

Logitech, Inc.

S-00112

Report No. LABT0415.1

Report Prepared By



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

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EMC Test Report

Certificate of Test
Last Date of Test: March 30, 2011
Logitech, Inc.
Model: S-00112

Emissions			
Test Description	Specification	Test Method	Pass/Fail
Emission Bandwidth	FCC 15.407:2011	ANSI C63.10:2009	Pass
Peak Power Spectral Density	FCC 15.407:2011	ANSI C63.10:2009	Pass
Peak Excursion of the Modulation Envelope	FCC 15.407:2011	ANSI C63.10:2009	Pass
Frequency Stability	FCC 15.407:2011	ANSI C63.10:2009	Pass
Peak Transmit Power	FCC 15.407:2011	ANSI C63.10:2009	Pass
Spurious Radiated Emissions	FCC 15.407:2011	ANSI C63.10:2009	Pass
AC Powerline Conducted Emissions	FCC 15.207:2011	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.
9349 W Broadway Ave.
Brooklyn Park, MN 55445

Phone: (763) 425-2281 Fax: (763) 424-3469

This site has been fully described in a report filed with and accepted by the FCC (Federal Communications Commission) and Industry Canada (Site filing #2834E-1).

Approved By:



Tim O'Shea, Operations Manager



NVLAP Lab Code: 200881-0

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 National Voluntary Laboratory Accreditation Program (NVLAP) for satisfactory compliance with the requirements of ISO/IEC 17025 for Testing Laboratories. NVLAP is administered by the National Institute of Standards and Technology (NIST), an agency of the U.S. Commerce Department. 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.

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.

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).



Accreditations and Authorizations

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).

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, Brooklyn Park: US0175*)

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



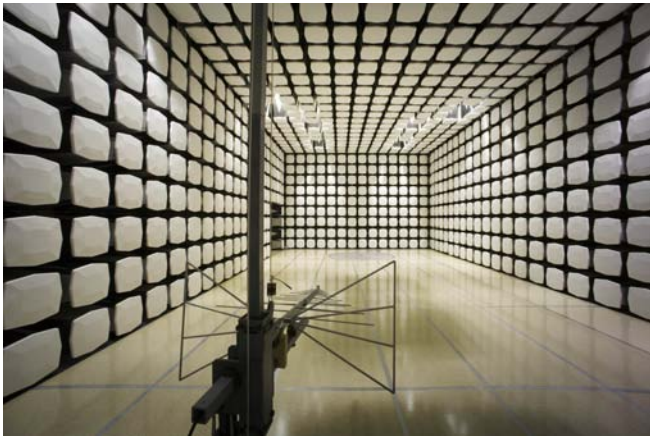
Oregon
Labs EV01-EV12
22975 NW Evergreen Pkwy
Suite 400
Hillsboro, OR 97124
(503) 844-4066

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:	4700 NW Camas Meadows Dr
City, State, Zip:	Camas, WA 98607
Test Requested By:	Aaron Cohen
Model:	S-00112
First Date of Test:	March 8, 2011
Last Date of Test:	March 30, 2011
Receipt Date of Samples:	February 28, 2011
Equipment Design Stage:	Prototype
Equipment Condition:	No Damage

Information Provided by the Party Requesting the Test

Functional Description of the EUT (Equipment Under Test):

Logitech proprietary radio.

The proprietary radio shall never use the IEEE 802.11b protocol during the normal operation of Logitech's Model Number S-00112. The communication from the host device never uses IEEE 802.11b modulations or data rates when communicating with Logitech's Model Number S-00112.

Furthermore, the user will never be able to force the S-00112 to connect to an 802.11b network. Firmware for the radio limits operation to 802.11g and 802.11a data rates of 6 – 24 Mbps only. No higher data rates are possible.

The equipment is limited to operation in the 2.4 GHz - 2.4835 GHz, 5.15 GHz – 5.25 GHz and 5.725 – 5.825 GHz bands.

Testing Objective:

To demonstrate compliance under FCC 15.407 for operation in the 5.15 - 5.25 GHz band.

CONFIGURATION 1 LABT0415

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Power Supply	PI Electronics	AD631MC	534-000410
EUT PCB	Logitech, Inc.	S-00112	C001

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Laptop	Asus	1015PE-BBK	LP 200000833024389
Laptop Adapter	Asus	ADP-40PH AB	LP 200000833024389
Right Speaker	Logitech, Inc.	S-00098	880-000146
Left Speaker	Logitech, Inc.	S-00098	880-000146
DC Adapter	Logitech, Inc.	EFS00901000070UL	534-000299

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
RCA	No	1.80m	No	EUT	Unterminated
DC Power	No	1.80m	No	EUT	Power Supply
AC Power	No	1.80m	No	Power Supply	AC Mains
USB	No	1.75m	No	Laptop	EUT
DC Power	No	1.75m	No	Laptop Adapter	Laptop
AC Power	No	1.45m	No	Laptop Adapter	AC Mains
DC Power	No	1.80m	No	DC Adapter	Right Speaker
AC Power	No	0.80m	No	DC Adapter	AC Mains
Audio	No	1.35m	No	EUT	Right Speaker
Audio	No	1.10m	No	Right Speaker	Left Speaker

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

CONFIGURATION 2 LABT0415

EUT

Description	Manufacturer	Model/Part Number	Serial Number
EUT	Logitech, Inc.	S-00112	R001
Power Supply	PI Electronics	AD631MC	534-000410

Peripherals in test setup boundary

Description	Manufacturer	Model/Part Number	Serial Number
Right Speaker	Logitech, Inc.	S-00098	880-000146
Left Speaker	Logitech, Inc.	S-00098	880-000146
DC Adapter	Logitech, Inc.	EFS00901000070UL	534-000299

Cables

Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
RCA	No	1.80m	No	EUT	Unterminated
DC Power	No	1.80m	No	EUT	Power Supply
AC Power	No	1.80m	No	Power Supply	AC Mains
DC Power	No	1.80m	No	DC Adapter	Right Speaker
AC Power	No	0.80m	No	DC Adapter	AC Mains
Audio	No	1.35m	No	EUT	Right Speaker
Audio	No	1.10m	No	Right Speaker	Left Speaker

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

CONFIGURATION 3 LABT0415**EUT**

Description	Manufacturer	Model/Part Number	Serial Number
EUT	Logitech, Inc.	S-00112	R001

Remote Equipment Outside of Test Setup Boundary

Description	Manufacturer	Model/Part Number	Serial Number
Power Supply	PI Electronics	AD631MC	534-000410
Laptop	Asus	1015PE-BBK	LP 200000833024389
Laptop Adapter	Asus	ADP-40PH AB	LP 200000833024389
Right Speaker	Logitech, Inc.	S-00098	880-000146
Left Speaker	Logitech, Inc.	S-00098	880-000146
DC Adapter	Logitech, Inc.	EFS00901000070UL	534-000299

Cables

Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
RCA	No	1.80m	No	EUT	Unterminated
DC Power	No	1.80m	No	EUT	Power Supply
AC Power	No	1.80m	No	Power Supply	AC Mains
USB	No	1.75m	No	Laptop	EUT
DC Power	No	1.75m	No	Laptop Adapter	Laptop
AC Power	No	1.45m	No	Laptop Adapter	AC Mains
DC Power	No	1.80m	No	DC Adapter	Right Speaker
Audio	No	1.35m	No	EUT	Right Speaker
Audio	No	1.10m	No	Right Speaker	Left Speaker

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

CONFIGURATION 4 LABT0415**EUT**

Description	Manufacturer	Model/Part Number	Serial Number
EUT	Logitech, Inc.	S-00112	R001

Remote Equipment Outside of Test Setup Boundary

Description	Manufacturer	Model/Part Number	Serial Number
Adjustable Power Supply	EZ	GP-4303D	0907005
Alternate Speaker R	Logitech, Inc.	S-00026	880-000065
Alternate Speaker L	Logitech, Inc.	S-00026	880-000065

Cables

Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
RCA	No	1.80m	No	EUT	Unterminated
DC Power	No	1.80m	No	EUT	Power Supply
AC Power	No	1.80m	No	Power Supply	AC Mains
AC Power	No	1.40m	No	Alternate Speaker L	AC Mains
Audio	No	1.20m	No	Alternate Speaker R	Alternate Speaker L
Audio	No	1.40m	No	Alternate Speaker R	EUT

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

CONFIGURATION 5 LABT0415**EUT**

Description	Manufacturer	Model/Part Number	Serial Number
EUT	Logitech, Inc.	S-00112	C011

Peripherals in test setup boundary

Description	Manufacturer	Model/Part Number	Serial Number
EUT PCB	Logitech, Inc.	S-00112	C001

Remote Equipment Outside of Test Setup Boundary

Description	Manufacturer	Model/Part Number	Serial Number
Remote PC	Dell	Inspiron 600	IS386

CONFIGURATION 6 LABT0415**EUT**

Description	Manufacturer	Model/Part Number	Serial Number
EUT	Logitech, Inc.	S-00112	R001

Peripherals in test setup boundary

Description	Manufacturer	Model/Part Number	Serial Number
Power Supply	PI Electronics	AD631MC	534-000410

Cables

Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Power	No	1.80m	No	EUT	Power Supply
RCA Audio x2	No	2.7m	No	EUT	Unterminated
Audio	No	2.0m	No	EUT	Unterminated

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	3/8/2011	AC Powerline 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.
2	3/11/2011	Peak Excursion of the Modulation Envelope	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	3/11/2011	Emission 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.
4	3/15/2011	Frequency Stability	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	3/29/2011	Peak 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.
6	3/29/2011	Peak Transmit 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.
7	3/30/2011	Spurious Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

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

TEST EQUIPMENT					
Description	Manufacturer	Model	ID	Last Cal.	Interval
Multimeter	Fluke	114	MMU	7/13/2009	24
DC Power Supply	EZ Digital Co	GP-4303D	TPY	NCR	0
40 GHz DC block	Fairview Microwave	SD3379	AMI	11/1/2010	13
Signal Generator	Agilent	N5183A	TIA	1/18/2011	24
Spectrum Analyzer	Agilent	E4446A	AAT	2/15/2011	12

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

FCC Public Notice DA 02-2138 was followed. The transmit frequency was set to the lowest, a medium, and the highest channels in each band. The transmit power was set to its default maximum. The lowest, a medium, and the highest data rates were measured if available. A direct connection was made between the RF output of the EUT and a spectrum analyzer. Attenuation and a DC block were used. The reference level offset on the spectrum analyzer was adjusted to compensate for cable loss and the external attenuation used between the RF output and the spectrum analyzer input.

The spectrum analyzer settings were as follows:

- Span = approximately 1.5 to 2 times the emission bandwidth, centered on the transmit channel.
- RBW = Approx. 1% of the emission bandwidth (B). This was an iterative process where an exact match of 1% may not be achieved. The largest value of RBW that came close to 1% of the emission bandwidth was used.
- A peak detector was used.

The marker-delta function was then used to measure 26 dB emission bandwidth

EUT: S-00112	Work Order: LABT0415
Serial Number: C001	Date: 03/11/11
Customer: Logitech, Inc.	Temperature: 22.92°C
Attendees: None	Humidity: 18%
Project: None	Barometric Pres.: 1012.8
Tested by: Trevor Buls	Power: 120VAC/60Hz
	Job Site: MN05

TEST SPECIFICATIONS	
FCC 15.407:2011	Test Method ANSI C63.10:2009

COMMENTS
None

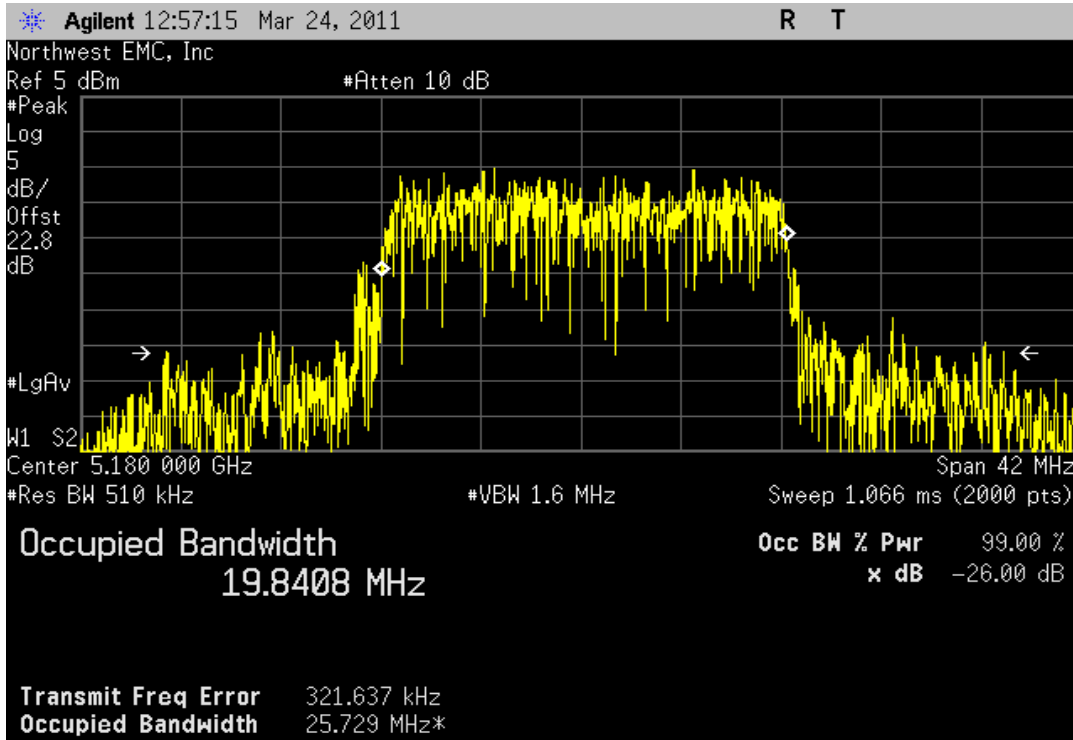
DEVIATIONS FROM TEST STANDARD
None

Configuration #	1	Signature <i>Trevor Buls</i>
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		Value	Limit	Result
802.11(a) 6 Mbps	5150 - 5250 MHz Band			
	Channel 36, Low Channel	25.73 MHz	N/A	N/A
	Channel 48, High Channel	24.62 MHz	N/A	N/A
802.11(a) 24 Mbps	5150 - 5250 MHz Band			
	Channel 36, Low Channel	29.853 MHz	N/A	N/A
	Channel 48, High Channel	28.102 MHz	N/A	N/A

