



**FCC CFR47 PART 15 SUBPART C
CERTIFICATION**

TEST REPORT

FOR

802.11 BASED, FIXED WIRELESS NODE

MODEL NUMBER: GATEWAY GW-1000, SEED SD-1000

FCC ID: RV7-GW-SD1000

REPORT NUMBER: 04U2523-1

ISSUE DATE: FEBRUARY 23, 2004

Prepared for
**SKYPILOT NETWORK, INC.
1301 SHOREWAY ROAD, STE 211
BELMONT
CA, 94002, USA**

Prepared by
**COMPLIANCE CERTIFICATION SERVICES
561F MONTEREY ROAD,
MORGAN HILL, CA 95037, USA
TEL: (408) 463-0885
FAX: (408) 463-0888**



TABLE OF CONTENTS

1. TEST RESULT CERTIFICATION.....	3
2. EUT DESCRIPTION.....	4
3. TEST METHODOLOGY	5
4. FACILITIES AND ACCREDITATION	5
5. CALIBRATION AND UNCERTAINTY.....	6
5.1. MEASURING INSTRUMENT CALIBRATION.....	6
5.2. MEASUREMENT UNCERTAINTY.....	6
5.3. TEST AND MEASUREMENT EQUIPMENT.....	7
6. SETUP OF EQUIPMENT UNDER TEST	8
7. APPLICABLE LIMITS AND TEST RESULTS	10
7.1. 6 dB BANDWIDTH.....	10
7.2. 99% BANDWIDTH.....	14
7.3. PEAK OUTPUT POWER.....	18
7.4. MAXIMUM PERMISSIBLE EXPOSURE	22
7.5. AVERAGE POWER.....	25
7.6. PEAK POWER SPECTRAL DENSITY	26
7.7. CONDUCTED SPURIOUS EMISSIONS.....	30
7.8. RADIATED EMISSIONS.....	37
7.8.1. TRANSMITTER RADIATED SPURIOUS EMISSIONS	37
7.8.2. TRANSMITTER RADIATED EMISSIONS ABOVE 1 GHZ	40
7.8.3. WORST-CASE RADIATED EMISSIONS BELOW 1 GHz.....	41
7.9. POWERLINE CONDUCTED EMISSIONS	45
8. SETUP PHOTOS	49

1. TEST RESULT CERTIFICATION

COMPANY NAME: SKYPILOT NETWORK, INC.
1301 SHOREWAY ROAD, STE 211
BELMONT, CA 94002, USA

EUT DESCRIPTION: 802.11 Based, Fixed Wireless Node

MODEL: Gateway GW-1000, Seed SD-1000

DATE TESTED: FEBRUARY 12 - 18, 2004

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 15 SUBPART C	NO NON-COMPLIANCE NOTED

Compliance Certification Services, Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: This document reports conditions under which testing was conducted and results of tests performed. This document may not be altered or revised in any way unless done so by Compliance Certification Services and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Compliance Certification Services will constitute fraud and shall nullify the document.

Approved & Released For CCS By:

Tested By:



MICHAEL HECKROTTE
CHIEF ENGINEER
COMPLIANCE CERTIFICATION SERVICES

FRANK IBRAHIM
EMC ENGINEER
COMPLIANCE CERTIFICATION SERVICES

2. EUT DESCRIPTION

The EUT is an 802.11a Fixed Wireless Node.

The transmitter has a maximum peak conducted output power as follows:

Frequency Band (MHz)	Mode	Output Power (dBm)	Output Power (mW)
5725 - 5825	802.11a	26.67	464.52

The radio utilizes eight identical internal antennas for diversity, each with a maximum gain of 16 dBi in the 5.8 GHz band. Operation is limited to Point-to-Point applications.

The GW-1000 and SD-1000 are differentiated only by a limited number of software features.

3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4/2001, FCC CFR 47 Part 2 and FCC CFR 47 Part 15.

4. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 561F Monterey Road, Morgan Hill, California, USA. The sites are constructed in conformance with the requirements of ANSI C63.4, ANSI C63.7 and CISPR Publication 22. All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

CCS is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at <http://www.ccsemc.com>.



No part of this report may be used to claim or imply product endorsement by NVLAP or any agency of the US Government.

5. CALIBRATION AND UNCERTAINTY

5.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

5.2. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Radiated Emission, 30 to 200 MHz	+/- 3.3 dB
Radiated Emission, 200 to 1000 MHz	+4.5 / -2.9 dB
Radiated Emission, 1000 to 2000 MHz	+4.5 / -2.9 dB
Power Line Conducted Emission	+/- 2.9 dB

Uncertainty figures are valid to a confidence level of 95%.

5.3. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST EQUIPMENT LIST				
Name of Equipment	Manufacturer	Model No.	Serial No.	Due Date
EMI Test Receiver	R & S	ESHS 20	827129/006	7/17/04
LISN, 10 kHz ~ 30 MHz	FCC	LISN-50/250-25-2	2023	10/13/04
Line Filter	Lindgren	LMF-3489	497	CNR
LISN, 10 kHz ~ 30 MHz	Solar	8012-50-R-24-BNC	8379443	10/13/04
Peak Power Meter	Agilent	E4416A	GB41291160	11/7/04
Peak / Average Power Sensor	Agilent	E9327A	US40440755	11/7/04
Spectrum Analyzer	Agilent	E4446A	MY43360112	1/13/05
EMI Receiver, 9 kHz ~ 2.9 GHz	HP	8542E	3942A00286	11/21/04
RF Filter Section	HP	85420E	3705A00256	11/21/04
Bilog Antenna	Sunol Sciences	JB1	A121003	12/22/04
Amplifier 1-26GHz	MITEQ	NSP2600-SP	924341	4/25/04
PreAmplifier 26-40 GHz	Miteq	NSP4000-SP2	924343	6/1/04
Antenna, Horn 1 ~ 18 GHz	EMCO	3115	6717	3/4/04
Antenna, Horn, 18 ~ 26 GHz	ARA	MWH-1826/B	1013	3/4/04
Antenna, Horn 26 ~ 40 GHz	ARA	MWH-2640/B	1029	12/3/04

6. SETUP OF EQUIPMENT UNDER TEST

SUPPORT EQUIPMENT

TEST PERIPHERALS				
Device Type	Manufacturer	Model Number	Serial Number	FCC ID
Laptop	Dell	PP01X	CN-03N642-12961-21E-8194	DoC
PS/2 Mouse	HP	M-S34	LZA81054997	DZL211029
PRINTER	HP	2225C	2541S41679	BS46XU2225C
Power Junction Box	Skypilot	640-00009-01	n/a	n/a
USB Mouse	Microsoft	X08-71118 PID 56180	3902C693	DoC

I/O CABLES

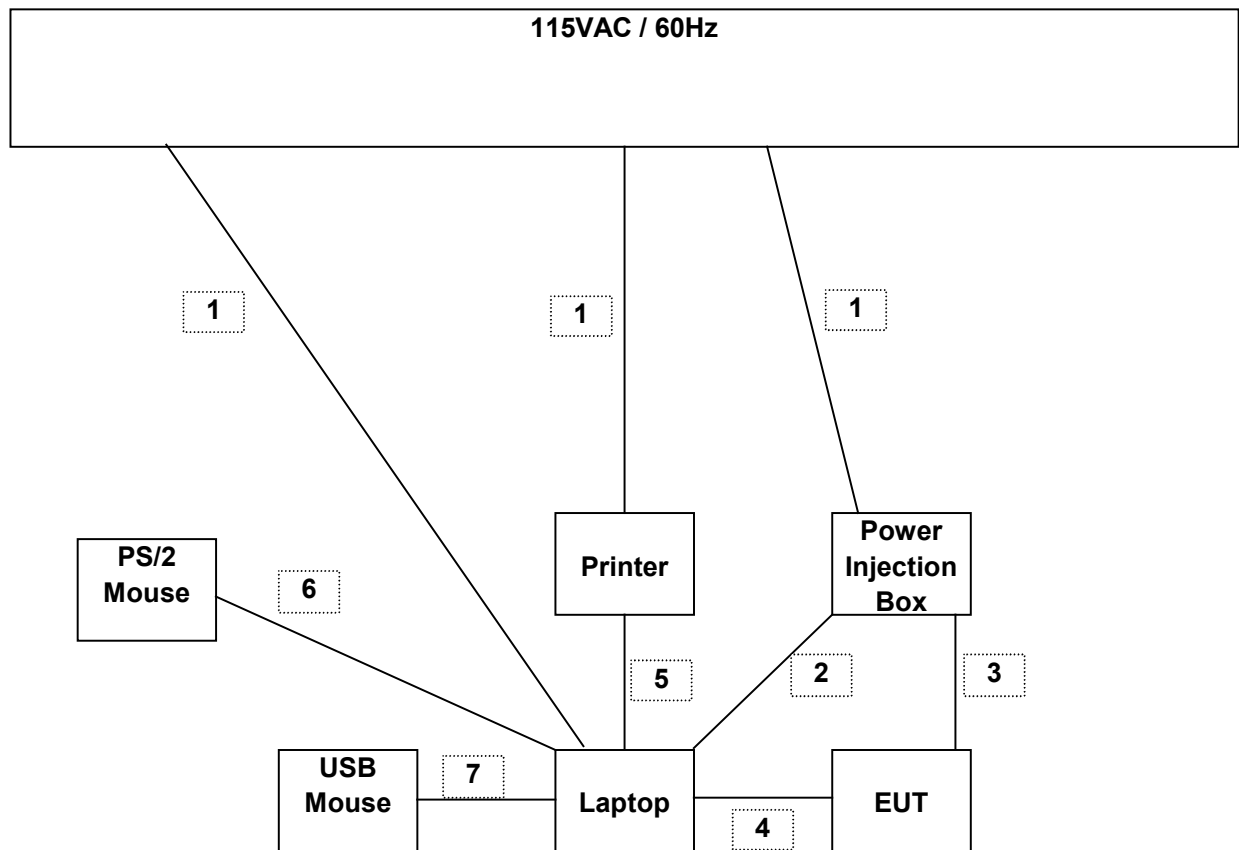
TEST I / O CABLES								
Cable No	I/O Port	# of I/O Port	Connector Type	Type of Cable	Cable Length	Data Traffic	Bundled	Remark
1	AC	3	US 115V	Un-shielded	2m	No	No	EUT power cable bundled only for LC test
2	Computer	1	RJ45	Un-shielded	1m	Yes	No	
3	CPE	1	RJ45	Un-shielded	1.5m	Yes	Yes	
4	Serial	1	RJ45	Un-shielded	1m	Yes	No	
5	Parallel	1	DB25	Shielded	2m	Yes	Yes	
6	Mouse	1	PS/2	Un-shielded	2m	Yes	No	
7	Mouse	1	USB	Un-shielded	2m	Yes	No	

TEST SETUP

The EUT is connected to a laptop computer via a serial cable, an embedded software provides for the discovery protocol, link management (including antenna control and modulation selection) traffic routing and management software.

