



FCC CFR47 PART 15 SUBPART C
INDUSTRY CANADA RSS-210 ISSUE 7
CLASS II PERMISSIVE CHANGE
TEST REPORT
FOR

XBOX 360 WIRELESS RACING WHEEL WITH FORCE FEEDBACK

MODEL NUMBER: WRW01

FCC ID: C3KWRW01

IC: 3048A-WRW01

REPORT NUMBER: 07U11304-1, REVISION A

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Prepared for

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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	11/18/07	Initial Issue	T. Chan
A	11/29/07	Corrected power adapter's serial number on page 4	D. Chang

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: MICROSOFT CORPORATION
1065 LA AVENIDA
MOUNTAIN VIEW, CA 94043, USA

EUT DESCRIPTION: XBOX 360 WIRELESS RACING WHEEL WITH FORCE FEEDBACK

MODEL: WRW01

SERIAL NUMBER: P74200010A1 (Power adapter)

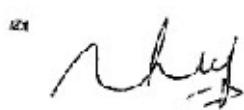
DATE TESTED: NOVEMBER 16, 2007

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C	No Non-Compliance Noted
RSS-210 Issue 7 Annex 8 and RSS-GEN Issue 2	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.

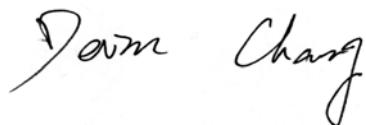
Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by Compliance Certification Services and all revisions are duly noted in the revisions section. 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:



THU CHAN
EMC SUPERVISOR
COMPLIANCE CERTIFICATION SERVICES

Tested By:



DEVIN CHANG
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, FCC CFR 47 Part 15, RSS-GEN Issue 2, and RSS-210 Issue 7.

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
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 Monaco 1 with alternate Microsoft AC adapter.

During the final tests, a special design test accessory (RTX Unity) was used to control the frequency channel and enable continuous transmission.

Proprietary communication protocol is detailed in the theory of operation.

5.2. DESCRIPTION OF CLASS II PERMISSIVE CHANGE

Monaco I with alternate Microsoft AC adapter, model number: PSC15R-240(MSK).

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a directional patch antenna, with a maximum peak gain of -2.1 dBi.

5.4. SOFTWARE AND FIRMWARE

The EUT driver software installed in the host support equipment during testing was BAT-menu-V0107.

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 2402 MHz.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT & PERIPHERALS

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
Steering Wheel	Microsoft Corp.	Monaco II	548000242715	NA
AC Adapter	Microsoft	PSC15R-240(MSK)	P74200010A1	DoC
Game Console	Microsoft Corp.	Xbox 360 Game Console	301800265205	DoC
AC Adapter 3 (200-240 VAC)	Hipro	HP-AW205EF3P LF	1967	DoC
Foot Pedals	Microsoft Corp.	Monaco II	5481000142	NA