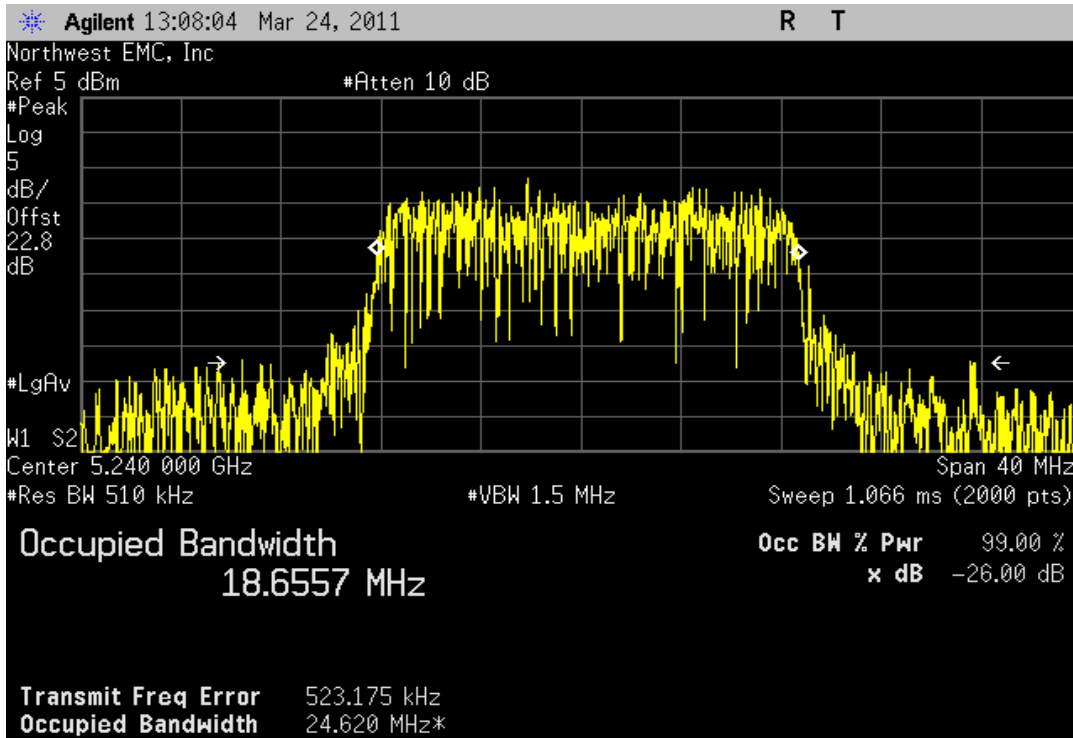
802.11(a) 6 Mbps, 5150 - 5250 MHz Band, Channel 36, Low Channel

Value	Limit	Result
25.73 MHz	N/A	N/A



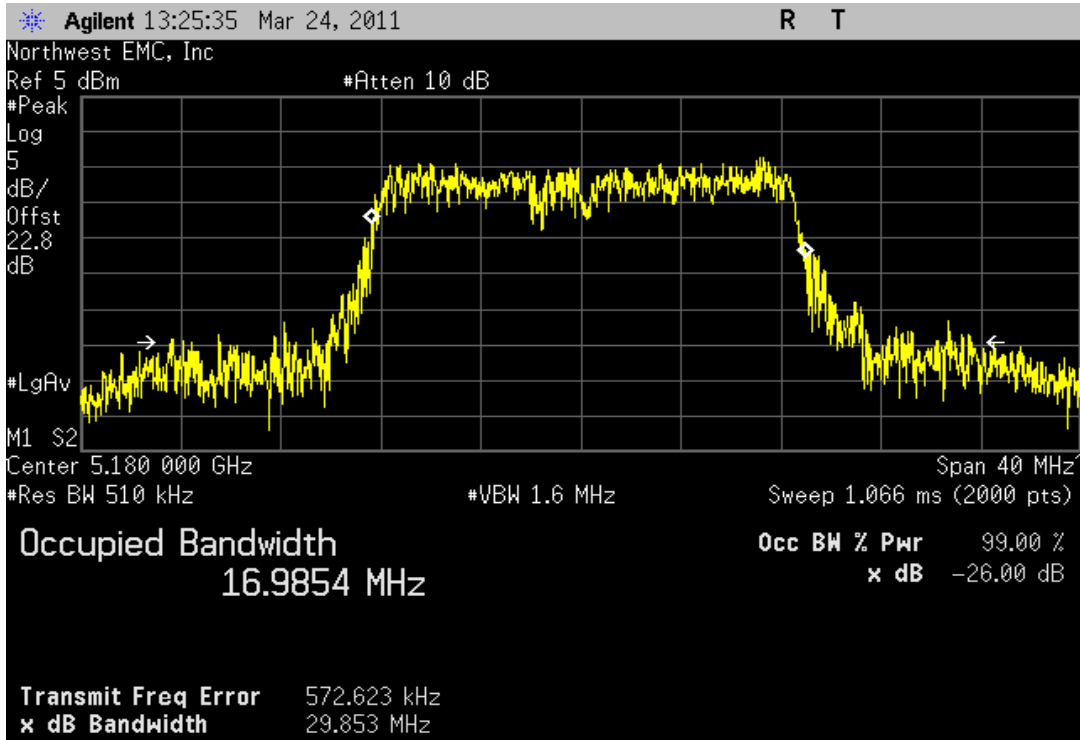
802.11(a) 6 Mbps, 5150 - 5250 MHz Band, Channel 48, High Channel

Value	Limit	Result
24.62 MHz	N/A	N/A



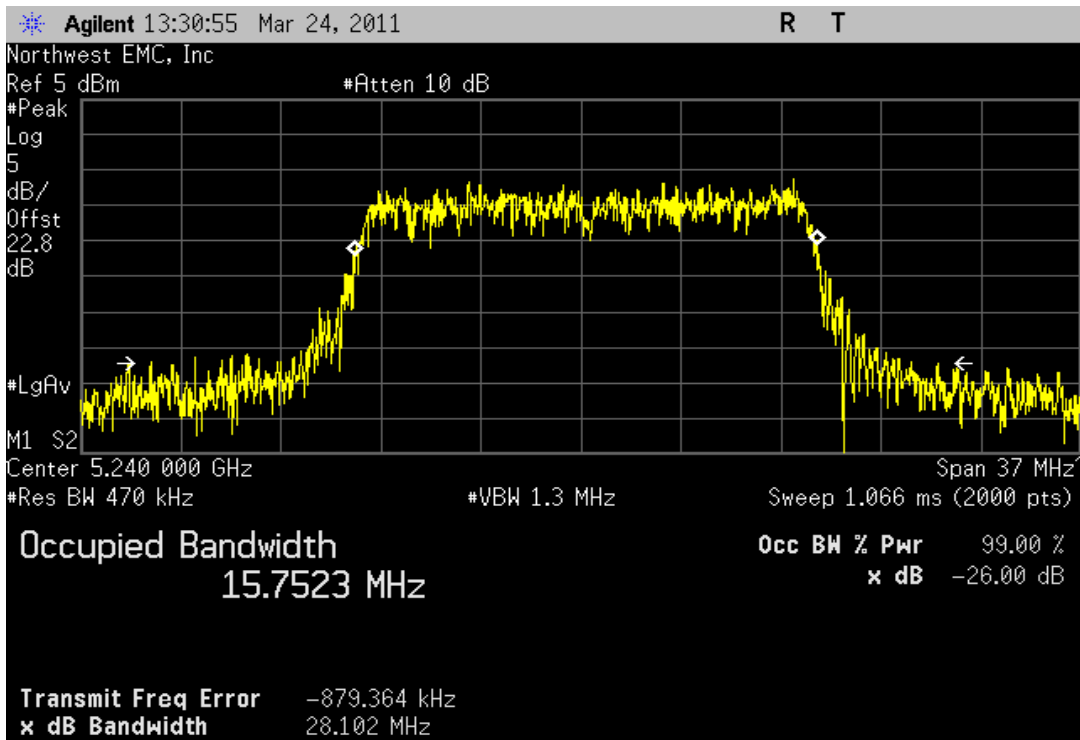
802.11(a) 24 Mbps, 5150 - 5250 MHz Band, Channel 36, Low Channel

Value	Limit	Result
29.853 MHz	N/A	N/A



802.11(a) 24 Mbps, 5150 - 5250 MHz Band, Channel 48, High Channel

Value	Limit	Result
28.102 MHz	N/A	N/A



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
40GHz DC Block	Miteq	DCB4000	AMD	8/5/2010	13
Spectrum Analyzer	Agilent	E4440A	AFD	6/1/2009	24
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	8/6/2010	12
MXG Vector Singal Generator	Agilent	N5182A	TIF	NCR	0
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0
Power Meter	Gigatronics	8651A	SPM	1/7/2010	24
Power Sensor	Gigatronics	80701A	SPL	1/7/2010	16

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

FCC Public Notice DA 02-2138 was followed. The transmit frequency was set to the mid channel in each band. The transmit power was set to its default maximum. The data rate of 6 Mbps was measured. A direct connection was made between the RF output of the EUT and a spectrum analyzer. Attenuation and a DC block were used. The reference level offset on the spectrum analyzer was adjusted to compensate for cable loss and the external attenuation used between the RF output and the spectrum analyzer input. The amplitude accuracy of the spectrum analyzer was further enhanced by calibrating the setup using the power meter and synthesized signal generator.

Prior to measuring peak transmit power; the emission bandwidth (B) and the transmission pulse duration (T) were measured. Both are required to determine the method of measuring Peak Transmit Power. The method of measuring the emission bandwidth and the associated data are found elsewhere in this test report. The transmission pulse duration (T) was measured using a zero span on the spectrum analyzer to see the pulses in the time domain. The scope photos precede the power measurement data.

Method #1 found in FCC Public Notice DA02-2138 was used because the analyzer sweep time was less than or equal to T.

The spectrum analyzer settings were as follows:

- The span was set to encompass entire emission bandwidth (B), centered on the transmit channel.
- The RBW = 1 MHz, VBW >= 3 MHz
- Peak detector mode because the bin width (span / number of spectral points) > 0.5 RBW.
- Trace average 100 traces in power averaging mode (not video averaging).
- Power was integrated across "B", by using the channel power function of the analyzer.

EMC

PEAK POWER SPECTRAL DENSITY

EUT: S-00112	Work Order: LABT0415
Serial Number: C011	Date: 03/29/11
Customer: Logitech, Inc.	Temperature: 22.8°C
Attendees: None	Humidity: 36%
Project: None	Barometric Pres.: 30.08 in
Tested by: Rod Peloquin	Power: 5 VDC
	Job Site: EV06

TEST SPECIFICATIONS	
FCC 15.407:2011	Test Method ANSI C63.10:2009

COMMENTS
None

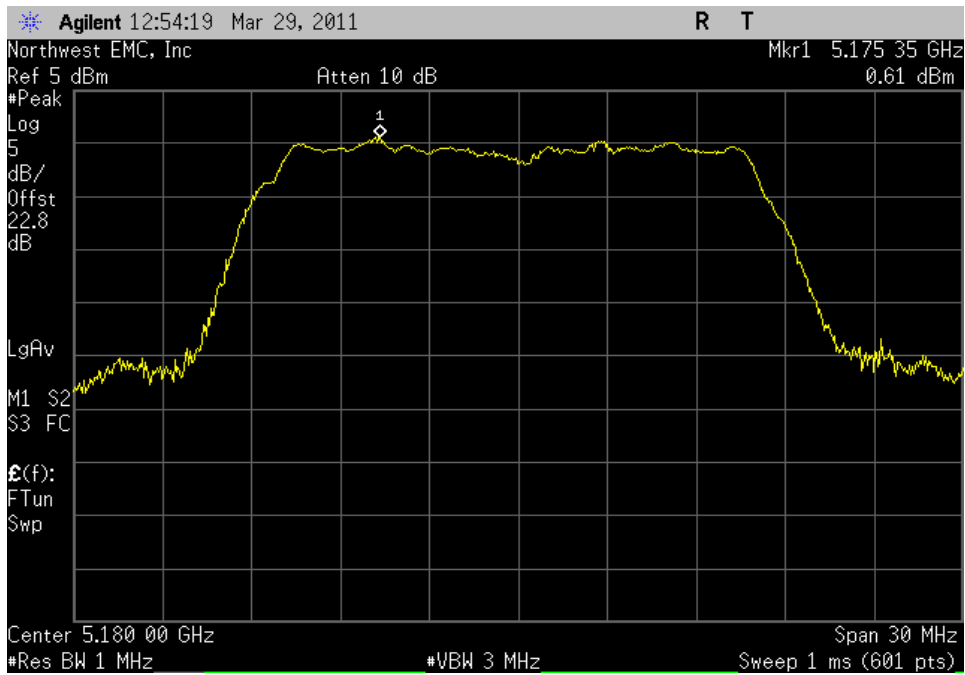
DEVIATIONS FROM TEST STANDARD
No Deviations

Configuration #	5	<i>Rod Peloquin</i> Signature
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		Value	Limit	Results
802.11(a) 6 Mbps	5150 - 5250 MHz Band			
	Channel 36, 5180 MHz, Low Channel	0.6 dBm / MHz	≤ 4 dBm / MHz	Pass
	Channel 48, 5240 MHz, High Channel	-2.4 dBm / MHz	≤ 4 dBm / MHz	Pass
802.11(a), 24 Mbps	5150 - 5250 MHz Band			
	Channel 36, 5180 MHz, Low Channel	0.6 dBm / MHz	≤ 4 dBm / MHz	Pass
	Channel 48, 5240 MHz, High Channel	-2.4 dBm / MHz	≤ 4 dBm / MHz	Pass

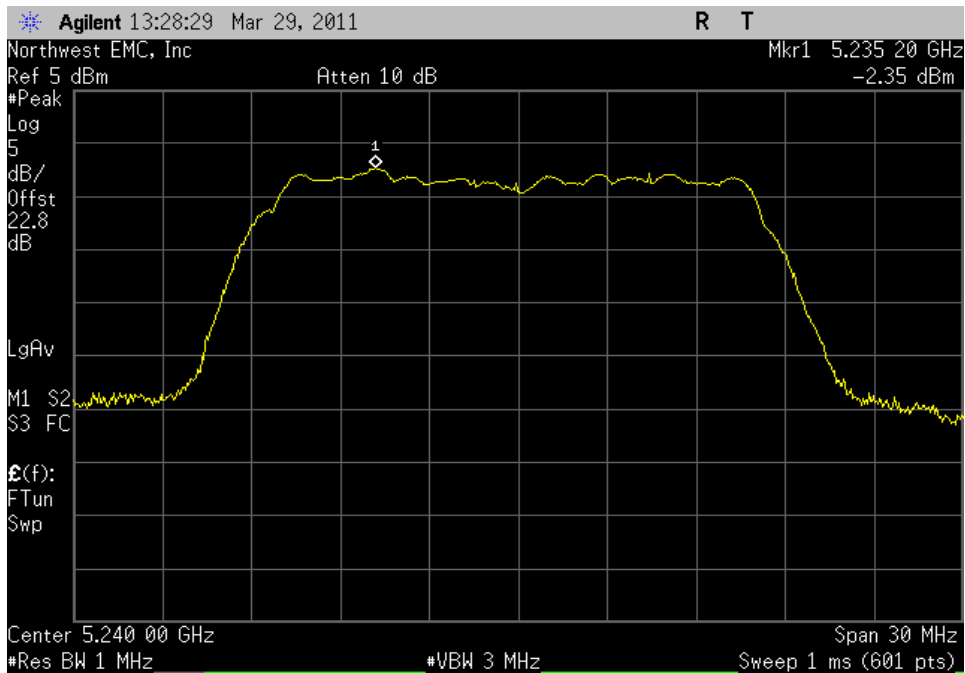
802.11(a) 6 Mbps, 5150 - 5250 MHz Band, Channel 36, 5180 MHz, Low Channel

