# Logitech, Inc.

## Z-5450 MN: S0181A Multimedia Speaker System

September 07, 2005

Report No. LABT0140

**Report Prepared By** 



www.nwemc.com 1-888-EMI-CERT

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#### Certificate of Test Issue Date: September 07, 2005 Logitech, Inc. Model: Z-5450 MN: S0181A Multimedia Speaker System

Emissions					
Specification	Test Method	Pass	Fail		
FCC 15.247(a) Occupied Bandwidth:2005-04	ANSI C63.4:2003				
FCC 15.247(a)(1) Channel Spacing:2005-04	ANSI C63.4:2003				
FCC 15.247(a)(1) Dwell Time:2005-04	ANSI C63.4:2003	$\square$			
FCC 15.247(a)(1) Number of Hopping Frequencies:2005-04	ANSI C63.4:2003				
FCC 15.247(b) Output Power:2005-04	ANSI C63.4:2003				
FCC 15.247(d) Band Edge Compliance:2005-04	ANSI C63.4:2003	$\square$			
FCC 15.247(d) Spurious Conducted Emissions:2005-04	ANSI C63.4:2003				
FCC 15.247(d) Spurious Radiated Emissions:2005-04	ANSI C63.4:2003				
FCC 15.207 Class B:2005-04 AC Powerline Conducted Emissions	ANSI C63.4:2003	$\square$			
FCC 15.107 Class B:2005-04 AC Powerline Conducted Emissions	ANSI C63.4:2003				
FCC 15.109(g) (CISPR 22:1997) Class B:2005-04 Radiated Emissions	ANSI C63.4:2003				

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

#### Test Facility

The measurement facility used to collect the data is located at:

Northwest EMC, Inc. 22975 NW Evergreen Parkway, Suite 400; Hillsboro, OR 97124 Phone: (503) 844-4066 Fax: 844-3826

This site has been fully described in a report filed with and accepted by the FCC (Federal Communications Commission) and Industry Canada.

Approved By:	
ADU.K.P	
Greg Kiemel, Director of Engineering	

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
00	None		



**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 recognized 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 89/336/EEC, ANSI C63.4, MIL-STD 461E, DO-160D and SAE J1113. 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.

**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 TUV Product Service Group's Listing of Recognized Laboratories. It qualifies in connection with the TUV Certification after Recognition of Agent's Testing Program for the product categories and/or standards shown in TUV's current Listing of CARAT Laboratories, available from TUV. A certificate was issued to represent that this laboratory continues to meet TUV's CARAT Program requirements. Certificate No. USA0401C.

**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).

**Technology International:** Assessed in accordance with ISO Guide 25 defining the general international requirements for the competence of calibration and testing laboratories and with ITI assessment criteria LACO196. Based upon that assessment, Interference Technology International, Ltd., has granted approval for specifications implementing the EU Directive on EMC (89/336/EEC and amendments). The scope of the approval was provided on a Schedule of Assessment supplied with the certificate and is available upon request.

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 and R-1025, Irvine: C-2094 and R-1943, Newberg: C-1877 and R-1760, Sultan: R-871, C-1784 and R-1761).

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. 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

> SCOPE For details on the Scopes of our Accreditations, please visit: http://www.nwemc.com/scope.asp











Revision 03/18/05

NEMKO





#### What is measurement uncertainty?

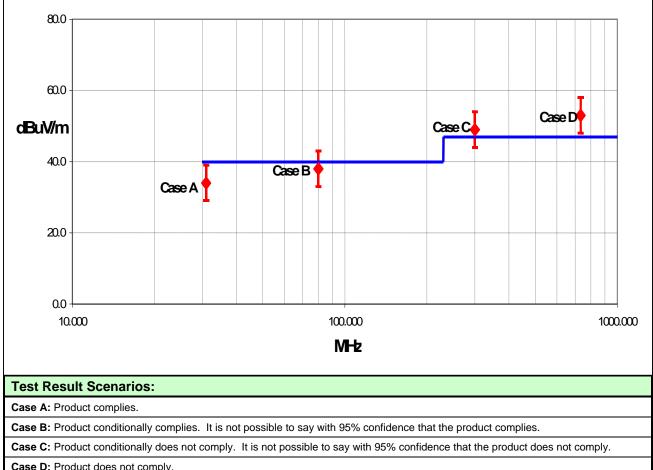
When a measurement is made, the result will be different from the true or theoretically correct value. The difference is the result of tolerances in the measurement system that cannot be completely eliminated. To the extent that technology allows us, it has been our aim to minimize this error. The following statement of measurement uncertainty is used to reflect the accuracy of the measured result as compared with its "true" value. In the case of transient tests (ESD, EFT, Surge, Voltage Dips and Interruptions), the test equipment has been demonstrated by calibration to provide at least a 95% confidence that it complies with the test specification requirements.

The following documents were the basis for determining the uncertainty levels of our measurements:

- "ISO Guide to the Expression of Uncertainty in Measurements", October 1993
- "NIS81: The Treatment of Uncertainty in EMC Measurements", May 1994
- "IEC CISPR 16-3 A1 f1 Ed.1: Radio-interference measurements and statistical techniques", December 2000

#### How might measurement uncertainty be applied to test results?

If the diamond marks the measured value for the test and the vertical bars bracket the range of + and measurement uncertainty, then test results can be interpreted from the diagram below.



Case D: Product does not comply.



Radiated Emissions ≤ 1 GHz		Value (	dB)				
	Probability	Probability Biconical		Log Pe	eriodic	D	ipole
	Distribution	Ante	enna	Ante	enna	An	tenna
Test Distance		3m	10m	3m	10m	3m	10m
Combined standard	normal	+ 1.86	+ 1.82	+ 2.23	+ 1.29	+ 1.31	+ 1.25
uncertainty <i>u<sub>c</sub>(y)</i>		- 1.88	- 1.87	- 1.41	- 1.26	- 1.27	- 1.25
Expanded uncertainty <b>U</b>	normal (k=2)	+ 3.72	+ 3.64	+ 4.46	+ 2.59	+ 2.61	+ 2.49
(level of confidence $\approx$ 95%)		- 3.77	- 3.73	-2.81	- 2.52	- 2.55	- 2.49

Radiated Emissions > 1 GHz	Value (dB)		
	Probability	Without High	With High
	Distribution	Pass Filter	Pass Filter
Combined standard uncertainty <i>u<sub>c</sub>(y)</i>	normal	+ 1.29 - 1.25	+ 1.38 - 1.35
Expanded uncertainty $U$	normal (k=2)	+ 2.57	+ 2.76
(level of confidence $\approx 95\%$ )		- 2.51	2.70

Conducted Emissions						
	Probability	Value				
	Distribution	(+/- dB)				
Combined standard uncertainty <i>uc(y)</i>	normal	1.48				
Expanded uncertainty <i>U</i> (level of confidence ≈ 95 %)	normal (k = 2)	2.97				

Radiated Immunity		
	Probability	Value
	Distribution	(+/- dB)
Combined standard uncertainty <i>uc(y)</i>	normal	1.05
Expanded uncertainty <b>U</b> (level of confidence ≈ 95 %)	normal (k = 2)	2.11

Conducted Immunity						
	Probability	Value				
	Distribution	(+/- dB)				
Combined standard uncertainty <i>uc(y</i> )	normal	1.05				
Expanded uncertainty <b>U</b> (level of confidence ≈ 95 %)	normal (k = 2)	2.10				

#### Legend

 $u_c(y)$  = square root of the sum of squares of the individual standard uncertainties

U = combined standard uncertainty multiplied by the coverage factor: **k**. This defines an interval about the measured result that will encompass the true value with a confidence level of approximately 95%. If a higher level of confidence is required, then k=3 (CL of 99.7%) can be used. Please note that with a coverage factor of one, uc(y) yields a confidence level of only 68%.



## **Facilities**



#### 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 – EV10

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



#### Oregon

Trails End Facility Labs TE01 – TE03

30475 NE Trails End Lane Newberg, OR 97132 (503) 844-4066 FAX (503) 537-0735



#### Washington

## Sultan Facility

## Labs SU01 – SU07

14128 339<sup>th</sup> Ave. SE Sultan, WA 98294 (888) 364-2378 FAX (360) 793-2536

Party Requesting the Test	
Company Name:	Logitech, Inc.
Address:	1499 SE Tech Center Place Suite 350
City, State, Zip:	Vancouver, WA 98683
Test Requested By:	Mitchell Phillipi
Model:	Z-5450 MN: S-0181A Multimedia Speaker System
First Date of Test:	July 15, 2005
Last Date of Test:	August 8, 2005
Receipt Date of Samples:	July 15, 2005
Equipment Design Stage:	Production
Equipment Condition:	No visual damage.

#### Information Provided by the Party Requesting the Test

Clocks/Oscillators:	49.152MHz
I/O Ports:	Fiber optic, Coax, Audio, Control

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

The S-0181A is a stand-alone, surround sound audio system with wireless rear satellite speakers. The wireless connection is achieved using frequency-hopping spread-spectrum (FHSS) radios in the front-located control pod and in the rear satellite speakers. The system consists of a control pod, amplifier/subwoofer assembly, three passive speaker systems, and a pair of wireless rear speakers. The Surround Sound Speaker system is to be used in a home or office environment, and connected to information technology equipment for audio entertainment purposes.

#### **Client Justification for EUT Selection:**

The product is a representative production sample.

#### **Client Justification for Test Selection:**

These tests satisfy the requirements of FCC 15.247 for FHSS devices.

The radios in the control pod and rear satellite speakers are identical except for their host devices. So radiated spurious emissions testing was performed on both the control pod and rear speakers, and antenna port direct connect measurements were made on only one configuration. AC Powerline Conducted emissions testing was also performed on both the control pod and rear speakers.



## **Modifications**

	Equipment modifications						
Item	Test	Date	Modification	Note	Disposition of EUT		
1	Radiated Emissions	07/15/2005	Internal antenna cable shortened and re-routed.	Modified from delivered configuration. Modifications made by Mitchell Phillipi.	EUT remained at Northwest EMC.		
2	Dwell Time	07/15/2005	No EMI suppression devices were added or modified during this test.	Same configuration as delivered.	EUT remained at Northwest EMC.		
3	Spurious Radiated Emissions	07/17/2005	No EMI suppression devices were added or modified during this test.	Same configuration as previous test.	EUT remained at Northwest EMC.		
4	Radiated Emissions	07/19/2005	No EMI suppression devices were added or modified during this test.	Same configuration as previous test.	EUT remained at Northwest EMC.		
5	Band Edge Compliance	08/03/2005	No EMI suppression devices were added or modified during this test.	Same configuration as delivered.	EUT remained at Northwest EMC.		
6	Number of Hopping Channels	08/03/2005	No EMI suppression devices were added or modified during this test.	Same configuration as previous test.	EUT remained at Northwest EMC.		
7	Channel Spacing	08/03/2005	No EMI suppression devices were added or modified during this test.	Same configuration as previous test.	EUT remained at Northwest EMC.		
8	Occupied Bandwidth	08/03/2005	No EMI suppression devices were added or modified during this test.	Same configuration as previous test.	EUT remained at Northwest EMC.		
9	Spurious Conducted Emissions	08/03/2005	No EMI suppression devices were added or modified during this test.	Same configuration as previous test.	EUT remained at Northwest EMC.		
10	Spurious Radiated Emissions	08/04/2005	No EMI suppression devices were added or modified during this test.	Same configuration as previous test.	EUT remained at Northwest EMC.		
11	Output Power	08/05/2005	No EMI suppression devices were added or modified during this test.	Same configuration as previous test.	EUT remained at Northwest EMC.		
12	Spurious Radiated Emissions	08/07/2005	No EMI suppression devices were added or modified during this test.	Same configuration as previous test.	EUT remained at Northwest EMC.		
13	AC Powerline Conducted Emissions	08/08/2005	No EMI suppression devices were added or modified during this test.	Same configuration as previous test.	EUT remained at Northwest EMC.		



#### Justification

The individuals and/or the organization requesting the test provided the modes, configurations and settings available to evaluate. While scanning the radiated emissions, all of the EUT parameters listed below were investigated. This includes, but may not be limited to, antennas, tuned transmit frequency ranges, operating modes, and data rates.

#### Channels in Specified Band Investigated:

15 channel frequency hopping set called out in script provided by customer

#### **Operating Modes Investigated:**

Frequency hopping

#### **Data Rates Investigated:**

Maximum

#### Power Input Settings Investigated:

120 VAC/60 Hz

Software\Firmware Applied During Test						
Exercise software	Special Test Software	Version	Z6DW a0.3.3.1.2.6			
Description						
The system was tested using special test codes on a remote laptop to exercise the functions of the device						
during the testing.						

EUT and Peripherals						
Description	Manufacturer	Model/Part Number	Serial Number			
Subwoofer	Logitech, Inc.	S-0181A	Unknown			
Control Pod	Logitech, Inc.	S-0181A	Unknown			
XPD Module	Logitech, Inc.	Unknown	Unknown			

Remote Equipment Outside of Test Setup Boundary					
Description Manufacturer Model/Part Number Serial Number					
Notebook PC Dell, Inc. Latitude D600 99XL661					
Equipment isolated from the	EUT so as not to contribute to the	e measurement result is considered to be out	side the test setup boundary		

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
AC Power	No	1.4	No	Subwoofer	AC Mains
Control	Yes	1.2	PA	Control Pod	Subwoofer
Serial	Yes	1.5	No	Notebook PC	XPD Module
Ribbon	No	0.2	No	XPD Module	Control Pod
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					



Measurement Equipment					
Description	Manufacturer	Model	Identifier	Last Cal	Interval
Spectrum Analyzer	Tektronix	2784	AAO	01/02/2005	12 mo

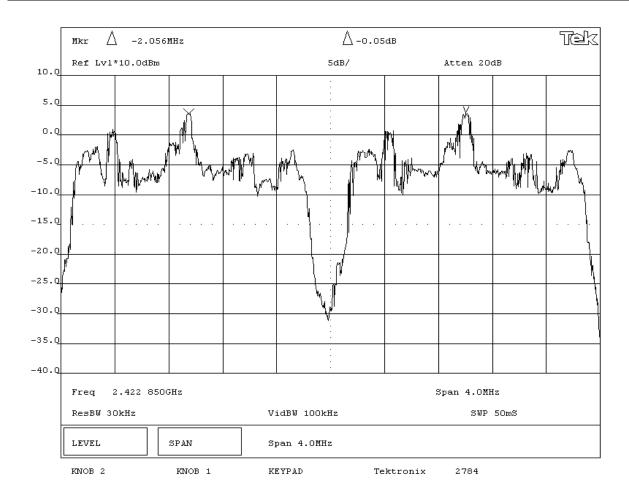
**Requirement**: Per 47 CFR 15.247(a)(1), the hopping channel carrier frequencies must be separated by a minimum of 25 kHz or the 20dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW. The measurement is made with the spectrum analyzer's resolution bandwidth set to greater than or equal to 1% of the span, and the video bandwidth set to greater than or equal to the resolution bandwidth.

**Configuration**: The carrier frequency separation was measured between two hopping channels in the middle of the authorized band. The measurements were made using a direct connection between the RF output of the EUT and the spectrum analyzer. The hopping function of the EUT was enabled.

Completed by:	
Rolyte	Peling

NORTHWEST							
EMC		CHANNEL	SPACING		Rev BETA 01/30/01		
EUT:	Z-5450 MN: S-0181A Multimedia S	Speaker System		Work Order: LABT014	0		
Serial Number:	Unknown			Date: 08/03/05			
Customer:	Logitech, Inc.	ogitech, Inc.					
Attendees:	None	None Tested by: Rod Peloquin					
Customer Ref. No.:	None		Power: Battery	Job Site: EV06			
TEST SPECIFICATION	NS						
Specification:	47 CFR 15.247(a)(1)	Year: 2005	Method: FCC DA 00-705, ANSI	C63.4 Year: 2000, 200	4		
SAMPLE CALCULATI	ONS						
COMMENTS							
Measured with a direct	ct connection between the RF outp	ut and a spectrum analyzer.					
EUT OPERATING MO	DES						
Modulated by PRBS a	t maximum data rate				-		
DEVIATIONS FROM T	EST STANDARD						
None							
REQUIREMENTS							
Frequency hopping s	ystems operating in the 2400-2483	.5 MHz band may have 20 dB band	dwidths up to 1.5 times the channel separation	on, provided the systems operate	with an		
output power no grea	ter than 125 mW.						
RESULTS			CHANNEL SPACING				
Pass			2.056 MHz				
SIGNATURE							
	Porting to Reling						
Tested By:							
DESCRIPTION OF TE	ST						
		Channel	Speeing				

#### Channel Spacing







## **Dwell Time**

#### Justification

The individuals and/or the organization requesting the test provided the modes, configurations and settings available to evaluate. While scanning the radiated emissions, all of the EUT parameters listed below were investigated. This includes, but may not be limited to, antennas, tuned transmit frequency ranges, operating modes, and data rates.

#### Channels in Specified Band Investigated:

15 channel frequency hopping set called out in script provided by customer

#### Data Rates Investigated:

Maximum

#### Output Power Setting(s) Investigated:

Maximum

#### Power Input Settings Investigated:

120 VAC/60 Hz

Software/Firmware Applied During Test						
Exercise softwareSpecial Test SoftwareVersionZ6DW a0.3.3.1.2.6						
Description						
The system was tested using special test codes on a remote laptop to exercise the functions of the device						
during the testing.						

EUT and Peripherals						
Description	Manufacturer	Model/Part Number	Serial Number			
Subwoofer	Logitech, Inc.	S-0181A	Unknown			
Control Pod	Logitech, Inc.	S-0181A	Unknown			
XPD Module	Logitech, Inc.	Unknown	Unknown			

Remote Equipment Outside of Test Setup Boundary					
Description Manufacturer Model/Part Number Serial Number					
Notebook PC Dell, Inc. Latitude D600 99XL661					
Equipment isolated from the	EUT so as not to contribute to the	e measurement result is considered to be out	side the test setup boundary		

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
AC Power	No	1.4	No	Subwoofer	AC Mains
Control	Yes	1.2	PA	Control Pod	Subwoofer
Serial	Yes	1.5	No	Notebook PC	XPD Module
Ribbon	No	0.2	No	XPD Module	Control Pod
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

Measurement Equipment						
Description	Manufacturer	Model	Identifier	Last Cal	Interval	
Spectrum Analyzer	Tektronix	2784	AAO	01/02/2005	12 mo	

Requirement: Per 47 CFR 15.247(a)(1), the average dwell time per hopping channel is measured.

Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

The measurement is made with the spectrum analyzer's span set to zero, the resolution bandwidth set to 1 MHz, and the video bandwidth set to 100 kHz. The measurement is made in two steps. First, the sweep speed is adjusted to capture the pulse width or dwell time of a single transmission. Then, the sweep speed is set to 6 seconds to count the number of transmissions during that period. The dwell time of a single transmission multiplied by the number of transmissions during a 6 second period equals the average time of occupancy during a 30 second period.

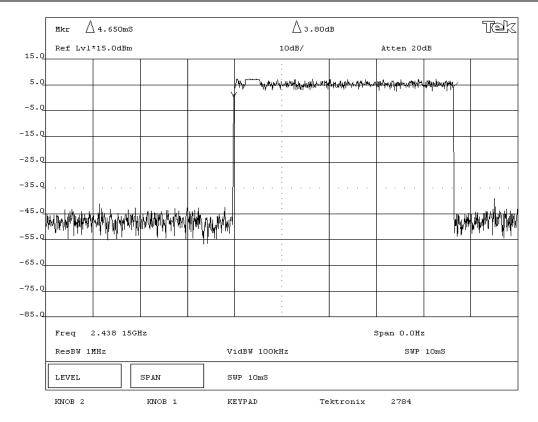
Dwell time = (single transmission (4.65 mS)) X (number of channels(15) x 0.4S) = .3627 Seconds

**Configuration**: The average dwell time per hopping channel was measured at one hopping channel in the middle of the authorized band. The measurements were made using a direct connection between the RF output of the EUT and the spectrum analyzer. The hopping function of the EUT was enabled.

