FCC CFR47 PART 15 SUBPART E CERTIFICATION

TEST REPORT

FOR

802.11a ACCESS POINT

MODEL NUMBER: AP48

FCC ID: LXC-AR5BAP-00048

REPORT NUMBER: 04U2761-1

ISSUE DATE: JULY 9, 2004

Prepared for
DENSO INTERNATIONAL AMERICA, INC.
3252 BUSINESS PARK DRIVE
VISTA, CA 92081, USA

Prepared by
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1. TEST RESULT CERTIFICATION

COMPANY NAME: Denso International America, Inc.
3252 Business Park Drive
Vista, CA, 92081, USA

EUT DESCRIPTION: 802.11a Access Point

MODEL: AP48

DATE TESTED: JUNE 21 - 30, 2004

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
FCC PART 15 SUBPART B	NO NON-COMPLIANCE NOTED
FCC PART 15 SUBPART E	NO NON-COMPLIANCE NOTED

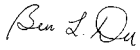
Compliance Certification Services, Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

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

Approved & Released For CCS By:

MIKE HECKROTTE
ENGINEERING MANAGER
COMPLIANCE CERTIFICATION SERVICES

Tested By:



BEN DU
EMC ENGINEER
COMPLIANCE CERTIFICATION SERVICES

2. EUT DESCRIPTION

The EUT is an 802.11a transceiver integrated with an access point, operating in the 5250 to 5350 MHz and 5725 to 5850 MHz bands. It is intended to be used in automotive research applications.

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

Frequency Band (MHz)	Mode	Output Power (dBm)	Output Power (mW)
5280 - 5320	802.11a	19.93	98.40

The radio utilizes two identical external antennas for diversity, each with a maximum gain of 6.75 dBi.

3. TEST METHODOLOGY

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

4. FACILITIES AND ACCREDITATION

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

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

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

5. CALIBRATION AND UNCERTAINTY

5.1. MEASURING INSTRUMENT CALIBRATION

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

5.2. MEASUREMENT UNCERTAINTY

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

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

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

5.3. TEST AND MEASUREMENT EQUIPMENT

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

TEST EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Serial Number**	**Cal Due**
Antenna, Horn 1 ~ 18 GHz	**EMCO**	**3117**	**29301**	**12/26/2004**
Preamplifier, 1 ~ 26 GHz	**Miteq**	**NSP10023988**	**646456**	**4/25/2005**
EMI Test Receiver	**R & S**	**ESIB40**	**100192**	**11/21/2004**
pectrum Analyzer 20 Hz ~ 44 GH	**Agilent**	**E4446A**	**US42070220**	**4/1/2005**
Peak Power Meter	**Agilent**	**E4416A**	**GB41291160**	**11/7/2004**
Peak / Average Power Sensor	**Agilent**	**E9327A**	**US40440755**	**11/7/2004**
30MHz---- 2Ghz	**Sunol Sciences**	**JB1 Antenna**	**A121003**	**12/22/2004**
EMI Receiver, 9 kHz ~ 2.9 GHz	**HP**	**8542E**	**3942A00286**	**11/21/2004**
RF Filter Section	**HP**	**85420E**	**3705A00256**	**11/21/2004**
LISN, 10 kHz ~ 30 MHz	**FCC**	**50/250-25-2**	**114**	**10/13/2004**
LISN, 10 kHz ~ 30 MHz	**Solar**	**8012-50-R-24-BNC**	**8379443**	**10/13/2004**
EMI Test Receiver	**R & S**	**ESHS 20**	**827129/006**	**7/17/2004**
ite A Line Stabilizer / Conditione	**Tripplite**	**LC-1800a**	**A0051681**	**CNR**

6. SETUP OF EQUIPMENT UNDER TEST

SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Laptop PC	HP	ze4101	CN24600011	CRVSA-02T1-75

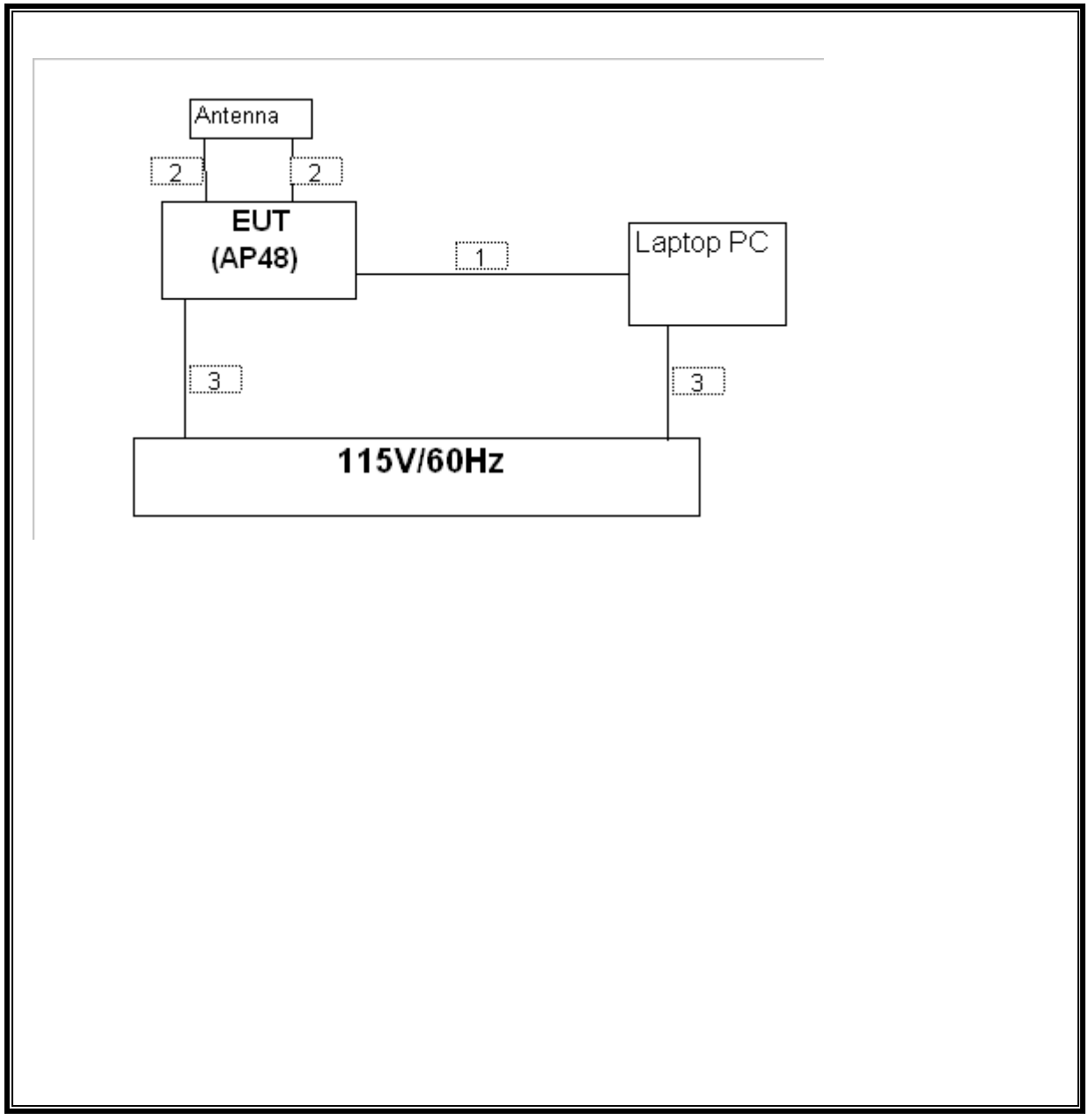
I/O CABLES

Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	I/O	1	RJ45	Un-Shielded	3m	N/A
2	Antenna	2	SMA	Shield	0.3m	to Antenna
3	AC Power	2	US 115V/60Hz	Un-Shielded	2m	

TEST SETUP

The EUT is controlled remotely by a host laptop computer via an ethernet connection. The laptop computer is placed outside the test site. The antennas are mounted on a ground plane to simulate the roof of an automobile. Test software exercised the radio card. All final measurements were made at the lowest data rate, which was determined to be the worst-case during preliminary tests.

SETUP DIAGRAM FOR TESTS



7. APPLICABLE LIMITS AND TEST RESULTS

7.1. EMISSION BANDWIDTH

LIMIT

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

TEST PROCEDURE

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

RESULTS

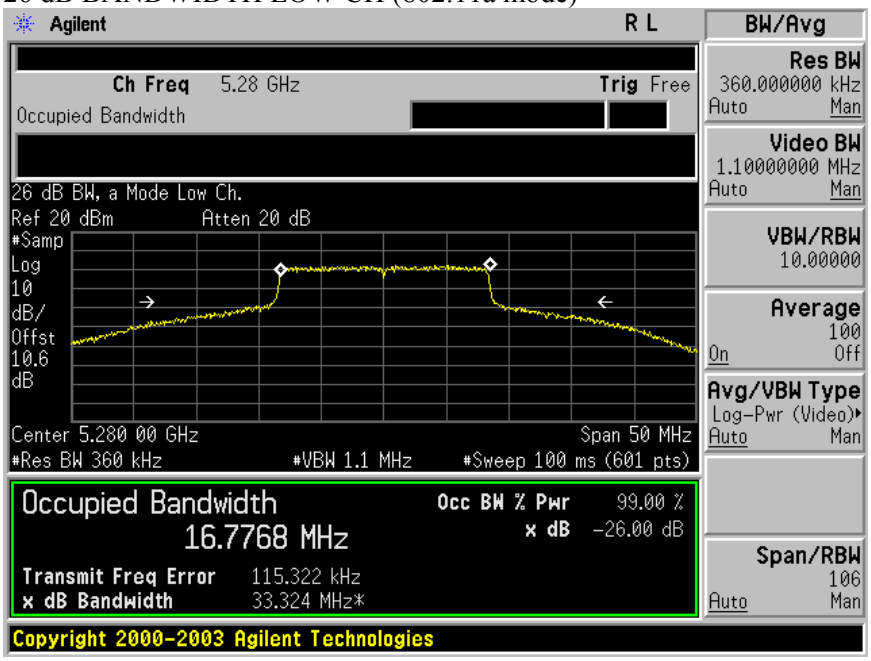
No non-compliance noted:

802.11a Mode

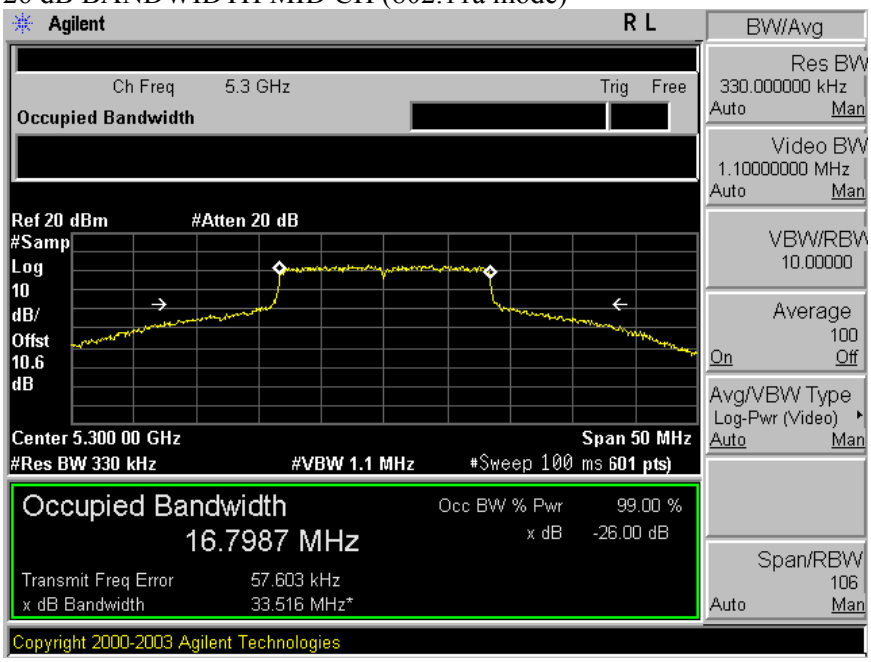
Channel	Frequency (MHz)	B (MHz)	10 Log B (dB)
Low	5280	33.32	15.23
Middle	5300	33.52	15.25
High	5320	34.66	15.40