Result: Pass **Value:** 0.61 dBm / MHz **Limit:** ≤ 4 dBm / MHz



802.11(a) 6 Mbps, 5150 - 5250 MHz Band, Channel 48, 5240 MHz, High Channel

Result: Pass **Value:** -2.35 dBm / MHz **Limit:** ≤ 4 dBm / MHz

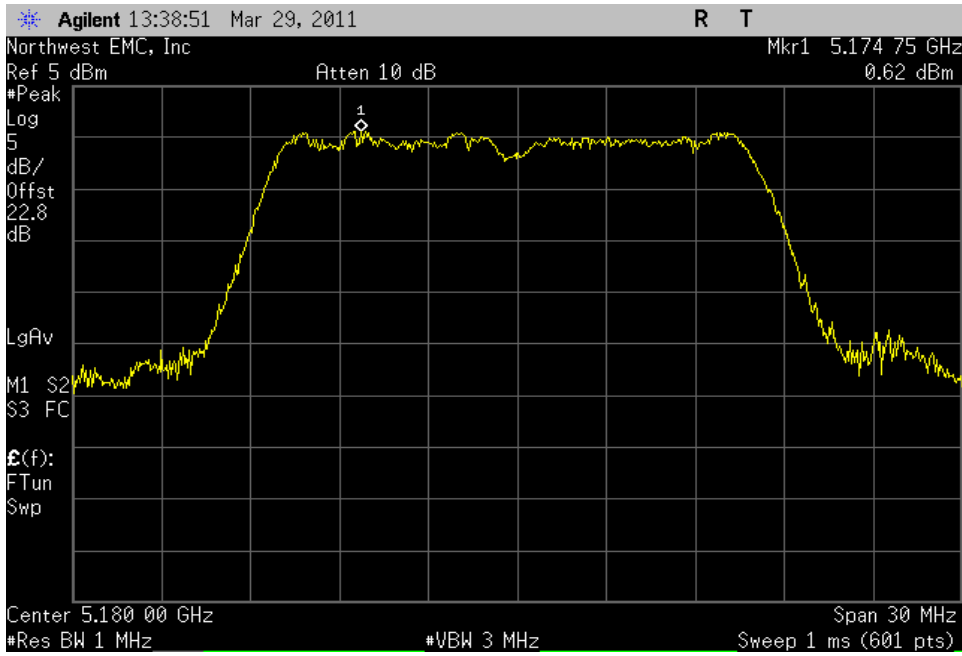


802.11(a), 24 Mbps, 5150 - 5250 MHz Band, Channel 36, 5180 MHz, Low Channel

Result: Pass

Value: 0.62 dBm / MHz

Limit: ≤ 4 dBm / MHz

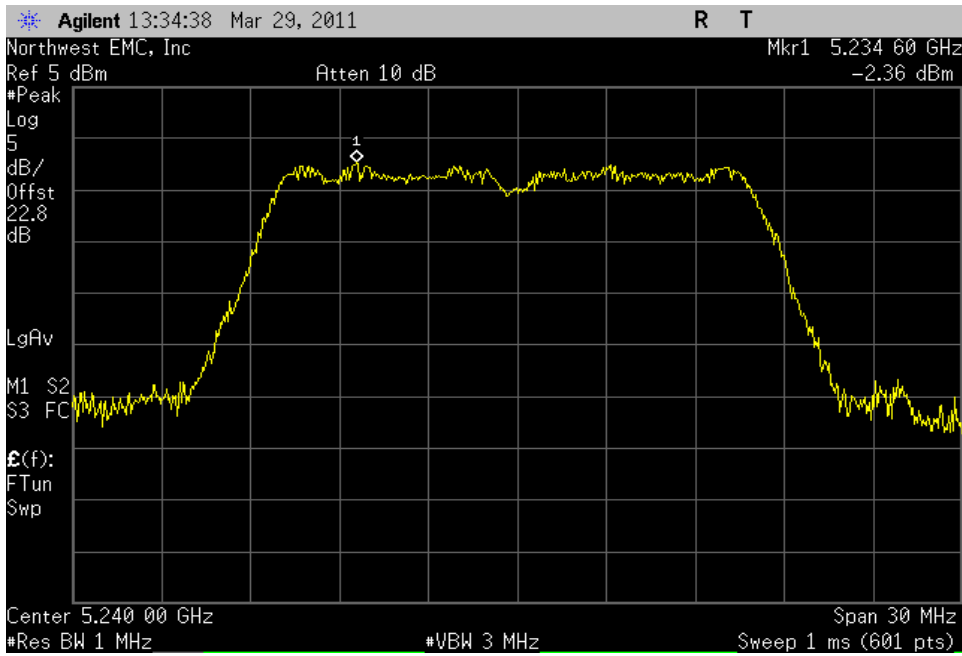


802.11(a), 24 Mbps, 5150 - 5250 MHz Band, Channel 48, 5240 MHz, High Channel

Result: Pass

Value: -2.36 dBm / MHz

Limit: ≤ 4 dBm / MHz



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
Multimeter	Fluke	114	MMU	7/13/2009	24
DC Power Supply	EZ Digital Co	GP-4303D	TPY	NCR	0
Signal Generator	Agilent	N5183A	TIA	1/18/2011	24
40 GHz DC block	Fairview Microwave	SD3379	AMI	11/1/2010	13
Spectrum Analyzer	Agilent	E4446A	AAT	2/15/2011	12

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

FCC Public Notice DA 02-2138 was followed. The transmit frequency was set to the required channels in each band. The transmit power was set to its default maximum. The lowest, a medium, and the highest data rates were measured. A direct connection was made between the RF output of the EUT and a spectrum analyzer. Attenuation and a DC block were used. The reference level offset on the spectrum analyzer was adjusted to compensate for cable loss and the external attenuation used between the RF output and the spectrum analyzer input.

The spectrum analyzer settings were as follows:

- Span set to encompass the entire emission bandwidth (B), centered on the transmit channel.
- Using the marker delta function, the largest difference between the following two traces was measured:
 - 1st Trace: RBW = 1 MHz, VBW >= 3 MHz with peak detector and max-hold settings.
 - 2nd Trace: Use same settings as were used for peak conducted transmit power. The sample detector was used as well as the VBW being matched to that used on the peak conducted transmit power.

EUT: S-00112	Work Order: LABT0415
Serial Number: C001	Date: 03/11/11
Customer: Logitech, Inc.	Temperature: 22.92°C
Attendees: None	Humidity: 18%
Project: None	Barometric Pres.: 1012.8
Tested by: Trevor Buls	Power: 120VAC/60Hz
	Job Site: MN05
TEST SPECIFICATIONS	
FCC 15.407:2011	Test Method: ANSI C63.10:2009

COMMENTS
None

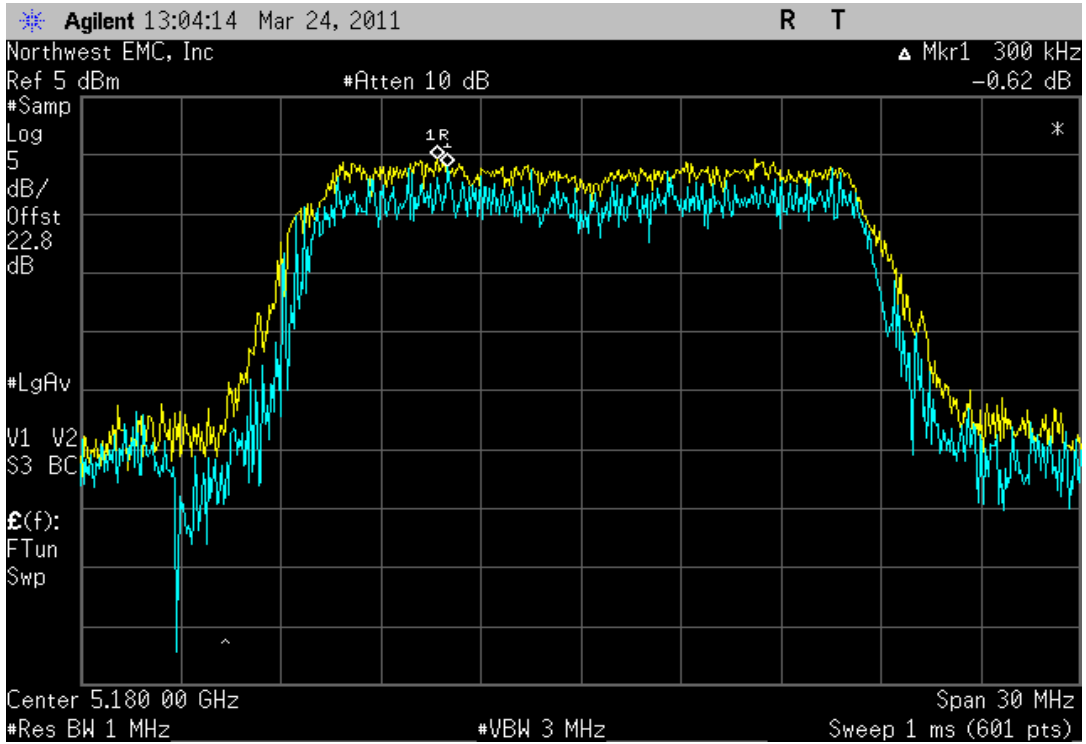
DEVIATIONS FROM TEST STANDARD
None

Configuration # 1
Signature *Trevor Buls*

		Value	Limit	Result
802.11(a) 6 Mbps	5150 - 5250 MHz Band			
	Channel 36, Low Channel	0.617 dBm	< 13 dB	Pass
	Channel 48, High Channel	0.855 dBm	< 13 dB	Pass
802.11(a) 24 Mbps	5150 - 5250 MHz Band			
	Channel 36, Low Channel	1.123 dBm	< 13 dB	Pass
	Channel 48, High Channel	0.5 dBm	< 13 dB	Pass

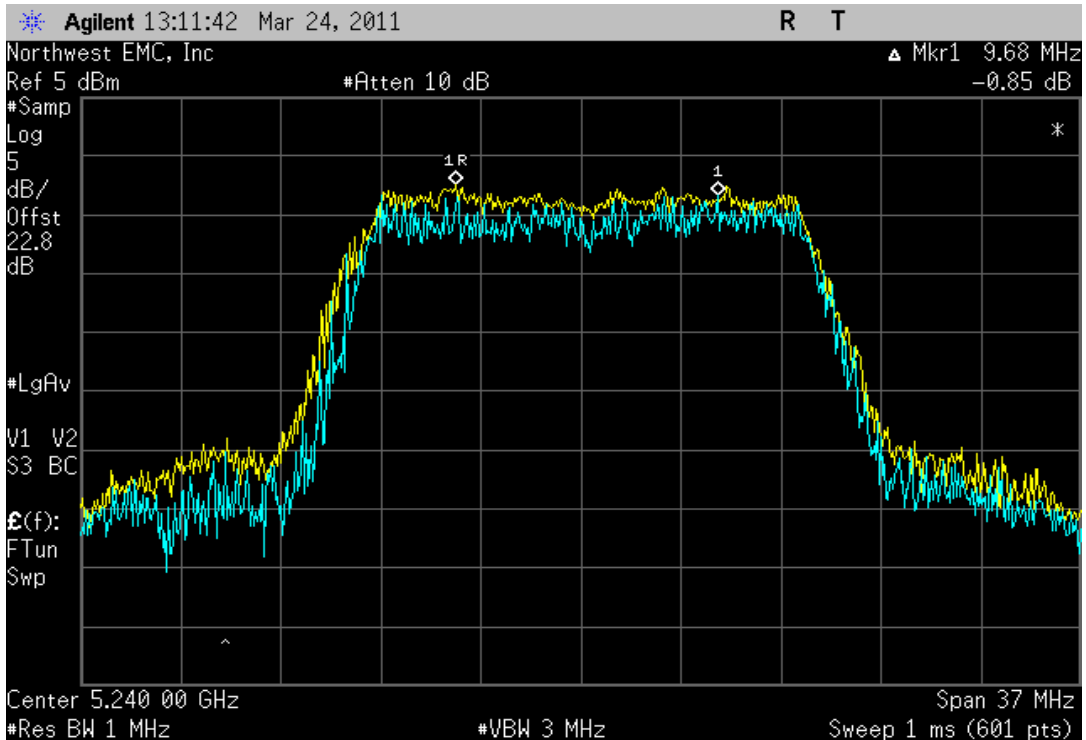
802.11(a) 6 Mbps, 5150 - 5250 MHz Band, Channel 36, Low Channel

Value	Limit	Result
0.617 dBm	< 13 dB	Pass



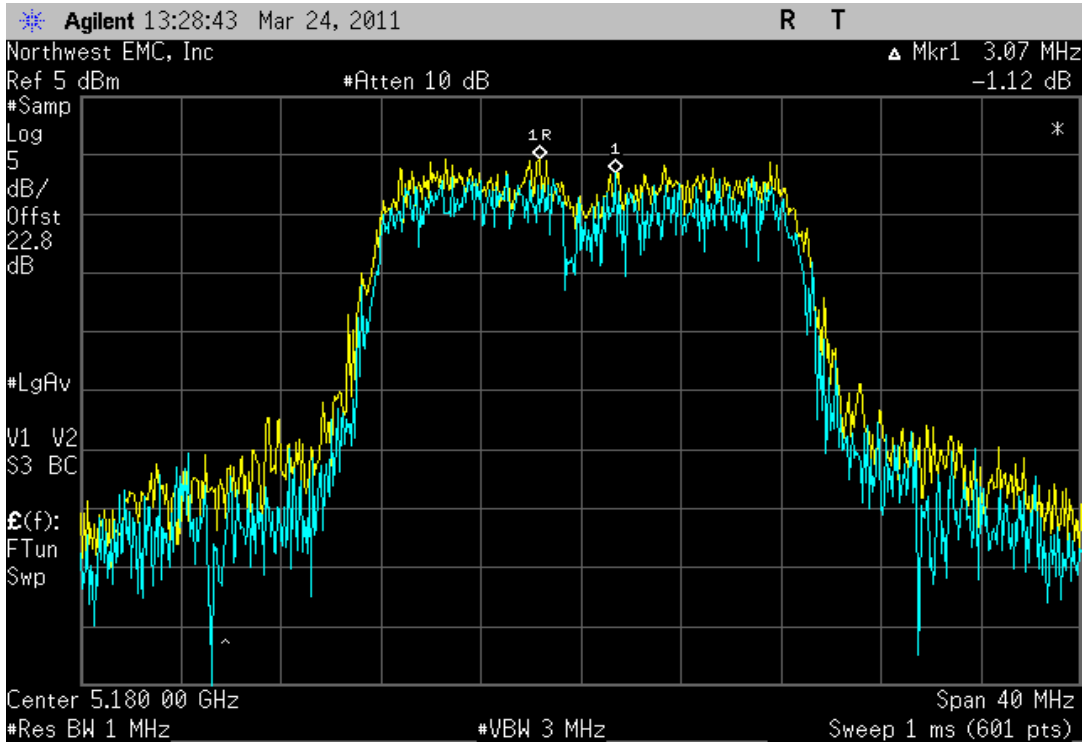
802.11(a) 6 Mbps, 5150 - 5250 MHz Band, Channel 48, High Channel