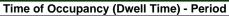
Completed by: Le Reling

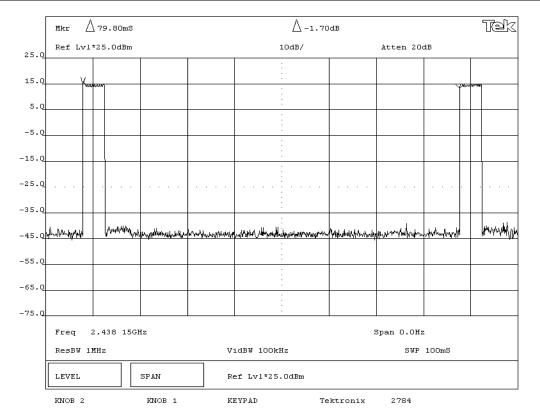
NORTHWEST DWELL TIME							
EUT: Z-5450 MN: S-0181A Multimedia Speak	aker System		Work Order:	01/30/01			
Serial Number: Unknown				07/15/05			
Customer: Logitech, Inc.			Temperature:				
Attendees: None	Attendees: None Tested by: Rod Peloquin						
Customer Ref. No.: None		Power: 120VAC/60Hz	Job Site:	EV06			
TEST SPECIFICATIONS							
Specification: 47 CFR 15.247(a)(1)(ii)	Year: 2005	Method: DA 00-705, ANSI C63.4	Year:	2003			
SAMPLE CALCULATIONS							
Total Dwell time = (Dwell Time during a single transmission(4	(4.65 mS)) X (Number of channe	els(15) x 0.4S) = .3627 Seconds					
COMMENTS							
	·····						
EUT OPERATING MODES							
Modulated by PRBS at maximum data rate. Hopping carrier.	•						
DEVIATIONS FROM TEST STANDARD None							
REQUIREMENTS							
Average time of occupancy on any channel shall not be greated	ater than 0.4 seconds in a perio	d of 0.4 seconds multiplied times the number	of channels used				
RESULTS		DWELL TIME DURING A SINGLE TRANSMISS					
Pass		4.65 mS					
SIGNATURE							
Norty to Peluy							
DESCRIPTION OF TEST							
Time of Oc	ccupancy (Dwell ]	Time) - Single Transmissi	on				

Time of Occupancy (Dwell Time) - Single Transmission



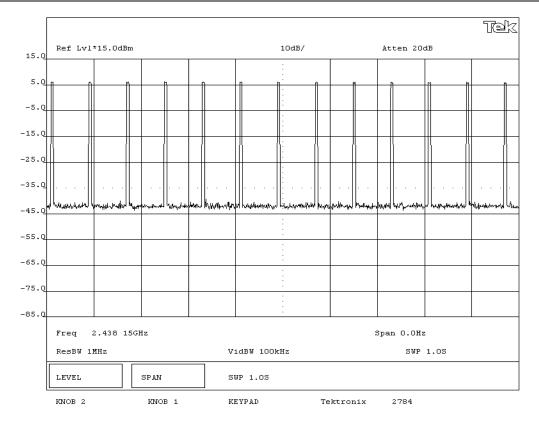
NORTHWEST EMC	DWEL	LTIME		Rev BETA 01/30/01	
EUT: Z-5450 MN: S-0181A Multimedia	a Speaker System		Work Order	LABT0140	
Serial Number: Unknown				: 07/15/05	
Customer: Logitech, Inc.	Customer: Logitech, Inc.				
Attendees: None		Tested by: Rod Peloquin	Humidity	/: 45% RH	
Customer Ref. No.: None					
TEST SPECIFICATIONS					
Specification: 47 CFR 15.247(a)(1)(ii)	Year: 2005	Method: DA 00-705, ANSI C63.4	Year	: 2003	
SAMPLE CALCULATIONS					
Total Dwell time = (Dwell Time during a single transmi	ssion(4.65 mS)) X (Number of channe	els(15) x 0.4S) = .3627 Seconds			
COMMENTO					
EUT OPERATING MODES					
Modulated by PRBS at maximum data rate. Hopping of	arrier.				
DEVIATIONS FROM TEST STANDARD					
None					
REQUIREMENTS					
Average time of occupancy on any channel shall not l	be greater than 0.4 seconds in a perio	od of 0.4 seconds multiplied times the number	of channels used.		
RESULTS		PERIOD			
Pass		79.8 mS			
SIGNATURE					
Rocky le Pieling Tested By:	с с				
DESCRIPTION OF TEST					
	Time of Occupancy	(Dwell Time) - Period			

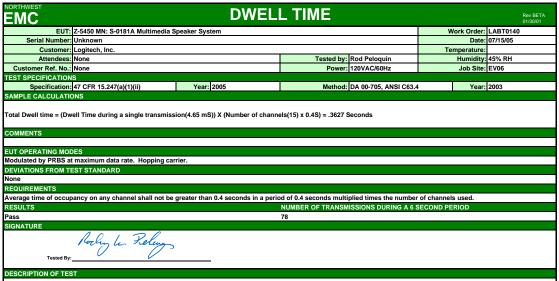




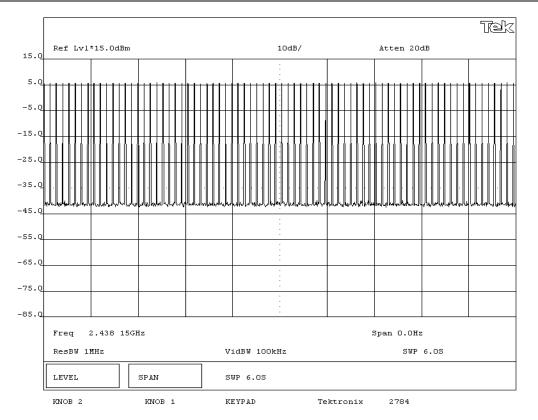
NORTHWEST	DWEL	LTIME			Rev BETA 01/30/01	
EUT: Z-5450 MN: S-0181A Multimedia Speaker System Work Order: LA						
Serial Number: Unknown						
Customer: Logitech, Inc.			Ter	mperature:		
Attendees: None		Tested by: Rod Peloquin		Humidity:	45% RH	
Customer Ref. No.: None		Power: 120VAC/60Hz		Job Site:	EV06	
TEST SPECIFICATIONS						
Specification: 47 CFR 15.247(a)(1)(ii)	Year: 2005	Method: DA 00-705, ANSI C63.4		Year:	2003	
SAMPLE CALCULATIONS						
Total Dwell time = (Dwell Time during a single transmission COMMENTS	(4.65 mS)) X (Number of channe	els(15) x 0.4S) = .3627 Seconds				
EUT OPERATING MODES						
Modulated by PRBS at maximum data rate. Hopping carrier	r.					
DEVIATIONS FROM TEST STANDARD						
None REQUIREMENTS						
Average time of occupancy on any channel shall not be gre	eter then 0.4 seconds in a naris	ad of 0.4 accords multiplied times the number	of channels	used		
RESULTS		NUMBER OF TRANSMISSIONS DURING A 1 S				
Pass		13	LCOND FL	RIOD		
SIGNATURE		15				
Tested By:						

Time of Occupancy (Dwell Time) - Number of transmissions during a 1 second period





Time of Occupancy (Dwell Time) - Number of transmissions during a 1 second period







#### Justification

The individuals and/or the organization requesting the test provided the modes, configurations and settings available to evaluate. While scanning the radiated emissions, all of the EUT parameters listed below were investigated. This includes, but may not be limited to, antennas, tuned transmit frequency ranges, operating modes, and data rates.

#### Channels in Specified Band Investigated:

15 channel frequency hopping set called out in script provided by customer

#### **Operating Modes Investigated:**

**Frequency Hopping** 

**Data Rates Investigated:** 

Maximum

Output Power Setting(s) Investigated: Maximum

Power Input Settings Investigated: 120 VAC/60 Hz

Software\Firmware Appl	ied During Test		
Exercise software	Special Test Software	Version	Z6DW a0.3.3.1.2.6
Description			
The system was tested us	ing special test codes on a	remote laptop to exercise t	he functions of the device
during the testing.			

EUT and Peripherals				
Description	Manufacturer	Model/Part Number	Serial Number	
Subwoofer	Logitech, Inc.	S-0181A	Unknown	
Control Pod	Logitech, Inc.	S-0181A	Unknown	
XPD Module	Logitech, Inc.	Unknown	Unknown	

Remote Equipment Outside of Test Setup Boundary					
Description	Manufacturer	Model/Part Number	Serial Number		
Notebook PC	Dell, Inc.	Latitude D600	99XL661		
Equipment isolated from the EUT so as not to contribute to the measurement result is considered to be outside the test setup boundary					

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
AC Power	No	1.4	No	Subwoofer	AC Mains
Control	Yes	1.2	PA	Control Pod	Subwoofer
Serial	Yes	1.5	No	Notebook PC	XPD Module
Ribbon	No	0.2	No	XPD Module	Control Pod
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

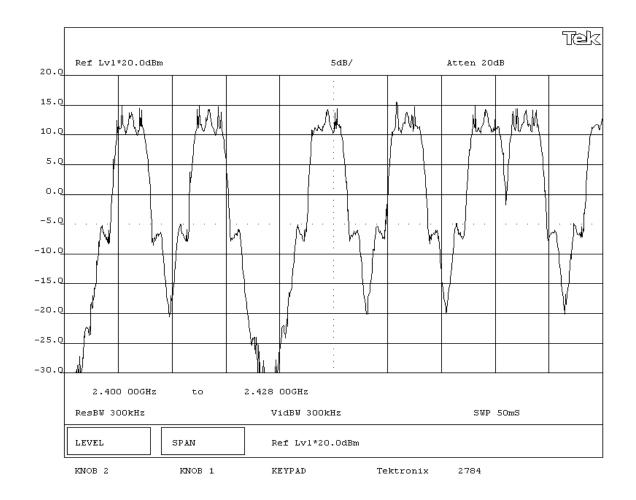
Measurement Equipment	1				
Description	Manufacturer	Model	Identifier	Last Cal	Interval
Spectrum Analyzer	Tektronix	2784	AAO	01/02/2005	12 mo

**Requirement**: Per 47 CFR 15.247(a)(1)(iii), Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The measurement is made with the spectrum analyzer's resolution bandwidth set to 100 kHz, and the video bandwidth set to greater than or equal to the resolution bandwidth.

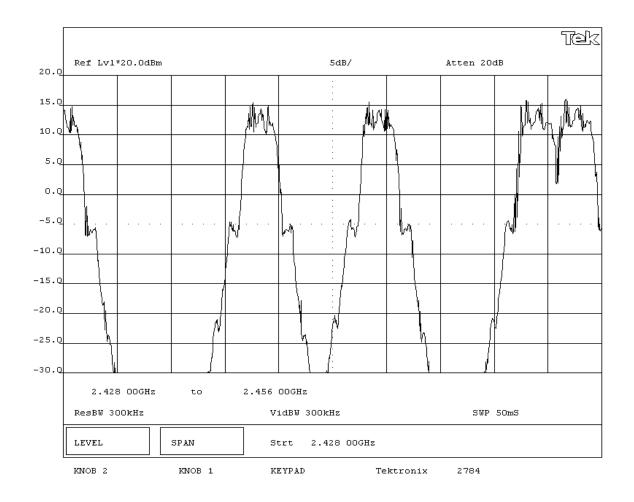
**Configuration**: The number of hopping frequencies was measured across the authorized band. The measurements were made using a direct connection between the RF output of the EUT and the spectrum analyzer. The hopping function of the EUT was enabled.

Completed by:	
Rocky le	Peling

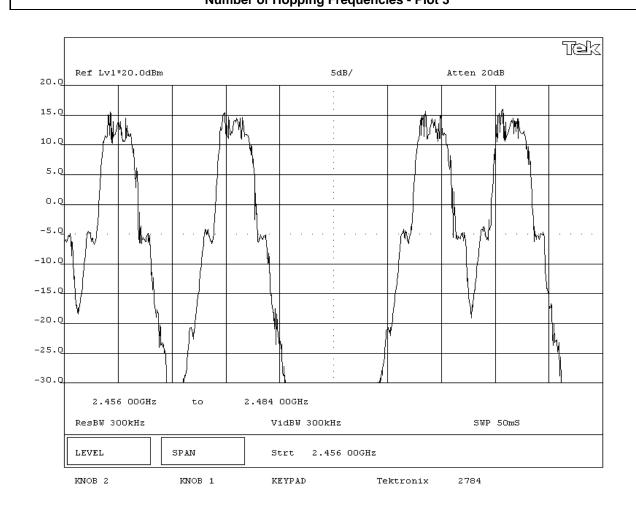
NORTHWEST EMC	NUME		ING FREQUENCIE	S	Rev BETA 01/30/01		
EUT:	Z-5450 MN: S-0181A Multimedia	Speaker System		Work Order:	LABT0140		
Serial Number:	Unknown			Date:	08/03/05		
Customer:	Logitech, Inc.			Temperature:	70 °F		
Attendees:	None Tested by: Rod Peloquin			Humidity:	43% RH		
Customer Ref. No.:	None		Power: Battery	Job Site:	EV06		
TEST SPECIFICATION	IS						
Specification:	47 CFR 15.247(a)(1)(i)	Year: 2005	Method: FCC DA 00-705, ANSI	C63.4 Year:	2000, 2004		
SAMPLE CALCULATIO	ONS						
COMMENTS							
	t connection between the RF outp	out and a spectrum analyzer.					
EUT OPERATING MOI							
	m data rate, at maximum output p	ower					
DEVIATIONS FROM T	EST STANDARD						
REQUIREMENTS	stems in the 2400-2483.5 MHz ba	nd shall use at least 15 shannels					
. ,,	vstems in the 2400-2465.5 Minz ba						
RESULTS			NUMBER OF HOPPING FREQUENCIES				
Pass SIGNATURE			15				
	Porty le Reling						
DESCRIPTION OF TES	ST						
		Number of Hopping	Frequencies - Plot 1				



NORTHWEST EMC	NUME		ING FREQUENCIE	S	Rev BETA 01/30/01		
EUT:	Z-5450 MN: S-0181A Multimedia S	Speaker System		Work Order:	LABT0140		
Serial Number:	Unknown			Date:	08/03/05		
Customer:	Logitech, Inc.			Temperature:	70 °F		
Attendees:	None Tested by: Rod Peloquin			Humidity:	43% RH		
Customer Ref. No.:	None		Power: Battery	Job Site:	EV06		
TEST SPECIFICATION	IS						
Specification:	47 CFR 15.247(a)(1)(i)	Year: 2005	Method: FCC DA 00-705, ANSI	C63.4 Year:	2000, 2004		
SAMPLE CALCULATIO	ONS						
COMMENTS							
	t connection between the RF outp	out and a spectrum analyzer.					
EUT OPERATING MOI							
	m data rate, at maximum output p	ower					
DEVIATIONS FROM T	EST STANDARD						
REQUIREMENTS	stems in the 2400-2483.5 MHz ba	nd shall use at least 15 shannels					
. ,,	vsteins in the 2400-2485.5 MHz bai						
RESULTS			NUMBER OF HOPPING FREQUENCIES				
Pass SIGNATURE			15				
	Porting to Roling						
DESCRIPTION OF TES	ST						
		Number of Hopping	Frequencies - Plot 2				



NORTHWEST			ING FREQUENCIE	'e
EMC	INDIVIE		ING FREQUENCIE	Rev BETA 01/30/01
EUT:	Z-5450 MN: S-0181A Multimedia	Speaker System		Work Order: LABT0140
Serial Number:	Unknown			Date: 08/03/05
Customer:	Logitech, Inc.			Temperature: 70 °F
Attendees:	None		Tested by: Rod Peloquin	Humidity: 43% RH
Customer Ref. No.:	None		Power: Battery	Job Site: EV06
TEST SPECIFICATION	NS			
Specification:	47 CFR 15.247(a)(1)(i)	Year: 2005	Method: FCC DA 00-705, ANSI	C63.4 Year: 2000, 2004
SAMPLE CALCULATI	ONS			
COMMENTS				
	ct connection between the RF outp	out and a spectrum analyzer.		
EUT OPERATING MO				
Modulated at maximu	im data rate, at maximum output p	ower		
DEVIATIONS FROM T	EST STANDARD			
None				
REQUIREMENTS				
Frequency hopping s	ystems in the 2400-2483.5 MHz ba	nd shall use at least 15 channels.		
RESULTS			NUMBER OF HOPPING FREQUENCIES	
Pass			15	
SIGNATURE				
Tested By	Porting to Feling			
DESCRIPTION OF TE	ST			
		Number of Hopping	Frequencies - Plot 3	







#### Justification

The individuals and/or the organization requesting the test provided the modes, configurations and settings available to evaluate. While scanning the radiated emissions, all of the EUT parameters listed below were investigated. This includes, but may not be limited to, antennas, tuned transmit frequency ranges, operating modes, and data rates.

Channels in Specified Band Investigated:
Low
Mid
High

Data Rates Investigated:

Maximum

Output Power Setting(s) Investigated: Maximum

#### Power Input Settings Investigated: 120 VAC/60 Hz

Software\Firmware Applied During Test								
Exercise software	Special Test Software	Version	Z6DW a0.3.3.1.2.6					
Description								
The system was tested us	ing special test codes on a	remote laptop to exercise t	he functions of the device					
during the testing.								

EUT and Peripherals								
Description	Manufacturer	Model/Part Number	Serial Number					
Subwoofer	Logitech, Inc.	S-0181A	Unknown					
Control Pod	Logitech, Inc.	S-0181A	Unknown					
XPD Module	Logitech, Inc.	Unknown	Unknown					

Remote Equipment Outside of Test Setup Boundary							
Description	Manufacturer	Model/Part Number	Serial Number				
Notebook PC	Dell, Inc.	Latitude D600	99XL661				
Equipment isolated from the	EUT so as not to contribute to the	e measurement result is considered to be out	side the test setup boundary				

Cables								
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2			
AC Power	No	1.4	No	Subwoofer	AC Mains			
Control	Yes	1.2	PA	Control Pod	Subwoofer			
Serial	Yes	1.5	No	Notebook PC	XPD Module			
Ribbon	No	0.2	No	XPD Module	Control Pod			
PA = Cable is perm	nanently attac	hed to the device.	Shielding and	d/or presence of ferrite	may be unknown.			

Measurement Equipment								
Description	Manufacturer	Model	Identifier	Last Cal	Interval			
Spectrum Analyzer	Agilent	E4446A	AAQ	04/08/2005	13 mo			

#### Requirement:

Per 47 CFR 15.247(a)(1), the hopping channel carrier frequencies must be separated by a minimum of 25 kHz or the 20dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

Per an FCC Interpretation sent to TCBs on October 8, 2002, frequency hoppers in the 2.4 GHz band operating under 15.247 are required to use a minimum of 15 non-overlapping channels. The hopping channel bandwidth can be wider than 1 MHz as long as the channels do not overlap and all emissions stay within the 2400-2483.5 MHz band. For example, a system that uses the minimum 15 channels can have hopping channel bandwidth that are up to 5 MHz wide. The measurement is made with the spectrum analyzer's resolution bandwidth set to  $\geq$ 1% of the 20dB bandwidth, and the video bandwidth set to greater than or equal to the resolution bandwidth.

<u>Configuration</u>: The occupied bandwidth was measured with the EUT set to low, medium, and high transmit frequencies. The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at its maximum data rate in a no hop mode.

Completed by: , Le Pelen

С		OCCUPI	ED BANDWI	DTH		Rev B 01/30/
EUT:	Z-5450 MN: S-0181A Mu	ultimedia Speaker System			Work Order: L/	ABT0140
Serial Number:					Date: 08	
Customer:	Logitech, Inc.				Temperature: 70	)°F
Attendees:			Tested by	Rod Peloquin	Humidity: 43	
omer Ref. No.:	None			Battery	Job Site: E	
ECIFICATIONS						
Specification:	47 CFR 15.247(a)	Year: 2005-04	Method	DA 00-705, ANSI C63.4	Year: 20	003
CALCULATIO						
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ERATING MOD		e RF output and a spectrum analyzer				
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	stems operating in the f	2400-2483.5 MHz band may have 20 d	B bandwidths up to 1 5 times 4	e channel congration provide	d the systems on a	ate with on co
o greater than			B Bandwidths up to 1.5 times th	e channel separation, provide	a me systems oper	
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Tested By:						
PTION OF TES	i i					
		20dB Band	dwidth - Low Chan	nel		
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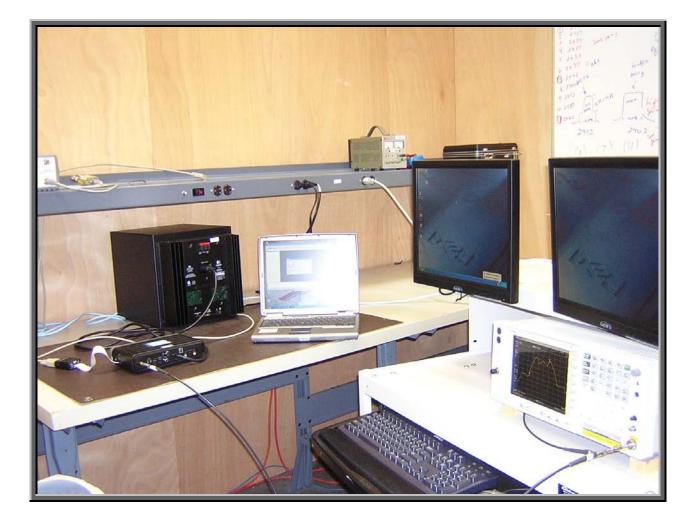
		0000	PIED BAI	NDWID	DTH		Rev I 01/30
EUT: Z-5	450 MN: S-0181A Mu	Iltimedia Speaker System				Work Order	LABT0140
Serial Number: Uni	known	• •				Date	: 08/03/05
Customer: Log	litech, Inc.					Temperature	
Attendees: Nor				Tested by:	Rod Peloquin		/: 43% RH
omer Ref. No.: Nor					Battery	Job Site	
PECIFICATIONS							
Specification: 47	CFR 15.247(a)	Year: 2005-04		Method:	DA 00-705, ANSI C63	.4 Year	r: 2003
E CALCULATIONS							
ENTS							
	nection between the	e RF output and a spectrum ana	lyzer				
ERATING MODES	meetion between the	e Ri Output and a spectrum and	19261.				
ed by PRBS at max	vimum data rate						
IONS FROM TEST							
IONS PROM TEST	JTANDARD						
REMENTS	e operating in the 2	200-2483 5 MHz band may bare	20 dB bandwidthe	to 1 5 times the	channel constation	provided the systems	perate with on a
icy hopping systen to greater than 125		400-2483.5 MHz band may have	20 dB bandwidths up	to 1.5 times the	e channel separation,	provided the systems o	perate with an o
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Tested By:	V						
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IC		OCCUPIEI			Rev 01/3
		lultimedia Speaker System			Work Order: LABT0140
Serial Number:	Unknown Logitech, Inc.				Date: 08/03/05 Temperature: 70 °F
Attendees:			Tested by:	Rod Peloquin	Humidity: 43% RH
stomer Ref. No.:			Power:	Battery	Job Site: EV06
SPECIFICATION Specification:	IS 47 CFR 15.247(a)	Year: 2005-04	Method:	DA 00-705, ANSI C63.4	Year: 2003
LE CALCULATI		Tear: 2005-04	wethou:	DA 00-705, ANSI C63.4	rear: 2003
PERATING MOI	DES	he RF output and a spectrum analyzer.			
	t maximum data rate EST STANDARD				
IREMENTS					
	vstems operating in the ter than 125 mW.	2400-2483.5 MHz band may have 20 dE	3 bandwidths up to 1.5 times	the channel separation, pro	vided the systems operate with a
LTS			BANDWIDTH		
			2.64 MHz		
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Tested By:	Rocky le F	elen			
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		lultimedia Speaker System				V	Vork Order:	
Serial Number:						-		08/03/05
Attendees:	Logitech, Inc.			Tested by:	Rod Peloquin	Te	mperature: Humidity:	70 °F 43% RH
stomer Ref. No.:					Battery			EV06
SPECIFICATION								
Specification: PLE CALCULATION	47 CFR 15.247(a)	Year: 200	5-04	Method:	DA 00-705, ANSI	C63.4	Year:	2003
MENTS								
		he RF output and a spectr	um analyzer.					
	t maximum data rate							
TIONS FROM TI	EST STANDARD							
IREMENTS								
	stems operating in the	2400-2483.5 MHz band ma	ay have 20 dB bandwid	ths up to 1.5 times	the channel sepa	ration, provided	the system	s operate with a
t power no great	er than 125 mW.							
LTS								
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Tested By:	0	$\mathcal{O}^{\circ}$						
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		ultimedia Speaker System				Work Order:	: LABT0140
Serial Number:							08/03/05
	Logitech, Inc.			Toptod hu	Rod Peloguin	Temperature:	
Attendees: omer Ref. No.:	None None				Battery	Humidity: Job Site:	
PECIFICATION				rower.			1
Specification:	47 CFR 15.247(a)	Year: 2005-04		Method:	DA 00-705, ANSI C6	3.4 Year:	2003
E CALCULATIO	ONS						
ENTS							
PERATING MO	DES	he RF output and a spectrum ana	lyzer.				
-	t maximum data rate EST STANDARD						
REMENTS							
	stems operating in the ter than 125 mW.	2400-2483.5 MHz band may have	20 dB bandwidths	up to 1.5 times	the channel separat	tion, provided the system	ns operate with a
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IC						Rev B 01/30/
		ultimedia Speaker System			Work Order: LA	
Serial Number: Customer:	Unknown Logitech, Inc.				Date: 08 Temperature: 70	
Attendees:			Tested by:	Rod Peloquin		% RH
stomer Ref. No.:	None		Power:		Job Site: EV	/06
SPECIFICATION						
Specification: LE CALCULATION	47 CFR 15.247(a)	Year: 2005-04	Method:	DA 00-705, ANSI C63.4	Year: 20	03
MENTS ured with a direc	t connection between t	he RF output and a spectrum analyzer.				
PERATING MOI	DES t maximum data rate					
TIONS FROM T	EST STANDARD					
IREMENTS						
ency hopping sy		2400-2483.5 MHz band may have 20 dl	B bandwidths up to 1.5 times	the channel separation, provi	ded the systems o	perate with a
	ter than 125 mW.					
LTS			BANDWIDTH 2.68 MHz			
TURE			2.00 WIF12			
Tested By:	Rochy Le F	Celing				
		20dB Bandw	idth - High Chan	inel		
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# **Output Power**

## Justification

The individuals and/or the organization requesting the test provided the modes, configurations and settings available to evaluate. While scanning the radiated emissions, all of the EUT parameters listed below were investigated. This includes, but may not be limited to, antennas, tuned transmit frequency ranges, operating modes, and data rates.

