



**FCC CFR47 PART 15 SUBPART E
CERTIFICATION
TEST REPORT
FOR**

802.11abg CARDBUS ADAPTER

MODEL NUMBER: WLI-CB-AG108HP

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TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS.....	4
2. TEST METHODOLOGY	5
3. FACILITIES AND ACCREDITATION	5
4. CALIBRATION AND UNCERTAINTY.....	5
4.1. <i>MEASURING INSTRUMENT CALIBRATION</i>	5
4.2. <i>MEASUREMENT UNCERTAINTY</i>	5
5. EQUIPMENT UNDER TEST.....	6
5.1. <i>DESCRIPTION OF EUT</i>	6
5.2. <i>MAXIMUM OUTPUT POWER</i>	6
5.3. <i>DESCRIPTION OF AVAILABLE ANTENNAS</i>	6
5.4. <i>SOFTWARE AND FIRMWARE</i>	6
5.5. <i>WORST-CASE CONFIGURATION AND MODE</i>	7
5.6. <i>DESCRIPTION OF TEST SETUP</i>	8
6. TEST AND MEASUREMENT EQUIPMENT	10
7. LIMITS AND RESULTS	11
7.1. <i>CHANNEL TESTS FOR THE 5150 TO 5350 MHz BAND</i>	11
7.1.1. <i>EMISSION BANDWIDTH</i>	11
7.1.2. <i>PEAK POWER</i>	18
7.1.3. <i>MAXIMUM PERMISSIBLE EXPOSURE</i>	27
7.1.4. <i>AVERAGE POWER</i>	30
7.1.5. <i>PEAK POWER SPECTRAL DENSITY</i>	31
7.1.6. <i>PEAK EXCURSION</i>	39
7.1.7. <i>CONDUCTED SPURIOUS EMISSIONS</i>	46
7.2. <i>RADIATED EMISSIONS</i>	53
7.2.1. <i>TRANSMITTER RADIATED SPURIOUS EMISSIONS</i>	53
7.2.2. <i>TRANSMITTER ABOVE 1 GHZ FOR 5150 TO 5350 MHz BAND</i>	56
7.2.3. <i>WORST-CASE RADIATED EMISSIONS BELOW 1 GHZ</i>	74
7.3. <i>POWERLINE CONDUCTED EMISSIONS</i>	78
8. SETUP PHOTOS.....	82

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: BUFFALO INC.
15, SHIBATA HONDORI 4-CHOME
MONAMI-KU, NAGOYA 457-8520, JAPAN

EUT DESCRIPTION: 802.11abg CARDBUS ADAPTER

MODEL: WLI-CB-AG108HP

SERIAL NUMBER: 01743

DATE TESTED: MAY 18-21, 2006

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 15 SUBPART E	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: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. 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. No part of this report may be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any government agency.

Approved & Released For CCS By:

Tested By:



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EMC SUPERVISOR
COMPLIANCE CERTIFICATION SERVICES

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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4-2003, FCC CFR 47 Part 2 and FCC CFR 47 Part 15.

3. 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>.

4. CALIBRATION AND UNCERTAINTY

4.1. 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.

4.2. 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. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is an 802.11abg transceiver cardbus adapter

The radio module is manufactured by BUFFALO INC..

5.2. MAXIMUM OUTPUT POWER

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

5150 to 5250 MHz Authorized Band

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
5180 - 5250	802.11a	15.10	32.36
5210 - 5250	802.11a Turbo	16.89	48.87

5250 to 5350 MHz Authorized Band

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
5250 - 5320	802.11a	18.59	72.28
5250 - 5290	802.11a Turbo	18.89	77.45

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a permanently attached integral antenna for 2.4GHz and 5GHz bands, with a maximum gain of 1.7dBi. and 0.6dBi respectively.

5.4. SOFTWARE AND FIRMWARE

The EUT driver software installed in the host support equipment during testing was Atheros ART 5.3

The test utility software used during testing was Art_v53_build5_all, rev. 5.3 Build #22

5.5. WORST-CASE CONFIGURATION AND MODE

The worst-case channel is determined as the channel with the highest output power. The highest measured output power was at 5320 MHz for normal mode and 5290 MHz for turbo mode.

The worst-case data rate for this channel is determined to be 6 Mb/s, based on previous experience with 802.11a WLAN product design architectures.

Thus all emissions tests were made in the 802.11a mode, 5320 MHz, 6 Mb/s for normal mode and 5290 MHz, 12 Mb/s for turbo mode.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop	Toshiba	Satellite	91617937PU	DoC
AC Adapter	Toshiba	PA3083U-1A2A	0109AQ043423G	DoC

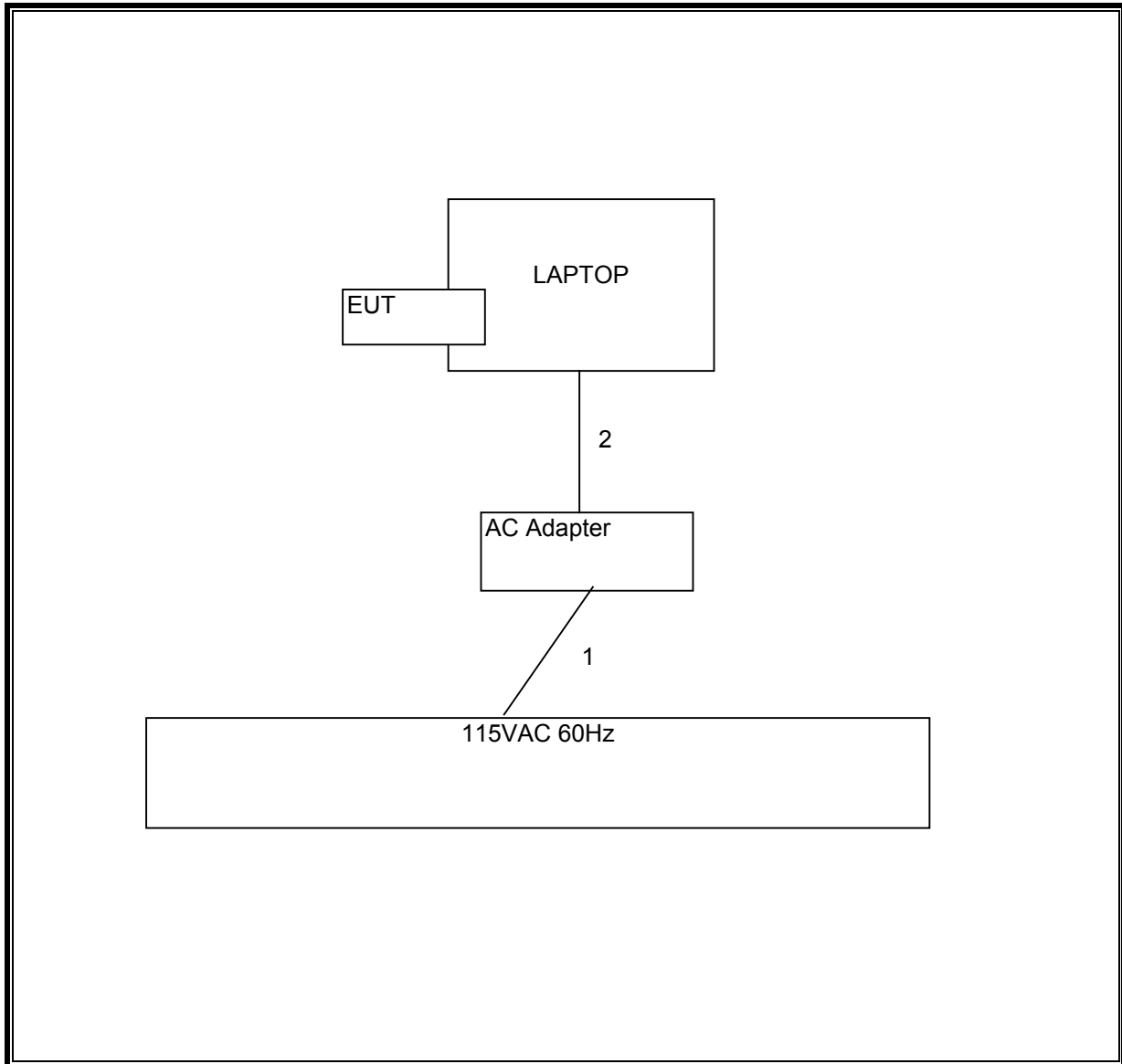
I/O CABLES

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	AC	1	US 115V	Un-shielded	2m	NA
2	DC	1	DC	Un-shielded	2m	NA

TEST SETUP

The EUT is installed in a host laptop computer during the tests. Test software exercised the radio card.

SETUP DIAGRAM FOR TESTS



6. TEST AND MEASUREMENT EQUIPMENT

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

TEST EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	Cal Due
Peak Power Meter	Agilent / HP	E4416A	GB41291160	12/2/2007
Peak / Average Power Sensor	Agilent	E9327A	US40440755	12/2/07
Spectrum Analyzer 3 Hz ~ 44 GHz	Agilent / HP	E4446A	US42510266	10/19/06
Antenna, Horn 1 ~ 18 GHz	EMCO	3115	2238	4/22/07
Preamplifier, 1 ~ 26.5 GHz	Agilent / HP	8449B	3008A00369	8/17/06
Antenna, Horn 18 ~ 26 GHz	ARA	MWH-1826/B	1049	9/12/06
Preamplifier, 26 ~ 40 GHz	Miteq	NSP4000-SP2	924343	8/18/06
Antenna, Bilog 30 MHz ~ 2 Ghz	Sunol Sciences	JB1	A121003	9/3/06
EMI Receiver, 9 kHz ~ 2.9 GHz	Agilent / HP	8542E	3942A00286	2/4/07
RF Filter Section	Agilent / HP	85420E	3705A00256	2/4/07
EMI Test Receiver	R & S	ESHS 20	827129/006	6/3/06
LISN, 10 kHz ~ 30 MHz	FCC	LISN-50/250-25-2	2023	8/30/06
Signal Generator, 40 GHz	R & S	SMP04	DE 34210	6/8/06
Antenna, Horn 1 ~ 18 GHz	EMCO	3115	6717	4/22/07

7. LIMITS AND RESULTS

7.1. CHANNEL TESTS FOR THE 5150 TO 5350 MHz BAND

7.1.1. EMISSION BANDWIDTH

LIMIT

§15.403 (i) Emission bandwidth. For purposes of this subpart the emission bandwidth shall be determined by measuring the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, that are 26 dB down relative to the maximum level of the modulated carrier. Determination of the emissions bandwidth is based on the use of measurement instrumentation employing a peak detector function with an instrument resolutions bandwidth approximately equal to 1.0 percent of the emission bandwidth of the device under measurement.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to 1% to 3% of the 26 dB bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled.

RESULTS

No non-compliance noted:

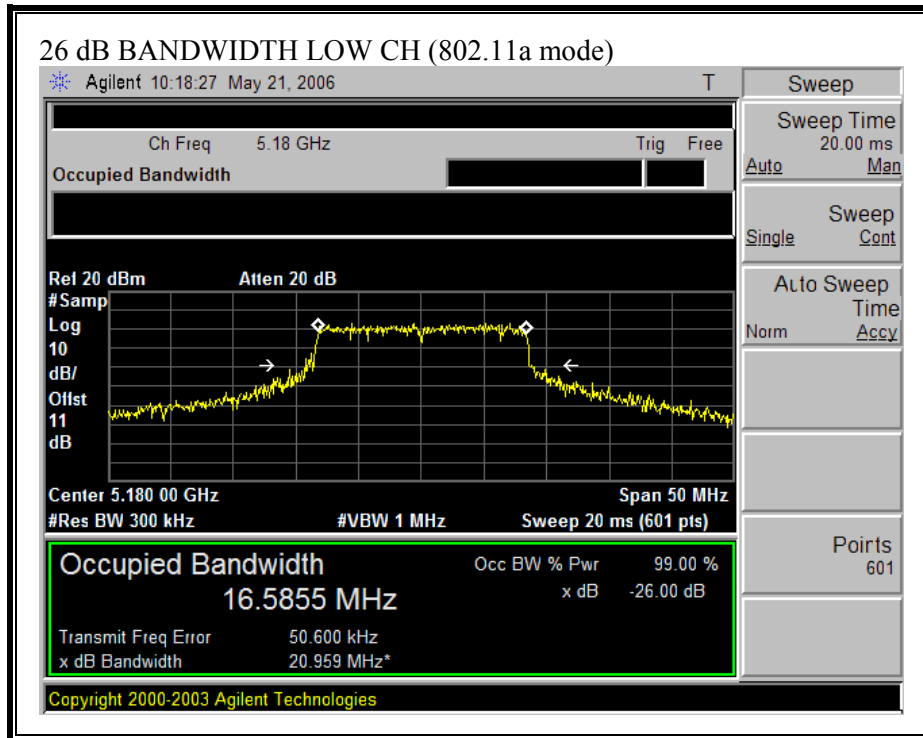
802.11a Mode

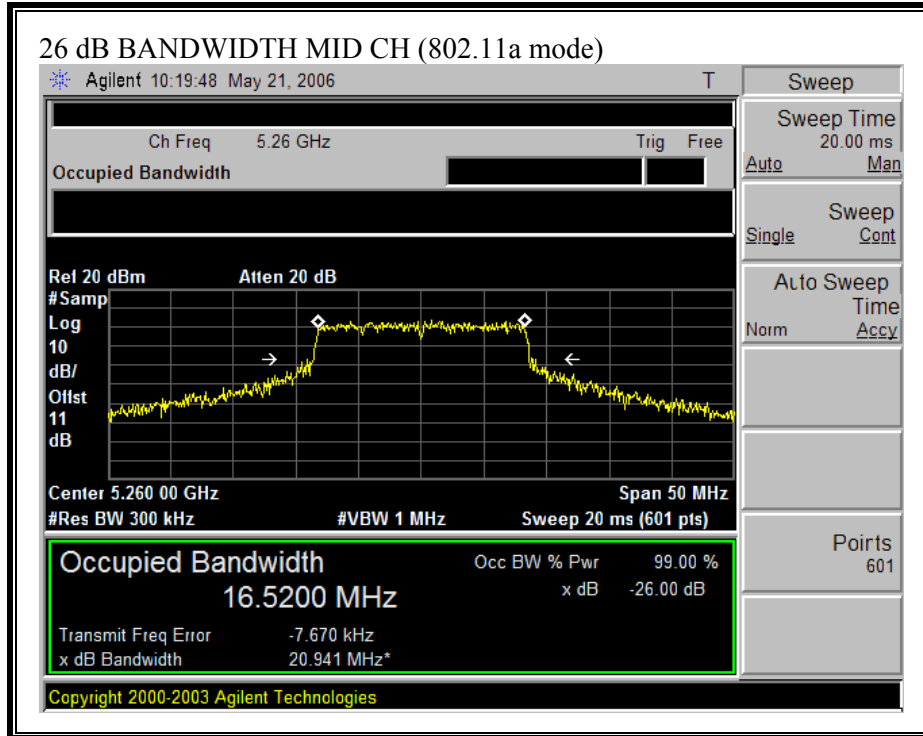
Channel	Frequency (MHz)	B (MHz)	10 Log B (dB)
Low	5180	20.96	13.21
Middle	5260	20.94	13.21
High	5320	20.94	13.21

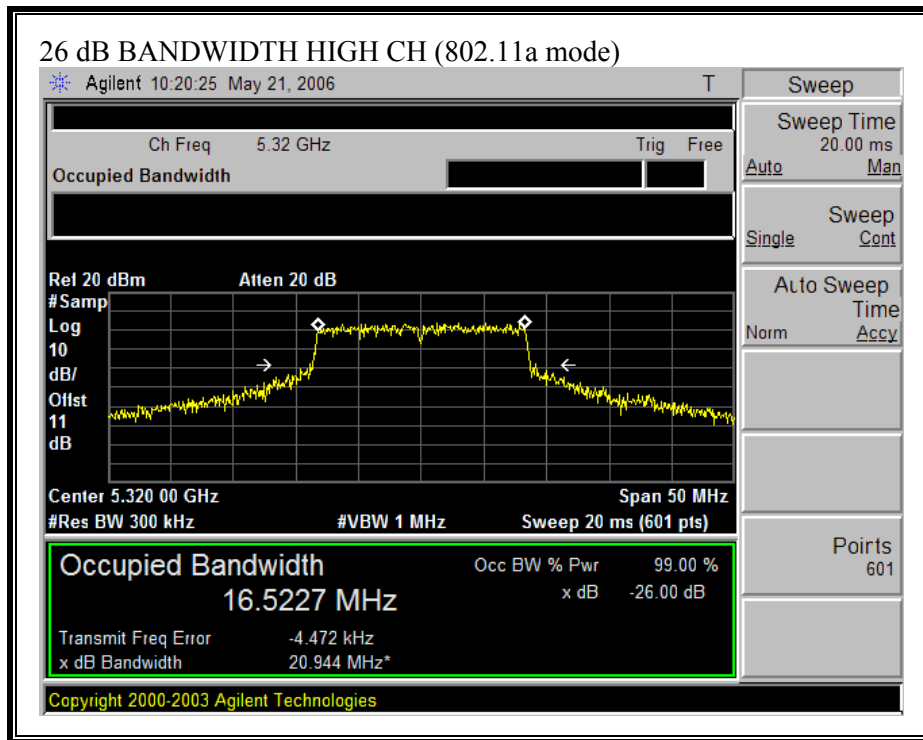
802.11a Turbo Mode

Channel	Frequency (MHz)	B (MHz)	10 Log B (dB)
Low	5210	41.84	16.22
Middle	5250	41.69	16.20
High	5290	41.05	16.13