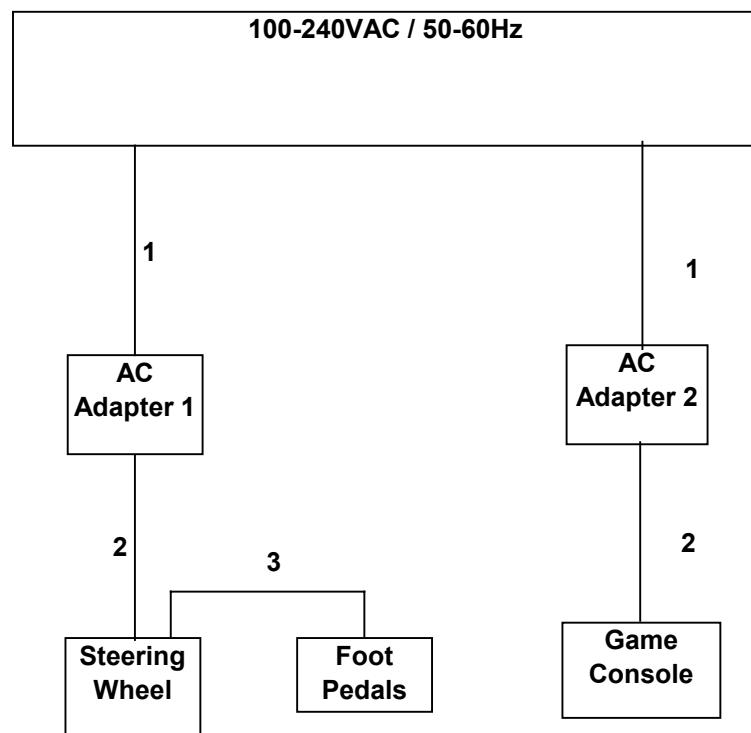
I/O CABLES

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	AC Input	2	US115V	Un-Shielded	2m	
2	DC Input	2	DC	Un-Shielded	1.75m	Ferrite at steering wheel end
3	Foot Pedal	1	RJ-11	Un-Shielded	2m	

TEST SETUP

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

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	Asset	Cal Date	Cal Due
SA Display Section	Agilent / HP	85662A	N02480	5/4/2006	4/7/2008
Quasi-Peak Adaptor	Agilent / HP	85650A	C00779	4/13/2006	1/21/08
SA RF Section, 1.5 GHz	Agilent / HP	85680B	N02455	4/4/2006	1/7/08
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	C01016	9/28/07/	9/28/08