Channels in Specified Band Investigated:
Low
Mid
High

**Operating Modes Investigated:** No Hop

Data Rates Investigated: Maximum

Output Power Setting(s) Investigated: Maximum

Power Input Settings Investigated:

120 VAC/60 Hz

Software\Firmware Applied During Test					
Exercise softwareSpecial Test SoftwareVersionZ6DW a0.3.3.1.2.6					
Description					
The system was tested using special test codes on a remote laptop to exercise the functions of the device during the testing.					

EUT and Peripherals					
Description	Manufacturer	Model/Part Number	Serial Number		
Subwoofer	Logitech, Inc.	S-0181A	Unknown		
Control Pod	Logitech, Inc.	S-0181A	Unknown		
XPD Module	Logitech, Inc.	Unknown	Unknown		

Remote Equipment Outside of Test Setup Boundary					
Description Manufacturer Model/Part Number Serial Number					
Notebook PC Dell, Inc. Latitude D600 99XL661					
Equipment isolated from the	Equipment isolated from the EUT so as not to contribute to the measurement result is considered to be outside the test setup boundary				

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
AC Power	No	1.4	No	Subwoofer	AC Mains
Control	Yes	1.2	PA	Control Pod	Subwoofer
Serial	Yes	1.5	No	Notebook PC	XPD Module
Ribbon	No	0.2	No	XPD Module	Control Pod
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

Measurement Equipment					
Description	Manufacturer	Model	Identifier	Last Cal	Interval
Power Meter	Hewlett Packard	E4418A	SPA	07/23/2004	24 mo
Power Sensor	Hewlett-Packard	8481H	SPB	07/23/2004	24 mo
Signal Generator	Hewlett Packard	8341B	TGN	02/07/2005	13 mo
Oscilloscope	Tektronix	TDS 3052	TOF	12/02/2004	13 mo
RF Detector	RLC Electronics	CR-133-R	ZZA	NCR	NA

**Requirement**: Per 47 CFR 15.247(a)(1), for this application frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

<u>Configuration</u>: The peak output power was measured with the EUT set to low, medium, and high transmit frequencies. The EUT was transmitting at its maximum output power. The data rate of the radio was varied to determine the level that produced the highest output power.

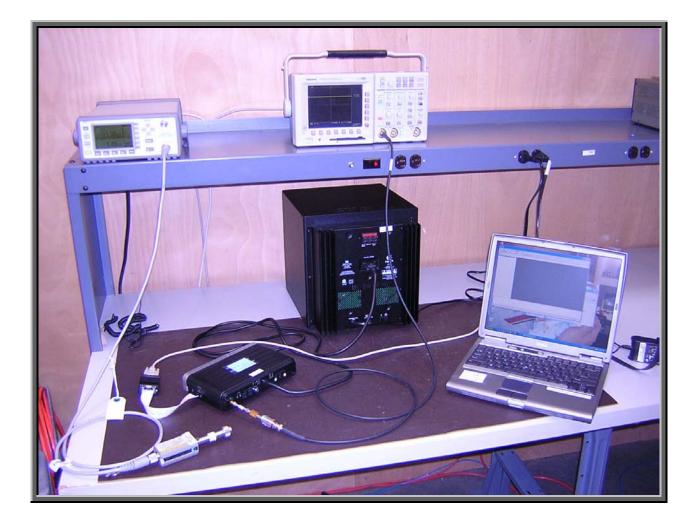
The measurement was made using a direct connection between the RF output of the EUT and a RF detector diode. The DC output of the diode was measured with the oscilloscope. The signal generator, tuned to the transmit frequency, was then substituted for the EUT. The CW output of the signal generator was adjusted until the DC output of the RF detector diode match the peak level produced when connected to the EUT. To further reduce measurement error, the power meter and sensor were then used to measure the output power level of the signal generator.

**De Facto EIRP Limit:** Per 47 CFR 15.247 (b)(1-3), the EUT meets the de facto EIRP limit of +36dBm.

Completed by: in he Reling

NORTHWEST						
EMC		OUTPU	T POWER		Rev BETA 01/30/01	
EUT:	Z-5450 MN: S-0181A Multimedia		Work Order:	LABT0140		
Serial Number:	Unknown	Inknown			08/05/05	
Customer:	Logitech, Inc.			Temperature:	70 °F	
Attendees:	None		Tested by: Rod Peloquin	Humidity:	45% RH	
Customer Ref. No.:			Power: 120VAC/60Hz	Job Site:	EV06	
TEST SPECIFICATION	NS					
	47 CFR 15.247(b)	Year: 2005-04	Method: DA 00-705, ANSI C63.4	Year:	2003	
SAMPLE CALCULATI	ONS					
COMMENTS						
EUT OPERATING MO						
Modulated by PRBS a						
DEVIATIONS FROM T	EST STANDARD					
None						
REQUIREMENTS						
			g channel carrier frequencies that are separated te with an output power no greater than	1 by 25 kHz or two-thi	rds of the 20 dB	
RESULTS			AMPLITUDE			
Pass	53.58 mW					
SIGNATURE						
Korly & Fielings						
DESCRIPTION OF TES	ST					
	Output Power					

Frequency (MHz)	Peak Power Measured w/ Diode Detector (dBm)	Peak Power (mW)	Spec (mW)
2403.4	15.74	37.50	125.0
2441.0	16.37	43.35	125.0
2480.0	17.29	53.58	125.0





The individuals and/or the organization requesting the test provided the modes, configurations and settings available to evaluate. While scanning the radiated emissions, all of the EUT parameters listed below were investigated. This includes, but may not be limited to, antennas, tuned transmit frequency ranges, operating modes, and data rates.

Channels in Specified Band Investigated:
High
Low

# **Operating Modes Investigated:** No Hop

Data Rates Investigated: Maximum

# Power Input Settings Investigated:

120 VAC/60 Hz

Software\Firmware Applied During Test					
Exercise softwareSpecial Test SoftwareVersionZ6DW a0.3.3.1.2.6					
Description					
The system was tested using special test codes on a remote laptop to exercise the functions of the device					
during the testing.					

EUT and Peripherals					
Description	Manufacturer	Model/Part Number	Serial Number		
Subwoofer	Logitech, Inc.	S-0181A	Unknown		
Control Pod	Logitech, Inc.	S-0181A	Unknown		
XPD Module	Logitech, Inc.	Unknown	Unknown		

Remote Equipment Outside of Test Setup Boundary					
Description Manufacturer Model/Part Number Serial Number					
Notebook PC Dell, Inc. Latitude D600 99XL661					
Equipment isolated from the EUT so as not to contribute to the measurement result is considered to be outside the test setup boundary					

Cables								
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2			
AC Power	No	1.4	No	Subwoofer	AC Mains			
Control	Yes	1.2	PA	Control Pod	Subwoofer			
Serial	Yes	1.5	No	Notebook PC	XPD Module			
Ribbon	No	0.2	No	XPD Module	Control Pod			
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.								



Measurement Equipment							
Description	Manufacturer	Model	Identifier	Last Cal	Interval		
Spectrum Analyzer	Tektronix	2784	AAO	01/02/2005	12 mo		

**Requirement**: Per 47 CFR 15.247(d), in any 100 kHz bandwidth outside the authorized band, the maximum level of radio frequency power must be at least 20dB down from the highest emission level within the authorized band. The measurement is made with the spectrum analyzer's resolution bandwidth set to 100 kHz, and the video bandwidth set to greater than or equal to the resolution bandwidth.

**Configuration**: The spurious RF conducted emissions at the edges of the authorized band were measured with the EUT set to low and high transmit frequencies. The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at its maximum data rate in a no hop mode. The channels closest to the band edges were selected. The spectrum was scanned across each band edge from 5 MHz below the band edge to 5 MHz above the band edge.

Completed by:	
Roly le	Peling

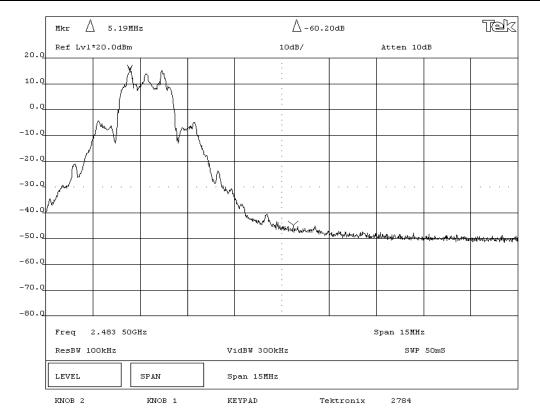
Nontingest       BANDEDGE COMPLIANCE         OWARD AND AND AND AND AND AND AND AND AND AN										
Serial Number:     Unknown     Date:     08/03/05       Customer:     Logitech, Inc.     Temperature:     70 °F       Attendees:     None     Tested by:     Rod Peloquin     Humidity:     43% RH       Customer Ref. No.:     None     Power:     120VAC/60Hz     Job Site:     EV06       TEST SPECIFICATIONS     Specification:     47 CFR 15.247(d)     Year:     2005-04     Method:     DA 00-705, ANSI C63.4     Year:     2003       SAMPLE CALCULATIONS     EUT OPERATING MODES     EUT OPERATING MODES     Modulated by PRBS at maximum data rate       Deventions     EUT OPERATING STANDARD     None     None     None     Date:     Date:	EMC		BAND EDGE	COMPLIANCE						
Customer:     Logitech, Inc.     Temperature:     70 °F       Attendees:     None     Tested by:     Rod Peloquin     Humidity:     43% RH       Customer Ref. No.:     None     Power:     120VAC/60Hz     Job Site:     EV06       TEST SPECIFICATIONS     Specification:     47 CFR 15.247(d)     Year:     2005-04     Method:     DA 00-705, ANSI C63.4     Year:     2003       SAMPLE CALCULATIONS     EUT OPERATING MODES     EUT OPERATING MODES     EUT OPERATING MODES     EUT OPERATING MODES       Modulated by PRBS at maximum data rate     DEVIATIONS FROM TEST STANDARD     None     EUT OPERATING MODES	EUT:	Z-5450 MN: S-0181A Multimedia S	speaker System		Work Order:	LABT0140				
Attendees:       None       Tested by:       Rod Peloquin       Humidity:       43% RH         Customer Ref. No.:       None       Power:       120VAC/60Hz       Job Site:       EV06         TEST SPECIFICATIONS       Specification:       47 CFR 15.247(d)       Year:       2005-04       Method:       DA 00-705, ANSI C63.4       Year:       2003         SAMPLE CALCULATIONS	Serial Number:	Unknown			Date:	08/03/05				
Customer Ref. No.:     None     Power:     120VAC/60Hz     Job Site:     EV06       TEST SPECIFICATIONS     Specification:     47 CFR 15.247(d)     Year:     2003       SAMPLE CALCULATIONS     Sample CALCULATIONS     Vear:     2003       COMMENTS     EUT OPERATING MODES     Modulated by PRBS at maximum data rate       DEVIATIONS FROM TEST STANDARD     None	Customer:	Logitech, Inc.			Temperature:	70 °F				
TEST SPECIFICATIONS         Specification:       47 CFR 15.247(d)       Year:       2005-04       Method:       DA 00-705, ANSI C63.4       Year:       2003         SAMPLE CALCULATIONS	Attendees:	None		Tested by: Rod Peloquin	Humidity:	43% RH				
Specification:       47 CFR 15.247(d)       Year:       2005-04       Method:       DA 00-705, ANSI C63.4       Year:       2003         SAMPLE CALCULATIONS	Customer Ref. No.:	None		Power: 120VAC/60Hz	Job Site:	EV06				
SAMPLE CALCULATIONS COMMENTS EUT OPERATING MODES Modulated by PRBS at maximum data rate DEVIATIONS FROM TEST STANDARD None										
COMMENTS EUT OPERATING MODES Modulated by PRBS at maximum data rate DEVIATIONS FROM TEST STANDARD None	Specification:	47 CFR 15.247(d)	Year: 2005-04	Method: DA 00-705, ANSI C63.4	Year:	2003				
EUT OPERATING MODES Modulated by PRBS at maximum data rate DEVIATIONS FROM TEST STANDARD None	SAMPLE CALCULATI	IONS								
EUT OPERATING MODES Modulated by PRBS at maximum data rate DEVIATIONS FROM TEST STANDARD None										
EUT OPERATING MODES Modulated by PRBS at maximum data rate DEVIATIONS FROM TEST STANDARD None										
EUT OPERATING MODES Modulated by PRBS at maximum data rate DEVIATIONS FROM TEST STANDARD None										
Modulated by PRBS at maximum data rate DEVIATIONS FROM TEST STANDARD None	COMMENTS									
Modulated by PRBS at maximum data rate DEVIATIONS FROM TEST STANDARD None										
DEVIATIONS FROM TEST STANDARD None										
None										
		EST STANDARD								
REQUIREMENTS										
	REQUIREMENTS									
Maximum level of any spurious emission at the edge of the authorized band is 20 dB down from the fundamental		/ spurious emission at the edge of	the authorized band is 20 dB dow							
RESULTS AMPLITUDE	RESULTS			AMPLITUDE						
Pass -54.4 dB										
	SIGNATURE									
Rocky to Reling										
DESCRIPTION OF TEST	DESCRIPTION OF TE	ST								
Band Edge Compliance - Low Channel			Band Edge Compli	ance - Low Channel						



[	Mkr 🛆 -3.34	4MHz					Tek
20.0	Ref Lv1*20.0dBn	a	10dB/		Atten 10d	В	
10.0				X	ΛΛ		
0.0							
-10.0							
-20.0				/ /	V		
-30.Q			N				
-40.0							**
-50.0	mussonnellipterstantions	man and a second second and a second and a second	What with a way way way way way way way way way w				Munnard.
-60.0			-				
-70.Q			-				
-80.Q			•				
	Freq 2.400 00	)GHz		នា	pan 15MHz		
	ResBW 100kHz	v	idBW 300kHz		SWP 5	50mS	
	LEVEL	SPAN F	req 2.400 00GHz				
_	KNOB 2	KNOB 1 K	EYPAD Te	ktronix	2784		

EMC BAND EDGE COMPLIANCE								
	Z-5450 MN: S-0181A Multimedia S	Speaker System			Wo	ork Order:	01/30/01	
Serial Number:							08/03/05	
Customer:	Logitech, Inc.				Terr	perature:	70 °F	
Attendees:			Tested by:	Rod Peloquin		Humidity:		
Customer Ref. No.:	None		Power:	120VAC/60Hz		Job Site:	EV06	
TEST SPECIFICATION	IS							
Specification:	47 CFR 15.247(d)	Year: 2005-04	Method:	DA 00-705, ANSI C63.4		Year:	2003	
SAMPLE CALCULATIO	ONS							
COMMENTS	COMMENTS							
EUT OPERATING MOD	DES							
Modulated by PRBS at	t maximum data rate							
DEVIATIONS FROM T	EST STANDARD							
None								
REQUIREMENTS								
	spurious emission at the edge of t	the authorized band is 20 dB down	from the fundamental					
RESULTS			AMPLITUDE					
Pass	Pass -60.2 dB							
SIGNATURE								
Tested By:	Porting to Reling							
DESCRIPTION OF TES	БТ							
	Band Edge Compliance - High Channel							









The individuals and/or the organization requesting the test provided the modes, configurations and settings available to evaluate. While scanning the radiated emissions, all of the EUT parameters listed below were investigated. This includes, but may not be limited to, antennas, tuned transmit frequency ranges, operating modes, and data rates.

Channels in Specified Band Investigated:
Low
Mid
High

**Operating Modes Investigated:** No Hop

Data Rates Investigated: Maximum

Output Power Setting(s) Investigated: Maximum

Power Input Settings Investigated:

120 VAC/60 Hz

Software\Firmware Applied During Test							
Exercise software	Special Test Software	Version	Z6DW a0.3.3.1.2.6				
Description							
The system was tested using special test codes on a remote laptop to exercise the functions of the device during the testing.							

EUT and Peripherals								
Description	Manufacturer	Model/Part Number	Serial Number					
Subwoofer	Logitech, Inc.	S-0181A	Unknown					
Control Pod	Logitech, Inc.	S-0181A	Unknown					
XPD Module	Logitech, Inc.	Unknown	Unknown					

Remote Equipment Outside of Test Setup Boundary						
Description	Manufacturer	Model/Part Number	Serial Number			
Notebook PC	Dell, Inc.	Latitude D600	99XL661			
Equipment isolated from the EUT so as not to contribute to the measurement result is considered to be outside the test setup boundary						

Cables								
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2			
AC Power	No	1.4	No	Subwoofer	AC Mains			
Control	Yes	1.2	PA	Control Pod	Subwoofer			
Serial	Yes	1.5	No	Notebook PC	XPD Module			
Ribbon	No	0.2	No	XPD Module	Control Pod			
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.								

Measurement Equipment							
Description	Manufacturer	Model	Identifier	Last Cal	Interval		
Spectrum Analyzer	Tektronix	2784	AAO	01/02/2005	12 mo		

**Requirement**: Per 47 CFR 15.247(d), in any 100 kHz bandwidth outside the authorized band, the maximum level of radio frequency power must be at least 20dB down from the highest emission level within the authorized band. The measurement is made with the spectrum analyzer's resolution bandwidth set to 100 kHz, and the video bandwidth set to greater than or equal to the resolution bandwidth.

**Configuration**: The spurious RF conducted emissions were measured with the EUT set to low, medium, and high transmit frequencies. The measurements were made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at its maximum data rate in a no hop mode. For each transmit frequency, the spectrum was scanned throughout the specified frequency.

Completed by:	
Rocky la	Peling

EMC EMIS	SIONS DATA SH	EET		Rev BETA			
EUT: Z-5450 MN: S-0181A Multimedia Speaker System			Work Order:	01/30/01			
Serial Number: Unknown				08/03/05			
Customer: Logitech, Inc.			Temperature:				
Attendees: None	Tested by:	Rod Peloquin	Humidity:				
Customer Ref. No.: None		120VAC/60Hz	Job Site:				
TEST SPECIFICATIONS							
Specification: 47 CFR 15.247(d) Year: 200	5-04 Method:	DA 00-705, ANSI C63.4	Year:	2003			
SAMPLE CALCULATIONS							
COMMENTS							
EUT OPERATING MODES							
Modulated by PRBS at maximum data rate							
DEVIATIONS FROM TEST STANDARD							
None							
REQUIREMENTS							
Maximum level of any spurious emission outside of the authorized band	is 20 dB down from the fundamental						
RESULTS							
Pass							
SIGNATURE							
Roching her Pielings							
DESCRIPTION OF TEST							
Antenna Conducted Sp	ourious Emissions - Low	Channel 0MH	lz-3GHz				

Antenna Conducted Spurious Emissions - Low Channel 0MHz-3GHz

								Tek
20.0	Ref Lv1*20.0dB	m		10dB/		Atten 10d	lB	
10.0								
				•				
0.0				· ·				
-10.0								
-20.Q				: : :				
-30.0								
-40.Q								
-50.0							Conception .	
-60.0	aperature and a second a second a	electer and the second and the second	have deres where	northern and and a second	ana ang ang ang ang ang ang ang ang ang	~	·····••>>>+++++++++++++++++++++++++++++	p-y
-70.0				•				
-80.0								
	OMHz	to	3.000GH	z		· · · · · · ·		
	ResBW 100kHz		VidBW	300kHz		SWP	1.75	
	LEVEL	SPAN	Ref L	vl*20.0dBm				
	KINOB 2	KNOB 1	KEYPA	D Te	ektronix	2784		

NORTHWEST								
EMC		EMISSIONS [	DATA SH	EET		Rev BETA 01/30/01		
EUT:	Z-5450 MN: S-0181A Multimedia S	peaker System			Work Order	LABT0140		
Serial Number:	Unknown				Date	08/03/05		
Customer:	Logitech, Inc.				Temperature	72°F		
Attendees:				Rod Peloquin	Humidity	45% RH		
Customer Ref. No.:	None		Power:	120VAC/60Hz	Job Site	EV06		
TEST SPECIFICATION	IS							
Specification:	47 CFR 15.247(d)	Year: 2005-04	Method:	DA 00-705, ANSI C63.4	Year	2003		
SAMPLE CALCULATION	ONS							
COMMENTS								
COMMENTO								
EUT OPERATING MOD	DES							
Modulated by PRBS a	t maximum data rate							
DEVIATIONS FROM T	EST STANDARD							
None								
REQUIREMENTS								
Maximum level of any	spurious emission outside of the	authorized band is 20 dB down fro	om the fundamental					
RESULTS								
Pass								
SIGNATURE								
Rochy Le Reling								
	Tested By:							
DESCRIPTION OF TES								
	Antenna Condu	cted Spurious Emis	ssions - Low	Channel 3GH	lz-6.5GHz			

# Antenna Conducted Spurious Emissions - Low Channel 3GHz-6.5GHz

									Tek
20.0	Ref Lv1*2	0.0dBm			10dB/		Atten 10	ldB	
_									
10.0									
0.0					· · ·				
-10.0									
-20.Q					· ·				
-30.Q									
-40.Q									
-50.Q									
		41	www	www.williams.	www.www.www.www.worker.	, market war had been see	enter and the second	www.wellow.com.com	- Hatter and the Arabit
-60.Q									
-70.0									
-80.0									
	2.990G	Hz	to	6.5	OOGHz				
	ResBW 100kHz		v:	VidBW 300kHz		SWP	2.05	_	
	LEVEL		SPAN	Re	≥f Lv1*20.0dBm				
	KNOB 2		KNOB 1	KI	EYPAD	Tektroni	ix 2784		

NORTHWEST							
EMISSIONS DATA SHEET							
EUT:	Z-5450 MN: S-0181A Multimedia S	peaker System		Work Order	LABT0140		
Serial Number:	Unknown			Date:	08/03/05		
Customer:	Logitech, Inc.			Temperature:	72°F		
Attendees:	None				45% RH		
Customer Ref. No.:	None	Job Site:	EV06				
TEST SPECIFICATION	IS						
Specification:	47 CFR 15.247(d)	Year: 2005-04	Method: DA 00-705, ANSI C	3.4 Year:	2003		
SAMPLE CALCULATI	ONS						
COMMENTS							
EUT OPERATING MO	DES						
Modulated by PRBS a	t maximum data rate						
<b>DEVIATIONS FROM T</b>	EST STANDARD						
None							
REQUIREMENTS							
Maximum level of any	spurious emission outside of the	authorized band is 20 dB down fro	om the fundamental				
RESULTS							
Pass							
SIGNATURE							
Korling Le Peeling							
100100 591	-						
DESCRIPTION OF TE	ST						
	Antenna Conduc	cted Spurious Emis	sions - Low Channel 6.	GHz-15GHz			

Antenna Conducted Spurious Emissions - Low Channel 6.5GHz-15GHz

										Tek
20.0	Ref Lvl <sup>;</sup>	20.0dBm			10	ldB/		Atten 100	1B	
10.0										
					:					
0.0					· ·					
-10.Q										
-20.Q										
-30.Q										
-40.Q					:					
-50.Q										
-60.0		and all for a far and the ser	nan an	for the state of the second	Mary Madridge and Mary and Mary	<sup>b</sup> ishkanghe Langerse	rifeteren antereteranteranter	verment the offered and the start of the sta	Adversed to be assessed	the physical and the store which
-70.0										
-80.0										
	6.499	9GHz	to	15.0	OOGHz					
	ResBW 100kHz		V:	VidBW 300kHz			SWP	4.85		
	LEVEL		SPAN	Re	⊇f Lv1*20.0	dBm				
	KINOB 2		KNOB 1	KI	EYPAD	Te	ktronix	2784		

