CKC LABORATORIES, INC. Testing the Future

ACCREDITED
Certicate Numbers
803.01 - 803.06
EMC/SAFETY

ADDENDUM TO FC03-053

FOR THE

WIRELESS NETWORK TRANSMITTER, LIBRA 5800

FCC PART 15 SUBPART C SECTIONS 15.207, 15.209 AND 15.247 AND RSS 210

COMPLIANCE

DATE OF ISSUE: SEPTEMBER 23, 2003

PREPARED FOR:

Wi-Lan Inc.
2891 Sunridge Way N.E.
Calgary, AB P1Y7K7 Canada

PREPARED BY:

Mary Ellen Clayton
CKC Laboratories, Inc.
5473A Clouds Rest
Mariposa, CA 95338

P.O. No.: 104704
W.O. No.: 80992

Date of test: August 8 - September 12, 2003

Report No.: FC03-053A

TABLE OF CONTENTS

ADMINISTRATIVE INFORMATION

DATE OF TEST:	August 8 - September 12, 2003
DATE OF RECEIPT:	August 8, 2003
PURPOSE OF TEST:	To demonstrate the compliance of the Wireless Network Transmitter, Libra 5800, with the requirements for FCC Part 15 Subpart C Sections 15.207, 15.209 and 15.247 and RSS 210 devices. **Addendum A** is to revise the frequency range tested.
TEST METHOD:	ANSI C63.4 (1992) and RSS 212
MANUFACTURER:	Wi-Lan Inc. 2891 Sunridge Way N.E. Calgary, AB P1Y7K7 Canada
REPRESENTATIVE:	Ian Guldberg
TEST LOCATION:	CKC Laboratories, Inc. 5473A Clouds Rest Mariposa, CA 95338

SUMMARY OF RESULTS

As received, the Wi-Lan Inc. Wireless Network Transmitter, Libra 5800 was found to be fully compliant with the following standards and specifications:

United States	**Canada**
PART 15.247	**RSS 210**
15.247(a)(1)	6.2.2(o)(a1)
15.247(a)(1)(i) 15.247(b)(2)	6.2.2(o)(a2)
15.247(a)(1)(ii) 15.247(a)(1)(iii) 15.247(b)(1) 15.247(b)(3) 15.247(b)(3)(i) 15.247(b)(3)(ii) 15.247(b)(3)(iii) 15.247(d)	6.2.2(o)(a3)
15.247(b)(1) 15.247(b)(3) 15.247(b)(3)(i) 15.247(b)(3)(ii) 15.247(b)(3)(iii) 15.247(d) 15.247(e)	6.2.2(o)(b)
15.247(f)	6.2.2(o)(c)
15.247(c)	6.2.2(o)(e)(1)
15.203	6.2.2(o)(e)(2)
NA	6.2.2(d)
15.247(a)(2)	NA
15.247(b)(4)	NA
15.203	5.5
15.205	6.3
15.207	6.6
15.209	6.2.1
ANSI C63.4 (1992) method	RSS 212 method
FCC Site No. 90477	Industry of Canada File No. IC 3082-B

CONDITIONS FOR COMPLIANCE
Modifications to EUT: DC power line has 3 turns with Steward P/N 28A2024-0A2 clipon ferrite.

APPROVALS

Steve Behm, Director of Engineering Services

QUALITY ASSURANCE:

Joyce Walker, Quality Assurance Administrative Manager

Mike Wilkinson, Lab Manager

TEST PERSONNEL:

Randy Clark, EMC Engineer

EQUIPMENT UNDER TEST (EUT) DESCRIPTION

The EUT tested by CKC Laboratories was a production unit.

FCC 15.31(e) Voltage Variations

FREQUENCY MHz	CORRECTED READING dBµV/m 85%	CORRECTED READING dBµV/m 100%	CORRECTED READING dBµV/m 115%	SPEC LIMIT dBµV/m
5819	135.8	135.8	135.8	137
5729	136.1	136.1	136.1	137
5775	135.8	135.8	135.8	137

Test Method: ANSI C63.4 (1992)
Spec Limit: FCC Part 15 Subpart C Section 15.247(b)(3)/15.31(e)
Test Distance: No Distance

FCC 15.31(m) Number Of Channels

This device was tested on three channels.

FCC 15.33(a) Frequency Ranges Tested

15.207 Conducted: 150 kHz – 30 MHz
15.209/15.247 Radiated: 30 MHz – 40 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 an external and removeable but must be professionally installed; therefore the EUT complies with Section 15.203 of the FCC rules.

FCC 15.205 Restricted Bands
The fundamental operating frequency lies outside the restricted bands and therefore complies with the requirements of Section 15.205 of the FCC rules. Any spurious emission coming from the EUT was investigated to determine if any portion lies inside the restricted band. If any portion of a spurious emissions signal was found to be within a restricted band, investigation was performed to ensure compliance with Section 15.209.

Eut Operating Frequency
The EUT was tested at 5730 MHz, 5775 MHz and 5820 MHz.

EQUIPMENT UNDER TEST

Wireless Network Transmitter
Manuf: Wi-Lan
Model: Libra 5800
Serial: CKC080803-001
FCC ID: pending

Ethernet AC/DC Adapter & Inserter
Manuf: Wi-Lan / ENG
Model: 57-24-1000D
Serial: NA
FCC ID: DoC

PERIPHERAL DEVICES

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

Power Supply
Manuf: Wi-Lan
Model: NA
Serial: CKC080803-002
FCC ID: NA

Laptop Power Supply
Manuf: Toshiba
Model: PA2444U
Serial: 0007A0742953
FCC ID: NA

Laptop
Manuf: Toshiba
Model: PS277U-6M9J0
Serial: 80857659U
FCC ID: DoC

MEASUREMENT UNCERTAINTY

TEST	HIGHEST UNCERTAINTY
Radiated Emissions	+/- 2.94 dB
Conducted Emissions	+/- 1.56 dB

Note: Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k=2. Statements of compliance are based on the nominal values only.

REPORT OF MEASUREMENTS

The following tables report the six highest worst case levels recorded during the tests performed on the EUT. All readings taken are peak readings unless otherwise noted. The data sheets from which these tables were compiled are contained in Appendix C.

Table 1: FCC 15.207 Six Highest Conducted Emission Levels

FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Lisn dB	dB	Cable dB	dB	CORRECTED READING dBµV	SPEC LIMIT dBµV	MARGIN dB	NOTES
0.150001	63.8	0.1		0.1		64.0	66.0	-2.0	BQ
0.150100	64.6	0.2		0.1		64.9	66.0	-1.1	WQ
28.666510	43.6	1.5		0.3		45.4	50.0	-4.6	B
29.331480	42.6	2.2		0.3		45.1	50.0	-4.9	W
29.694690	43.4	1.7		0.3		45.4	50.0	-4.6	B
29.997370	43.5	1.7		0.3		45.5	50.0	-4.5	B

Test Method: ANSI C63.4 (1992)
Spec Limit: FCC Part 15 Subpart C Section 15.207

NOTES: Q = Quasi Peak Reading
B = Black Lead
W = White Lead

COMMENTS: EUT is a wireless network base station transmitter. EUT is transmitting continuously on a set channel. Transmitter is set to maximum output power. The frequencies chosen for the upper and lower channels are such that the channel is as close to the band edge as practical. Frequency Range Investigated: 150kHz - 30MHz. QP margins are listed to the QP spec limit. All other margins are listed to the Average limit. Channel Selections are as follows: Low Channel = 5730 MHz, Mid Channel = 5775 MHz, High Channel = 5820 MHz. EUT is transmitting at the center channel. Modifications to EUT: DC power line has 3 turns with Steward P/N 28A2024-0A2 clipon ferrite.

Table 2: FCC 15.209 Six Highest Radiated Emission Levels: 30 MHz - 1 GHz

FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Ant dB	Amp dB	Cable dB	dB	CORRECTED READING dBµV/m	SPEC LIMIT dBµV/m	MARGIN dB	NOTES
31.330	42.7	17.2	-27.3	0.7		33.3	40.0	-6.7	H
31.357	48.8	17.2	-27.3	0.7		39.4	40.0	-0.6	VQ
32.022	48.7	16.8	-27.3	0.7		38.9	40.0	-1.1	VQ
76.360	51.3	6.4	-27.2	1.4		31.9	40.0	-8.1	V
76.680	51.9	6.4	-27.2	1.4		32.5	40.0	-7.5	V
78.030	52.6	6.5	-27.2	1.5		33.4	40.0	-6.6	V

Test Method: ANSI C63.4 (1992)
Spec Limit: FCC Part 15 Subpart C Section 15.209
Test Distance: 3 Meters

NOTES: H = Horizontal Polarization
V = Vertical Polarization
Q = Quasi Peak Reading

COMMENTS: EUT is a wireless network base station transmitter. EUT is transmitting continuously on a set channel. Transmitter is set to maximum output power. The frequencies chosen for the upper and lower channels are such that the channel is as close to the band edge as practical. Frequency Range Investigated: 30 - 1000MHz. Channel Selections are as follows: Low Channel = 5730 MHz, Mid Channel = 5775 MHz, High Channel = 5820 MHz. Data reprentative of all high middle and low transmit channels. Modifications to EUT: DC power line has 3 turns with Steward P/N 28A2024-0A2 clipon ferrite.

Table 3: FCC 15.209 Six Highest Radiated Emission Levels: 1-40 GHz

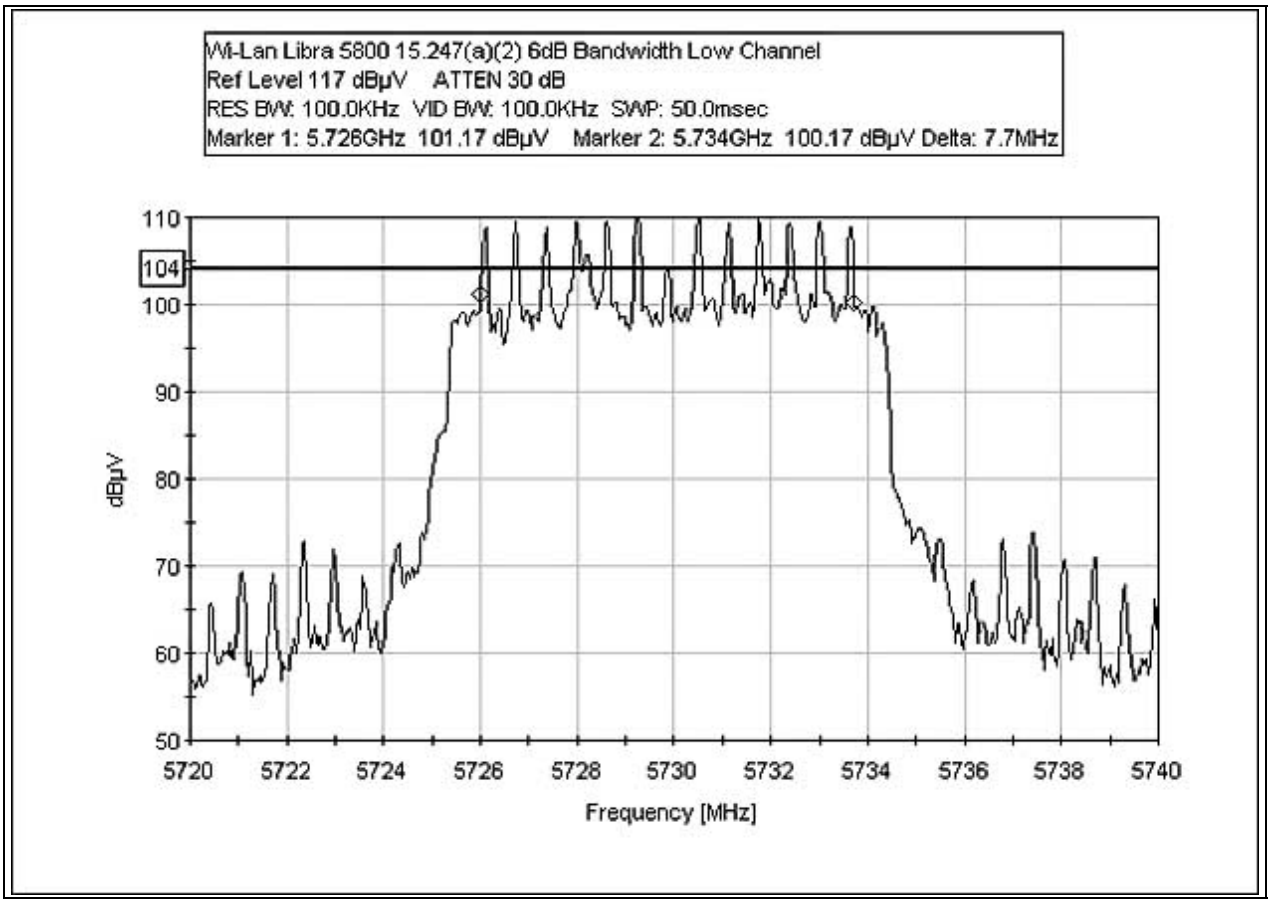
FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Ant dB	Amp dB	Cable dB	dB	CORRECTED READING dBµV/m	SPEC LIMIT dBµV/m	MARGIN dB	NOTES
5690.250	23.9	34.6	-34.7	17.6		41.4	54.0	-12.6	V
5893.250	30.3	34.4	-34.8	18.0		47.9	54.0	-6.1	V
11547.340	7.9	38.2	-34.7	28.5		39.9	54.0	-14.1	H
11547.350	10.8	38.2	-34.7	28.5		42.8	54.0	-11.2	V
17321.020	-2.3	41.7	-33.2	38.8		45.0	54.0	-9.0	V
17321.030	-5.0	41.7	-33.2	38.8		42.3	54.0	-11.7	H

Test Method: ANSI C63.4 (1992)
Spec Limit: FCC Part 15 Subpart C Section 15.209
Test Distance: 3 Meters