26 dB EMISSION BANDWIDTH (802.11a MODE)

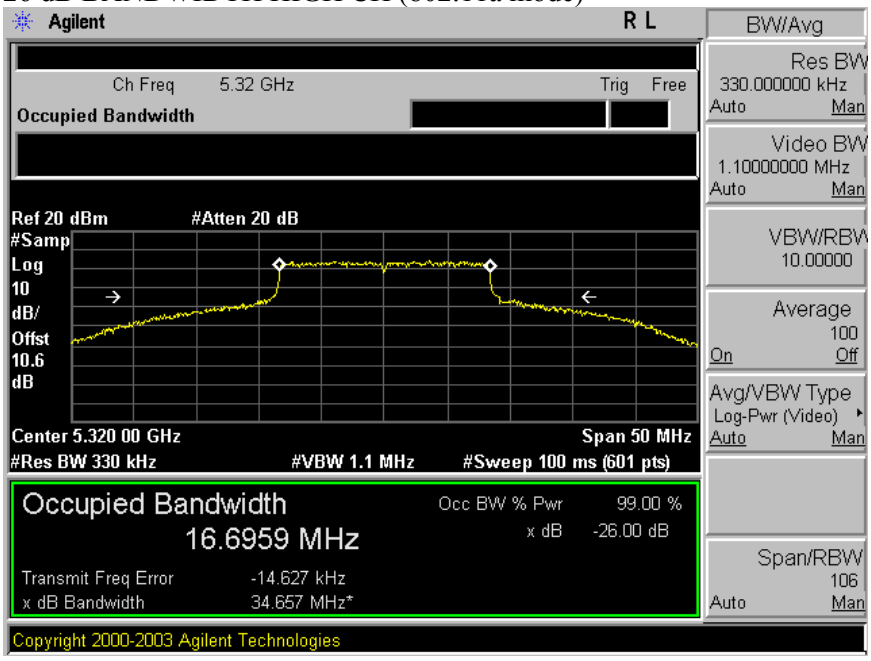
26 dB BANDWIDTH LOW CH (802.11a mode)



26 dB BANDWIDTH MID CH (802.11a mode)



26 dB BANDWIDTH HIGH CH (802.11a mode)



7.2. PEAK POWER

LIMIT

§15.407 (a) (1) For the band 5.25-5.35 GHz, the peak transmit power over the frequency band of operation shall not exceed the lesser of 250 mW (24 dBm) or 11 dBm + 10 log B, where B is the 26-dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 11 dBm in any 1-MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST PROCEDURE

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

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

LIMITS AND RESULTS

No non-compliance noted:

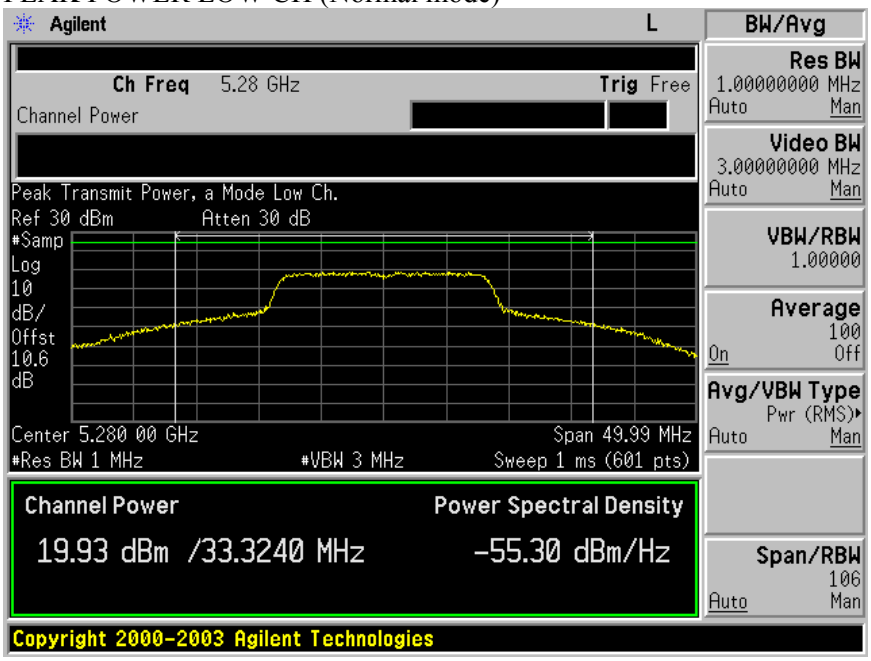
Mode	Frequency (MHz)	Fixed Limit (dBm)	B (MHz)	11 + 10 Log B Limit (dBm)	Antenna Gain (dBi)	Limit (dBm)
802.11a	5280	24	33.32	26.23	6.75	23.25
802.11a	5300	24	33.52	26.25	6.75	23.25
802.11a	5320	24	34.66	26.40	6.75	23.25

802.11a mode Results

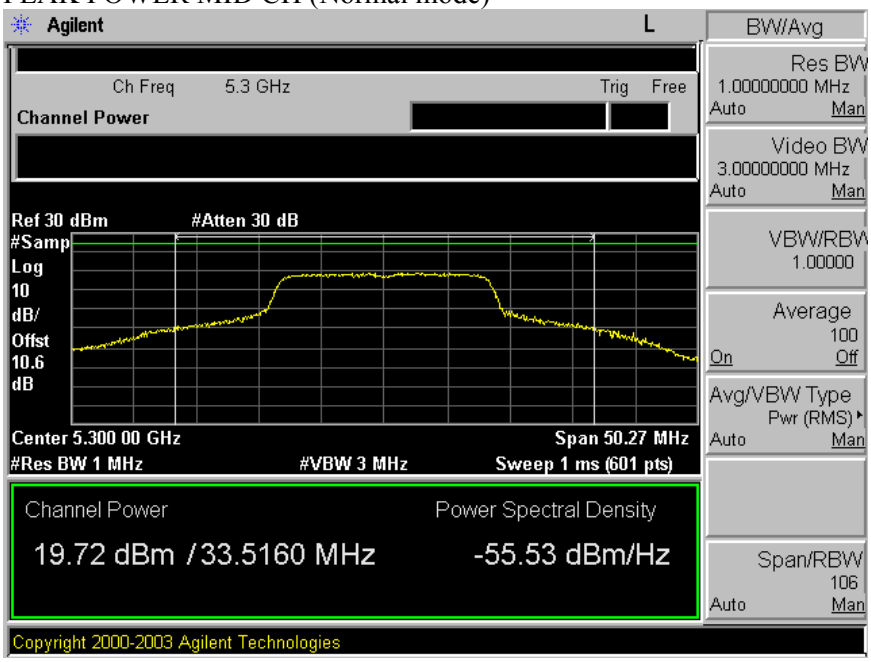
Channel	Frequency (MHz)	Power (dBm)	Limit (dBm)	Margin (dB)
Low	5280	19.93	23.25	-3.32
Middle	5300	19.72	23.25	-3.53
High	5320	15.96	23.25	-7.29

PEAK POWER (NORMAL MODE)

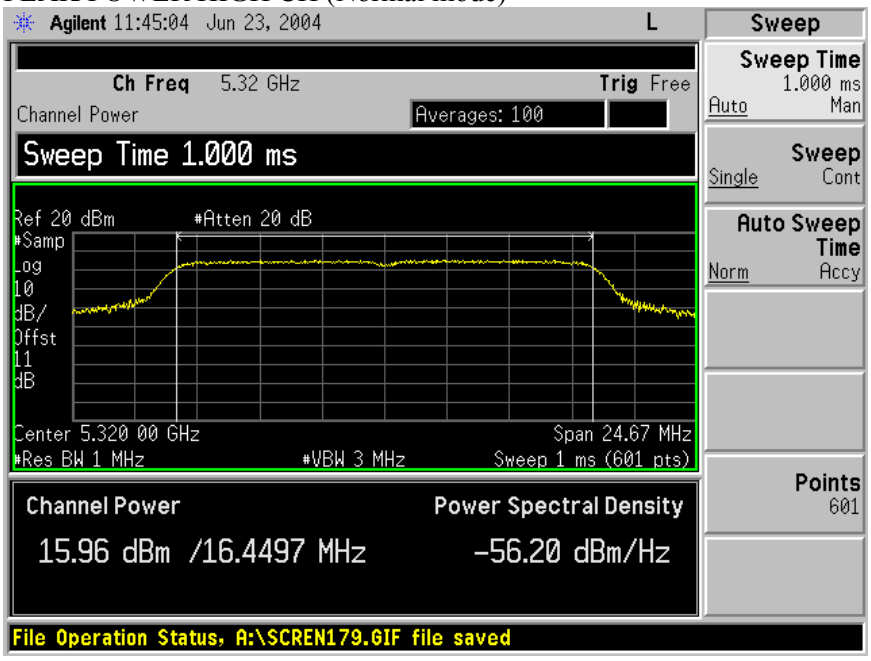
PEAK POWER LOW CH (Normal mode)



PEAK POWER MID CH (Normal mode)



PEAK POWER HIGH CH (Normal mode)



7.3. 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 10.60 dB (including 10 dB pad and 0.6 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

802.11a Mode

Channel	Frequency (MHz)	Average Power (dBm)
Low	5280	19.63
Middle	5300	19.38
High	5320	15.67

7.4. PEAK POWER SPECTRAL DENSITY

LIMIT

§15.407 (a) (1) For the band 5.25-5.35 GHz, the peak transmit power over the frequency band of operation shall not exceed the lesser of 250 mW (24 dBm) or 11 dBm + 10 log B, where B is the 26-dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 11 dBm in any 1-MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

The maximum antenna gain = 6.75 dBi, therefore the PPSD limit is reduced to 10.25 dBm due to excess antenna gain.

