FCC CFR47 PART 90 SUBPART Y
CERTIFICATION
TEST REPORT

FOR

4.9 GHz ACCESS POINT

MODEL NUMBER: ORiNOCO AP-4900

FCC ID: HZB-L49U24U50

REPORT NUMBER: 05U3569-1C

ISSUE DATE: OCTOBER 3, 2005

Prepared for
PROXIM
2115 O'NEL DRIVE
SAN JOSE, CA 95131
USA

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Revision History

Rev.	Issue Date	Revisions	Revised By
A	9/13/05	Initial Issue	MH
B	9/19/05	Changed FCC ID to HZB-L49U24U50; Changed applicant's address	DZ
C	10/3/05	Added Radiated substitution measurement data	MH

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: PROXIM
2115 O'NEL DRIVE
SAN JOSE, CA 95131, USA

EUT DESCRIPTION: 4.9 GHz ACCESS POINT

MODEL: ORiNOCO AP-4900

SERIAL NUMBER: 05UT12560150

DATE TESTED: JUNE 27 – OCTOBER 3, 2005

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
FCC PART 90 SUBPART Y	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:

MIKE HECKROTTE
ENGINEERING MANAGER
COMPLIANCE CERTIFICATION SERVICES

Tested By:

DAVE GARCIA
EMC SUPERVISOR
COMPLIANCE CERTIFICATION SERVICES

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 90.

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 a 4.9 GHz transceiver access point.

The radio module is manufactured by Proxim Corporation.

5.2. MAXIMUM OUTPUT POWER

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

For Antenna Gains up to 9 dBi

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
4942.5 - 4987.5	5 MHz Bandwidth	12.77	18.92
4945 - 4985	10 MHz Bandwidth	15.72	37.33
4950 - 4980	20 MHz Bandwidth	18.51	70.96

For Antenna Gains up to 14 dBi

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
4942.5 - 4987.5	5 MHz Bandwidth	7.59	5.74
4945 - 4985	10 MHz Bandwidth	10.89	12.27
4950 - 4980	20 MHz Bandwidth	13.57	22.75

For Antenna Gains up to 17 dBi

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
4942.5 - 4987.5	5 MHz Bandwidth	4.67	2.93
4945 - 4985	10 MHz Bandwidth	7.97	6.27
4950 - 4980	20 MHz Bandwidth	10.65	11.61

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio may be used with a variety of antennas up to 17 dBi, providing that for antenna gain over 9 dBi the conducted output power is adjusted as required to meet EIRP and MPE limits:

The radio was tested with a 17 dBi Sector Antenna, a 5 dBi Car Mount Antenna, and a 2 dBi Dipole Antenna.

5.4. SOFTWARE AND FIRMWARE

The test utility software used during testing was ART, rev. 5 build #11 Mainline.

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 4962.5 MHz for 5 MHz channel bandwidth operation, 4985 MHz for 10 MHz channel bandwidth operation and 4980 MHz for 20 MHz channel operation.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Laptop PC	H-P	Ze4400	CNF3370PWY	DoC
PC AC Adapter	H-P	PPP014S	565C50AU4P6707	N/A
EUT AC Adapter	Hipro	HP-OJ015L6A	05UT12560150	N/A

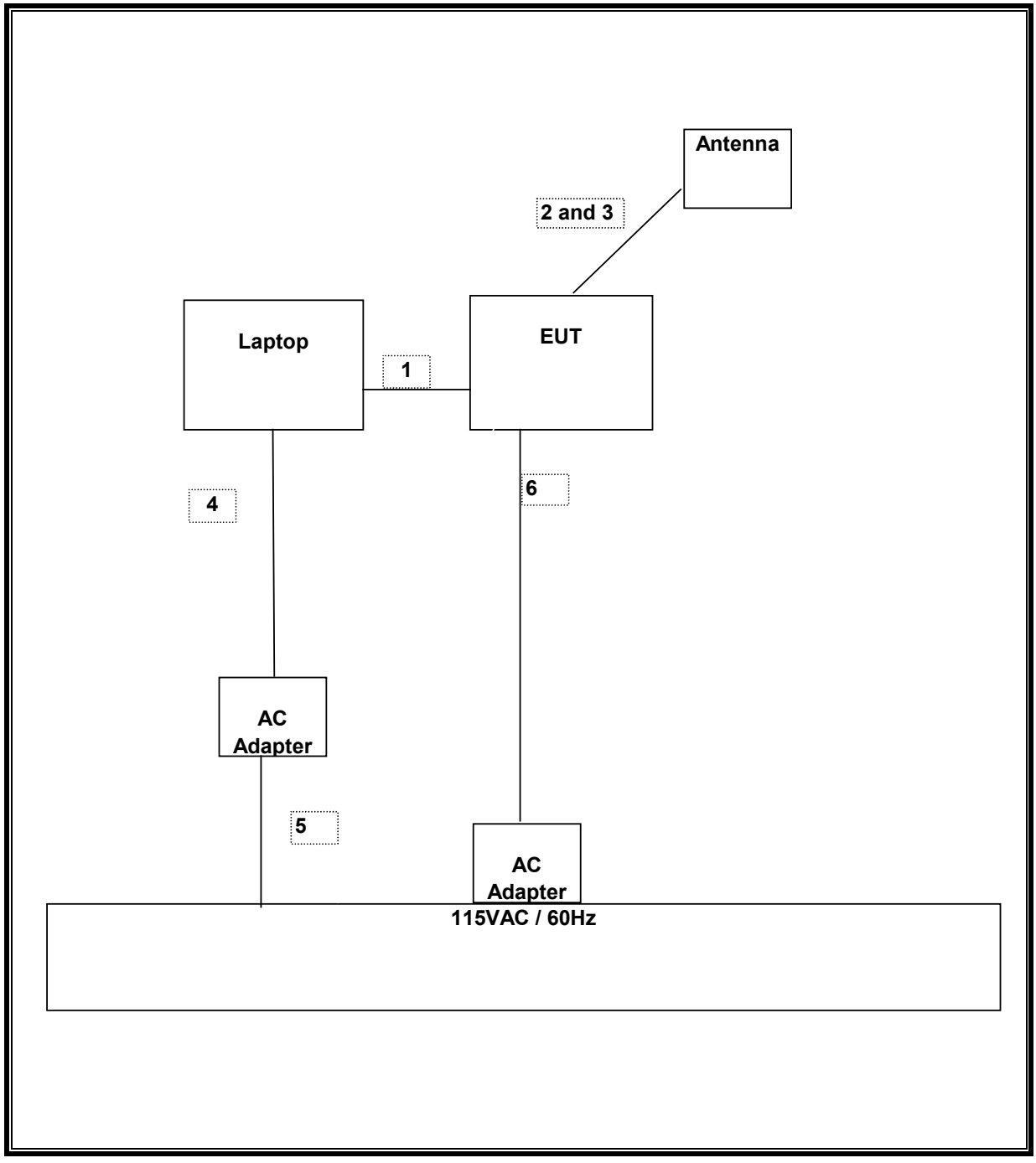
I/O CABLES

I/O CABLE LIST						
Cable No.	**Port**	**# of Identical Ports**	**Connector Type**	**Cable Type**	**Cable Length**	**Remarks**
1	LAN	1	RJ45	Unshielded CAT5	9m	Crossover cable
2	Antenna	1	N	Shielded Coax	1.88	Car mount cable
3	Antenna	1	N	Shielded Coax	0.53	Sector and Dipole cable

TEST SETUP

The EUT is connected to a host laptop computer via an unshielded crossover LAN cable 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**
EMI Test Receiver	R & S	ESHS 20	827129/006	6/3/2006
Spectrum Analyzer 3 Hz ~ 44 GHz	Agilent	E4446A	US42510266	8/25/2005
Temperature / Humidity Chamber	Thermotron	SE 600-10-10	29800	6/10/2006
Antenna, Horn 1 ~ 18 GHz	EMCO	3115	2238	4/22/2006
Preamplifier, 1 ~ 26 GHz	Miteq	NSP2600-44	646456	8/17/2005
Antenna, Bilog 30MHz ~ 2Ghz	Sunol Sciences	JB1	A121003	3/3/2006
EMI Receiver, 9 kHz ~ 2.9 GHz	HP	8542E	3942A00286	3/29/2006
RF Filter Section	HP	85420E	3705A00256	3/29/2006
Peak Power Meter	Agilent	E4416A	GB41291160	2/9/2006
Peak / Average Power Sensor	Agilent	E9327A	US40440755	2/10/2006
LISN, 10 kHz ~ 30 MHz	Solar	8012-50-R-24-BNC	8379443	10/21/2005
Site A Line Stabilizer/Conditioner	Tripplite	LC-1800a	A005181	CNR
LISN, 10 kHz ~ 30 MHz	FCC	LISN-50/250-25-2	2023	8/30/2005
4.0 High Pass Filter	Micro Tronics	HPM13351	3	N/A

7. LIMITS AND RESULTS

7.1. CHANNEL TESTS FOR 5 MHz CHANNEL BANDWIDTH MODE

7.1.1. EMISSION BANDWIDTH

LIMIT

For reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to 1% to 3% of the 26 dB bandwidth and /or the 99% bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled.

RESULTS

No non-compliance noted:

26 dB Bandwidth

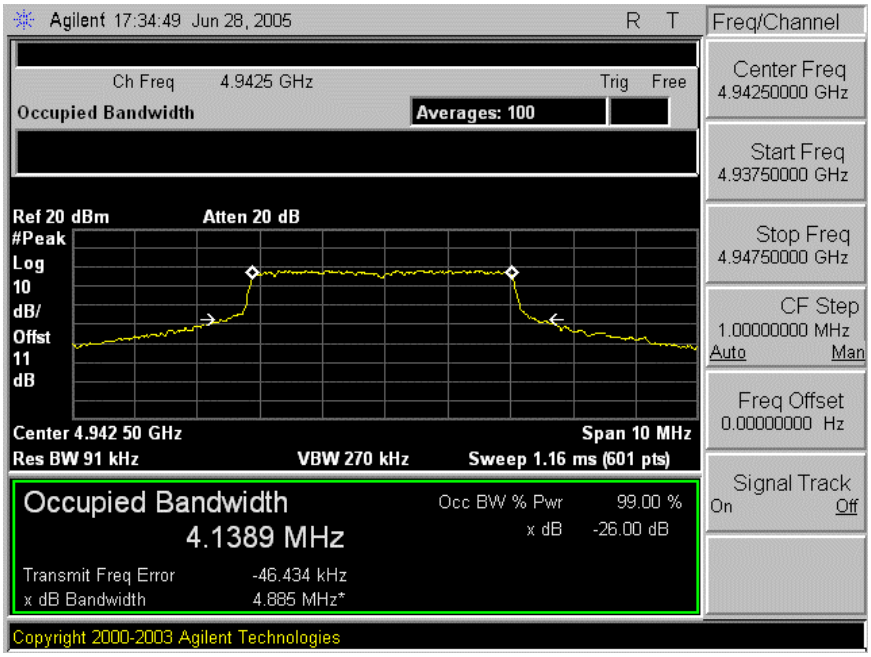
Channel	Frequency (MHz)	26 dB BW (MHz)	10 Log B (dB)
Low	4942.5	4.89	6.89
Middle	4962.5	4.79	6.80
High	4987.5	4.93	6.93

99% Bandwidth

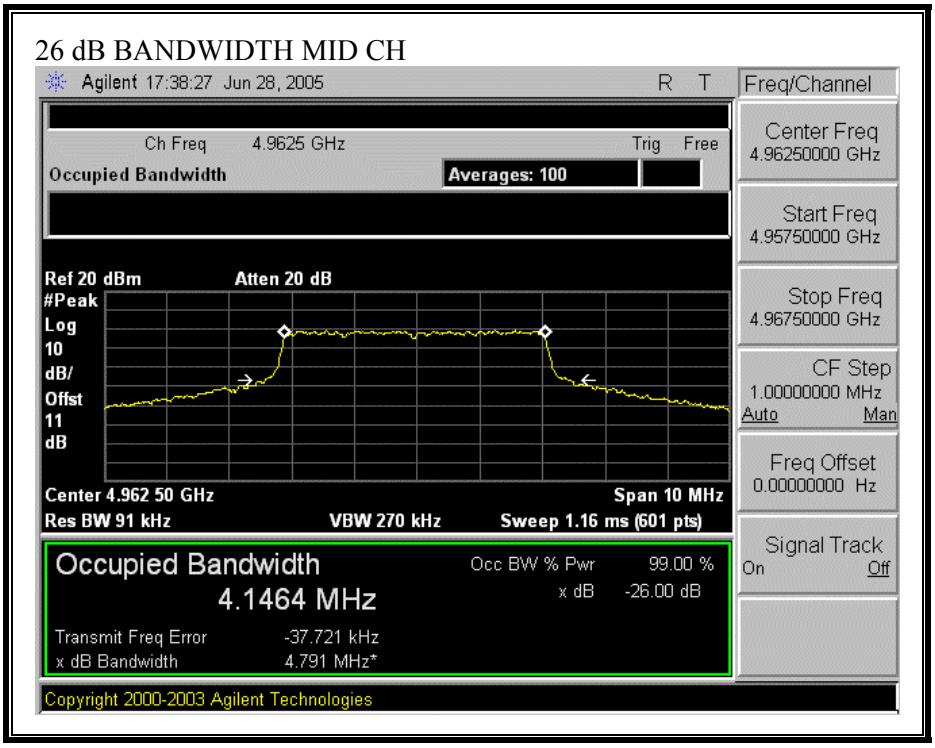
Channel	Frequency (MHz)	99% BW (MHz)
Low	4942.5	4.14
Middle	4962.5	4.15
High	4987.5	4.15

26 dB EMISSION BANDWIDTH

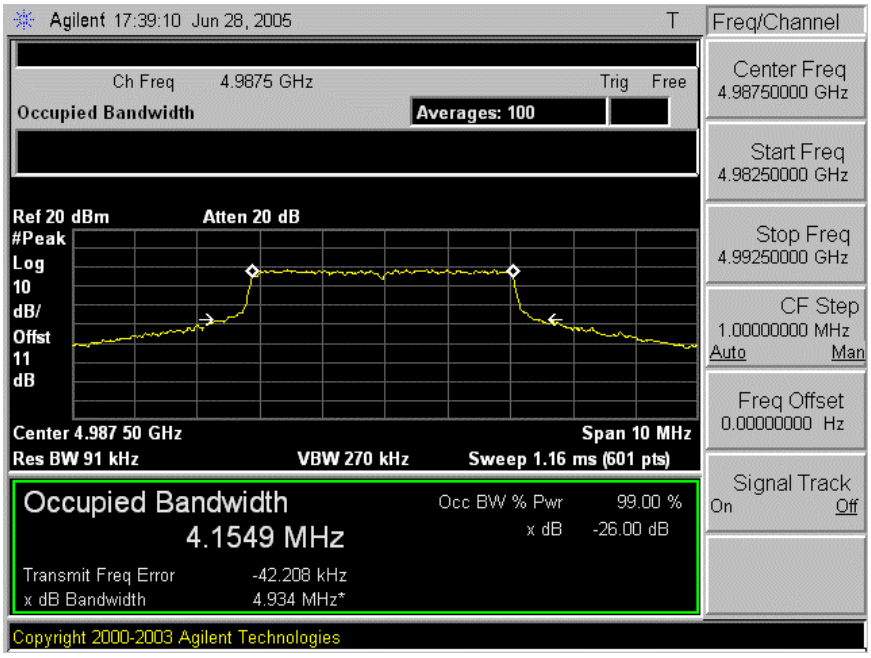
26 dB BANDWIDTH LOW CH



26 dB BANDWIDTH MID CH



26 dB BANDWIDTH HIGH CH



7.1.2. PEAK OUTPUT POWER

PEAK POWER LIMIT

§ 90.1215 The transmitting power of stations operating in the 4940–4990 MHz band must not exceed the maximum limits in this section.

(a) The peak transmit power should not exceed:

Channel bandwidth (MHz)	Low power Device Peak transmitter Power (dBm)	High power Device Peak transmitter Power (dBm)
1.....	7	20
5.....	14	27
10.....	17	30
15.....	18.8	31.8
20.....	20	33

High power devices are also limited to a peak power spectral density of 21 dBm per one MHz. High power devices using channel bandwidths other than those listed above are permitted; however, they are limited to a peak power spectral density of 21 dBm/MHz. If transmitting antennas of directional gain greater than 9 dBi are used, both the peak transmit power and the peak power spectral density should be reduced by the amount in decibels that the directional gain of the antenna exceeds 9 dBi. However, high power point-to-point or point-to-multipoint operation (both fixed and temporary-fixed rapid deployment) may employ transmitting antennas with directional gain up to 26 dBi without any corresponding reduction in the transmitter power or spectral density. Corresponding reduction in the peak transmit power and peak power spectral density should be the amount in decibels that the directional gain of the antenna exceeds 26 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.

RESULTS

For antenna gains up to 9 dBi the limit is 14 dBm.

For the 14 dBi antenna gain the limit is 9 dBm and for the 17 dBi gain antenna the limit is 6 dBm.

No non-compliance noted:

For antennas up to 9 dBi

Channel	Frequency (MHz)	Peak Power (dBm)	Limit (dBm)	Margin (dB)
Low	4942.5	12.53	14	-1.47
Middle	4962.5	12.77	14	-1.23
High	4987.5	12.55	14	-1.45

For 14 dBi antenna

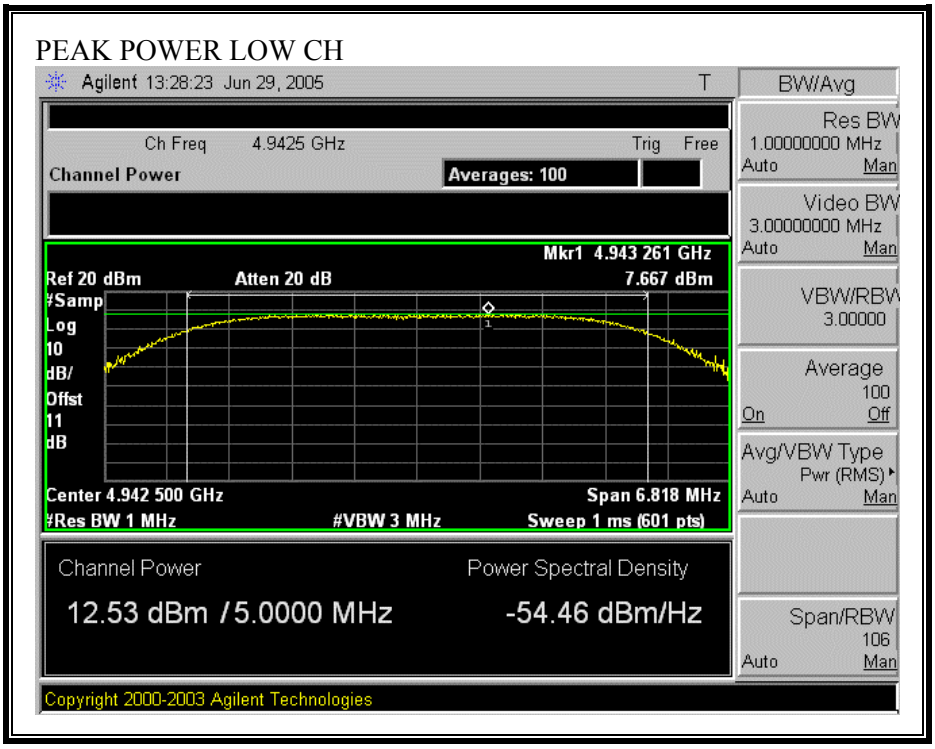
Channel	Frequency (MHz)	Peak Power (dBm)	Limit (dBm)	Margin (dB)
Low	4942.5	7.36	9	-1.64
Middle	4962.5	7.23	9	-1.77
High	4987.5	7.59	9	-1.41

For 17 dBi antenna

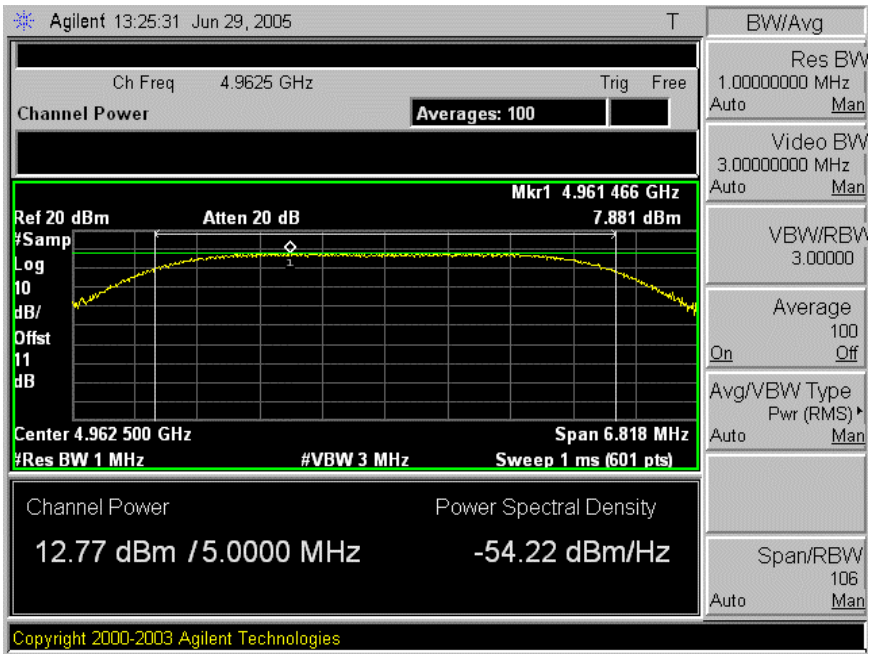
Channel	Frequency (MHz)	Peak Power (dBm)	Limit (dBm)	Margin (dB)
Low	4942.5	4.56	6	-1.44
Middle	4962.5	4.67	6	-1.33
High	4987.5	4.56	6	-1.44

OUTPUT POWER (802.11a MODE, FOR ANTENNAS UP TO 9 dBi)

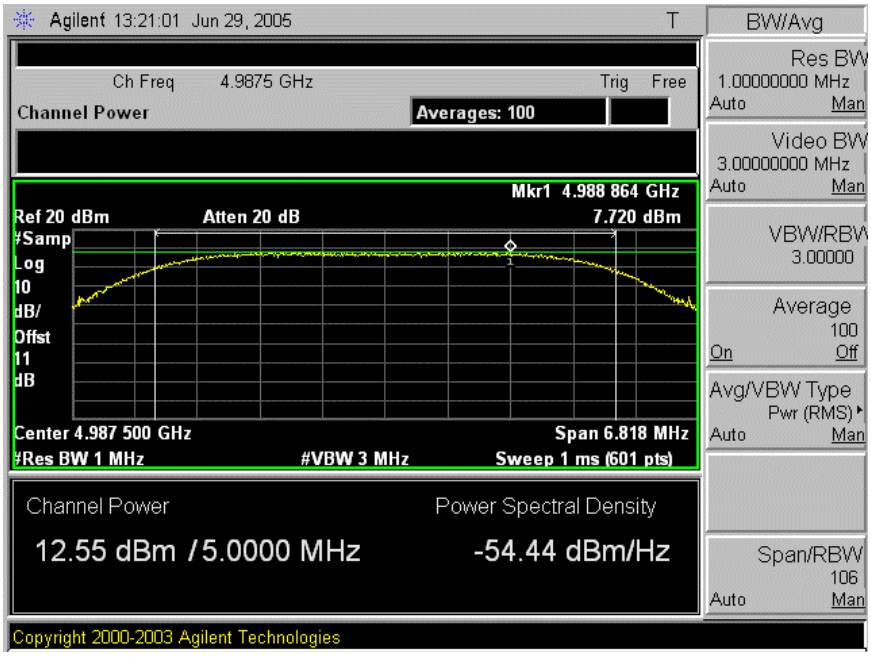
PEAK POWER LOW CH



PEAK POWER MID CH

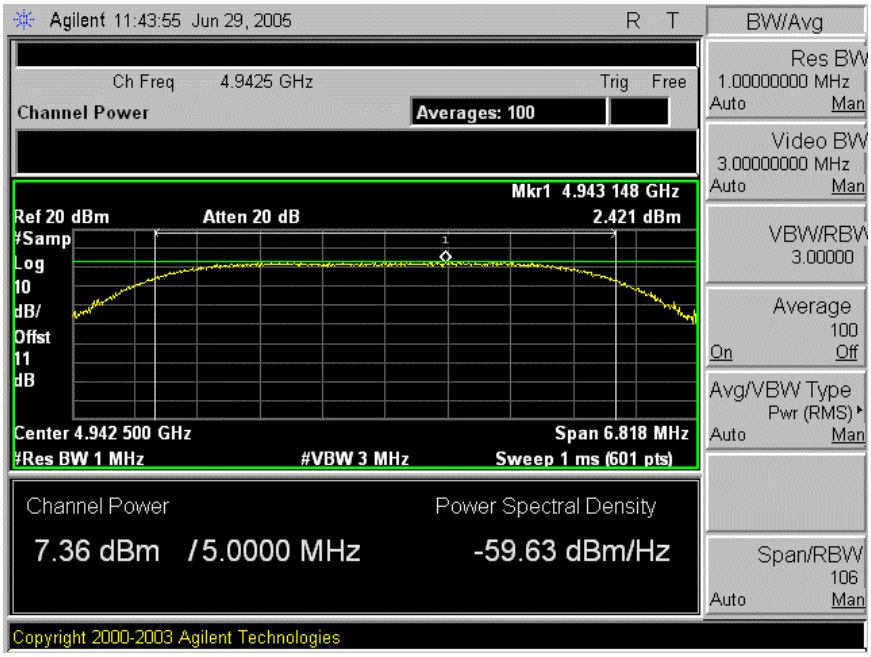


PEAK POWER HIGH CH

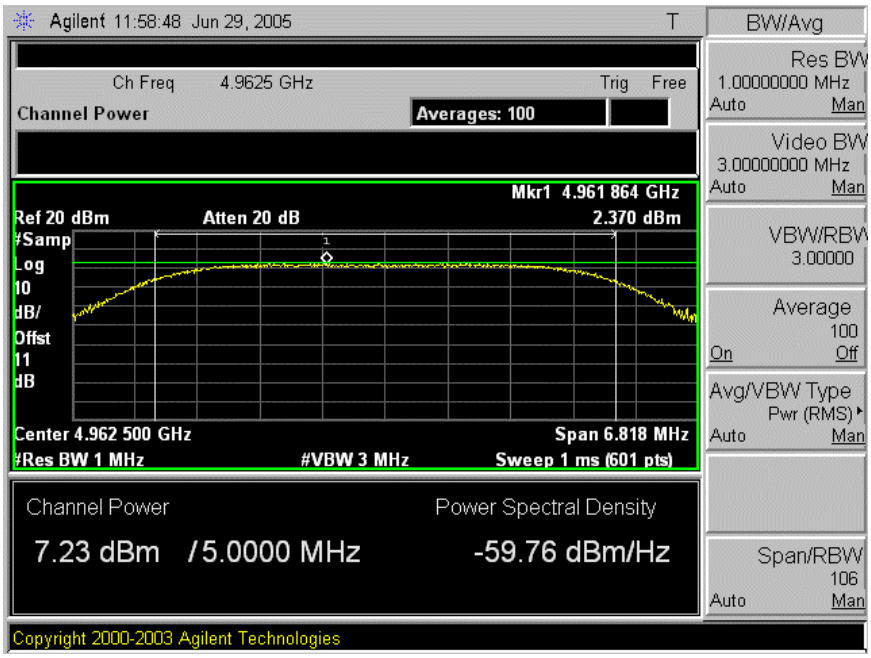


OUTPUT POWER (802.11a MODE, FOR 14 dBi ANTENNA)

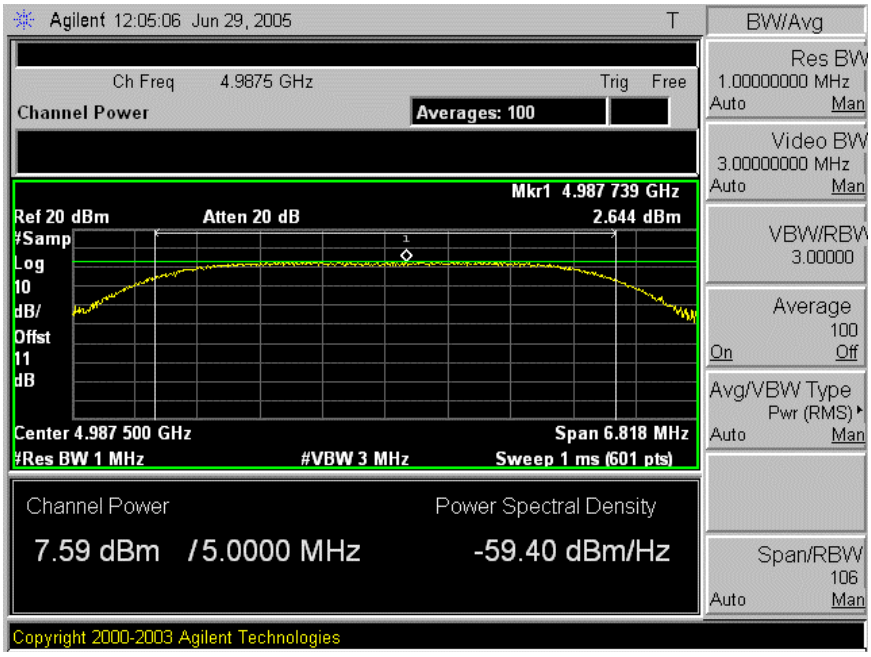
PEAK POWER LOW CH



PEAK POWER MID CH

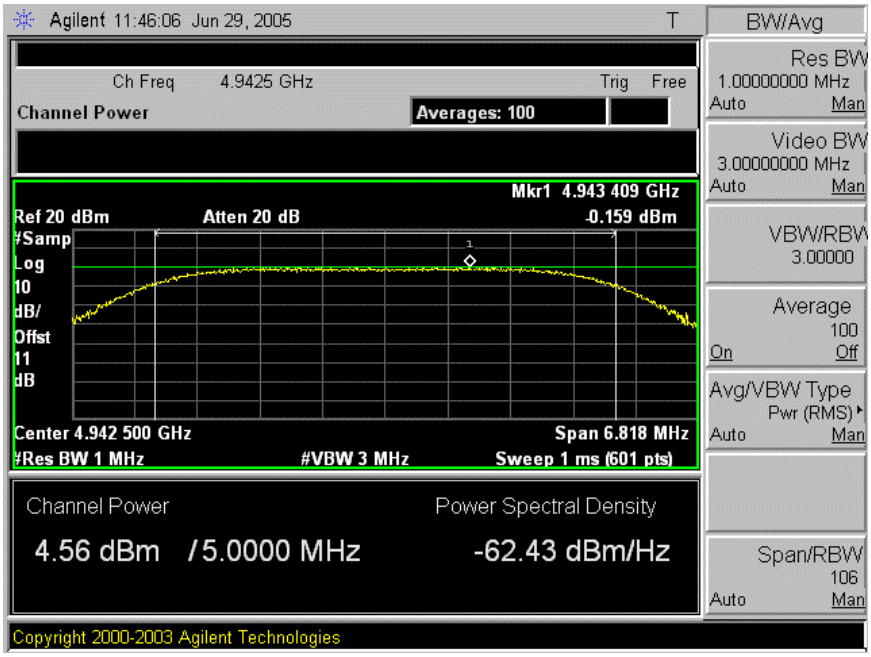


PEAK POWER HIGH CH

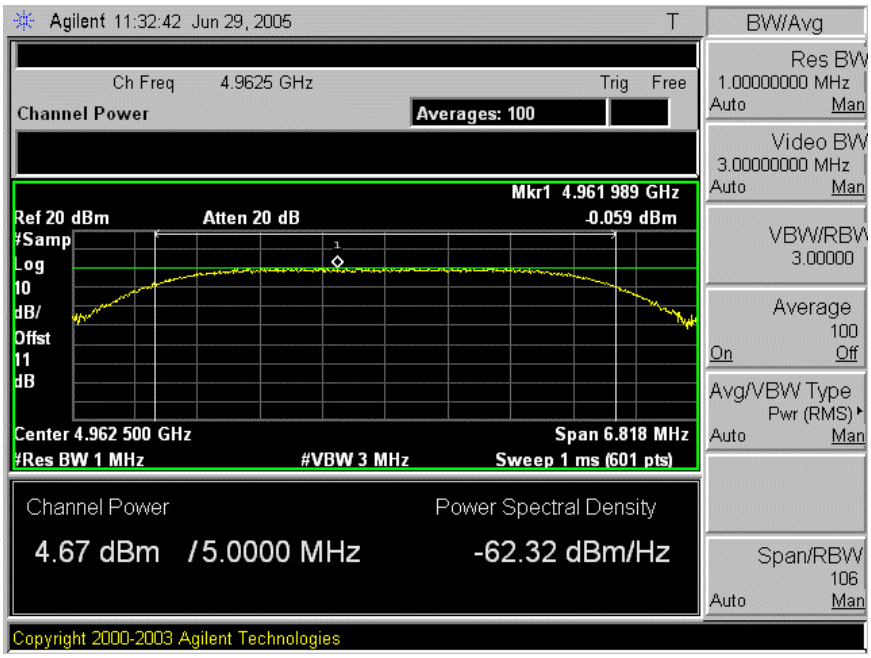


OUTPUT POWER (802.11a MODE, FOR 17 dBi ANTENNA)

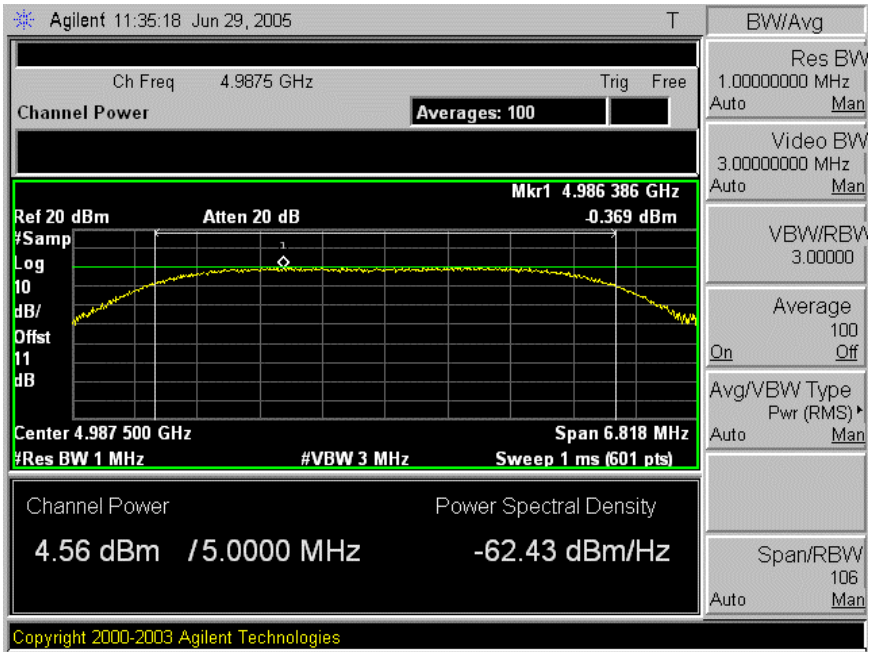
PEAK POWER LOW CH



PEAK POWER MID CH



PEAK POWER HIGH CH



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 (mW) = P (W) / 1000 and
d (cm) =100 * d (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/cm^2

Substituting the logarithmic form of power and gain using:

P (mW) = 10 ^ (P (dBm) / 10) and
G (numeric) = 10 ^ (G (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/cm^2

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 mW/cm^2

RESULTS

No non-compliance noted:

Mode	MPE Distance (cm)	Output Power (dBm)	Antenna Gain (dBi)	Power Density (mW/cm^2)
5 MHz Channel BW	20.0	12.77	9.00	0.03
5 MHz Channel BW	20.0	7.59	14.00	0.03
5 MHz Channel BW	20.0	4.67	17.00	0.03

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 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.

