FCC CFR47 PART 15 SUBPART C
INDUSTRY CANADA RSS-210 ISSUE 7

CERTIFICATION TEST REPORT
FOR

CAR CHARGER/ FM TRANSMITTER

MODEL NUMBER: 1129

FCC ID: C3K-1129

IC: 3048A-1129

REPORT NUMBER: 08U12046-1, Revision B

ISSUE DATE: SEPTEMBER 11, 2008

Prepared for
MICROSOFT CORPORATION
1065 LA AVENIDA
MOUNTAIN VIEW, CA 94043, USA

Prepared by
COMPLIANCE CERTIFICATION SERVICES
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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
---	09/03/08	Initial Issue	T. Chan
A	09/08/08	Revised Section 5.2	T. Chan
B	09/11/08	Revised Section 7.1, Bandwidth Table	T. Chan

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS

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

EUT DESCRIPTION: CAR CHARGER/ FM TRANSMITTER

MODEL: 1129

SERIAL NUMBER: P70310A2

DATE TESTED: SEPTEMBER 3, 2008

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
FCC PART 15 SUBPART C	PASS
RSS-210 ISSUE 7 ANNEX 2	PASS
RSS-GEN ISSUE 2	PASS

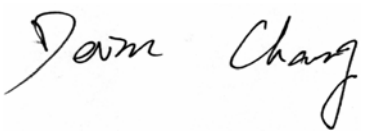
Compliance Certification Services, Inc. (CCS) tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by CCS based on interpretations and/or observations of test results. The test results show 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 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
ENGINEERING MANAGER
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 ANNEX 2.

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 a low power FM Broadcast Band Transmitter powered by a 12V DC car battery.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum radiated fundamental field strength at 3m distance as follows:

Frequency Range (MHz)	Maximum Fund F.S. (dBuV/m)
88.1 - 107.9	48.45

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an integrated monopole antenna.

5.4. SOFTWARE AND FIRMWARE

Firmware number:3.90.

5.5. WORST-CASE CONFIGURATION AND MODE

The worst-case channel is determined as the channel with un-modulated signal has the highest field strength.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
ZUNE MP3 Player	Microsoft	1376	100031828.00	N/A
12VDC Battery	OPTIMA	SPR	SC31DM-SPR-J7	N/A

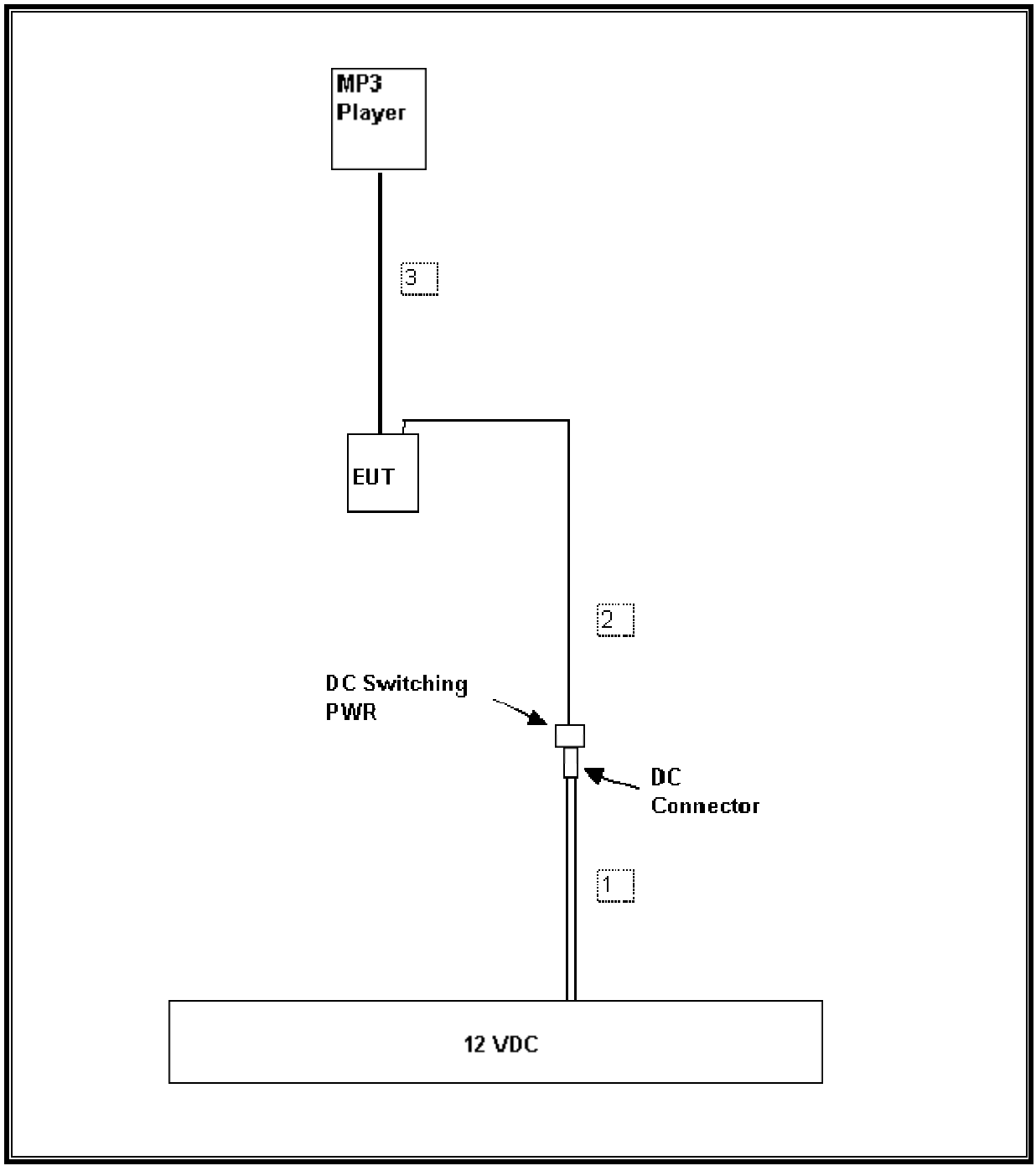
I/O CABLES

I/O CABLE LIST						
Cable No.	**Port**	**# of Identical Ports**	**Connector Type**	**Cable Type**	**Cable Length**	**Remarks**
1	DC	1	DC Plug	Unshielded	1.5m	No
2	DC	1	Car DC Plug	Unshielded	.5m	No
3	Lin out	1	Line out	Unshielded	.5m	No

TEST SETUP

The EUT is connected to an MP3 player during the tests. An audio music file at maximum volume was running continuously.