Value	Limit	Result
0.855 dBm	< 13 dB	Pass



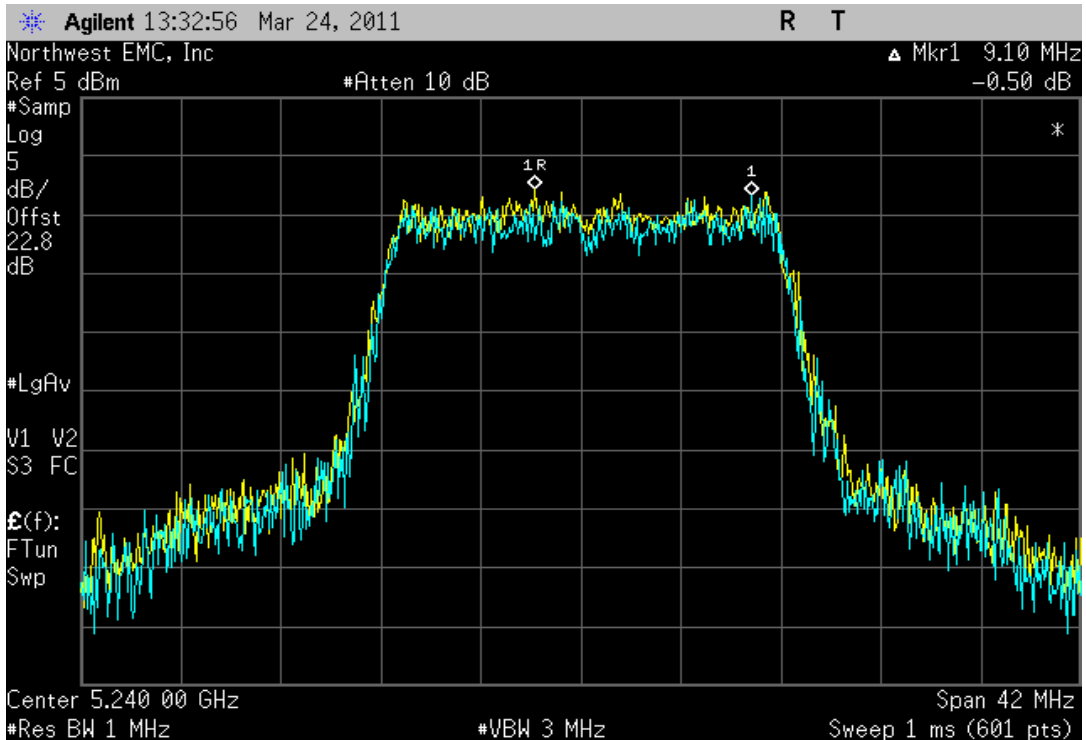
802.11(a) 24 Mbps, 5150 - 5250 MHz Band, Channel 36, Low Channel

Value	Limit	Result
1.123 dBm	< 13 dB	Pass



802.11(a) 24 Mbps, 5150 - 5250 MHz Band, Channel 48, High Channel

Value	Limit	Result
0.5 dBm	< 13 dB	Pass



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
DC Power Supply	EZ Digital Co	GP-4303D	TPY	NCR	0
Multimeter	Fluke	114	MMU	7/13/2009	24
Chamber, Temp./Humidity Chamber	Cincinnati Sub Zero (CSZ)	ZPH-32-3.5-SCT/AC	TBF	12/29/2009	24
Near Field Probe Set	ETS	7405	IPO	NCR	0
Spectrum Analyzer	Agilent	E4446A	AAT	2/15/2011	12

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

Variation of Supply Voltage

The primary supply voltage was varied from 85% to 115% of nominal.

Variation of Ambient Temperature

Using a temperature chamber, the transmit frequency was recorded at the extremes of the specified temperature range (-30° to +50° C) and at 10°C intervals.

Measurements were made at the single transmit frequency. The antenna is integral to the EUT, so a radiated measurement was made using a spectrum analyzer and a near field probe. The spectrum analyzer is equipped with a precision frequency reference that exceeds the stability requirement of the EUT.

EMC

EUT: S-00112	Work Order: LABT0415
Serial Number: R001	Date: 03/15/11
Customer: Logitech, Inc.	Temperature: 23.38°C
Attendees: None	Humidity: 18%
Project: None	Barometric Pres.: 1017.4
Tested by: Trevor Buls	Power: 120VAC/60Hz
	Job Site: MN05

TEST SPECIFICATIONS	Test Method
FCC 15.407:2011	ANSI C63.10:2009

COMMENTS
Transmitting, CW mode.

DEVIATIONS FROM TEST STANDARD
None

Configuration #	3	Signature <i>Trevor Buls</i>
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		Value (MHz)	Error (ppm)	Limit (ppm)	Results
Assigned Frequency					
+20°	Channel 36	5180.000000	N/A	N/A	N/A
	Channel 48	5240.000000	N/A	N/A	N/A
Voltage Variation					
+5.92 Vdc (115%)	Channel 36	5180.253773	49.0	100	Pass
	Channel 48	5240.256983	49.0	100	Pass
+5.15 Vdc (100%)	Channel 36	5180.255365	49.3	100	Pass
	Channel 48	5240.258784	49.4	100	Pass
+4.38 Vdc (85%)	Channel 36	5180.254507	49.1	100	Pass
	Channel 48	5240.258784	49.4	100	Pass
Temperature Variation					
+50°	Channel 36	5180.242271	46.8	100	Pass
	Channel 48	5240.245079	46.8	100	Pass
+40°	Channel 36	5180.242920	46.9	100	Pass
	Channel 48	5240.246112	47.0	100	Pass
+20°	Channel 36	5180.245903	47.5	100	Pass
	Channel 48	5240.249146	47.5	100	Pass
+30°	Channel 36	5180.253844	49.0	100	Pass
	Channel 48	5240.256983	49.0	100	Pass
+10°	Channel 36	5180.260127	50.2	100	Pass
	Channel 48	5240.263837	50.4	100	Pass
0°	Channel 36	5180.264174	51.0	100	Pass
	Channel 48	5240.266987	51.0	100	Pass
-10°	Channel 36	5180.262023	50.6	100	Pass
	Channel 48	5240.263893	50.4	100	Pass
-20°	Channel 36	5180.248453	48.0	100	Pass
	Channel 48	5240.248362	47.4	100	Pass
-30°	Channel 36	5180.227117	43.8	100	Pass
	Channel 48	5240.225233	43.0	100	Pass

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	E4440A	AFD	6/1/2009	24
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0
40GHz DC Block	Miteq	DCB4000	AMD	8/5/2010	13
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	8/6/2010	12
MXG Vector Singal Generator	Agilent	N5182A	TIF	NCR	0
Power Meter	Gigatronics	8651A	SPM	1/7/2010	24
Power Sensor	Gigatronics	80701A	SPL	1/7/2010	16

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

ANSI C63.10 was followed. The transmit frequency was set to the required channels in each band. The transmit power was set to its default maximum. A direct connection was made between the RF output of the EUT and a spectrum analyzer. Attenuation and a DC block were used. The reference level offset on the spectrum analyzer was adjusted to compensate for cable loss and the external attenuation used between the RF output and the spectrum analyzer input. The amplitude accuracy of the spectrum analyzer was further enhanced by calibrating the setup using the power meter and synthesized signal generator.

Prior to measuring peak transmit power; the emission bandwidth (B) was measured. This is required to determine the method of measuring Peak Transmit Power. The method of measuring the emission bandwidth and the associated data are found elsewhere in this test report. The transmission pulse duration (T) was measured using a zero span on the spectrum analyzer to see the pulses in the time domain.

Method #3 was used because the analyzer sweep time was greater than T for the operating mode which has the shortest transmission pulse duration and the Emission Bandwidth was greater than the largest RBW on the analyzer.

RF gating was used on the analyzer with the gate source setting of 'RF Burst'. The analyzer span was set to match the channel power integration bandwidth due to the use of the 'RF Burst' source.

The spectrum analyzer settings were as follows:

- The span was set to encompass entire emission bandwidth (B), centered on the transmit channel.
- The RBW = 1 MHz, VBW > / = 1/T
- Sample detector mode because the bin width (span / number of spectral points) < 0.5 RBW.
- Power was integrated across "B", by using the channel power function of the analyzer.

The power limits are based on the following formulas:

5.15 MHz – 5.25 MHz band - The lesser of 50 mW or 4 dBm + 10 log B, where B is the -26dB emission bandwidth in MHz.

EMC

PEAK TRANSMIT POWER

EUT: S-00112	Work Order: LABT0415
Serial Number: C011	Date: 03/29/11
Customer: Logitech, Inc.	Temperature: 22.8°C
Attendees: None	Humidity: 36%
Project: None	Barometric Pres.: 30.08 in
Tested by: Rod Peloquin	Power: 5 VDC
	Job Site: EV06

TEST SPECIFICATIONS	
FCC 15.407:2011	Test Method ANSI C63.10:2009

COMMENTS

Utilizing RF gating on the spectrum analyzer to capture the high time during the transmission burst

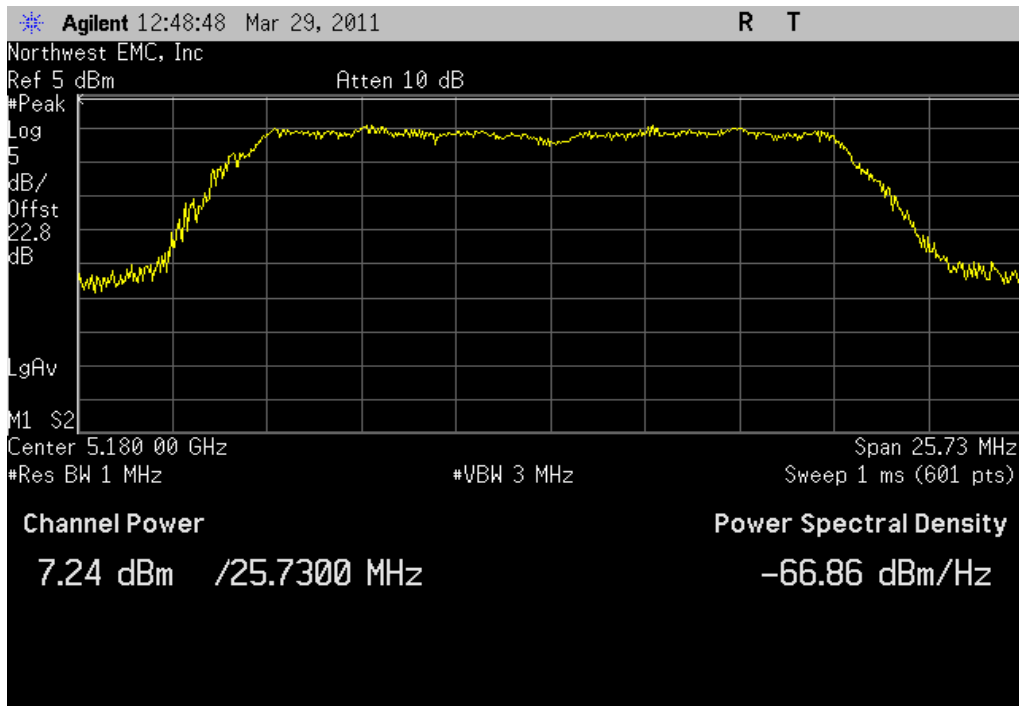
DEVIATIONS FROM TEST STANDARD

No Deviations

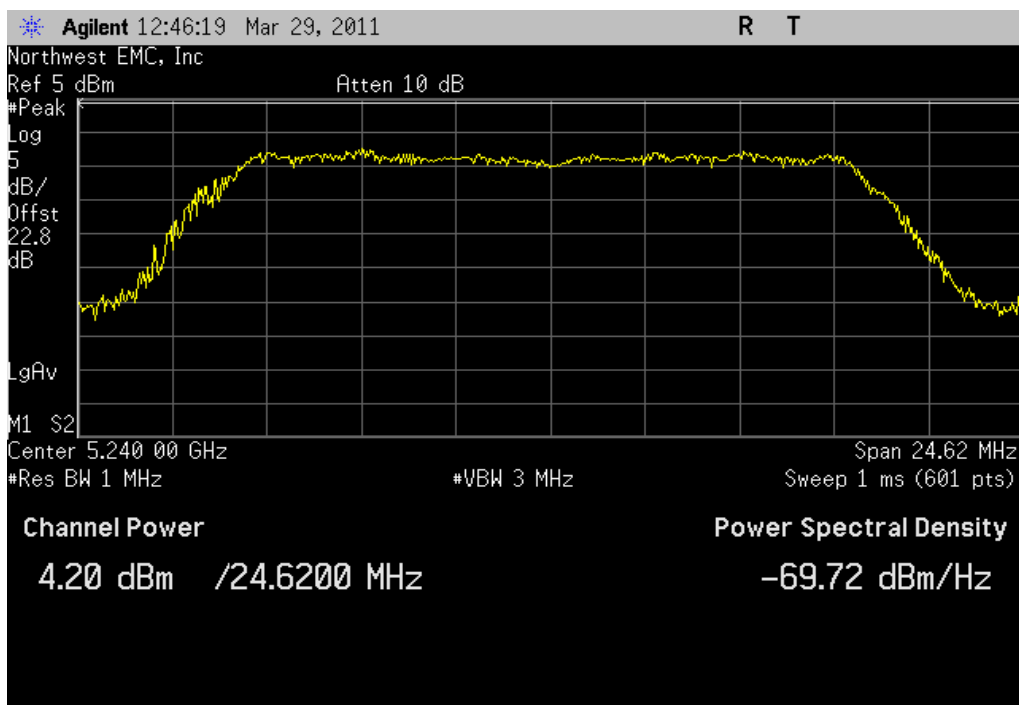
Configuration #	5	<i>Rod Peloquin</i> Signature
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		Value	Limit	Results
802.11(a) 6 Mbps	5150 - 5250 MHz Band			
	Channel 36, Low Channel	7.2 dBm	17 dBm	Pass
	Channel 48, High Channel	4.2 dBm	17 dBm	Pass
802.11(a), 24 Mbps	5150 - 5250 MHz Band			
	Channel 36, Low Channel	4.1 dBm	17 dBm	Pass
	Channel 48, High Channel	1.0 dBm	17 dBm	Pass

