

Logitech, Inc.

A-00023

Report No. LABT0369

Report Prepared By



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

© 2010 Northwest EMC, Inc

EMC Test Report

Certificate of Test
Last Date of Test: May 12, 2010
Logitech, Inc.
Model: A-00023

Emissions			
Test Description	Specification	Test Method	Pass/Fail
Spurious Radiated Emissions	FCC 15.247:2010	ANSI C63.10:2009	Pass
Occupied Bandwidth	FCC 15.247:2010	ANSI C63.10:2009	Pass
Output Power	FCC 15.247:2010	ANSI C63.10:2009	Pass
Band Edge Compliance	FCC 15.247:2010	ANSI C63.10:2009	Pass
Spurious Conducted Emissions	FCC 15.247:2010	ANSI C63.10:2009	Pass
Power Spectral Density	FCC 15.247:2010	ANSI C63.10:2009	Pass
AC Powerline Conducted Emissions	FCC 15.209:2010	ANSI C63.10:2009	Pass

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 (Site filing #2834D-2).

Approved By:



Don Facticeau, IS Manager



NVLAP Lab Code: 200630-0

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

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

Revision Number	Description	Date	Page Number
00	None		

Barometric Pressure

The recorded barometric pressure has been normalized to sea level.



Accreditations and Authorizations

FCC

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



NVLAP

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



NVLAP LAB CODE 200629-0
NVLAP LAB CODE 200630-0
NVLAP LAB CODE 200676-0
NVLAP LAB CODE 200761-0
NVLAP LAB CODE 200881-0

Industry Canada

Accredited by NVLAP for performance of Industry Canada RSS and ICES testing. Our Open Area Test Sites and certification chambers comply with RSS-Gen, Issue 2 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. (*Site Filing Numbers - Hillsboro: 2834D-1, 2834D-2, Sultan: 2834C-1, Irvine: 2834B-1, 2834B-2, Brooklyn Park: 2834E-1*)



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.



NEMKO

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



Australia/New Zealand

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



VCCI

Accepted as an Associate Member to the VCCI, Acceptance No. 564. Conducted and radiated measurement facilities have been registered in accordance with Regulations for Voluntary Control Measures, Article 8. (Registration Numbers. - Hillsboro: C-1071, R-1025, G-84, C-2687, T-1658, and R-2318, Irvine: R-1943, G-85, C-2766, and T-1659, Sultan: R-871, G-83, C-1784, and T-1511, Brooklyn Park: R-3125, G-86, G-141, C-3464, and T-1634).



BSMI

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



GOST

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



KCC

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



VIETNAM

Vietnam MIC has approved Northwest EMC as an accredited test lab. Per Decision No. 194/QD-QLCL (dated December 15, 2009), Northwest EMC test reports can be used for Vietnam approval submissions.



SCOPE

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

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



Northwest EMC Locations



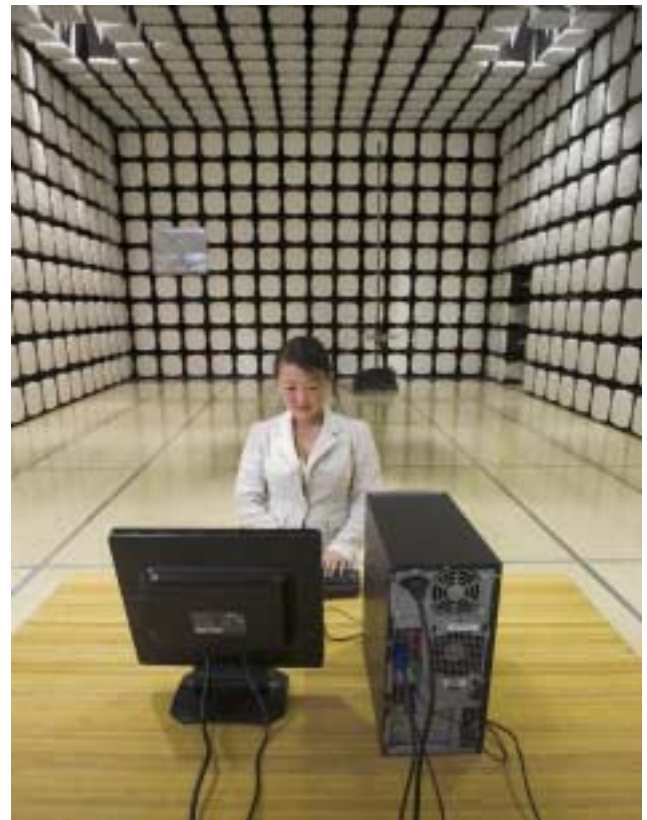
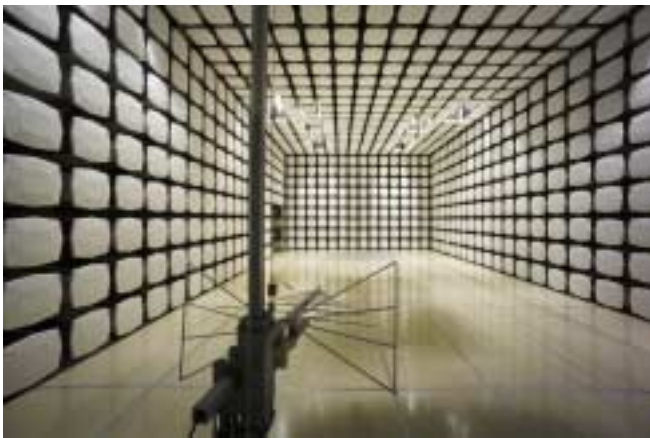
Oregon
Labs EV01-EV12
22975 NW Evergreen Pkwy
Suite 400
Hillsboro, OR 97124
(503) 844-4066

California
Labs OC01-OC13
41 Tesla
Irvine, CA 92618
(949) 861-8918

Minnesota
Labs MN01-MN08
9349 W Broadway Ave.
Brooklyn Park,
MN 55445
(763) 425-2281

Washington
Labs SU01-SU07
14128 339th Ave. SE
Sultan, WA 98294
(360) 793-8675

New York
Labs WA01-WA04
4939 Jordan Rd.
Elbridge, NY 13060
(315) 685-0796



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:	Aaron Cohen
Model:	A-00023
First Date of Test:	May 12, 2010
Last Date of Test:	May 7, 2010
Receipt Date of Samples:	May 5, 2010
Equipment Design Stage:	Preproduction
Equipment Condition:	No Damage

Information Provided by the Party Requesting the Test**Functional Description of the EUT (Equipment Under Test):**

2.4 GHz ISM Radio

Testing Objective:

Seeking approval by a TCB under FCC 15.247.

CONFIGURATION 2 LABT0369**EUT**

Description	Manufacturer	Model/Part Number	Serial Number
Headset	Logitech	A-00024	#2 (Tx & Rx Sample)

Peripherals in test setup boundary

Description	Manufacturer	Model/Part Number	Serial Number
USB Puck	Logitech	A-00024	None

Remote Equipment Outside of Test Setup Boundary

Description	Manufacturer	Model/Part Number	Serial Number
Host Laptop	Dell	Inspiron E1505	G4MBX91

Cables

Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
USB	Yes	1.5m	No	Host PC	USB Puck
USB	Yes	0.7m	No	USB Puck	Headset

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

CONFIGURATION 4 LABT0369**Software/Firmware Running during test**

Description	Version
Windows XP	2002
NW EMC Exerciser	1.1
Windows Media Player	10.0.0

EUT

Description	Manufacturer	Model/Part Number	Serial Number
USB Puck	Logitech	A-00024	None
USB Dongle	Logitech	A-00024	None
Headset	Logitech	A-00024	#2 (Tx & Rx Sample)

Peripherals in test setup boundary

Description	Manufacturer	Model/Part Number	Serial Number
Host PC	Dell	Dimension 1100	CNOYD544
Monitor	HP	HPW1907	3CQ61433DT
Parallel Printer	Epson	LX300	1YLY287403
Keyboard	IBM	KB-9910	0033545
Mouse	Microsoft	IntelliMouse 1.1A	4549526-00000

Cables

Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
AC mains	No	1.8m	No	Host PC	AC mains
AC mains	No	1.8m	No	Monitor	AC mains
AC mains	No	1.7m	No	Parallel Printer	AC mains
Keyboard	Yes	1.6m	No	Keyboard	Host PC
Mouse	Yes	1.5m	No	Mouse	Host PC
Video	Yes	1.5m	Yes	Monitor	Host PC
Parallel	Yes	1.5m	No	Parallel Printer	Host PC
USB	Yes	1.5m	No	Host PC	USB Puck
USB	Yes	0.7m	No	USB Puck	Headset

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

Equipment modifications					
Item	Date	Test	Modification	Note	Disposition of EUT
1	5/7/2010	Output Power	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
2	5/7/2010	Occupied Bandwidth	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
3	5/7/2010	Band Edge Compliance	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
4	5/7/2010	Power Spectral Density	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
5	5/7/2010	Spurious Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
6	5/10/2010	Spurious Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
7	5/12/2010	AC Powerline Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

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

TEST EQUIPMENT					
Description	Manufacturer	Model	ID	Last Cal.	Interval
Spectrum Analyzer	Agilent	E4407B	AAU	12/12/2008	24
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	7/21/2009	13
26 GHz DC Block, SMA	Pasternack	PE8210	AME	10/19/2009	13
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0

MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

TEST DESCRIPTION

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 with the typical modulation.

EMC

OCCUPIED BANDWIDTH

EUT:	A-00023	Work Order:	LABT0369
Serial Number:	#1	Date:	05/07/10
Customer:	Logitech, Inc.	Temperature:	23°C
Attendees:	none	Humidity:	33%
Project:	none	Barometric Pres.:	30.19 in
Tested by:	Rod Peloquin	Power:	Battery
		Job Site:	EV06

TEST SPECIFICATIONS		Test Method
FCC 15.247:2010		ANSI C63.10:2009

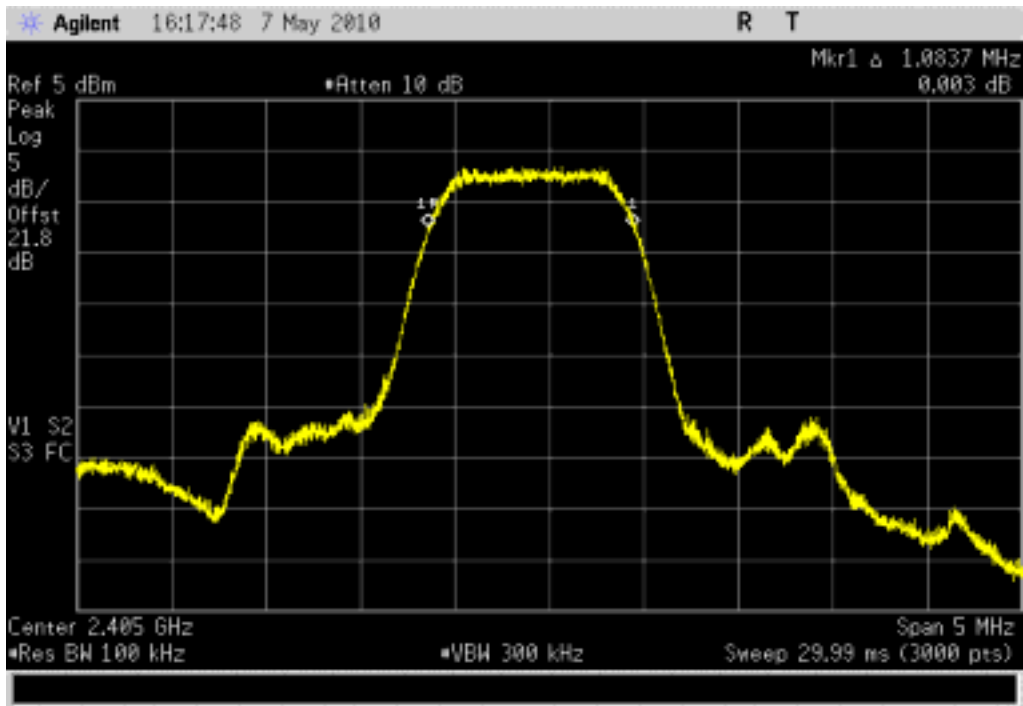
COMMENTS
None

DEVIATIONS FROM TEST STANDARD
No Deviations

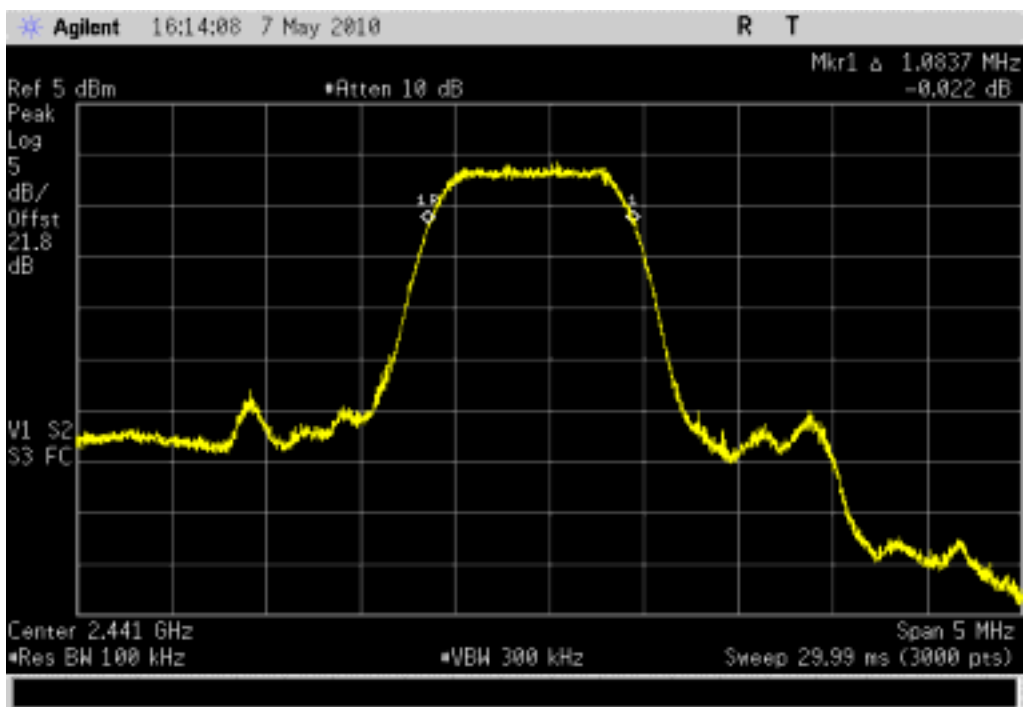
Configuration #	2	Signature 
------------------------	---	---

	Value	Limit	Results
Low Channel	1.084 MHz	> 500 kHz	Pass
Mid Channel	1.084 MHz	> 500 kHz	Pass
High Channel	1.087 MHz	> 500 kHz	Pass

Low Channel		
Result: Pass	Value: 1.084 MHz	Limit: > 500 kHz



Mid Channel		
Result: Pass	Value: 1.084 MHz	Limit: > 500 kHz



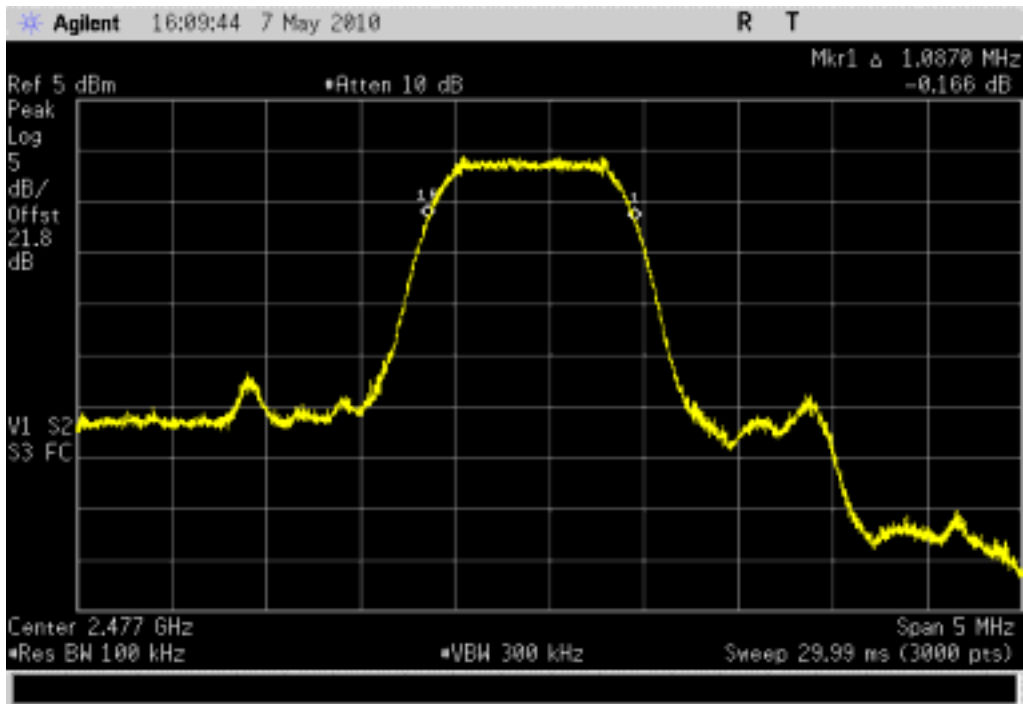
OCCUPIED BANDWIDTH

High Channel

Result: Pass

Value: 1.087 MHz

Limit: > 500 kHz





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

TEST EQUIPMENT					
Description	Manufacturer	Model	ID	Last Cal.	Interval
Spectrum Analyzer	Agilent	E4407B	AAU	12/12/2008	24
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	7/21/2009	13
26 GHz DC Block, SMA	Pasternack	PE8210	AME	10/19/2009	13
Power Meter	Gigatronics	8651A	SPM	1/7/2010	13
Power Sensor	Gigatronics	80701A	SPL	1/7/2010	13
Signal Generator	Agilent	E8257D	TGX	12/10/2008	24

MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

TEST DESCRIPTION

The peak output power 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 a spectrum analyzer. The EUT was transmitting at its maximum data rate in a no hop mode.