TEST PROCEDURE

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

RESULTS

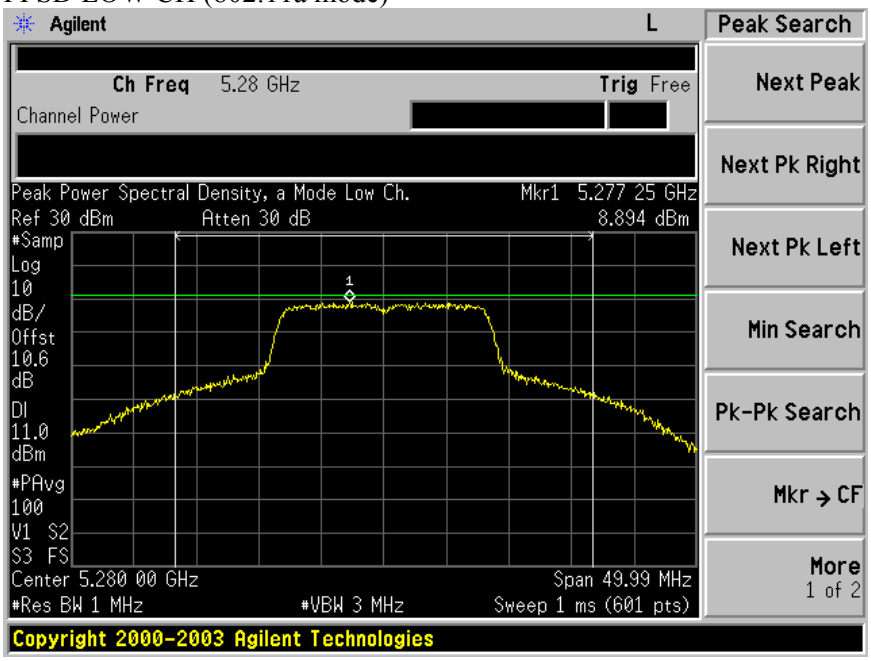
No non-compliance noted:

802.11a Mode

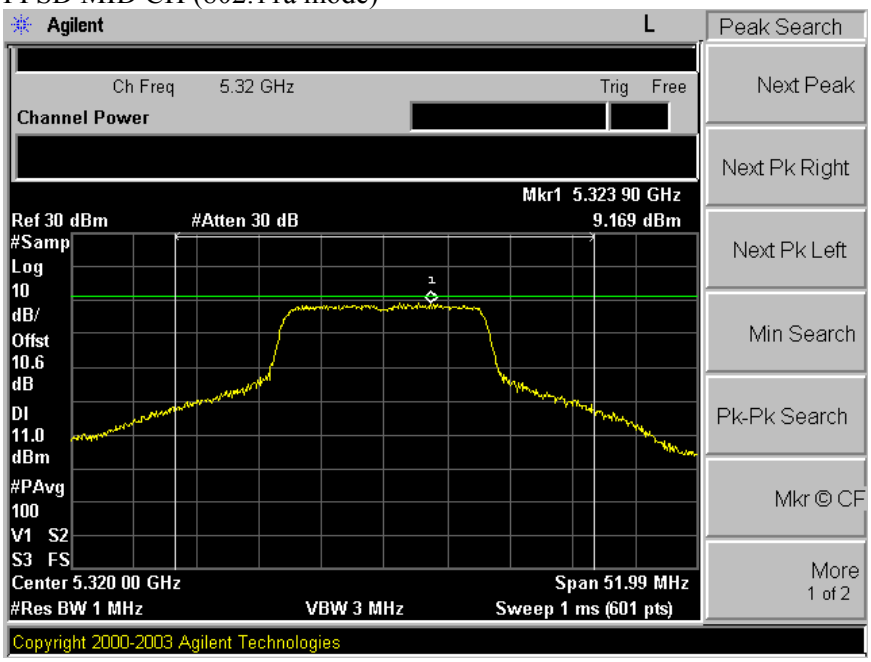
Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
Low	5280	8.89	10.25	-1.36
Middle	5300	9.17	10.25	-1.08
High	5320	5.35	10.25	-4.90

PEAK POWER SPECTRAL DENSITY (802.11a MODE)

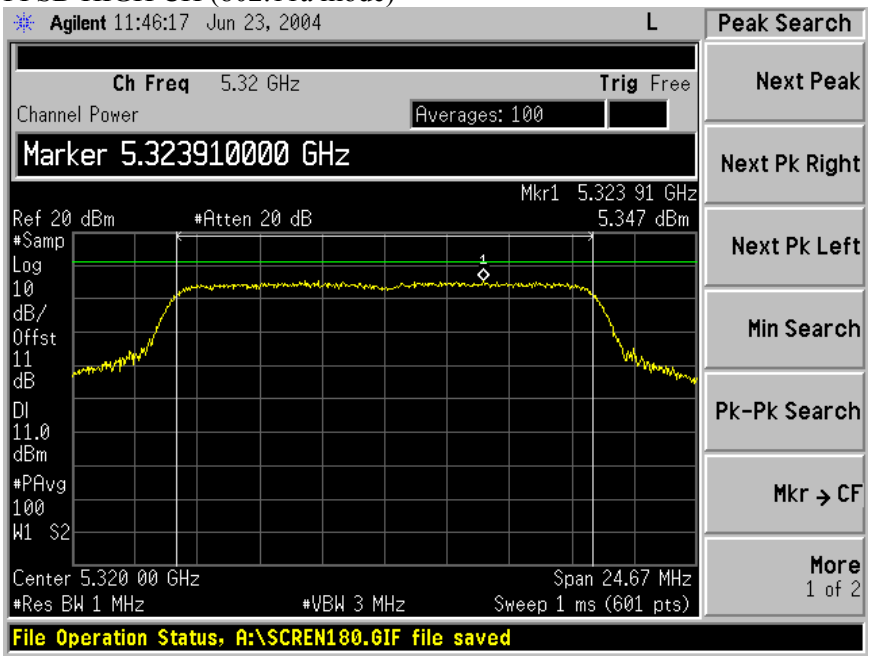
PPSD LOW CH (802.11a mode)



PPSD MID CH (802.11a mode)



PPSD HIGH CH (802.11a mode)



7.5. PEAK EXCURSION

LIMIT

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

TEST PROCEDURE

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

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

RESULTS

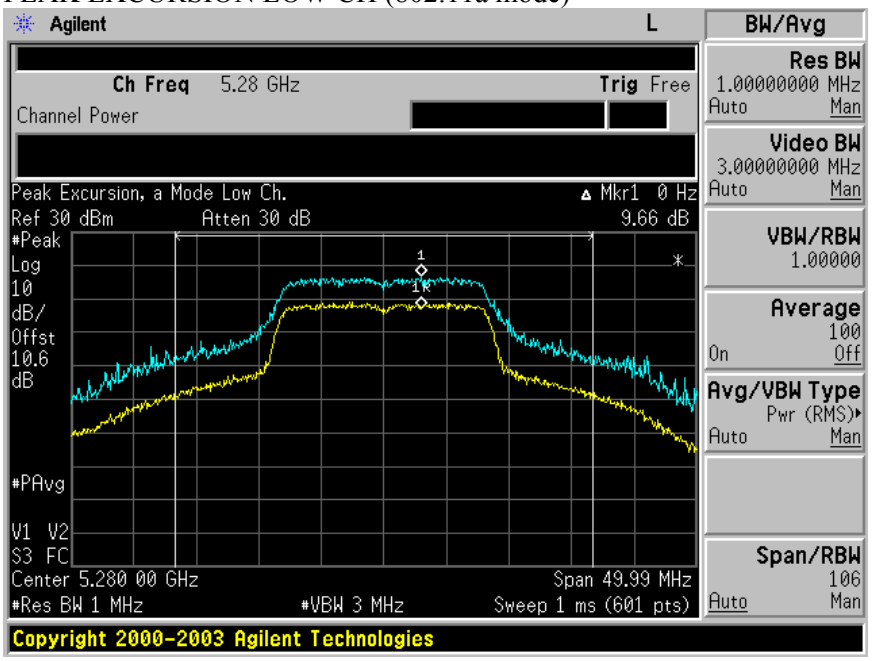
No non-compliance noted:

802.11a Mode

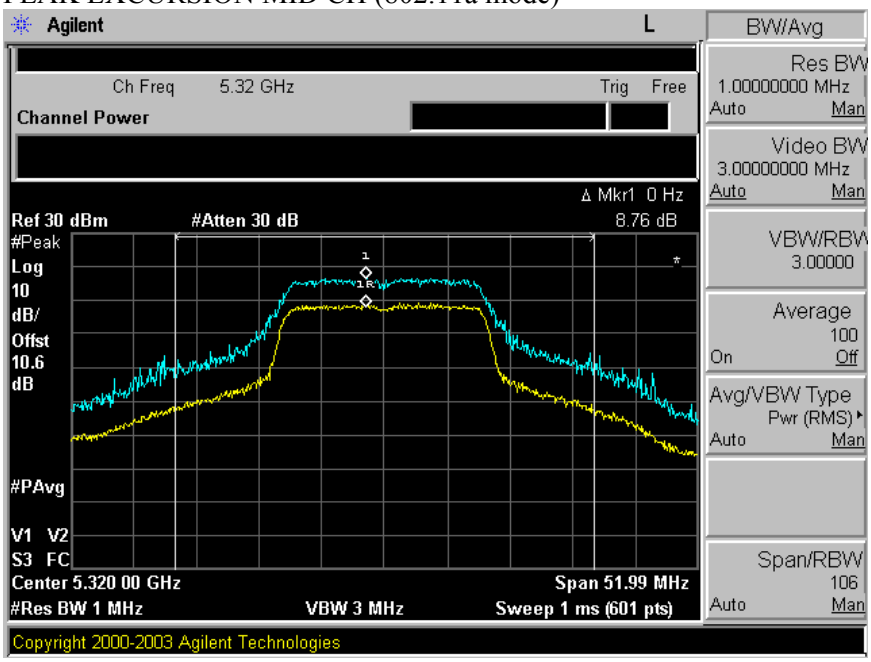
Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5280	9.66	13	-3.34
Middle	5300	8.76	13	-4.24
High	5320	9.21	13	-3.79

PEAK EXCURSION (802.11a MODE)

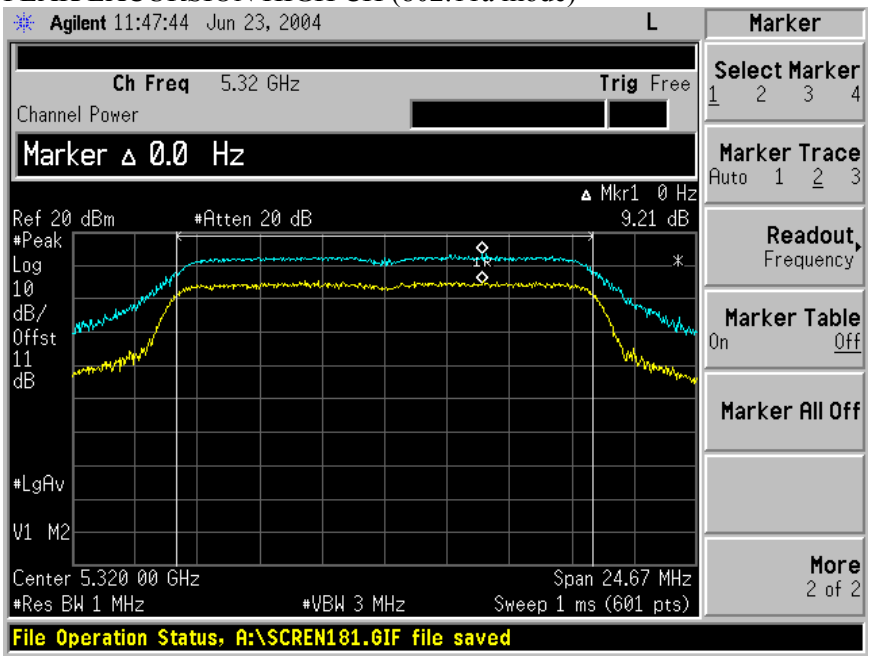
PEAK EXCURSION LOW CH (802.11a mode)



PEAK EXCURSION MID CH (802.11a mode)



PEAK EXCURSION HIGH CH (802.11a mode)



7.6. CONDUCTED SPURIOUS EMISSIONS

LIMITS

§15.407 (b) (2) For transmitters operating in the 5.25-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27dBm / MHz. Devices operating in the 5.25-5.35 GHz band that generate emissions in the 5.15-5.25 GHz band must meet all applicable technical requirements for operation in the 5.15-5.25 GHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of –27 dBm/MHz in the 5.15-5.25 GHz band.