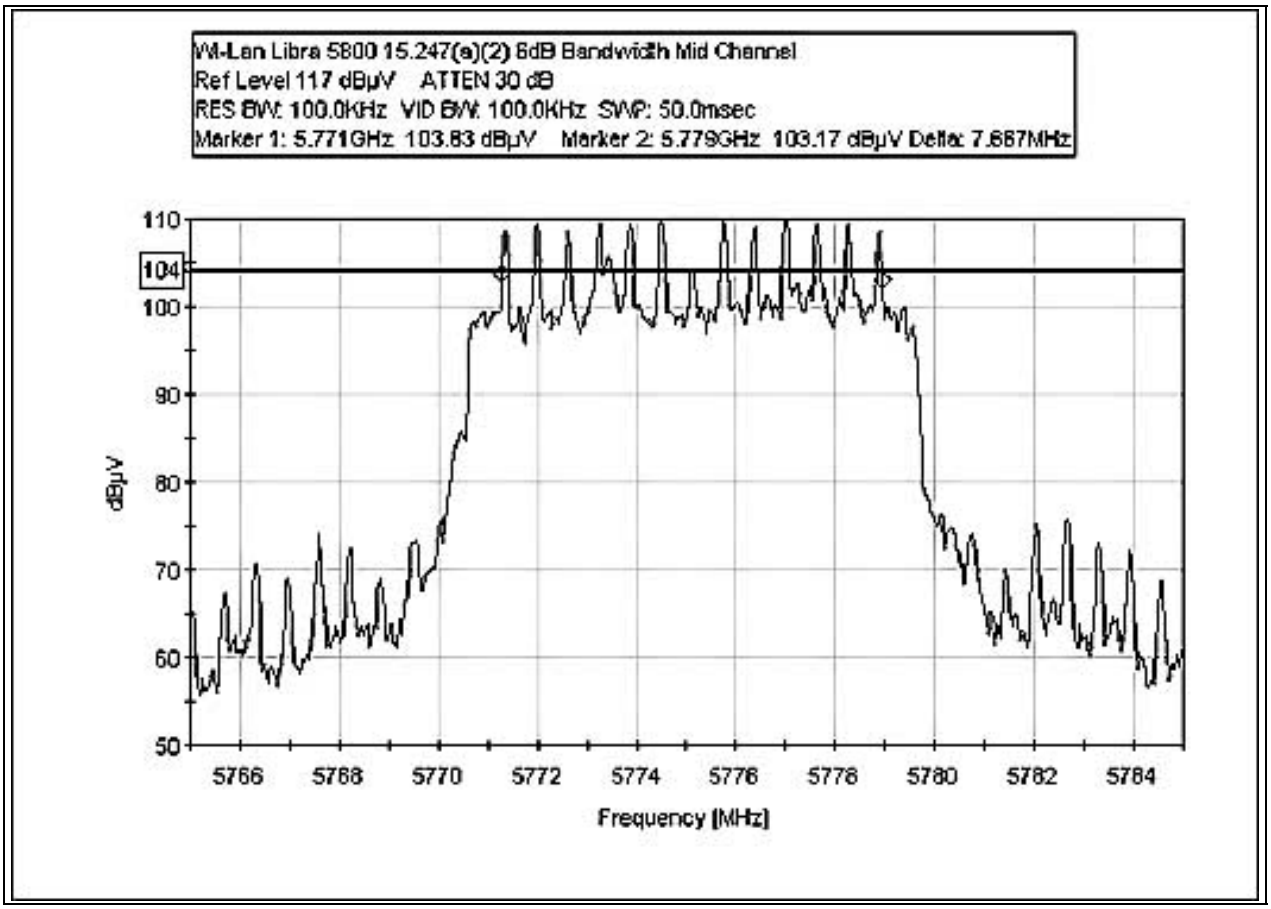
NOTES: H = Horizontal Polarization
V = Vertical Polarization

COMMENTS: EUT is a wireless network base station transmitter. EUT is transmitting continuously on a set channel. Transmitter is set to maximum output power. The frequencies chosen for the upper and lower channels are such that the channel is as close to the band edge as practical. Frequency Range Investigated: 1 - 40GHz. Channel Selections are as follows: Low Channel = 5730 MHz, Mid Channel = 5775 MHz, High Channel = 5820 MHz. Data reprentative of all high middle and low transmit channels. Modifications to EUT: DC power line has 3 turns with Steward P/N 28A2024-0A2 clipon ferrite. Readings from the second harmonic and above represent ambient noise floor levels.

FCC 15.247(a)(2) 6 dB BANDWIDTH LOW CHANNEL



FCC 15.247(a)(2) 6 dB BANDWIDTH MID CHANNEL



FCC 15.247(a)(2) 6 dB BANDWIDTH HIGH CHANNEL

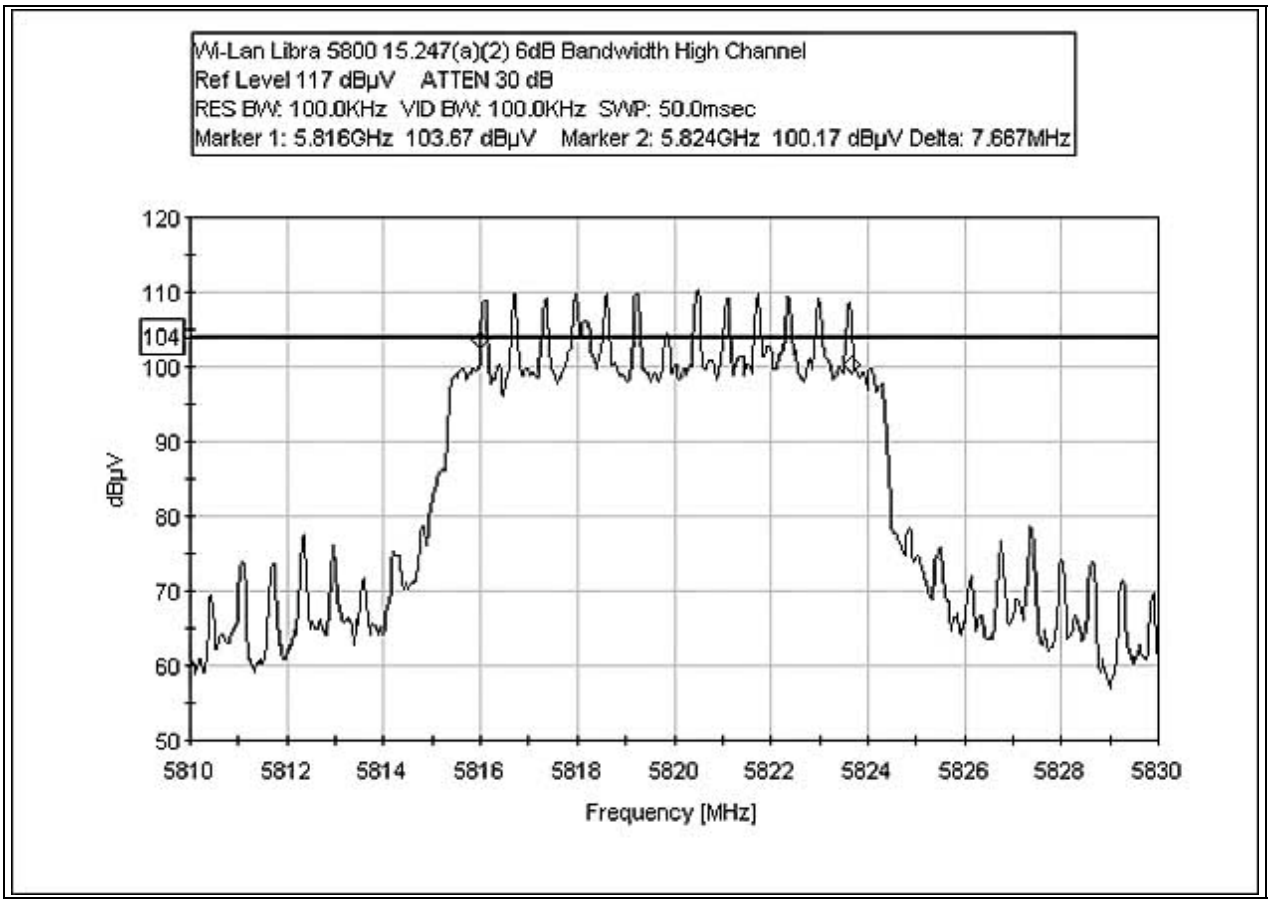


Table 4: FCC 15.247(b)(3) Peak Output Power									
	METER	CORRECTION FACTORS				CORRECTED	SPEC		
FREQUENCY MHz	READING dBµV	Att dB	Corr dB	Cable dB	dB	READING dBµV	LIMIT dBµV	MARGIN dB	NOTES
5729.700	119.8	10.0	5.8	0.5		136.1	137.0	-0.9	N

Test Method: ANSI C63.4 (1992) NOTES: N = No Polarization
Spec Limit: FCC Part 15 Subpart C Sections 15.247(b)(3)

COMMENTS: EUT is a wireless network base station transmitter. EUT is transmitting continuously on a set channel. The frequencies chosen for the upper and lower channels are such that the channel is as close to the band edge as practical. Equipment is transmitting at its maximum power output setting. Frequency Range Investigated: Carrier. RBW = 2MHz VBW = 3MHz. The bandwidth of the measuring reciever is adjusted for the emissions bandwidth as follows: The 6dB bandwidth is 7.7MHz, the RBW used is 3MHz, therefore a correction factor is used as defined by CF = 10 * LOG (BW1/BW2) In this case, the correction factor is 10 * LOG (7.7 / 2.0) = 5.8dB. Channel Selections are as follows: Low Channel = 5730 MHz, Mid Channel = 5775 MHz, High Channel = 5820 MHz. Temperature 73°F, Humidity 56%.

Conducted Power Output.

Channel (MHz)	Power Output (dBm)	Limit (dBm)	Results
5730	29.1	30	Pass
5775	28.8	30	Pass
5820	28.8	30	Pass

EIRP is calculated based on 23dBi antenna gain

Channel (MHz)	Power Output (dBm)	EIRP (dBm)
5730	29.1	52.1
5775	28.8	51.8
5820	28.8	51.8

Table 5: FCC 15.247(c) Six Highest Spurious Emission Levels: 30 MHz - 1 GHz

FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Ant dB	dB	dB	dB	CORRECTED READING dBµV	SPEC LIMIT dBµV	MARGIN dB	NOTES
73.117	32.8	0.0				32.8	105.4	-72.6	N-1
495.934	32.5	0.0				32.5	105.4	-72.9	N-3
569.988	32.5	0.0				32.5	105.4	-72.9	N-3
637.308	32.8	0.0				32.8	105.4	-72.6	N-1
862.834	32.8	0.0				32.8	105.4	-72.6	N-3
996.634	32.7	0.0				32.7	105.4	-72.7	N-2

Test Method: ANSI C63.4 (1992)
Spec Limit: FCC Part 15 Subpart C Section 15.47(c)

NOTES: N = No Polarization
1 = 5730 MHz
2 = 5820 MHz
3 = 5820 MHz

COMMENTS: EUT is a wireless network base station transmitter. EUT is transmitting continuously on a set channel. Transmitter is set to maximum output power. The frequencies chosen for the upper and lower channels are such that the channel is as close to the band edge as practical. Low, Mid and High Channels Selected. Frequency Range Investigated: 30 - 1000 MHz. No EUT emissions detected within 20dB of the limit in this frequency range. Channel Selections are as follows: Low Channel = 5730 MHz, Mid Channel = 5775 MHz, High Channel = 5820 MHz.

Table 6: FCC 15.247(c) Six Highest Spurious Emission Levels - 1-40 GHz

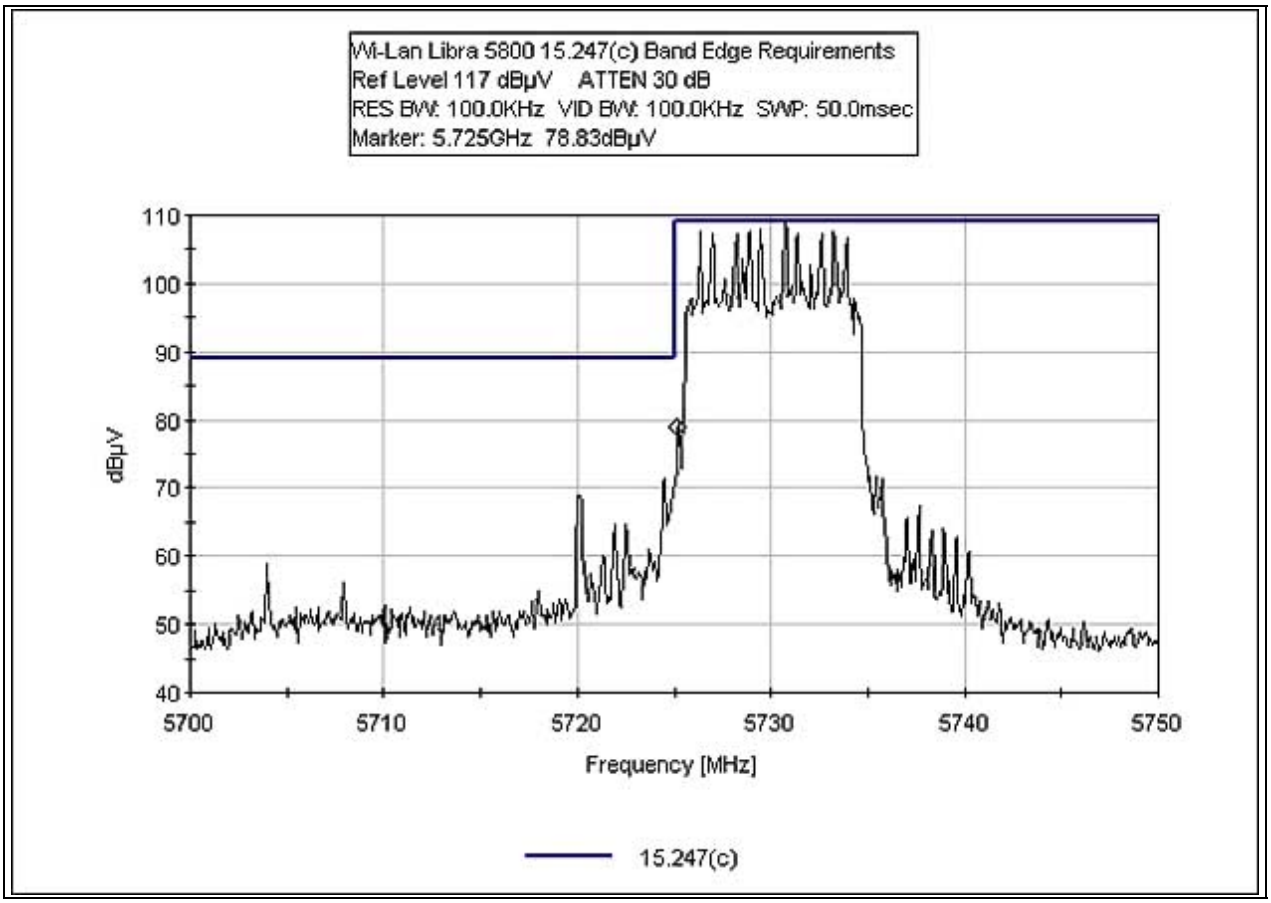
FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Ant dB		Cable dB		CORRECTED READING dBµV	SPEC LIMIT dBµV	MARGIN dB	NOTES
5722.500	72.8	10.0		0.5		83.3	105.4	-22.1	N-1
5826.833	75.3	10.0		0.5		85.8	105.4	-19.6	N-2
5827.500	76.7	10.0		0.5		87.2	105.4	-18.2	N-2
5827.667	77.2	10.0		0.5		87.7	105.4	-17.7	N-2
5828.833	72.5	10.0		0.5		83.0	105.4	-22.4	N-2
11640.590	76.5	10.2		1.0		87.7	105.4	-17.7	N-2

Test Method: ANSI C63.4 (1992)
Spec Limit: FCC Part 15 Subpart C Sections 15.247(c)

NOTES: N = No Polarization
1 = 5730 MHz
2 = 5820 MHz

COMMENTS: EUT is a wireless network base station transmitter. EUT is transmitting continuously on a set channel. Transmitter is set to maximum output power. The frequencies chosen for the upper and lower channels are such that the channel is as close to the band edge as practical. Low. Mid and High Channels Selected. Frequency Range Investigated: 1-40GHz. Channel Selections are as follows: Low Channel = 5730 MHz, Mid Channel = 5775 MHz, High Channel = 5820 MHz.