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

EMC

OUTPUT POWER

EUT: A-00023	Work Order: LABT0369
Serial Number: #1	Date: 05/07/10
Customer: Logitech, Inc.	Temperature: 23°C
Attendees: None	Humidity: 33%
Project: None	Barometric Pres.: 30.19 in
Tested by: Rod Peloquin	Power: Battery
	Job Site: EV06

TEST SPECIFICATIONS	
FCC 15.247:2010	Test Method: ANSI C63.10:2009

COMMENTS
None

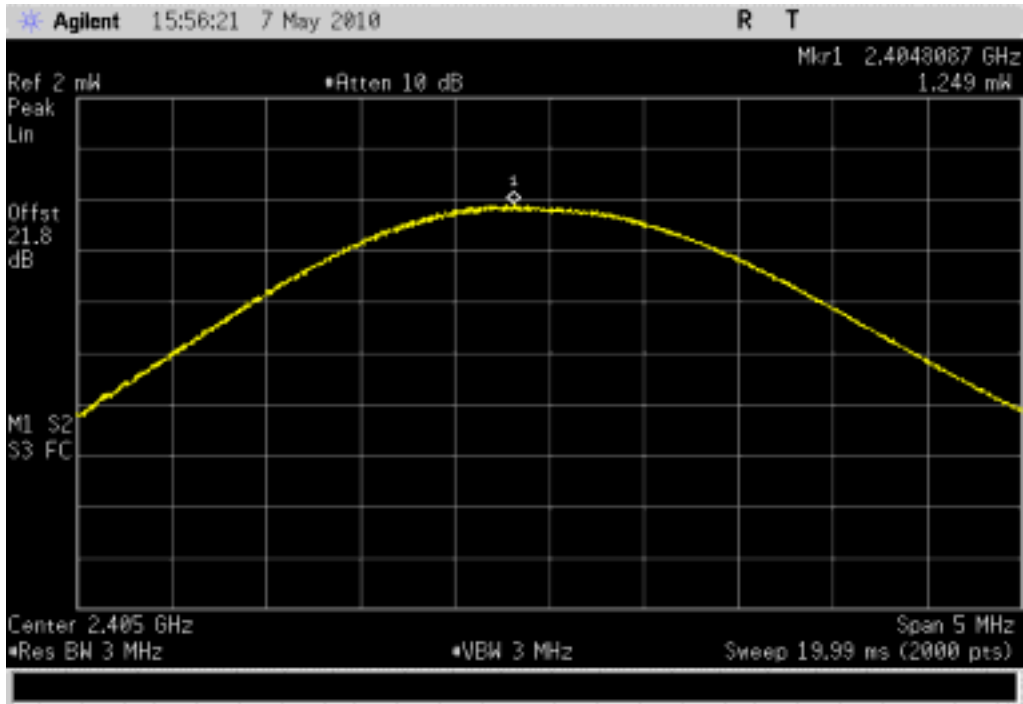
DEVIATIONS FROM TEST STANDARD
No Deviations

Configuration #	2	<i>Rod Peloquin</i> Signature
------------------------	---	----------------------------------

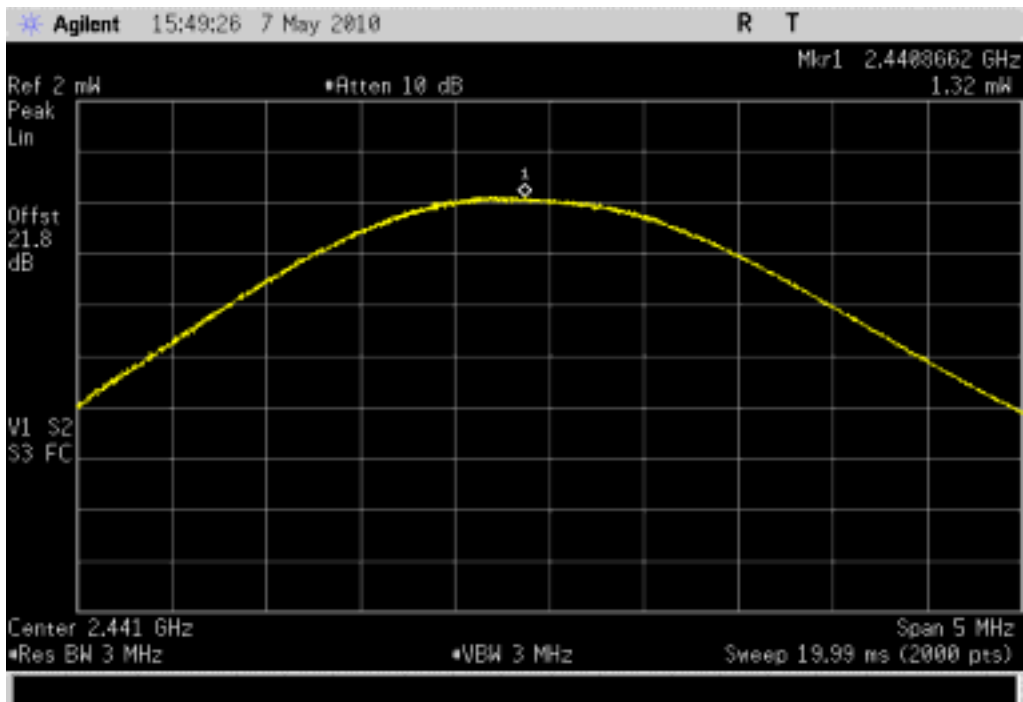
	Value	Limit	Results
Low Channel	1.25 mW	1 W	Pass
Mid Channel	1.32 mW	1W	Pass
High Channel	1.44 mW	1 W	Pass

OUTPUT POWER

Low Channel		
Result: Pass	Value: 1.25 mW	Limit: 1 W



Mid Channel		
Result: Pass	Value: 1.32 mW	Limit: 1W



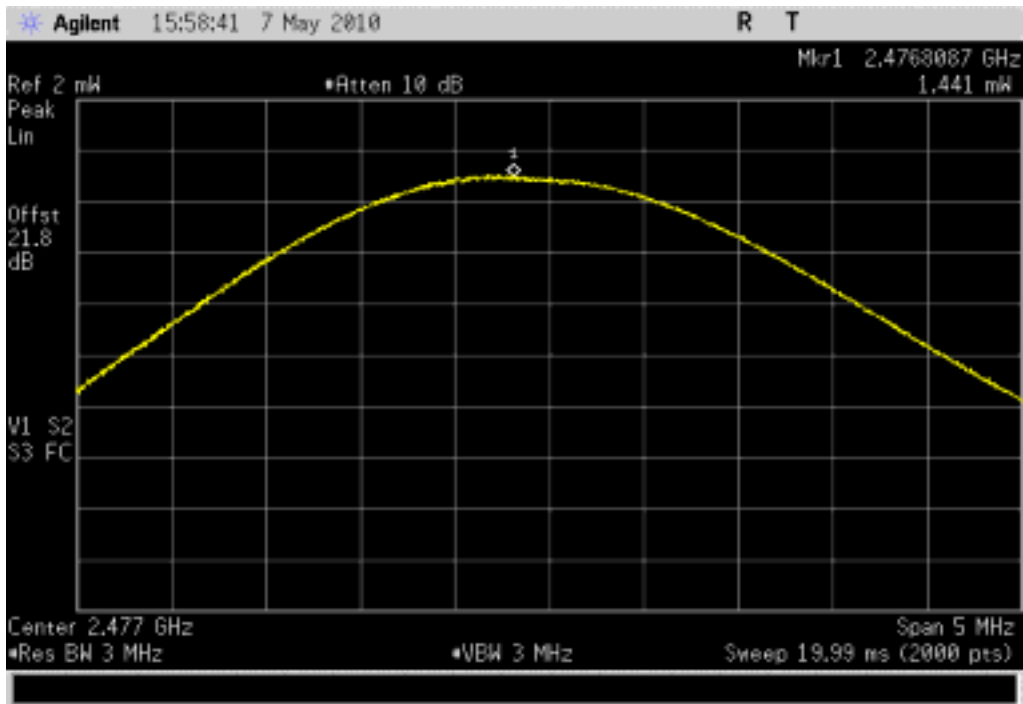
OUTPUT POWER

High Channel

Result: Pass

Value: 1.44 mW

Limit: 1 W





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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Spectrum Analyzer	Agilent	E4407B	AAU	12/12/2008	24
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	7/21/2009	13
26 GHz DC Block, SMA	Pasternack	PE8210	AME	10/19/2009	13
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0

MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.


TEST DESCRIPTION

The spurious RF conducted emissions at the edges of the authorized bands were measured with the EUT set to low and high transmit frequencies in each available band. The channels closest to the band edges were selected. 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 only data rate available.

The spectrum was scanned across each band edge from at least 10 MHz below the band edge to 10 MHz above the band edge.

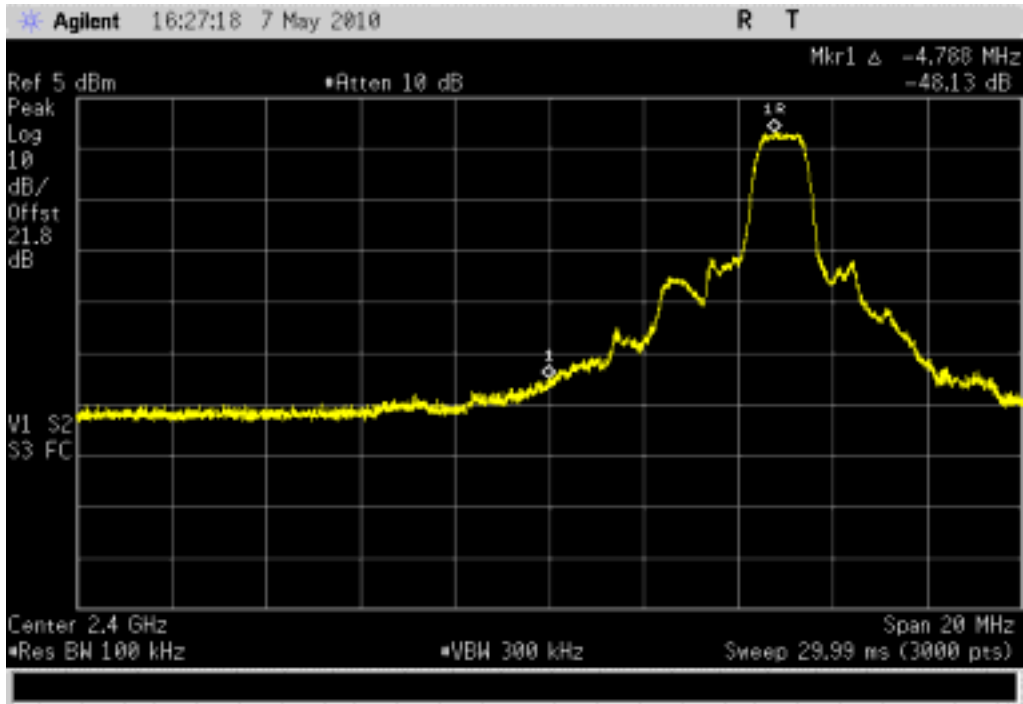
EMC

BAND EDGE COMPLIANCE

EUT:	A-00023	Work Order:	LABT0369
Serial Number:	#1	Date:	05/07/10
Customer:	Logitech, Inc.	Temperature:	23°C
Attendees:	none	Humidity:	33%
Project:	none	Barometric Pres.:	30.19 in
Tested by:	Rod Peloquin	Power:	Battery
		Job Site:	EV06
TEST SPECIFICATIONS		Test Method	
FCC 15.247:2010		ANSI C63.10:2009	
COMMENTS			
None			
DEVIATIONS FROM TEST STANDARD			
No Deviations			
Configuration #	2	Signature 	
		Value	Limit
Low Channel		-48.1 dBc	≤ -20 dBc
High Channel		-52.0 dBc	≤ -20 dBc
			Results
			Pass
			Pass

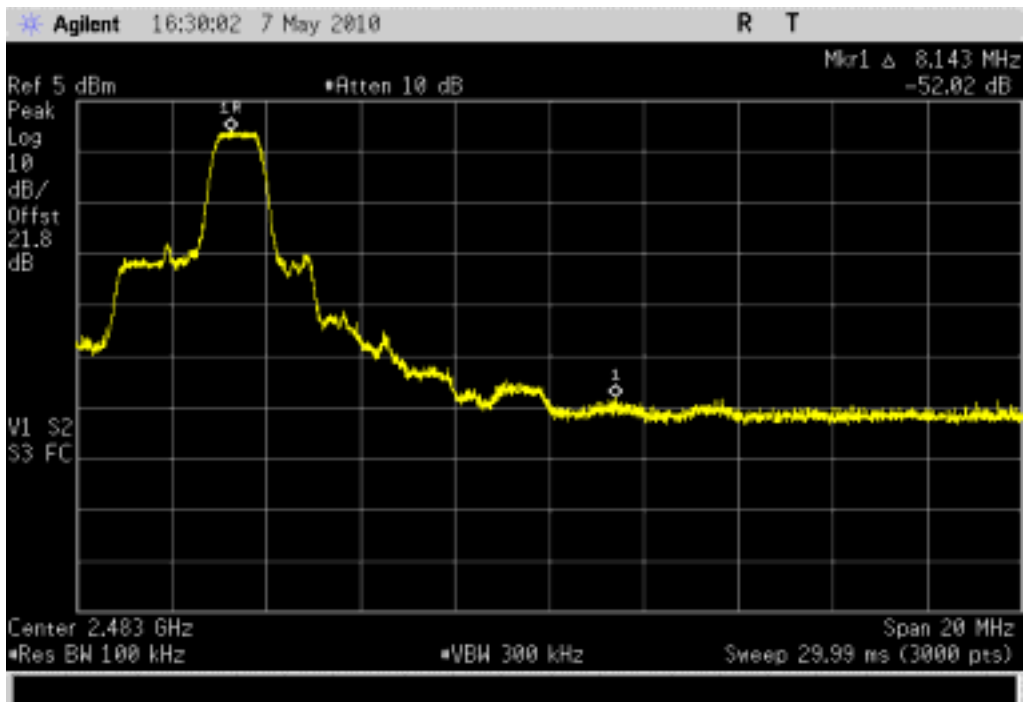
Low Channel

Result: Pass **Value:** -48.1 dBc **Limit:** ≤ -20 dBc



High Channel

Result: Pass **Value:** -52.0 dBc **Limit:** ≤ -20 dBc





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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Spectrum Analyzer	Agilent	E4407B	AAU	12/12/2008	24
26 GHz DC Block, SMA	Pasternack	PE8210	AME	10/19/2009	13
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	7/21/2009	13
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0

MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

TEST DESCRIPTION

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 using direct sequence modulation. For each transmit frequency, the spectrum was scanned throughout the specified frequency range.

EMC

SPURIOUS CONDUCTED EMISSIONS

EUT: A-00023	Work Order: LABT0369
Serial Number: #1	Date: 05/07/10
Customer: Logitech, Inc.	Temperature: 23°C
Attendees: None	Humidity: 33%
Project: None	Barometric Pres.: 30.19 in
Tested by: Rod Peloquin	Power: Battery
	Job Site: EV06

TEST SPECIFICATIONS	Test Method
FCC 15.247:2010	ANSI C63.10:2009

COMMENTS
None

DEVIATIONS FROM TEST STANDARD
No Deviations

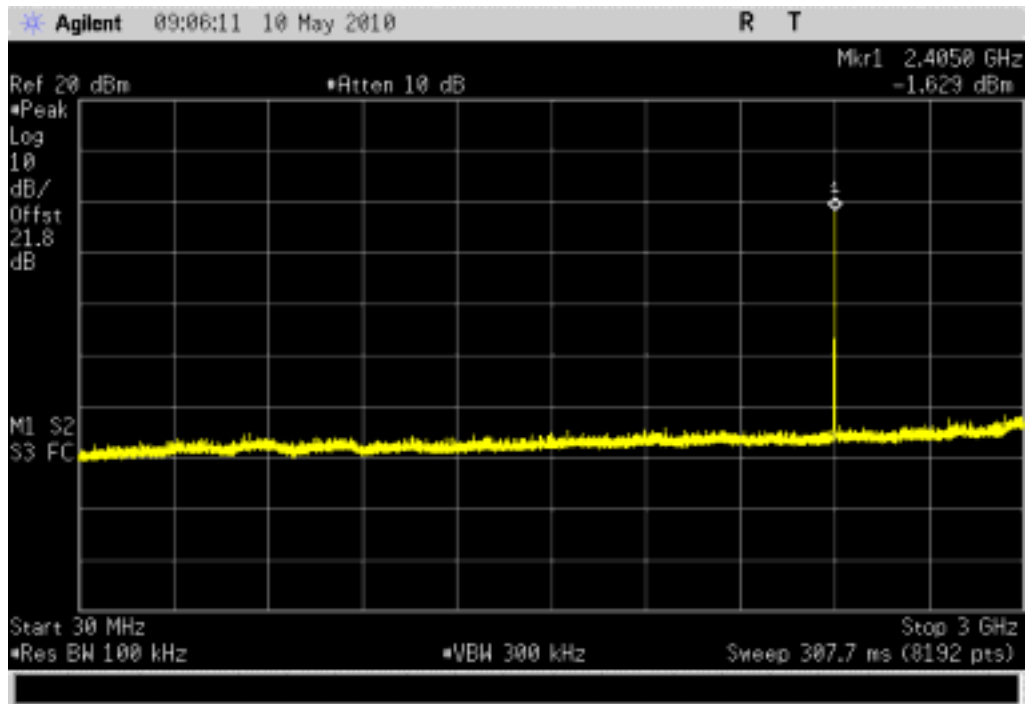
Configuration #	2	Signature 
-----------------	---	---