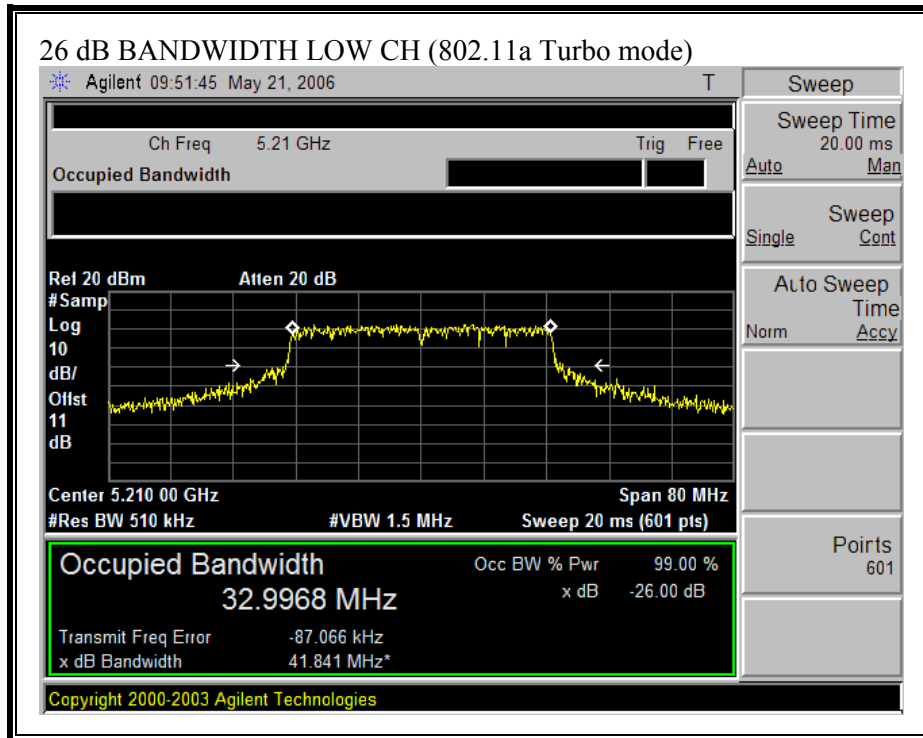
26 dB EMISSION BANDWIDTH (802.11a MODE)

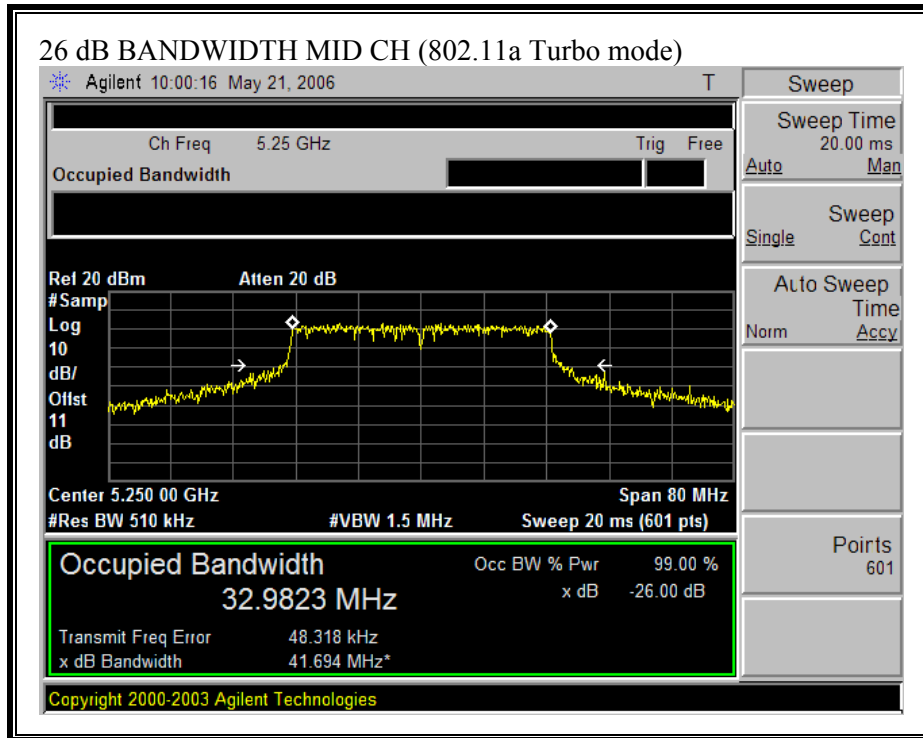


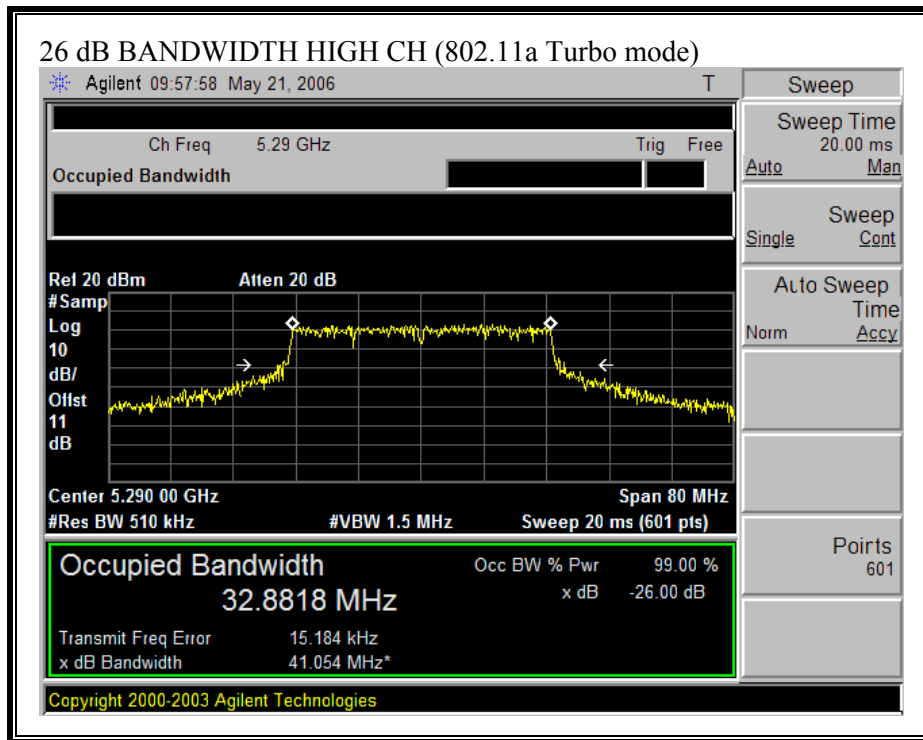




26 dB EMISSION BANDWIDTH (802.11a TURBO MODE)







7.1.2. PEAK POWER

LIMIT

§15.407 (a) (1) For the band 5.15-5.25 GHz, the peak transmit power over the frequency band of operation shall not exceed the lesser of 50 mW or $4 \text{ dBm} + 10 \log B$, where B is the 26-dB emission bandwidth in MHz. If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

§15.407 (a) (1) For the band 5.25-5.35 GHz, the peak transmit power over the frequency band of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26-dB emission bandwidth in MHz. If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST PROCEDURE

The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002.

The transmitter output operates continuously therefore Method # 1 is used.

LIMITS AND RESULTS

No non-compliance noted:

Limit in 5150 to 5250 MHz Band

Channel	Frequency (MHz)	Fixed Limit (dBm)	B (MHz)	4 + 10 Log B Limit (dBm)	Antenna Gain (dBi)	Limit (dBm)
Low	5180	17	20.959	17.21	0.60	17.00

Limit in 5250 to 5350 MHz Band

Channel	Frequency (MHz)	Fixed Limit (dBm)	B (MHz)	11 + 10 Log B Limit (dBm)	Antenna Gain (dBi)	Limit (dBm)
Mid	5260	24	20.941	24.21	0.60	24.00
High	5320	24	20.944	24.21	0.60	24.00

Results

Channel	Frequency (MHz)	Power (dBm)	Limit (dBm)	Margin (dB)
Low	5180	15.10	17.00	-1.90
Mid	5260	18.52	24.00	-5.48
High	5320	18.59	24.00	-5.41

LIMITS AND RESULTS FOR TURBO MODE

Limit in 5150 to 5250 MHz Band

Turbo Channel	Frequency (MHz)	Fixed Limit (dBm)	B (MHz)	4 + 10 Log B Limit (dBm)	Antenna Gain (dBi)	Limit (dBm)
Low	5210	17	41.841	20.22	0.60	17.00
Mid	5250	17	41.694	20.20	0.60	17.00

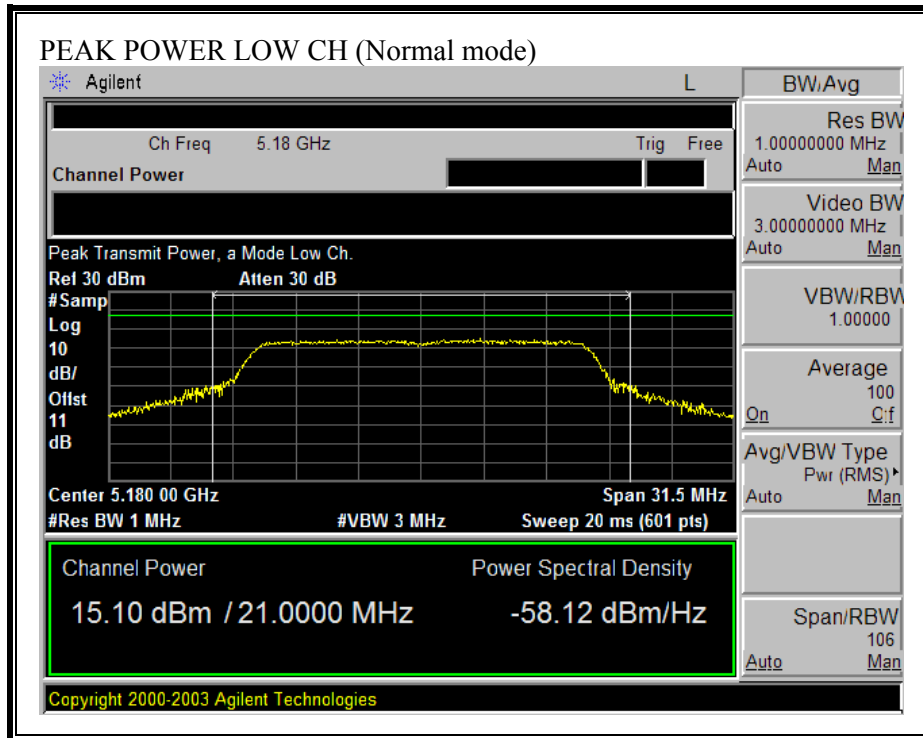
Limit in 5250 to 5350 MHz Band

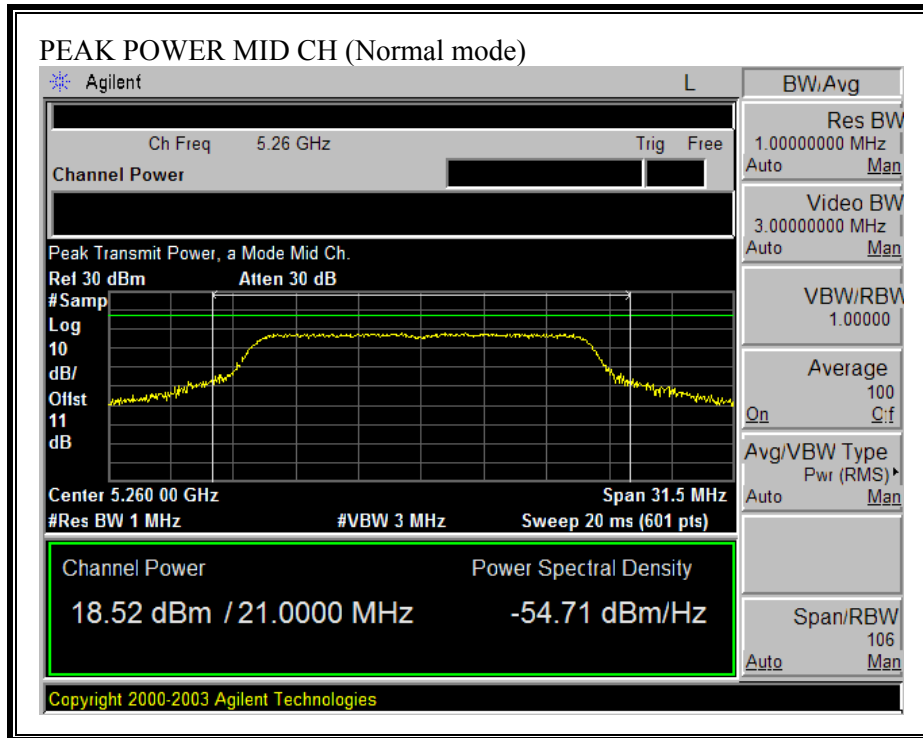
Turbo Channel	Frequency (MHz)	Fixed Limit (dBm)	B (MHz)	11 + 10 Log B Limit (dBm)	Antenna Gain (dBi)	Limit (dBm)
High	5290	24	41.054	27.13	0.60	24.00

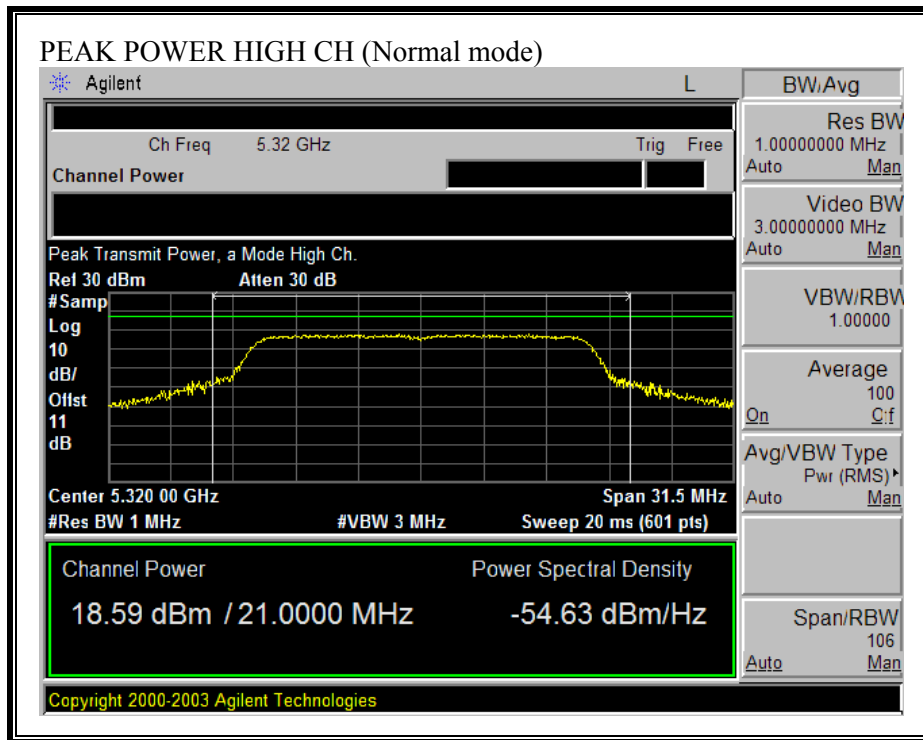
Results

Turbo Channel	Frequency (MHz)	Power (dBm)	Limit (dBm)	Margin (dB)
Low	5210	16.70	17.00	-0.30
Mid	5250	16.89	17.00	-0.11
High	5290	18.89	24.00	-5.11

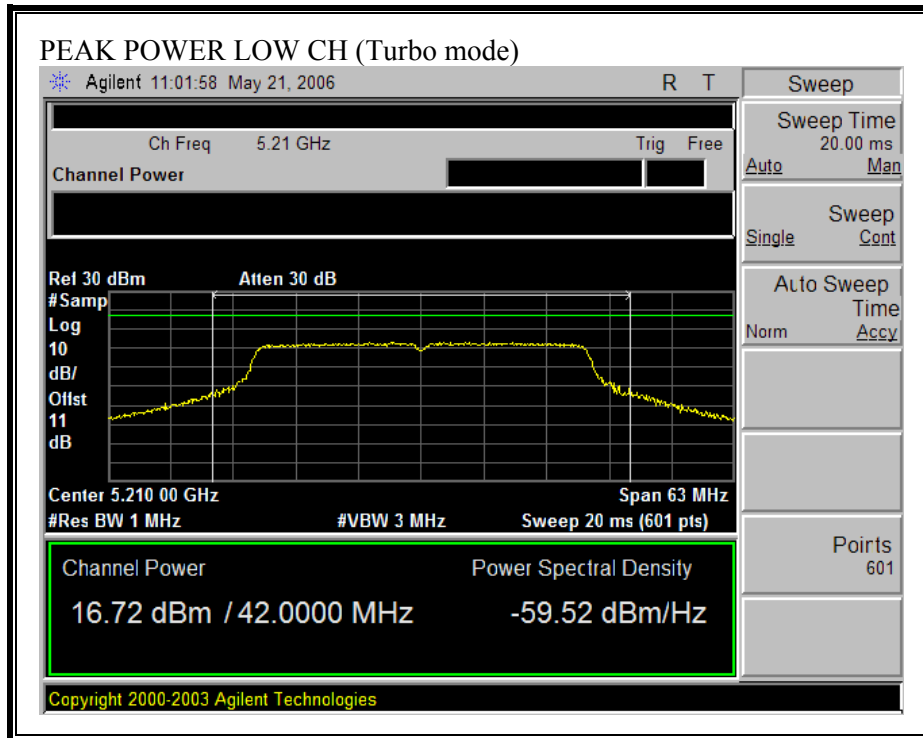
PEAK POWER (NORMAL MODE)