FCC 15.247(c) BAND EDGE PLOT LOW



FCC 14.247(c) BAND EDGE PLOT HIGH

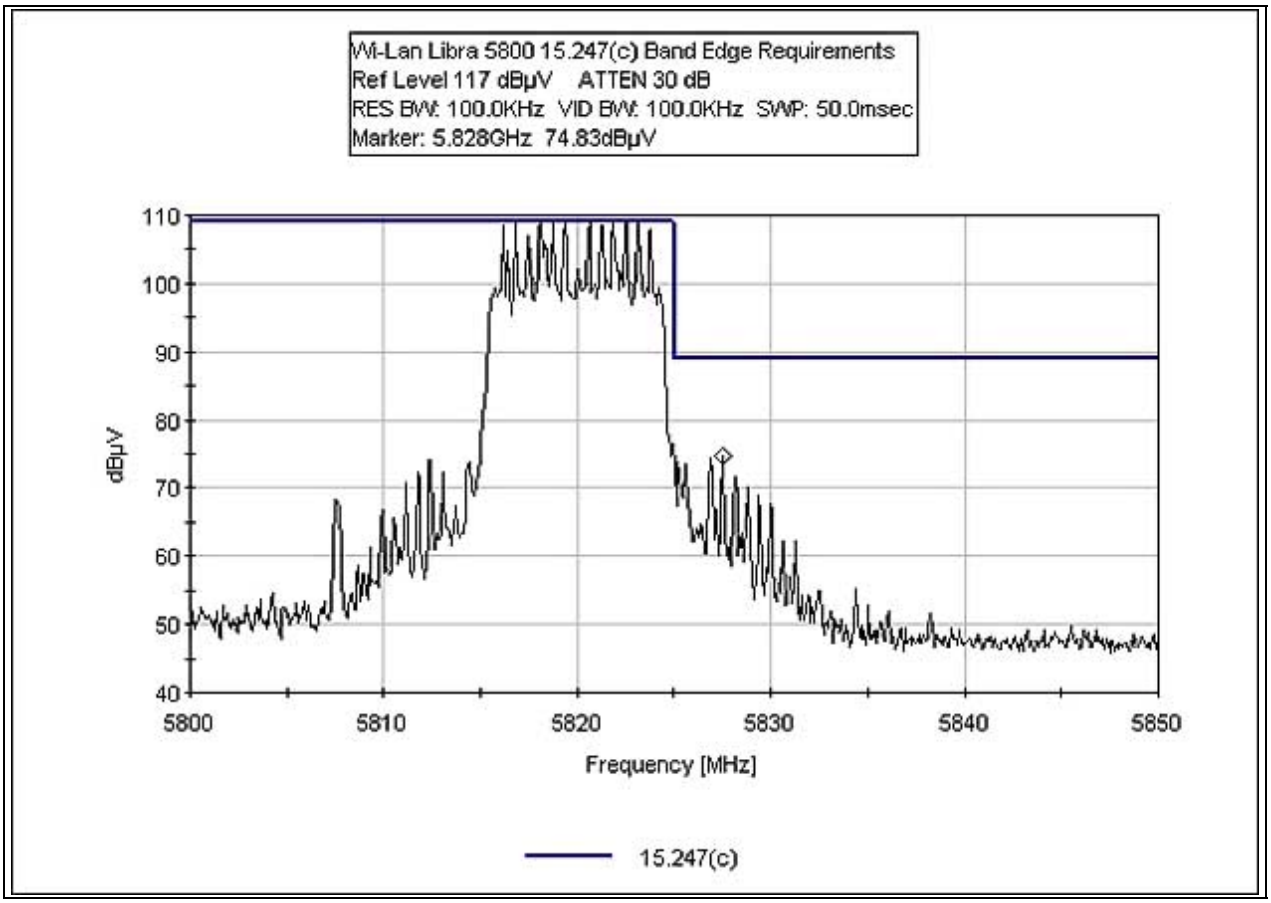


Table 7: FCC 15.247(d) Peak Power Spectral Density

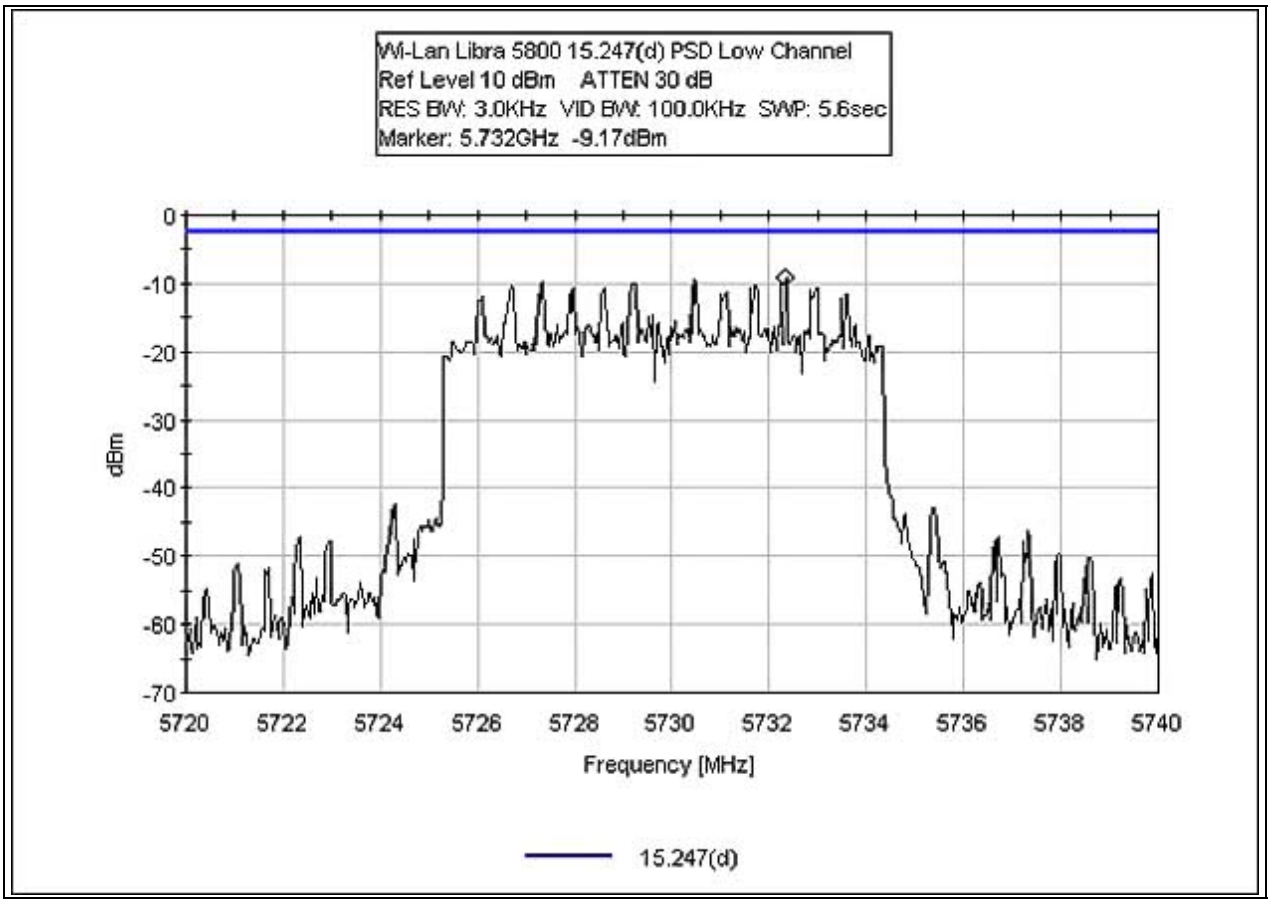
FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Att dB		Cable dB		CORRECTED READING dBµV	SPEC LIMIT dBµV	MARGIN dB	NOTES
5732.333	-9.2	10.0		0.5		1.3	8.0	-6.7	N
5777.567	-9.2	10.0		0.5		1.3	8.0	-6.7	N
5822.300	-9.0	10.0		0.5		1.5	8.0	-6.5	N

Test Method: ANSI C63.4 (1992)
Spec Limit: FCC Part 15 Subpart C Sections 15.247(d)

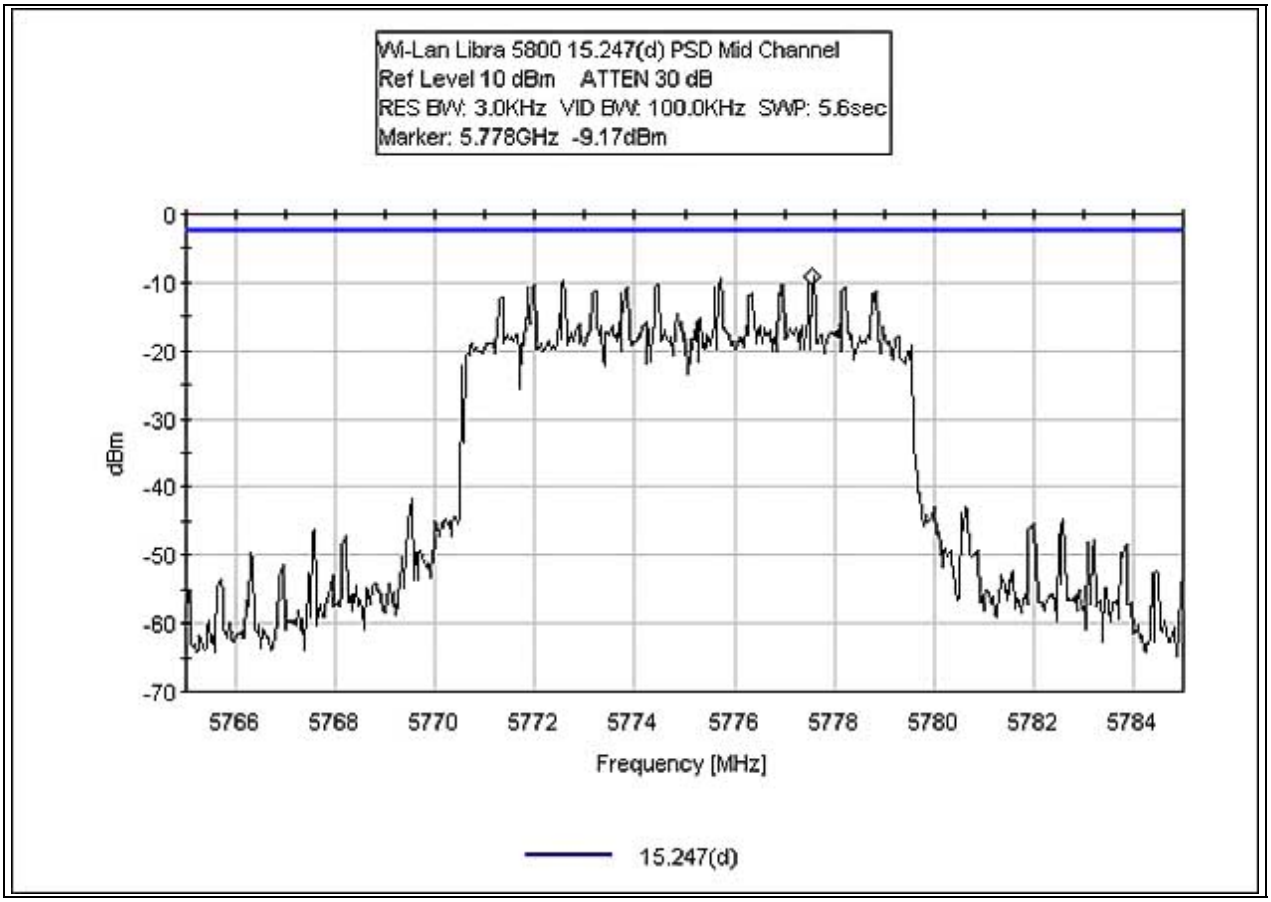
NOTES: N = No Polarization

COMMENTS: EUT is a wireless network base station transmitter. EUT is transmitting continuously on a set channel. The frequencies chosen for the upper and lower channels are such that the channel is as close to the band edge as practical. Equipment is transmitting at its maximum power output setting. Frequency Range Investigated: Carrier. Channel Selections are as follows: Low Channel = 5730 MHz, Mid Channel = 5775 MHz, High Channel = 5820 MHz.

