

# Microsoft Corporation

**Zune 120GB  
Model Number: 1376  
FCC ID:C3K-1126**

June 20, 2008

Report No. MCSO1369 Rev 01

Report Prepared By



[www.nwemc.com](http://www.nwemc.com)  
1-888-EMI-CERT

**EMC Test Report**

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22975 NW Evergreen Parkway  
Suite 400  
Hillsboro, Oregon 97124

**Certificate of Test**  
**Issue Date: June 20, 2008**  
**Microsoft Corporation**  
**Model: Zune 120GB Model Number: 1376**

Emissions			
Test Description	Specification	Test Method	Pass/Fail
Radiated Emissions	EN 55022: 2006 Class B	CISPR 22:2005 (Amended by A1:2005 and A2:2006)	Pass
Radiated Emissions	FCC 15.109:2007 Class B	ANSI C63.4:2003	Pass
Radiated Emissions	FCC 15.109(g) (CISPR 22:1997):2007 Class B	ANSI C63.4:2003	Pass
Conducted Emissions	EN 55022: 2006 Class B	CISPR 22:2005 (Amended by A1:2005 and A2:2006)	Pass
Conducted Emissions	FCC 15.107:2007 Class B	ANSI C63.4:2003	Pass

**Modifications made to the product**  
**See the Modifications section of this report**

**Approved By:**  
  
Dean Ghizzone, President



NVLAP Lab Code: 200629-0

*This report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government of the United States of America.*

*Product compliance is the responsibility of the client, therefore the tests and equipment modes of operation represented in this report were agreed upon by the client, prior to testing. This Report may only be duplicated in its entirety. The results of this test pertain only to the sample(s) tested. The specific description is noted in each of the individual sections of the test report supporting this certificate of test.*

Revision Number	Description	Date	Page Number
01	Per client's request, add FCC ID:C3K-1126 to the cover page.	6/20/2008	Cover Page

**FCC:** Accredited by NVLAP for performance of FCC radio, digital, and ISM device testing. Our Open Area Test Sites, certification chambers, and conducted measurement facilities have been fully described in reports filed with the FCC and accepted by the FCC in letters maintained in our files. Northwest EMC has been accredited by ANSI to ISO / IEC Guide 65 as a product certifier. We have been designated by the FCC as a Telecommunications Certification Body (TCB). This allows Northwest EMC to certify transmitters to FCC specifications in accordance with 47 CFR 2.960 and 2.962.



**NVLAP:** Northwest EMC, Inc. is accredited under the United States Department of Commerce, National Institute of Standards and Technology, and National Voluntary Laboratory Accreditation Program for satisfactory compliance with the requirements of ISO/IEC 17025 for Testing Laboratories. The NVLAP accreditation encompasses Electromagnetic Compatibility Testing in accordance with the European Union EMC Directive 2004/108/EC, and ANSI C63.4. Additionally, Northwest EMC is accredited by NVLAP to perform radio testing in accordance with the European Union R&TTE Directive 1999/5/EEC, the requirements of FCC, and the RSS radio standards for Industry Canada.



NVLAP LAB CODE 200629-0  
 NVLAP LAB CODE 200630-0  
 NVLAP LAB CODE 200676-0  
 NVLAP LAB CODE 200761-0

**Industry Canada:** Accredited by NVLAP for performance of Industry Canada RSS and ICES testing. Our Open Area Test Sites and certification chambers comply with RSS 212, Issue 1 (Provisional) and have been filed with Industry Canada and accepted. Northwest EMC has been accredited by ANSI to ISO / IEC Guide 65 as a product certifier. We have been designated by NIST and recognized by Industry Canada as a Certification Body (CB) per the APEC Mutual Recognition Arrangement (MRA). This allows Northwest EMC to certify transmitters to Industry Canada technical requirements.



**CAB:** Designated by NIST and validated by the European Commission as a Conformity Assessment Body (CAB) to conduct tests and approve products to the EMC directive and transmitters to the R&TTE directive, as described in the U.S. - EU Mutual Recognition Agreement.



**TÜV Product Service:** Included in TÜV Product Service Group's Listing of Recognized Laboratories. It qualifies in connection with the TÜV Certification after Recognition of Agent's Testing Program for the product categories and/or standards shown in TÜV's current Listing of CARAT Laboratories, available from TÜV. A certificate was issued to represent that this laboratory continues to meet TÜV's CARAT Program requirements. Certificate No. USA0604C.



**TÜV Rheinland:** Authorized to carryout EMC tests by order and under supervision of TÜV Rheinland. This authorization is based on "Conditions for EMC-Subcontractors" of November 1992.



**NEMKO:** Assessed and accredited by NEMKO (Norwegian testing and certification body) for European emissions and immunity testing. As a result of NEMKO's laboratory assessment, they will accept test results from Northwest EMC, Inc. for product certification (Authorization No. ELA 119).



**Australia/New Zealand:** The National Association of Testing Authorities (NATA), Australia has been appointed by the ACA as an accreditation body to accredit test laboratories and competent bodies for EMC standards. Accredited test reports or assessments by competent bodies must carry the NATA logo. Test reports made by an overseas laboratory that has been accredited for the relevant standards by an overseas accreditation body that has a Mutual Recognition Agreement (MRA) with NATA are also accepted as technical grounds for product conformity. The report should be endorsed with the respective logo of the accreditation body (NVLAP).



**VCCI:** Accepted as an Associate Member to the VCCI, Acceptance No. 564. Conducted and radiated measurement facilities have been registered in accordance with Regulations for Voluntary Control Measures, Article 8. (*Registration Numbers. - Hillsboro: C-1071, R-1025, C-2687, T-289, and R-2318, Irvine: R-1943, C-2766, and T-298, Sultan: R-871, C-1784, and T-294.*)



**BSMI:** Northwest EMC has been designated by NIST and validated by C-Taipei (BSMI) as a CAB to conduct tests as described in the APEC Mutual Recognition Agreement (US0017). License No.SL2-IN-E-1017.



**GOST:** Northwest EMC, Inc. has been assessed and accredited by the Russian Certification bodies Certinform VNIINMASH, CERTINFO, SAMTES, and Federal CHEC, to perform EMC and Hygienic testing for Information Technology Products. As a result of their laboratory assessment, they will accept test results from Northwest EMC, Inc. for product certification



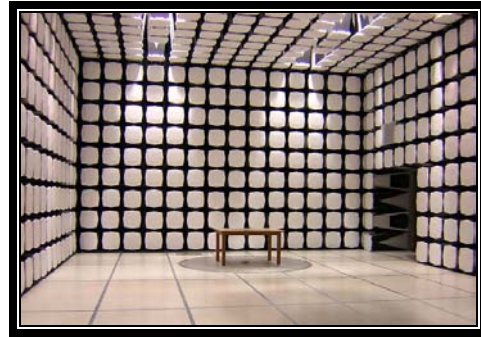
**MIC:** Northwest EMC, Inc is a CAB designated by MRA partners and recognized by Korea. (*Assigned Lab Numbers: Hillsboro: US0017, Irvine: US0158, Sultan: US0157*)



## SCOPE

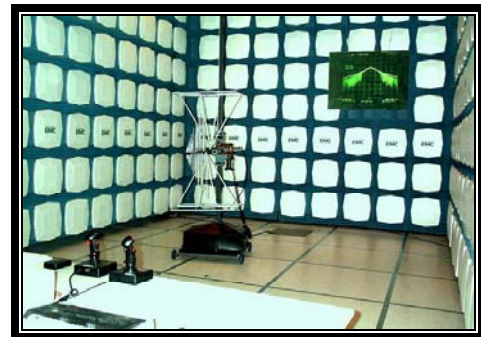
For details on the Scopes of our Accreditations, please visit:

<http://www.nwemc.com/accreditations/>



**California – Orange County Facility  
Labs OC01 – OC13**

41 Tesla Ave. Irvine, CA 92618  
(888) 364-2378 Fax: (503) 844-3826



**Oregon – Evergreen Facility  
Labs EV01 – EV11**

22975 NW Evergreen Pkwy. Suite 400 Hillsboro, OR 97124  
(503) 844-4066 Fax: (503) 844-3826



**Washington – Sultan Facility  
Labs SU01 – SU07**

14128 339<sup>th</sup> Ave. SE Sultan, WA 98294  
(888) 364-2378

## Party Requesting the Test

<b>Company Name:</b>	Microsoft Corporation
<b>Address:</b>	One Microsoft Way
<b>City, State, Zip:</b>	Redmond, WA 98052-6399
<b>Test Requested By:</b>	James Wooten
<b>Model:</b>	Zune 120GB Model Number: 1376
<b>First Date of Test:</b>	June 19, 2008
<b>Last Date of Test:</b>	June 20, 2008
<b>Receipt Date of Samples:</b>	June 19, 2008
<b>Equipment Design Stage:</b>	Production
<b>Equipment Condition:</b>	No Damage

## Information Provided by the Party Requesting the Test

## Functional Description of the EUT (Equipment Under Test):

Portable Media Device with 120GB Hard Drive.

