



**FCC CFR47 PART 15 SUBPART C
CLASS II PERMISSIVE CHANGE
TEST REPORT**

FOR

TRAPEZE NETWORKS

802.11 a/b/g COMBO ACCESS POINT

MODEL NUMBER: MOBILITY POINT 100/101/122

BRAND NAME: TRAPEZE NETWORKS, INC.

FCC ID: QZE100

REPORT NUMBER: 03U2157-1B

ISSUE DATE: OCTOBER 3, 2003

Prepared for
**TRAPEZE NETWORKS, INC.
5753 W. LAS POSITAS BLVD.
PLEASANTON, CA 94588**

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

NVLAP[®]
LAB CODE:200065-0

TABLE OF CONTENTS

1. TEST RESULT CERTIFICATION	3
2. DESCRIPTION OF CLASS II PERMISSIVE CHANGE.....	4
3. TEST METHODOLOGY	5
4. FACILITIES AND ACCREDITATION	5
5. CALIBRATION AND UNCERTAINTY	5
5.1. MEASURING INSTRUMENT CALIBRATION	5
5.2. MEASUREMENT UNCERTAINTY	5
5.3. TEST AND MEASUREMENT EQUIPMENT.....	6
6. SETUP OF EQUIPMENT UNDER TEST.....	7
7. APPLICABLE LIMITS AND TEST RESULTS.....	9
7.1. 6 dB BANDWIDTH.....	9
7.2. 99% BANDWIDTH.....	13
7.3. PEAK OUTPUT POWER	17
7.4. MAXIMUM PERMISSIBLE EXPOSURE.....	21
7.5. AVERAGE POWER	23
7.6. PEAK POWER SPECTRAL DENSITY	24
7.7. CONDUCTED SPURIOUS EMISSIONS	28
7.8. RADIATED EMISSIONS	35
7.9. CO-LOCATED RADIATED EMISSIONS	48
7.10. POWERLINE CONDUCTED EMISSIONS.....	58
8. SETUP PHOTOS.....	62

1. TEST RESULT CERTIFICATION

COMPANY NAME: TRAPEZE NETWORKS, INC.
5753 W. LAS POSTAS BLVD.
PLEASANTON, CA. 94588

EUT DESCRIPTION: 802.11 A/B/G COMBO ACCESS POINT

MODEL: MOBILITY POINT 100/101/122

DATE TESTED: AUGUST 5 TO OCTOBER 3, 2003

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:



MIKE HECKROTTE
CHIEF ENGINEER
COMPLIANCE CERTIFICATION SERVICES

FRANK IBRAHIM
EMC ENGINEER
COMPLIANCE CERTIFICATION SERVICES

2. DESCRIPTION OF CLASS II PERMISSIVE CHANGE

The EUT is an 802.11 a/b access point; 802.11a and 802.11b modes have been tested previously. The purpose of this class II permissive change is to add 802.11g mode.

This report documents 802.11g mode performance. The EUT has a peak output power of 18.2 dBm (66.1 mW), with an antenna gain of 2.0 dBi.

3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4/1992, FCC CFR 47 Part 2 and FCC CFR 47 Part 15.

4. FACILITIES AND ACCREDITATION

The open area test sites and conducted 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 C63.7, ANSI C63.4 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 measurement instruments utilized to perform the tests documented in this report have been calibrated in accordance with the manufacturer's recommendations, and are traceable to national standards.

5.2. MEASUREMENT UNCERTAINTY

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

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 AND MEASUREMENT EQUIPMENT LIST				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due Date
Quasi-Peak Adapter	HP	85650A	2521A01038	7/16/2004
SA Display Section	HP	85662A	2314A04793	7/16/2004
SA RF Section	HP	85680A	2314A02604	7/16/2004
Preamplifier	HP	8447D	2944A06833	8/15/2004
Antenna, Biconical	Eaton	94455-1	1214	3/6/04
Antenna, Log Periodic	EMCO	3146	9107-3163	3/06/04
EMI Test Receiver	R & S	ESHS 20	827129/006	7/17/2004
LISN, 10 kHz ~ 30 MHz	FCC	50/250-25-2	114	9/6/2003
Spectrum Analyzer	AGILENT	E4446A	US42070220	1/13/04
Pre-amplifier	MITEQ	NSP2600-SP	924341	4/25/04
Horn Antenna	EMCO	3115	6717	2/4/04
Power Meter	AGILENT	E4416A	0841291160	11/7/04
Power Sensor	Agilent	E9327A	US40440755	11/7/04
Antenna, Biconical	Eaton	94455-1	1214	3/6/04
Antenna, Log Periodic	EMCO	3146	9107-3163	3/06/04
Preamplifier	Miteq	NSP10023988	646456	4/26/04
High Pass Filter (4.57GHz)	FSY Microwave	FM-4570-9SS	003	N.C.R.

6. SETUP OF EQUIPMENT UNDER TEST

SUPPORT EQUIPMENT

Device Type	Manufacturer	Model	Serial Number
LAPTOP	IBM	TYPE 2656	N/A
AC ADAPTER	IBM	AA21131	11S02K67462ZIZ2UF28
POE	LUXUL	N/A	N/A
AC ADAPTER	N/A	PSA-3IU-480	I2340021A2

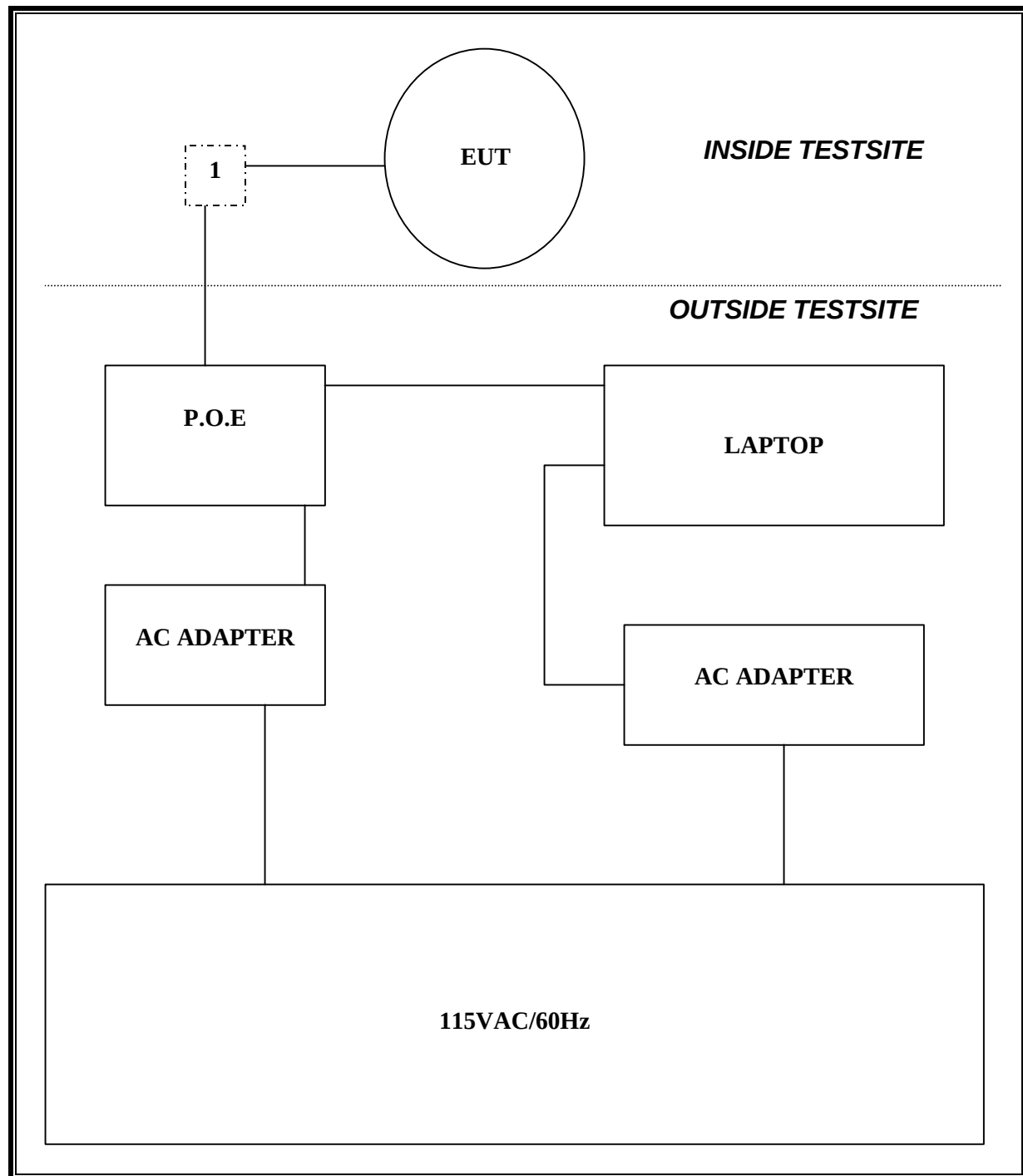
I/O CABLES

Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	ETHERNET	2	RJ45	UNSHIELDED	3M	N/A

TEST SETUP

The EUT was tested in the X, Y, and Z positions; the worst case was used for radiated measurements. The EUT was operated by the remote laptop.

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.

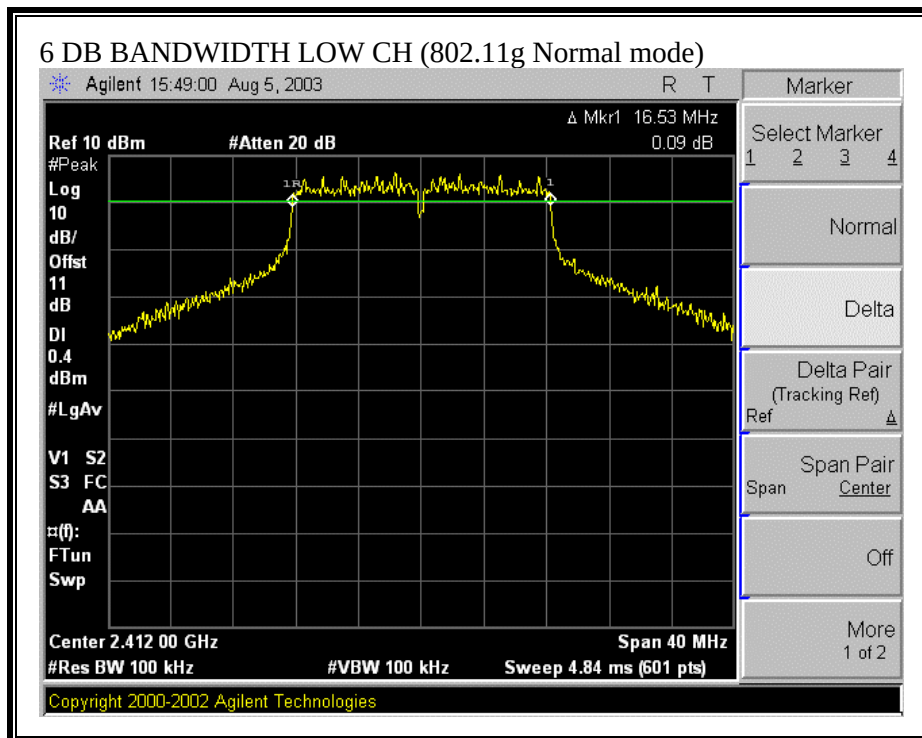
RESULTS

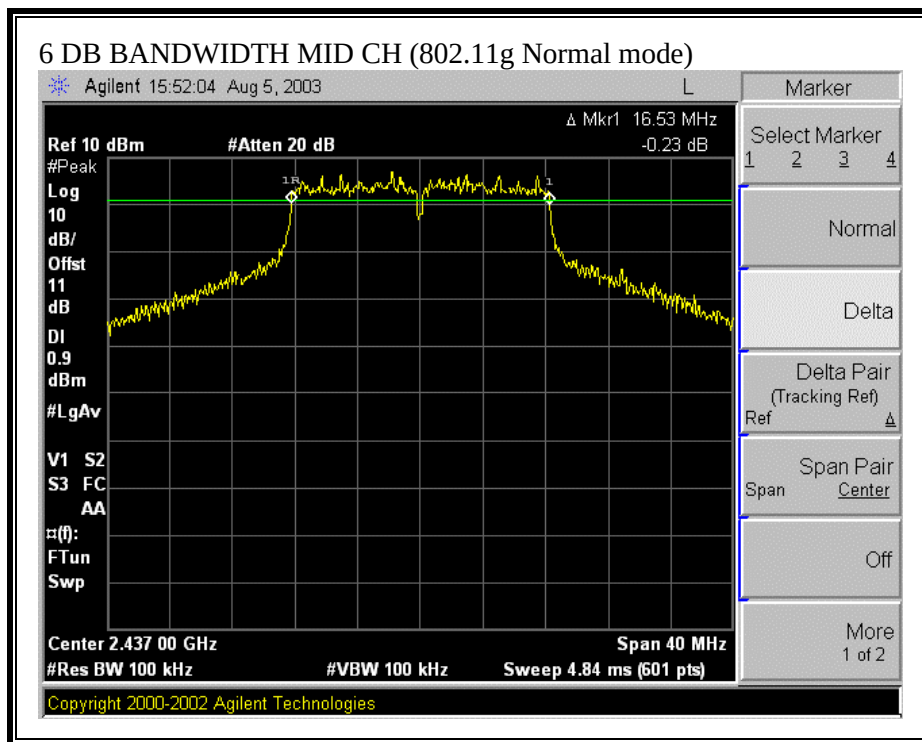
No non-compliance noted:

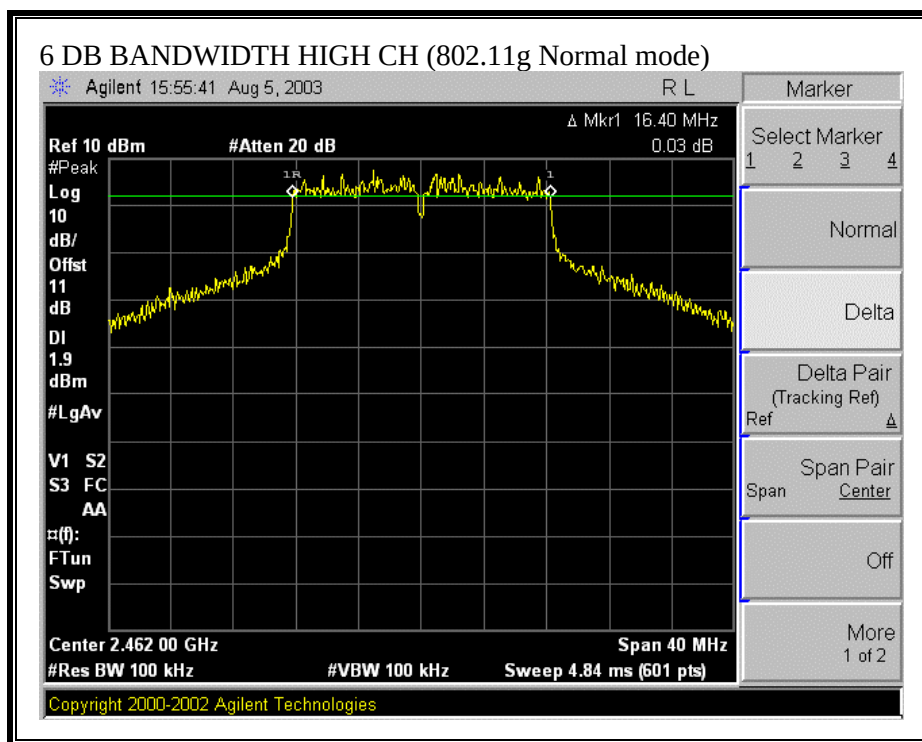
802.11g Normal Mode

Channel	Frequency (MHz)	6 dB Bandwidth (kHz)	Minimum Limit (kHz)	Margin (kHz)
Low	2412	16530	500	16030
Middle	2437	16530	500	16030
High	2462	16400	500	15900

6 DB BANDWIDTH (802.11g NORMAL 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.

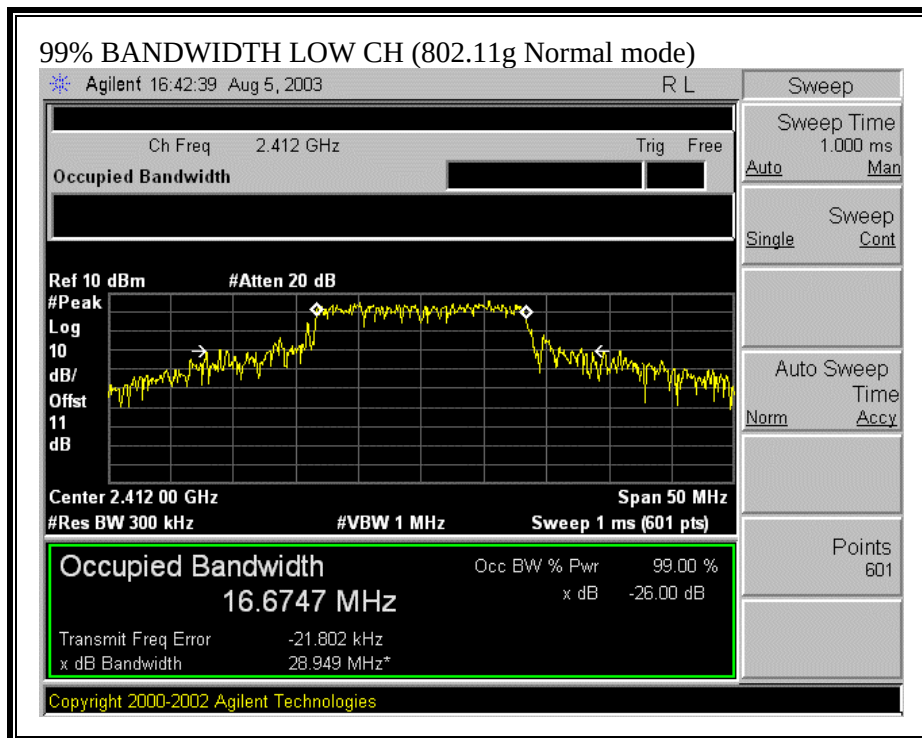
RESULTS

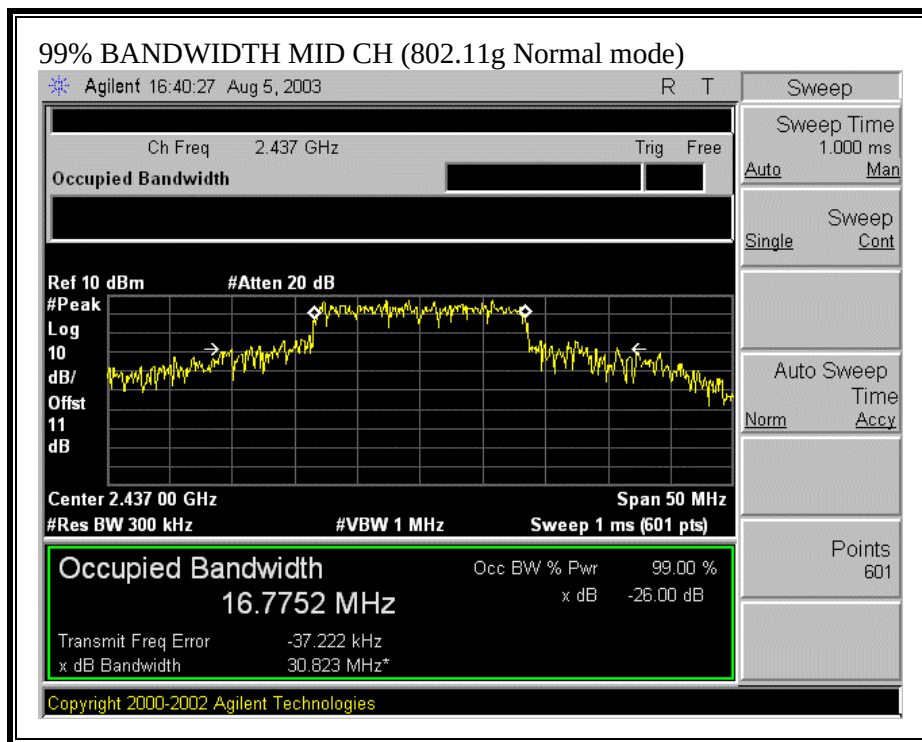
No non-compliance noted:

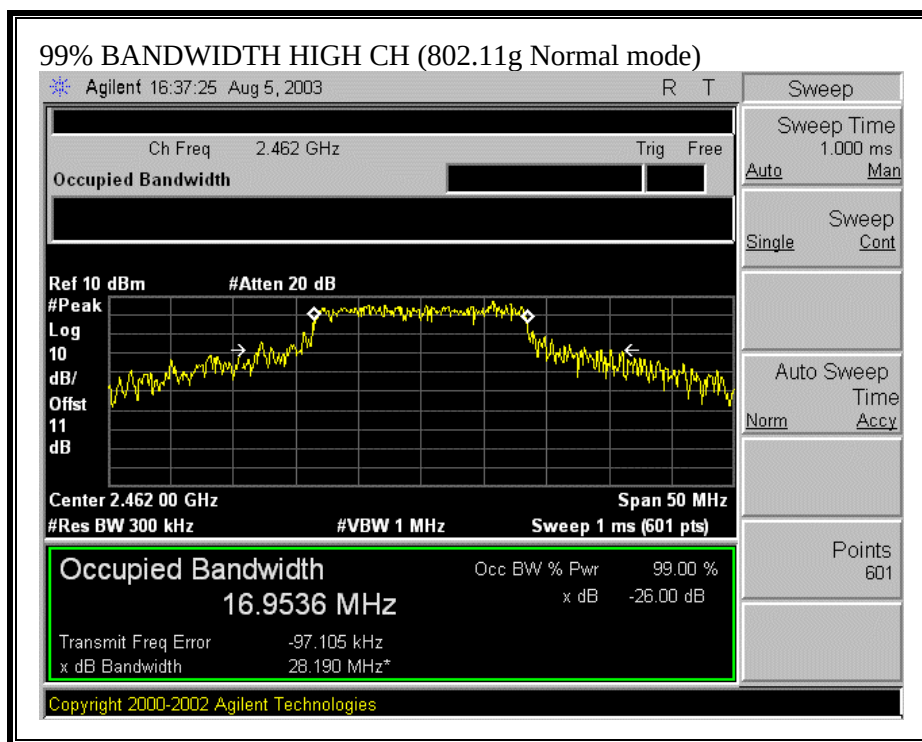
802.11g Normal Mode

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2412	16.6747
Middle	2437	16.7752
High	2462	16.9536

99% BANDWIDTH (802.11g NORMAL 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.

§15.247 (b) (4) Except as shown in paragraphs (b)(3) (i), (ii) and (iii) of this section, if transmitting antennas of directional gain greater than 6 dBi are used the peak output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1) or (b)(2) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

The maximum antenna gain is 2 dBi, therefore the limit is 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.

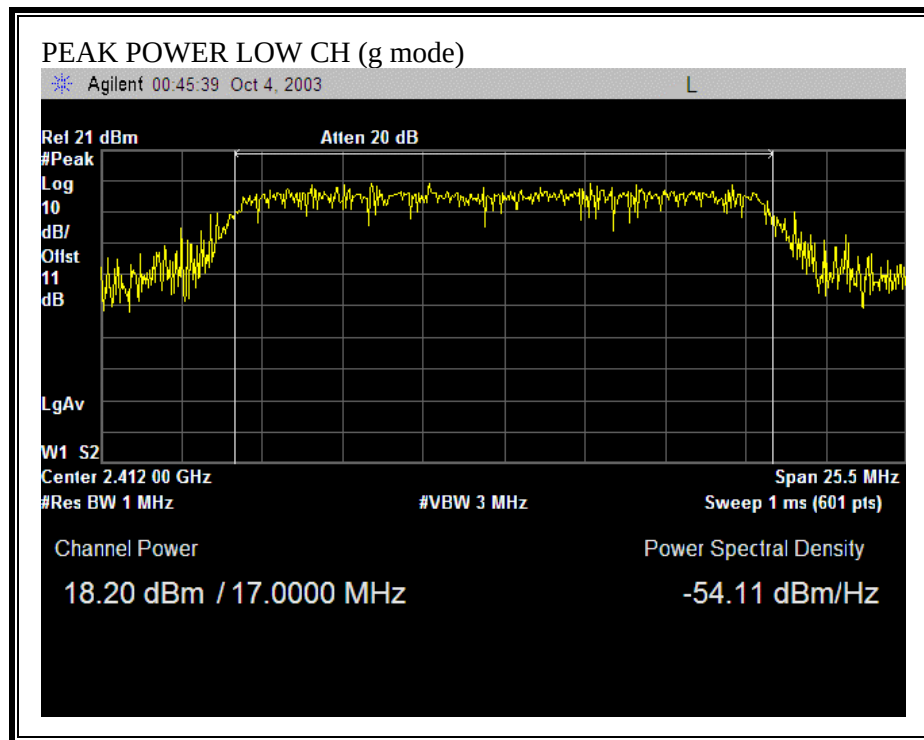
RESULTS

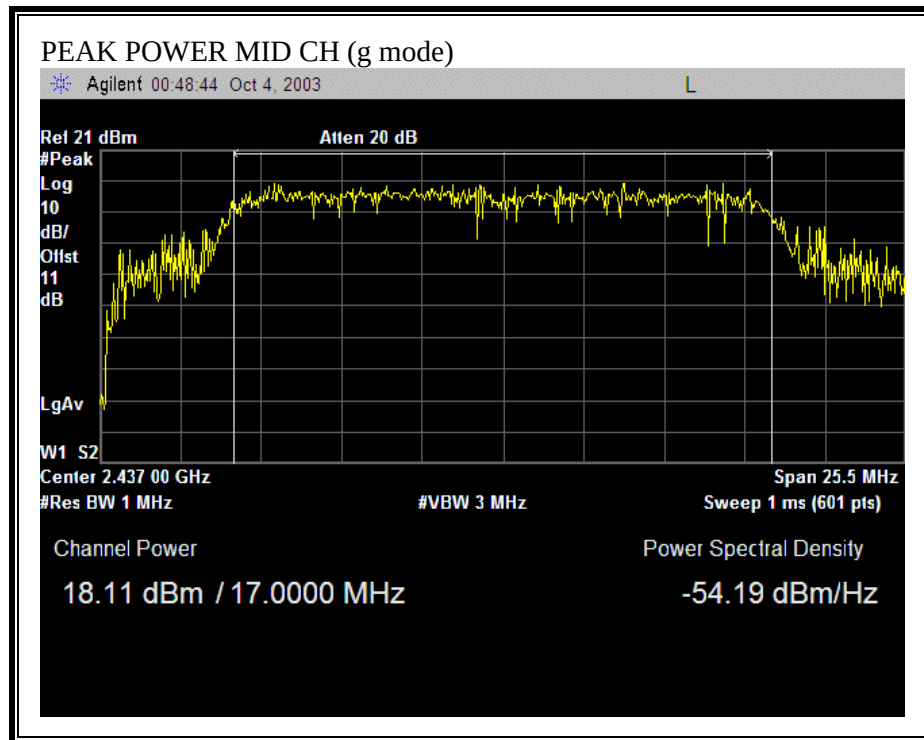
No non-compliance noted:

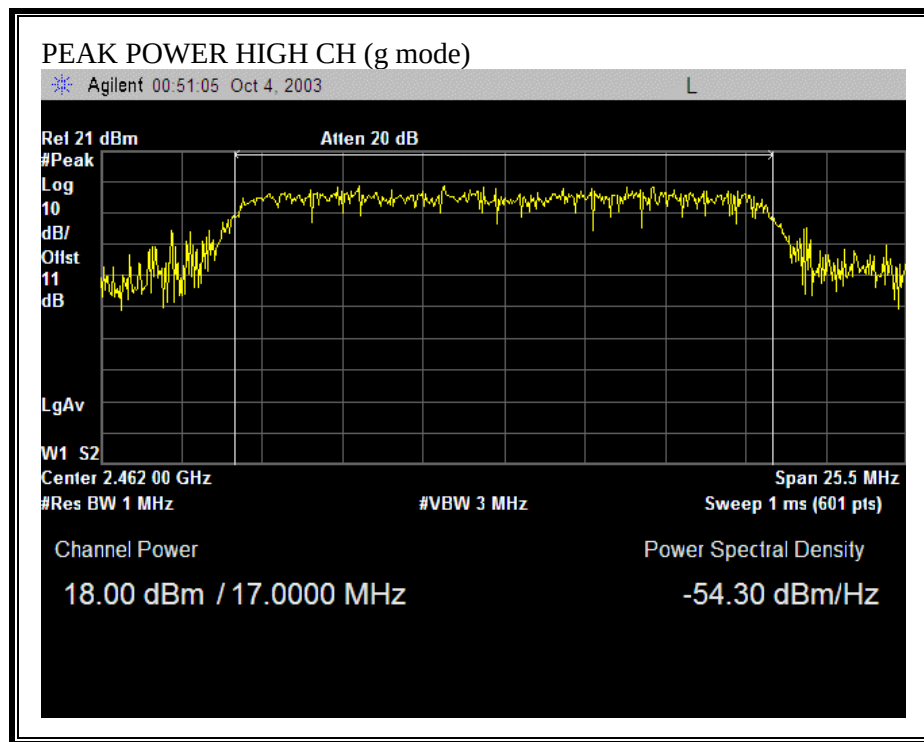
802.11g Normal Mode

Channel	Frequency	Peak Power	Limit	Margin
	(MHz)	(dBm)	(dBm)	(dB)
Low	2412	18.20	30	-11.80
Middle	2437	18.11	30	-11.89
High	2462	18.00	30	-12.00

OUTPUT POWER (802.11g MODE)







7.4. MAXIMUM PERMISSIBLE EXPOSURE

LIMITS

§15.247 (b) (5) Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines. See §1.1307(b)(1) of this chapter.

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 mW and 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

S = 1.0 mW / cm² from 1.1310 Table 1

RESULTS

No non-compliance noted:

Mode	Power Density Limit (mW/cm ²)	Output Power (dBm)	Antenna Gain (dBi)	MPE Distance (cm)
802.11g Normal	1.0	18.20	2.00	2.89

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 dB (including 10 dB pad and 1.0 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

802.11g Normal Mode

Channel	Frequency (MHz)	Average Power (dBm)
Low	2412	14.40
Middle	2437	14.20
High	2462	14.00

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.

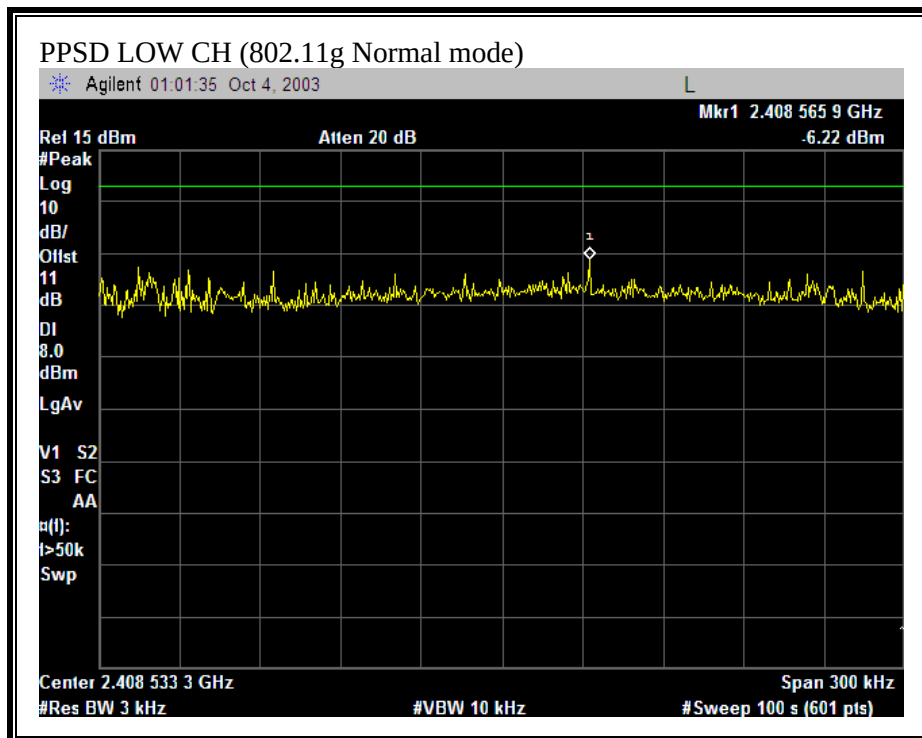
RESULTS

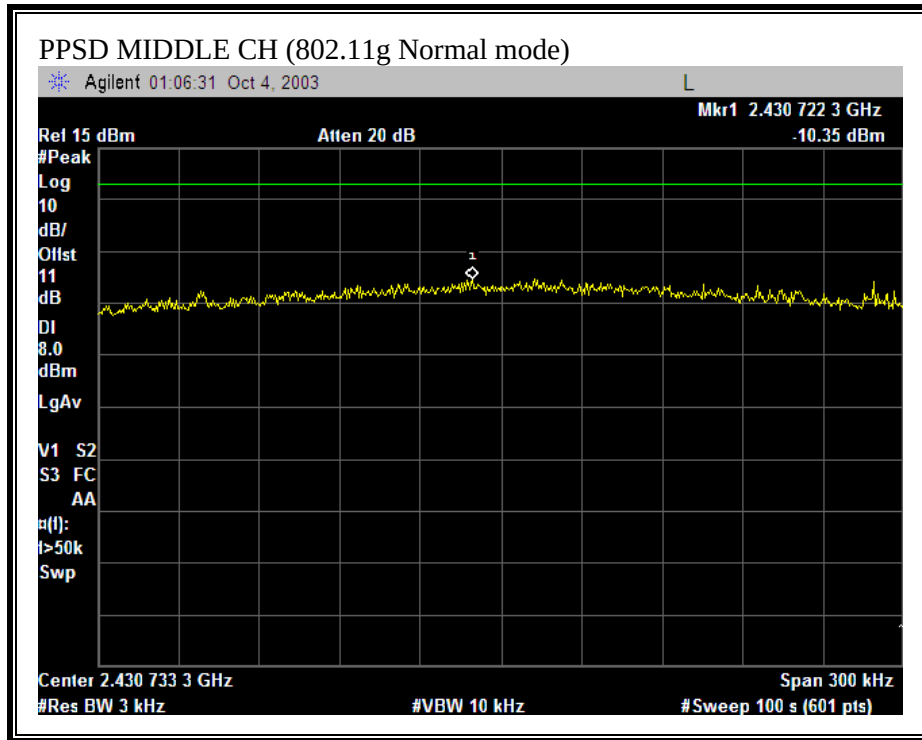
No non-compliance noted:

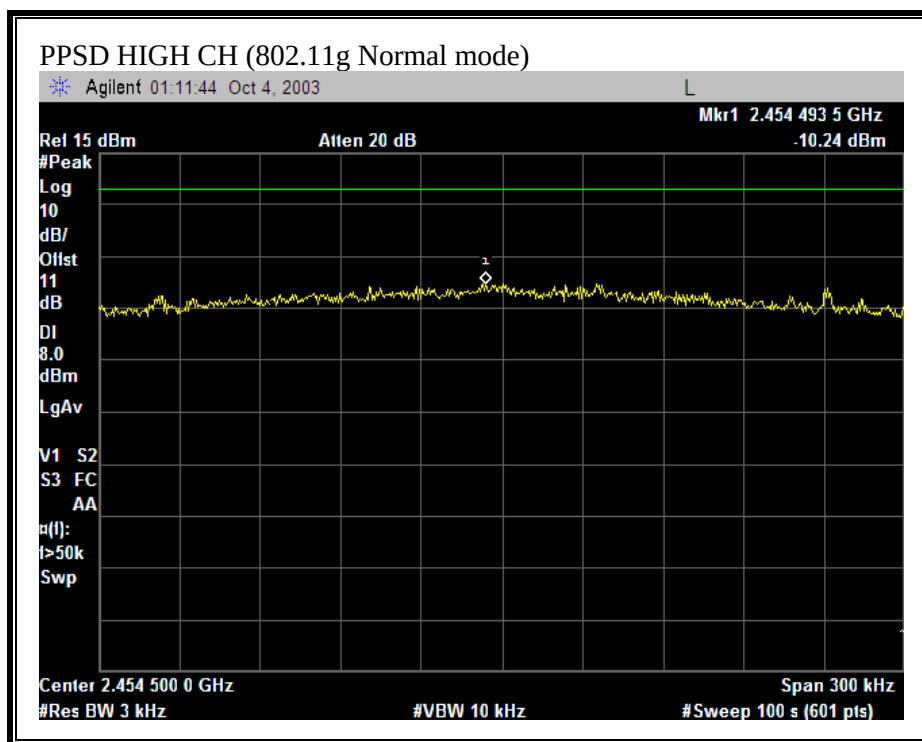
802.11g Normal Mode

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-6.22	8	-14.22
Middle	2437	-10.35	8	-18.35
High	2462	-10.24	8	-18.24

PEAK POWER SPECTRAL DENSITY (802.11g NORMAL 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

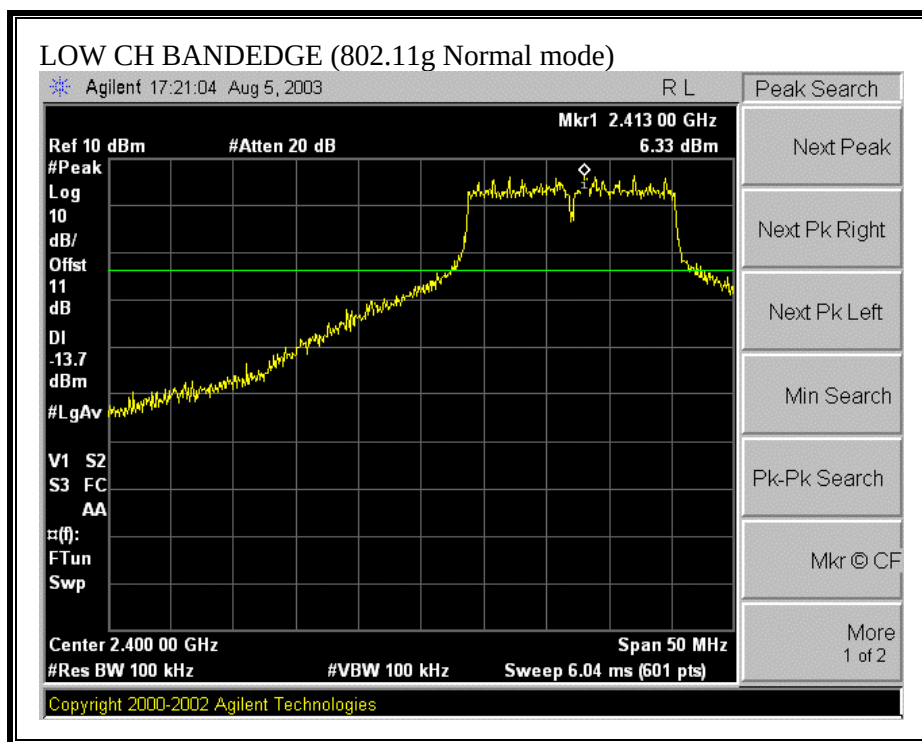
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 100 kHz.