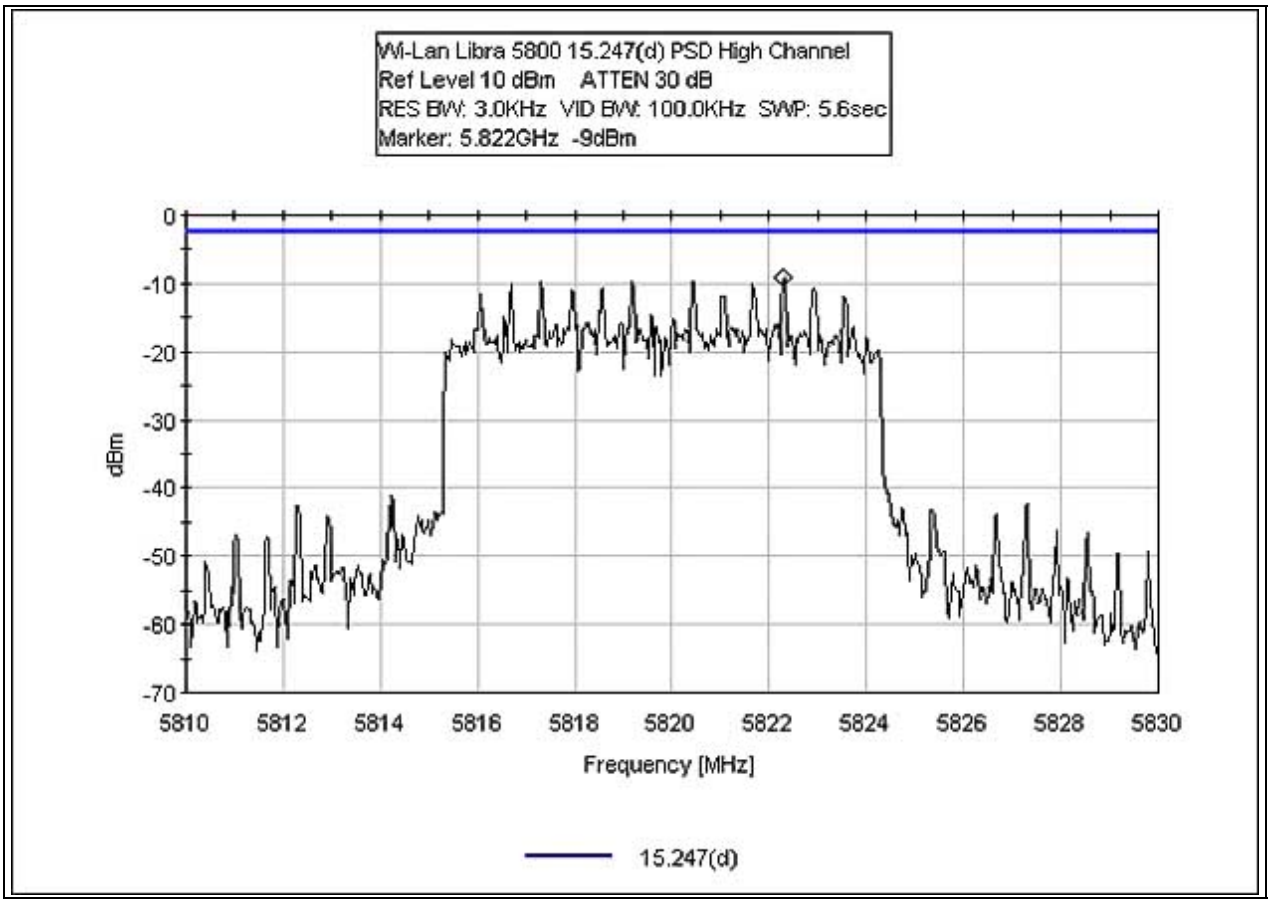
FCC 15.247(d) PEAK POWER SPECTRAL DENSITY LOW CHANNEL



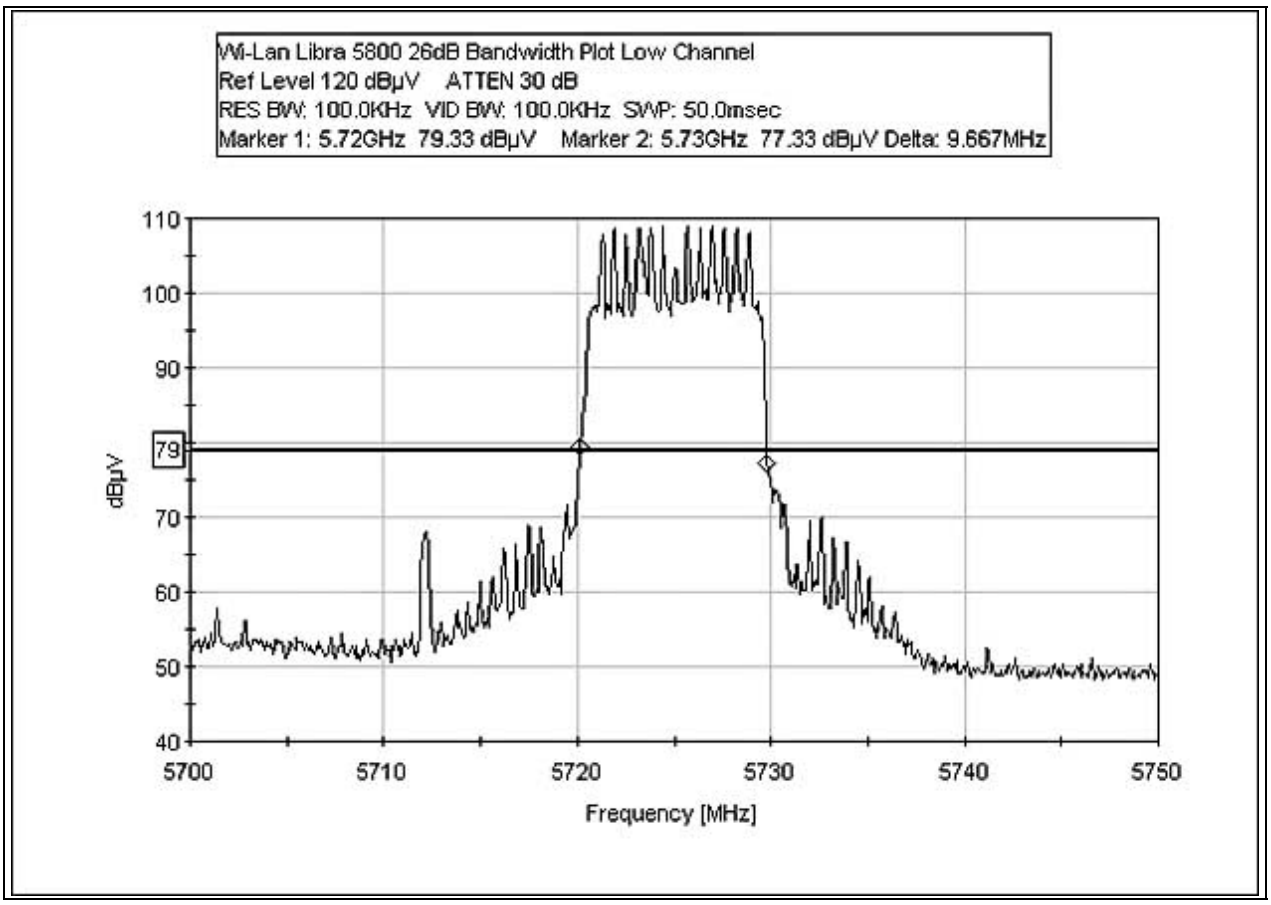
FCC 15.247(d) PEAK POWER SPECTRAL DENSITY MID CHANNEL



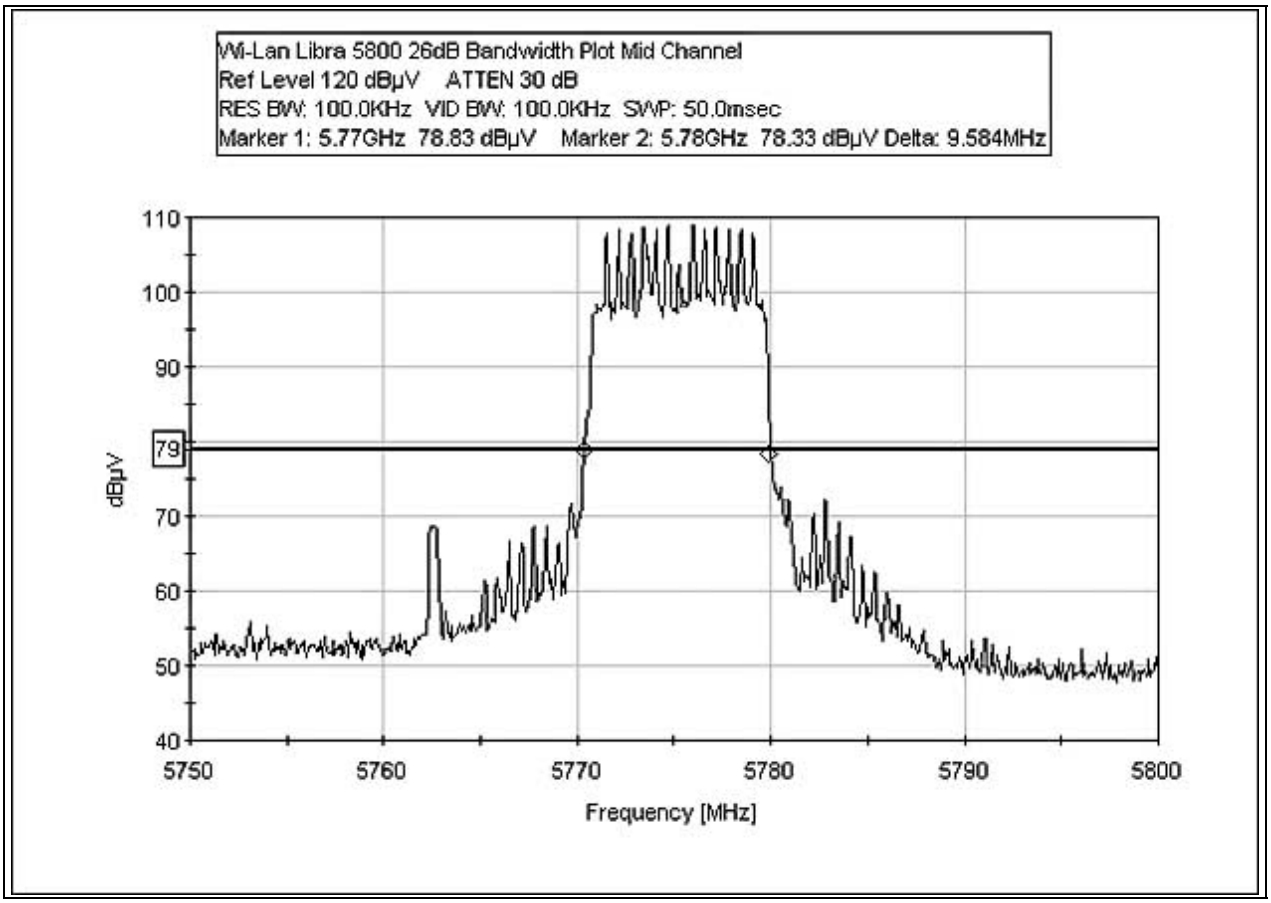
FCC 15.247(d) PEAK POWER SPECTRAL DENSITY HIGH CHANNEL



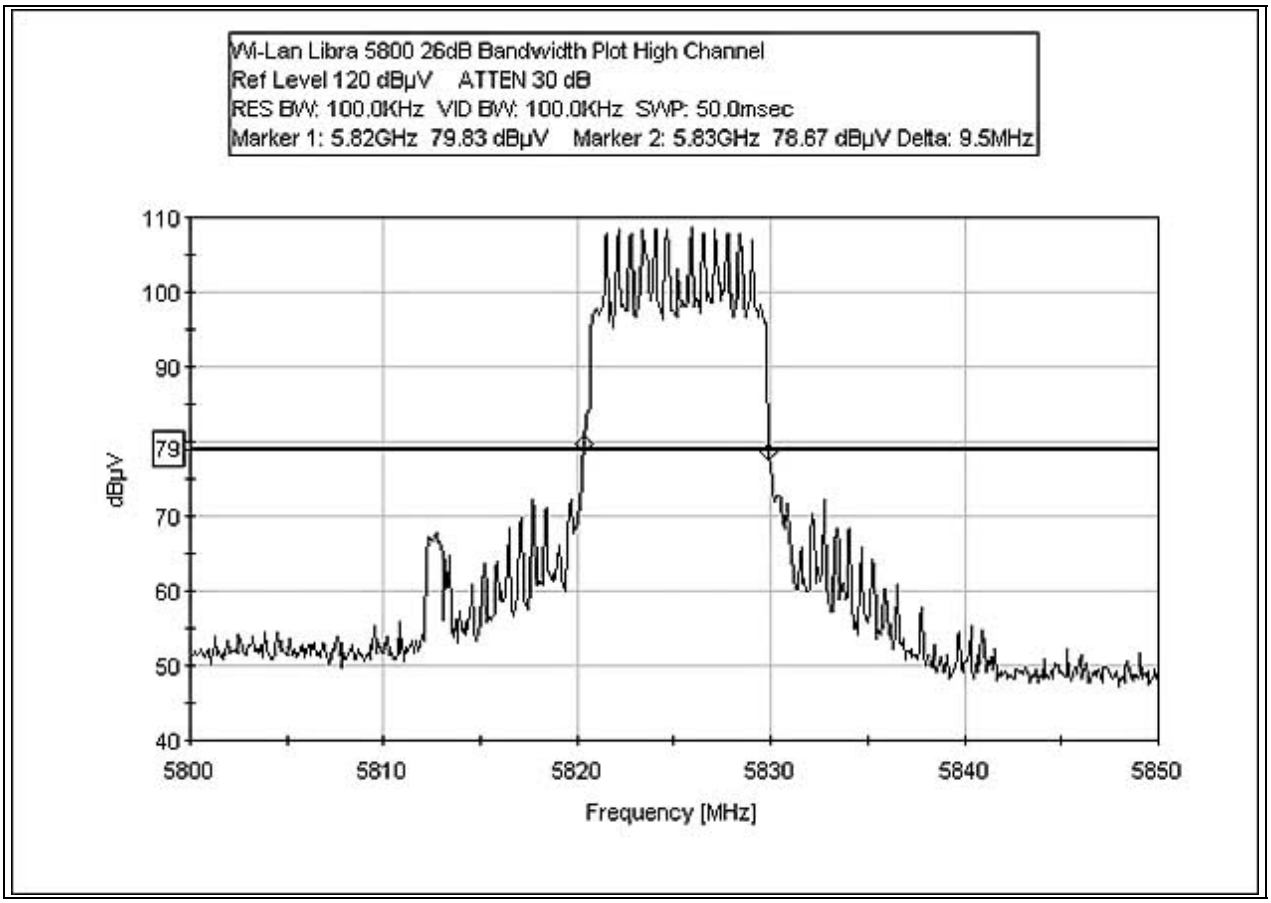
RSS 210 26 dB BANDWIDTH PLOT LOW CHANNEL



RSS 210 26 dB BANDWIDTH PLOT MID CHANNEL



RSS 210 26 dB BANDWIDTH HIGH CHANNEL



Maximum Permissible Exposure Calculations

Date of Report: September 12, 2003

Calculations prepared for:

Wi-Lan Inc.

Calculations prepared by:

Randal Clark
CKC Laboratories, Inc.
5473A Clouds Rest Road
Mariposa, CA 95338

Model Number: Libra 5800

Fundamental Operating Frequency: 5.725-5.825 GHz

Maximum Rated Output Power: 30.0 dBm
Measured Output Power: 29.1 dBm

Calculation of measured EIRP is based on the use of a 23dBi gain antenna. The measured output power is 29.1dBm + 23dBi = 52.1 dBm (EIRP). MPE calculations are based on EIRP output power.

Power Output and Operating Frequency Information used for these calculations were from:
CKC Laboratories, Test Report #

MPE Limit in accordance with 1.1310(b): Limits for general population/uncontrolled exposure

MPE Limit = 1 (mW/cm^2)

EIRP (mW)	Distance (cm)	Power Density (mW/cm^2)	Result
162181.01	**113.6**	**1**	**Pass**

$$PowerDensity(mW/cm^2) = \frac{EIRP}{4\pi d^2}$$ Given: **EIRP** in *mW* and **d** in *cm*

As can be seen from the MPE results, this device passes the limits specified in 1.1310 at a distance of 1.2 meters and at a output power of 52.1dBm (EIRP). Users and installers must be provided with appropriate antenna installation instructions and transmitter operating conditions to satisfy RF exposure compliance.

TEMPERATURE AND HUMIDITY DURING TESTING

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

EUT SETUP

The equipment under test (EUT) was set up in a manner that represented its normal use, as shown in the photographs in Appendix A. Any special conditions required for the EUT to operate normally are identified in the comments that accompany the emissions tables. The corrected data was then compared to the applicable emission limits to determine compliance.

The cables were routed consistent with the typical application by varying the configuration of the test sample. Interface cables were connected to the available I/O ports of the test unit. The effect of varying the position of the cables was investigated to find the configuration that produced maximum emissions. I/O cables were of the type and length specified in the individual requirements. The length of cable that produced maximum emissions was selected.

The radiated and conducted emissions data of the EUT was taken with the HP Spectrum Analyzer. Incorporating the applicable correction factors for distance, antenna, cable loss and amplifier gain, the data was reduced as shown in Table A.