		Value	Limit	Results
Low Channel				
	0 - 3 GHz	< -30 dBc	≤ -20 dBc	Pass
	3 - 6.5 GHz	-42.4 dBc	≤ -20 dBc	Pass
	6.5 - 12.8 GHz	-38.4 dBc	≤ -20 dBc	Pass
	12.8 - 25 GHz	< -30 dBc	≤ -20 dBc	Pass
Mid Channel				
	0 - 3 GHz	< -30 dBc	≤ -20 dBc	Pass
	3 - 6.5 GHz	-43.2 dBc	≤ -20 dBc	Pass
	6.5 - 12.8 GHz	-36.6 dBc	≤ -20 dBc	Pass
	12.8 - 25 GHz	< -30 dBc	≤ -20 dBc	Pass
High Channel				
	0 - 3 GHz	< -30 dBc	≤ -20 dBc	Pass
	3 - 6.5 GHz	< -30 dBc	≤ -20 dBc	Pass
	6.5 - 12.8 GHz	-34.6 dBc	≤ -20 dBc	Pass
	12.8 - 25 GHz	< -30 dBc	≤ -20 dBc	Pass

Low Channel, 0 - 3 GHz

Result: Pass

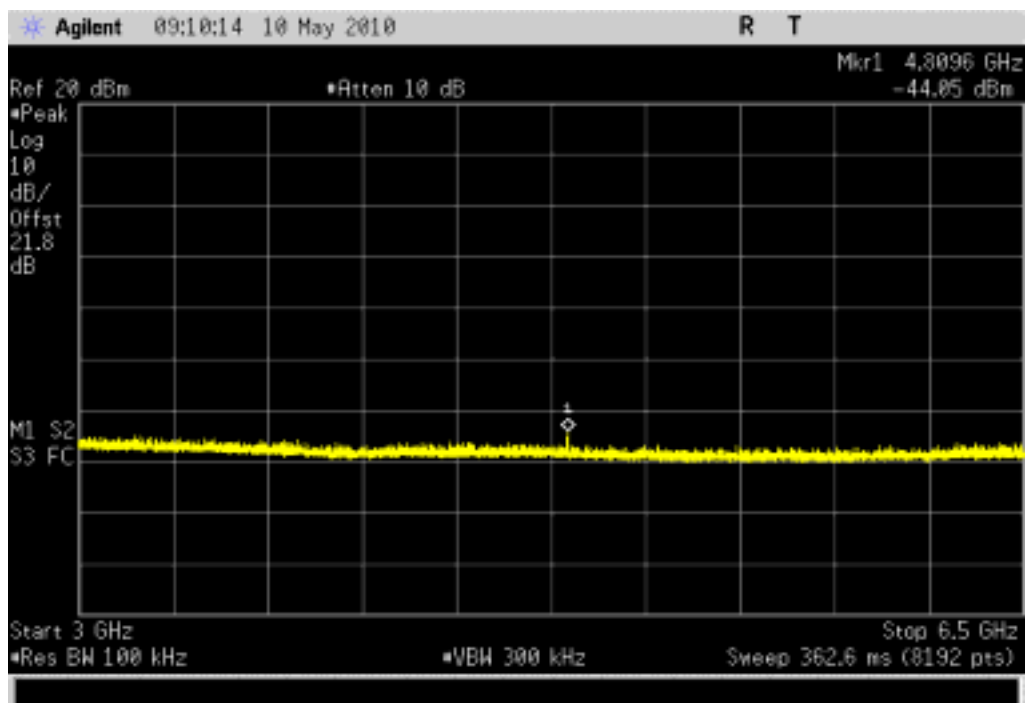
Value: < -30 dBc

Limit: \leq -20 dBc

Low Channel, 3 - 6.5 GHz

Result: Pass

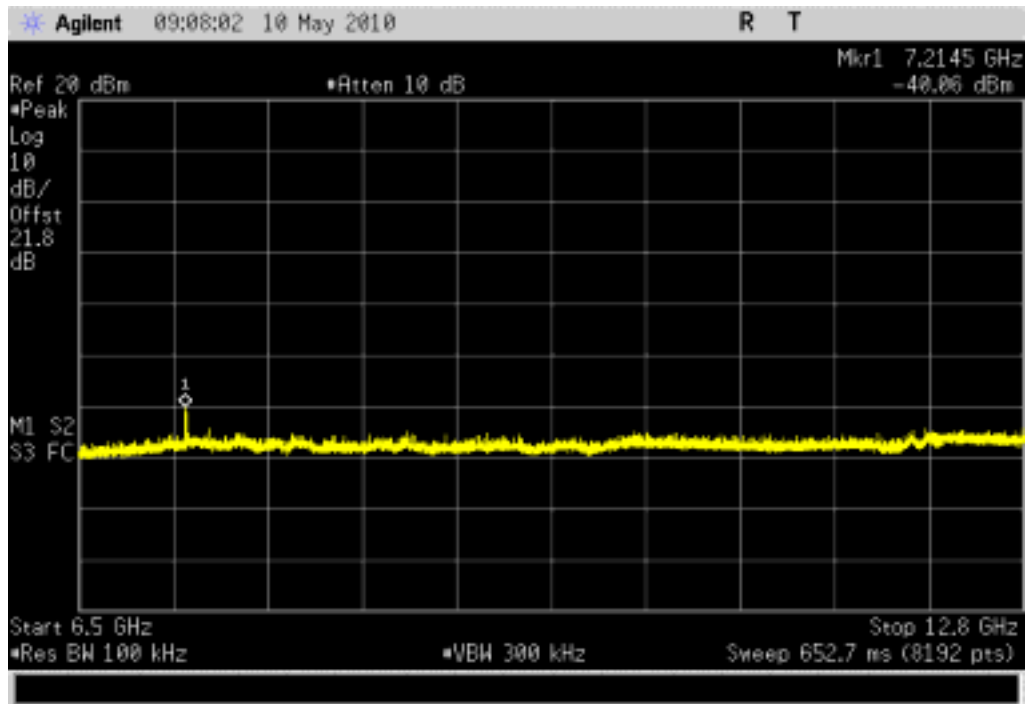
Value: -42.4 dBc

Limit: \leq -20 dBc

Low Channel, 6.5 - 12.8 GHz

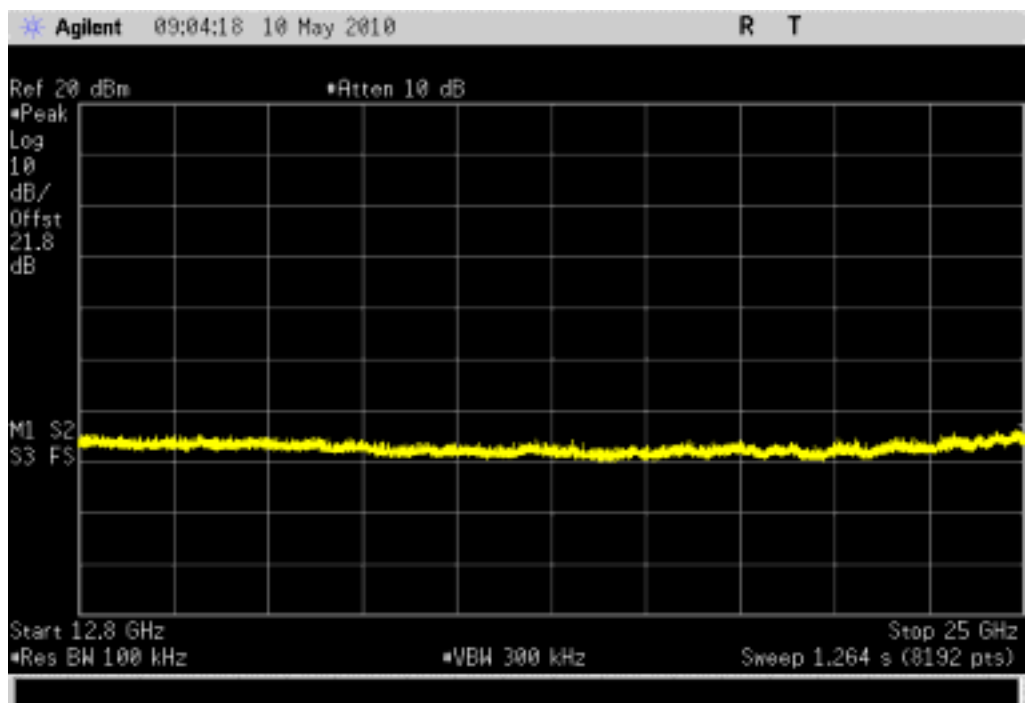
Result: Pass

Value: -38.4 dBc

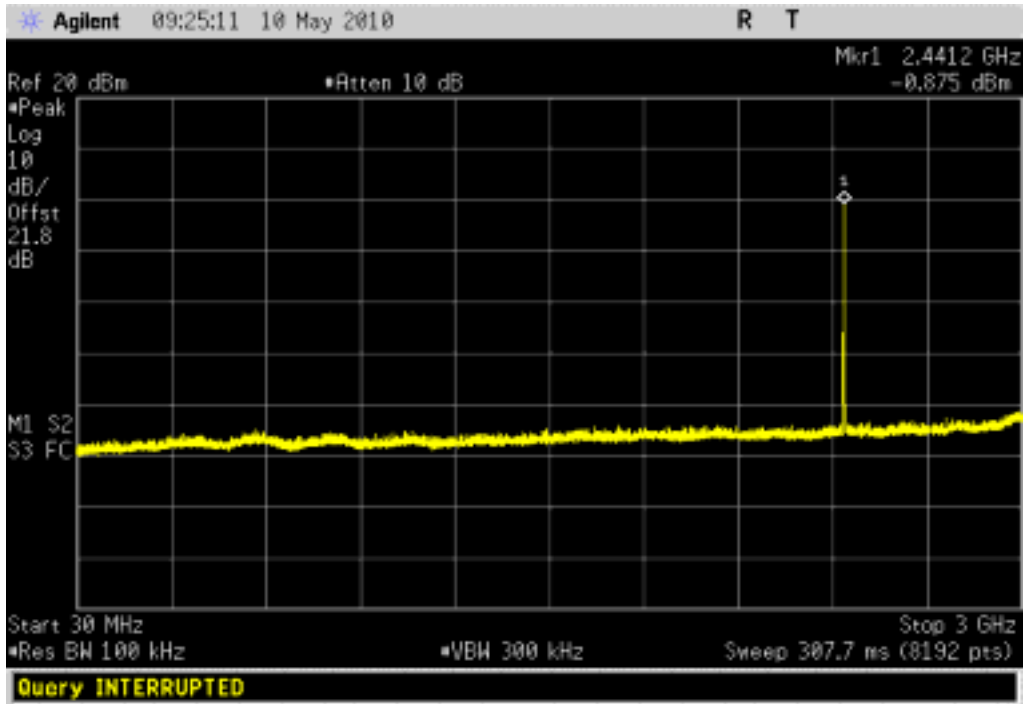
Limit: ≤ -20 dBc

Low Channel, 12.8 - 25 GHz

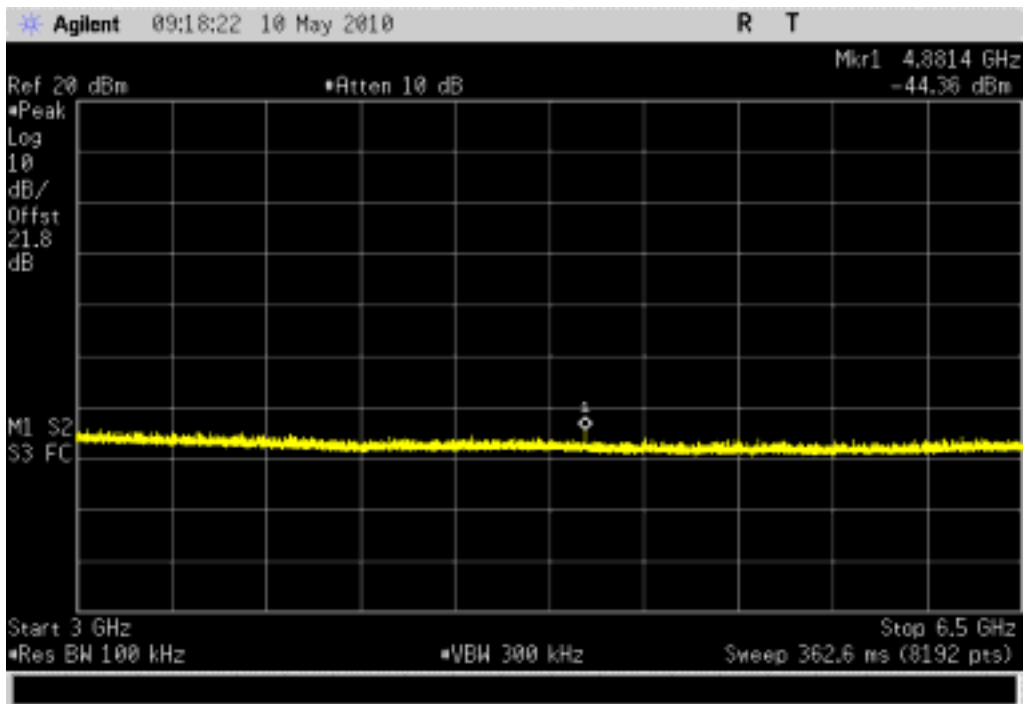
Result: Pass

Value: < -30 dBcLimit: ≤ -20 dBc

Mid Channel, 0 - 3 GHz
Result: Pass **Value:** < -30 dBc **Limit:** ≤ -20 dBc

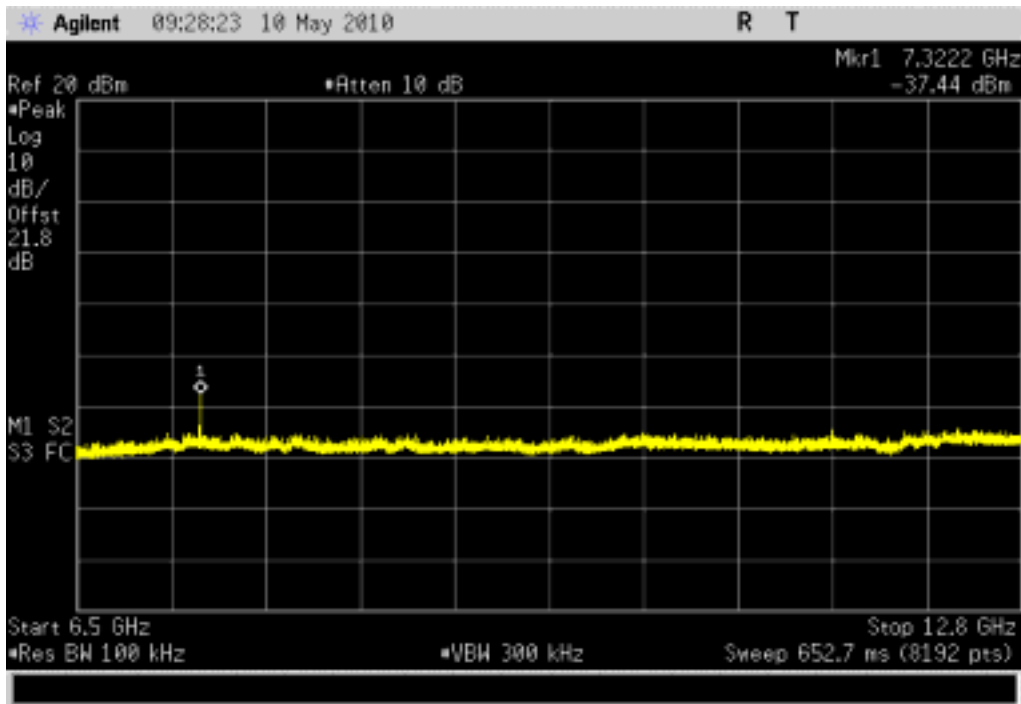


Mid Channel, 3 - 6.5 GHz
Result: Pass **Value:** -43.2 dBc **Limit:** ≤ -20 dBc

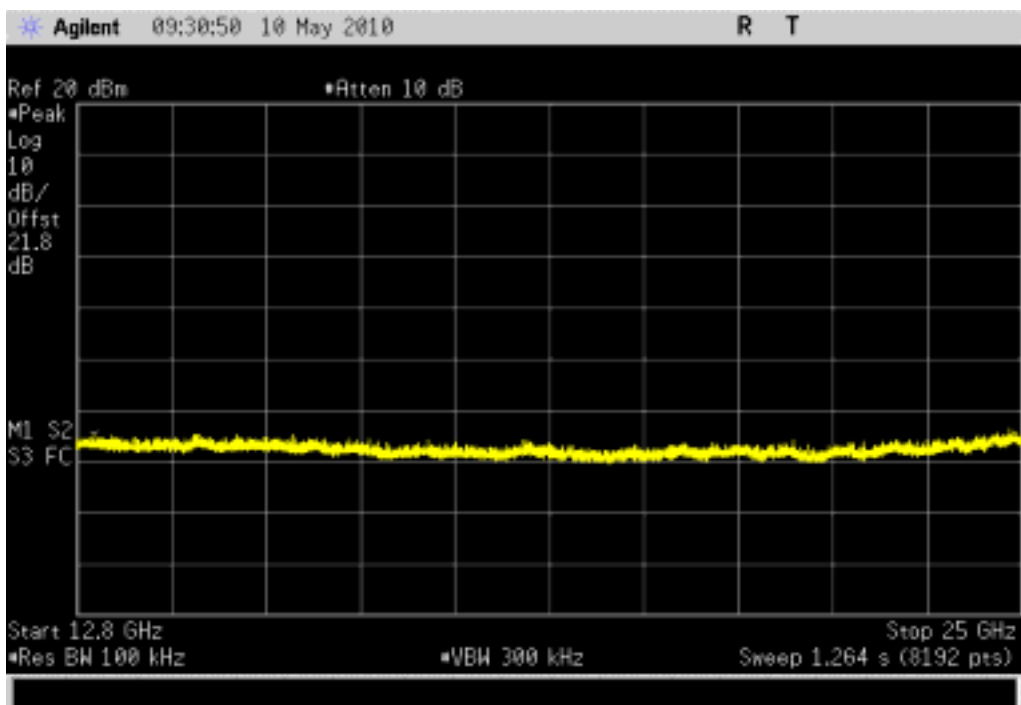


SPURIOUS CONDUCTED EMISSIONS

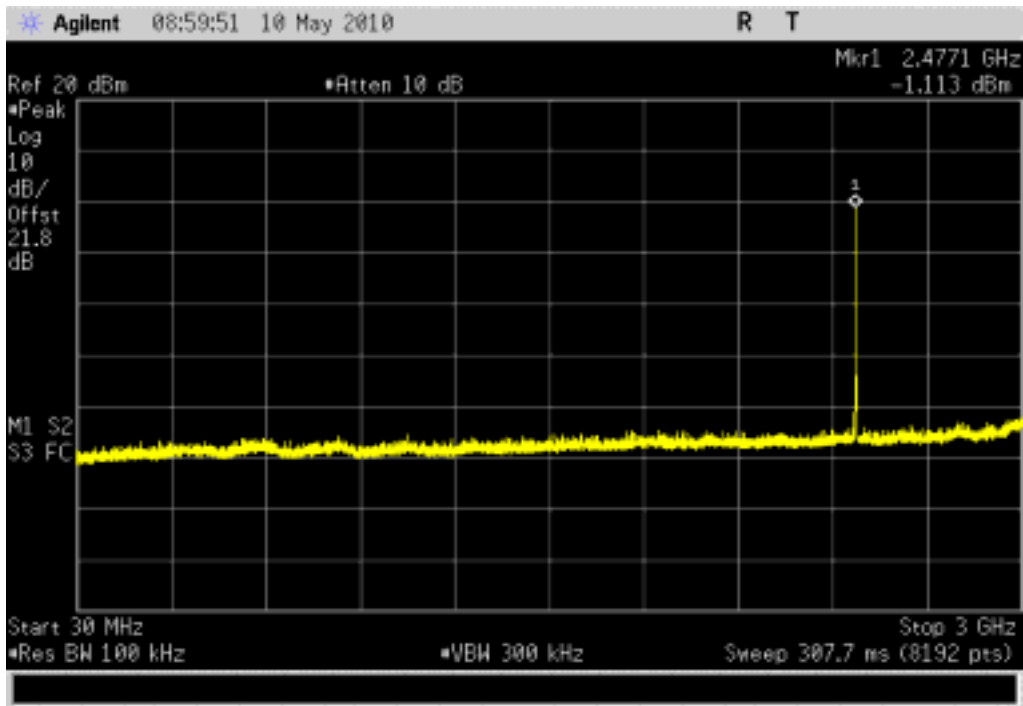
Mid Channel, 6.5 - 12.8 GHz		
Result: Pass	Value: -36.6 dBc	Limit: ≤ -20 dBc



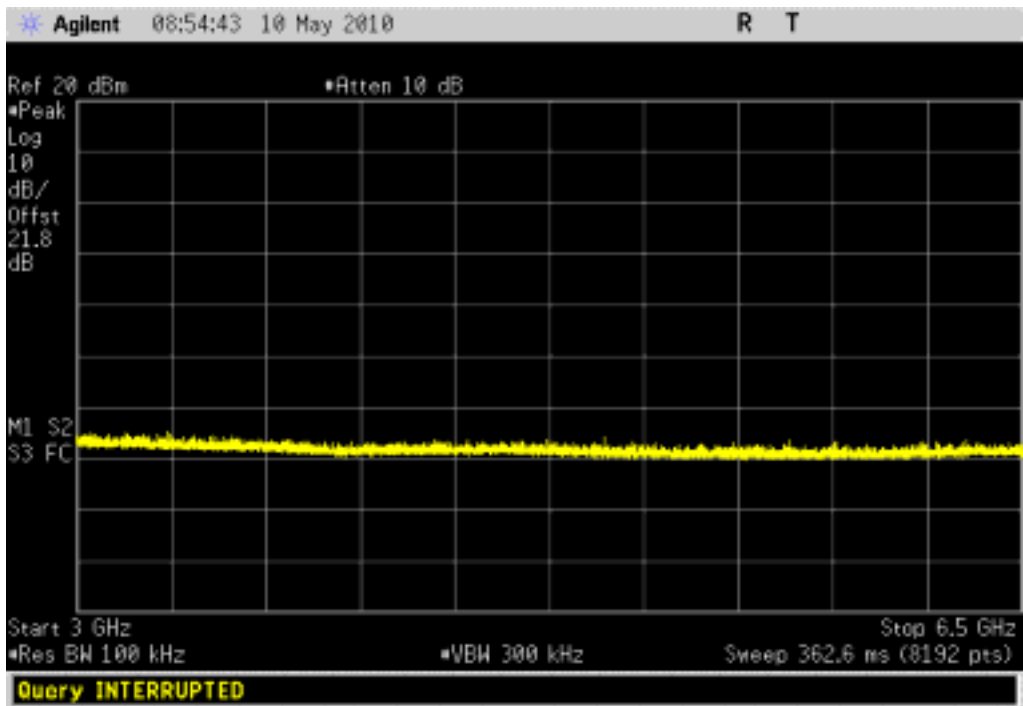
Mid Channel, 12.8 - 25 GHz		
Result: Pass	Value: < -30 dBc	Limit: ≤ -20 dBc



High Channel, 0 - 3 GHz
Result: Pass **Value:** < -30 dBc **Limit:** ≤ -20 dBc

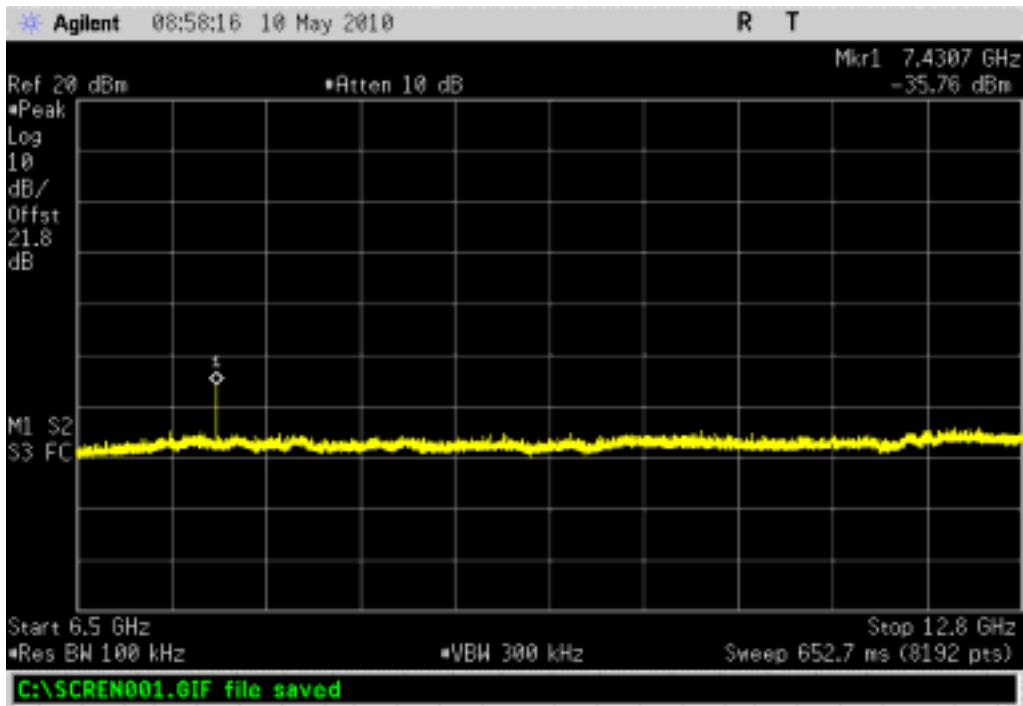


High Channel, 3 - 6.5 GHz
Result: Pass **Value:** < -30 dBc **Limit:** ≤ -20 dBc

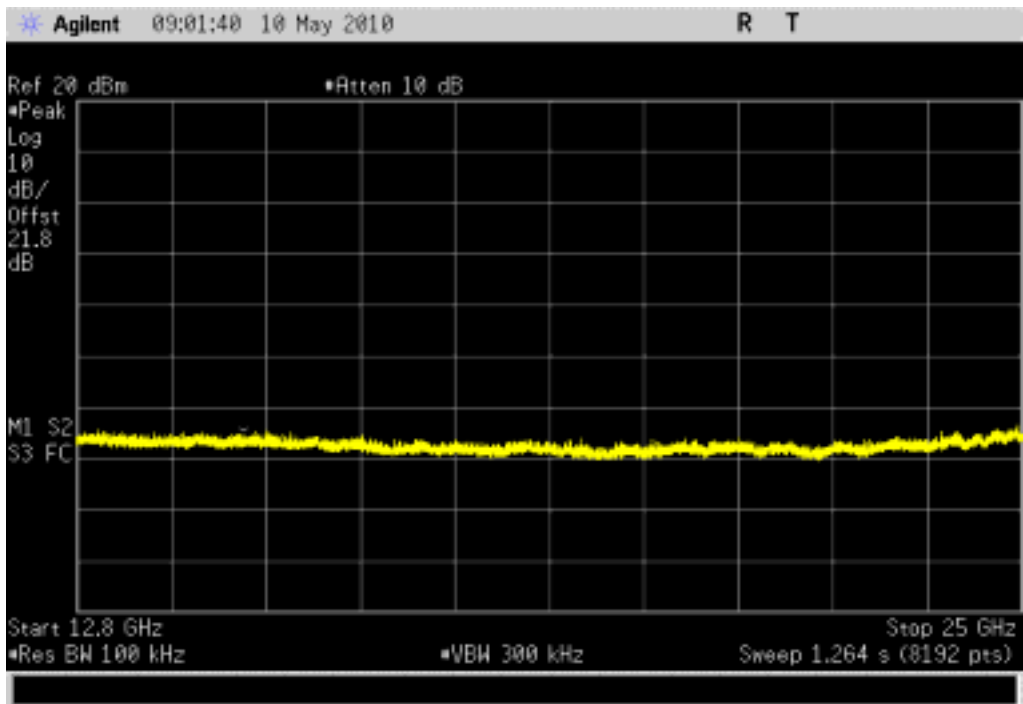


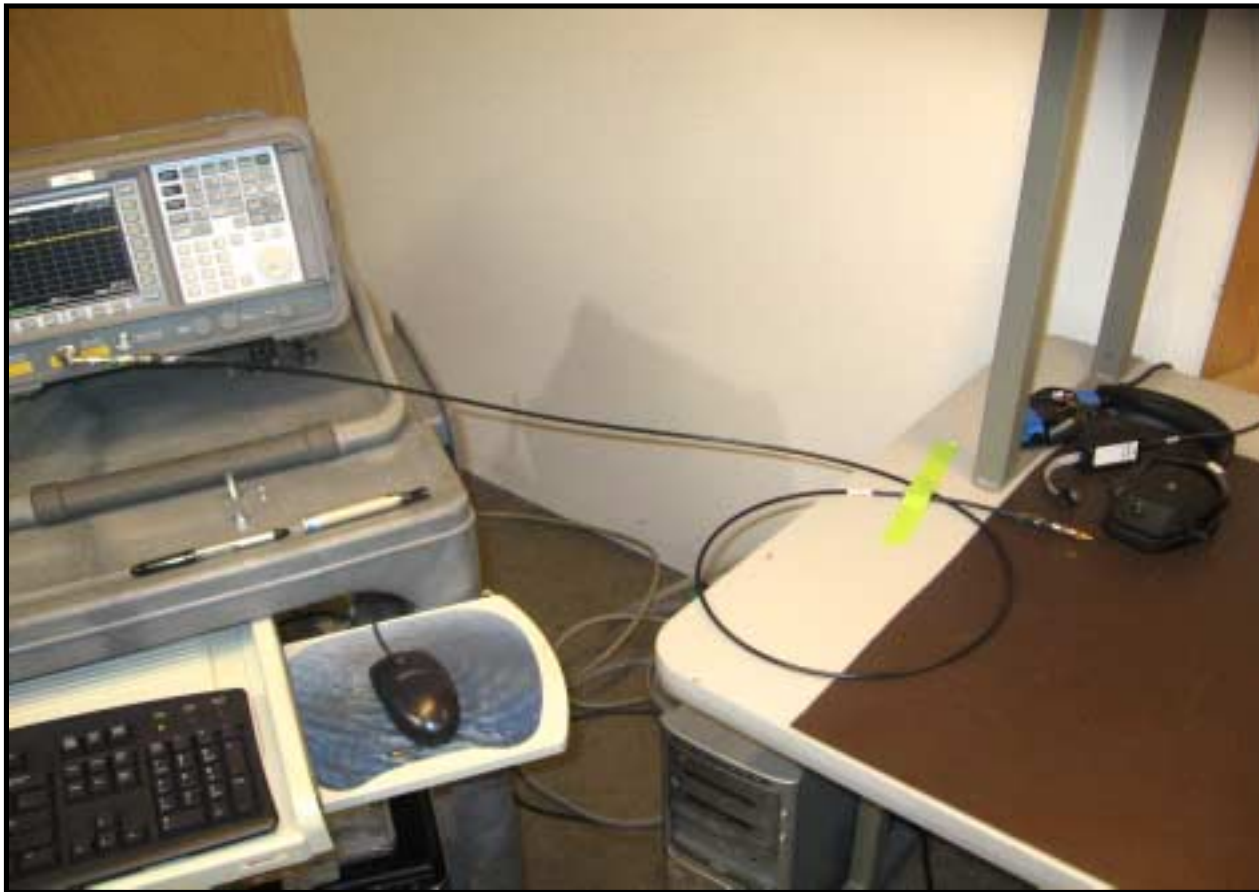
