

Logitech, Inc.

A-0363A Cordless Headset for X-Box

November 02, 2004

Report No. LABT0106 Rev 1

Report Prepared By



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

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EMC Test Report



22975 NW Evergreen Parkway
Suite 400
Hillsboro, Oregon 97124

Certificate of Test

Issue Date: November 02, 2004

Logitech, Inc.

Model: A-0363A Cordless Headset for X-Box

Specification	Emissions		
	Test Method	Pass	Fail
FCC 15.207 AC Powerline Conducted Emissions:2003	ANSI C63.4:2001	<input checked="" type="checkbox"/>	<input type="checkbox"/>
FCC 15.247(a) Occupied Bandwidth:2003	ANSI C63.4:2001	<input checked="" type="checkbox"/>	<input type="checkbox"/>
FCC 15.247(b) Output Power:2003	ANSI C63.4:2001	<input checked="" type="checkbox"/>	<input type="checkbox"/>
FCC 15.247(c) Band Edge Compliance:2003	ANSI C63.4:2001	<input checked="" type="checkbox"/>	<input type="checkbox"/>
FCC 15.247(c) Spurious Conducted Emissions:2003	ANSI C63.4:2001	<input checked="" type="checkbox"/>	<input type="checkbox"/>
FCC 15.247(c) Spurious Radiated Emissions:2003	ANSI C63.4:2001	<input checked="" type="checkbox"/>	<input type="checkbox"/>
FCC 15.247(d) Power Spectral Density:2003	ANSI C63.4:2001	<input checked="" type="checkbox"/>	<input type="checkbox"/>

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

Test Facility

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

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

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

Approved By:

Greg Kiemel, Director of Engineering

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

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

Revision Number	Description	Date	Page Number
01	Per client's request, change model number and name to "A-0363A Cordless Headset for X-Box".	11/22/04	Cover Page
01	Per client's request, change model number and name to "A-0363A Cordless Headset for X-Box".	11/22/04	2
01	Per client's request, change model number and name to "A-0363A Cordless Headset for X-Box".	11/22/04	11
01	Per client's request, in the EUT & Peripherals section, change the model number to "A-0363A".	11/22/04	13
01	Per client's request, change the EUT to "A-0363A Cordless Headset for X-Box".	11/22/04	15, 16, 17
01	Per client's request, in the EUT & Peripherals section, change the model number to "A-0363A".	11/22/04	19
01	Per client's request, change the EUT to "A-0363A Cordless Headset for X-Box".	11/22/04	21, 22, 23
01	Per client's request, in the EUT & Peripherals section, change the model number to "A-0363A".	11/22/04	25
01	Per client's request, change the EUT to "A-0363A Cordless Headset for X-Box".	11/22/04	27, 28
01	Per client's request, in the EUT & Peripherals section, change the model number to "A-0363A".	11/22/04	30
01	Per client's request, change the EUT to "A-0363A Cordless Headset for X-Box".	11/22/04	32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43
01	Per client's request, in the EUT & Peripherals section, change the model number to "A-0363A".	11/22/04	45
01	Per client's request, change the EUT to "A-0363A Cordless Headset for X-Box".	11/22/04	47, 48, 49
01	Per client's request, in the EUT & Peripheral section, change the model number to "A-0363A".	11/22/04	51
01	Per client's request, change the EUT to "A-0363A Cordless Headset for X-Box".	11/22/04	54, 55, 56, 57, 58
01	Per client's request, in the EUT & Peripherals section, change the model number to "A-0363A".	11/22/04	65
01	Per client's request, change the EUT to "A-0363A Cordless Headset for X-Box".	11/22/04	67, 68, 69, 70, 71, 72

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



NVLAP: Northwest EMC, Inc. is recognized under the United States Department of Commerce, National Institute of Standards and Technology, National Voluntary Laboratory Accreditation Program for satisfactory compliance with the requirements of ISO/IEC 17025 for Testing Laboratories. The NVLAP accreditation encompasses Electromagnetic Compatibility Testing in accordance with the European Union EMC Directive 89/336/EEC, ANSI C63.4, MIL-STD 461E, DO-160D and SAE J1113. Additionally, Northwest EMC is accredited by NVLAP to perform radio testing in accordance with the European Union R&TTE Directive 1999/5/EEC, the requirements of FCC, and the RSS radio standards for Industry Canada. Accreditation has been granted to Northwest EMC, Inc. under Certificate Numbers: 200629-0, 200630-0, and 200676-0.



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



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



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



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



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



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



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



VCCI: Accepted as an Associate Member to the VCCI, Acceptance No. 564. Conducted and radiated measurement facilities have been registered in accordance with Regulations for Voluntary Control Measures, Article 8. (*Registration Nos. - Hillsboro: C-1071 and R-1025, Irvine: C-2094 and R-1943, Newberg: C-1877 and R-1760, Sultan: R-871, C-1784 and R-1761*)



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



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



SCOPE

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

<http://www.nwemc.com/scope.asp>

How important is it to understand performance criteria?

It is the responsibility of the test laboratory to observe the results of the tests that are performed and to accurately report those results. As the responsible party (manufacturer, importer, etc) it is your responsibility to take those results, compare them against the specifications and standards, then, if appropriate make a declaration of conformity. As the responsible party it makes sense that you are fully aware of the requirements, how your device performs when tested to those requirements, and what information is being used to declare conformity.

To better assist you in making those conformity decisions, Northwest EMC has adopted a very simple, yet very clear performance assessment procedure. The following criteria is used when performing immunity or susceptibility tests:

Performance Criteria 1:

- ❑ The EUT exhibited no change in performance when operating as specified by the manufacturer. In this case no changes were observed during the test.
- ❑ In most cases this would be equivalent to Performance Criteria A. When operating the equipment in the modes or configurations specified by the responsible party, monitoring the parameters specified, no changes were observed. Basically nothing happened.

Performance Criteria 2:

- ❑ The EUT exhibited a change in performance when operating as specified by the manufacturer. In this case the equipment recovered without any operator intervention. The data sheets will detail the exact phenomena observed.
- ❑ In most cases this would be equivalent to Performance Criteria B. When operating the equipment in the modes or configurations specified by the responsible party, monitoring the parameters specified, changes were observed. The EUT was able to recover from those changes without any operator intervention.

Performance Criteria 3:

- ❑ The EUT exhibited a change in performance when operating as specified by the manufacturer. In this case the equipment required some operator intervention in order to recover. This intervention may be in the form of reducing the test levels, changing parameters, or even resetting the system. The data sheets will detail the exact phenomena observed.
- ❑ In most cases this would be equivalent to Performance Criteria C. When operating the equipment in the modes or configurations specified by the responsible party, monitoring the parameters specified, changes were observed. The EUT required some sort of operator intervention to recover. There was no permanent damage and the EUT appeared to function normally after completion test.

Performance Criteria 4:

- ❑ The EUT exhibited a change in performance when operating as specified by the manufacturer. In this case the equipment was damaged and would not recover. The data sheets will detail the exact phenomena observed.
- ❑ In most cases there is no specific criterion to compare this to, it typically ends the test. When operating the equipment in the modes or configurations specified by the responsible party, monitoring the parameters specified, changes were observed. There was no recovery; the equipment would no longer function as intended.

Each of the standards and specifications has unique performance criteria. In order to make an accurate assessment, one must compare the test results provided with the specific performance criteria. **To ensure that a responsible party is compliant with the specifications, one must read and understand those specifications. Provided below is a sample performance criteria, taken from EN 50082-1.**

EN 50082-1 Performance Criteria

Performance Criteria A: *The apparatus shall continue to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation and what the user may reasonably expect from the apparatus if used as intended.*

Performance Criteria B: *The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. The performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is allowed. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation and what the user may reasonably expect from the apparatus if used as intended.*

Performance Criteria C: *Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of controls.*

How should a device perform in order for a declaration of conformity to be made?

As already stated, it is the responsible party that must interpret and understand the results in such a way that a declaration of conformity is made. Having said that, we are often asked to render our opinion as to how a device should perform. Our recommendation simply follows the standards, as can be referenced below. Most of the standards and specifications offer the same performance criterion shown below as their requirements.

Test	Performance Criteria typically specified by the Standard	Equivalent Northwest EMC Performance Criteria
ESD	Performance Criteria B	Performance Criteria 1 or 2
Radiated RF	Performance Criteria A	Performance Criteria 1
EFT/Burst	Performance Criteria B	Performance Criteria 1 or 2
Surge	Performance Criteria B	Performance Criteria 1 or 2
Conducted RF	Performance Criteria A	Performance Criteria 1
Magnetic Field	Performance Criteria A	Performance Criteria 1
Voltage Dips and Variations	Performance Criteria B & C	Performance Criteria 1, 2, or 3

What is measurement uncertainty?

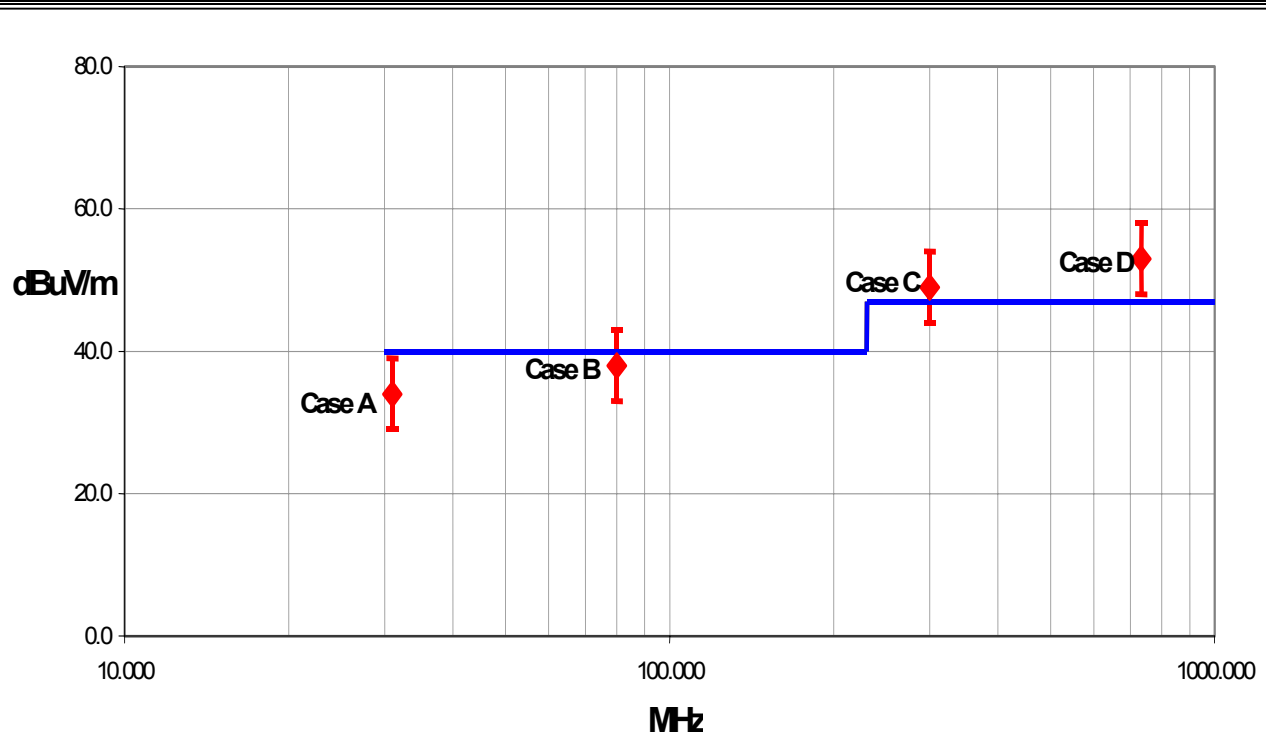
When a measurement is made, the result will be different from the true or theoretically correct value. The difference is the result of tolerances in the measurement system that cannot be completely eliminated. To the extent that technology allows us, it has been our aim to minimize this error. The following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

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

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

How might measurement uncertainty be applied to test results?

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



Test Result Scenarios:

Case A: Product complies.

Case B: Product conditionally complies. It is not possible to say with 95% confidence that the product complies.

Case C: Product conditionally does not comply. It is not possible to say with 95% confidence that the product does not comply.

Case D: Product does not comply.

Radiated Emissions ≤ 1 GHz

Value (dB)

Test Distance	Probability Distribution	Biconical Antenna		Log Periodic Antenna		Dipole Antenna	
		3m	10m	3m	10m	3m	10m
Combined standard uncertainty $u_c(y)$	normal	+ 1.86	+ 1.82	+ 2.23	+ 1.29	+ 1.31	+ 1.25
		- 1.88	- 1.87	- 1.41	- 1.26	- 1.27	- 1.25
Expanded uncertainty U (level of confidence ≈ 95%)	normal (k=2)	+ 3.72	+ 3.64	+ 4.46	+ 2.59	+ 2.61	+ 2.49
		- 3.77	- 3.73	- 2.81	- 2.52	- 2.55	- 2.49

Radiated Emissions > 1 GHz

Value (dB)

Test Distance	Probability Distribution	Without High Pass Filter		With High Pass Filter	
		3m	10m	3m	10m
Combined standard uncertainty $u_c(y)$	normal	+ 1.29	+ 1.29	+ 1.38	+ 1.38
		- 1.25	- 1.25	- 1.35	- 1.35
Expanded uncertainty U (level of confidence ≈ 95%)	normal (k=2)	+ 2.57	+ 2.57	+ 2.76	+ 2.76
		- 2.51	- 2.51	- 2.70	- 2.70

Conducted Emissions

	Probability Distribution	Value (+/- dB)
Combined standard uncertainty $u_c(y)$	normal	1.48
Expanded uncertainty U (level of confidence ≈ 95 %)	normal (k = 2)	2.97

Radiated Immunity

	Probability Distribution	Value (+/- dB)
Combined standard uncertainty $u_c(y)$	normal	1.05
Expanded uncertainty U (level of confidence ≈ 95 %)	normal (k = 2)	2.11

Conducted Immunity

	Probability Distribution	Value (+/- dB)
Combined standard uncertainty $u_c(y)$	normal	1.05
Expanded uncertainty U (level of confidence ≈ 95 %)	normal (k = 2)	2.10

Legend

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

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



California

Orange County Facility

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



Oregon

Evergreen Facility

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



Oregon

Trails End Facility

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



Washington

Sultan Facility

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

Party Requesting the Test

Company Name:	Logitech, Inc.
Address:	1499 SE Tech Center Place Suite 350
City, State, Zip:	Vancouver, WA 98683
Test Requested By:	Mitchell Phillipi
Model:	A-0363A Cordless Headset for X-Box
First Date of Test:	10-06-2004
Last Date of Test:	10-22-2004
Receipt Date of Samples:	10-06-2004
Equipment Design Stage:	Production
Equipment Condition:	No visual damage.