For antenna gains up to 9 dBi

Channel	Frequency (MHz)	Average Power (dBm)
Low	4942.5	12.33
Middle	4962.5	12.94
High	4987.5	12.70

For 14 dBi Antenna

Channel	Frequency (MHz)	Average Power (dBm)
Low	4942.5	7.30
Middle	4962.5	7.50
High	4987.5	7.81

For 17 dBi Antenna

Channel	Frequency (MHz)	Average Power (dBm)
Low	4942.5	4.89
Middle	4962.5	4.65
High	4987.5	4.53

7.1.5. PEAK POWER SPECTRAL DENSITY

LIMIT

§ 90.1215 (b) Low power devices are also limited to a peak power spectral density of 8 dBm per one MHz. Low power devices using channel bandwidths other than those listed above are permitted; however, they are limited to a peak power spectral density of 8 dBm/MHz. If transmitting antennas of directional gain greater than 9 dBi are used, both the peak transmit power and the peak power spectral density should be reduced by the amount in decibels that the directional gain of the antenna exceeds 9 dBi..

(c) The peak power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test. If the device cannot be connected directly, alternative techniques acceptable to the Commission may be used. Measurements are made over a bandwidth of 1 MHz or the 26 dB emission bandwidth of the device, whichever is less. A resolution bandwidth less than the measurement bandwidth can be used, provided that the measured power is integrated to show total power over the measurement bandwidth. If the resolution bandwidth is approximately equal to the measurement bandwidth, and much less than the emission bandwidth of the equipment under test, the measured results shall be corrected to account for any difference between the resolution bandwidth of the test instrument and its actual noise bandwidth.

Limits as determined by antenna Gain:

Antenna Gain dBi	Limit dBm
Up to 9	8
14	3
17	0

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.

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 = 1 MHz and VBW 3 MHz. The PPSD is the highest level found across the emission in any 3 kHz band.

RESULTS

No non-compliance noted:

Up to 9 dBi Antenna

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
Low	4942.5	7.67	8	-0.33
Middle	4962.5	7.88	8	-0.12
High	4987.5	7.72	8	-0.28

14 dBi Antenna

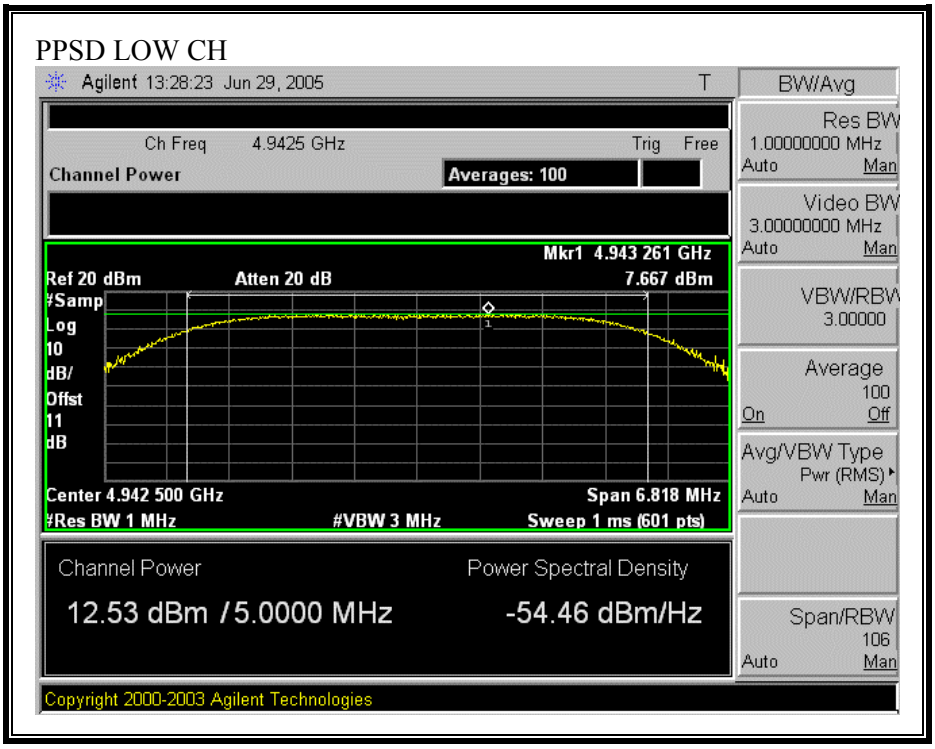
Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
Low	4942.5	2.42	3	-0.58
Middle	4962.5	2.37	3	-0.63
High	4987.5	2.64	3	-0.36

17 dBi Antenna

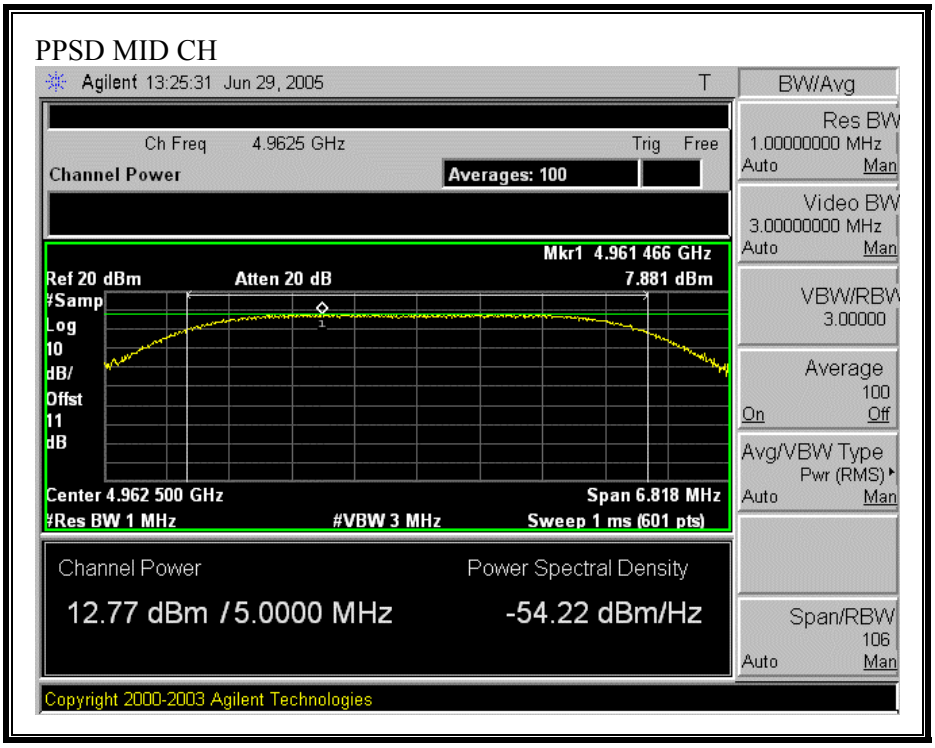
Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
Low	4942.5	-0.16	0	-0.16
Middle	4962.5	-0.06	0	-0.06
High	4987.5	-0.37	0	-0.37

PEAK POWER SPECTRAL DENSITY (FOR UPTO 9 dBi ANTENNA GAIN)

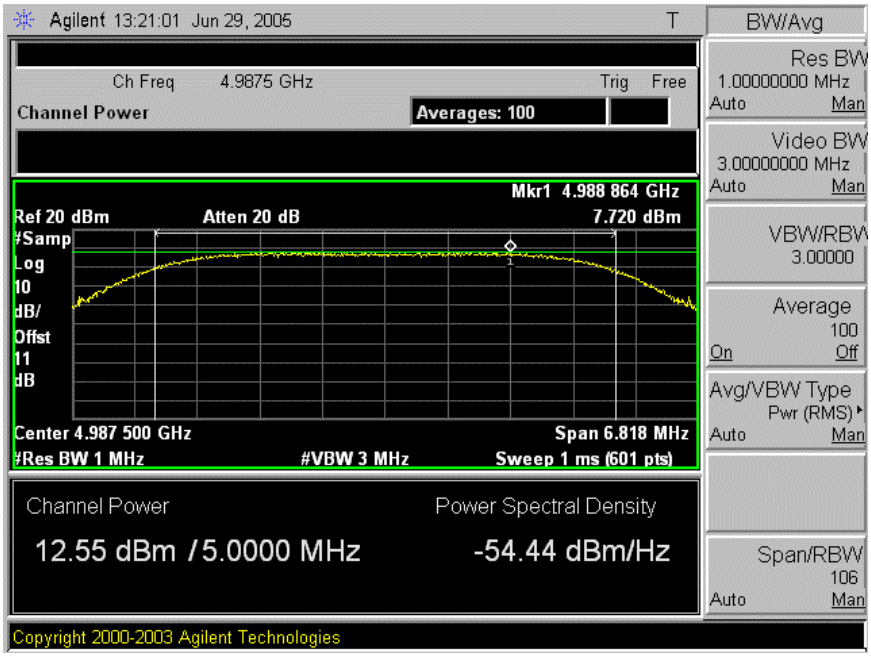
PPSD LOW CH



PPSD MID CH

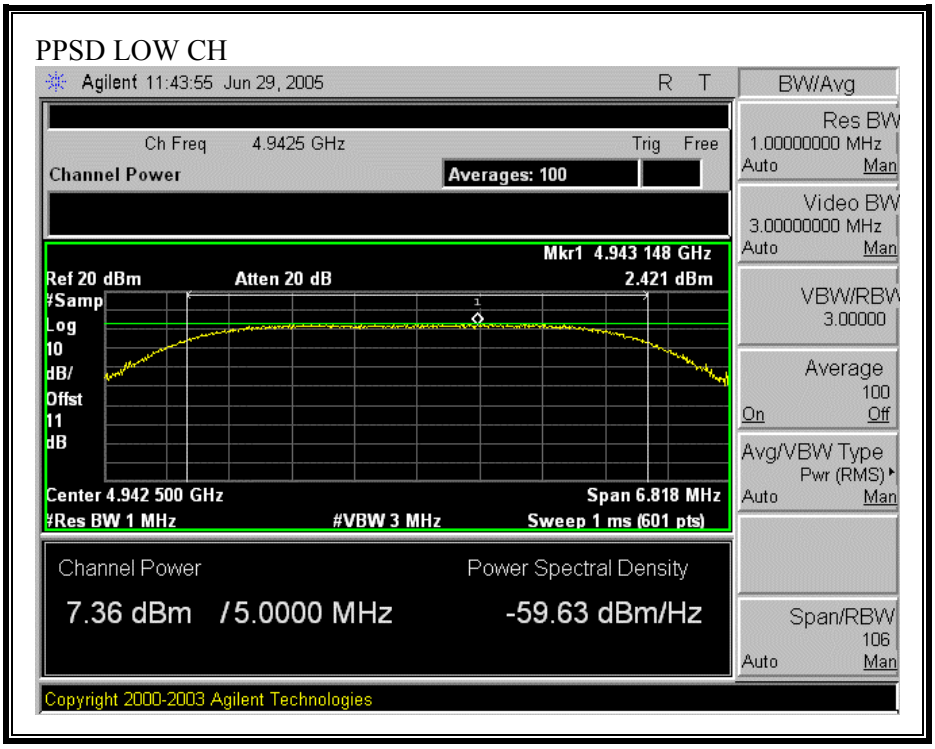


PPSD HIGH CH

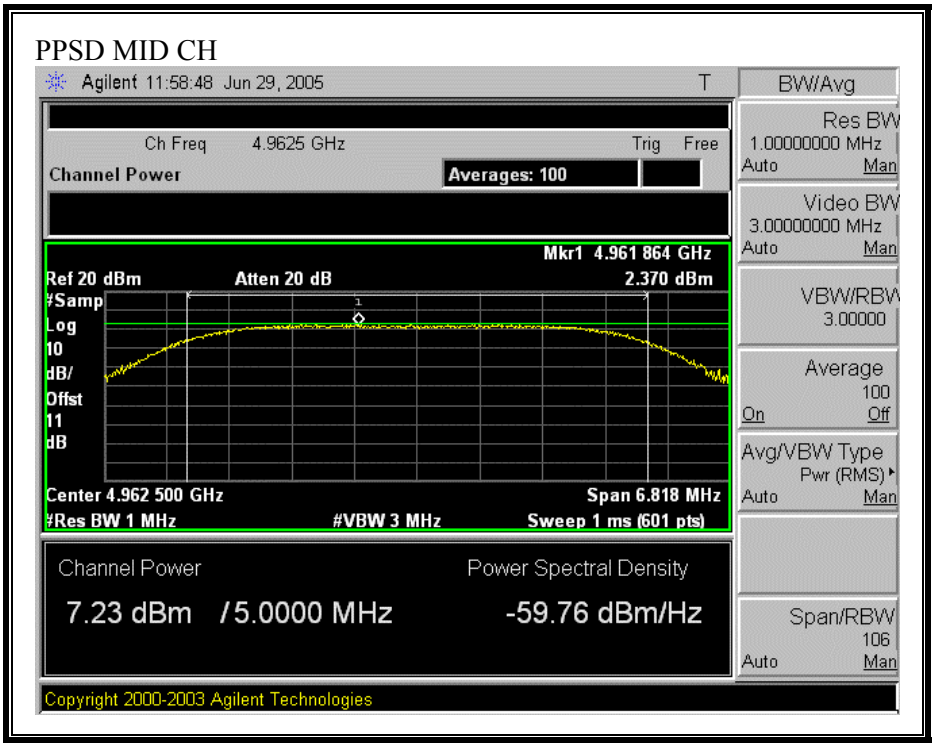


PEAK POWER SPECTRAL DENSITY (FOR 14 dBi ANTENNA GAIN)

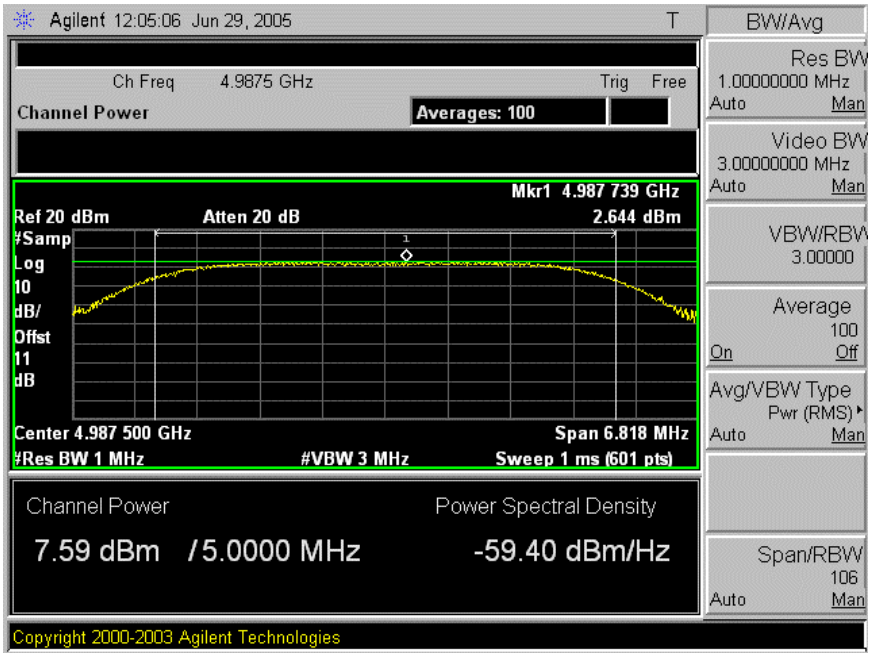
PPSD LOW CH



PPSD MID CH

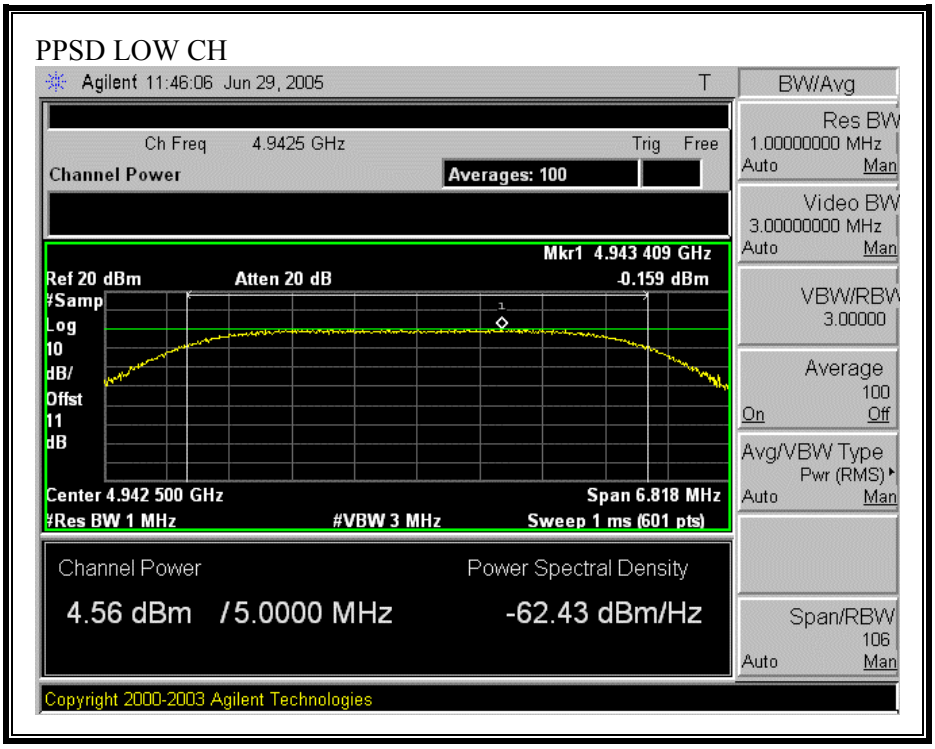


PPSD HIGH CH

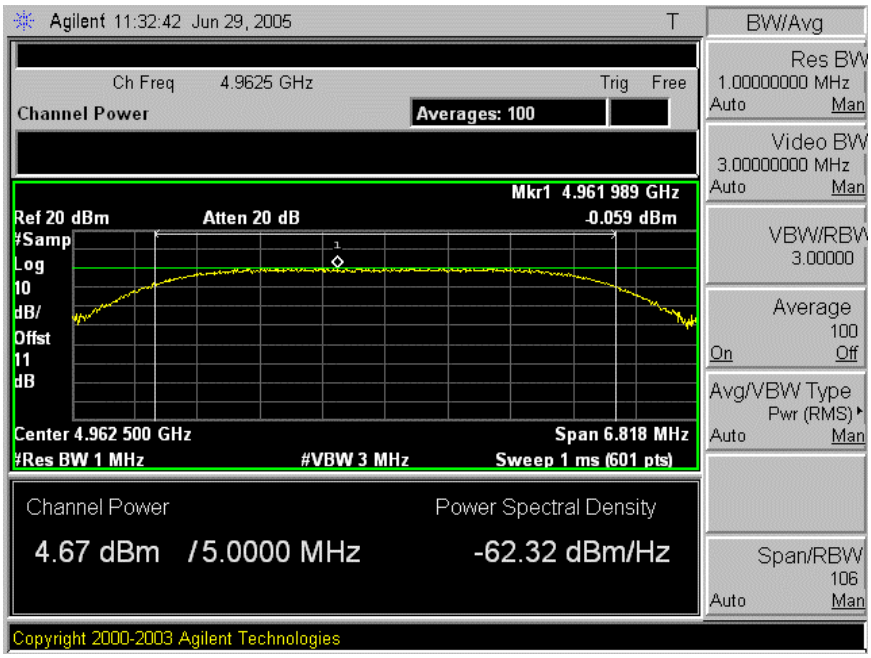


PEAK POWER SPECTRAL DENSITY (FOR 17 dBi ANTENNA GAIN)

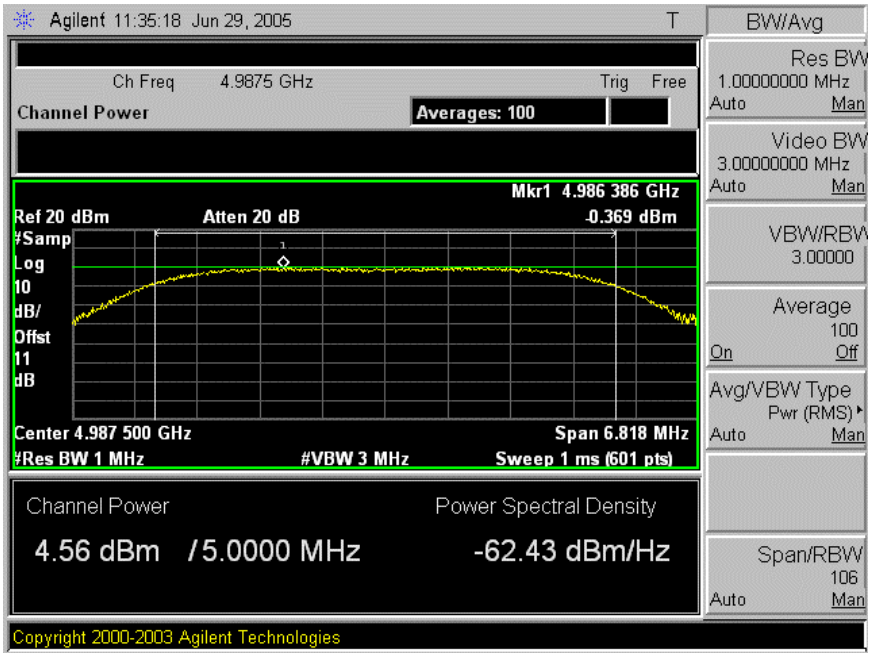
PPSD LOW CH



PPSD MID CH



PPSD HIGH CH



7.1.6. EMISSION MASK AND CONDUCTED SPURIOUS

§ 90.210 (l) Emission Mask L. For low power transmitters (20 dBm or less) operating in the 4940–4990 MHz frequency band, the power spectral density of the emissions must be attenuated below the output power of the transmitter as follows:

(1) On any frequency removed from the assigned frequency between 0–45% of the authorized bandwidth (BW): 0 dB.
(2) On any frequency removed from the assigned frequency between 45–50% of the authorized bandwidth: 219 log (% of (BW)/45) dB.
(3) On any frequency removed from the assigned frequency between 50–55% of the authorized bandwidth: 10 + 242 log (% of (BW)/50) dB.
(4) On any frequency removed from the assigned frequency between 55–100% of the authorized bandwidth: 20 + 31 log (% of (BW)/55) dB attenuation.
(5) On any frequency removed from the assigned frequency between 100–150% of the authorized bandwidth: 28 + 68 log (% of (BW)/100) dB attenuation.
(6) On any frequency removed from the assigned frequency above 150% of the authorized bandwidth: 50 dB.
(7) The zero dB reference is measured relative to the highest average power of the fundamental emission measured across the designated channel bandwidth using a resolution bandwidth of at least one percent of the occupied bandwidth of the fundamental emission and a video bandwidth of 30 kHz. The power spectral density is the power measured within the resolution bandwidth of the measurement device divided by the resolution bandwidth of the measurement device. Emission levels are also based on the use of measurement instrumentation employing a resolution bandwidth of at least one percent of the occupied bandwidth.

TEST PROCEDURE

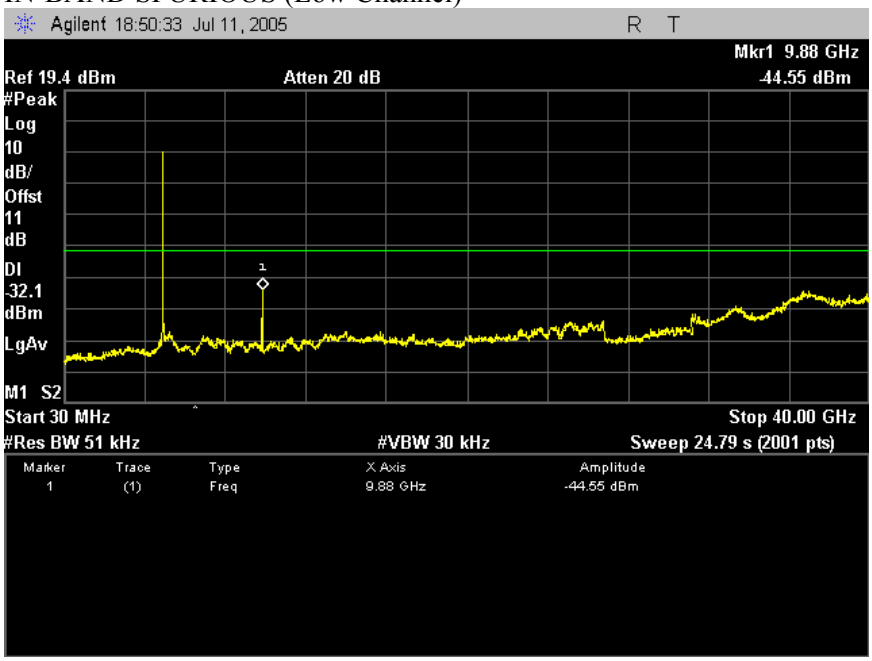
The EUT is connected to the spectrum analyzer, the peak amplitude is used as the 0 dB reference value for the mask, and the trace is compared to the mask.