For radiated emission measurements all peripheral support equipment except the power junction box was located off the test site.

SETUP DIAGRAM FOR TESTS



7. APPLICABLE LIMITS AND TEST RESULTS

7.1. 6 dB BANDWIDTH

LIMIT

§15.247 (a) (2) For direct sequence systems, the minimum 6 dB bandwidth shall be at least 500 kHz.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 100 kHz. The sweep time is coupled.

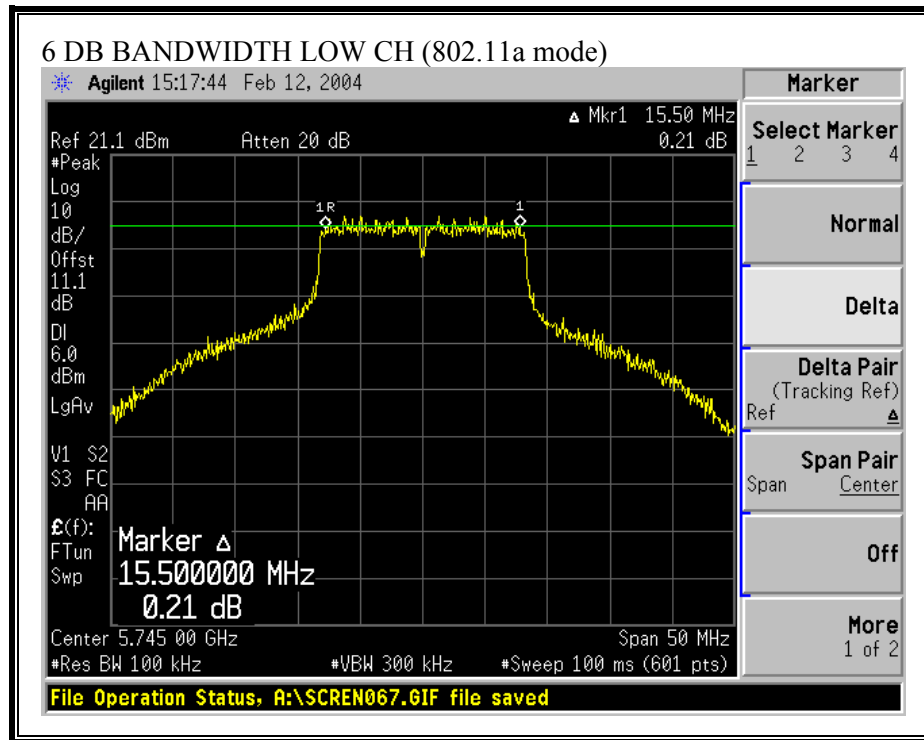
RESULTS

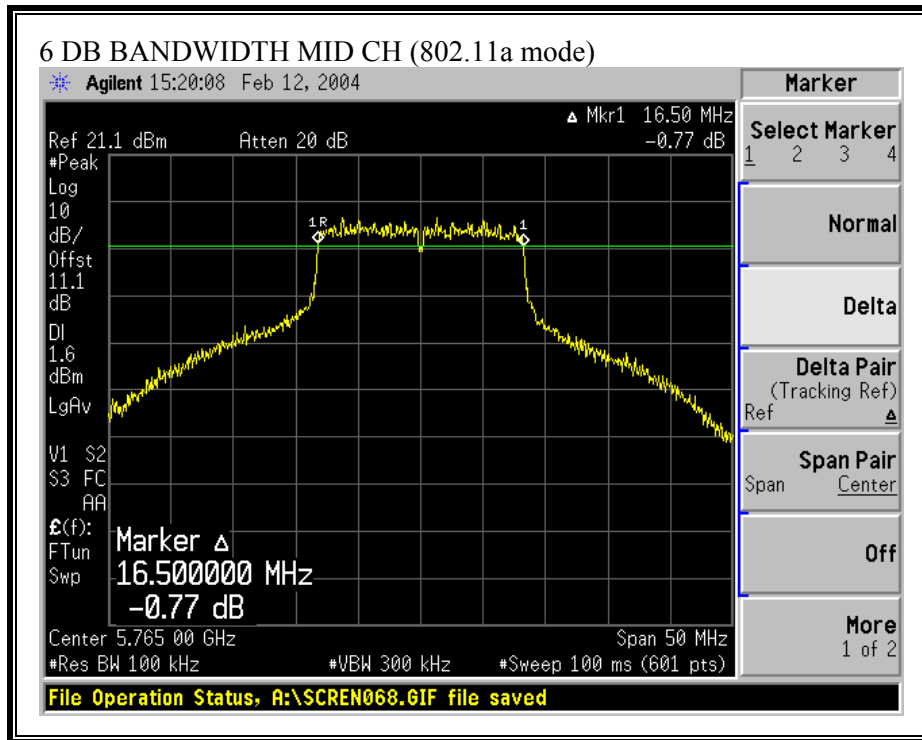
No non-compliance noted:

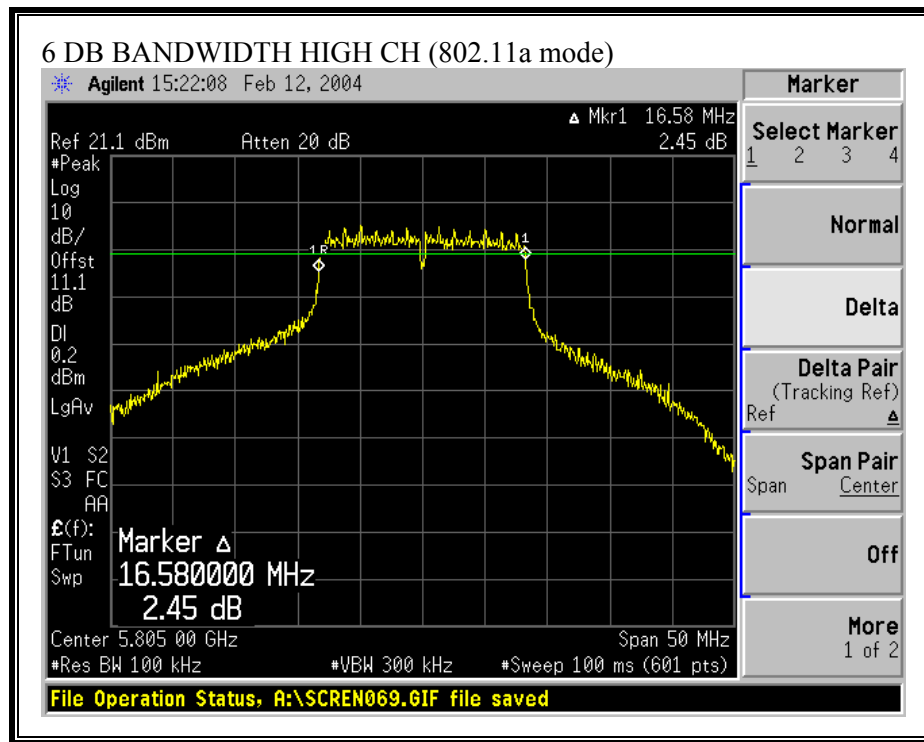
802.11a Mode

Channel	Frequency (MHz)	6 dB Bandwidth (kHz)	Minimum Limit (kHz)	Margin (kHz)
Low	5745	15500	500	15000
Middle	5765	16500	500	16000
High	5805	16580	500	16080