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 Receiver, 9 kHz ~ 2.9 GHz	HP	8542E	3942A00286	9/19/2009
RF Filter Section	HP	85420E	3705A00256	9/19/2009
Preamplifier	HP	8447D	1937A02062	3/31/2009
Antenna, Bilog 30MHz ~ 2Ghz	Sunol Sciences	JB1	A0022704	9/29/2008
Spectrum Analyzer 3 Hz ~ 44 GHz	Agilent	E4446A	MY43360122	3/3/2009

7. LIMITS AND RESULTS

7.1. 20 dB AND 99% BANDWIDTH

LIMIT

§15.239 (b)
RSS-210 Issue 7 Clause A2.8

200 kHz

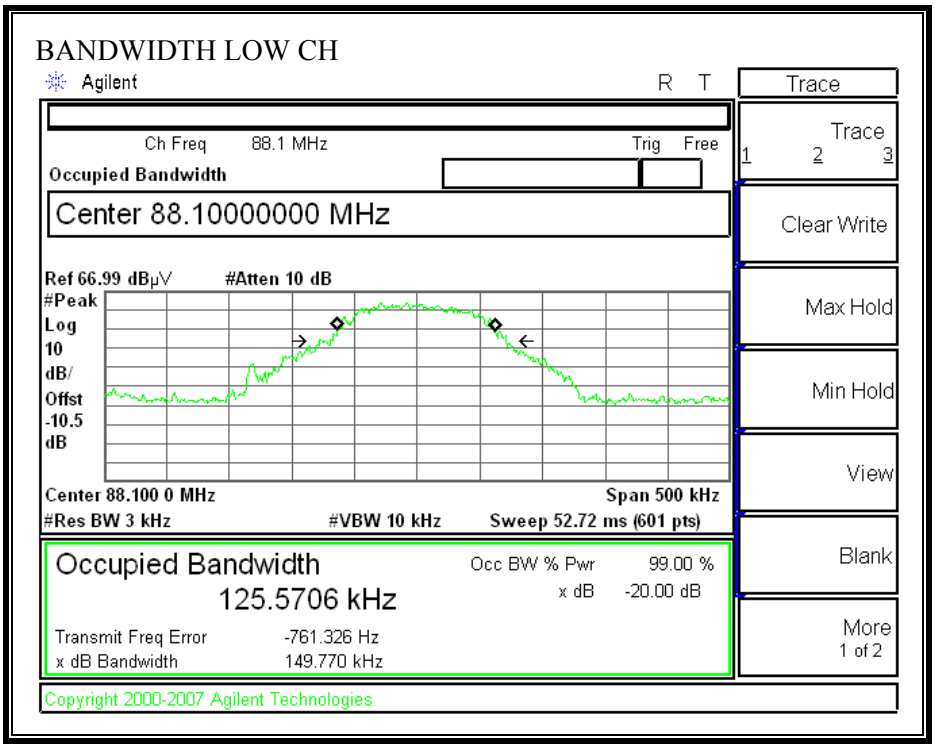
TEST PROCEDURE

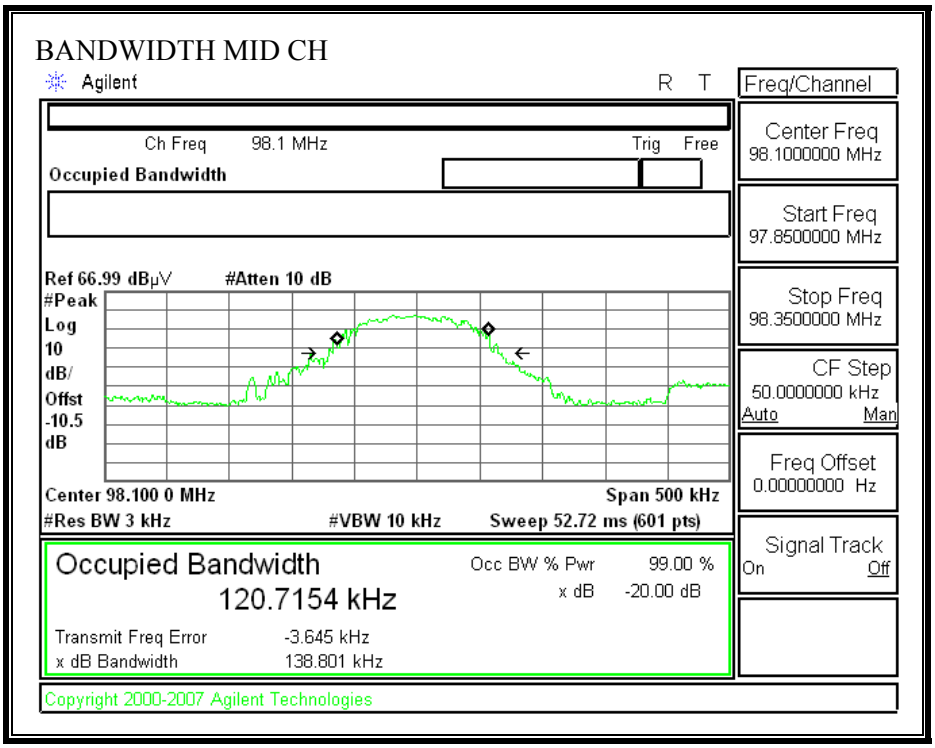
The receive test antenna is connected to a spectrum analyzer. The RBW is set to 3 kHz, VBW is set to 10 kHz. The span is set to 500 kHz.