## Testing Objective:

These tests were selected to satisfy the EMC requirements requested by the client.

## EUT Photo





**CONFIGURATION 1 MCSO1369**

Software/Firmware Running during test	
Description	Version
Zune	2.5 (1614) Boot Loader 1613

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Zune 120GB	Microsoft Corporation	Model Number: 1376	100117824

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Laptop	IBM	2668-43U	L3-A3877
Monitor	Dell	UltraScan P991	8164482
Printer	HP	HP LaserJet 2550L	CNGFG05808
Power Supply (Laptop)	IBM	92P1020	11S92P1020Z1Z9RM67H2S4

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
AC Power	No	1.0m	No	AC Mains	Power Supply (Laptop)
AC Power	No	2.2m	No	AC Mains	Monitor
AC Power	No	2.4m	No	AC Mains	Printer
Video	No	1.9m	Yes	Monitor	Laptop
Parallel	Yes	1.8m	No	Printer	Laptop
DC Leads	No	1.8m	Yes	Power Supply (Laptop)	Laptop
Sync	No	1.5m	No	Laptop	EUT
Premium Earbuds	No	1.35m	No	EUT	Premium Earbuds
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

**CONFIGURATION 2 MCSO1369****Software/Firmware Running during test**

Description	Version
Zune	2.5 (1614) Boot Loader 1613

**EUT**

Description	Manufacturer	Model/Part Number	Serial Number
Zune 120GB	Microsoft Corporation	Model Number: 1376	100117824

**Peripherals in test setup boundary**

Description	Manufacturer	Model/Part Number	Serial Number
Power Supply ( Zune)	Delta	DPSN-8CB-A Rev S3	00837702237

**Cables**

Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
Sync	No	1.5m	No	Laptop	EUT
Premium Earbuds	No	1.35m	No	EUT	Premium Earbuds
AC Power	No	0.8m	No	Power Supply	AC Mains

PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.

**CONFIGURATION 3 MCSO1369****Software/Firmware Running during test**

Description	Version
Zune	2.5 (1614) Boot Loader 1613

**EUT**

Description	Manufacturer	Model/Part Number	Serial Number
Zune 120GB	Microsoft Corporation	Model Number: 1376	100117824

**Peripherals in test setup boundary**

Description	Manufacturer	Model/Part Number	Serial Number
Power Supply (Zune)	Phihong	PSM05A-050Q-R	176

**Cables**

Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
Sync	No	1.5m	No	Laptop	EUT
Premium Earbuds	No	1.35m	No	EUT	Premium Earbuds
AC Power	No	0.8m	No	Power Supply	AC Mains

PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.

<b>Equipment modifications</b>					
<b>Item</b>	<b>Date</b>	<b>Test</b>	<b>Modification</b>	<b>Note</b>	<b>Disposition of EUT</b>
1	6/19/2008	Radiated Emissions-High Freq.	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
2	6/19/2008	Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
3	6/20/2008	Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

#### MODES OF OPERATION

Syncing to Laptop

#### MODE USED FOR FINAL DATA

Syncing to Laptop

#### POWER SETTINGS INVESTIGATED

120VAC/60Hz

#### POWER SETTINGS USED FOR FINAL DATA

120VAC/60Hz

#### FREQUENCY RANGE INVESTIGATED

Start Frequency	30MHz	Stop Frequency	1000MHz
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#### SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

#### TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Antenna, Bicon	EMCO	3104C	ABA	2/18/2008	13
Antenna, Log Periodic	EMCO	3146	ALE	2/18/2008	13
SU02 cables a,b,c			SUK	12/12/2007	13
Pre-Amplifier	Miteq	AM-1402	AOT	12/12/2007	13
Spectrum Analyzer	Hewlett-Packard	8568B	AAE	12/7/2007	13
Quasi-Peak Adapter	Hewlett Packard	85650A	AQG	12/7/2007	13

#### MEASUREMENT BANDWIDTHS

Frequency Range (MHz)	Peak Data (kHz)	Quasi-Peak Data (kHz)	Average Data (kHz)
0.01 - 0.15	1.0	0.2	0.2
0.15 - 30.0	10.0	9.0	9.0
30.0 - 1000	100.0	120.0	120.0
Above 1000	1000.0	N/A	1000.0

Measurements were made using the bandwidths and detectors specified. No video filter was used.

#### MEASUREMENT UNCERTAINTY

Measurement uncertainty is used to reflect the accuracy of the measured result as compared with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. In the case of transient tests our test equipment has been demonstrated by calibration to provide at least a 95% confidence that it complies with the test specification requirements. The measurement uncertainty for any test is available upon request.

#### TEST DESCRIPTION

Using the mode of operation and configuration noted within this report, a final radiated emissions test was performed. The frequency range investigated (scanned), is also noted in this report. Radiated emissions measurements were made at the EUT azimuth and antenna height such that the maximum radiated emissions level will be detected. This requires the use of a turntable and an antenna positioner. The preferred method of a continuous azimuth search is utilized for frequency scans of the EUT field strength with both polarities of the measuring antenna. A calibrated, linearly polarized antenna was positioned at the specified distance from the periphery of the EUT.

Tests were made with the antenna positioned in both the horizontal and vertical planes of polarization. The antenna was varied in height above the conducting ground plane to obtain the maximum signal strength. Though specified in the report, the measurement distance shall be 3 meters or 10 meters. At any measurement distance, the antenna height was varied from 1 meter to 4 meters. These height scans apply for both horizontal and vertical polarization, except that for vertical polarization the minimum height of the center of the antenna shall be increased so that the lowest point of the bottom of the antenna clears the ground surface by at least 25 cm.

<b>EUT:</b> Zune 120GB Model Number: 1376	<b>Work Order:</b> MCSO1369
<b>Serial Number:</b> 0100117824	<b>Date:</b> 06/19/08
<b>Customer:</b> Microsoft Corporation	<b>Temperature:</b> 22
<b>Attendees:</b> James Wooten	<b>Humidity:</b> 47%
<b>Project:</b> None	<b>Barometric Pres.:</b> 1025.3
<b>Tested by:</b> Travis Rychener	<b>Power:</b> 120VAC/60Hz
	<b>Job Site:</b> SU02

<b>TEST SPECIFICATIONS</b>	<b>Test Method</b>
FCC 15.109(g) (CISPR 22:1997):2007 Class B EN 55022: 2006: Class B	ANSI C63.4:2003 CISPR 22:2005 (Amended by A1:2005 and A2:2006):

<b>TEST PARAMETERS</b>
<b>Antenna Height(s) (m)</b>   1 - 4   <b>Test Distance (m)</b>

