



**FCC CFR47 PART 15 SUBPART C
CERTIFICATION TEST REPORT**

FOR

WIRELESS LAN MODULE

MODEL NUMBER: DWM-W006

FCC ID: EW4DWMW006

REPORT NUMBER: 08J11761-1

ISSUE DATE: MAY 7, 2008

Prepared for

**MITSUMI ELECTRIC CO., LTD
1601, SAKAI, ATSUGI-SHI
KANAGAWA, 243-8533, JAPAN**

Prepared by

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NVLAP LAB CODE 200065-0

Revision History

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
--	05/07/08	Initial Issue	F. Ibrahim

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: MITSUMI ELECTRIC CO., LTD
1601, SAKAI, ATSUGI-SHI
KANAGAWA, 243-8533, JAPAN

EUT DESCRIPTION: WIRELESS LAN MODULE

MODEL: DWM-W006

SERIAL NUMBER: 00A096800159

DATE TESTED: APRIL 25, 2008

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C	Pass

Compliance Certification Services, Inc. (CCS) tested the above equipment in accordance with the requirements set forth in the above standards. All expressions of Pass/Fail in this report are opinions expressed by CCS based on interpretations of the test results. 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 CCS and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by CCS will constitute fraud and shall nullify the document. No part of this report may be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any government agency.

Approved & Released For CCS By:

Tested By:



FRANK IBRAHIM
EMC SUPERVISOR
COMPLIANCE CERTIFICATION SERVICES

YOBİ ZHOU
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.

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
Power Line Conducted Emission	+/- 2.3 dB
Radiated Emission	+/- 3.4 dB

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a wireless LAN transceiver, installed in a portable game machine, operating in the 2400-2483.5MHz band with 13 channels.

5.2. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a sleeve antenna, with a maximum gain of -0.73 dBi.

5.3. SOFTWARE AND FIRMWARE

The test utility software, which was used during the testing, was WM Test.

5.4. 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 2412MHz.

The worst-case data rate for this channel is determined to be 1Mb/s, based on the previous experience with 802.11 WLAN product design architectures.

Thus all emissions tests were made in the 802.11 mode, 2412MHz, 1Mb/s.

The EUT was tested in three orthogonal orientations X, Y and Z, X orientation was found to be the worst-case orientation.

5.5. DESCRIPTION OF TEST SETUP

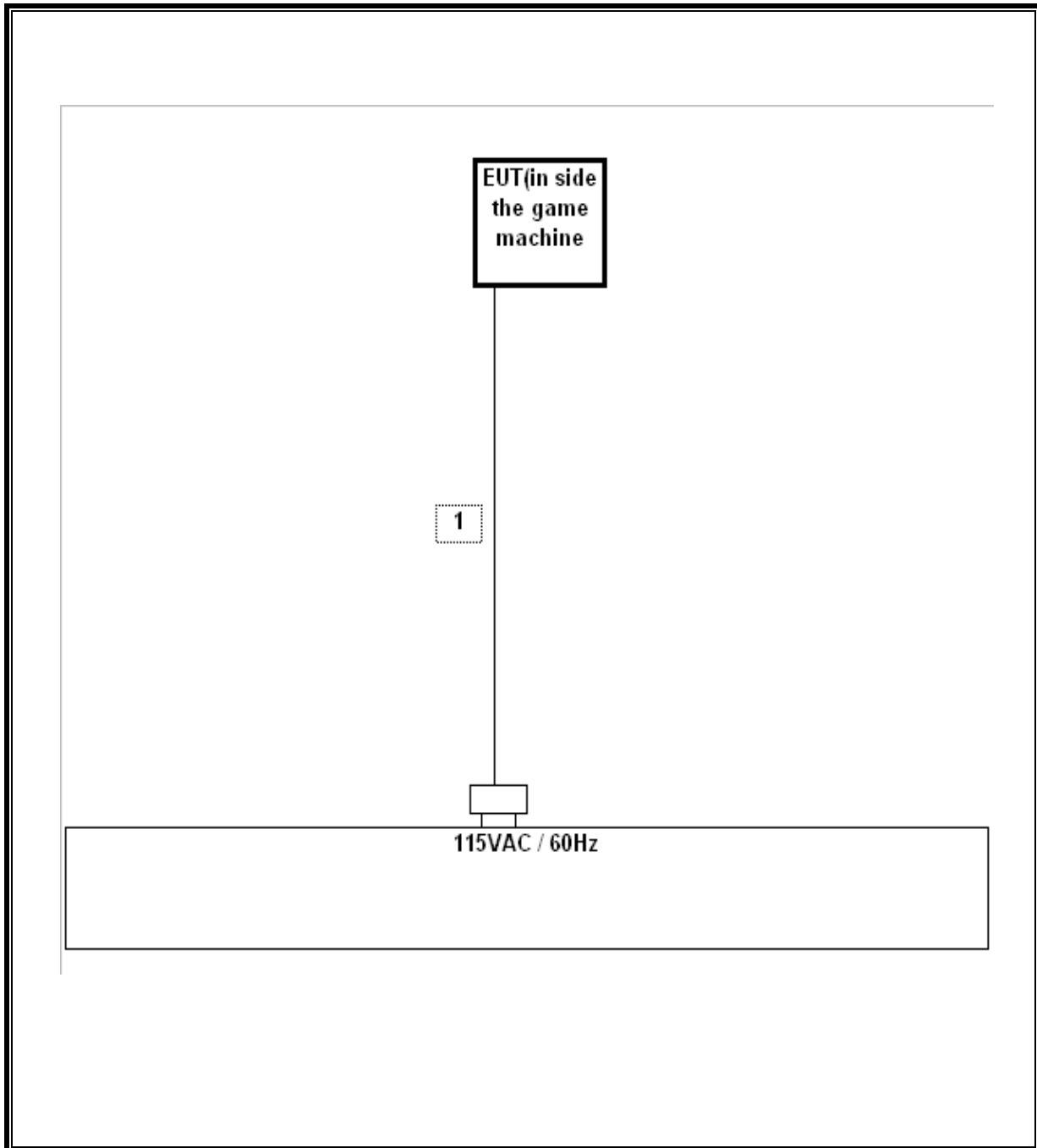
SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST			
Description	Manufacturer	Model	Serial Number
Portable Game Machine	Nintendo	USG-001C	UJH10688391
Game Card	Nintendo	NTR-005	WM TEST
AC Adapter	Nintendo	USG-002	N/A

I/O CABLES

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	Power	1	DC	Unshielded	2m	N/A