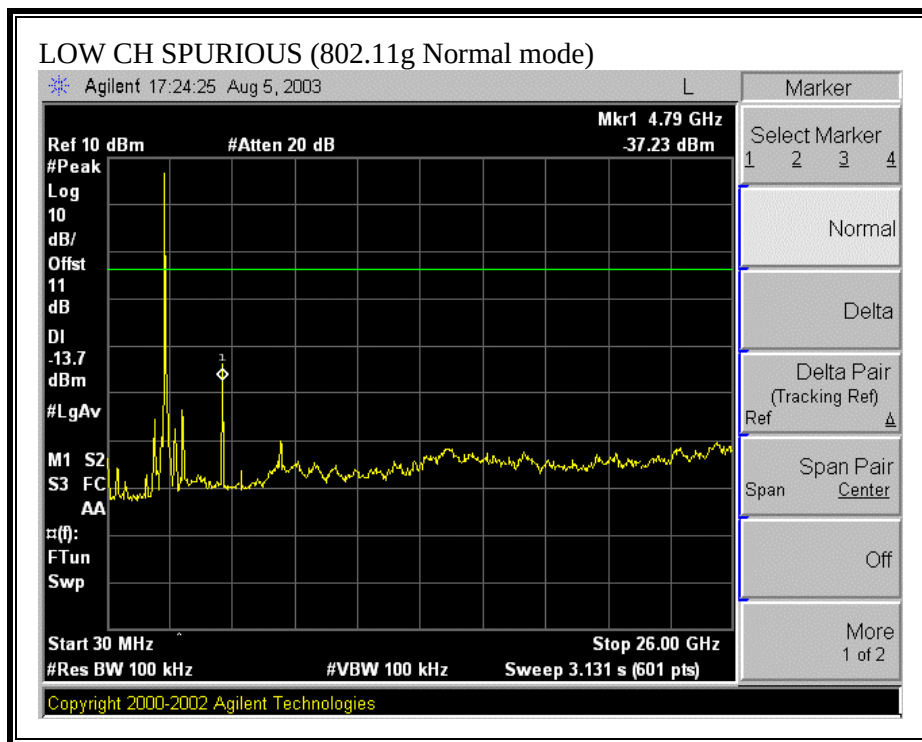
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

RESULTS

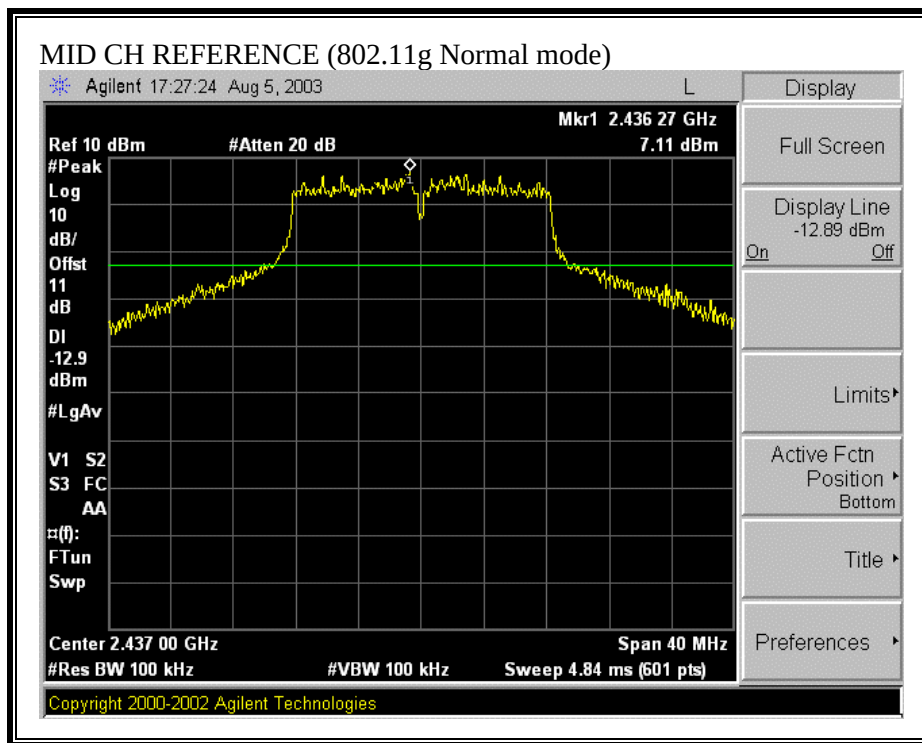
No non-compliance noted:

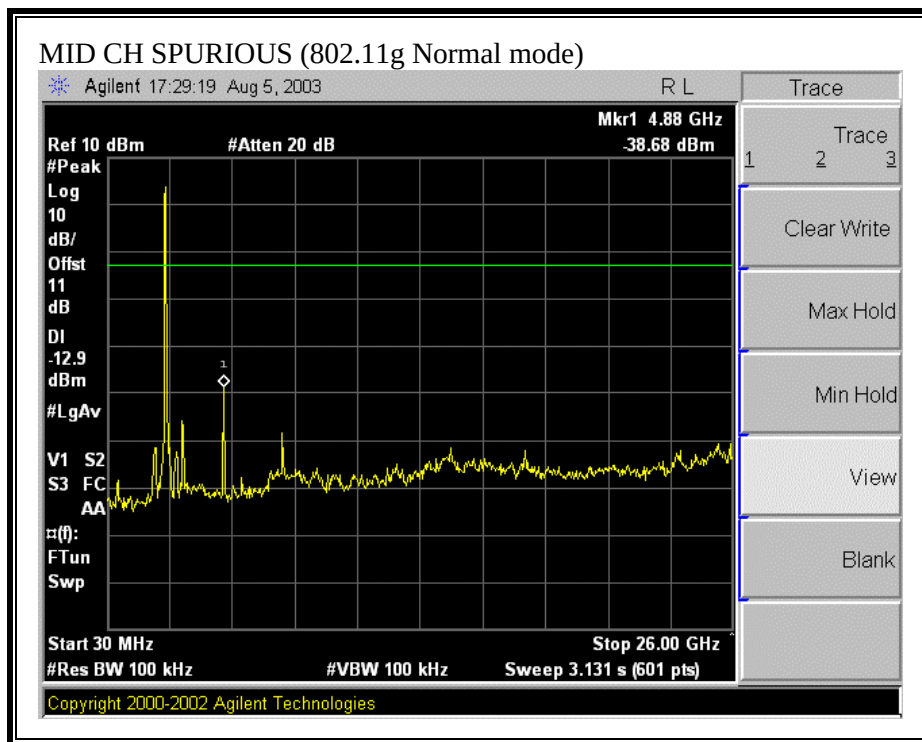
SPURIOUS EMISSIONS, LOW CHANNEL (802.11g NORMAL MODE)



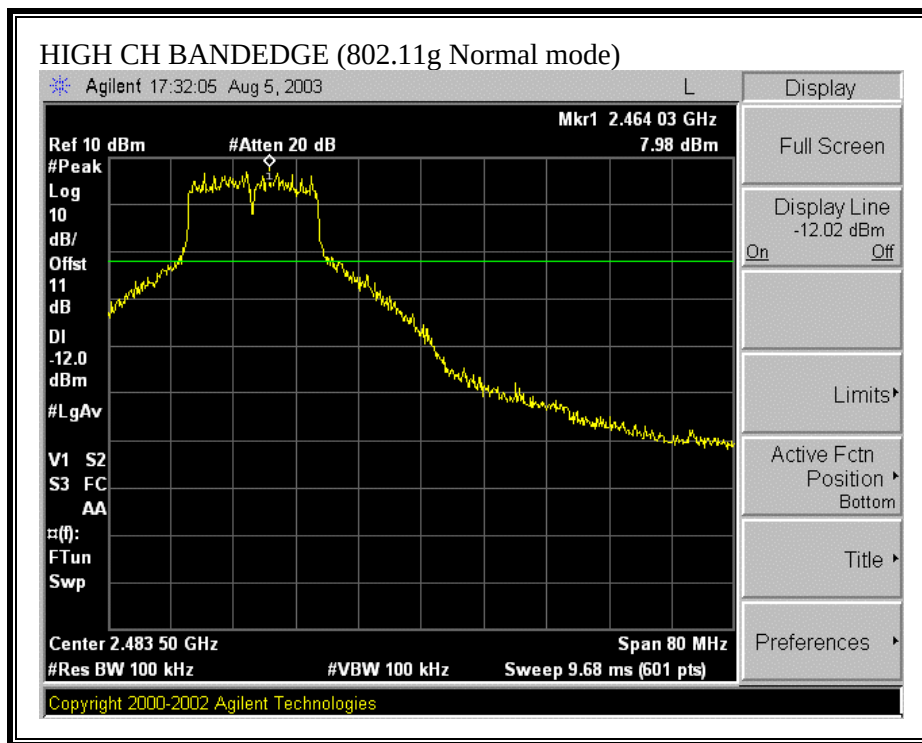


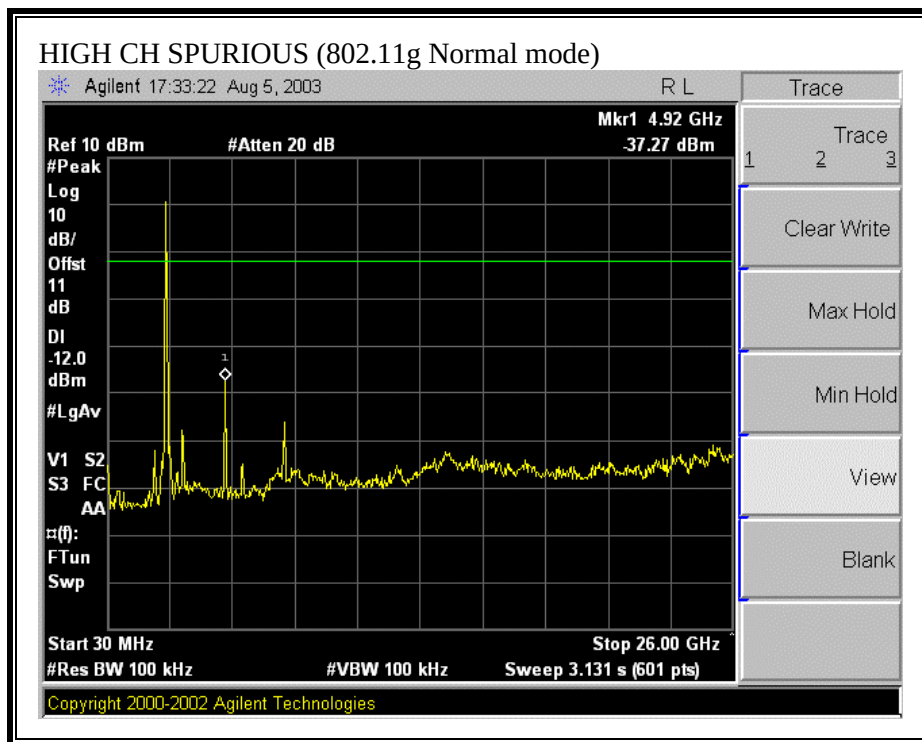
SPURIOUS EMISSIONS, MID CHANNEL (802.11g NORMAL MODE)





SPURIOUS EMISSIONS, HIGH CHANNEL (802.11g NORMAL MODE)





7.8. RADIATED 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.

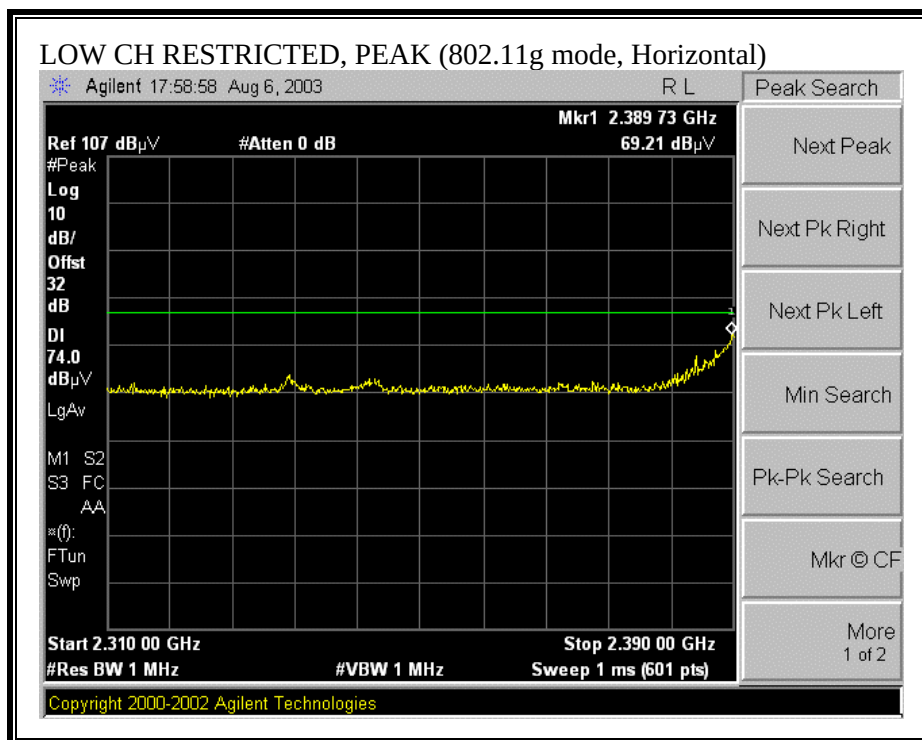
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