RESULTS

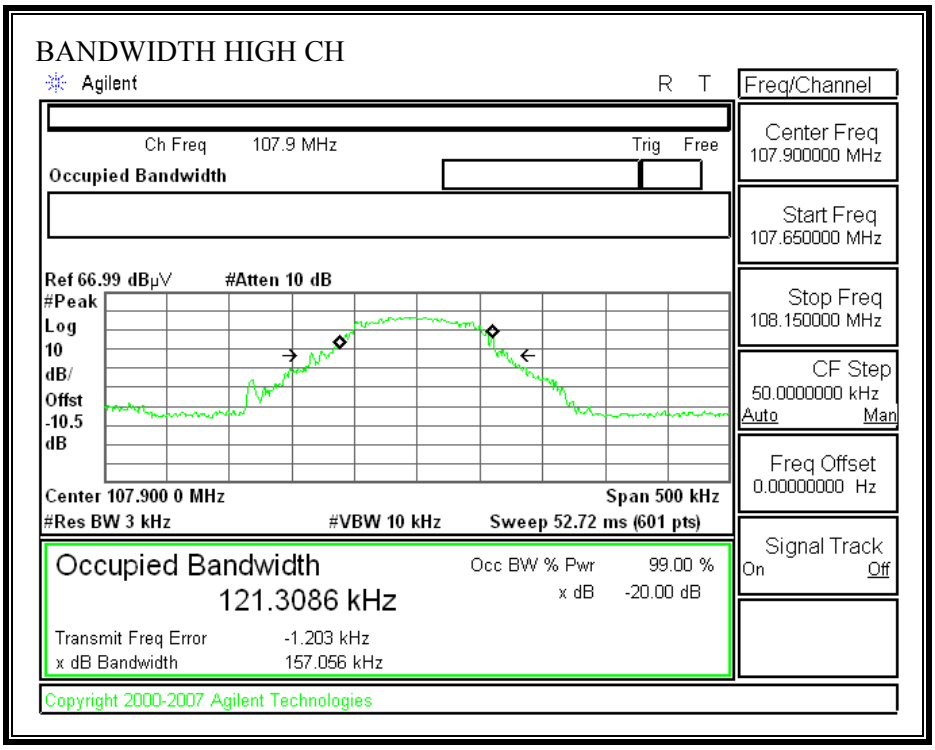
Channel	Frequency (MHz)	99% Bandwidth (kHz)	20dB Bandwidth (kHz)
Low	88.1	125.5706	149.77
Middle	98.1	120.7154	138.801
High	107.9	121.3086	157.056

20 dB AND 99% BANDWIDTH





BANDWIDTH HIGH CH



7.2. FUNDAMENTAL FIELD STRENGTH

LIMIT

§15.239 (b)
RSS-210 Issue 7 Clause A2.8

48 dBuV/m Average at 3m distance.
68 dBuV/m Peak at 3m distance

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 level of the fundamental signal 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. Three orthogonal orientations of the EUT were investigated to find worst-case for Middle channel and that worst-case orientation was used for Low and High channels.

RBW and VBW for the spectrum analyzer were 300 kHz and 1 MHz respectively for Peak measurement, and they were 300 kHz and 10 Hz respectively as required for Average measurement.

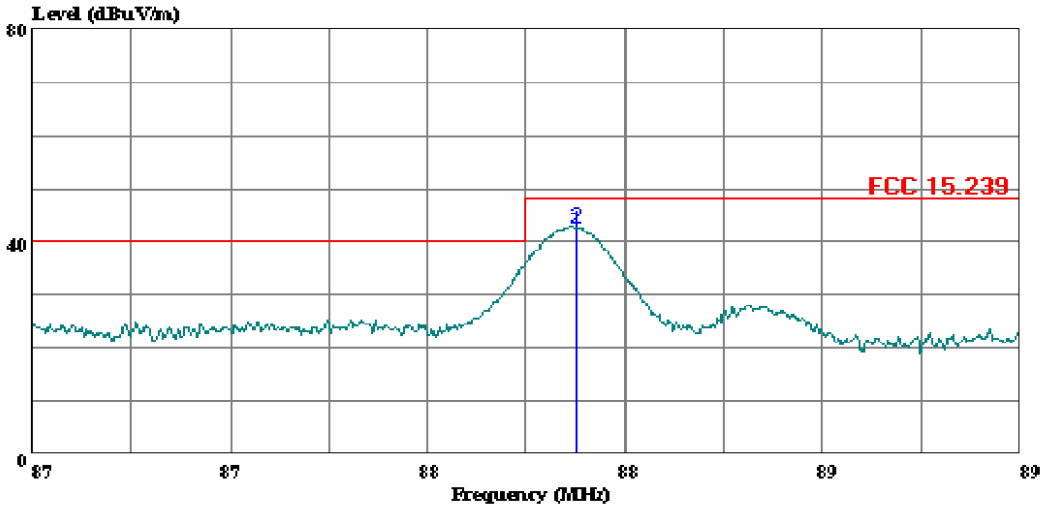
RESULTS

Channel	Frequency (MHz)	Peak Fund F.S. (dBuV/m)	Average Fund F.S. (dBuV/m)	PK Limit (dBuV/m)	AV Limit (dBuV/m)	PK Margin (dB)	AV Margin (dB)
Low	88.1	48.45	45.02	68	48	-19.55	-2.98
Middle	98.1	45.41	42.96	68	48	-22.59	-5.04
High	107.9	48.33	43.45	68	48	-19.67	-4.55

FIELD STRENGTH DATA, LOW CHANNEL, HORIZONTAL

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

Data#: 78 File#: 07u11179.emi Date: 09-03-2008 Time: 14:11:04



Trace: 75 Ref Trace:

Condition: FCC 15.239 3m ANTENNA A_5M 021109 HORIZONTAL
Test Operator:: Devin Chang
Project #: : 07U11179
Company: : Microsoft
Configuration:: EUT(88.1MHz) with Zune FW3.90
Mode : : TX(unmodulation)
Target: : FCC Class B
: (peak:RBW=VBW=100kHz;
: Average:RBW=100KHz, VBW=10Hz)

Page: 1

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	88.100	60.93	-18.90	42.03	48.00	-5.97	Average
2	88.102	61.41	-18.90	42.51	68.00	-25.49	Peak

FIELD STRENGTH DATA, LOW CHANNEL, VERTICAL

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47173 Benicia Street
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Tel: (510) 771-1000
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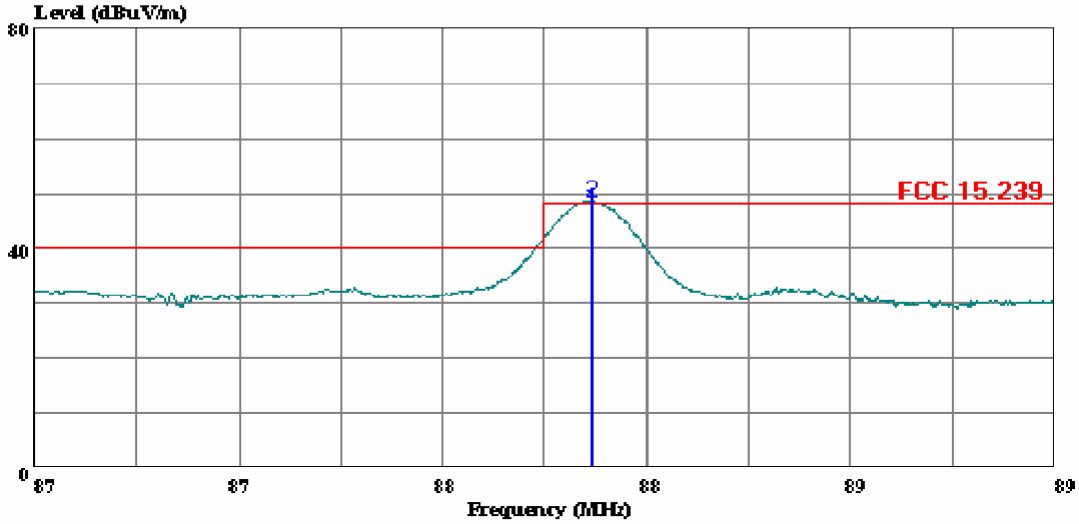

Trace: 71 Ref Trace:

Condition: FCC 15.239 3m ANTENNA A_5M 021109 VERTICAL
Test Operator:: Devin Chang
Project #: : 07U11179
Company: : Microsoft
Configuration:: EUT(88.1MHz) with Zune FW3.90
Mode : : TX(unmodulation)
Target: : FCC Class B
: (peak:RBW=VBW=100kHz;
: Average:RBW=100KHz, VBW=10Hz)

Page: 1

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	88.092	65.92	-18.90	45.02	48.00	-2.98	Average
2	88.092	67.35	-18.90	48.45	68.00	-19.55	Peak

FIELD STRENGTH DATA, MID CHANNEL, HORIZONTAL

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Fremont, CA 94538
Tel: (510) 771-1000
Fax: (510) 661-0888

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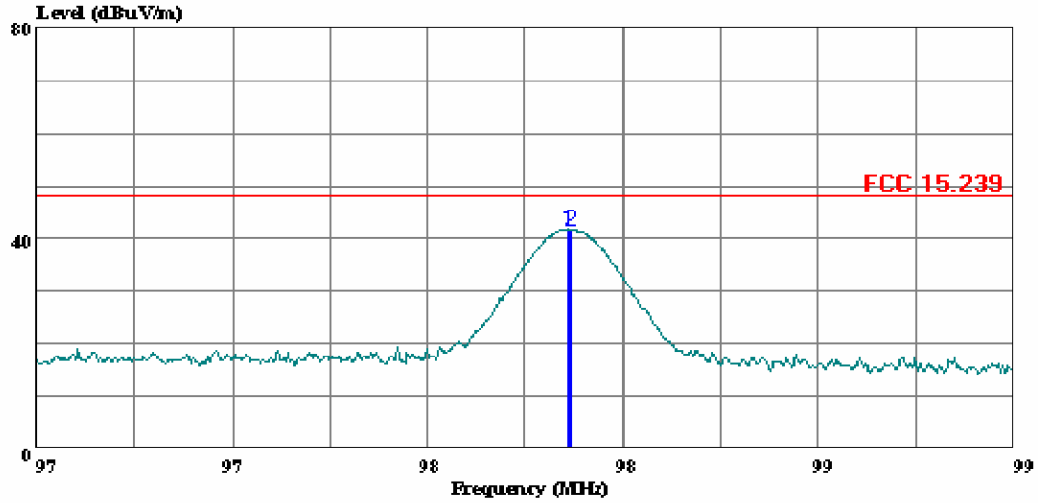

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Condition: FCC 15.239 3m ANTENNA A_5M 021109 HORIZONTAL
Test Operator:: Devin Chang
Project #: : 07U11179
Company: : Microsoft
Configuration:: EUT(98.1MHz) with Zune FW3.90
Mode : : TX(unmodulation)
Target: : FCC Class B
: (peak:RBW=VBW=100kHz;
: Average:RBW=100KHz, VBW=10Hz)

Page: 1

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	98.090	58.36	-16.87	41.49	48.00	-6.51	Average
2	98.092	58.58	-16.87	41.71	68.00	-26.29	Peak