SPURIOUS CONDUCTED EMISSIONS

High Channel, 6.5 - 12.8 GHz		
Result: Pass	Value: -34.6 dBc	Limit: ≤ -20 dBc



High Channel, 12.8 - 25 GHz		
Result: Pass	Value: < -30 dBc	Limit: ≤ -20 dBc





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

TEST EQUIPMENT					
Description	Manufacturer	Model	ID	Last Cal.	Interval
Spectrum Analyzer	Agilent	E4407B	AAU	12/12/2008	24
26 GHz DC Block, SMA	Pasternack	PE8210	AME	10/19/2009	13
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	7/21/2009	13
Attenuator, 6 dB, 'SMA'	N/A	93459 3330A-6	AUF	4/1/2010	13
Power Meter	Gigatronics	8651A	SPM	1/7/2010	13
Power Sensor	Gigatronics	80701A	SPL	1/7/2010	13
Signal Generator	Agilent	E8257D	TGX	12/10/2008	24

MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

TEST DESCRIPTION

The peak power spectral density measurements were measured with the EUT set to low, mid, 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 for each modulation type available. Per the procedure outlined in FCC KDB 558074, March 23, 2005, the spectrum analyzer was used as follows:

The emission peak(s) were located and zoom in on within the passband. The resolution bandwidth was set to 3 kHz, the video bandwidth was set to greater than or equal to the resolution bandwidth. The sweep speed was set equal to the span divided by 3 kHz (sweep = (SPAN/3 kHz)). For example, given a span of 1.5 MHz, the sweep should be $1.5 \times 10^6 \div 3 \times 10^3 = 500$ seconds. External attenuation was used and added to the reading. The following FCC procedure was used for modifying the power spectral density measurements:

"If the spectrum line spacing cannot be resolved on the available spectrum analyzer, the noise density function on most modern conventional spectrum analyzers will directly measure the noise power density normalized to a 1 Hz noise power bandwidth. Add 35 dB for correction to 3 kHz."