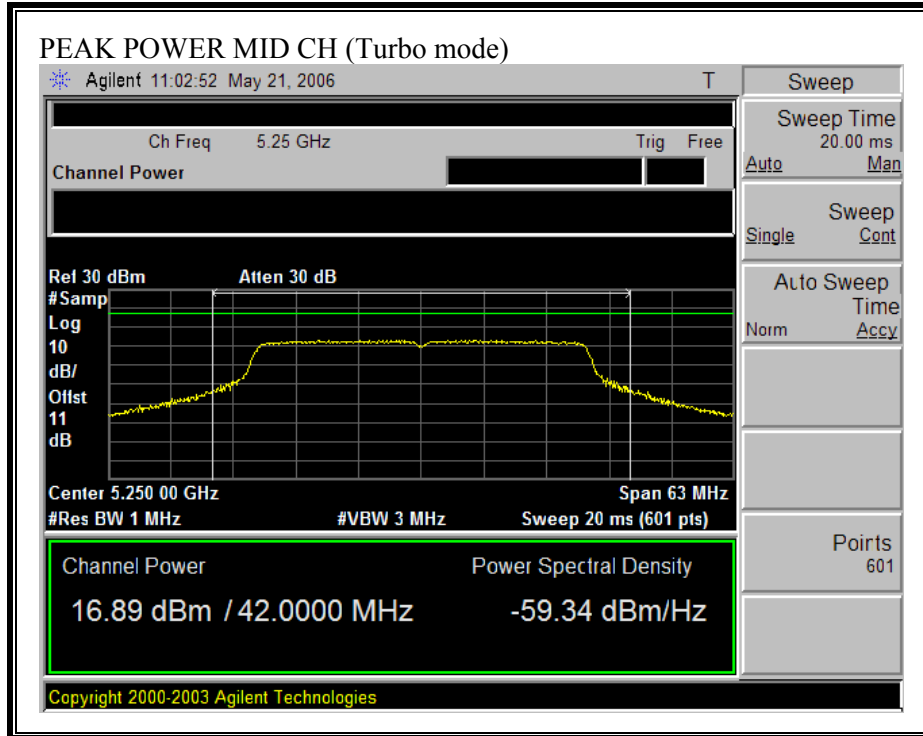


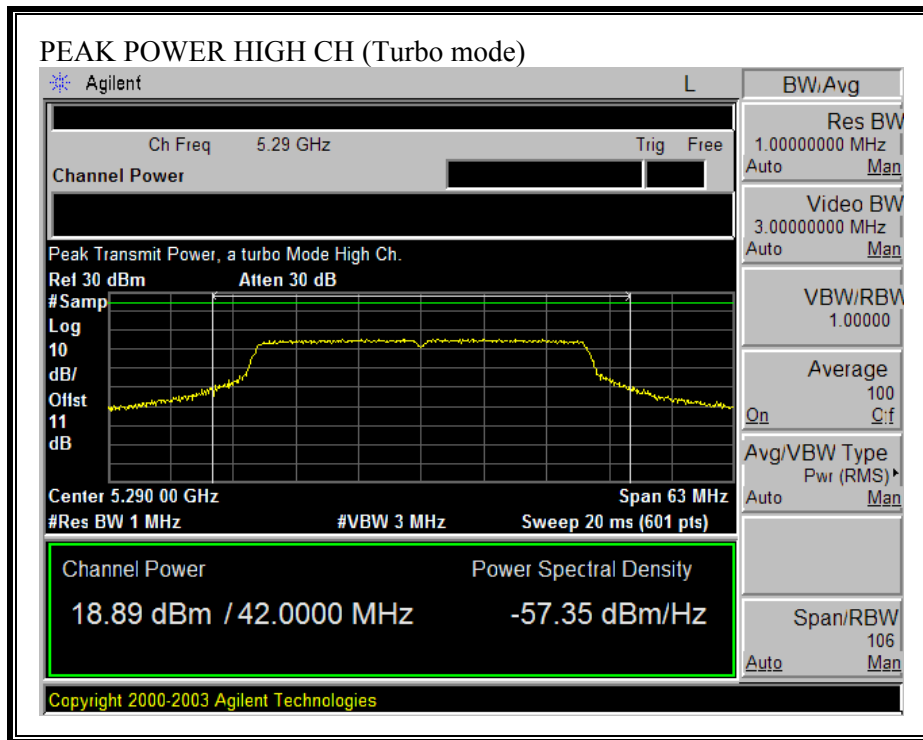




PEAK POWER (TURBO MODE)







7.1.3. 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

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

where

d = MPE distance in cm

P = Power in dBm

G = Antenna Gain in dBi

S = Power Density Limit in mW/cm²

Rearranging terms to calculate the power density at a specific distance yields

$$S = 0.0795 * 10^{((P + G) / 10)} / (d^2)$$

LIMITS

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

RESULTS

No non-compliance noted: (MPE distance equals 20 cm)

Mode	MPE Distance (cm)	Output Power (dBm)	Antenna Gain (dBi)	Power Density (mW/cm²)
802.11a	20.0	18.59	0.60	0.02
802.11a Turbo	20.0	18.89	0.60	0.02

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.

7.1.4. 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 11dB (including 10 dB pad and 1dB 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	5180	15.00
Middle	5260	18.00
High	5320	17.90

802.11a Turbo Mode

Channel	Frequency (MHz)	Average Power (dBm)
Low	5210	16.50
Middle	5250	16.50
High	5290	17.80

7.1.5. PEAK POWER SPECTRAL DENSITY

LIMIT

§15.407 (a) (1) For the band 5.15-5.25 GHz, the peak power spectral density shall not exceed 4 dBm in any 1-MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

§15.407 (a) (1) For the band 5.25-5.35 GHz, the peak power spectral density shall not exceed 11 dBm in any 1-MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

The maximum antenna gain = 0.6dBi, therefore there is no reduction due to antenna gain.

TEST PROCEDURE

The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002. PPSD method #2 was used.

RESULTS

No non-compliance noted:

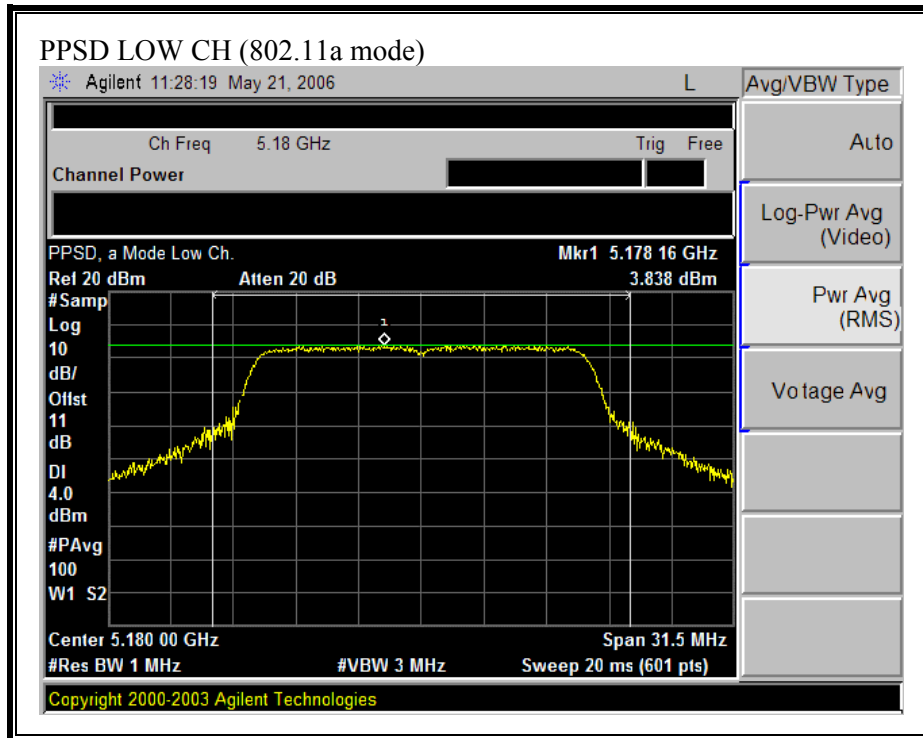
802.11a Mode

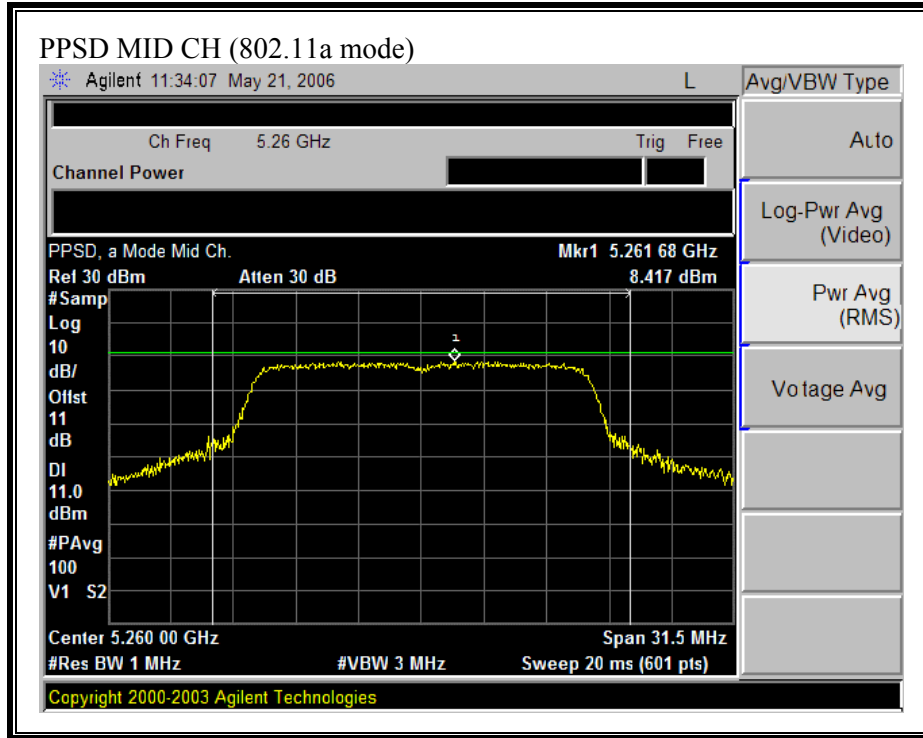
Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
Low	5180	3.84	4.00	-0.16
Mid	5260	8.42	11.00	-2.58
High	5320	8.30	11.00	-2.70

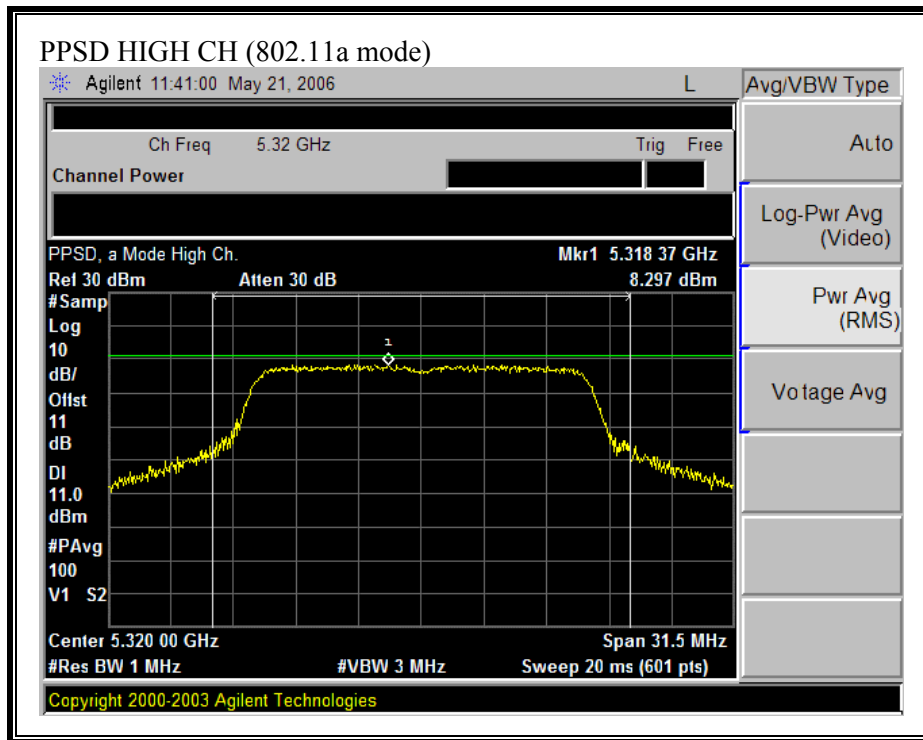
802.11a Turbo Mode

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
Low	5210	3.17	4.00	-0.83
Mid	5250	3.49	4.00	-0.51
High	5290	5.09	11.00	-5.91

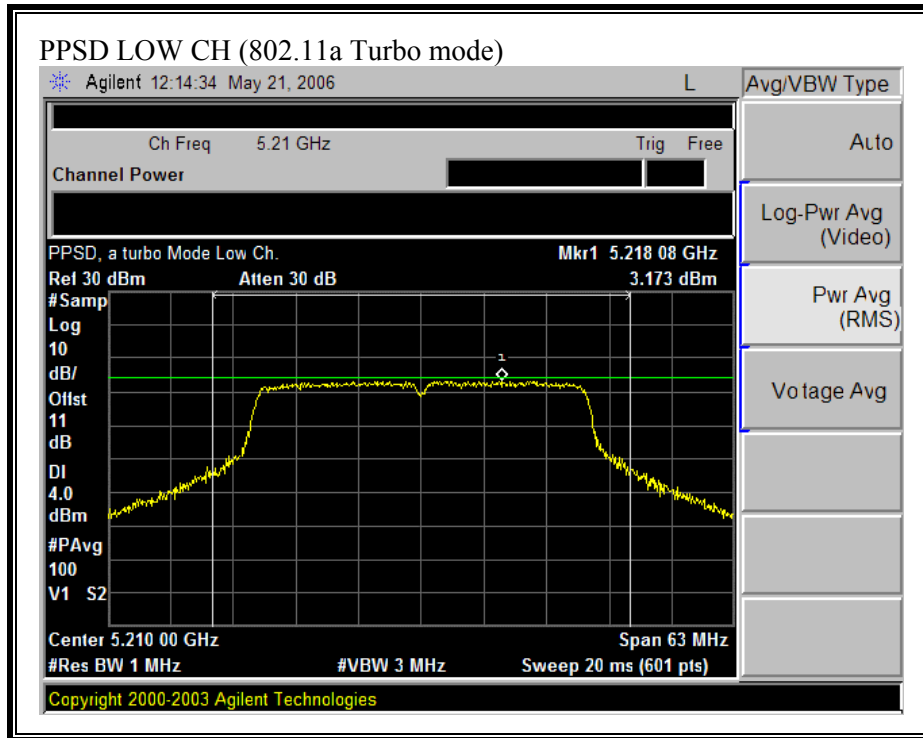
PEAK POWER SPECTRAL DENSITY (802.11a MODE)

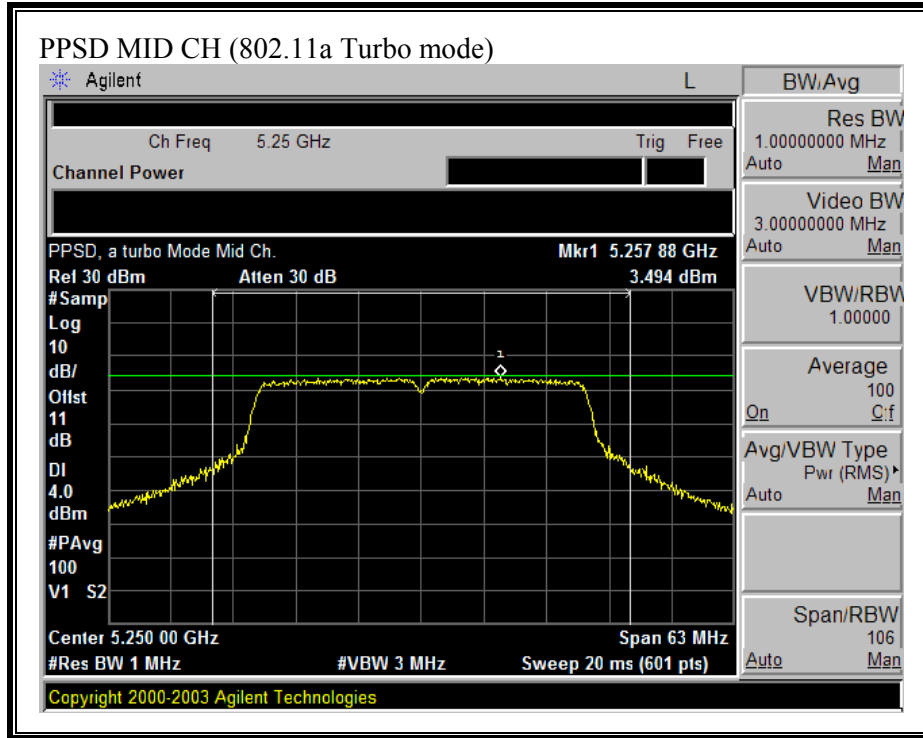


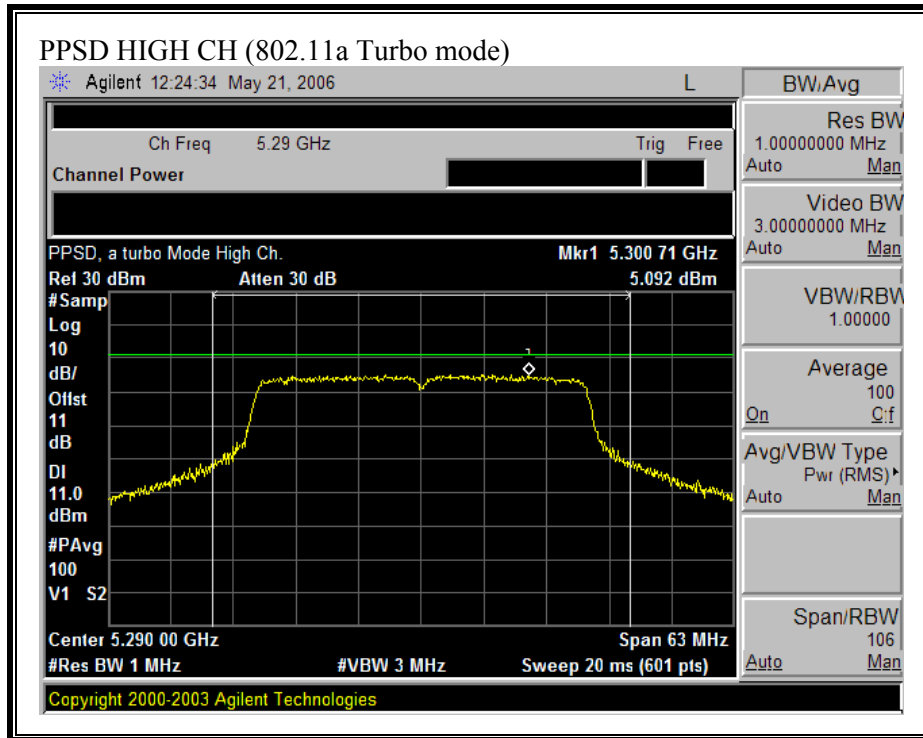




PEAK POWER SPECTRAL DENSITY (802.11a TURBO MODE)







7.1.6. PEAK EXCURSION

LIMIT

§15.407 (a) (6) The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

TEST PROCEDURE

The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002.

Since Method # 1 was used for peak power measurements, Method # 1 settings are used for the second PPSD trace.