FIELD STRENGTH DATA, MID CHANNEL, VERTICAL

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Tel: (510) 771-1000
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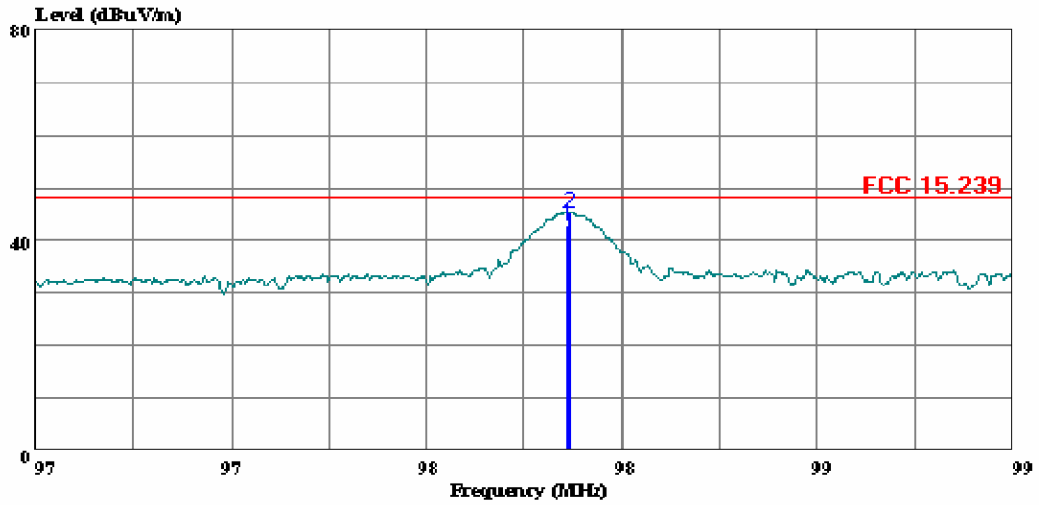

Trace: 87 Ref Trace:

Condition: FCC 15.239 3m ANTENNA A_5M 021109 VERTICAL
Test Operator:: Devin Chang
Project #: : 07U11179
Company: : Microsoft
Configuration:: EUT(98.1MHz) with Zune FW3.90
Mode : : TX(unmodulation)
Target: : FCC Class B
: (peak:RBW=VBW=100kHz;
: Average:RBW=100KHz, VBW=10Hz)

Page: 1

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	98.090	59.83	-16.87	42.96	48.00	-5.04	Average
2	98.092	62.28	-16.87	45.41	68.00	-22.59	Peak

FIELD STRENGTH DATA, HIGH CHANNEL, HORIZONTAL

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47173 Benicia Street
Fremont, CA 94538
Tel: (510) 771-1000
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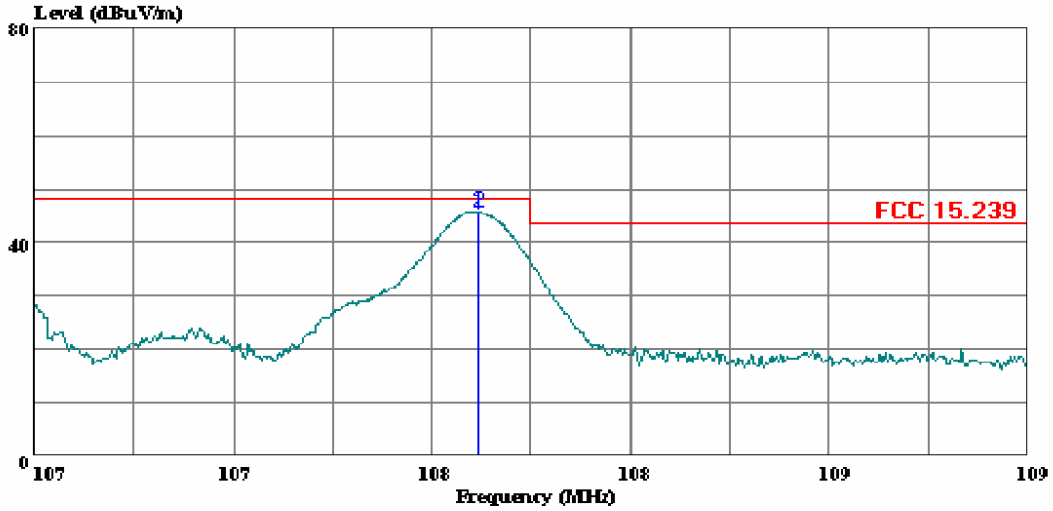

Trace: 79 Ref Trace:

Condition: FCC 15.239 3m ANTENNA A_5M 021109 HORIZONTAL
Test Operator:: Devin Chang
Project #: : 07U11179
Company: : Microsoft
Configuration:: EUT(107.9MHz) with Zune FW3.90
Mode : : TX(unmodulation)
Target: : FCC Class B
: (peak:RBW=VBW=100kHz;
: Average:RBW=100KHz, VBW=10Hz)

Page: 1

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	107.894	60.39	-14.90	45.49	48.00	-2.51	Average
2	107.894	60.58	-14.90	45.68	68.00	-22.32	Peak

FIELD STRENGTH DATA, HIGH CHANNEL, VERTICAL

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

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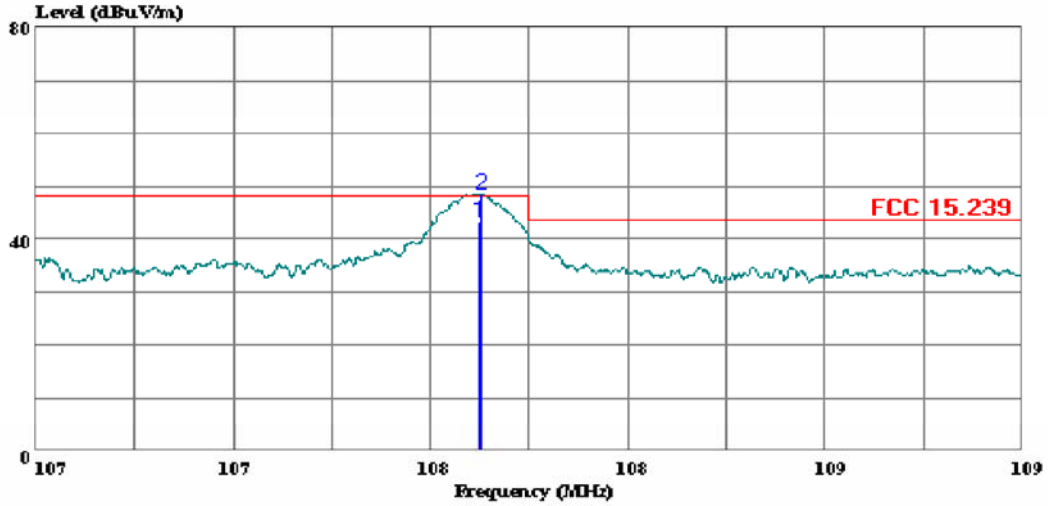