NORTHWEST								
EMC	EMISSIONS DATA SHEET							
EUT:	Z-5450 MN: S-0181A Multimedia S	peaker System			Work Order:	LABT0140		
Serial Number:	Unknown				Date:	08/03/05		
Customer:	Logitech, Inc.				Temperature:	72°F		
Attendees:	lone Tested by: Rod Peloquin			Humidity:	45% RH			
Customer Ref. No.:	None		Power:	120VAC/60Hz	Job Site:	EV06		
TEST SPECIFICATION	IS							
Specification:	47 CFR 15.247(d)	Year: 2005-04	Method:	DA 00-705, ANSI C63.4	Year:	2003		
SAMPLE CALCULATIO	ONS							
COMMENTS								
EUT OPERATING MOD								
Modulated by PRBS a	t maximum data rate							
DEVIATIONS FROM T	EST STANDARD							
None								
REQUIREMENTS								
Maximum level of any	spurious emission outside of the	authorized band is 20 dB down fro	om the fundamental					
RESULTS								
Pass								
SIGNATURE								
Rocky te Pieleng								
DESCRIPTION OF TES	DESCRIPTION OF TEST							
	Antenna Conduc	ted Spurious Emis	sions - Low (	Channel 15GI	Hz - 25GHz			

Antenna Conducted Spurious Emissions - Low Channel 15GHz - 25GHz

										Tek
20.0	Ref Lv1*2	20.0dBm			1	.0dB/		Atten 100	цв	
_										
10.0										
0.0										
-10.0										
-20.Q										
-30.Q										
-40.Q										
-50.0						4	Mar March where	fer the big big big the provide a company	h-warder and which	Approximation
	anterio mander and a second	Newsmith	mappensertendance	witherstrates and the	and an or the second	<sup>, , ,</sup> , ,, ,, ,, ,, ,, ,, ,, ,, ,, ,, ,,	54.1			
-60.0										
-70.Q										
-80.0										
	14.99GH	Iz	to	25.	OOGHz					
	ResBW 100	)kHz		Va	idBW 300kH	z		SWP	5.7%	
	LEVEL		SPAN	Re	≥f Lv1*20.	OdBm				
	KNOB 2		KNOB 1	KI	EYPAD	Te	ktronix	2784		

NORTHWEST								
EMC		EMISSIONS I	DATA SHE	ET		Rev BETA 01/30/01		
EUT:	Z-5450 MN: S-0181A Multimedia S	peaker System			Work Order:	LABT0140		
Serial Number:	Unknown				Date:	08/03/05		
Customer:	Logitech, Inc.				Temperature:	72°F		
Attendees:	None				Humidity:	45% RH		
Customer Ref. No.:	: None Power: 120VAC/60Hz				Job Site:	EV06		
TEST SPECIFICATION	NS							
Specification:	47 CFR 15.247(d)	Year: 2005-04	Method: DA	00-705, ANSI C63.4	Year:	2003		
SAMPLE CALCULATI	ONS							
COMMENTS								
EUT OPERATING MO	DES							
Modulated by PRBS a	t maximum data rate							
<b>DEVIATIONS FROM T</b>	EST STANDARD							
None								
REQUIREMENTS								
Maximum level of any	spurious emission outside of the	authorized band is 20 dB down fro	om the fundamental					
RESULTS								
Pass								
SIGNATURE								
Porty to Reling								
DESCRIPTION OF TE								
		uctod Spurious Em	issions - Mid C	bannol OM				
	Antenna Cond	ucted Spurious Em			nz-30 <b>n</b> z			

Antenna Conducted Spurious Emissions - Mid Channel 0MHz-3GHz

					Tek
20.0	Ref Lv1*20.0dBr	n	10dB/	Atten	10dB
10.0					
0.0					
-10.0					
-20.Q					
-30.Q					
-40.Q					
-50.Q					
-60.0	halastalana marana ang kana sa mana kang kang kang kang kang kang kang k	www.www.www.and		with the kine own that a def	Miller alland and an an an and a second
-70.0					
-80.Q	OMHz	to	3.000GHz		
	ResBW 100kHz		VidBW 300kHz	ទរ	IP 1.75
	LEVEL	SPAN	Ref Lv1*20.0dBm		
	KNOB 2	KNOB 1	KEYPAD	Tektronix 2784	

EMISSIONS DATA SHEET						
EMC	EINI122101121	DATA SHEET		Rev BETA 01/30/01		
EUT: Z-5450 MN: S-0181A Multimedia S	peaker System		Work Order:	LABT0140		
Serial Number: Unknown			Date:	08/03/05		
Customer: Logitech, Inc.	Customer: Logitech, Inc.					
Attendees: None		Tested by: Rod Peloquin	Humidity:	45% RH		
Customer Ref. No.: None		Power: 120VAC/60Hz	Job Site:	EV06		
TEST SPECIFICATIONS				-		
Specification: 47 CFR 15.247(d)	Year: 2005-04	Method: DA 00-705, ANSI C63.4	Year:	2003		
SAMPLE CALCULATIONS						
COMMENTS						
EUT OPERATING MODES						
Modulated by PRBS at maximum data rate						
DEVIATIONS FROM TEST STANDARD						
None						
REQUIREMENTS Maximum level of any spurious emission outside of the a	authorized hand is 20 dB down fr	am the fundamental				
RESULTS	authorized band is 20 dB down in	om the fundamental				
Pass SIGNATURE						
1						
Porting ter Reling						
	2					
Tested By:						
DESCRIPTION OF TEST						
Antenna Condu	icted Spurious Emi	ssions - Mid Channel 3GH	1Z-6.5GHZ			

# Antenna Conducted Spurious Emissions - Mid Channel 3GHz-6.5GHz

					Tek
20.0	Ref Lv1*20.0	dBm	10dB/	Atten 10dB	
20.0					
10.0			· ·		
0.0					
40.0					
-10.0			:		
-20.Q					
-30.Q					
-40.Q					
-50.0					
-30.0	waylower, Wyang ward	wandersamburgingeran and the own	where the and the particular and the second and the second se	out was an an an an an an and a second	warman wards warman warder the stand
-60.Q					
-70.0					
-80.0					
	2.990GHz	to	6.500GHz		
	ResBW 100kHz		VidBW 300kHz	SWP 2	.05
	LEVEL	SPAN	Ref Lv1*20.0dBm		
	KINOB 2	KNOB 1	KEYPAD Te	ktronix 2784	

NORTHWEST												
EMC		EMISSIONS I	DATA SHEET		Rev BETA 01/30/01							
EUT:	Z-5450 MN: S-0181A Multimedia S	peaker System		Work Orde	r: LABT0140							
Serial Number:	Unknown			Date	: 08/03/05							
Customer:	Logitech, Inc.			Temperature	: 72°F							
Attendees:	None		Tested by: Rod Peloquin	Humidity	/: 45% RH							
Customer Ref. No.:	None		Power: 120VAC/60Hz	Job Site	: EV06							
TEST SPECIFICATION	NS											
Specification:	47 CFR 15.247(d)	Year: 2005-04	Method: DA 00-705, ANSI C	63.4 Yea	: 2003							
SAMPLE CALCULATI	ONS											
COMMENTS												
EUT OPERATING MO	DES											
Modulated by PRBS a	t maximum data rate											
<b>DEVIATIONS FROM T</b>	EST STANDARD											
None												
REQUIREMENTS												
Maximum level of any	spurious emission outside of the	authorized band is 20 dB down fr	om the fundamental									
RESULTS												
Pass												
SIGNATURE												
Rocky ter Pielings												
DESCRIPTION OF TE	DESCRIPTION OF TEST											
	Antenna Condu	cted Spurious Emis	ssions - Mid Channel 6.	bGHz-15GHz								

Antenna Conducted Spurious Emissions - Mid Channel 6.5GHz-15GHz

										Tek
20.0	Ref Lvl <sup>;</sup>	20.OdBm			10	dB/		Atten 100	1B	
_					-					
10.0										
0.0					•					
-10.0										
-20.Q					:					
-30.Q										
-40.Q										
-50.Q					-					
-60.0		welling algebrach	www.whent	Www.Alexandykart	Karrison dan Arter and a lart	°onoryny helfyrywr	here we have for the second	the alphanest and the second	following the	vylor-maninghanghanni
-70. <u>0</u>					· ·					
-80.Q					:					
	6.499	9GHz	to	15.0	OOGHz					
	ResBW 10	)0kHz		V:	idBW 300kHz			SWP	4.85	
	LEVEL		SPAN	Re	≘f Lv1*20.00	1Bm				
	KINOB 2		KNOB 1	KI	EYPAD	Te	ktronix	2784		

NORTHWEST											
EMC		EMISSIONS	DATA SHEET		Rev BETA 01/30/01						
EUT:	Z-5450 MN: S-0181A Multimedia S	Speaker System		Work Order:	LABT0140						
Serial Number:	Unknown			Date:	08/03/05						
Customer:	Logitech, Inc.			Temperature:	72°F						
Attendees:	None		Tested by: Rod Peloquin	Humidity:	45% RH						
Customer Ref. No.:	None		Power: 120VAC/60Hz	Job Site:	EV06						
TEST SPECIFICATION	NS										
Specification:	47 CFR 15.247(d)	Year: 2005-04	Method: DA 00-705, ANSI C63.4	Year:	2003						
SAMPLE CALCULATI	ONS										
COMMENTS											
EUT OPERATING MO	DES										
Modulated by PRBS a	t maximum data rate										
<b>DEVIATIONS FROM T</b>	EST STANDARD										
None											
REQUIREMENTS											
Maximum level of any	spurious emission outside of the	authorized band is 20 dB down f	rom the fundamental								
RESULTS											
Pass											
SIGNATURE											
Rochy te Reling											
Tested By:	Tested By:										
DESCRIPTION OF TE	DESCRIPTION OF TEST										
	Antenna Condu	cted Spurious Emi	issions - Mid Channel 15G	Hz-25GHz							

Antenna Conducted Spurious Emissions - Mid Channel 15GHz-25GHz

										Tek
20.0	Ref Lvl'	20.0dBm			10	ldB/		Atten 100	iB	
10.0										
0.0										
-10.0					:					
-20.Q										
-30.0										
-40.0					:					
-50.Q					4. 4.		hunderson	An and a second a second and a second	white an and	harden of the second
		with Manutanian	man and a state with the state of the state	weight a strate of the states	man and the for the states of the states	uler-magenhadent				
-60.0					:					
-70.0					•					
-80.Q					:					
	14.990	Hz	to	25.0	OOGHz					
	ResBW 10	)0kHz		Vi	idBW 300kHz			SWP	5.75	
	LEVEL		SPAN	Re	ef Lv1*20.0	dBm				
	KINOB 2		KNOB 1	KE	CYPAD	Te	ktronix	2784		

NORTHWEST												
EMC		EMISSIONS [	DATA SHEET		Rev BETA 01/30/01							
EUT:	Z-5450 MN: S-0181A Multimedia S	Speaker System		Work Order:	LABT0140							
Serial Number:	Unknown			Date:	08/03/05							
Customer:	Logitech, Inc.			Temperature:	72°F							
Attendees:	None		Tested by: Rod Peloquin	Humidity:	45% RH							
Customer Ref. No.:	None		Power: 120VAC/60Hz	Job Site:	EV06							
TEST SPECIFICATION	NS											
Specification:	47 CFR 15.247(d)	Year: 2005-04	Method: DA 00-705, ANSI C63.4	Year:	2003							
SAMPLE CALCULATI	ONS											
COMMENTS												
EUT OPERATING MO	DES											
Modulated by PRBS a	t maximum data rate											
<b>DEVIATIONS FROM T</b>	EST STANDARD											
None												
REQUIREMENTS												
Maximum level of any	spurious emission outside of the	authorized band is 20 dB down fro	om the fundamental									
RESULTS												
Pass												
SIGNATURE												
Porting to Reling												
Tested By:	Tested By:											
DESCRIPTION OF TE	DESCRIPTION OF TEST											
		ucted Spurious Emi	ssions - High Channel 0N	IHz-3GHz								

# Antenna Conducted Spurious Emissions - High Channel 0MHz-3GHz

										Tek
20.0	Ref Lv1*20	.OdBm			10dB	37		Atten 10	dB	
					-					
10.0					:					
0.0					:					
-10.0					-					
-20.0										
-30.0										
-40.0										
-50.0					· · · · · · · · · · · · · · · · · · ·					
-60.0	market war warden		where we apply a fear the second second	and the stranged of the	noffensisharasinarisharasinalansis	welenhow	wm.tannohnalus	markand	and a contract of the	www.weensteinet
-00.0										
-70.0										
-80.Q										
	OMHz		to	3.0	OOGHz					
	ResBW 100k	Hz		v:	idBW 300kHz			SWP	1.75	
	LEVEL		SPAN	Re	ef Lv1*20.0dB	im				
	KINOB 2		KNOB 1	KI	EYPAD	Tel	ktronix	2784		

		EMISSIONS	DATA SH	EET		Rev BETA						
EMC						01/30/01						
EUT:	Z-5450 MN: S-0181A Multimedia S	Speaker System			Work Order	LABT0140						
Serial Number:	Unknown				Date:	08/03/05						
Customer:	Logitech, Inc.				Temperature:	72°F						
Attendees:	None		Tested by:	Rod Peloquin	Humidity	45% RH						
Customer Ref. No.:	None		Power:	120VAC/60Hz	Job Site:	EV06						
TEST SPECIFICATIONS												
Specification:	47 CFR 15.247(d)	Year: 2005-04	Method:	DA 00-705, ANSI C63.4	Year:	2003						
SAMPLE CALCULATI	ONS											
COMMENTS												
EUT OPERATING MO	DES											
Modulated by PRBS a	t maximum data rate											
DEVIATIONS FROM T	EST STANDARD											
None												
REQUIREMENTS												
Maximum level of any	spurious emission outside of the	authorized band is 20 dB dow	n from the fundamental									
RESULTS	-											
Pass												
SIGNATURE												
Pooling her Reling												
Tested By:	Tested By:											
DESCRIPTION OF TES	DESCRIPTION OF TEST											
	Antenna Condu	cted Spurious Er	nissions - High	Channel 3GI	Hz-6.5GHz							

# Antenna Conducted Spurious Emissions - High Channel 3GHz-6.5GHz

							Tek
20.0	Ref Lv1*20.0	DdBm	10dB/		Atten 100	цВ	
10.0							
			· · · · · · · · · · · · · · · · · · ·				
0.0			· · · · · · · · · · · · · · · · · · ·				
-10.0			:				
-20.0							
-30.Q							
-40.0							
-50.0			allionallyprovedingston orthogol and a standard		a a dawashi waxa a	Noter Martin was the	-
-60.0		ngfpradoranter forwarder and a particular and a solutions	alle and a second se	and a constraint of the state o			
-70.0							
-80.0							
	2.990GHz	to	6.500GHz				
	ResBW 100kH:	z	VidBW 300kHz		SWP	2.05	
	LEVEL	SPAN	Ref Lv1*20.0dBm				
	KNOB 2	KNOB 1	KEYPAD	Tektronix	2784		

NORTHWEST												
EMC		EMISSIONS I	DATA SH	EET		Rev BETA 01/30/01						
EUT:	Z-5450 MN: S-0181A Multimedia S	peaker System			Work Order:	: LABT0140						
Serial Number:	Unknown				Date:	: 08/03/05						
Customer:	Logitech, Inc.				Temperature:	72°F						
Attendees:	None		Tested by:	Rod Peloquin	Humidity:	: 45% RH						
Customer Ref. No.: None Power: 120VAC/60Hz Job Site: EV06												
TEST SPECIFICATIONS												
Specification:	47 CFR 15.247(d)	Year: 2005-04	Method:	DA 00-705, ANSI C63.4	4 Year:	: 2003						
SAMPLE CALCULATIONS												
COMMENTS												
COMMENTS												
EUT OPERATING MOI	DES											
Modulated by PRBS a	it maximum data rate											
DEVIATIONS FROM T	EST STANDARD											
None												
REQUIREMENTS												
Maximum level of any	y spurious emission outside of the	authorized band is 20 dB down fr	om the fundamental									
RESULTS												
Pass												
SIGNATURE												
Tested By:												
DESCRIPTION OF TES	ST											
	Antenna Conduc	cted Spurious Emis	sions - High	Channel 6.50	Hz-15GHz							

Antenna Conducted Spurious Emissions - High Channel 6.5GHz-15GHz

										Tek
20.0	Ref Lvl*2	20.0dBm			100	IB/		Atten 100	iB	
_					-					
10.0										
0.0										
-10.0					•					
-20.Q										
-30.Q					· · · · · ·					
-40.Q					:					
-50.0										
-60.0	where the second subsection with	her water of the second	Hub Marker M	New York Contraction of the Cont	marchedorasted you have the	weberschartenseben	hallend and an indiana	and the second second in	the share and a start and a start and a start and a start a st	were and the second part of
-70.0					· · ·					
-80.Q										
	6.4990	GHz	to	15.0	OOGHz					
	ResBW 100	)kHz		V:	idBW 300kHz			SWP	4.85	
	LEVEL		SPAN	Re	≥f Lv1*20.0d	lBm				
	KINOB 2		KNOB 1	KI	EYPAD	Te	ktronix	2784		

NORTHWEST					_						
EMC		EMISSIONS I	DATA SHEET			Rev BETA 01/30/01					
EUT:	Z-5450 MN: S-0181A Multimedia S	peaker System		v	Vork Order:	LABT0140					
Serial Number:	Unknown				Date:	08/03/05					
Customer:	Logitech, Inc.			Те	mperature:	72°F					
Attendees:	None		Tested by: Rod Peloquin		Humidity:	45% RH					
Customer Ref. No.:	None		Power: 120VAC/60Hz		Job Site:	EV06					
TEST SPECIFICATION	IS										
Specification:	47 CFR 15.247(d)	Year: 2005-04	Method: DA 00-705, ANS	C63.4	Year:	2003					
SAMPLE CALCULATI	ONS										
COMMENTS											
EUT OPERATING MO	DES										
Modulated by PRBS a	t maximum data rate										
<b>DEVIATIONS FROM T</b>	EST STANDARD										
None											
REQUIREMENTS											
Maximum level of any	spurious emission outside of the	authorized band is 20 dB down fro	om the fundamental								
RESULTS											
Pass											
SIGNATURE											
Portug la Relings Tested By:											
·······											
DESCRIPTION OF TEST											
	Antenna Conduc	cted Spurious Emis	sions - High Channel	15GHz-25	GHz						

Antenna Conducted Spurious Emissions - High Channel 15GHz-25GHz

										Tek
20.0	Ref Lvl*	20.0dBm			1	DdB/		Atten 100	1B	
_					:					
10.0					:					
0.0					•					
-10.0					:					
-20.Q					:					
-30.Q					· · · · ·					
-40.Q										
-50.0					: : :		j-#144.4.4.4.4.4	u.M.M. www.www.www.	entropy and the second	in the weather the the
	and the second	and the second	and the second and the second s	ethologicalitics	Annal March and	<b>°</b> ∿∿y¥≈h√∿≪shikiv≫?				
-60.0					:					
-70.0										
-80.Q					:					
	14.990	Hz	to	25.	OOGHz					
	ResBW 10	OkHz		Vi	idBW 300kH:	2		SWP	5.7%	
	LEVEL		SPAN	Re	≥f Lv1*20.(	)dBm				
	KNOB 2		KNOB 1	KI	EYPAD	Te	ktronix	2784		





The individuals and/or the organization requesting the test provided the modes, configurations and settings available to evaluate. All of the EUT parameters listed below were investigated. This includes, but may not be limited to, CPU speeds, video resolution settings, operational modes, and input voltages.

Operating Modes Investigated:
Playing audio from DVD player
Operating Mode used for Final Test:
Playing audio from DVD player

Power Input Settings Investigated:
120 VAC, 60 Hz on US unit, M/N: S-0118A
230 VAC, 50 Hz on EU unit, M/N: S-0118A
230 VAC, 50 Hz on wired EU unit, M/N: S-0118B
Input Power Setting used for Final Test:
120 VAC, 60 Hz on US unit, M/N: S-0118A

Units Investigated:
S-0118A
S-0118B
Unit used for Final Test:
S-0118A

Frequency Range Inves	tigated		
Start Frequency	30 MHz	Stop Frequency	1 GHz

Software\Firmware Applied During Test									
Operating system	N/A	Version	N/A						
Exercise software	Standard Production Firmware	Version	Z6DW a0.3.3.1.2.6						
Description									
The system was tested	d using standard operating production software	to exercise the	e functions of the						
device during the testi	ng.								

EUT and Peripherals in	<b>Test Setup Boundary</b>	/	
Description	Manufacturer	Model/Part Number	Serial Number
Left front speaker	Logitech, Inc.	S-0181A	Unknown
Right front speaker	Logitech, Inc.	S-0181A	Unknown
Center front speaker	Logitech, Inc.	S-0181A	Unknown
Right rear speaker	Logitech, Inc.	S-0181A	Unknown
Left rear speaker	Logitech, Inc.	S-0181A	Unknown
Subwoofer	Logitech, Inc.	S-0181A	Unknown
Control Pod	Logitech, Inc.	S-0181A	Unknown
DVD Player	Pioneer	DV-578A-S	DDTE 003395 CC

Cables								
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2			
Audio	No	1.5	No	Subwoofer	Right front speaker			
Audio	No	1.4	No	Subwoofer Center front spea				
Audio	No	1.8	No	No Subwoofer Left front speaker				
AC Power	No	1.4	No	Subwoofer	AC Mains			
AC Power	No	1.4	No	Left rear speaker AC Mains				
AC Power	No	1.4	No	lo Right rear speaker AC Mains				
Control	Yes	1.2	PA	PA Control Pod Subwoofer				
Audio (x3)	No	1.4	No	Control Pod	DVD Player			
Fiber optic	No	1.2	No	Control Pod	DVD Player			
Coax	Yes	1.2	No	Control Pod	DVD Player			
AC Power	No	1.4	No	DVD Player	AC Mains			
PA = Ca	ble is permane	ently attached to the	e device. Shi	ielding and/or presence of f	errite may be unknown.			

Measurement Equipment					
Description	Manufacturer	Model	Identifier	Last Cal	Interval
Quasi-Peak Adapter	Hewlett-Packard	85650A	AQF	12/02/2004	13 mo
Spectrum Analyzer	Hewlett-Packard	8566B	AAL	12/02/2004	13 mo
Spectrum Analyzer Display	Hewlett Packard	85662A	AALD	12/02/2004	13 mo
Antenna, Biconilog	EMCO	3141	AXE	12/03/2003	24 mo
Pre-Amplifier	Amplifier Research	LN1000A	APS	03/01/2005	13 mo

The final radiated emissions test was performed using the parameters described above as worst case. That final test was conducted at a facility that meets the ANSI C63.4 NSA requirements. The frequency range noted in the data sheets was scanned/tested at that facility. Emissions were maximized as specified, by maximizing table azimuth, antenna height, and cable manipulation.

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.