6 DB BANDWIDTH (802.11a MODE)







7.2. 99% BANDWIDTH

LIMIT

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

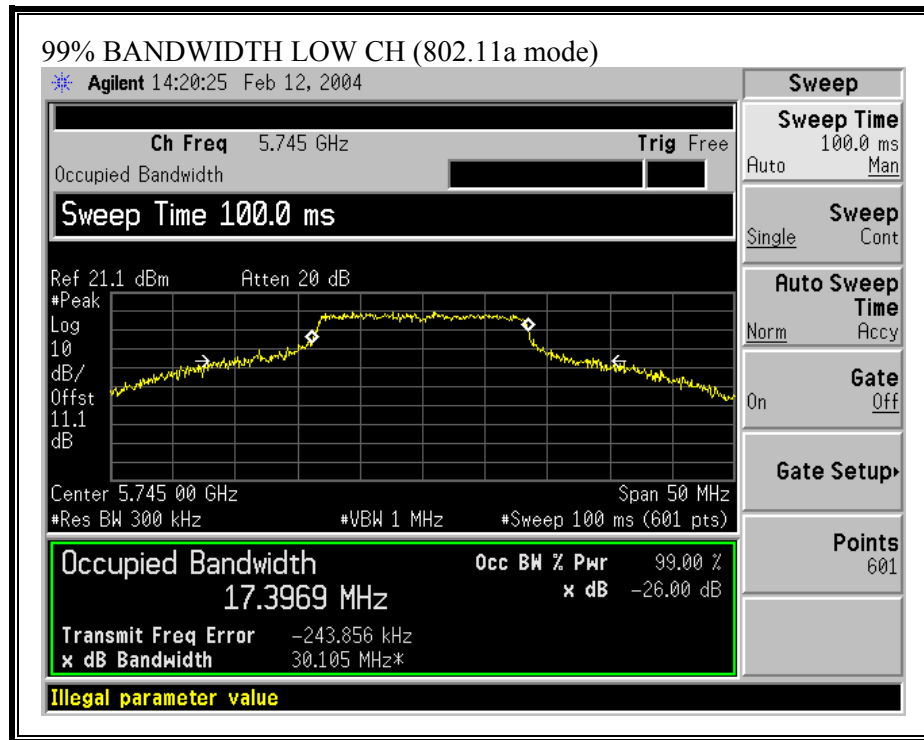
RESULTS

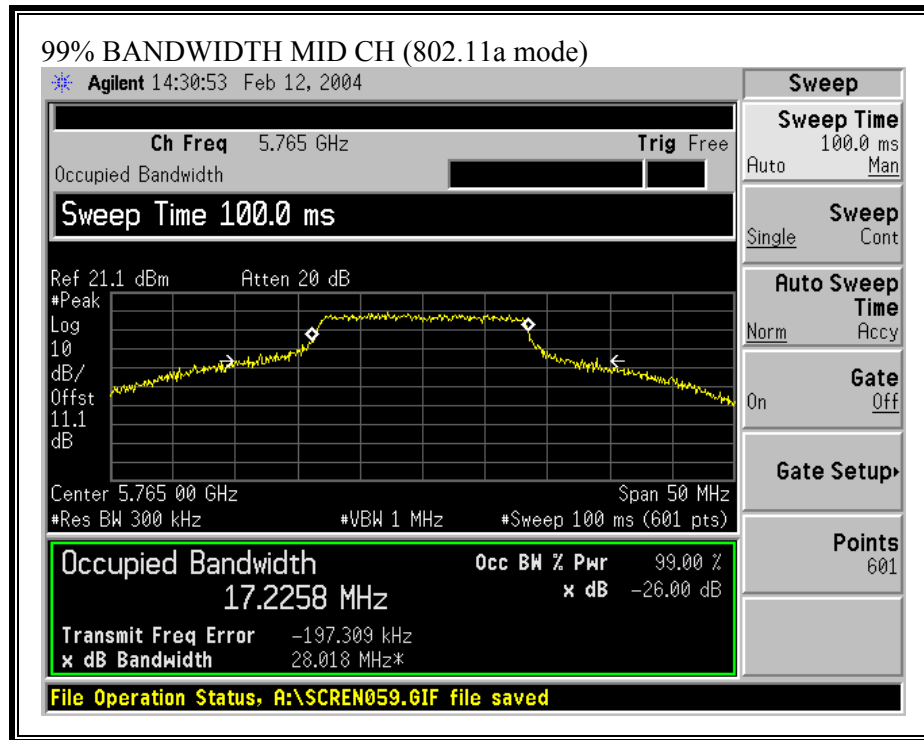
No non-compliance noted:

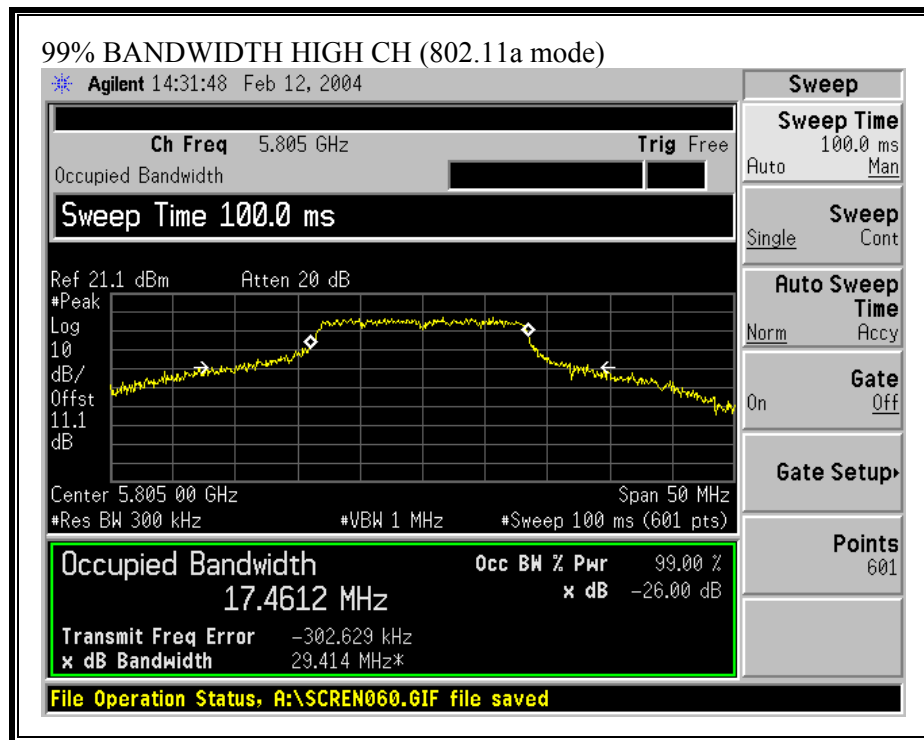
802.11a Mode

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5745	17.3969
Middle	5765	17.2258
High	5805	17.4612

99% BANDWIDTH (802.11a MODE)







7.3. PEAK OUTPUT POWER

PEAK POWER LIMIT

§15.247 (b) The maximum peak output power of the intentional radiator shall not exceed the following:

§15.247 (b) (3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz , and 5725-5850 MHz bands: 1 watt (30 dBm).

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer and the analyzer's internal channel power integration function is used to integrate the power over a bandwidth greater than or equal to the 99% bandwidth.

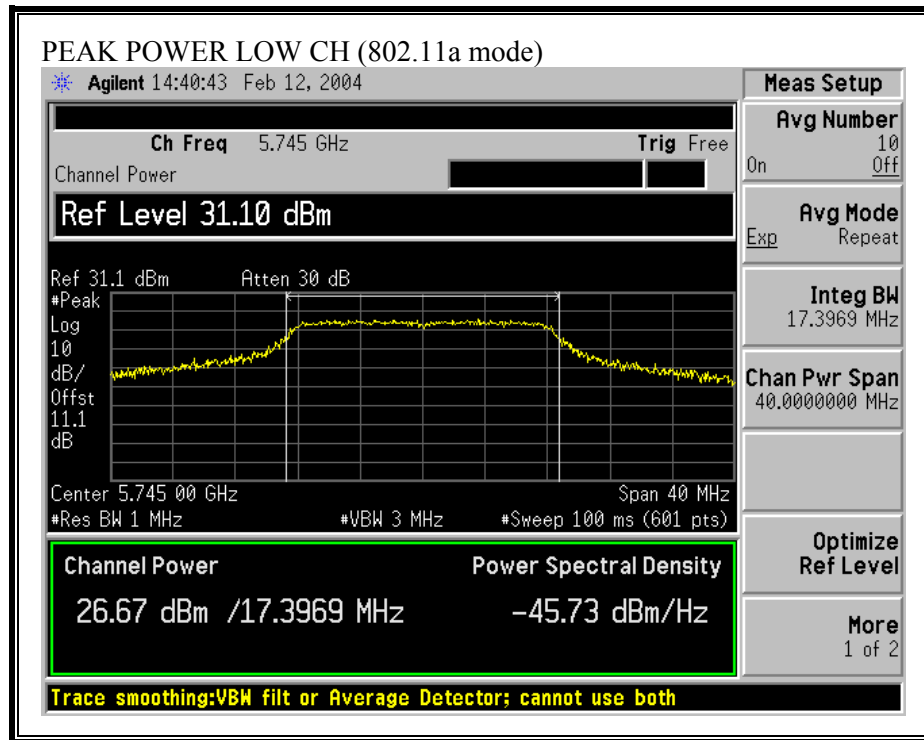
RESULTS

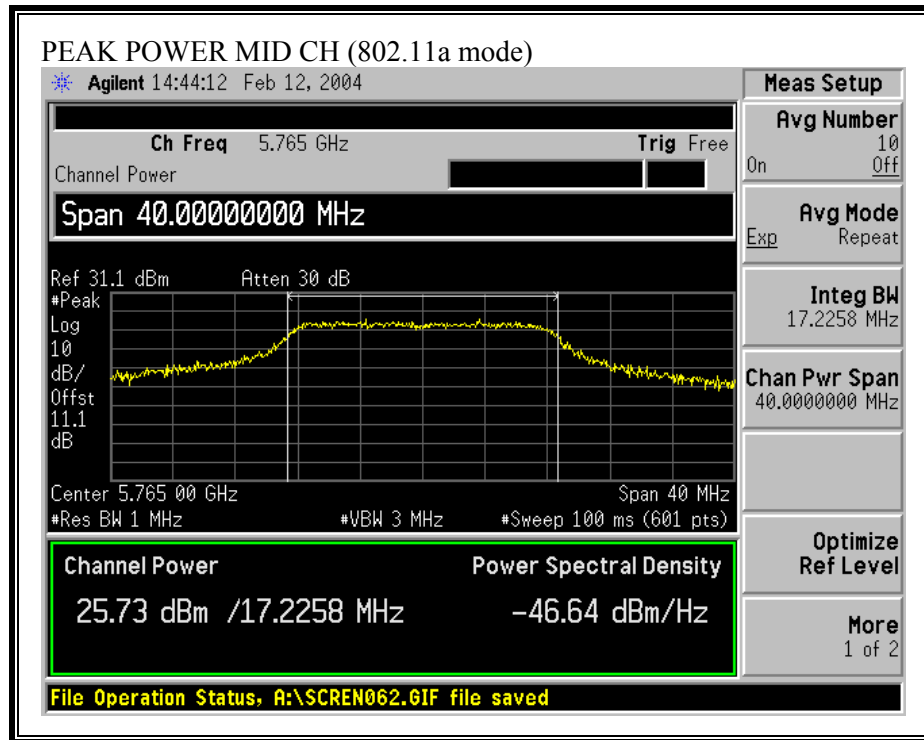
No non-compliance noted:

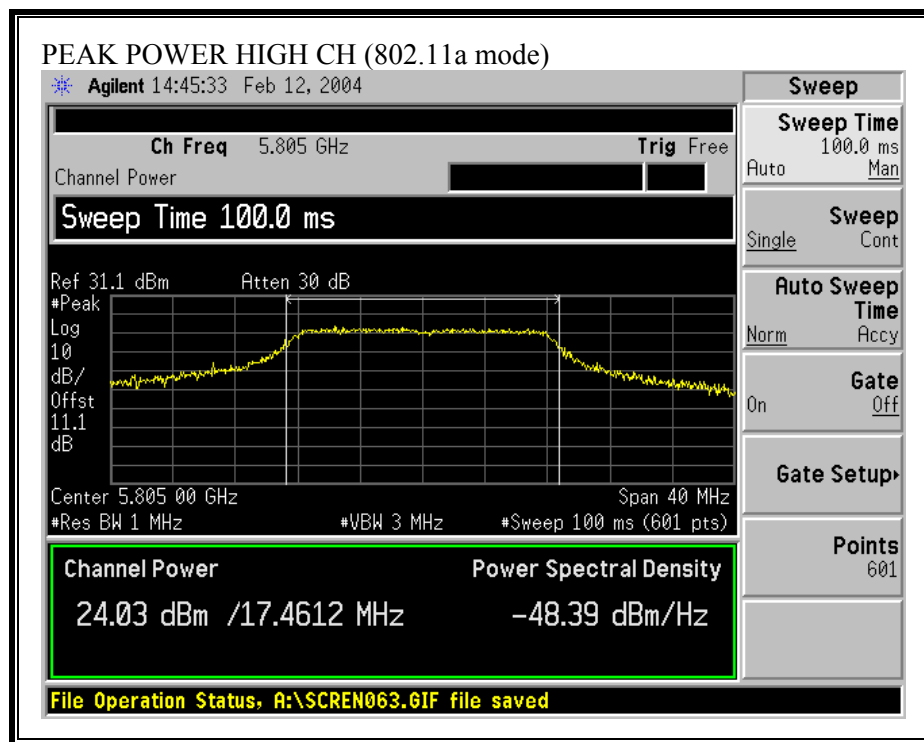
802.11a Mode

Channel	Frequency (MHz)	Peak Power (dBm)	Limit (dBm)	Margin (dB)
Low	5745	26.67	30	-3.33
Middle	5765	25.73	30	-4.27
High	5805	24.03	30	-5.97

OUTPUT POWER (802.11a MODE)







7.4. MAXIMUM PERMISSIBLE EXPOSURE

LIMITS

§1.1310 The criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in §1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of §2.1093 of this chapter.

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3–3.0	614	1.63	*(100)	6
3.0–30	1842/f	4.89/f	*(900/f ²)	6
30–300	61.4	0.163	1.0	6
300–1500			f/300	6
1500–100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f ²)	30

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)—Continued

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
30–300	27.5	0.073	0.2	30
300–1500			f/1500	30
1500–100,000			1.0	30

f = frequency in MHz

* = Plane-wave equivalent power density

NOTE 1 TO TABLE 1: Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

NOTE 2 TO TABLE 1: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.

CALCULATIONS

Given

$$E = \sqrt{(30 * P * G) / d}$$

and

$$S = E^2 / 3770$$

where

E = Field Strength in Volts/meter

P = Power in Watts

G = Numeric antenna gain

d = Distance in meters

S = Power Density in milliwatts/square centimeter

Combining equations and rearranging the terms to express the distance as a function of the remaining variables yields:

$$d = \sqrt{((30 * P * G) / (3770 * S))}$$

Changing to units of Power to mW and Distance to cm, using:

$$P \text{ (mW)} = P \text{ (W)} / 1000 \text{ and}$$

$$d \text{ (cm)} = 100 * d \text{ (m)}$$

yields

$$d = 100 * \sqrt{((30 * (P / 1000) * G) / (3770 * S))}$$

$$d = 0.282 * \sqrt{(P * G / S)}$$

where

d = distance in cm

P = Power in mW

G = Numeric antenna gain

S = Power Density in mW/cm²

Substituting the logarithmic form of power and gain using:

$$P \text{ (mW)} = 10^{(P \text{ (dBm)} / 10)} \text{ and}$$

$$G \text{ (numeric)} = 10^{(G \text{ (dBi)} / 10)}$$

yields

$$d = 0.282 * 10^{((P + G) / 20)} / \sqrt{S} \quad \text{Equation (1)}$$

where

d = MPE distance in cm

P = Power in dBm

G = Antenna Gain in dBi

S = Power Density Limit in mW/cm²

Equation (1) and the measured peak power is used to calculate the MPE distance.

LIMITS

From §1.1310 Table 1 (B), $S = 1.0 \text{ mW/cm}^2$

RESULTS

No non-compliance noted:

Mode	Power Density Limit (mW/cm²)	Output Power (dBm)	Antenna Gain (dBi)	MPE Distance (cm)
802.11a	1.0	26.67	16.00	38.35

NOTE: For mobile or fixed location transmitters, the minimum separation distance is 20 cm, even if calculations indicate that the MPE distance would be less.

7.5. AVERAGE POWER

AVERAGE POWER LIMIT

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

No non-compliance noted:

The cable assembly insertion loss of 11.1 dB (including 10 dB pad and 1.1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

802.11a Mode

Channel	Frequency (MHz)	Average Power (dBm)
Low	5745	18.40
Middle	5765	17.40
High	5805	16.30

7.6. PEAK POWER SPECTRAL DENSITY

LIMIT

§15.247 (d) For direct sequence systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer, the maximum level in a 3 kHz bandwidth is measured with the spectrum analyzer using RBW = 3 kHz and VBW > 3 kHz, sweep time = span / 3 kHz, and video averaging is turned off. The PPSD is the highest level found across the emission in any 3 kHz band.

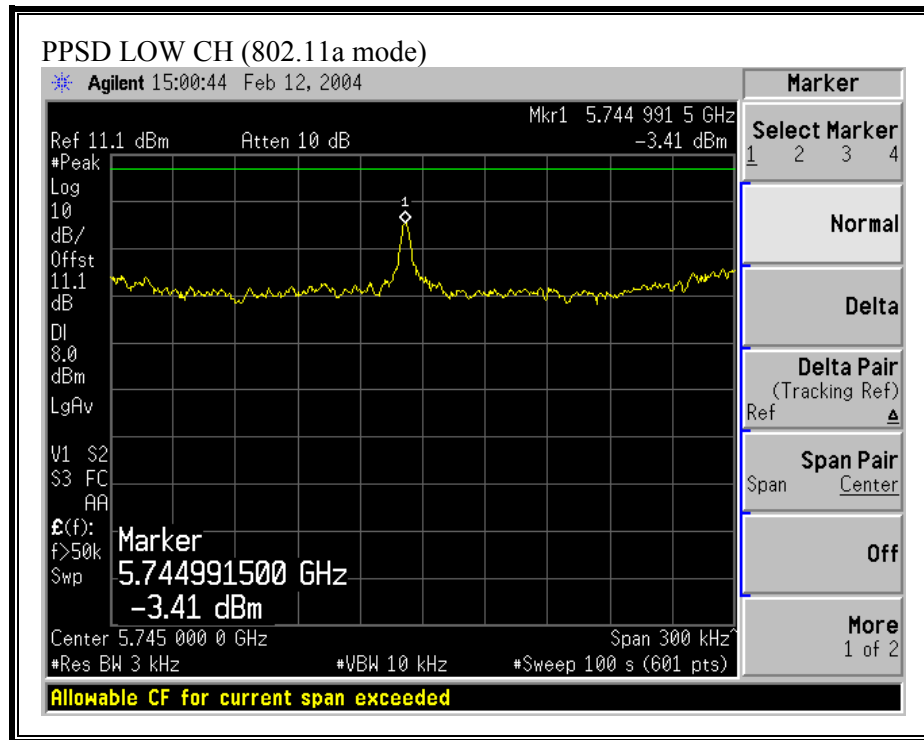
RESULTS

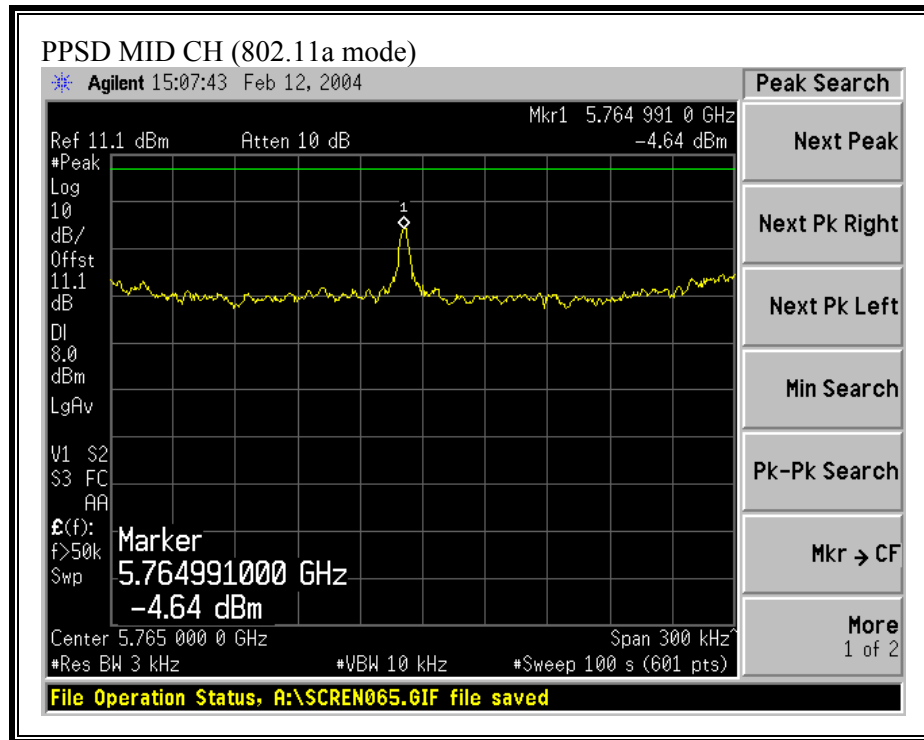
No non-compliance noted:

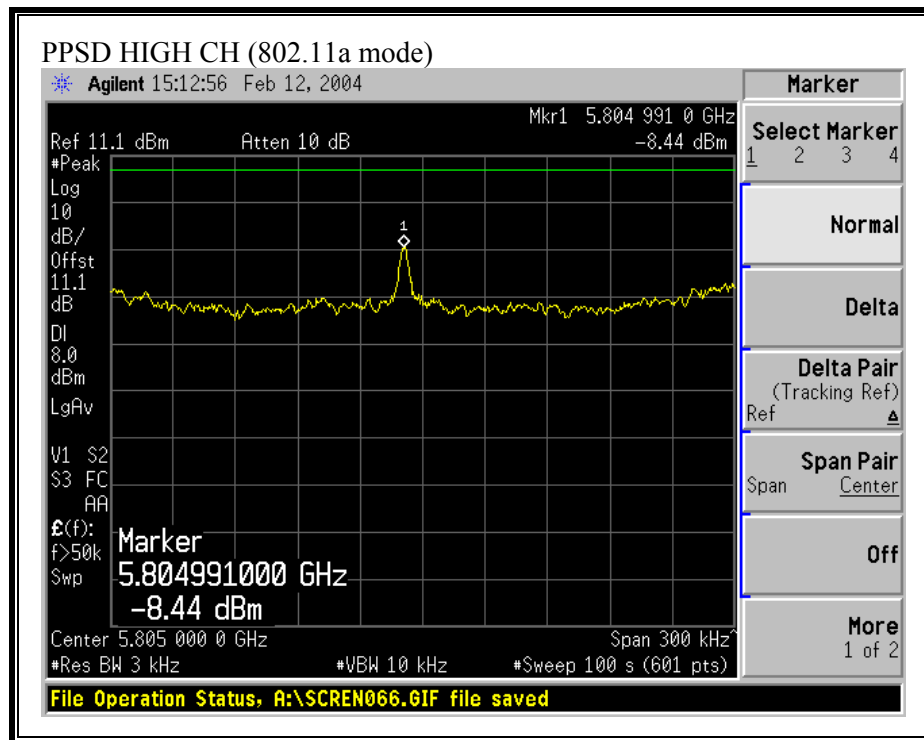
802.11a Mode

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
Low	5745	-3.41	8	-11.41
Middle	5765	-4.64	8	-12.64
High	5805	-8.44	8	-16.44

PEAK POWER SPECTRAL DENSITY (802.11a MODE)







7.7. CONDUCTED SPURIOUS EMISSIONS

LIMITS

§15.247 (c) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

TEST PROCEDURE

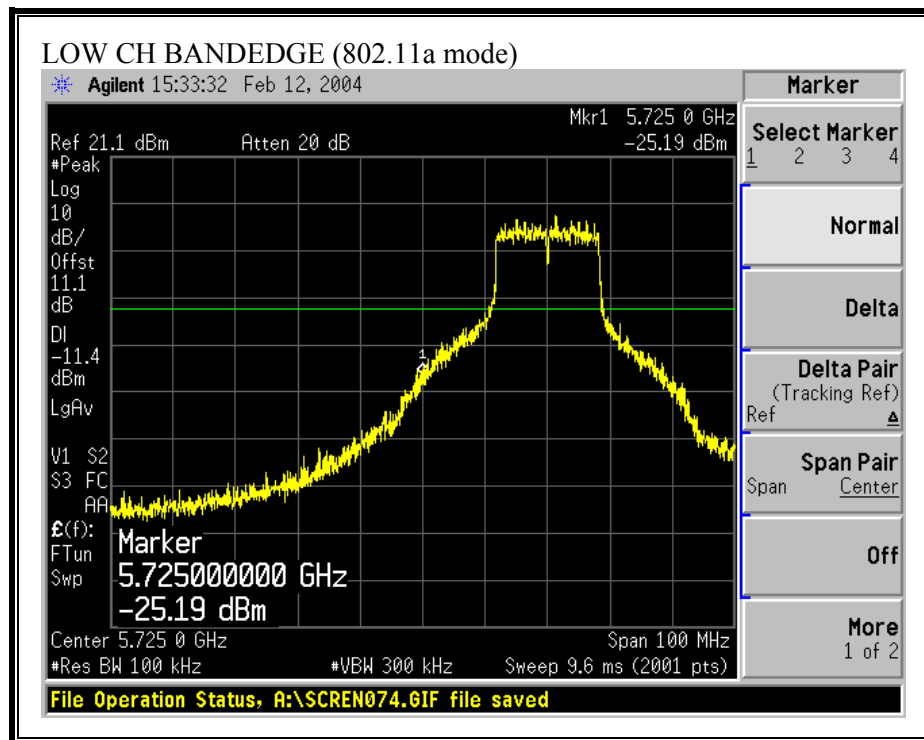
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 100 kHz.

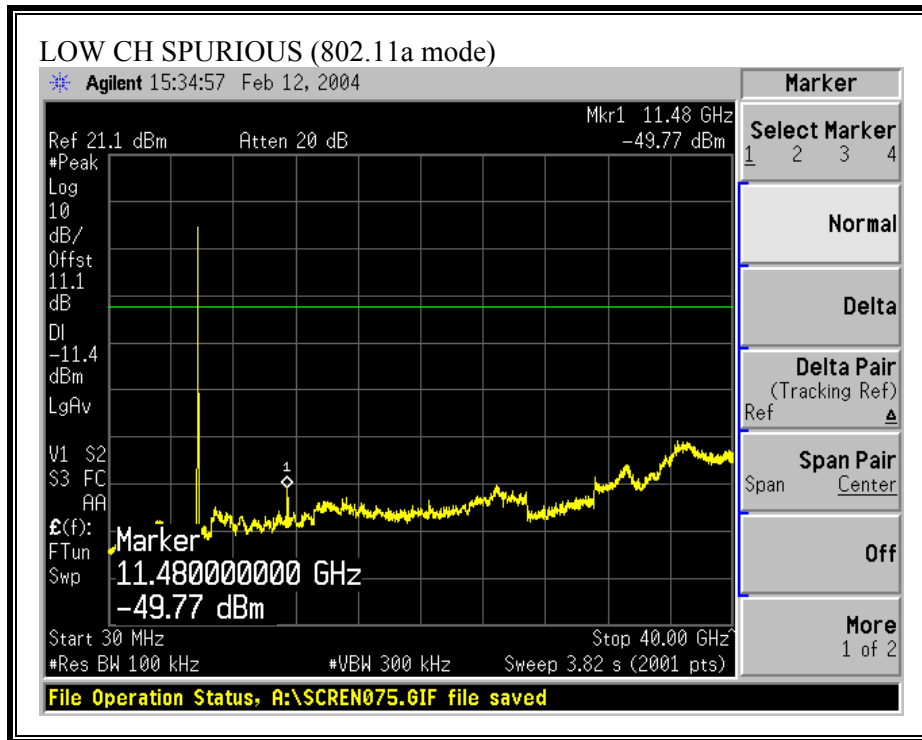
The spectrum from 30 MHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 5.8 GHz band.

RESULTS

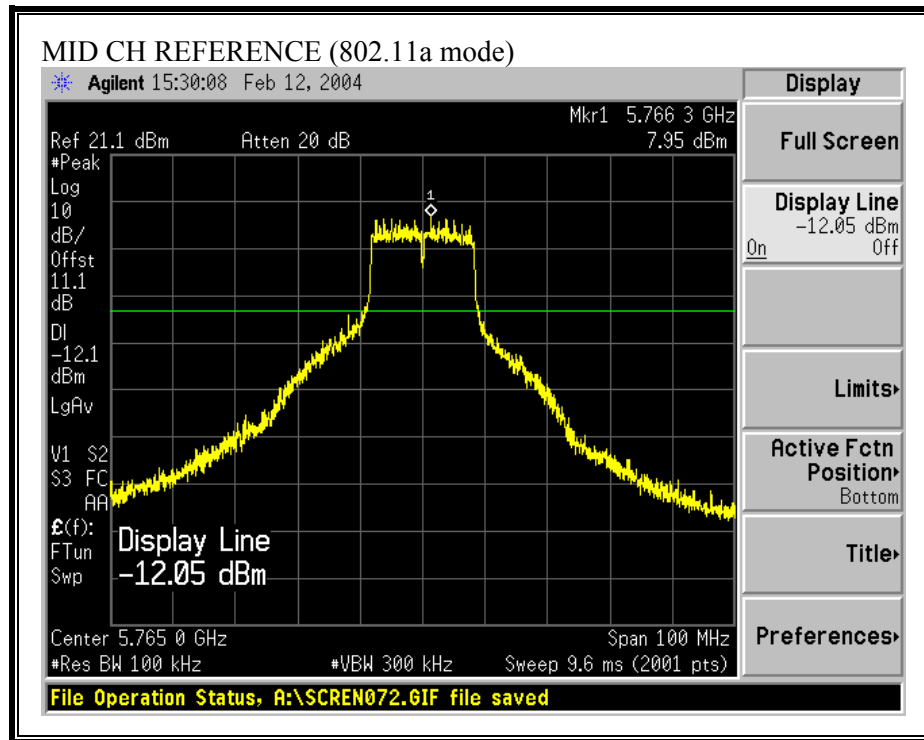
No non-compliance noted:

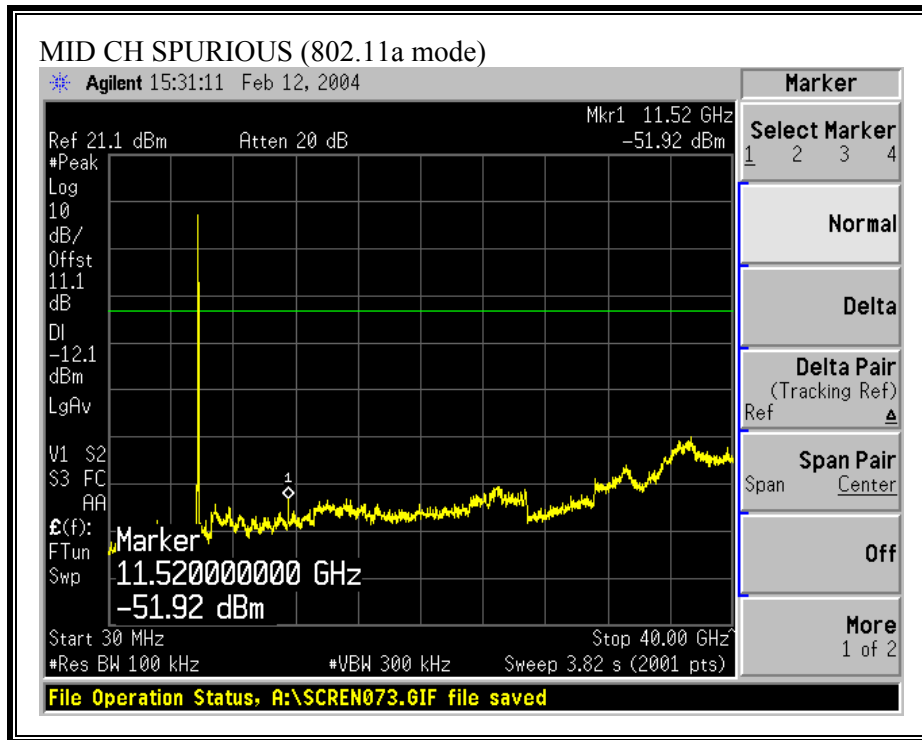
SPURIOUS EMISSIONS, LOW CHANNEL (802.11a MODE)