Trace: 83 Ref Trace:

Condition: FCC 15.239 3m ANTENNA A_5M 021109 VERTICAL
Test Operator:: Devin Chang
Project #: : 07U11179
Company: : Microsoft
Configuration:: EUT(107.9MHz) with Zune FW3.90
Mode : : TX(unmodulation)
Target: : FCC Class B
: (peak:RBW=VBW=100kHz;
: Average:RBW=100KHz, VBW=10Hz)

Page: 1

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	107.900	58.35	-14.90	43.45	48.00	-4.55	Average
2	107.902	63.23	-14.90	48.33	68.00	-19.67	Peak

7.3. RADIATED SPURIOUS EMISSIONS

LIMITS

FCC §15.205 and §15.209

IC RSS-210 Clause 2.6

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 2 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 88-108 MHz FM 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.

NOTE

The emission in each the SPURIOUS FIELD STRENGTH plots that exceeds the out-of-band spurious limits is due to the fundamental, which has measured with respect to the in-band limit in Section 7.2 above.

SPURIOUS FIELD STRENGTH DATA, LOW CHANNEL, HORIZONTAL

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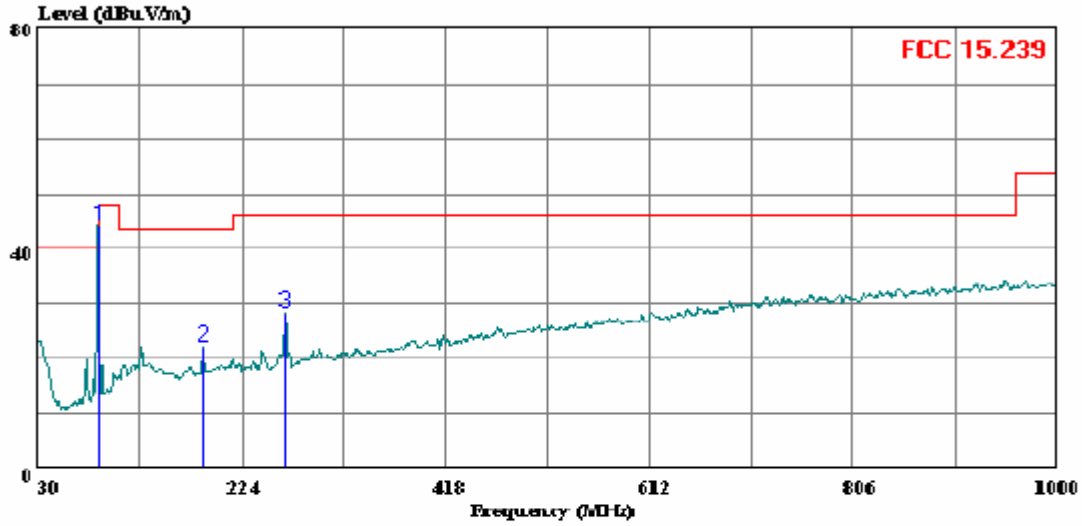
Tel: (510) 771-1000
Fax: (510) 661-0888

Data#: 106 File#: 07u11179.emi Date: 09-03-2008 Time: 15:46:07



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Condition: FCC 15.239 3m ANTENNA A_5M 021109 HORIZONTAL
Test Operator:: Devin Chang
Project #: : 07U11179
Company: : Microsoft
Configuration:: EUT(88.1MHz) with Zune FW3.90
Mode : : TX
Target: : FCC Class B

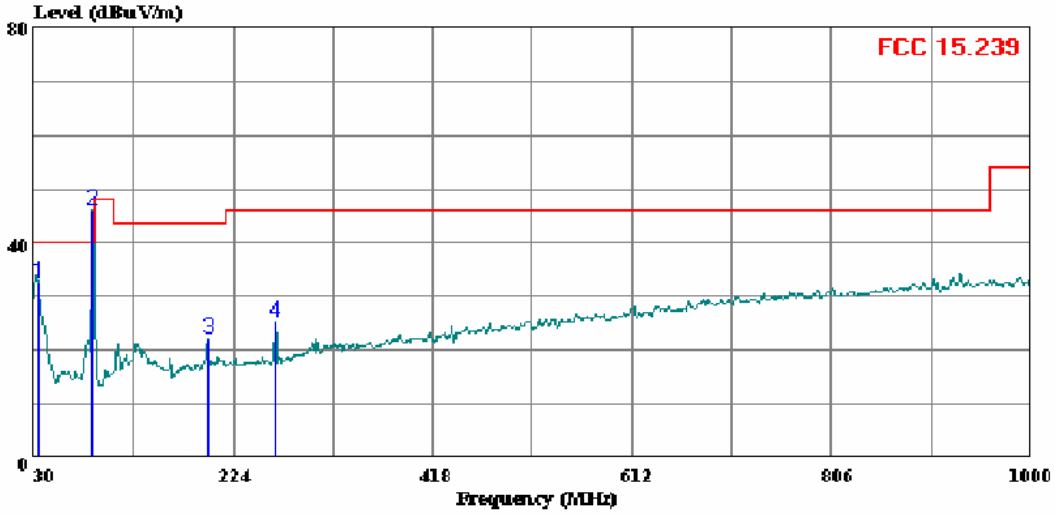
Page: 1

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	88.100	63.25	-18.91	44.34	48.00	-3.66	Peak
2	187.140	35.74	-13.69	22.05	43.50	-21.45	Peak
3	264.740	40.85	-12.40	28.45	46.00	-17.55	Peak

