FCC CFR47 PART 15
CLASS II PERMISSIVE CHANGE
TEST REPORT

FOR

802.11 a/b/g/n Access Point

MODEL NUMBER: A1143

FCC ID: BCGA1143

REPORT NUMBER: 07U11152-1

ISSUE DATE: AUGUST 3, 2007

Prepared for
APPLE, INC.
1 INFINITE LOOP
CUPERTINO, CA 95014, U.S.A.

Prepared by
COMPLIANCE CERTIFICATION SERVICES
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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	08/3/07	Initial Issue	M. Heckrotte

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: APPLE, INC.
1 INFINITE LOOP
CUPERTINO, CA 95014, U.S.A.

EUT DESCRIPTION: 802.11 a/b/g/n ACCESS POINT

MODEL: A1143

SERIAL NUMBER: 6F715006YCP

DATE TESTED: JULY 2, 2007

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
FCC PART 15 SUBPART C	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: 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:

MICHAEL HECKROTTE
ENGINEERING MANAGER
COMPLIANCE CERTIFICATION SERVICES

Tested By:

THANH NGUYEN
EMC ENGINEER
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 15.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA. The sites are constructed in conformance with the requirements of ANSI C63.4, ANSI C63.7 and CISPR Publication 22. All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

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

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

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

4.2. MEASUREMENT UNCERTAINTY

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

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

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is an 802.11a/b/g/n Access Point.

5.2. DESCRIPTION OF CLASS II PERMISSIVE CHANGE

The major change filed under this application are:

Change #1: Change Ethernet Switch from BCM5325 to BCM5397
Change #2: Change Ethernet CM Filter from 824-00339R to 824-M0312R
Change #3: Change Communications controller from 88F5181 to 88F5281

5.3. SOFTWARE AND FIRMWARE

The firmware installed in the EUT was 7.2d2auto20070529T0400.

The test utility used during testing was Iperf Version 2003 from a terminal window.

5.4. MODIFICATIONS

No modifications were made during testing.

5.5. DETAILS OF TESTED SYSTEM

SUPPORT EQUIPMENT & PERIPHERALS

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Notebook PC 1	Apple Computer	M59	SW862801EWFV	DoC
Notebook PC 2	Apple Computer	A1181	PT358811	DoC
Notebook PC 2 AC Adapter	Delta Electronics	A1184	MV625H2QVHKB	DoC
MP3 Player	Apple Computer	Ipod Nano	YM5447S4SZB	DoC