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	S/N	Cal Due
Spectrum Analyzer 3 Hz ~ 44 GHz	Agilent / HP	E4446A	US42510266	10/26/08
Power Meter	HP	438A	2822A05684	06/20/08
Power Sensor 10MHz - 18GHz	Agilent / HP	8481A	2349A36506	04/18/09
EMI Receiver, 9 kHz ~ 2.9 GHz	Agilent / HP	8542E	3942A00286	06/12/08
RF Filter Section	Agilent / HP	85420E	3705A00256	06/12/08
Antenna, Bilog 30 MHz ~ 2 GHz	Sunol Sciences	JB1	A121003	09/28/08
Antenna, Horn 1 ~ 18 GHz	ETS	3117	29301	05/15/08
Antenna, Horn, 26.5 GHz	ARA	SWH-28	C01015	09/28/08
Preamplifier, 1 ~ 26.5 GHz	Agilent / HP	8449B	3008A00561	09/27/08
LISN, 10 kHz ~ 30 MHz	FCC	LISN-50/250-25-2	2023	10/25/08
LISN, 10 kHz ~ 30 MHz	Solar	8012-50-R-24-BNC	8379443	10/25/08
EMI Test Receiver	R & S	ESHS 20	827129/006	08/06/09

7. ANTENNA PORT TEST RESULTS

7.1. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	Power (dBm)
Low	2412	0.82
Middle	2442	0.24
High	2472	-0.04

8. RADIATED TEST RESULTS

8.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

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.

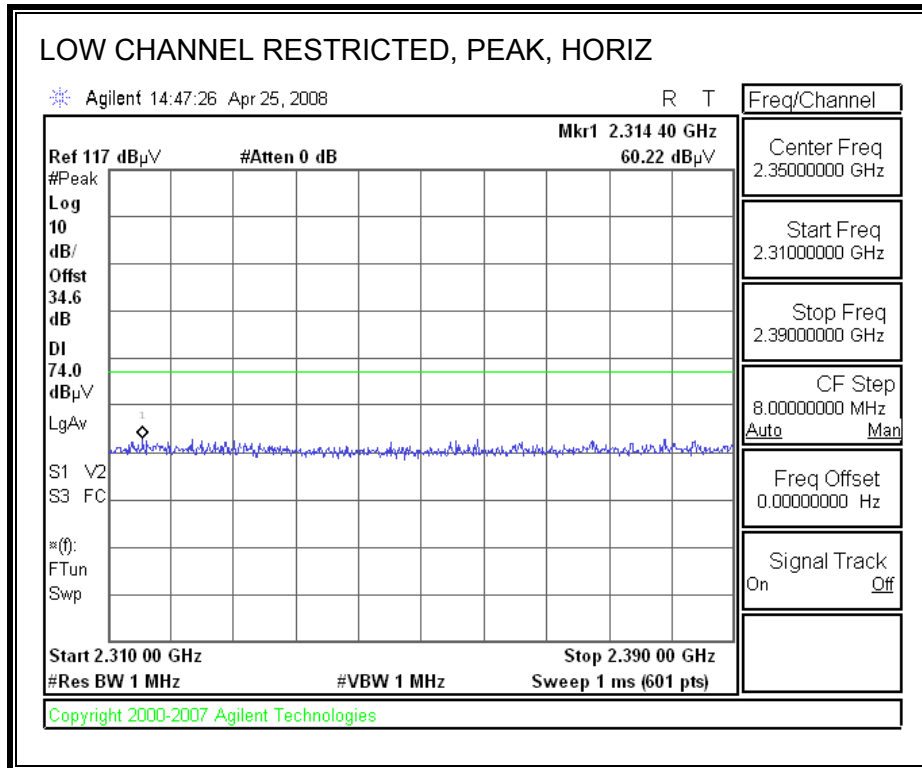
For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, and then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

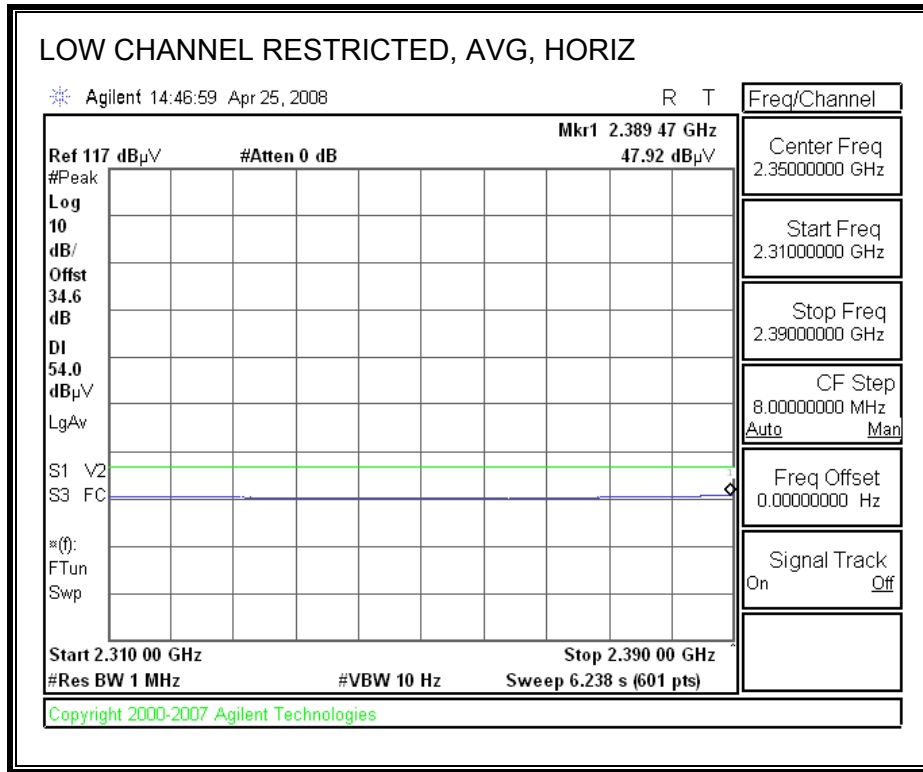
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

