

TEST RESULT SUMMARY

FCC Part 15 Subpart C Section 15.239

MANUFACTURER'S NAME	Cool and Useful Products LLC
NAME OF EQUIPMENT	iHear
MODEL NUMBER(S) TESTED	iHear
MANUFACTURER'S ADDRESS	640 West Street Carlisle MA 01741
TEST REPORT NUMBER	WC606379 Rev B
TEST DATE(S)	03 November 2006 and 22 March 2007

According to testing performed at TÜV SÜD America Inc, the above mentioned unit is in compliance with the applicable electromagnetic compatibility (EMC) portions of the requirements defined in FCC Part 15 Subpart C Section 15.239

It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical characteristics. Any modifications necessary for compliance made during testing on the above mentioned date(s) must be implemented in all production units for compliance to be maintained.

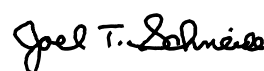
TÜV SÜD America Inc, as an independent testing laboratory, declares that the equipment tested as specified above conforms to the applicable EMC requirements of FCC Part 15 Subpart C Section 15.239 "Operation in the band 88-108 MHz".

Date: 10 April 2007

Location: Taylors Falls MN
USA



Ross Johnson
Senior EMC Technician



Joel Schneider
Sr. EMC Engineer

Not Transferable

EMC TEST REPORT

Test Report File No. : **WC606379 Rev B** Date of issue: 10 April 2007

Model / Serial No(s) Tested : iHear / ---

Product Type : mp3 / cell phone / microphone FM transmitter

Applicant : Cool and Useful Products LLC

Manufacturer : Cool and Useful Products LLC

License holder : Cool and Useful Products LLC

Address : 640 West Street
Carlisle MA 01741

Test Result : ☒ **Positive** ☐ **Negative**

Test Project Number
References : WC606379 Rev B

Total pages including
Appendices : 31

TÜV SÜD AMERICA Inc reports apply only to the specific samples tested under stated test conditions. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. TÜV SÜD America Inc shall have no liability for any deductions, inferences or generalizations drawn by the client or others from TÜV SÜD America Inc issued reports.

This report is the confidential property of the client. As a mutual protection to our clients, the public and ourselves, extracts from the test report shall not be reproduced except in full without our written approval. This report shall not be used by the client to claim product endorsement by NVLAP, NIST, or any agency of the US government.

TÜV SÜD AMERICA Inc and its professional staff hold government and professional organization certifications and are members of AAMI, ACIL, AEA, ANSI, IEEE, NARTE, and VCCI.

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Sign Explanations:

- ☐ - not applicable
☒ - applicable

R E V I S I O N R E C O R D

REVISION	TOTAL NUMBER OF PAGES	DATE	DESCRIPTION
	31	13 December 2006	Initial Release
A	31	22 March 2007	Revisions include: <ul style="list-style-type: none"> ▪ Updated BW summary and plots, pages 4 - 7 ▪ Emissions within band, updated summary, page 8 ▪ Emissions outside the band, updated summary, Page 9 ▪ Replaced radiated emissions data, pages 10 - 14 ▪ Replaced band edge plots, pages 15 - 16 ▪ Added a statement, describing rotation of the EUT through 3 orthogonal axes, to the radiated emissions paragraph of measurement protocol, page 31 ▪ Updated test condition, page 20
B	31	10 April 2007	Revisions include: <ul style="list-style-type: none"> ▪ Page 22: Added modification reference. ▪ Appendix B: Revised to include details regarding implemented modifications.

EMC TEST REGULATIONS:

The tests were performed according to the following regulations :

- ☐ - EN 50081-1 / 1991
- ☐ - EN 55014-2: 1997 + Amendment A1: 2001 - Category ____
- ☐ - EN 55024: 1998 + Amendments A1: 2001 + A2: 2003
- ☐ - EN 60601-1-2: 2001
- ☐ - EN 61000-6-1: 2001
- ☐ - EN 61000-6-2: 2001
- ☐ - EN 61326: 1997 + Amendments A1: 1998 + A2: 2001 + A3: 2003
- ☐ - EN 61800-3: 1996 + Amendment A11: 2000
- ☐ - ETS 300 683: 1997
- ☐ - ETS 300 683: 1997
- ☐ - ETSI EN 301 489-3 V1.4.1: 2002
- ☐ - EN 300 220-3 V1.1.1
- ☐ - EN 300 330-2 V1.1.1
- ☐ - FCC Part 15 Subpart C Section 15.207
- ☐ - FCC Part 15 Subpart C Section 15.209
- ☒ - FCC Part 15 Subpart C Section 15.239
- ☐ - FCC Part 15 Subpart C Section 15.247
- ☐ - FCC Part 15 Subpart C Section 15.249
- ☐ - IC RSS-210 Issue 6
- ☐ - IC RSS-Gen Issue 1
- ☐ - IC RSS-Gen Issue 1

ENVIRONMENTAL CONDITIONS IN THE LAB

	<u>Actual</u>
Temperature:	: 20 - 21 °C
Atmospheric pressure	: 98 - 99 kPa
Relative Humidity	: 21 - 27 %

POWER SUPPLY UTILIZED

Power supply system : 5 VDC Internal Battery

FCC 15.239(a) 200 kHz Bandwidth

Test summary

The requirements are: ☒ - MET ☐ - NOT MET

Maximum 20 dB bandwidth = 188.8 kHz

Test location

☒ - Wild River Lab Large Test Site (Open Area Test Site)

☐ - Wild River Lab Small Test Site (Open Area Test Site)

Test equipment

TUV ID	Model Number	Manufacturer	Description	Serial Number	Cal Due
3367	E4440A	Agilent	Spectrum Analyzer	MY42510439	14 Sep 07
	7405-901	EMCO	Near field probe	na	Code Y

Cal Code B = Calibration verification performed internally. Cal Code Y = Calibration not required when used with other calibrated equipment.