Preamp, 1000MHz	Sonoma	310N	NA	1/20/2007	1/20/08
Antenna, Horn, 18 GHz	EMCO	3115	C00872	4/15/2007	4/15/08
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01069	12/14/2006	3/18/08
LISN, 30 MHz	FCC	LISN-50/250-25-2	N02625	9/15/2007	9/15/08
EMI Test Receiver, 30 MHz	R & S	ESHS 20	N02396	10/16/2007	1/27/08

7. RADIATED TEST RESULTS

7.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

IC RSS-210 Clause 2.6 (Transmitter)

IC RSS-GEN Clause 6 (Receiver)

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.

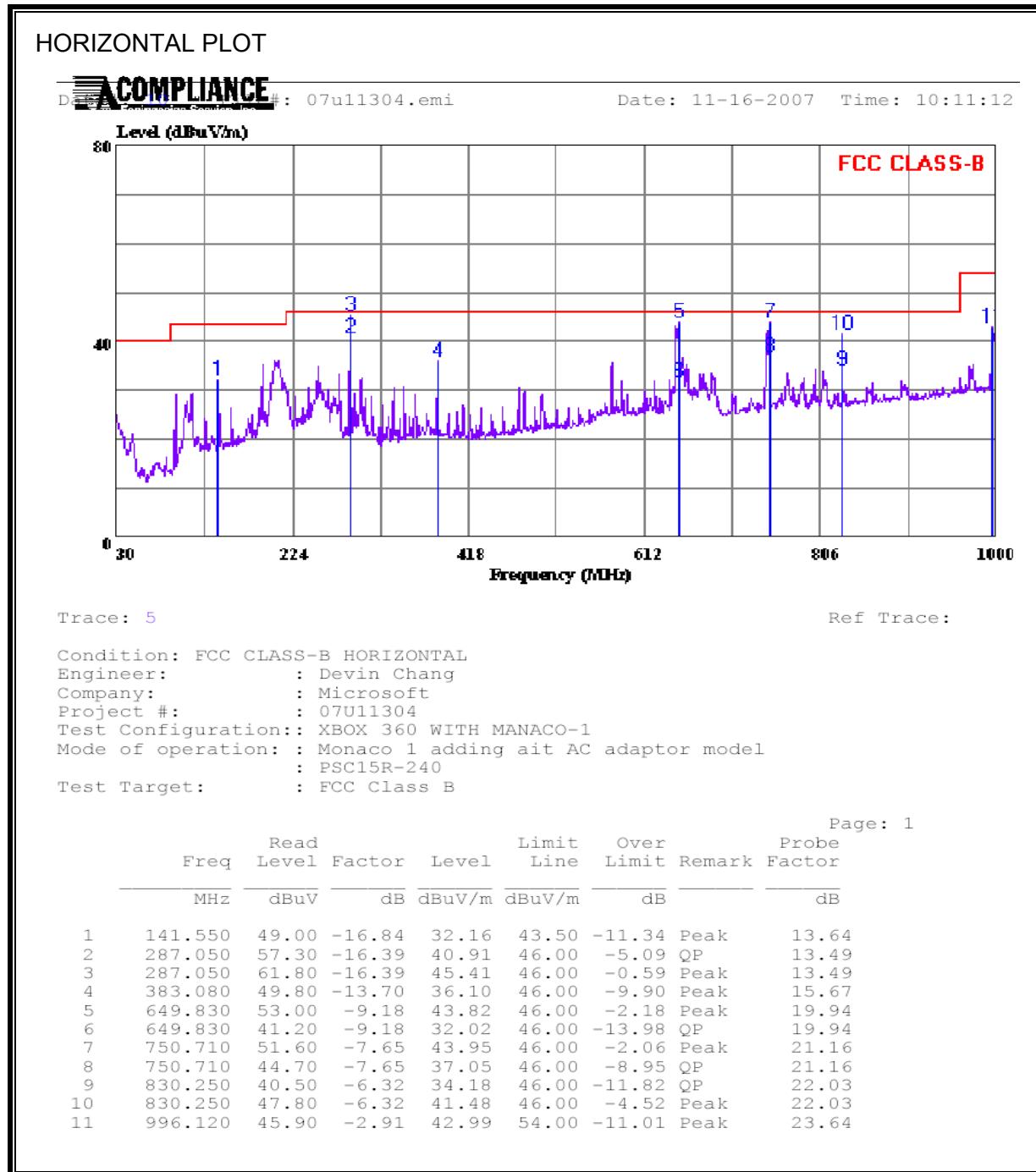
For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