Information Provided by the Party Requesting the Test

Clocks/Oscillators:	Not provided.
I/O Ports:	None

Functional Description of the EUT (Equipment Under Test):

Wireless headset for Xbox.

Client Justification for EUT Selection:

Not Provided

Client Justification for Test Selection:

Not Provided

EUT Photo

Equipment modifications

Item	Test	Date	Modification	Note	Disposition of EUT
1	Spurious Radiated Emissions	10/06/2004	No EMI suppression devices were added or modified during this test.	Same configuration as delivered.	EUT remained at Northwest EMC.
2	Occupied Bandwidth	10/15/2004	No EMI suppression devices were added or modified during this test.	Using a different unit than the previous test. Switched to a unit with direct connect capabilities.	EUT remained at Northwest EMC.
3	Band Edge Compliance	10/15/2004	No EMI suppression devices were added or modified during this test.	Same configuration as in previous test.	EUT remained at Northwest EMC.
4	Output Power	10/15/2004	No EMI suppression devices were added or modified during this test.	Same configuration as in previous test.	EUT remained at Northwest EMC.
5	Spurious Conducted Emissions	10/15/2004	No EMI suppression devices were added or modified during this test.	Same configuration as in previous test.	EUT remained at Northwest EMC.
6	Power Spectral Density	10/15/2004	No EMI suppression devices were added or modified during this test.	Same configuration as in previous test.	EUT remained at Northwest EMC.
7	AC Powerline Conducted Emissions	10/22/2004	No EMI suppression devices were added or modified during this test.	Using a different unit than the previous test. Returned to the same unit from Test #1.	EUT remained at Northwest EMC.

Justification

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

Channels in Specified Band Investigated:

High

Mid

Low

Operating Modes Investigated:

No Hop

Data Rates Investigated:

Maximum

Output Power Setting(s) Investigated:

Maximum

Power Input Settings Investigated:

120 VAC/60 Hz

Other Settings Investigated:

Stand-alone mode

Software\Firmware Applied During Test

Exercise software	N/A	Version	N/A
Description			
The system was tested using special firmware developed to test all functions of the device during the test.			

EUT and Peripherals

Description	Manufacturer	Model/Part Number	Serial Number
AC/DC adaptor	Logitech, Inc	AG055V150T	None
EUT - Cordless Headset for XBox	Logitech, Inc.	A-0363A	EMC #2

Cables

Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Leads	No	1.8	PA	AC/DC adaptor	Cordless Headset for XBox
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

Measurement Equipment

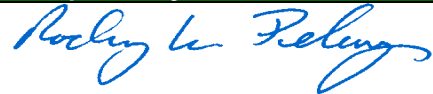
Description	Manufacturer	Model	Identifier	Last Cal	Interval
Spectrum Analyzer	Tektronix	2784	AAO	02/26/2003	24 mo

Test Description

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

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

Completed by:



NORTHWEST
EMC

EMISSIONS DATA SHEET

Rev BETA
01/30/01

EUT: A-0363A Cordless Headset for X-Box		Work Order: LABT0106
Serial Number: EMC #2		Date: 10/15//2004
Customer: Logitech, Inc.		Temperature: 71 °F
Attendees: None		Humidity: 48% RH
Customer Ref. No.:	Tested by: Rod Peloquin	Power: 120VAC/60Hz
		Job Site: EV06

TEST SPECIFICATIONS			
Specification: 47 CFR 15.247(a)(1)(ii)	Year: Most Current	Method: DA 00-705, ANSI C63.4	Year: 2001

SAMPLE CALCULATIONS			

COMMENTS

EUT OPERATING MODES

Modulated, No hop mode

DEVIATIONS FROM TEST STANDARD

None

REQUIREMENTS

The maximum 20dB bandwidth of the hopping channel is 1 MHz

RESULTS

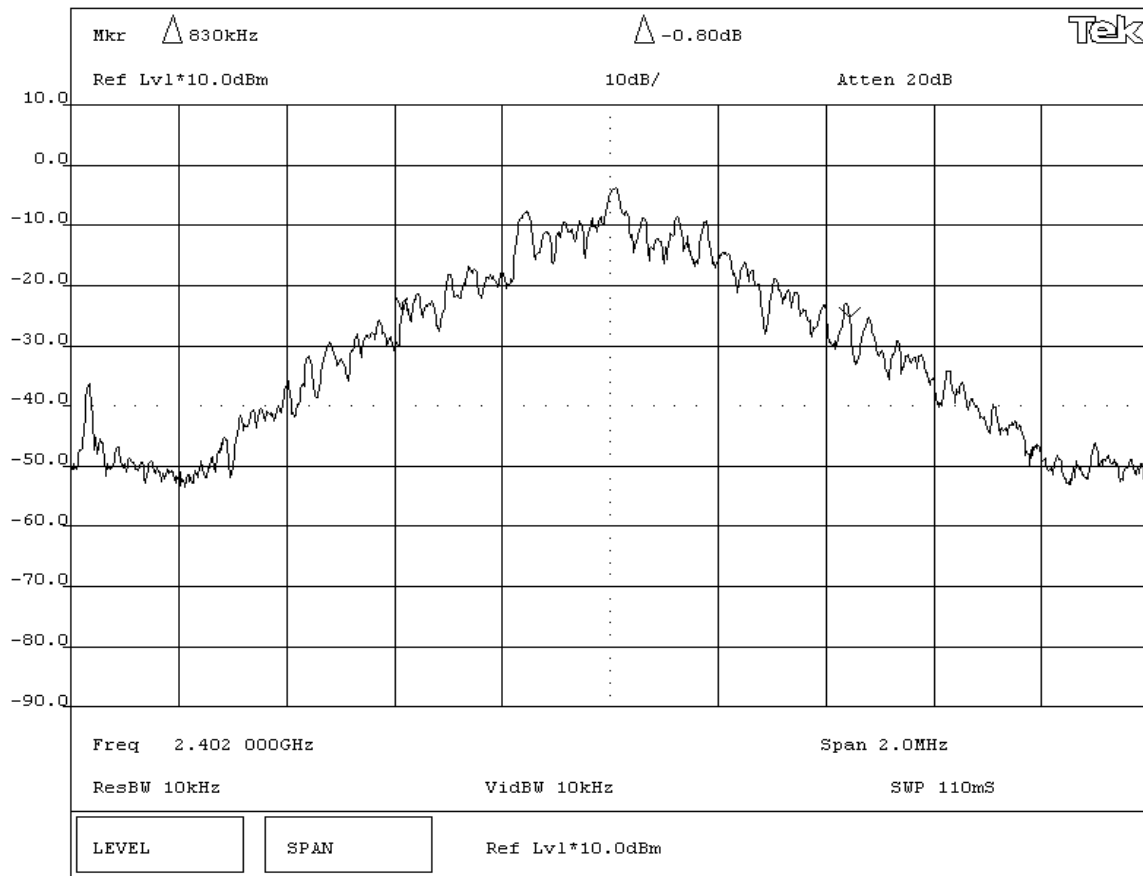
Pass BANDWIDTH 830 kHz

SIGNATURE

Tested By: 

DESCRIPTION OF TEST

20dB Bandwidth - Low Channel



Knob 2

Knob 1

Keypad

Tektronix

2784

NORTHWEST
EMC

EMISSIONS DATA SHEET

Rev BETA
01/30/01

EUT: A-0363A Cordless Headset for X-Box		Work Order: LABT0106
Serial Number: EMC #2		Date: 10/15//2004
Customer: Logitech, Inc.		Temperature: 71 °F
Attendees: None	Tested by: Rod Peloquin	Humidity: 48% RH
Customer Ref. No.:	Power: 120VAC/60Hz	Job Site: EV06

TEST SPECIFICATIONS			
Specification: 47 CFR 15.247(a)(1)(ii)	Year: Most Current	Method: DA 00-705, ANSI C63.4	Year: 2001

SAMPLE CALCULATIONS

COMMENTS

EUT OPERATING MODES

Modulated, No hop mode

DEVIATIONS FROM TEST STANDARD

None

REQUIREMENTS

The maximum 20dB bandwidth of the hopping channel is 1 MHz

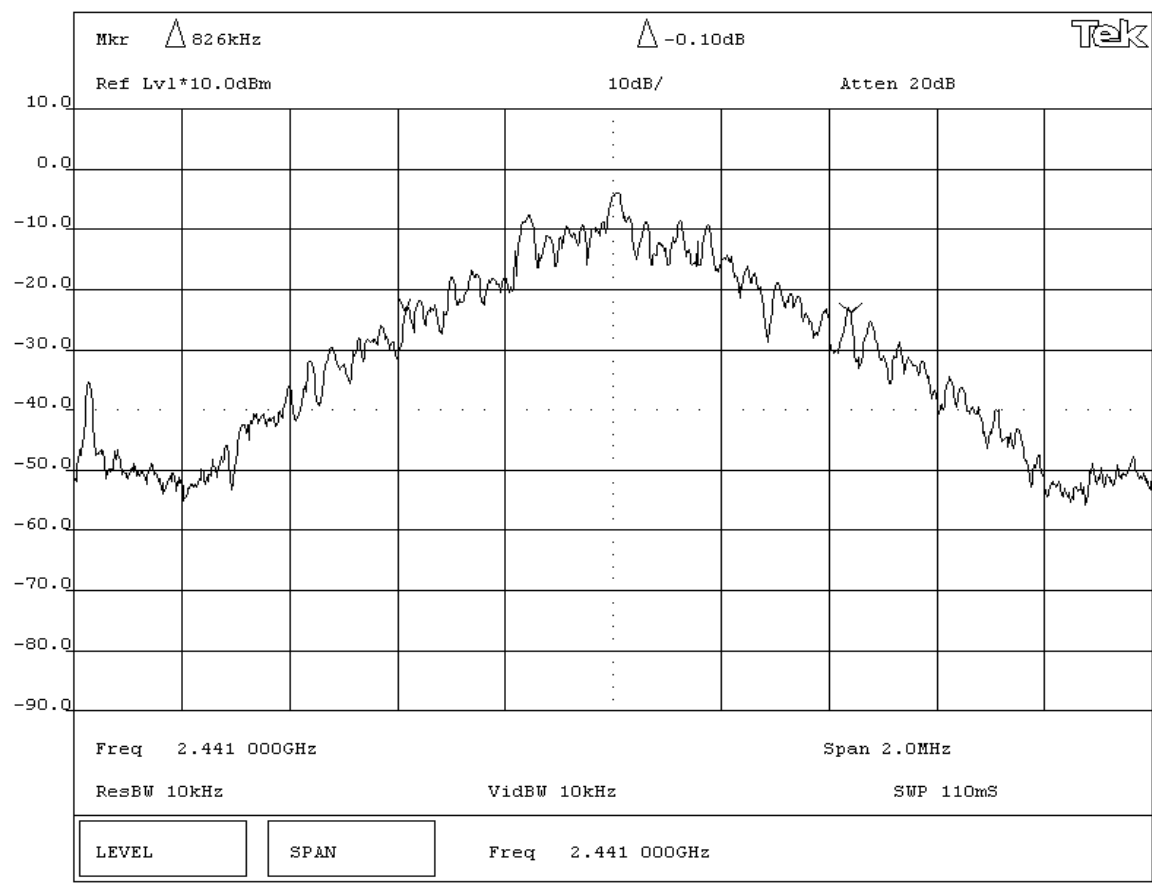
RESULTS	BANDWIDTH
Pass	826 kHz

SIGNATURE

Tested By: *Rod Peloquin*

DESCRIPTION OF TEST

20dB Bandwidth - Mid Channel



KNOB 2
KNOB 1
KEYPAD
Tektronix
2784

EUT: A-0363A Cordless Headset for X-Box		Work Order: LABT0106
Serial Number: EMC #2		Date: 10/15//2004
Customer: Logitech, Inc.		Temperature: 71 °F
Attendees: None	Tested by: Rod Peloquin	Humidity: 48% RH
Customer Ref. No.:	Power: 120VAC/60Hz	Job Site: EV06

TEST SPECIFICATIONS			
Specification: 47 CFR 15.247(a)(1)(ii)	Year: Most Current	Method: DA 00-705, ANSI C63.4	Year: 2001