RESULTS

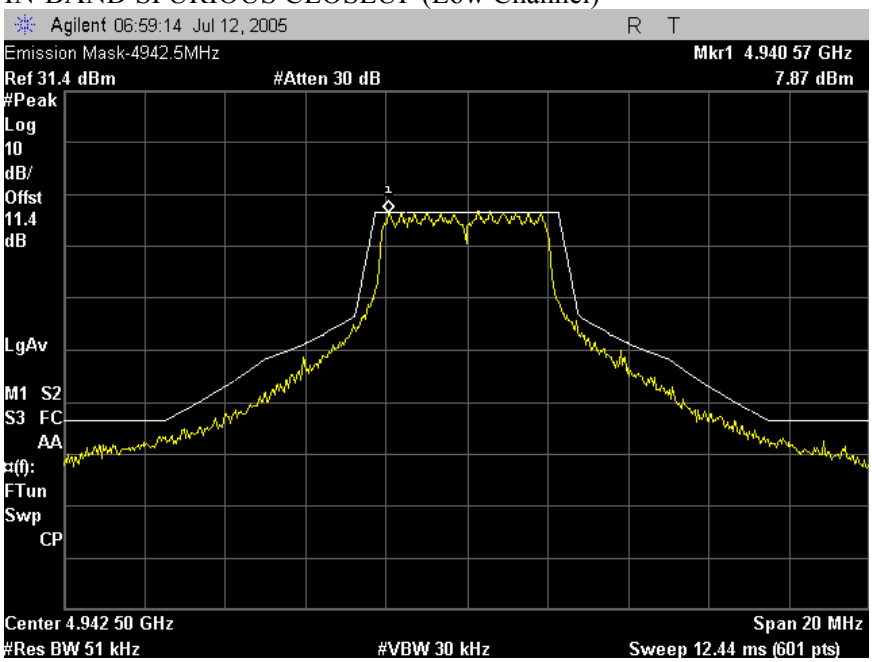
No non-compliance noted:

IN-BAND SPURIOUS EMISSIONS

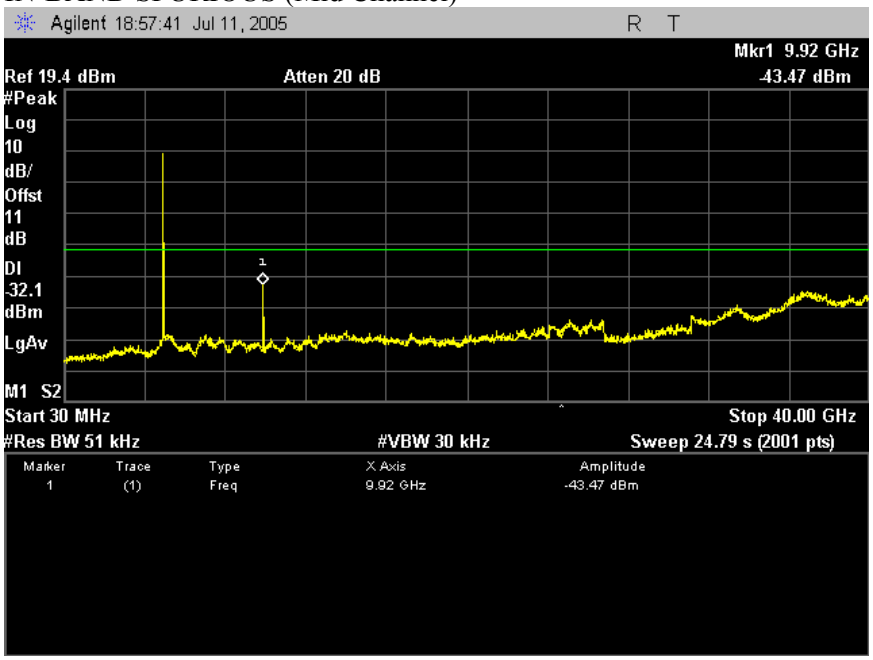
IN-BAND SPURIOUS (Low Channel)



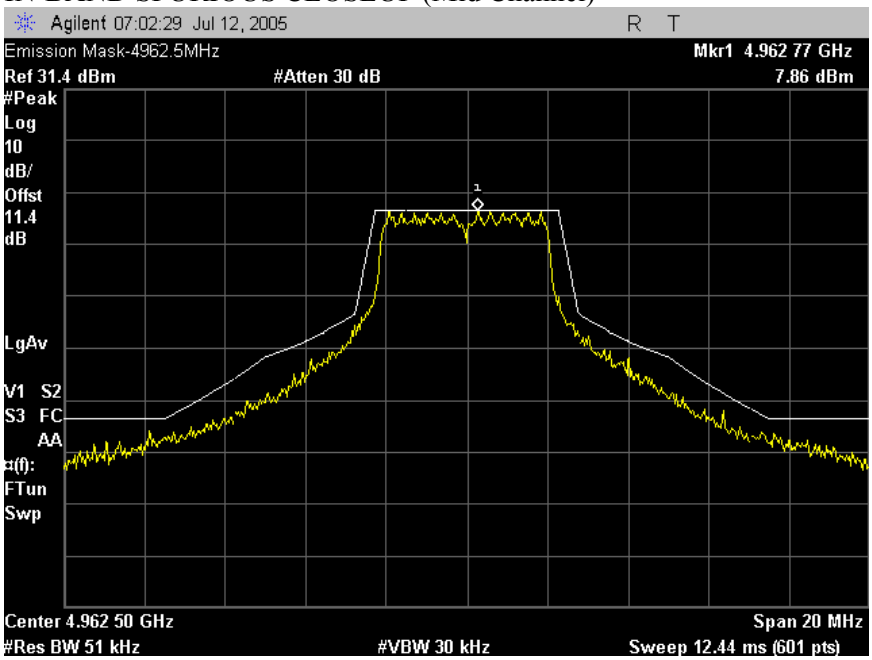
IN-BAND SPURIOUS CLOSEUP (Low Channel)



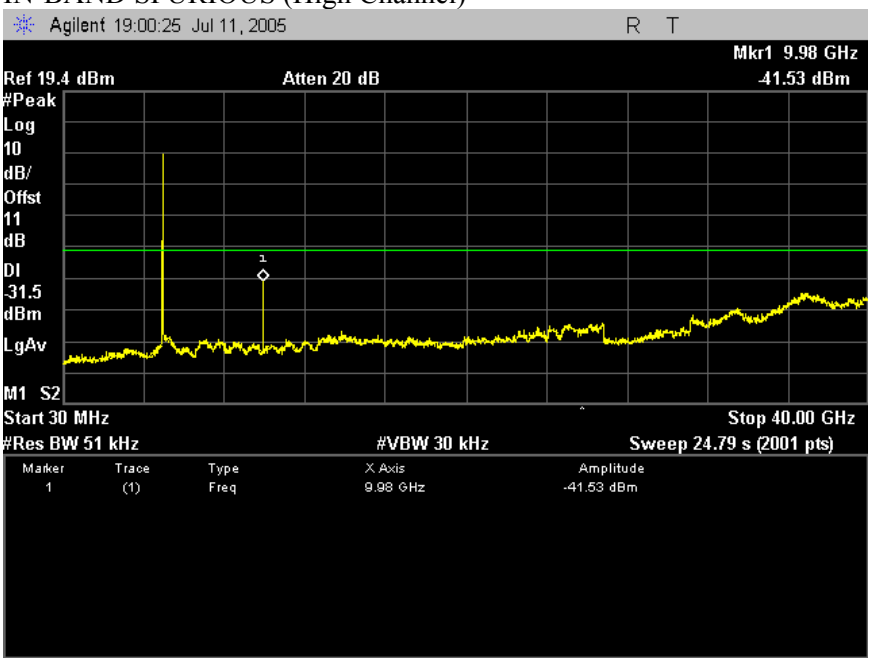
IN-BAND SPURIOUS (Mid Channel)



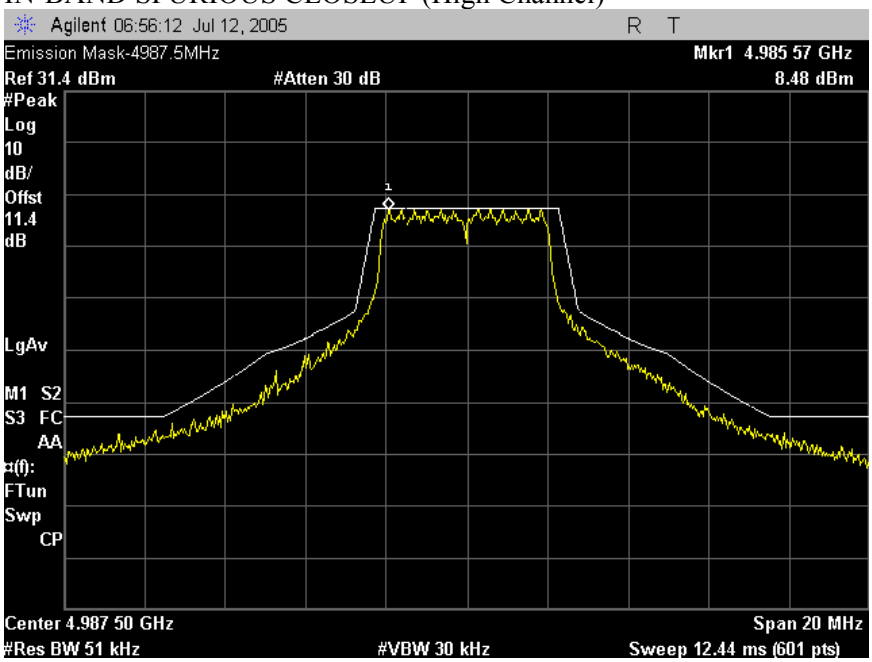
IN-BAND SPURIOUS CLOSEUP (Mid Channel)



IN-BAND SPURIOUS (High Channel)



IN-BAND SPURIOUS CLOSEUP (High Channel)



7.2. CHANNEL TESTS FOR 10 MHz CHANNEL BANDWIDTH MODE

7.2.1. EMISSION BANDWIDTH

LIMIT

For reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to 1% to 3% of the 26 dB bandwidth and /or the 99% bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled.

RESULTS

No non-compliance noted:

26 dB Bandwidth

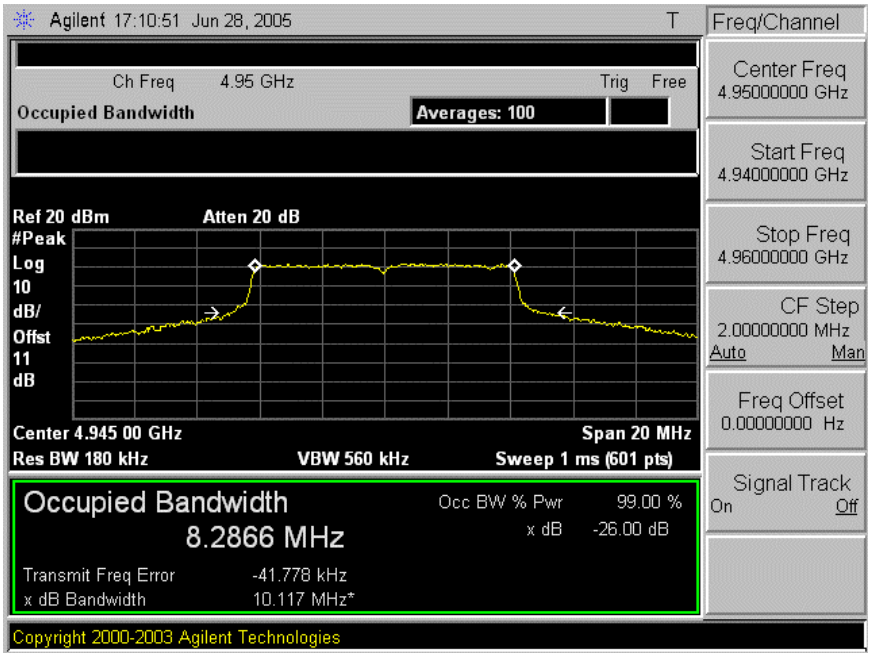
Channel	Frequency (MHz)	26 dB BW (MHz)	10 Log B (dB)
Low	4945	10.12	10.05
Middle	4965	10.49	10.21
High	4985	10.75	10.32

99% Bandwidth

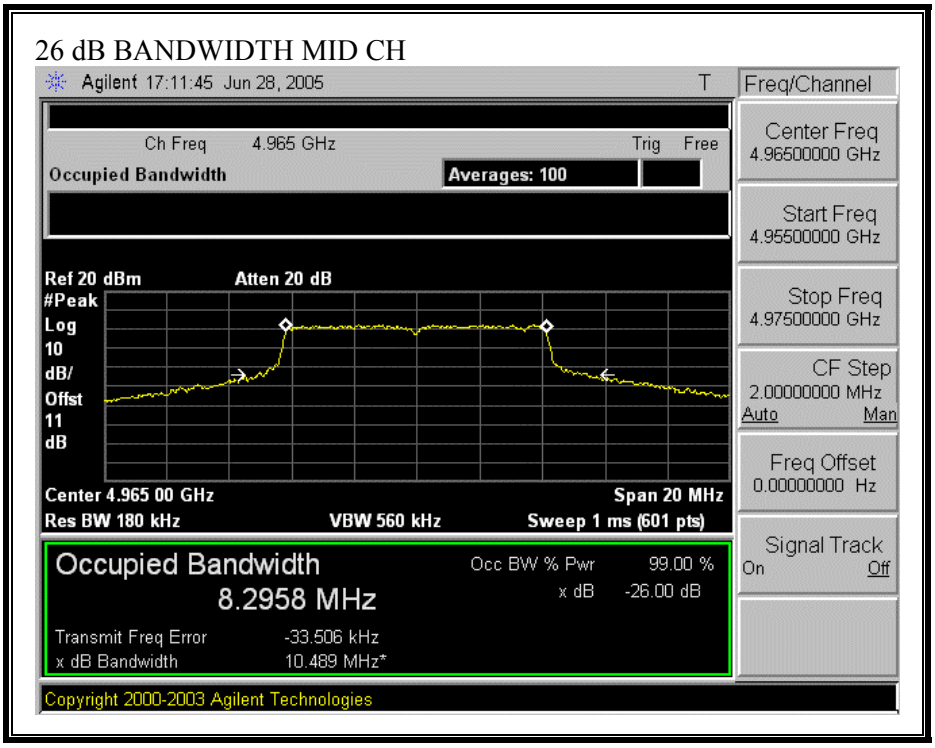
Channel	Frequency (MHz)	99% BW (MHz)
Low	4945	8.29
Middle	4965	8.30
High	4985	8.26

26 dB EMISSION BANDWIDTH

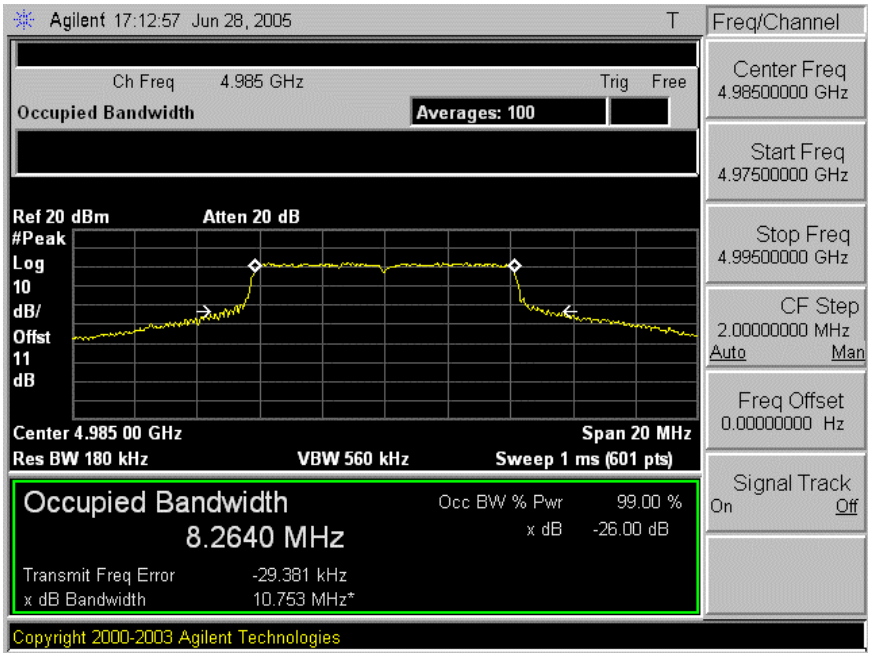
26 dB BANDWIDTH LOW CH



26 dB BANDWIDTH MID CH



26 dB BANDWIDTH HIGH CH



7.2.2. PEAK OUTPUT POWER

PEAK POWER LIMIT

§ 90.1215 The transmitting power of stations operating in the 4940–4990 MHz band must not exceed the maximum limits in this section.

(a) The peak transmit power should not exceed:

Channel bandwidth (MHz)	Low power Device Peak transmitter Power (dBm)	High power Device Peak transmitter Power (dBm)
1.....	7	20
5.....	14	27
10.....	17	30
15.....	18.8	31.8
20.....	20	33

High power devices are also limited to a peak power spectral density of 21 dBm per one MHz. High power devices using channel bandwidths other than those listed above are permitted; however, they are limited to a peak power spectral density of 21 dBm/MHz. If transmitting antennas of directional gain greater than 9 dBi are used, both the peak transmit power and the peak power spectral density should be reduced by the amount in decibels that the directional gain of the antenna exceeds 9 dBi. However, high power point-to-point or point-to-multipoint operation (both fixed and temporary-fixed rapid deployment) may employ transmitting antennas with directional gain up to 26 dBi without any corresponding reduction in the transmitter power or spectral density. Corresponding reduction in the peak transmit power and peak power spectral density should be the amount in decibels that the directional gain of the antenna exceeds 26 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.

RESULTS

For antenna gains up to 9 dBi the limit is 17 dBm.

For the 14 dBi antenna gain the limit is 12 dBm and for the 17 dBi gain antenna the limit is 9 dBm.

No non-compliance noted:

For antennas up to 9 dBi

Channel	Frequency (MHz)	Peak Power (dBm)	Limit (dBm)	Margin (dB)
Low	4945	15.43	17	-1.57
Middle	4965	15.37	17	-1.63
High	4985	15.72	17	-1.28

For 14 dBi antenna

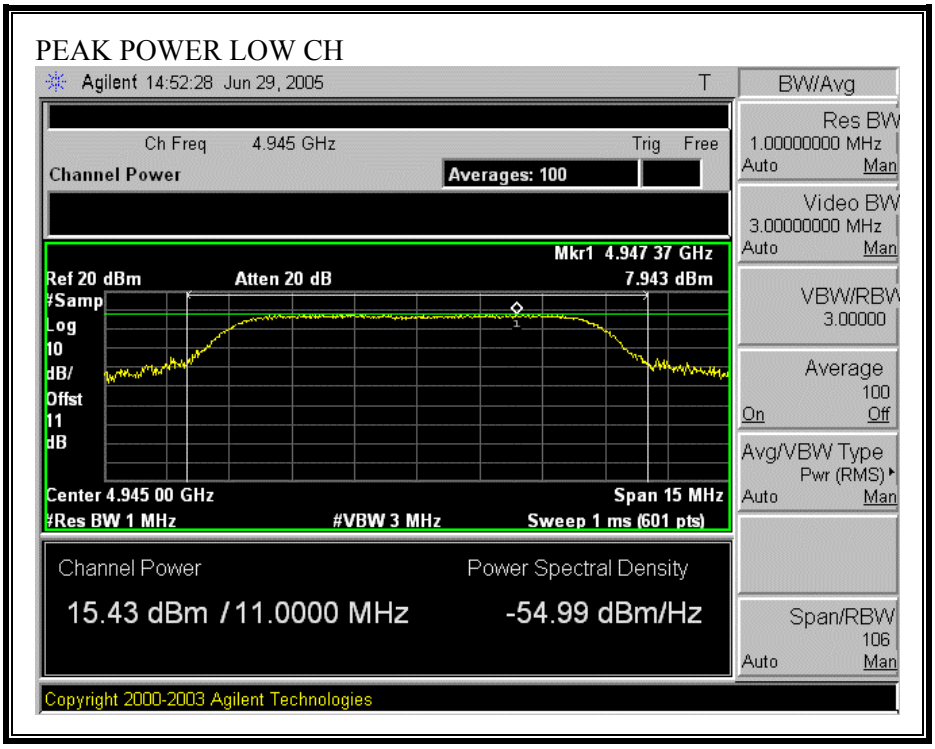
Channel	Frequency (MHz)	Peak Power (dBm)	Limit (dBm)	Margin (dB)
Low	4945	10.89	12	-1.11
Middle	4965	10.19	12	-1.81
High	4985	10.68	12	-1.32

For 17 dBi antenna

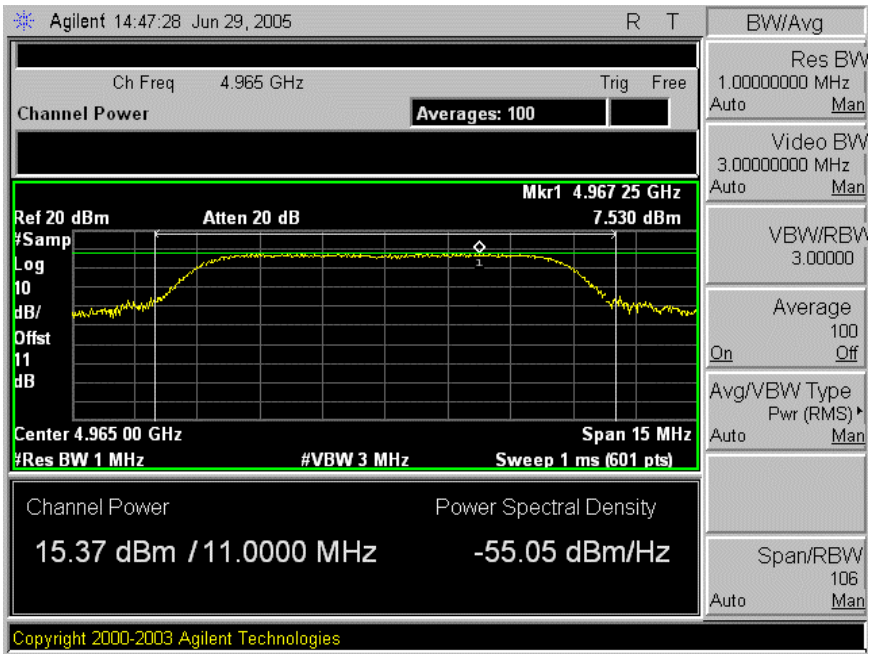
Channel	Frequency (MHz)	Peak Power (dBm)	Limit (dBm)	Margin (dB)
Low	4945	7.21	9	-1.79
Middle	4965	7.97	9	-1.03
High	4985	7.77	9	-1.23

OUTPUT POWER (802.11a MODE, FOR ANTENNAS UP TO 9 dBi)

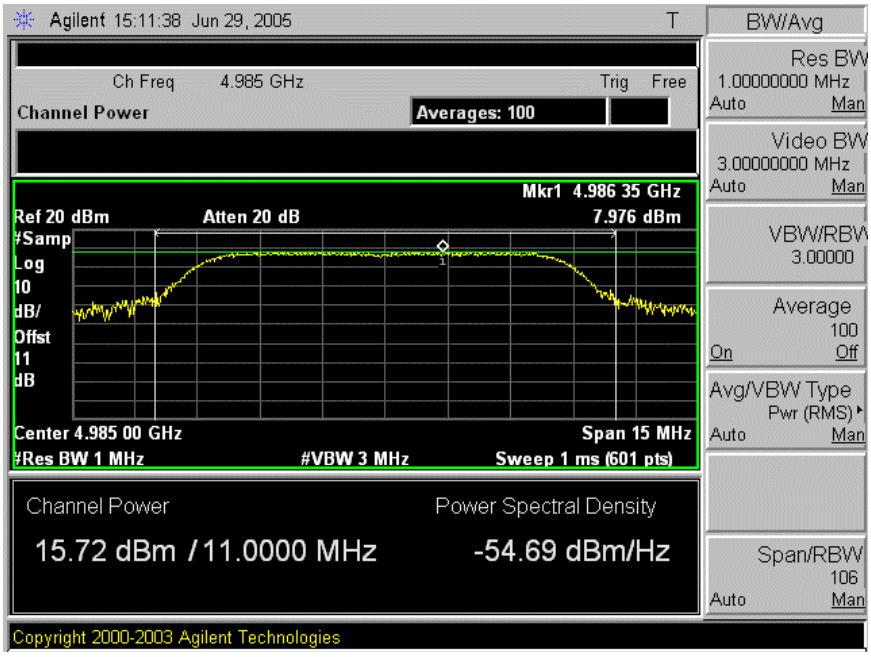
PEAK POWER LOW CH



PEAK POWER MID CH

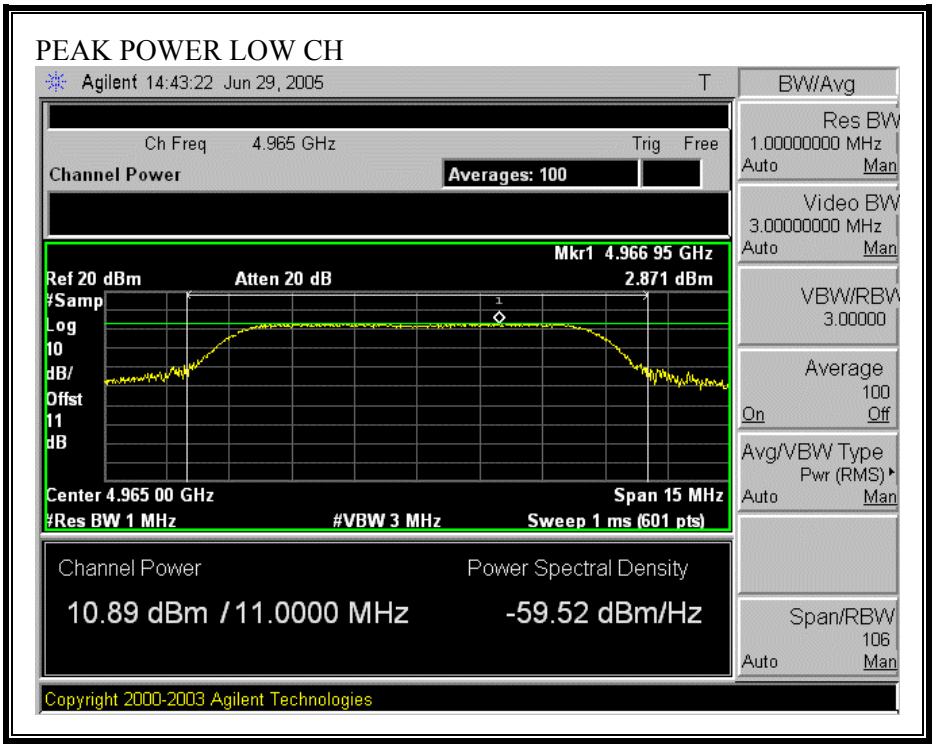


PEAK POWER HIGH CH

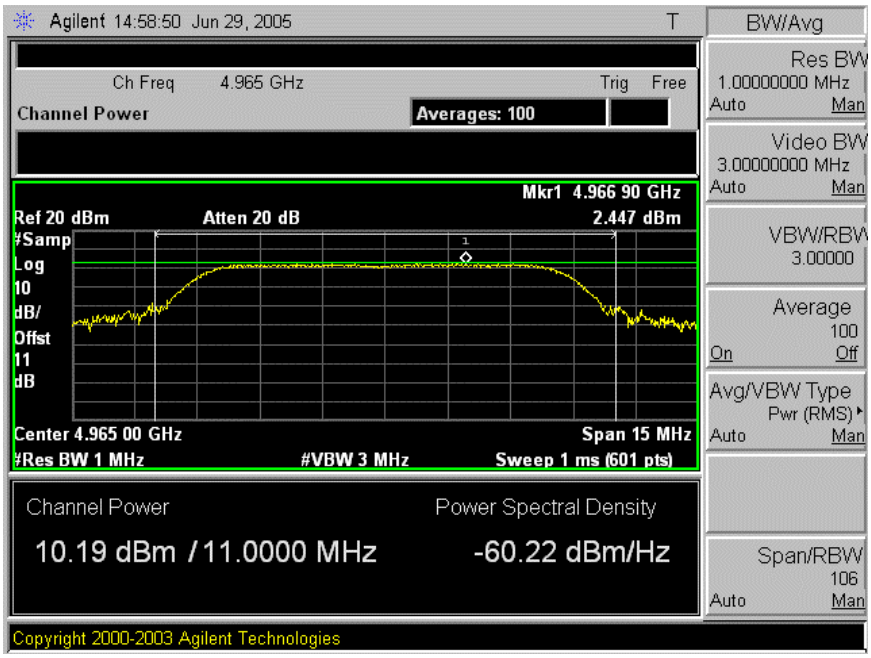


OUTPUT POWER (802.11a MODE, FOR 14 dBi ANTENNA)

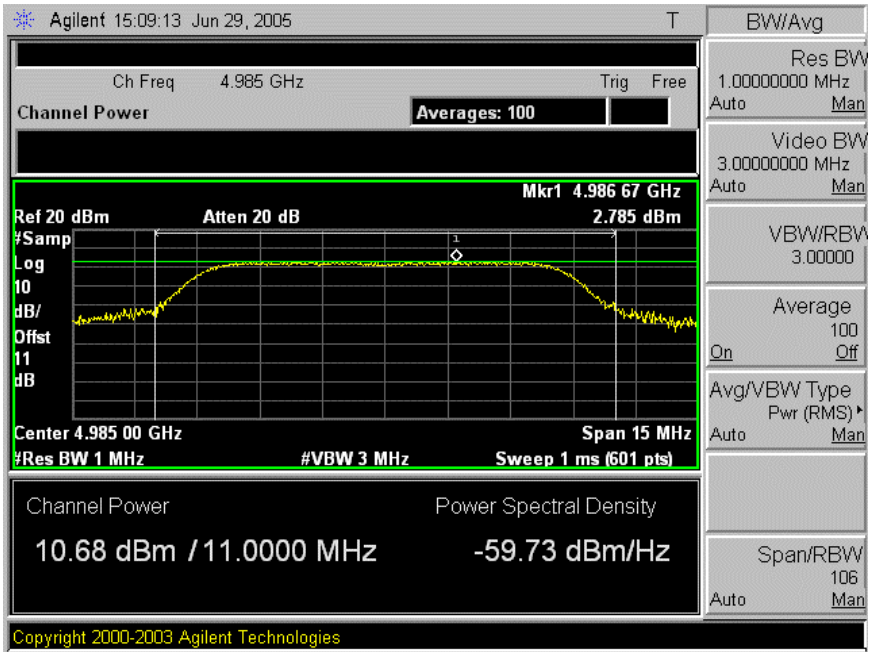
PEAK POWER LOW CH



PEAK POWER MID CH

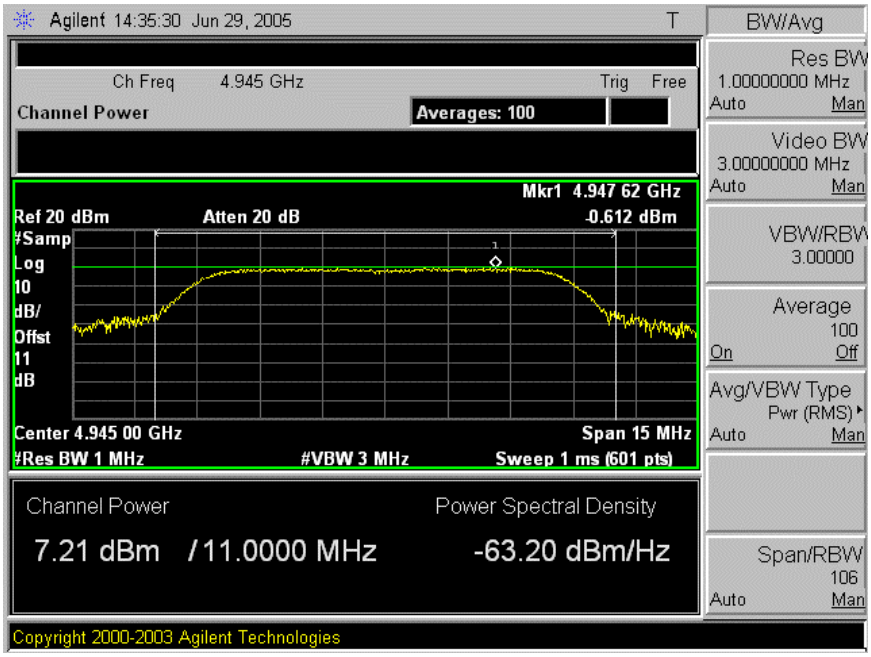


PEAK POWER HIGH CH

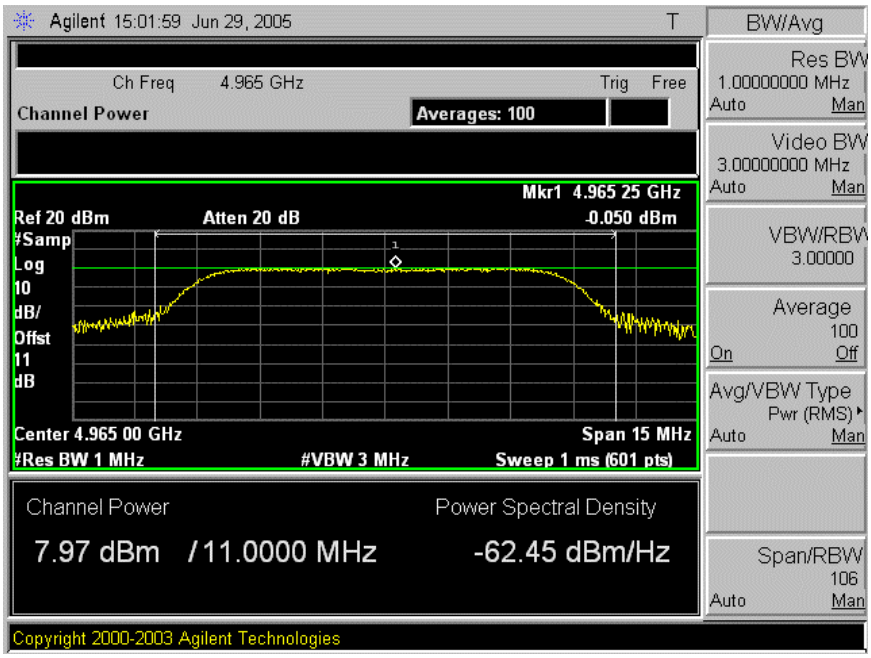


OUTPUT POWER (802.11a MODE, FOR 17 dBi ANTENNA)

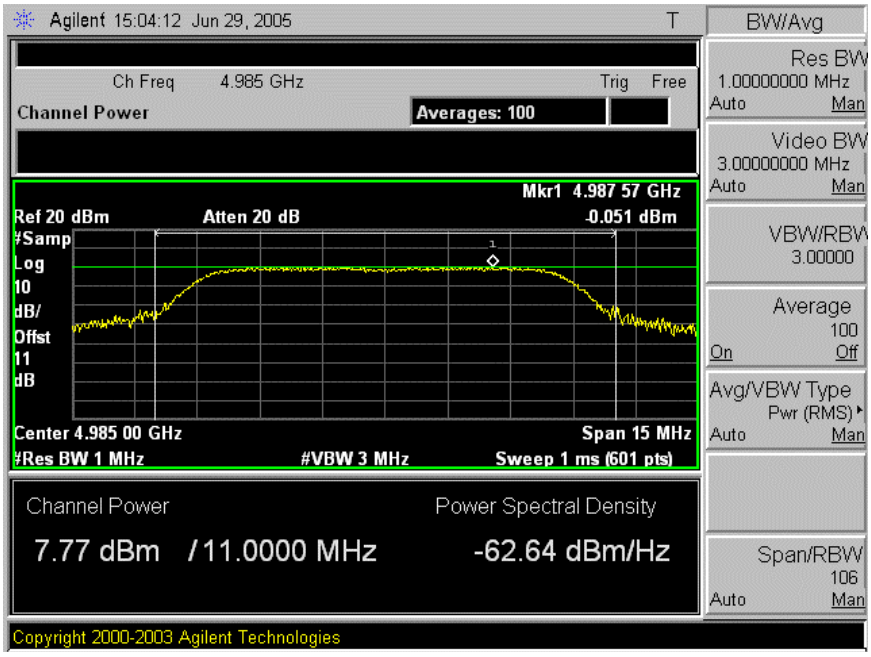
PEAK POWER LOW CH



PEAK POWER MID CH



PEAK POWER HIGH CH



7.2.3. 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 (mW) = P (W) / 1000 and
d (cm) =100 * d (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/cm^2

Substituting the logarithmic form of power and gain using:

P (mW) = 10 ^ (P (dBm) / 10) and
G (numeric) = 10 ^ (G (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/cm^2

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 mW/cm^2

RESULTS

No non-compliance noted:

Mode	MPE Distance (cm)	Output Power (dBm)	Antenna Gain (dBi)	Power Density (mW/cm^2)
10 MHz Channel BW	20.0	15.72	9.00	0.06
10 MHz Channel BW	20.0	10.89	14.00	0.06
10 MHz Channel BW	20.0	7.97	17.00	0.06

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.