Test limit

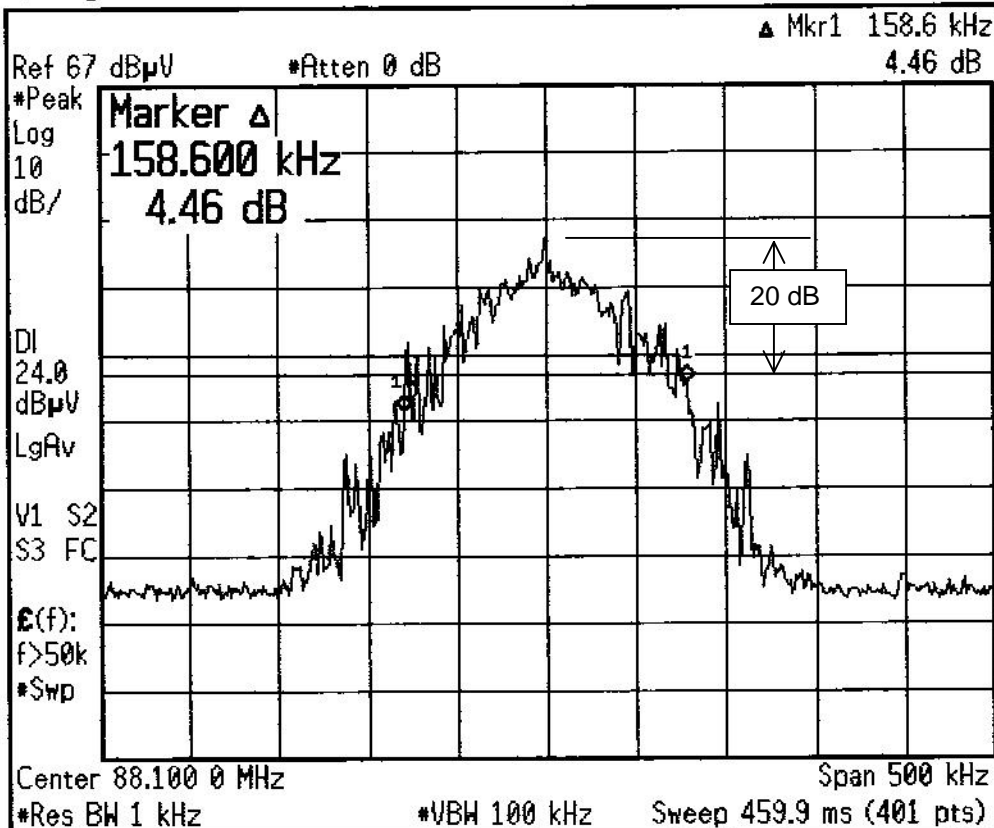
200 kHz

Test data

Pages 5 - 7

20 dB Bandwidth, Low channel

※ Agilent 10:20:33 Mar 22, 2007



Print Setup

Printer Setup

Orientation
Portrait

Page Size
Letter

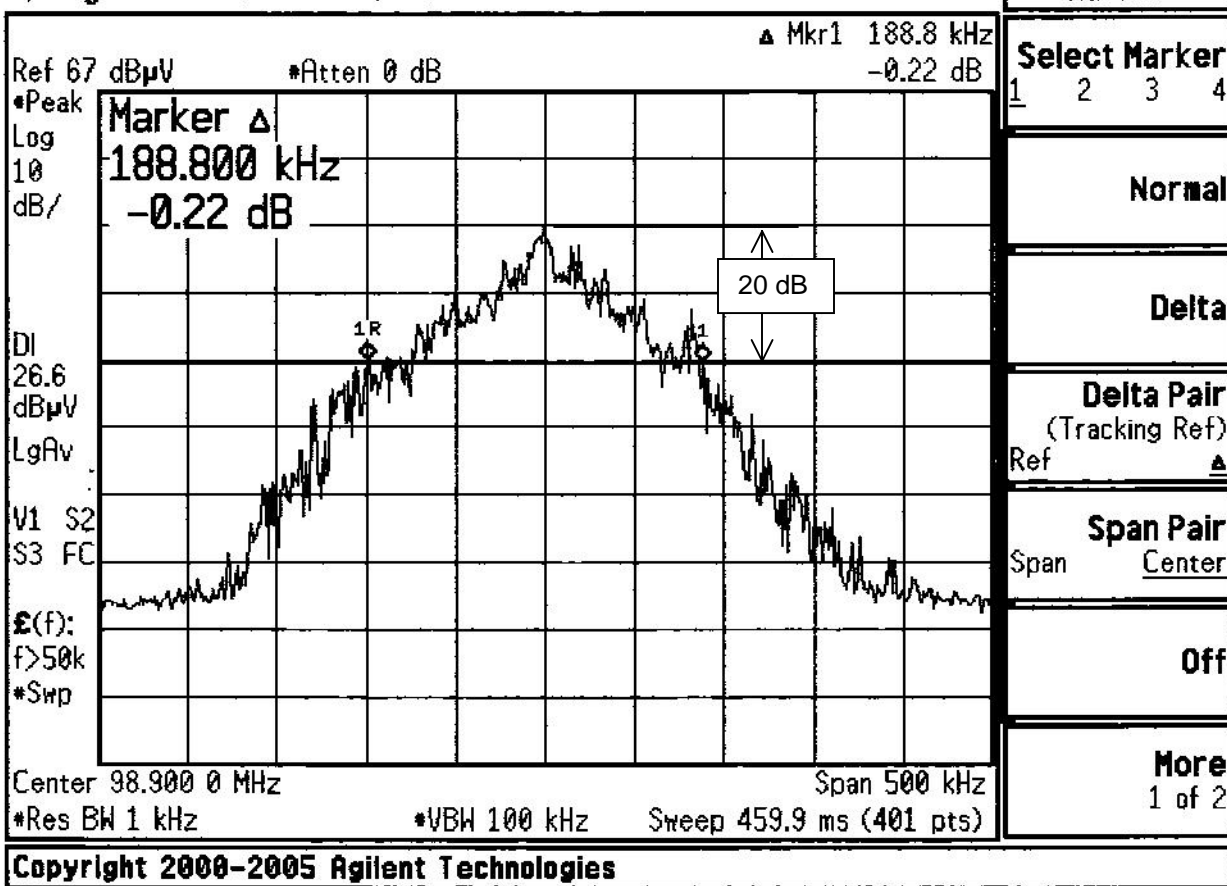
Color
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More
1 of 2