SPURIOUS FIELD STRENGTH DATA, LOW CHANNEL, VERTICAL

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

Data#: 109 File#: 07u11179.emi Date: 09-03-2008 Time: 15:59:11



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Condition: FCC 15.239 3m ANTENNA A_5M 021109 VERTICAL
Test Operator:: Devin Chang
Project #: : 07U11179
Company: : Microsoft
Configuration:: EUT(88.1MHz) with Zune FW3.90
Mode : : TX
Target: : FCC Class B

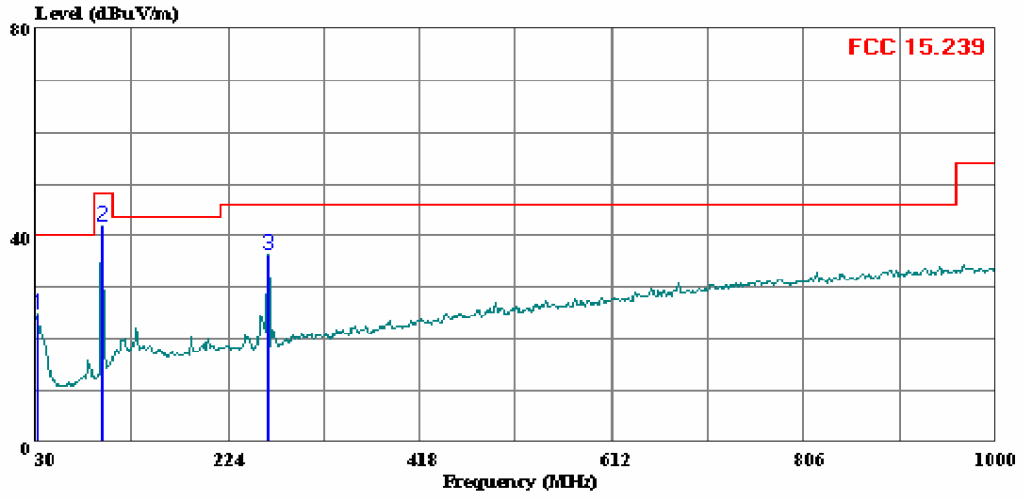
Page: 1

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	33.880	41.78	-9.30	32.48	40.00	-7.52	Peak
2	88.100	64.96	-18.91	46.05	48.00	-1.95	Peak
3	198.780	35.20	-12.90	22.30	43.50	-21.20	Peak
4	264.740	37.82	-12.40	25.42	46.00	-20.58	Peak

SPURIOUS FIELD STRENGTH DATA, MID CHANNEL, HORIZONTAL

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

Data#: 104 File#: 07u11179.emi Date: 09-03-2008 Time: 15:37:41



Trace: 103 Ref Trace:

Condition: FCC 15.239 3m ANTENNA A_5M 021109 HORIZONTAL
Test Operator:: Devin Chang
Project #: : 07U11179
Company: : Microsoft
Configuration:: EUT(98.1MHz) with Zune FW3.90
Mode : : TX
Target: : FCC Class B

Page: 1

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	31.940	33.06	-8.17	24.89	40.00	-15.11	Peak
2	96.930	59.21	-17.27	41.94	48.00	-6.06	Peak
3	264.740	48.72	-12.40	36.32	46.00	-9.68	Peak

SPURIOUS FIELD STRENGTH DATA, MID CHANNEL, VERTICAL

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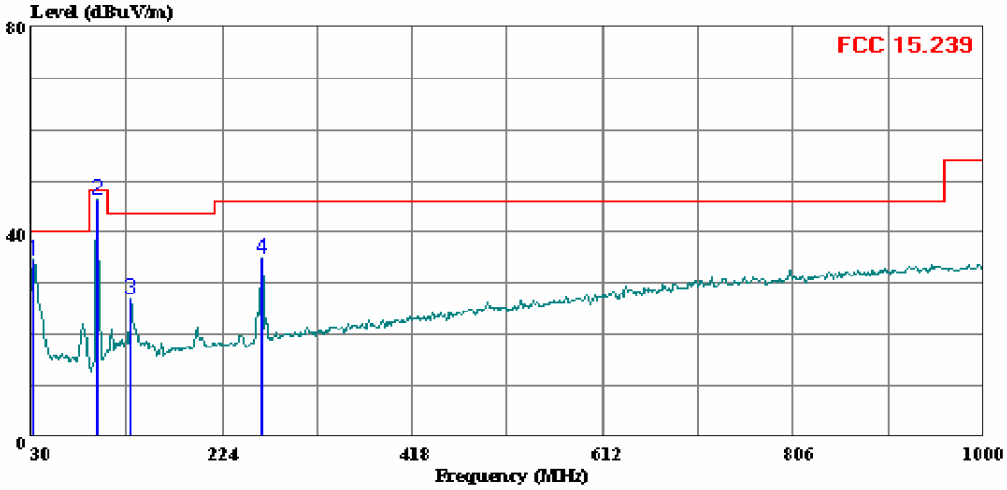
Fax: (510) 661-0888

Data#: 102 File#: 07u11179.emi Date: 09-03-2008 Time: 15:26:29



Trace: 101 Ref Trace:

Condition: FCC 15.239 3m ANTENNA A_5M 021109 VERTICAL
Test Operator:: Devin Chang
Project #: : 07U11179
Company: : Microsoft
Configuration:: EUT(98.1MHz) with Zune FW3.90
Mode : : TX
Target: : FCC Class B