7.2.4. 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 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.

For antenna gains up to 9 dBi

Channel	Frequency (MHz)	Average Power (dBm)
Low	4945	15.61
Middle	4965	16.00
High	4985	15.70

For 14 dBi Antenna

Channel	Frequency (MHz)	Average Power (dBm)
Low	4945	11.00
Middle	4965	10.55
High	4985	10.80

For 17 dBi Antenna

Channel	Frequency (MHz)	Average Power (dBm)
Low	4945	7.12
Middle	4965	8.09
High	4985	7.82

7.2.5. PEAK POWER SPECTRAL DENSITY

LIMIT

§ 90.1215 (b) Low power devices are also limited to a peak power spectral density of 8 dBm per one MHz. Low power devices using channel bandwidths other than those listed above are permitted; however, they are limited to a peak power spectral density of 8 dBm/MHz. If transmitting antennas of directional gain greater than 9 dBi are used, both the peak transmit power and the peak power spectral density should be reduced by the amount in decibels that the directional gain of the antenna exceeds 9 dBi..

(c) The peak power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test. If the device cannot be connected directly, alternative techniques acceptable to the Commission may be used. Measurements are made over a bandwidth of 1 MHz or the 26 dB emission bandwidth of the device, whichever is less. A resolution bandwidth less than the measurement bandwidth can be used, provided that the measured power is integrated to show total power over the measurement bandwidth. If the resolution bandwidth is approximately equal to the measurement bandwidth, and much less than the emission bandwidth of the equipment under test, the measured results shall be corrected to account for any difference between the resolution bandwidth of the test instrument and its actual noise bandwidth.

Limits as determined by antenna Gain:

Antenna Gain dBi	**Limit dBm**
Up to 9	8
14	3
17	0

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.

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 = 1 MHz and VBW 3 MHz. The PPSD is the highest level found across the emission in any 3 kHz band.

RESULTS

No non-compliance noted:

Up to 9 dBi Antenna

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
Low	4945	7.94	8	-0.06
Middle	4965	7.53	8	-0.47
High	4985	7.98	8	-0.02

14 dBi Antenna

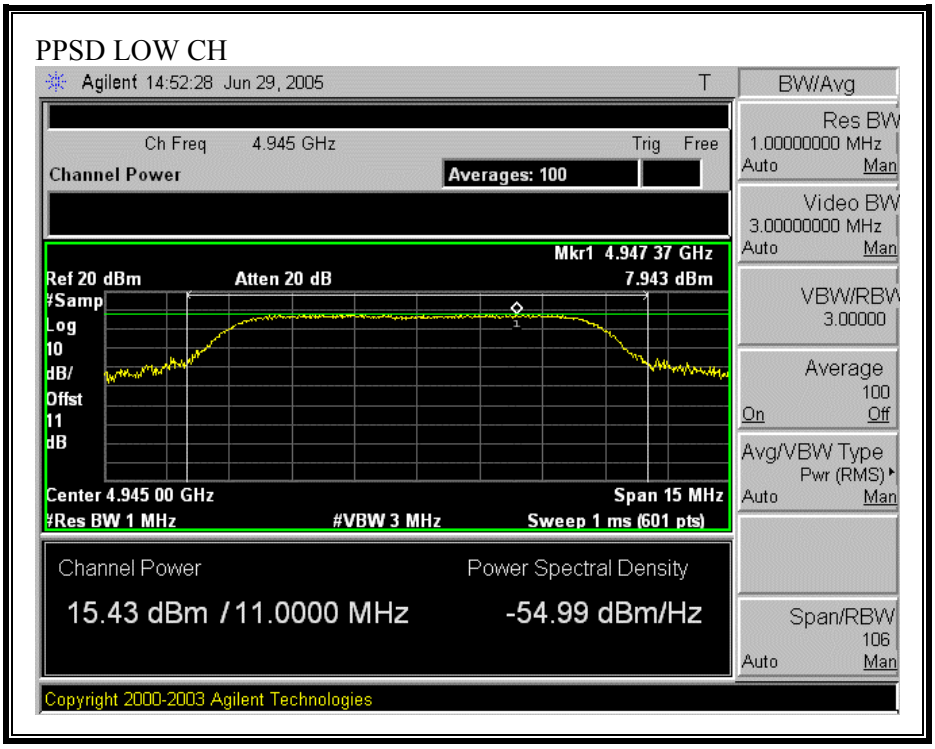
Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
Low	4945	2.87	3	-0.13
Middle	4965	2.45	3	-0.55
High	4985	2.79	3	-0.22

17 dBi Antenna

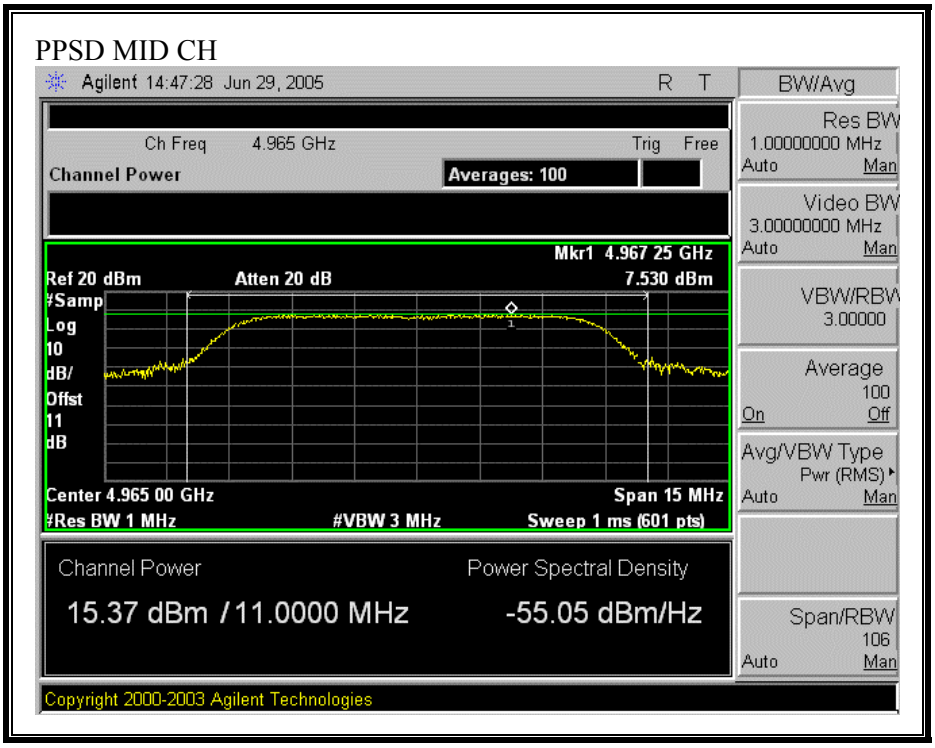
Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
Low	4945	-0.61	0	-0.61
Middle	4965	-0.05	0	-0.05
High	4985	-0.05	0	-0.05

PEAK POWER SPECTRAL DENSITY (FOR UPTO 9 dBi ANTENNA GAIN)

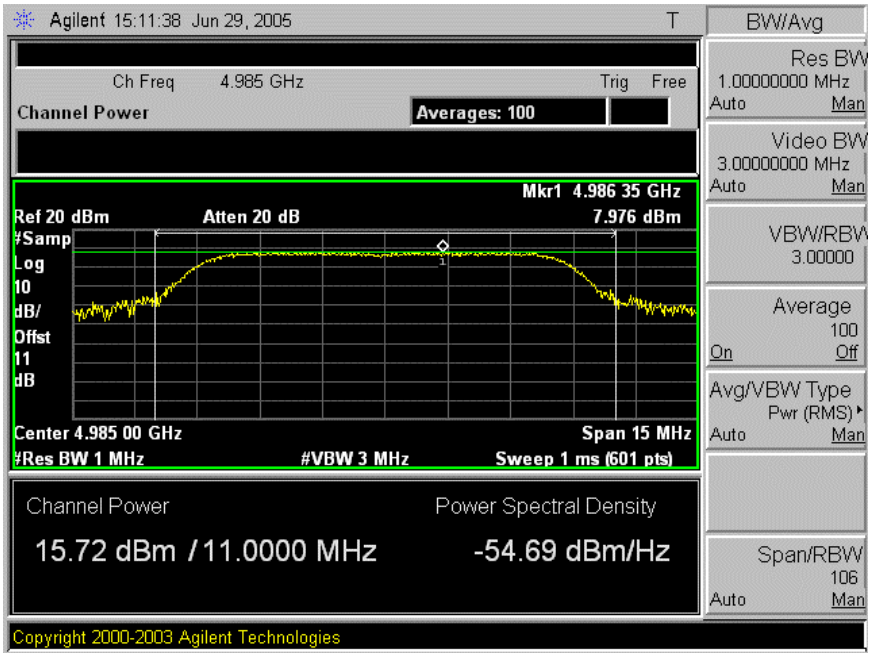
PPSD LOW CH



PPSD MID CH

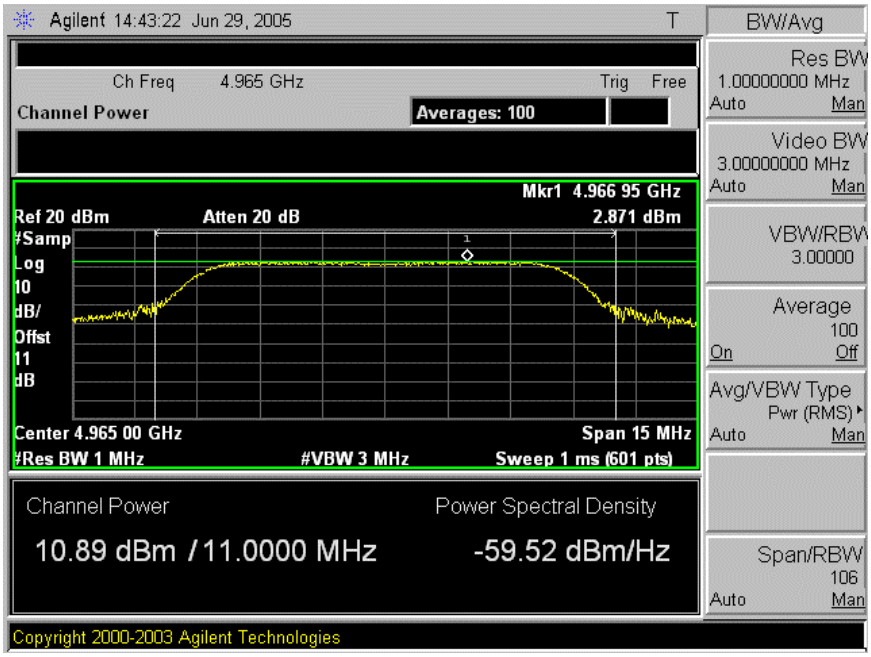


PPSD HIGH CH

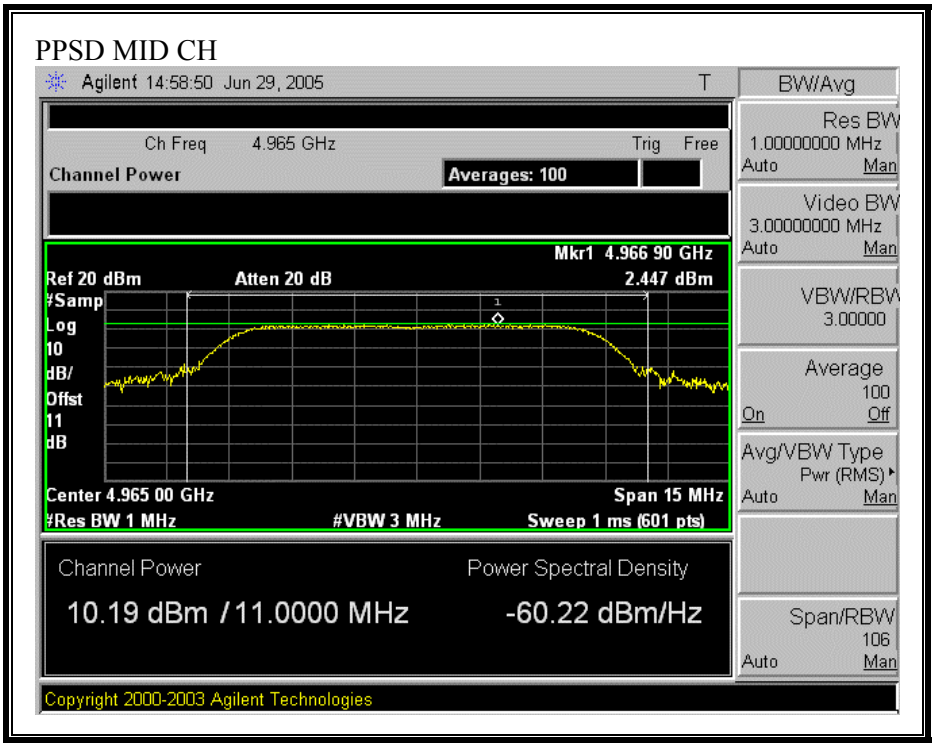


PEAK POWER SPECTRAL DENSITY (FOR 14 dBi ANTENNA GAIN)

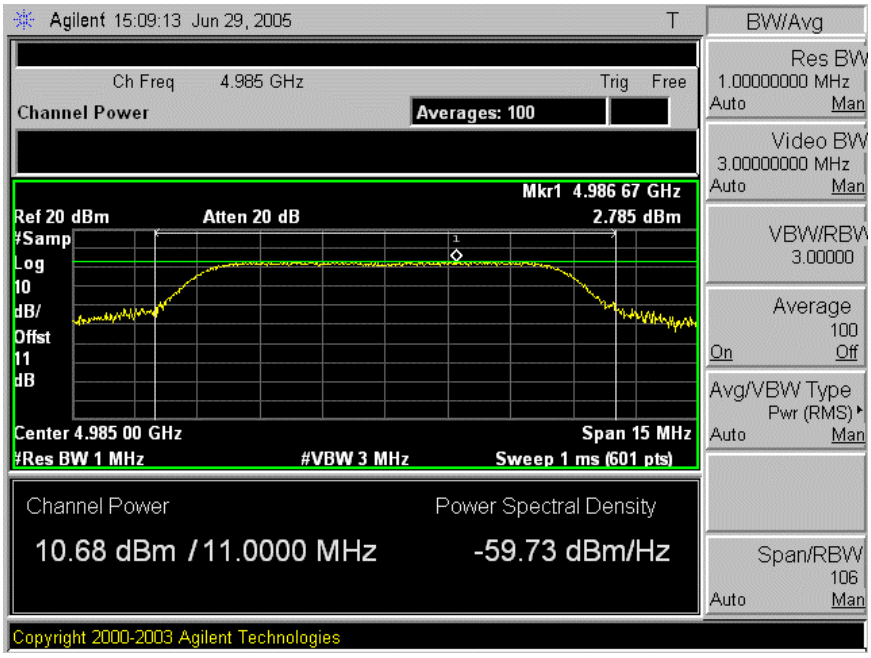
PPSD LOW CH



PPSD MID CH

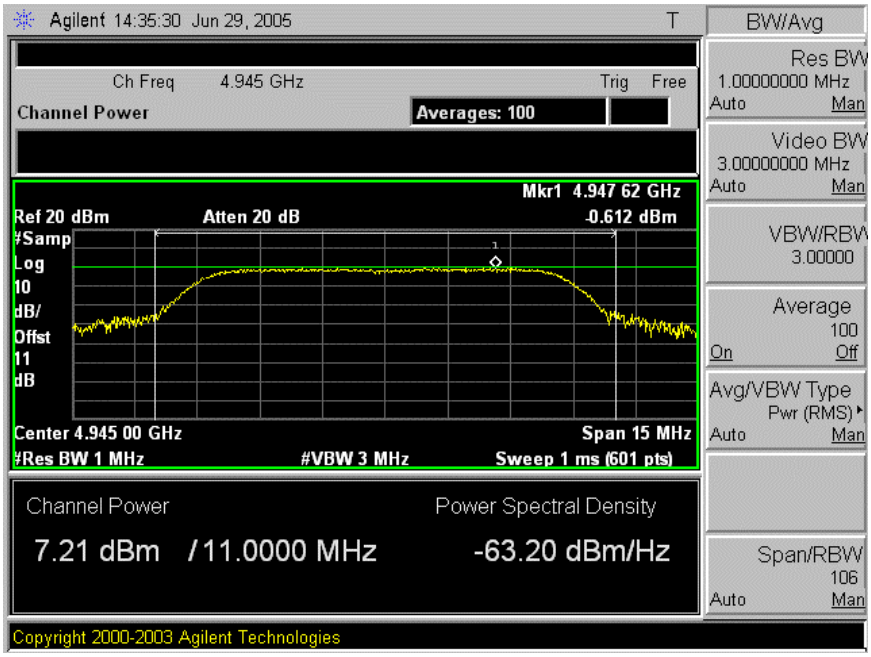


PPSD HIGH CH

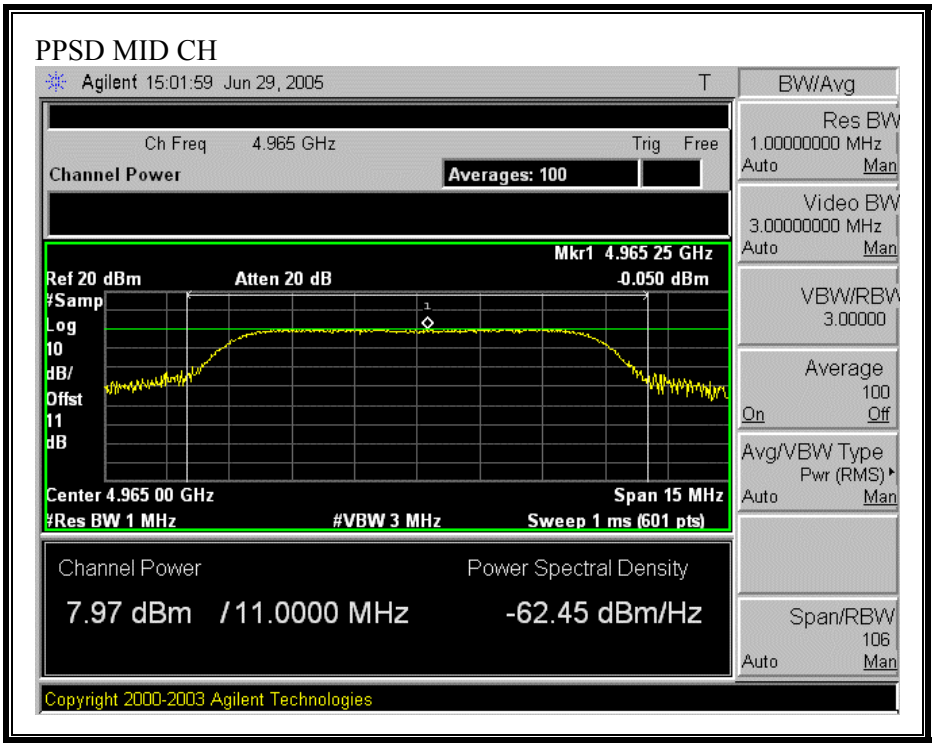


PEAK POWER SPECTRAL DENSITY (FOR 17 dBi ANTENNA GAIN)

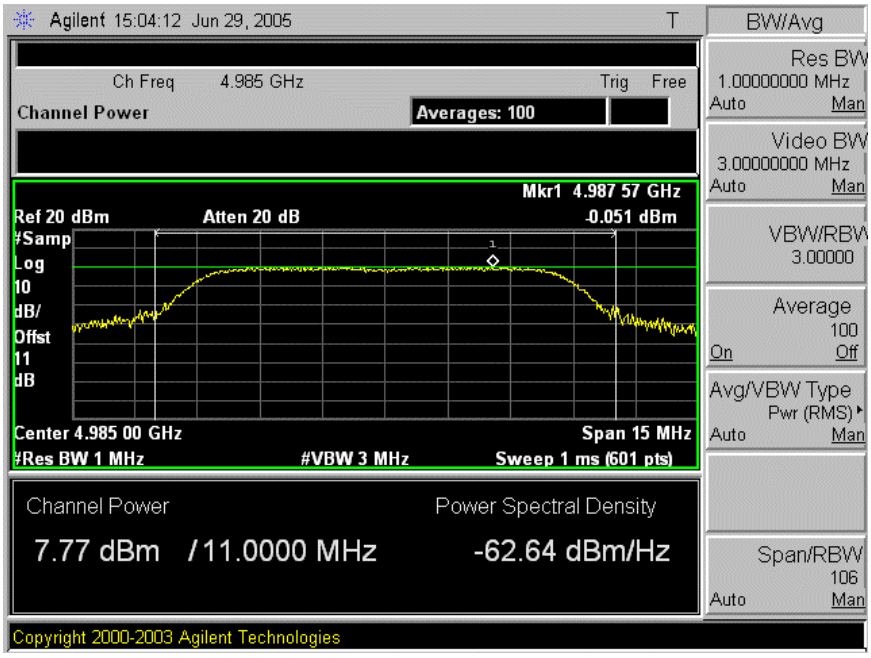
PPSD LOW CH



PPSD MID CH



PPSD HIGH CH



7.2.6. EMISSION MASK AND CONDUCTED SPURIOUS

§ 90.210 (l) Emission Mask L. For low power transmitters (20 dBm or less) operating in the 4940–4990 MHz frequency band, the power spectral density of the emissions must be attenuated below the output power of the transmitter as follows:

(1) On any frequency removed from the assigned frequency between 0–45% of the authorized bandwidth (BW): 0 dB.
(2) On any frequency removed from the assigned frequency between 45–50% of the authorized bandwidth: 219 log (% of (BW)/45) dB.
(3) On any frequency removed from the assigned frequency between 50–55% of the authorized bandwidth: 10 + 242 log (% of (BW)/50) dB.
(4) On any frequency removed from the assigned frequency between 55–100% of the authorized bandwidth: 20 + 31 log (% of (BW)/55) dB attenuation.
(5) On any frequency removed from the assigned frequency between 100–150% of the authorized bandwidth: 28 + 68 log (% of (BW)/100) dB attenuation.
(6) On any frequency removed from the assigned frequency above 150% of the authorized bandwidth: 40 dB.
(7) The zero dB reference is measured relative to the highest average power of the fundamental emission measured across the designated channel bandwidth using a resolution bandwidth of at least one percent of the occupied bandwidth of the fundamental emission and a video bandwidth of 30 kHz. The power spectral density is the power measured within the resolution bandwidth of the measurement device divided by the resolution bandwidth of the measurement device. Emission levels are also based on the use of measurement instrumentation employing a resolution bandwidth of at least one percent of the occupied bandwidth.

TEST PROCEDURE

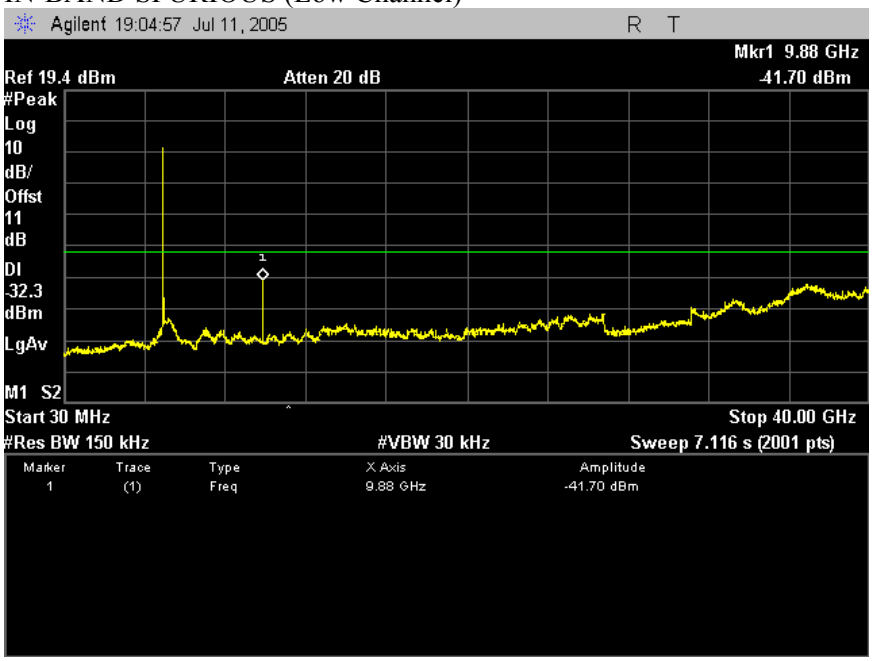
The EUT is connected to the spectrum analyzer, the peak amplitude is used as the 0 dB reference value for the mask, and the trace is compared to the mask.