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 in Table A. This reading was then compared to the applicable specification limit to determine compliance.

TABLE A: 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 in Table A were used to collect both the radiated and conducted emissions data for the EUT. For frequencies from 30 to 1000 MHz, the biconilog antenna was used. The horn antenna was used for frequencies above 1000 MHz. Conducted emissions tests required the use of the FCC type LISNs.

The HP spectrum analyzer was used for all measurements. Table B shows the analyzer bandwidth settings that were used in designated frequency bands. For conducted emissions, an appropriate reference level and a vertical scale size of 10 dB per division were used. A 10 dB external attenuator was also used during conducted tests, with internal offset correction in the analyzer. During radiated testing, the measurements were made with 0 dB of attenuation, a reference level of 97 dBµV, and a vertical scale of 10 dB per division.

SPECTRUM ANALYZER DETECTOR FUNCTIONS

The notes that accompany the measurements contained in the 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 six highest readings, this is indicated as a "Q" or an "A" in the appropriate table. 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 or test engineer recorded all emissions at their peak value as the frequency band selected was scanned. By combining this function with another feature of the analyzer called "peak hold," the analyzer had the ability to measure transients or low duty cycle transient emission peak levels. In this mode the analyzer 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 HP Quasi-Peak Adapter for the HP Spectrum Analyzer. The detailed procedure for making quasi peak measurements contained in the HP Quasi-Peak Adapter manual were followed.

Average

For certain frequencies, average measurements may be made using the spectrum analyzer. To make these measurements, the test engineer reduces the video bandwidth on the analyzer until the modulation of the signal is filtered out. At this point the analyzer is set into the linear mode and the scan time is reduced.

EUT TESTING

Mains Conducted Emissions

During conducted emissions testing, the EUT was located on a wooden table measuring approximately 80 cm high, 1 meter deep, and 1.5 meters in length. One wall of the room where the EUT was located has a minimum 2 meter by 2 meter conductive plane. The EUT was mounted on the wooden table 40 cm away from the conductive plane, and 80 cm from any other conductive surface.

The vertical metal plane used for conducted emissions was grounded to the earth. Power to the EUT was provided through a LISN. The LISN was grounded to the ground plane. All other objects were kept a minimum of 80 cm away from the EUT during the conducted test.

The LISNs used were 50 µH-/+50 ohms. Above 150 kHz, a 0.15 µF series capacitor was added in-line prior to connecting the analyzer to restore the proper impedance for the range. A 30 to 50 second sweep time was used for automated measurements in the frequency bands of 150 kHz to 500 kHz, and 500 kHz to 30 MHz. All readings within 20 dB of the limit were recorded, and those within 6 dB of the limit were examined with additional measurements using a slower sweep time.

Antenna Conducted Emissions

For measuring the signal strength on the RF output port of the EUT, the spectrum analyzer was connected directly to the EUT. The sweep time of the analyzer was adjusted so that the spectrum analyzer readings were always in a calibrated range. All readings within 20 dB of the limit were recorded.

Radiated Emissions

The EUT was mounted on a nonconductive, rotating table 80 cm above the conductive grid. The nonconductive table dimensions were 1 meter by 1.5 meters.

During the preliminary radiated scan, the EUT was powered up and operating in its defined FCC test mode. The frequency range of 30 MHz to 1000 MHz was scanned with the biconilog antenna located about 1.5 meter above the ground plane in the vertical polarity. During this scan, the turntable was rotated and all peaks at or near the limit were recorded. A scan of the FM band from 88 to 110 MHz was then made using a reduced resolution bandwidth and frequency span. The biconilog antenna was changed to the horizontal polarity and the above steps were repeated. For frequencies exceeding 1000 MHz, the horn antenna was used. Care was taken to ensure that no frequencies were missed within the FM and TV bands. An analysis was performed to determine if the signals that were at or near the limit were caused by an ambient transmission. If unable to determine by analysis, the equipment was powered down to make the final determination if the EUT was the source of the emission.

A thorough scan of all frequencies was made manually using a small frequency span, rotating the turntable as needed. The test engineer maximized the readings with respect to the table rotation and configuration of EUT. Maximizing of the EUT was achieved by monitoring the spectrum analyzer on a closed circuit television monitor.

TRANSMITTER CHARACTERISTICS

FCC 15.247(a)(2) Bandwidth Measurements (Direct Sequence)
The fundamental frequency was kept within the permitted band 5725-5850 MHz. The minimum 6dB bandwidth was at least 500 kHz. Refer to the following occupied bandwidth plots.

FCC 15.247(b) Peak Output Power
Frequency of Transmitter: 5725-5850 MHz

The RF conducted test was measured using a direct connection between the antenna port of the transmitter and the spectrum analyzer, through suitable attenuation. The resolution bandwidth was adjusted to greater than the 6 dB bandwidth of the emissions.

- **FCC 15.247(b)(3)** If the transmitting antenna of directional gain greater than 6 dBi was used, except as shown in sections 15.247(b)(3)(i), (ii) & (iii), the peak output power was reduced below the stated values in paragraphs (b)(1) or (b)(2) of section 15.247, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

FCC 15.247(d) Peak Power Spectral Density
The peak power spectral density conducted from the EUT to the antenna was not greater than 8 dm in any 3 kHz band during any time interval of continuous transmission.

APPENDIX A

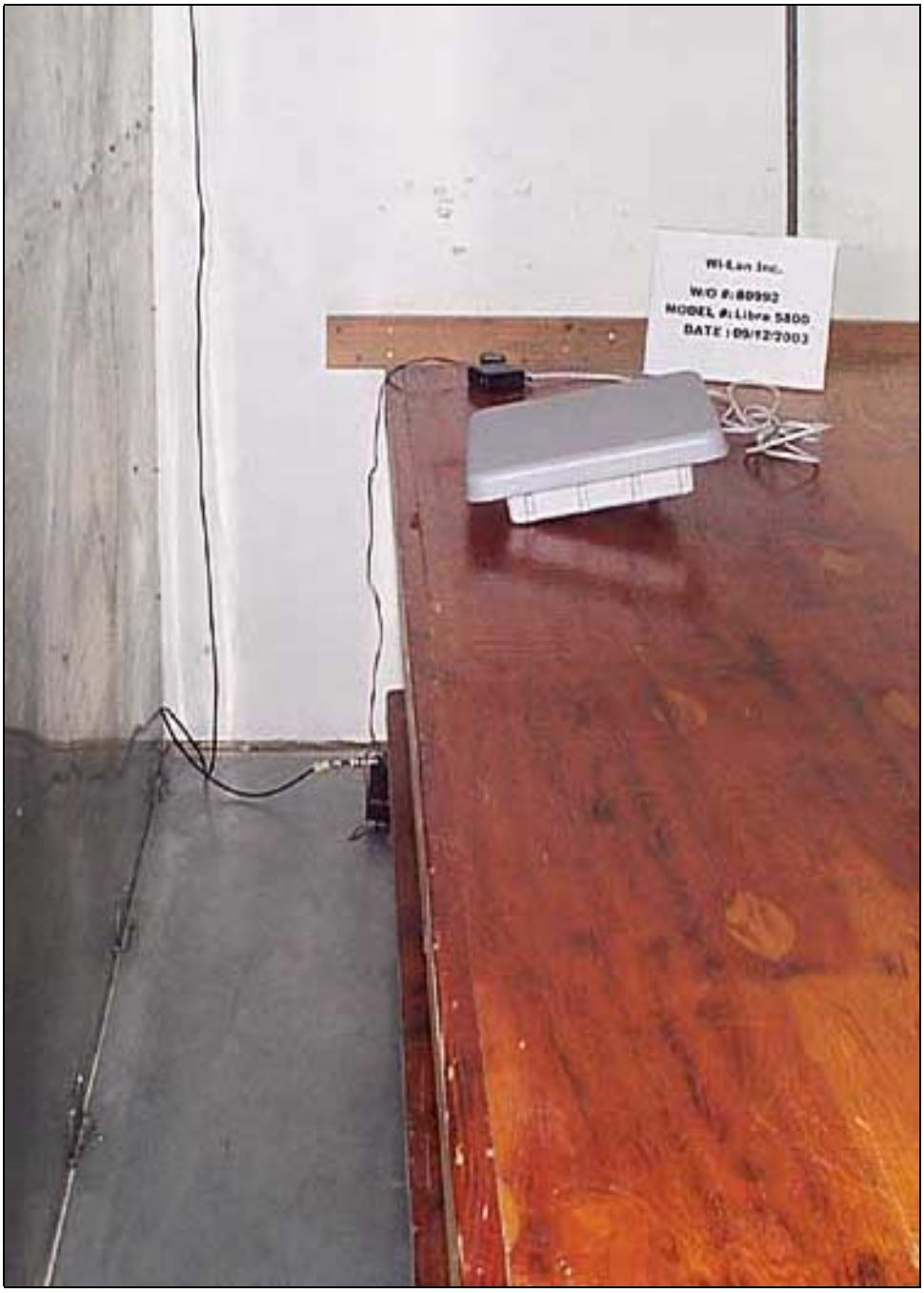
TEST SETUP PHOTOGRAPHS

PHOTOGRAPH SHOWING DIRECT CONNECT

PHOTOGRAPH SHOWING MAINS CONDUCTED EMISSIONS

Mains Conducted Emissions - Front View

PHOTOGRAPH SHOWING MAINS CONDUCTED EMISSIONS

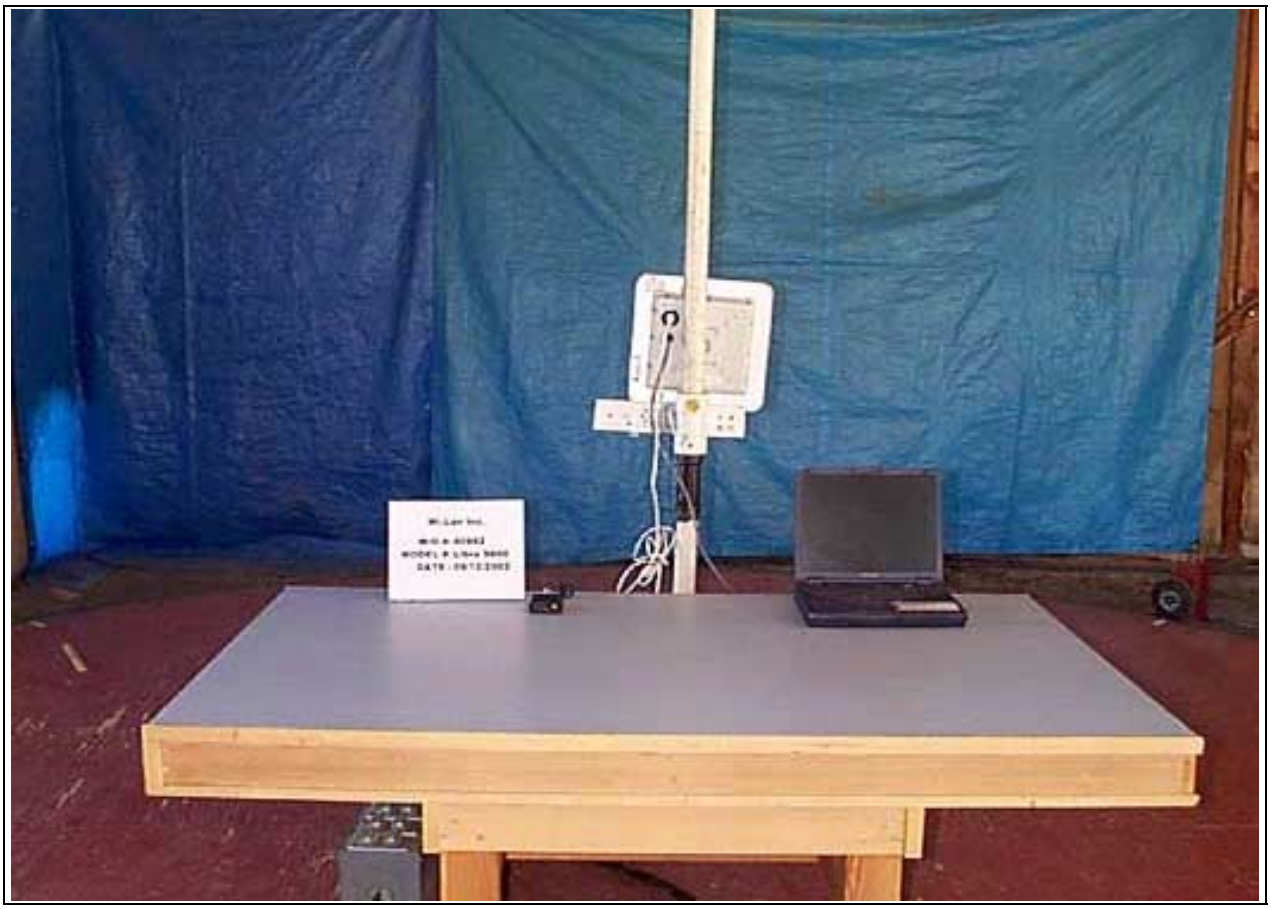


Mains Conducted Emissions - Side View

PHOTOGRAPH SHOWING RADIATED EMISSIONS

Radiated Emissions - Front View

PHOTOGRAPH SHOWING RADIATED EMISSIONS



Radiated Emissions - Back View

APPENDIX B

TEST EQUIPMENT LIST

Description	*Asset #*	*Manufacturer*	*Model #*	*Serial #*	*Cal Date*	*Cal Due*
Antenna, Biconilog	01991	Chase	CBL6111C	2456	12/13/02	12/12/04
Antennna, Horn 18-26GHz	02046	ARA	MWH-1826/B	1005	7/1/03	6/30/04
Power Stat	02037	Superior Electric	126	N/A	5/1/03	4/30/04
Spectrum Analyzer, 9kHz to 26.5 GHz	02111	HP	8593EM	3624A00159	5/12/03	5/11/05
Antennna, Horn 1-18GHz	00656	EMCO	3115	9307-4085	4/25/03	4/24/05
HF Cable, 2 foot	P01527	WL Gore	6011305-004	149047	4/10/03	4/9/04
HF Cable, 25 foot	P01353	Huber+Suhner		90148405	1/21/04	1/21/04
HF Cable, 35 foot	P01352	Huber+Suhner		90148402	1/21/03	1/21/04
Spectrum Analyzer	01406	HP	8564E	3623A00539	6/27/02	6/26/04
Antennna, Horn 26-40GHz	01414	HP	84125-80008	942126-003	7/12/02	7/11/04
Preamp	99	HP	8447D	1937A02604	3/7/03	3/7/04
LISN	374	Solar	8028-50-TS-24-BNC	901235 & 903750	7/8/03	7/8/05

APPENDIX C
MEASUREMENT DATA SHEETS

Test Location: CKC Laboratories •5473A Clouds Rest • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **Wi-Lan Inc.**
Specification: **FCC 15.207 - AVE**
Work Order #: **80992** Date: 09/12/2003
Test Type: **Conducted Emissions** Time: 12:01:46
Equipment: **Wireless Network Transmitter** Sequence#: 17
Manufacturer: Wi-Lan Tested By: Randal Clark
Model: Libra 5800 120V 60Hz
S/N: CKC080803-001

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

Function	Manufacturer	Model #	S/N
Wireless Network Transmitter*	Wi-Lan	Libra 5800	CKC080803-001
Ethernet AC/DC Adapter & Inserter	Wi-Lan / ENG	57-24-1000D	NA

Support Devices:

Function	Manufacturer	Model #	S/N

Test Conditions / Notes:

EUT is a wireless network base station transmitter. EUT is transmitting continuously on a set channel. Transmitter is set to maximum output power. The frequencies chosen for the upper and lower channels are such that the channel is as close to the band edge as practical. Frequency Range Investigated: 150kHz - 30MHz. QP margins are listed to the QP spec limit. All other margins are listed to the Average limit. Channel Selections are as follows: Low Channel = 5730 MHz, Mid Channel = 5775 MHz, High Channel = 5820 MHz. EUT is transmitting at the center channel. Modifications to EUT: DC power line has 3 turns with Steward P/N 28A2024-0A2 clipon ferrite.