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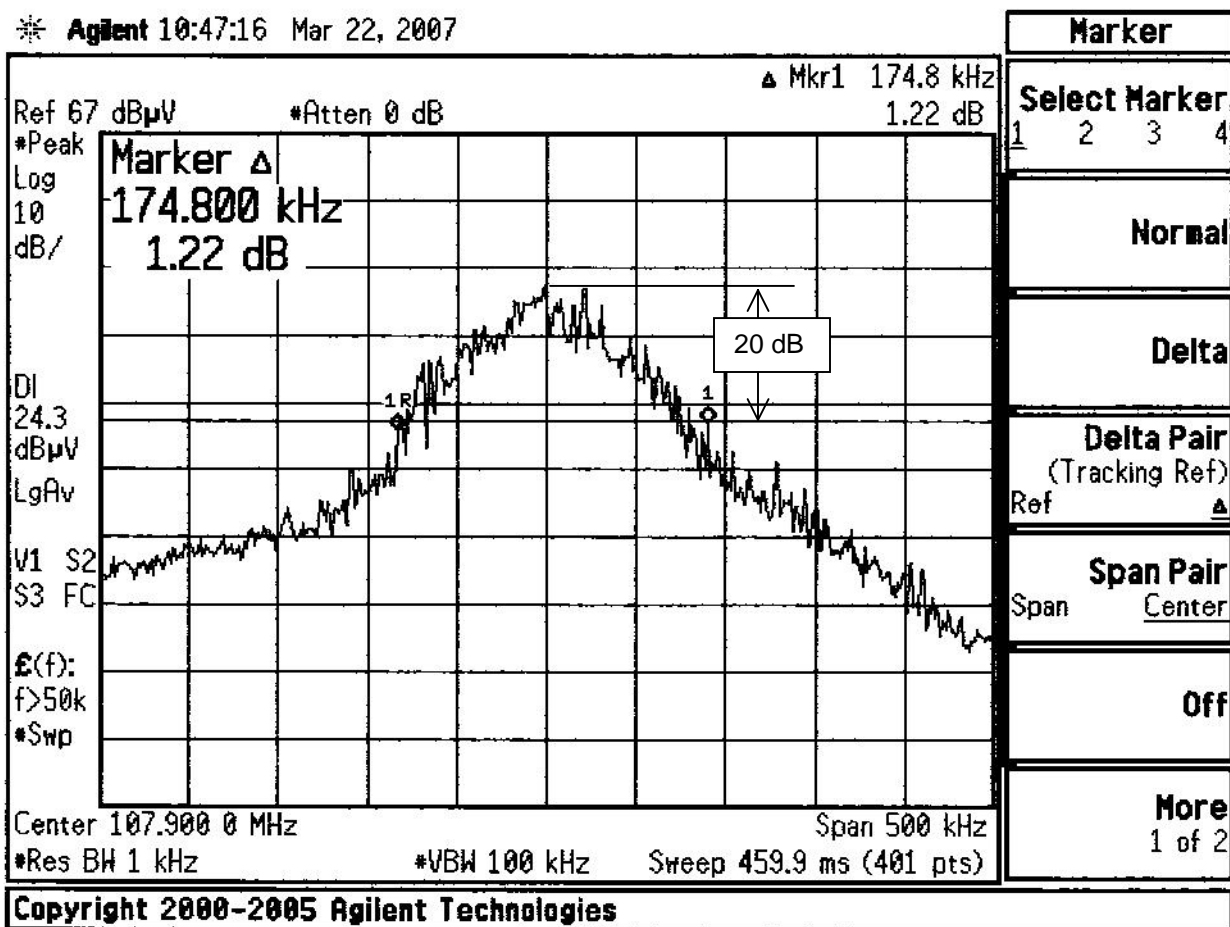
20 dB Bandwidth, Mid channel

Agilent 10:38:10 Mar 22, 2007



20 dB Bandwidth, High channel

* Agilent 10:47:16 Mar 22, 2007



FCC 15.239(b) Emissions within the permitted band

Test summary

The requirements are: ☒ - MET ☐ - NOT MET

Minimum margin of compliance is 5.2 dB at 107.9 MHz

Lowest channel = 88.1 MHz, highest channel = 107.9 MHz

Test location

☒ - Wild River Lab Large Test Site (Open Area Test Site)

☐ - Wild River Lab Small Test Site (Open Area Test Site)

Test distance

☒ - 3 meters

☐ - 10 meters

Test equipment

TUV ID	Model Number	Manufacturer	Description	Serial Number	Cal Due
3203	EM-6917B	Electro-Metrics	Biconicalog Periodic	106	02-May-07
3847	ZHL-1042J	Mini-Circuits	Preamplifier 10 - 3000 MHz	0607	Code B
2690	8566B	Hewlett-Packard	Spectrum Analyzer	2430A00930	12 May 07
2673	85662A	Hewlett-Packard	Analyzer Display	2152A03687	12 May 07
2680	85650A	Hewlett-Packard	Quasi-Peak Adapter	2043A00343	16 June 07
2535	ESVS-20	Rhode & Schwarz	EMI Receiver	830350/004	26-Jun-07

Cal Code B = Calibration verification performed internally. Cal Code Y = Calibration not required when used with other calibrated equipment.