SAMPLE CALCULATIONS

COMMENTS

EUT OPERATING MODES
Modulated, No hop mode

DEVIATIONS FROM TEST STANDARD
None

REQUIREMENTS
The maximum 20dB bandwidth of the hopping channel is 1 MHz

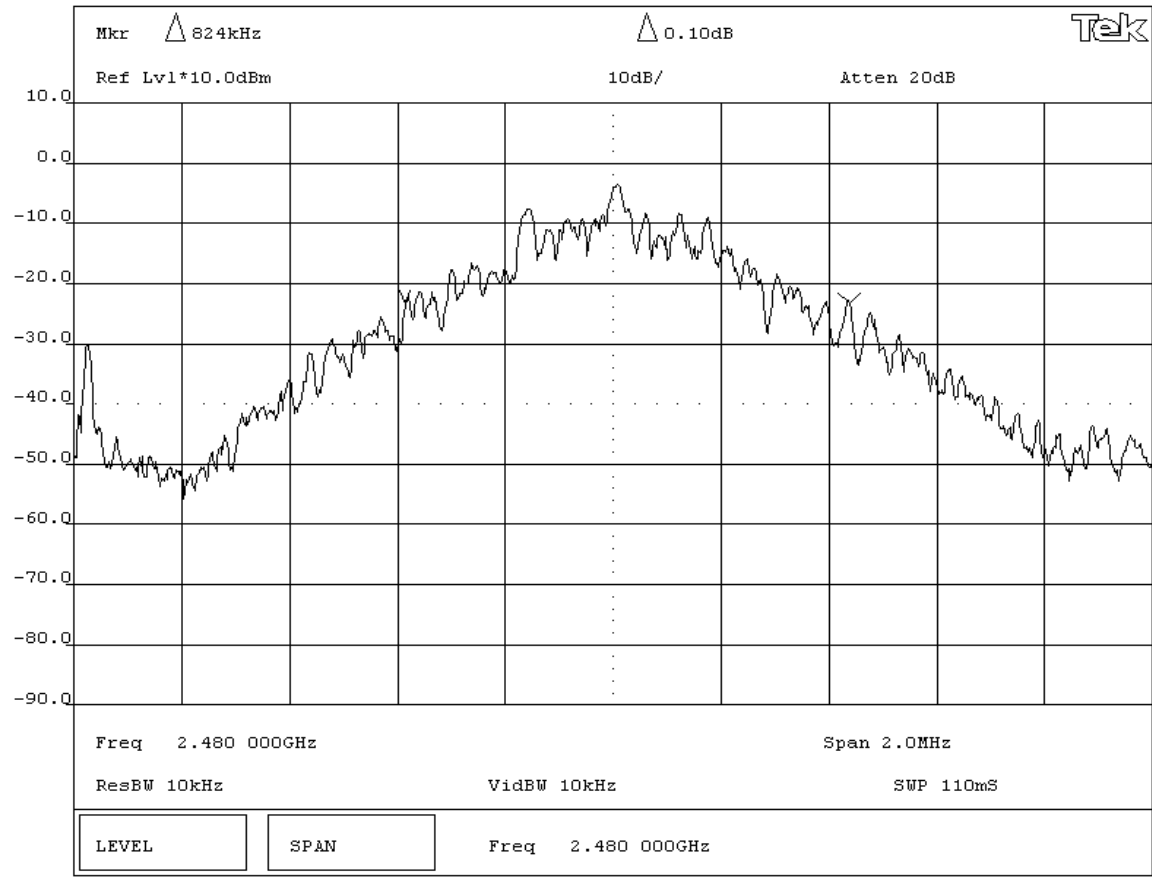
RESULTS	BANDWIDTH
Pass	824 kHz

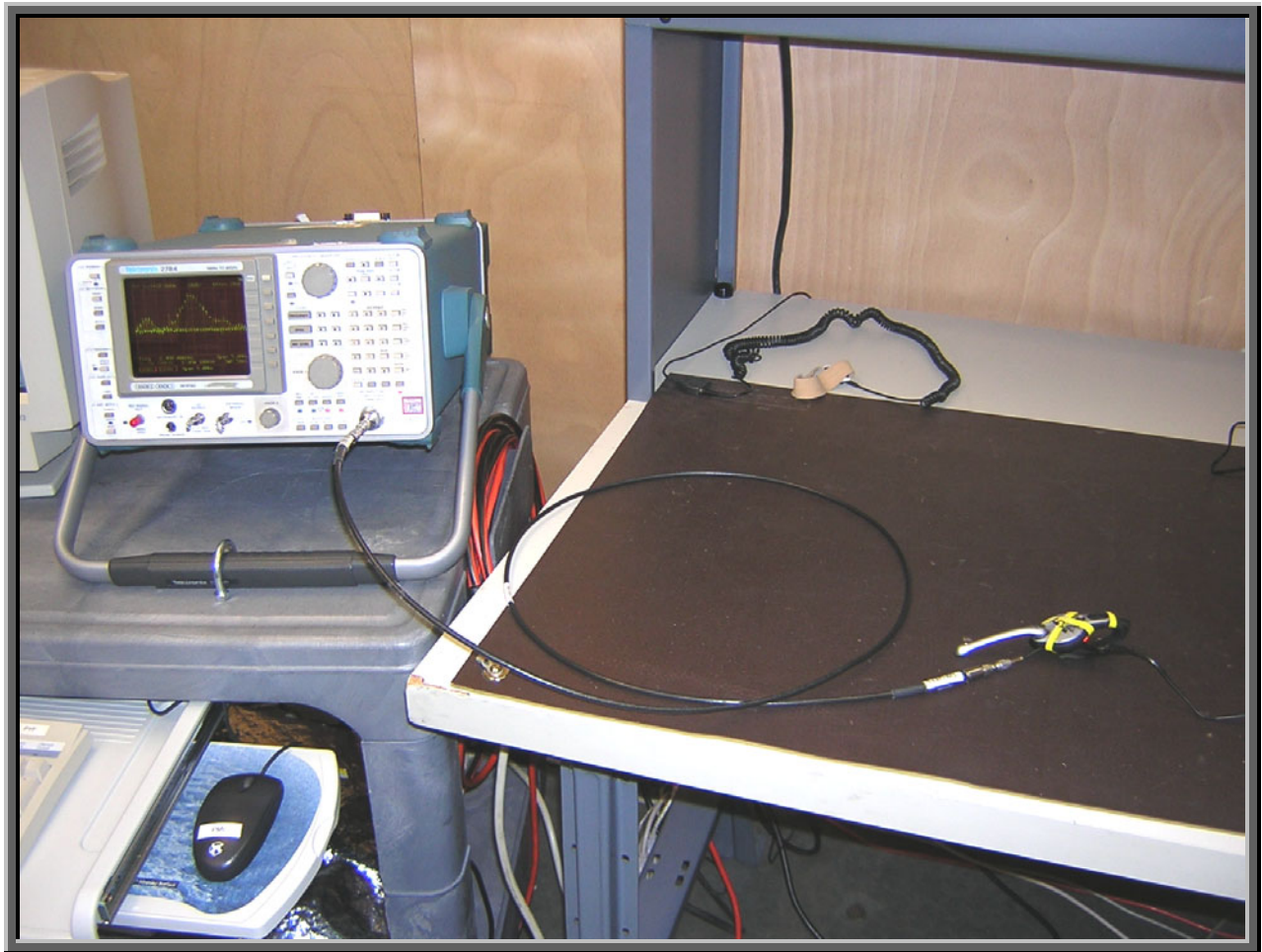
SIGNATURE

Tested By: *Rod Peloquin*

DESCRIPTION OF TEST

20dB Bandwidth - High Channel





Justification

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

Channels in Specified Band Investigated:

Low

Mid

High

Operating Modes Investigated:

No Hop

Data Rates Investigated:

Maximum

Output Power Setting(s) Investigated:

Maximum

Power Input Settings Investigated:

120 VAC/60 Hz

Other Settings Investigated:

Stand-alone mode

Software\Firmware Applied During Test

Exercise software	N/A	Version	N/A
Description			
The system was tested using special firmware developed to test all functions of the device during the test.			

EUT and Peripherals

Description	Manufacturer	Model/Part Number	Serial Number
EUT - Cordless Headset for XBox	Logitech, Inc.	A-0363A	EMC #2
AC/DC adaptor	Logitech, Inc	AG055V150T	None

Cables

Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Leads	No	1.8	PA	AC/DC adaptor	Cordless Headset for XBox
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

Measurement Equipment

Description	Manufacturer	Model	Identifier	Last Cal	Interval
Spectrum Analyzer	Tektronix	2784	AAO	02/26/2003	24 mo

Test Description

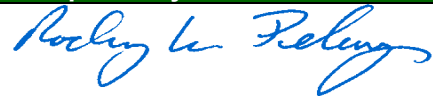
Requirement: Per 47 CFR 15.247(b)(1), the maximum peak output power must not exceed 1 Watt. The measurement is made using a spectrum analyzer using the following settings:

- Resolution bandwidth set to greater than the 6 dB bandwidth of the modulated carrier, and
- The video bandwidth set to greater than or equal to the resolution bandwidth.

Configuration: 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.

Completed by:



NORTHWEST
EMC

EMISSIONS DATA SHEET

Rev BETA
01/30/01

EUT: A-0363A Cordless Headset for X-Box		Work Order: LABT0106
Serial Number: EMC #2		Date: 10/15//2004
Customer: Logitech, Inc.		Temperature: 71 °F
Attendees: None	Tested by: Rod Peloquin	Humidity: 48% RH
Customer Ref. No.:	Power: 120VAC/60Hz	Job Site: EV06

TEST SPECIFICATIONS			
Specification: 47 CFR 15.247(b)(1)	Year: 2003	Method: DA 00-705, ANSI C63.4	Year: 2003

SAMPLE CALCULATIONS			


COMMENTS			

EUT OPERATING MODES			
Modulated by PRBS at maximum data rate			

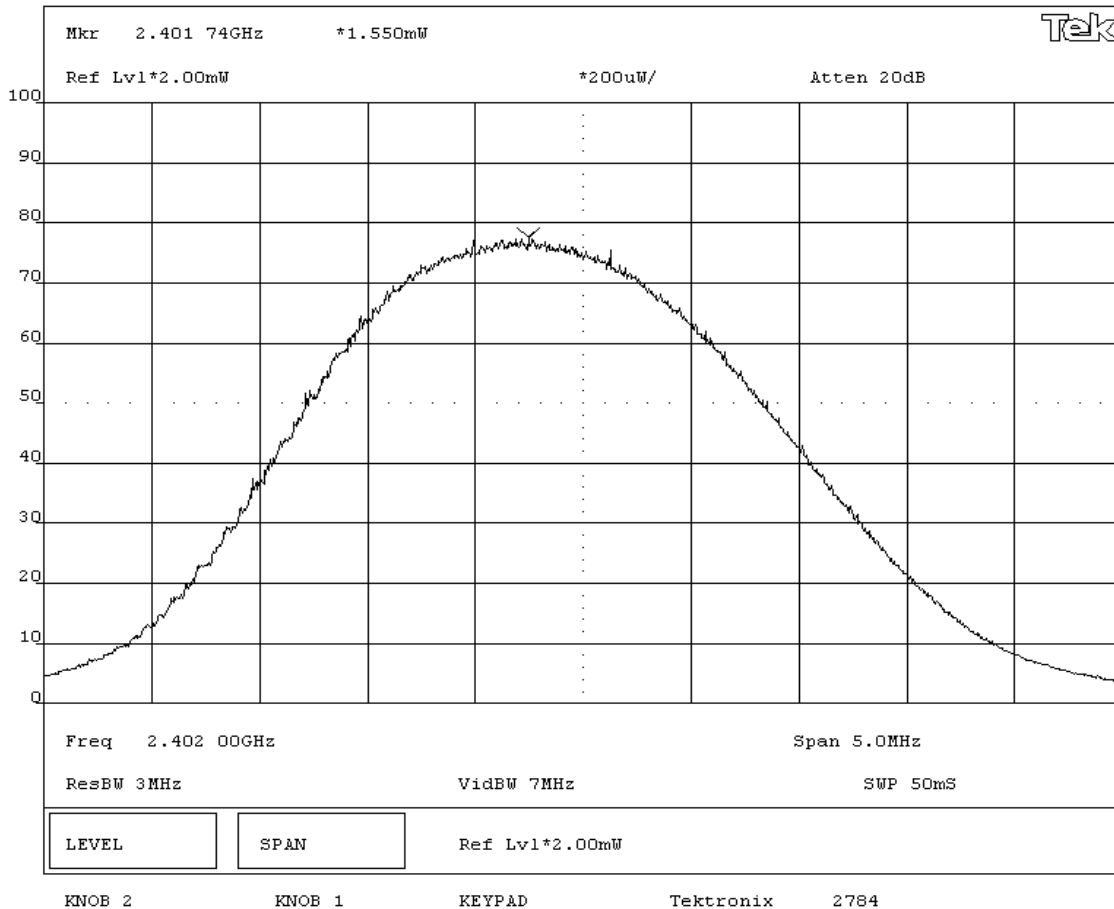
DEVIATIONS FROM TEST STANDARD			
None			

REQUIREMENTS			
Maximum peak conducted output power does not exceed 1 Watt			

RESULTS	AMPLITUDE
Pass	1.55 mW

SIGNATURE			
 Tested By: _____			

DESCRIPTION OF TEST			
Output Power - Low Channel			



NORTHWEST
EMC

EMISSIONS DATA SHEET

Rev BETA
01/30/01

EUT: A-0363A Cordless Headset for X-Box		Work Order: LABT0106
Serial Number: EMC #2		Date: 10/15//2004
Customer: Logitech, Inc.		Temperature: 71 °F
Attendees: None	Tested by: Rod Peloquin	Humidity: 48% RH
Customer Ref. No.:	Power: 120VAC/60Hz	Job Site: EV06

TEST SPECIFICATIONS			
Specification: 47 CFR 15.247(b)(1)	Year: 2003	Method: DA 00-705, ANSI C63.4	Year: 2003