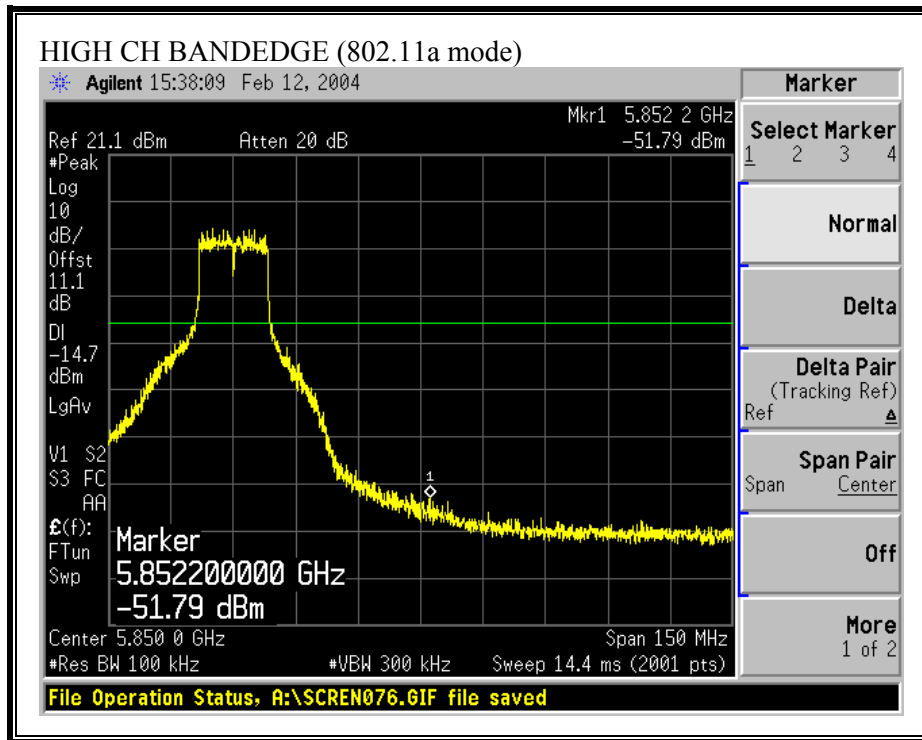


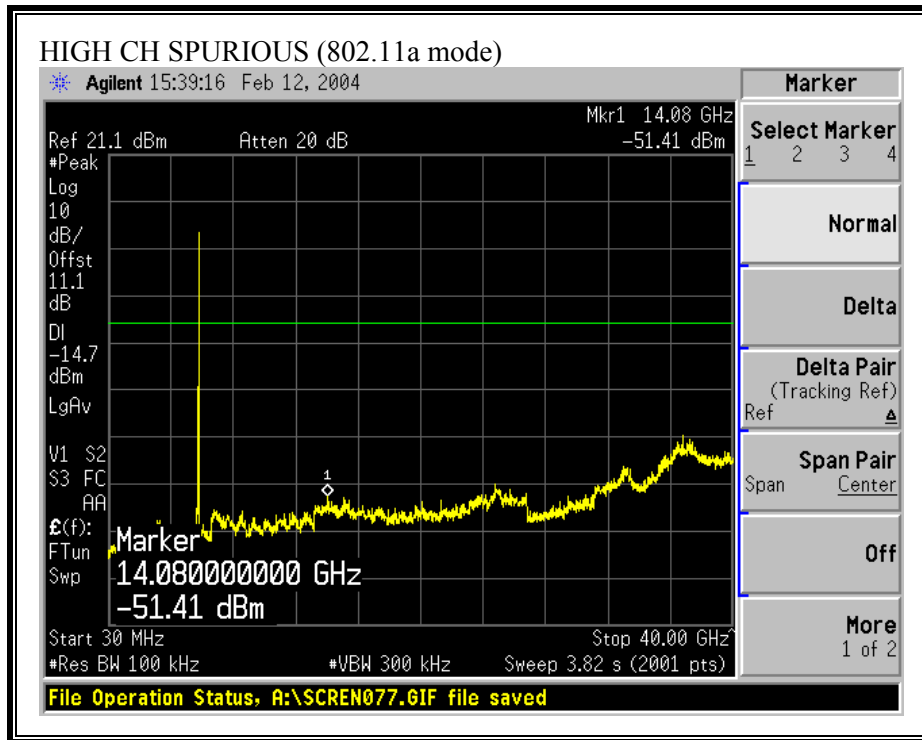
SPURIOUS EMISSIONS, MID CHANNEL (802.11a MODE)





SPURIOUS EMISSIONS, HIGH CHANNEL (802.11a MODE)





7.8. RADIATED EMISSIONS

7.8.1. TRANSMITTER RADIATED SPURIOUS EMISSIONS

LIMITS

§15.205 (a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 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
6.215 - 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	(²)
13.36 - 13.41			

¹ Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

² Above 38.6

§15.205 (b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

§15.209 (a) Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
30 - 88	100 **	3
88 - 216	150 **	3
216 - 960	200 **	3
Above 960	500	3

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

§15.209 (b) In the emission table above, the tighter limit applies at the band edges.

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.4. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

The spectrum from 30 MHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels of the 5.8 GHz band.

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

RESULTS

No non-compliance noted:

7.8.2. TRANSMITTER RADIATED EMISSIONS ABOVE 1 GHZ

HARMONICS AND SPURIOUS EMISSIONS (a MODE)

02/18/04 High Frequency Measurement Compliance Certification Services, Morgan Hill Open Field Site															
Test Engr: Yan Zheng Project #: 04U2523 Company: Skypilot Network, Inc. EUT Descr.: 802.11 a fixed wireless Node EUT M/N: GW-1000/SD-1000 Test Target: FCC 15.247 Mode Oper: Transmit															
Test Equipment:															
EMCO Horn 1-18GHz T73; S/N: 6717 @3m		Spectrum Analyzer Agilent E4446A Analyzer		Pre-amplifier 1-26GHz T86 Miteq 924341		Pre-amplifier 26-40GHz		Horn >18GHz							
HI Frequency Cables ☐ (2 ft) ☐ (2 ~ 3 ft) ☒ (4 ~ 6 ft) ☒ (12 ft)															
Peak Measurements: 1 MHz Resolution Bandwidth 1 MHz Video Bandwidth															
Average Measurements: 1 MHz Resolution Bandwidth 10 Hz Video Bandwidth															
f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
a mode															
Low channel 5745MHz															
11.490	9.8	49.5	44.2	38.8	8.1	-44.6	0.0	1.0	52.7	47.4	74.0	54.0	-21.3	-6.6	V, asb=3, sb=55, antenna 1
11.490	9.8	59.0	46.2	38.8	8.1	-44.6	0.0	1.0	62.2	49.4	74.0	54.0	-11.8	-4.6	V, asb=3, sb=55, antenna 7
11.490	9.8	60.3	46.5	38.8	8.1	-44.6	0.0	1.0	63.5	49.7	74.0	54.0	-10.5	-4.3	H, asb=3, sb=55, antenna 1
11.490	9.8	64.9	50.4	38.8	8.1	-44.6	0.0	1.0	68.1	53.6	74.0	54.0	-5.9	-0.4	H, asb=3, sb=55, antenna 7
Mid channel 5765MHz															
11.530	9.8	56.3	42.6	38.8	8.1	-44.6	0.0	1.0	59.5	45.8	74.0	54.0	-14.5	-8.2	V, asb=3, sb=55, antenna 1
11.530	9.8	57.9	43.8	38.8	8.1	-44.6	0.0	1.0	61.1	47.0	74.0	54.0	-12.9	-7.0	V, asb=3, sb=55, antenna 7
11.530	9.8	60.3	46.3	38.8	8.1	-44.6	0.0	1.0	63.5	49.5	74.0	54.0	-10.5	-4.5	H, asb=3, sb=55, antenna 1
11.530	9.8	64.7	49.9	38.8	8.1	-44.6	0.0	1.0	67.9	53.1	74.0	54.0	-6.1	-0.9	H, asb=3, sb=55, antenna 7
High channel 5805MHz															
11.610	9.8	55.5	43.0	38.9	8.2	-44.7	0.0	1.0	58.7	46.2	74.0	54.0	-15.3	-7.8	V, asb=3, sb=55, antenna 1
11.610	9.8	56.6	44.4	38.9	8.2	-44.7	0.0	1.0	59.8	47.6	74.0	54.0	-14.2	-6.4	V, asb=3, sb=55, antenna 7
11.610	9.8	59.8	45.5	38.9	8.2	-44.7	0.0	1.0	63.0	48.7	74.0	54.0	-11.0	-5.3	H, asb=3, sb=55, antenna 1
11.610	9.8	60.2	46.9	38.9	8.2	-44.7	0.0	1.0	63.4	50.1	74.0	54.0	-10.6	-3.9	H, asb=3, sb=55, antenna 7
No other spurious or harmonic emissions above the system noise floor were detected above 1 GHz.															
f	Measurement Frequency			Amp	Preamp Gain			Avg Lim	Average Field Strength Limit						
Dist	Distance to Antenna			D Corr	Distance Correct to 3 meters			Pk Lim	Peak Field Strength Limit						
Read	Analyzer Reading			Avg	Average Field Strength @ 3 m			Avg Mar	Margin vs. Average Limit						
AF	Antenna Factor			Peak	Calculated Peak Field Strength			Pk Mar	Margin vs. Peak Limit						
CL	Cable Loss			HPF	High Pass Filter										