**COMMENTS**  
Zune Config B (Samsung HDD/Epson LCD). Config 1B-1: Sync Cable, Premium Earbuds. Printer and Monitor

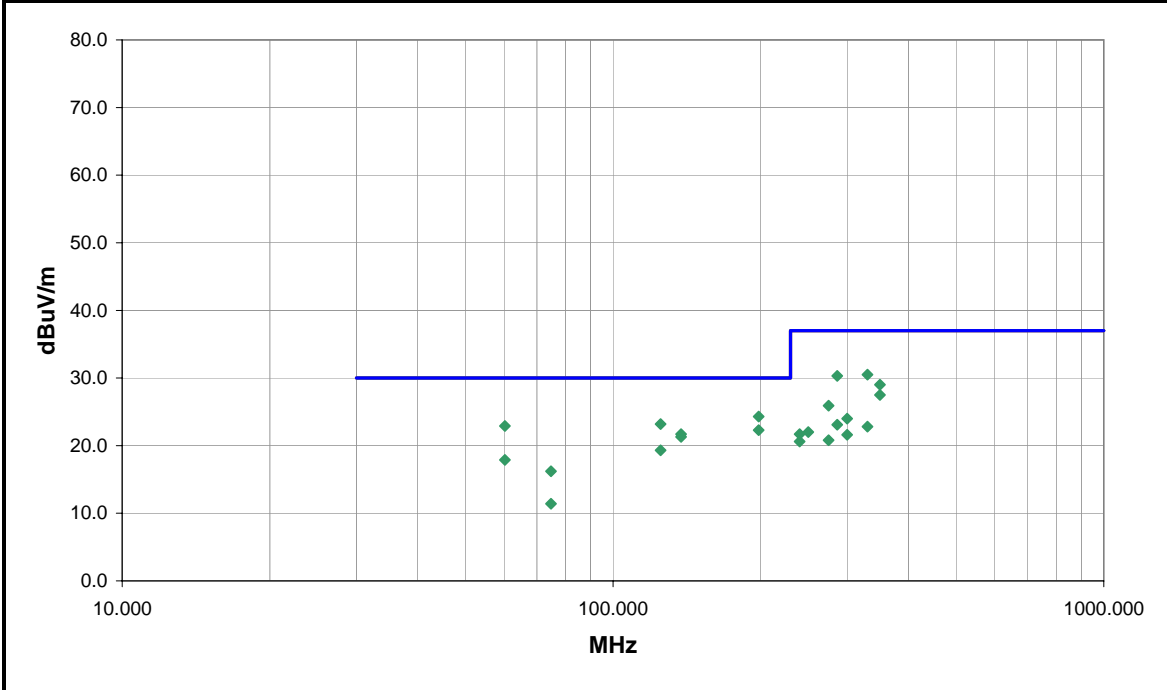
**EUT OPERATING MODES**

Syncing to Laptop

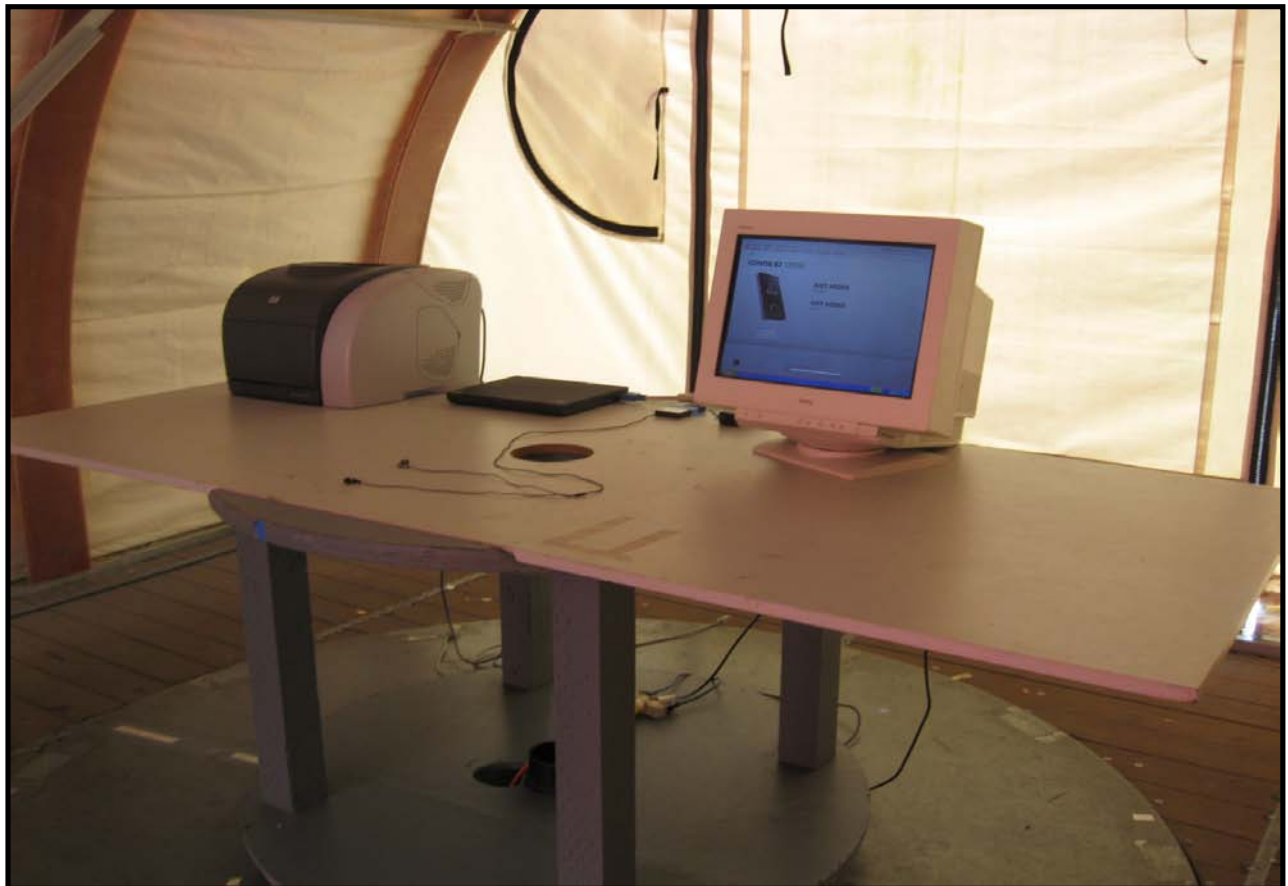
**DEVIATIONS FROM TEST STANDARD**

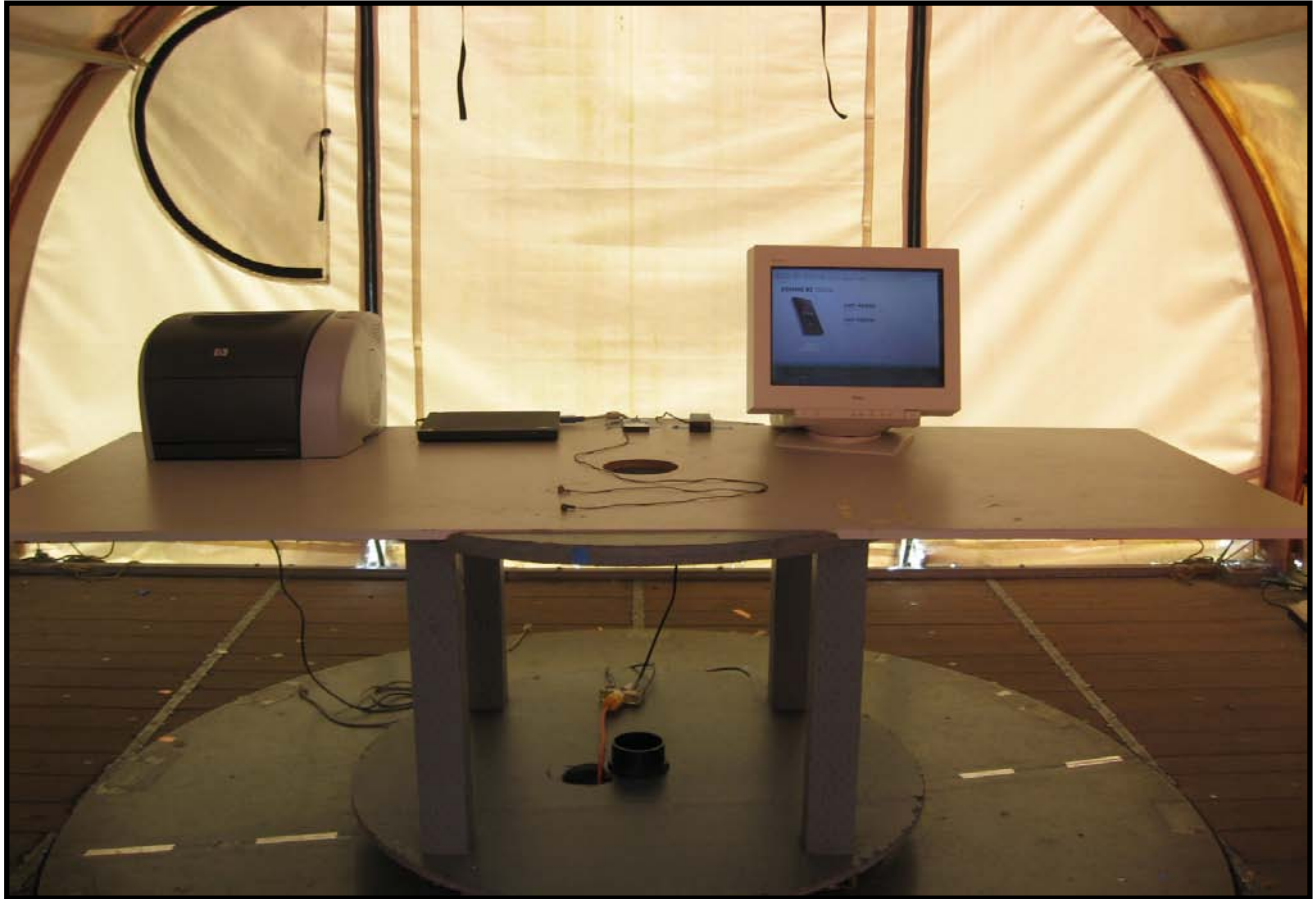
No deviations.

<b>Run #</b>	1	 Signature
<b>Configuration #</b>	1	
<b>Results</b>	Pass	



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)
197.999	24.3	0.0	0.0	4.0	10.0	0.0	H-Bicon	QP	0.0	24.3	30.0	-5.7
329.998	32.2	-1.7	321.0	3.0	10.0	0.0	H-LPA	QP	0.0	30.5	37.0	-6.5
286.393	33.6	-3.3	187.0	4.0	10.0	0.0	H-LPA	QP	0.0	30.3	37.0	-6.7
125.001	27.7	-4.5	360.0	1.0	10.0	0.0	V-Bicon	QP	0.0	23.2	30.0	-6.8
60.232	31.2	-8.3	33.0	1.0	10.0	0.0	V-Bicon	QP	0.0	22.9	30.0	-7.1
198.000	22.3	0.0	295.0	1.6	10.0	0.0	V-Bicon	QP	0.0	22.3	30.0	-7.7
349.907	30.4	-1.4	160.0	1.0	10.0	0.0	H-LPA	QP	0.0	29.0	37.0	-8.0
137.623	26.9	-5.2	360.0	1.0	10.0	0.0	V-Bicon	QP	0.0	21.7	30.0	-8.3
137.667	26.5	-5.2	205.0	3.2	10.0	0.0	H-Bicon	QP	0.0	21.3	30.0	-8.7
349.913	28.9	-1.4	360.0	1.0	10.0	0.0	V-LPA	QP	0.0	27.5	37.0	-9.5
125.002	23.8	-4.5	360.0	4.0	10.0	0.0	H-Bicon	QP	0.0	19.3	30.0	-10.7
274.927	29.8	-3.9	360.0	4.0	10.0	0.0	H-LPA	QP	0.0	25.9	37.0	-11.1
60.227	26.2	-8.3	0.0	2.9	10.0	0.0	H-Bicon	QP	0.0	17.9	30.0	-12.1
299.997	26.2	-2.2	360.0	3.7	10.0	0.0	H-LPA	QP	0.0	24.0	37.0	-13.0
74.743	27.6	-11.4	132.0	1.0	10.0	0.0	V-Bicon	QP	0.0	16.2	30.0	-13.8
286.374	26.4	-3.3	15.0	1.5	10.0	0.0	V-LPA	QP	0.0	23.1	37.0	-13.9
329.998	24.5	-1.7	333.0	1.0	10.0	0.0	V-LPA	QP	0.0	22.8	37.0	-14.2
249.993	26.8	-4.8	0.0	4.0	10.0	0.0	H-LPA	QP	0.0	22.0	37.0	-15.0
240.031	27.0	-5.3	360.0	1.0	10.0	0.0	V-LPA	QP	0.0	21.7	37.0	-15.3
299.998	23.8	-2.2	59.0	2.6	10.0	0.0	V-LPA	QP	0.0	21.6	37.0	-15.4
274.927	24.7	-3.9	6.0	1.0	10.0	0.0	V-LPA	QP	0.0	20.8	37.0	-16.2
240.027	25.9	-5.3	19.0	4.0	10.0	0.0	H-LPA	QP	0.0	20.6	37.0	-16.4
74.743	22.8	-11.4	205.0	4.0	10.0	0.0	H-Bicon	QP	0.0	11.4	30.0	-18.6







Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

#### MODES OF OPERATION

Syncing to Laptop

#### MODE USED FOR FINAL DATA

Syncing to Laptop