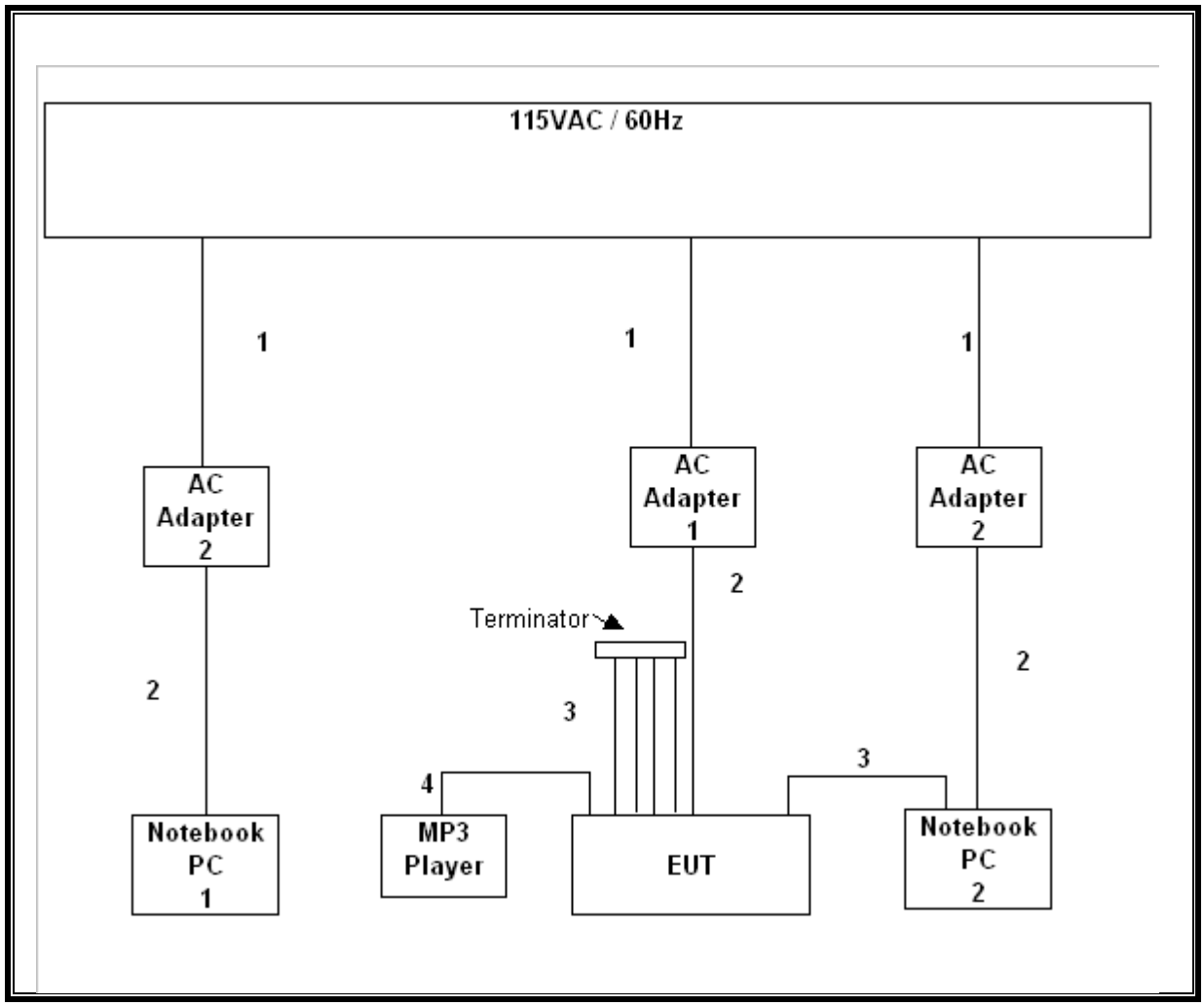
I/O CABLES

I/O CABLE LIST						
Cable No.	**Port**	**# of Identical Ports**	**Connector Type**	**Cable Type**	**Cable Length**	**Remarks**
1	AC Input	3	2 Prong	Un-shielded	1.5m	N
2	DC Input	3	3 Prong	Un-shielded	2m	N
3	LAN	5	RJ45	Shielded	2m	N
4	USB	1	USB	Shielded	2m	Y

TEST SETUP

The EUT is installed in a typical configuration. Test software exercised the EUT.

TEST SETUP DIAGRAM



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 Receiver, 9 kHz ~ 2.9 GHz	Agilent / HP	8542E	3942A00286	6/12/2008
RF Filter Section	Agilent / HP	85420E	3705A00256	6/12/2008
EMI Test Receiver	R & S	ESIB40	100192	9/26/2007
Antenna, Bilog 30 MHz ~ 2 Ghz	Sunol Sciences	JB1	A0022704	8/13/2007
Antenna, Horn 1 ~ 18 GHz	EMCO	3115	2238	4/15/2008
Preamplifier, 1 ~ 26.5 GHz	Agilent / HP	8449B	3008A00931	8/1/2007
EMI Test Receiver	R & S	ESHS 20	827129/006	1/27/2008
LISN, 10 kHz ~ 30 MHz	FCC	LISN-50/250-25-2	2023	9/15/2007
LISN, 10 kHz ~ 30 MHz	Solar	8012-50-R-24-BNC	8379443	9/15/2007

7. APPLICABLE LIMITS AND TEST RESULTS

7.1. RADIATED EMISSIONS

LIMITS

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

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

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

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

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

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

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

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

TEST PROCEDURE

The EUT is configured and tested in accordance with ANSI C63.4.