RESULTS

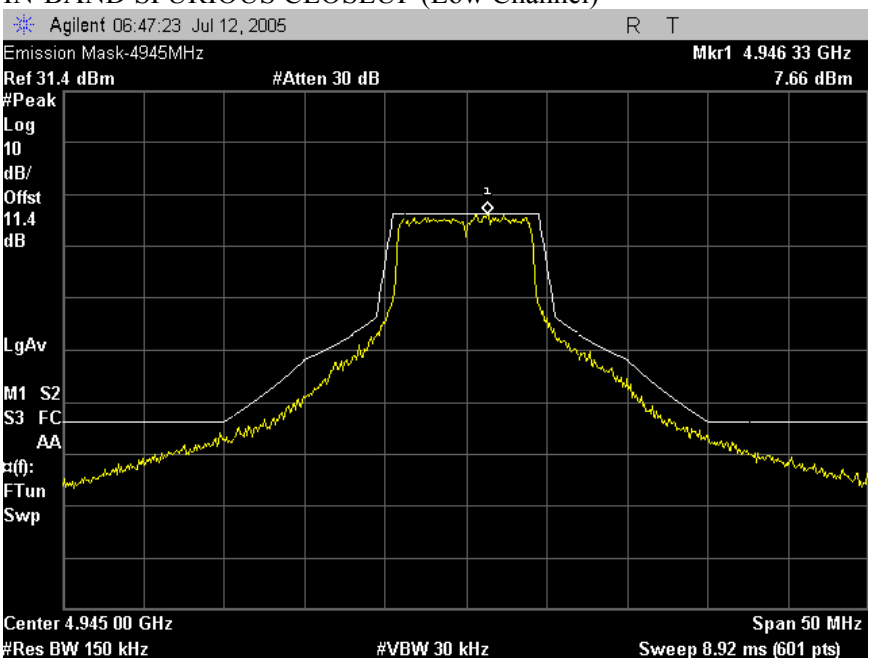
No non-compliance noted:

IN-BAND SPURIOUS EMISSIONS

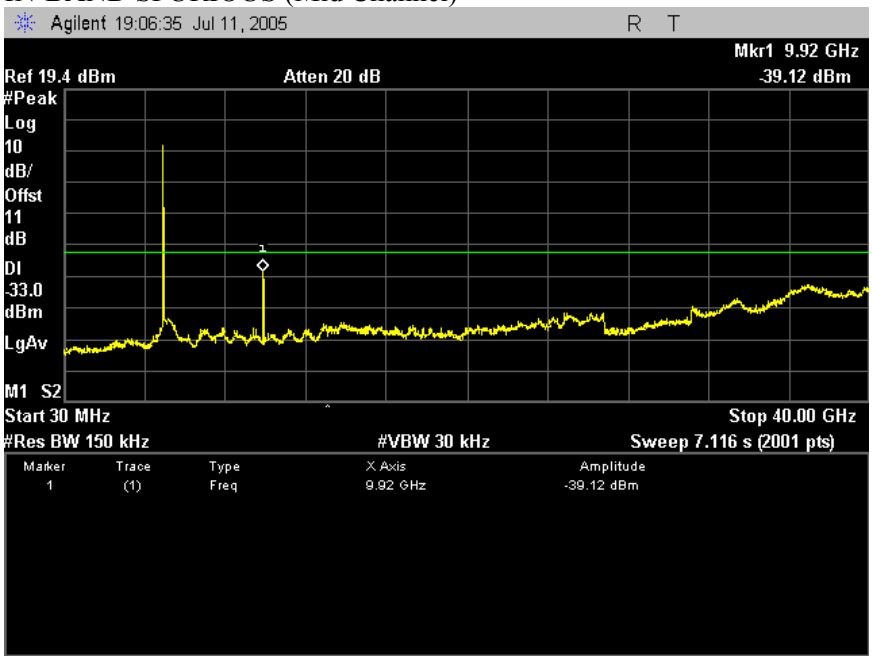
IN-BAND SPURIOUS (Low Channel)



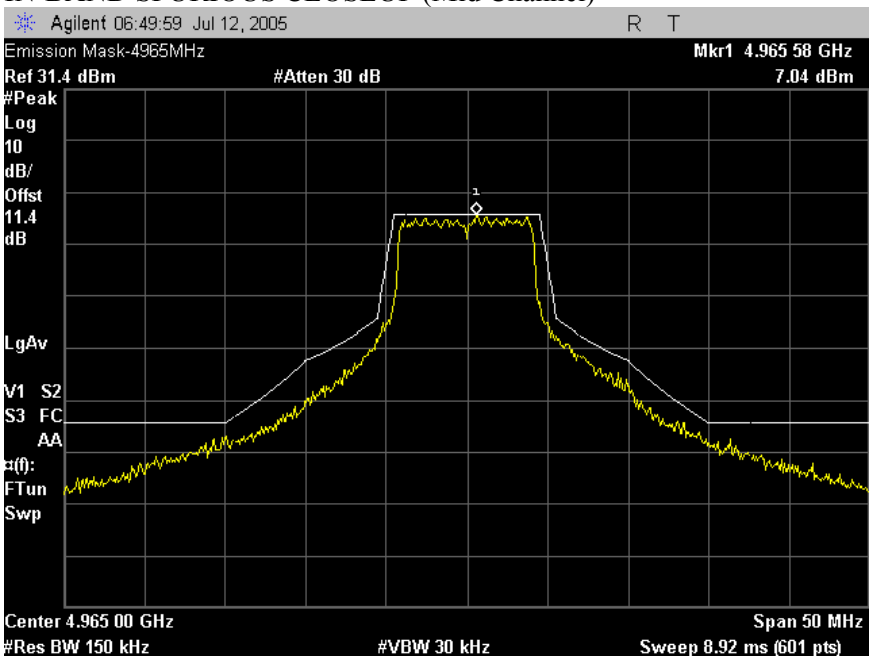
IN-BAND SPURIOUS CLOSEUP (Low Channel)



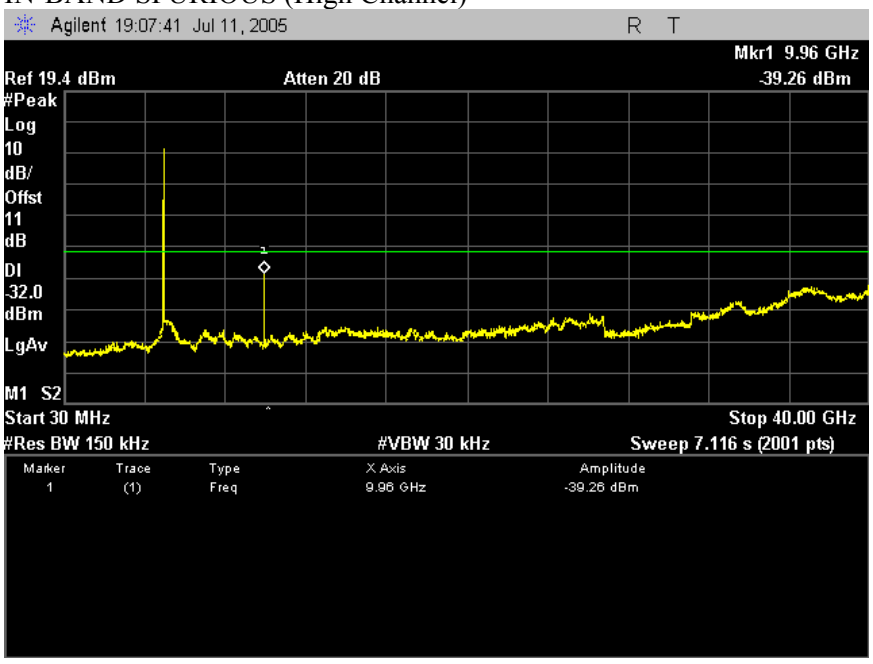
IN-BAND SPURIOUS (Mid Channel)



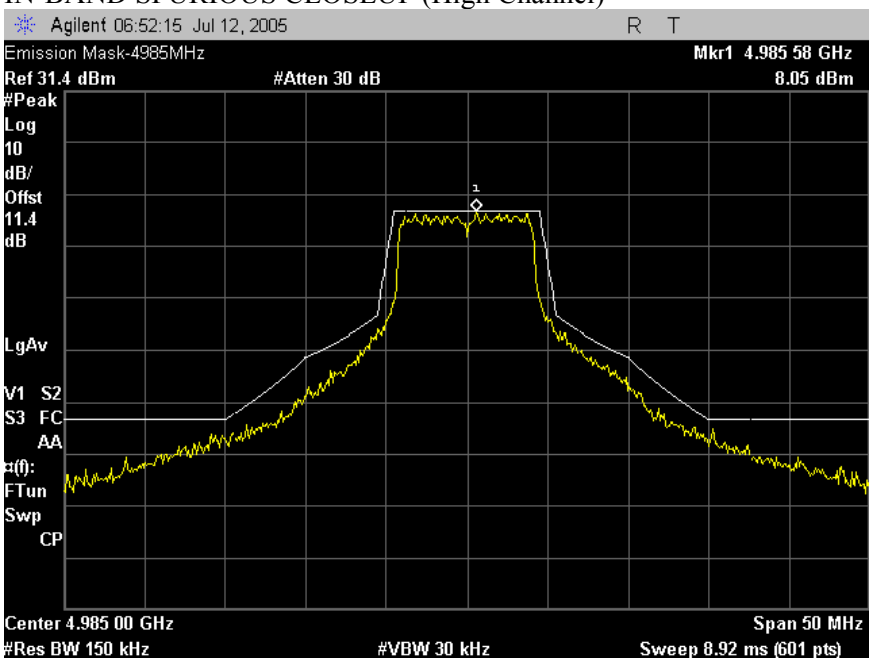
IN-BAND SPURIOUS CLOSEUP (Mid Channel)



IN-BAND SPURIOUS (High Channel)



IN-BAND SPURIOUS CLOSEUP (High Channel)



7.3. CHANNEL TESTS FOR 20 MHz CHANNEL BANDWIDTH MODE

7.3.1. EMISSION BANDWIDTH

LIMIT

For reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to 1% to 3% of the 26 dB bandwidth and /or the 99% bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled.

RESULTS

No non-compliance noted:

26 dB Bandwidth

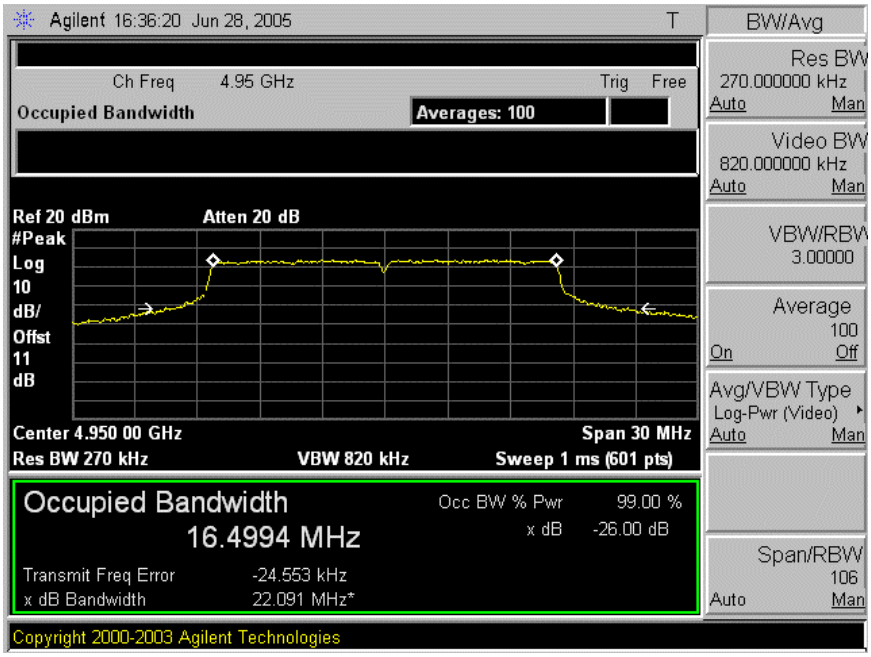
Channel	Frequency (MHz)	26 dB BW (MHz)	10 Log B (dB)
Low	4950	22.09	13.44
Middle	4965	22.46	13.51
High	4980	23.01	13.62

99% Bandwidth

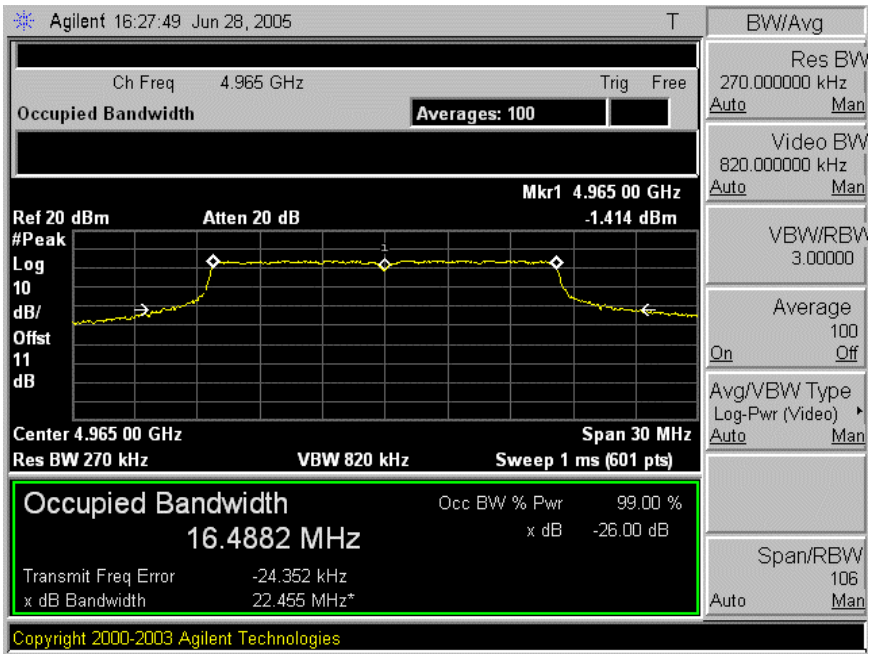
Channel	Frequency (MHz)	99% BW (MHz)
Low	4950	16.50
Middle	4965	16.49
High	4980	16.49

26 dB EMISSION BANDWIDTH

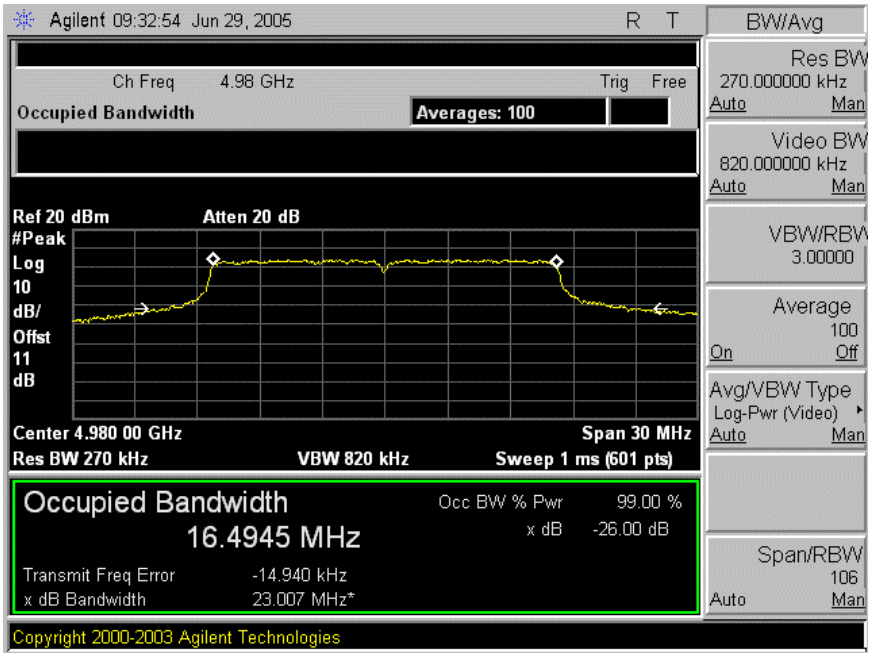
26 dB BANDWIDTH LOW CH



26 dB BANDWIDTH MID CH



26 dB BANDWIDTH HIGH CH



7.3.2. PEAK OUTPUT POWER

PEAK POWER LIMIT

§ 90.1215 The transmitting power of stations operating in the 4940–4990 MHz band must not exceed the maximum limits in this section.

(a) The peak transmit power should not exceed:

Channel bandwidth (MHz)	Low power Device Peak transmitter Power (dBm)	High power Device Peak transmitter Power (dBm)
1.....	7	20
5.....	14	27
10.....	17	30
15.....	18.8	31.8
20.....	20	33

High power devices are also limited to a peak power spectral density of 21 dBm per one MHz. High power devices using channel bandwidths other than those listed above are permitted; however, they are limited to a peak power spectral density of 21 dBm/MHz. If transmitting antennas of directional gain greater than 9 dBi are used, both the peak transmit power and the peak power spectral density should be reduced by the amount in decibels that the directional gain of the antenna exceeds 9 dBi. However, high power point-to-point or point-to-multipoint operation (both fixed and temporary-fixed rapid deployment) may employ transmitting antennas with directional gain up to 26 dBi without any corresponding reduction in the transmitter power or spectral density. Corresponding reduction in the peak transmit power and peak power spectral density should be the amount in decibels that the directional gain of the antenna exceeds 26 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.

RESULTS

For antenna gains up to 9 dBi the limit is 20 dBm.

For the 14 dBi antenna gain the limit is 15 dBi and for the 17 dBi gain antenna the limit is 12 dBi.

No non-compliance noted:

For antennas up to 9 dBi

Channel	Frequency (MHz)	Peak Power (dBm)	Limit (dBm)	Margin (dB)
Low	4950	18.33	20	-1.67
Middle	4965	18.11	20	-1.89
High	4980	18.51	20	-1.49

For 14 dBi antenna

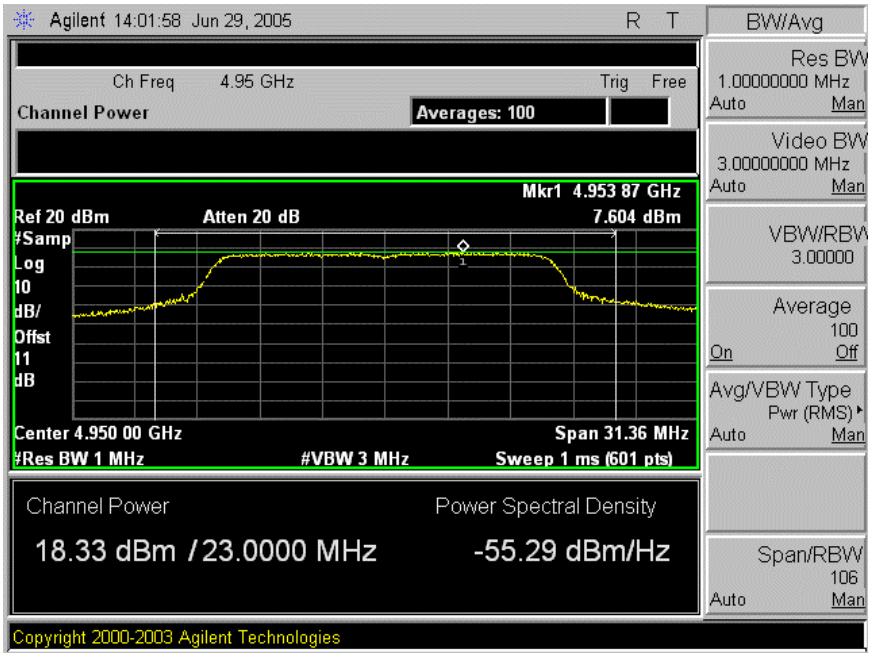
Channel	Frequency (MHz)	Peak Power (dBm)	Limit (dBm)	Margin (dB)
Low	4950	13.57	15	-1.43
Middle	4965	13.38	15	-1.62
High	4980	13.42	15	-1.58

For 17 dBi antenna

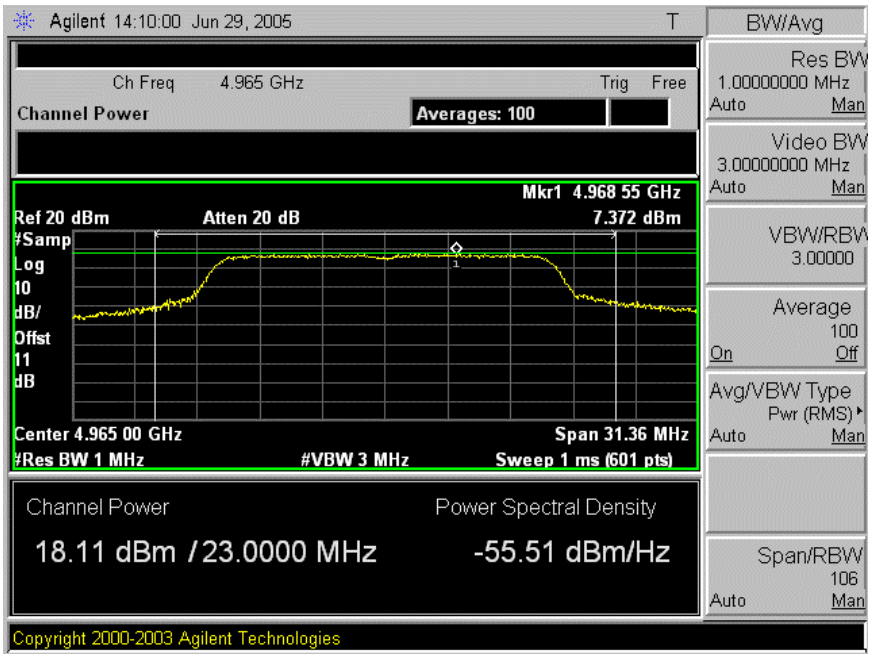
Channel	Frequency (MHz)	Peak Power (dBm)	Limit (dBm)	Margin (dB)
Low	4950	10.65	12	-1.35
Middle	4965	10.11	12	-1.89
High	4980	10.44	12	-1.56

OUTPUT POWER (802.11a MODE, FOR ANTENNAS UP TO 9 dBi)

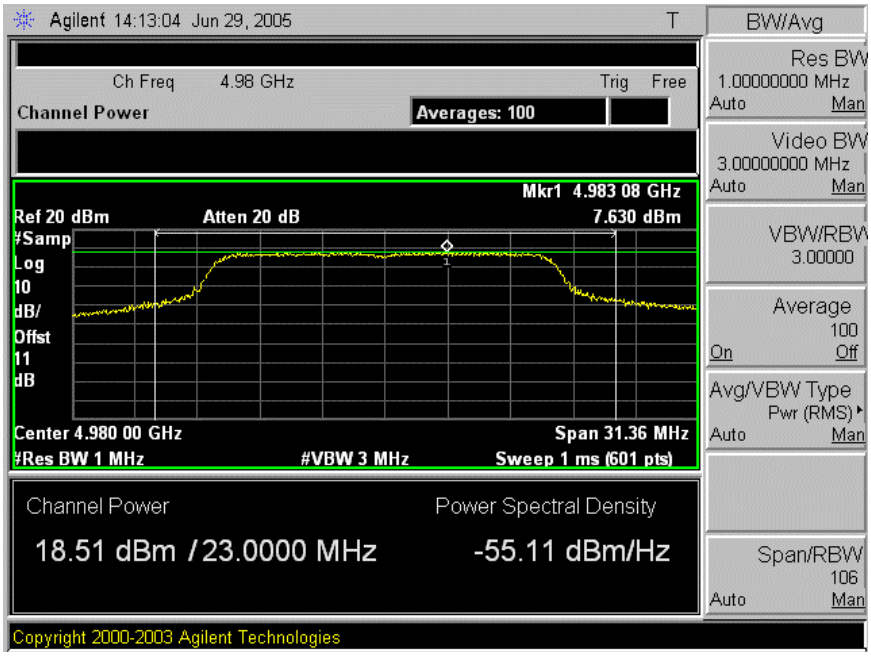
PEAK POWER LOW CH



PEAK POWER MID CH

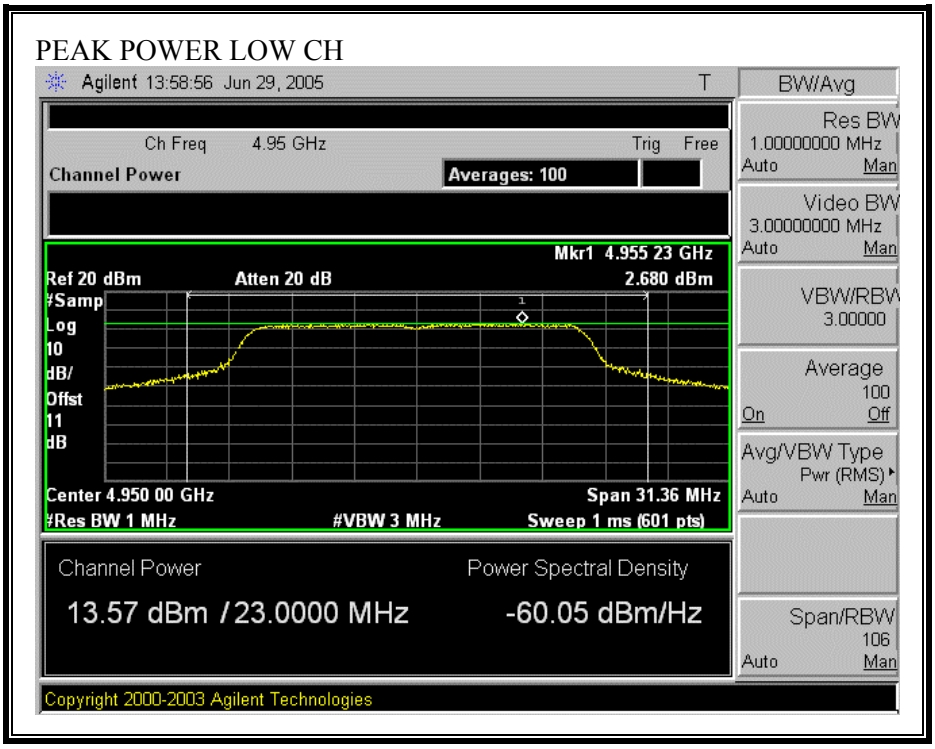


PEAK POWER HIGH CH

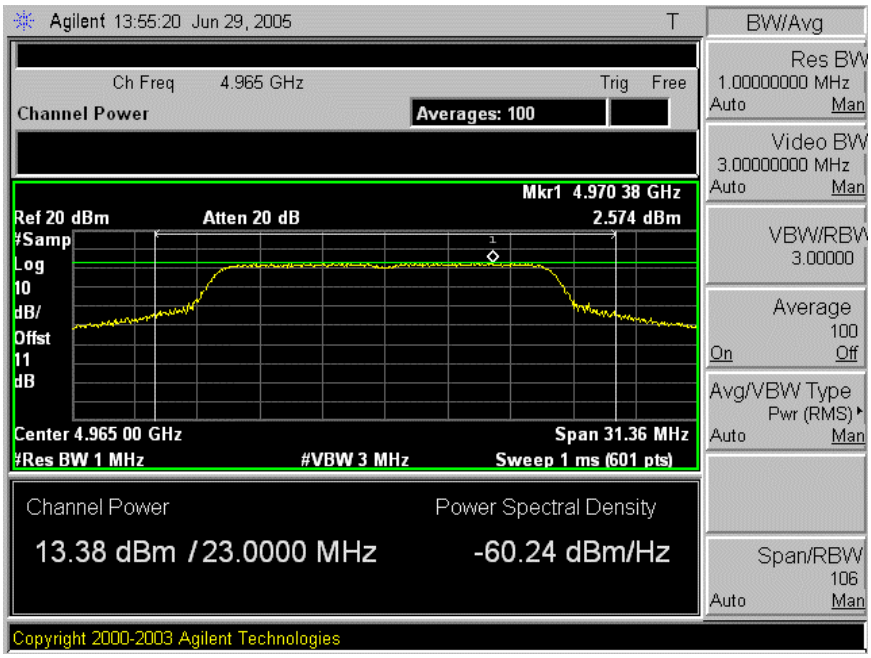


OUTPUT POWER (802.11a MODE, FOR 14 dBi ANTENNA)

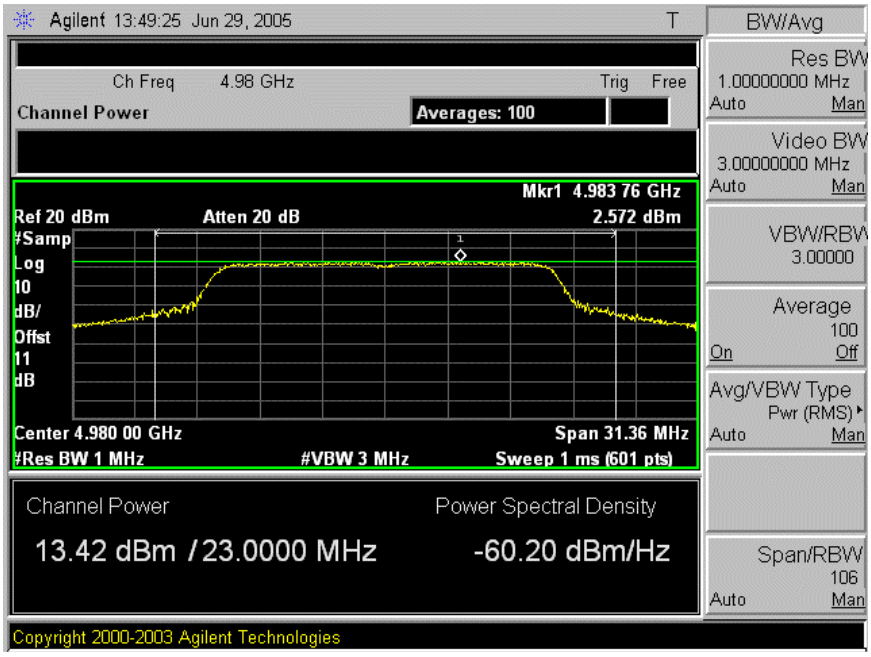
PEAK POWER LOW CH



PEAK POWER MID CH

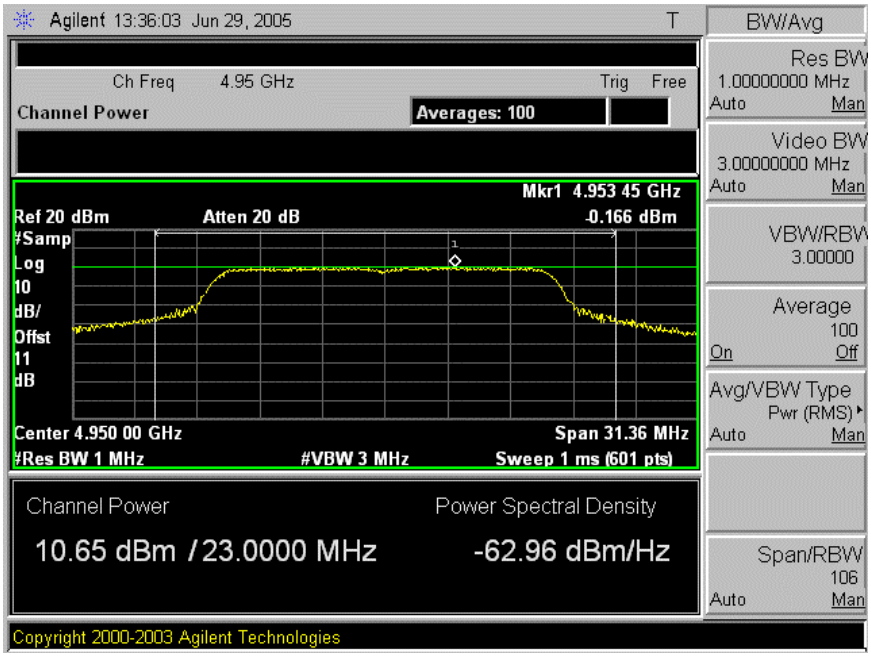


PEAK POWER HIGH CH

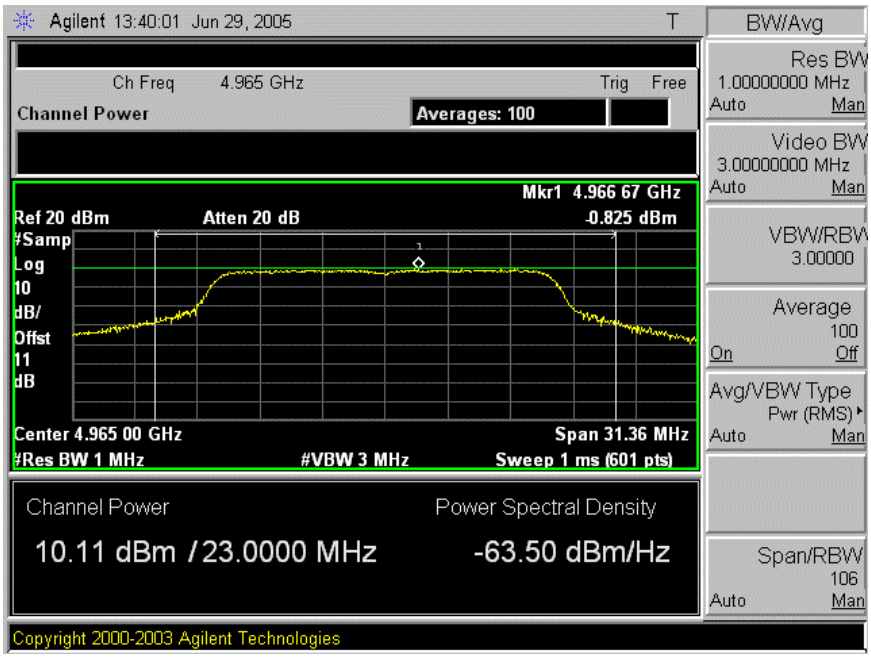


OUTPUT POWER (802.11a MODE, FOR 17 dBi ANTENNA)

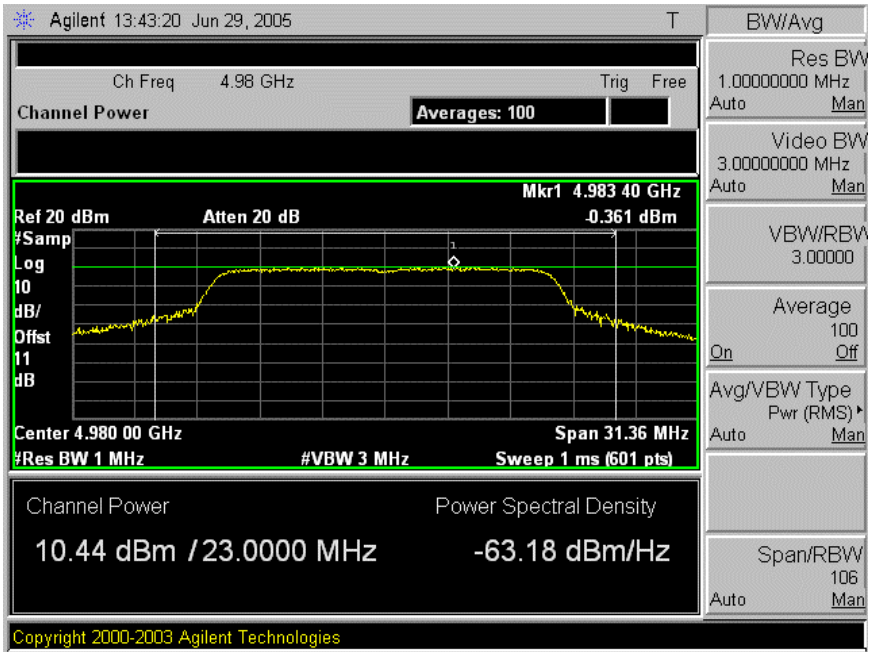
PEAK POWER LOW CH



PEAK POWER MID CH



PEAK POWER HIGH CH



7.3.3. 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 (mW) = P (W) / 1000 and
d (cm) =100 * d (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/cm^2

Substituting the logarithmic form of power and gain using:

P (mW) = 10 ^ (P (dBm) / 10) and
G (numeric) = 10 ^ (G (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/cm^2

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 mW/cm^2

RESULTS

No non-compliance noted:

Mode	MPE Distance (cm)	Output Power (dBm)	Antenna Gain (dBi)	Power Density (mW/cm^2)
20 MHz Channel BW	20.0	18.51	9.00	0.11
20 MHz Channel BW	20.0	13.57	14.00	0.11
20 MHz Channel BW	20.0	10.65	17.00	0.12

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.