Test limit

250 μ V/m or 48 dB μ V/m at 3 meters

Test data

Pages 10, 12, 14

15.239(c) Emissions outside the specified band

Test summary

The requirements are: ☒ - MET ☐ - NOT MET

Minimum margin of compliance is 2.2 dB at 197 MHz

Test location

☒ - Wild River Lab Large Test Site (Open Area Test Site)

☐ - Wild River Lab Small Test Site (Open Area Test Site)

Test distance

☒ - 3 meters

☐ - 10 meters

Test equipment

TUV ID	Model Number	Manufacturer	Description	Serial Number	Cal Due
3203	EM-6917B	Electro-Metrics	Biconicalog Periodic	106	02-May-07
3847	ZHL-1042J	Mini-Circuits	Preamplifier 10 - 3000 MHz	0607	Code B
2690	8566B	Hewlett-Packard	Spectrum Analyzer	2430A00930	12 May 07
2673	85662A	Hewlett-Packard	Analyzer Display	2152A03687	12 May 07
2684	85650A	Hewlett-Packard	Quasi-Peak Adapter	2521A01006	15 Mar 07
2535	ESVS-20	Rhode & Schwarz	EMI Receiver	830350/004	26-Jun-07
3367	E4440A	Agilent	Spectrum Analyzer	MY42510439	14 Sep 07
	7405-901	EMCO	Near field probe	na	Code Y

Cal Code B = Calibration verification performed internally. Cal Code Y = Calibration not required when used with other calibrated equipment.

Test limits

Frequency (MHz)	Field strength ($\mu\text{V}/\text{m}$)	Field strength ($\text{dB}\mu\text{V}/\text{m}$)	Measurement distance (m)
30-88	100	40	3
88-216	150	43.5	3
219-960	200	46	3
> 960	500	54	3

Test data

Pages 10 - 16

RADIATED EMISSIONS



Test Report #: WC606379 Run 3 Test Area: LTS

EUT Model #: iHear Date: 3/22/2007

EUT Serial #: PROTOTYPE EUT Power: INTERNAL BATTERY Temperature: 20.0 °C

Test Method: FCC B Air Pressure: 98.0 kPa

Customer: LARCO Rel. Humidity: 27.0 %

EUT Description: FM TRANSMITTER FOR MP3 PLAYERS

Notes: CARRIER MODULATED WITH MUSIC FROM AN MP3 PLAYER (MP3 PLAYER AT MAX OUTPUT)

Data File Name: 6379.dat

Page: 1 of 5

List of measurements for run #: 3

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA1 15.239 (88- 108) TRANSMITTER	DELTA2 FCC-B <1GHz 3m
3 ORTHOGANAL AXIS INVESTIGATED TO FIND THE WORST CASE AXIS WHICH WAS VERTICAL.						
HIGH CHANNEL - 107.9MHz. - MAXIMIZED.						
107.9 MHz	67.95 Pk	0.96 / 9.42 / 29.55 / 0.0	48.78	V / 1.00 / 0	0.78*	5.28*
107.9 MHz	61.97 Av	0.96 / 9.42 / 29.55 / 0.0	42.8	V / 1.00 / 0	-5.2	n/a
MIDDLE CHANNEL - 98.9MHz - MAXIMIZED.						
98.9 MHz	65.15 Pk	0.94 / 8.62 / 29.54 / 0.0	45.17	V / 1.00 / 0	-2.83*	1.67*
98.9 MHz	61.43 Av	0.94 / 8.62 / 29.54 / 0.0	41.45	V / 1.00 / 0	-6.55	n/a
LOW CHANNEL - 88.1MHz - MAXIMIZED.						
88.1 MHz	59.76 Pk	0.91 / 7.67 / 29.52 / 0.0	38.82	V / 1.20 / 177	-9.18*	-4.68*
88.1 MHz	58.34 Av	0.91 / 7.67 / 29.52 / 0.0	37.4	V / 1.20 / 177	-10.6	n/a
LOW CHANNEL SPURIOUS - 88.1MHz.						
176.186 MHz	54.35 Qp	1.27 / 9.86 / 29.53 / 0.0	35.96	V / 1.20 / 0	n/a	-7.54
264.286 MHz	28.6 Qp	1.52 / 12.36 / 29.67 / 0.0	12.82	V / 1.20 / 0	n/a	-33.18
352.386 MHz	27.25 Qp	1.92 / 14.9 / 29.81 / 0.0	14.26	V / 1.20 / 0	n/a	-31.74
440.486 MHz	27.0 Qp	2.05 / 16.66 / 29.95 / 0.0	15.76	V / 1.20 / 0	n/a	-30.24
528.586 MHz	27.95 Qp	2.22 / 17.96 / 30.09 / 0.0	18.04	V / 1.20 / 0	n/a	-27.96
616.512 MHz	29.6 Qp	2.52 / 19.65 / 30.17 / 0.0	21.6	V / 1.20 / 0	n/a	-24.4
440.486 MHz	28.1 Qp	2.05 / 16.66 / 29.95 / 0.0	16.86	V / 1.20 / 90	n/a	-29.14
264.286 MHz	31.65 Qp	1.52 / 12.36 / 29.67 / 0.0	15.87	V / 1.20 / 180	n/a	-30.13
MAXIMIZED.						

Tested by: R. M. Johnson

Printed

R. M. Johnson

Signature

Reviewed by: Greg Jakubowski

Printed

G. Jakubowski

Signature

RADIATED EMISSIONS



Test Report #: WC606379 Run 3 Test Area: LTS

EUT Model #: iHear Date: 3/22/2007

EUT Serial #: PROTOTYPE EUT Power: INTERNAL BATTERY Temperature: 20.0 °C

Test Method: FCC B Air Pressure: 98.0 kPa

Customer: LARCO Rel. Humidity: 27.0 %

EUT Description: FM TRANSMITTER FOR MP3 PLAYERS

Notes: CARRIER MODULATED WITH MUSIC FROM AN MP3 PLAYER (MP3 PLAYER AT MAX OUTPUT)