SAMPLE CALCULATIONS			

COMMENTS			

EUT OPERATING MODES			
Modulated by PRBS at maximum data rate			

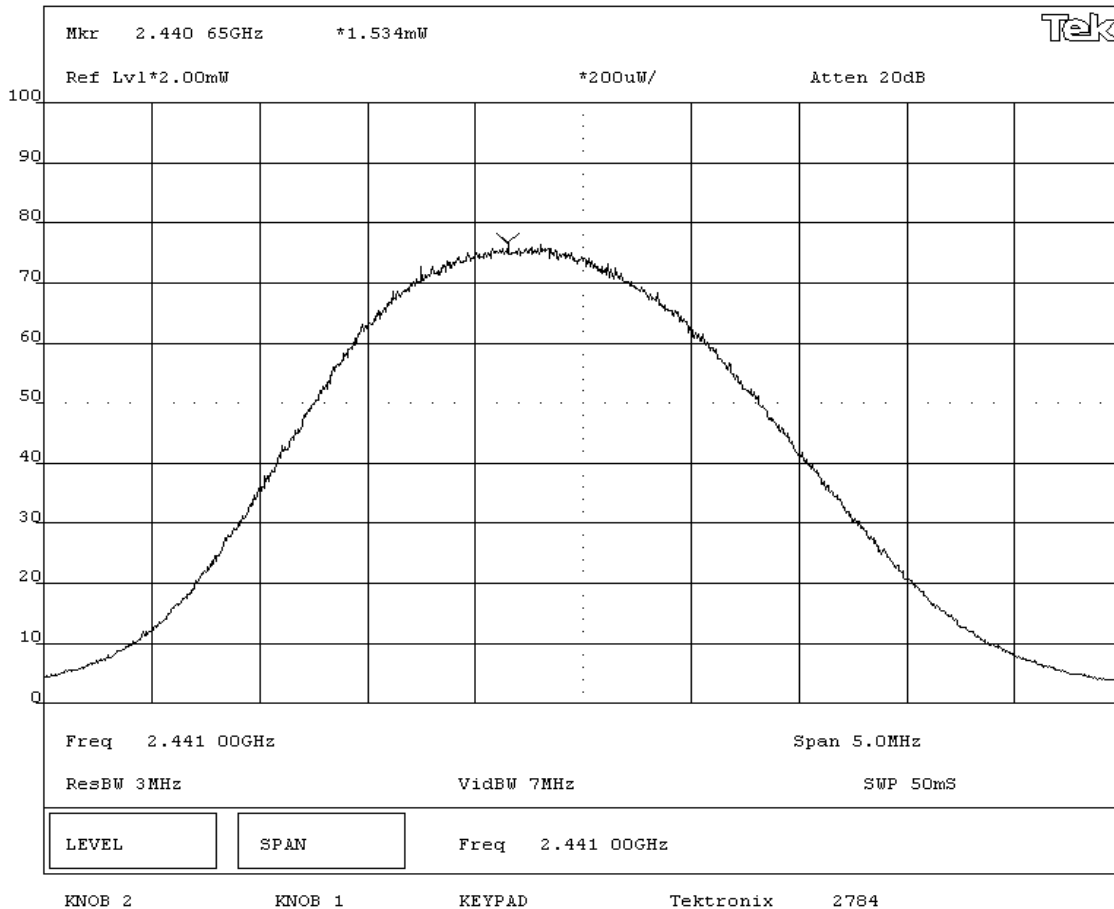
DEVIATIONS FROM TEST STANDARD			
None			

REQUIREMENTS			
Maximum peak conducted output power does not exceed 1 Watt			

RESULTS	AMPLITUDE
Pass	1.534 mW

SIGNATURE	
 Tested By: _____	

DESCRIPTION OF TEST	
Output Power - Mid Channel	



EUT: A-0363A Cordless Headset for X-Box		Work Order: LABT0106
Serial Number: EMC #2		Date: 10/15//2004
Customer: Logitech, Inc.		Temperature: 71 °F
Attendees: None	Tested by: Rod Peloquin	Humidity: 48% RH
Customer Ref. No.:	Power: 120VAC/60Hz	Job Site: EV06

TEST SPECIFICATIONS			
Specification: 47 CFR 15.247(b)(1)	Year: 2003	Method: DA 00-705, ANSI C63.4	Year: 2003

SAMPLE CALCULATIONS			


COMMENTS			

EUT OPERATING MODES			
Modulated by PRBS at maximum data rate			

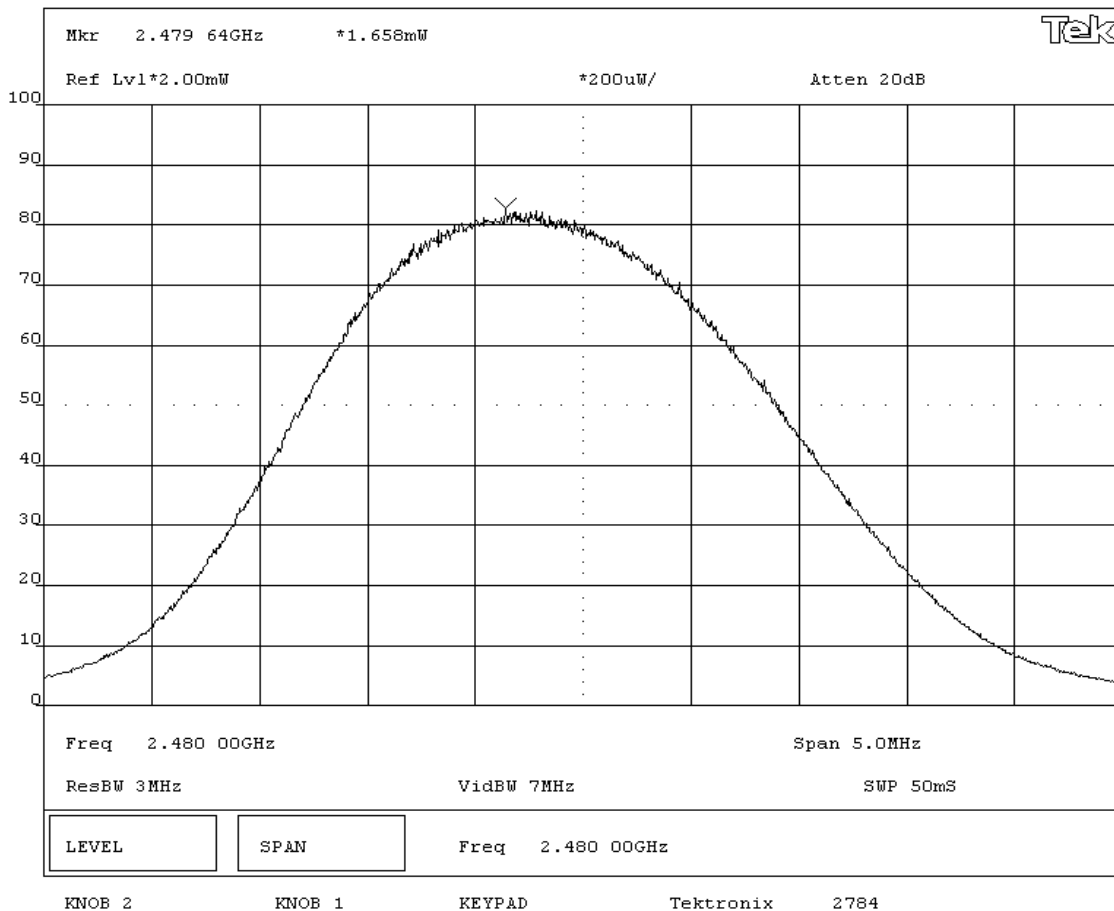
DEVIATIONS FROM TEST STANDARD			
None			

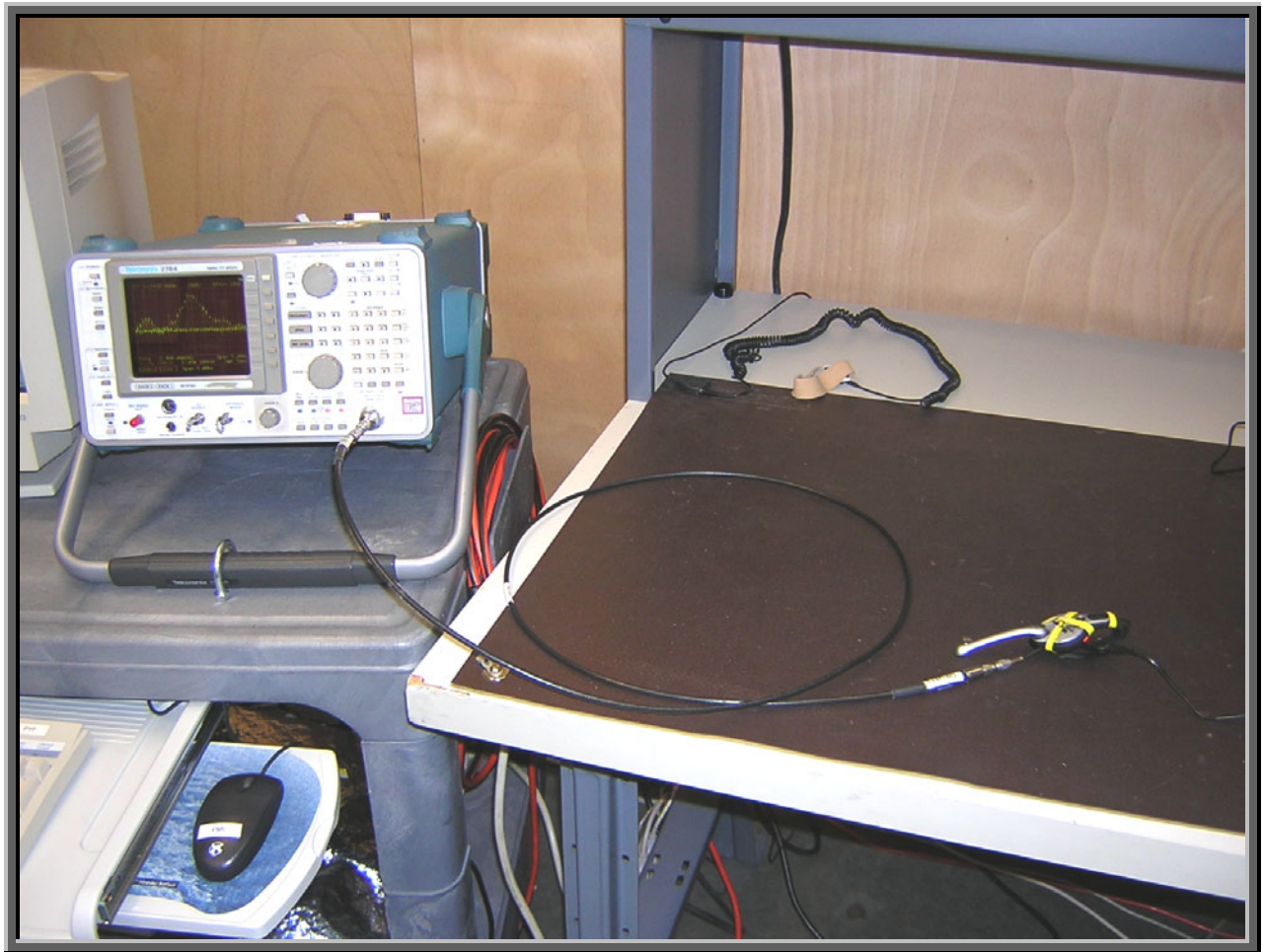
REQUIREMENTS			
Maximum peak conducted output power does not exceed 1 Watt			

RESULTS	AMPLITUDE
Pass	1.658 mW

SIGNATURE	
 Tested By: _____	

DESCRIPTION OF TEST	
Output Power - High Channel	





Justification

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

Channels in Specified Band Investigated:

High
Low

Operating Modes Investigated:

No Hop

Data Rates Investigated:

Maximum

Output Power Setting(s) Investigated:

Maximum

Power Input Settings Investigated:

120 VAC/60 Hz

Other Settings Investigated:

Stand-alone mode

Software\Firmware Applied During Test

Exercise software	N/A	Version	N/A
Description			
The system was tested using special firmware developed to test all functions of the device during the test.			

EUT and Peripherals

Description	Manufacturer	Model/Part Number	Serial Number
EUT - Cordless Headset for XBox	Logitech, Inc.	A-0363A	EMC #2
AC/DC adaptor	Logitech, Inc	AG055V150T	None

Cables

Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Leads	No	1.8	PA	AC/DC adaptor	Cordless Headset for XBox
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

Measurement Equipment

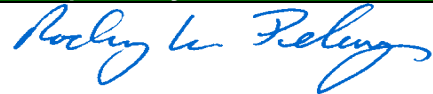
Description	Manufacturer	Model	Identifier	Last Cal	Interval
Spectrum Analyzer	Tektronix	2784	AAO	02/26/2003	24 mo

Test Description

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

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

Completed by:



EMISSIONS DATA SHEET

EUT: A-0363A Cordless Headset for X-Box		Work Order: LABT0106
Serial Number: EMC #2		Date: 10/15//2004
Customer: Logitech, Inc.		Temperature: 71 °F
Attendees: None	Tested by: Rod Peloquin	Humidity: 48% RH
Customer Ref. No.:	Power: 120VAC/60Hz	Job Site: EV06

TEST SPECIFICATIONS			
Specification: 47 CFR 15.247(c)	Year: Most Current	Method: DA 00-705, ANSI C63.4	Year: 2001

SAMPLE CALCULATIONS			

COMMENTS

EUT OPERATING MODES

Modulated, No hop mode

DEVIATIONS FROM TEST STANDARD

None

REQUIREMENTS

Maximum level of any spurious emission at the edge of the authorized band is 20 dB down from the fundamental