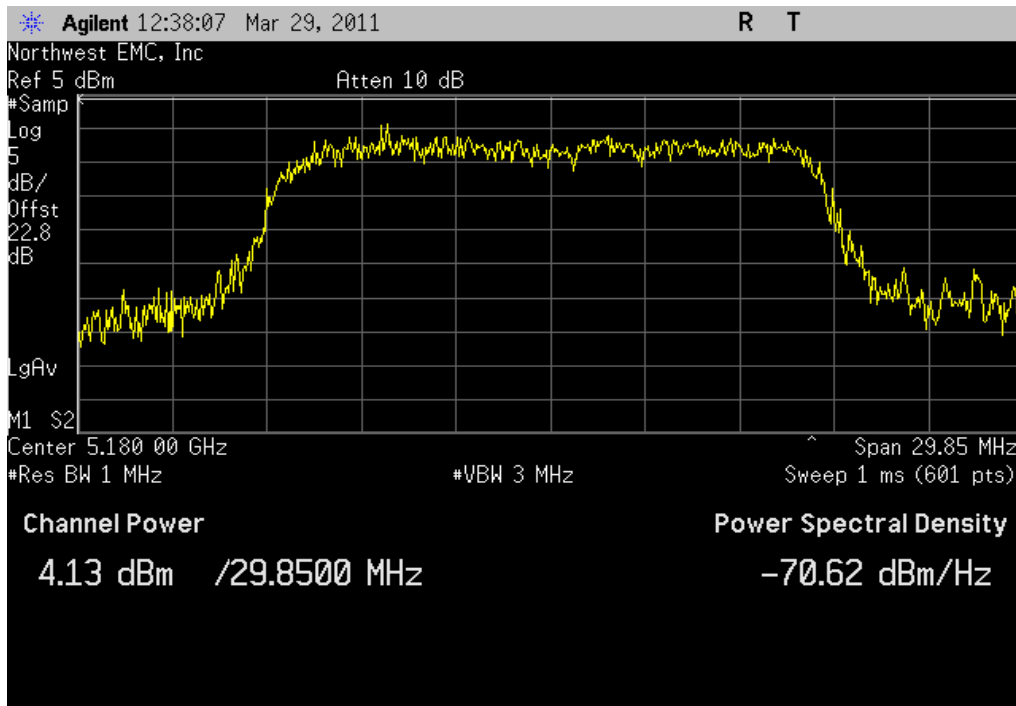
802.11(a) 6 Mbps, 5150 - 5250 MHz Band, Channel 36, Low Channel

Result: Pass**Value:** 7.24 dBm**Limit:** 17 dBm

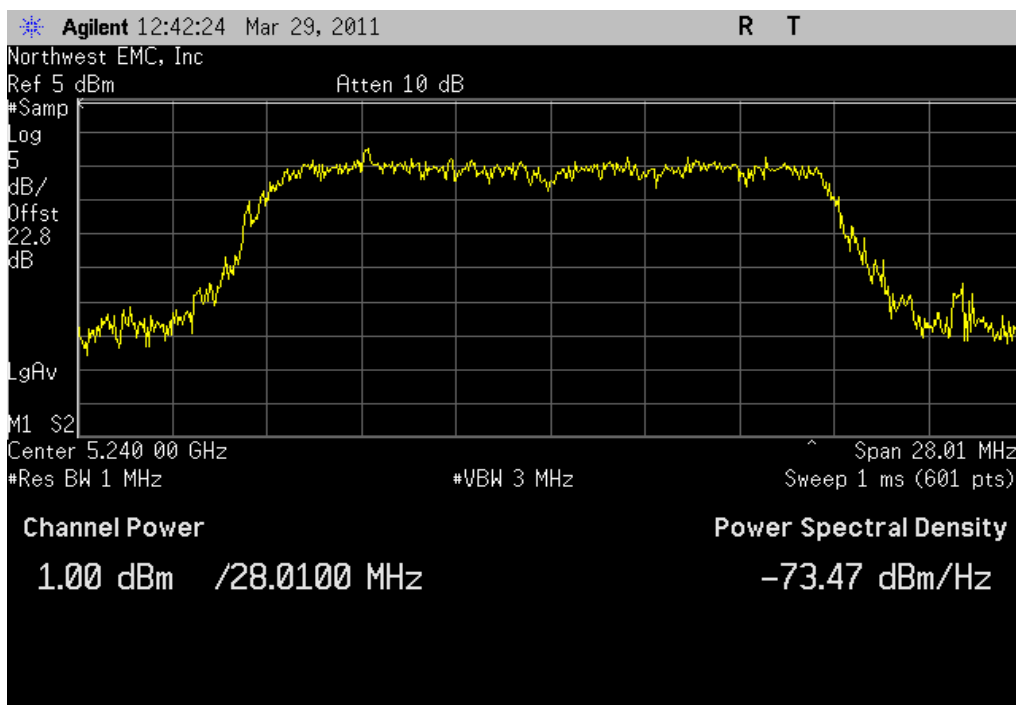
802.11(a) 6 Mbps, 5150 - 5250 MHz Band, Channel 48, High Channel

Result: Pass**Value:** 4.20 dBm**Limit:** 17 dBm

802.11(a), 24 Mbps, 5150 - 5250 MHz Band, Channel 36, Low Channel

Result: Pass**Value:** 4.13 dBm**Limit:** 17 dBm

802.11(a), 24 Mbps, 5150 - 5250 MHz Band, Channel 48, High Channel

Result: Pass**Value:** 1.00 dBm**Limit:** 17 dBm

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. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

MODES OF OPERATION

Transmitting UNII, channel 48.
Transmitting UNII, channel 36.

POWER SETTINGS INVESTIGATED

120VAC/60Hz

CONFIGURATIONS INVESTIGATED

LABT0415 - 4

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	40 GHz
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SAMPLE CALCULATIONS

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Low Pass Filter	Micro-Tronics	LPM50004	HGK	7/9/2010	24 mo
High Pass Filter	Micro-Tronics	HPM50112	HGA	10/8/2010	24 mo
5.725-5.875 Notch Filter	Micro-Tronics	BRC50705	HGJ	8/6/2010	24 mo
5.47-5.725 Notch Filter	Micro-Tronics	BRC50704	HGI	10/8/2010	24 mo
5.25 GHz Notch Filter	K&L Microwave	8N50-5250/X200-0/0	HFK	4/2/2010	24 mo
MN05 Cables	ESM Cable Corp.	Standard Gain Horn Cables	MNJ	7/19/2010	12 mo
Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AVV	7/19/2010	12 mo
Antenna, Horn	ETS	3160-07	AXP	NCR	0 mo
Pre-Amplifier	Miteq	AM-1616-1000	AVY	7/19/2010	12 mo
MN05 Cables	ESM Cable Corp.	Bilog Cables	MNH	2/2/2011	12 mo
Antenna, Biconilog	ETS Lindgren	3142D	AXN	12/30/2009	24 mo
Pre-Amplifier	Miteq	JSW45-26004000-40-5P	AVN	11/8/2010	12 mo
26-40GHz Cable	N/A	TTBJ141-KMKM-72	EVX	11/5/2010	12 mo
Antenna, Horn	ETS	3160-10	AIC	NCR	0 mo
Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVX	7/19/2010	12 mo
MN05 Cables	ESM Cable Corp.	Double Ridge Guide Horn Cables	MNI	7/19/2010	12 mo
Antenna, Horn	ETS Lindgren	3115	AIP	12/22/2009	24 mo
Pre-Amplifier	Miteq	JSD4-18002600-26-8P	APU	1/27/2010	16 mo
MN05 Cables	N/A	18-26GHz Standard Gain Horn Cable	EVD	1/27/2010	16 mo
Antenna, Horn	ETS	3160-09	AHG	NCR	0 mo
Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AVW	7/19/2010	12 mo
Spectrum Analyzer	Agilent	E4446A	AAT	2/15/2011	12 mo
Attenuator, 20 dB, 'SMA'	SM Electronics	SA6-20	REO	7/9/2010	12 mo
Multimeter	Fluke	114	MMU	7/13/2009	24 mo
DC Power Supply	EZ Digital Co	GP-4303D	TPY	NCR	0 mo
Antenna, Horn	ETS Lindgren	3160-08	AIQ	NCR	0 mo

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 IF bandwidths and detectors specified. No video filter was used, except in the case of the

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 highest gain antenna of each type to be used with the EUT were tested. The EUT was configured for the lowest, a middle, and the highest transmit frequency in each operational band. For each configuration, the spectrum was scanned throughout the specified range. Measurements were made to satisfy the three requirements of 47 CFR 15.407: Field strength under 1GHz, Restricted Bands of 47 CFR 15.205, and EIRP of 47 CFR 15.407. While scanning, emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antenna in three orthogonal axis, and adjusting the measurement antenna height and polarization (per ANSI C63.10:2009). A preamp and high pass filter (and notch filter) were used for this test in order to provide sufficient measurement sensitivity.

The amplitude and frequency of the highest emissions were noted. The EUT was then replaced with a 1/4 wave dipole that was successively tuned to each of the highest spurious emissions. A signal generator was connected to the dipole (horn antenna for frequencies above 1GHz), and its output was adjusted to match the level previously noted for each frequency. The output of the sig

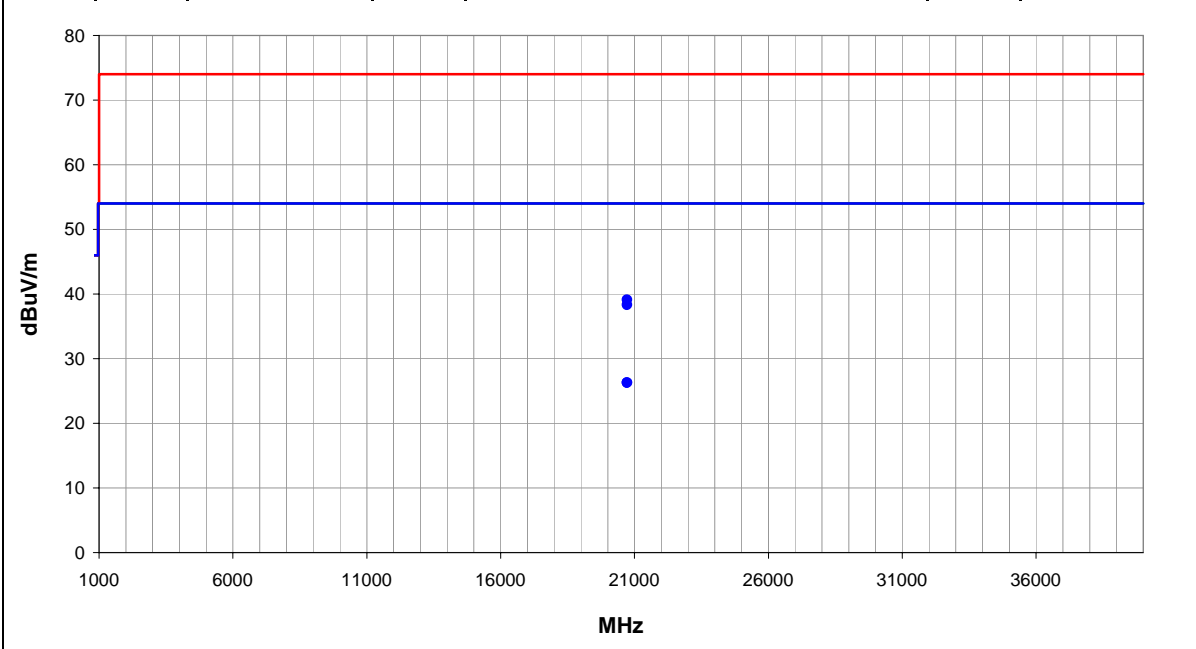
EMC

Spurious Radiated Emissions

Work Order:	LABT0415	Date:	03/25/11	<i>Trevor Buls</i> Tested by: Trevor Buls
Project:	None	Temperature:	22.95°C	
Job Site:	MN05	Humidity:	15.78	
Serial Number:	R001	Barometric Pres.:	1022.5	
EUT:	S-00112			
Configuration:	4 - LABT0415			
Customer:	Logitech, Inc.			
Attendees:	None			
EUT Power:	120VAC/60Hz			
Operating Mode:	Transmitting UNII, channel 36.			
Deviations:	None			
Comments:	None			

Test Specifications FCC 15.209:2011	Test Method ANSI C63.10:2009
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Run #	21	Test Distance (m)	3	Antenna Height(s)	1-4m	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
20720.830	26.3	0.0	1.2	0.0	3.0	0.0	Vert	AV	0.0	26.3	54.0	-27.7	EUT on Side, 6 Mbps
20721.020	26.3	0.0	1.2	0.0	3.0	0.0	Horz	AV	0.0	26.3	54.0	-27.7	EUT on Side, 6 Mbps
20720.740	39.1	0.0	1.2	0.0	3.0	0.0	Horz	PK	0.0	39.1	74.0	-34.9	EUT on Side, 6 Mbps
20717.980	38.3	0.0	1.2	0.0	3.0	0.0	Vert	PK	0.0	38.3	74.0	-35.7	EUT on Side, 6 Mbps

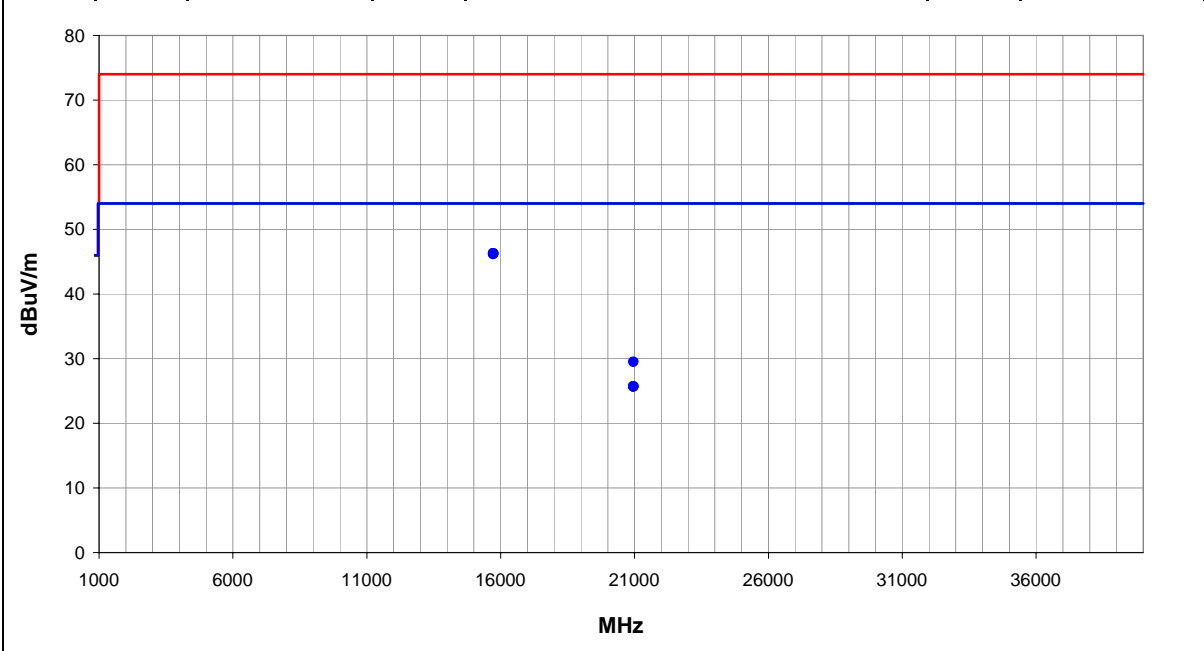
EMC

Spurious Radiated Emissions

Work Order:	LABT0415	Date:	03/25/11	<i>Trevor Buls</i> Tested by: Trevor Buls
Project:	None	Temperature:	22.95°C	
Job Site:	MN05	Humidity:	15.78	
Serial Number:	R001	Barometric Pres.:	1022.5	
EUT:	S-00112			
Configuration:	4 - LABT0415			
Customer:	Logitech, Inc.			
Attendees:	None			
EUT Power:	120VAC/60Hz			
Operating Mode:	Transmitting UNII, channel 48.			
Deviations:	None			
Comments:	None			