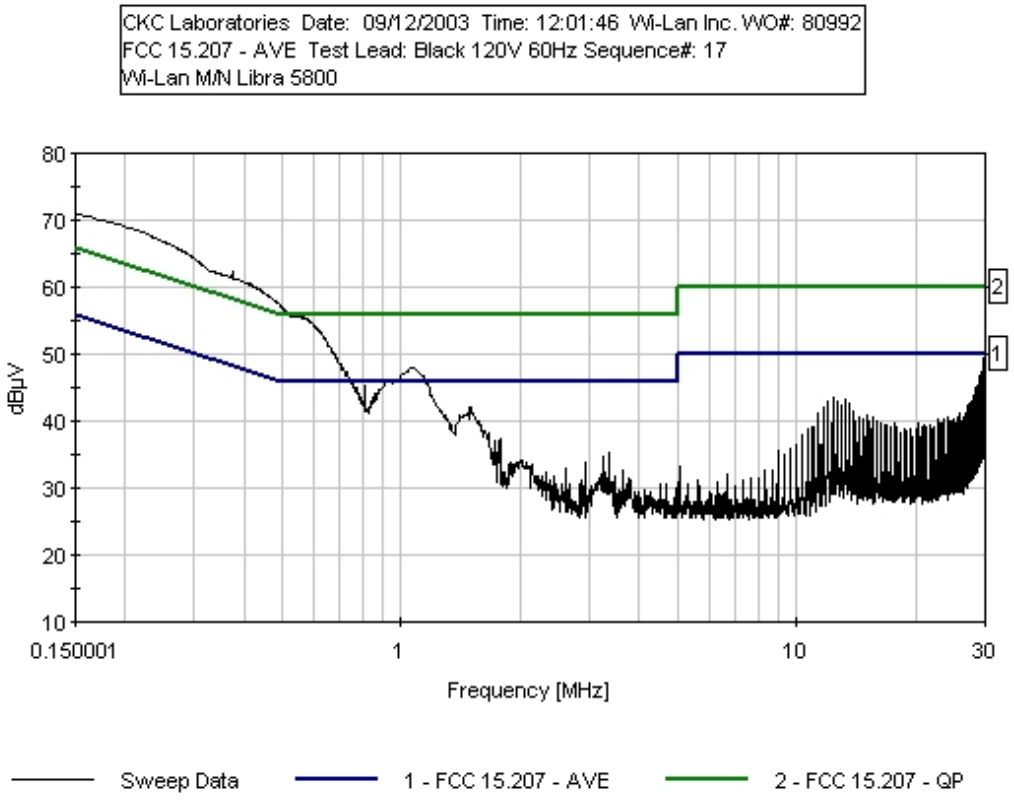
Transducer Legend:

T1=Cable & Cap (Bench)	T2=LISN-00374BK SN235

Measurement Data: Reading listed by margin. Test Lead: Black

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	150.001k QP	63.8	+0.1	+0.1			+0.0	64.0	66.0	-2.0	Black
2	29.997M	43.5	+0.3	+1.7			+0.0	45.5	50.0	-4.5	Black
3	28.667M	43.6	+0.3	+1.5			+0.0	45.4	50.0	-4.6	Black
4	29.695M	43.4	+0.3	+1.7			+0.0	45.4	50.0	-4.6	Black
5	29.642M	43.1	+0.3	+1.6			+0.0	45.0	50.0	-5.0	Black
6	28.336M	43.2	+0.3	+1.4			+0.0	44.9	50.0	-5.1	Black
7	29.647M	42.4	+0.3	+1.6			+0.0	44.3	50.0	-5.7	Black
8	29.668M Ave	42.0	+0.3	+1.7			+0.0	44.0	50.0	-6.0	Black
^	29.668M	47.3	+0.3	+1.7			+0.0	49.3	50.0	-0.7	Black

10	28.005M	42.0	+0.3	+1.4		+0.0	43.7	50.0	-6.3	Black
11	29.939M	41.7	+0.3	+1.7		+0.0	43.7	50.0	-6.3	Black
12	12.336M	43.0	+0.2	+0.4		+0.0	43.6	50.0	-6.4	Black
13	13.318M	42.5	+0.2	+0.4		+0.0	43.1	50.0	-6.9	Black
14	27.664M	41.4	+0.3	+1.3		+0.0	43.0	50.0	-7.0	Black
15	12.005M	42.4	+0.2	+0.3		+0.0	42.9	50.0	-7.1	Black
16	12.677M	42.3	+0.2	+0.4		+0.0	42.9	50.0	-7.1	Black
17	29.966M	40.7	+0.3	+1.7		+0.0	42.7	50.0	-7.3	Black
18	29.331M Ave	40.4	+0.3	+1.6		+0.0	42.3	50.0	-7.7	Black
^	29.331M	45.5	+0.3	+1.6		+0.0	47.4	50.0	-2.6	Black
20	29.000M Ave	40.0	+0.3	+1.6		+0.0	41.9	50.0	-8.1	Black
^	29.000M	45.0	+0.3	+1.6		+0.0	46.9	50.0	-3.1	Black
22	150.001k Ave	33.3	+0.1	+0.1		+0.0	33.5	56.0	-22.5	Black
^	150.001k	70.8	+0.1	+0.1		+0.0	71.0	56.0	+15.0	Black
24	809.939k Ave	14.0	+0.0	+0.1		+0.0	14.1	46.0	-31.9	Black
^	809.939k	45.3	+0.0	+0.1		+0.0	45.4	46.0	-0.6	Black
26	1.058M Ave	13.7	+0.0	+0.0		+0.0	13.7	46.0	-32.3	Black
^	1.058M	47.9	+0.0	+0.0		+0.0	47.9	46.0	+1.9	Black


CKC Laboratories Date: 09/12/2003 Time: 12:01:46 Wi-Lan Inc. WO#: 80992
FCC 15.207 - AVE Test Lead: Black 120V 60Hz Sequence#: 17
Wi-Lan M/N Libra 5800
80
70
60
50
40
30
20
10
dBµV
0.150001
1
10
30
Frequency [MHz]
2
1
Sweep Data
1 - FCC 15.207 - AVE
2 - FCC 15.207 - QP

Test Location: CKC Laboratories •5473A Clouds Rest • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **Wi-Lan Inc.**
Specification: **FCC 15.207 - QP**
Work Order #: **80992** Date: 09/12/2003
Test Type: **Conducted Emissions** Time: 12:32:28
Equipment: **Wireless Network Transmitter** Sequence#: 18
Manufacturer: Wi-Lan Tested By: Randal Clark
Model: Libra 5800 120V 60Hz
S/N: CKC080803-001

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

Function	Manufacturer	Model #	S/N
Wireless Network Transmitter*	Wi-Lan	Libra 5800	CKC080803-001
Ethernet AC/DC Adapter & Inserter	Wi-Lan / ENG	57-24-1000D	NA

Support Devices:

Function	Manufacturer	Model #	S/N

Test Conditions / Notes:

EUT is a wireless network base station transmitter. EUT is transmitting continuously on a set channel. Transmitter is set to maximum output power. The frequencies chosen for the upper and lower channels are such that the channel is as close to the band edge as practical. Frequency Range Investigated: 150kHz - 30MHz. QP margins are listed to the QP spec limit. All other margins are listed to the Average limit. Channel Selections are as follows: Low Channel = 5730 MHz, Mid Channel = 5775 MHz, High Channel = 5820 MHz. EUT is transmitting at the center channel. Modifications to EUT: DC power line has 3 turns with Steward P/N 28A2024-0A2 clipon ferrite.

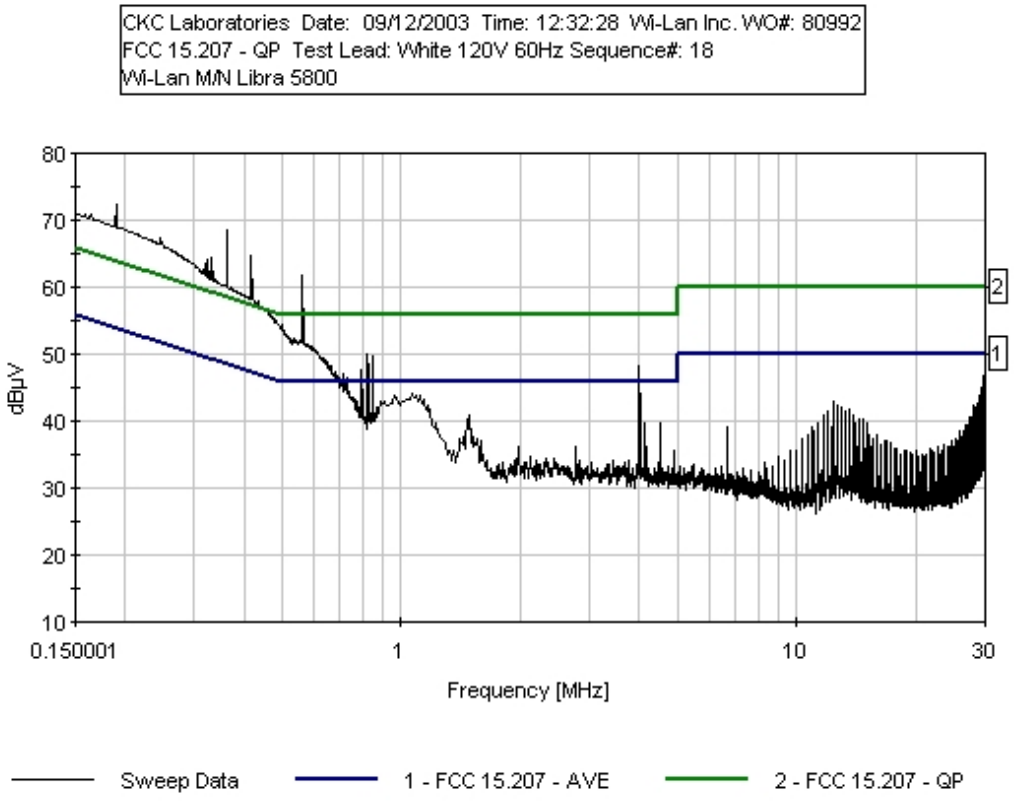
Transducer Legend:

T1=Cable & Cap (Bench)	T2=LISN-00374WH SN750

Measurement Data: Reading listed by margin. Test Lead: White

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	150.100k QP	64.6	+0.1	+0.2			+0.0	64.9	66.0	-1.1	White
^	150.100k	70.8	+0.1	+0.2			+0.0	71.1	56.0	+15.1	White
3	29.331M	42.6	+0.3	+2.2			+0.0	45.1	50.0	-4.9	White
4	1.489M	40.8	+0.0	+0.2			+0.0	41.0	46.0	-5.0	White
5	4.506M	39.4	+0.1	+0.3			+0.0	39.8	46.0	-6.2	White
6	28.997M	41.3	+0.3	+2.1			+0.0	43.7	50.0	-6.3	White
7	4.145M	39.2	+0.1	+0.3			+0.0	39.6	46.0	-6.4	White
8	12.336M	42.2	+0.2	+0.5			+0.0	42.9	50.0	-7.1	White
9	28.667M	40.3	+0.3	+2.1			+0.0	42.7	50.0	-7.3	White

10 Ave	29.666M	39.6	+0.3	+2.2		+0.0	42.1	50.0	-7.9	White
^	29.666M	44.4	+0.3	+2.2		+0.0	46.9	50.0	-3.1	White
12 Ave	150.100k	40.8	+0.1	+0.2		+0.0	41.1	56.0	-14.9	White
13 Ave	189.997k	37.7	+0.0	+0.1		+0.0	37.8	54.0	-16.2	White
^	189.997k	72.4	+0.0	+0.1		+0.0	72.5	54.0	+18.5	White
15 Ave	791.759k	20.2	+0.0	+0.1		+0.0	20.3	46.0	-25.7	White
^	791.759k	47.6	+0.0	+0.1		+0.0	47.7	46.0	+1.7	White
17 Ave	3.985M	19.3	+0.1	+0.3		+0.0	19.7	46.0	-26.3	White
^	3.985M	47.8	+0.1	+0.3		+0.0	48.2	46.0	+2.2	White
19 Ave	362.708k	22.0	+0.1	+0.2		+0.0	22.3	48.7	-26.4	White
^	362.708k	68.3	+0.1	+0.2		+0.0	68.6	48.7	+19.9	White
21 Ave	822.665k	19.4	+0.0	+0.1		+0.0	19.5	46.0	-26.5	White
^	822.665k	50.0	+0.0	+0.1		+0.0	50.1	46.0	+4.1	White
23 Ave	562.690k	19.3	+0.1	+0.1		+0.0	19.5	46.0	-26.5	White
^	562.690k	61.5	+0.1	+0.1		+0.0	61.7	46.0	+15.7	White
25 Ave	1.068M	18.5	+0.0	+0.2		+0.0	18.7	46.0	-27.3	White
^	1.068M	43.9	+0.0	+0.2		+0.0	44.1	46.0	-1.9	White
27 Ave	417.249k	19.9	+0.1	+0.2		+0.0	20.2	47.5	-27.3	White
^	417.249k	64.3	+0.1	+0.2		+0.0	64.6	47.5	+17.1	White
29 Ave	4.025M	17.9	+0.1	+0.3		+0.0	18.3	46.0	-27.7	White
^	4.025M	43.8	+0.1	+0.3		+0.0	44.2	46.0	-1.8	White


CKC Laboratories Date: 09/12/2003 Time: 12:32:28 Wi-Lan Inc. WO#: 80992
FCC 15.207 - QP Test Lead: White 120V 60Hz Sequence#: 18
Wi-Lan M/N Libra 5800
80
70
60
50
40
30
20
10
dBµV
0.150001
1
10
30
Frequency [MHz]
2
1
Sweep Data
1 - FCC 15.207 - AVE
2 - FCC 15.207 - QP

Test Location: CKC Laboratories •5473A Clouds Rest • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **Wi-Lan Inc.**
Specification: **FCC 15.209**
Work Order #: **80992** Date: 09/12/2003
Test Type: **Radiated Scan** Time: 13:23:13
Equipment: **Wireless Network Transmitter** Sequence#: 11
Manufacturer: Wi-Lan Tested By: Randal Clark
Model: Libra 5800
S/N: CKC081303-003

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

Function	Manufacturer	Model #	S/N
Wireless Network Transmitter*	Wi-Lan	Libra 5800	CKC081303-003

Support Devices:

Function	Manufacturer	Model #	S/N
Power Supply	Wi-Lan		CKC080803-002
Laptop Power Supply	Toshiba	PA2444U	0007A0742953
Laptop	Toshiba	PS277U-6M9J0	80857659U

Test Conditions / Notes:

EUT is a wireless network base station transmitter. EUT is transmitting continuously on a set channel. Transmitter is set to maximum output power. The frequencies chosen for the upper and lower channels are such that the channel is as close to the band edge as practical. Frequency Range Investigated: 30 - 1000MHz. Channel Selections are as follows: Low Channel = 5730 MHz, Mid Channel = 5775 MHz, High Channel = 5820 MHz. Data reprentative of all high middle and low transmit channels. Modifications to EUT: DC power line has 3 turns with Steward P/N 28A2024-0A2 clipon ferrite.