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

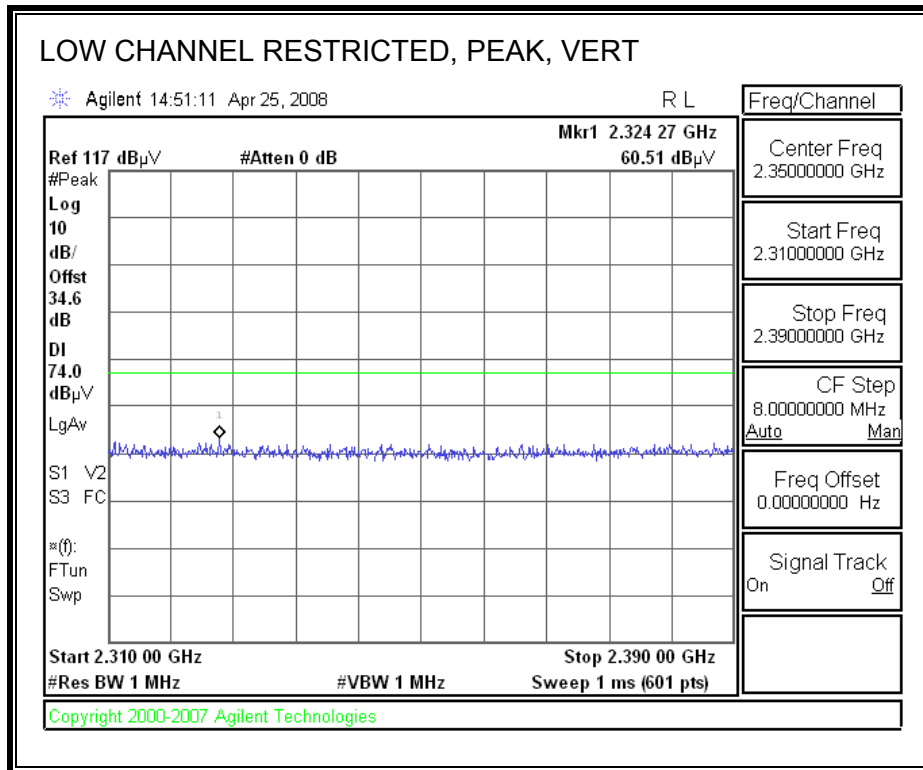
8.2. TRANSMITTER ABOVE 1 GHz

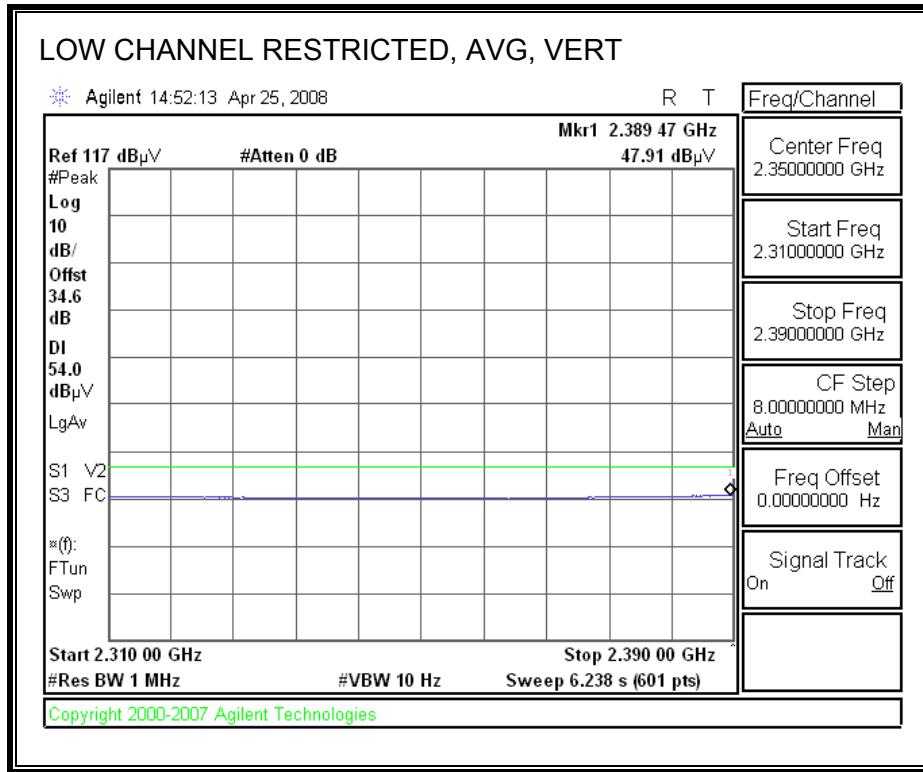
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