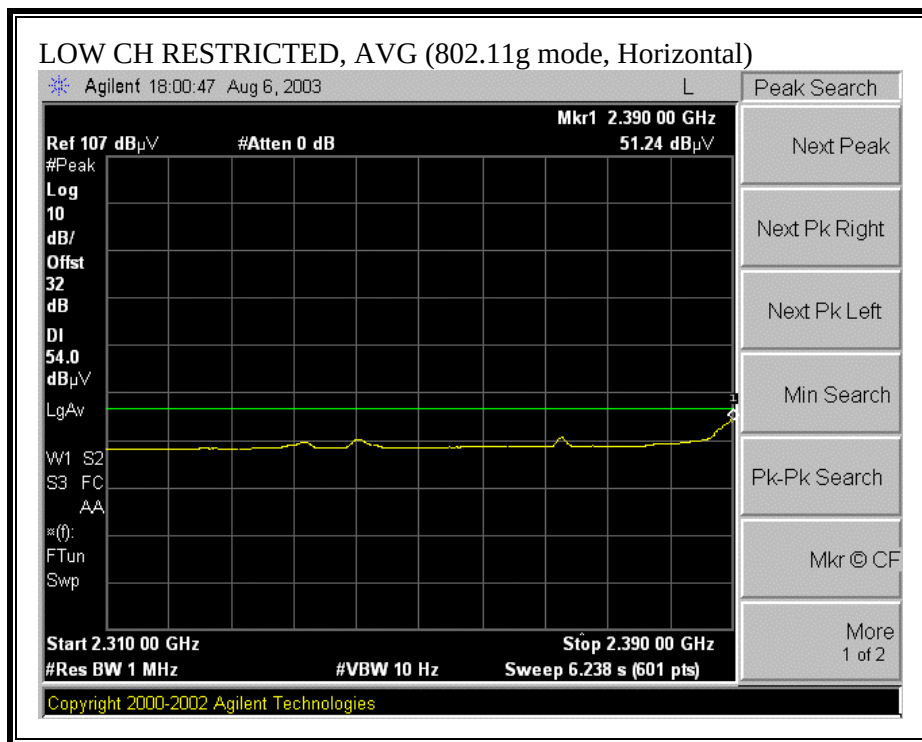
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

RESULTS

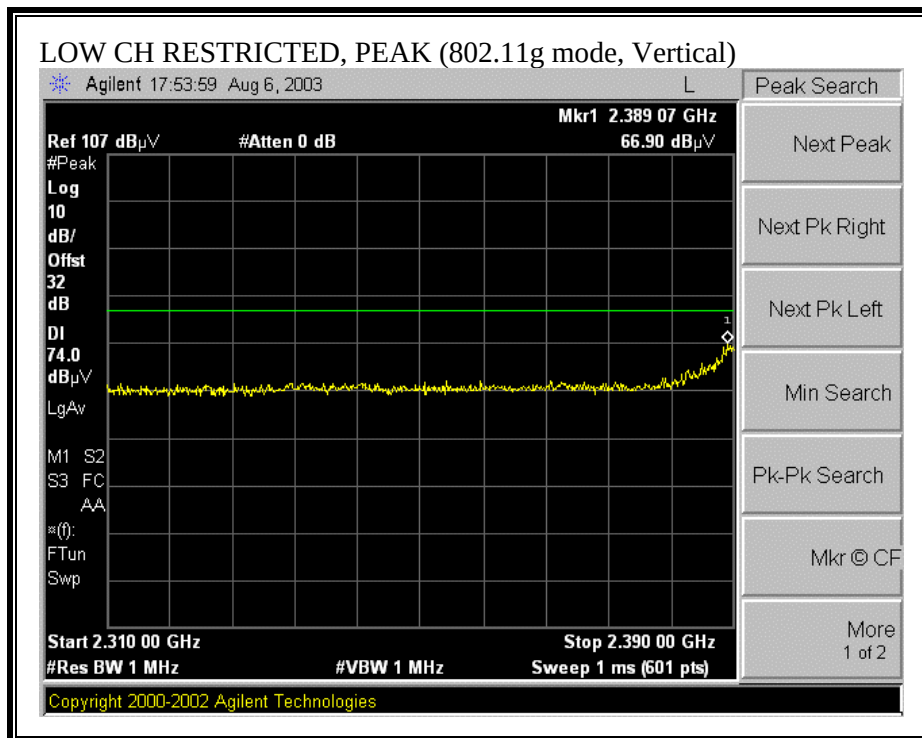
No non-compliance noted:

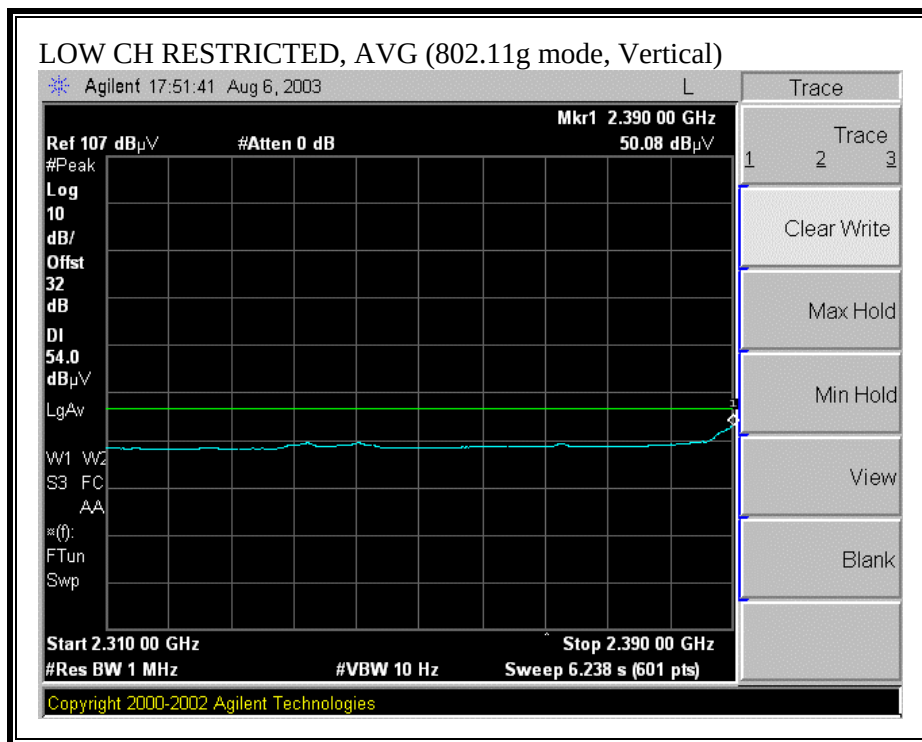
RESTRICTED BANDEDGE (g MODE, LOW CHANNEL, HORIZONTAL)



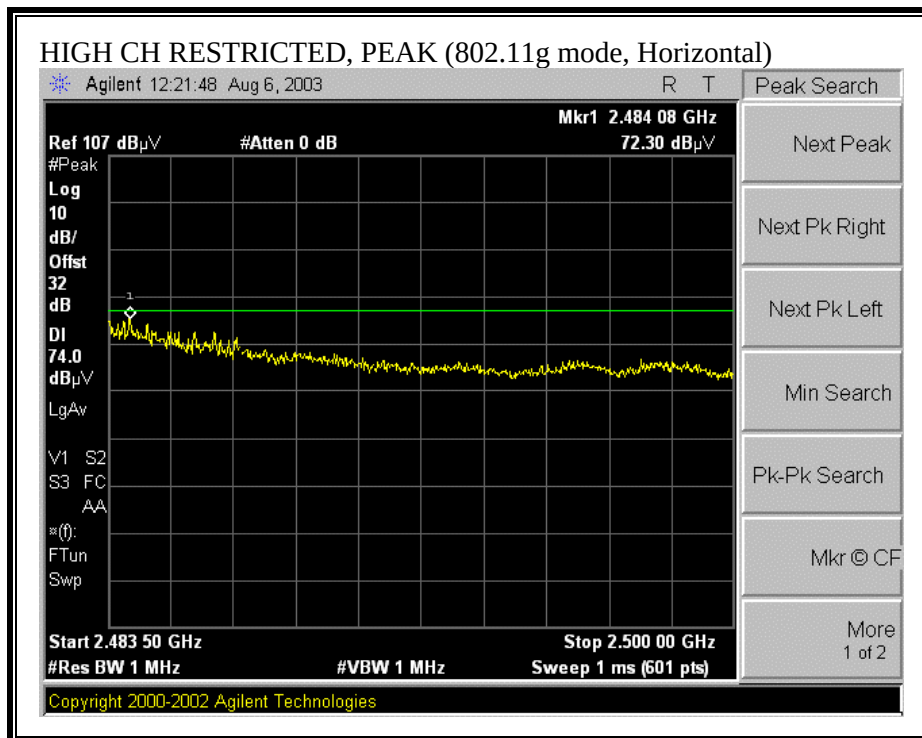


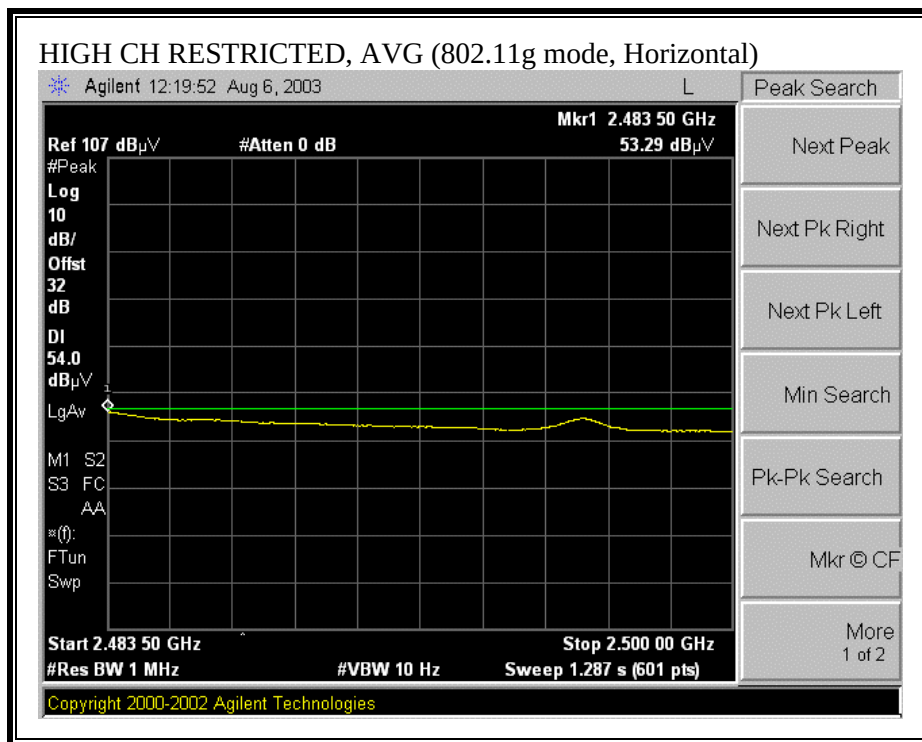
RESTRICTED BANDEDGE (g MODE, LOW CHANNEL, VERTICAL)