7.3.4. 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 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.

For antenna gains up to 9 dBi

Channel	Frequency (MHz)	Average Power (dBm)
Low	4950	18.25
Middle	4965	18.43
High	4980	18.23

For 14 dBi Antenna

Channel	Frequency (MHz)	Average Power (dBm)
Low	4950	13.53
Middle	4965	13.25
High	4980	13.30

For 17 dBi Antenna

Channel	Frequency (MHz)	Average Power (dBm)
Low	4950	10.49
Middle	4965	10.07
High	4980	10.16

7.3.5. PEAK POWER SPECTRAL DENSITY

LIMIT

§ 90.1215 (b) Low power devices are also limited to a peak power spectral density of 8 dBm per one MHz. Low power devices using channel bandwidths other than those listed above are permitted; however, they are limited to a peak power spectral density of 8 dBm/MHz. If transmitting antennas of directional gain greater than 9 dBi are used, both the peak transmit power and the peak power spectral density should be reduced by the amount in decibels that the directional gain of the antenna exceeds 9 dBi..

(c) The peak power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test. If the device cannot be connected directly, alternative techniques acceptable to the Commission may be used. Measurements are made over a bandwidth of 1 MHz or the 26 dB emission bandwidth of the device, whichever is less. A resolution bandwidth less than the measurement bandwidth can be used, provided that the measured power is integrated to show total power over the measurement bandwidth. If the resolution bandwidth is approximately equal to the measurement bandwidth, and much less than the emission bandwidth of the equipment under test, the measured results shall be corrected to account for any difference between the resolution bandwidth of the test instrument and its actual noise bandwidth.

Limits as determined by antenna Gain:

Antenna Gain dBi	Limit dBm
Up to 9	8
14	3
17	0

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.

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 = 1 MHz and VBW 3 MHz. The PPSD is the highest level found across the emission in any 3 kHz band.

RESULTS

No non-compliance noted:

Up to 9 dBi Antenna

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
Low	4950	7.60	8	-0.40
Middle	4965	7.37	8	-0.63
High	4980	7.63	8	-0.37

14 dBi Antenna

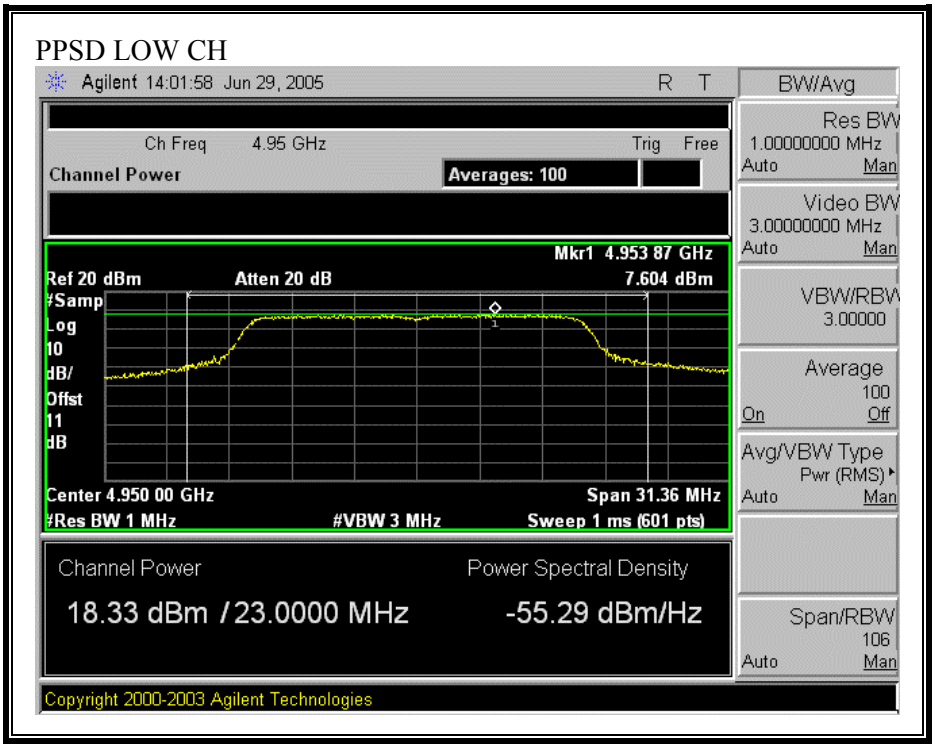
Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
Low	4950	2.68	3	-0.32
Middle	4965	2.57	3	-0.43
High	4980	2.57	3	-0.43

17 dBi Antenna

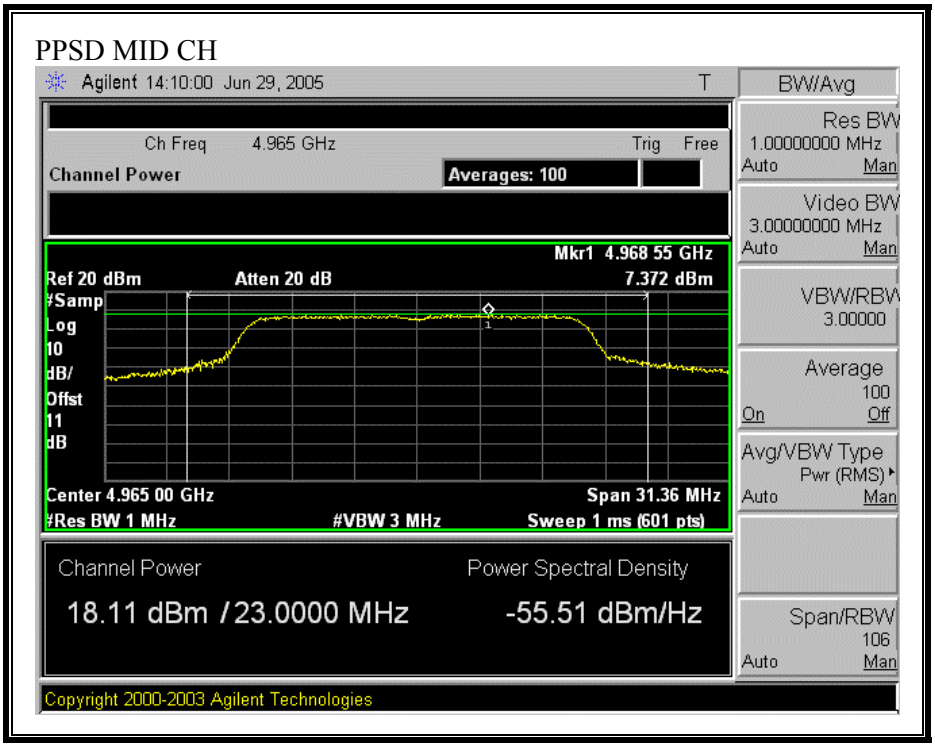
Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
Low	4950	-0.17	0	-0.17
Middle	4965	-0.83	0	-0.83
High	4980	-0.36	0	-0.36

PEAK POWER SPECTRAL DENSITY (FOR UPTO 9 dBi ANTENNA GAIN)

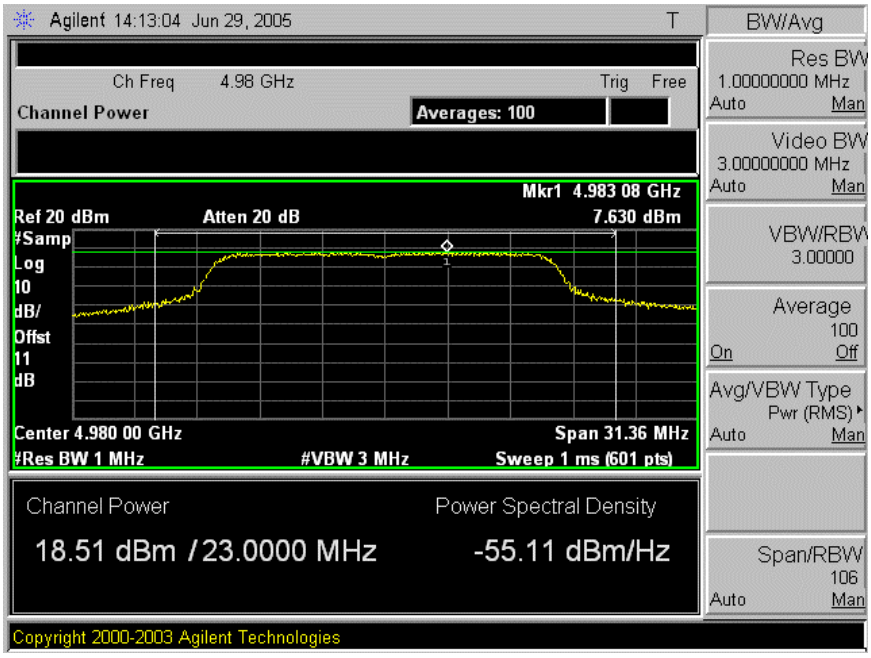
PPSD LOW CH



PPSD MID CH

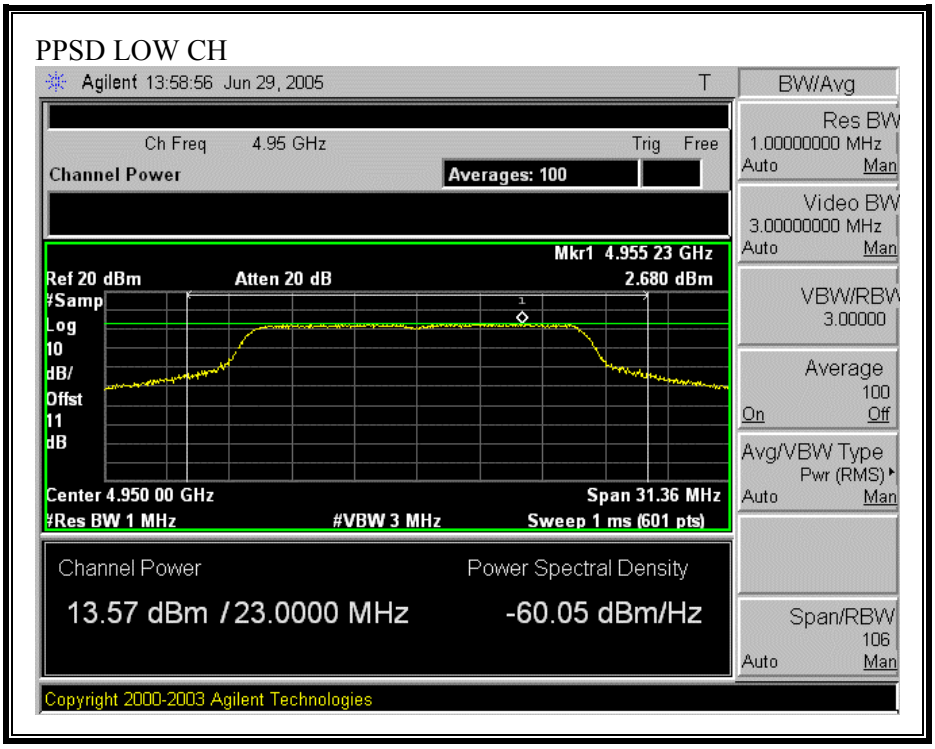


PPSD HIGH CH

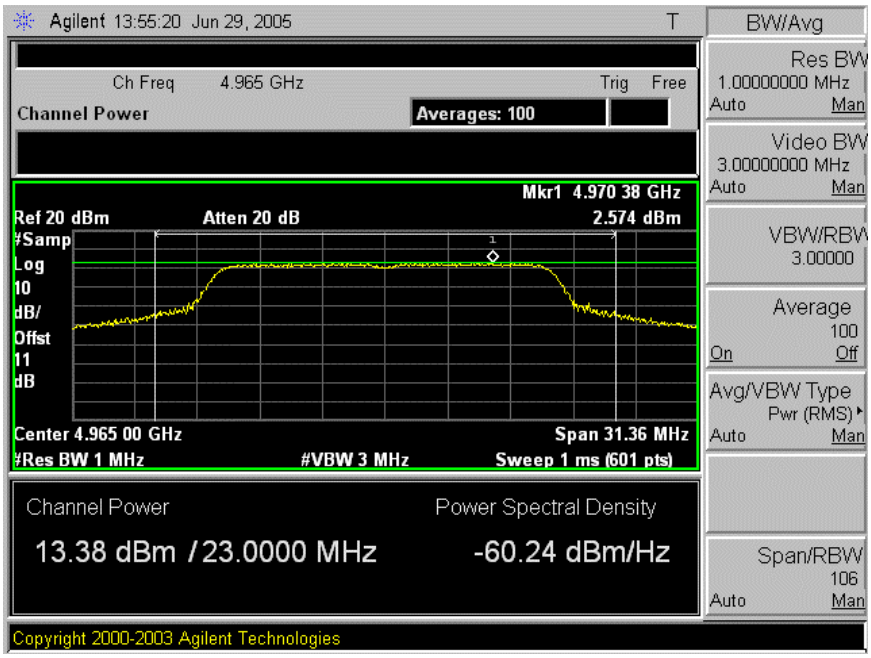


PEAK POWER SPECTRAL DENSITY (FOR 14 dBi ANTENNA GAIN)

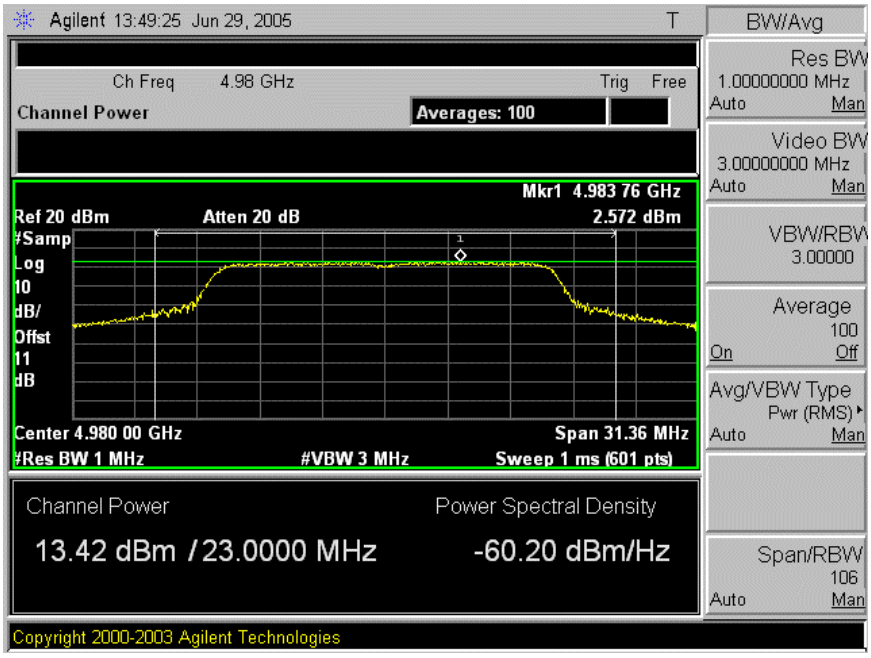
PPSD LOW CH



PPSD MID CH

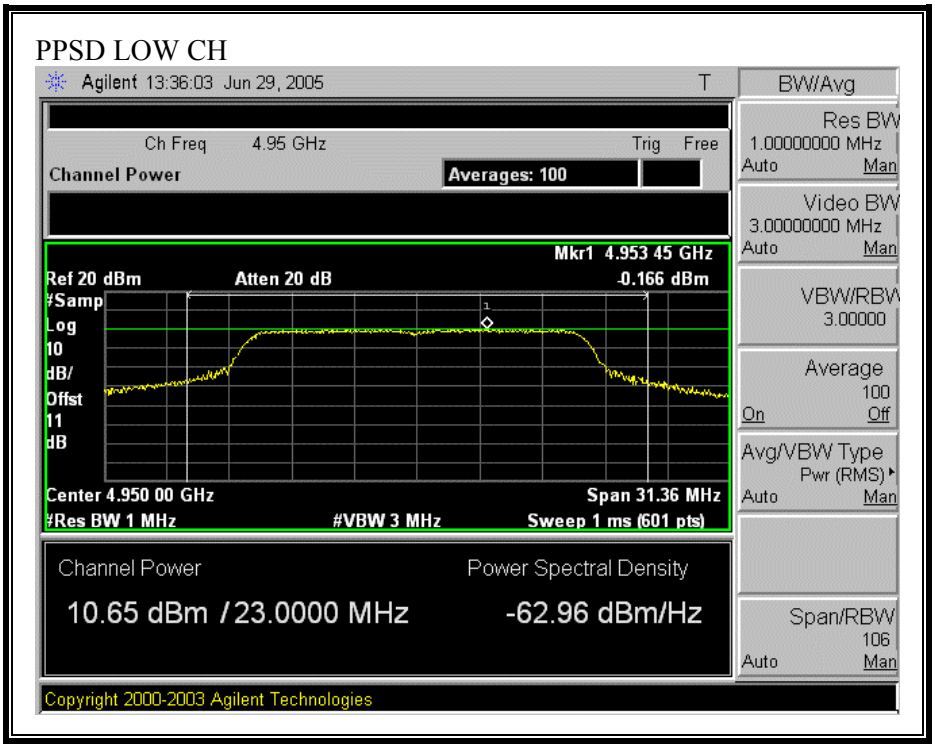


PPSD HIGH CH

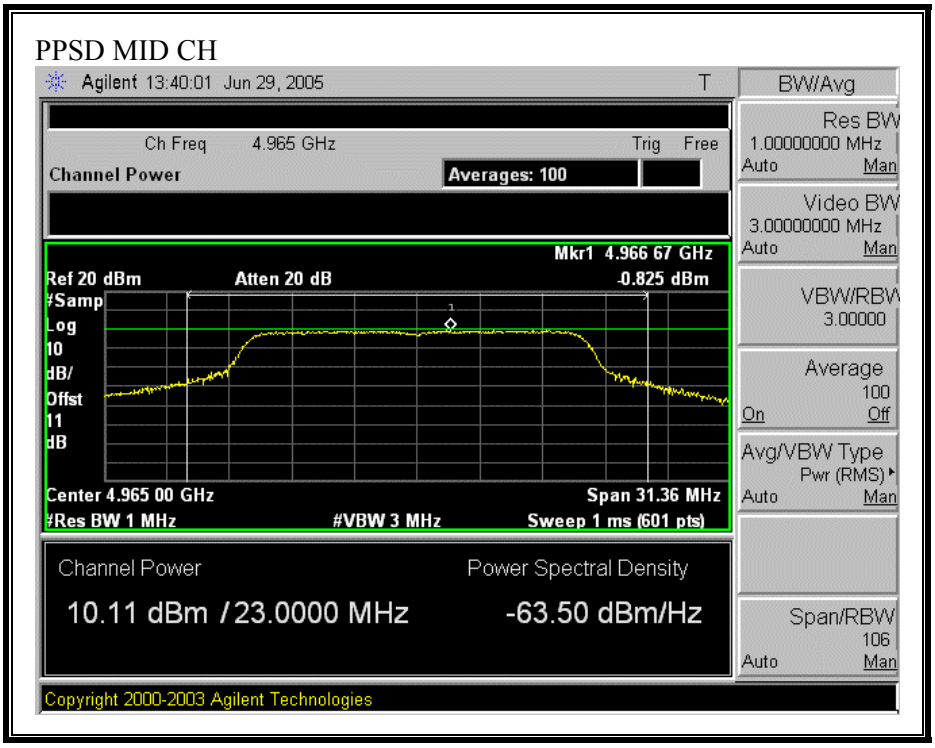


PEAK POWER SPECTRAL DENSITY (FOR 17 dBi ANTENNA GAIN)

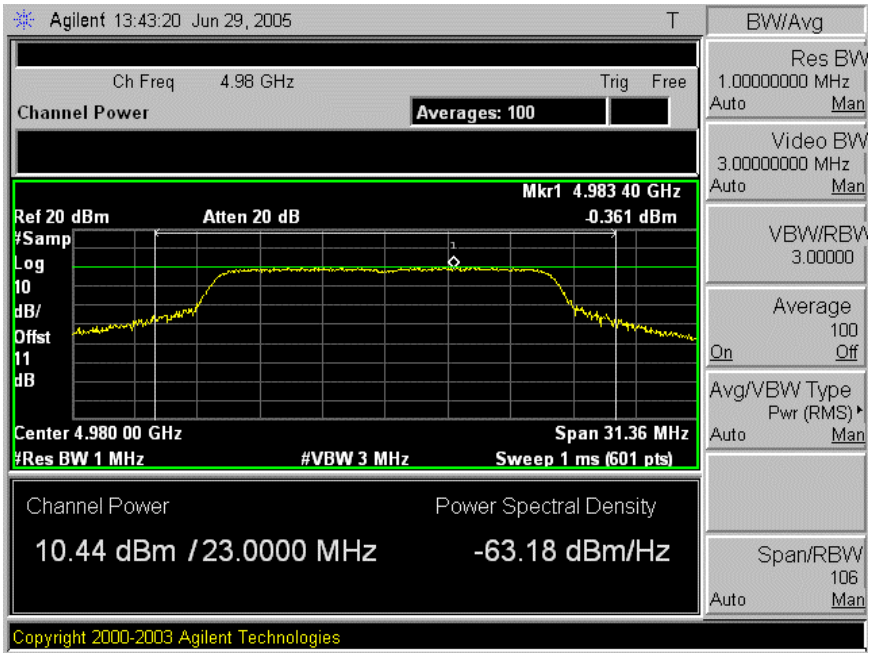
PPSD LOW CH



PPSD MID CH



PPSD HIGH CH



7.3.6. EMISSION MASK AND CONDUCTED SPURIOUS

§ 90.210 (l) Emission Mask L. For low power transmitters (20 dBm or less) operating in the 4940–4990 MHz frequency band, the power spectral density of the emissions must be attenuated below the output power of the transmitter as follows:

(1) On any frequency removed from the assigned frequency between 0–45% of the authorized bandwidth (BW): 0 dB.
(2) On any frequency removed from the assigned frequency between 45–50% of the authorized bandwidth: 219 log (% of (BW)/45) dB.
(3) On any frequency removed from the assigned frequency between 50–55% of the authorized bandwidth: 10 + 242 log (% of (BW)/50) dB.
(4) On any frequency removed from the assigned frequency between 55–100% of the authorized bandwidth: 20 + 31 log (% of (BW)/55) dB attenuation.
(5) On any frequency removed from the assigned frequency between 100–150% of the authorized bandwidth: 28 + 68 log (% of (BW)/100) dB attenuation.
(6) On any frequency removed from the assigned frequency above 150% of the authorized bandwidth: 40 dB.
(7) The zero dB reference is measured relative to the highest average power of the fundamental emission measured across the designated channel bandwidth using a resolution bandwidth of at least one percent of the occupied bandwidth of the fundamental emission and a video bandwidth of 30 kHz. The power spectral density is the power measured within the resolution bandwidth of the measurement device divided by the resolution bandwidth of the measurement device. Emission levels are also based on the use of measurement instrumentation employing a resolution bandwidth of at least one percent of the occupied bandwidth.

TEST PROCEDURE

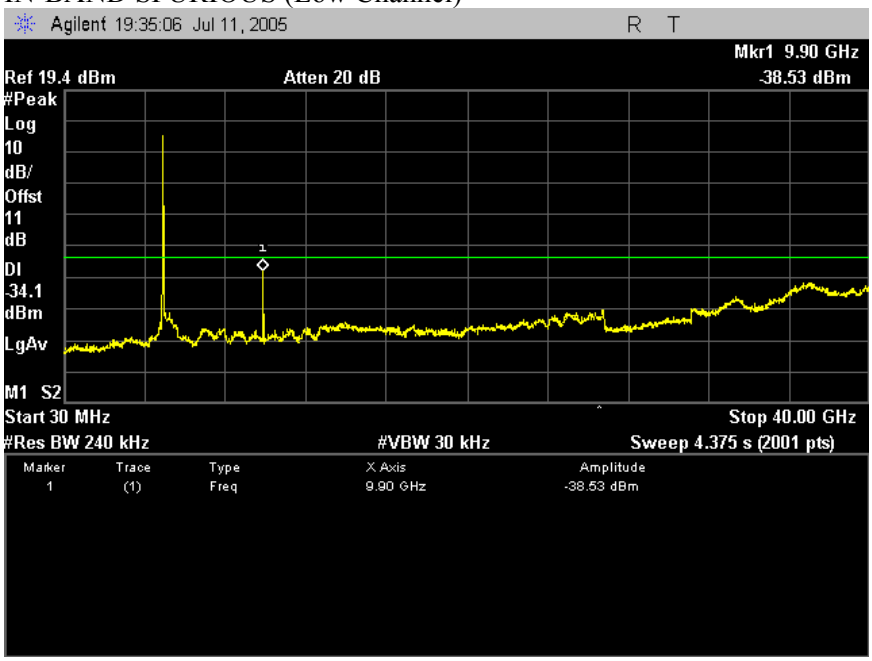
The EUT is connected to the spectrum analyzer, the peak amplitude is used as the 0 dB reference value for the mask, and the trace is compared to the mask.

RESULTS

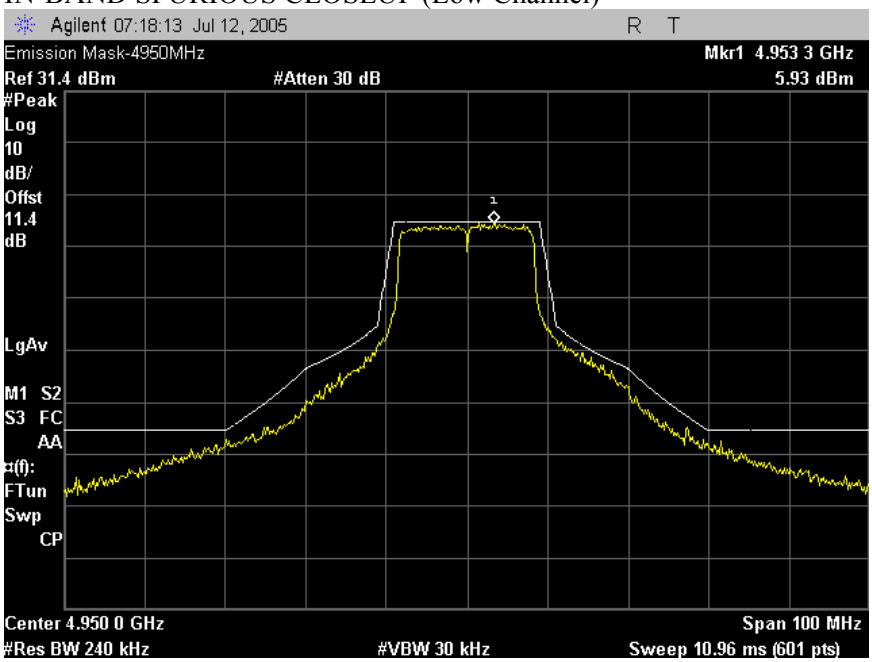
No non-compliance noted:

IN-BAND SPURIOUS EMISSIONS

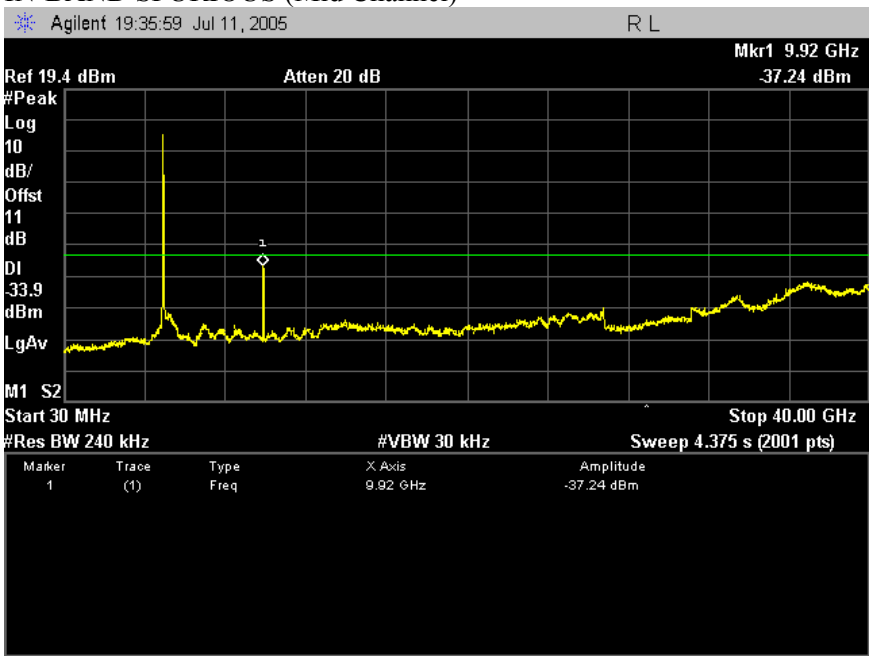
IN-BAND SPURIOUS (Low Channel)



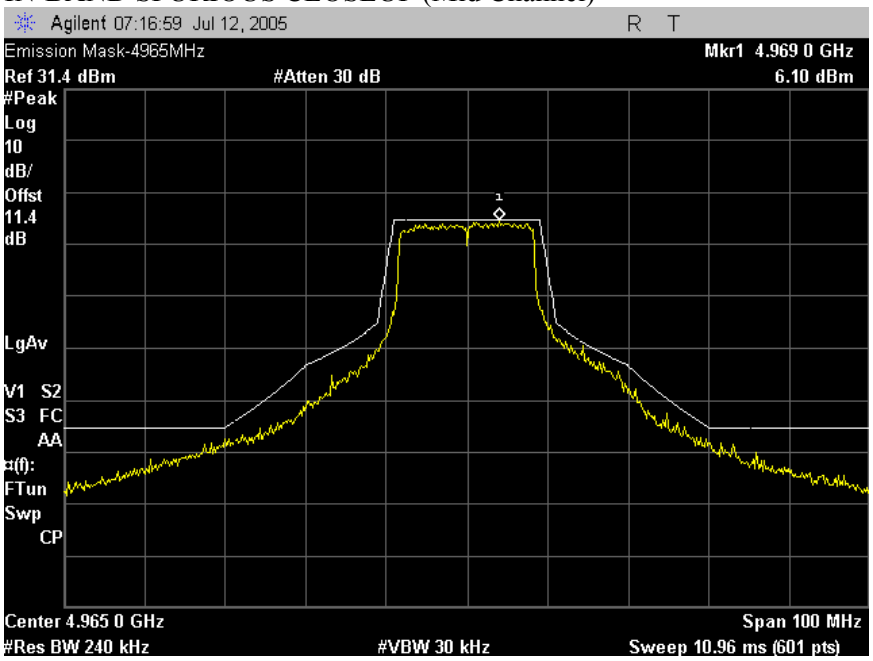
IN-BAND SPURIOUS CLOSEUP (Low Channel)



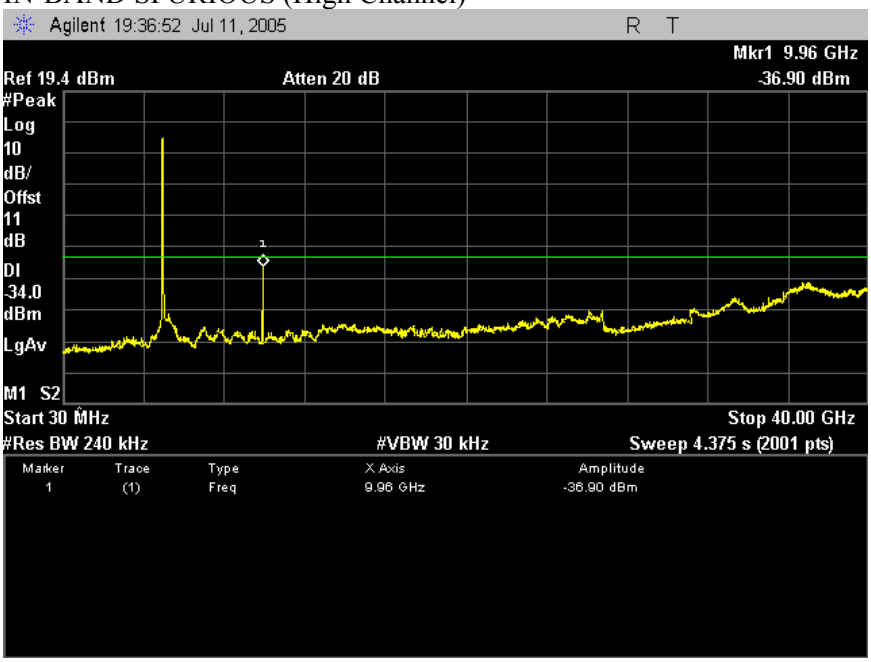
IN-BAND SPURIOUS (Mid Channel)



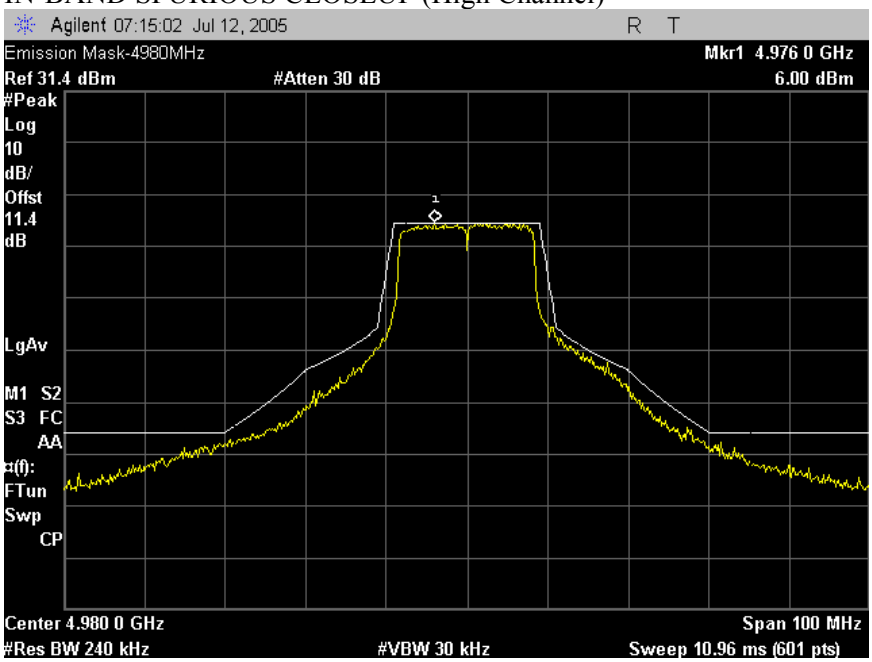
IN-BAND SPURIOUS CLOSEUP (Mid Channel)



IN-BAND SPURIOUS (High Channel)



IN-BAND SPURIOUS CLOSEUP (High Channel)



7.4. RADIATED EMISSIONS

7.4.1. TRANSMITTER RADIATED SPURIOUS EMISSIONS

LIMITS

§ 90.210 (l) Emission Mask L. For low power transmitters (20 dBm or less) operating in the 4940–4990 MHz frequency band, the power spectral density of the emissions must be attenuated below the output power of the transmitter as follows:

On any frequency removed from the assigned frequency above 150% of the authorized bandwidth: 40 dB.