Transducer Legend:

T1=Bilog Site B T2=Amp - S/N 604
T3=Cable - 10 Meter

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

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1 QP	31.357M	48.8	+17.2	-27.3	+0.7		+0.0	39.4	40.0	-0.6	Vert
^	31.347M	52.4	+17.2	-27.3	+0.7		+0.0	43.0	40.0	+3.0	Vert
3 QP	32.022M	48.7	+16.8	-27.3	+0.7		+0.0	38.9	40.0	-1.1	Vert
^	31.987M	49.5	+16.8	-27.3	+0.7		+0.0	39.7	40.0	-0.3	Vert
5	78.030M	52.6	+6.5	-27.2	+1.5		+0.0	33.4	40.0	-6.6	Vert
6	31.330M	42.7	+17.2	-27.3	+0.7		+0.0	33.3	40.0	-6.7	Horiz
7	76.680M	51.9	+6.4	-27.2	+1.4		+0.0	32.5	40.0	-7.5	Vert
8	76.360M	51.3	+6.4	-27.2	+1.4		+0.0	31.9	40.0	-8.1	Vert

9	32.000M	41.6	+16.8	-27.3	+0.7	+0.0	31.8	40.0	-8.2	Horiz
10	34.330M	40.9	+15.6	-27.3	+0.8	+0.0	30.0	40.0	-10.0	Horiz
11	73.730M	49.0	+6.1	-27.2	+1.4	+0.0	29.3	40.0	-10.7	Vert
12	107.360M	47.3	+10.0	-27.2	+1.6	+0.0	31.7	43.5	-11.8	Vert
13	110.960M	46.4	+10.3	-27.2	+1.6	+0.0	31.1	43.5	-12.4	Vert
14	109.660M	46.4	+10.2	-27.2	+1.6	+0.0	31.0	43.5	-12.5	Vert
15	111.680M	46.1	+10.3	-27.2	+1.6	+0.0	30.8	43.5	-12.7	Vert
16	108.710M	46.0	+10.1	-27.2	+1.6	+0.0	30.5	43.5	-13.0	Vert
17	112.360M	45.0	+10.4	-27.2	+1.7	+0.0	29.9	43.5	-13.6	Vert
18	79.960M	44.9	+6.7	-27.2	+1.5	+0.0	25.9	40.0	-14.1	Vert
19	113.330M	44.2	+10.5	-27.2	+1.7	+0.0	29.2	43.5	-14.3	Vert
20	33.250M	34.1	+16.2	-27.3	+0.8	+0.0	23.8	40.0	-16.2	Horiz
21	65.330M	42.6	+5.9	-27.2	+1.2	+0.0	22.5	40.0	-17.5	Vert
22	114.330M	40.7	+10.5	-27.2	+1.7	+0.0	25.7	43.5	-17.8	Vert
23	66.360M	41.9	+5.8	-27.2	+1.2	+0.0	21.7	40.0	-18.3	Vert
24	115.330M	38.8	+10.6	-27.2	+1.7	+0.0	23.9	43.5	-19.6	Vert
25	145.060M	37.8	+10.6	-27.0	+1.9	+0.0	23.3	43.5	-20.2	Vert
26	149.630M	37.8	+10.4	-27.0	+1.9	+0.0	23.1	43.5	-20.4	Vert
27	67.530M	39.7	+5.8	-27.2	+1.3	+0.0	19.6	40.0	-20.4	Vert
28	150.610M	37.7	+10.4	-27.0	+1.9	+0.0	23.0	43.5	-20.5	Vert
29	129.030M	36.3	+11.1	-27.2	+1.7	+0.0	21.9	43.5	-21.6	Horiz
30	148.010M	36.5	+10.5	-27.0	+1.9	+0.0	21.9	43.5	-21.6	Vert
31	116.030M	36.8	+10.6	-27.2	+1.7	+0.0	21.9	43.5	-21.6	Vert

32	126.650M	36.0	+11.2	-27.2	+1.7	+0.0	21.7	43.5	-21.8	Horiz
33	64.510M	38.3	+5.9	-27.3	+1.2	+0.0	18.1	40.0	-21.9	Vert
34	122.980M	35.3	+11.1	-27.2	+1.7	+0.0	20.9	43.5	-22.6	Horiz
35	124.650M	34.8	+11.2	-27.2	+1.7	+0.0	20.5	43.5	-23.0	Horiz

Test Location: CKC Laboratories •5473A Clouds Rest • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **Wi-Lan Inc.**
Specification: **FCC 15.209**
Work Order #: **80992** Date: 09/12/2003
Test Type: **Radiated Scan** Time: 14:41:10
Equipment: **Wireless Network Transmitter** Sequence#: 12
Manufacturer: Wi-Lan Tested By: Randal Clark
Model: Libra 5800
S/N: CKC081303-003

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

Function	Manufacturer	Model #	S/N
Wireless Network Transmitter*	Wi-Lan	Libra 5800	CKC081303-003
Ethernet AC/DC Adapter & Inserter	Wi-Lan / ENG	57-24-1000D	NA

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop Power Supply	Toshiba	PA2444U	0007A0742953
Laptop	Toshiba	PS277U-6M9J0	80857659U

Test Conditions / Notes:

EUT is a wireless network base station transmitter. EUT is transmitting continuously on a set channel. Transmitter is set to maximum output power. The frequencies chosen for the upper and lower channels are such that the channel is as close to the band edge as practical. Frequency Range Investigated: 1 - 40GHz. Channel Selections are as follows: Low Channel = 5730 MHz, Mid Channel = 5775 MHz, High Channel = 5820 MHz. Data reprentative of all high middle and low transmit channels. Modifications to EUT: DC power line has 3 turns with Steward P/N 28A2024-0A2 clipon ferrite. Readings from the second harmonic and above represent ambient noise floor levels.

Transducer Legend:

T1=Amp - S/N 301	T2=Horn AN 00656 1-18 GHz (Mariposa)
T3=Cable HF P01527	T4=Cable 35' Blue SMA CKC P1352
T5=Cable 25' blue SMA ANP01353	

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	5893.250M	30.3	-34.8 +8.4	+34.4	+0.6	+9.0	+0.0	47.9	54.0	-6.1	Vert
2	17321.020M	-2.3	-33.2 +18.3	+41.7	+1.1	+19.4	+0.0	45.1	54.0	-8.9	Vert
3	11547.350M	10.8	-34.7 +13.2	+38.2	+0.9	+14.4	+0.0	42.8	54.0	-11.2	Vert
4	17321.030M	-5.0	-33.2 +18.3	+41.7	+1.1	+19.4	+0.0	42.3	54.0	-11.7	Horiz
5	5690.250M	23.9	-34.7 +8.2	+34.6	+0.6	+8.8	+0.0	41.4	54.0	-12.6	Vert
6	11547.340M	7.9	-34.7 +13.2	+38.2	+0.9	+14.4	+0.0	39.9	54.0	-14.1	Horiz

Test Location: CKC Laboratories •5473A Clouds Rest • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **Wi-Lan Inc.**
Specification: **15.247(b)(3)**
Work Order #: **80992** Date: 08/12/2003
Test Type: **Antenna Terminals** Time: 14:38:29
Equipment: **Wireless Network Transmitter** Sequence#: 1
Manufacturer: Wi-Lan Tested By: Randal Clark
Model: Libra 5800
S/N: CKC080803-001

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

Function	Manufacturer	Model #	S/N
Wireless Network Transmitter*	Wi-Lan	Libra 5800	CKC080803-001

Support Devices:

Function	Manufacturer	Model #	S/N
Power Supply	Wi-Lan		CKC080803-002
Laptop Power Supply	Toshiba	PA2444U	0007A0742953
Laptop	Toshiba	PS277U-6M9J0	80857659U

Test Conditions / Notes:

EUT is a wireless network base station transmitter. EUT is transmitting continuously on a set channel. The frequencies chosen for the upper and lower channels are such that the channel is as close to the band edge as practical. Equipment is transmitting at its maximum power output setting. Frequency Range Investigated: Carrier. RBW = 2MHz VBW = 3MHz. The bandwidth of the measureing reciever is adjusted for the emissions bandwidth as follows: The 6dB bandwidth is 7.7MHz, the RBW used is 3MHz, therefore a correction factor is used as defined by CF = 10 * LOG (BW1/BW2). In this case, the correction factor is 10 * LOG (7.7 / 2.0) = 5.8dB. Channel Selections are as follows: Low Channel = 5730 MHz, Mid Channel = 5775 MHz, High Channel = 5820 MHz. Temperature 73ºF, Humidity 56%.

Transducer Legend:

T1=Att 10dB AN02139 T2=CABLE - HF Kit ANP04292
T3=BW Correction Factor

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

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	5729.700M	119.8	+10.0	+0.5	+5.8		+0.0	136.1	137.0	-0.9	None
2	5729.667M	119.8	+10.0	+0.5	+5.8		+0.0	136.1	137.0 -15% Nominal Voltage	-0.9	None
3	5729.600M	119.8	+10.0	+0.5	+5.8		+0.0	136.1	137.0 +15% Nominal Voltage	-0.9	None
4	5775.066M	119.5	+10.0	+0.5	+5.8		+0.0	135.8	137.0 -15% Nominal Voltage	-1.2	None
5	5775.066M	119.5	+10.0	+0.5	+5.8		+0.0	135.8	137.0 +15% Nominal Voltage	-1.2	None

6	5819.800M	119.5	+10.0	+0.5	+5.8	+0.0	135.8	137.0 -15% Nominal Voltage	-1.2	None
7	5819.733M	119.5	+10.0	+0.5	+5.8	+0.0	135.8	137.0 +15% Nominal Voltage	-1.2	None
8	5819.667M	119.5	+10.0	+0.5	+5.8	+0.0	135.8	137.0	-1.2	None
9	5774.900M	119.5	+10.0	+0.5	+5.8	+0.0	135.8	137.0	-1.2	None

Test Location: CKC Laboratories •5473A Clouds Rest • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **Wi-Lan Inc.**
Specification: **15.247(c)**
Work Order #: **80992** Date: 08/12/2003
Test Type: **Antenna Terminals** Time: 4:13:34 PM
Equipment: **Wireless Network Transmitter** Sequence#: 6
Manufacturer: Wi-Lan Tested By: Randal Clark
Model: Libra 5800
S/N: CKC080803-001

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

Function	Manufacturer	Model #	S/N
Wireless Network Transmitter*	Wi-Lan	Libra 5800	CKC080803-001

Support Devices:

Function	Manufacturer	Model #	S/N
Power Supply	Wi-Lan		CKC080803-002
Laptop Power Supply	Toshiba	PA2444U	0007A0742953
Laptop	Toshiba	PS277U-6M9J0	80857659U

Test Conditions / Notes:

EUT is a wireless network base station transmitter. EUT is transmitting continuously on a set channel. Transmitter is set to maximum output power. The frequencies chosen for the upper and lower channels are such that the channel is as close to the band edge as practical. Low Channel Selected. Frequency Range Investigated: 30 - 1000 MHz. No EUT emissions detected within 20dB of the limit in this frequency range. Channel Selections are as follows: Low Channel = 5730 MHz, Mid Channel = 5775 MHz, High Channel = 5820 MHz.

Transducer Legend:

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

#	Freq MHz	Rdng dBµV	dB	dB	dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	73.117M	32.8					+0.0	32.8	105.4	-72.6	None
2	637.308M	32.8					+0.0	32.8	105.4	-72.6	None
3	132.945M	32.0					+0.0	32.0	105.4	-73.4	None
4	472.564M	31.8					+0.0	31.8	105.4	-73.6	None
5	33.512M	31.3					+0.0	31.3	105.4	-74.1	None

Test Location: CKC Laboratories •5473A Clouds Rest • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **Wi-Lan Inc.**
Specification: **15.247(c)**
Work Order #: **80992** Date: 08/12/2003
Test Type: **Antenna Terminals** Time: 4:18:06 PM
Equipment: **Wireless Network Transmitter** Sequence#: 7
Manufacturer: Wi-Lan Tested By: Randal Clark
Model: Libra 5800
S/N: CKC080803-001

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

Function	Manufacturer	Model #	S/N
Wireless Network Transmitter*	Wi-Lan	Libra 5800	CKC080803-001

Support Devices:

Function	Manufacturer	Model #	S/N
Power Supply	Wi-Lan		CKC080803-002
Laptop Power Supply	Toshiba	PA2444U	0007A0742953
Laptop	Toshiba	PS277U-6M9J0	80857659U

Test Conditions / Notes:

EUT is a wireless network base station transmitter. EUT is transmitting continuously on a set channel. Transmitter is set to maximum output power. The frequencies chosen for the upper and lower channels are such that the channel is as close to the band edge as practical. Mid Channel Selected. Frequency Range Investigated: 30 - 1000 MHz. No EUT emissions detected within 20dB of the limit in this frequency range. Channel Selections are as follows: Low Channel = 5730 MHz, Mid Channel = 5775 MHz, High Channel = 5820 MHz.

Transducer Legend:

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

#	Freq MHz	Rdng dBµV	dB	dB	dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	862.834M	32.8					+0.0	32.8	105.4	-72.6	None
2	478.824M	32.5					+0.0	32.5	105.4	-72.9	None
3	495.934M	32.5					+0.0	32.5	105.4	-72.9	None
4	569.988M	32.5					+0.0	32.5	105.4	-72.9	None
5	157.161M	32.3					+0.0	32.3	105.4	-73.1	None
6	81.431M	31.8					+0.0	31.8	105.4	-73.6	None
7	38.603M	31.7					+0.0	31.7	105.4	-73.7	None

Test Location: CKC Laboratories •5473A Clouds Rest • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **Wi-Lan Inc.**
Specification: **15.247(c)**
Work Order #: **80992** Date: 08/12/2003
Test Type: **Antenna Terminals** Time: 4:24:37 PM
Equipment: **Wireless Network Transmitter** Sequence#: 8
Manufacturer: Wi-Lan Tested By: Randal Clark
Model: Libra 5800
S/N: CKC080803-001

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

Function	Manufacturer	Model #	S/N
Wireless Network Transmitter*	Wi-Lan	Libra 5800	CKC080803-001

Support Devices:

Function	Manufacturer	Model #	S/N
Power Supply	Wi-Lan		CKC080803-002
Laptop Power Supply	Toshiba	PA2444U	0007A0742953
Laptop	Toshiba	PS277U-6M9J0	80857659U

Test Conditions / Notes:

EUT is a wireless network base station transmitter. EUT is transmitting continuously on a set channel. Transmitter is set to maximum output power. The frequencies chosen for the upper and lower channels are such that the channel is as close to the band edge as practical. High Channel Selected. Frequency Range Investigated: 30 - 1000 MHz. No EUT emissions detected within 20dB of the limit in this frequency range. Channel Selections are as follows: Low Channel = 5730 MHz, Mid Channel = 5775 MHz, High Channel = 5820 MHz.