#### POWER SETTINGS INVESTIGATED

120VAC/60Hz

#### POWER SETTINGS USED FOR FINAL DATA

120VAC/60Hz

#### FREQUENCY RANGE INVESTIGATED

Start Frequency	1000MHz	Stop Frequency	12000MHz
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#### CLOCKS AND OSCILLATORS

27MHz, 32.768kHz, 38.4MHz, and 66MHz

#### SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

#### TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
A292 Cable for Standard Gain Horns	ESM Cable Corp.	LA292	SUL	12/12/2007	13
Antenna, Horn	EMCO	3115	AHF	4/10/2006	27
Antenna, Horn	EMCO	3160-07	AHP	NCR	0
Spectrum Analyzer	Agilent	E4440A	AAW	12/7/2007	13
A292 Cable for Standard Gain Horns	ESM Cable Corp.	LA292	SUL	12/12/2007	13
Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AOK	12/12/2007	13

#### MEASUREMENT BANDWIDTHS

Frequency Range (MHz)	Peak Data (kHz)	Quasi-Peak Data (kHz)	Average Data (kHz)
0.01 - 0.15	1.0	0.2	0.2
0.15 - 30.0	10.0	9.0	9.0
30.0 - 1000	100.0	120.0	120.0
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Measurement uncertainty is used to reflect the accuracy of the measured result as compared with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. In the case of transient tests our test equipment has been demonstrated by calibration to provide at least a 95% confidence that it complies with the test specification requirements. The measurement uncertainty for any test is available upon request.

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Tests were made with the antenna positioned in both the horizontal and vertical planes of polarization. The antenna was varied in height above the conducting ground plane to obtain the maximum signal strength. Though specified in the report, the measurement distance shall be 3 meters or 10 meters. At any measurement distance, the antenna height was varied from 1 meter to 4 meters. These height scans apply for both horizontal and vertical polarization, except that for vertical polarization the minimum height of the center of the antenna shall be increased so that the lowest point of the bottom of the antenna clears the ground surface by at least 25 cm.