RESULTS

No non-compliance noted:

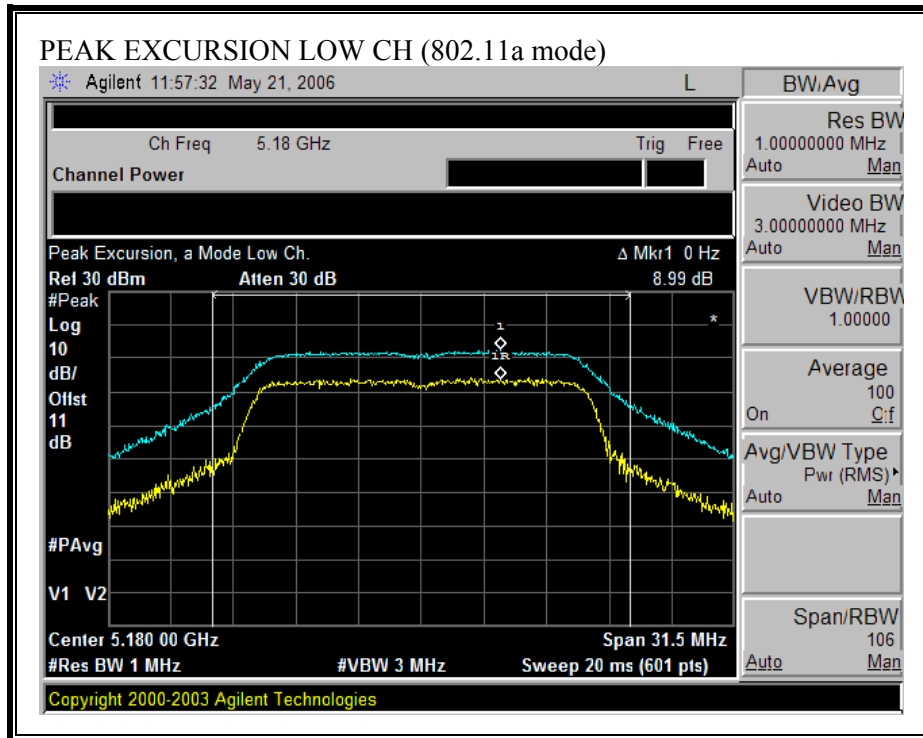
802.11a Mode

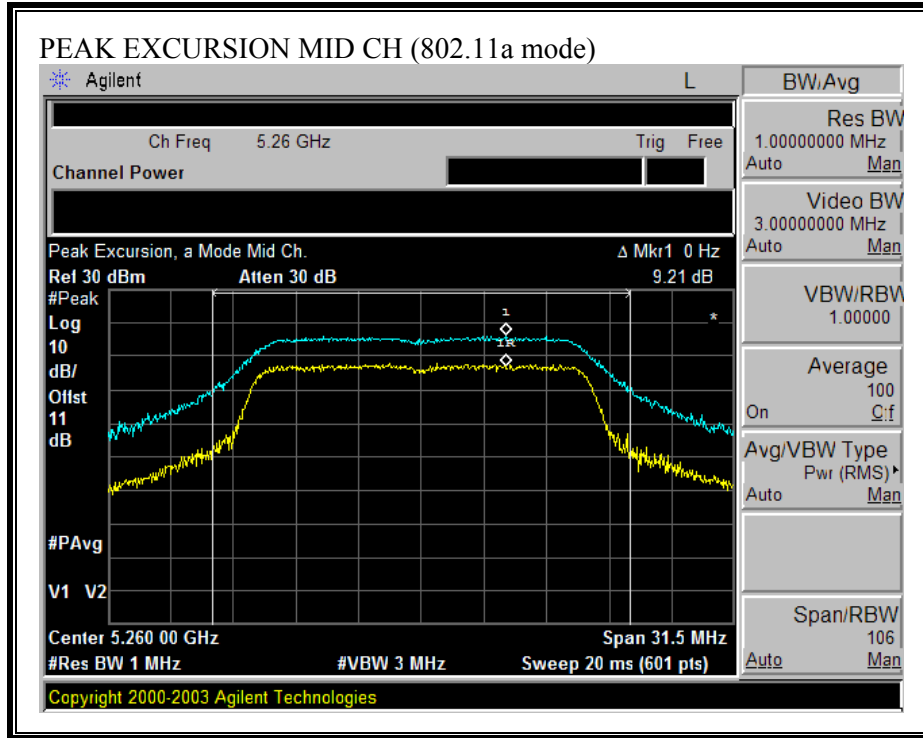
Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5180	8.99	13	-4.01
Middle	5200	9.21	13	-3.79
High	5240	9.15	13	-3.85

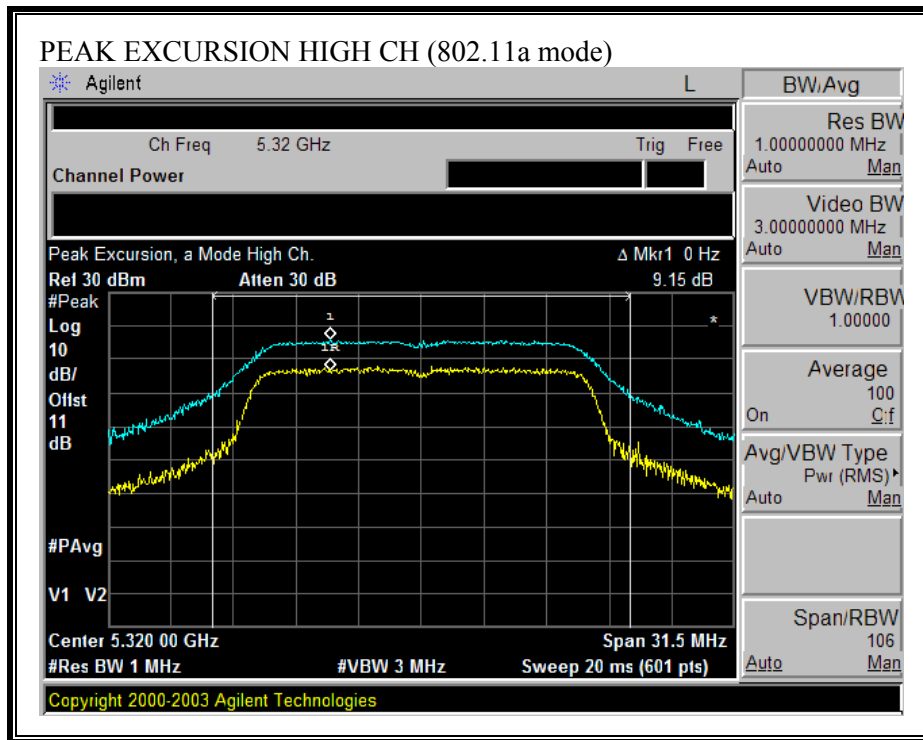
802.11a Turbo Mode

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5210	9.47	13	-3.53
Mid	5250	9.80	13	-3.20
High	5290	9.71	13	-3.29

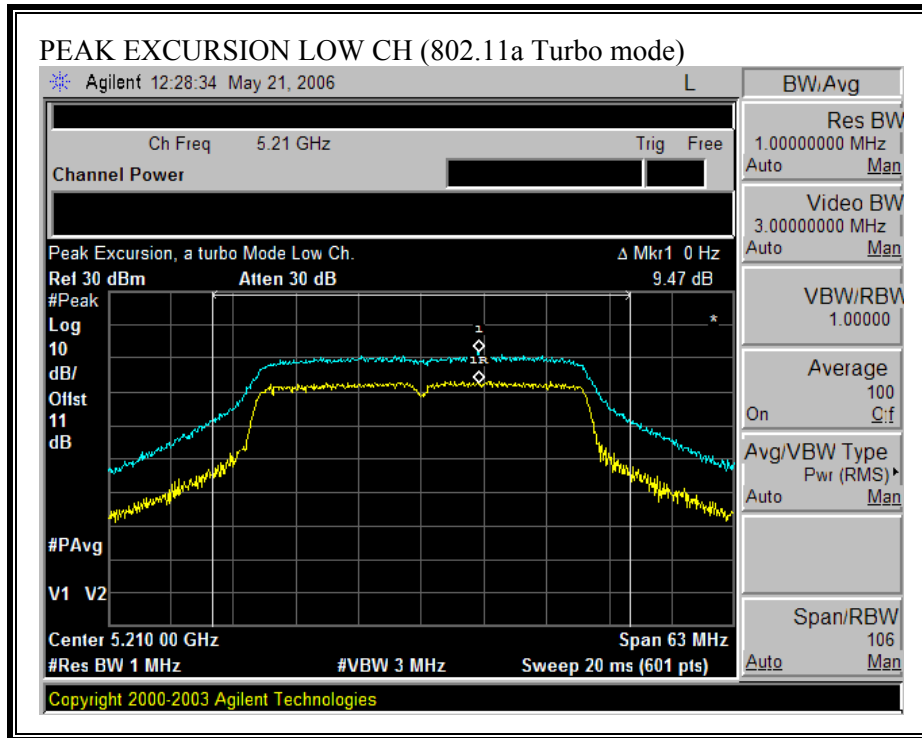
PEAK EXCURSION (802.11a MODE)

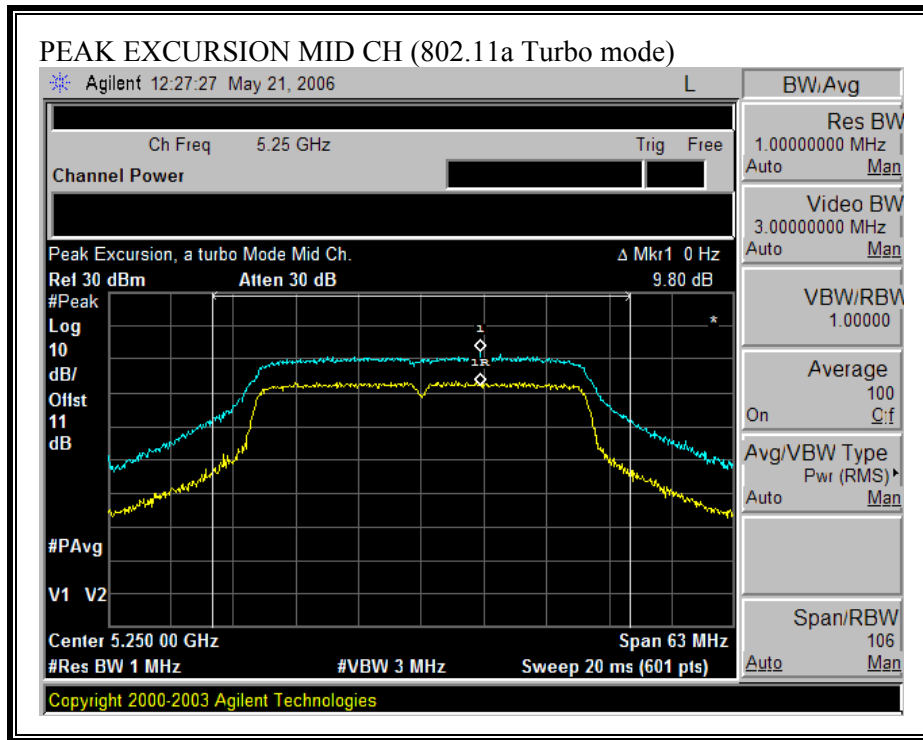


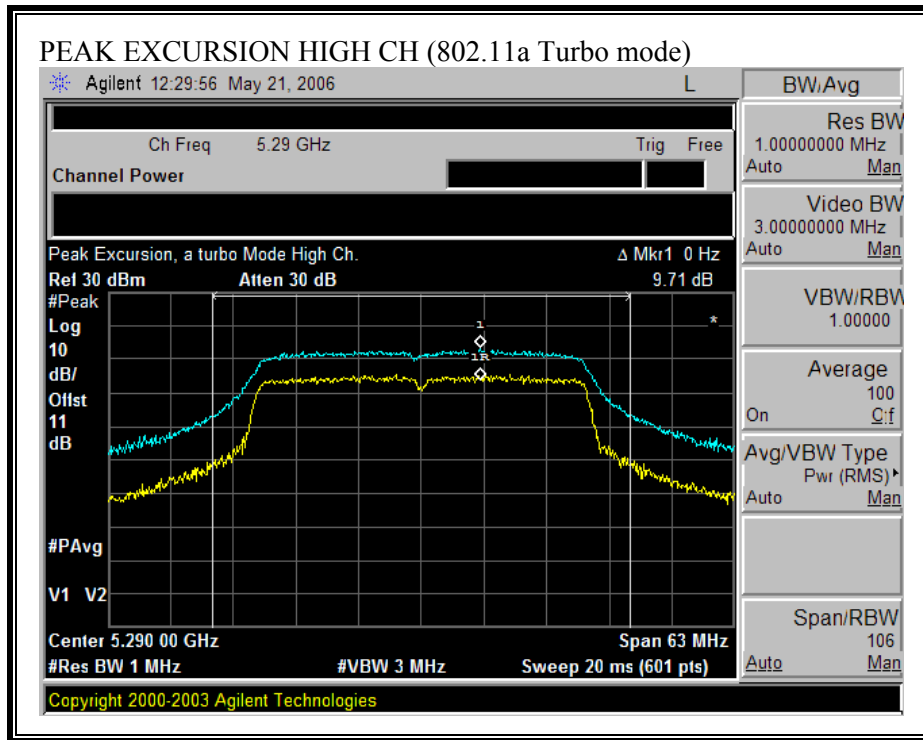




PEAK EXCURSION (802.11a TURBO MODE)







7.1.7. CONDUCTED SPURIOUS EMISSIONS

LIMITS

§15.407 (b) (1 & 2) For transmitters operating in the 5.15-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27dBm / MHz.

TEST PROCEDURE

Conducted RF measurements of the transmitter output are made to confirm that the EUT antenna port conducted emissions meet the specified limit and to identify any spurious signals that require further investigation or measurements on the radiated emissions site.

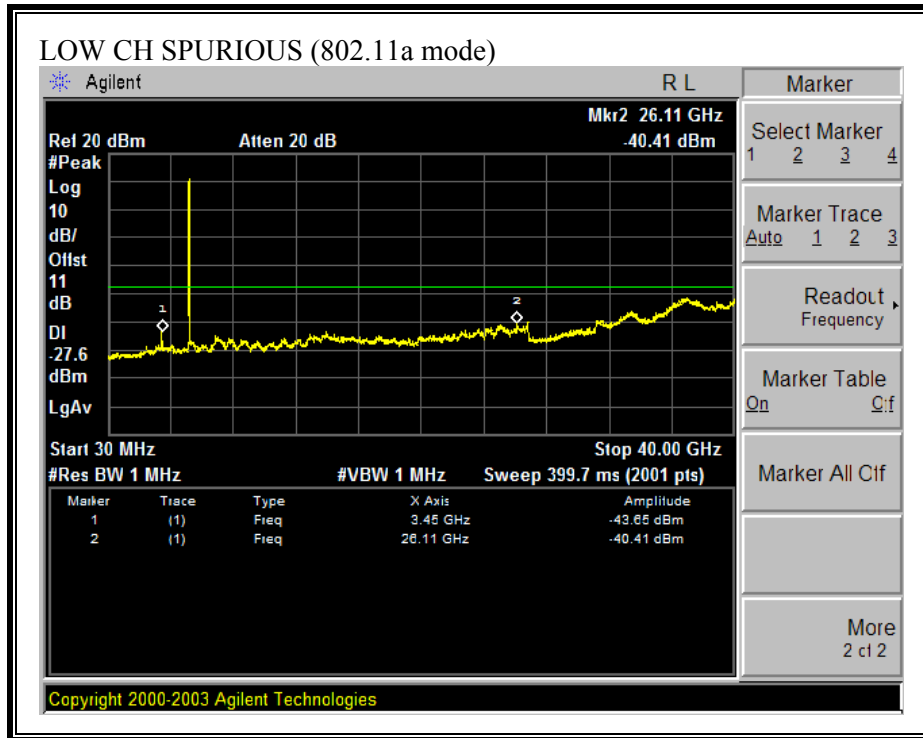
The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to 1 MHz. The video bandwidth is set to 1 MHz. Peak detection measurements are compared to the average EIRP limit, adjusted for the maximum antenna gain. If necessary, additional average detection measurements are made.

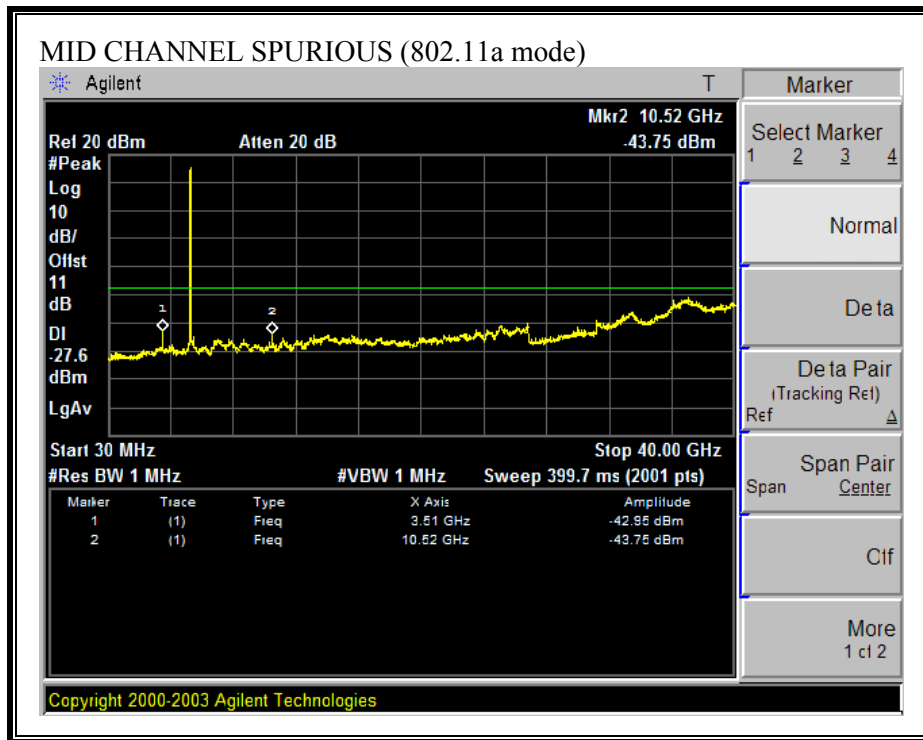
Measurements are made over the 30 MHz to 40 GHz range with the transmitter set to the lowest, middle, and highest channels.