TEST PROCEDURE

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

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

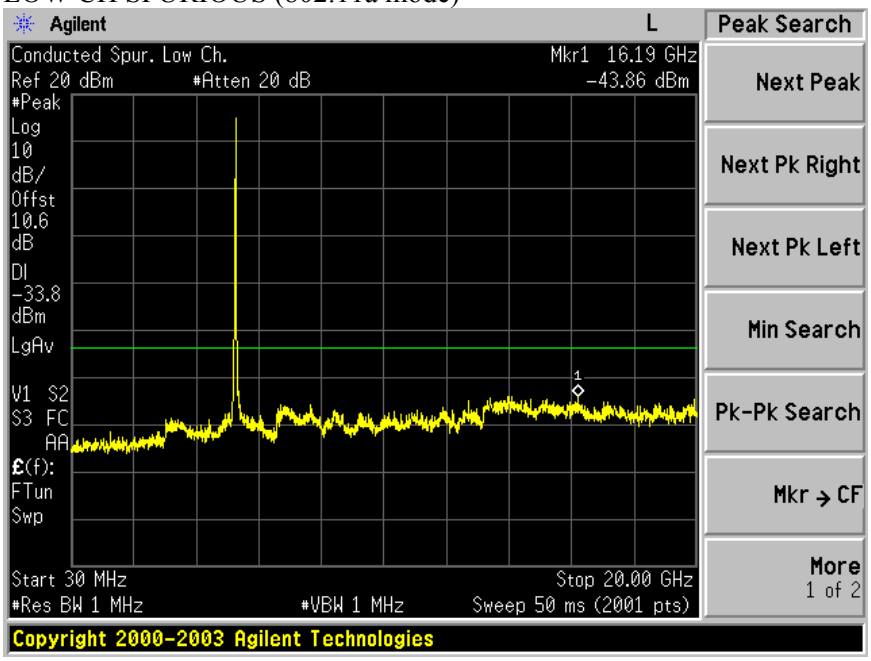
Measurements are made over the 30 MHz to 40 GHz range with the transmitter set to the lowest, middle, and highest channels.

RESULTS

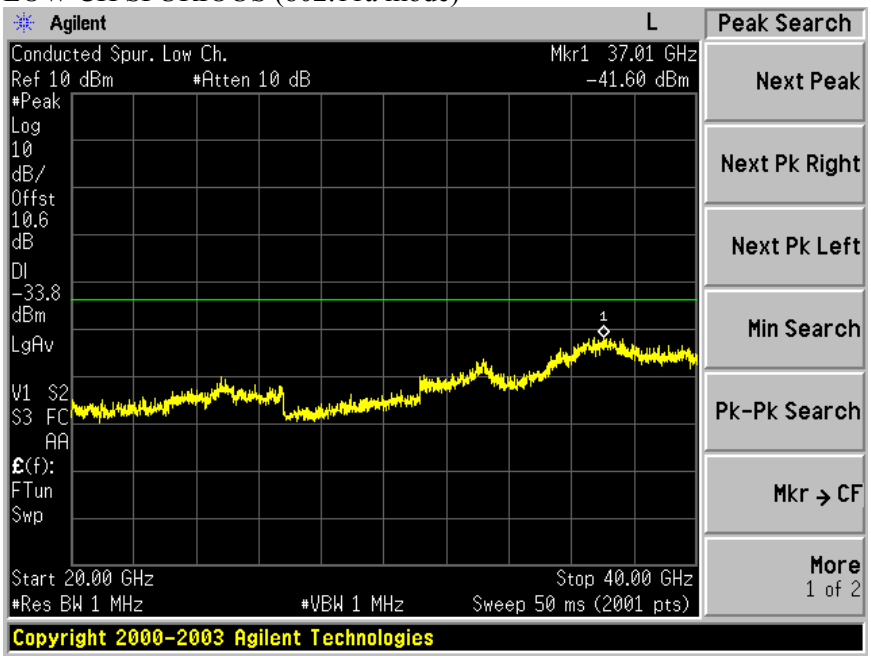
No non-compliance noted:

SPURIOUS EMISSIONS (802.11a MODE)

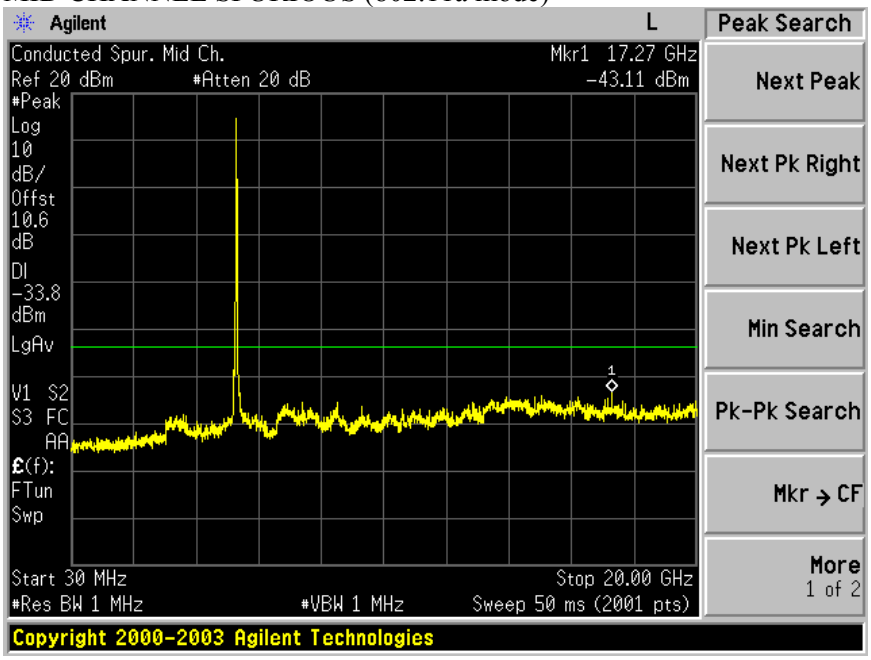
LOW CH SPURIOUS (802.11a mode)



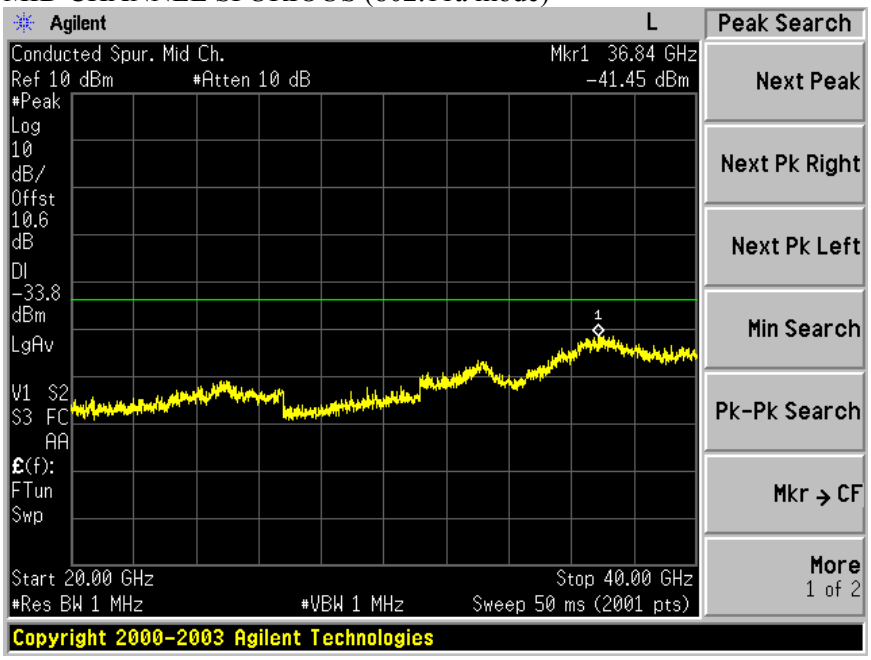
LOW CH SPURIOUS (802.11a mode)



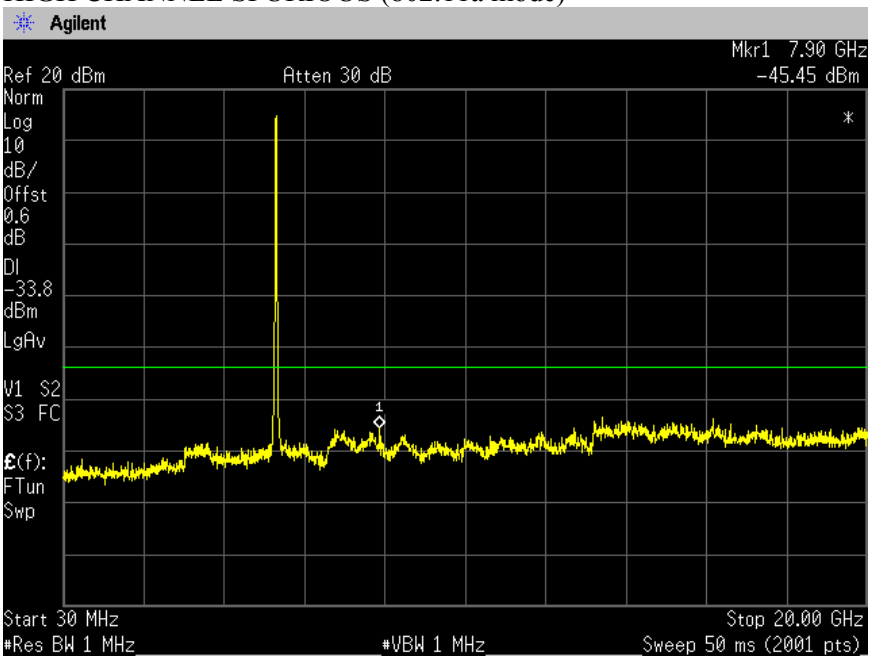
MID CHANNEL SPURIOUS (802.11a mode)



MID CHANNEL SPURIOUS (802.11a mode)



HIGH CHANNEL SPURIOUS (802.11a mode)



HIGH CHANNEL SPURIOUS (802.11a mode)

7.7. RADIATED EMISSIONS

7.7.1. TRANSMITTER RADIATED SPURIOUS EMISSIONS

LIMITS

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

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1]0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	([2])
13.36 - 13.41			

[1] Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.
[2] Above 38.6

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

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

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

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

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

TEST PROCEDURE

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

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

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

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

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

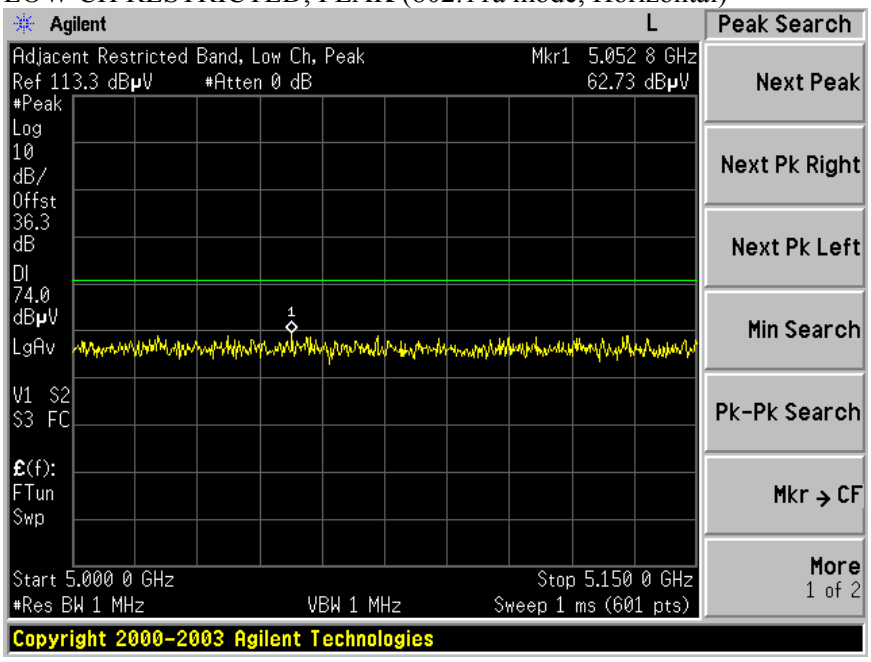
RESULTS

No non-compliance noted:

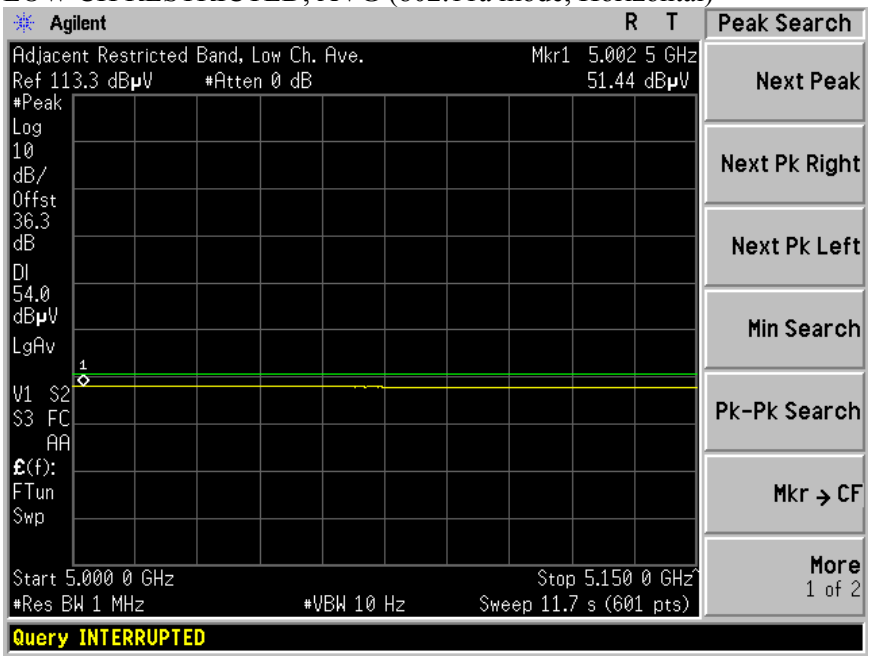
7.7.2. TRANSMITTER RADIATED EMISSIONS ABOVE 1 GHZ

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

LOW CH RESTRICTED, PEAK (802.11a mode, Horizontal)

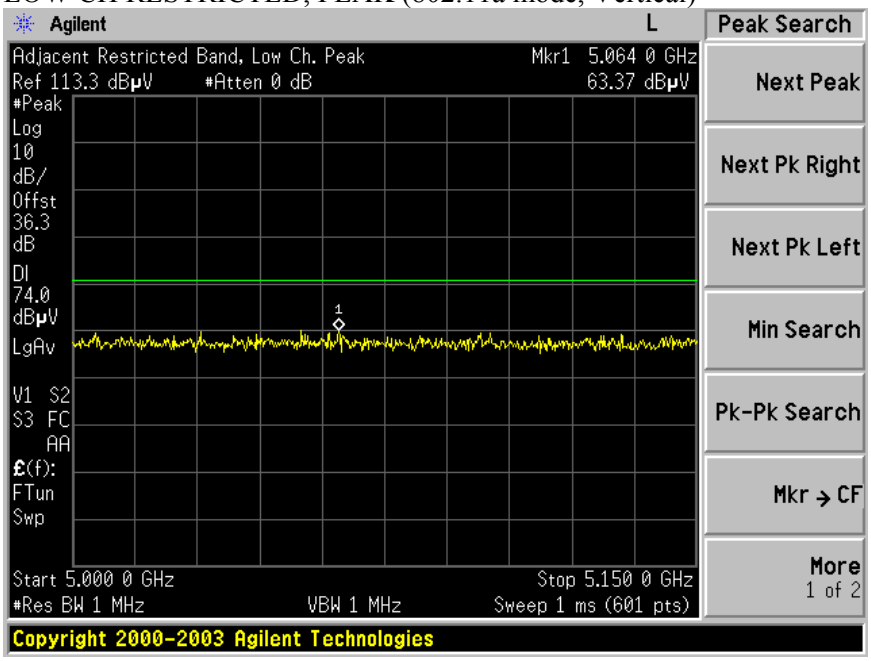


LOW CH RESTRICTED, AVG (802.11a mode, Horizontal)

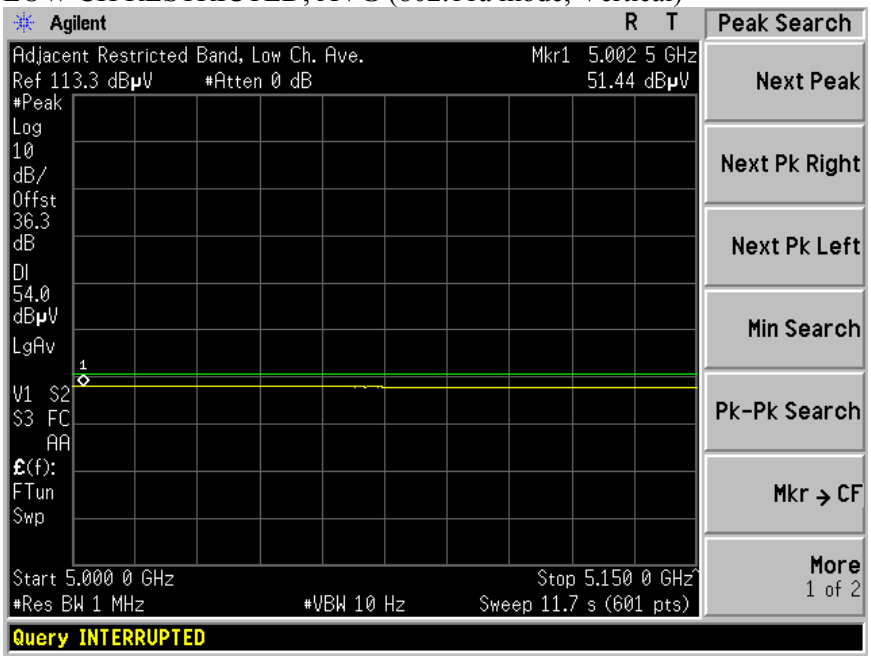


RESTRICTED BANDEDGE (802.11a MODE, LOW CHANNEL, VERTICAL)

LOW CH RESTRICTED, PEAK (802.11a mode, Vertical)

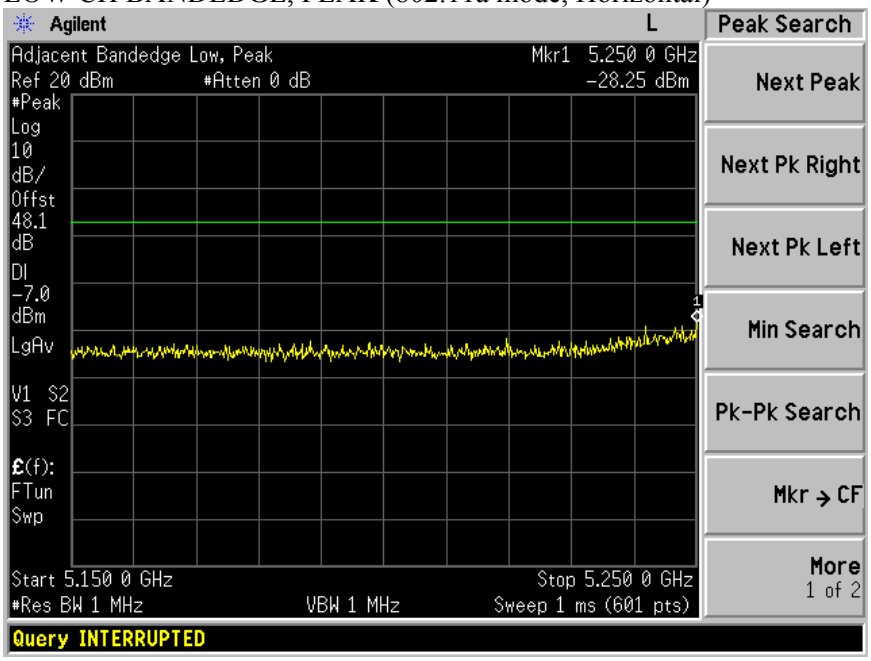


LOW CH RESTRICTED, AVG (802.11a mode, Vertical)

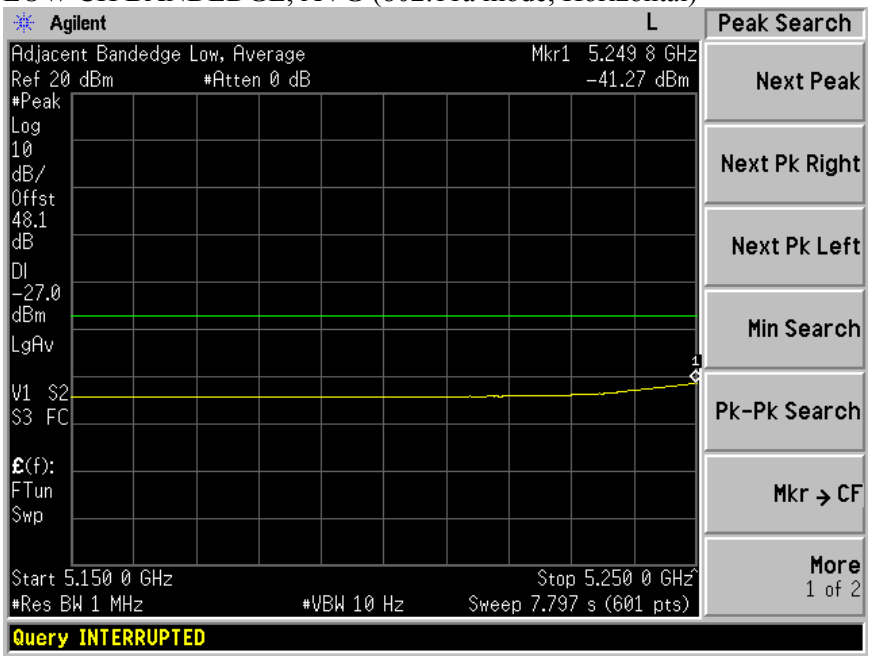


ADJACENT BANDEDGE (802.11a MODE, LOW CHANNEL, HORIZONTAL)

LOW CH BANDEDGE, PEAK (802.11a mode, Horizontal)

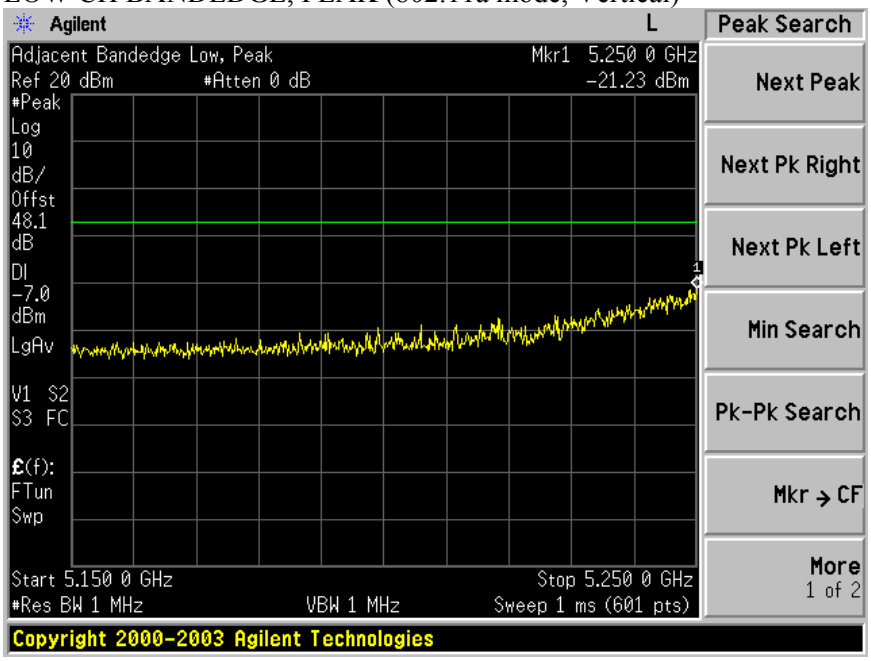


LOW CH BANDEDGE, AVG (802.11a mode, Horizontal)