EUT:	Zune 120GB Model Number: 1376	Work Order:	MCSO1360
Serial Number:	0100117824	Date:	06/19/08
Customer:	Microsoft Corporation	Temperature:	22
Attendees:	James Wooten	Humidity:	47%
Project:	None	Barometric Pres.:	1025.3
Tested by:	Travis Rychener	Power:	120VAC/60Hz
		Job Site:	SU07

<b>TEST SPECIFICATIONS</b>		<b>Test Method</b>	
FCC 15.109:2007 Class B		ANSI C63.4:2003	

<b>TEST PARAMETERS</b>			
Antenna Height(s) (m)	1.0-4.0	Test Distance (m)	3

**COMMENTS**  
Zune Config B (Samsung HDD/Epson LCD). Config 1B-1: Sync Cable, Premium Earbuds. Brother HL-1440 printer and Dell Trinitron Monitor

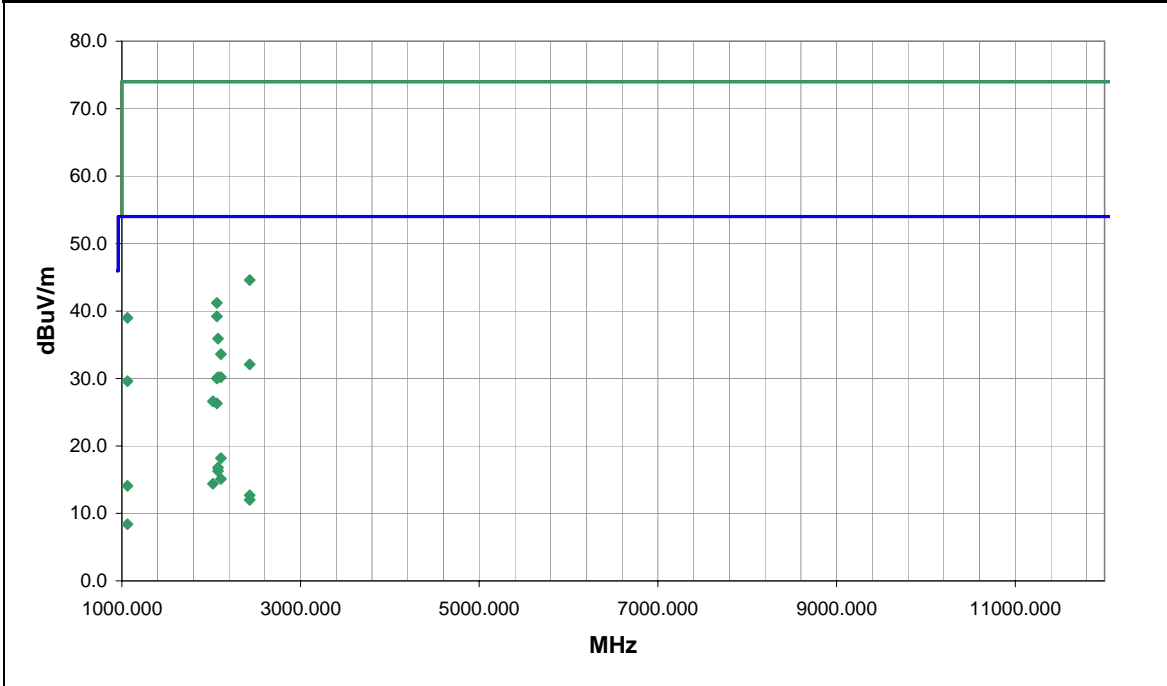
**EUT OPERATING MODES**

Syncing to Laptop

**DEVIATIONS FROM TEST STANDARD**

No deviations.

Run #	1	 Signature
Configuration #	1	
Results	Pass	



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)
2064.253	45.7	-6.5	221.0	1.2	3.0	0.0	H-Horn	AV	0.0	39.2	54.0	-14.8
2064.257	32.8	-6.5	234.0	1.0	3.0	0.0	V-Horn	AV	0.0	26.3	54.0	-27.7
2430.923	49.7	-5.1	186.0	1.2	3.0	0.0	H-Horn	PK	0.0	44.6	74.0	-29.4
2064.258	47.7	-6.5	221.0	1.2	3.0	0.0	H-Horn	PK	0.0	41.2	74.0	-32.8
1063.417	49.7	-10.7	300.0	1.0	3.0	0.0	H-Horn	PK	0.0	39.0	74.0	-35.0
2109.036	24.5	-6.3	131.0	1.0	3.0	0.0	V-Horn	AV	0.0	18.2	54.0	-35.8
2076.808	23.3	-6.5	123.0	1.0	3.0	0.0	V-Horn	AV	0.0	16.8	54.0	-37.2
2076.807	22.8	-6.5	266.0	1.0	3.0	0.0	H-Horn	AV	0.0	16.3	54.0	-37.7
2076.593	42.4	-6.5	123.0	1.0	3.0	0.0	V-Horn	PK	0.0	35.9	74.0	-38.1
2109.076	21.4	-6.3	163.0	1.0	3.0	0.0	H-Horn	AV	0.0	15.1	54.0	-38.9
2018.405	21.0	-6.6	213.0	1.2	3.0	0.0	H-Horn	AV	0.0	14.4	54.0	-39.6
1063.218	24.8	-10.7	300.0	1.0	3.0	0.0	H-Horn	AV	0.0	14.1	54.0	-39.9
2109.280	39.9	-6.3	131.0	1.0	3.0	0.0	V-Horn	PK	0.0	33.6	74.0	-40.4
2430.444	17.8	-5.1	175.0	1.0	3.0	0.0	V-Horn	AV	0.0	12.7	54.0	-41.3
2431.402	37.2	-5.1	175.0	1.0	3.0	0.0	V-Horn	PK	0.0	32.1	74.0	-41.9
2430.516	17.1	-5.1	186.0	1.2	3.0	0.0	H-Horn	AV	0.0	12.0	54.0	-42.0
2076.790	36.7	-6.5	266.0	1.0	3.0	0.0	H-Horn	PK	0.0	30.2	74.0	-43.8
2109.011	36.5	-6.3	163.0	1.0	3.0	0.0	H-Horn	PK	0.0	30.2	74.0	-43.8
2064.290	36.5	-6.5	234.0	1.0	3.0	0.0	V-Horn	PK	0.0	30.0	74.0	-44.0
1063.243	40.3	-10.7	247.0	1.1	3.0	0.0	V-Horn	PK	0.0	29.6	74.0	-44.4
1063.188	19.1	-10.7	247.0	1.1	3.0	0.0	V-Horn	AV	0.0	8.4	54.0	-45.6
2018.349	33.2	-6.6	213.0	1.2	3.0	0.0	H-Horn	PK	0.0	26.6	74.0	-47.4



Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

**MODES OF OPERATION**

Syncing to Laptop  
AV Playback

**POWER SETTINGS INVESTIGATED**

120VAC/60Hz

**CONFIGURATIONS INVESTIGATED**

1, 2, 3

**SAMPLE CALCULATIONS**

Conducted Emissions: Adjusted Level = Measured Level + Transducer Factor + Cable Attenuation Factor + External Attenuator

**TEST EQUIPMENT**

Description	Manufacturer	Model	ID	Last Cal.	Interval
LISN	Solar	9252-50-R-24-BNC	LIM	2/12/2008	13 mo
LISN	Solar	9252-50-R-24-BNC	LIK	2/12/2008	13 mo
SU07 cables d,c,a			SUC	12/12/2007	13 mo
Attenuator	Pasternack		AUL	2/11/2008	13 mo
High Pass Filter	TTE	H647-100k-50-718B	HFB	2/11/2008	13 mo
Receiver	Rohde & Schwarz	ESCI	ARE	12/7/2007	13 mo

**MEASUREMENT BANDWIDTHS**

	Frequency Range	Peak Data	Quasi-Peak Data	Average Data
	(MHz)	(kHz)	(kHz)	(kHz)
	0.01 - 0.15	1.0	0.2	0.2
	0.15 - 30.0	10.0	9.0	9.0
	30.0 - 1000	100.0	120.0	120.0
	Above 1000	1000.0	N/A	1000.0

Measurements were made using the bandwidths and detectors specified. No video filter was used.