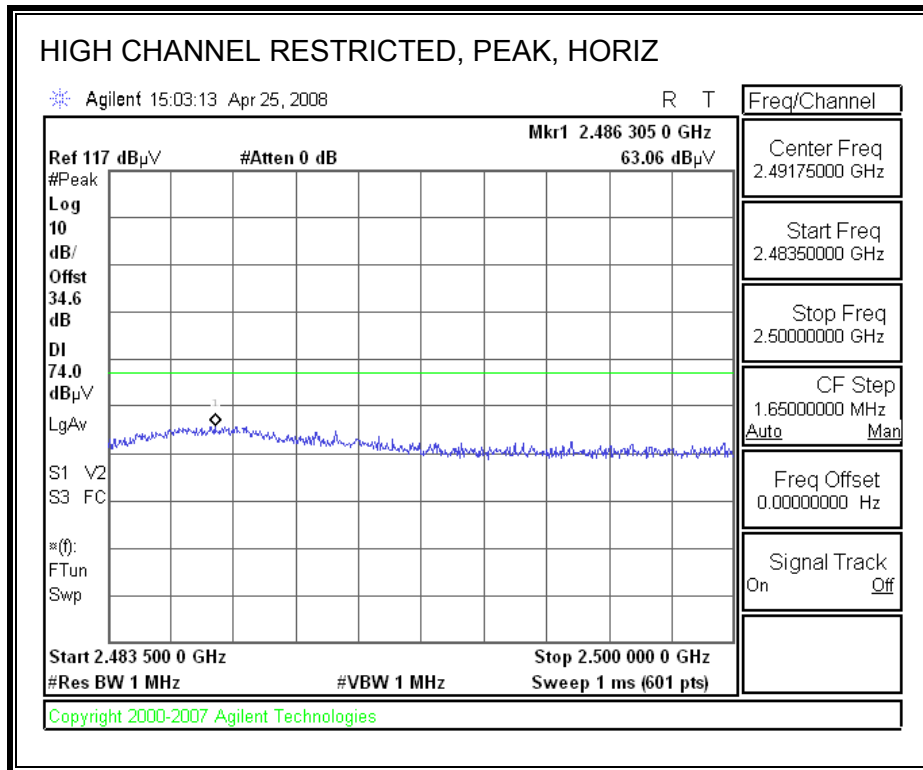


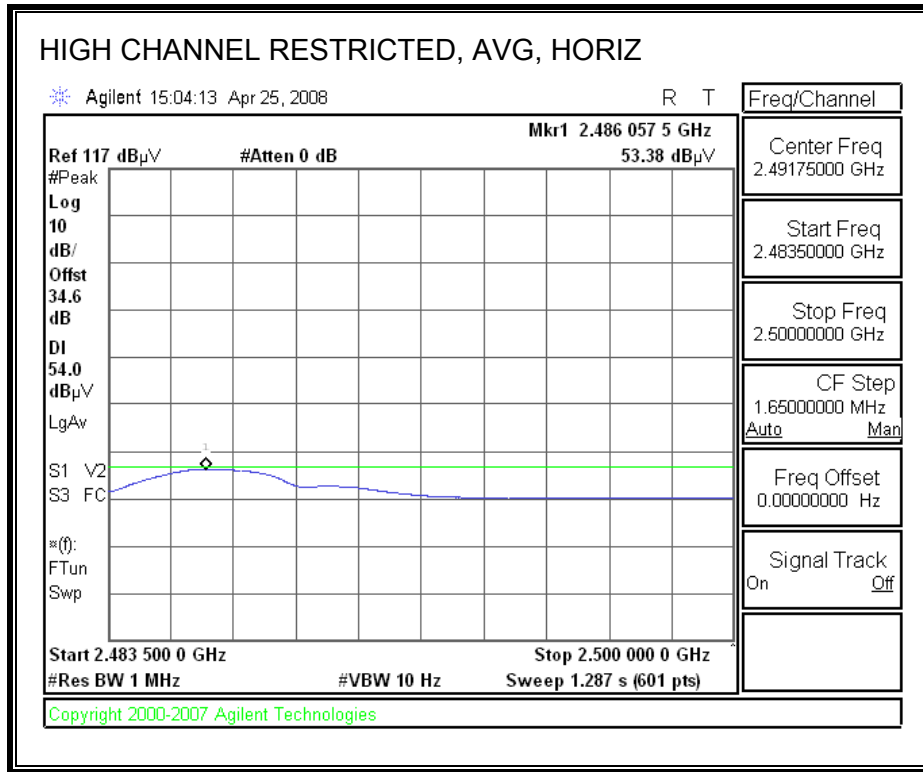
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



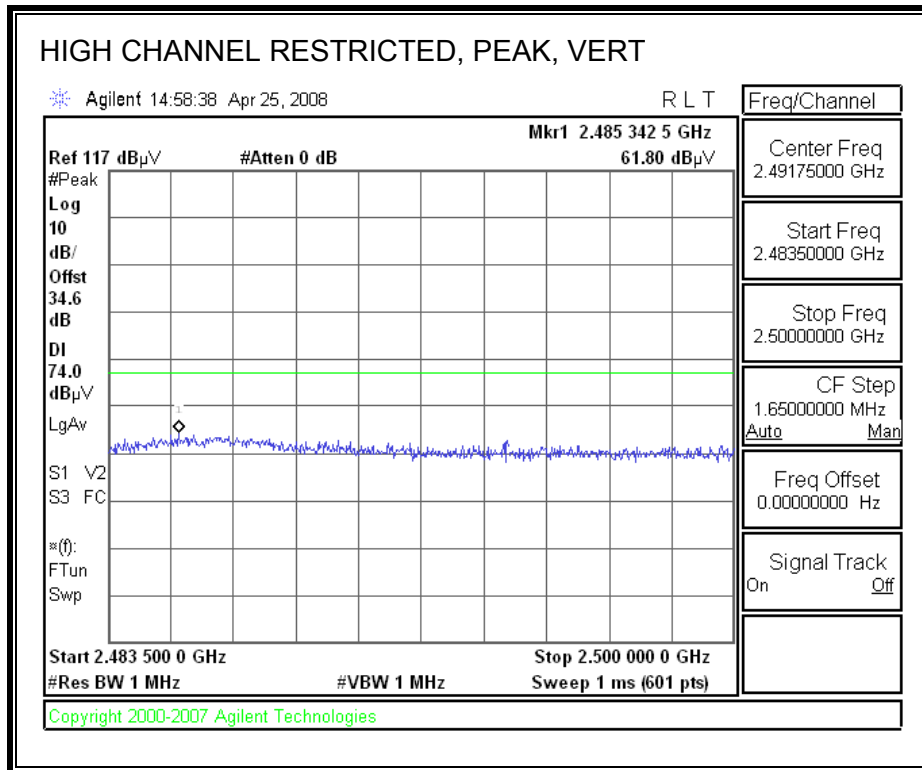


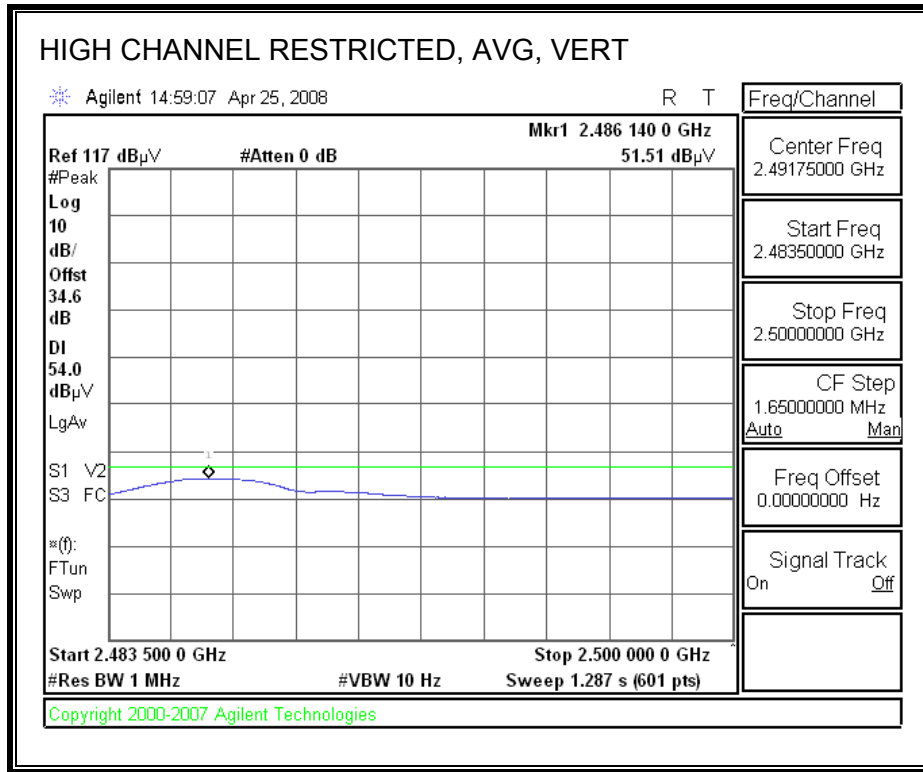
RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)





RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)





HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
 Compliance Certification Services, Fremont 5m Chamber

Company: Nintendo/Mitsumi
 Project #: 08J11761
 Date: 04.25.2008
 Test Engineer: Y.Z.
 Configuration: EUT Only
 Mode: Tx On

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T73; S/N: 6717 @3m	T34 HP 8449B		T125; ARA 18-26GHz; S/N:1007	FCC 15.209

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter	Peak Measurements RBW=VBW=1MHz
		B-5m Chamber		R_001	Average Measurements RBW=1MHz ; VBW=10Hz

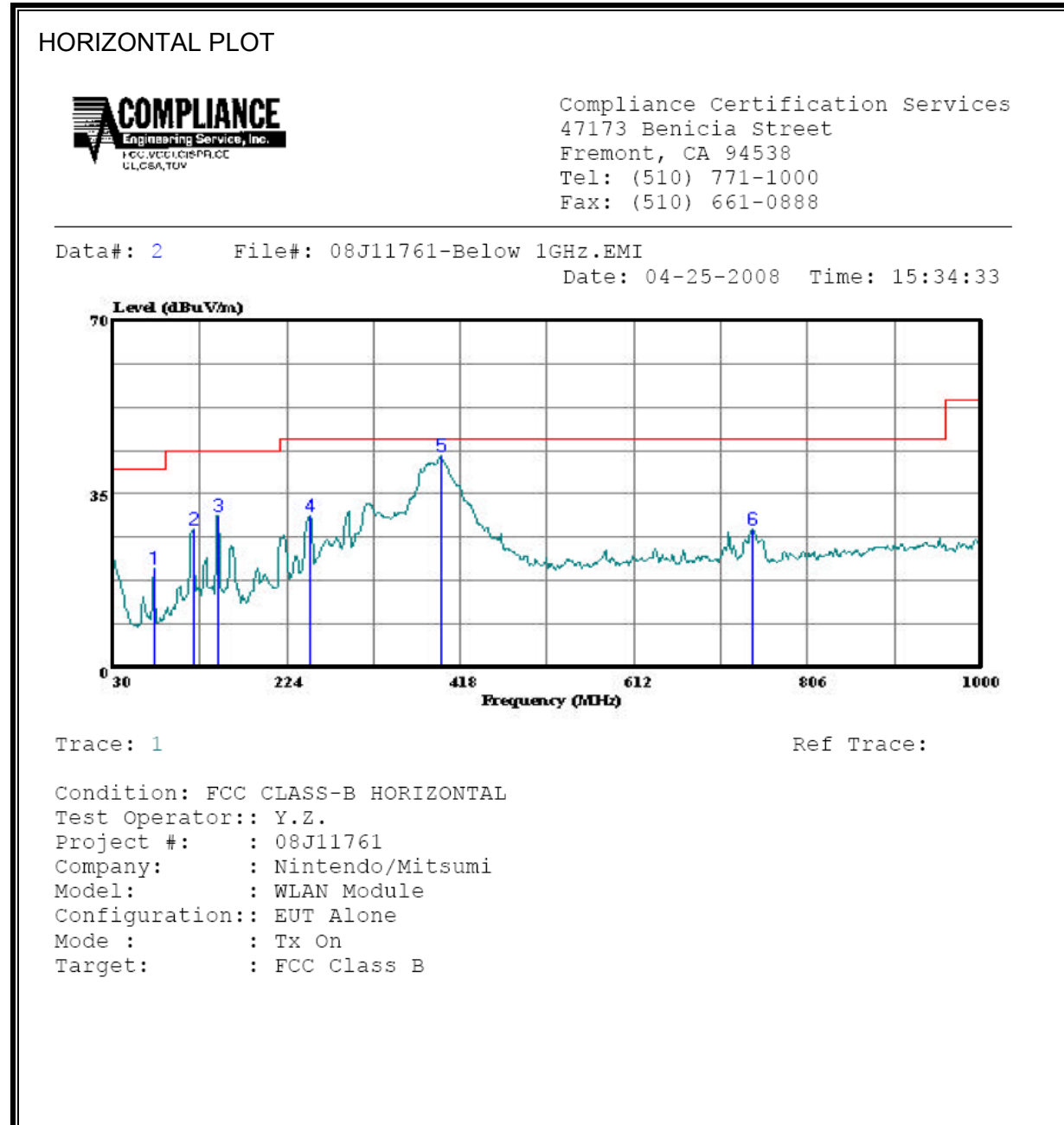
f GHz	Dist (m)	Read Pk dBuV	Read Avg dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Filtr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Low Chan															
1.047	3.0	46.8	32.9	25.8	3.3	-38.2	0.0	0.0	37.8	23.8	74	54	-36.2	-30.2	V
3.216	3.0	50.9	49.2	31.1	5.7	-35.7	0.0	0.0	52.1	50.3	74	54	-21.9	-3.7	V
4.824	3.0	43.7	40.0	33.7	7.1	-34.8	0.0	0.0	49.7	46.0	74	54	-24.3	-8.0	V
1.070	3.0	45.7	33.0	25.9	3.3	-38.2	0.0	0.0	36.8	24.0	74	54	-37.2	-30.0	H
3.216	3.0	47.9	45.0	31.1	5.7	-35.7	0.0	0.0	49.1	46.1	74	54	-24.9	-7.9	H
4.824	3.0	41.0	34.1	33.7	7.1	-34.8	0.0	0.0	47.0	40.1	74	54	-27.0	-13.9	H
Mid Chan															
1.013	3.0	46.1	32.8	25.8	3.2	-38.2	0.0	0.0	36.8	23.5	74	54	-37.2	-30.5	V
3.256	3.0	50.8	48.7	31.2	5.8	-35.7	0.0	0.0	52.1	50.0	74	54	-21.9	-4.0	V
4.884	3.0	44.0	39.6	33.8	7.2	-34.8	0.0	0.0	50.1	45.7	74	54	-23.9	-8.3	V
1.115	3.0	44.5	31.6	26.0	3.4	-38.1	0.0	0.0	35.8	22.9	74	54	-38.2	-31.1	H
3.256	3.0	45.7	41.9	31.2	5.8	-35.7	0.0	0.0	47.0	43.2	74	54	-27.0	-10.8	H
4.884	3.0	41.4	35.4	33.8	7.2	-34.8	0.0	0.0	47.6	41.5	74	54	-26.4	-12.5	H
High Chan															
1.013	3.0	46.7	32.8	25.8	3.2	-38.2	0.0	0.0	37.5	23.6	74	54	-36.5	-30.4	V
3.296	3.0	50.5	48.5	31.3	5.8	-35.6	0.0	0.0	51.9	49.9	74	54	-22.1	-4.1	V
4.944	3.0	42.7	38.5	33.9	7.2	-34.8	0.0	0.0	49.0	44.8	74	54	-25.0	-9.2	V
1.013	3.0	45.9	33.1	25.8	3.2	-38.2	0.0	0.0	36.7	23.9	74	54	-37.3	-30.1	H
3.296	3.0	46.8	42.7	31.3	5.8	-35.6	0.0	0.0	48.3	44.2	74	54	-25.7	-9.8	H
4.944	3.0	40.6	34.4	33.9	7.2	-34.8	0.0	0.0	46.9	40.7	74	54	-27.1	-13.3	H