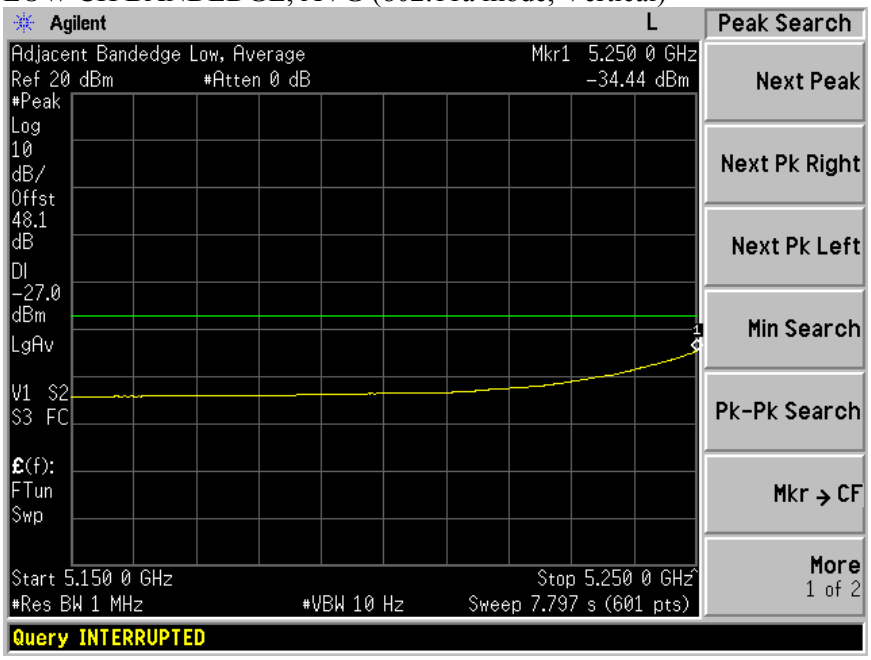


ADJACENT BANDEDGE (802.11a MODE, LOW CHANNEL, VERTICAL)

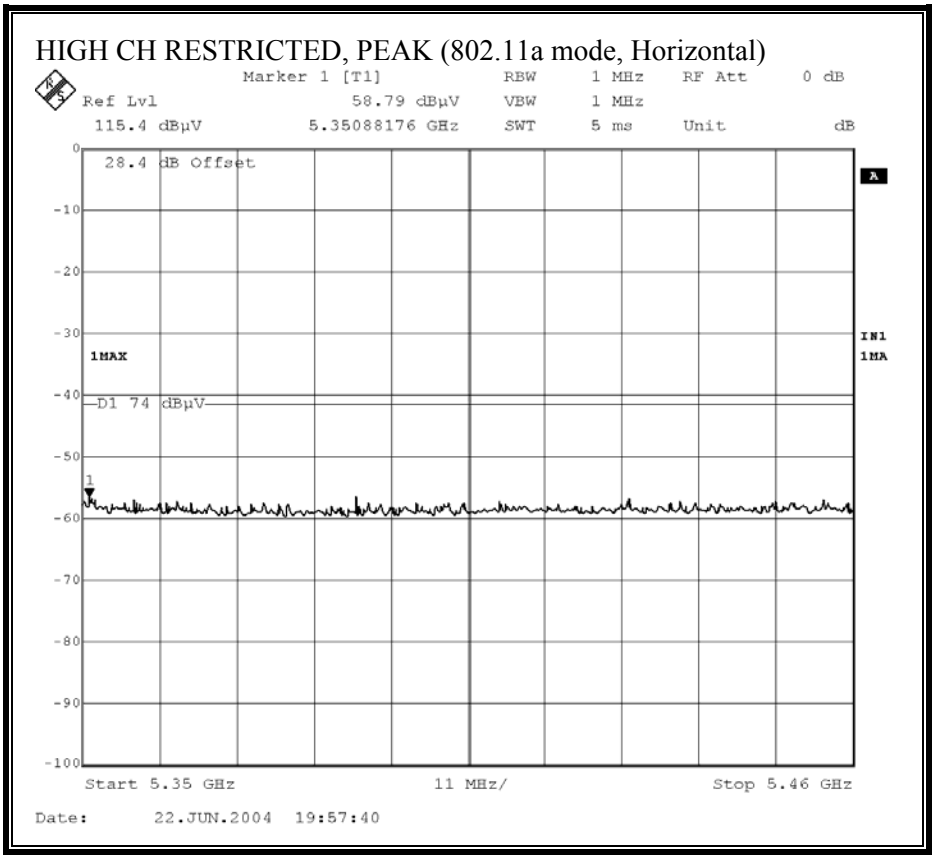
LOW CH BANDEDGE, PEAK (802.11a mode, Vertical)



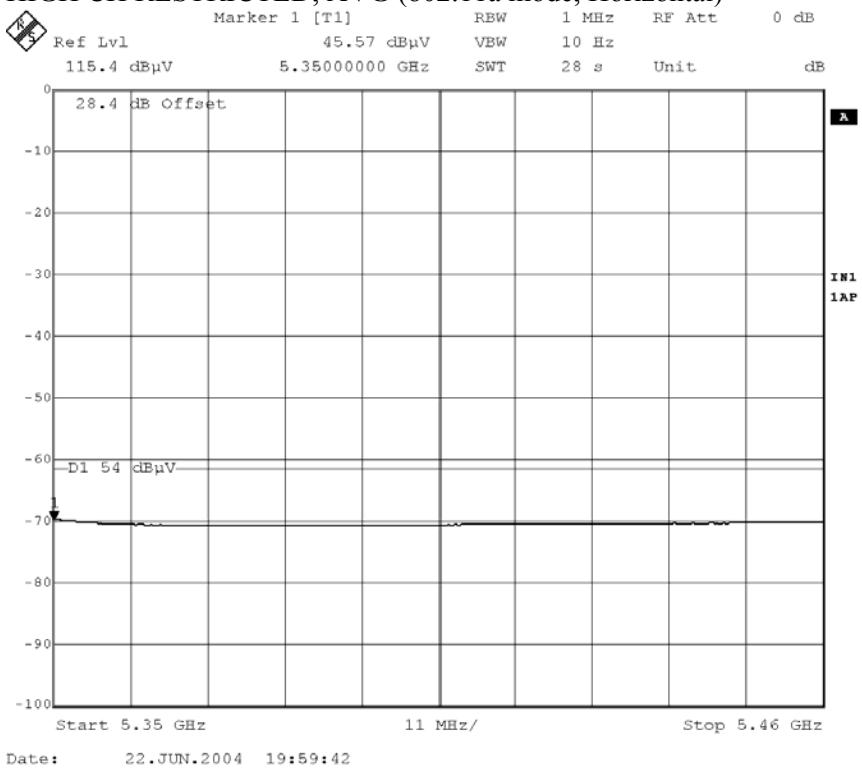
LOW CH BANDEDGE, AVG (802.11a mode, Vertical)



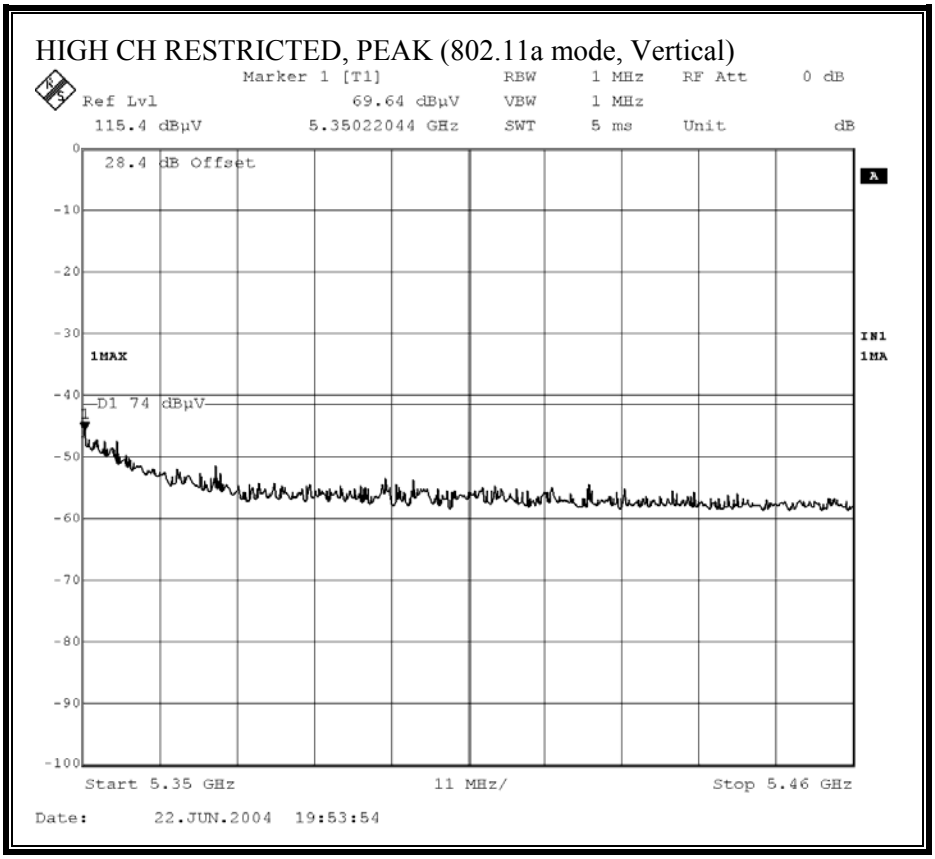
RESTRICTED BANDEDGE (802.11a MODE, HIGH CHANNEL, HORIZONTAL)



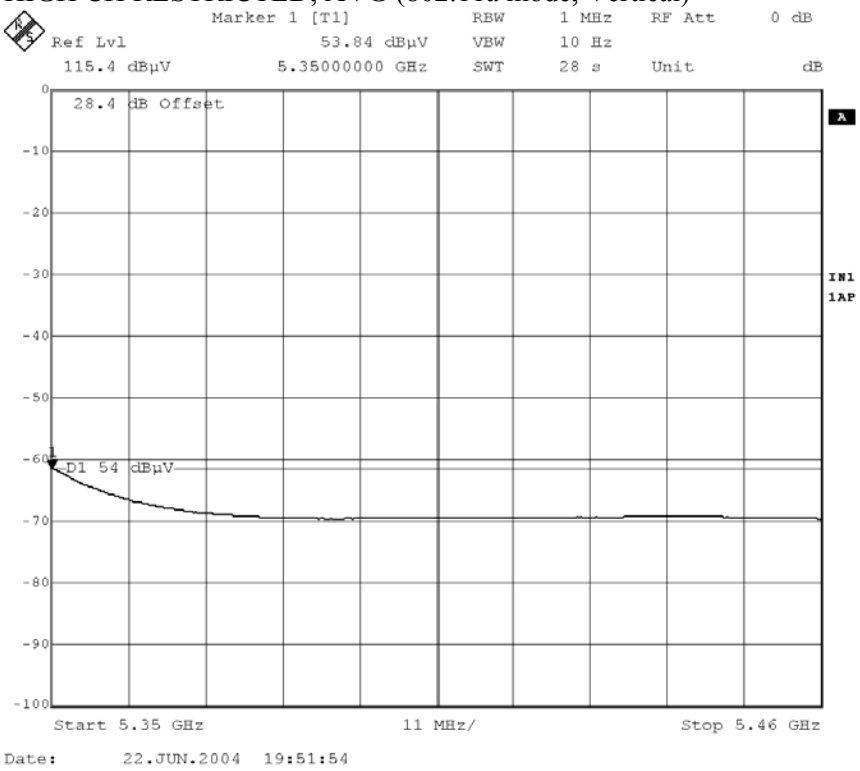
HIGH CH RESTRICTED, AVG (802.11a mode, Horizontal)



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



HIGH CH RESTRICTED, AVG (802.11a mode, Vertical)