**MEASUREMENT UNCERTAINTY**


Measurement uncertainty is used to reflect the accuracy of the measured result as compared with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. In the case of transient tests our test equipment has been demonstrated by calibration to provide at least a 95% confidence that it complies with the test specification requirements. The measurement uncertainty for any test is available upon request.

**TEST DESCRIPTION**

Using the mode of operation and configuration noted within this report, conducted emissions tests were performed. The frequency range investigated (scanned), is also noted in this report. Conducted power line measurements are made, unless otherwise specified, over the frequency range from 150 kHz to 30 MHz to determine the line-to-ground radio-noise voltage that is conducted from the EUT power-input terminals that are directly (or indirectly via separate transformer or power supplies) connected to a public power network. Equipment is tested with power cords that are normally used or that have electrical or shielding characteristics that are the same as those cords normally used. Typically those measurements are made using a LISN (Line Impedance Stabilization Network), the 50ohm measuring port is terminated by a 50ohm EMI meter or a 50ohm resistive load. All 50ohm measuring ports of the LISN are terminated by 50ohm.

# EMC

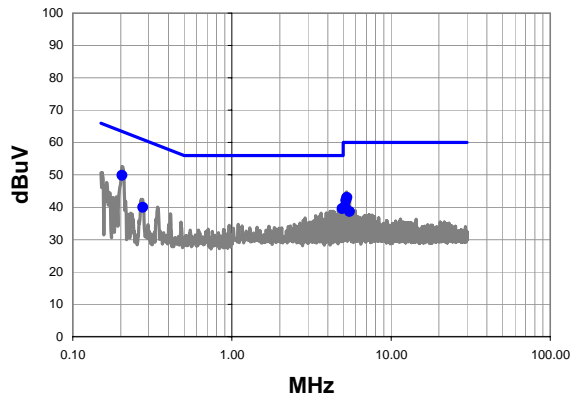
# CONDUCTED EMISSIONS

<b>Work Order:</b>	MCSO1369	<b>Date:</b>	06/19/08	 <b>Tested by:</b> Travis Rychener
<b>Project:</b>	None	<b>Temperature:</b>	22	
<b>Job Site:</b>	SU01	<b>Humidity:</b>	47	
<b>Serial Number:</b>	100117824	<b>Barometric Pres.:</b>	1025.3	
<b>EUT:</b>	Zune 120GB Model Number: 1376			
<b>Configuration:</b>	1			
<b>Customer:</b>	Microsoft Corporation			
<b>Attendees:</b>	James Wooten			
<b>EUT Power:</b>	120VAC/60Hz			
<b>Operating Mode:</b>	Syncing to Laptop			
<b>Deviations:</b>	No deviations.			
<b>Comments:</b>	Zune Config B (Samsung HDD/Epson LCD). Config 1B-1: Sync Cable, Premium Earbuds. Brother HL-1440 printer and Dell Trinitron Monitor			

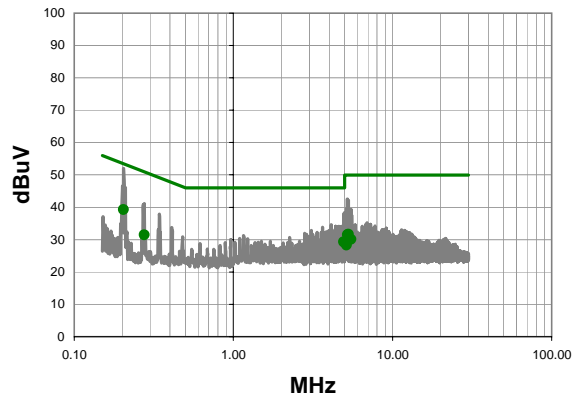
<b>Test Specifications</b>	<b>Class B</b>	<b>Test Method</b>
EN 55022: 2006 FCC 15.107:2007		CISPR 22:2005 (Amended by A1:2005 and A2:2006) ANSI C63.4:2003

<b>Run #</b>	1	<b>Line:</b>	High Line	<b>Ext. Attenuation:</b>	20	<b>Results</b>	Pass
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Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



Quasi Peak Data - vs - Quasi Peak Limit


Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.204	28.8	21.1	49.9	63.4	-13.6
4.940	19.1	20.4	39.5	56.0	-16.5
5.284	22.6	20.4	43.0	60.0	-17.0
5.214	21.7	20.4	42.1	60.0	-17.9
5.148	19.7	20.4	40.1	60.0	-19.9
0.276	19.2	20.7	39.9	60.9	-21.0
5.492	18.2	20.4	38.6	60.0	-21.4

Average Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.204	18.2	21.1	39.3	53.4	-14.2
4.940	8.8	20.4	29.2	46.0	-16.8
5.284	11.2	20.4	31.6	50.0	-18.4
5.214	11.0	20.4	31.4	50.0	-18.6
0.276	10.7	20.7	31.4	50.9	-19.5
5.492	9.6	20.4	30.0	50.0	-20.0
5.148	7.8	20.4	28.2	50.0	-21.8

# EMC

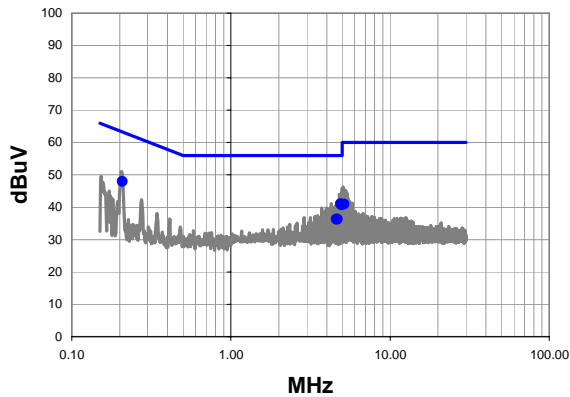
# CONDUCTED EMISSIONS

<b>Work Order:</b>	MCSO1369	<b>Date:</b>	06/19/08	 <b>Tested by:</b> Travis Rychener
<b>Project:</b>	None	<b>Temperature:</b>	22	
<b>Job Site:</b>	SU01	<b>Humidity:</b>	47	
<b>Serial Number:</b>	100117824	<b>Barometric Pres.:</b>	1025.3	
<b>EUT:</b>	Zune 120GB Model Number: 1376			
<b>Configuration:</b>	1			
<b>Customer:</b>	Microsoft Corporation			
<b>Attendees:</b>	James Wooten			
<b>EUT Power:</b>	120VAC/60Hz			
<b>Operating Mode:</b>	Syncing to Laptop			
<b>Deviations:</b>	No deviations.			
<b>Comments:</b>	Zune Config B (Samsung HDD/Epson LCD). Config 1B-1: Sync Cable, Premium Earbuds. Brother HL-1440 printer and Dell Trinitron Monitor			

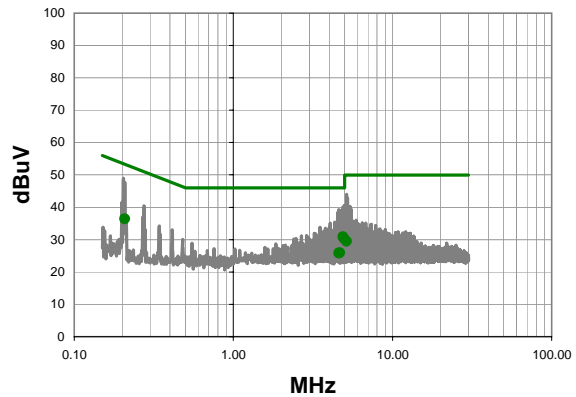
<b>Test Specifications</b>	<b>Class B</b>	<b>Test Method</b>
EN 55022: 2006 FCC 15.107:2007		CISPR 22:2005 (Amended by A1:2005 and A2:2006) ANSI C63.4:2003

<b>Run #</b>	2	<b>Line:</b>	Neutral	<b>Ext. Attenuation:</b>	20	<b>Results</b>	Pass
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Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



