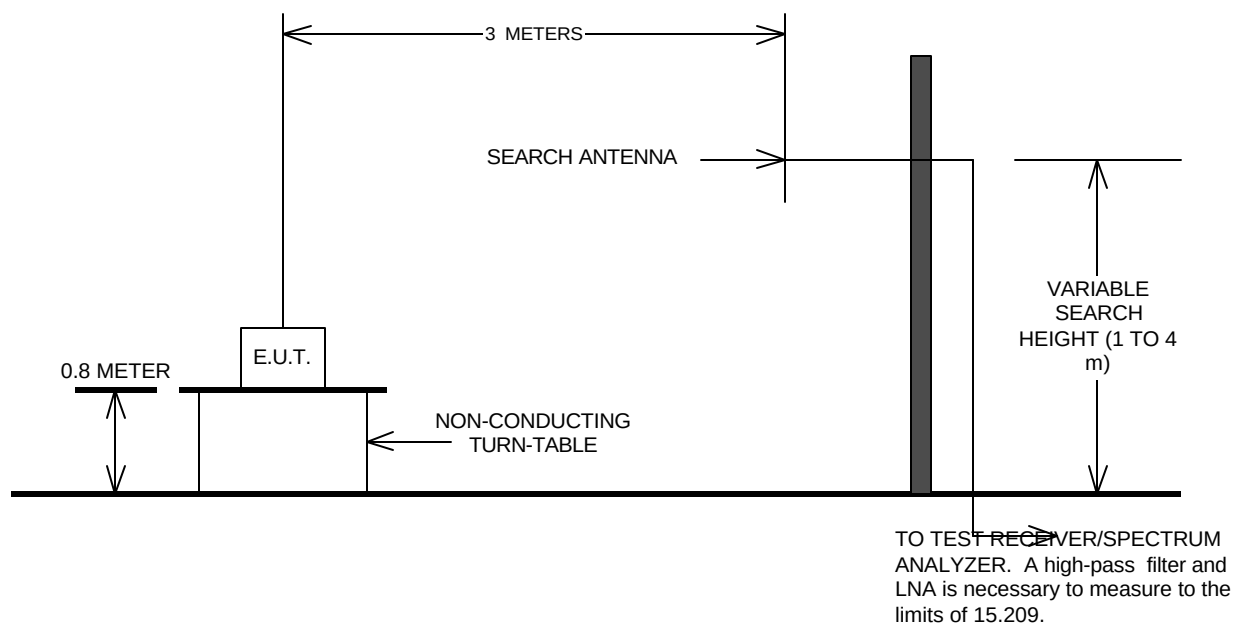
For devices with non-detachable antennas, the received field strength is peaked and the spectrum analyzer is set as above. The peak emission level is then measured and converted to a field strength by adding the appropriate antenna factor and cable loss. This field strength is then converted to an equivalent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

Number of channels tested:

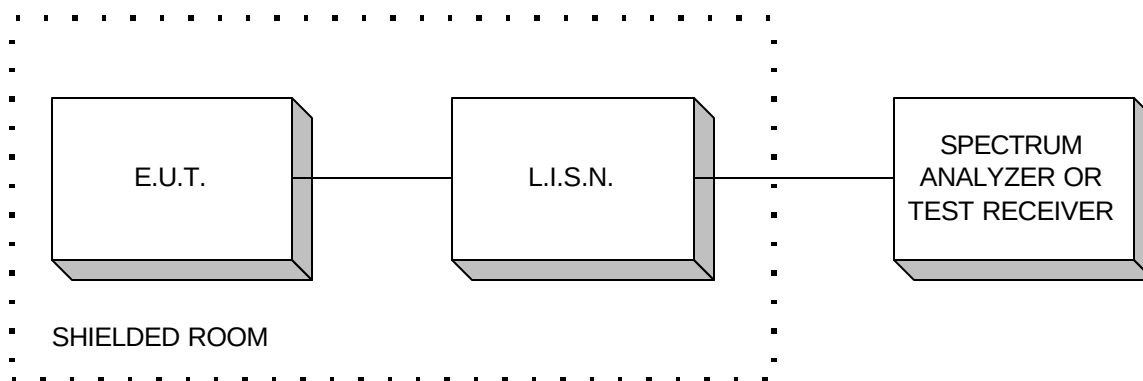
Tuning Range	Number Of Channels Tested	Channel Location In Band
1 MHz or Less	1	Middle
1 to 10 MHz	2	Top And Bottom
More Than 10 MHz	3	Top, Middle, Bottom

ANNEX B - TEST DIAGRAMS

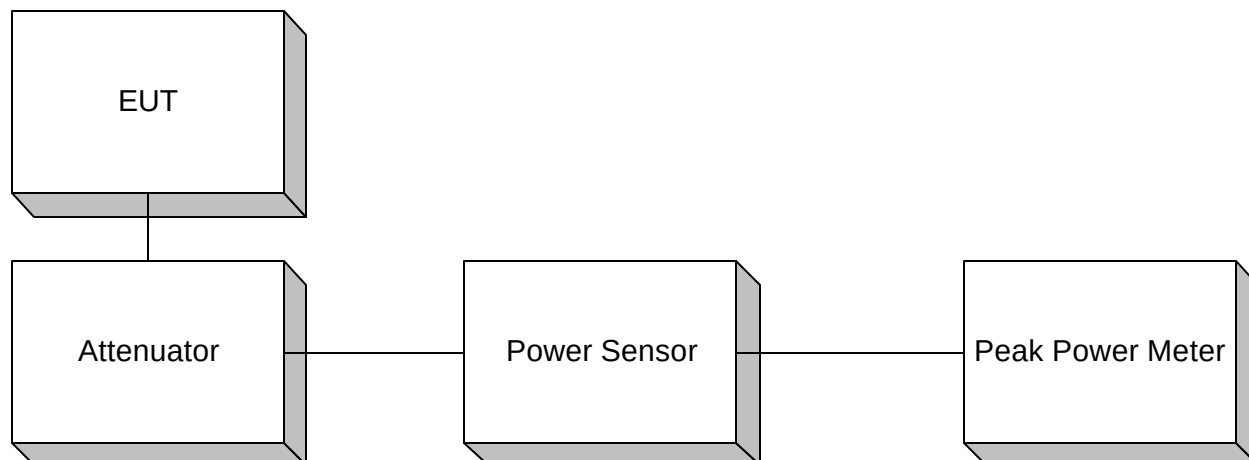
Test Site For Radiated Emissions



Conducted Emissions



Peak Power At Antenna Terminals



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