Test Specifications FCC 15.209:2011	Test Method ANSI C63.10:2009
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Run #	22	Test Distance (m)	3	Antenna Height(s)	1-4m	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
15722.320	29.5	16.8	1.0	223.0	3.0	0.0	Horz	AV	0.0	46.3	54.0	-7.7	EUT on Side, 6 Mbps
15722.370	29.5	16.8	1.0	223.0	3.0	0.0	Horz	AV	0.0	46.3	54.0	-7.7	EUT on Side, 6 Mbps
15721.970	29.4	16.8	1.0	138.0	3.0	0.0	Vert	AV	0.0	46.2	54.0	-7.8	EUT on Side, 6 Mbps
15720.570	29.4	16.8	1.0	138.0	3.0	0.0	Vert	AV	0.0	46.2	54.0	-7.8	EUT on Side, 6 Mbps
20958.210	29.5	0.0	1.3	0.0	3.0	0.0	Horz	AV	0.0	29.5	54.0	-24.5	EUT on Side, 6 Mbps
20959.470	25.7	0.0	1.3	0.0	3.0	0.0	Vert	AV	0.0	25.7	54.0	-28.3	EUT on Side, 6 Mbps
20959.560	25.7	0.0	1.3	0.0	3.0	0.0	Vert	AV	0.0	25.7	54.0	-28.3	EUT on Side, 6 Mbps
20960.830	25.7	0.0	1.3	0.0	3.0	0.0	Horz	AV	0.0	25.7	54.0	-28.3	EUT on Side, 6 Mbps

EUT: S-00112	Work Order: LABT0415
Serial Number: R001	Date: 03/30/11
Customer: Logitech, Inc.	Temperature: 22.5 °C
Attendees: none	Humidity: 41%
Project: None	Barometric Pres.: 1023.3 mb
Tested by: Dan Haas	Power: 120VAC/60Hz
	Job Site: EV12

TEST SPECIFICATIONS		Test Method	
FCC 15.209:2011		ANSI C63.10:2009	

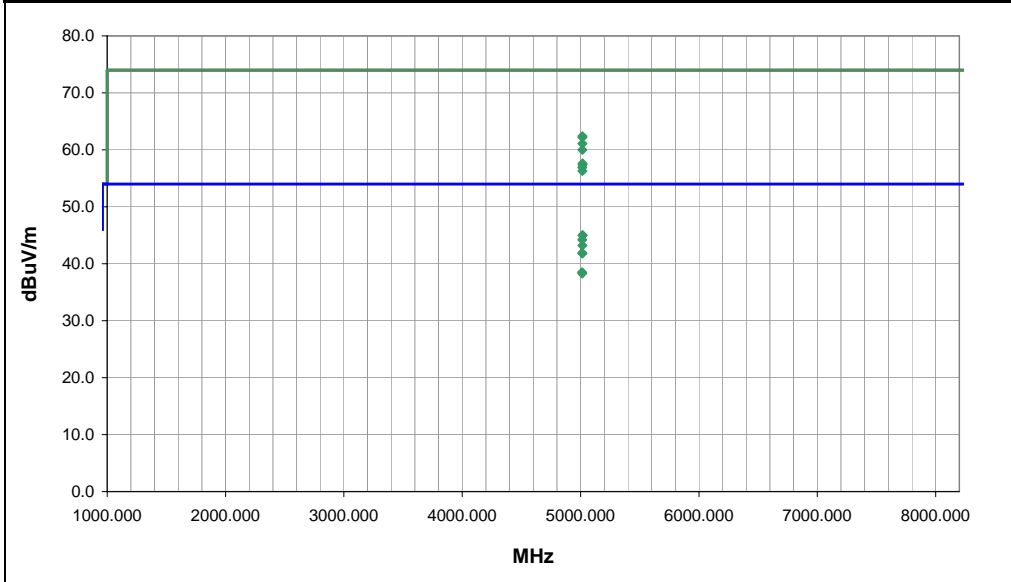
TEST PARAMETERS			
Antenna Height(s) (m)	1 - 4	Test Distance (m)	3

COMMENTS
See comments for Channel and data rate.

EUT OPERATING MODES
Continuous Tx, 802.11a

DEVIATIONS FROM TEST STANDARD
No deviations.

Run #	1	Signature 
Configuration #	6	
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
5015.070	35.3	9.7	142.0	1.2	3.0	0.0	H-Horn	AV	0.0	45.0	54.0	-9.0	Ch. 36, 6Mbps. EUT vertical
5017.170	35.3	9.7	323.0	1.2	3.0	0.0	H-Horn	AV	0.0	45.0	54.0	-9.0	Ch. 36, 6Mbps. EUT Horizontal
5013.270	34.5	9.7	164.0	1.1	3.0	0.0	V-Horn	AV	0.0	44.2	54.0	-9.8	Ch. 36, 6Mbps. EUT vertical
5015.300	33.5	9.7	129.0	1.3	3.0	0.0	H-Horn	AV	0.0	43.2	54.0	-10.8	Ch. 36, 6Mbps. EUT on side
5015.330	52.7	9.7	142.0	1.2	3.0	0.0	H-Horn	PK	0.0	62.4	74.0	-11.6	Ch. 36, 6Mbps. EUT vertical
5014.670	52.5	9.7	323.0	1.2	3.0	0.0	H-Horn	PK	0.0	62.2	74.0	-11.8	Ch. 36, 6Mbps. EUT Horizontal
5013.130	32.2	9.7	147.0	1.3	3.0	0.0	V-Horn	AV	0.0	41.9	54.0	-12.1	Ch. 36, 6Mbps. EUT on side
5015.170	32.1	9.7	120.0	1.2	3.0	0.0	V-Horn	AV	0.0	41.8	54.0	-12.2	Ch. 36, 6Mbps. EUT Horizontal
5015.470	51.4	9.7	164.0	1.1	3.0	0.0	V-Horn	PK	0.0	61.1	74.0	-12.9	Ch. 36, 6Mbps. EUT vertical
5015.600	50.3	9.7	129.0	1.3	3.0	0.0	H-Horn	PK	0.0	60.0	74.0	-14.0	Ch. 36, 6Mbps. EUT on side
5012.700	28.8	9.7	127.0	1.1	3.0	0.0	H-Horn	AV	0.0	38.5	54.0	-15.5	Ch. 36, 24Mbps. EUT vertical
5013.070	28.6	9.7	80.0	1.2	3.0	0.0	V-Horn	AV	0.0	38.3	54.0	-15.7	Ch. 36, 24Mbps. EUT vertical
5016.170	47.9	9.7	127.0	1.1	3.0	0.0	H-Horn	PK	0.0	57.6	74.0	-16.4	Ch. 36, 24Mbps. EUT vertical
5016.030	47.7	9.7	120.0	1.2	3.0	0.0	V-Horn	PK	0.0	57.4	74.0	-16.6	Ch. 36, 6Mbps. EUT Horizontal
5014.270	47.2	9.7	147.0	1.3	3.0	0.0	V-Horn	PK	0.0	56.9	74.0	-17.1	Ch. 36, 6Mbps. EUT on side
5015.000	46.6	9.7	80.0	1.2	3.0	0.0	V-Horn	PK	0.0	56.3	74.0	-17.7	Ch. 36, 24Mbps. EUT vertical

EUT: S-00112	Work Order: LABT0415
Serial Number: R001	Date: 03/30/11
Customer: Logitech, Inc.	Temperature: 22.2 °C
Attendees: none	Humidity: 42%
Project: None	Barometric Pres.: 1025.0 mb
Tested by: Dan Haas	Power: 120VAC/60Hz
	Job Site: EV12

TEST SPECIFICATIONS	Test Method
FCC 15.209:2011	ANSI C63.10:2009

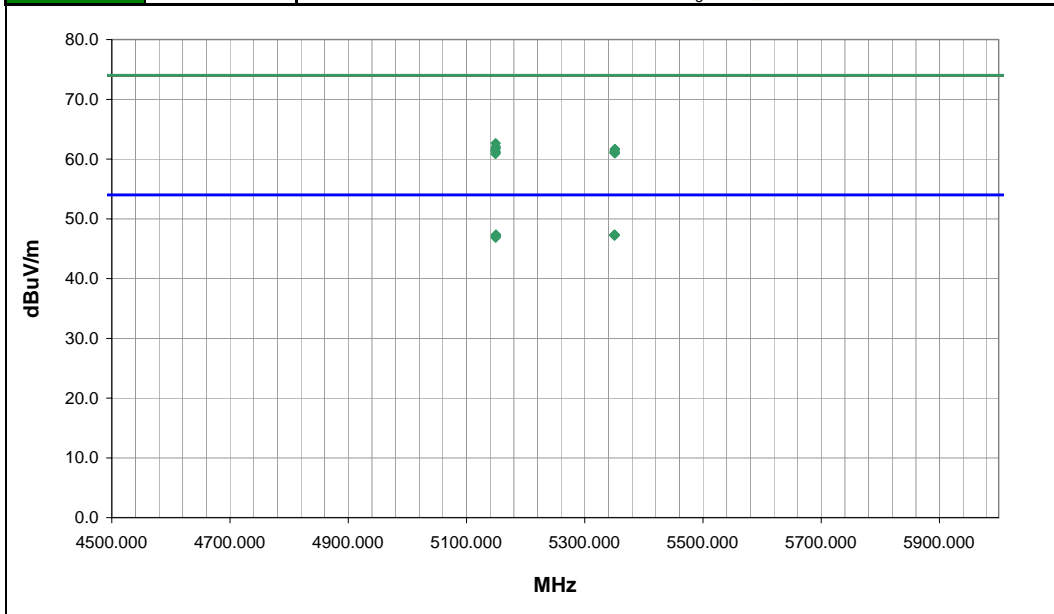
TEST PARAMETERS
Antenna Height(s) (m) 1 - 2 Test Distance (m) 1

COMMENTS
See comments for EUT orientation, and data rate.

EUT OPERATING MODES
Continuous Tx, 802.11a, Ch. 36.

DEVIATIONS FROM TEST STANDARD
No deviations.

Run #	2	Signature 
Configuration #	6	
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
5149.807	20.6	36.3	118.0	1.0	1.0	0.0	H-Horn	AV	-9.5	47.4	54.0	-6.6	6Mbps, EUT on side.
5350.337	20.2	36.7	145.0	1.0	1.0	0.0	H-Horn	AV	-9.5	47.4	54.0	-6.6	6Mbps, EUT vertical.
5149.780	20.5	36.3	268.0	1.0	1.0	0.0	V-Horn	AV	-9.5	47.3	54.0	-6.7	6Mbps, EUT vertical.
5350.010	20.1	36.7	118.0	1.0	1.0	0.0	H-Horn	AV	-9.5	47.3	54.0	-6.7	6Mbps, EUT on side.
5350.010	20.1	36.7	41.0	1.2	1.0	0.0	V-Horn	AV	-9.5	47.3	54.0	-6.7	6Mbps, EUT on side.
5350.120	20.1	36.7	268.0	1.0	1.0	0.0	V-Horn	AV	-9.5	47.3	54.0	-6.7	6Mbps, EUT vertical.
5350.150	20.1	36.7	298.0	1.0	1.0	0.0	H-Horn	AV	-9.5	47.3	54.0	-6.7	6Mbps, EUT horizontal.
5350.890	20.1	36.7	298.0	1.0	1.0	0.0	H-Horn	AV	-9.5	47.3	54.0	-6.7	24Mbps, EUT horizontal.
5149.667	20.4	36.3	41.0	1.2	1.0	0.0	V-Horn	AV	-9.5	47.2	54.0	-6.8	6Mbps, EUT on side.
5149.767	20.4	36.3	298.0	1.0	1.0	0.0	H-Horn	AV	-9.5	47.2	54.0	-6.8	6Mbps, EUT horizontal.
5149.837	20.3	36.3	145.0	1.0	1.0	0.0	H-Horn	AV	-9.5	47.1	54.0	-6.9	6Mbps, EUT vertical.
5149.310	20.1	36.3	298.0	1.0	1.0	0.0	H-Horn	AV	-9.5	46.9	54.0	-7.1	24Mbps, EUT horizontal.
5149.187	35.9	36.3	298.0	1.0	1.0	0.0	H-Horn	PK	-9.5	62.7	74.0	-11.3	24Mbps, EUT horizontal.
5149.477	35.3	36.3	298.0	1.0	1.0	0.0	H-Horn	PK	-9.5	62.1	74.0	-11.9	6Mbps, EUT horizontal.
5149.403	35.0	36.3	118.0	1.0	1.0	0.0	H-Horn	PK	-9.5	61.8	74.0	-12.2	6Mbps, EUT on side.
5350.910	34.5	36.7	268.0	1.0	1.0	0.0	V-Horn	PK	-9.5	61.7	74.0	-12.3	6Mbps, EUT vertical.
5351.047	34.5	36.7	41.0	1.2	1.0	0.0	V-Horn	PK	-9.5	61.7	74.0	-12.3	6Mbps, EUT on side.
5148.450	34.7	36.3	268.0	1.0	1.0	0.0	V-Horn	PK	-9.5	61.5	74.0	-12.5	6Mbps, EUT vertical.
5350.303	34.2	36.7	118.0	1.0	1.0	0.0	H-Horn	PK	-9.5	61.4	74.0	-12.6	6Mbps, EUT on side.
5149.700	34.4	36.3	41.0	1.2	1.0	0.0	V-Horn	PK	-9.5	61.2	74.0	-12.8	6Mbps, EUT on side.