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.

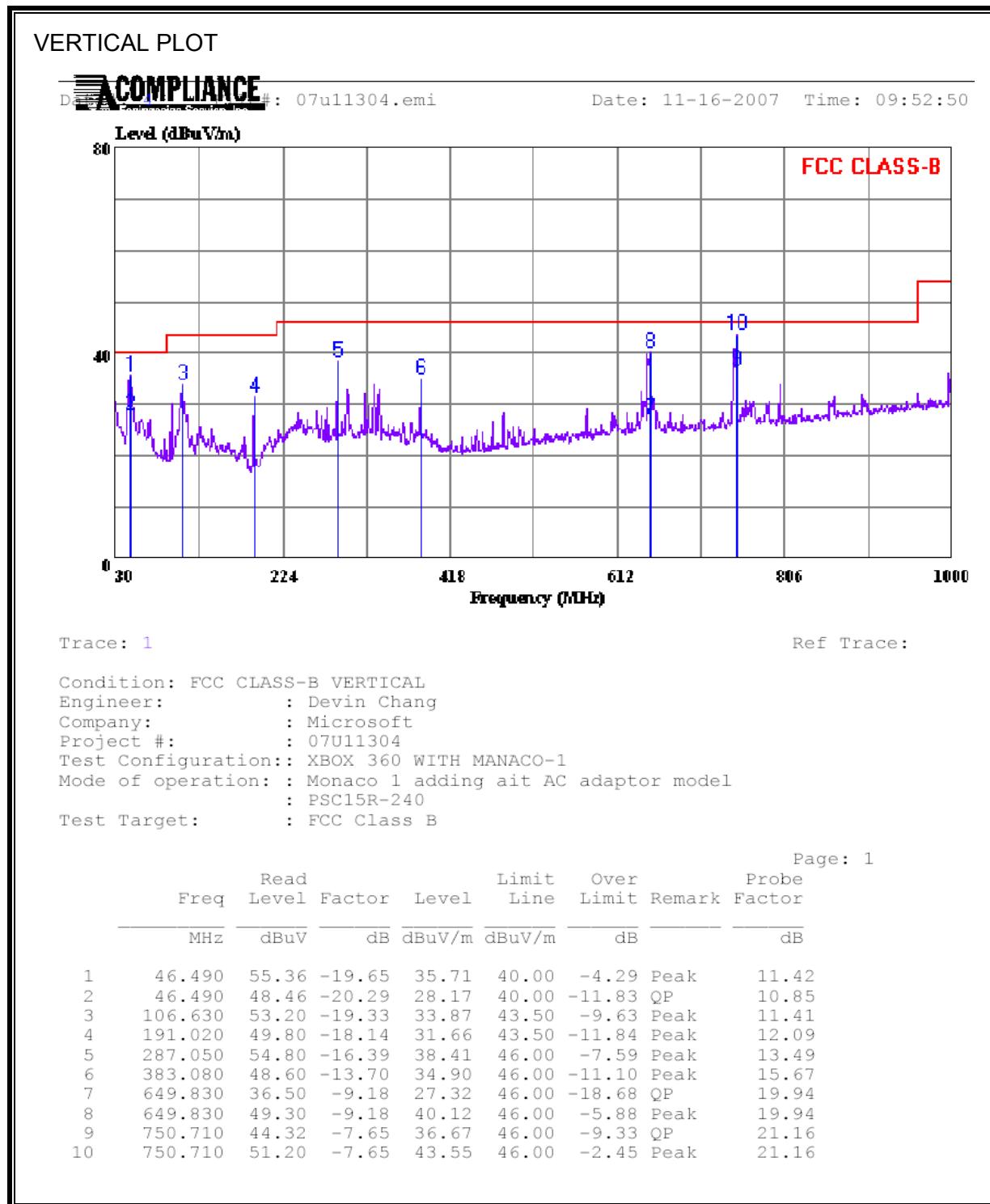
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