EMC

POWER SPECTRAL DENSITY

EUT: A-00023	Work Order: LABT0369
Serial Number: #1	Date: 05/07/10
Customer: Logitech, Inc.	Temperature: 23°C
Attendees: None	Humidity: 33%
Project: None	Barometric Pres.: 30.19 in
Tested by: Rod Peloquin	Power: Battery
	Job Site: EV06

TEST SPECIFICATIONS	
FCC 15.247:2010	Test Method: ANSI C63.10:2009

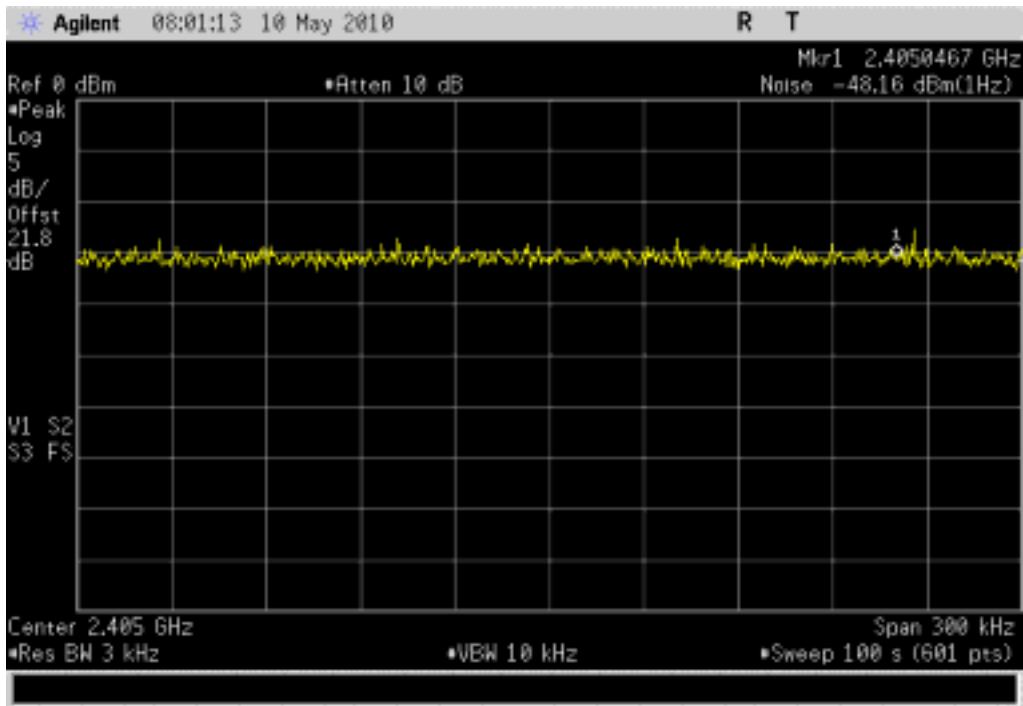
COMMENTS
None

DEVIATIONS FROM TEST STANDARD
No Deviations

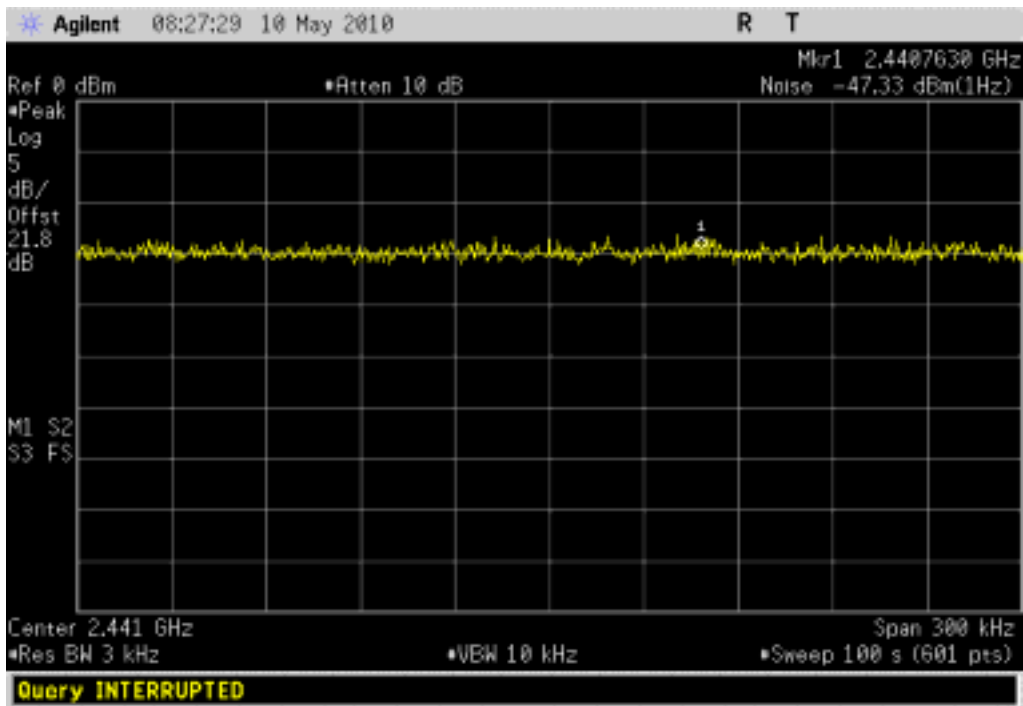
Configuration #	2	<i>Rod L. Peloquin</i> Signature
------------------------	---	-------------------------------------

	Value	Limit	Results
Low Channel	-13.36 dBm / 3 kHz	8 dBm / 3 kHz	Pass
Mid Channel	-12.53 dBm / 3 kHz	8 dBm / 3 kHz	Pass
High Channel	-12.44 dBm / 3 kHz	8 dBm / 3 kHz	Pass

Low Channel
Result: Pass **Value:** -13.36 dBm / 3 kHz **Limit:** 8 dBm / 3 kHz



Mid Channel
Result: Pass **Value:** -12.53 dBm / 3 kHz **Limit:** 8 dBm / 3 kHz



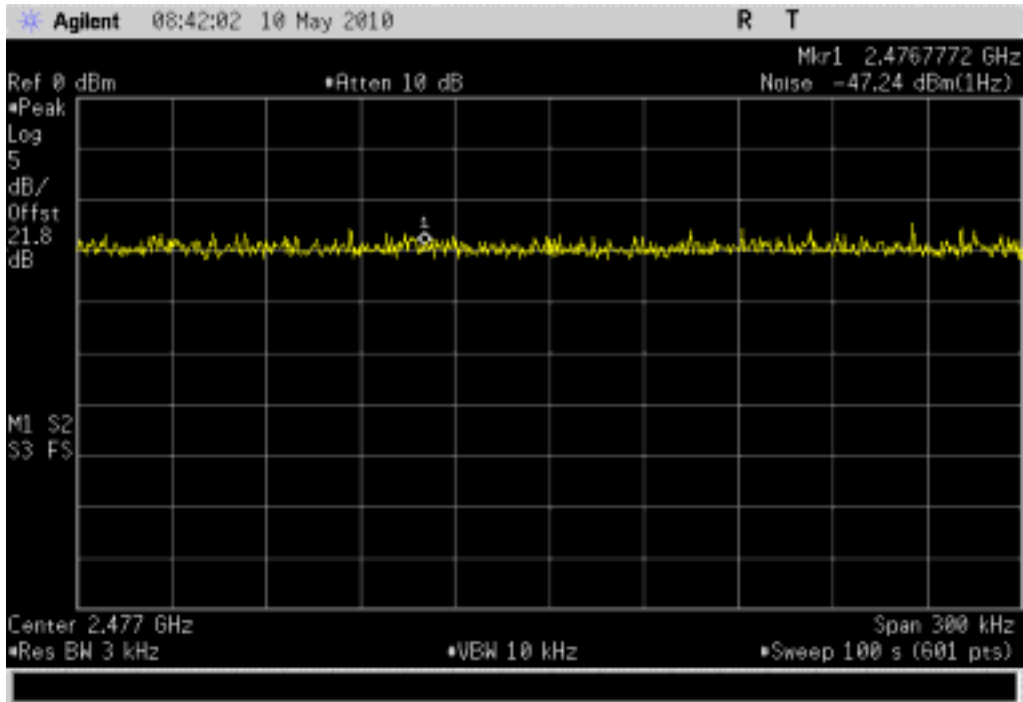
POWER SPECTRAL DENSITY

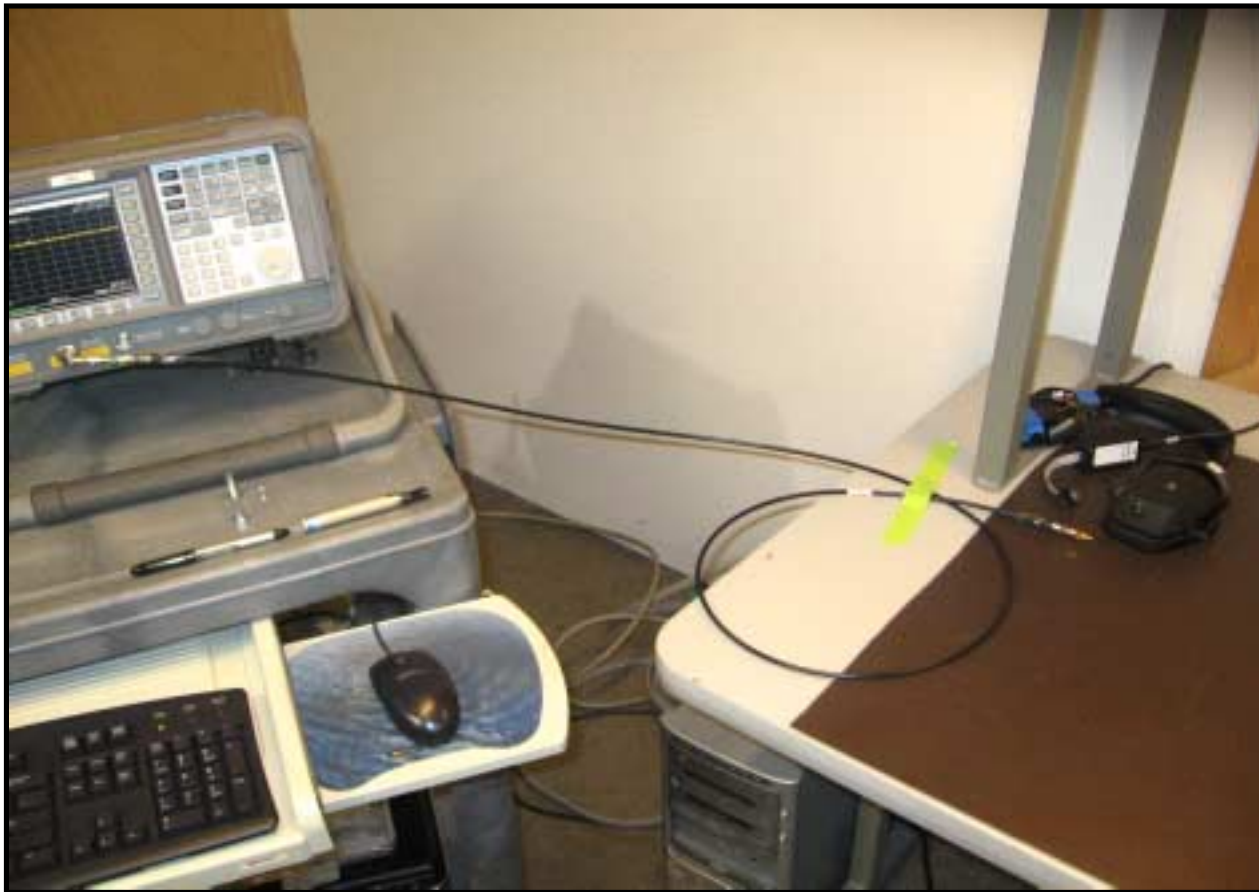
High Channel

Result: Pass

Value: -12.44 dBm / 3 kHz

Limit: 8 dBm / 3 kHz





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

MODES OF OPERATION

Transmitting continuous, high antenna
Transmitting continuous, low antenna

CHANNELS INVESTIGATED

Low, Mid, and High channels

POWER SETTINGS INVESTIGATED

Battery

FREQUENCY RANGE INVESTIGATED

Start Frequency	30MHz	Stop Frequency	26.5 GHz
-----------------	-------	----------------	----------

SAMPLE CALCULATIONS

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Antenna, Horn	ETS Lindgren	3160-09	AIV	NCR	0
Cable	ESM Cable Corp.	KMKM-72	EVZ	11/3/2009	13
Pre-Amplifier	Miteq	AMF-6F-18002650-25-10P	AVU	5/19/2009	13
Antenna, Horn	ETS	3160-08	AIA	NCR	0
Cable	ESM Cable Corp.	KMKM-72	EVY	11/3/2009	13
Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AVI	6/26/2009	13
EV12 Cables	N/A	Standard Gain Horn Cables	EVU	6/25/2009	13
Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AVH	6/26/2009	13
High Pass Filter	Micro-Tronics	50111	HGE	1/13/2010	13
Pre-Amplifier	Miteq	JSW45-26004000-40-5P	AVN	9/30/2009	13
Antenna, Horn	ETS	3115	AIB	8/25/2008	24
EV12 Cables	N/A	Double Ridge Horn Cables	EVT	10/23/2009	13
Pre-Amplifier	Miteq	AMF-3D00100800-32-13P	AVF	6/25/2009	13
Antenna, Biconilog	EMCO	3141	AXG	2/15/2010	13
EV12 Cables	N/A	Bilog Cables	EVS	6/25/2009	13
Pre-Amplifier	Miteq	AM-1616-1000	AVM	6/25/2009	13
Spectrum Analyzer	Agilent	E4440A	AFD	6/1/2009	24

MEASUREMENT BANDWIDTHS

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

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

MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. The measurement uncertainty estimation is available upon request.

TEST DESCRIPTION

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 axes, and adjusting measurement antenna height and polarization, and manipulating the EUT antenna in 3 orthogonal planes (per ANSI C63.10:2009). A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

EMC

SPURIOUS RADIATED EMISSIONS

EUT: A-00023	Work Order: LABT0369
Serial Number: #1	Date: 05/10/10
Customer: Logitech, Inc.	Temperature: 23°C
Attendees: None	Humidity: 33%
Project: None	Barometric Pres.: 30.19 in
Tested by: Ethan Schoonover	Power: Battery
	Job Site: EV12

TEST SPECIFICATIONS	Test Method
FCC 15.247:2010	ANSI C63.10:2009

TEST PARAMETERS
Antenna Height(s) (m) 1 - 4 Test Distance (m) 3

COMMENTS
See below

EUT OPERATING MODES

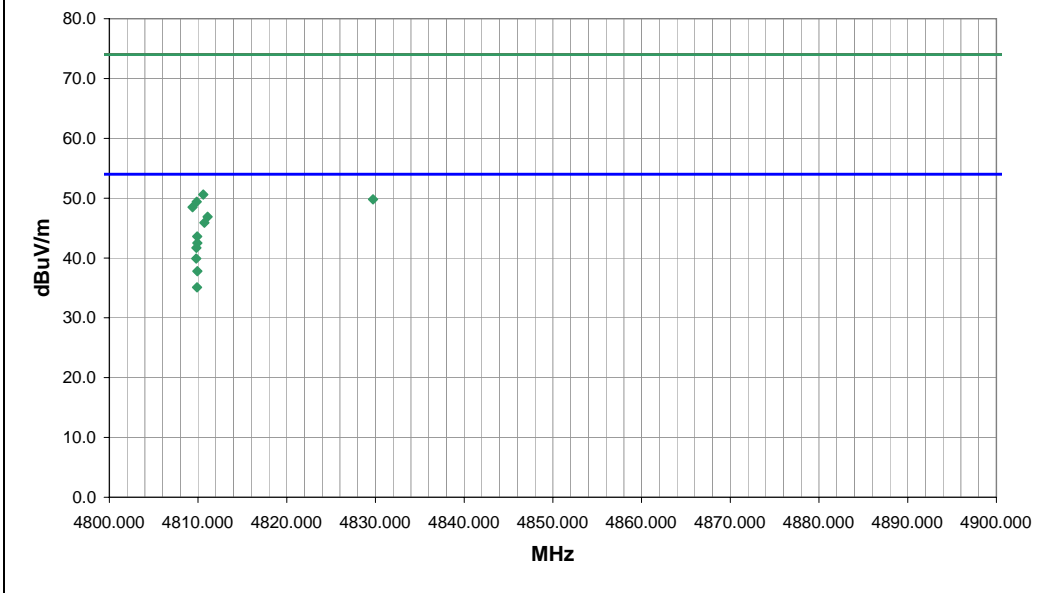
Tx, high antenna

DEVIATIONS FROM TEST STANDARD

No deviations.

Run #	1
Configuration #	2
Results	Pass

Signature 



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)	Comments
4809.895	35.0	8.6	136.0	1.0	3.0	0.0	H-Horn	AV	0.0	43.6	54.0	-10.4	EUT Normal orientation.
4809.924	33.9	8.6	150.0	1.0	3.0	0.0	V-Horn	AV	0.0	42.5	54.0	-11.5	EUT on side.
4809.817	33.2	8.5	85.0	1.0	3.0	0.0	V-Horn	AV	0.0	41.7	54.0	-12.3	EUT on back.
4809.801	31.3	8.6	146.0	1.0	3.0	0.0	H-Horn	AV	0.0	39.9	54.0	-14.1	EUT on side.
4809.918	29.2	8.6	175.0	1.0	3.0	0.0	H-Horn	AV	0.0	37.8	54.0	-16.2	EUT on back.
4809.883	26.5	8.6	214.0	1.0	3.0	0.0	V-Horn	AV	0.0	35.1	54.0	-18.9	EUT Normal orientation.
4810.590	42.0	8.6	136.0	1.0	3.0	0.0	H-Horn	PK	0.0	50.6	74.0	-23.4	EUT Normal orientation.
4829.720	41.2	8.6	85.0	1.0	3.0	0.0	V-Horn	PK	0.0	49.8	74.0	-24.2	EUT on back.
4809.840	40.8	8.6	150.0	1.0	3.0	0.0	V-Horn	PK	0.0	49.4	74.0	-24.6	EUT on side.
4809.380	39.9	8.6	146.0	1.0	3.0	0.0	H-Horn	PK	0.0	48.5	74.0	-25.5	EUT on side.
4811.070	38.3	8.6	175.0	1.0	3.0	0.0	H-Horn	PK	0.0	46.9	74.0	-27.1	EUT on back.
4810.720	37.3	8.6	214.0	1.0	3.0	0.0	V-Horn	PK	0.0	45.9	74.0	-28.1	EUT Normal orientation.