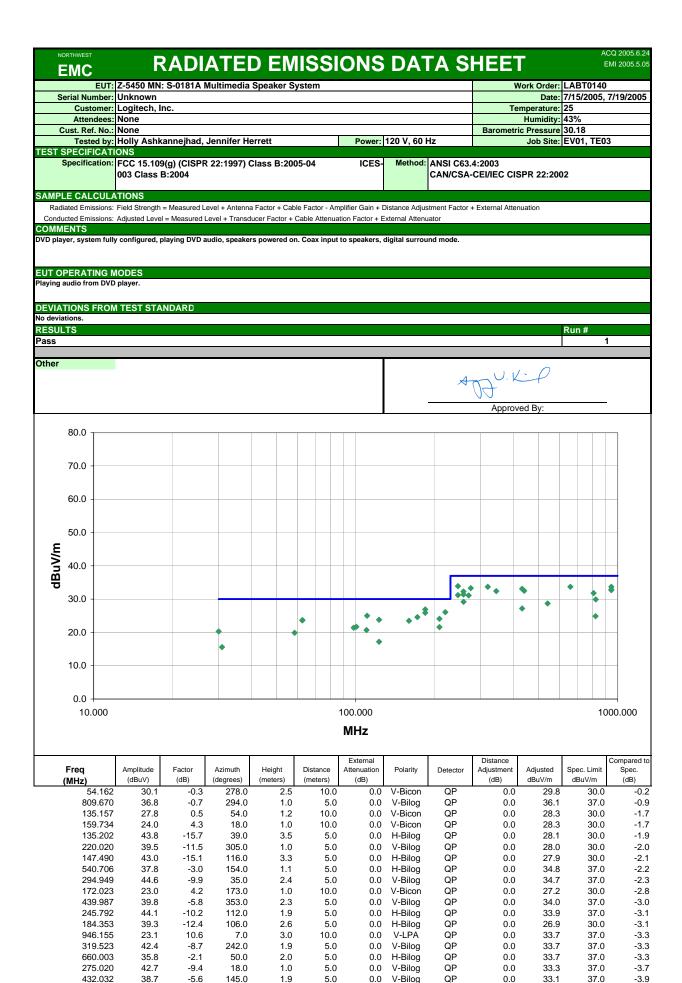
Note: The specified distance is the horizontal separation between the closest periphery of the EUT and the center of the axis of the elements of the receiving antenna. However, if the receiving antenna is a log-periodic array, the specified distance shall be the distance between the closest periphery of the EUT and the front-to-back center of the array of elements.

Tests were made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement 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 1 meter, 3 meters, 5 meters, 10 meters, or 30 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.



Measurement Bandwidths	5					
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.						

Completed by: U.K.P



V-LPA

V-Bilog

0.0

0.0

QP

QP

26.1

25.9

0.0

0.0

-3.9

-4.1

30.0

30.0

219,988

184.347

-7.1

-12.4

24.0

89.0

1.2

1.0

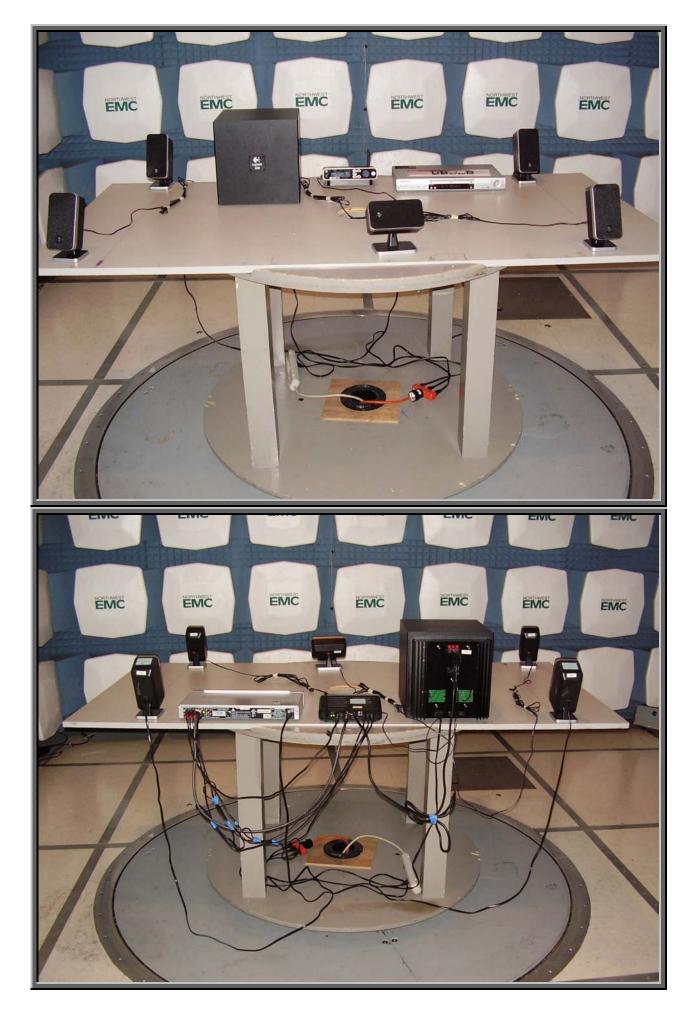
10.0

5.0

33.2

38.3

_			_				External		_	Distance			Compared to
Freq		Amplitude	Factor	Azimuth	Height	Distance	Attenuation	Polarity	Detector	Adjustment	Adjusted	Spec. Limit	Spec.
(MHz)		(dBuV)	(dB)	(degrees)	(meters)	(meters)	(dB)			(dB)	dBuV/m	dBuV/m	(dB)
	.152	22.3	10.6	268.0	3.8	10.0		H-LPA	QP	0.0	32.9	37.0	
946.		32.8	-0.1	190.0	1.2	5.0	0.0	H-Bilog	QP	0.0	32.7	37.0	
	.002	38.3	-5.8	134.0	1.1	5.0	0.0	H-Bilog	QP	0.0	32.5	37.0	
	.097	39.6	-7.2	81.0	2.3	5.0	0.0	V-Bilog	QP	0.0	32.4	37.0	
	.032	37.6	-5.3	127.0	4.0	10.0	0.0	H-LPA	QP	0.0	32.3	37.0	
	.585	22.8	2.2	215.0	1.1	10.0	0.0	V-Bicon	QP	0.0	25.0	30.0	-5.0
809.		32.5	-0.7	274.0	1.5	5.0	0.0	H-Bilog	QP	0.0	31.8	37.0	
	.063	37.8	-13.2	106.0	2.6	5.0	0.0	H-Bilog	QP	0.0	24.6	30.0	
	.034	36.7	-5.3	10.0	1.0	10.0	0.0	V-LPA	QP	0.0	31.4	37.0	
	.792	41.4	-10.2	168.0	1.2	5.0	0.0	V-Bilog	QP	0.0	31.2	37.0	
	.033	40.7	-9.6	338.0	1.0	5.0	0.0	V-Bilog	QP	0.0	31.1	37.0	
	.929	36.2	-12.1	26.0	3.3	5.0	0.0	H-Bilog	QP	0.0	24.1	30.0	
	.882	22.6	1.2	106.0	1.5	10.0	0.0	V-Bicon	QP	0.0	23.8	30.0	-6.2
	.673	39.5	-15.8	249.0	3.9	5.0	0.0	H-Bilog	QP	0.0	23.7	30.0	
	.549	39.4	-15.8	250.0	3.4	5.0	0.0	H-Bilog	QP	0.0	23.6	30.0	
	.777	37.1	-13.6	74.0	2.2	5.0	0.0	H-Bilog	QP	0.0	23.5	30.0	
	.362	31.3	-1.4	79.0	1.5	5.0	0.0	H-Bilog	QP	0.0	29.9	37.0	
258.		39.0	-9.8	348.0	1.1	5.0	0.0	V-Bilog	QP	0.0	29.2	37.0	
	.634	36.4	-14.7	149.0	1.1	5.0	0.0	V-Bilog	QP	0.0	21.7	30.0	
	.704	31.7	-3.0	144.0	2.0	5.0	0.0	V-Bilog	QP	0.0	28.7	37.0	-8.3
208.		33.7	-12.1	176.0	1.2	5.0	0.0	V-Bilog	QP	0.0	21.6	30.0	
	.333	36.2	-14.8	279.0	3.8	5.0	0.0	H-Bilog	QP	0.0	21.4	30.0	
110.	.036	35.6	-14.9	209.0	2.6	5.0	0.0	H-Bilog	QP	0.0	20.7	30.0	-9.3
	.000	26.5	-6.2	260.0	1.0	5.0	0.0	V-Bilog	QP	0.0	20.3	30.0	-9.7
432.	.032	32.8	-5.6	131.0	1.4	5.0	0.0	H-Bilog	QP	0.0	27.2	37.0	-9.8
58.	.474	35.3	-15.4	233.0	4.0	5.0	0.0	H-Bilog	QP	0.0	19.9	30.0	-10.1
823.	.329	26.2	-1.3	100.0	1.0	5.0	0.0	V-Bilog	QP	0.0	24.9	37.0	-12.1
122.	.915	33.0	-15.8	306.0	2.6	5.0	0.0	H-Bilog	QP	0.0	17.2	30.0	-12.8
30.	.903	22.3	-6.7	266.0	1.5	5.0	0.0	H-Bilog	QP	0.0	15.6	30.0	-14.4





The individuals and/or the organization requesting the test provided the modes, configurations and settings available to evaluate. While scanning the radiated emissions, all of the EUT parameters listed below were investigated. This includes, but may not be limited to, antennas, tuned transmit frequency ranges, operating modes, and data rates.

Channels in Specified Band Investigated:
High
Mid
Low

**Operating Modes Investigated:** Typical

Data Rates Investigated: Maximum

# Power Input Settings Investigated:

120 VAC, 60 Hz.

Other Settings Investigated:
Control pod transmitting only - Rear speakers unplugged
Rear speaker transmitting only – Control pod not transmitting.

Frequency Range Invest	igated		
Start Frequency	30 MHz	Stop Frequency	26 GHz

Software/Firmware Applied During Test									
Exercise software	Standard Production Software	Version	Z6DW a0.3.3.1.2.6						
Description									
The system was tested using special test codes on a remote laptop to exercise the functions of the device during the testing.									

EUT and Peripherals										
Description	Manufacturer	Model/Part Number	Serial Number							
Left front speaker	Logitech, Inc.	S-0181A	Unknown							
Right front speaker	Logitech, Inc.	S-0181A	Unknown							
Center front speaker	Logitech, Inc.	S-0181A	Unknown							
Right rear speaker	Logitech, Inc.	S-0181A	Unknown							
Left rear speaker	Logitech, Inc.	S-0181A	Unknown							
Subwoofer	Logitech, Inc.	S-0181A	Unknown							
Control Pod	Logitech, Inc.	S-0181A	Unknown							
DVD Player	Pioneer	DV-578A-S	DDTE 003395 CC							

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
Audio	No	1.5	No	Subwoofer	Right front speaker
Audio	No	1.4	No	Subwoofer	Center front speaker
Audio	No	1.8	No	Subwoofer	Left front speaker
AC Power	No	1.4	No	Subwoofer	AC Mains
Control	Yes	1.2	PA	Control Pod	Subwoofer
Audio (x3)	No	1.4	No	Control Pod	DVD Player
Fiber optic	No	1.2	No	Control Pod	DVD Player
Coax	Yes	1.2	No	Control Pod	DVD Player
AC Power	No	1.4	No	DVD Player	AC Mains
AC Power	No	1.4	No	Left rear speaker	Unterminated, while testing control pod. AC Mains, while testing rear speaker.
AC Power	No	1.4	No	Right rear speaker	Unterminated
PA = Cable is p	permanent	ly attached to t	he device.	Shielding and/or prese	ence of ferrite may be unknown.

Measurement Equipment					
Description	Manufacturer	Model	Identifier	Last Cal	Interval
Antenna, Horn	EMCO	3160-08	AHK	NCR	NA
Pre-Amplifier	Miteq	AMF-4D- 005180-24-10P	APC	02/17/2005	13 mo
Spectrum Analyzer	Tektronix	2784	AAO	01/02/2005	12 mo
Antenna, Horn	EMCO	3115	AHC	09/07/2004	12 mo
Pre-Amplifier	Miteq	AMF-4D- 005180-24-10P	APJ	05/05/2005	3 mo
Pre-Amplifier	Amplifier Research	LN1000A	APS	03/01/2005	13 mo
Antenna, Biconilog	EMCO	3141	AXE	12/03/2003	24 mo
Spectrum Analyzer	Hewlett-Packard	8566B	AAL	12/02/2004	13 mo
Quasi-Peak Adapter	Hewlett-Packard	85650A	AQF	12/02/2004	13 mo
Spectrum Analyzer Display	Hewlett Packard	85662A	AALD	12/02/2004	13 mo
Attenuator	Coaxicom	66702 5910-20	RBJ	02/25/2005	13 mo
High Pass Filter	Micro-Tronics	HPM50111	HFO	03/09/2005	13 mo
Antenna, Horn	EMCO	3160-09	AHG	NCR	NA
Pre-Amplifier	Miteq	JSD4-18002600- 26-8P	APU	02/15/2005	13 mo
Pre-Amplifier	Miteq	AM-1616-1000	AOL	05/03/2005	13 mo
Spectrum Analyzer	Agilent	E4446A	AAQ	04/08/2005	13 mo
Pre-Amplifier	Miteq	AMF-4D- 010100-24-10P	APW	ERR	15 mo



**<u>Requirement</u>**: The field strength of any spurious emissions or modulation products that fall in a restricted band, as defined in 47 CFR 15.205, is measured. The peak level must comply with the limits specified in 47 CFR 15.35(b). The average level (taken with a 10Hz VBW) must comply with the limits specified in 15.209.

<u>Configuration</u>: The highest gain of each type of antenna to be used with the EUT was tested. The EUT was configured for low, mid, and high band transmit frequencies. For each configuration, the spectrum was scanned throughout the specified range. In addition, measurements were made in the restricted bands to verify compliance. While scanning, emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and the EUT antenna in three orthogonal axis, and adjusting measurement antenna height and polarization, and manipulating the EUT antenna in 3 orthogonal planes (per ANSI C63.4:2003). A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

Bandwidths Used for Meas	surements		
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 ma	de using the bandwidth	s and detectors specified. No	video filter was used.

Completed by: Holy Arling

	THWEST MC		RA	DIAT	ED E	MISSI	ONS	DATA	SHE	ET			PSA 2005.7.20 EMI 2005.8.3
			: S-0181A	Multimedia	a Speaker S	ystem				V		LABT0140	0
Ser	ial Number:	Unknown Logitech, I	<b>no</b>									08/04/05	
	Attendees:		nç.							le	mperature: Humidity:		
	Project:	None								Barometr	ic Pressure	29.94	
		Holly Ash	annejhad				Power:	120VAC, 6			Job Site:	EV01	
			tod Emile -	00005	04			Test Metho ANSI C63.					
	247(d) Spur		ieu Emissi	uns:2003-	U4			ANOI U03.	4.2003				
	ARAMETER Height(s)		1 - 4				Test Dista	nce (m)	3				
COMME		,	, - <del>-</del> -										
	ERATING N		neaker										
	ng high chanr												
No deviation			MDAND										
Run #		1	0			57		in	7				
Configu	ration #					11. 1.	Ale	mi					
Results		Pa	SS		Signature	How	/	/					
8	80.0												
-	70.0												
e	60.0	•											*
	50.0												
dBuV/m	40.0												
_	30.0	*											
2	20.0												
	10.0												
	0.0												
	1600.000	1700.0	000 180	00.000	1900.000	2000.0	00 2100 MHz	0.000 2	200.000	2300.000	) 2400	.000 25	500.000
	req MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Duty Cycle Correction Factor	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)
248	33.500	41.5	0.5	145.0	1.1	0.0	20.0	V-Horn	PK	0.0	62.0	74.0	-12.0
	33.500	40.5	0.5	223.0	1.1	0.0	20.0	V-Horn	PK	0.0	61.0	74.0	-13.0
	52.451 52.415	41.6 41.4	-2.6 -2.6	218.0 343.0	1.1 1.3	0.0 0.0	20.0 20.0	V-Horn H-Horn	PK PK	0.0 0.0	59.0 58.8	74.0 74.0	-15.0 -15.2
	52.793	34.8	-2.6	343.0 343.0	1.3	24.6	20.0	H-Horn	AV	0.0	27.6	54.0	-15.2
165	52.858	33.5	-2.6	218.0	1.1	24.6	20.0	V-Horn	AV	0.0	26.3	54.0	-27.7
	33.500	28.5	0.5	223.0	1.1	24.6	20.0	V-Horn	AV	0.0	24.4	54.0	-29.6
248	33.500	28.3	0.5	145.0	1.1	24.6	20.0	V-Horn	AV	0.0	24.2	54.0	-29.8

	THWEST MC		R	ADIAT	ED E	MISS	SIONS	DATA	SHE	ET		Ρ	SA 2005.7.20 EMI 2005.8.3
	EUT:		: S-0181/	Multimedia	Speaker S	System				١		LABT0140	
Ser		Unknown								T		08/04/05	
	Attendees:	Logitech, I None	nc.							10	emperature: Humidity:		
	Project:	None								Baromete	ric Pressure	29.94	
TEST SP	Tested by: PECIFICAT	Holly Ashk	annejhao	ł			Power:	120VAC, 6 Test Metho			Job Site:	EV01	
			ted Emis	sions:2005-0	4			ANSI C63.4					
TESTDA	ARAMETER	26											
	Height(s)		1 - 4				Test Dista	ince (m)	3	}			
СОММЕ		、 <i>,</i>						. ,		-			
	ERATING N												
	ONS FROM	el from rear sp N TEST STA											
Run #		1	1					×	2				
Configu	ration #			1		11	le Al	inti					
Results		Pa	SS	1	Signature	Ho	ly Al	/					
8	80.0												
7	70.0												
6	60.0												
Ę	50.0											4	
dBuV/m	40.0	*											
	30.0												
	20.0												
													•
	10.0	•											
	0.0												ļ
	4000.000	5000	.000	6000.000	7000.	000	8000.000	9000.00	00 100	000.000	11000.00	0 1200	0.000
							MHz						
	req /Hz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Duty Cyc Correctio Factor	Attenuation	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)
400	06.401	48.8	5.7	70.0	1.0	0.0	0.0	H-Horn	PK	0.0	54.5	74.0	-19.5
	12.700 11.810	36.0 35.3	16.0 16.0	162.0 144.0	1.3 1.0	0.0 0.0	0.0 0.0	H-Horn V-Horn	PK PK	0.0 0.0	52.0 51.3	74.0 74.0	-22.0 -22.7
	)4.558	45.1	5.7	90.0	1.3	0.0	0.0	V-Horn	PK	0.0	50.8	74.0	-23.2
480	6.849	38.1	6.4	49.0	1.3	0.0	0.0	H-Horn	PK	0.0	44.5	74.0	-29.5

12011.010	55.5	10.0	144.0	1.0	0.0	0.0	v-110111		0.0	51.5	74.0	-22.1
4004.558	45.1	5.7	90.0	1.3	0.0	0.0	V-Horn	PK	0.0	50.8	74.0	-23.2
4806.849	38.1	6.4	49.0	1.3	0.0	0.0	H-Horn	PK	0.0	44.5	74.0	-29.5
4004.708	42.0	5.7	70.0	1.0	24.6	0.0	H-Horn	AV	0.0	23.1	54.0	-30.9
4807.476	36.1	6.4	87.0	1.0	0.0	0.0	V-Horn	PK	0.0	42.5	74.0	-31.5
4004.680	38.4	5.7	90.0	1.3	24.6	0.0	V-Horn	AV	0.0	19.5	54.0	-34.5
12015.070	22.0	16.0	162.0	1.3	24.6	0.0	H-Horn	AV	0.0	13.4	54.0	-40.6
12011.880	21.9	16.0	144.0	1.0	24.6	0.0	V-Horn	AV	0.0	13.3	54.0	-40.7
4805.850	25.2	6.4	49.0	1.3	24.6	0.0	H-Horn	AV	0.0	7.0	54.0	-47.0
4807.527	24.5	6.4	87.0	1.0	24.6	0.0	V-Horn	AV	0.0	6.3	54.0	-47.7

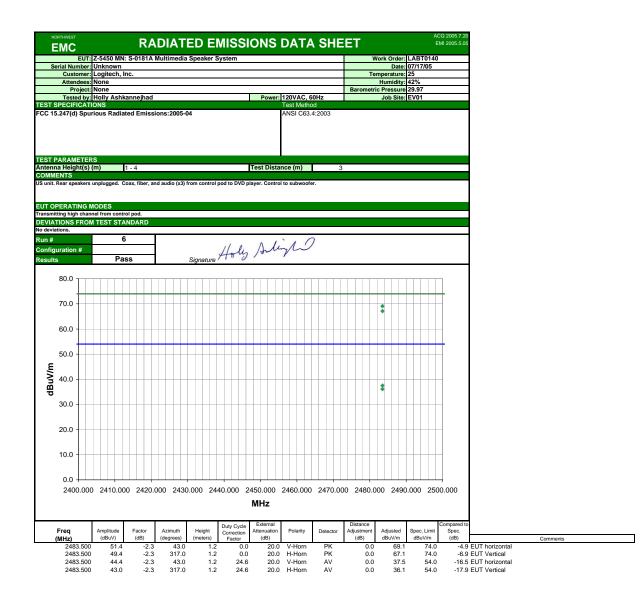
NORTHWEST EMC		RA		ED E	MISS	IONS	DATA	SHE	ET		F	PSA 2005.7.20 EMI 2005.8.3
	Z-5450 MN:	S-0191A	Multimodia	Speaker	Svetom					Vork Order:		
Serial Number:		3-0101A	wuitimeula	эреакег	System						08/04/05	
	Logitech, In	c.							Te	mperature:		
Attendees:										Humidity:		
Project:									Barometr	ic Pressure		
	Holly Ashka	nnejhad				Power:	120VAC, 6			Job Site:	EV01	
TEST SPECIFICATIO							Test Metho					
FCC 15.247(d) Spuri		ed Emissi	ons:2005-(	)4			ANSI C63.4	1:2003				
Antenna Height(s) (i		- 4				Test Dista	nce (m)	3				
COMMENTS		- 4				Test Dista	nce (m)	3				
EUT OPERATING M Transmitting low channe DEVIATIONS FROM No deviations.	I from rear spe TEST STAN	IDARD										
Run #	12				1 .	, Ale	10	)				
Configuration #					Ille	Au	m					
Results	Pas	S		Sianature	400	/ / ·	/					
				- 5								
80.0												
70.0												
70.0												
60.0												
50.0												
#/Angp 40.0												
30.0												
20.0												
10.0												
0.0												
							1005	10-1				
1600.000	1610.000	1620.	000 163	0.000 16	640.000	1650.000	1660.000	1670.00	00 1680.	JUU 169	0.000 17	00.000
						MHz						
r					1		,		Dist			0
Freq	Amplitude	Factor	Azimuth	Height	Duty Cycle	External Attenuation	Polarity	Detector	Distance Adjustment	Adjusted	Spec. Limit	Compared to Spec.
(MHz)	(dBuV)	(dB)	(degrees)	(meters)	Correction Factor	(dB)	roiding	Delector	(dB)	dBuV/m	dBuV/m	(dB)
1602.119	45.8	-2.8	159.0	1.2	0.0	20.0	V-Horn	PK	0.0	63.0	74.0	-11.0
1601.857	43.2	-2.8	181.0	2.0	0.0	20.0	H-Horn	PK	0.0	60.4	74.0	-13.6
1602.263	42.1	-2.8	159.0	1.2	24.6	20.0	V-Horn	AV	0.0	34.7	54.0	-19.3
1602.187	38.8	-2.8	181.0	2.0	24.6	20.0	H-Horn	AV	0.0	31.4	54.0	-22.6