7.8.3. WORST-CASE RADIATED EMISSIONS BELOW 1 GHz

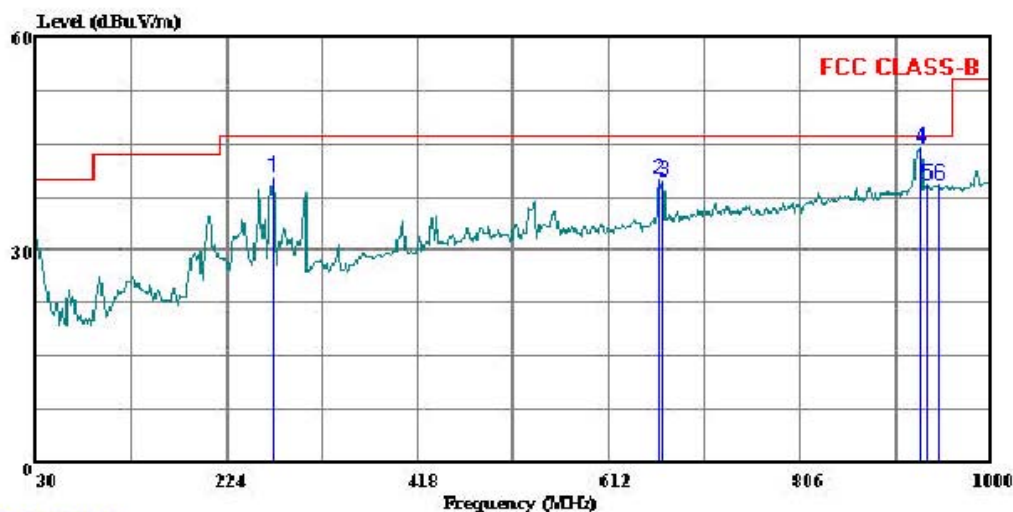
SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)

HORIZONTAL PLOT



561F Monterey Road
San Jose, CA 95131
Tel: (408) 463-0888
Fax: (408) 463-0885

Data#: 5 File#: rad0213.EMI Date: 02-13-2004 Time: 16:38:20



(Auxiliary ATC)

Trace: 4

Ref Trace:

Condition: FCC CLASS-B SUNOL BILOG 12/22/04 HORIZONTAL
Test Eng: : Frank Ibrahim
Project #: : 04U2523-1
Company: : Skipilot Network
EUT: : 802.11a Fixed Wireless Node
Model No: : GW-1000/ SD-1000
Configuration: : EUT AND PERIPHERALS
Target of Test: : FCC 15.209, IC
Mode of Operation: TX Worst case (Low Channel)
: Antenna 7

HORIZONTAL DATA

	Freq	Remark	Read Level	Factor	Level	Limit Line	Over Limit
	MHz		dBuV	dB	dBuV/m	dBuV/m	dB
1	271.530	Peak	25.12	15.15	40.27	46.00	-5.73
2	662.440	Peak	16.94	23.15	40.09	46.00	-5.91
3	667.290	Peak	16.58	23.21	39.79	46.00	-6.21
4	929.190	Peak	17.71	26.76	44.47	46.00	-1.53
5	935.980	Peak	12.36	26.83	39.19	46.00	-6.81
6	948.590	Peak	12.27	26.88	39.15	46.00	-6.85

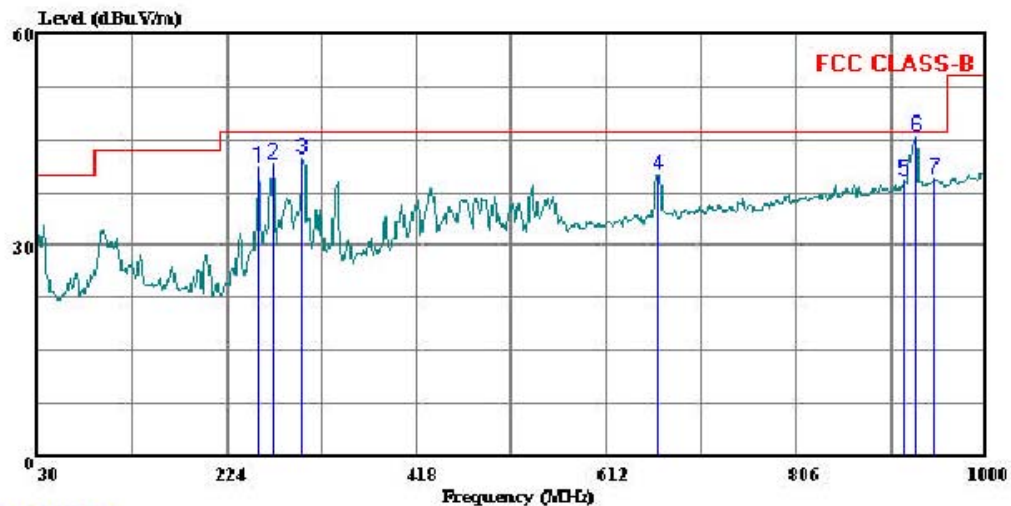
SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, VERTICAL)

VERTICAL PLOT



561F Monterey Road
San Jose, CA 95131
Tel: (408) 463-0888
Fax: (408) 463-0885

Data#: 7 File#: rad0213.EMI Date: 02-13-2004 Time: 16:49:46



(Auxiliary A.T.C.)

Trace: 6

Ref Trace:

Condition: FCC CLASS-B SUNOL BILOG 12/22/04 VERTICAL
Test Eng: : Frank Ibrahim
Project #: : 04U2523-1
Company: : Skipilot Network
EUT: : 802.11a Fixed Wireless Node
Model No: : GW-1000/ SD-1000
Configuration: : EUT AND PERIPHERALS
Target of Test: : FCC 15.209, IC
Mode of Operation: TX Worst case (Low Channel)
: Antenna 1

VERTICAL DATA

	Freq	Remark	Read Level	Factor	Level	Limit Line	Over Limit
	MHz		dBuV	dB	dBuV/m	dBuV/m	dB
1	256.980	Peak	26.55	14.45	41.00	46.00	-5.00
2	271.530	Peak	26.51	15.15	41.66	46.00	-4.34
3	300.630	Peak	26.31	15.93	42.24	46.00	-3.76
4	664.380	Peak	16.90	23.15	40.05	46.00	-5.95
5	916.580	Peak	12.68	26.57	39.25	46.00	-6.75
6	929.190	Peak	18.58	26.76	45.34	46.00	-0.66
7	948.590	Peak	12.61	26.88	39.49	46.00	-6.51

7.9. POWERLINE CONDUCTED EMISSIONS

LIMIT

§15.207 (a) Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal.

The lower limit applies at the boundary between the frequency ranges.

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

TEST PROCEDURE

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.4.

The resolution bandwidth is set to 9 kHz for both peak detection and quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

Line conducted data is recorded for both NEUTRAL and HOT lines.

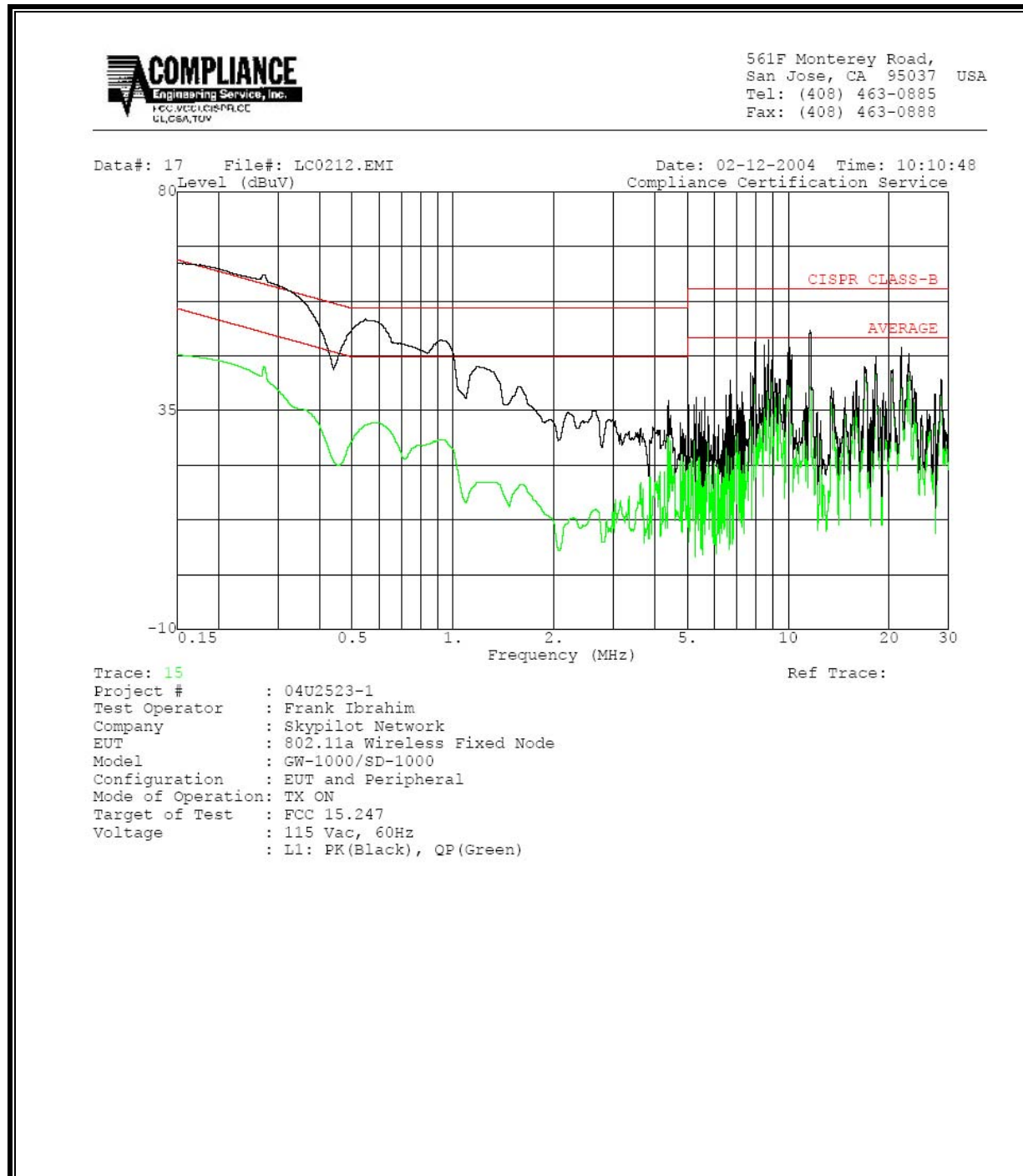
RESULTS

No non-compliance noted:

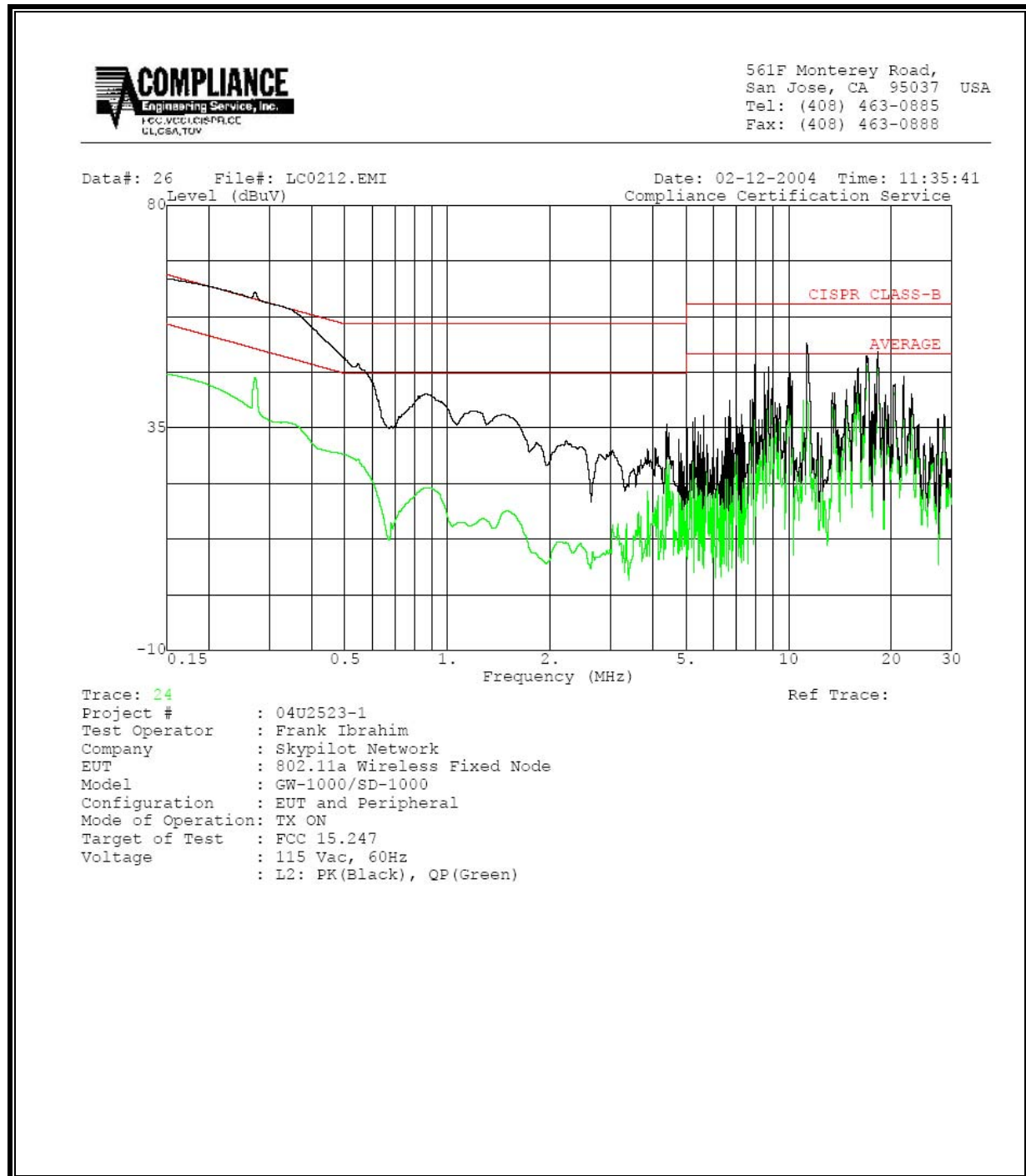
6 WORST EMISSIONS

CONDUCTED EMISSIONS DATA (115VAC 60Hz)									
Freq.	Reading			Closs	Limit	EN_B	Margin		Remark
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1 / L2
0.19	64.48	45.52	--	0.00	64.86	54.86	-19.34	-9.34	L1
0.27	62.90	44.15	--	0.00	62.51	52.51	-18.36	-8.36	L1
11.62	51.46	46.60	--	0.00	60.00	50.00	-13.40	-3.40	L1
0.21	63.34	43.14	--	0.00	64.34	54.34	-21.20	-11.20	L2
0.27	62.42	45.13	--	0.00	62.49	52.49	-17.36	-7.36	L2
11.32	52.12	40.26	--	0.00	60.00	50.00	-19.74	-9.74	L2
6 Worst Data									

LINE 1 RESULTS

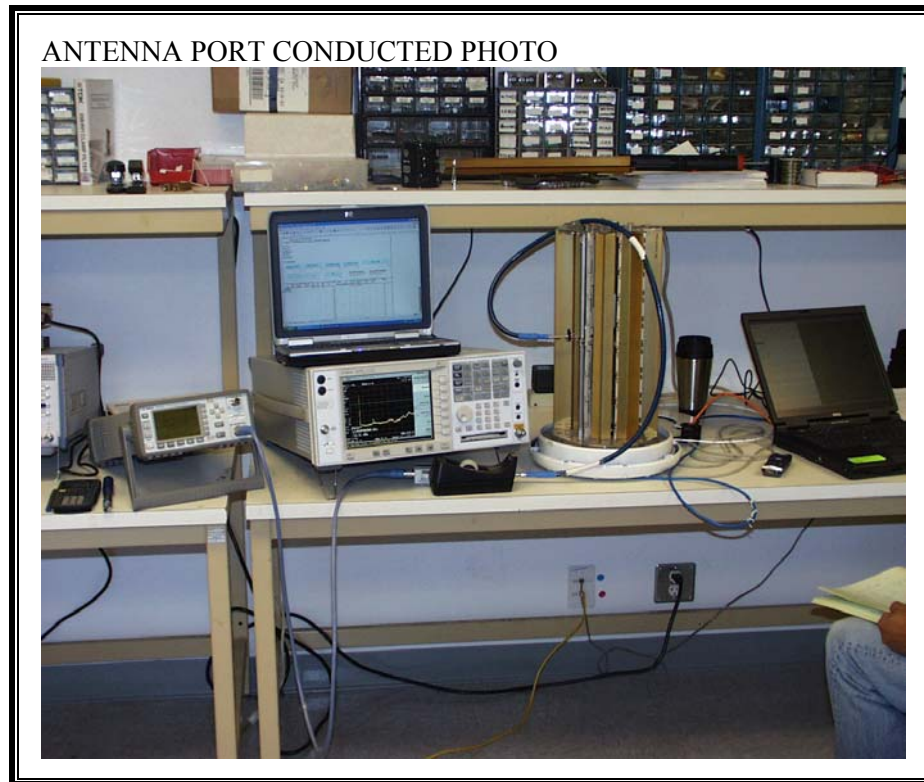


LINE 2 RESULTS



8. SETUP PHOTOS

ANTENNA PORT CONDUCTED RF MEASUREMENT SETUP



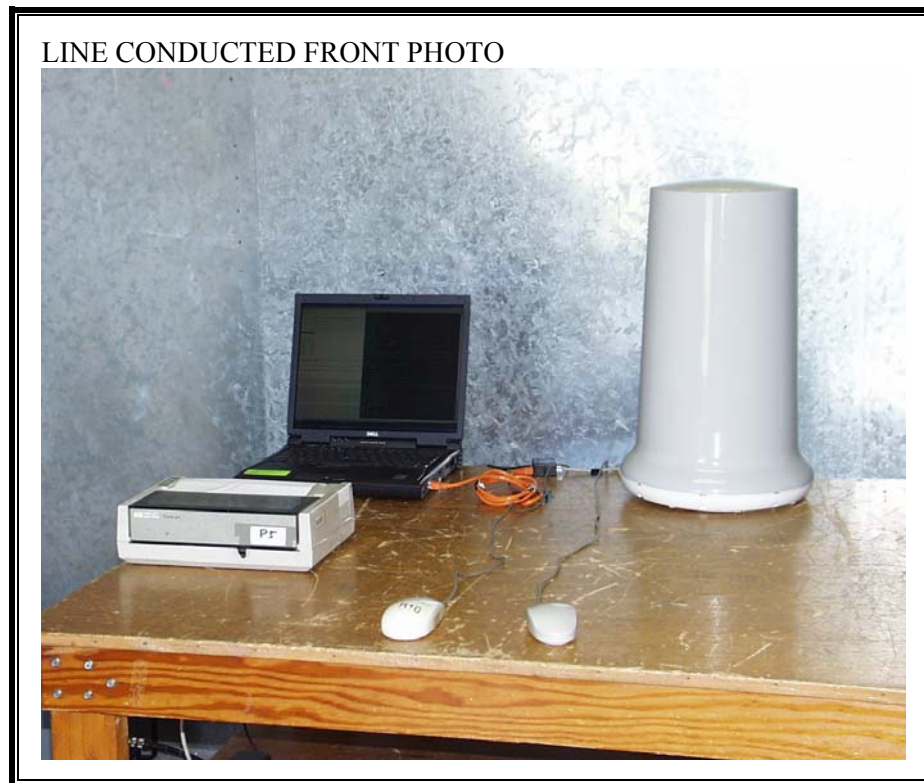
RADIATED RF MEASUREMENT SETUP



RADIATED BACK PHOTO



POWERLINE CONDUCTED EMISSIONS MEASUREMENT SETUP



LINE CONDUCTED BACK PHOTO



END OF REPORT