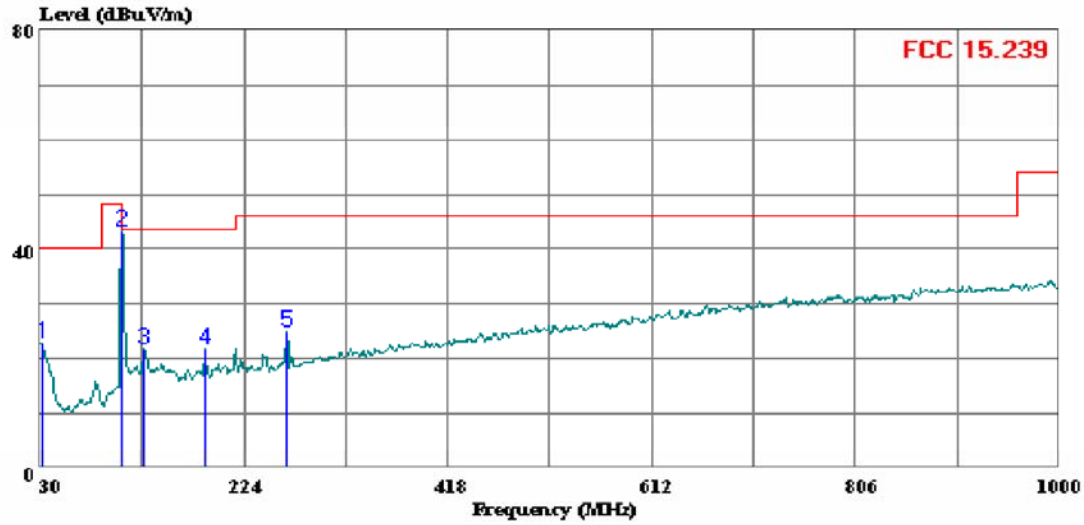
Page: 1

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	31.940	42.83	-8.17	34.66	40.00	-5.34	Peak
2	96.930	63.71	-17.27	46.44	48.00	-1.56	Peak
3	130.880	40.19	-13.21	26.98	43.50	-16.52	Peak
4	264.740	47.28	-12.40	34.88	46.00	-11.12	Peak

SPURIOUS FIELD STRENGTH DATA, HIGH CHANNEL, HORIZONTAL

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

Data#: 113 File#: 07u11179.emi Date: 09-03-2008 Time: 16:10:08



Trace: 112 Ref Trace:

Condition: FCC 15.239 3m ANTENNA A_5M 021109 HORIZONTAL
Test Operator:: Devin Chang
Project #: : 07U11179
Company: : Microsoft
Configuration:: EUT(107.9MHz) with Zune FW3.90
Mode : : TX
Target: : FCC Class B

Page: 1

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	31.940	30.99	-8.17	22.82	40.00	-17.18	Peak
2	107.600	58.23	-15.06	43.17	48.00	-4.83	Peak
3	128.940	35.10	-13.24	21.86	43.50	-21.64	Peak
4	187.140	35.39	-13.69	21.70	43.50	-21.80	Peak
5	264.740	37.36	-12.40	24.96	46.00	-21.04	Peak

SPURIOUS FIELD STRENGTH DATA, HIGH CHANNEL, VERTICAL

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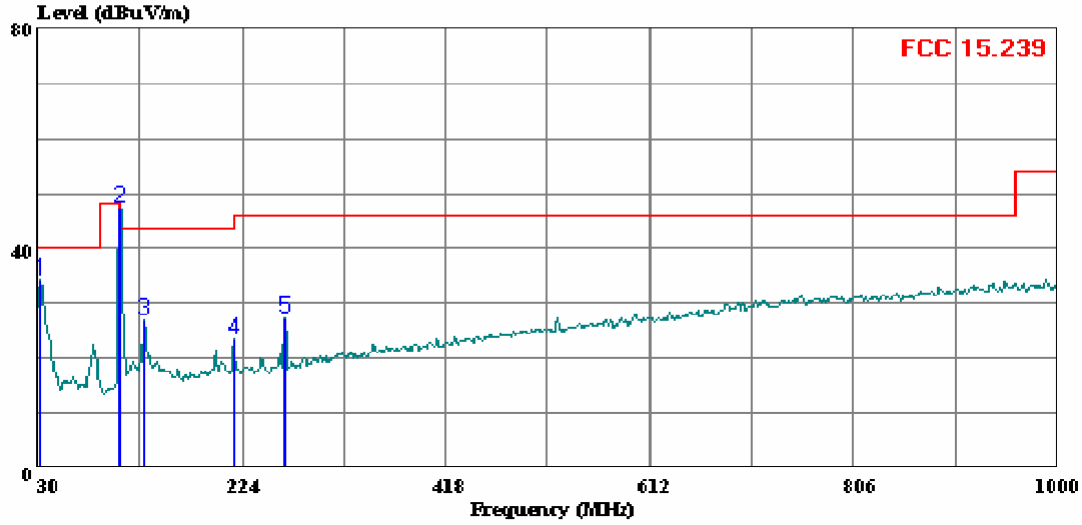
Data#: 111 File#: 07u11179.emi Date: 09-03-2008 Time: 16:04:11



Trace: 110 Ref Trace:

Condition: FCC 15.239 3m ANTENNA A_5M 021109 VERTICAL
Test Operator:: Devin Chang
Project #: : 07U11179
Company: : Microsoft
Configuration:: EUT(107.9MHz) with Zune FW3.90
Mode : : TX
Target: : FCC Class B

Page: 1

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	31.940	42.55	-8.17	34.38	40.00	-5.62	Peak
2	107.600	62.60	-15.06	47.54	48.00	-0.46	Peak
3	130.880	40.17	-13.21	26.96	43.50	-16.54	Peak
4	216.240	36.39	-12.89	23.50	46.00	-22.50	Peak
5	264.740	39.62	-12.40	27.22	46.00	-18.78	Peak

HARMONICS AND SPURIOUS EMISSIONS ABOVE 1GHZ

Note: No significant differences in the emissions above 1 GHz were observed as a function of the transmitter channel.