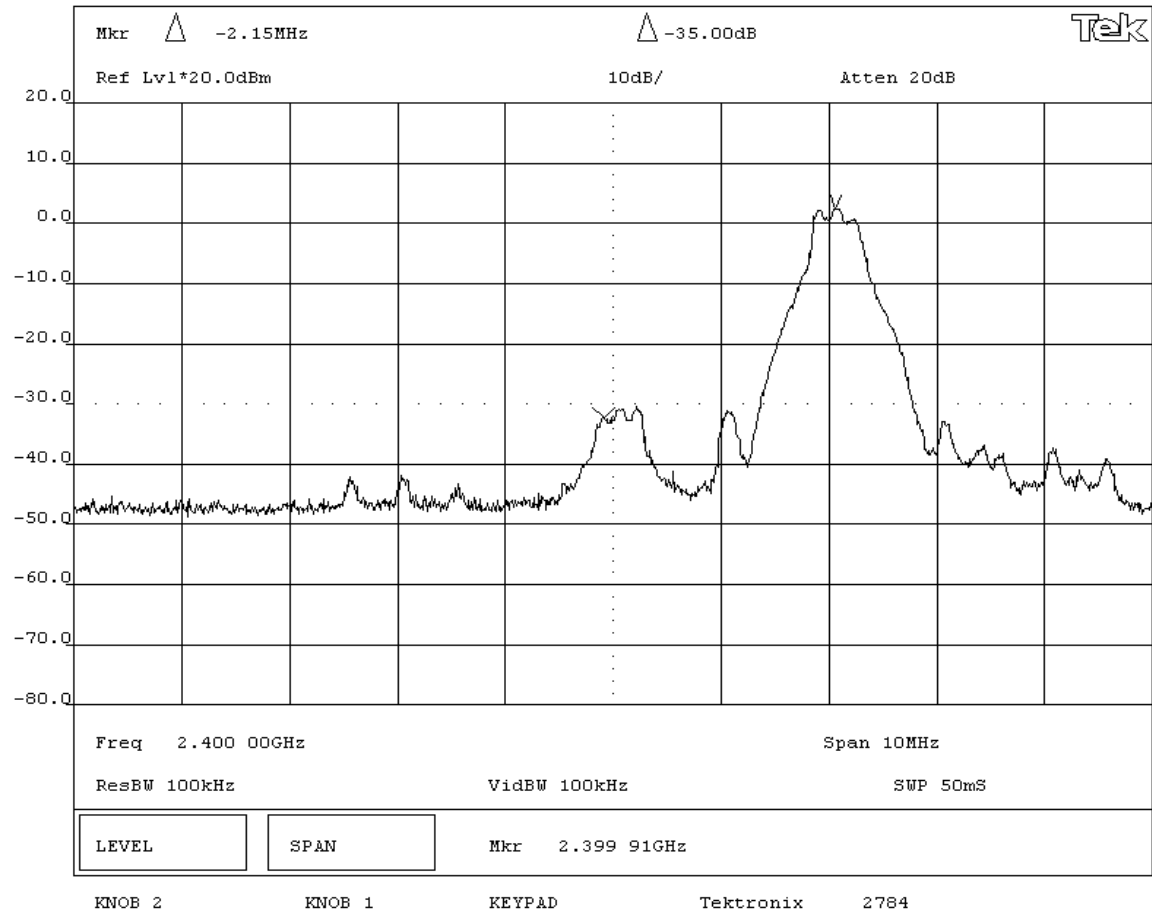
RESULTS	AMPLITUDE
Pass	-35.0 dB

SIGNATURE

Tested By: *Rod Peloquin*

DESCRIPTION OF TEST

Band Edge Compliance - Low Channel



NORTHWEST EMC EMISSIONS DATA SHEET Rev BETA 01/20/01

EUT: A-0363A Cordless Headset for X-Box	Work Order: LABT0106
Serial Number: EMC #2	Date: 10/15/2004
Customer: Logitech, Inc.	Temperature: 71 °F
Attendees: None	Humidity: 48% RH
Tested by: Rod Peloquin	Job Site: EV06
Customer Ref. No.:	Power: 120VAC/60Hz

Specification: 47 CFR 15.247(c)	Year: Most Current	Method: DA 00-705, ANSI C63.4	Year: 2001
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SAMPLE CALCULATIONS

COMMENTS

EUT OPERATING MODES
Modulated, No hop mode

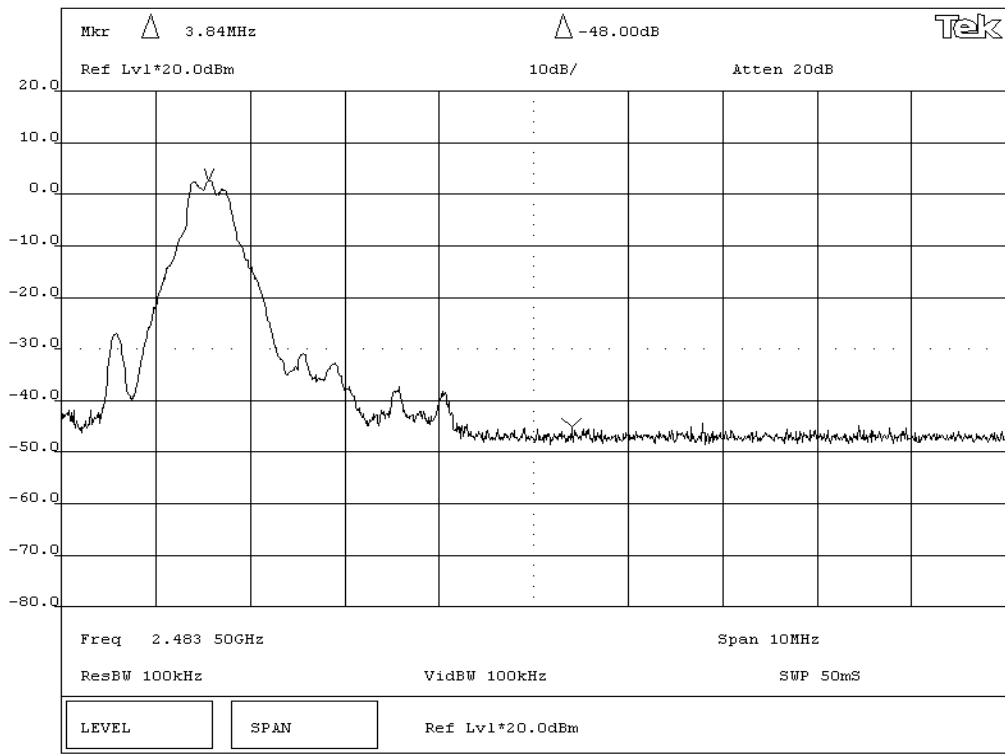
DEVIATIONS FROM TEST STANDARD
None

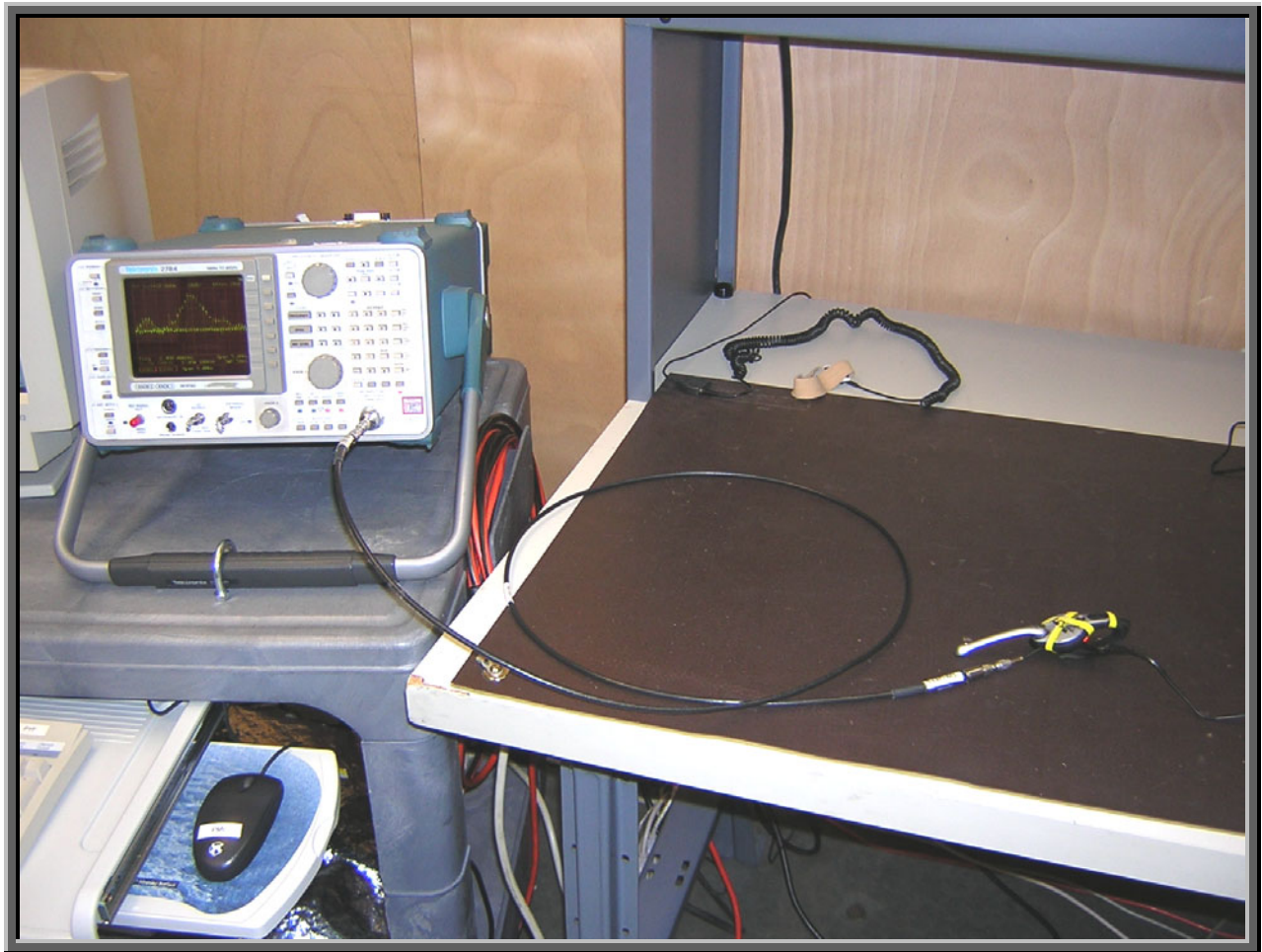
REQUIREMENTS
Maximum level of any spurious emission at the edge of the authorized band is 20 dB down from the fundamental

RESULTS
Pass AMPLITUDE -48.0 dB

SIGNATURE
Tested By: *Rod Peloquin*

DESCRIPTION OF TEST
Band Edge Compliance - High Channel





Justification

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

Channels in Specified Band Investigated:

Low
Mid
High

Operating Modes Investigated:

No Hop

Data Rates Investigated:

Maximum

Output Power Setting(s) Investigated:

Maximum

Power Input Settings Investigated:

120 VAC/60 Hz

Other Settings Investigated:

Stand-alone mode

Software\Firmware Applied During Test

Exercise software	N/A	Version	N/A
Description			
The system was tested using special firmware developed to test all functions of the device during the test.			

EUT and Peripherals

Description	Manufacturer	Model/Part Number	Serial Number
EUT - Cordless Headset for Xbox	Logitech, Inc.	A-0363A	EMC #2
AC/DC adaptor	Logitech, Inc	AG055V150T	None

Cables

Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Leads	No	1.8	PA	AC/DC adaptor	Cordless Headset for Xbox
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

Measurement Equipment

Description	Manufacturer	Model	Identifier	Last Cal	Interval
Spectrum Analyzer	Tektronix	2784	AAO	02/26/2003	24 mo

Test Description

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

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

Completed by:



EMISSIONS DATA SHEET

EUT: A-0363A Cordless Headset for X-Box		Work Order: LABT0106
Serial Number: EMC #2		Date: 10/15/2004
Customer: Logitech, Inc.		Temperature: 71 °F
Attendees: None	Tested by: Rod Peloquin	Humidity: 48% RH
Customer Ref. No.:	Power: 120VAC/60Hz	Job Site: EV06

TEST SPECIFICATIONS			
Specification: 47 CFR 15.247(c)	Year: Most Current	Method: DA 00-705, ANSI C63.4	Year: 2001
SAMPLE CALCULATIONS			

COMMENTS

EUT OPERATING MODES
Modulated by "FFFF" at maximum data rate

DEVIATIONS FROM TEST STANDARD
None

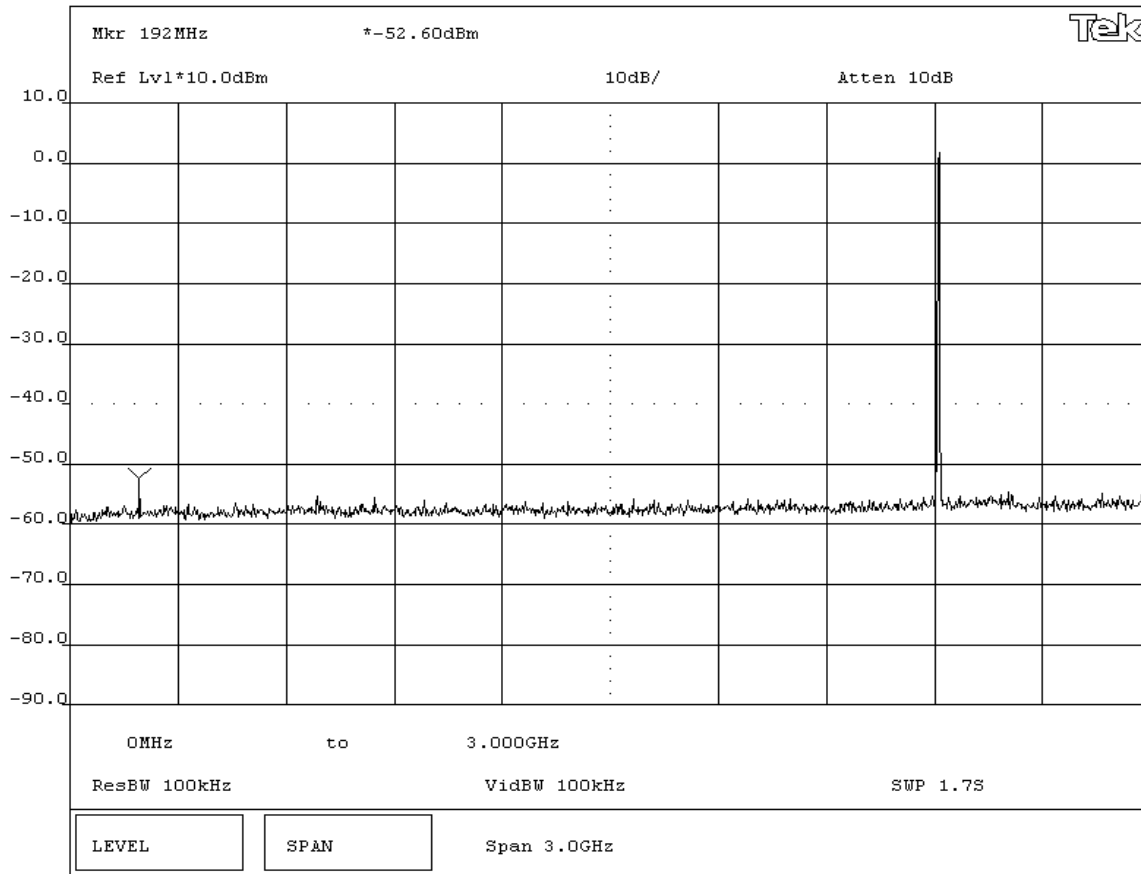
REQUIREMENTS
Maximum level of any spurious emission outside of the authorized band is 20 dB down from the fundamental