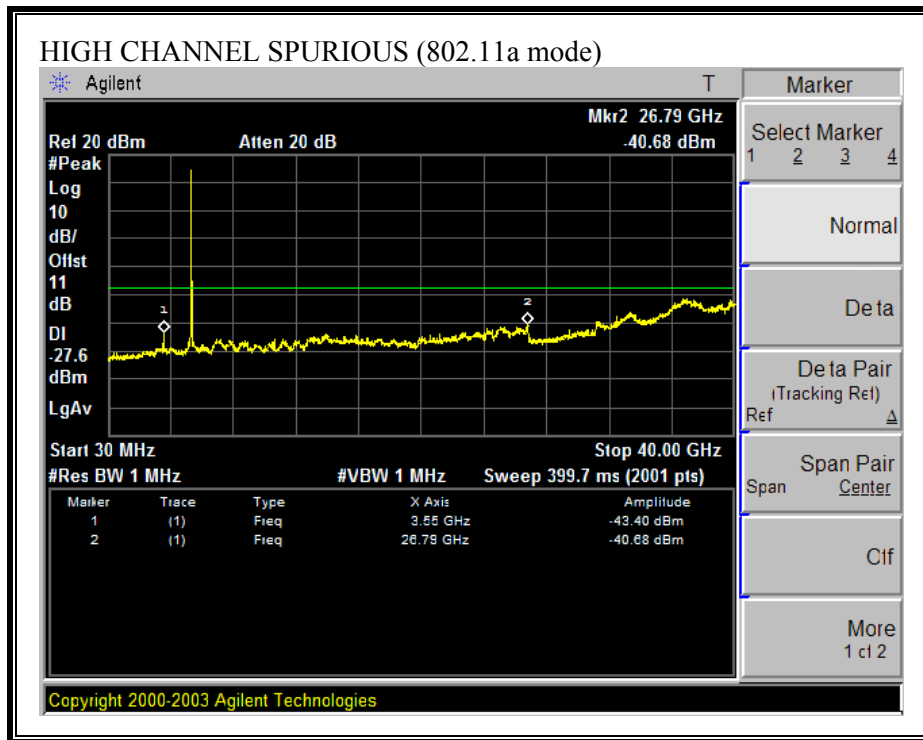
RESULTS

No non-compliance noted:

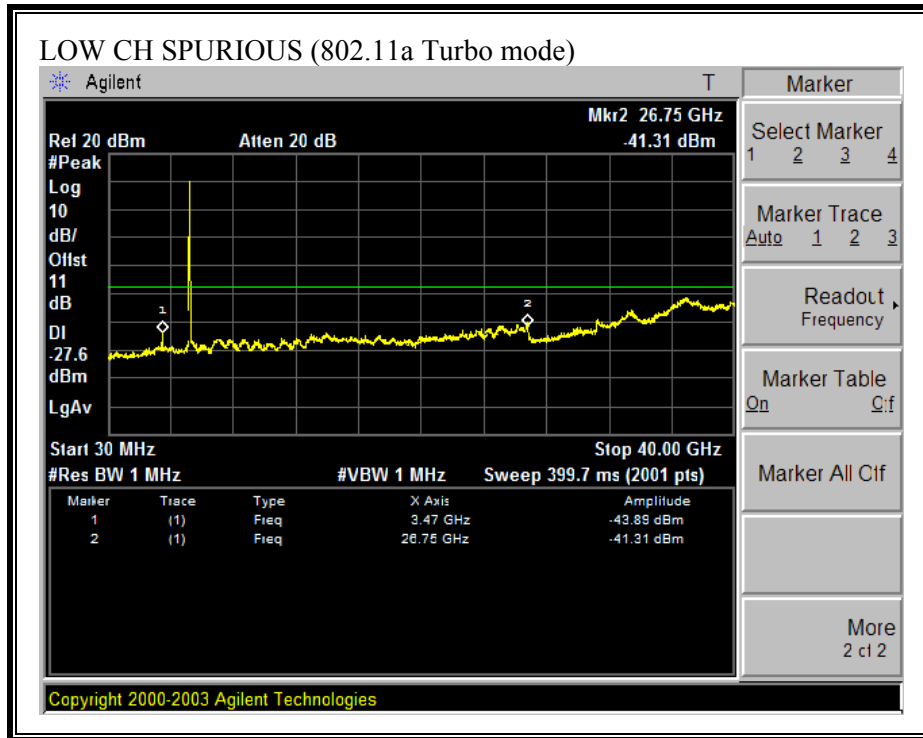
SPURIOUS EMISSIONS (802.11a MODE)

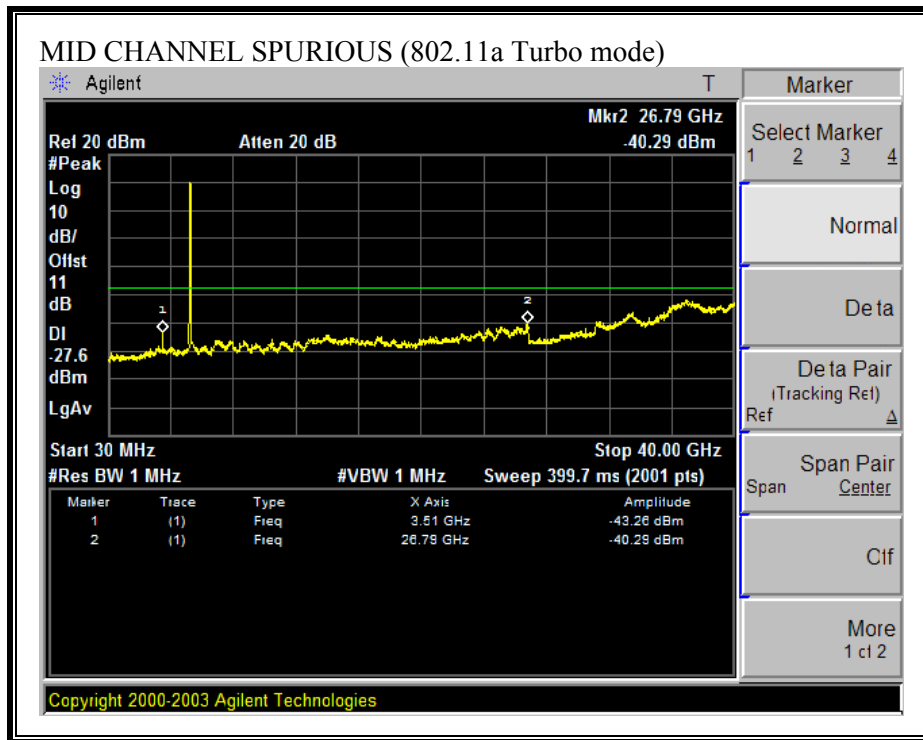


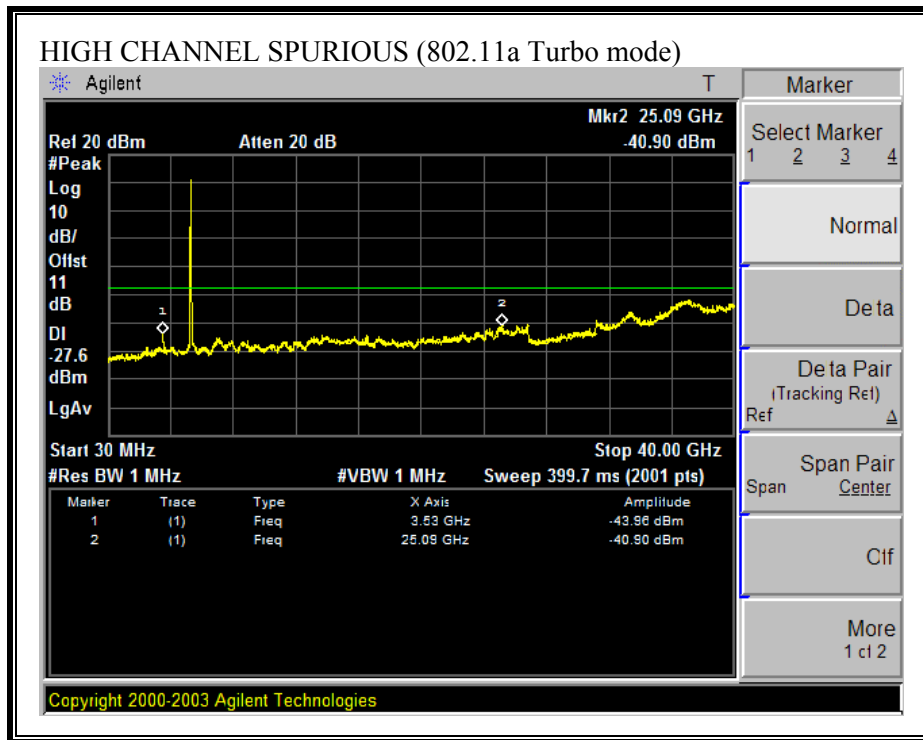




SPURIOUS EMISSIONS (802.11a TURBO MODE)







7.2. RADIATED EMISSIONS

7.2.1. 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.

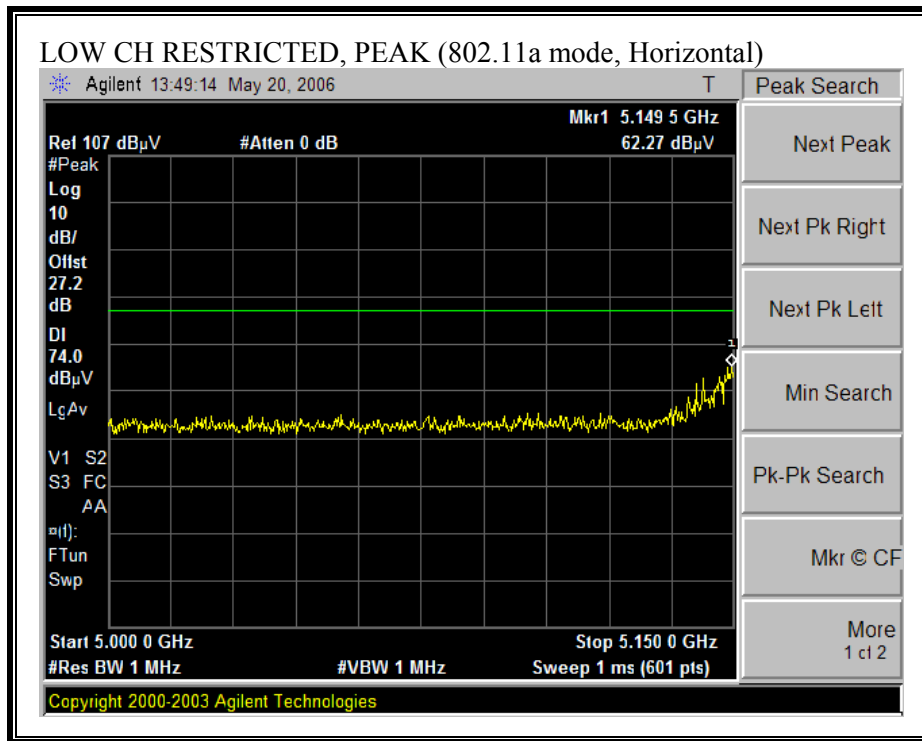
For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

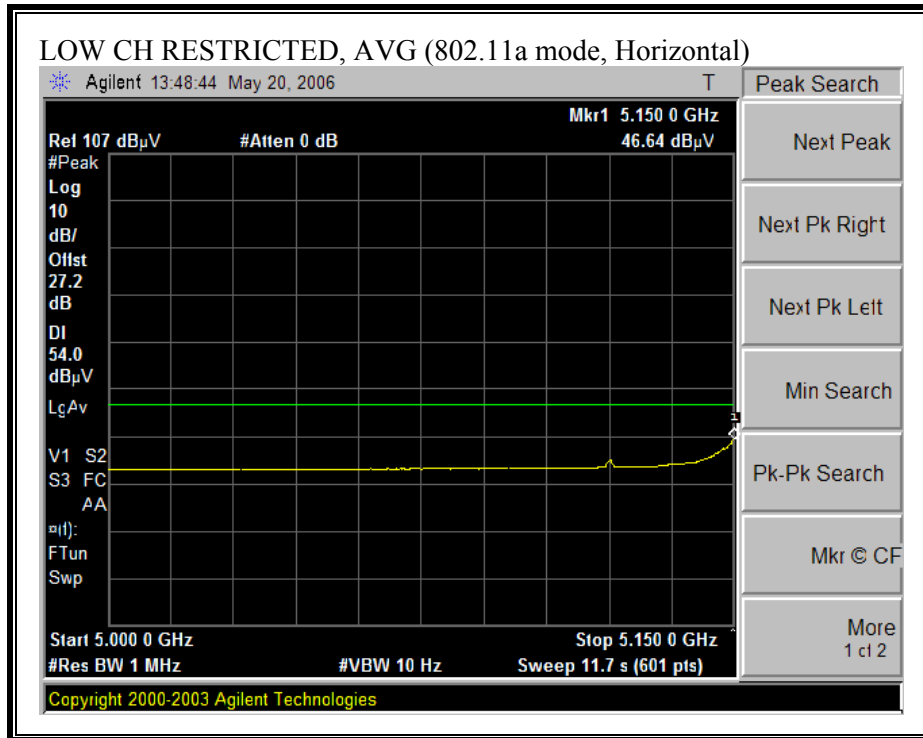
The spectrum from 30 MHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each band.

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.

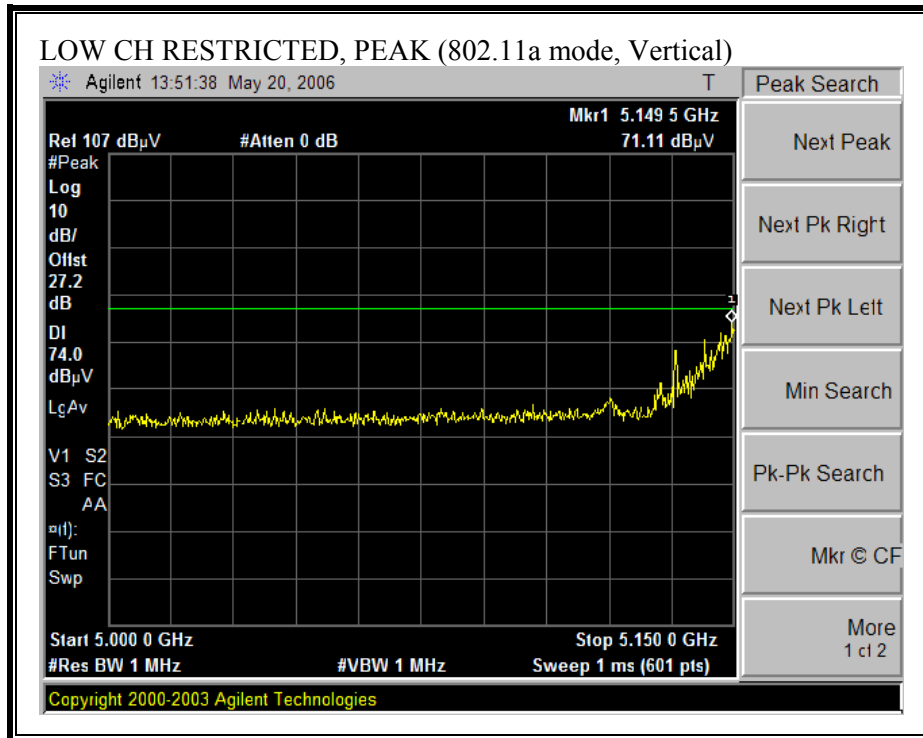
7.2.2. TRANSMITTER ABOVE 1 GHZ FOR 5150 TO 5350 MHz BAND

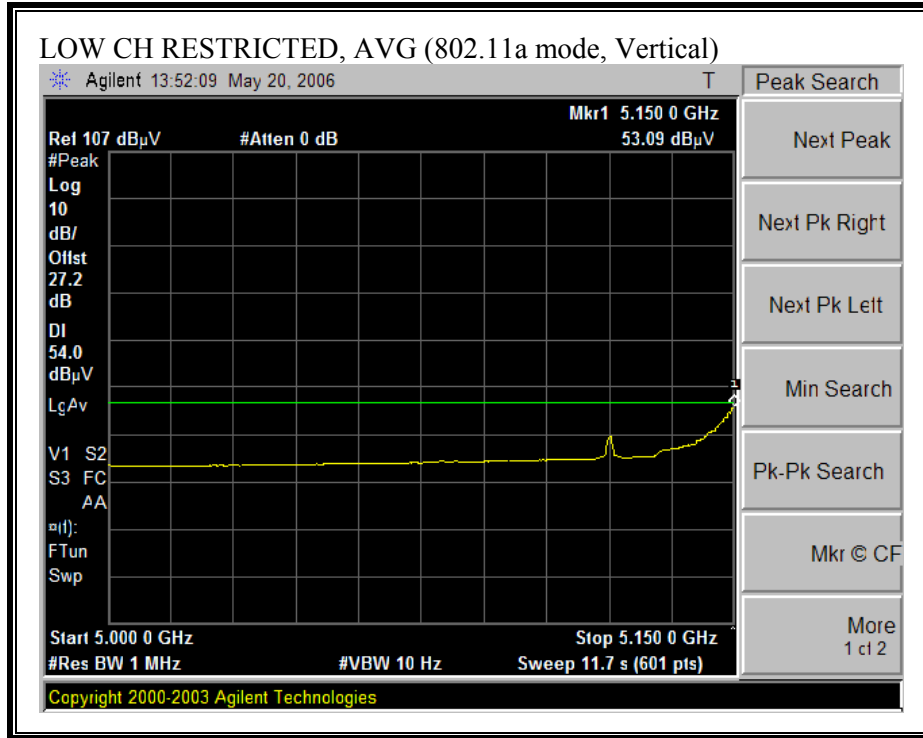
RESTRICTED BANDEDGE (802.11a MODE, LOW CHANNEL, HORIZONTAL)