The zero dB reference is measured relative to the highest average power of the fundamental emission measured across the designated channel bandwidth using a resolution bandwidth of at least one percent of the occupied bandwidth of the fundamental emission and a video bandwidth of 30 kHz. The power spectral density is the power measured within the resolution bandwidth of the measurement device divided by the resolution bandwidth of the measurement device. Emission levels are also based on the use of measurement instrumentation employing a resolution bandwidth of at least one percent of the occupied bandwidth.

§15.109 (a) Except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

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

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.

The field strength of the fundamental is measured to provide a reference value for the –40 dBc limit. All measurements are peak.

The resolution bandwidth is set to 1 MHz, and the video bandwidth is set to 1 MHz for peak measurements.

The spectrum from 30 MHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels. Conducted measurements are made of spurious signals removed by less than 150% of the authorized bandwidth. Conducted and radiated measurements are made of spurious signals removed by more than 150% of the authorized bandwidth.

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.

7.4.2. TRANSMITTER ABOVE 1 GHz FOR 5 MHZ CHANNEL BANDWIDTH

HARMONICS AND SPURIOUS EMISSIONS (2 dBi DIPOLE ANTENNA)

10/03/05 **High Frequency Fundamental Measurement**
Compliance Certification Services, Morgan Hill 5m Chamber Site

Test Engr: Vien Tran
Project #: 05U3569
Company: Proxim Corp
EUT Descrip.: 4.9 GHz Access Point
EUT M/N: ORiNOCO AP-4900
Test Target: FCC Part 90
Mode Oper: Tx on with Dipole Antenna (2 dBi) 5 MHz BW

Test Equipment:

EMCO Horn 1-18GHz: T60; S/N: 2238 @3m
Horn > 18GHz:
Limit: EIRP
☐ High Pass Filter
Hi Frequency Cables: ☐ (2 ft) ☐ (2 ~ 3 ft) ☐ (4 ~ 6 ft) ☑ (12 ft)
Pre-amplifer 1-26GHz: T63 Miteq 646456
Pre-amplifer 26-40GHz:

f GHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Channel 4.9425 MHz										
4.943	66.9	V	5.3	2.4	11.1	9.0	14.0			Fundamental
9.884	42.4	V	-48.5	3.5	11.8	9.7	-40.1	-26.0	-14.2	2nd Harmonic
14.826	33.3	V	-56.6	4.4	13.6	11.4	-47.4	-26.0	-21.4	3rd Harmonic
4.943	50.7	H	-10.6	2.4	11.1	9.0	-1.9			Fundamental
9.885	33.0	H	-57.9	3.5	11.8	9.7	-49.5	-41.9	-7.7	2nd Harmonic
14.827	32.5	H	-56.7	4.4	13.6	11.4	-47.5	-41.9	-5.7	3rd Harmonic
Mid Channel 49625 MHzl										
4.963	66.2	V	4.6	2.4	11.2	9.0	13.4			Fundamental
9.924	42.2	V	-48.7	3.5	11.9	9.7	-40.3	-26.6	-13.7	2nd Harmonic
14.887	32.6	V	-57.2	4.4	13.5	11.4	-48.1	-26.6	-21.5	3rd Harmonic
4.963	50.1	H	-11.1	2.4	11.2	9.0	-2.4			Fundamental
9.924	33.0	H	-57.9	3.5	11.9	9.7	-49.5	-42.4	-7.1	2nd Harmonic
14.887	32.5	H	-56.6	4.4	13.5	11.4	-47.5	-42.4	-5.1	3rd Harmonic
High Channel 49875 MHz										
4.988	66.4	V	4.8	2.4	11.2	9.0	13.6			Fundamental
9.974	44.4	V	-46.4	3.5	11.9	9.7	-38.0	-26.4	-11.6	2nd Harmonic
14.962	32.9	V	-57.0	4.4	13.5	11.4	-47.9	-26.4	-21.5	3rd Harmonic
4.988	49.5	H	-11.8	2.4	11.2	9.0	-3.0			Fundamental
9.975	32.4	H	-58.4	3.5	11.9	9.7	-50.0	-43.0	-7.0	2nd Harmonic
14.961	31.9	H	-57.2	4.4	13.5	11.4	-48.2	-43.0	-5.2	3rd Harmonic
No other emissions were detected above system noise floor										

HARMONICS AND SPURIOUS EMISSIONS (5 dBi CAR MOUNT ANTENNA)

10/03/05 **High Frequency Fundamental Measurement**
Compliance Certification Services, Morgan Hill 5m Chamber Site

Test Engr: Vien Tran
Project #: 05U3569
Company: Proxim Corp
EUT Descrip.: 4.9 GHz Access Point
EUT M/N: ORiNOCO AP-4900
Test Target: FCC Part 90
Mode Oper: Tx on with Car Mount Antenna (5 dBi) _ 5 MHz BW

Test Equipment:

EMCO Horn 1-18GHz: T60; S/N: 2238 @3m
Horn > 18GHz:
Limit: EIRP
☐ High Pass Filter

Hi Frequency Cables: ☐ (2 ft) ☐ (2 ~ 3 ft) ☐ (4 ~ 6 ft) ☑ (12 ft)

Pre-amplifer 1-26GHz: T63 Miteq 646456
Pre-amplifer 26-40GHz:

f GHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Channel 4.9425 MHz										
4.943	66.9	V	5.3	2.4	11.1	9.0	14.0			Fundamental
9.884	42.4	V	-48.5	3.5	11.8	9.7	-40.1	-26.0	-14.2	2nd Harmonic
14.826	33.3	V	-56.6	4.4	13.6	11.4	-47.4	-26.0	-21.4	3rd Harmonic
4.943	50.7	H	-10.6	2.4	11.1	9.0	-1.9			Fundamental
9.885	33.0	H	-57.9	3.5	11.8	9.7	-49.5	-41.9	-7.7	2nd Harmonic
14.827	32.5	H	-56.7	4.4	13.6	11.4	-47.5	-41.9	-5.7	3rd Harmonic
Mid Channel 49625 MHz										
4.963	66.2	V	4.6	2.4	11.2	9.0	13.4			Fundamental
9.924	42.2	V	-48.7	3.5	11.9	9.7	-40.3	-26.6	-13.7	2nd Harmonic
14.887	32.6	V	-57.2	4.4	13.5	11.4	-48.1	-26.6	-21.5	3rd Harmonic
4.963	50.1	H	-11.1	2.4	11.2	9.0	-2.4			Fundamental
9.924	33.0	H	-57.9	3.5	11.9	9.7	-49.5	-42.4	-7.1	2nd Harmonic
14.887	32.5	H	-56.6	4.4	13.5	11.4	-47.5	-42.4	-5.1	3rd Harmonic
High Channel 49875 MHz										
4.988	66.4	V	4.8	2.4	11.2	9.0	13.6			Fundamental
9.974	44.4	V	-46.4	3.5	11.9	9.7	-38.0	-26.4	-11.6	2nd Harmonic
14.962	32.9	V	-57.0	4.4	13.5	11.4	-47.9	-26.4	-21.5	3rd Harmonic
4.988	49.5	H	-11.8	2.4	11.2	9.0	-3.0			Fundamental
9.975	32.4	H	-58.4	3.5	11.9	9.7	-50.0	-43.0	-7.0	2nd Harmonic
14.961	31.9	H	-57.2	4.4	13.5	11.4	-48.2	-43.0	-5.2	3rd Harmonic
No other emissions were detected above system noise floor										

HARMONICS AND SPURIOUS EMISSIONS (17 dBi SECTOR ANTENNA)

10/03/05 **High Frequency Fundamental Measurement**
Compliance Certification Services, Morgan Hill 5m Chamber Site

Test Engr: Vien Tran
Project #: 05U3569
Company: Proxim Corp
EUT Descrip.: 4.9 GHz Access Point
EUT M/N: ORiNOCO AP-4900
Test Target: FCC Part 90
Mode Oper: Tx on with Sector Antenna (17 dBi) 5 MHz BW

Test Equipment:

EMCO Horn 1-18GHz: T60; S/N: 2238 @3m
Horn > 18GHz:
Limit: EIRP
☐ High Pass Filter
Hi Frequency Cables: ☐ (2 ft) ☐ (2 ~ 3 ft) ☐ (4 ~ 6 ft) ☑ (12 ft)
Pre-amplifer 1-26GHz: T63 Miteq 646456
Pre-amplifer 26-40GHz:

f GHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Channel 4.9425 MHz										
4.943	57.4	V	-4.2	2.4	11.1	9.0	4.5			Fundamental
9.885	38.4	V	-52.5	3.5	11.8	9.7	-44.1	-35.5	-8.6	2nd Harmonic
14.828	32.0	V	-57.9	4.4	13.6	11.4	-48.7	-35.5	-13.2	3rd Harmonic
4.943	57.1	H	-4.2	2.4	11.1	9.0	4.5			Fundamental
9.885	35.8	H	-55.1	3.5	11.8	9.7	-46.7	-35.5	-11.3	2nd Harmonic
14.828	33.5	H	-55.7	4.4	13.6	11.4	-46.5	-35.5	-11.1	3rd Harmonic
Mid Channel 49625 MHZ										
4.963	57.3	V	-4.3	2.4	11.2	9.0	4.4			Fundamental
9.925	38.4	V	-52.5	3.5	11.9	9.7	-44.1	-35.6	-8.5	2nd Harmonic
14.888	33.2	V	-56.6	4.4	13.5	11.4	-47.5	-35.6	-12.0	3rd Harmonic
4.963	57.1	H	-4.2	2.4	11.2	9.0	4.6			Fundamental
9.925	39.5	H	-51.4	3.5	11.9	9.7	-43.0	-35.4	-7.6	2nd Harmonic
14.888	33.6	H	-55.5	4.4	13.5	11.4	-46.4	-35.4	-11.0	3rd Harmonic
High Channel 49875 MHz										
4.988	57.8	V	-3.8	2.4	11.2	9.0	5.0			Fundamental
9.975	40.5	V	-50.3	3.5	11.9	9.7	-41.9	-35.0	-6.9	2nd Harmonic
14.963	34.5	V	-55.3	4.4	13.5	11.4	-46.2	-35.0	-11.2	3rd Harmonic
4.988	57.5	H	-3.7	2.4	11.2	9.0	5.0			Fundamental
9.975	39.0	H	-51.8	3.5	11.9	9.7	-43.4	-35.0	-8.4	2nd Harmonic
14.963	33.1	H	-56.0	4.4	13.5	11.4	-46.9	-35.0	-12.0	3rd Harmonic
No other emissions were detected above system noise floor										

7.4.3. TRANSMITTER ABOVE 1 GHz FOR 10 MHZ CHANNEL BANDWIDTH

HARMONICS AND SPURIOUS EMISSIONS (2 dBi DIPOLE ANTENNA)

10/03/05 **High Frequency Fundamental Measurement**
Compliance Certification Services, Morgan Hill 5m Chamber Site

Test Engr:	Vien Tran
Project #:	05U3569
Company:	Proxim Corp
EUT Descrip.:	4.9 GHz Access Point
EUT M/N:	ORiNOCO AP-4900
Test Target:	FCC Part 90
Mode Oper:	Tx on with Dipole Antenna (2 dBi)_10 MHz Channel Bandwidth

Test Equipment:

EMCO Horn 1-18GHz: T60; S/N: 2238 @3m
Horn > 18GHz:
Limit: EIRP
☐ High Pass Filter

Hi Frequency Cables: ☐ (2 ft) ☐ (2 ~ 3 ft) ☐ (4 ~ 6 ft) ☑ (12 ft)

Pre-amplifer 1-26GHz: T63 Miteq 646456
Pre-amplifer 26-40GHz:

f GHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Channel 4.945 MHz										
4.945	69.8	V	8.2	2.4	11.1	9.0	16.9			Fundamental
9.890	44.6	V	-46.4	3.5	11.9	9.7	-38.0	-23.1	-14.9	2nd Harmonic
14.835	34.9	V	-55.0	4.4	13.6	11.4	-45.9	-23.1	-22.8	3rd Harmonic
4.945	54.0	H	-7.2	2.4	11.1	9.0	1.5			Fundamental
9.890	35.5	H	-55.5	3.5	11.9	9.7	-47.1	-38.5	-8.6	2nd Harmonic
14.834	34.8	H	-54.3	4.4	13.6	11.4	-45.2	-38.5	-6.7	3rd Harmonic
Mid Channel 4965 MHz										
4.965	69.4	V	7.8	2.4	11.2	9.0	16.6			Fundamental
9.930	46.7	V	-44.2	3.5	11.9	9.7	-35.8	-23.4	-12.4	2nd Harmonic
14.896	35.0	V	-54.8	4.4	13.5	11.4	-45.7	-23.4	-22.3	3rd Harmonic
4.965	53.5	H	-7.8	2.4	11.2	9.0	1.0			Fundamental
9.930	36.9	H	-54.0	3.5	11.9	9.7	-45.6	-39.0	-6.6	2nd Harmonic
14.897	35.0	H	-54.1	4.4	13.5	11.4	-45.0	-39.0	-6.0	3rd Harmonic
High Channel 4985 MHz										
4.985	69.5	V	7.9	2.4	11.2	9.0	16.6			Fundamental
9.970	46.3	V	-44.5	3.5	11.9	9.7	-36.1	-23.4	-12.8	2nd Harmonic
14.955	35.1	V	-54.8	4.4	13.5	11.4	-45.7	-23.4	-22.3	3rd Harmonic
4.985	53.4	H	-7.8	2.4	11.2	9.0	0.9			Fundamental
9.969	37.9	H	-52.9	3.5	11.9	9.7	-44.5	-39.1	-5.4	2nd Harmonic
14.954	34.6	H	-54.5	4.4	13.5	11.4	-45.5	-39.1	-6.4	3rd Harmonic
No other emissions were detected above system noise floor										

HARMONICS AND SPURIOUS EMISSIONS (5 dBi CAR MOUNT ANTENNA)

10/03/05 **High Frequency Fundamental Measurement**
Compliance Certification Services, Morgan Hill 5m Chamber Site

Test Engr: Vien Tran
Project #: 05U3569
Company: Proxim Corp
EUT Descrip.: 4.9 GHz Access Point
EUT M/N: ORiNOCO AP-4900
Test Target: FCC Part 90
Mode Oper: Tx on with Car Mouth Antenna (5 dBi)_10 MHz Channel Bandwidth

Test Equipment:

EMCO Horn 1-18GHz: T60; S/N: 2238 @3m
Horn > 18GHz:
Limit: EIRP
☐ High Pass Filter
Hi Frequency Cables: ☐ (2 ft) ☐ (2 ~ 3 ft) ☐ (4 ~ 6 ft) ☑ (12 ft)
Pre-amplifer 1-26GHz: T63 Miteq 646456
Pre-amplifer 26-40GHz:

f GHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Channel 4.945 MHz										
4.945	69.8	V	8.2	2.4	11.1	9.0	16.9			Fundamental
9.890	44.6	V	-46.4	3.5	11.9	9.7	-38.0	-23.1	-14.9	2nd Harmonic
14.835	34.9	V	-55.0	4.4	13.6	11.4	-45.9	-23.1	-22.8	3rd Harmonic
4.945	54.0	H	-7.2	2.4	11.1	9.0	1.5			Fundamental
9.890	35.5	H	-55.5	3.5	11.9	9.7	-47.1	-38.5	-8.6	2nd Harmonic
14.835	34.8	H	-54.3	4.4	13.6	11.4	-45.2	-38.5	-6.7	3rd Harmonic
Mid Channel 4965 MHz										
4.965	69.4	V	7.8	2.4	11.2	9.0	16.6			Fundamental
9.930	46.7	V	-44.2	3.5	11.9	9.7	-35.8	-23.4	-12.4	2nd Harmonic
14.895	35.0	V	-54.8	4.4	13.5	11.4	-45.7	-23.4	-22.3	3rd Harmonic
4.965	53.5	H	-7.8	2.4	11.2	9.0	1.0			Fundamental
9.930	36.9	H	-54.0	3.5	11.9	9.7	-45.6	-39.0	-6.6	2nd Harmonic
14.895	35.0	H	-54.1	4.4	13.5	11.4	-45.0	-39.0	-6.0	3rd Harmonic
High Channel 4985 MHz										
4.985	69.5	V	7.9	2.4	11.2	9.0	16.6			Fundamental
9.970	46.3	V	-44.5	3.5	11.9	9.7	-36.1	-23.4	-12.8	2nd Harmonic
14.955	35.1	V	-54.8	4.4	13.5	11.4	-45.7	-23.4	-22.3	3rd Harmonic
4.985	53.4	H	-7.8	2.4	11.2	9.0	0.9			Fundamental
9.970	37.9	H	-52.9	3.5	11.9	9.7	-44.5	-39.1	-5.4	2nd Harmonic
14.955	34.6	H	-54.5	4.4	13.5	11.4	-45.5	-39.1	-6.4	3rd Harmonic
No other emissions were detected above system noise floor										

HARMONICS AND SPURIOUS EMISSIONS (17 dBi SECTOR ANTENNA)

10/03/05 **High Frequency Fundamental Measurement**
Compliance Certification Services, Morgan Hill 5m Chamber Site

Test Engr: Vien Tran
Project #: 05U3569
Company: Proxim Corp
EUT Descrip.: 4.9 GHz Access Point
EUT M/N: ORiNOCO AP-4900
Test Target: FCC Part 90
Mode Oper: Tx on with Sector Antenna (17 dBi)_10 MHz Channel Bandwidth

Test Equipment:

EMCO Horn 1-18GHz: T60; S/N: 2238 @3m
Horn > 18GHz:
Limit: EIRP
☐ High Pass Filter
Hi Frequency Cables: ☐ (2 ft) ☐ (2 ~ 3 ft) ☐ (4 ~ 6 ft) ☑ (12 ft)
Pre-amplifer 1-26GHz: T63 Miteq 646456
Pre-amplifer 26-40GHz:

f GHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Channel 4.945 MHz										
4.945	59.3	V	-2.3	2.4	11.1	9.0	6.4			Fundamental
9.890	38.6	V	-52.3	3.5	11.9	9.7	-43.9	-33.6	-10.3	2nd Harmonic
14.835	36.5	V	-53.4	4.4	13.6	11.4	-44.2	-33.6	-10.6	3rd Harmonic
4.945	58.7	H	-2.6	2.4	11.1	9.0	6.1			Fundamental
9.890	39.3	H	-51.6	3.5	11.9	9.7	-43.2	-33.9	-9.4	2nd Harmonic
14.835	36.2	H	-53.0	4.4	13.6	11.4	-43.8	-33.9	-10.0	3rd Harmonic
Mid Channel 4965 MHz										
4.965	59.7	V	-1.9	2.4	11.2	9.0	6.8			Fundamental
9.930	40.2	V	-50.7	3.5	11.9	9.7	-42.3	-33.2	-9.1	2nd Harmonic
14.895	35.8	V	-54.0	4.4	13.5	11.4	-44.9	-33.2	-11.8	3rd Harmonic
4.965	58.2	H	-3.1	2.4	11.2	9.0	5.7			Fundamental
9.930	41.6	H	-49.3	3.5	11.9	9.7	-40.9	-34.3	-6.6	2nd Harmonic
14.895	36.2	H	-52.9	4.4	13.5	11.4	-43.8	-34.3	-9.5	3rd Harmonic
High Channel 4985 MHz										
4.985	59.7	V	-1.9	2.4	11.2	9.0	6.9			Fundamental
9.970	44.0	V	-46.8	3.5	11.9	9.7	-38.4	-33.1	-5.3	2nd Harmonic
14.955	37.0	V	-52.8	4.4	13.5	11.4	-43.7	-33.1	-10.6	3rd Harmonic
4.985	59.5	H	-1.7	2.4	11.2	9.0	7.0			Fundamental
9.970	42.4	H	-48.4	3.5	11.9	9.7	-40.0	-33.0	-7.0	2nd Harmonic
14.955	36.2	H	-52.9	4.4	13.5	11.4	-43.8	-33.0	-10.9	3rd Harmonic
No other emissions were detected above system noise floor										

7.4.4. TRANSMITTER ABOVE 1 GHz FOR 20 MHZ CHANNEL BANDWIDTH

HARMONICS AND SPURIOUS EMISSIONS (2 dBi DIPOLE ANTENNA)

10/03/05 **High Frequency Fundamental Measurement**
Compliance Certification Services, Morgan Hill 5m Chamber Site

Test Engr: Vien Tran
Project #: 05U3569
Company: Proxim Corp
EUT Descrip.: 4.9 GHz Access Point
EUT M/N: ORiNOCO AP-4900
Test Target: FCC Part 90
Mode Oper: Tx on with Dipole Antenna (2 dBi)_20 MHz Channel Bandwidth

Test Equipment:

EMCO Horn 1-18GHz: T60; S/N: 2238 @3m
Horn > 18GHz:
Limit: EIRP
☐ High Pass Filter
Hi Frequency Cables: ☐ (2 ft) ☐ (2 ~ 3 ft) ☐ (4 ~ 6 ft) ☑ (12 ft)
Pre-amplifer 1-26GHz: T63 Miteq 646456
Pre-amplifer 26-40GHz:

f GHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Channel 4.950 MHz										
4.950	70.5	V	8.9	2.4	11.1	9.0	17.6			Fundamental
9.902	45.6	V	-45.3	3.5	11.9	9.7	-36.9	-22.4	-14.5	2nd Harmonic
14.851	36.6	V	-53.3	4.4	13.5	11.4	-44.1	-22.4	-21.7	3rd Harmonic
4.950	58.6	H	-2.6	2.4	11.1	9.0	6.1			Fundamental
9.900	34.4	H	-56.6	3.5	11.9	9.7	-48.2	-33.9	-14.2	2nd Harmonic
14.846	34.3	H	-54.9	4.4	13.5	11.4	-45.7	-33.9	-11.8	3rd Harmonic
Mid Channel 4965 MHz										
4.965	70.6	V	9.0	2.4	11.2	9.0	17.8			Fundamental
9.930	45.1	V	-45.8	3.5	11.9	9.7	-37.4	-22.2	-15.1	2nd Harmonic
14.899	36.8	V	-53.0	4.4	13.5	11.4	-43.9	-22.2	-21.7	3rd Harmonic
4.965	57.1	H	-4.2	2.4	11.2	9.0	4.6			Fundamental
9.933	36.5	H	-54.3	3.5	11.9	9.7	-45.9	-35.4	-10.5	2nd Harmonic
14.891	36.3	H	-52.8	4.4	13.5	11.4	-43.7	-35.4	-8.3	3rd Harmonic
High Channel 4980 MHz										
4.980	70.4	V	8.8	2.4	11.2	9.0	17.6			Fundamental
9.959	47.2	V	-43.6	3.5	11.9	9.7	-35.3	-22.4	-12.8	2nd Harmonic
14.936	36.1	V	-53.7	4.4	13.5	11.4	-44.6	-22.4	-22.2	3rd Harmonic
4.980	54.6	H	-6.7	2.4	11.2	9.0	2.1			Fundamental
9.961	36.8	H	-54.0	3.5	11.9	9.7	-45.6	-37.9	-7.7	2nd Harmonic
14.937	36.4	H	-52.7	4.4	13.5	11.4	-43.6	-37.9	-5.7	3rd Harmonic
No other emissions were detected above system noise floor										

HARMONICS AND SPURIOUS EMISSIONS (5 dBi CAR MOUNT ANTENNA)

10/03/05 **High Frequency Fundamental Measurement**
Compliance Certification Services, Morgan Hill 5m Chamber Site

Test Engr: Vien Tran
Project #: 05U3569
Company: Proxim Corp
EUT Descrip.: 4.9 GHz Access Point
EUT M/N: ORiNOCO AP-4900
Test Target: FCC Part 90
Mode Oper: Tx on with Car Mouth Antenna (5 dBi)_20 MHz Channel Bandwidth

Test Equipment:

EMCO Horn 1-18GHz: T60; S/N: 2238 @3m
Horn > 18GHz:
Limit: EIRP
☐ High Pass Filter
Hi Frequency Cables: ☐ (2 ft) ☐ (2 ~ 3 ft) ☐ (4 ~ 6 ft) ☑ (12 ft)
Pre-amplifer 1-26GHz: T63 Miteq 646456
Pre-amplifer 26-40GHz:

f GHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Channel 4.950 MHz										
4.950	63.8	V	2.2	2.4	11.1	9.0	10.9			Fundamental
9.900	36.7	V	-54.2	3.5	11.9	9.7	-45.8	-29.1	-16.7	2nd Harmonic
14.850	35.4	V	-54.5	4.4	13.5	11.4	-45.3	-29.1	-16.2	3rd Harmonic
4.950	58.6	H	-2.7	2.4	11.1	9.0	6.0			Fundamental
9.900	45.0	H	-45.9	3.5	11.9	9.7	-37.5	-34.0	-3.6	2nd Harmonic
14.850	37.0	H	-52.2	4.4	13.5	11.4	-43.0	-34.0	-9.1	3rd Harmonic
Mid Channel 4965 MHz										
4.965	62.5	V	0.9	2.4	11.2	9.0	9.6			Fundamental
9.930	36.3	V	-54.6	3.5	11.9	9.7	-46.2	-30.4	-15.8	2nd Harmonic
14.895	35.0	V	-54.8	4.4	13.5	11.4	-45.7	-30.4	-15.4	3rd Harmonic
4.965	61.9	H	0.6	2.4	11.2	9.0	9.4			Fundamental
9.930	44.6	H	-46.3	3.5	11.9	9.7	-37.9	-30.6	-7.3	2nd Harmonic
14.895	36.4	H	-52.7	4.4	13.5	11.4	-43.6	-30.6	-13.0	3rd Harmonic
High Channel 4980 MHz										
4.980	62.5	V	0.9	2.4	11.2	9.0	9.7			Fundamental
9.960	39.3	V	-51.5	3.5	11.9	9.7	-43.1	-30.3	-12.8	2nd Harmonic
14.940	37.1	V	-52.7	4.4	13.5	11.4	-43.6	-30.3	-13.3	3rd Harmonic
4.980	59.4	H	-1.8	2.4	11.2	9.0	6.9			Fundamental
9.960	46.2	H	-44.6	3.5	11.9	9.7	-36.2	-33.1	-3.1	2nd Harmonic
14.940	37.6	H	-51.5	4.4	13.5	11.4	-42.4	-33.1	-9.3	3rd Harmonic
No other emissions were detected above system noise floor										

HARMONICS AND SPURIOUS EMISSIONS (17 dBi SECTOR ANTENNA)

10/03/05 **High Frequency Fundamental Measurement**
Compliance Certification Services, Morgan Hill 5m Chamber Site

Test Engr: Vien Tran
Project #: 05U3569
Company: Proxim Corp
EUT Descrip.: 4.9 GHz Access Point
EUT M/N: ORiNOCO AP-4900
Test Target: FCC Part 90
Mode Oper: Tx on with Sector Antenna (17 dBi)_20 MHz Channel Bandwidth

Test Equipment:

EMCO Horn 1-18GHz: T60; S/N: 2238 @3m
Horn > 18GHz:
Limit: EIRP
☐ High Pass Filter
Hi Frequency Cables: ☐ (2 ft) ☐ (2 ~ 3 ft) ☐ (4 ~ 6 ft) ☑ (12 ft)
Pre-amplifer 1-26GHz: T63 Miteq 646456
Pre-amplifer 26-40GHz:

f GHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Channel 4.950 MHz										
4.950	60.2	V	-1.4	2.4	11.1	9.0	7.3			Fundamental
9.900	43.4	V	-47.5	3.5	11.9	9.7	-39.1	-32.7	-6.4	2nd Harmonic
14.850	37.8	V	-52.1	4.4	13.5	11.4	-42.9	-32.7	-10.2	3rd Harmonic
4.950	59.6	H	-1.7	2.4	11.1	9.0	7.0			Fundamental
9.900	41.7	H	-49.2	3.5	11.9	9.7	-40.8	-33.0	-7.9	2nd Harmonic
14.850	37.3	H	-51.9	4.4	13.5	11.4	-42.7	-33.0	-9.8	3rd Harmonic
Mid Channel 4965 MHz										
4.965	60.0	V	-1.6	2.4	11.2	9.0	7.1			Fundamental
9.930	44.2	V	-46.7	3.5	11.9	9.7	-38.3	-32.9	-5.4	2nd Harmonic
14.895	37.8	V	-52.0	4.4	13.5	11.4	-42.9	-32.9	-10.1	3rd Harmonic
4.965	59.5	H	-1.8	2.4	11.2	9.0	7.0			Fundamental
9.930	41.8	H	-49.1	3.5	11.9	9.7	-40.7	-33.0	-7.7	2nd Harmonic
14.895	37.6	H	-51.5	4.4	13.5	11.4	-42.4	-33.0	-9.4	3rd Harmonic
High Channel 4980 MHz										
4.980	60.4	V	-1.2	2.4	11.2	9.0	7.6			Fundamental
9.960	41.4	V	-49.4	3.5	11.9	9.7	-41.0	-32.4	-8.6	2nd Harmonic
14.940	37.4	V	-52.4	4.4	13.5	11.4	-43.3	-32.4	-10.9	3rd Harmonic
4.980	60.6	H	-0.6	2.4	11.2	9.0	8.1			Fundamental
9.960	44.0	H	-46.8	3.5	11.9	9.7	-38.4	-31.9	-6.5	2nd Harmonic
14.940	37.9	H	-51.2	4.4	13.5	11.4	-42.1	-31.9	-10.2	3rd Harmonic
No other emissions were detected above system noise floor										