7.2. WORST-CASE BELOW 1 GHz

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



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



8. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

RSS-Gen 7.2.2

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 receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

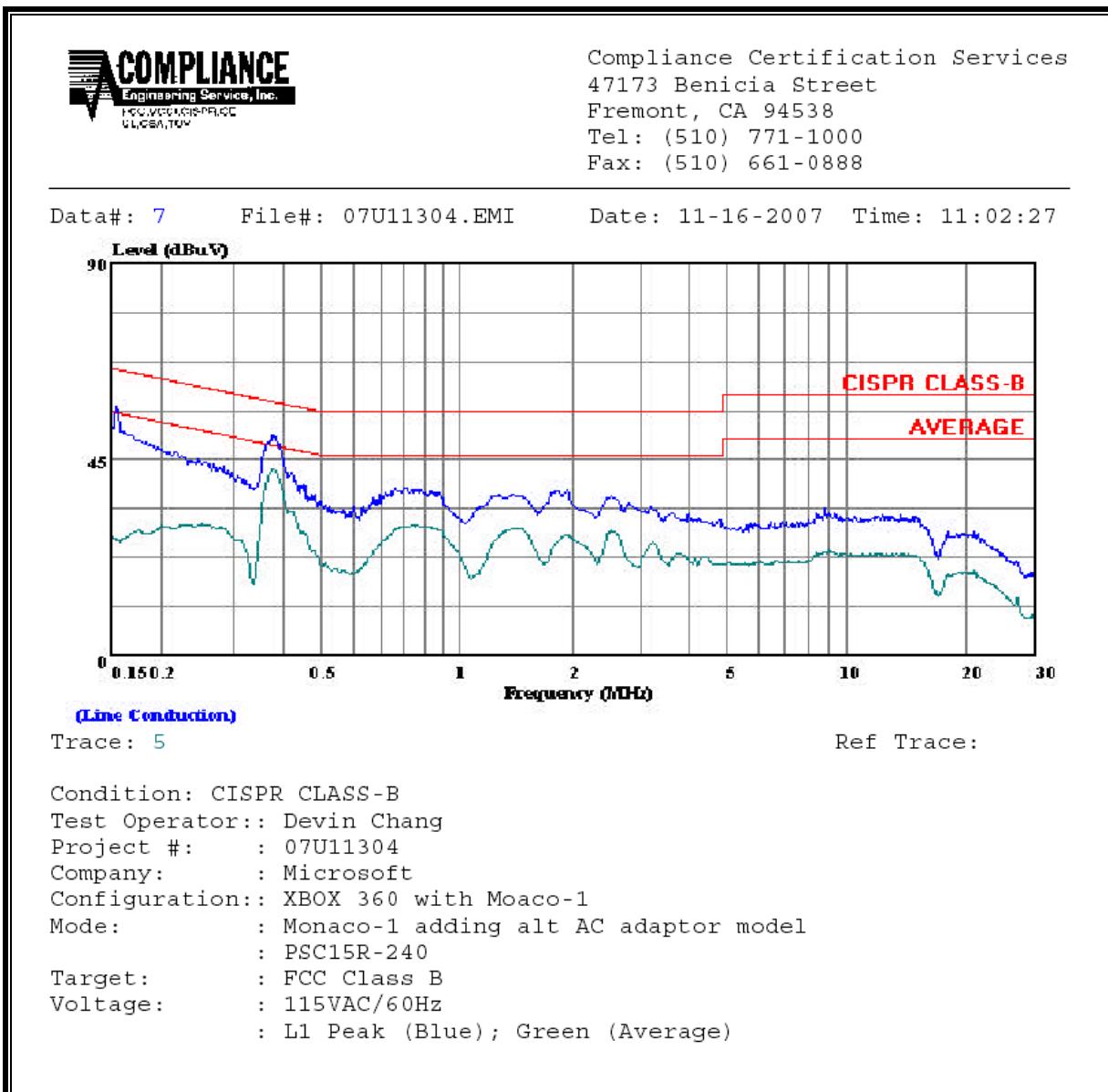
Line conducted data is recorded for both NEUTRAL and HOT lines.