Rev. 4.12.7

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		

8.3. WORST-CASE BELOW 1 GHz

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



HORIZONTAL DATA

Page: 1

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	75.590	39.40	-19.27	20.14	40.00	-19.86	Peak
2	119.240	41.32	-13.32	28.00	43.50	-15.50	Peak
3	148.340	44.49	-13.74	30.75	43.50	-12.75	Peak
4	250.190	44.97	-14.23	30.74	46.00	-15.26	Peak
5	395.690	52.64	-10.06	42.58	46.00	-3.42	Peak
6	744.890	31.09	-3.08	28.01	46.00	-17.99	Peak

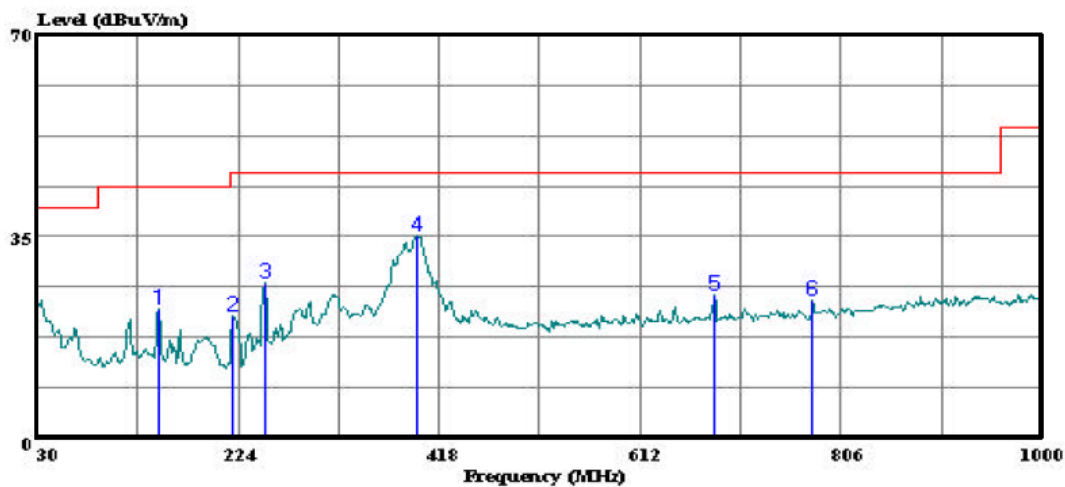
SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, VERTICAL)

VERTICAL PLOT



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

Data#: 4 File#: 08J11761-Below 1GHz.EMI Date: 04-25-2008 Time: 15:40:30



Trace: 3

Ref Trace:

Condition: FCC CLASS-B VERTICAL
Test Operator:: Y.Z.
Project #: : 08J11761
Company: : Nintendo/Mitsumi
Model: : WLAN Module
Configuration:: EUT Alone
Mode : : Tx On
Target: : FCC Class B

VERTICAL DATA

Page: 1

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	148.340	36.18	-13.74	22.44	43.50	-21.06	Peak
2	218.180	36.23	-15.17	21.06	46.00	-24.94	Peak
3	250.190	41.09	-14.23	26.86	46.00	-19.14	Peak
4	395.690	45.25	-10.06	35.19	46.00	-10.81	Peak
5	683.780	29.11	-4.15	24.96	46.00	-21.04	Peak
6	778.840	26.67	-2.81	23.86	46.00	-22.14	Peak

9. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

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

ANSI C63.4

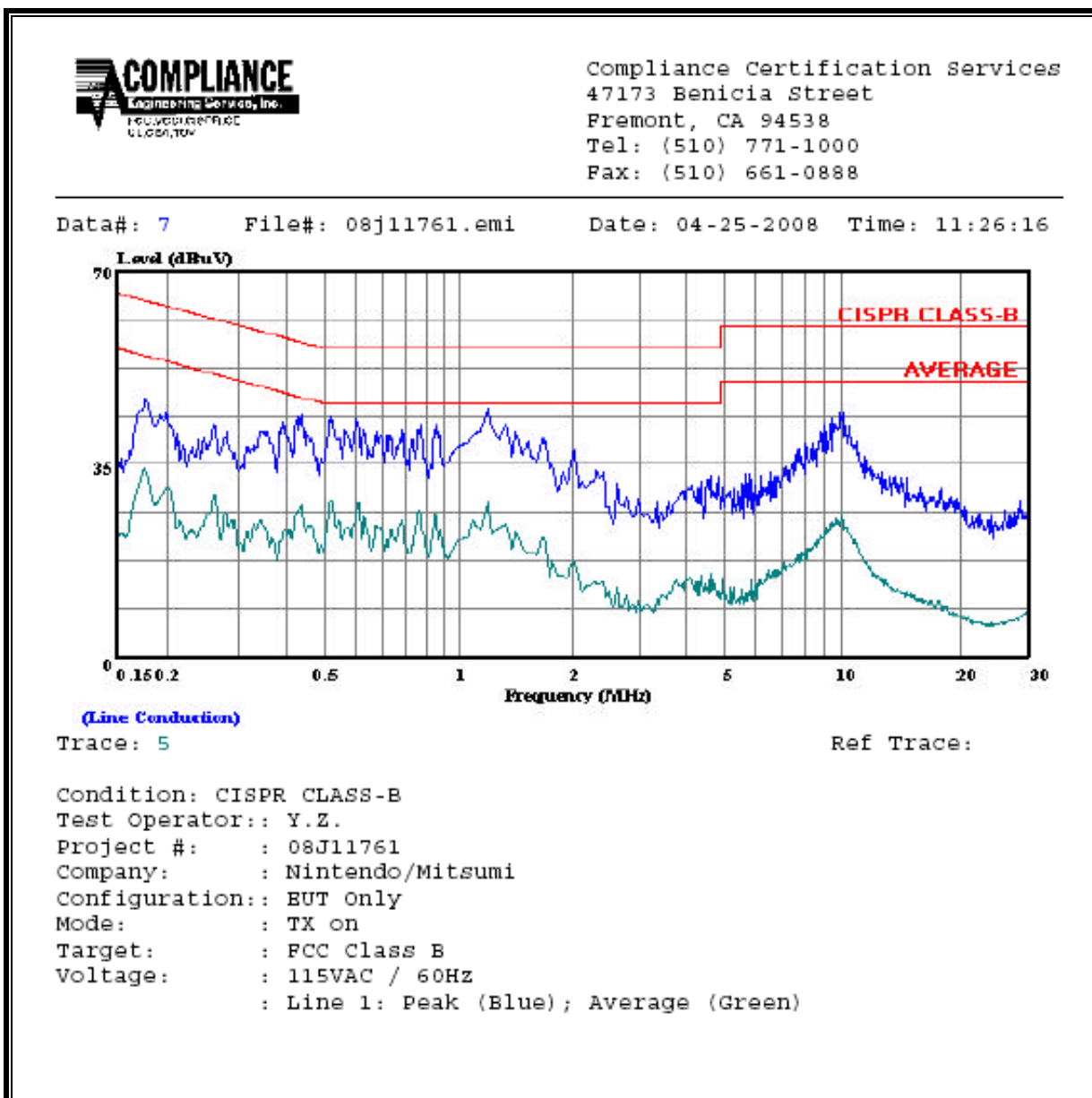
RESULTS

No non-compliance noted

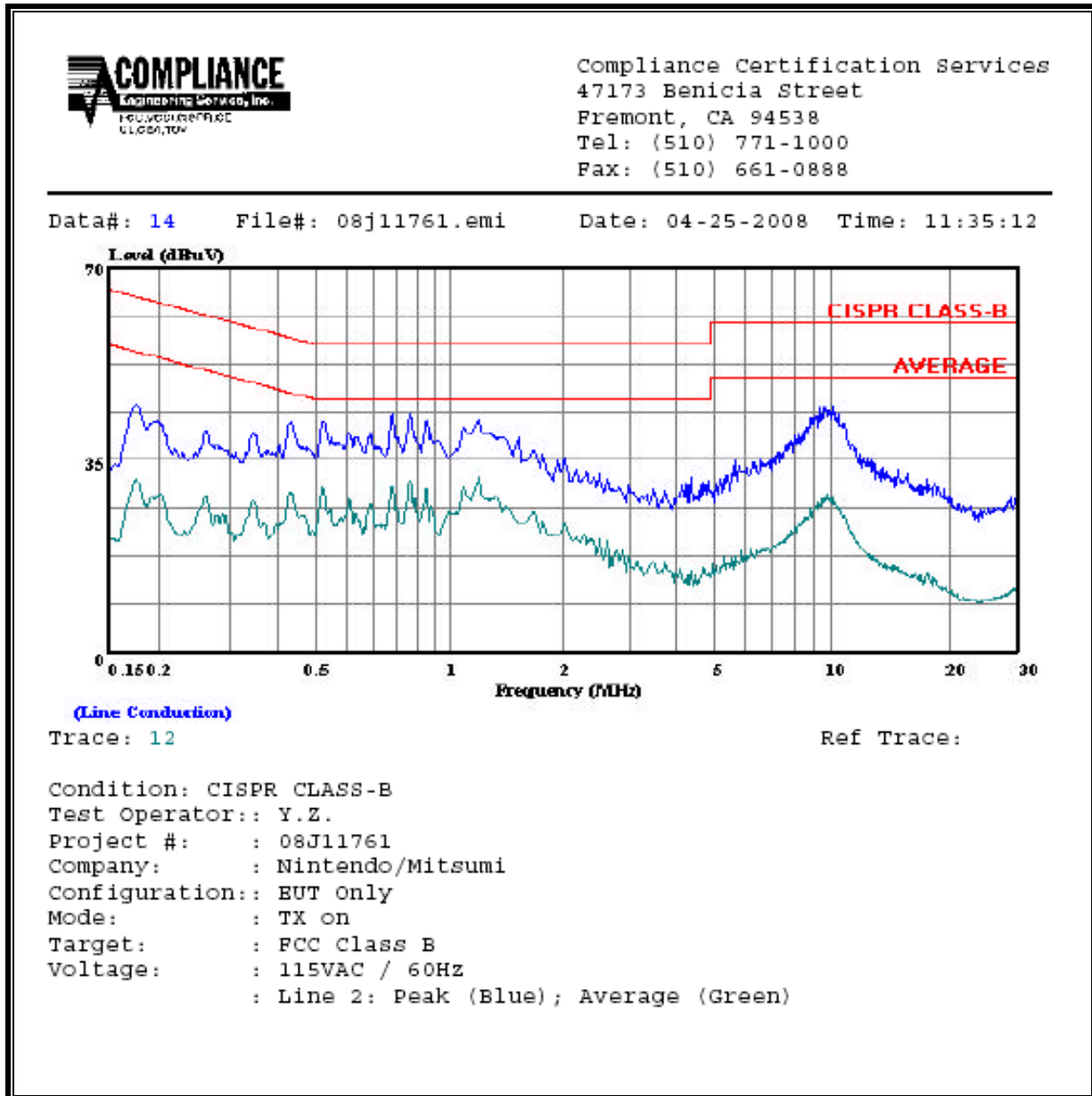
6 WORST EMISSIONS

CONDUCTED EMISSIONS DATA (115VAC 60Hz)									
Freq.	Reading			Class	Limit	EN_B	Margin		Remark
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1 / L2
0.18	46.89	--	34.06	0.00	64.63	54.63	-17.74	-20.57	L1
1.29	45.05	--	28.18	0.00	56.00	46.00	-10.95	-17.82	L1
10.23	44.21	--	24.38	0.00	60.00	50.00	-15.79	-25.62	L1
0.18	45.04	--	31.43	0.00	64.63	54.63	-19.59	-23.20	L2
0.87	43.27	--	31.12	0.00	56.00	46.00	-12.73	-14.88	L2
10.18	44.93	--	27.67	0.00	60.00	50.00	-15.07	-22.33	L2
6 Worst Data									