NORTHWEST EMC		R/	ADIAT	ED E	MISSI	ONS	DATA	SHE	ET		F	PSA 2005.7.20 EMI 2005.8.3
EUT	: Z-5450 N	N: S-0181A	Multimedia	a Speaker S	ystem				V	Vork Order:	LABT0140	)
Serial Number											08/04/05	
	: Logitech	, Inc.							Те	mperature:		
Attendees									Day	Humidity:		
	None	hkannejhad				Douro	120VAC, 6	047	Barometr	ic Pressure		
TEST SPECIFICA		пкаппејпай				Power:	Test Metho			Job Site:		
FCC 15.247(d) Sp		iated Emiss	ions:2005-	04			ANSI C63.					
TEST PARAMETE Antenna Height(s)		1 - 4				Test Dista	nce (m)	3	6			
COMMENTS	MODES											
Transmitting high cha		r speaker.										
DEVIATIONS FRO												
No deviations.	M TEOLO	ANDARD										
Run #		13	I					2				
			-		1/ 0	A L	-1-1	/				
Configuration #	-		-	0	Holy	Jon	in					
Results	F	ass	]	Signature								
80.0												
70.0												
60.0												
50.0	•											_
40.0	•											
30.0												_
20.0	•											_
10.0	•										*	
0.0												
4100.00	0 4200	.000 43	00.000	4400.000	4500.0	00 460 MHz	0.000 4	700.000	4800.000	0 4900	.000 50	00.000
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Duty Cycle Correction Factor	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)
4132.814	45.7	5.7	42.0	1.0	0.0	0.0	H-Horn	PK	0.0	51.4	74.0	-22.6
4959.439	41.1	6.8	42.0	1.0	0.0	0.0	H-Horn	PK	0.0	47.9	74.0	-26.1
4959.201	40.5	6.8	327.0	1.1	0.0	0.0	V-Horn	PK	0.0	47.3	74.0	-26.7
4132.891	39.8	5.7	120.0	1.3	0.0	0.0	V-Horn	PK	0.0	45.5	74.0	-28.5
4132.677	38.3	5.7	42.0	1.0	24.6	0.0	H-Horn	AV	0.0	19.4	54.0	-34.6
4959.223 4959.219	31.7 31.0	6.8	42.0 327.0	1.0 1.1	24.6 24.6	0.0 0.0	H-Horn V-Horn	AV AV	0.0	13.9	54.0	-40.1 -40.8
4959.219 4132.781	31.0 30.5	6.8 5.7	327.0 120.0	1.1	24.6 24.6	0.0	V-Horn V-Horn	AV	0.0 0.0	13.2 11.6	54.0 54.0	-40.8 -42.4
-		-		-	-	-	-		-	-	-	

NORTHWEST EMC		RA	ADIAT	ED E	MISSI	ONS	DATA	SHE	ET			SA 2005.7.20 EMI 2005.8.3
	Z-5450 MN	: S-0181A	Multimedia	Speaker S	System				١		LABT0140	
Serial Number:									_		08/07/05	
Customer: Attendees:	Logitech, I	nC.							Те	emperature: Humidity:		
Project:									Barometr	ric Pressure		
Tested by:	Greg Kiem	el				Power:	120 VAC, 0			Job Site:		
TEST SPECIFICAT							Test Metho					
FCC 15.247(d) Spu TEST PARAMETER		ted Emiss	ions:2005-(	)4			ANSI C63.	4:2003				
Antenna Height(s)		1 - 4				Test Dista	nce (m)	3				
COMMENTS	MODES											
Transmitting mid channers DEVIATIONS FROM	nel from rear s											
No deviations.												
Run #	1	4				11/2	0					
Configuration #			]		Am	J. Kit						
Results	Pa	ss		Signature	VJ							
80.0												1
												+
70.0												_
60.0												_
50.0	•				•							_
• ء ا												
40.0												_
30.0												_
20.0	•											
20.0					*							
10.0												_
0.0												
3000.000	4000.0	00 5000	).000 60	00.000	7000.000	8000.00	0 9000.	000 1000	00.000 11	000.000	12000.000	
						MHz						
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Duty Cycle Correction Factor	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)
7325.520	(dDuV) 40.6	13.5	28.0	1.6	0.0	0.0	H-Horn	PK	0.0	54.1	74.0	-19.9
4069.490	47.9	5.8	14.0	1.3	0.0	0.0	H-Horn	PK	0.0	53.7	74.0	-20.3
7325.130	38.4	13.5	171.0	1.2	0.0	0.0	V-Horn	PK	0.0	51.9	74.0	-22.1
4069.670	45.2	5.8	111.0	1.1	0.0	0.0	V-Horn	PK	0.0	51.0	74.0	-23.0
3255.560 3257.035	46.6 42.9	3.3 3.3	99.0 268.0	1.3 1.2	0.0 0.0	0.0 0.0	H-Horn V-Horn	PK PK	0.0 0.0	49.9 46.2	74.0 74.0	-24.1 -27.8
4069.790	42.9	5.8	14.0	1.2	24.6	0.0	H-Horn	AV	0.0	21.3	74.0 54.0	-32.7
4069.810	37.9	5.8	111.0	1.1	24.6	0.0	V-Horn	AV	0.0	19.1	54.0	-34.9
3255.780	39.5	3.3	99.0	1.3	24.6	0.0	H-Horn	AV	0.0	18.2	54.0	-35.8
7324.900	28.7	13.5	28.0	1.6	24.6	0.0	H-Horn	AV	0.0	17.6	54.0	-36.4

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Duty Cycle Correction Factor	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)
7325.520	40.6	13.5	28.0	1.6	0.0	0.0	H-Horn	PK	0.0	54.1	74.0	-19.9
4069.490	47.9	5.8	14.0	1.3	0.0	0.0	H-Horn	PK	0.0	53.7	74.0	-20.3
7325.130	38.4	13.5	171.0	1.2	0.0	0.0	V-Horn	PK	0.0	51.9	74.0	-22.1
4069.670	45.2	5.8	111.0	1.1	0.0	0.0	V-Horn	PK	0.0	51.0	74.0	-23.0
3255.560	46.6	3.3	99.0	1.3	0.0	0.0	H-Horn	PK	0.0	49.9	74.0	-24.1
3257.035	42.9	3.3	268.0	1.2	0.0	0.0	V-Horn	PK	0.0	46.2	74.0	-27.8
4069.790	40.1	5.8	14.0	1.3	24.6	0.0	H-Horn	AV	0.0	21.3	54.0	-32.7
4069.810	37.9	5.8	111.0	1.1	24.6	0.0	V-Horn	AV	0.0	19.1	54.0	-34.9
3255.780	39.5	3.3	99.0	1.3	24.6	0.0	H-Horn	AV	0.0	18.2	54.0	-35.8
7324.900	28.7	13.5	28.0	1.6	24.6	0.0	H-Horn	AV	0.0	17.6	54.0	-36.4
7328.260	27.9	13.5	171.0	1.2	24.6	0.0	V-Horn	AV	0.0	16.8	54.0	-37.2
3256.705	34.9	3.3	268.0	1.2	24.6	0.0	V-Horn	AV	0.0	13.6	54.0	-40.4

	orthwest				R/		ED E	MIS	SI	ONS	5 [		<b>SHE</b>	ET			CQ 2005.7.20 EMI 2005.5.05
	-	EUT-	7-545	0 MN	S-0181A	Multimedi	a Speaker S	System							Work Order:		)
s	erial Nun				. 0-0101A	Mantinical		ystem								07/17/05	
			Logite		nc.									Т	emperature:		
	Attend		None None											Deveryor	Humidity:		
					annejhad					Pow	ver:	120VAC, 6	50Hz	Baromet	ric Pressure Job Site:		
TEST S	SPECIFI			-								Test Metho					
FCC 1	5.247(d)	Spur	ious F	Radiat	ted Emiss	ions:2005	04				,	ANSI C63.	4:2003				
	PARAME				1 - 4					Test Di	stan	ce (m)	3	2			
COMM			,		1 7					100121	oran			,			
US unit.	Rear spea	akers ι	unplugg	ged. Co	oax, fiber, an	d audio (x3)	from control p	ood to D\	/D pla	yer. Cont	rol to	subwoofer.					
	PERATI tting low of				l pod.												
DEVIA No devia	TIONS F	ROM	I TESI	T STA	NDARD												
Run #				5				54		23		/	7				
	uration	#						11	li	A	le	N	/				
Result	s			Pas	SS		Signature	40	9	1.		<i>r</i>					
	80.0 -																
																	+
	70.0 -																_
	60.0 -										_						•
						•		*					•				•
	50.0																1
	50.0 -																
dBuV/m																	
	40.0 -										_						_
ā																	
Ŭ	30.0 -																
	30.0 -					•											
								•					•				•
	20.0 -							•									-
	10.0 -																
	10.0																
	0.0 -																
	1100	0.000		120	00.000	1300	.000	1400.	.000		150	0.000	1600.	000	1700.000	180	00.000
										MHz							
	Freq		Ampli	tude	Factor	Azimuth	Height	Duty C Correc		Externa Attenuati		Polarity	Detector	Distance Adjustment	Adjusted	Spec. Limit	Compared to Spec.
	(MHz)		(dBu		(dB)	(degrees)	(meters)	Fact		(dB)	.0	1 oldiny	Detector	(dB)	dBuV/m	dBuV/m	(dB)
	1795			44.4	-5.0				0.0		0.0	H-Horn	PK	0.0		74.0	-14.6
	1795 1290			43.2 44.7	-5.0 -7.6				0.0 0.0		0.0 0.0	V-Horn V-Horn	PK PK	0.0 0.0		74.0 74.0	-15.8 -16.9
	1290			44.6	-7.6				0.0		0.0	H-Horn	PK	0.0		74.0	-17.0
	1602	2.231		42.9	-6.1	360.0	) 1.4		0.0	20	0.0	H-Horn	PK	0.0	56.8	74.0	-17.2
	1602			42.7	-6.1	330.0			0.0		0.0	V-Horn	PK	0.0		74.0	-17.4
	1376 1376			43.3 42.2	-7.2 -7.2				0.0 0.0		0.0 0.0	V-Horn H-Horn	PK PK	0.0 0.0		74.0 74.0	-17.9 -19.0
	1117			42.7	-8.4				0.0		0.0	V-Horn	PK	0.0		74.0	-19.7
	1117			41.4	-8.4				0.0		0.0	H-Horn	PK	0.0		74.0	-21.0
	1290 1290			38.6	-7.6				24.6		0.0	V-Horn H-Horn	AV	0.0 0.0		54.0	-27.6 -27.7
	1290			38.5 35.9	-7.6 -6.1	351.0			24.6 24.6		0.0 0.0	H-Horn V-Horn	AV AV	0.0		54.0 54.0	-27.7 -28.8
	1795			34.6	-5.0				24.6		0.0	H-Horn	AV	0.0		54.0	-20.0
	1602	2.231		35.2	-6.1	360.0	) 1.4		24.6	20	0.0	H-Horn	AV	0.0	24.5	54.0	-29.5
	1376			34.9	-7.2				24.6		0.0	V-Horn	AV	0.0		54.0	-30.9
	1795 1376			32.7 32.6	-5.0 -7.2				24.6 24.6		0.0 0.0	V-Horn H-Horn	AV AV	0.0 0.0		54.0 54.0	-30.9 -33.2
	1117			32.0 33.7	-7.2				24.6 24.6		0.0	V-Horn	AV	0.0		54.0 54.0	-33.2
	1117			29.9	-8.4				24.6		0.0	H-Horn	AV	0.0		54.0	-37.1



	orthwest EMC		RA	DIAT	ED E	MISS	ONS	DAT	A SHE	ET			CQ 2005.7.20 EMI 2005.5.05
		Z-5450 MN	: S-0181A	Multimedia	Speaker S	ystem				V	Nork Order:		
S	erial Number:									_		07/17/05	
<u> </u>	Customer: Attendees:	Logitech, I None	NC.							Te	emperature: Humidity:		
	Project:									Barometr	ic Pressure		
	Tested by:	Holly Ash	annejhad				Power:	120VAC,			Job Site:		
	SPECIFICATI							Test Meth					
	5.247(d) Spur		ted Emissi	ons:2005-0	14			ANSI C63	.4:2003				
	PARAMETER na Height(s) (		1 - 4				Test Dista	nce (m)	3	2			
COMM		,	1 - 4				Test Dista						
EUT O Transmi	Rear speakers of PERATING M tting high channer TIONS FROM ations.	IODES nel from contr	ol pod.	d audio (x3) fi	rom control p	od to DVD pla	ayer. Control t	o subwoofe	r.				
Run #		7	7			52		· . /	2				
	uration #					11. 21	, sile	mi					
Result	s	Pa	SS		Signature	Hory		r					
	80.0												
	70.0											*	
	60.0											•	
Ę	50.0			•									
dBuV/m	40.0												_
	30.0											•	
	20.0			•									_
	10.0												_
	0.0												
	4100.000	46	00.000	5100	.000	5600.00	00 6	100.000	660	00.000	7100.0	00	
							MHz		1		1		
	Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Duty Cycle Correction Factor	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)
	7437.374 7437.374	51.6 50.8	12.0 12.0	56.0 144.0	1.1 1.2	0.0 0.0		V-Horn H-Horn	PK PK	0.0 0.0	63.6 62.8	74.0 74.0	-10.4 -11.2
	4131.740	50.6	4.1	338.0	1.2	0.0		V-Horn	PK	0.0	54.7	74.0	-19.3
	4958.197	46.2	6.4	205.0	1.1	0.0	0.0	V-Horn	PK	0.0	52.6	74.0	-21.4
	4958.197	45.9	6.4	304.0	1.2	0.0		H-Horn	PK	0.0	52.3	74.0	-21.7
	4131.740	47.9	4.1	178.0	1.1	0.0		H-Horn	PK	0.0	52.0	74.0	-22.0
	7437.374 7437.374	41.5	12.0	144.0	1.2	24.6		H-Horn V-Horn	AV AV	0.0 0.0	28.9	54.0	-25.1 -25.3
	4131.740	41.3 43.8	12.0 4.1	56.0 338.0	1.1 1.2	24.6 24.6		V-Horn V-Horn	AV AV	0.0	28.7 23.3	54.0 54.0	-25.3 -30.7
	4958.197	38.9	6.4	205.0	1.2	24.0		V-Hom V-Horn	AV	0.0	20.7	54.0	-33.3
	4131.740	40.1	4.1	178.0	1.1	24.6		H-Horn	AV	0.0	19.6	54.0	-34.4
	4958.197	36.7	6.4	304.0	1.2	24.6	0.0	H-Horn	AV	0.0	18.5	54.0	-35.5

	orthwest			RA	DIAT	ED E	MISS	IONS	DAT	A SHE	ET			CQ 2005.7.20 EMI 2005.5.05
				N: S-0181A	Multimedia	Speaker S	ystem				٧		LABT0140	
S			Unknown Logitech,	Inc							-	Date: emperature:	07/17/05	
			None								16	Humidity:		
			None								Barometr	ric Pressure		
				kannejhad				Power:	120VAC,			Job Site:	EV01	
	SPECIFI				0005 0				Test Meth					
				ated Emissi	ions:2005-0	14			ANSI C63	3.4:2003				
	PARAM na Heigl			1 - 4				Test Dista	nce (m)	3	2			
COMM	_	11(3) (	,	- 4				Test Dista			)			
EUT O Transmi	PERATI tting mid	NG N chann		ol pod.	d audio (x3) fi	rom control p	od to DVD pl	ayer. Control t	o subwoofe	r.				
Run #	ations.			8						0				
	uration	#					11 0.	Ale	mi					
Result			Pa	ass		Signature	Hory	, Ale	P					
						<b>J</b>								
	80.0 -													7
														+
	70.0													-
	60.0 -													_
	50.0 -	•			•									
Ę	00.0													
dBuV/m	40.0 -													_
<del>م</del> ا	30 0													
	30.0 -												*	
					•									
	20.0													-
	10.0 -													_
	0.0 -													
		0.000	45	500.000	5000	.000	5500.00	00 6	000.000	650	00.000	7000.0	00	
								MHz						
	Freq (MHz)		Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Duty Cycle Correction Factor	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)
		5.827 5.827	51.6 51.5		322.0 145.0	1.8 1.1	0.0 0.0		V-Horn H-Horn	PK PK	0.0 0.0		74.0 74.0	-10.6 -10.7
		1.290	49.7			1.1	0.0		H-Horn	PK	0.0		74.0	-10.7
		).471	49.8		348.0	1.2	0.0			PK	0.0		74.0	-20.1
		4.290	45.5			1.2	0.0			PK	0.0		74.0	-22.3
		).471	47.1		181.0	1.1	0.0		H-Horn	PK	0.0		74.0	-22.8
		5.827	40.2		322.0	1.8	24.6			AV	0.0		54.0	-26.6
		5.827 4.290	39.3 43.2		145.0 186.0	1.1 1.3	24.6 24.6			AV AV	0.0 0.0		54.0 54.0	-27.5 -29.2
		+.290 ).471	43.2		348.0	1.3	24.6		V-Horn	AV	0.0		54.0 54.0	-29.2
		1.290	37.7			1.2	24.6			AV	0.0		54.0	-34.7
		).471	38.2		181.0	1.1	24.6			AV	0.0		54.0	-36.3

	IORTHWEST		RA		ED EI	MISSI	ONS	DATA	A SHE	ET			CQ 2005.7.20 MI 2005.5.05
			: S-0181A	Multimedia	Speaker S	ystem				1		LABT0140	
S	Serial Number: Customer:	Unknown Logitech, I	nc.							T	Date: emperature:	07/17/05 25	
	Attendees:										Humidity:		
	Project:									Barometr	ric Pressure		
TEST	Tested by: SPECIFICATI	Holly Ash	cannejhad				Power:	120VAC, Test Meth			Job Site:	EV01	
	5.247(d) Spu		ted Emissi	ons:2005-0	4			ANSI C63					
	PARAMETER												
	na Height(s)		1 - 4				Test Dista	nce (m)	3				
COMM	IENTS						<u>n</u>	. ,					
US unit.	. Rear speakers	unplugged. C	oax, fiber, an	d audio (x3) fr	om control po	od to DVD pla	ayer. Control t	o subwoofe	r.				
Transmi	PERATING M itting low chann	el from contro											
No devia													
Run #		ę	9			. / .	Ale	11	2				
	guration #					Holy	Au	yn					
Result	ts	Pa	SS		Signature	1-0		10.1					
	80.0												]
	70.0												-
	60.0											•	_
_	50.0												-
dBuV/m	40.0												_
	30.0											*	
	20.0												-
	10.0												-
	0.0												
	4800.000	) 580	0.000	6800.00	0 78	00.000	8800.0	000	9800.000	1080	0.000	11800.00	0
							MHz						
	Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Duty Cycle Correction Factor	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)
	12016.880 12016.880	47.0 46.3	17.3 17.3	347.0 133.0	1.2 2.1	0.0 0.0		V-Horn H-Horn	PK PK	0.0 0.0		74.0 74.0	-9.7 -10.4
	4806.550	46.3 56.1	5.8	133.0	1.1	0.0		H-Hom H-Hom	PK	0.0		74.0	-10.4
	4806.550	55.4	5.8	293.0	1.8	0.0	0.0	V-Horn	PK	0.0	61.2	74.0	-12.8
	4806.550 12016.880	49.2 35.6	5.8 17.3	178.0 133.0	1.1 2.1	24.6 24.6		H-Horn H-Horn	AV AV	0.0 0.0		54.0	-23.6 -25.7
	4806.550	35.6 46.9	17.3 5.8	133.0 293.0	2.1	24.6 24.6			AV AV	0.0		54.0 54.0	-25.7 -25.9
	12016.880	34.8	17.3	347.0	1.2	24.6			AV	0.0		54.0	-26.5

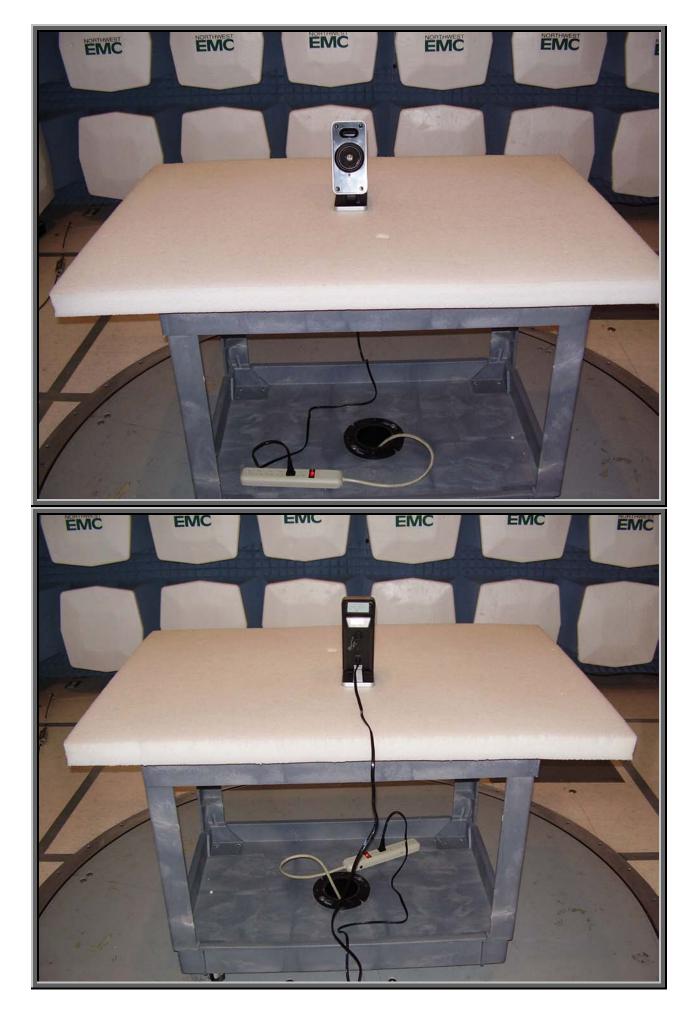
NORTHWEST		R/		ED E	MISSI	ONS	DATA	SHE	ET			PSA 2005.7.20 EMI 2005.8.3
		N: S-0181A	Multimedia	a Speaker S	ystem				v		LABT014	)
Serial Number		lue							T		08/04/05	
Customer Attendees	Logitech,	IIIC.							Te	emperature: Humidity:		
Project									Barometr	ic Pressure		
Tested by	Holly Ash	kannejhad				Power:	120VAC, 6	60Hz		Job Site:		
TEST SPECIFICAT							Test Metho					
FCC 15.247(d) Spu	irious Radia	ated Emiss	ions:2005-	04			ANSI C63.	4:2003				
TEST PARAMETER Antenna Height(s)		1 - 4				Test Dista	ince (m)	3				
COMMENTS												
EUT OPERATING		speaker.										
DEVIATIONS FROM No deviations.	M TEST ST.	ANDARD										
Run #	1	0				· · /	inf	2				
Configuration #					11 . l.	All	mi	/				
Results	Pa	ass		Signature	Hoy	1.	r					
80.0												
70.0												
60.0	•											
50.0												
40.0 <b>BD</b>												
30.0	*											
20.0												
10.0												
0.0												
1600.00	0 1700.	000 18	00.000	1900.000	2000.0		0.000 2	200.000	2300.000	0 2400	.000 25	500.000
						MHz						
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Duty Cycle Correction Factor	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)
2483.500	41.5	0.5	145.0	1.1	0.0	20.0	V-Horn	PK	0.0	62.0	74.0	-12.0
2483.500	40.5	0.5	223.0	1.1	0.0	20.0	V-Horn	PK	0.0	61.0	74.0	-13.0
1652.451 1652.415	41.6 41.4	-2.6 -2.6	218.0 343.0	1.1 1.3	0.0 0.0	20.0 20.0	V-Horn H-Horn	PK PK	0.0 0.0	59.0 58.8	74.0 74.0	-15.0 -15.2
1652.793	34.8	-2.6	343.0 343.0	1.3	24.6	20.0	H-Horn	AV	0.0	56.6 27.6	74.0 54.0	-15.2
1652.858	33.5	-2.6	218.0	1.1	24.6	20.0	V-Horn	AV	0.0	26.3	54.0	-27.7
2483.500	28.5	0.5	223.0	1.1	24.6	20.0	V-Horn	AV	0.0	24.4	54.0	-29.6
2483.500	28.3	0.5	145.0	1.1	24.6	20.0	V-Horn	AV	0.0	24.2	54.0	-29.8