EUT: A-00023	Work Order: LABT0369
Serial Number: #1	Date: 05/10/10
Customer: Logitech, Inc.	Temperature: 23°C
Attendees: None	Humidity: 33%
Project: None	Barometric Pres.: 30.19 in
Tested by: Ethan Schoonover	Power: Battery
	Job Site: EV12

TEST SPECIFICATIONS	Test Method
FCC 15.247:2010	ANSI C63.10:2009

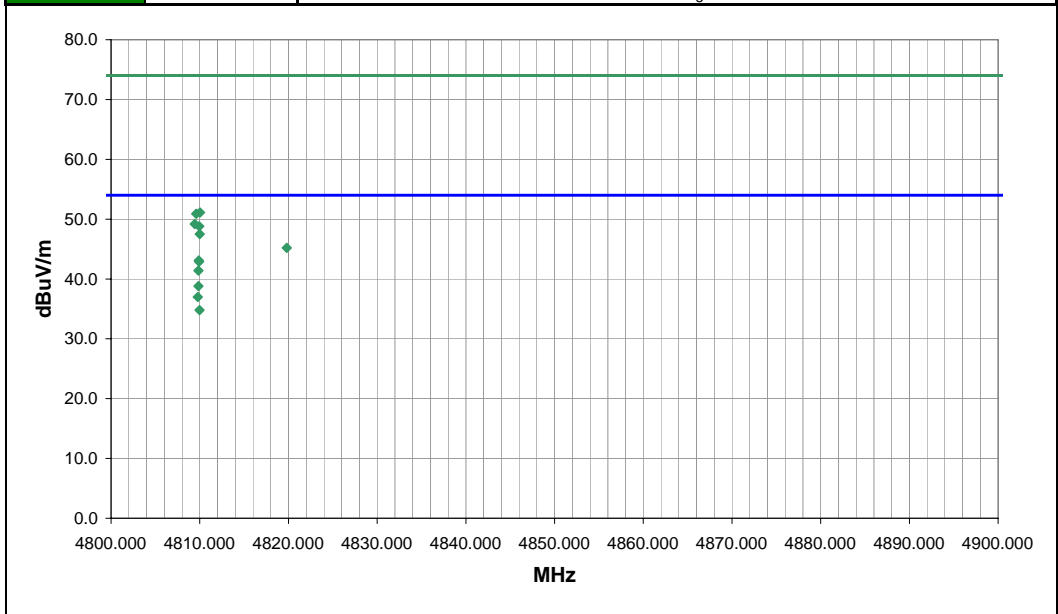
TEST PARAMETERS
Antenna Height(s) (m) 1 - 4 Test Distance (m) 3

COMMENTS
See below

EUT OPERATING MODES
Tx, low antenna

DEVIATIONS FROM TEST STANDARD
No deviations.

Run #	2	Signature 
Configuration #	2	
Results	Pass	



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)	Comments
4809.883	34.5	8.6	51.0	1.5	3.0	0.0	V-Horn	AV	0.0	43.1	54.0	-10.9	EUT on back.
4809.924	34.3	8.6	331.0	1.7	3.0	0.0	H-Horn	AV	0.0	42.9	54.0	-11.1	EUT on side.
4809.847	32.8	8.6	69.0	1.0	3.0	0.0	V-Horn	AV	0.0	41.4	54.0	-12.6	EUT in typical orientation.
4809.842	30.2	8.6	41.0	1.7	3.0	0.0	H-Horn	AV	0.0	38.8	54.0	-15.2	EUT on back.
4809.777	28.4	8.6	336.0	1.1	3.0	0.0	V-Horn	AV	0.0	37.0	54.0	-17.0	EUT on side.
4809.977	26.2	8.6	360.0	1.3	3.0	0.0	H-Horn	AV	0.0	34.8	54.0	-19.2	EUT in typical orientation.
4810.020	42.5	8.6	331.0	1.7	3.0	0.0	H-Horn	PK	0.0	51.1	74.0	-22.9	EUT on side.
4809.600	42.3	8.6	51.0	1.5	3.0	0.0	V-Horn	PK	0.0	50.9	74.0	-23.1	EUT on back.
4809.440	40.6	8.6	69.0	1.0	3.0	0.0	V-Horn	PK	0.0	49.2	74.0	-24.8	EUT in typical orientation.
4809.940	40.2	8.6	41.0	1.7	3.0	0.0	H-Horn	PK	0.0	48.8	74.0	-25.2	EUT on back.
4810.000	38.9	8.6	336.0	1.1	3.0	0.0	V-Horn	PK	0.0	47.5	74.0	-26.5	EUT on side.
4819.800	36.6	8.6	360.0	1.3	3.0	0.0	H-Horn	PK	0.0	45.2	74.0	-28.8	EUT in typical orientation.

EUT: A-00023	Work Order: LABT0369
Serial Number: #1	Date: 05/10/10
Customer: Logitech, Inc.	Temperature: 23°C
Attendees: None	Humidity: 33%
Project: None	Barometric Pres.: 30.19 in
Tested by: Ethan Schoonover	Power: Battery
	Job Site: EV12

TEST SPECIFICATIONS	Test Method
FCC 15.247:2010	ANSI C63.10:2009

TEST PARAMETERS			
Antenna Height(s) (m)	1 - 4	Test Distance (m)	3

COMMENTS

See below. EUT on back

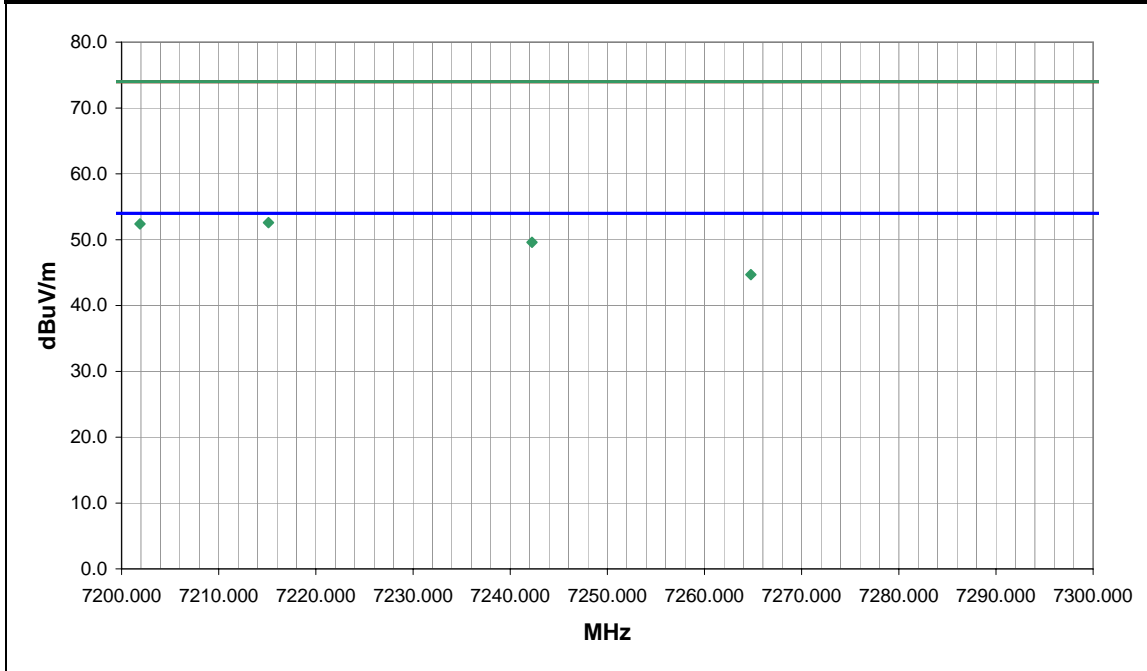
EUT OPERATING MODES

Tx, high antenna

DEVIATIONS FROM TEST STANDARD

No deviations.

Run #	3	Signature 
Configuration #	2	
Results	Pass	



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)	Comments
7242.250	34.6	15.0	36.0	1.0	3.0	0.0	V-Horn	AV	0.0	49.6	54.0	-4.4	
7264.780	29.7	15.0	92.0	1.0	3.0	0.0	H-Horn	AV	0.0	44.7	54.0	-9.3	
7215.120	37.6	15.0	92.0	1.0	3.0	0.0	H-Horn	PK	0.0	52.6	74.0	-21.4	
7201.890	37.4	15.0	36.0	1.0	3.0	0.0	V-Horn	PK	0.0	52.4	74.0	-21.6	

EUT: A-00023	Work Order: LABT0369
Serial Number: #1	Date: 05/10/10
Customer: Logitech, Inc.	Temperature: 23°C
Attendees: None	Humidity: 33%
Project: None	Barometric Pres.: 30.19 in
Tested by: Ethan Schoonover	Power: Battery
	Job Site: EV12

TEST SPECIFICATIONS	Test Method
FCC 15.247:2010	ANSI C63.10:2009

TEST PARAMETERS	
Antenna Height(s) (m) 1 - 4	Test Distance (m) 3

COMMENTS
See below

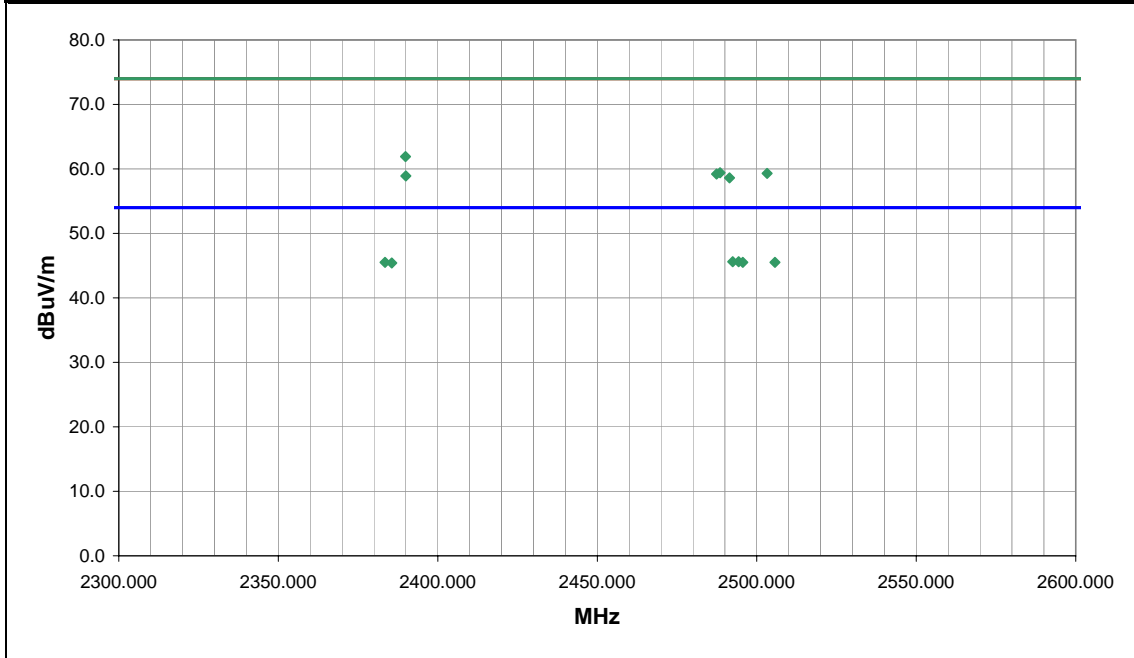
EUT OPERATING MODES

Tx, high antenna

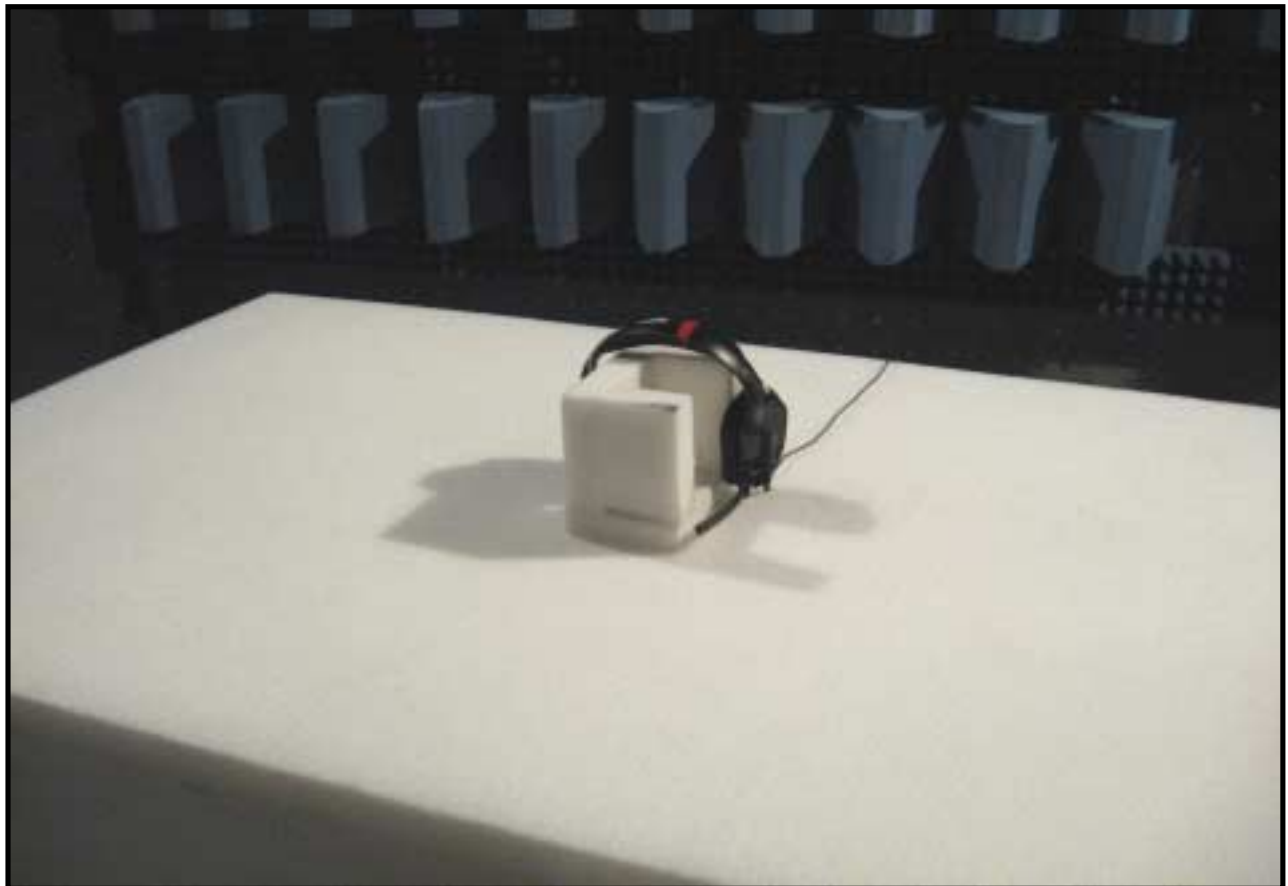
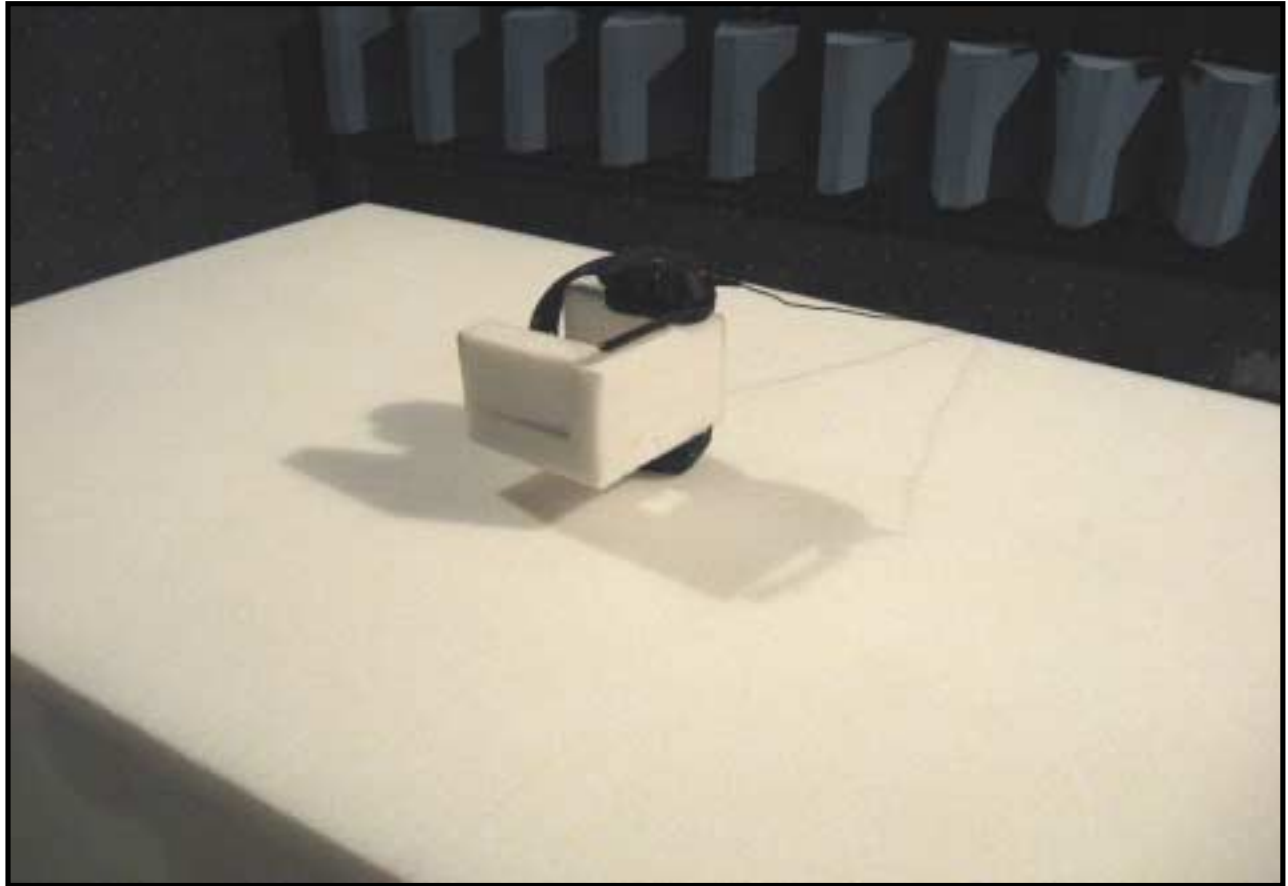
DEVIATIONS FROM TEST STANDARD