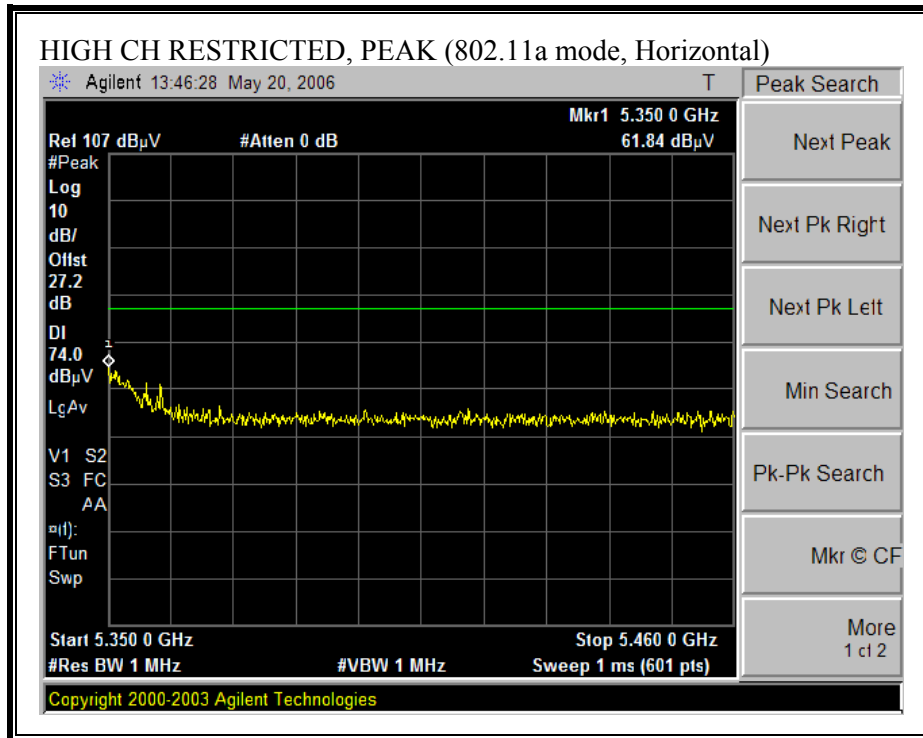


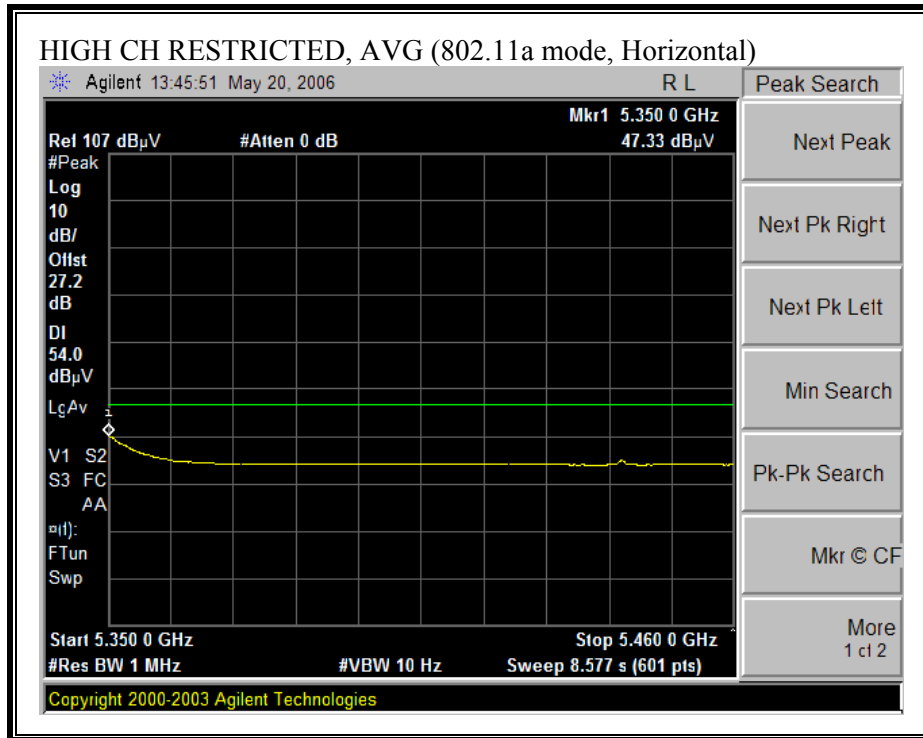
RESTRICTED BANDEDGE (802.11a MODE, LOW CHANNEL, VERTICAL)



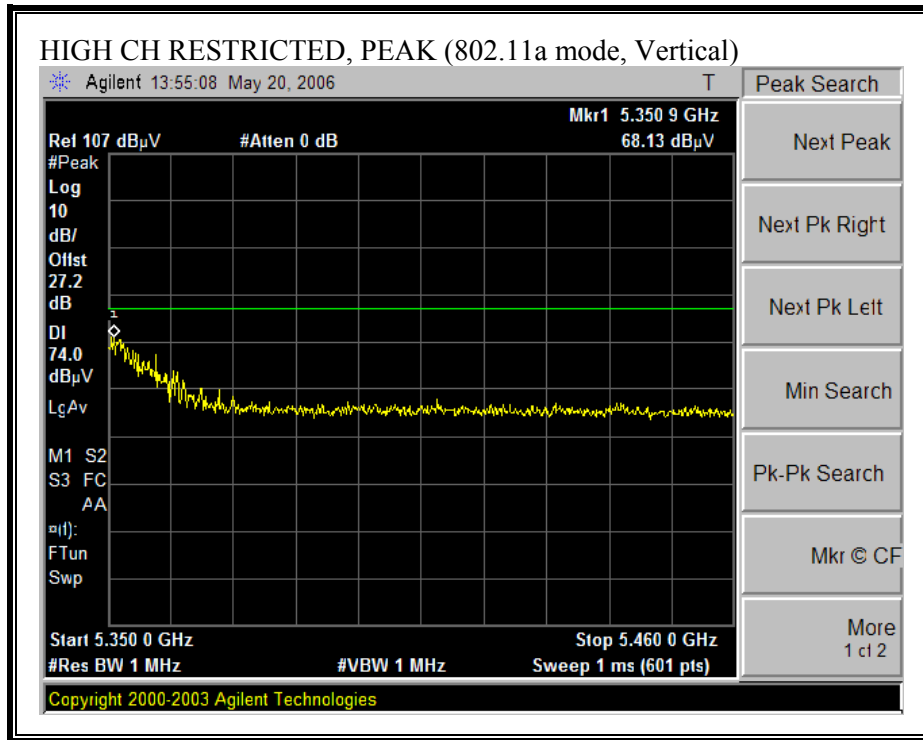


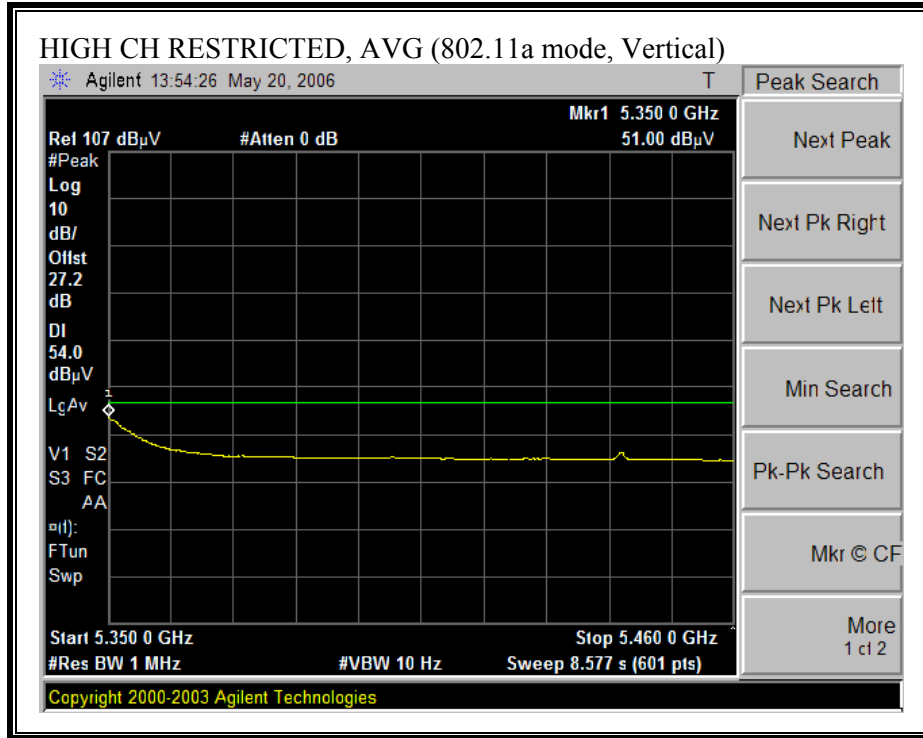
RESTRICTED BANDEDGE (802.11a MODE, HIGH CHANNEL, HORIZONTAL)





RESTRICTED BANDEDGE (802.11a MODE, HIGH CHANNEL, VERTICAL)





HARMONICS AND SPURIOUS EMISSIONS (802.11a MODE)

High Frequency Measurement
 Compliance Certification Services, Morgan Hill Open Field Site

Company: Buffalo Inc.
 Project #: 06J10304
 Date: MAY 20, 2006
 Test Engineer: Chin Pang
 Configuration: EUT Only
 Mode: TX, FCC 5 GHz UNNI Band

Test Equipment:

Horn 1-18GHz	Pre-amplifier 1-26GHz	Pre-amplifier 26-40GHz	Horn > 18GHz	Limit
T60; S/N: 2238 @3m	T34 HP 8449B			FCC 15.205

Hi Frequency Cables

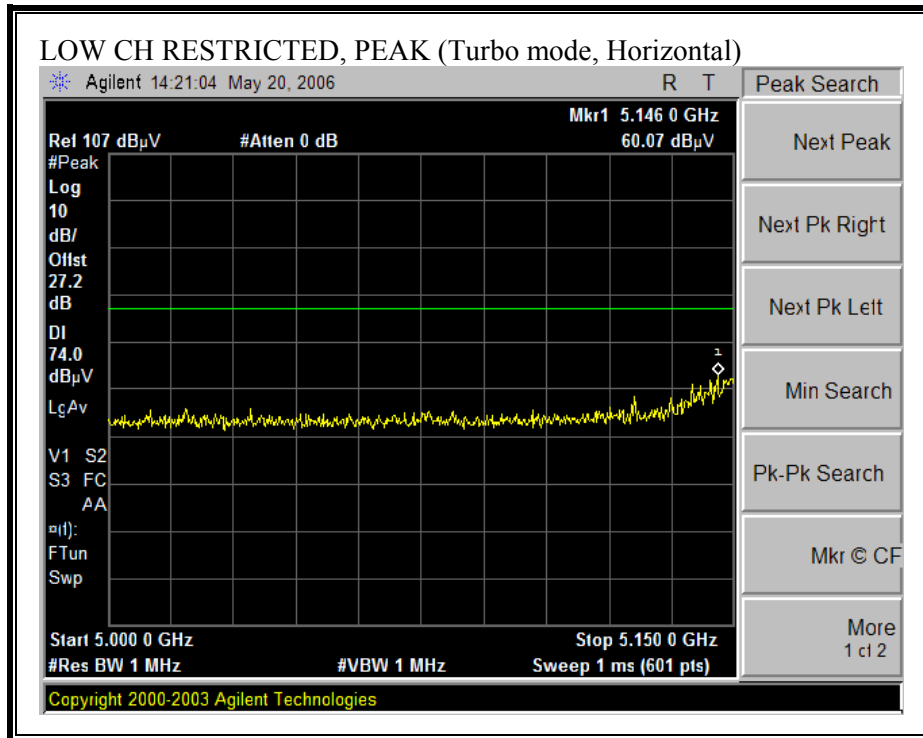
2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter	Peak Measurements RBW=VBW=1MHz
	Chin 197538001	Chin 200354001	HPF_7.6GHz		Average Measurements RBW=1MHz ; VBW=10Hz

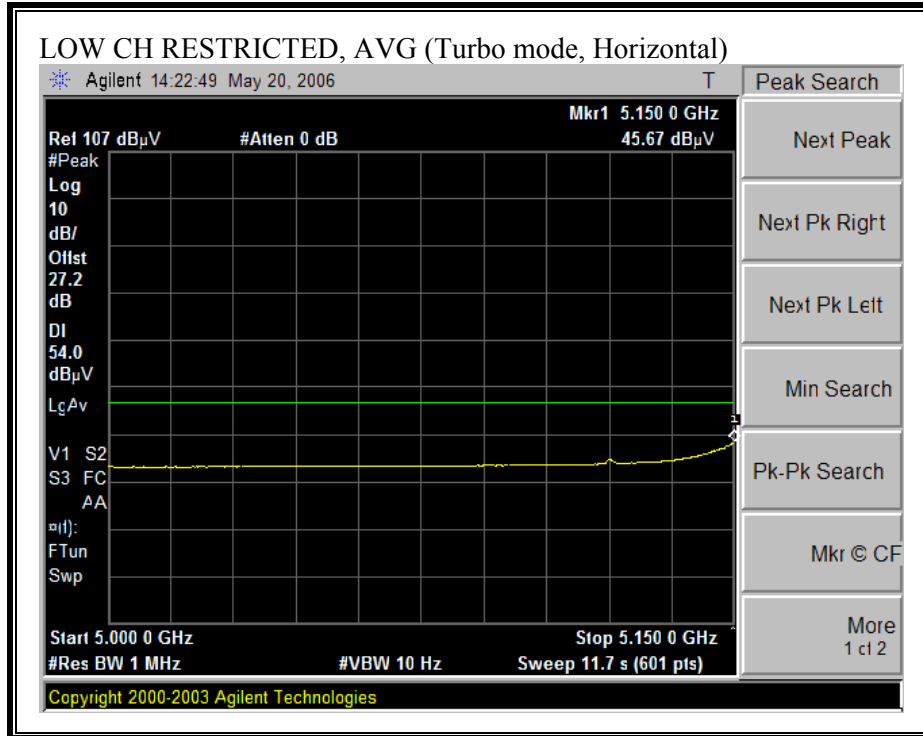
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Filtr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Low Ch, 5180MHz															
15.540	3.0	55.5	39.1	38.0	5.8	-32.2	0.0	0.7	67.8	51.4	74	54	-6.2	-2.6	V
15.540	3.0	49.0	34.4	38.0	5.8	-32.2	0.0	0.7	61.3	46.7	74	54	-12.7	-7.3	H
Mid Ch, 5260MHz															
15.780	3.0	54.0	37.6	37.9	5.9	-32.2	0.0	0.7	66.3	49.9	74	54	-7.7	-4.1	V
15.780	3.0	48.0	34.0	37.9	5.9	-32.2	0.0	0.7	60.3	46.3	74	54	-13.7	-7.7	H
High Ch, 5320MHz															
10.640	3.0	45.0	33.0	37.3	4.3	-32.6	0.0	0.8	54.8	42.8	74	54	-19.2	-11.2	V
15.960	3.0	54.5	38.6	37.8	5.9	-32.1	0.0	0.7	66.9	51.0	74	54	-7.1	-3.0	V
10.640	3.0	44.5	32.0	37.3	4.3	-32.6	0.0	0.8	54.3	41.8	74	54	-19.7	-12.2	H
15.960	3.0	50.0	36.0	37.8	5.9	-32.1	0.0	0.7	62.4	48.4	74	54	-11.6	-5.6	H

Rev. 5.1.6
 Note: No other emissions were detected above the system noise floor.

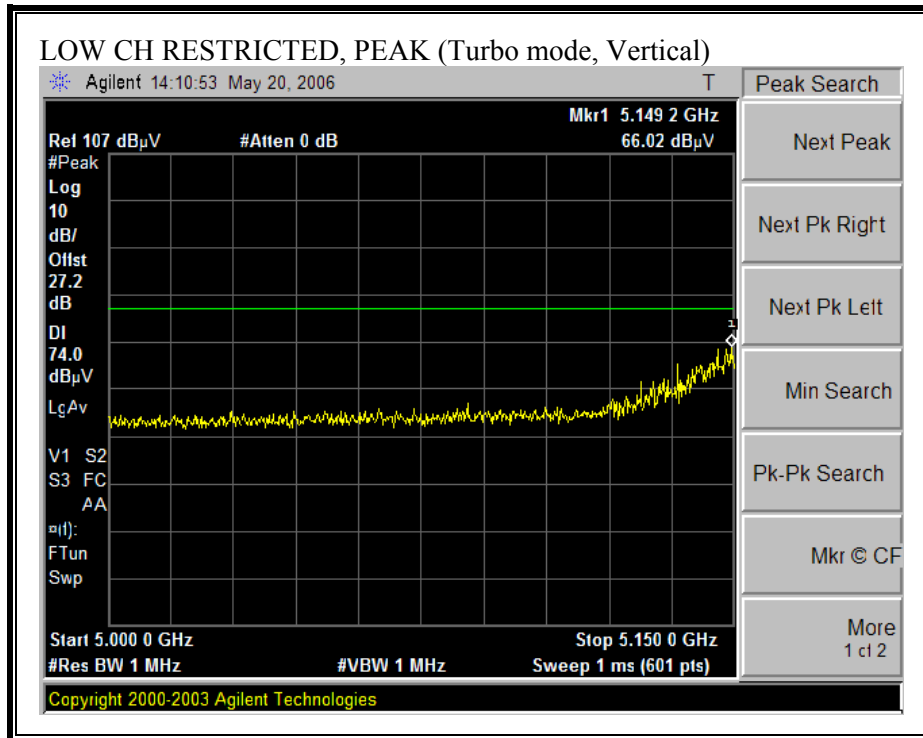
f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

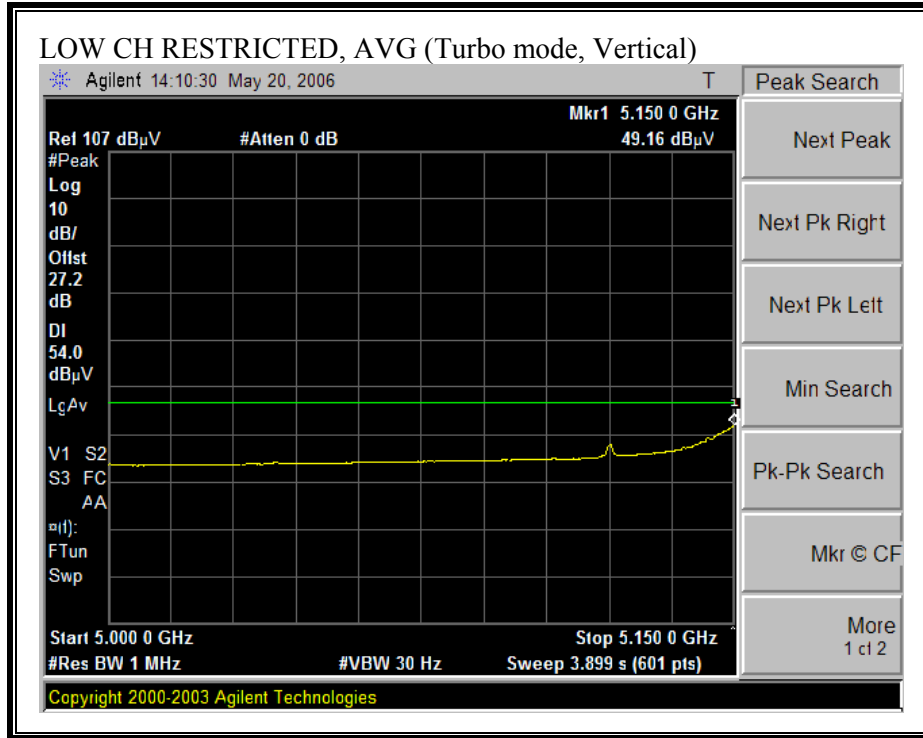
RESTRICTED BANDEDGE (802.11a TURBO MODE, LOW CHANNEL, HORIZONTAL)