RESULTS
Pass

SIGNATURE

Tested By: *Rod Peloquin*

DESCRIPTION OF TEST
Antenna Conducted Spurious Emissions - Low Channel 0MHz-3GHz



EMISSIONS DATA SHEET

EUT: A-0363A Cordless Headset for X-Box		Work Order: LABT0106
Serial Number: EMC #2		Date: 10/15//2004
Customer: Logitech, Inc.		Temperature: 71 °F
Attendees: None	Tested by: Rod Peloquin	Humidity: 48% RH
Customer Ref. No.:	Power: 120VAC/60Hz	Job Site: EV06

TEST SPECIFICATIONS			
Specification: 47 CFR 15.247(c)	Year: Most Current	Method: DA 00-705, ANSI C63.4	Year: 2001

SAMPLE CALCULATIONS

COMMENTS

EUT OPERATING MODES

Modulated by "FFFF" at maximum data rate

DEVIATIONS FROM TEST STANDARD

None

REQUIREMENTS

Maximum level of any spurious emission outside of the authorized band is 20 dB down from the fundamental

RESULTS

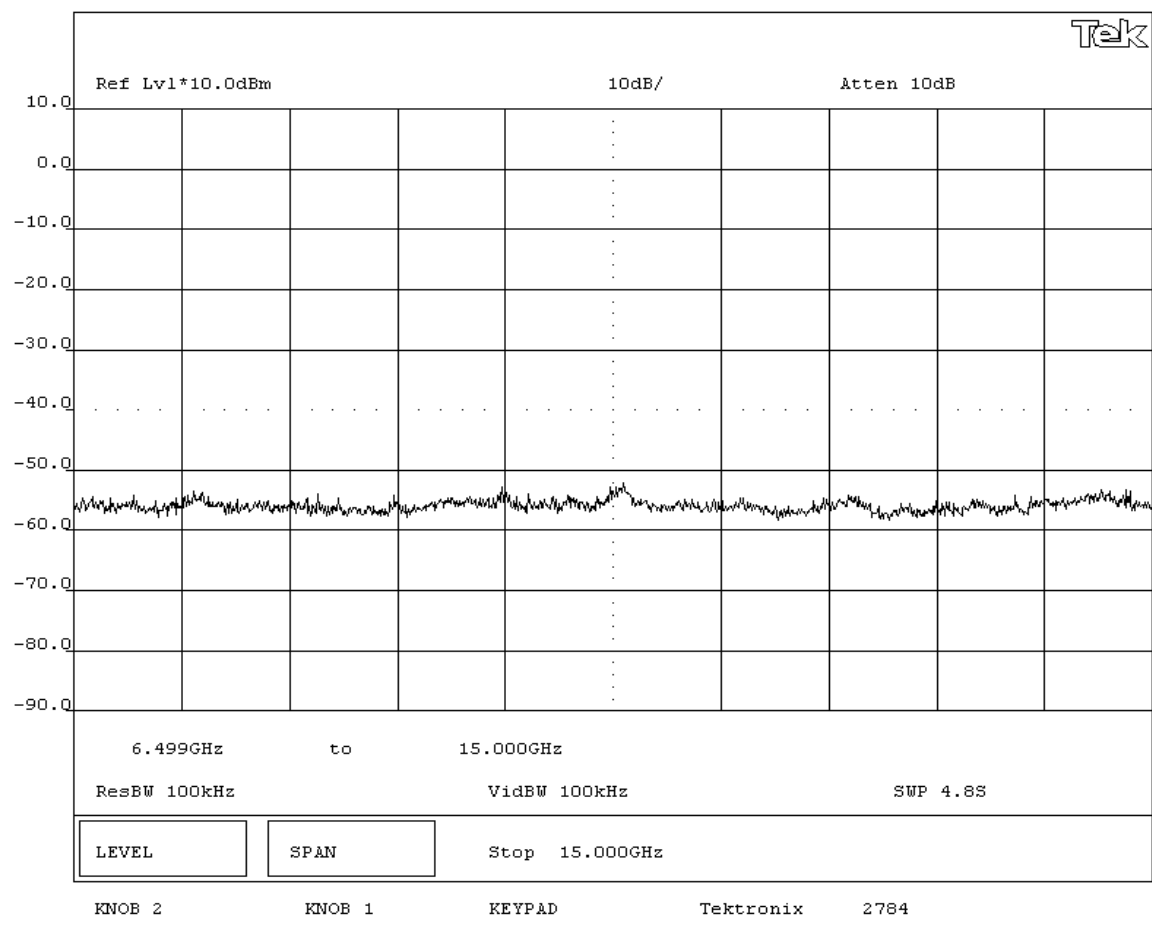
Pass

SIGNATURE

Tested By: *Rod Peloquin*

DESCRIPTION OF TEST

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



EMISSIONS DATA SHEET

EUT: A-0363A Cordless Headset for X-Box		Work Order: LABT0106
Serial Number: EMC #2		Date: 10/15//2004
Customer: Logitech, Inc.		Temperature: 71 °F
Attendees: None	Tested by: Rod Peloquin	Humidity: 48% RH
Customer Ref. No.:	Power: 120VAC/60Hz	Job Site: EV06

TEST SPECIFICATIONS			
Specification: 47 CFR 15.247(c)	Year: Most Current	Method: DA 00-705, ANSI C63.4	Year: 2001

SAMPLE CALCULATIONS			

COMMENTS			

EUT OPERATING MODES			
Modulated by "FFFF" at maximum data rate			

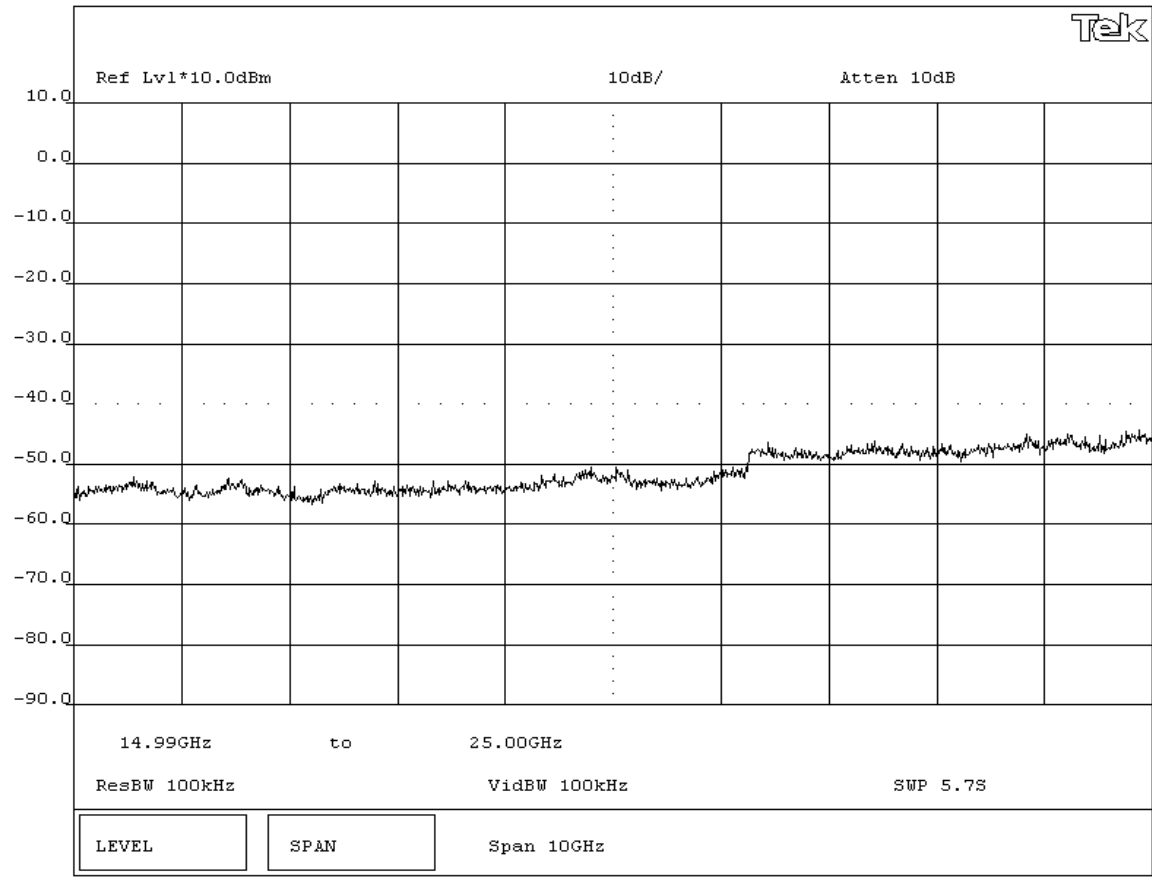
DEVIATIONS FROM TEST STANDARD			
None			

REQUIREMENTS			
Maximum level of any spurious emission outside of the authorized band is 20 dB down from the fundamental			

RESULTS			
Pass			

SIGNATURE			
 Tested By: _____			

DESCRIPTION OF TEST			
Antenna Conducted Spurious Emissions - Low Channel 15GHz - 25GHz			



EMISSIONS DATA SHEET

EUT: A-0363A Cordless Headset for X-Box		Work Order: LABT0106
Serial Number: EMC #2		Date: 10/15//2004
Customer: Logitech, Inc.		Temperature: 71 °F
Attendees: None	Tested by: Rod Peloquin	Humidity: 48% RH
Customer Ref. No.:	Power: 120VAC/60Hz	Job Site: EV06

TEST SPECIFICATIONS			
Specification: 47 CFR 15.247(c)	Year: Most Current	Method: DA 00-705, ANSI C63.4	Year: 2001

SAMPLE CALCULATIONS			

COMMENTS			

EUT OPERATING MODES			
Modulated by "FFFF" at maximum data rate			

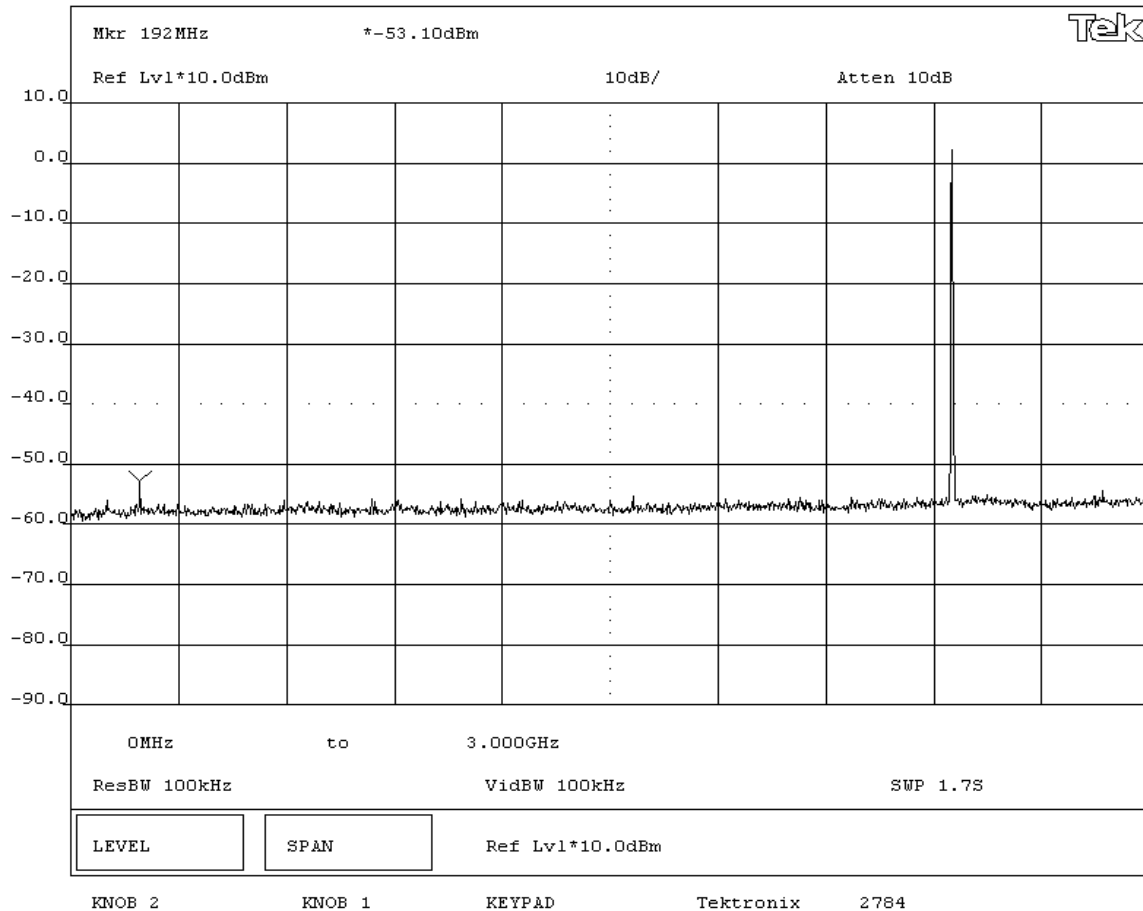
DEVIATIONS FROM TEST STANDARD			
None			

REQUIREMENTS			
Maximum level of any spurious emission outside of the authorized band is 20 dB down from the fundamental			