HARMONICS AND SPURIOUS EMISSIONS (802.11a MODE)

06/30/04 **High Frequency Measurement**
Compliance Certification Services, Morgan Hill Open Field Site

Test Engr:William Zhuang
Project #:
Company:Denso
EUT Descrip.:
EUT M/N:
Test Target:
Mode Oper:Tx

Test Equipment:

EMCO Horn 1-18GHz	Spectrum Analyzer	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz
T73; S/N: 6717 @3m		T63 Miteq 646456		

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

Peak Measurements:
1 MHz Resolution Bandwidth
1MHz Video Bandwidth

Average Measurements:
1 MHz Resolution Bandwidth
10Hz Video Bandwidth

f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
5280 Low Channel															
4.262	9.8	55.7	40.1	32.8	2.8	-35.4	0.0	1.0	56.8	41.2	74.0	54.0	-17.2	-12.8	V
4.265	9.8	52.7	38.1	32.8	2.8	-35.4	0.0	1.0	53.8	39.2	74.0	54.0	-20.2	-14.8	H
5300 Mid Channel															
10.600	9.8	47.1	35.5	38.3	4.7	-33.5	0.0	1.0	57.6	46.0	74.0	54.0	-16.4	-8.0	V
10.600	9.8	44.4	35.0	38.3	4.7	-33.5	0.0	1.0	54.9	45.5	74.0	54.0	-19.1	-8.5	H
15.900	9.8	55.1	44.1	38.4	5.8	-40.0	0.0	1.0	60.2	49.2	74.0	54.0	-13.8	-4.8	V
15.900	9.8	50.0	36.8	38.4	5.8	-40.0	0.0	1.0	55.1	41.8	74.0	54.0	-18.9	-12.2	H
5320 High Channel															V
10.640	9.8	47.5	34.9	38.3	4.7	-33.5	0.0	1.0	58.0	45.4	74.0	54.0	-16.0	-8.6	V
10.640	9.8	48.2	36.0	38.3	4.7	-33.5	0.0	1.0	58.7	46.5	74.0	54.0	-15.3	-7.5	V
15.960	9.8	54.0	43.2	38.2	5.8	-40.0	0.0	1.0	59.0	48.2	74.0	54.0	-15.0	-5.8	V
15.960	9.8	47.6	35.7	38.2	5.8	-40.0	0.0	1.0	52.6	40.7	74.0	54.0	-21.4	-13.3	H

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

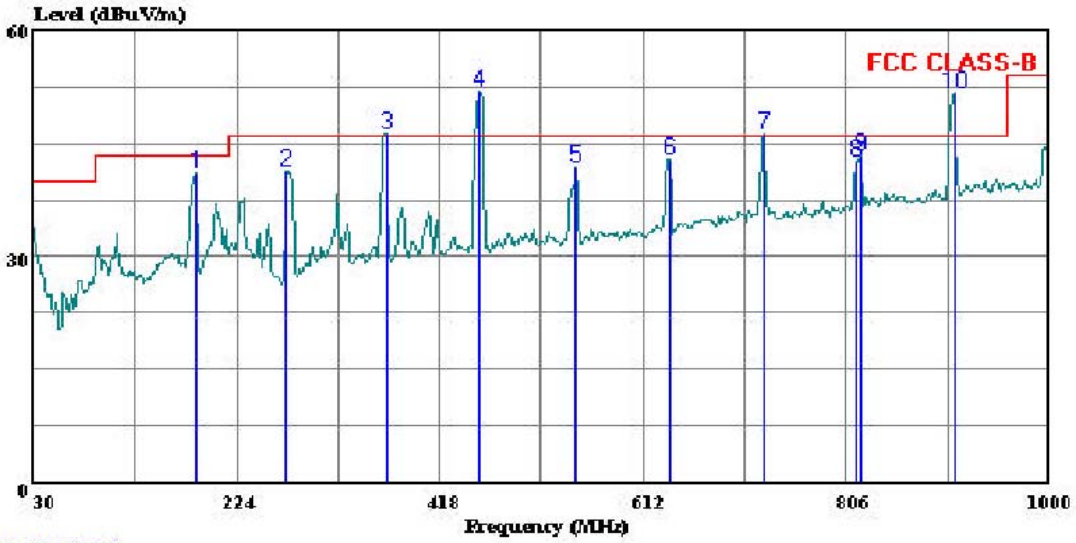
7.7.3. WORST-CASE TRANSMITTER RADIATED EMISSIONS BELOW 1 GHz

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

HORIZONTAL PLOT

COMPLIANCE Engineering Services, Inc.
561F Monterey Road
San Jose, CA 95131
Tel: (408) 463-0888
Fax: (408) 463-0885

Data#: 14 File#: 04u2761.emi Date: 06-22-2004 Time: 15:56:38



(Audix ATC)

Trace: 5 Ref Trace:

Condition: 3m HORIZONTAL
Test Operator: : Ben Du
Project #: : 04U2761
Company: : Denso
EUT: : 11a AP
Model No: : AP48
Configuration: : EUT w/IBM Laptop
Target of Test: : FCC Class B
Mode of Operation: TX.
: Emissions 3, 4, 7, & 10 are not from the
: radio.These are from the digital device.

HORIZONTAL DATA

	Freq	Remark	Read Level	Factor	Level	Limit Line	Over Limit
	MHz		dBuV	dB	dBuV/m	dBuV/m	dB
1	184.230	Peak	27.97	12.94	40.91	43.50	-2.59
2	271.530	Peak	26.10	15.15	41.25	46.00	-4.75
5	547.980	Peak	20.75	20.95	41.70	46.00	-4.30
6	638.190	Peak	20.36	22.61	42.97	46.00	-3.03

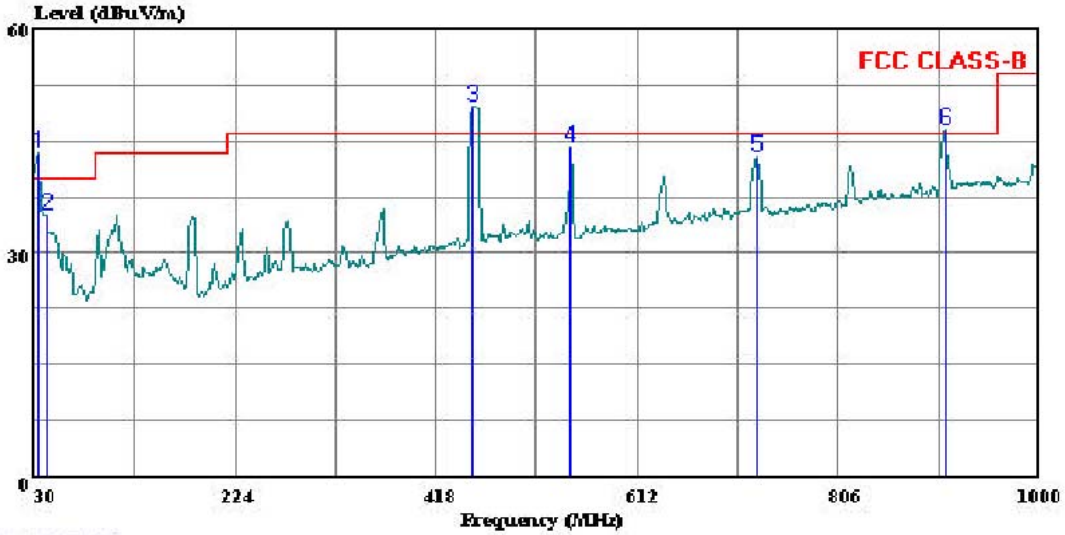
	Freq	Remark	Read Level	Factor	Level	Limit Line	Over Limit
	MHz		dBuV	dB	dBuV/m	dBuV/m	dB
8	814.730	Peak	17.45	25.14	42.59	46.00	-3.41
9	819.580	Peak	18.26	25.19	43.45	46.00	-2.55

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

VERTICAL PLOT

COMPLIANCE Engineering Service, Inc.
561F Monterey Road
San Jose, CA 95131
Tel: (408) 463-0888
Fax: (408) 463-0885

Data#: 15 File#: 04u2761.emi Date: 06-22-2004 Time: 16:03:25



Trace: 16 Ref Trace:

Condition: 3m VERTICAL
Test Operator: : Ben Du
Project #: : 04U2761
Company: : Denso
EUT: : 11a AP
Model No: : AP48
Configuration: : EUT w/IBM Laptop
Target of Test: : FCC Class B
Mode of Operation: TX.
: Emissions 1, 3 & 6 are not from the
: radio.These are from the digital device.

VERTICAL DATA

	Freq	Remark	Read Level	Factor	Level	Limit Line	Over Limit
	MHz		dBuV	dB	dBuV/m	dBuV/m	dB
2	41.640	Peak	19.35	15.74	35.09	40.00	-4.91
4	547.980	Peak	23.13	20.95	44.08	46.00	-1.92
5	727.430	Peak	18.61	24.22	42.83	46.00	-3.17

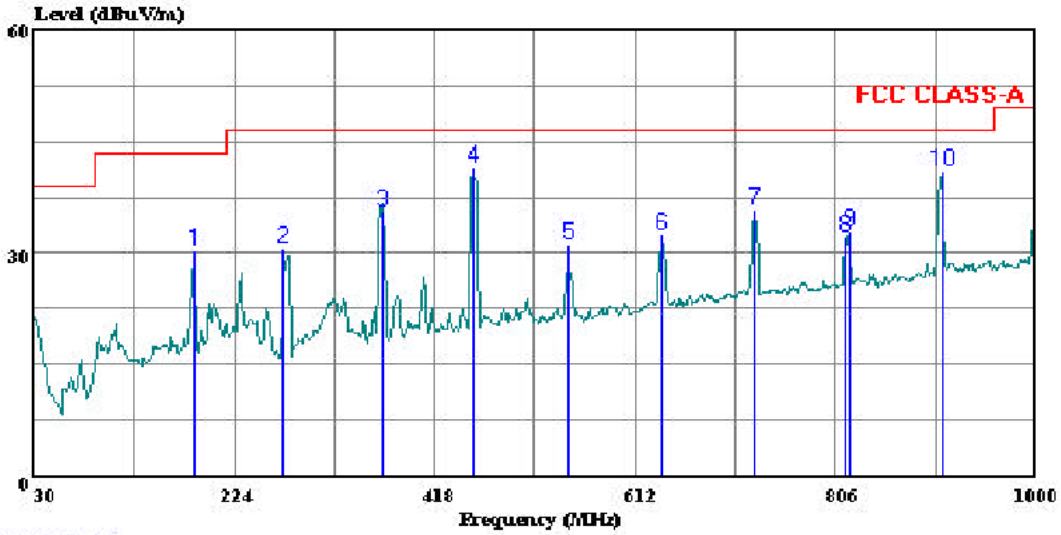
7.7.4. WORST-CASE DIGITAL DEVICE RADIATED EMISSIONS

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

HORIZONTAL PLOT

COMPLIANCE Engineering Service, Inc.
561F Monterey Road
San Jose, CA 95131
Tel: (408) 463-0888
Fax: (408) 463-0885

Data#: 18 File#: 04u2761.emi Date: 06-22-2004 Time: 15:56:38



(Audix ATC)

Trace: 17 Ref Trace:

Condition: 3m HORIZONTAL
Test Operator: : Ben Du
Project #: : 04U2761
Company: : Denso
EUT: : 11a AP
Model No: : AP48
Configuration: : EUT w/IBM Laptop
Target of Test: : FCC Class A
Mode of Operation: Access Point