7.4.5. WORST-CASE RADIATED EMISSIONS BELOW 1 GHz

SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, 2 dBi DIPOLE ANTENNA)

10/03/05 **30 - 1000MHz Substitution Measurement**

Compliance Certification Services, Morgan Hill 5m Chamber Site

Test Engr:	Vien Tran
Project #:	05U3569
Company:	Proxim Corp
EUT Descrip.:	4.9 GHz Access Point
EUT M/N:	ORiNOCO AP-4900
Test Target:	FCC Part 90
Mode Oper:	Tx, Worst Case(Mid channel 18.5dBm) with Dipole Antenna (2 dBi)

Test Equipment:

Bilog Antenna	Cable	Pre-amplifer 8447D	Limit
5m Chamber Sunol Bilog	5m Chamber Cable		EIRP

f MHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
43.58	25.7	V	-58.6	1.0	-8.8	-10.9	-70.6	-26.6	-43.9	
70.74	25.7	V	-58.9	1.2	-1.7	-3.8	-63.9	-26.6	-37.3	
114.39	22.7	V	-57.5	1.4	-2.2	-4.4	-63.2	-26.6	-36.6	
198.78	20.2	V	-62.1	1.7	4.2	2.1	-61.7	-26.6	-35.1	
405.39	19.2	V	-57.8	2.4	6.0	3.9	-56.3	-26.6	-29.7	
541.19	18.9	V	-55.7	2.8	6.5	4.3	-54.1	-26.6	-27.5	
967.99	13.0	V	-56.0	3.8	6.9	4.8	-55.0	-26.6	-28.4	
72.68	24.8	H	-62.6	1.2	-1.4	-3.6	-67.3	-42.4	-24.9	
169.68	26.7	H	-55.1	1.6	2.2	0.0	-56.7	-42.4	-14.3	
206.54	27.8	H	-52.4	1.8	5.3	3.1	-51.1	-42.4	-8.7	
235.64	27.8	H	-54.7	1.9	6.0	3.8	-52.8	-42.4	-10.4	
265.71	26.4	H	-54.8	2.0	6.1	3.9	-52.9	-42.4	-10.5	
407.33	22.8	H	-54.3	2.4	6.1	3.9	-52.8	-42.4	-10.4	
790.48	17.8	H	-52.4	3.4	6.7	4.5	-51.2	-42.4	-8.9	

No other emissions were detected above system noise floor

SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, 5 dBi CAR MOUNT ANTENNA)

10/03/05 **30 - 1000MHz Substitution Measurement**

Compliance Certification Services, Morgan Hill 5m Chamber Site

Test Engr: Vien Tran
Project #: 05U3569
Company: Proxim Corp
EUT Descrip.: 4.9 GHz Access Point
EUT M/N: ORiNOCO AP-4900
Test Target: FCC Part 90
Mode Oper: Tx, Worst Case(Low channel 10.5dBm) with Car Mount Antenna (5 dBi)

Test Equipment:

Bilog Antenna	Cable	Pre-amplifer 8447D	Limit
5m Chamber Sunol Bilog	5m Chamber Cable		EIRP

f MHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
30.00	13.7	V	-62.3	0.9	-19.4	-21.5	-84.8	-26.0	-58.8	
43.58	21.0	V	-63.3	1.0	-8.8	-10.9	-75.3	-26.0	-49.3	
114.39	25.8	V	-54.3	1.4	-2.2	-4.4	-60.1	-26.0	-34.1	
528.58	19.8	V	-55.0	2.7	6.4	4.2	-53.5	-26.0	-27.5	
931.13	13.9	V	-55.4	3.7	6.8	4.7	-54.4	-26.0	-28.4	
125.06	26.3	V	-53.5	1.4	-2.3	-4.5	-59.4	-26.0	-33.4	
184.23	29.4	H	-52.8	1.7	3.3	1.2	-53.3	-42.0	-11.3	
191.99	27.4	H	-54.9	1.7	3.8	1.7	-55.0	-42.0	-13.0	
198.78	26.8	H	-55.6	1.7	4.2	2.1	-55.3	-42.0	-13.3	
206.54	27.8	H	-52.3	1.8	5.3	3.1	-51.0	-42.0	-9.0	
266.68	28.1	H	-53.1	2.0	6.0	3.9	-51.1	-42.0	-9.1	
526.64	23.0	H	-52.1	2.7	6.4	4.2	-50.6	-42.0	-8.6	
No other emissions were detected above system noise floor										

SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, 17 dBi SECTOR ANTENNA)

10/03/05 **30 - 1000MHz Substitution Measurement**

Compliance Certification Services, Morgan Hill 5m Chamber Site

Test Engr: Vien Tran
Project #: 05U3569
Company: Proxim Corp
EUT Descrip.: 4.9 GHz Access Point
EUT M/N: ORiNOCO AP-4900
Test Target: FCC Part 90
Mode Oper: Tx, Worst Case(Low channel 10.5dBm) with Sector Antenna (17 dBi)

Test Equipment:

Bilog Antenna	Cable	Pre-amplifer 8447D	Limit
5m Chamber Sunol Bilog	5m Chamber Cable		EIRP

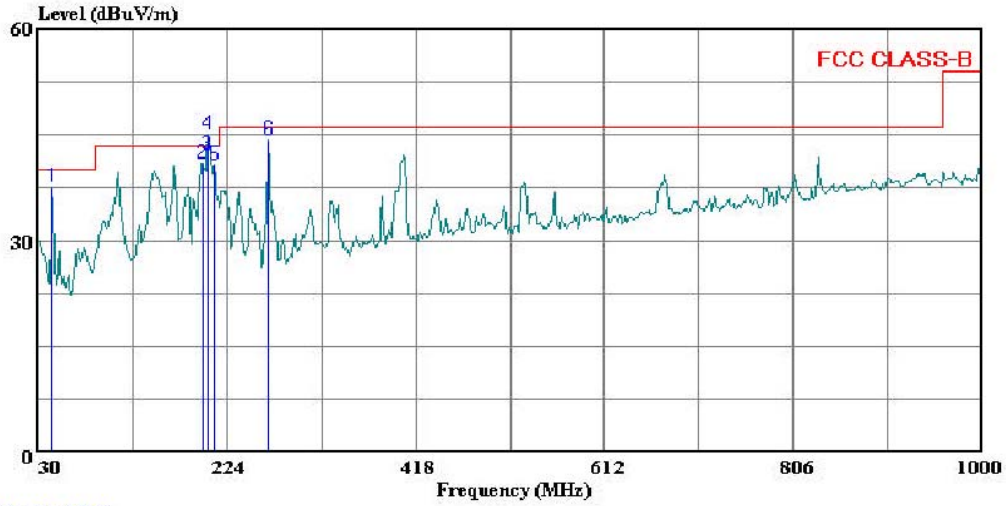
f MHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
30.00	17.3	V	-58.8	0.9	-19.4	-21.5	-81.2	-32.7	-48.5	
43.58	24.1	V	-60.3	1.0	-8.8	-10.9	-72.2	-32.7	-39.5	
51.34	27.1	V	-60.9	1.0	-4.5	-6.7	-68.6	-32.7	-35.9	
114.39	26.5	V	-53.6	1.4	-2.2	-4.4	-59.4	-32.7	-26.7	
150.28	25.3	V	-55.3	1.6	0.4	-1.7	-58.6	-32.7	-25.9	
528.58	21.5	V	-53.3	2.7	6.4	4.2	-51.8	-32.7	-19.1	
43.58	24.5	H	-56.9	1.0	-8.8	-10.9	-68.8	-33.0	-35.8	
198.78	26.6	H	-55.8	1.7	4.2	2.1	-55.4	-33.0	-22.4	
203.63	28.0	H	-51.8	1.8	4.8	2.7	-50.9	-33.0	-17.9	
211.39	27.7	H	-55.5	1.9	5.8	3.6	-53.7	-33.0	-20.7	
266.68	29.8	H	-51.4	2.0	6.0	3.9	-49.5	-33.0	-16.5	
No other emissions were detected above system noise floor										

7.4.6. WORST-CASE DIGITAL DEVICE RADIATED EMISSIONS

HORIZONTAL PLOT

561F Monterey Road
Morgan Hill, CA 95037
Tel: (408) 463-0888
Fax: (408) 463-0885

Data#: 12 File#: 30-1000MHz.EMI Date: 07-14-2005 Time: 08:45:53



Trace: 7 Ref Trace:

Condition: FCC CLASS-B HORIZONTAL
Test Operator : Vien Tran
Project # : 05U3569
Company : Proxim
EUT : 4.9 GHz Access Point
Model No. : ORINOCO AP-4900
Configuration : EUT with Sector Antenna
Target of Test : FCC Class B
Mode of Operation: Tx, worst case (Low ch 10.5dBm)

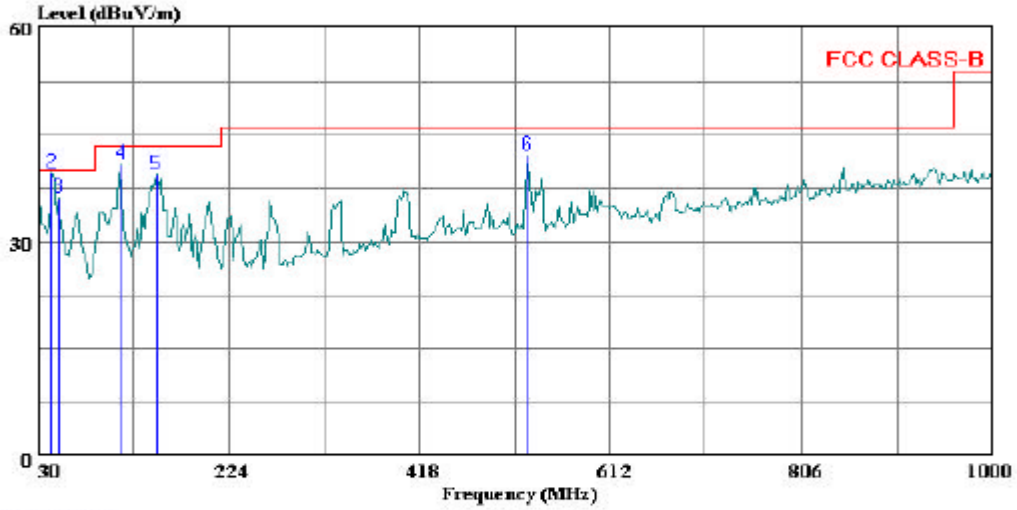
HORIZONTAL DATA

		Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1		43.580	24.52	13.02	37.54	40.00	-2.46	Peak
2		198.780	26.59	14.37	40.96	43.50	-2.54	Peak
3		203.630	28.04	14.01	42.05	43.50	-1.45	QP
4	*	203.630	31.06	14.01	45.07	43.50	1.57	Peak
5		211.390	27.72	12.92	40.64	43.50	-2.86	Peak
6		266.680	29.77	14.45	44.22	46.00	-1.78	Peak

VERTICAL PLOT

561F Monterey Road
Morgan Hill, CA 95037
Tel: (408) 463-0888
Fax: (408) 463-0885

Data#: 6 File#: 30-1000MHz.EMI Date: 07-14-2005 Time: 08:30:01



(Audix ATC)
Trace: 5 Ref Trace:

Condition: FCC CLASS-B VERTICAL
Test Operator: : Vien Tran
Project #: : 05U3569
Company: : Proxim
EUT: : 4.9 GHz Access Point
Model No. : ORINOCO AP-4900
Configuration : EUT with Sector Antenna
Target of Test : FCC Class B
Mode of Operation: Tx, worst case (Low ch 10.5dBm)

VERTICAL DATA

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	30.000	17.25	20.45	37.70	40.00	-2.30	Peak
2	43.580	24.05	13.58	37.63	40.00	-2.37	QP
3	43.580	26.69	13.02	39.71	40.00	-0.29	Peak
4	51.340	27.07	9.05	36.12	40.00	-3.88	Peak
5	114.390	26.53	14.46	40.99	43.50	-2.51	Peak
6	150.280	25.31	14.10	39.41	43.50	-4.09	Peak
7	528.580	21.48	20.63	42.11	46.00	-3.89	Peak

7.5. SPURIOUS EMISSIONS 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 µH/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.

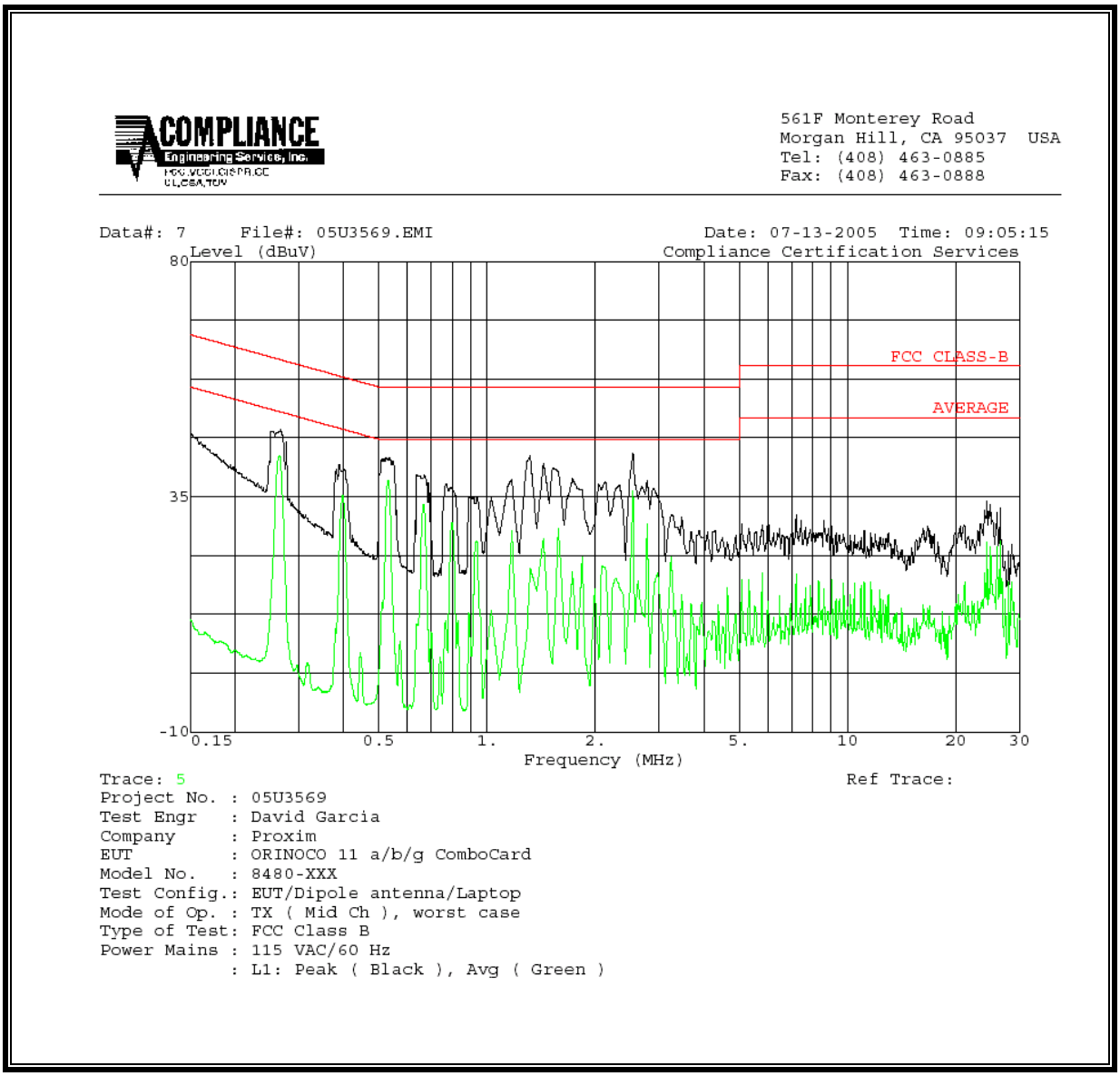
RESULTS

No non-compliance noted:

6 WORST EMISSIONS

CONDUCTED EMISSIONS DATA (115VAC 60Hz)									
Freq.	Reading			Closs	Limit	FCC_B	Margin		Remark
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1 / L2
0.27	47.78	--	--	0.00	61.21	51.21	-13.43	-3.43	L1
1.32	42.82	--	--	0.00	56.00	46.00	-13.18	-3.18	L1
2.54	43.32	--	--	0.00	56.00	46.00	-12.68	-2.68	L1
0.27	46.60	--	--	0.00	61.21	51.21	-14.61	-4.61	L2
1.64	41.84	--	--	0.00	56.00	46.00	-14.16	-4.16	L2
2.54	44.46	--	--	0.00	56.00	46.00	-11.54	-1.54	L2
6 Worst Data									

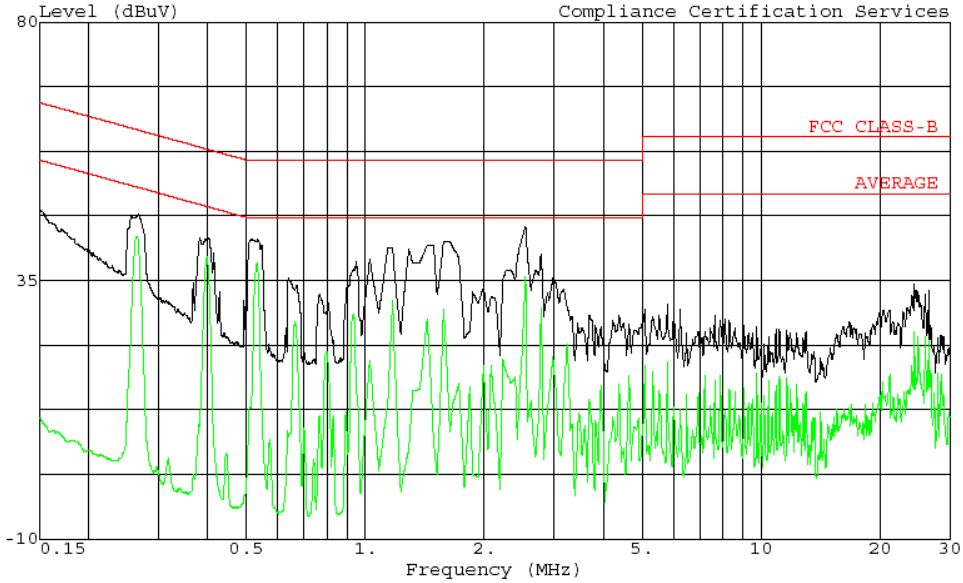
LINE 1 RESULTS



LINE 2 RESULTS

561F Monterey Road
Morgan Hill, CA 95037 USA
Tel: (408) 463-0885
Fax: (408) 463-0888

Data#: 14 File#: 05U3569.EMI Date: 07-13-2005 Time: 09:17:54

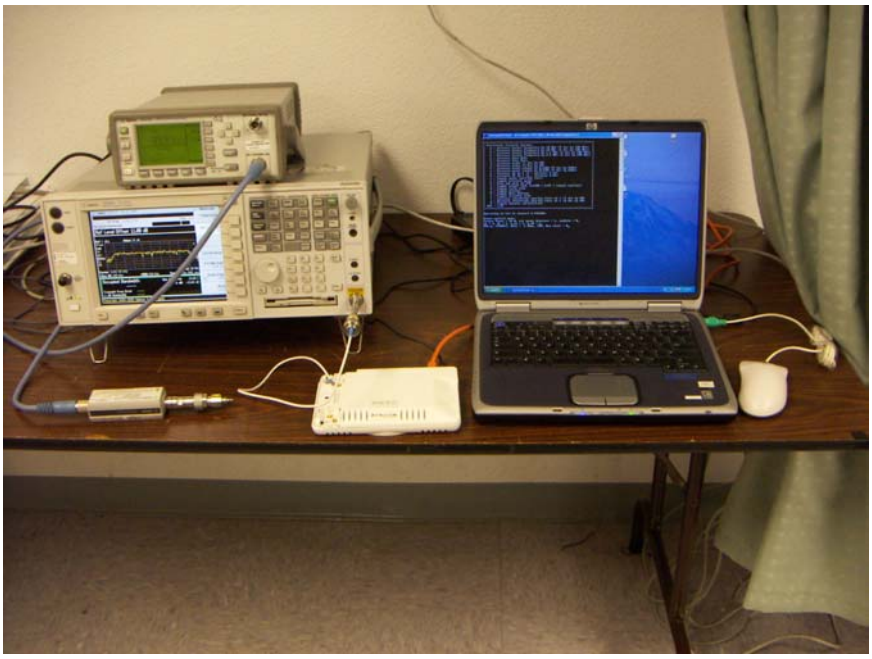


Trace: 12 Ref Trace:
Project No. : 05U3569
Test Engr : David Garcia
Company : Proxim
EUT : ORINOCO 11 a/b/g ComboCard
Model No. : 8480-XXX
Test Config.: EUT/Dipole antenna/Laptop
Mode of Op. : TX (Mid Ch), worst case
Type of Test: FCC Class B
Power Mains : 115 VAC/60 Hz
: L2: Peak (Black), Avg (Green)

8. SETUP PHOTOS

ANTENNA PORT CONDUCTED RF MEASUREMENT SETUP

ANTENNA PORT CONDUCTED PHOTO

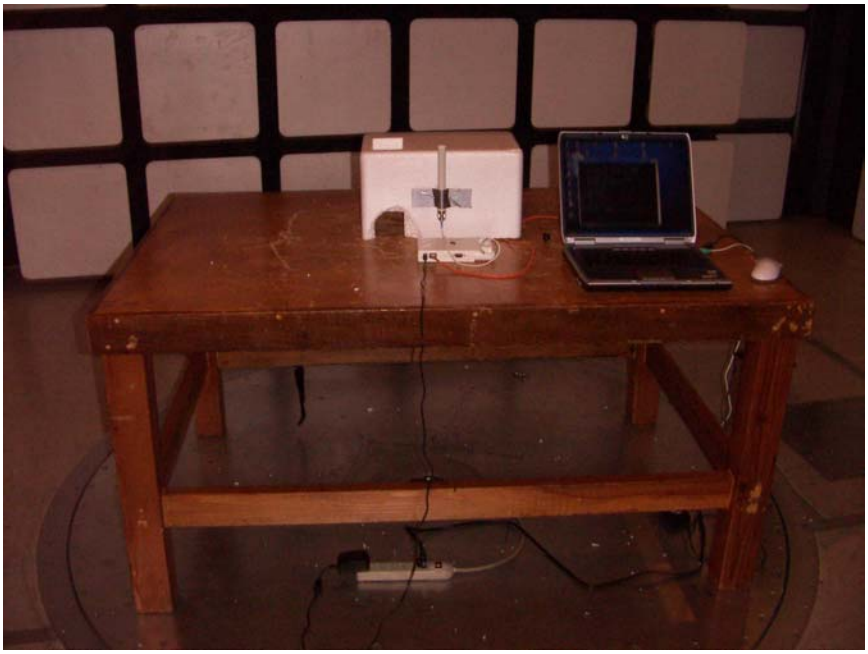


TEMPERATURE CHAMBER MEASUREMENT SETUP

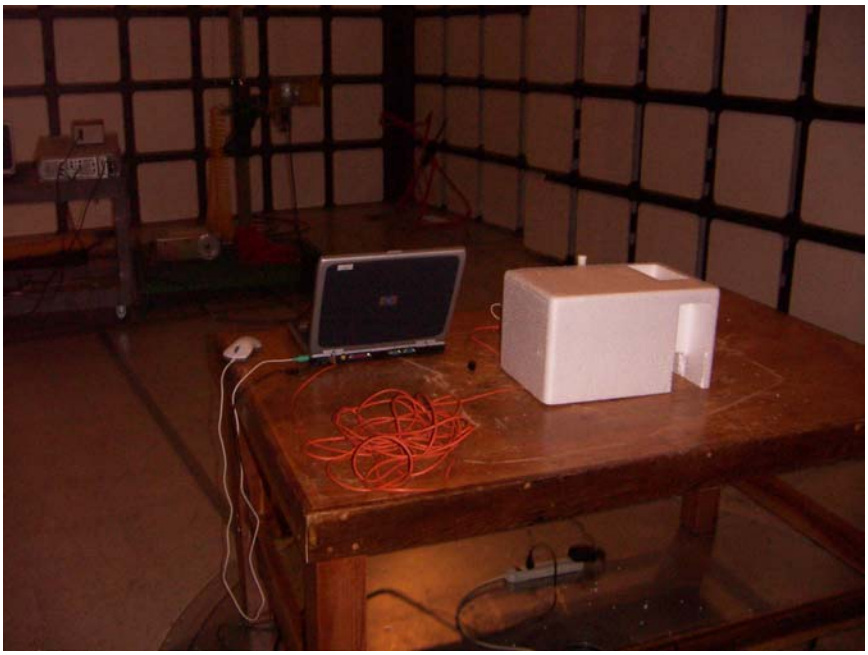
TEMPERATURE CHAMBER PHOTO

RADIATED RF MEASUREMENT SETUP WITH 2 dBi DIPOLE ANTENNA

RADIATED FRONT PHOTO



RADIATED BACK PHOTO



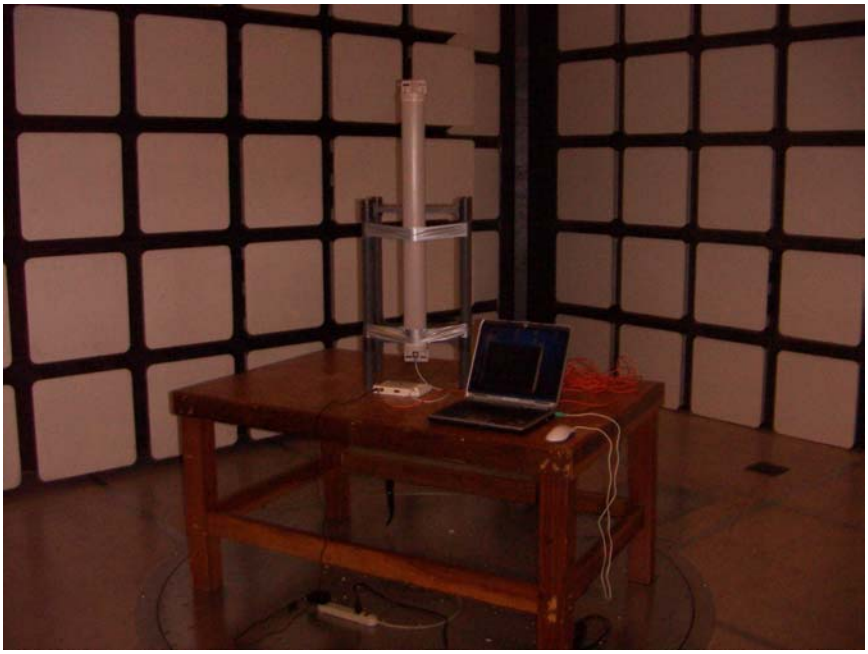
RADIATED RF MEASUREMENT SETUP WITH 5 dBi CAR MOUNT ANTENNA

RADIATED FRONT PHOTO

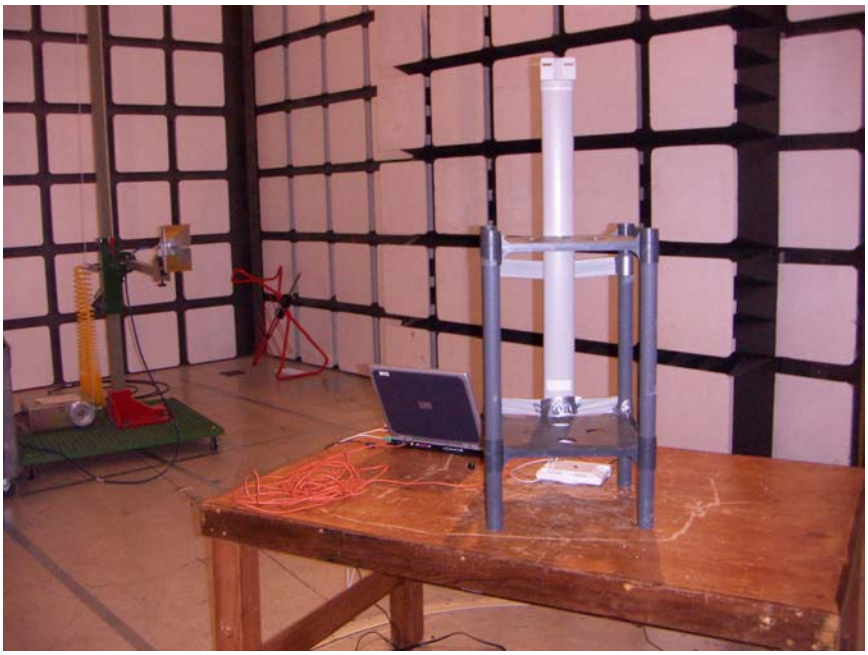
RADIATED BACK PHOTO

RADIATED RF MEASUREMENT SETUP WITH 17 dBi SECTOR ANTENNA

RADIATED FRONT PHOTO



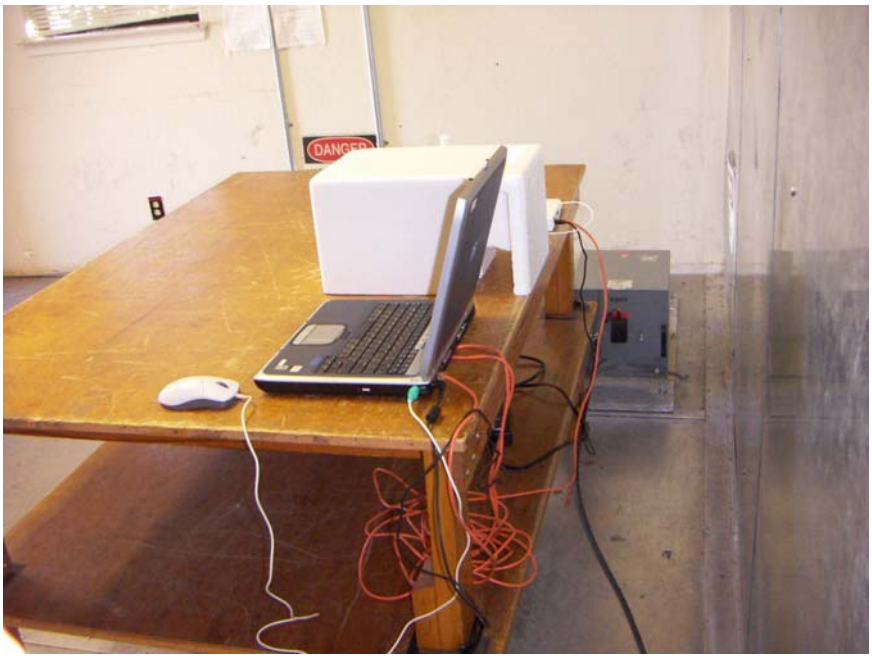
RADIATED BACK PHOTO



POWERLINE CONDUCTED EMISSIONS MEASUREMENT SETUP

LINE CONDUCTED FRONT PHOTO

LINE CONDUCTED BACK PHOTO



END OF REPORT