Quasi Peak Data - vs - Quasi Peak Limit


Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
4.876	20.6	20.4	41.0	56.0	-15.0
4.944	20.3	20.4	40.7	56.0	-15.3
0.208	26.9	21.0	47.9	63.3	-15.4
5.150	20.5	20.4	40.9	60.0	-19.1
4.672	15.9	20.4	36.3	56.0	-19.7
4.600	15.9	20.4	36.3	56.0	-19.7

Average Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
4.876	10.4	20.4	30.8	46.0	-15.2
4.944	9.9	20.4	30.3	46.0	-15.7
0.208	15.4	21.0	36.4	53.3	-16.9
4.672	5.5	20.4	25.9	46.0	-20.1
4.600	5.4	20.4	25.8	46.0	-20.2
5.150	9.0	20.4	29.4	50.0	-20.6

# EMC

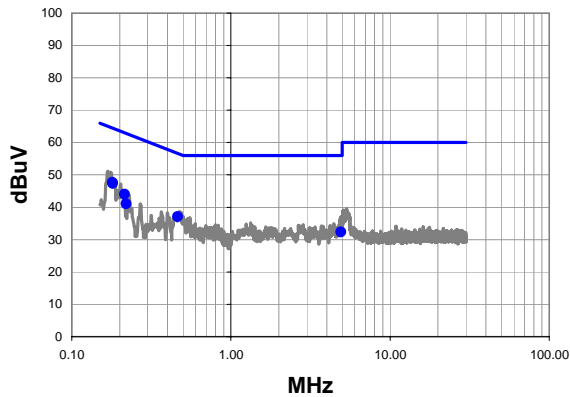
# CONDUCTED EMISSIONS

<b>Work Order:</b>	MCSO1360	<b>Date:</b>	06/20/08	 <b>Tested by:</b> Travis Rychener
<b>Project:</b>	None	<b>Temperature:</b>	22.8	
<b>Job Site:</b>	SU01	<b>Humidity:</b>	46.09	
<b>Serial Number:</b>	100117824	<b>Barometric Pres.:</b>	1017.7	
<b>EUT:</b>	Zune 120GB Model Number: 1376			
<b>Configuration:</b>	2			
<b>Customer:</b>	Microsoft Corporation			
<b>Attendees:</b>	James Wooten			
<b>EUT Power:</b>	120VAC/60Hz			
<b>Operating Mode:</b>	AV Playback			
<b>Deviations:</b>	No deviations.			
<b>Comments:</b>	Zune Config B (Samsung HDD/Epson LCD). Config 2B-D: Sync Cable, Premium Earbuds. DPSN-8CB-A Rev S3 PS sn: 00837702237			

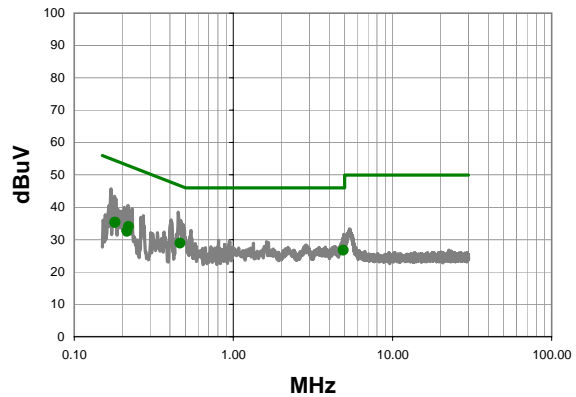
<b>Test Specifications</b>	<b>Class B</b>	<b>Test Method</b>
EN 55022: 2006 FCC 15.107:2007		CISPR 22:2005 (Amended by A1:2005 and A2:2006) ANSI C63.4:2003

<b>Run #</b>	3	<b>Line:</b>	High Line	<b>Ext. Attenuation:</b>	20	<b>Results</b>	Pass
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Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



Quasi Peak Data - vs - Quasi Peak Limit


Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.180	26.4	21.2	47.6	64.5	-16.8
0.181	26.1	21.2	47.3	64.4	-17.1
0.215	23.0	21.0	44.0	63.0	-19.0
0.463	16.6	20.5	37.1	56.6	-19.6
0.220	20.1	21.0	41.1	62.8	-21.8
4.920	11.9	20.4	32.3	56.0	-23.7

Average Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.463	8.4	20.5	28.9	46.6	-17.8
0.220	13.1	21.0	34.1	52.8	-18.8
0.181	14.1	21.2	35.3	54.4	-19.1
0.180	14.1	21.2	35.3	54.5	-19.1
4.920	6.3	20.4	26.7	46.0	-19.3
0.215	11.6	21.0	32.6	53.0	-20.4

# EMC

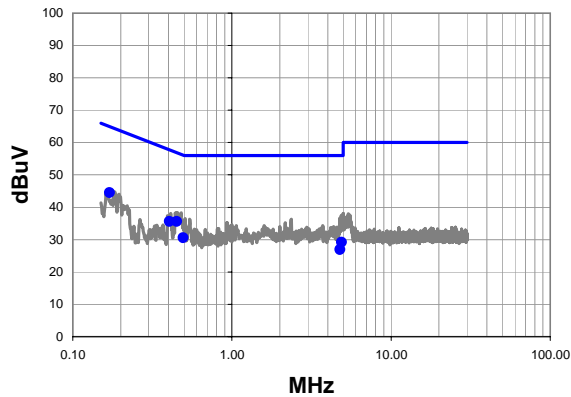
# CONDUCTED EMISSIONS

<b>Work Order:</b>	MCSO1360	<b>Date:</b>	06/20/08	 <b>Tested by:</b> Travis Rychener
<b>Project:</b>	None	<b>Temperature:</b>	22.8	
<b>Job Site:</b>	SU01	<b>Humidity:</b>	46.09	
<b>Serial Number:</b>	100117824	<b>Barometric Pres.:</b>	1017.7	
<b>EUT:</b>	Zune 120GB Model Number: 1376			
<b>Configuration:</b>	2			
<b>Customer:</b>	Microsoft Corporation			
<b>Attendees:</b>	James Wooten			
<b>EUT Power:</b>	120VAC/60Hz			
<b>Operating Mode:</b>	AV Playback			
<b>Deviations:</b>	No deviations.			
<b>Comments:</b>	Zune Config B (Samsung HDD/Epson LCD). Config 2B-D: Sync Cable, Premium Earbuds. DPSN-8CB-A Rev S3 PS sn: 00837702237			

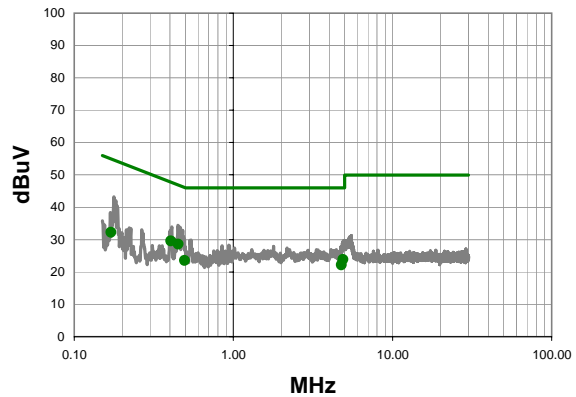
<b>Test Specifications</b>	<b>Class B</b>	<b>Test Method</b>
EN 55022: 2006 FCC 15.107:2007		CISPR 22:2005 (Amended by A1:2005 and A2:2006) ANSI C63.4:2003

<b>Run #</b>	4	<b>Line:</b>	Neutral	<b>Ext. Attenuation:</b>	20	<b>Results</b>	Pass
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Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.170	23.2	21.3	44.5	65.0	-20.4
0.450	15.1	20.5	35.6	56.9	-21.3
0.404	15.1	20.5	35.6	57.8	-22.1
0.495	10.1	20.5	30.6	56.1	-25.5
4.884	8.7	20.4	29.1	56.0	-26.9
4.772	6.5	20.4	26.9	56.0	-29.1