HORIZONTAL DATA

	Freq	Remark	Read Level	Factor	Level	Limit Line	Over Limit
	MHz		dBuV	dB	dBuV/m	dBuV/m	dB
1	184.230	Peak	17.47	12.94	30.41	43.50	-13.09
2	271.530	Peak	15.60	15.15	30.75	46.40	-15.65
3	366.590	Peak	18.27	17.35	35.62	46.40	-10.78
4	455.830	Peak	21.87	19.59	41.46	46.40	-4.94
5	547.980	Peak	10.25	20.95	31.20	46.40	-15.20
6	638.190	Peak	9.86	22.61	32.47	46.40	-13.93
7	727.430	Peak	11.54	24.22	35.76	46.40	-10.64
8	814.730	Peak	6.95	25.14	32.09	46.40	-14.31

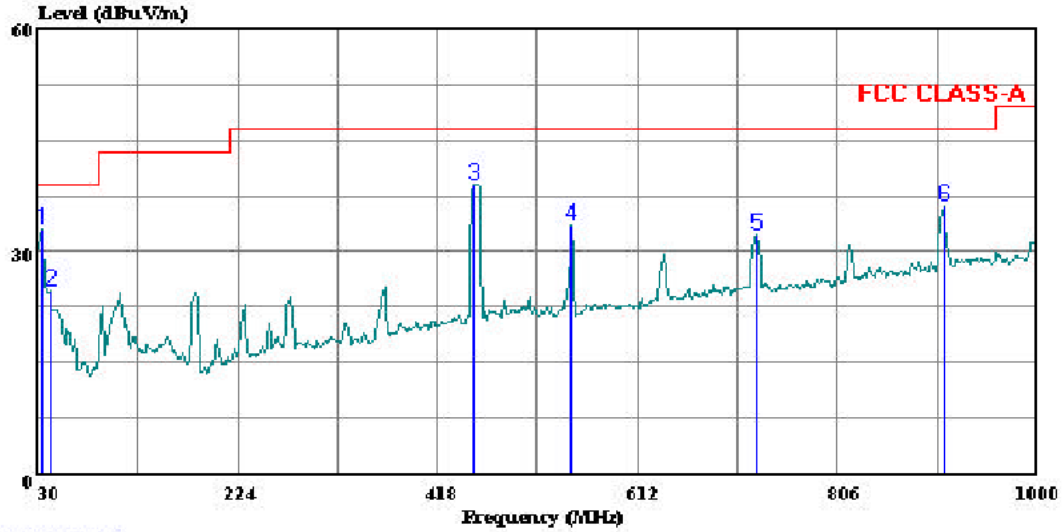
	Freq	Remark	Read Level	Factor	Level	Limit Line	Over Limit
	MHz		dBuV	dB	dBuV/m	dBuV/m	dB
9	819.580	Peak	7.76	25.19	32.95	46.40	-13.45
10	909.790	Peak	14.71	26.42	41.13	46.40	-5.27

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

VERTICAL PLOT

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

Data#: 19 File#: 04u2761.emi Date: 06-22-2004 Time: 16:03:25



(Audix A TC)

Trace: 20 Ref Trace:

Condition: 3m VERTICAL
Test Operator: : Ben Du
Project #: : 04U2761
Company: : Denso
EUT: : 11a AP
Model No: : AP48
Configuration: : EUT w/IBM Laptop
Target of Test: : FCC Class A
Mode of Operation: Access Point

VERTICAL DATA

	Freq	Remark	Read Level	Factor	Level	Limit Line	Over Limit
	MHz		dBuV	dB	dBuV/m	dBuV/m	dB
1	33.880	Peak	12.20	20.70	32.90	39.00	-6.10
2	41.640	Peak	8.85	15.74	24.59	39.00	-14.41
3	453.890	Peak	19.54	19.52	39.06	46.40	-7.34
4	547.980	Peak	12.63	20.95	33.58	46.40	-12.82
5	727.430	Peak	8.11	24.22	32.33	46.40	-14.07
6	909.790	Peak	9.61	26.42	36.03	46.40	-10.38

7.8. 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:

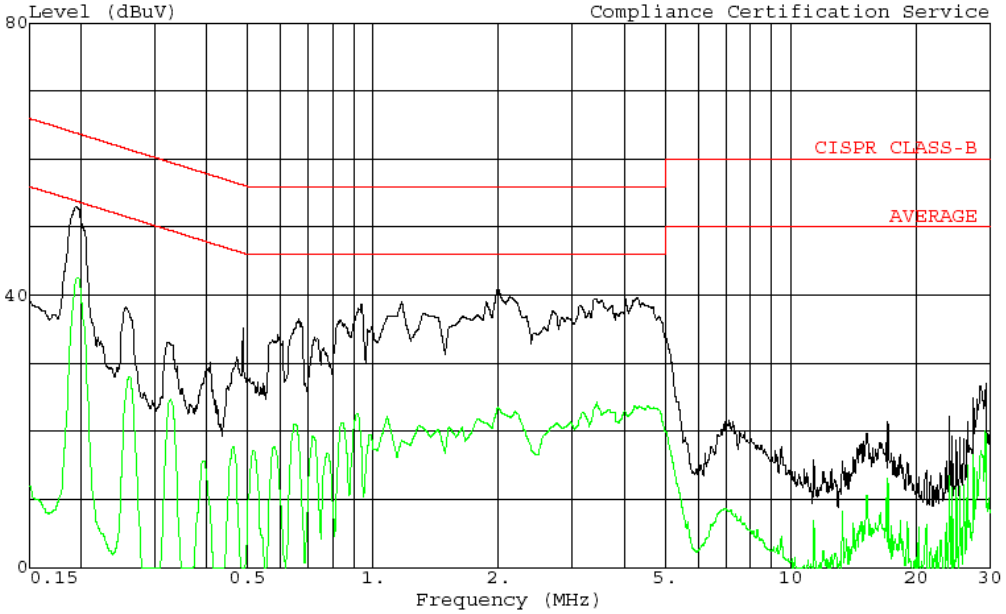
6 WORST EMISSIONS

CONDUCTED EMISSIONS DATA (115VAC 60Hz)									
Freq.	Reading			Closs	Limit	EN_B	Margin		Remark
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1 / L2
0.20	52.68	--	--	0.00	64.63	54.63	-11.95	-1.95	L1
1.99	41.22	--	--	0.00	56.00	46.00	-14.78	-4.78	L1
4.29	39.66	--	--	0.00	56.00	46.00	-16.34	-6.34	L1
0.19	54.72	--	42.90	0.00	64.91	54.91	-10.19	-12.01	L2
0.91	42.18	--	32.11	0.00	56.00	46.00	-13.82	-13.89	L2
2.13	43.94	--	28.35	0.00	56.00	46.00	-12.06	-17.65	L2
6 Worst Data									

LINE 1 RESULTS

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

Data#: 7 File#: 04U2761.EMI Date: 06-24-2004 Time: 13:50:48

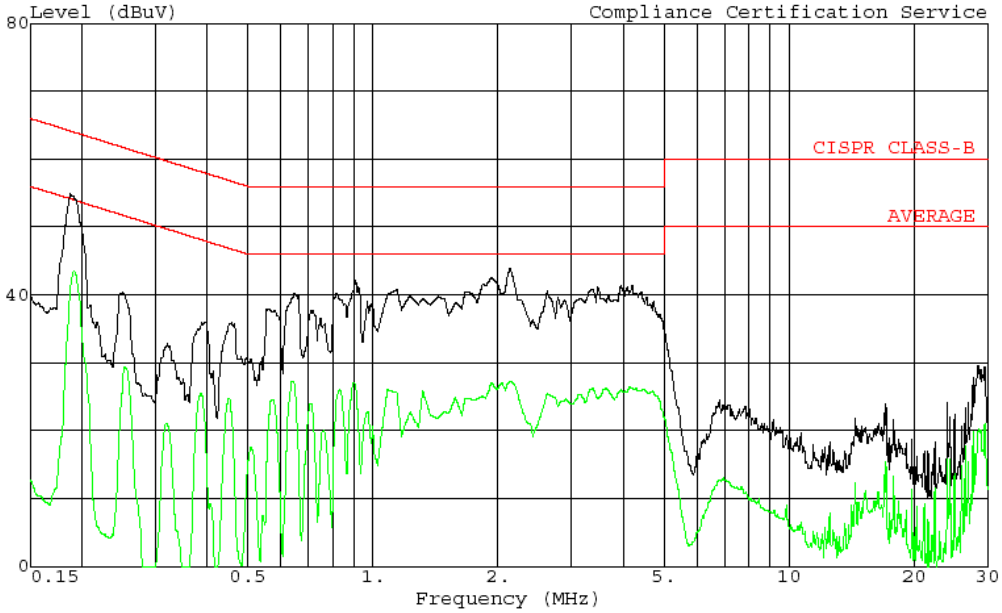


Trace: 5 Ref Trace:
Project # : 04U2761
Test Operator : Ben Du
Company : Denso
EUT : 11a Access Point
Model : AP48
Configuration : EUT/HP Laptop PC
Mode of Operation: Tx
Target of Test : FCC Class B
Voltage : 115VAC/60Hz
: L1: Peak (Black), Avg (Green)

LINE 2 RESULTS

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

Data#: 14 File#: 04U2761.EMI Date: 06-24-2004 Time: 14:19:23

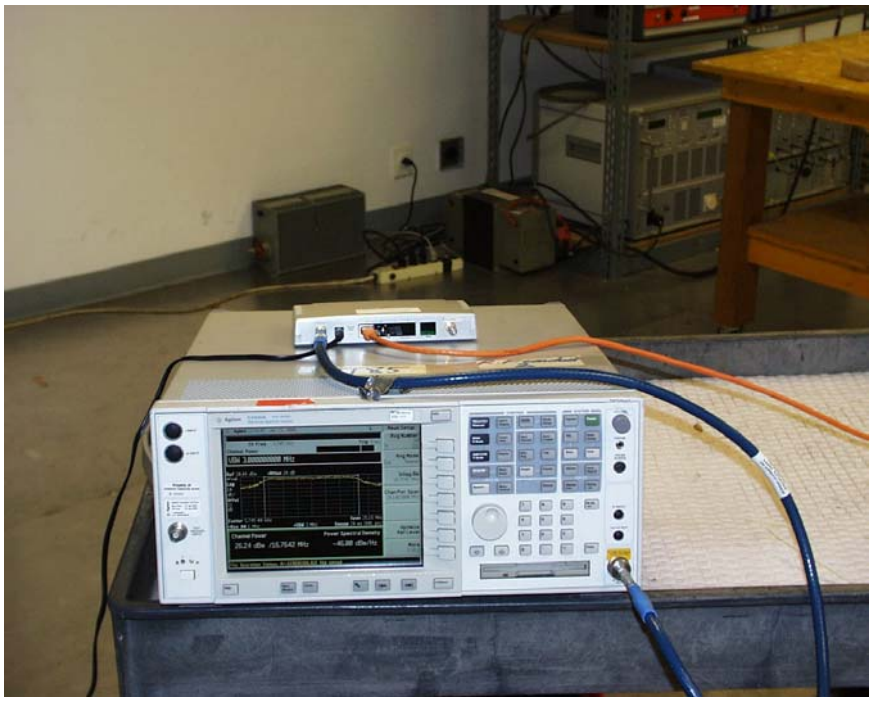


Trace: 12 Ref Trace:
Project # : 04U2761
Test Operator : Ben Du
Company : Denso
EUT : 11a Access Point
Model : AP48
Configuration : EUT/HP Laptop PC
Mode of Operation: Tx
Target of Test : FCC Class B
Voltage : 115VAC/60Hz
: L2: Peak (Black), Avg (Green)

8. SETUP PHOTOS

ANTENNA PORT CONDUCTED RF MEASUREMENT SETUP

ANTENNA PORT CONDUCTED PHOTO



RADIATED RF MEASUREMENT SETUP

RADIATED FRONT PHOTO

RADIATED BACK PHOTO

POWERLINE CONDUCTED EMISSIONS MEASUREMENT SETUP

LINE CONDUCTED FRONT PHOTO

LINE CONDUCTED BACK PHOTO

END OF REPORT