Data File Name: 6379.dat

Page: 2 of 5

List of measurements for run #: 3

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA1 15.239 (88- 108) TRANSMITTER	DELTA2 FCC-B <1GHz 3m
176.186 MHz	54.45 Qp	1.27 / 9.86 / 29.53 / 0.0	36.06	V / 1.00 / 117	n/a	-7.44
NO NEW OR HIGHER EMISSIONS FOUND WITH HORIZONTAL POLARIZATION AT ALL AZIMUTHS.						
MIDDLE CHANNEL SPURIOUS - 98.9MHz.						
197.8 MHz	58.1 Qp	1.35 / 11.04 / 29.56 / 0.0	40.93	V / 1.00 / 0	n/a	-2.57
296.7 MHz	28.4 Qp	1.69 / 13.3 / 29.72 / 0.0	13.67	V / 1.00 / 0	n/a	-32.33
395.6 MHz	27.8 Qp	2.0 / 15.72 / 29.88 / 0.0	15.64	V / 1.00 / 0	n/a	-30.36
494.5 MHz	27.05 Qp	2.13 / 17.79 / 30.04 / 0.0	16.93	V / 1.00 / 0	n/a	-29.07
197.8 MHz	58.2 Qp	1.35 / 11.04 / 29.56 / 0.0	41.03	V / 1.00 / 180	n/a	-2.47
395.6 MHz	28.05 Qp	2.0 / 15.72 / 29.88 / 0.0	15.89	V / 1.00 / 180	n/a	-30.11
494.5 MHz	27.2 Qp	2.13 / 17.79 / 30.04 / 0.0	17.08	V / 1.00 / 180	n/a	-28.92
MAXIMIZED.						
197.8 MHz	58.4 Qp	1.35 / 11.04 / 29.56 / 0.0	41.23	V / 1.00 / 0	n/a	-2.27
NO NEW OR HIGHER EMISSIONS FOUND WITH HORIZONTAL POLARIZATION AT ALL AZIMUTHS.						
HIGH CHANNEL SPURIOUS - 107.9MHz.						
215.788 MHz	50.45 Qp	1.41 / 10.97 / 29.59 / 0.0	33.24	V / 1.00 / 0	n/a	-10.26
323.688 MHz	30.45 Qp	1.82 / 14.08 / 29.76 / 0.0	16.58	V / 1.00 / 0	n/a	-29.42
431.588 MHz	29.9 Qp	2.04 / 16.47 / 29.93 / 0.0	18.48	V / 1.00 / 0	n/a	-27.52
MAXIMIZED.						
215.788 MHz	50.95 Qp	1.41 / 10.97 / 29.59 / 0.0	33.74	V / 1.20 / 0	n/a	-9.76

Tested by: R. M. Johnson

Printed

R. M. Johnson

Signature

Reviewed by: Greg Jakubowski

Printed

G. Jakubowski

Signature

RADIATED EMISSIONS



Test Report #: WC606379 Run 3 Test Area: LTS
EUT Model #: iHear Date: 3/22/2007
EUT Serial #: PROTOTYPE EUT Power: INTERNAL BATTERY Temperature: 20.0 °C
Test Method: FCC B Air Pressure: 98.0 kPa
Customer: LARCO Rel. Humidity: 27.0 %

EUT Description: FM TRANSMITTER FOR MP3 PLAYERS

Notes: CARRIER MODULATED WITH MUSIC FROM AN MP3 PLAYER (MP3 PLAYER AT MAX OUTPUT)

Data File Name: 6379.dat

Page: 3 of 5

List of measurements for run #: 3

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA1 15.239 (88- 108) TRANSMITTER	DELTA2 FCC-B <1GHz 3m
NO NEW OR HIGHER EMISSIONS FOUND WITH HORIZONTAL POLARIZATION AT ALL AZIMUTHS.						
END OF SCAN 30 - 1080MHz.						

Measurement summary for limit1: 15.239 (88-108) TRANSMITTER (Av)

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA1 15.239 (88- 108) TRANSMITTER
107.9 MHz	61.97 Av	0.96 / 9.42 / 29.55 / 0.0	42.8	V / 1.00 / 0	-5.2
98.9 MHz	61.43 Av	0.94 / 8.62 / 29.54 / 0.0	41.45	V / 1.00 / 0	-6.55
88.1 MHz	58.34 Av	0.91 / 7.67 / 29.52 / 0.0	37.4	V / 1.20 / 177	-10.6
98.9 MHz	65.15 Pk	0.94 / 8.62 / 29.54 / 0.0	45.17	V / 1.00 / 0	-2.83*
88.1 MHz	59.76 Pk	0.91 / 7.67 / 29.52 / 0.0	38.82	V / 1.20 / 177	-9.18*

Tested by: R. M. Johnson

Printed

Signature

Reviewed by: Greg Jakubowski

Printed

Signature

RADIATED EMISSIONS



Test Report #: WC606379 Run 3 Test Area: LTS

EUT Model #: iHear Date: 3/22/2007

EUT Serial #: PROTOTYPE EUT Power: INTERNAL BATTERY Temperature: 20.0 °C

Test Method: FCC B Air Pressure: 98.0 kPa

Customer: LARCO Rel. Humidity: 27.0 %

EUT Description: FM TRANSMITTER FOR MP3 PLAYERS

Notes: CARRIER MODULATED WITH MUSIC FROM AN MP3 PLAYER (MP3 PLAYER AT MAX OUTPUT)

Data File Name: 6379.dat

Page: 4 of 5

Measurement summary for limit2: FCC-B <1GHz 3m (Qp)

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA2 FCC-B <1GHz 3m
197.8 MHz	58.4 Qp	1.35 / 11.04 / 29.56 / 0.0	41.23	V / 1.00 / 0	-2.27
176.186 MHz	54.45 Qp	1.27 / 9.86 / 29.53 / 0.0	36.06	V / 1.00 / 117	-7.44
215.788 MHz	50.95 Qp	1.41 / 10.97 / 29.59 / 0.0	33.74	V / 1.20 / 0	-9.76
616.512 MHz	29.6 Qp	2.52 / 19.65 / 30.17 / 0.0	21.6	V / 1.20 / 0	-24.4
431.588 MHz	29.9 Qp	2.04 / 16.47 / 29.93 / 0.0	18.48	V / 1.00 / 0	-27.52
528.586 MHz	27.95 Qp	2.22 / 17.96 / 30.09 / 0.0	18.04	V / 1.20 / 0	-27.96
494.5 MHz	27.2 Qp	2.13 / 17.79 / 30.04 / 0.0	17.08	V / 1.00 / 180	-28.92
440.486 MHz	28.1 Qp	2.05 / 16.66 / 29.95 / 0.0	16.86	V / 1.20 / 90	-29.14
323.688 MHz	30.45 Qp	1.82 / 14.08 / 29.76 / 0.0	16.58	V / 1.00 / 0	-29.42
395.6 MHz	28.05 Qp	2.0 / 15.72 / 29.88 / 0.0	15.89	V / 1.00 / 180	-30.11
264.286 MHz	31.65 Qp	1.52 / 12.36 / 29.67 / 0.0	15.87	V / 1.20 / 180	-30.13
352.386 MHz	27.25 Qp	1.92 / 14.9 / 29.81 / 0.0	14.26	V / 1.20 / 0	-31.74
296.7 MHz	28.4 Qp	1.69 / 13.3 / 29.72 / 0.0	13.67	V / 1.00 / 0	-32.33
98.9 MHz	65.15 Pk	0.94 / 8.62 / 29.54 / 0.0	45.17	V / 1.00 / 0	1.67*
88.1 MHz	59.76 Pk	0.91 / 7.67 / 29.52 / 0.0	38.82	V / 1.20 / 177	-4.68*