Average Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.404	9.1	20.5	29.6	47.8	-18.1
0.450	8.1	20.5	28.6	46.9	-18.3
4.884	3.4	20.4	23.8	46.0	-22.2
0.495	3.1	20.5	23.6	46.1	-22.5
0.170	10.9	21.3	32.2	55.0	-22.7
4.772	1.7	20.4	22.1	46.0	-23.9



# EMC

# CONDUCTED EMISSIONS

<b>Work Order:</b>	MCSO1360	<b>Date:</b>	06/20/08	
<b>Project:</b>	None	<b>Temperature:</b>	22.8	
<b>Job Site:</b>	SU01	<b>Humidity:</b>	46.09	
<b>Serial Number:</b>	100117824	<b>Barometric Pres.:</b>	1017.7	

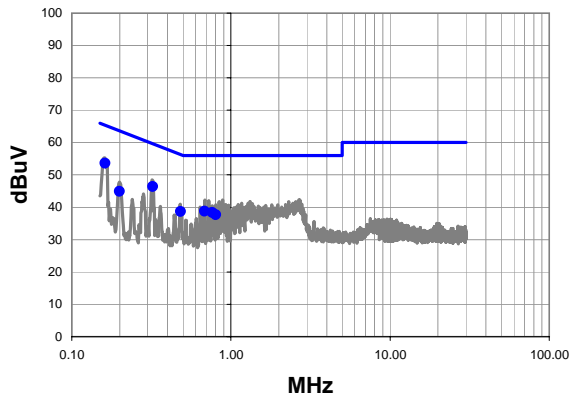
**Tested by:** Travis Rychener

<b>EUT:</b>	Zune 120GB Model Number: 1376
<b>Configuration:</b>	3
<b>Customer:</b>	Microsoft Corporation
<b>Attendees:</b>	James Wooten
<b>EUT Power:</b>	120VAC/60Hz
<b>Operating Mode:</b>	AV Playback
<b>Deviations:</b>	No deviations.
<b>Comments:</b>	Zune Config B (Samsung HDD/Epson LCD). Config 2B-P: Sync Cable, Premium Earbuds. Phihong DV5 mn: PSM05A-050Q-R sn: 176

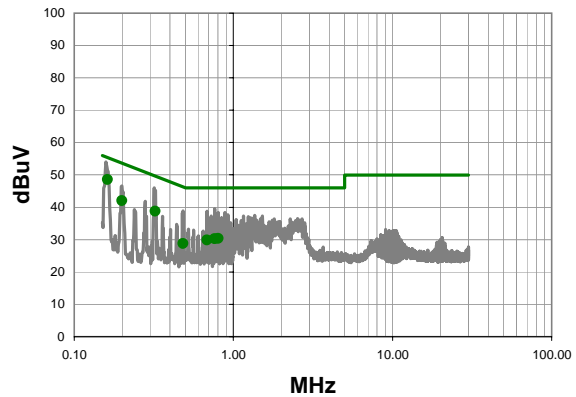
<b>Test Specifications</b>	<b>Class B</b>	<b>Test Method</b>
EN 55022: 2006 FCC 15.107:2007		CISPR 22:2005 (Amended by A1:2005 and A2:2006) ANSI C63.4:2003

<b>Run #</b>	5	<b>Line:</b>	High Line	<b>Ext. Attenuation:</b>	20	<b>Results</b>	Pass
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Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



Quasi Peak Data - vs - Quasi Peak Limit


Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.162	32.2	21.4	53.6	65.4	-11.7
0.322	25.8	20.6	46.4	59.7	-13.2
0.682	18.4	20.4	38.8	56.0	-17.2
0.762	18.0	20.4	38.4	56.0	-17.6
0.483	18.2	20.5	38.7	56.3	-17.6
0.803	17.3	20.4	37.7	56.0	-18.3
0.199	23.8	21.1	44.9	63.7	-18.8

Average Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.162	27.1	21.4	48.5	55.4	-6.8
0.322	18.1	20.6	38.7	49.7	-10.9
0.199	20.9	21.1	42.0	53.7	-11.7
0.803	10.0	20.4	30.4	46.0	-15.6
0.762	9.9	20.4	30.3	46.0	-15.7
0.682	9.5	20.4	29.9	46.0	-16.1
0.483	8.3	20.5	28.8	46.3	-17.5

# EMC

# CONDUCTED EMISSIONS

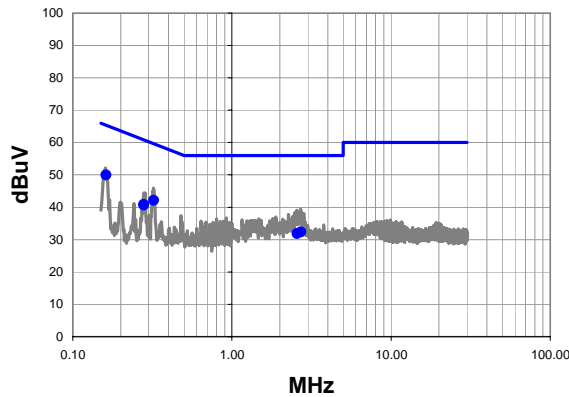
<b>Work Order:</b>	MCSO1360	<b>Date:</b>	06/20/08	 <b>Tested by:</b> Travis Rychener
<b>Project:</b>	None	<b>Temperature:</b>	22.8	
<b>Job Site:</b>	SU01	<b>Humidity:</b>	46.09	
<b>Serial Number:</b>	100117824	<b>Barometric Pres.:</b>	1017.7	

<b>EUT:</b>	Zune 120GB Model Number: 1376
<b>Configuration:</b>	3
<b>Customer:</b>	Microsoft Corporation
<b>Attendees:</b>	James Wooten
<b>EUT Power:</b>	120VAC/60Hz
<b>Operating Mode:</b>	AV Playback
<b>Deviations:</b>	No deviations.
<b>Comments:</b>	Zune Config B (Samsung HDD/Epson LCD). Config 2B-P: Sync Cable, Premium Earbuds. Pihong DV5 mn: PSM05A-050Q-R sn: 176

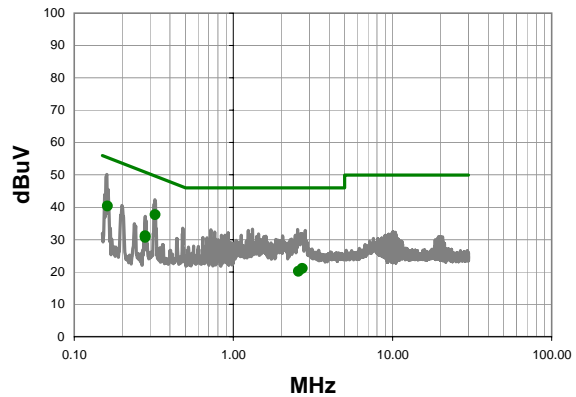
<b>Test Specifications</b>	<b>Class B</b>	<b>Test Method</b>
EN 55022: 2006 FCC 15.107:2007		CISPR 22:2005 (Amended by A1:2005 and A2:2006) ANSI C63.4:2003

<b>Run #</b>	6	<b>Line:</b>	Neutral	<b>Ext. Attenuation:</b>	20	<b>Results</b>	Pass
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Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.162	28.5	21.4	49.9	65.4	-15.4
0.322	21.5	20.6	42.1	59.7	-17.5
0.279	20.1	20.7	40.8	60.8	-20.0
0.280	19.9	20.7	40.6	60.8	-20.2
2.708	12.0	20.4	32.4	56.0	-23.6
2.564	11.5	20.4	31.9	56.0	-24.1

Average Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.322	17.1	20.6	37.7	49.7	-11.9
0.162	18.9	21.4	40.3	55.4	-15.0
0.280	10.4	20.7	31.1	50.8	-19.7
0.279	9.9	20.7	30.6	50.8	-20.2
2.708	0.7	20.4	21.1	46.0	-24.9
2.564	-0.2	20.4	20.2	46.0	-25.8

# Conducted Emissions