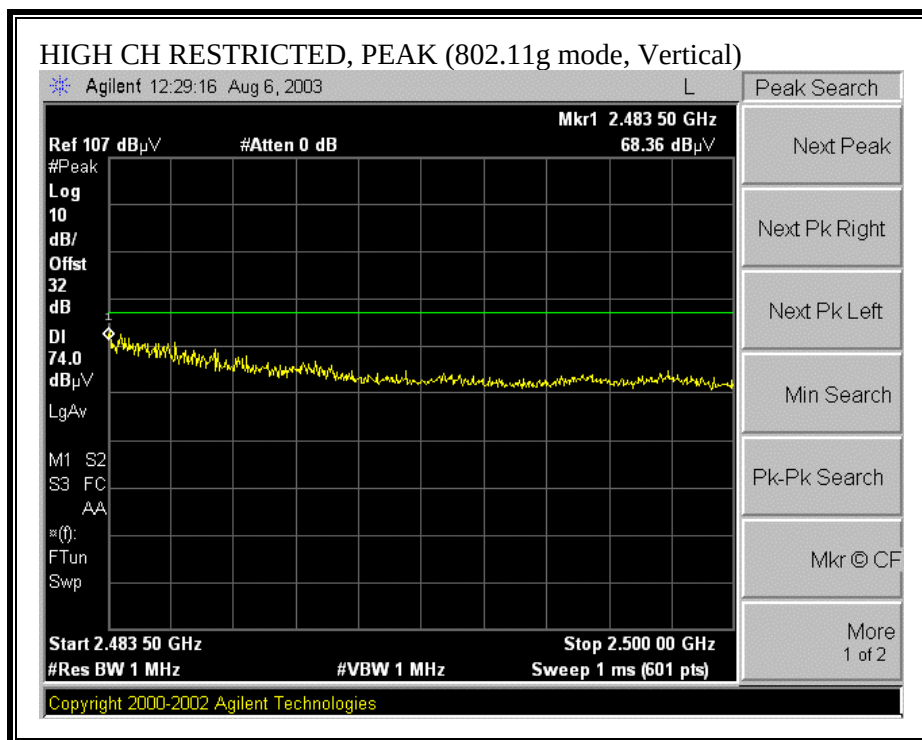


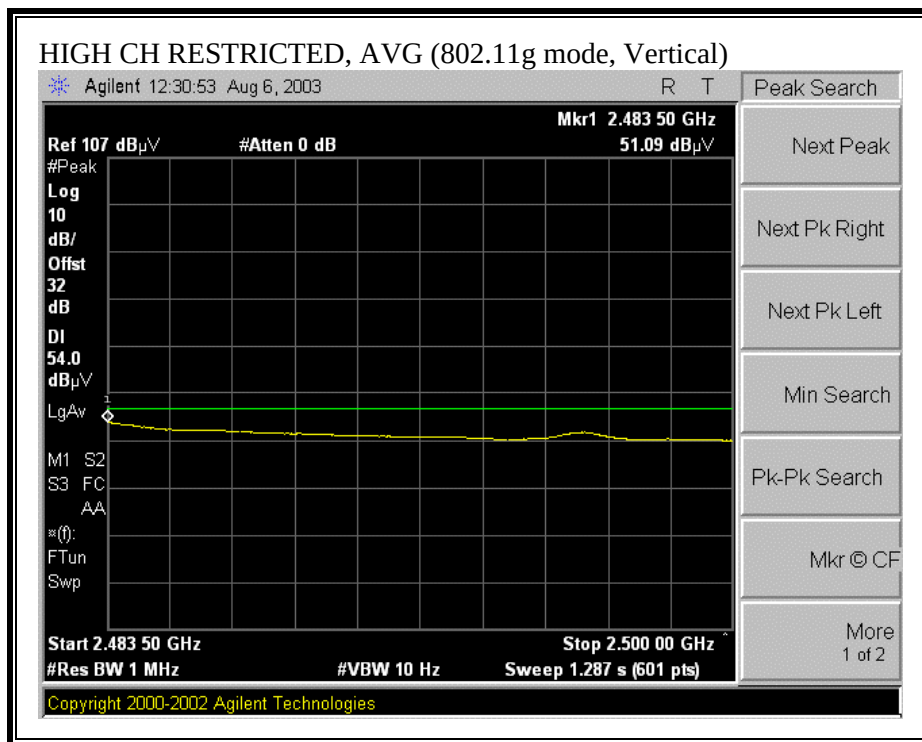
RESTRICTED BANDEDGE (g MODE, HIGH CHANNEL, HORIZONTAL)





RESTRICTED BANDEDGE (g MODE, HIGH CHANNEL, VERTICAL)





HARMONICS AND SPURIOUS EMISSIONS (g NORMAL MODE, L,M & H CHANNEL)

Company: Trapeze Networks EUT Descr: 802.11 a/b/g Access Point EUTMN: 100 Test Target: FCC Class B Mode: Oper: Tx																
Test Equipment:																
EMCOHm 1-18GHz T73; SN:6717 @3m				Preamplifier 1-26GHz T87 Miteq924342				Spectrum Analyzer Agilent E446A Analyzer				Hm > 18GHz				
H 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	ReadPk dBuV	ReadAvg dBuV	AF dBm	CL dB	Amp dB	DCor dB	HPF	Peak dBuV/m	Avg dBuV/m	PkLim dBuV/m	AvgLim dBuV/m	PkMir dB	AvgMir dB	Notes	
Transmitting at low Ch																
4824	98	71.5	55.9	33.4	3.9	-44.7	0.0	1.0	65.1	49.4	74.0	54.0	-8.9	-4.6	V,15dBm	
7238	98	52.8	40.5	35.7	5.1	-44.6	0.0	1.0	50.0	37.7	74.0	54.0	-24.0	-16.3	V,15dBm	
4824	98	74.3	56.0	33.4	3.9	-44.7	0.0	1.0	67.9	49.6	74.0	54.0	-6.1	-4.4	H,15dBm	
7238	98	55.0	42.1	35.7	5.1	-44.6	0.0	1.0	52.2	39.3	74.0	54.0	-21.8	-14.7	H,15dBm	
Transmitting at mid Ch																
4874	98	75.6	53.5	33.4	4.0	-44.7	0.0	1.0	69.2	47.1	74.0	54.0	-4.8	-6.9	V,15dBm	
7311	98	59.2	44.3	35.8	5.2	-44.5	0.0	1.0	56.6	41.7	74.0	54.0	-17.4	-12.3	V,15dBm	
4874	98	78.9	53.8	33.4	4.0	-44.7	0.0	1.0	72.5	47.4	74.0	54.0	-1.5	-6.6	H,15dBm	
7311	98	54.7	42.8	35.8	5.2	-44.5	0.0	1.0	52.1	40.2	74.0	54.0	-21.9	-13.8	H,15dBm	
Transmitting at high Ch																
4924	98	77.3	52.6	33.5	4.0	-44.8	0.0	1.0	71.0	46.3	74.0	54.0	-3.0	-7.7	V,15dBm	
7386	98	59.0	45.0	36.0	5.2	-44.5	0.0	1.0	56.7	42.7	74.0	54.0	-17.3	-11.3	V,15dBm	
4924	98	75.9	52.8	33.5	4.0	-44.8	0.0	1.0	69.5	46.5	74.0	54.0	-4.5	-7.5	H,15dBm	
7386	98	57.0	45.1	36.0	5.2	-44.5	0.0	1.0	54.6	42.8	74.0	54.0	-19.4	-11.2	H,15dBm	
No other emissions were detected above system noise floor.																
f	Measurement Frequency		Amp		Preamp Gain		AvgLim		Average Field Strength Limit		PkLim		Peak Field Strength Limit			
Dist	Distance to Antenna		DCor		Distance Correct to 3 meters		AvgMir		Margin vs. Average Limit		PkMir		Margin vs. Peak Limit			
Read	Analyzer Reading		Avg		Average Field Strength @3 m											
AF	Antenna Factor		Peak		Calculated Peak Field Strength											
CL	Cable Loss		HPF		High Pass Filter											

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

 FCC, VCCI, CISPR, CE, AUSTEL, NZ UL, CSA, TUV, BSMI, DHHS, NVLAP 561F MONTEREY ROAD, SAN JOSE, CA 95037-9001 PHONE: (408) 463-0885 FAX: (408) 463-0888						Project #: 03U2157-1 Report #: 030807B1 Date & Time: 08/07/03 2:19 PM Test Engr: Vien Tran					
Company: Trapeze Networks EUT Description: 802.11 a/b/g Access Point Test Configuration : EUT Only Type of Test: FCC Class B Mode of Operation: Tx											
<< Main Sheet											
Freq.	Reading	AF	Closs	Pre-amp	Level	Limit	Margin	Pol	Az	Height	Mark
(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	FCC_B	(dB)	(H/V)	(Deg)	(Meter)	(P/Q/A)
599.31	48.70	18.82	6.20	28.93	44.79	46.00	-1.21	3mV	0.00	1.50	P
683.68	43.50	18.77	6.71	29.01	39.97	46.00	-6.03	3mV	0.00	1.00	P
336.06	44.60	13.71	4.48	28.13	34.66	46.00	-11.34	3mV	0.00	1.00	P
137.52	45.00	11.57	2.83	28.32	31.08	43.50	-12.42	3mV	0.00	1.00	P
143.82	45.40	11.03	2.87	28.30	31.00	43.50	-12.50	3mV	0.00	1.00	P
105.85	45.80	10.35	2.49	28.44	30.20	43.50	-13.30	3mV	0.00	1.00	P
6 Worst Data											

7.9. CO-LOCATED RADIATED EMISSIONS

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.

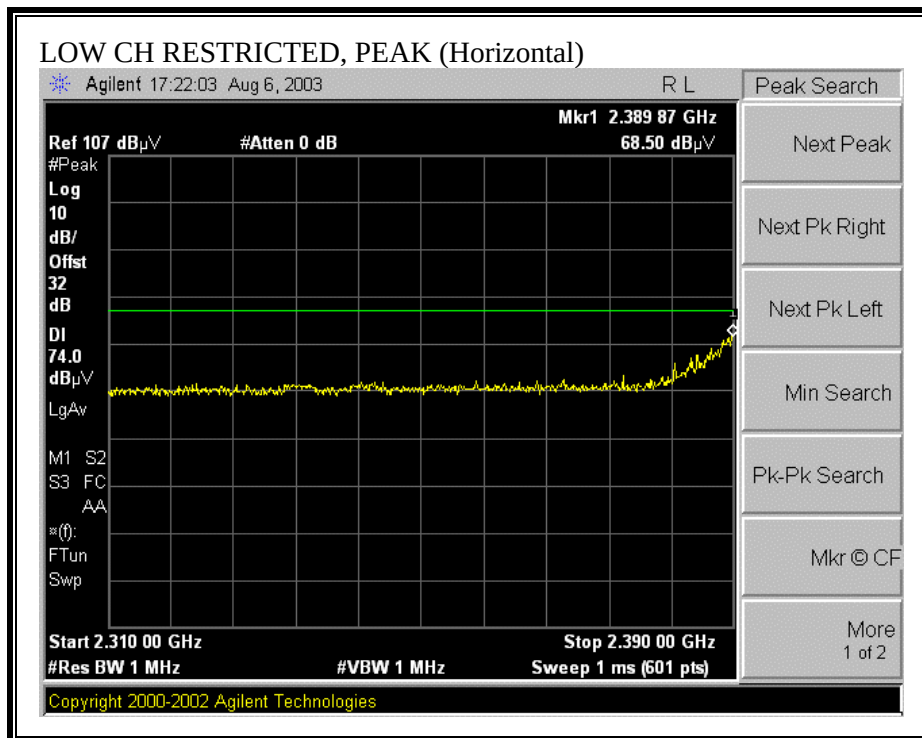
The dominant transmitter is set to the worst case channel. The spurious emissions performance of the dominant transmitter is investigated as the settings of the non-dominant transmitter are varied. Worst case results are reported.

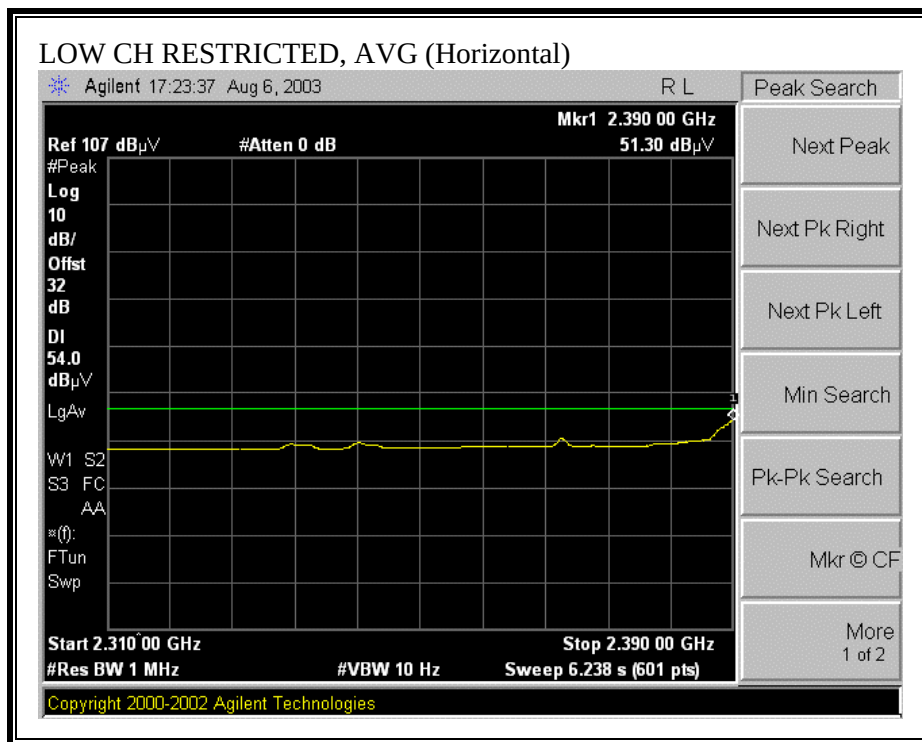
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