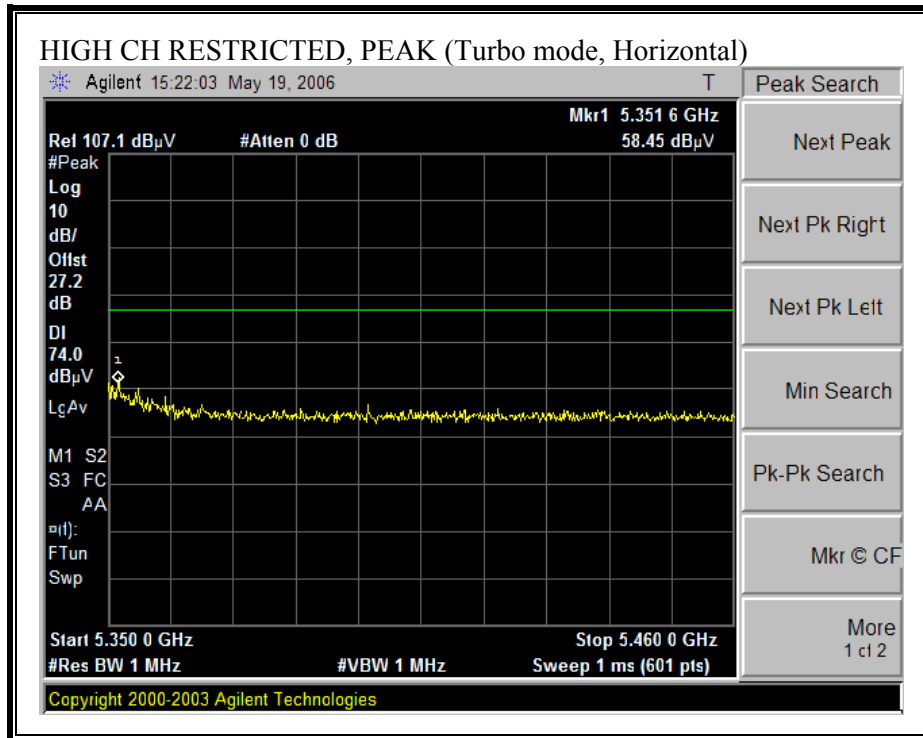


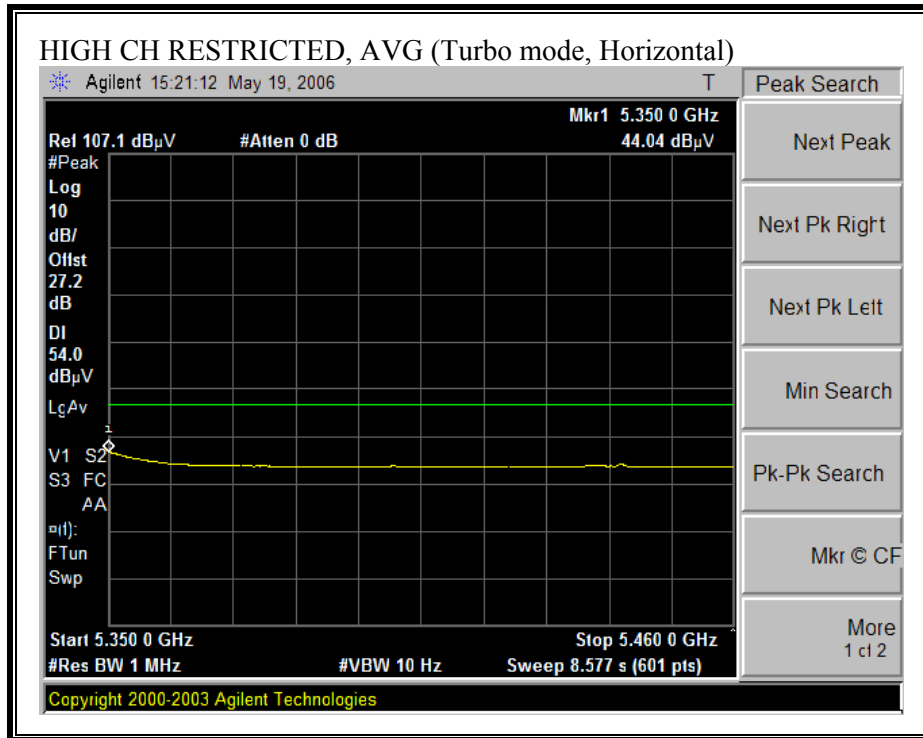
RESTRICTED BANDEDGE (802.11a TURBO MODE, LOW CHANNEL, VERTICAL)



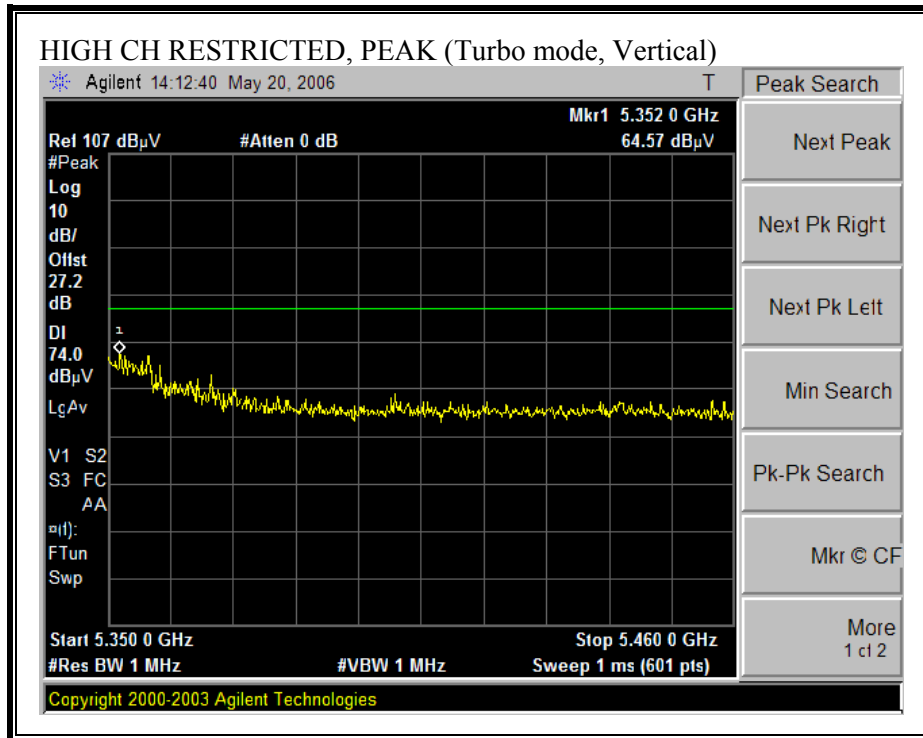


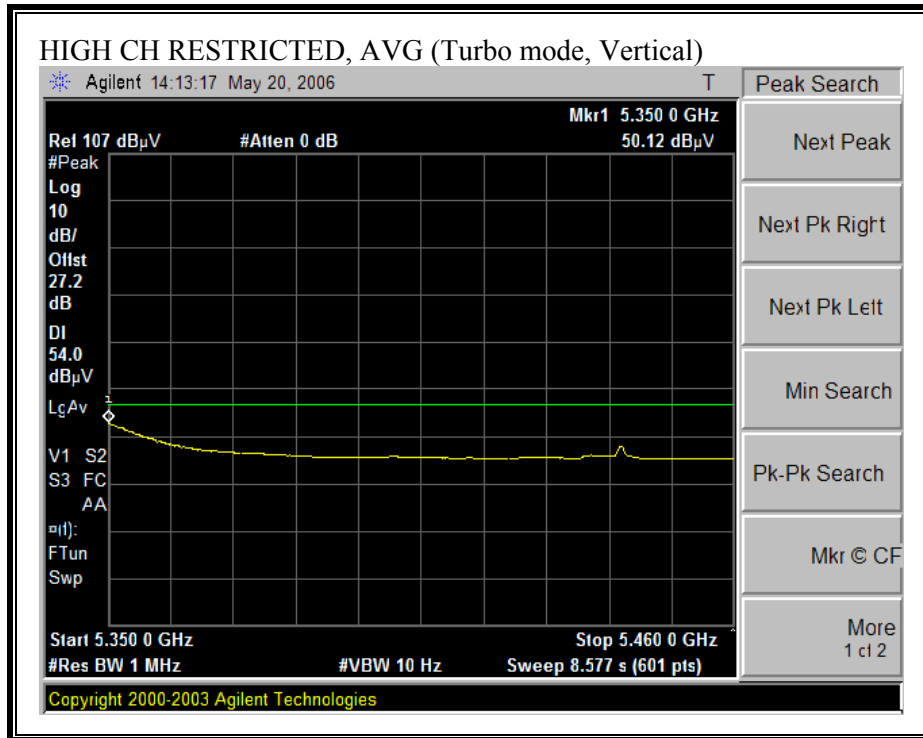
RESTRICTED BANDEDGE (802.11a TURBO MODE, HIGH CHANNEL, HORIZONTAL)





RESTRICTED BANDEDGE (802.11a TURBO MODE, HIGH CHANNEL, VERTICAL)





HARMONICS AND SPURIOUS EMISSIONS (802.11a TURBO MODE)

High Frequency Measurement
 Compliance Certification Services, Morgan Hill Open Field Site

Company: Buffalo Inc.
 Project #: 06J10304
 Date: MAY 20, 2006
 Test Engineer: Chin Pang
 Configuration: EUT Only
 Mode: TX, FCC 5 GHz UNNI Band, turbo

Test Equipment:

Horn 1-18GHz	Pre-amplifier 1-26GHz	Pre-amplifier 26-40GHz	Horn > 18GHz	Limit
T60; S/N: 2238 @3m	T34 HP 8449B	T88 Miteq 26-40GHz	T89; ARA 18-26GHz; S/N:1049	FCC 15.205

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter	Peak Measurements RBW=VBW=1MHz	Average Measurements RBW=1MHz ; VBW=10Hz
	Chin 197538001	Chin 200354001	HPF_7.6GHz			

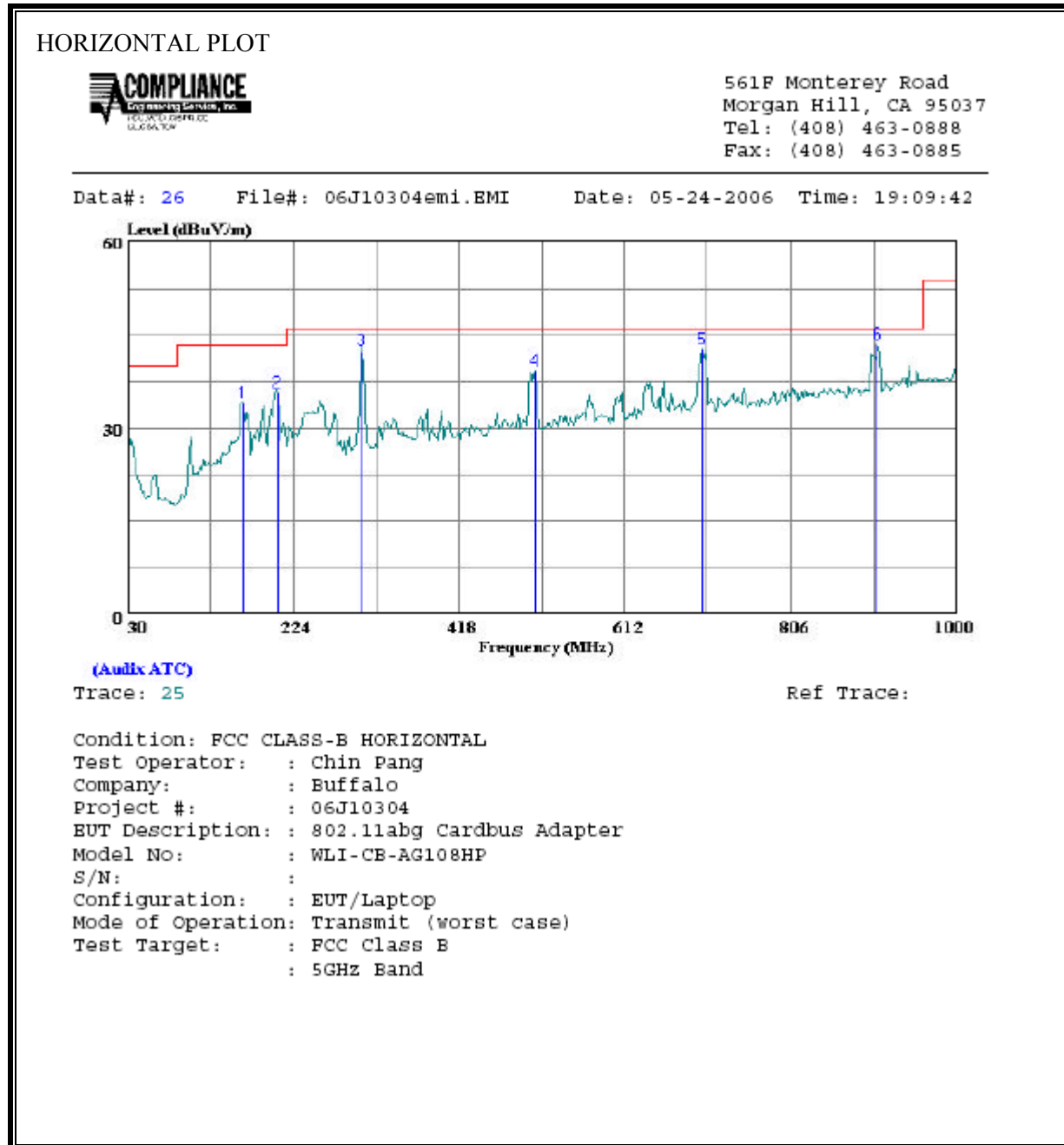
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Filtr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Low Ch, 5210MHz															
15.630	3.0	53.0	37.2	38.0	5.8	-32.2	0.0	0.7	65.3	49.5	74	54	-8.7	-4.5	V
15.630	3.0	49.0	34.4	38.0	5.8	-32.2	0.0	0.7	61.3	46.7	74	54	-12.7	-7.3	H
Mid Ch, 5250MHz															
15.750	3.0	50.0	36.4	37.9	5.9	-32.2	0.0	0.7	62.3	48.7	74	54	-11.7	-5.3	V
15.750	3.0	48.0	34.0	37.9	5.9	-32.2	0.0	0.7	60.3	46.3	74	54	-13.7	-7.7	H
High Ch, 5290MHz															
15.870	3.0	50.0	36.0	37.9	5.9	-32.1	0.0	0.7	62.3	48.3	74	54	-11.7	-5.7	V
15.870	3.0	46.5	32.6	37.9	5.9	-32.1	0.0	0.7	58.8	44.9	74	54	-15.2	-9.1	H

Rev. 5.1.6
 Note: No other emissions were detected above the 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		

7.2.3. WORST-CASE RADIATED EMISSIONS BELOW 1 GHz

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

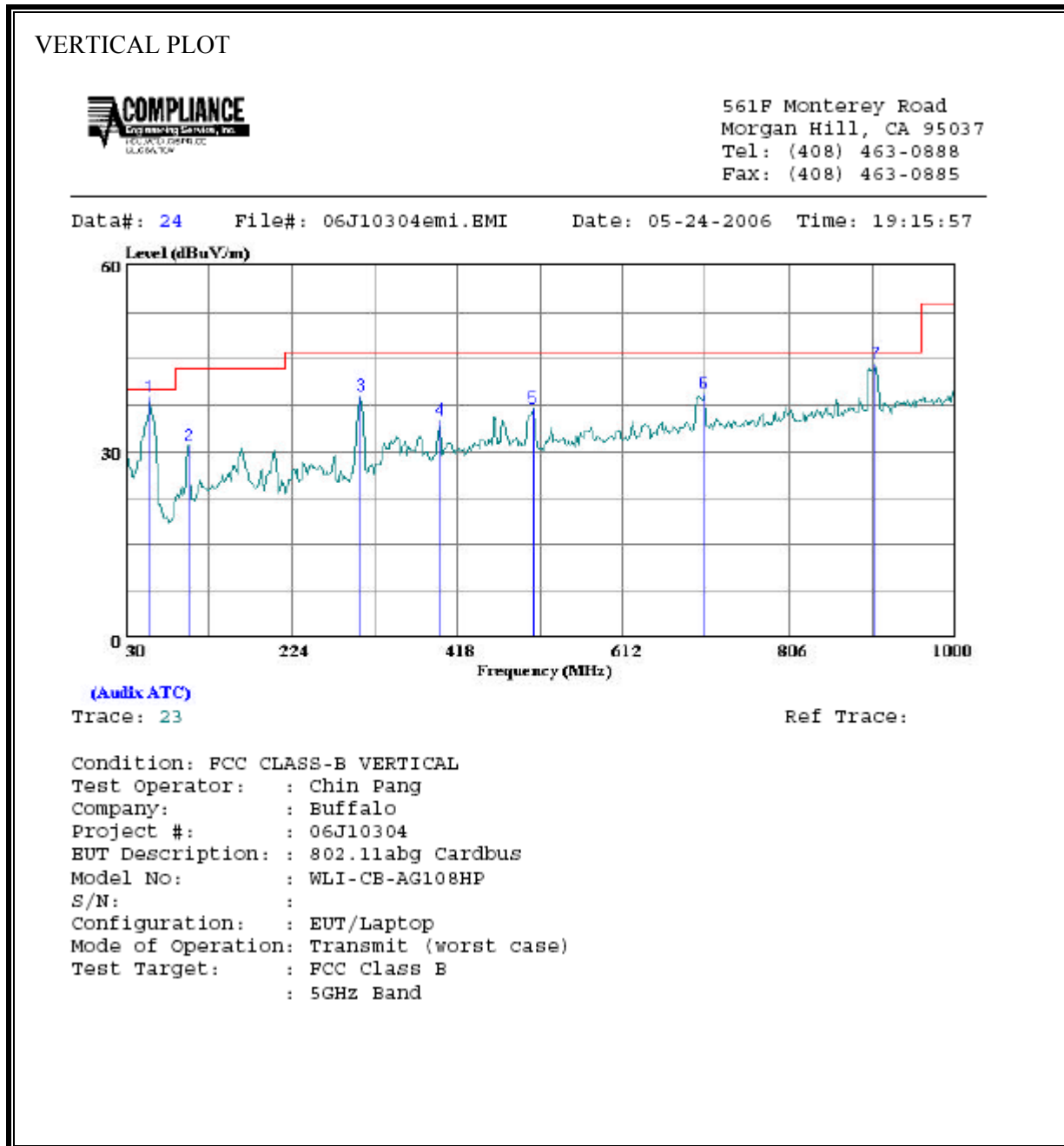


HORIZONTAL DATA

Page: 1

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHZ	dBuV	dB	dBuV/m	dBuV/m	dB	
1	164.830	20.53	13.61	34.14	43.50	-9.36	Peak
2	205.570	22.00	13.71	35.71	43.50	-7.79	Peak
3	304.510	26.88	15.78	42.66	46.00	-3.34	Peak
4	507.240	18.93	20.31	39.24	46.00	-6.76	Peak
5	703.180	19.55	23.12	42.67	46.00	-3.33	Peak
6	906.880	17.70	26.01	43.71	46.00	-2.29	Peak

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



VERTICAL DATA

Page: 1

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	58.130	30.28	8.61	38.89	40.00	-1.11	Peak
2	104.690	18.56	12.38	30.94	43.50	-12.56	Peak
3	305.480	23.24	15.80	39.04	46.00	-6.96	Peak
4	397.630	17.09	17.99	35.08	46.00	-10.92	Peak
5	507.240	16.55	20.31	36.86	46.00	-9.14	Peak
6	708.030	16.21	23.23	39.44	46.00	-6.56	Peak
7	906.880	18.18	26.01	44.19	46.00	-1.81	Peak

7.3. 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.