RESULTS

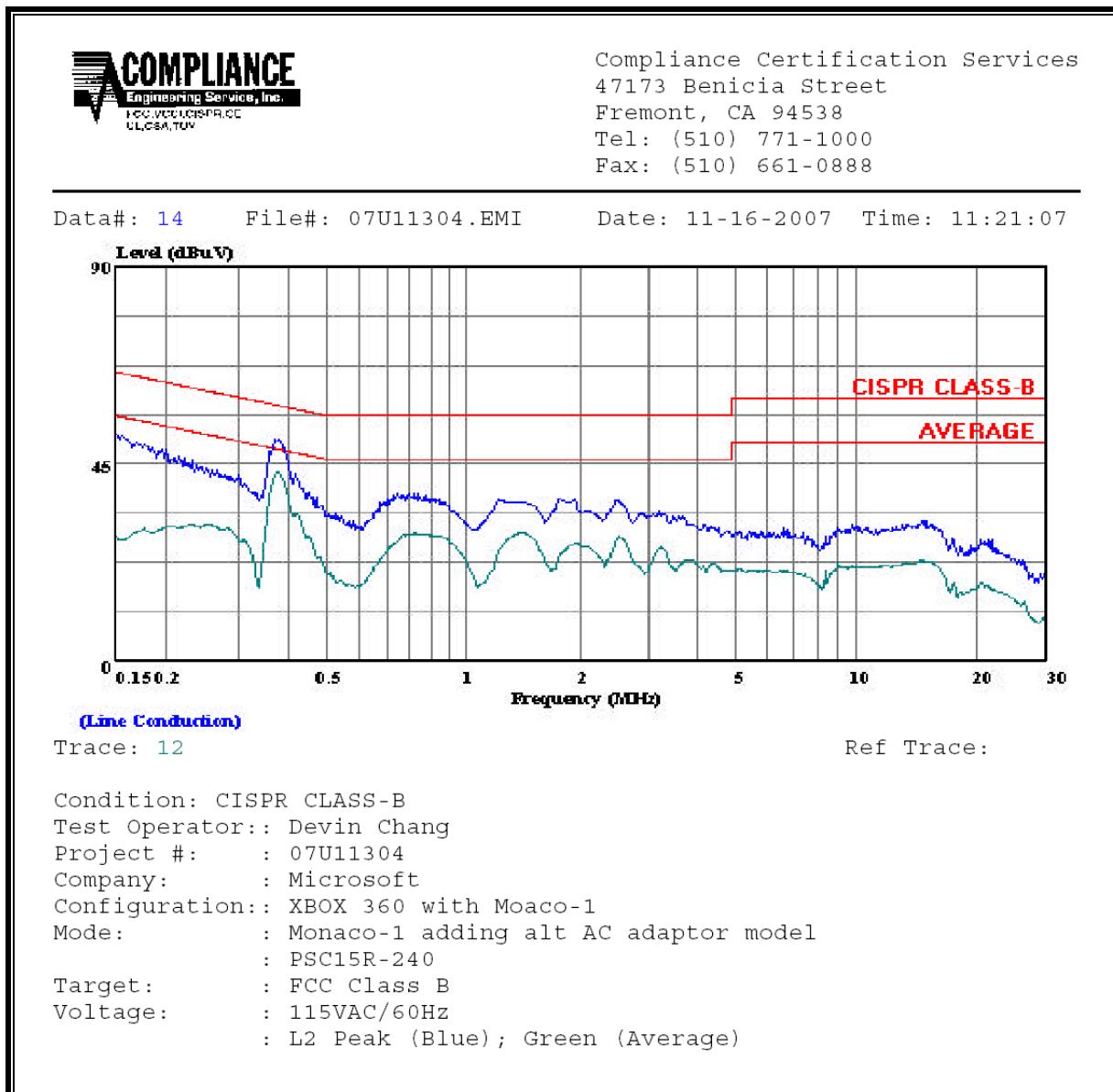
6 WORST EMISSIONS

CONDUCTED EMISSIONS DATA (115VAC 60Hz)									
Freq. (MHz)	Reading			Closs (dB)	Limit	FCC B	Margin		Remark
	PK (dBuV)	QP (dBuV)	AV (dBuV)				QP	AV	
0.15	57.30	--	26.75	0.00	65.84	55.84	-8.54	-29.09	L1
0.38	50.46	--	42.92	0.00	58.30	48.30	-7.84	-5.38	L1
2.59	36.35	--	28.49	0.00	56.00	46.00	-19.65	-17.51	L1
0.15	50.74	--	28.61	0.00	65.84	55.84	-15.10	-27.23	L2
0.38	50.74	--	43.12	0.00	58.30	48.30	-7.56	-5.18	L2
2.62	36.66	--	28.34	0.00	56.00	46.00	-19.34	-17.66	L2
6 Worst Data									

LINE 1 RESULTS



LINE 2 RESULTS



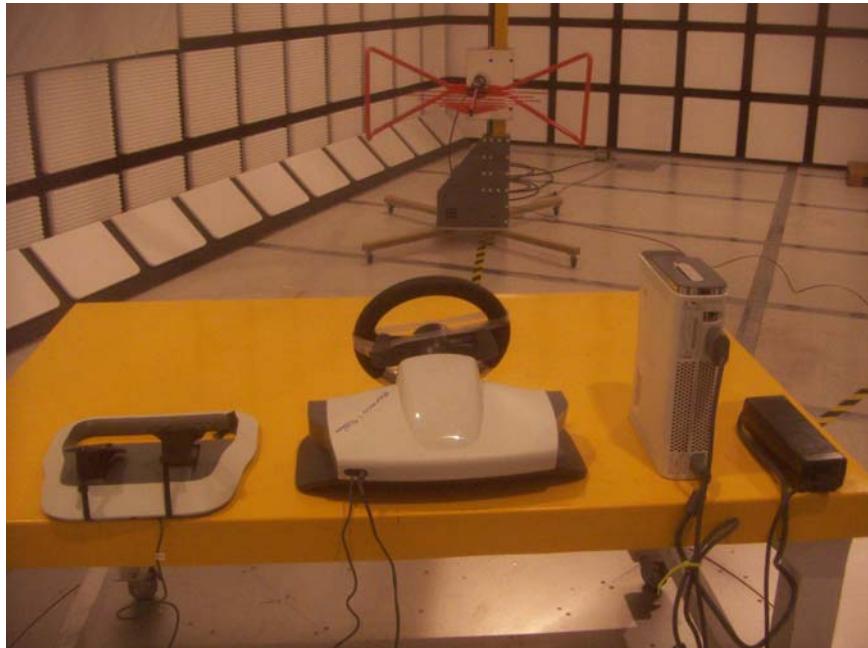
9. SETUP PHOTOS

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