RESULTS			
Pass			

SIGNATURE			
			
Tested By: _____			

DESCRIPTION OF TEST			
Antenna Conducted Spurious Emissions - Mid Channel 0MHz-3GHz			



NORTHWEST EMC EMISSIONS DATA SHEET Rev BETA 01/30/01

EUT: A-0363A Cordless Headset for X-Box		Work Order: LABT0106
Serial Number: EMC #2		Date: 10/15//2004
Customer: Logitech, Inc.		Temperature: 71 °F
Attendees: None	Tested by: Rod Peloquin	Humidity: 48% RH
Customer Ref. No.:	Power: 120VAC/60Hz	Job Site: EV06

TEST SPECIFICATIONS

Specification: 47 CFR 15.247(c)	Year: Most Current	Method: DA 00-705, ANSI C63.4	Year: 2001
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SAMPLE CALCULATIONS

COMMENTS

EUT OPERATING MODES
Modulated by "FFFF" at maximum data rate

DEVIATIONS FROM TEST STANDARD
None

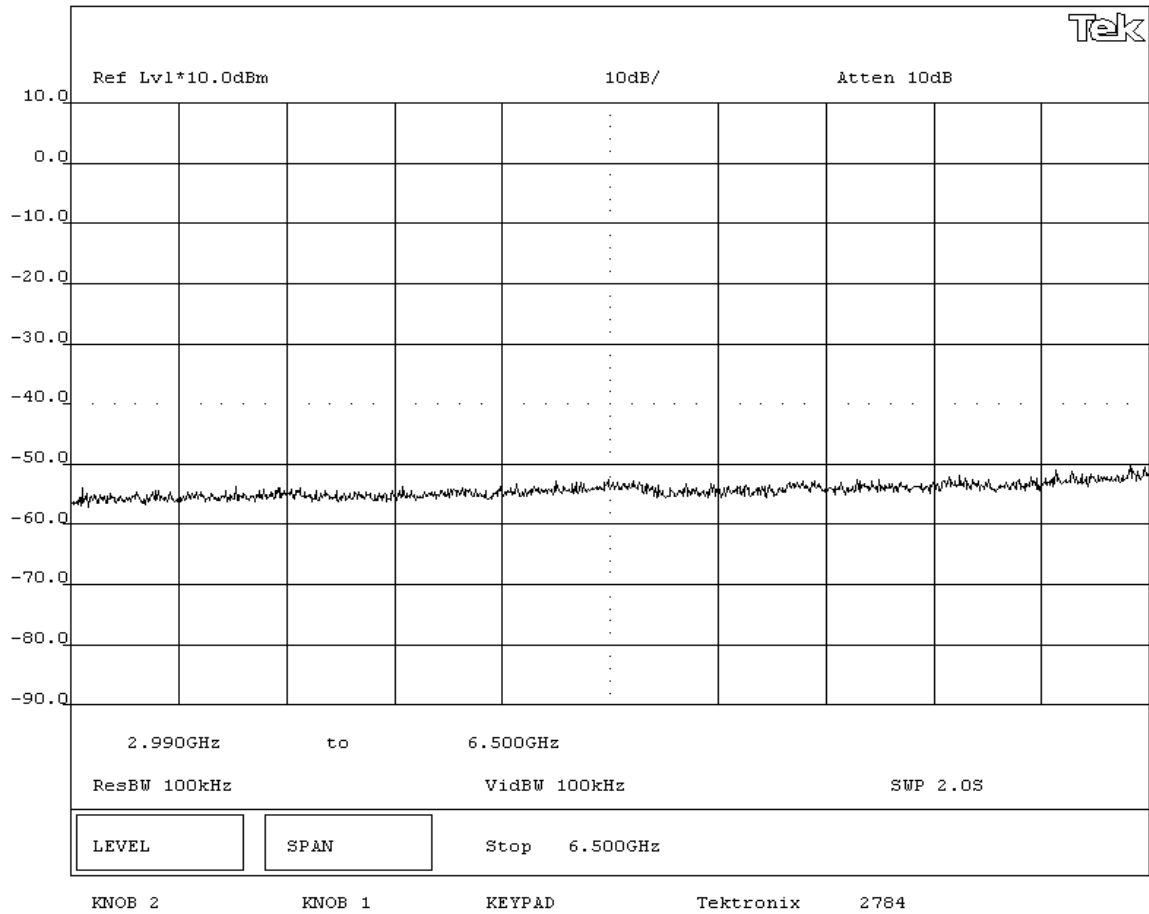
REQUIREMENTS
Maximum level of any spurious emission outside of the authorized band is 20 dB down from the fundamental

RESULTS
Pass

SIGNATURE


 Tested By: _____

DESCRIPTION OF TEST
Antenna Conducted Spurious Emissions - Mid Channel 3GHz-6.5GHz



EMISSIONS DATA SHEET

EUT: A-0363A Cordless Headset for X-Box		Work Order: LABT0106
Serial Number: EMC #2		Date: 10/15//2004
Customer: Logitech, Inc.		Temperature: 71 °F
Attendees: None	Tested by: Rod Peloquin	Humidity: 48% RH
Customer Ref. No.:	Power: 120VAC/60Hz	Job Site: EV06

TEST SPECIFICATIONS			
Specification: 47 CFR 15.247(c)	Year: Most Current	Method: DA 00-705, ANSI C63.4	Year: 2001

SAMPLE CALCULATIONS			

COMMENTS			

EUT OPERATING MODES			
Modulated by "FFFF" at maximum data rate			

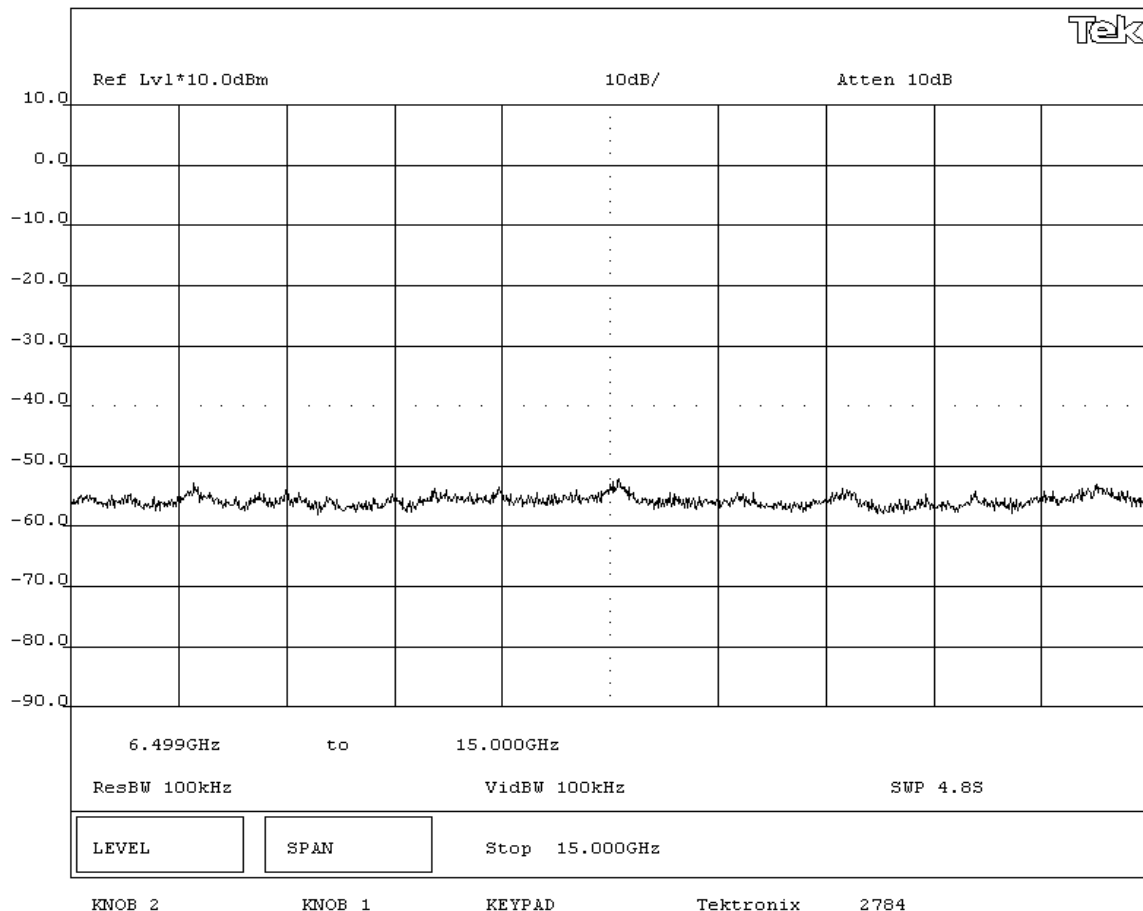
DEVIATIONS FROM TEST STANDARD			
None			

REQUIREMENTS			
Maximum level of any spurious emission outside of the authorized band is 20 dB down from the fundamental			

RESULTS			
Pass			

SIGNATURE			
 Tested By: _____			

DESCRIPTION OF TEST			
Antenna Conducted Spurious Emissions - Mid Channel 6.5GHz-15GHz			



EMISSIONS DATA SHEET

EUT: A-0363A Cordless Headset for X-Box		Work Order: LABT0106
Serial Number: EMC #2		Date: 10/15//2004
Customer: Logitech, Inc.		Temperature: 71 °F
Attendees: None	Tested by: Rod Peloquin	Humidity: 48% RH
Customer Ref. No.:	Power: 120VAC/60Hz	Job Site: EV06

TEST SPECIFICATIONS			
Specification: 47 CFR 15.247(c)	Year: Most Current	Method: DA 00-705, ANSI C63.4	Year: 2001

SAMPLE CALCULATIONS

COMMENTS

EUT OPERATING MODES
Modulated by "FFFF" at maximum data rate

DEVIATIONS FROM TEST STANDARD
None

REQUIREMENTS
Maximum level of any spurious emission outside of the authorized band is 20 dB down from the fundamental

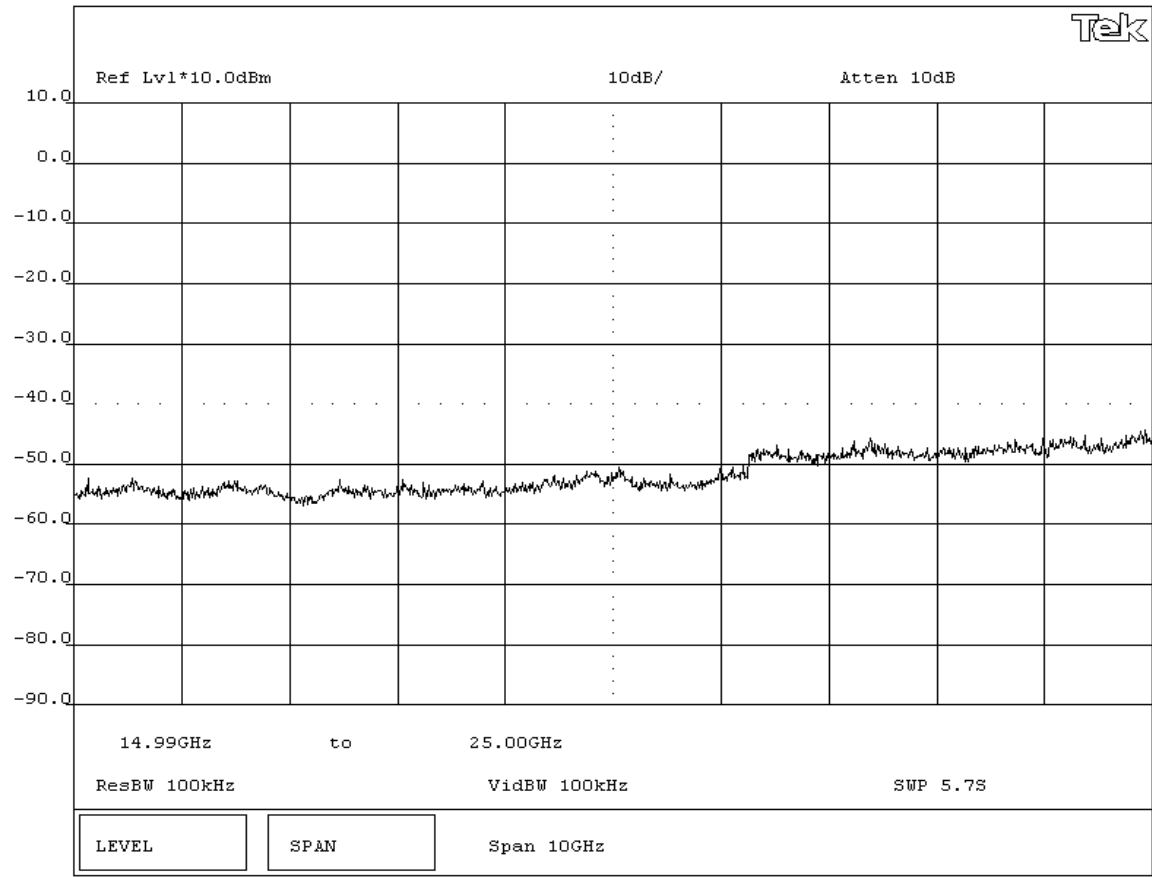
RESULTS
Pass

SIGNATURE

Rod Peloquin

Tested By: _____

DESCRIPTION OF TEST
Antenna Conducted Spurious Emissions - Mid Channel 15GHz-25GHz



EMISSIONS DATA SHEET

EUT: A-0363A Cordless Headset for X-Box		Work Order: LABT0106
Serial Number: EMC #2		Date: 10/15//2004
Customer: Logitech, Inc.		Temperature: 71 °F
Attendees: None	Tested by: Rod Peloquin	Humidity: 48% RH
Customer Ref. No.:	Power: 120VAC/60Hz	Job Site: EV06