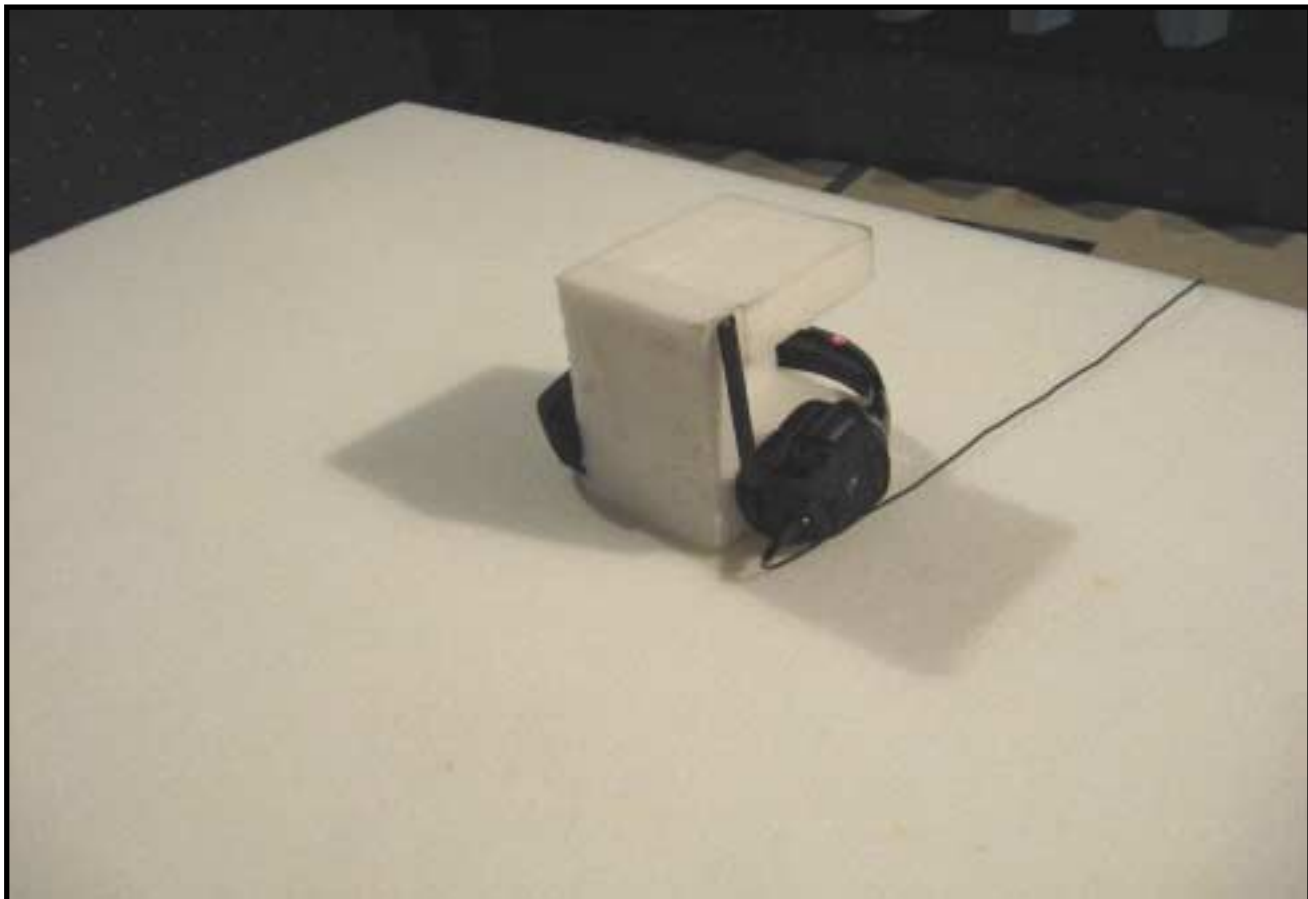
No deviations.

Run #	5	Signature 
Configuration #	2	
Results	Pass	



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)	Comments
2492.470	26.6	-1.0	4.0	1.0	3.0	20.0	V-Horn	AV	0.0	45.6	54.0	-8.4	EUT on back
2494.330	26.6	-1.0	4.0	1.0	3.0	20.0	V-Horn	AV	0.0	45.6	54.0	-8.4	EUT Normal
2495.600	26.5	-1.0	357.0	1.0	3.0	20.0	H-Horn	AV	0.0	45.5	54.0	-8.5	EUT Normal
2505.720	26.5	-1.0	4.0	1.0	3.0	20.0	H-Horn	AV	0.0	45.5	54.0	-8.5	EUT on back
2383.440	26.8	-1.3	38.0	1.0	3.0	20.0	V-Horn	AV	0.0	45.5	54.0	-8.5	EUT Normal
2385.593	26.7	-1.3	48.0	2.2	3.0	20.0	H-Horn	AV	0.0	45.4	54.0	-8.6	EUT Normal
2389.867	43.2	-1.3	48.0	2.2	3.0	20.0	H-Horn	PK	0.0	61.9	74.0	-12.1	EUT Normal
2488.510	40.4	-1.0	4.0	1.0	3.0	20.0	V-Horn	PK	0.0	59.4	74.0	-14.6	EUT on back
2503.250	40.3	-1.0	4.0	1.0	3.0	20.0	H-Horn	PK	0.0	59.3	74.0	-14.7	EUT on back
2487.400	40.2	-1.0	4.0	1.0	3.0	20.0	V-Horn	PK	0.0	59.2	74.0	-14.8	EUT Normal
2390.000	40.2	-1.3	37.0	1.0	3.0	20.0	V-Horn	PK	0.0	58.9	74.0	-15.1	EUT Normal
2491.450	39.6	-1.0	357.0	1.0	3.0	20.0	H-Horn	PK	0.0	58.6	74.0	-15.4	EUT Normal





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

MODES OF OPERATION

Tx Low Antenna High channel
Tx Low Antenna Mid channel
Tx Low Antenna Low channel

POWER SETTINGS INVESTIGATED

120VAC/60Hz

CONFIGURATIONS INVESTIGATED

LABT0369 - 4

SAMPLE CALCULATIONS

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
LISN	Solar	9252-50-R-24-BNC	LIR	3/2/2010	13 mo
Attenuator	Coaxicom	66702 2910-20	ATO	7/21/2009	13 mo
High Pass Filter	TTE	H97-100K-50-720B	HFX	2/16/2010	13 mo
Receiver	Rohde & Schwarz	ESCI	ARE	4/29/2010	12 mo
EV07 Cables	N/A	Conducted Cables	EVG	6/1/2009	13 mo
LISN	Solar	9252-50-R-24-BNC	LIP	3/2/2010	13 mo

MEASUREMENT BANDWIDTHS

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

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

MEASUREMENT UNCERTAINTY


A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

TEST DESCRIPTION

The EUT will be powered either directly or indirectly from the AC power line. Therefore, conducted emissions measurements were made on the AC input of the EUT, or on the AC input of 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 ANSIC63.10-2009.

EMC

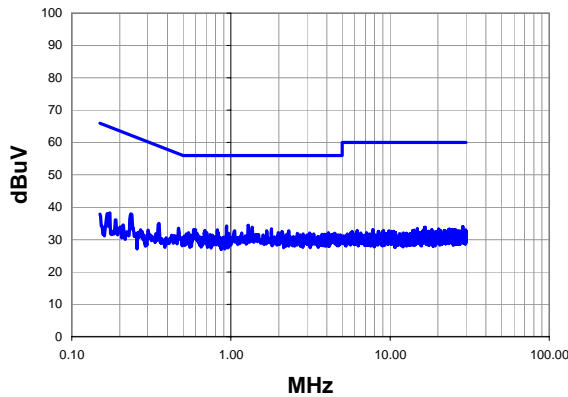
AC POWERLINE CONDUCTED EMISSIONS

Work Order:	LABT0369	Date:	05/12/10	 Tested by: Ethan Schoonover
Project:	None	Temperature:	23°C	
Job Site:	EV07	Humidity:	33	
Serial Number:	#1	Barometric Pres.:	30.19 in	
EUT:	A-00023			
Configuration:	4			
Customer:	Logitech, Inc.			
Attendees:	None			
EUT Power:	120VAC/60Hz			
Operating Mode:	Tx Low Antenna Low channel			
Deviations:				
Comments:	Dell tower			

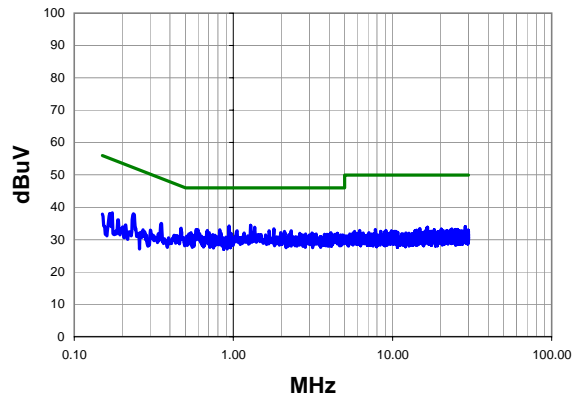
Test Specifications FCC 15.209:2010	Test Method ANSI C63.10:2009
---	--

Run #	6	Line:	High Line	Ext. Attenuation:	20	Results	Pass
--------------	---	--------------	-----------	--------------------------	----	----------------	------

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



Peak Data - vs - Quasi Peak Limit


Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
1.280	14.2	20.2	34.4	56.0	-21.6
0.939	14.0	20.2	34.2	56.0	-21.8
1.360	13.6	20.2	33.8	56.0	-22.2
1.800	13.1	20.3	33.4	56.0	-22.6
0.584	13.0	20.2	33.2	56.0	-22.8
0.821	12.9	20.2	33.1	56.0	-22.9
0.470	13.4	20.2	33.6	56.5	-23.0
0.686	12.7	20.2	32.9	56.0	-23.1
1.056	12.6	20.2	32.8	56.0	-23.2
1.680	12.5	20.2	32.7	56.0	-23.3
2.304	12.4	20.3	32.7	56.0	-23.3
2.096	12.3	20.3	32.6	56.0	-23.4
0.541	12.0	20.2	32.2	56.0	-23.8
0.704	12.0	20.2	32.2	56.0	-23.8
0.835	12.0	20.2	32.2	56.0	-23.8
1.992	11.9	20.3	32.2	56.0	-23.8
4.104	11.8	20.3	32.1	56.0	-23.9
0.352	14.8	20.2	35.0	58.9	-23.9
3.120	11.7	20.3	32.0	56.0	-24.0
1.168	11.8	20.2	32.0	56.0	-24.0

Peak Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
1.280	14.2	20.2	34.4	46.0	-11.6
0.939	14.0	20.2	34.2	46.0	-11.8
1.360	13.6	20.2	33.8	46.0	-12.2
1.800	13.1	20.3	33.4	46.0	-12.6
0.584	13.0	20.2	33.2	46.0	-12.8
0.821	12.9	20.2	33.1	46.0	-12.9
0.470	13.4	20.2	33.6	46.5	-13.0
0.686	12.7	20.2	32.9	46.0	-13.1
1.056	12.6	20.2	32.8	46.0	-13.2
1.680	12.5	20.2	32.7	46.0	-13.3
2.304	12.4	20.3	32.7	46.0	-13.3
2.096	12.3	20.3	32.6	46.0	-13.4
0.541	12.0	20.2	32.2	46.0	-13.8
0.704	12.0	20.2	32.2	46.0	-13.8
0.835	12.0	20.2	32.2	46.0	-13.8
1.992	11.9	20.3	32.2	46.0	-13.8
4.104	11.8	20.3	32.1	46.0	-13.9
0.352	14.8	20.2	35.0	48.9	-13.9
3.120	11.7	20.3	32.0	46.0	-14.0
1.168	11.8	20.2	32.0	46.0	-14.0

EMC

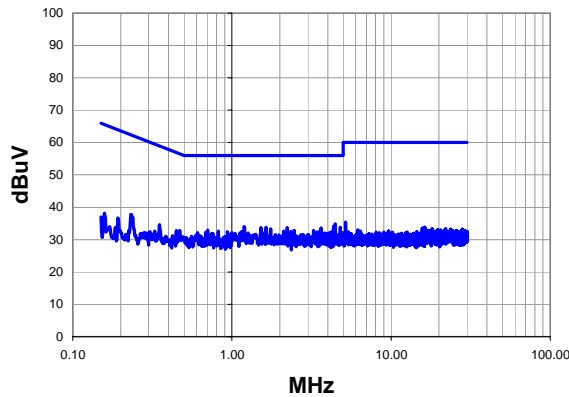
AC POWERLINE CONDUCTED EMISSIONS

Work Order:	LABT0369	Date:	05/12/10	 Tested by: Ethan Schoonover
Project:	None	Temperature:	23°C	
Job Site:	EV07	Humidity:	33	
Serial Number:	#1	Barometric Pres.:	30.19 in	
EUT:	A-00023			
Configuration:	4			
Customer:	Logitech, Inc.			
Attendees:	None			
EUT Power:	120VAC/60Hz			
Operating Mode:	Tx Low Antenna Low channel			
Deviations:	None			
Comments:	Dell tower			

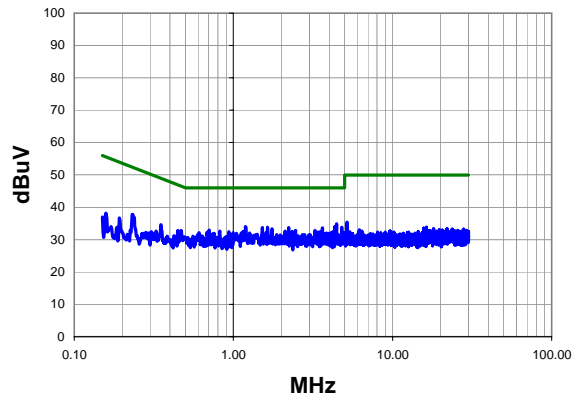
Test Specifications FCC 15.209:2010	Test Method ANSI C63.10:2009
---	--

Run #	7	Line:	Neutral	Ext. Attenuation:	20	Results	Pass
--------------	---	--------------	---------	--------------------------	----	----------------	------

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



Peak Data - vs - Quasi Peak Limit


Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
4.448	14.5	20.3	34.8	56.0	-21.2
4.344	13.8	20.3	34.1	56.0	-21.9
1.192	13.8	20.2	34.0	56.0	-22.0
4.792	13.5	20.4	33.9	56.0	-22.1
1.640	13.6	20.2	33.8	56.0	-22.2
1.520	13.5	20.2	33.7	56.0	-22.3
2.224	13.4	20.3	33.7	56.0	-22.3
3.632	13.3	20.3	33.6	56.0	-22.4
1.752	13.1	20.3	33.4	56.0	-22.6
0.704	12.8	20.2	33.0	56.0	-23.0
3.256	12.5	20.3	32.8	56.0	-23.2
2.456	12.5	20.3	32.8	56.0	-23.2
0.821	12.5	20.2	32.7	56.0	-23.3
2.112	12.4	20.3	32.7	56.0	-23.3
2.344	12.2	20.3	32.5	56.0	-23.5
0.937	12.3	20.2	32.5	56.0	-23.5
4.216	12.1	20.3	32.4	56.0	-23.6
3.512	12.1	20.3	32.4	56.0	-23.6
0.470	12.7	20.2	32.9	56.5	-23.7
3.400	12.0	20.3	32.3	56.0	-23.7

Peak Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
4.448	14.5	20.3	34.8	46.0	-11.2
4.344	13.8	20.3	34.1	46.0	-11.9
1.192	13.8	20.2	34.0	46.0	-12.0
4.792	13.5	20.4	33.9	46.0	-12.1
1.640	13.6	20.2	33.8	46.0	-12.2
1.520	13.5	20.2	33.7	46.0	-12.3
2.224	13.4	20.3	33.7	46.0	-12.3
3.632	13.3	20.3	33.6	46.0	-12.4
1.752	13.1	20.3	33.4	46.0	-12.6
0.704	12.8	20.2	33.0	46.0	-13.0
3.256	12.5	20.3	32.8	46.0	-13.2
2.456	12.5	20.3	32.8	46.0	-13.2
0.821	12.5	20.2	32.7	46.0	-13.3
2.112	12.4	20.3	32.7	46.0	-13.3
2.344	12.2	20.3	32.5	46.0	-13.5
0.937	12.3	20.2	32.5	46.0	-13.5
4.216	12.1	20.3	32.4	46.0	-13.6
3.512	12.1	20.3	32.4	46.0	-13.6
0.470	12.7	20.2	32.9	46.5	-13.7
3.400	12.0	20.3	32.3	46.0	-13.7

EMC

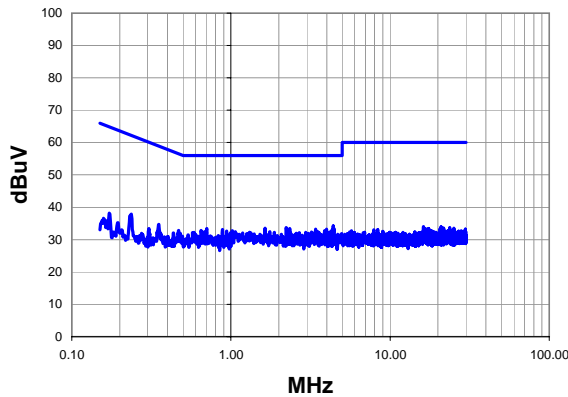
AC POWERLINE CONDUCTED EMISSIONS

Work Order:	LABT0369	Date:	05/12/10	 Tested by: Ethan Schoonover
Project:	None	Temperature:	23°C	
Job Site:	EV07	Humidity:	33	
Serial Number:	#1	Barometric Pres.:	30.19 in	
EUT:	A-00023			
Configuration:	4			
Customer:	Logitech, Inc.			
Attendees:	None			
EUT Power:	120VAC/60Hz			
Operating Mode:	Tx Low Antenna Mid channel			
Deviations:	None			
Comments:	Dell tower			