Tested by: R. M. Johnson

Printed

R. M. Johnson

Signature

Reviewed by: Greg Jakubowski

Printed

G. Jakubowski

Signature

RADIATED EMISSIONS



Test Report #: WC606379 Run 3 Test Area: LTS
EUT Model #: iHear Date: 3/22/2007
EUT Serial #: PROTOTYPE EUT Power: INTERNAL BATTERY Temperature: 20.0 °C
Test Method: FCC B Air Pressure: 98.0 kPa
Customer: LARCO Rel. Humidity: 27.0 %

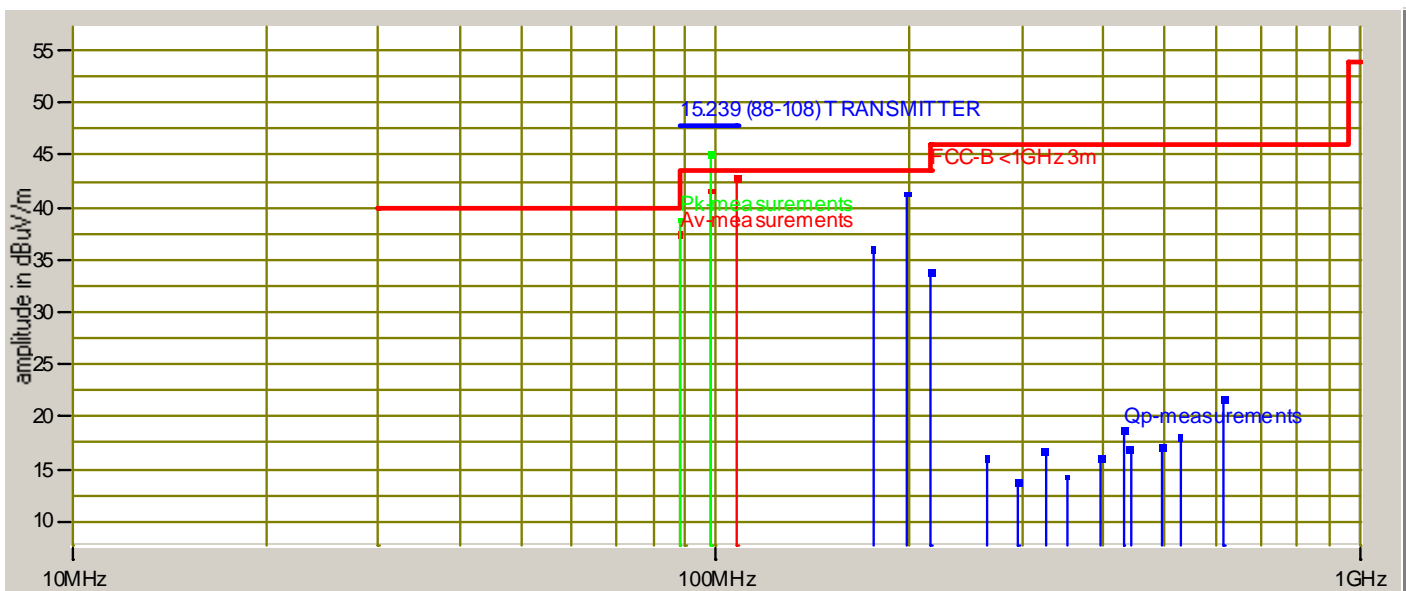
EUT Description: FM TRANSMITTER FOR MP3 PLAYERS

Notes: CARRIER MODULATED WITH MUSIC FROM AN MP3 PLAYER (MP3 PLAYER AT MAX OUTPUT)

Data File Name: 6379.dat

Page: 5 of 5

Graph:



Tested by: R. M. Johnson

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R. M. Johnson

Signature

Reviewed by: Greg Jakubowski

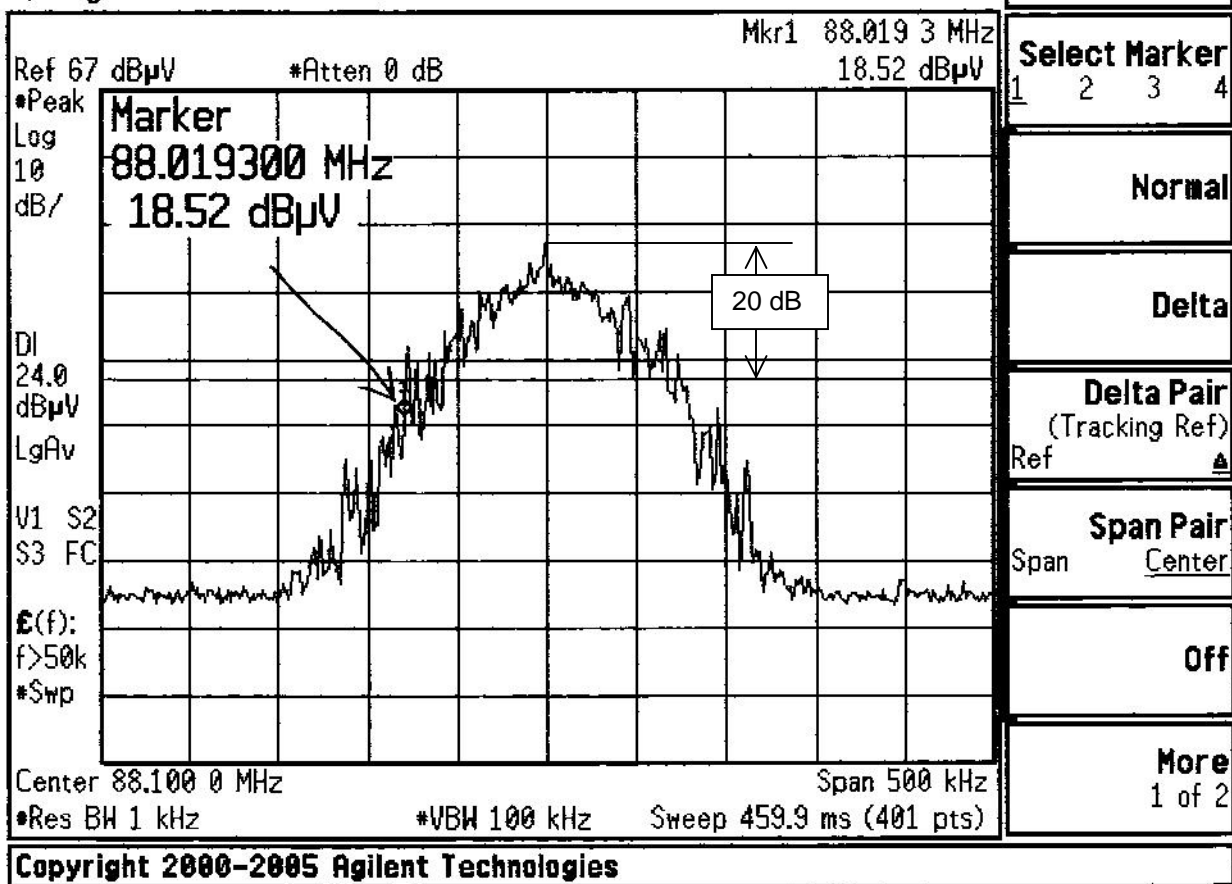
Printed

Greg Jakubowski

Signature

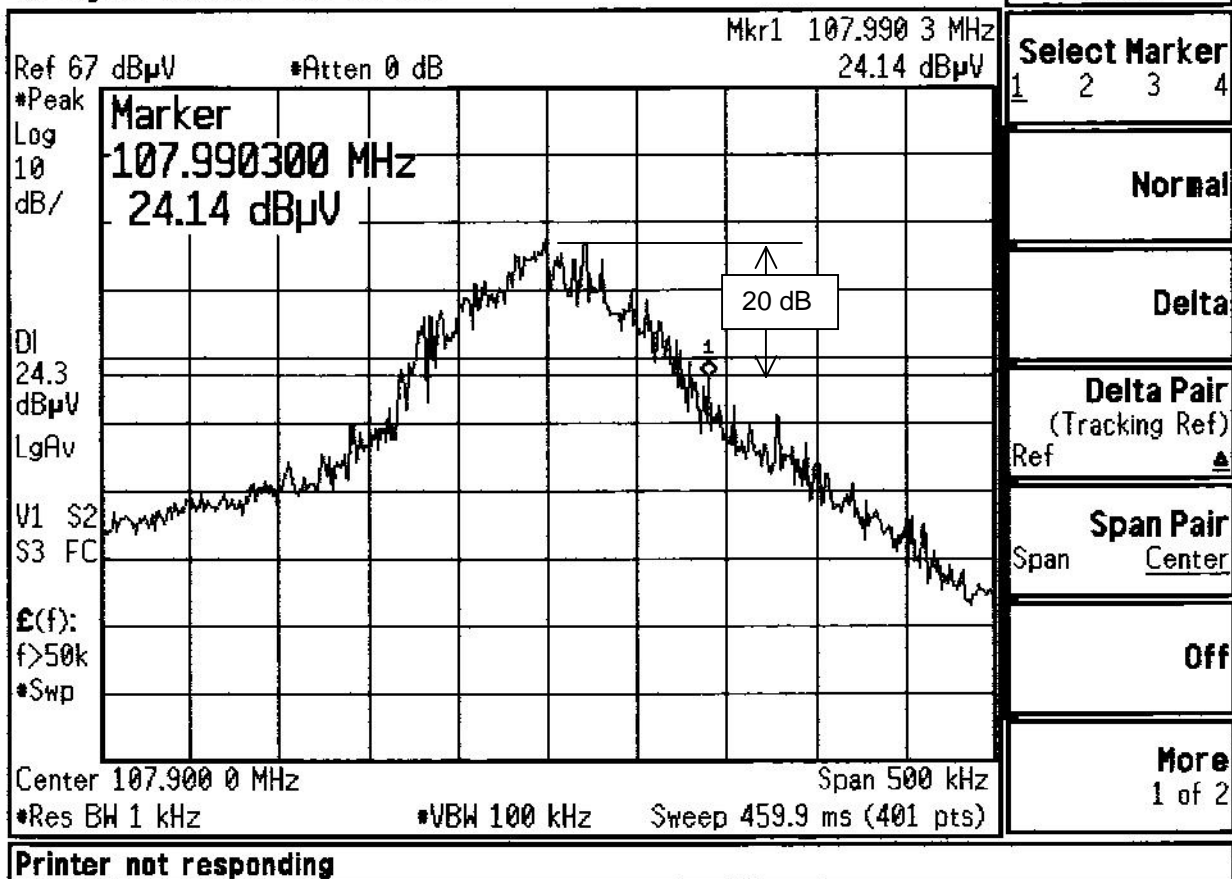