RESULTS

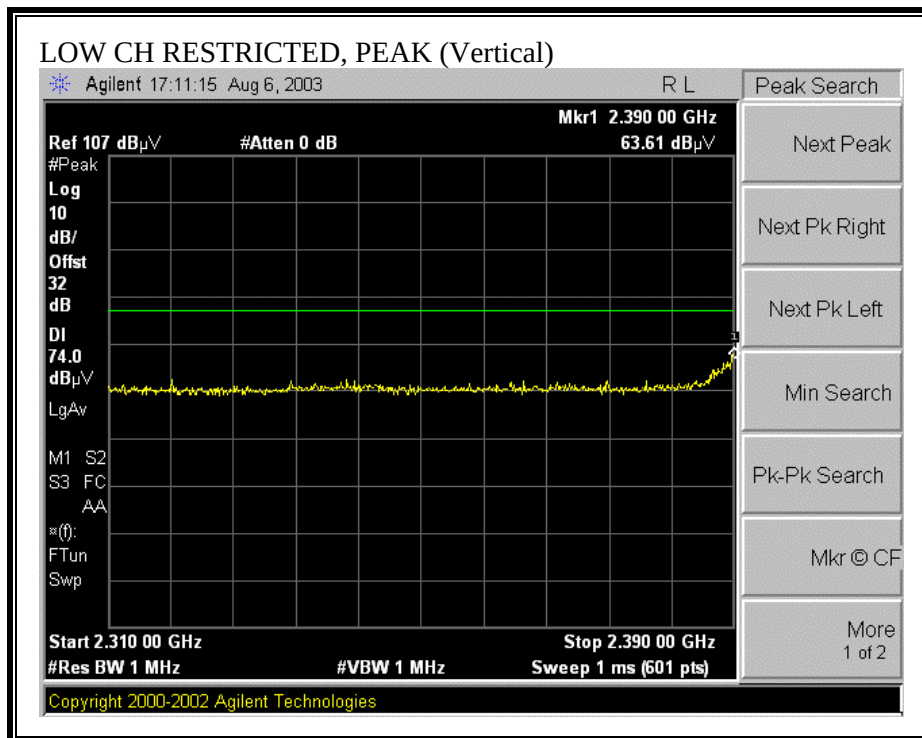
No non-compliance noted:

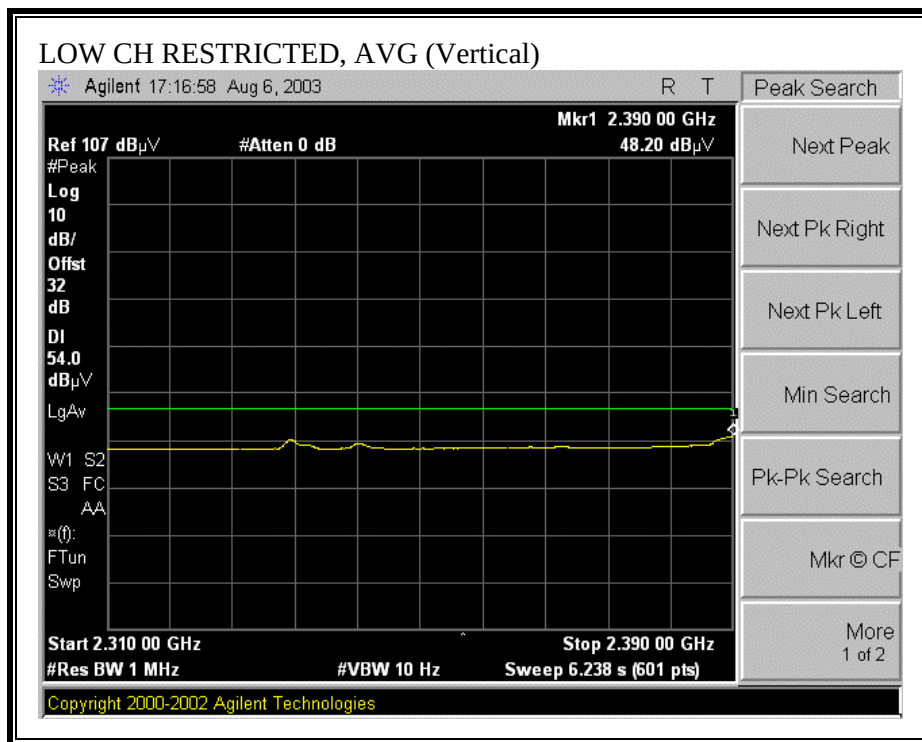
WORST-CASE RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



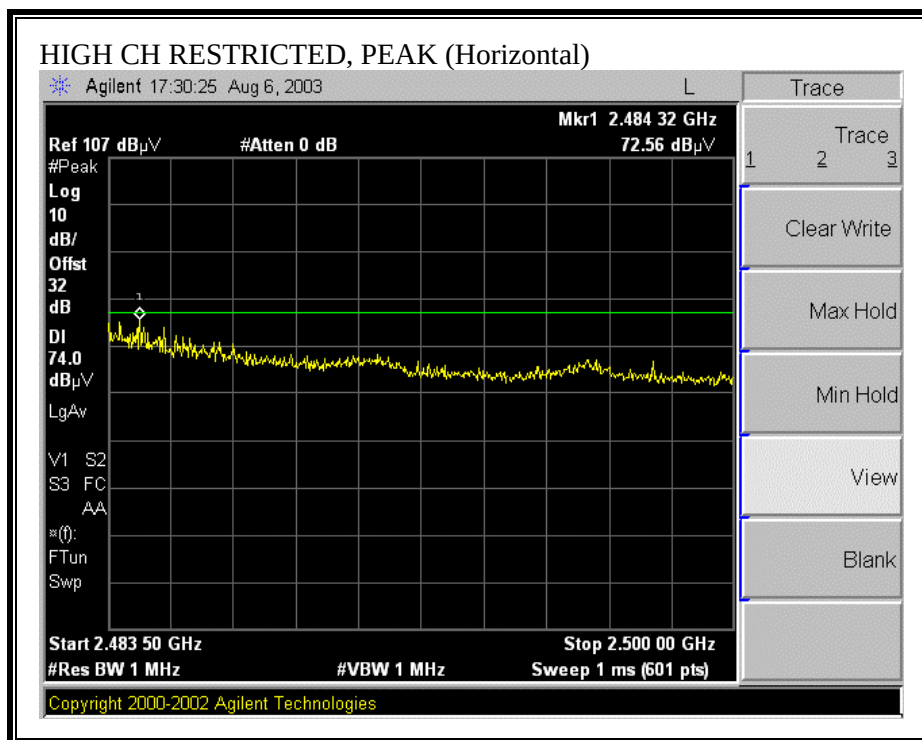


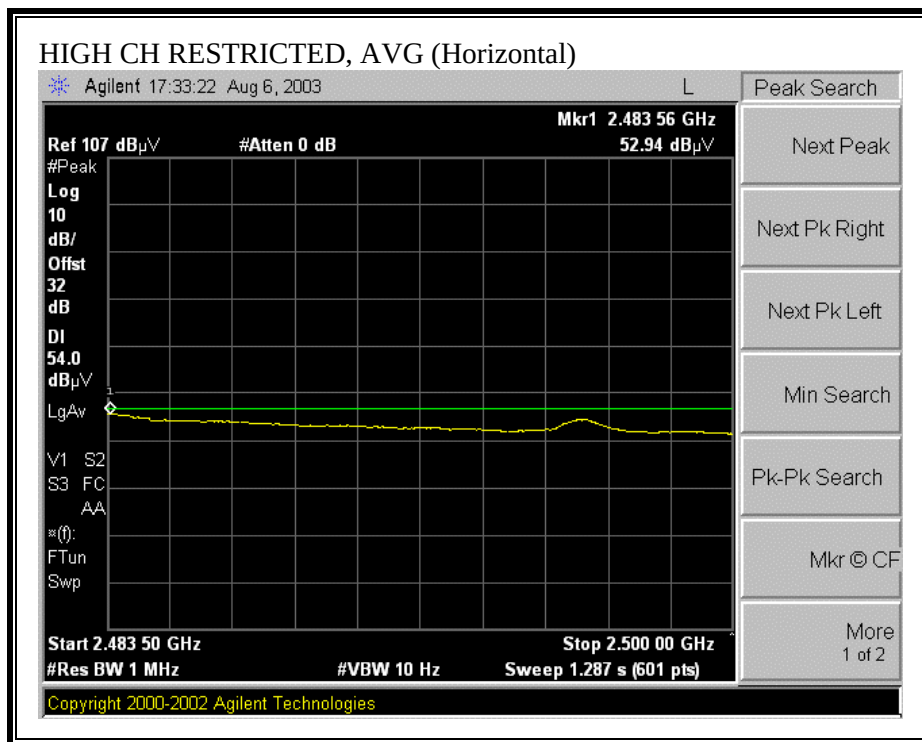
WORST-CASE RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



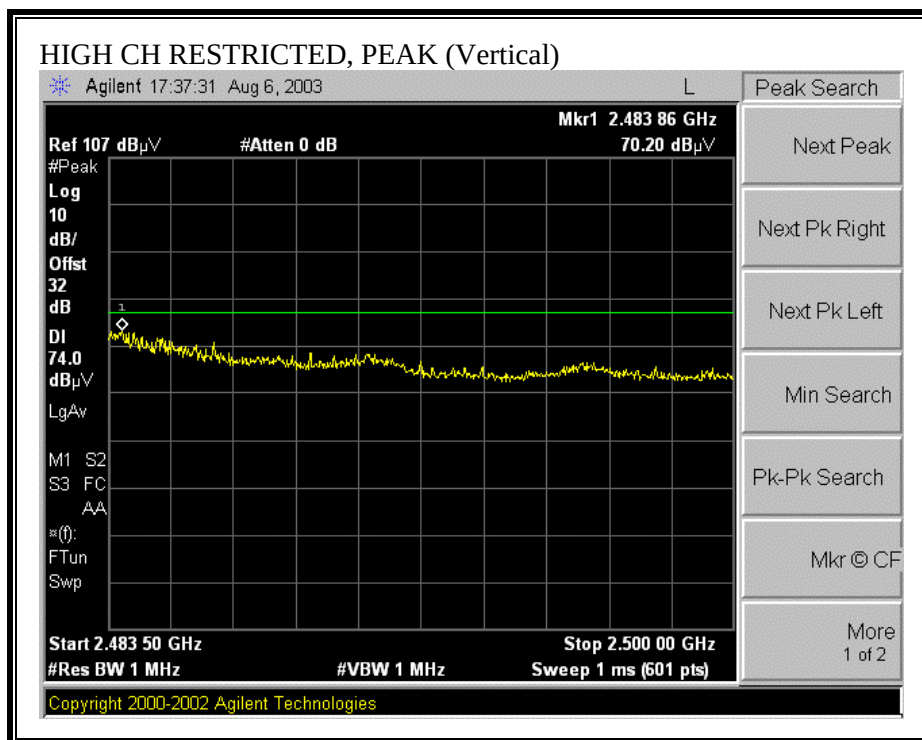


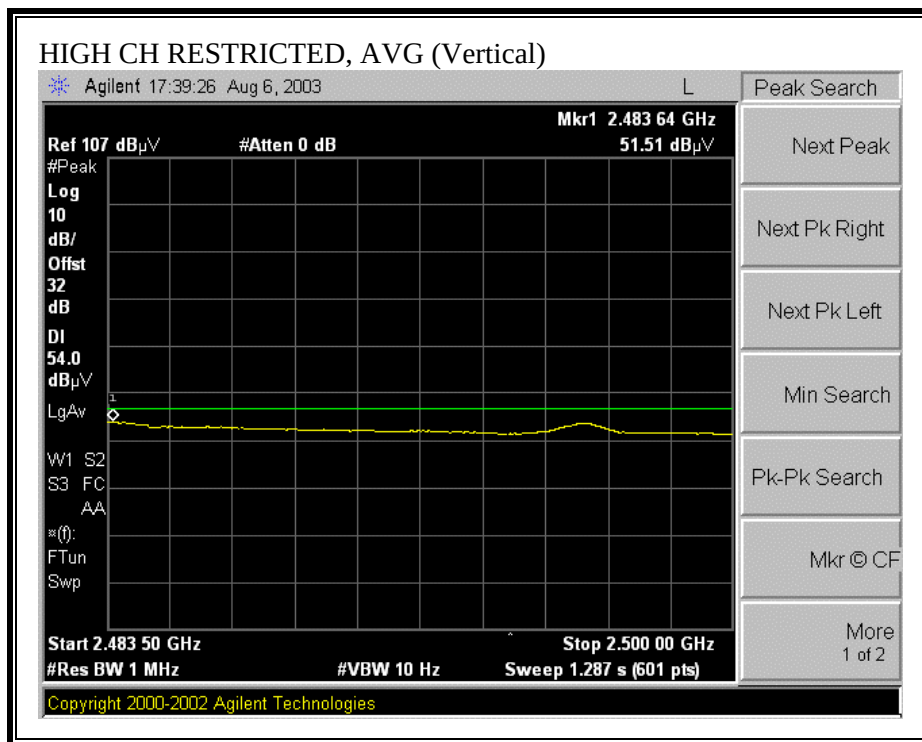
WORST-CASE RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)





WORST-CASE RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)