LINE 1 RESULTS



LINE 2 RESULTS



10. SETUP PHOTOS

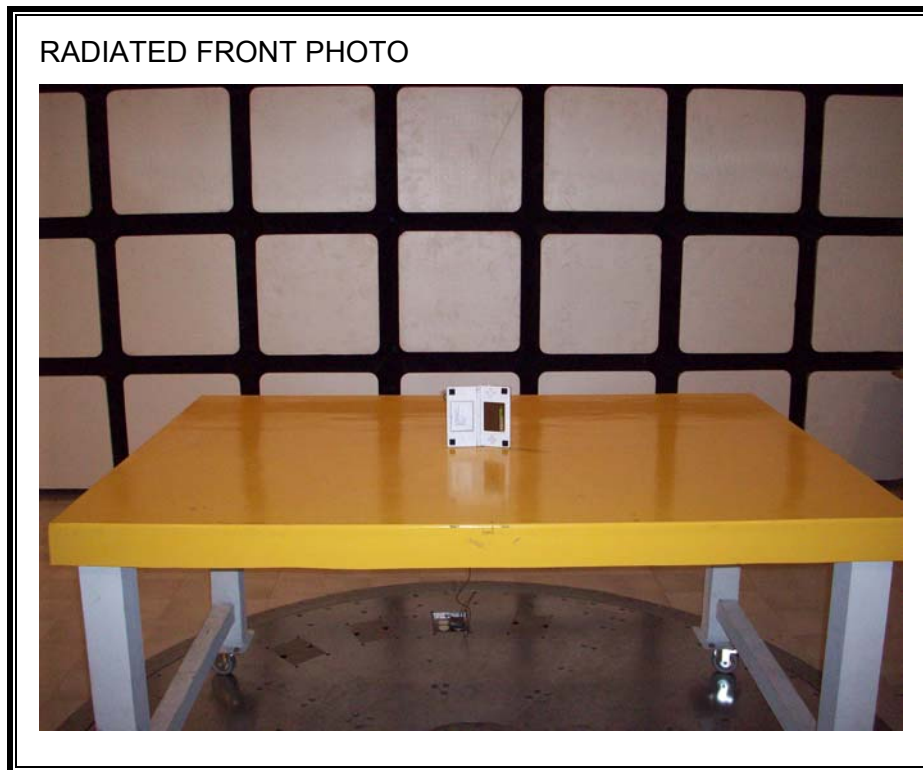
RADIATED RF MEASUREMENT SETUP

X POSITION





Y POSITION





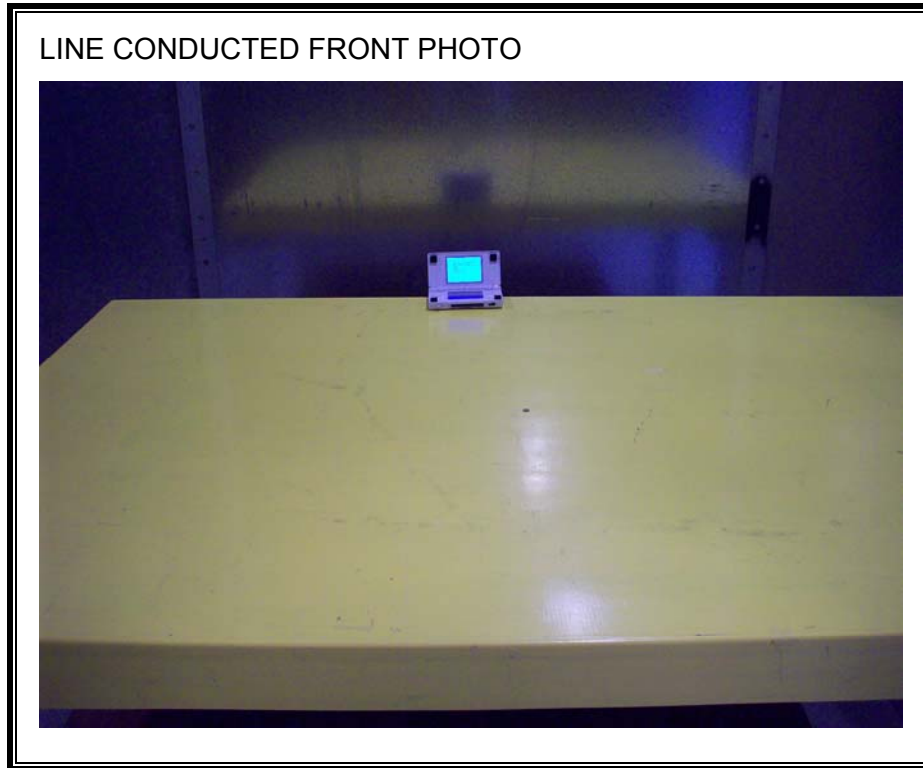
Z POSITION

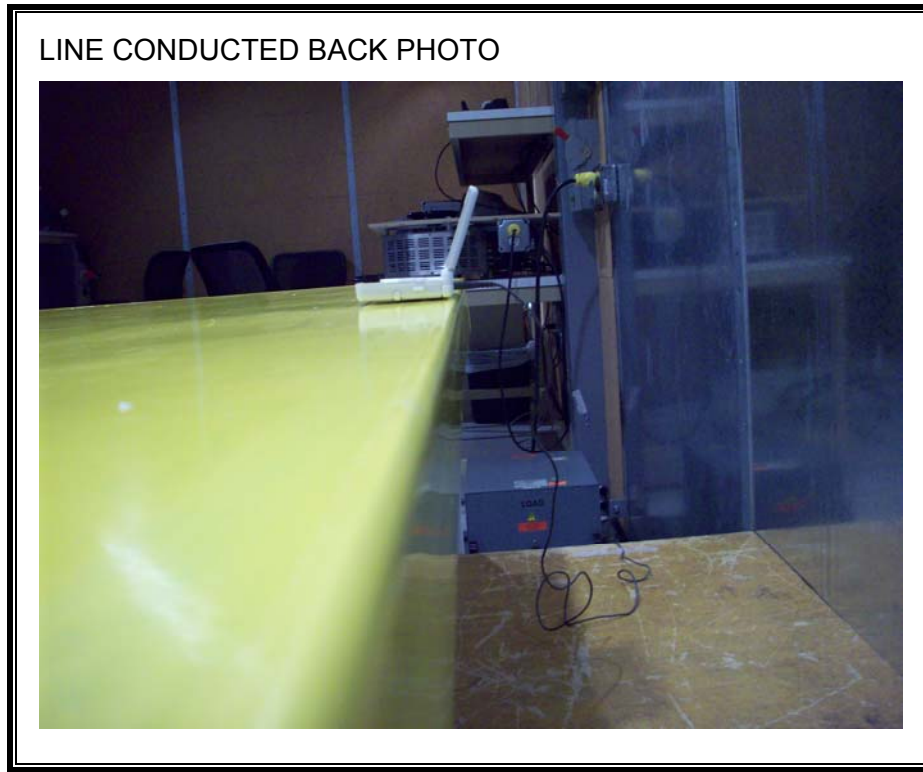


RADIATED BACK PHOTO



POWERLINE CONDUCTED EMISSIONS MEASUREMENT SETUP





END OF REPORT