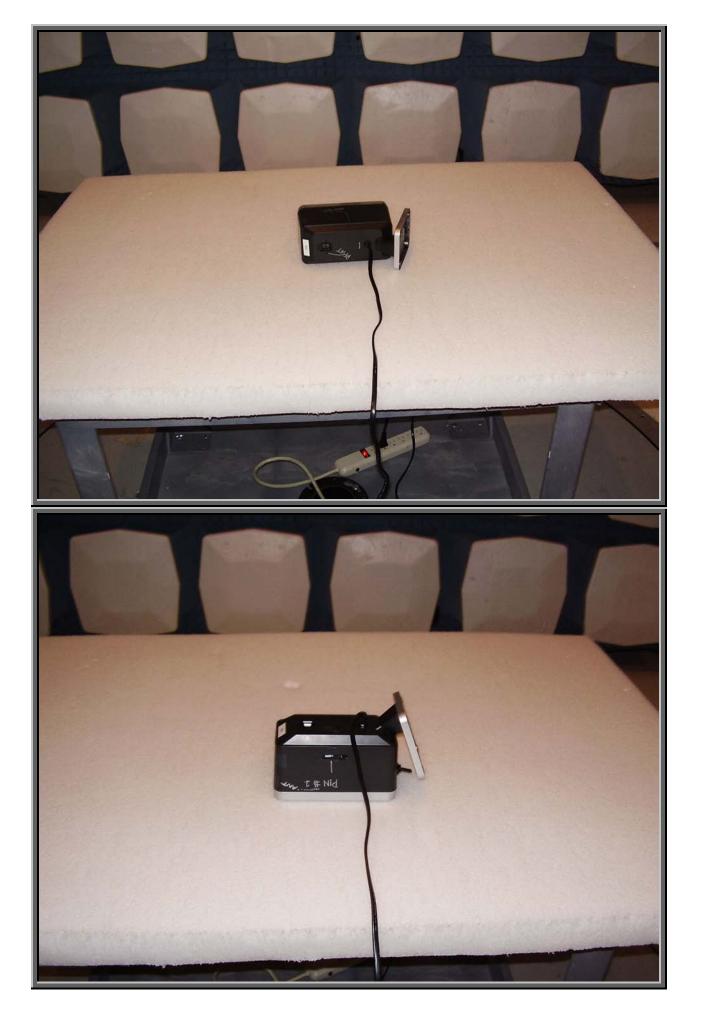
NORTHWEST EMC		R	ADIAT	ED E	MISS		DATA	SHE	ET			PSA 2005.7.20 EMI 2005.8.3
		: S-0181A	Multimedia	Speaker S	System				٧		LABT0140	)
Serial Number:		nc							т.	Date: emperature:	08/04/05	
Attendees	Logitech, I								16	Humidity:		
Project	None								Barometr	ic Pressure		_
Tested by:	Holly Ashk	kannejhad				Power:	120VAC, 6			Job Site:		
TEST SPECIFICAT		ted Ford	lana.0005 0				Test Metho					
FCC 15.247(d) Spu TEST PARAMETER			1011S.2005-0	4			ANSI C63.	4.2003				
Antenna Height(s)		1 - 4				Test Dista	nce (m)	3	3			
COMMENTS EUT OPERATING I												
Transmitting low channers DEVIATIONS FROM												
No deviations.	1	1						2				
Run #	I	•	-		1/ 1	A L	10	)				
Configuration # Results	Pa	SS		Signature	Holy	, Ale	$\gamma \sim$					
00.0												
80.0												
70.0												
60.0												
50.0												•
<b>W/N gp</b> 40.0	*											
30.0												
20.0												
10.0	•											•
0.0												
4000.000	0 5000	.000	6000.000	7000.	000	8000.000 MHz	9000.00	JU 100	000.000	11000.00	1200	0.000
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Duty Cycle Correction Factor		Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)
4006.401	48.8	5.7	70.0	1.0	0.0	0.0	H-Horn	PK	0.0	54.5	74.0	-19.5
12012.700	36.0	16.0	162.0	1.3	0.0	0.0	H-Horn	PK	0.0	52.0	74.0	-22.0
12011.810	35.3	16.0	144.0	1.0	0.0	0.0	V-Horn	PK	0.0	51.3	74.0	-22.7
4004.558 4806.849	45.1 38.1	5.7 6.4	90.0 49.0	1.3 1.3	0.0 0.0	0.0 0.0	V-Horn H-Horn	PK PK	0.0 0.0	50.8 44.5	74.0 74.0	-23.2 -29.5
4806.849	38.1 42.0	6.4 5.7	49.0 70.0	1.3	24.6	0.0	H-Hom H-Hom		0.0	44.5 23.1	74.0 54.0	-29.5

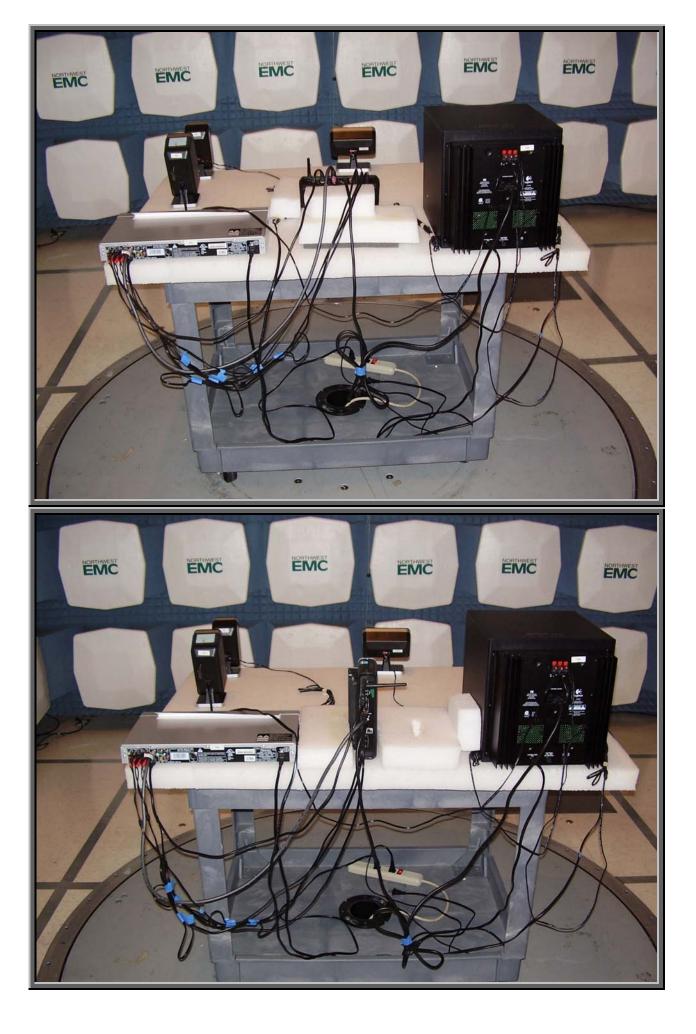
4004.558	45.1	5.7	90.0	1.3	0.0	0.0	V-Horn	PK	0.0	50.8	74.0	-23.2
4806.849	38.1	6.4	49.0	1.3	0.0	0.0	H-Horn	PK	0.0	44.5	74.0	-29.5
4004.708	42.0	5.7	70.0	1.0	24.6	0.0	H-Horn	AV	0.0	23.1	54.0	-30.9
4807.476	36.1	6.4	87.0	1.0	0.0	0.0	V-Horn	PK	0.0	42.5	74.0	-31.5
4004.680	38.4	5.7	90.0	1.3	24.6	0.0	V-Horn	AV	0.0	19.5	54.0	-34.5
12015.070	22.0	16.0	162.0	1.3	24.6	0.0	H-Horn	AV	0.0	13.4	54.0	-40.6
12011.880	21.9	16.0	144.0	1.0	24.6	0.0	V-Horn	AV	0.0	13.3	54.0	-40.7
4805.850	25.2	6.4	49.0	1.3	24.6	0.0	H-Horn	AV	0.0	7.0	54.0	-47.0
4807.527	24.5	6.4	87.0	1.0	24.6	0.0	V-Horn	AV	0.0	6.3	54.0	-47.7

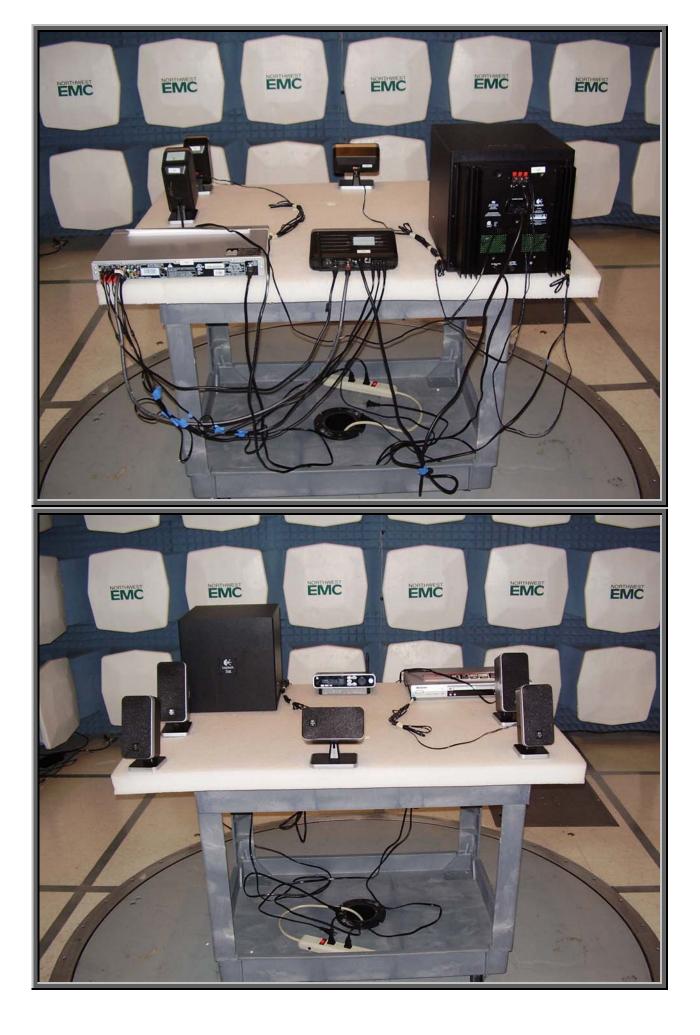
NORTHWEST EMC		R/		ED E	MISS	IONS	DATA	SHE	ET		F	PSA 2005.7.20 EMI 2005.8.3
	7 5450 141	6 04 04 4	Multime	- Cno-les-	Sustan					Verla Carda	LABT0140	
Serial Number:	Z-5450 MN:	5-0181A	Multimedi	a Speaker	System				V		08/04/05	)
	Logitech, Ir	10							Те	mperature:		
Attendees:		10.							10	Humidity:		
Project:									Barometr	ic Pressure		
	Holly Ashk	annejhad				Power:	120VAC, 6	OHz		Job Site:		
TEST SPECIFICAT	IONS						Test Metho	d				
FCC 15.247(d) Spu TEST PARAMETER		ed Emiss	ions:2005-	04			ANSI C63.4	1:2003				
Antenna Height(s)		1 - 4				Test Dista	nce (m)	3				
COMMENTS	(III)	1 - 4				Test Dista	nce (m)	3				
EUT OPERATING M Transmitting low chann DEVIATIONS FROM No deviations.	el from rear sp // TEST STA	NDARD										
Run #	12	2				, Ale	. , ()	)				
Configuration #					11 81	All	mi					
Results	Pas	SS		Signature	How	, , , ,	1					
Roouno				orginataro								
80.0												
												<b></b>
70.0												
70.0												
60.0												
50.0												
50.0												
40.0 +												
30.0												
20.0												
10.0												
0.0 +											+	
1600.000	) 1610.00	0 1620	.000 163	0.000 10	640.000	1650.000	1660.000	1670.00	00 1680.0	000 169	0.000 17	00.000
						MHz						
	,											
Freq	Amplitude	Factor	Azimuth	Height	Duty Cycle	External Attenuation	Polarity	Detector	Distance Adjustment	Adjusted	Spec. Limit	Compared to Spec.
(MHz)	(dBuV)	(dB)	(degrees)	(meters)	Correction Factor	(dB)	rolanty	Derector	(dB)	dBuV/m	dBuV/m	(dB)
1602.119	45.8	-2.8	(degrees) 159.0	1.2	0.0	20.0	V-Horn	PK	0.0	63.0	74.0	-11.0
1601.857	43.2	-2.8	181.0	2.0	0.0	20.0	H-Horn	PK	0.0	60.4	74.0	-13.6
1602.263	42.1	-2.8	159.0	1.2	24.6	20.0	V-Horn	AV	0.0	34.7	54.0	-19.3
1602.187	38.8	-2.8	181.0	2.0	24.6	20.0	H-Horn	AV	0.0	31.4	54.0	-22.6

Work Order: Date: 6091:00           Series None         Work Order: Date: 6091:00           Temperature: 28           None         Burometric Managhad           Project: None         Burometric Managhad           Project: None         Burometric Managhad           Test Markate Emissions: 2005-04         None         Colspan="2">Colspan="2"           Colspan="2"         Colspan="2"           Colspan="2"         Colspan="2"           Colspan="2"         Colspan="2"           Colspan="2"          Colspan="2"           Colspan= 10 <t< th=""><th>NORTHWEST EMC</th><th></th><th>R/</th><th></th><th>ED E</th><th>MISSI</th><th>ONS</th><th>DATA</th><th>SHE</th><th>ET</th><th></th><th>F</th><th>PSA 2005.7.20 EMI 2005.8.3</th></t<>	NORTHWEST EMC		R/		ED E	MISSI	ONS	DATA	SHE	ET		F	PSA 2005.7.20 EMI 2005.8.3
Custome:         Continue:         Tempet:         23           Project:         None         Barometric Pressure [25]         Barometric Pressure [25]           Project:         None         Barometric Pressure [25]         Barometric Pressure [25]           Project:         None         Barometric Pressure [25]         Barometric Pressure [25]           PEGC 15:247(0)         Supress         Supressure [25]         Missions: 2005-04         Missions: 2005           MSI (C5):4:2003         MSI (C5):4:2003         MSI (C5):4:2003         MSI (C5):4:2003           Contents Relight(c) (m)         1:.4         [est Distance (m)]         3           COMUNITY:         Pass         Signature         Mathematic Pressure [25]           Supressure Pass         Signature         Mathematic Pressure [25]         Mathematic Pressure [25]           Supressure Pass         Signature         Mathematic Pressure [25]         Mathematic Pressure [25]           Supressure Pass         Signature         Mathematic Pressure [25]         Mathematic Pressure [25]           Supressure Pass         Signature         Mathematic Pressure [25]         Mathematic Pressure [25]           Supressure Pass         Signature         Mathematic Pressure [25]         Mathematic Pressure [25]         Mathmatic Pressure [25]		Z-5450 MN	I: S-0181A	Multimedia	Speaker S	ystem				V	Vork Order:	LABT0140	)
Attendese:         None         Humanity:         Barometic Pressure [23:64]           Traded by Holly Akhannejhad         Power; [20VAC; 60Hz         Job Site; [EV01]           Traded by Holly Akhannejhad         Test Bool         Job Site; [EV01]           File Scientic Anosa         Test Bool         Job Site; [EV01]           Scientic Matter Scientic Anosa         Scientic Matter Scientic Anosa         Job Si													
Project None         Biometic Pressure (28.94)           Test Bredoric Anolysis         Biometic Pressure (28.94)           Test SeldoricAnolysis         Test Metricos           Advisor         Test Metricos           Test PARAMETERS         Test Metricos           Advisor         Test Metricos           Configuration #         Test Metricos           Parametic Press         Signature           More Test STANDARD         Signature           Gonfiguration #         Test Metricos           70.0         Gonfiguration           60.0         Gonfiguration           70.0         Gonfiguration           70.0 <td></td> <td></td> <td>Inc.</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>Te</td> <td></td> <td></td> <td></td>			Inc.							Te			
Tested by Holy Ashtannejhad         Power 120VAC, 60Hz         Job Site.         EV01           FCC 15.247(d) Spurious Radiated Emissions:2005-04         Aklin C63.4 2003         Aklin C63.4 2003           TEST PARAMETERS         1 - 4         Test Distance (m)         3           COMMENTS         Pass         Signature         Add Minor (m)           Signature         Signature         Add Minor (m)         1           Signature         Signature         Add Minor (m)         1         1           Signature         Signature         Minor (m)         1         1         1           Signature         Signature         Signature         Minor (m)         1         1         1           Signature													
Test specific Ations         Test Method           FCC 15.347(d) Spurious Radiated Emissions:2005-04         ANSI C63.4.2003           Test PARAMETERS         ANSI C63.4.2003           Test PARAMETERS         Test Distance (m) 3           COMMENTS         3           EUT OFERATING MODES         BOOMESTS           Pass         Signature           Poly Attoms from res speaker.         BOOMESTS           Poly Attoms from res speaker.         BOOMESTS           Signature         Add Add Add Add Add Add Add Add Add Ad			annaihad				Deuren	1201/40 6	<u>0U-</u>	Barometr			
FCC 15.247(d) Spurious Radiated Emissions:2005-04       ANSI C63.4:2003         TEST PARAMIETERS         Anterna Height(s)(m) [:-4         Test Distance (m) ] 3         EUT OPERATING MODES         EUT OPERATING MODES         EUTOPERATING MODES         EUTOPERATING MODES         Coll Anter Status engelace:         OPERATING MODES         Colspan="2">Colspan="2"         Colspan="2">Colspan="2"         Colspan="2"			kannejnad				Power:				Job Site:	EVUI	
TEST PARAMETERS         1-4         Test Distance (m)         3           COMMENTS         COMMENTS         Commention (m)         3           CUT OPERATING MODES         Transmitting high channel from rar speake.         Commention (m)         3           Cervitations         13         Configuration (m)         3         Configuration (m)         Configuration (m) <t< td=""><td></td><td></td><td>ted Emiss</td><td>ions:2005-0</td><td>N4</td><td></td><td></td><td>ā</td><td></td><td></td><td></td><td></td><td></td></t<>			ted Emiss	ions:2005-0	N4			ā					
Antenna Height(s) (m)         1 - 4         Test Distance (m)         3           EUT OPERATING MODES													
EUT OPERATING MODES           Transmitting high channel from rest spacks.           DEVIATIONS FROM TEST STANDAD           No division in the space of the			1 - 4				Test Dista	nce (m)	3				
Transmitting high channel form rar speaker.	COMMENTS												
BEVATIONS FROM TEST STANDARD           Run #         13           Configuration #         Run #         13           Good deviations         Run #         143         Good deviations           Good deviations         Run #         140													
No devisions.           Run #         13           Configuration #         Pass           Signature         Additional Mathematical Mathmatematical Matematical Mathematical Matematical Matematical Mate			speaker.										
Ron #         13         Add M Ministry           Configuration #         Pass         Signature         Add M Ministry           Signature         Add M Ministry         Signature         Add M Ministry           80.0         70.0         60.0         60.0         60.0         60.0           50.0         9 <td></td> <td>I TEST ST</td> <td>NDARD</td> <td></td>		I TEST ST	NDARD										
80.0	No deviations.												
80.0	Run #	1	3			10	. /	/	2				
80.0	Configuration #					11 %	Al	inti	/				
80.0		Pa	ISS		Sianature	How	1.	1					
Tree         Amplitude         Factor         Adjusted         Spec. Imilia         Compared to Conserved on the sec.           M122.814         45.7         5.7         42.0         1.0         0.0         0.0         Height Conserved on the sec.         Adjusted         Spec. Imilia         Spec. Im	Robuito				orginataro								
60.0         60.0 <th< td=""><td>80.0</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></th<>	80.0												
So.0         Image: Solo of the sector o	70.0												
SU.0         All         All<         All         All         All </td <td>60.0</td> <td></td>	60.0												
30.0       20.0       30.0       20.0       30.0       20.0       30.0       20.0       30.0       20.0       30.0       20.0       30.0       20.0       30.0       20.0       30.0       20.0       30.0       20.0       30.0       20.0       30.0       20.0       30.0       30.0       30.0       30.0       30.0       30.0       30.0       40.0	50.0												
30.0       20.0       30.0       20.0       30.0       40.0													
Inc.0       Inc.0 <th< td=""><td>30.0</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></th<>	30.0												
Freq (MHz)         Amplitude (dBuV)         Factor (dB)         Azimuth (degrees)         Height (meters)         Duty Cycle Correction Factor         External Attenuation (dB)         Polarity Detector         Distance Adjustment (dB)         Adjusted dBUV/m         Spec. Limit dBUV/m         Compared to Spec. (dB)           4132.814         45.7         5.7         42.0         1.0         0.0         0.0         H-Horn Horn         PK         0.0         51.4         74.0         -22.6           4959.439         41.1         6.8         42.0         1.0         0.0         0.0         H-Horn Horn         PK         0.0         47.3         74.0         -26.7           4132.811         39.8         5.7         120.0         1.3         0.0         0.0         V-Horn         PK         0.0         47.3         74.0         -26.7           4132.811         39.8         5.7         120.0         1.3         0.0         0.0         V-Horn         PK         0.0         47.3         74.0         -26.7           4132.871         39.8         5.7         120.0         1.3         0.0         V-Horn         PK         0.0         45.5         74.0         -28.5           4132.677         38.3         5.7 </td <td>20.0</td> <td></td>	20.0												
4100.000       4200.000       4300.000       4400.000       4500.000       4600.000       4700.000       4800.000       4900.000       5000.000         MHz       MHz       MHz       MHz       MHz       Distance       Adjusted       Spec. Limit       Compared to Spec.         MHz       MHz       Meight (degrees)       Duty Cycle (meters)       External Attenuation (dB)       Polarity       Detector       Adjustment (dB)       Adjusted       Spec. Limit       Compared to Spec.         4132.814       45.7       5.7       42.0       1.0       0.0       0.0       H-Horn       PK       0.0       51.4       74.0       -22.6         4959.439       41.1       6.8       42.0       1.0       0.0       0.0       V-Horn       PK       0.0       47.3       74.0       -22.6         4959.201       40.5       6.8       327.0       1.1       0.0       0.0       V-Horn       PK       0.0       47.3       74.0       -26.7         4132.877       38.3       5.7       120.0       1.3       0.0       0.0       V-Horn       PK       0.0       45.5       74.0       -28.5         4132.871       39.8       5.7       120.0       24.6	10.0											*	
Freq (MHz)         Amplitude (dB)         Factor (dB)         Azimuth (degrees)         Height (meters)         Duty Cycle Correction Factor         External Attenuation (dB)         Polarity         Detector         Adjustment (dB)         Adjusted dBuV/m         Spec. Limit (dB)         Compared to Spec. (dB)           4132.814         45.7         5.7         42.0         1.0         0.0         0.0         H-Horn Horn         PK         0.0         51.4         74.0         -22.6           4959.439         41.1         6.8         42.0         1.0         0.0         0.0         H-Horn Horn         PK         0.0         47.9         74.0         -26.1           4959.201         40.5         6.8         327.0         1.1         0.0         0.0         V-Horn         PK         0.0         47.3         74.0         -26.7           4132.891         39.8         5.7         120.0         1.3         0.0         0.0         V-Horn         PK         0.0         45.5         74.0         -28.5           4132.677         38.3         5.7         42.0         1.0         24.6         0.0         H-Horn         AV         0.0         13.2         54.0         -40.1           4959.219         31	0.0												
Freq (MHz)         Amplitude (dBW)         Factor (dB)         Azimuth (degrees)         Height (meters)         Orrection Factor         Attenuation (dB)         Polarity         Detector         Adjustment (dB)         Adjusted dBW/m         Spec. Limit dBW/m         Spec. Limit (dB)         Spec. Limit (dB)         Spec. Limit (dB)         Spec. Limit dBW/m         Spe	4100.000	) 4200.0	000 43	00.000	4400.000	4500.0		0.000 4	700.000	4800.000	) 4900	.000 50	00.000
4132.814         45.7         5.7         42.0         1.0         0.0         0.0         H-Horn         PK         0.0         51.4         74.0         -22.6           4959.439         41.1         6.8         42.0         1.0         0.0         0.0         H-Horn         PK         0.0         47.9         74.0         -22.6           4959.439         41.1         6.8         42.0         1.0         0.0         0.0         H-Horn         PK         0.0         47.9         74.0         -26.1           4959.201         40.5         6.8         327.0         1.1         0.0         0.0         V-Horn         PK         0.0         47.3         74.0         -26.7           4132.891         39.8         5.7         120.0         1.3         0.0         0.0         V-Horn         PK         0.0         45.5         74.0         -28.5           4132.677         38.3         5.7         42.0         1.0         24.6         0.0         H-Horn         AV         0.0         13.9         54.0         -34.6           4959.223         31.7         6.8         42.0         1.0         24.6         0.0         H-Horn         AV						Correction	Attenuation	Polarity	Detector	Adjustment			Spec.
4959.20140.56.8327.01.10.00.0V-HornPK0.047.374.0-26.74132.89139.85.7120.01.30.00.0V-HornPK0.045.574.0-28.54132.67738.35.742.01.024.60.0H-HornAV0.019.454.0-34.64959.22331.76.842.01.024.60.0H-HornAV0.013.954.0-40.14959.21931.06.8327.01.124.60.0V-HornAV0.013.254.0-40.8	4132.814		5.7			0.0				0.0			
4132.89139.85.7120.01.30.00.0V-HornPK0.045.574.0-28.54132.67738.35.742.01.024.60.0H-HornAV0.019.454.0-34.64959.22331.76.842.01.024.60.0H-HornAV0.013.954.0-40.14959.21931.06.8327.01.124.60.0V-HornAV0.013.254.0-40.8													
4132.677         38.3         5.7         42.0         1.0         24.6         0.0         H-Horn         AV         0.0         19.4         54.0         -34.6           4959.223         31.7         6.8         42.0         1.0         24.6         0.0         H-Horn         AV         0.0         13.9         54.0         -40.1           4959.219         31.0         6.8         327.0         1.1         24.6         0.0         V-Horn         AV         0.0         13.2         54.0         -40.8													
4959.223         31.7         6.8         42.0         1.0         24.6         0.0         H-Horn         AV         0.0         13.9         54.0         -40.1           4959.219         31.0         6.8         327.0         1.1         24.6         0.0         V-Horn         AV         0.0         13.2         54.0         -40.8													
4959.219 31.0 6.8 327.0 1.1 24.6 0.0 V-Horn AV 0.0 13.2 54.0 -40.8													
								V-Horn V-Horn					