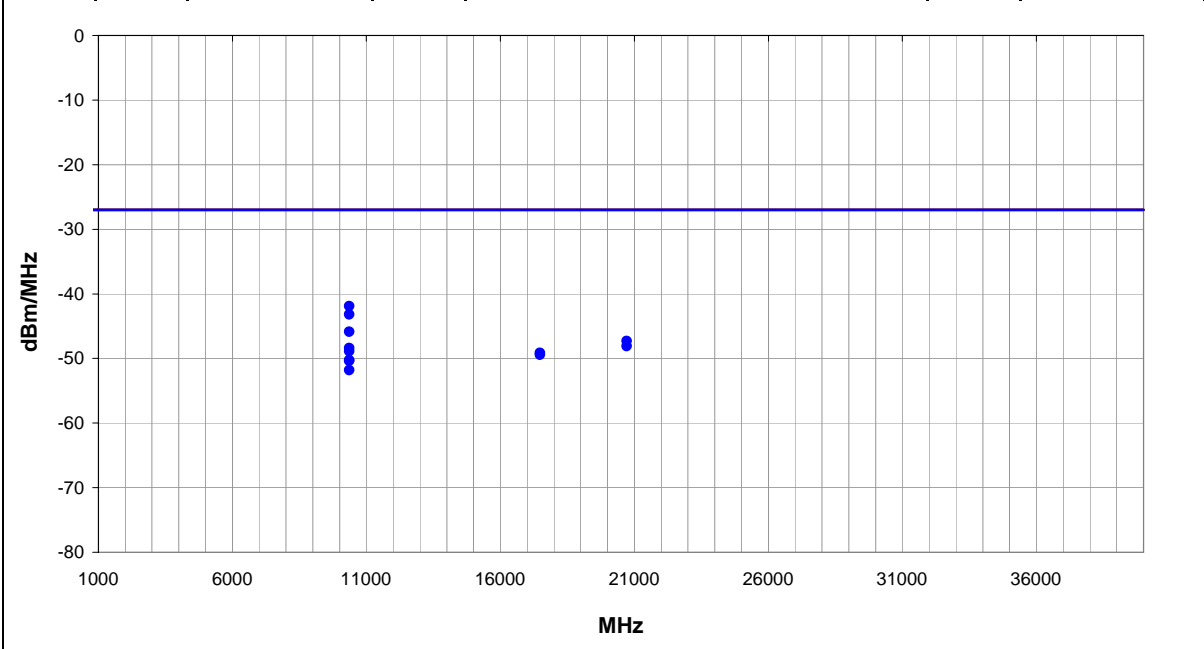
EMC

Spurious Radiated Emissions

Work Order:	LABT0415	Date:	03/25/11	<i>Trevor Buls</i> Tested by: Trevor Buls
Project:	None	Temperature:	22.95°C	
Job Site:	MN05	Humidity:	15.78	
Serial Number:	R001	Barometric Pres.:	1022.5	
EUT:	S-00112			
Configuration:	4 - LABT0415			
Customer:	Logitech, Inc.			
Attendees:	None			
EUT Power:	120VAC/60Hz			
Operating Mode:	Transmitting UNII, channel 36.			
Deviations:	None			
Comments:	None			

Test Specifications FCC 15.407:2011	Test Method ANSI C63.10:2009
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Run #	21	Test Distance (m)	3	Antenna Height(s)	1-4m	Results	Pass
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Freq (MHz)	Antenna Height (meters)	Azimuth (degrees)	Polarity/Transducer Type	Detector	EIRP (Watts/MHz)	EIRP (dBm/MHz)	Spec. Limit (dBm/MHz)	Compared to Spec. (dB)	Comments
10360.430	1.3	350.0	Horz	PK	6.47E-08	-41.9	-27.0	-14.9	EUT on Side, 6 Mbps
10359.940	1.2	342.0	Horz	PK	4.80E-08	-43.2	-27.0	-16.2	EUT on Side, 24 Mbps
10360.140	1.5	36.0	Vert	PK	2.58E-08	-45.9	-27.0	-18.9	EUT Horizontal, 6 Mbps
20720.740	1.2	0.0	Horz	PK	1.86E-08	-47.3	-27.0	-20.3	EUT on Side, 6 Mbps
20717.980	1.2	0.0	Vert	PK	1.55E-08	-48.1	-27.0	-21.1	EUT on Side, 6 Mbps
10360.510	1.2	258.0	Vert	PK	1.45E-08	-48.4	-27.0	-21.4	EUT Vertical, 6 Mbps
10360.630	1.0	316.0	Horz	PK	1.29E-08	-48.9	-27.0	-21.9	EUT Vertical, 6 Mbps
17475.910	1.0	56.0	Horz	PK	1.22E-08	-49.1	-27.0	-22.1	EUT on Side, 6 Mbps
17475.780	1.0	286.0	Vert	PK	1.14E-08	-49.4	-27.0	-22.4	EUT on Side, 6 Mbps
10360.730	1.0	335.0	Vert	PK	9.35E-09	-50.3	-27.0	-23.3	EUT on Side, 24 Mbps
10359.130	1.0	321.0	Vert	PK	9.14E-09	-50.4	-27.0	-23.4	EUT on Side, 6 Mbps
10360.660	1.0	121.0	Horz	PK	6.62E-09	-51.8	-27.0	-24.8	EUT Horizontal, 6 Mbps

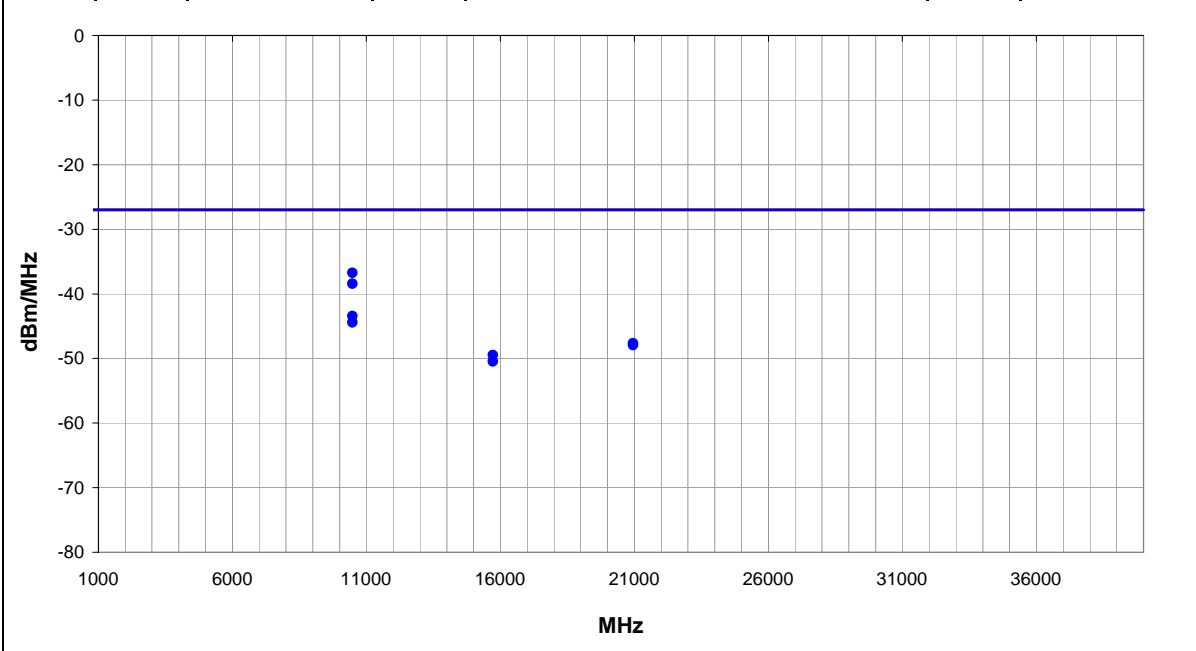
EMC

Spurious Radiated Emissions

Work Order:	LABT0415	Date:	03/25/11	<i>Trevor Buls</i> Tested by: Trevor Buls
Project:	None	Temperature:	22.95°C	
Job Site:	MN05	Humidity:	15.78	
Serial Number:	R001	Barometric Pres.:	1022.5	
EUT:	S-00112			
Configuration:	4 - LABT0415			
Customer:	Logitech, Inc.			
Attendees:	None			
EUT Power:	120VAC/60Hz			
Operating Mode:	Transmitting UNII, channel 48.			
Deviations:	None			
Comments:	None			

Test Specifications FCC 15.407:2011	Test Method ANSI C63.10:2009
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Run #	22	Test Distance (m)	3	Antenna Height(s)	1-4m	Results	Pass
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Freq (MHz)	Antenna Height (meters)	Azimuth (degrees)	Polarity/Transducer Type	Detector	EIRP (Watts/MHz)	EIRP (dBm/MHz)	Spec. Limit (dBm/MHz)	Compared to Spec. (dB)	Comments
10480.310	1.3	319.0	Vert	PK	4.53E-08	-43.4	-27.0	-16.4	EUT on Side, 24 Mbps
10480.880	1.4	335.0	Horz	PK	1.43E-07	-38.4	-27.0	-11.4	EUT on Side, 24 Mbps
10481.130	1.3	342.0	Horz	PK	2.12E-07	-36.7	-27.0	-9.7	EUT on Side, 6 Mbps
10481.380	1.0	335.0	Vert	PK	3.60E-08	-44.4	-27.0	-17.4	EUT on Side, 6 Mbps
15721.970	1.0	138.0	Vert	PK	8.94E-09	-50.5	-27.0	-23.5	EUT on Side, 6 Mbps
15722.370	1.0	223.0	Horz	PK	1.13E-08	-49.5	-27.0	-22.5	EUT on Side, 6 Mbps
20958.210	1.3	0.0	Horz	PK	1.72E-08	-47.7	-27.0	-20.7	EUT on Side, 6 Mbps
20959.560	1.3	0.0	Vert	PK	1.60E-08	-48.0	-27.0	-21.0	EUT on Side, 6 Mbps

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 Channel 48, 6 Mbps.

Transmitting Channel 36, 6 Mbps.

POWER SETTINGS INVESTIGATED

120VAC/60Hz

CONFIGURATIONS INVESTIGATED

LABT0415 - 2

SAMPLE CALCULATIONS

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
MN03 Cables	ESM Cable Corp.	Conducted Cables	MNC	6/8/2010	13 mo
50-150 Ohm Adapter	Fischer Custom Communications	FCC-801-150-50-CDNNN	RAF	NCR	0 mo
High Pass Filter	TTE	H97-100K-50-720B	HGN	6/28/2010	13 mo
LISN	Solar	9252-50-R-24-BNC	LIO	3/12/2010	12 mo
LISN	Solar Electronics	9252-50-R-24-BNC	LIY	8/3/2010	12 mo
Receiver	Rohde & Schwarz	ESCI	ARF	3/30/2010	12 mo

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. 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 ANSI C63.10-2009.

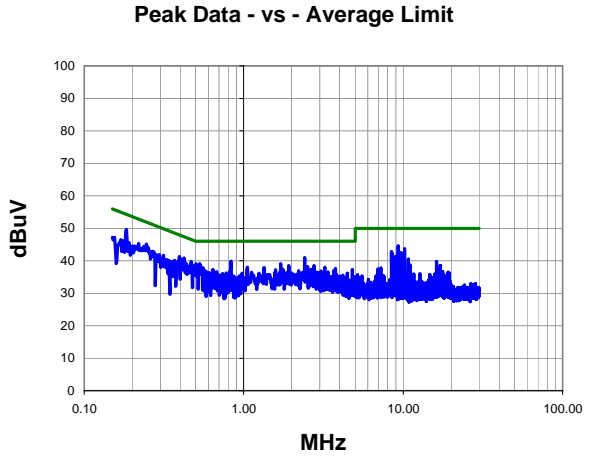
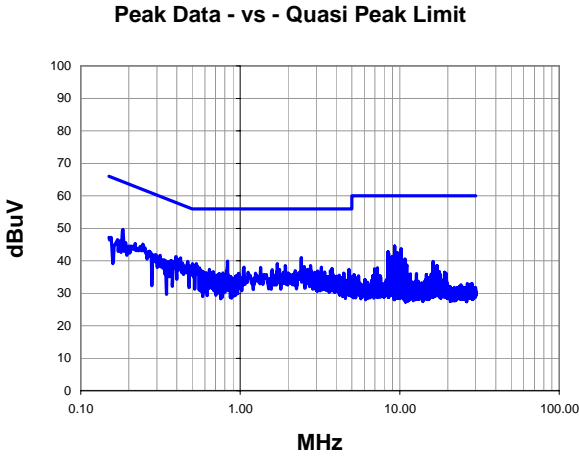
EMC

AC Powerline Conducted Emissions

Work Order:	z	Date:	03/08/11	<i>Trevor Buls</i> Tested by: Trevor Buls
Project:	None	Temperature:	23.18°C	
Job Site:	MN03	Humidity:	16.58	
Serial Number:	R001	Barometric Pres.:	1025.2	
EUT:	S-00112			
Configuration:	2 - LABT0415			
Customer:	Logitech, Inc.			
Attendees:	None			
EUT Power:	120VAC/60Hz			
Operating Mode:	Transmitting Channel 36, 6 Mbps.			
Deviations:	None			
Comments:	None			

Test Specifications FCC 15.207:2011	Test Method ANSI C63.10:2009
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Run #	13	Line:	High Line	Ext. Attenuation:	20	Results	Pass
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Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.184	29.6	20.1	49.7	64.3	-14.6
2.408	20.8	20.2	41.0	56.0	-15.0
9.300	24.1	20.5	44.6	60.0	-15.4
0.833	19.8	20.1	39.9	56.0	-16.1
10.220	23.2	20.5	43.7	60.0	-16.3
0.422	20.8	20.1	40.9	57.4	-16.5
0.395	21.2	20.1	41.3	58.0	-16.7
0.468	19.7	20.1	39.8	56.6	-16.8
0.529	19.0	20.1	39.1	56.0	-16.9
0.502	19.0	20.1	39.1	56.0	-16.9
1.704	18.9	20.2	39.1	56.0	-16.9
0.405	20.4	20.1	40.5	57.8	-17.3
8.450	22.3	20.4	42.7	60.0	-17.3
2.760	18.3	20.2	38.5	56.0	-17.5
1.912	18.3	20.2	38.5	56.0	-17.5
9.660	22.0	20.5	42.5	60.0	-17.5
0.220	25.2	20.1	45.3	62.8	-17.5
8.520	21.8	20.4	42.2	60.0	-17.8
2.520	18.0	20.2	38.2	56.0	-17.8
9.800	21.7	20.5	42.2	60.0	-17.8

Peak Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.184	29.6	20.1	49.7	54.3	-4.6
2.408	20.8	20.2	41.0	46.0	-5.0
9.300	24.1	20.5	44.6	50.0	-5.4
0.833	19.8	20.1	39.9	46.0	-6.1
10.220	23.2	20.5	43.7	50.0	-6.3
0.422	20.8	20.1	40.9	47.4	-6.5
0.395	21.2	20.1	41.3	48.0	-6.7
0.468	19.7	20.1	39.8	46.6	-6.8
0.529	19.0	20.1	39.1	46.0	-6.9
0.502	19.0	20.1	39.1	46.0	-6.9
1.704	18.9	20.2	39.1	46.0	-6.9
0.405	20.4	20.1	40.5	47.8	-7.3
8.450	22.3	20.4	42.7	50.0	-7.3
2.760	18.3	20.2	38.5	46.0	-7.5
1.912	18.3	20.2	38.5	46.0	-7.5
9.660	22.0	20.5	42.5	50.0	-7.5
0.220	25.2	20.1	45.3	52.8	-7.5
8.520	21.8	20.4	42.2	50.0	-7.8
2.520	18.0	20.2	38.2	46.0	-7.8
9.800	21.7	20.5	42.2	50.0	-7.8