TEST SPECIFICATIONS			
Specification: 47 CFR 15.247(c)	Year: Most Current	Method: DA 00-705, ANSI C63.4	Year: 2001

SAMPLE CALCULATIONS			

COMMENTS			

EUT OPERATING MODES			
Modulated by "FFFF" at maximum data rate			

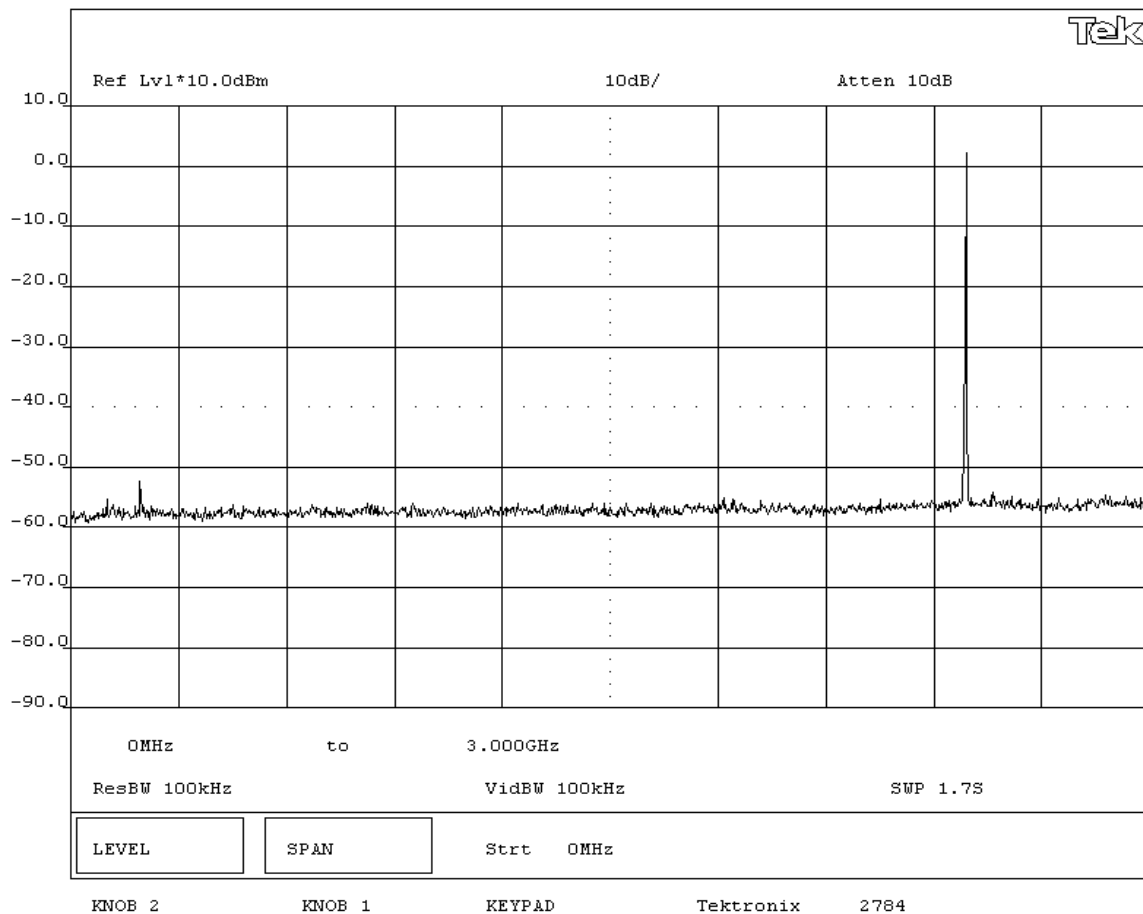
DEVIATIONS FROM TEST STANDARD			
None			

REQUIREMENTS			
Maximum level of any spurious emission outside of the authorized band is 20 dB down from the fundamental			

RESULTS			
Pass			

SIGNATURE			
 Tested By: _____			

DESCRIPTION OF TEST			
Antenna Conducted Spurious Emissions - High Channel 0MHz-3GHz			



EMISSIONS DATA SHEET

EUT: A-0363A Cordless Headset for X-Box		Work Order: LABT0106
Serial Number: EMC #2		Date: 10/15//2004
Customer: Logitech, Inc.		Temperature: 71 °F
Attendees: None	Tested by: Rod Peloquin	Humidity: 48% RH
Customer Ref. No.:	Power: 120VAC/60Hz	Job Site: EV06

TEST SPECIFICATIONS			
Specification: 47 CFR 15.247(c)	Year: Most Current	Method: DA 00-705, ANSI C63.4	Year: 2001

SAMPLE CALCULATIONS			

COMMENTS			

EUT OPERATING MODES			
Modulated by "FFFF" at maximum data rate			

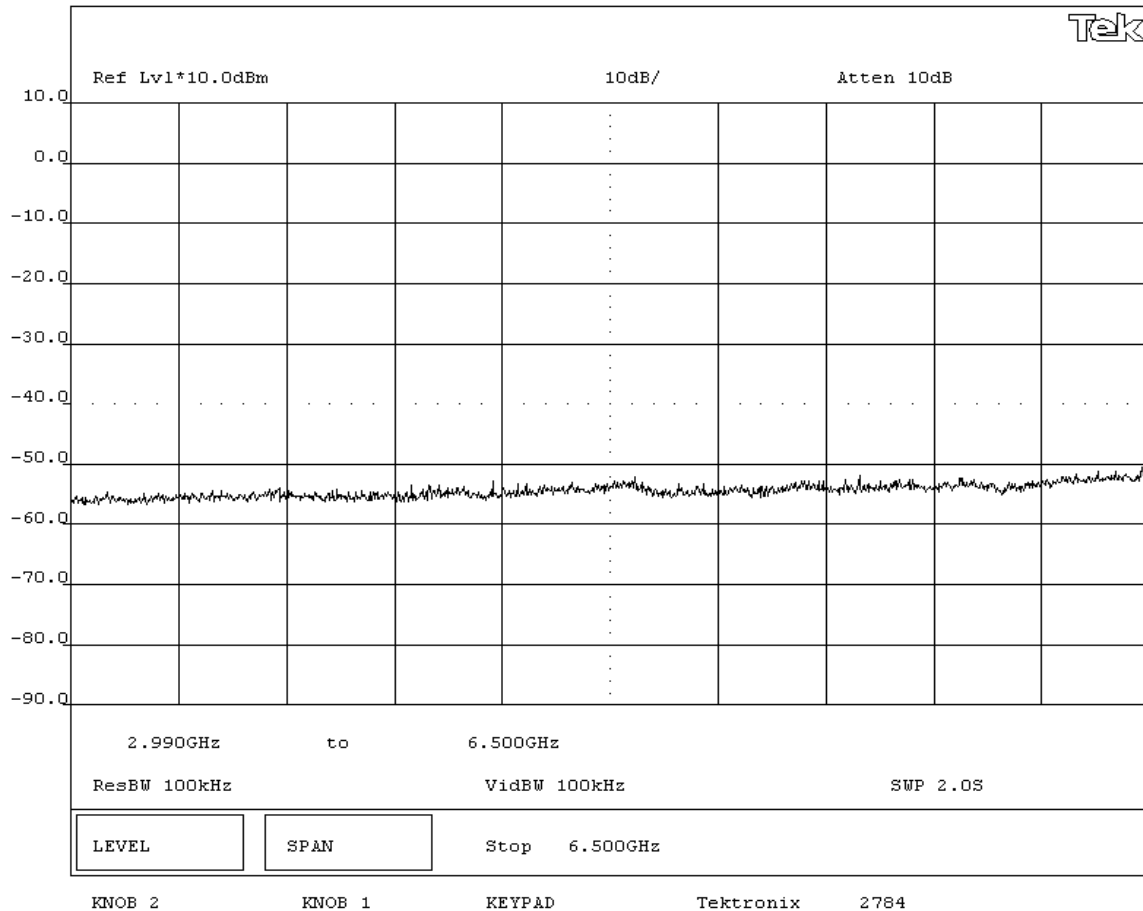
DEVIATIONS FROM TEST STANDARD			
None			

REQUIREMENTS			
Maximum level of any spurious emission outside of the authorized band is 20 dB down from the fundamental			

RESULTS			
Pass			

SIGNATURE			
 Tested By: _____			

DESCRIPTION OF TEST			
Antenna Conducted Spurious Emissions - High Channel 3GHz-6.5GHz			



EMISSIONS DATA SHEET

EUT: A-0363A Cordless Headset for X-Box		Work Order: LABT0106
Serial Number: EMC #2		Date: 10/15//2004
Customer: Logitech, Inc.		Temperature: 71 °F
Attendees: None	Tested by: Rod Peloquin	Humidity: 48% RH
Customer Ref. No.:	Power: 120VAC/60Hz	Job Site: EV06

TEST SPECIFICATIONS			
Specification: 47 CFR 15.247(c)	Year: Most Current	Method: DA 00-705, ANSI C63.4	Year: 2001

SAMPLE CALCULATIONS			

COMMENTS			

EUT OPERATING MODES			
Modulated by "FFFF" at maximum data rate			

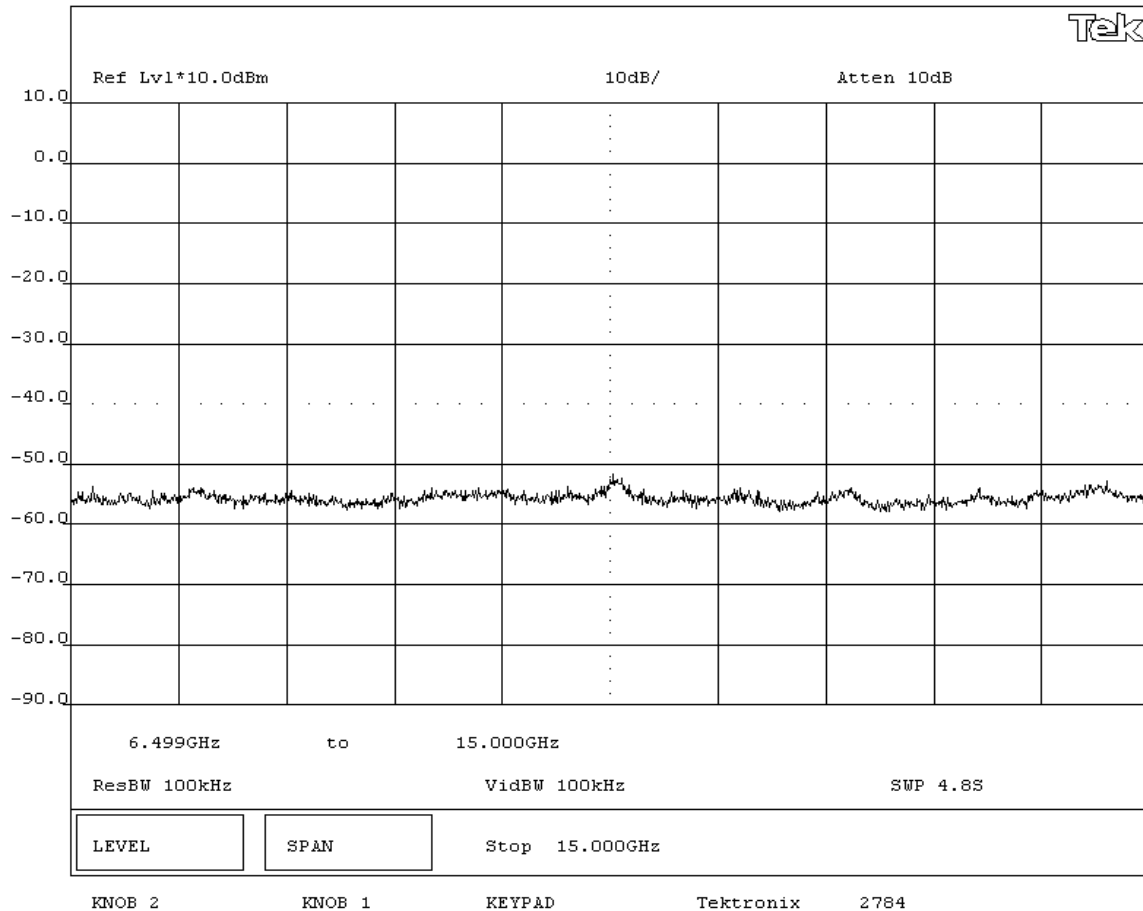
DEVIATIONS FROM TEST STANDARD			
None			

REQUIREMENTS			
Maximum level of any spurious emission outside of the authorized band is 20 dB down from the fundamental			

RESULTS			
Pass			

SIGNATURE			
 Tested By: _____			

DESCRIPTION OF TEST			
Antenna Conducted Spurious Emissions - High Channel 6.5GHz-15GHz			



EMISSIONS DATA SHEET

EUT: A-0363A Cordless Headset for X-Box		Work Order: LABT0106
Serial Number: EMC #2		Date: 10/15//2004
Customer: Logitech, Inc.		Temperature: 71 °F
Attendees: None	Tested by: Rod Peloquin	Humidity: 48% RH
Customer Ref. No.:	Power: 120VAC/60Hz	Job Site: EV06

TEST SPECIFICATIONS			
Specification: 47 CFR 15.247(c)	Year: Most Current	Method: DA 00-705, ANSI C63.4	Year: 2001

SAMPLE CALCULATIONS

COMMENTS

EUT OPERATING MODES
Modulated by "FFFF" at maximum data rate

DEVIATIONS FROM TEST STANDARD
None

REQUIREMENTS
Maximum level of any spurious emission outside of the authorized band is 20 dB down from the fundamental

RESULTS
Pass

SIGNATURE

Rod Peloquin

Tested By: _____

DESCRIPTION OF TEST
Antenna Conducted Spurious Emissions - High Channel 15GHz-25GHz