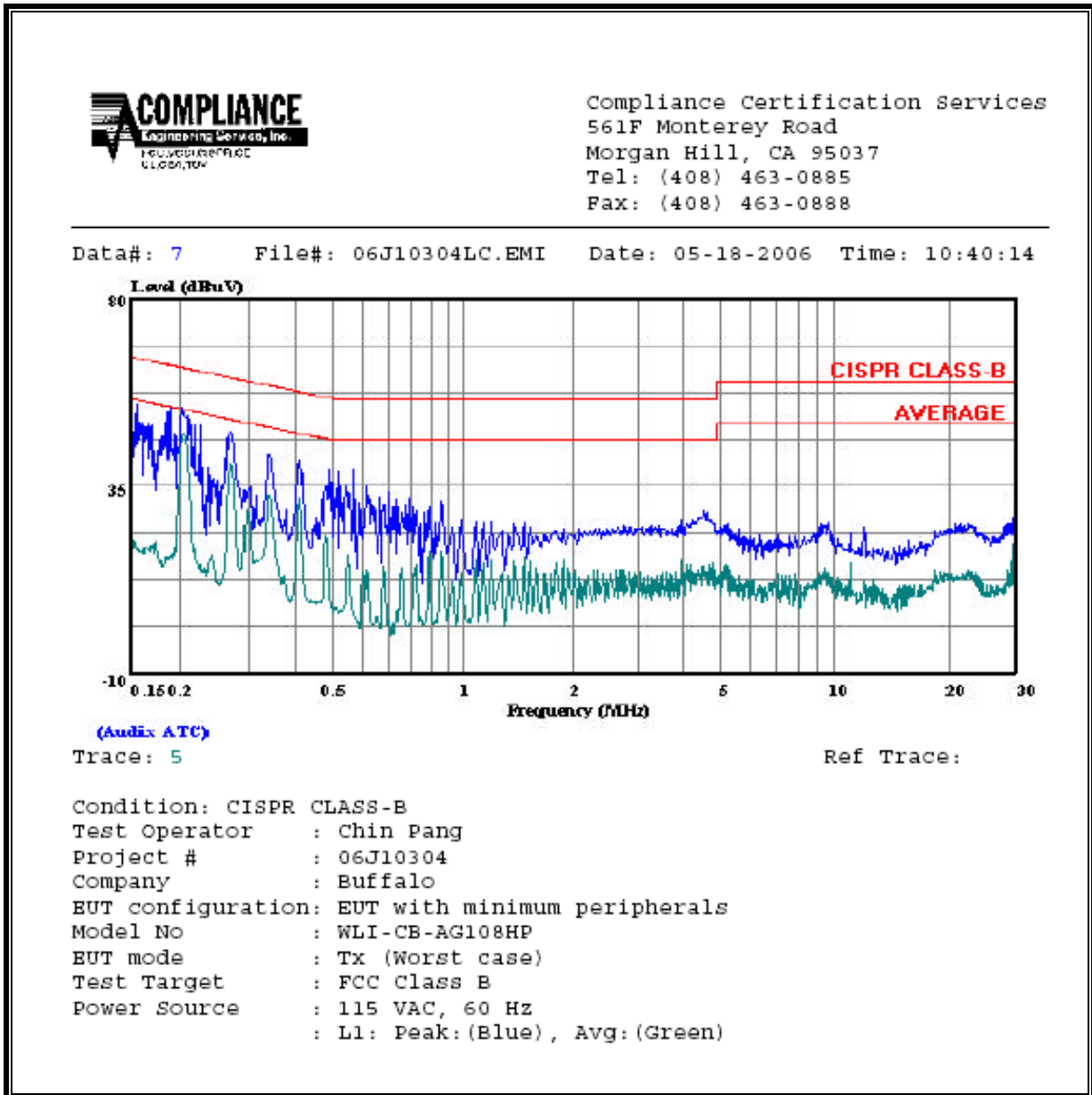
RESULTS

No non-compliance noted:

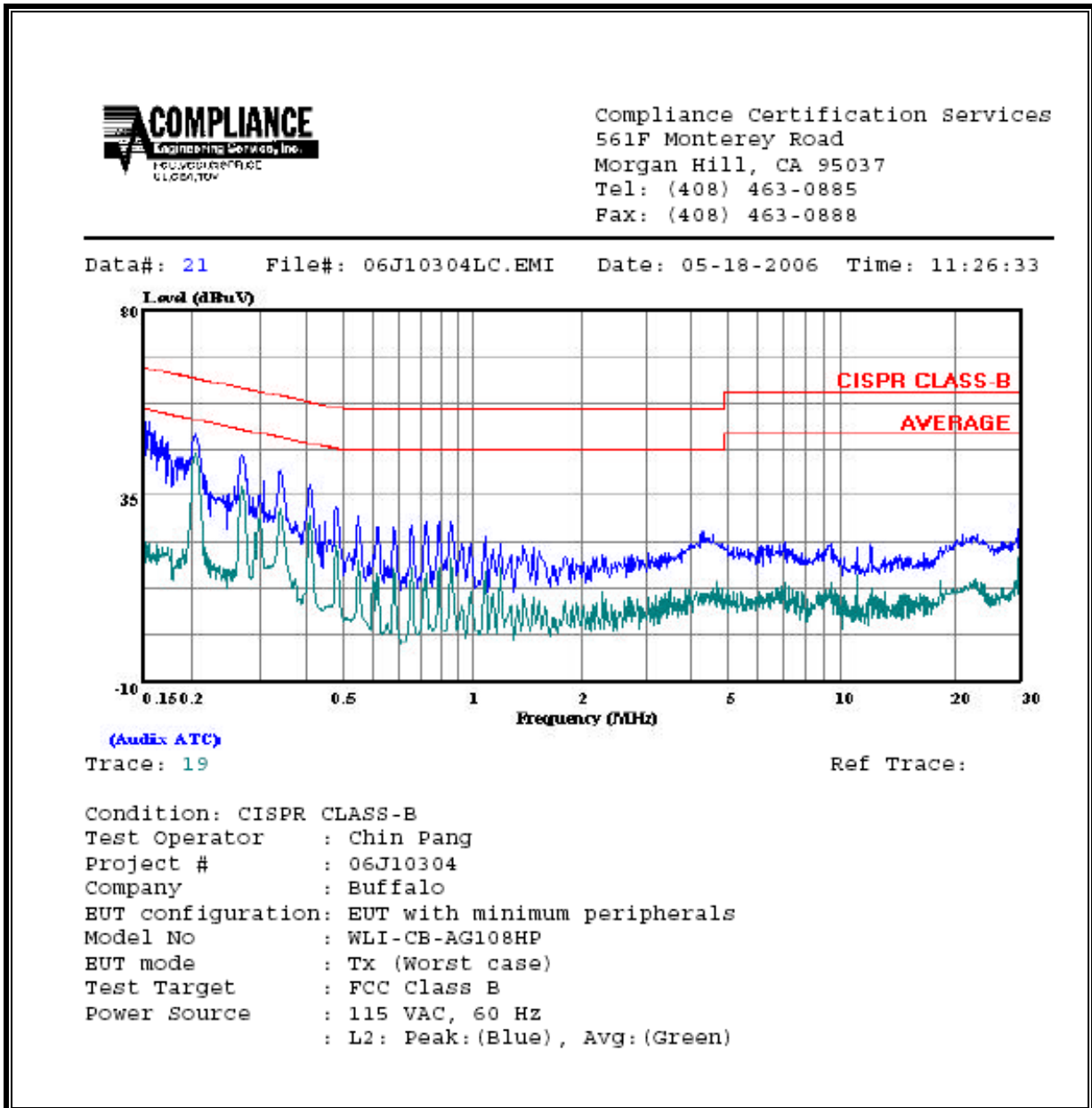
6 WORST EMISSIONS

CONDUCTED EMISSIONS DATA (115VAC 60Hz)									
Freq. (MHz)	Reading			Closs (dB)	Limit QP	EN_B AV	Margin		Remark L1 / L2
	PK (dBuV)	QP (dBuV)	AV (dBuV)				QP (dB)	AV (dB)	
0.20	53.78	--	47.84	0.00	63.53	53.53	-9.75	-5.69	L1
0.27	48.14	--	39.62	0.00	61.06	51.06	-12.92	-11.44	L1
0.41	39.18	--	32.08	0.00	57.65	47.65	-18.47	-15.57	L1
0.20	49.82	--	45.16	0.00	63.45	53.45	-13.63	-8.29	L2
0.27	45.08	--	36.24	0.00	61.00	51.00	-15.92	-14.76	L2
0.34	40.92	--	30.20	0.00	59.13	49.13	-18.21	-18.93	L2
6 Worst Data									

LINE 1 RESULTS

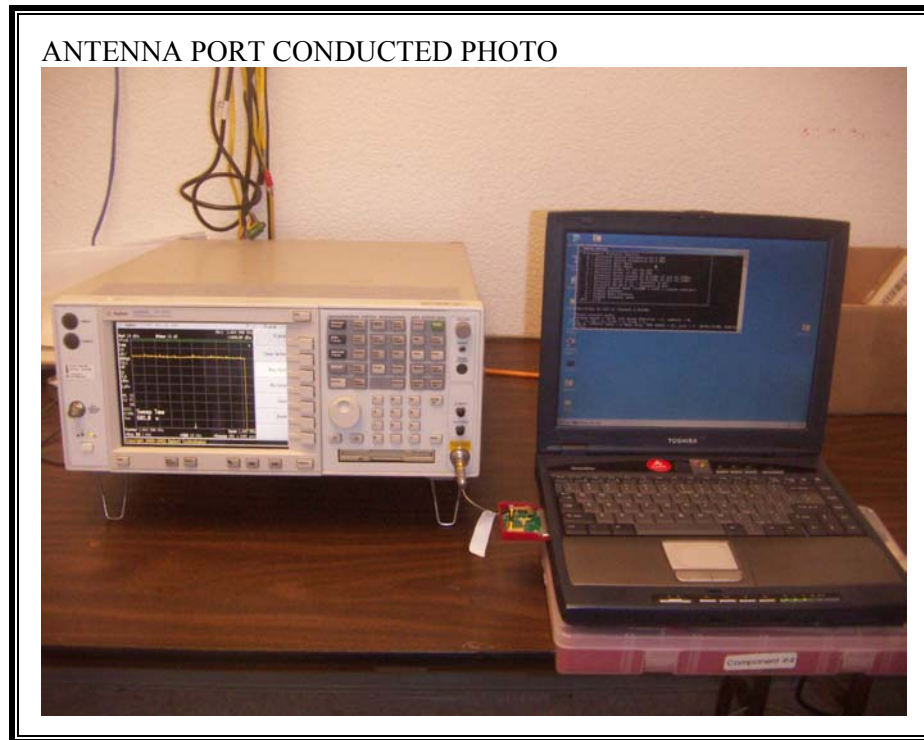


LINE 2 RESULTS

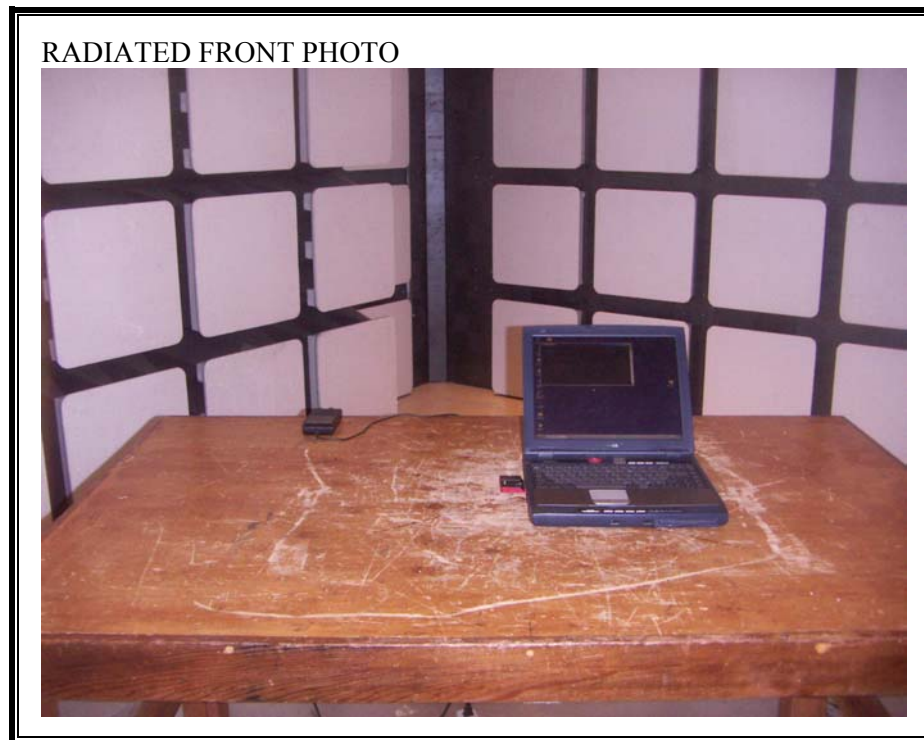


8. SETUP PHOTOS

ANTENNA PORT CONDUCTED RF MEASUREMENT SETUP



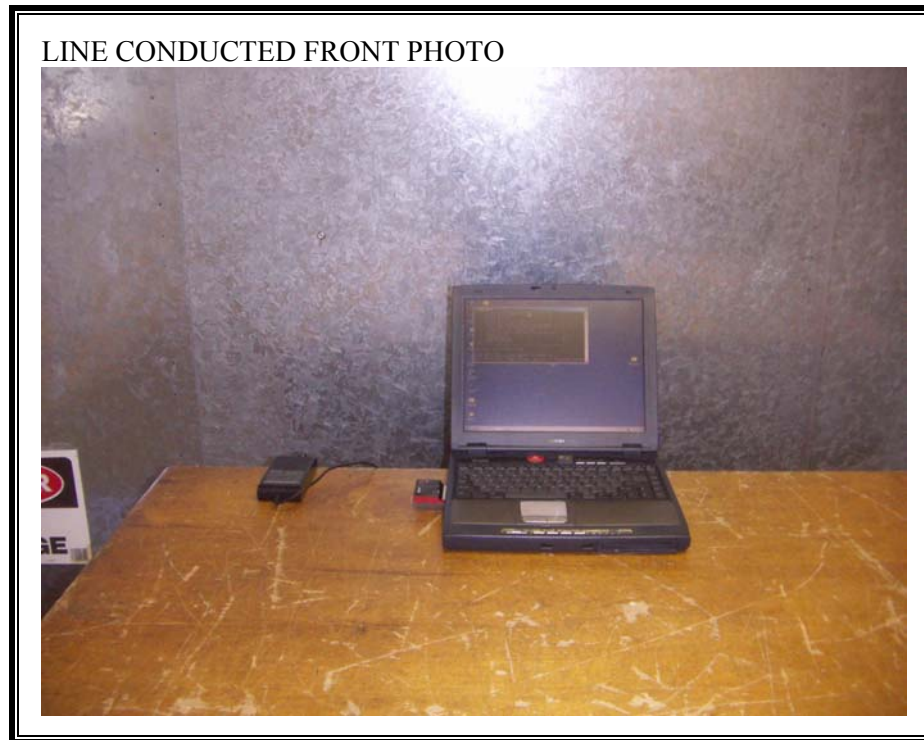
RADIATED RF MEASUREMENT SETUP

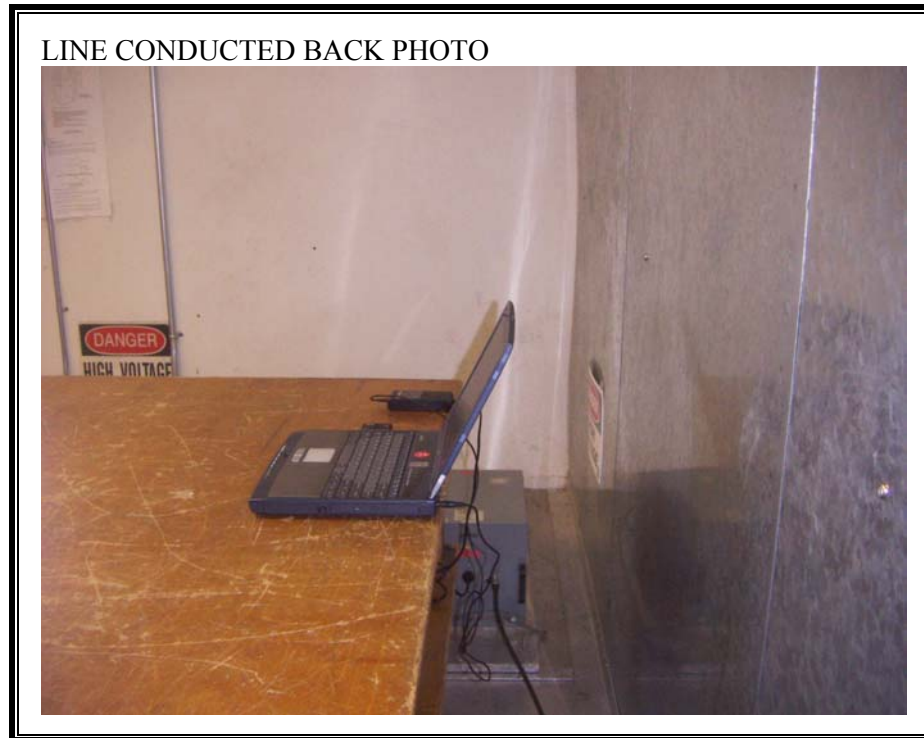


RADIATED BACK PHOTO



POWERLINE CONDUCTED EMISSIONS MEASUREMENT SETUP





END OF REPORT