Transducer Legend:

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

#	Freq MHz	Rdng dBµV	dB	dB	dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	996.634M	32.7					+0.0	32.7	105.4	-72.7	None
2	201.038M	32.2					+0.0	32.2	105.4	-73.2	None
3	65.932M	32.0					+0.0	32.0	105.4	-73.4	None
4	432.082M	31.8					+0.0	31.8	105.4	-73.6	None
5	53.314M	31.7					+0.0	31.7	105.4	-73.7	None

Test Location: CKC Laboratories •5473A Clouds Rest • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **Wi-Lan Inc.**
Specification: **15.247(c)**
Work Order #: **80992** Date: 08/12/2003
Test Type: **Antenna Terminals** Time: 15:48:39
Equipment: **Wireless Network Transmitter** Sequence#: 4
Manufacturer: Wi-Lan Tested By: Randal Clark
Model: Libra 5800
S/N: CKC080803-001

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

Function	Manufacturer	Model #	S/N
Wireless Network Transmitter*	Wi-Lan	Libra 5800	CKC080803-001

Support Devices:

Function	Manufacturer	Model #	S/N
Power Supply	Wi-Lan		CKC080803-002
Laptop Power Supply	Toshiba	PA2444U	0007A0742953
Laptop	Toshiba	PS277U-6M9J0	80857659U

Test Conditions / Notes:

EUT is a wireless network base station transmitter. EUT is transmitting continuously on a set channel. Transmitter is set to maximum output power. The frequencies chosen for the upper and lower channels are such that the channel is as close to the band edge as practical. Low Channel Selected. Frequency Range Investigated: 1-40GHz. Channel Selections are as follows: Low Channel = 5730 MHz, Mid Channel = 5775 MHz, High Channel = 5820 MHz.

Transducer Legend:

T1=Att 10dB AN02139	T2=CABLE - HF Kit ANP04292

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

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	5722.500M	72.8	+10.0	+0.5			+0.0	83.3	105.4	-22.1	None
2	5723.333M	71.5	+10.0	+0.5			+0.0	82.0	105.4	-23.4	None
3	5717.667M	67.5	+10.0	+0.5			+0.0	78.0	105.4	-27.4	None
4	5997.667M	67.2	+10.0	+0.5			+0.0	77.7	105.4	-27.7	None
5	5716.333M	67.0	+10.0	+0.5			+0.0	77.5	105.4	-27.9	None
6	11460.170M	66.0	+10.2	+1.0			+0.0	77.2	105.4	-28.2	None
7	6005.343M	66.7	+10.0	+0.5			+0.0	77.2	105.4	-28.2	None
8	6031.667M	63.3	+10.0	+0.5			+0.0	73.8	105.4	-31.6	None
9	5964.333M	62.3	+10.0	+0.5			+0.0	72.8	105.4	-32.6	None

10	24737.860M	60.8	+10.5	+1.3		+0.0	72.6	105.4	-32.8	None
11	24037.940M	58.5	+10.6	+1.1		+0.0	70.2	105.4	-35.2	None
12	11462.140M	57.8	+10.2	+1.0		+0.0	69.0	105.4	-36.4	None
13	37759.580M	54.0	+12.7	+2.2		+0.0	68.9	105.4	-36.5	None
14	39987.980M	49.3	+17.7	+1.9		+0.0	68.9	105.4	-36.5	None
15	5704.000M	57.5	+10.0	+0.5		+0.0	68.0	105.4	-37.4	None
16	37502.450M	52.3	+12.8	+2.4		+0.0	67.5	105.4	-37.9	None
17	21938.190M	55.5	+10.6	+1.2		+0.0	67.3	105.4	-38.1	None
18	17501.670M	55.0	+10.4	+1.0		+0.0	66.4	105.4	-39.0	None
19	19666.330M	54.5	+10.5	+1.1		+0.0	66.1	105.4	-39.3	None
20	2605.271M	55.2	+9.9	+0.2		+0.0	65.3	105.4	-40.1	None
21	2857.594M	55.0	+10.0	+0.3		+0.0	65.3	105.4	-40.1	None
22	11141.980M	53.3	+10.2	+0.9		+0.0	64.4	105.4	-41.0	None
23	1744.469M	53.7	+9.9	+0.2		+0.0	63.8	105.4	-41.6	None
24	7271.352M	53.2	+10.1	+0.5		+0.0	63.8	105.4	-41.6	None
25	5709.167M	52.8	+10.0	+0.5		+0.0	63.3	105.4	-42.1	None
26	1329.195M	52.7	+10.0	+0.2		+0.0	62.9	105.4	-42.5	None
27	9004.790M	52.3	+10.1	+0.5		+0.0	62.9	105.4	-42.5	None
28	6210.552M	52.3	+10.0	+0.5		+0.0	62.8	105.4	-42.6	None
29	31034.740M	49.5	+10.8	+2.1		+0.0	62.4	105.4	-43.0	None
30	26135.550M	49.0	+10.7	+1.4		+0.0	61.1	105.4	-44.3	None
31	3118.854M	50.8	+9.9	+0.3		+0.0	61.0	105.4	-44.4	None
32	5685.833M	50.0	+10.0	+0.4		+0.0	60.4	105.4	-45.0	None

Test Location: CKC Laboratories •5473A Clouds Rest • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **Wi-Lan Inc.**
Specification: **15.247(c)**
Work Order #: **80992** Date: 08/12/2003
Test Type: **Antenna Terminals** Time: 15:37:26
Equipment: **Wireless Network Transmitter** Sequence#: 3
Manufacturer: Wi-Lan Tested By: Randal Clark
Model: Libra 5800
S/N: CKC080803-001

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

Function	Manufacturer	Model #	S/N
Wireless Network Transmitter*	Wi-Lan	Libra 5800	CKC080803-001

Support Devices:

Function	Manufacturer	Model #	S/N
Power Supply	Wi-Lan		CKC080803-002
Laptop Power Supply	Toshiba	PA2444U	0007A0742953
Laptop	Toshiba	PS277U-6M9J0	80857659U

Test Conditions / Notes:

EUT is a wireless network base station transmitter. EUT is transmitting continuously on a set channel. Transmitter is set to maximum output power. The frequencies chosen for the upper and lower channels are such that the channel is as close to the band edge as practical. Mid Channel Selected. Frequency Range Investigated: 1-40GHz. Channel Selections are as follows: Low Channel = 5730 MHz, Mid Channel = 5775 MHz, High Channel = 5820 MHz.

Transducer Legend:

T1=Att 10dB AN02139 T2=CABLE - HF Kit ANP04292

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

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	11550.750M	71.5	+10.2	+1.0			+0.0	82.7	105.4	-22.7	None
2	5998.829M	67.0	+10.0	+0.5			+0.0	77.5	105.4	-27.9	None
3	5992.000M	66.7	+10.0	+0.5			+0.0	77.2	105.4	-28.2	None
4	6027.000M	63.2	+10.0	+0.5			+0.0	73.7	105.4	-31.7	None
5	5964.333M	62.5	+10.0	+0.5			+0.0	73.0	105.4	-32.4	None
6	24967.340M	59.2	+10.5	+1.5			+0.0	71.2	105.4	-34.2	None
7	25919.680M	58.7	+10.6	+1.5			+0.0	70.8	105.4	-34.6	None
8	39903.810M	49.7	+17.5	+1.9			+0.0	69.1	105.4	-36.3	None
9	37386.260M	52.8	+12.6	+2.5			+0.0	67.9	105.4	-37.5	None

10	21961.140M	55.7	+10.6	+1.2		+0.0	67.5	105.4	-37.9	None
11	17491.810M	55.3	+10.4	+1.0		+0.0	66.7	105.4	-38.7	None
12	22993.800M	54.7	+10.5	+1.0		+0.0	66.2	105.4	-39.2	None
13	2611.501M	54.8	+9.9	+0.2		+0.0	64.9	105.4	-40.5	None
14	6560.078M	53.5	+10.0	+0.5		+0.0	64.0	105.4	-41.4	None
15	2019.117M	53.5	+10.0	+0.2		+0.0	63.7	105.4	-41.7	None
16	7224.248M	52.8	+10.1	+0.5		+0.0	63.4	105.4	-42.0	None
17	1291.211M	52.8	+10.0	+0.2		+0.0	63.0	105.4	-42.4	None
18	31034.740M	49.8	+10.8	+2.1		+0.0	62.7	105.4	-42.7	None
19	26213.010M	50.3	+10.7	+1.4		+0.0	62.4	105.4	-43.0	None
20	3188.679M	50.8	+10.0	+0.3		+0.0	61.1	105.4	-44.3	None

Test Location: CKC Laboratories •5473A Clouds Rest • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **Wi-Lan Inc.**
Specification: **15.247(c)**
Work Order #: **80992** Date: 08/12/2003
Test Type: **Antenna Terminals** Time: 15:32:36
Equipment: **Wireless Network Transmitter** Sequence#: 2
Manufacturer: Wi-Lan Tested By: Randal Clark
Model: Libra 5800
S/N: CKC080803-001

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

Function	Manufacturer	Model #	S/N
Wireless Network Transmitter*	Wi-Lan	Libra 5800	CKC080803-001

Support Devices:

Function	Manufacturer	Model #	S/N
Power Supply	Wi-Lan		CKC080803-002
Laptop Power Supply	Toshiba	PA2444U	0007A0742953
Laptop	Toshiba	PS277U-6M9J0	80857659U

Test Conditions / Notes:

EUT is a wireless network base station transmitter. EUT is transmitting continuously on a set channel. Transmitter is set to maximum output power. The frequencies chosen for the upper and lower channels are such that the channel is as close to the band edge as practical. High Channel Selected. Frequency Range Investigated: 1-40GHz. Channel Selections are as follows: Low Channel = 5730 MHz, Mid Channel = 5775 MHz, High Channel = 5820 MHz.

Transducer Legend:

T1=Att 10dB AN02139	T2=CABLE - HF Kit ANP04292

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

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	11640.590M	76.5	+10.2	+1.0			+0.0	87.7	105.4	-17.7	None
2	5827.667M	77.2	+10.0	+0.5			+0.0	87.7	105.4	-17.7	None
3	5827.500M	76.7	+10.0	+0.5			+0.0	87.2	105.4	-18.2	None
4	5826.833M	75.3	+10.0	+0.5			+0.0	85.8	105.4	-19.6	None
5	5828.833M	72.5	+10.0	+0.5			+0.0	83.0	105.4	-22.4	None
6	5829.333M	71.0	+10.0	+0.5			+0.0	81.5	105.4	-23.9	None
7	5989.057M	66.7	+10.0	+0.5			+0.0	77.2	105.4	-28.2	None
8	5998.000M	66.3	+10.0	+0.5			+0.0	76.8	105.4	-28.6	None
9	5831.500M	62.8	+10.0	+0.5			+0.0	73.3	105.4	-32.1	None

10	24703.430M	59.2	+10.5	+1.3	+0.0	71.0	105.4	-34.4	None
11	25885.260M	58.0	+10.6	+1.5	+0.0	70.1	105.4	-35.3	None
12	21926.720M	55.7	+10.6	+1.2	+0.0	67.5	105.4	-37.9	None
13	36998.970M	52.2	+12.5	+2.7	+0.0	67.4	105.4	-38.0	None
14	5834.500M	56.3	+10.0	+0.5	+0.0	66.8	105.4	-38.6	None
15	19643.380M	55.2	+10.5	+1.1	+0.0	66.8	105.4	-38.6	None
16	17294.800M	55.2	+10.4	+1.1	+0.0	66.7	105.4	-38.7	None
17	14792.690M	54.8	+10.3	+0.7	+0.0	65.8	105.4	-39.6	None
18	2859.152M	55.0	+10.0	+0.3	+0.0	65.3	105.4	-40.1	None
19	12974.370M	54.0	+10.3	+0.8	+0.0	65.1	105.4	-40.3	None
20	1880.177M	53.0	+9.9	+0.2	+0.0	63.1	105.4	-42.3	None
21	7450.349M	52.5	+10.1	+0.5	+0.0	63.1	105.4	-42.3	None
22	1296.424M	52.7	+10.0	+0.2	+0.0	62.9	105.4	-42.5	None
23	31170.290M	48.5	+10.7	+2.0	+0.0	61.2	105.4	-44.2	None
24	5858.500M	50.7	+10.0	+0.5	+0.0	61.2	105.4	-44.2	None
25	26135.550M	49.0	+10.7	+1.4	+0.0	61.1	105.4	-44.3	None
26	3240.484M	50.3	+10.0	+0.3	+0.0	60.6	105.4	-44.8	None

Test Location: CKC Laboratories •5473A Clouds Rest • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **Wi-Lan Inc.**
Specification: **15.247(d)**
Work Order #: **80992** Date: 08/12/2003
Test Type: **Antenna Terminals** Time: 13:09:20
Equipment: **Wireless Network Transmitter** Sequence#: 5
Manufacturer: Wi-Lan Tested By: Randal Clark
Model: Libra 5800
S/N: CKC080803-001

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

Function	Manufacturer	Model #	S/N
Wireless Network Transmitter*	Wi-Lan	Libra 5800	CKC080803-001

Support Devices:

Function	Manufacturer	Model #	S/N
Power Supply	Wi-Lan		CKC080803-002
Laptop Power Supply	Toshiba	PA2444U	0007A0742953
Laptop	Toshiba	PS277U-6M9J0	80857659U

Test Conditions / Notes:

EUT is a wireless network base station transmitter. EUT is transmitting continuously on a set channel. The frequencies chosen for the upper and lower channels are such that the channel is as close to the band edge as practical. Equipment is transmitting at its maximum power output setting. Frequency Range Investigated: Carrier. Channel Selections are as follows: Low Channel = 5730 MHz, Mid Channel = 5775 MHz, High Channel = 5820 MHz.

Transducer Legend:

T1=Att 10dB AN02139	T2=CABLE - HF Kit ANP04292

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

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBm	Spec dBm	Margin dB	Polar Ant
1	5822.300M	-9.0	+10.0	+0.5			+0.0	1.5	8.0	-6.5	None
2	5777.567M	-9.2	+10.0	+0.5			+0.0	1.3	8.0	-6.7	None
3	5732.333M	-9.2	+10.0	+0.5			+0.0	1.3	8.0	-6.7	None