## Justification

The individuals and/or the organization requesting the test provided the modes, configurations and settings available to evaluate. While scanning the radiated emissions, all of the EUT parameters listed below were investigated. This includes, but may not be limited to, antennas, tuned transmit frequency ranges, operating modes, and data rates.

Channels in Specified Band Investigated:
Low
Mid
High

**Operating Modes Investigated:** No Hop

Data Rates Investigated: Maximum

Output Power Setting(s) Investigated: Maximum

Power Input Settings Investigated: 120 VAC/60 Hz 230 VAC, 50 Hz.

Software\Firmware Applied During Test								
Exercise software	Special Test Software	Version	Z6DW a0.3.3.1.2.6					
Description								
The system was tested us during the testing.	ing special test codes on a	remote laptop to exercise t	he functions of the device					

EUT and Peripherals in Test Setup Boundary								
Description	Manufacturer	Model/Part Number	Serial Number					
Left front speaker	Logitech, Inc.	S-0181A	Unknown					
Right front speaker	Logitech, Inc.	S-0181A	Unknown					
Center front speaker	Logitech, Inc.	S-0181A	Unknown					
Right rear speaker	Logitech, Inc.	S-0181A	Unknown					
Left rear speaker	Logitech, Inc.	S-0181A	Unknown					
Subwoofer – US Unit	Logitech, Inc.	S-0181A	Unknown					
Subwoofer – EU Unit	Logitech, Inc.	S-0181A	Unknown					
DVD Player	Pioneer	DV-578A-S	DDTE 003395 CC					
Control Pod	Logitech, Inc.	S-0181A	Unknown					

Remote Equipment Outside of Test Setup Boundary							
Description Manufacturer Model/Part Number Serial Number							
Notebook PC Dell, Inc. Latitude D600 99XL661							
Equipment isolated from the EUT so as not to contribute to the measurement result is considered to be outside the test setup boundary							

Cables										
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2					
Audio	No	1.5	No	Subwoofer	Right front speaker					
Audio	No	1.4	No	Subwoofer	Center front speaker					
Audio	No	1.8	No	Subwoofer	Left front speaker					
AC Power	No	1.4	No	Subwoofer	AC Mains					
AC Power	No	1.4	No	Left rear speaker	AC Mains					
AC Power	No	1.4	No	Right rear speaker	AC Mains					
Control	Yes	1.2	PA	Control Pod	Subwoofer					
Audio (x3)	No	1.4	No	Control Pod	DVD Player					
Fiber optic	No	1.2	No	Control Pod	DVD Player					
Coax	Yes	1.2	No	Control Pod	DVD Player					
AC Power	No	1.4	No	DVD Player	AC Mains					
PA	PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.									

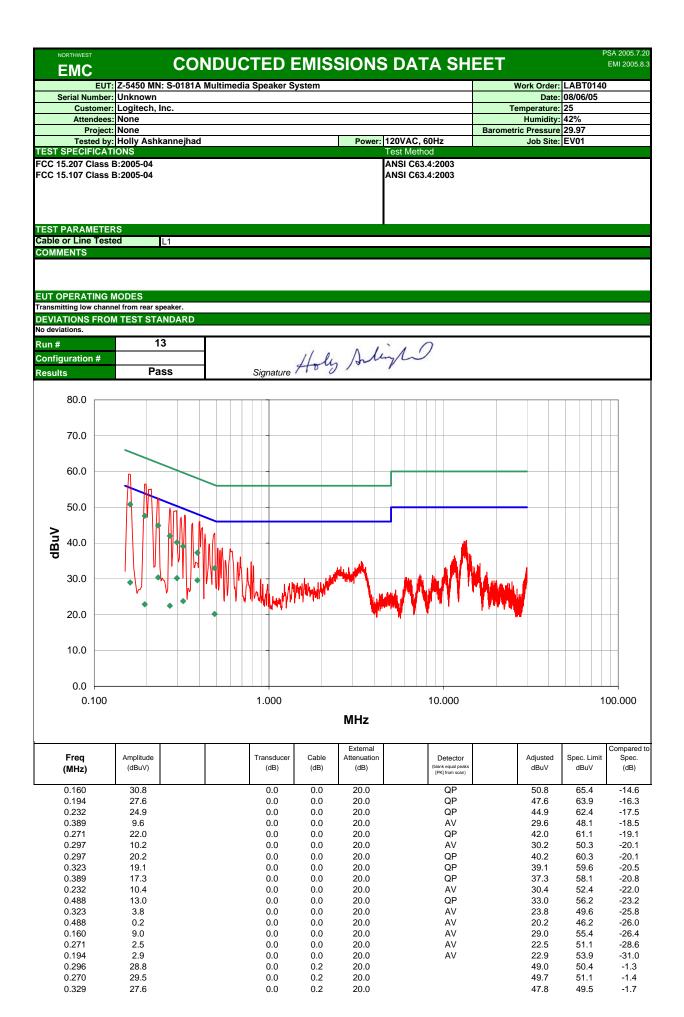
Measurement Equipment									
Description	Manufacturer	Model	Identifier	Last Cal	Interval				
LISN	Solar	9252-50-R-24-BNC	LIN	12/29/2004	13 mo				
LISN	Solar	9252-50-R-24-BNC	LIP	12/29/2004	13 mo				
High Pass Filter	TTE	H97-100k-50-720B	HFC	12/29/2004	13 mo				
Attenuator	Tektronix	011-0059-02	ATH	12/29/2004	13 mo				
Spectrum Analyzer	Agilent	E4446A	AAQ	04/08/2005	13 mo				

## **Test Description**

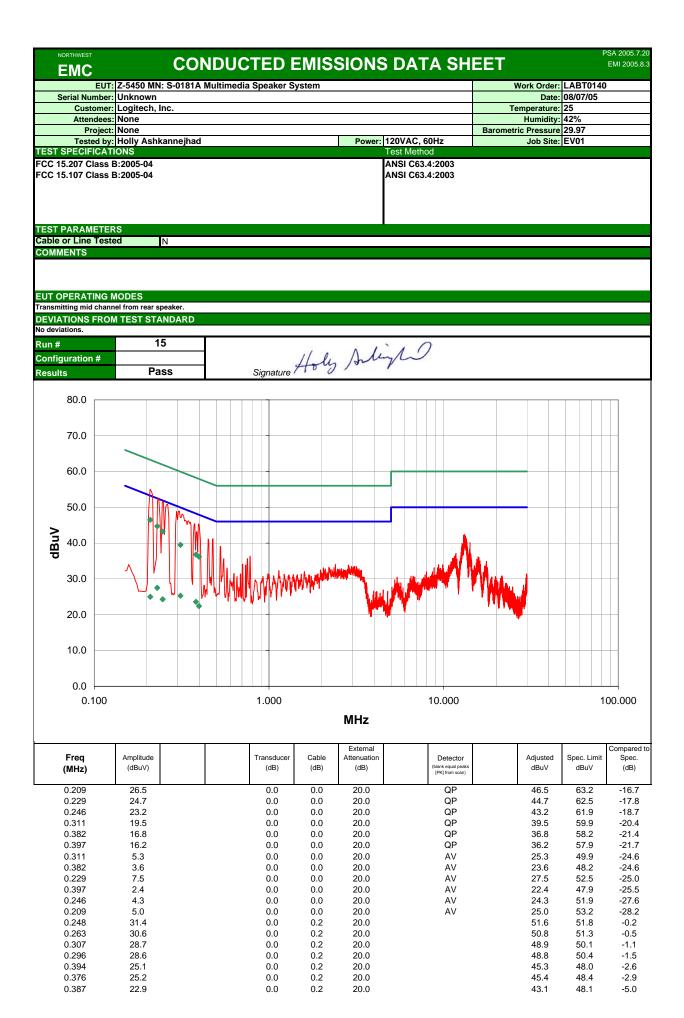
**<u>Requirement:</u>** EN 301 489-1, clause 8.4. If the EUT is connected to the AC power line indirectly, obtaining its power from another device that is connected to the AC power line, then it should be tested to demonstrate compliance with the conducted limits or EN 55022 Class B.

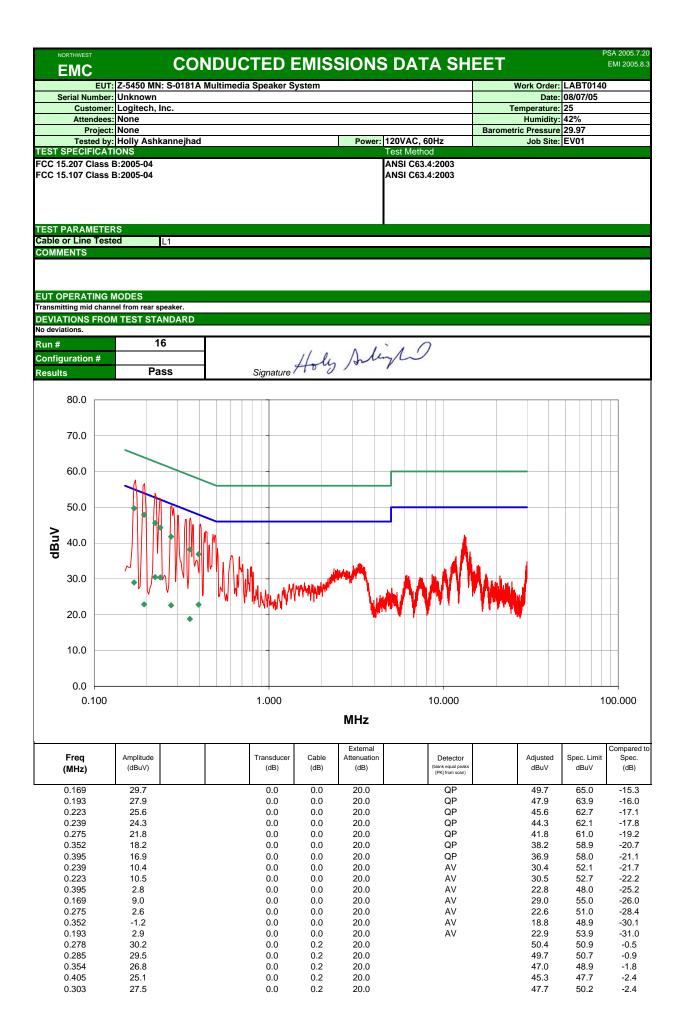
**<u>Configuration</u>**: The EUT will be powered from a device that could be connected to the AC power line. Therefore, the measurements were made on the device used to power the EUT. The AC power line conducted emissions were measured with the EUT operating at the lowest, the highest, and a middle channel in the operational band. The EUT was transmitting at its maximum data rate. For each mode, the spectrum was scanned from 150 kHz to 30 MHz. The test setup and procedures were in accordance with EN 55022.

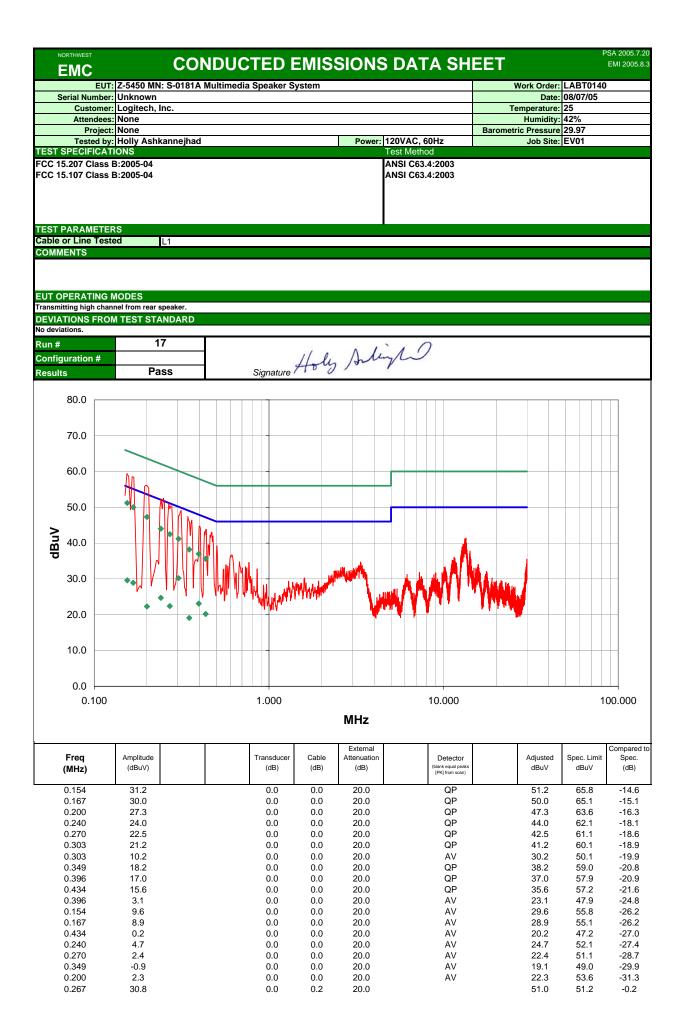
Completed by:							
Holy	Sigh						



NORTHWEST		CON	DUC	TED E	MIS	SION	S DATA SH	IEET		F	PSA 2005.7.20 EMI 2005.8.3
	EUT: Z-5450 MN:	S-0181A Mu	Itimedia	Speaker S	/stem			W	ork Order:	LABT0140	)
Serial Num	nber: Unknown								Date:	08/06/05	
	mer: Logitech, Ir dees: None	1C.						Tei	nperature: Humidity:		
Pro	ject: None							Barometri			
	d by: Holly Ashk	annejhad				Power:	120VAC, 60Hz		Job Site:	EV01	
TEST SPECIFIC FCC 15.207 Cla							Test Method ANSI C63.4:2003				
FCC 15.107 Cla							ANSI C63.4:2003				
TEST PARAME Cable or Line 1											
Cable of Line	lested	N									
COMMENTO											
EUT OPERATI	NG MODES										
	channel from rear sp	eaker.									
DEVIATIONS F No deviations.	ROM TEST STA	NDARD									
	14	1					-				
Run # Configuration		•			11 0	A le	1.2				
Results	# Pas	ss			Holy	Jour	in				
Results				olghatale							
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70.0											
60.0											
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<b>Angp</b> 40.0		╊ <u>╏╢</u> ┝╷╢╟	A1	_							
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30.0	** * <sup>1</sup>		I'INA.IA	MIANIWA	WYW	<b>"</b> \.		Y VIII.			
	•	V V V	. 11. JAN /		•						
20.0		•				<b>1</b> ,1			<u>,                                     </u>		
10.0											
10.0											
0.0											
0.1	00			1.000			10.000			1	00.000
						MHz					
Erre	American			Tropeducer	Cabl	External			المراقب	Spee Limit	Compared to
Freq (MHz)	Amplitude (dBuV)			Transducer (dB)	Cable (dB)	Attenuation (dB)	(blank equal peak	IS .	Adjusted dBuV	Spec. Limit dBuV	Spec. (dB)
							[PK] from scan)				
0.153 0.173	31.8 29.6			0.0 0.0	0.0 0.0	20.0 20.0	QP QP		51.8 49.6	65.8 64.8	-14.0 -15.2
0.173	29.6			0.0	0.0	20.0	QP		49.6 47.7	63.7	-15.2
0.229	25.1			0.0	0.0	20.0	QP		45.1	62.5	-17.4
0.252	23.1			0.0	0.0	20.0	QP		43.1	61.7	-18.6
0.274 0.317	21.2 19.2			0.0 0.0	0.0 0.0	20.0 20.0	QP QP		41.2 39.2	61.0 59.8	-19.8 -20.6
0.312	19.2			0.0	0.0	20.0	QP		39.2 39.0	59.9	-20.0
0.229	7.5			0.0	0.0	20.0	AV		27.5	52.5	-25.0
0.173 0.312	8.5 3.6			0.0 0.0	0.0 0.0	20.0 20.0	AV AV		28.5 23.6	54.8 49.9	-26.3 -26.3
0.312	3.6 9.0			0.0	0.0	20.0	AV AV		23.6 29.0	49.9 55.8	-26.3 -26.8
0.252	4.4			0.0	0.0	20.0	AV		24.4	51.7	-27.3
0.274	2.4			0.0	0.0	20.0	AV		22.4	51.0	-28.6
0.197 0.252	2.9 31.2			0.0 0.0	0.0 0.2	20.0 20.0	AV		22.9 51.4	53.7 51.7	-30.8 -0.3
0.278	30.1			0.0	0.2	20.0			50.3	50.9	-0.6
0.314	28.8			0.0	0.2	20.0			49.0	49.9	-0.8
0.288	29.4			0.0	0.2	20.0			49.6	50.6	-0.9







	CO	NDUCTED E	MIS	SIONS	DATA SHEET		F	PSA 2005.7.20 EMI 2005.8.3
	EUT: Z-5450 MN: S-0181A	Multimedia Speaker S	/stem			Work Order	LABT0140	)
	nber: Unknown					Date	08/07/05	
	omer: Logitech, Inc. dees: None				т	emperature Humidity		
	oject: None				Baromet	ric Pressure		
	d by: Holly Ashkannejhad	ł			120VAC, 60Hz	Job Site:	EV01	
TEST SPECIFI FCC 15.207 CI					Test Method ANSI C63.4:2003			
FCC 15.207 C					ANSI C63.4:2003			
TEST PARAM Cable or Line								
Cable of Line	Tested N							
EUT OPERAT								
	channel from rear speaker.							
DEVIATIONS I No deviations.	FROM TEST STANDARD							
	18	1						
Run # Configuration	-	-	11 0	A Li	1.0			
Results	# Pass	Signature	Holi	, Arti	$\gamma \sim$			
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<b>Angp</b> 40.0								
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30.0		III III N AND A			I. I. MANY MALL			
50.0	· ••₩ ' <u>  </u> ∿/'	I INTE AMPRIMAN ANTERVITY	THIT		A APPT I TYMAL			
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				MHz				
Freq	Amplitude	Transducer	Cable	External Attenuation	Detector	Adjusted	Spec. Limit	Compared to Spec.
(MHz)	(dBuV)	(dB)	(dB)	(dB)	(blank equal peaks [PK] from scan)	dBuV	dBuV	(dB)
			0.0	00.0		E0.1	05.0	10.0
0.152 0.169	32.1 30.2	0.0 0.0	0.0 0.0	20.0 20.0	QP QP	52.1 50.2	65.9 65.0	-13.8 -14.8
0.244	23.6	0.0	0.0	20.0	QP	43.6	62.0	-18.4
0.275	21.6	0.0	0.0	20.0	QP	41.6	61.0	-19.4
0.304 0.402	19.9 15.6	0.0 0.0	0.0 0.0	20.0 20.0	QP QP	39.9 35.6	60.1 57.8	-20.2 -22.2
0.402	14.5	0.0	0.0	20.0	QP	34.5	57.2	-22.2
0.304	5.4	0.0	0.0	20.0	AV	25.4	50.1	-24.7
0.402 0.169	2.8 9.2	0.0 0.0	0.0 0.0	20.0 20.0	AV AV	22.8 29.2	47.8 55.0	-25.0 -25.8
0.169	9.2 9.0	0.0	0.0	20.0	AV AV	29.2 29.0	55.0 55.9	-25.8 -26.9
0.244	4.6	0.0	0.0	20.0	AV	24.6	52.0	-27.4
0.433	-0.2	0.0	0.0	20.0	AV	19.8	47.2	-27.4
0.275 0.237	2.5 31.9	0.0 0.0	0.0 0.2	20.0 20.0	AV	22.5 52.1	51.0 52.2	-28.5 -0.1
0.259	30.9	0.0	0.2	20.0		51.1	51.5	-0.3
0.274	28.8	0.0	0.2	20.0		49.0	51.0	-2.0
0.303 0.434	27.1 23.6	0.0 0.0	0.2 0.2	20.0 20.0		47.3 43.8	50.2 47.2	-2.8 -3.3
0.101		0.0	0.2	_0.0				0.0