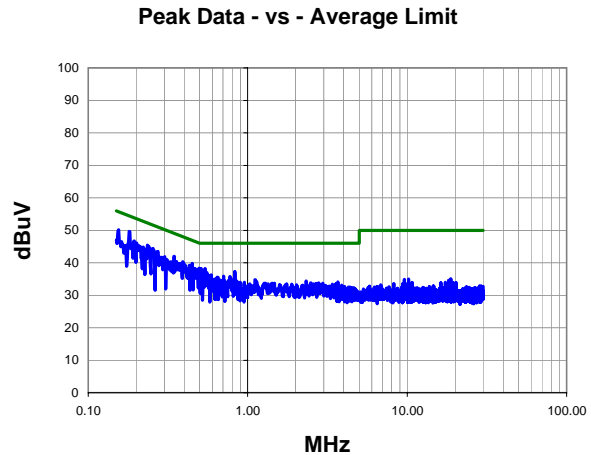
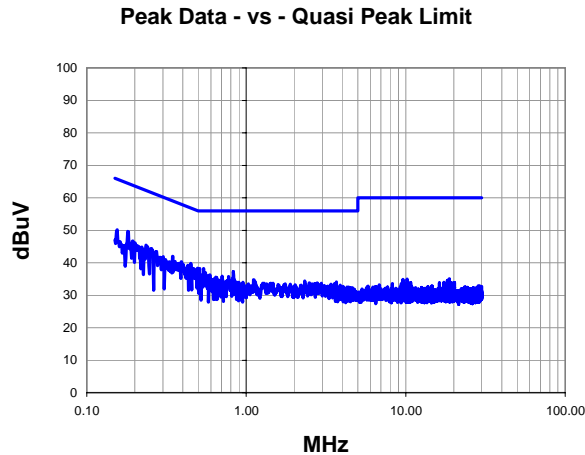
EMC

AC Powerline Conducted Emissions

Work Order:	LABT0415	Date:	03/08/11	<i>Trevor Buls</i> Tested by: Trevor Buls
Project:	None	Temperature:	23.18°C	
Job Site:	MN03	Humidity:	16.58	
Serial Number:	R001	Barometric Pres.:	1025.2	
EUT:	S-00112			
Configuration:	2 - LABT0415			
Customer:	Logitech, Inc.			
Attendees:	None			
EUT Power:	120VAC/60Hz			
Operating Mode:	Transmitting Channel 36, 6 Mbps.			
Deviations:	None			
Comments:	None			

Test Specifications FCC 15.207:2011	Test Method ANSI C63.10:2009
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Run #	14	Line:	Neutral	Ext. Attenuation:	20	Results	Pass
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Peak Data - vs - Quasi Peak Limit

Peak Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.181	29.6	20.1	49.7	64.5	-14.8
0.155	30.0	20.1	50.1	65.7	-15.6
0.235	25.3	20.1	45.4	62.3	-16.9
0.346	21.9	20.1	42.0	59.1	-17.1
0.449	19.7	20.1	39.8	56.9	-17.1
0.194	26.6	20.1	46.7	63.9	-17.2
0.252	24.2	20.1	44.3	61.7	-17.4
0.201	26.0	20.1	46.1	63.6	-17.5
0.271	23.3	20.1	43.4	61.1	-17.7
0.391	20.2	20.1	40.3	58.0	-17.7
0.495	18.2	20.1	38.3	56.1	-17.8
0.541	18.1	20.1	38.2	56.0	-17.8
0.510	18.1	20.1	38.2	56.0	-17.8
0.221	24.7	20.1	44.8	62.8	-18.0
0.431	19.1	20.1	39.2	57.2	-18.0
0.301	21.8	20.1	41.9	60.2	-18.3
0.357	20.3	20.1	40.4	58.8	-18.4
0.463	18.1	20.1	38.2	56.6	-18.4
0.830	17.2	20.1	37.3	56.0	-18.7
0.312	20.9	20.1	41.0	59.9	-18.9

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.181	29.6	20.1	49.7	54.5	-4.8
0.155	30.0	20.1	50.1	55.7	-5.6
0.235	25.3	20.1	45.4	52.3	-6.9
0.346	21.9	20.1	42.0	49.1	-7.1
0.449	19.7	20.1	39.8	46.9	-7.1
0.194	26.6	20.1	46.7	53.9	-7.2
0.252	24.2	20.1	44.3	51.7	-7.4
0.201	26.0	20.1	46.1	53.6	-7.5
0.271	23.3	20.1	43.4	51.1	-7.7
0.391	20.2	20.1	40.3	48.0	-7.7
0.495	18.2	20.1	38.3	46.1	-7.8
0.541	18.1	20.1	38.2	46.0	-7.8
0.510	18.1	20.1	38.2	46.0	-7.8
0.221	24.7	20.1	44.8	52.8	-8.0
0.431	19.1	20.1	39.2	47.2	-8.0
0.301	21.8	20.1	41.9	50.2	-8.3
0.357	20.3	20.1	40.4	48.8	-8.4
0.463	18.1	20.1	38.2	46.6	-8.4
0.830	17.2	20.1	37.3	46.0	-8.7
0.312	20.9	20.1	41.0	49.9	-8.9

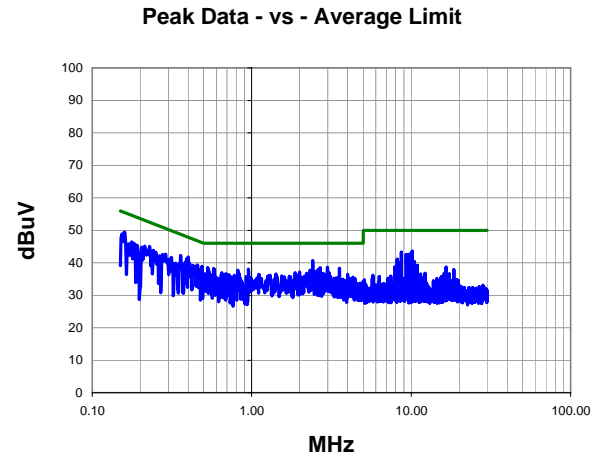
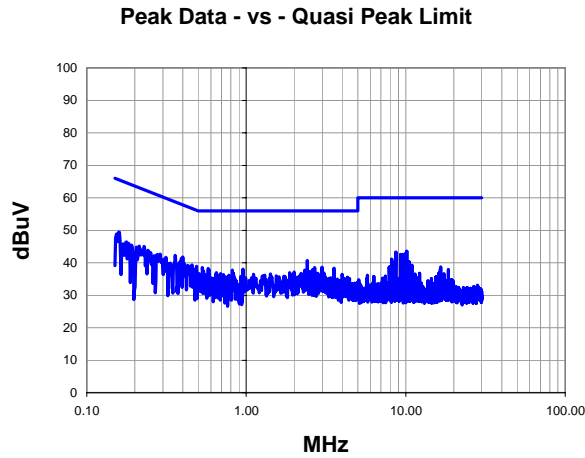
EMC

AC Powerline Conducted Emissions

Work Order:	LABT0415	Date:	03/08/11	<i>Trevor Buls</i> Tested by: Trevor Buls
Project:	None	Temperature:	23.18°C	
Job Site:	MN03	Humidity:	16.58	
Serial Number:	R001	Barometric Pres.:	1025.2	
EUT:	S-00112			
Configuration:	2 - LABT0415			
Customer:	Logitech, Inc.			
Attendees:	None			
EUT Power:	120VAC/60Hz			
Operating Mode:	Transmitting Channel 48, 6 Mbps.			
Deviations:	None			
Comments:	None			

Test Specifications FCC 15.207:2011	Test Method ANSI C63.10:2009
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Run #	15	Line:	High Line	Ext. Attenuation:	20	Results	Pass
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Peak Data - vs - Quasi Peak Limit

Peak Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
2.416	20.5	20.2	40.7	56.0	-15.3
0.159	29.4	20.1	49.5	65.5	-16.0
0.400	21.7	20.1	41.8	57.9	-16.1
0.357	22.2	20.1	42.3	58.8	-16.5
10.150	23.0	20.5	43.5	60.0	-16.5
0.393	21.3	20.1	41.4	58.0	-16.6
8.670	22.8	20.4	43.2	60.0	-16.8
9.950	22.5	20.5	43.0	60.0	-17.0
0.488	18.8	20.1	38.9	56.2	-17.3
2.984	18.4	20.2	38.6	56.0	-17.4
9.600	22.1	20.5	42.6	60.0	-17.4
9.310	22.1	20.5	42.6	60.0	-17.4
0.456	19.2	20.1	39.3	56.8	-17.5
0.531	18.4	20.1	38.5	56.0	-17.5
2.688	18.3	20.2	38.5	56.0	-17.5
3.552	18.1	20.2	38.3	56.0	-17.7
0.577	18.1	20.1	38.2	56.0	-17.8
0.385	20.2	20.1	40.3	58.2	-17.9
0.288	22.6	20.1	42.7	60.6	-17.9
0.213	25.0	20.1	45.1	63.1	-18.0

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
2.416	20.5	20.2	40.7	46.0	-5.3
0.159	29.4	20.1	49.5	55.5	-6.0
0.400	21.7	20.1	41.8	47.9	-6.1
0.357	22.2	20.1	42.3	48.8	-6.5
10.150	23.0	20.5	43.5	50.0	-6.5
0.393	21.3	20.1	41.4	48.0	-6.6
8.670	22.8	20.4	43.2	50.0	-6.8
9.950	22.5	20.5	43.0	50.0	-7.0
0.488	18.8	20.1	38.9	46.2	-7.3
2.984	18.4	20.2	38.6	46.0	-7.4
9.600	22.1	20.5	42.6	50.0	-7.4
9.310	22.1	20.5	42.6	50.0	-7.4
0.456	19.2	20.1	39.3	46.8	-7.5
0.531	18.4	20.1	38.5	46.0	-7.5
2.688	18.3	20.2	38.5	46.0	-7.5
3.552	18.1	20.2	38.3	46.0	-7.7
0.577	18.1	20.1	38.2	46.0	-7.8
0.385	20.2	20.1	40.3	48.2	-7.9
0.288	22.6	20.1	42.7	50.6	-7.9
0.213	25.0	20.1	45.1	53.1	-8.0

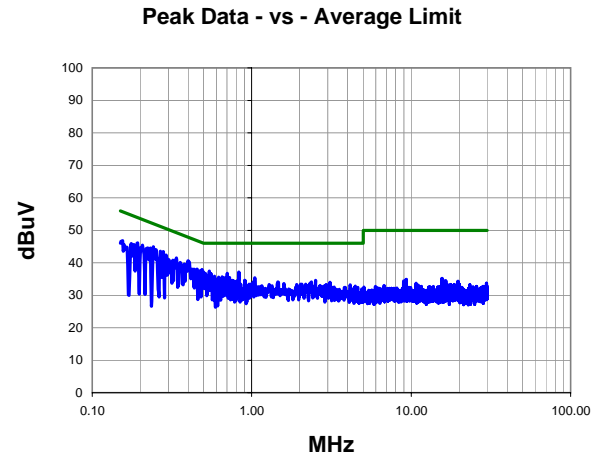
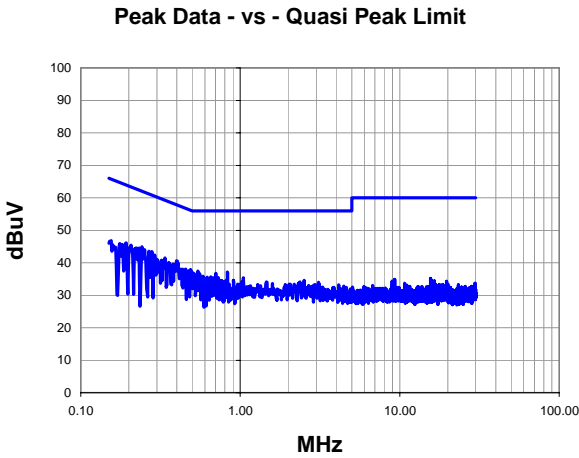
EMC

AC Powerline Conducted Emissions

Work Order:	LABT0415	Date:	03/08/11	<i>Trevor Buls</i> Tested by: Trevor Buls
Project:	None	Temperature:	23.18°C	
Job Site:	MN03	Humidity:	16.58	
Serial Number:	R001	Barometric Pres.:	1025.2	
EUT:	S-00112			
Configuration:	2 - LABT0415			
Customer:	Logitech, Inc.			
Attendees:	None			
EUT Power:	120VAC/60Hz			
Operating Mode:	Transmitting Channel 48, 6 Mbps.			
Deviations:	None			
Comments:	None			

Test Specifications FCC 15.207:2011	Test Method ANSI C63.10:2009
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Run #	16	Line:	Neutral	Ext. Attenuation:	20	Results	Pass
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Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.242	24.8	20.1	44.9	62.0	-17.1
0.398	20.5	20.1	40.6	57.9	-17.3
0.279	23.3	20.1	43.4	60.8	-17.4
0.267	23.4	20.1	43.5	61.2	-17.7
0.337	21.4	20.1	41.5	59.3	-17.8
0.193	26.0	20.1	46.1	63.9	-17.8
0.232	24.4	20.1	44.5	62.4	-17.9
0.206	25.3	20.1	45.4	63.4	-18.0
0.291	22.3	20.1	42.4	60.5	-18.1
0.221	24.4	20.1	44.5	62.8	-18.3
0.488	17.8	20.1	37.9	56.2	-18.3
0.543	17.3	20.1	37.4	56.0	-18.6
0.378	19.5	20.1	39.6	58.3	-18.7
0.356	20.0	20.1	40.1	58.8	-18.7
0.182	25.5	20.1	45.6	64.4	-18.8
0.176	25.8	20.1	45.9	64.7	-18.8
0.453	17.9	20.1	38.0	56.8	-18.8
0.832	17.1	20.1	37.2	56.0	-18.8
0.320	20.7	20.1	40.8	59.7	-18.9
0.155	26.7	20.1	46.8	65.7	-18.9

Peak Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.242	24.8	20.1	44.9	52.0	-7.1
0.398	20.5	20.1	40.6	47.9	-7.3
0.279	23.3	20.1	43.4	50.8	-7.4
0.267	23.4	20.1	43.5	51.2	-7.7
0.337	21.4	20.1	41.5	49.3	-7.8
0.193	26.0	20.1	46.1	53.9	-7.8
0.232	24.4	20.1	44.5	52.4	-7.9
0.206	25.3	20.1	45.4	53.4	-8.0
0.291	22.3	20.1	42.4	50.5	-8.1
0.221	24.4	20.1	44.5	52.8	-8.3
0.488	17.8	20.1	37.9	46.2	-8.3
0.543	17.3	20.1	37.4	46.0	-8.6
0.378	19.5	20.1	39.6	48.3	-8.7
0.356	20.0	20.1	40.1	48.8	-8.7
0.182	25.5	20.1	45.6	54.4	-8.8
0.176	25.8	20.1	45.9	54.7	-8.8
0.453	17.9	20.1	38.0	46.8	-8.8
0.832	17.1	20.1	37.2	46.0	-8.8
0.320	20.7	20.1	40.8	49.7	-8.9
0.155	26.7	20.1	46.8	55.7	-8.9