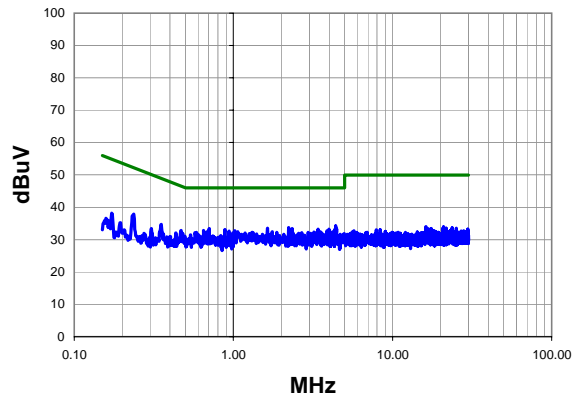
Test Specifications FCC 15.209:2010	Test Method ANSI C63.10:2009
---	--

Run #	8	Line:	Neutral	Ext. Attenuation:	20	Results	Pass
--------------	---	--------------	---------	--------------------------	----	----------------	------

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



Peak Data - vs - Quasi Peak Limit


Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
4.392	13.9	20.3	34.2	56.0	-21.8
2.224	13.4	20.3	33.7	56.0	-22.3
1.640	13.3	20.2	33.5	56.0	-22.5
0.704	13.3	20.2	33.5	56.0	-22.5
2.344	13.1	20.3	33.4	56.0	-22.6
4.448	13.0	20.3	33.3	56.0	-22.7
3.984	12.9	20.3	33.2	56.0	-22.8
3.400	12.9	20.3	33.2	56.0	-22.8
0.884	13.0	20.2	33.2	56.0	-22.8
4.328	12.8	20.3	33.1	56.0	-22.9
0.650	12.7	20.2	32.9	56.0	-23.1
1.016	12.6	20.2	32.8	56.0	-23.2
3.872	12.4	20.3	32.7	56.0	-23.3
0.939	12.5	20.2	32.7	56.0	-23.3
1.064	12.3	20.2	32.5	56.0	-23.5
0.682	12.3	20.2	32.5	56.0	-23.5
1.760	12.2	20.3	32.5	56.0	-23.5
4.216	12.1	20.3	32.4	56.0	-23.6
3.520	12.1	20.3	32.4	56.0	-23.6
0.470	12.7	20.2	32.9	56.5	-23.7

Peak Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
4.392	13.9	20.3	34.2	46.0	-11.8
2.224	13.4	20.3	33.7	46.0	-12.3
1.640	13.3	20.2	33.5	46.0	-12.5
0.704	13.3	20.2	33.5	46.0	-12.5
2.344	13.1	20.3	33.4	46.0	-12.6
4.448	13.0	20.3	33.3	46.0	-12.7
3.984	12.9	20.3	33.2	46.0	-12.8
3.400	12.9	20.3	33.2	46.0	-12.8
0.884	13.0	20.2	33.2	46.0	-12.8
4.328	12.8	20.3	33.1	46.0	-12.9
0.650	12.7	20.2	32.9	46.0	-13.1
1.016	12.6	20.2	32.8	46.0	-13.2
3.872	12.4	20.3	32.7	46.0	-13.3
0.939	12.5	20.2	32.7	46.0	-13.3
1.064	12.3	20.2	32.5	46.0	-13.5
0.682	12.3	20.2	32.5	46.0	-13.5
1.760	12.2	20.3	32.5	46.0	-13.5
4.216	12.1	20.3	32.4	46.0	-13.6
3.520	12.1	20.3	32.4	46.0	-13.6
0.470	12.7	20.2	32.9	46.5	-13.7

EMC

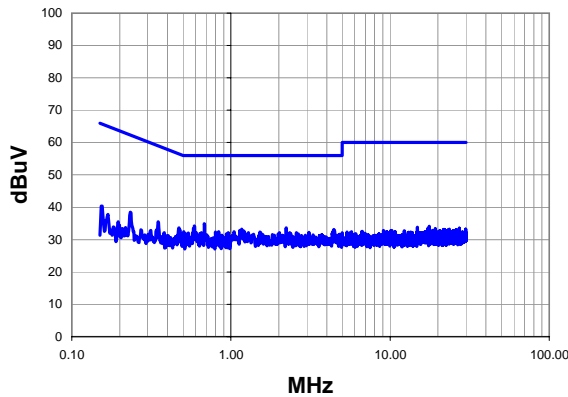
AC POWERLINE CONDUCTED EMISSIONS

Work Order:	LABT0369	Date:	05/12/10	
Project:	None	Temperature:	23°C	
Job Site:	EV07	Humidity:	33	
Serial Number:	#1	Barometric Pres.:	30.19 in	
EUT:	A-00023			
Configuration:	4			
Customer:	Logitech, Inc.			
Attendees:	None			
EUT Power:	120VAC/60Hz			
Operating Mode:	Tx Low Antenna Mid channel			
Deviations:	None			
Comments:	Dell tower			

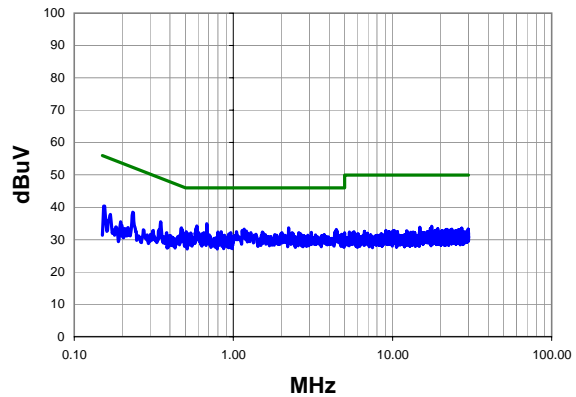
Test Specifications FCC 15.209:2010	Test Method ANSI C63.10:2009
---	--

Run #	9	Line:	High Line	Ext. Attenuation:	20	Results	Pass
--------------	---	--------------	-----------	--------------------------	----	----------------	------

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



Peak Data - vs - Quasi Peak Limit


Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.680	14.7	20.2	34.9	56.0	-21.1
0.590	14.0	20.2	34.2	56.0	-21.8
2.224	13.3	20.3	33.6	56.0	-22.4
1.168	13.0	20.2	33.2	56.0	-22.8
0.471	13.5	20.2	33.7	56.5	-22.8
4.440	12.8	20.3	33.1	56.0	-22.9
4.480	12.4	20.3	32.7	56.0	-23.3
0.476	12.9	20.2	33.1	56.4	-23.3
1.048	12.3	20.2	32.5	56.0	-23.5
0.349	15.3	20.2	35.5	59.0	-23.5
0.838	12.3	20.2	32.5	56.0	-23.5
0.505	12.3	20.2	32.5	56.0	-23.5
0.801	12.2	20.2	32.4	56.0	-23.6
1.520	12.1	20.2	32.3	56.0	-23.7
3.096	11.9	20.3	32.2	56.0	-23.8
0.961	12.0	20.2	32.2	56.0	-23.8
0.652	12.0	20.2	32.2	56.0	-23.8
2.016	11.9	20.3	32.2	56.0	-23.8
0.233	18.3	20.2	38.5	62.3	-23.9
2.576	11.8	20.3	32.1	56.0	-23.9

Peak Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.680	14.7	20.2	34.9	46.0	-11.1
0.590	14.0	20.2	34.2	46.0	-11.8
2.224	13.3	20.3	33.6	46.0	-12.4
1.168	13.0	20.2	33.2	46.0	-12.8
0.471	13.5	20.2	33.7	46.5	-12.8
4.440	12.8	20.3	33.1	46.0	-12.9
4.480	12.4	20.3	32.7	46.0	-13.3
0.476	12.9	20.2	33.1	46.4	-13.3
1.048	12.3	20.2	32.5	46.0	-13.5
0.349	15.3	20.2	35.5	49.0	-13.5
0.838	12.3	20.2	32.5	46.0	-13.5
0.505	12.3	20.2	32.5	46.0	-13.5
0.801	12.2	20.2	32.4	46.0	-13.6
1.520	12.1	20.2	32.3	46.0	-13.7
3.096	11.9	20.3	32.2	46.0	-13.8
0.961	12.0	20.2	32.2	46.0	-13.8
0.652	12.0	20.2	32.2	46.0	-13.8
2.016	11.9	20.3	32.2	46.0	-13.8
0.233	18.3	20.2	38.5	52.3	-13.9
2.576	11.8	20.3	32.1	46.0	-13.9

EMC

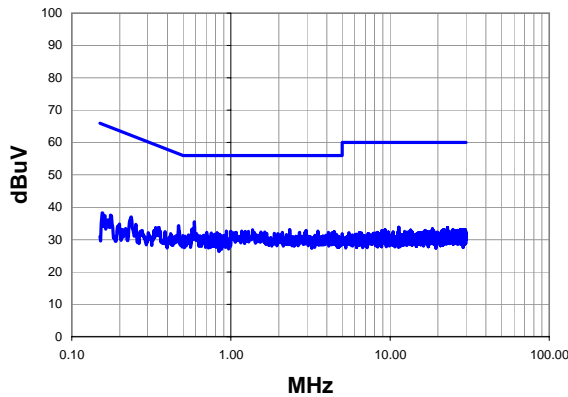
AC POWERLINE CONDUCTED EMISSIONS

Work Order:	LABT0369	Date:	05/12/10	 Tested by: Ethan Schoonover
Project:	None	Temperature:	23°C	
Job Site:	EV07	Humidity:	33	
Serial Number:	#1	Barometric Pres.:	30.19 in	
EUT:	A-00023			
Configuration:	4			
Customer:	Logitech, Inc.			
Attendees:	None			
EUT Power:	120VAC/60Hz			
Operating Mode:	Tx Low Antenna High channel			
Deviations:	None			
Comments:	Dell tower			

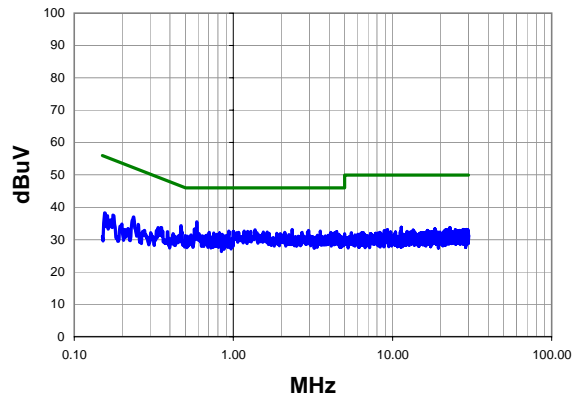
Test Specifications FCC 15.209:2010	Test Method ANSI C63.10:2009
---	--

Run #	10	Line: High Line	Ext. Attenuation: 20	Results	Pass
--------------	----	------------------------	-----------------------------	----------------	------

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



Peak Data - vs - Quasi Peak Limit


Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.589	15.3	20.2	35.5	56.0	-20.5
0.470	14.2	20.2	34.4	56.5	-22.2
0.568	13.1	20.2	33.3	56.0	-22.7
2.344	12.8	20.3	33.1	56.0	-22.9
1.368	12.8	20.2	33.0	56.0	-23.0
2.968	12.5	20.3	32.8	56.0	-23.2
0.937	12.5	20.2	32.7	56.0	-23.3
3.520	12.3	20.3	32.6	56.0	-23.4
1.168	12.4	20.2	32.6	56.0	-23.4
1.000	12.4	20.2	32.6	56.0	-23.4
1.288	12.3	20.2	32.5	56.0	-23.5
4.456	12.1	20.3	32.4	56.0	-23.6
1.632	12.1	20.2	32.3	56.0	-23.7
1.544	12.1	20.2	32.3	56.0	-23.7
2.928	12.0	20.3	32.3	56.0	-23.7
1.080	12.1	20.2	32.3	56.0	-23.7
0.704	12.1	20.2	32.3	56.0	-23.7
2.104	12.0	20.3	32.3	56.0	-23.7
4.104	11.9	20.3	32.2	56.0	-23.8
2.696	11.9	20.3	32.2	56.0	-23.8

Peak Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.589	15.3	20.2	35.5	46.0	-10.5
0.470	14.2	20.2	34.4	46.5	-12.2
0.568	13.1	20.2	33.3	46.0	-12.7
2.344	12.8	20.3	33.1	46.0	-12.9
1.368	12.8	20.2	33.0	46.0	-13.0
2.968	12.5	20.3	32.8	46.0	-13.2
0.937	12.5	20.2	32.7	46.0	-13.3
3.520	12.3	20.3	32.6	46.0	-13.4
1.168	12.4	20.2	32.6	46.0	-13.4
1.000	12.4	20.2	32.6	46.0	-13.4
1.288	12.3	20.2	32.5	46.0	-13.5
4.456	12.1	20.3	32.4	46.0	-13.6
1.632	12.1	20.2	32.3	46.0	-13.7
1.544	12.1	20.2	32.3	46.0	-13.7
2.928	12.0	20.3	32.3	46.0	-13.7
1.080	12.1	20.2	32.3	46.0	-13.7
0.704	12.1	20.2	32.3	46.0	-13.7
2.104	12.0	20.3	32.3	46.0	-13.7
4.104	11.9	20.3	32.2	46.0	-13.8
2.696	11.9	20.3	32.2	46.0	-13.8

EMC

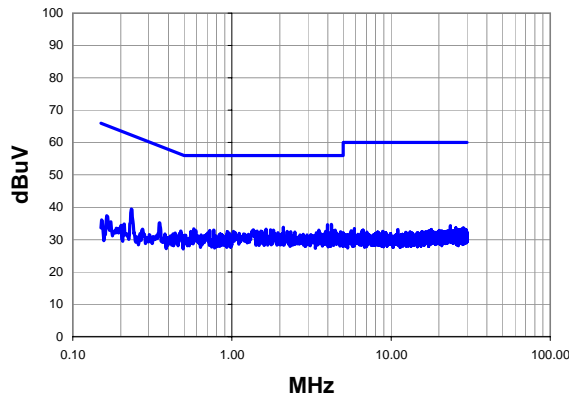
AC POWERLINE CONDUCTED EMISSIONS

Work Order:	LABT0369	Date:	05/12/10	 Tested by: Ethan Schoonover
Project:	None	Temperature:	23°C	
Job Site:	EV07	Humidity:	33	
Serial Number:	#1	Barometric Pres.:	30.19 in	
EUT:	A-00023			
Configuration:	4			
Customer:	Logitech, Inc.			
Attendees:	None			
EUT Power:	120VAC/60Hz			
Operating Mode:	Tx Low Antenna High channel			
Deviations:	None			
Comments:	Dell tower			

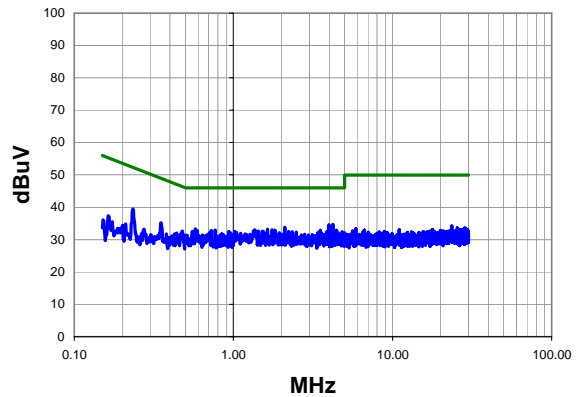
Test Specifications FCC 15.209:2010	Test Method ANSI C63.10:2009
---	--

Run #	11	Line:	Neutral	Ext. Attenuation:	20	Results	Pass
--------------	----	--------------	---------	--------------------------	----	----------------	------

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
4.216	14.4	20.3	34.7	56.0	-21.3
3.984	14.3	20.3	34.6	56.0	-21.4
2.104	13.6	20.3	33.9	56.0	-22.1
0.577	13.2	20.2	33.4	56.0	-22.6
1.640	13.0	20.2	33.2	56.0	-22.8
0.233	19.3	20.2	39.5	62.3	-22.9
1.752	12.8	20.3	33.1	56.0	-22.9
1.360	12.8	20.2	33.0	56.0	-23.0
0.767	12.8	20.2	33.0	56.0	-23.0
1.824	12.7	20.3	33.0	56.0	-23.0
4.448	12.6	20.3	32.9	56.0	-23.1
3.512	12.6	20.3	32.9	56.0	-23.1
0.726	12.7	20.2	32.9	56.0	-23.1
4.384	12.3	20.3	32.6	56.0	-23.4
4.336	12.3	20.3	32.6	56.0	-23.4
1.520	12.4	20.2	32.6	56.0	-23.4
1.440	12.4	20.2	32.6	56.0	-23.4
1.024	12.4	20.2	32.6	56.0	-23.4
2.224	12.3	20.3	32.6	56.0	-23.4
0.551	12.4	20.2	32.6	56.0	-23.4

Peak Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
4.216	14.4	20.3	34.7	46.0	-11.3
3.984	14.3	20.3	34.6	46.0	-11.4
2.104	13.6	20.3	33.9	46.0	-12.1
0.577	13.2	20.2	33.4	46.0	-12.6
1.640	13.0	20.2	33.2	46.0	-12.8
0.233	19.3	20.2	39.5	52.3	-12.9
1.752	12.8	20.3	33.1	46.0	-12.9
1.360	12.8	20.2	33.0	46.0	-13.0
0.767	12.8	20.2	33.0	46.0	-13.0
1.824	12.7	20.3	33.0	46.0	-13.0
4.448	12.6	20.3	32.9	46.0	-13.1
3.512	12.6	20.3	32.9	46.0	-13.1
0.726	12.7	20.2	32.9	46.0	-13.1
4.384	12.3	20.3	32.6	46.0	-13.4
4.336	12.3	20.3	32.6	46.0	-13.4
1.520	12.4	20.2	32.6	46.0	-13.4
1.440	12.4	20.2	32.6	46.0	-13.4
1.024	12.4	20.2	32.6	46.0	-13.4
2.224	12.3	20.3	32.6	46.0	-13.4
0.551	12.4	20.2	32.6	46.0	-13.4

AC Powerline Conducted Emissions