RESULTS

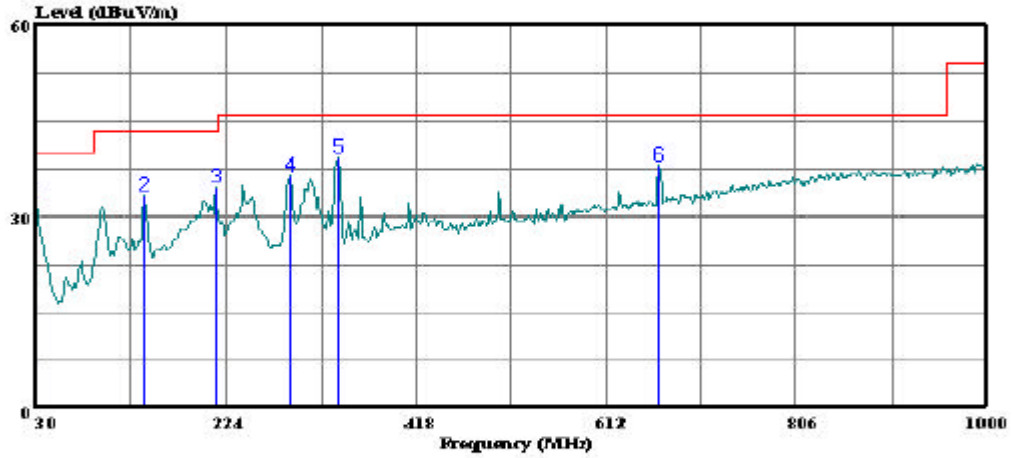
No non-compliance noted:

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

HORIZONTAL PLOT

Compliance Certification Services
47173 Benicia Street
Fremont, CA 94538
Tel: (510) 771-1000
Fax: (510) 661-0888

Data#: 10 File#: 07U11152Chamber.EMI
Date: 08-01-2007 Time: 14:34:04



Trace: 9 Ref Trace:

Condition: FCC CLASS-B HORIZONTAL
Test Operator:: Thanh Nguyen
Project #: : 07U11152
Company: : Apple Computer
Configuration:: EUT and support peripheral
Mode : : Tx/Rx data packet through wireless netwk
Target: : FCC Class B

HORIZONTAL DATA

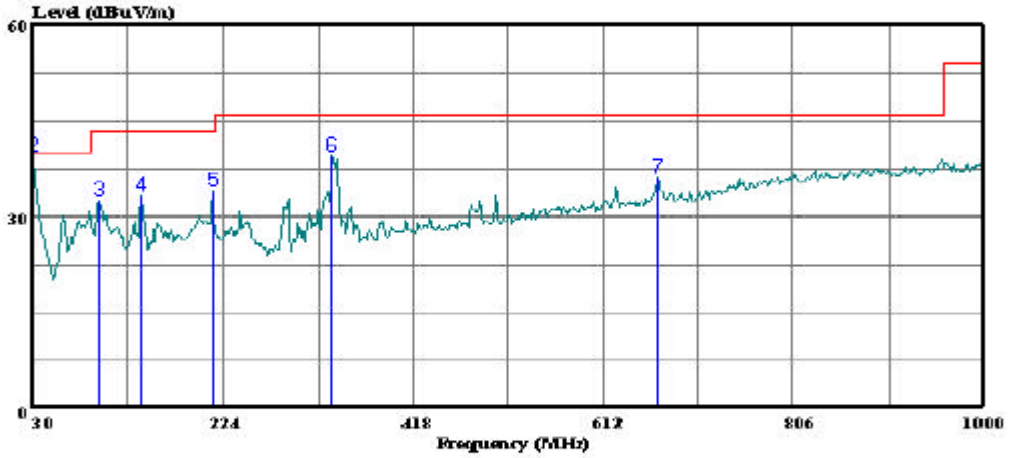
	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	30.000	9.46	22.65	32.11	40.00	-7.89	Peak
2	140.580	18.22	14.90	33.12	43.50	-10.38	Peak
3	213.330	21.80	12.74	34.54	43.50	-8.96	Peak
4	288.990	20.83	15.42	36.25	46.00	-9.75	Peak
5	337.490	22.49	16.72	39.21	46.00	-6.79	Peak
6	664.380	15.06	22.97	38.03	46.00	-7.97	Peak

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

VERTICAL PLOT

Compliance Certification Services
47173 Benicia Street
Fremont, CA 94538
Tel: (510) 771-1000
Fax: (510) 661-0888

Data#: 8 File#: 07U11152Chamber.EMI
Date: 08-01-2007 Time: 14:27:34



Trace: 5 Ref Trace:

Condition: FCC CLASS-B VERTICAL
Test Operator:: Thanh Nguyen
Project #: : 07U11152
Company: : Apple Computer
Configuration:: EUT and support peripheral
Mode : : Tx/Rx data packet through wireless netwk
Target: : FCC Class B

VERTICAL DATA

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	30.000	12.91	22.65	35.56	40.00	-4.44	QP
2	30.000	16.96	22.65	39.61	40.00	-0.39	Peak
3	96.930	22.02	10.38	32.40	43.50	-11.10	Peak
4	140.580	18.44	14.90	33.34	43.50	-10.16	Peak
5	213.330	21.25	12.74	33.99	43.50	-9.51	Peak
6	334.580	22.83	16.65	39.48	46.00	-6.52	Peak
7	667.290	13.06	23.01	36.07	46.00	-9.93	Peak

SPURIOUS EMISSIONS 1000MHz TO 10 GHz (WORST-CASE CONFIGURATION, VERTICAL)

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

Company: APPLE COMPUTER INC.
Project #: 07U11152
Date: 08-01-2007
Test Engineer: Thanh Nguyen
Configuration: EUT, support Laptop and Peripheral.
Mode: Transmit and Receive data w/ wireless link.

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T60; S/N: 2238 @3m	T144 Miteq 3008A00931			FCC 15.209

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
		Gordon 203134001		

Peak Measurements
RBW=VBW=1MHz
Average Measurements
RBW=1MHz ; VBW=10Hz

f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Spuriuos emisssions															
1.008	3.0	51.87	41.74	25.4	3.0	-39.5	0.0	0.0	40.9	30.7	74	54	-33.1	-23.3	H
1.330	3.0	51.35	40.68	26.3	3.4	-39.0	0.0	0.0	42.0	31.3	74	54	-32.0	-22.7	H
1.428	3.0	47.01	37.56	26.5	3.6	-38.9	0.0	0.0	38.2	28.7	74	54	-35.8	-25.3	H
1.875	3.0	46.50	36.08	27.6	4.1	-38.2	0.0	0.0	40.0	29.6	74	54	-34.0	-24.4	H
1.997	3.0	45.98	34.66	27.9	4.3	-38.1	0.0	0.0	40.1	28.8	74	54	-33.9	-25.2	H
1.012	3.0	52.38	42.33	25.5	3.0	-39.5	0.0	0.0	41.4	31.3	74	54	-32.6	-22.7	V
1.328	3.0	53.77	42.77	26.3	3.4	-39.0	0.0	0.0	44.4	33.4	74	54	-29.6	-20.6	V
1.993	3.0	49.55	35.45	27.9	4.3	-38.1	0.0	0.0	43.7	29.6	74	54	-30.3	-24.4	V

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

7.2. AC MAINS LINE 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 configured and tested in accordance with ANSI C63.4.

RESULTS

No non-compliance noted:

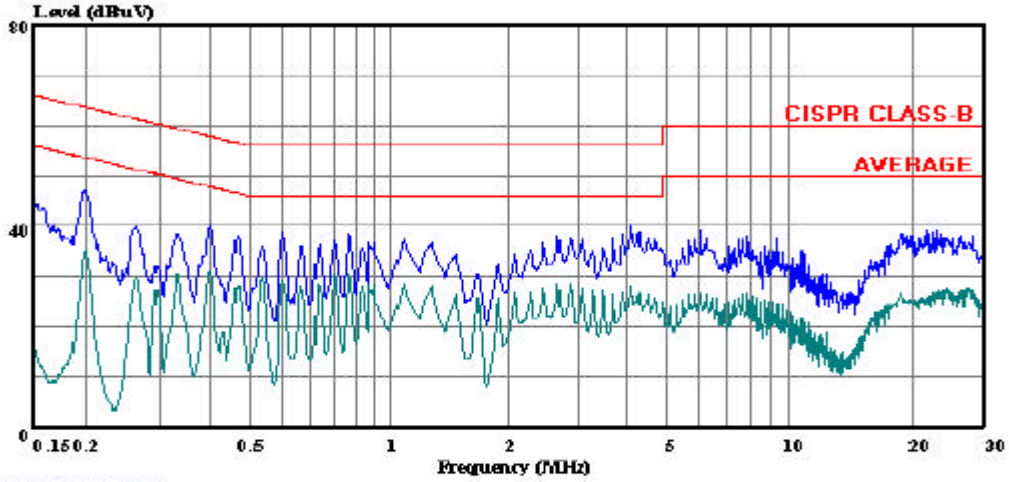
6 WORST EMISSIONS

CONDUCTED EMISSIONS DATA (115VAC 60Hz)									
Freq.	Reading			Closs	Limit		Margin		Remark
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1 / L2
0.20	47.04	--	--	0.00	63.69	53.69	-16.65	-6.65	L1
4.20	40.10	--	--	0.00	56.00	46.00	-15.90	-5.90	L1
23.14	39.28	--	--	0.00	60.00	50.00	-20.72	-10.72	L1
0.20	47.70	--	--	0.00	63.61	53.61	-15.91	-5.91	L2
1.58	42.58	--	--	0.00	56.00	46.00	-13.42	-3.42	L2
18.72	42.28	--	--	0.00	60.00	50.00	-17.72	-7.72	L2
6 Worst Data									

LINE 1 RESULTS

Compliance Certification Services
47173 Benicia Street
Fremont, CA 94538
Tel: (510) 771-1000
Fax: (510) 661-0888

Data#: 44 File#: 07U11152LC.EMI Date: 08-01-2007 Time: 17:01:47



(Line Conduction)

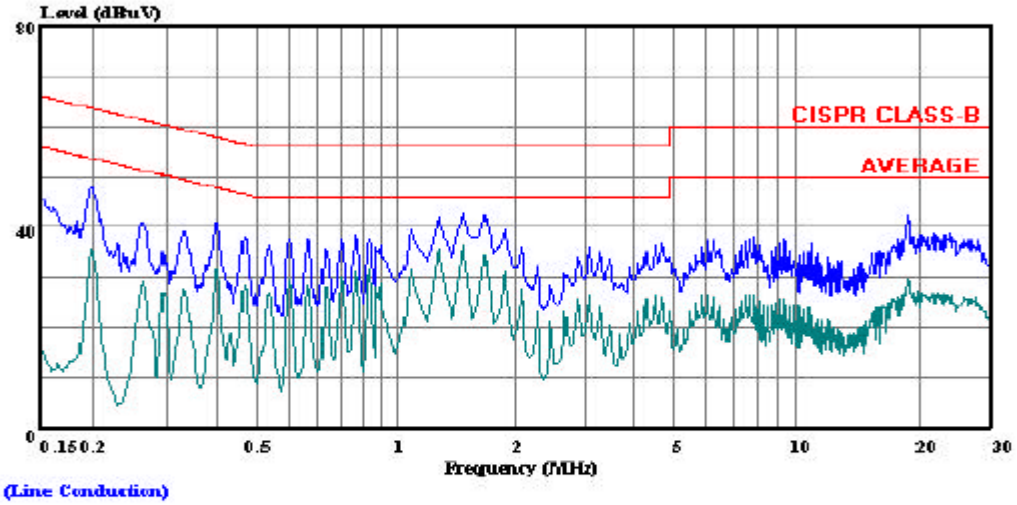
Trace: 42 Ref Trace:

Condition: CISPR CLASS-B
Test Operator:: Thanh Nguyen
Project #: : 07U11152
Company: : Apple Computer
Configuration:: EUT and support peripheral
Mode: : Tx and Rx data packet w/ wireless link.
Target: : FCC CLASS B
Voltage: : 115VAC/60Hz
: L1 : Peak(Blue),Avg(Green)

LINE 2 RESULTS

Compliance Certification Services
47173 Benicia Street
Fremont, CA 94538
Tel: (510) 771-1000
Fax: (510) 661-0888

Data#: 35 File#: 07U11152LC.EMI Date: 08-01-2007 Time: 16:25:32



(Line Conduction)

Trace: 33 Ref Trace:

Condition: CISPR CLASS-B
Test Operator:: Thanh Nguyen
Project #: : 07U11152
Company: : Apple Computer
Configuration:: EUT and support peripheral
Mode: : Tx and Rx data packet w/ wireless link.
Target: : FCC CLASS B
Voltage: : 115VAC/60Hz
: L2 : Peak(Blue),Avg(Green)