WORST-CASE HARMONICS AND SPURIOUS EMISSIONS

08/11/03 High Frequency Measurement Compliance Certification Services, Morgan Hill Open Field Site																
Test Engr: Chin Pang Project #: 03u2157-1 Company: Trapeze Networks EUT Descrip.: 802.11 a/b/g Access Point EUT M/N: 100 Test Target:FCC Class B Mode Oper: Tx g mode with a mode at the same time																
Test Equipment:																
EMCO Horn 1-18GHz T73; S/N: 6717 @3m				Pre-amplifier 1-26GHz T87 Miteq 924342				Spectrum Analyzer Agilent E4446A Analyzer				Horn > 18GHz				
Hi Frequency Cables ☐ (2 ft) ☒ (2 ~ 3 ft) ☐ (4 ~ 6 ft) ☒ (12 ft) High																
Peak Measurements: 1 MHz Resolution Bandwidth 1MHz Video Bandwidth																
Average Measurements: 1 MHz Resolution Bandwidth 10Hz Video Bandwidth																
co-location g mode & a mode at 14dBm																
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	
g mode, mid ch with a mode low ch, 5180MHz																
4.874	9.8	75.3	52.2	33.4	4.0	-44.7	0.0	1.0	68.9	45.8	74.0	54.0	-5.1	-8.2	V	
7.311	9.8	61.9	46.8	35.8	5.2	-44.5	0.0	1.0	59.4	44.2	74.0	54.0	-14.6	-9.8	V	
4.874	9.8	75.2	52.1	33.4	4.0	-44.7	0.0	1.0	68.9	45.7	74.0	54.0	-5.1	-8.3	H	
7.311	9.8	57.5	42.9	35.8	5.2	-44.5	0.0	1.0	54.9	40.3	74.0	54.0	-19.1	-13.7	H	
g mode, mid ch with a mode mid ch, 5260MHz																
4.874	9.8	74.2	52.0	33.4	4.0	-44.7	0.0	1.0	67.8	45.6	74.0	54.0	-6.2	-8.4	V	
7.311	9.8	61.8	46.5	35.8	5.2	-44.5	0.0	1.0	59.2	43.9	74.0	54.0	-14.8	-10.1	V	
4.874	9.8	72.2	50.5	33.4	4.0	-44.7	0.0	1.0	65.9	44.1	74.0	54.0	-8.1	-9.9	H	
7.311	9.8	55.5	42.0	35.8	5.2	-44.5	0.0	1.0	52.9	39.4	74.0	54.0	-21.1	-14.6	H	
g mode, mid ch with a mode high ch, 5320MHz																
4.874	9.8	73.5	51.8	33.4	4.0	-44.7	0.0	1.0	67.1	45.4	74.0	54.0	-6.9	-8.6	V	
7.311	9.8	61.9	46.5	35.8	5.2	-44.5	0.0	1.0	59.3	43.9	74.0	54.0	-14.7	-10.1	V	
4.874	9.8	73.8	52.0	33.4	4.0	-44.7	0.0	1.0	67.4	45.6	74.0	54.0	-6.6	-8.4	H	
7.311	9.8	57.5	43.4	35.8	5.2	-44.5	0.0	1.0	54.9	40.8	74.0	54.0	-19.1	-13.2	H	
No other emission were detected above system noise floor																
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									

7.10. 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.

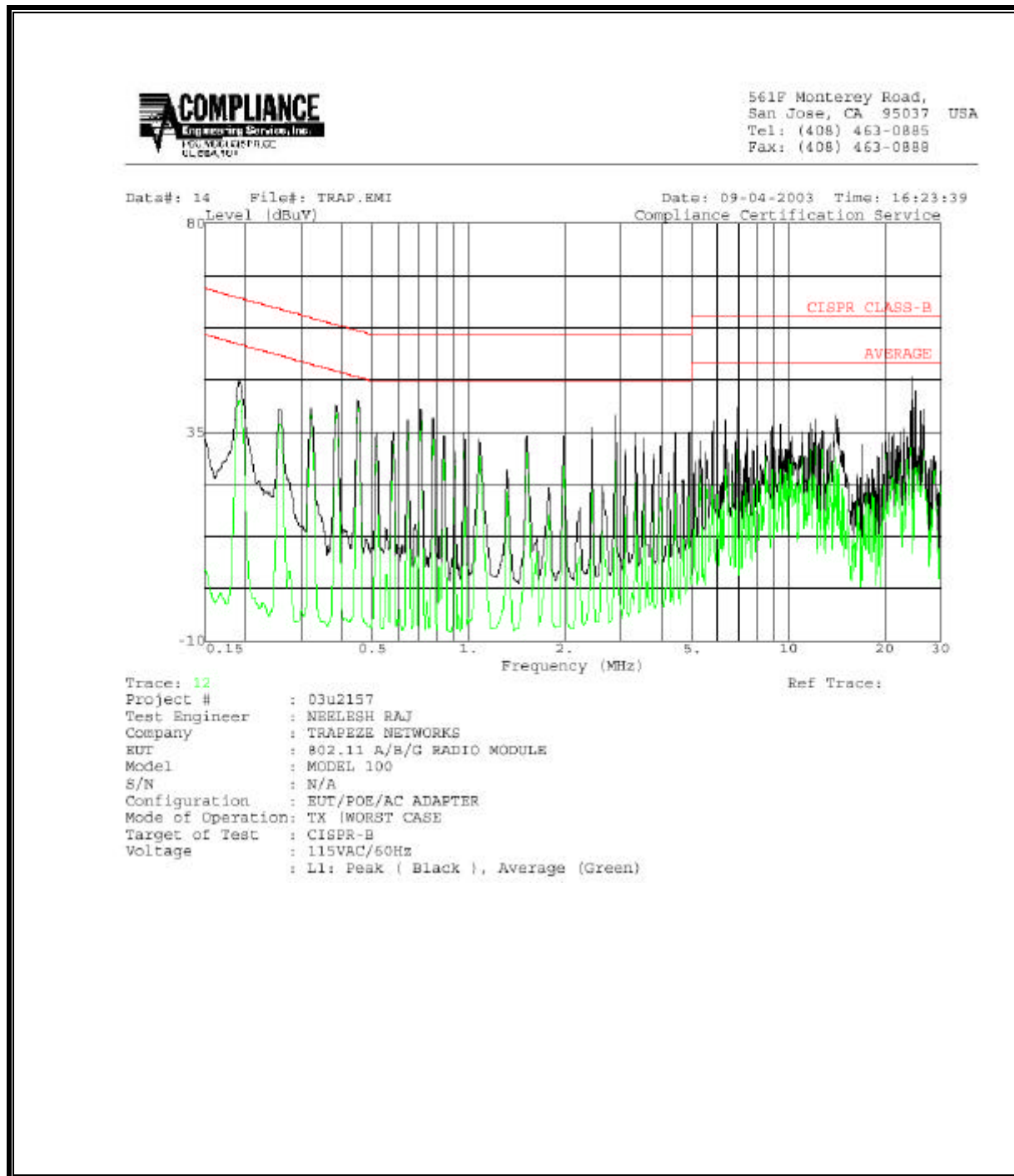
RESULTS

No non-compliance noted:

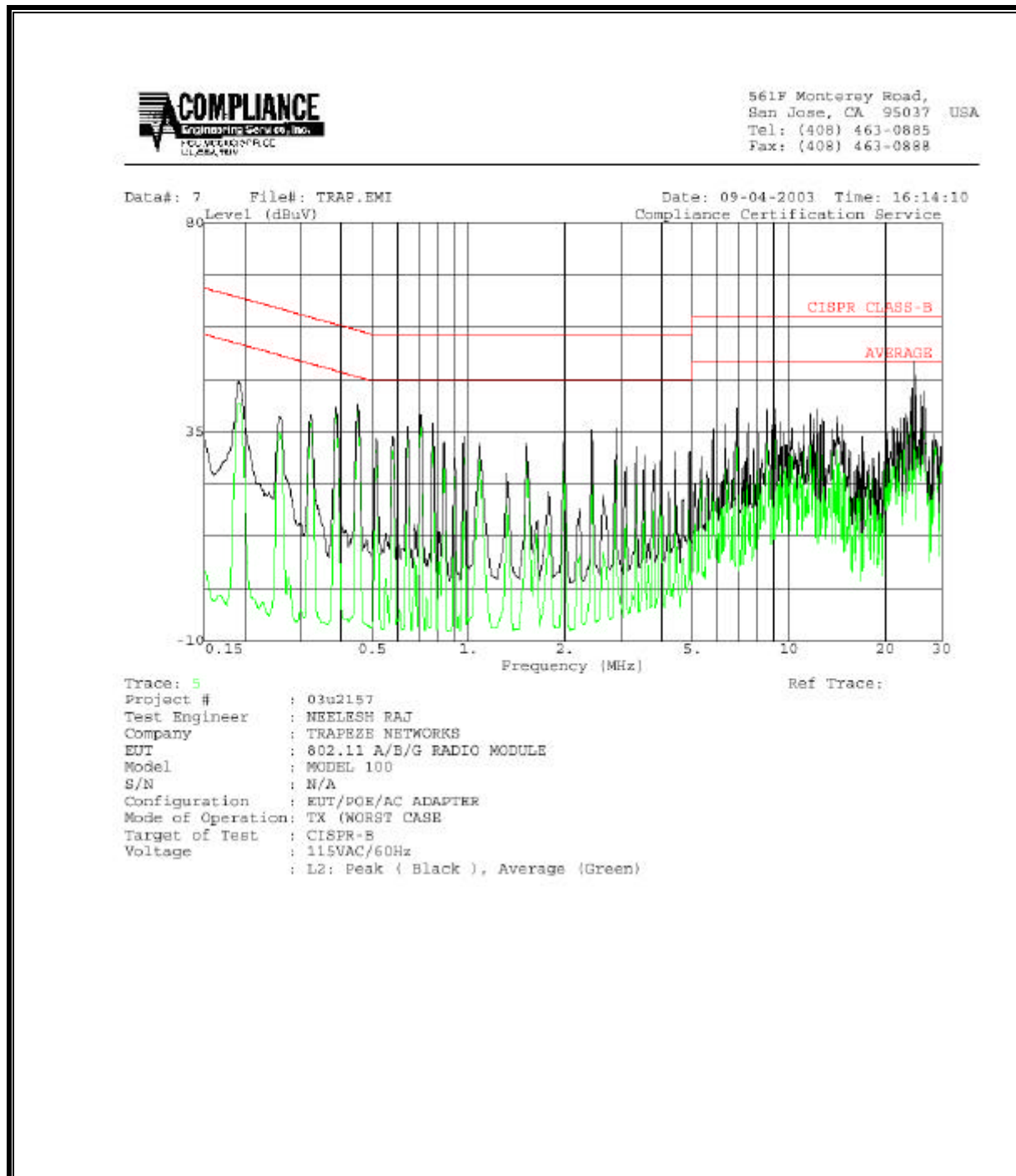
6 WORST EMISSIONS

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
24.40	46.92	--	45.59	0.00	60.00	50.00	-13.08	-4.41	L1
24.92	43.84	--	42.18	0.00	60.00	50.00	-16.16	-7.82	L1
0.19	46.04	--	41.94	0.00	64.83	54.83	-18.79	-12.89	L1
24.40	50.20	--	48.87	0.00	60.00	50.00	-9.80	-1.13	L2
24.92	47.20	--	45.58	0.00	60.00	50.00	-12.80	-4.42	L2
0.19	45.70	--	40.78	0.00	64.83	54.83	-19.13	-14.05	L2
6 Worst Data									

LINE 1 RESULTS

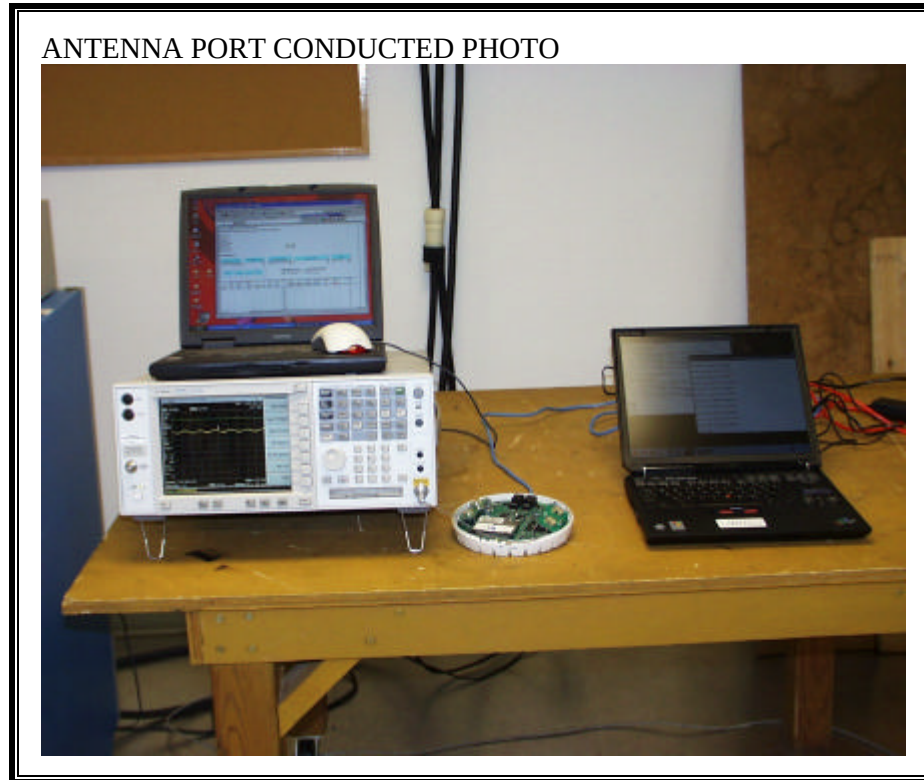


LINE 2 RESULTS



8. SETUP PHOTOS

ANTENNA PORT CONDUCTED RF MEASUREMENT SETUP



RADIATED RF MEASUREMENT SETUP



DIGITAL DEVICE RADIATED EMISSIONS SETUP



DIGITAL DEVICE BACK PHOTO



POWERLINE CONDUCTED EMISSIONS MEASUREMENT SETUP



LINE CONDUCTED BACK PHOTO



END OF REPORT