Band edge, low channel

Agilent 10:27:47 Mar 22, 2007



Band edge, high channel

Agilent 10:48:30 Mar 22, 2007

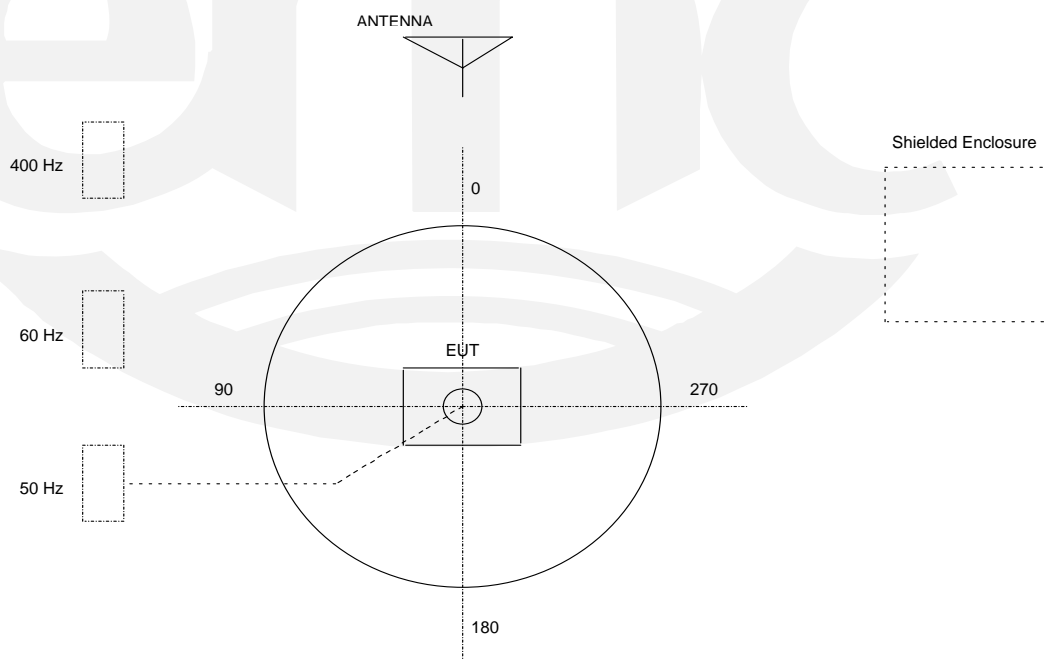


TEST SETUP FOR EMISSIONS TESTING

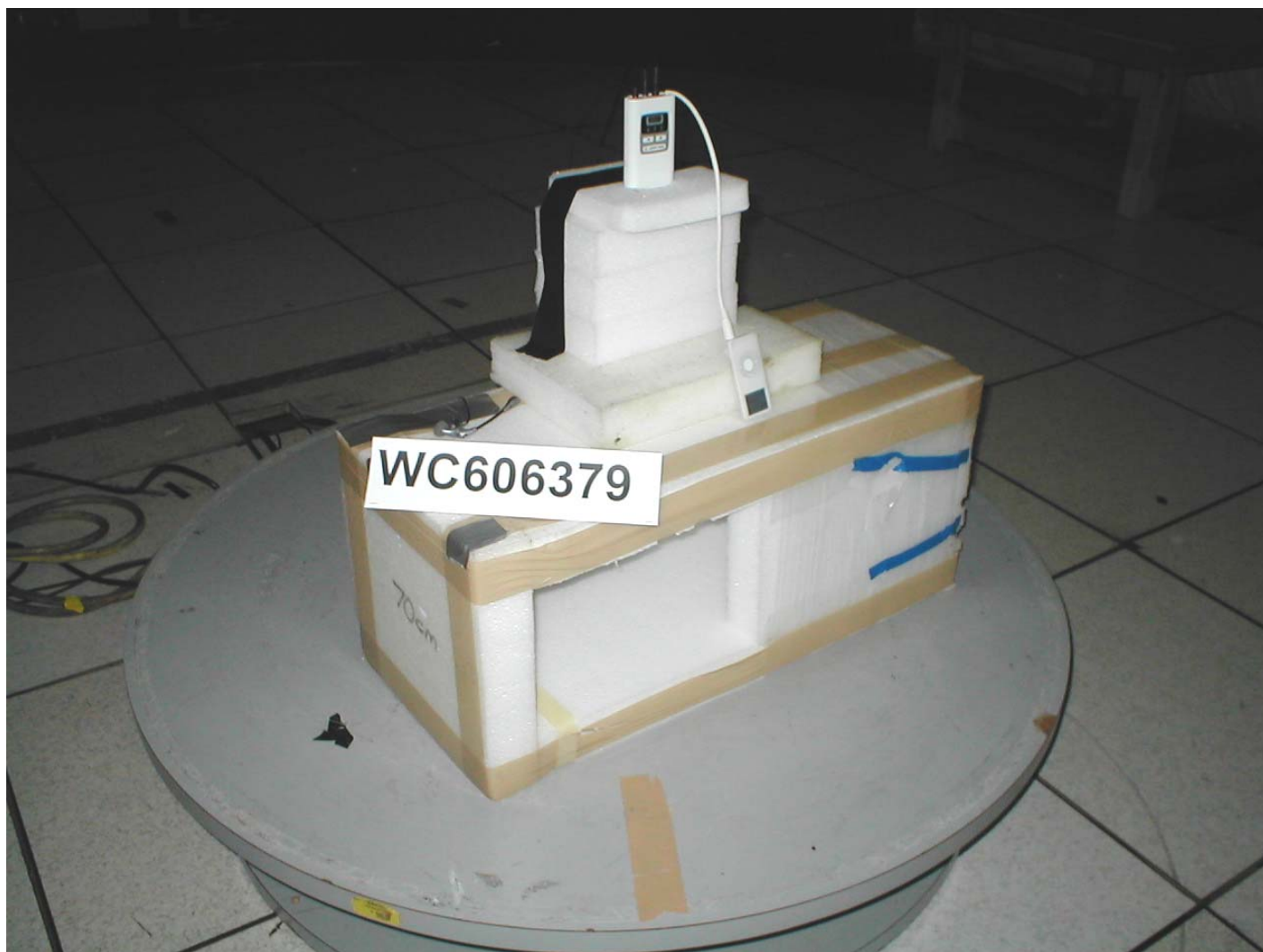
WILD RIVER LAB Large Test Site

Notes:

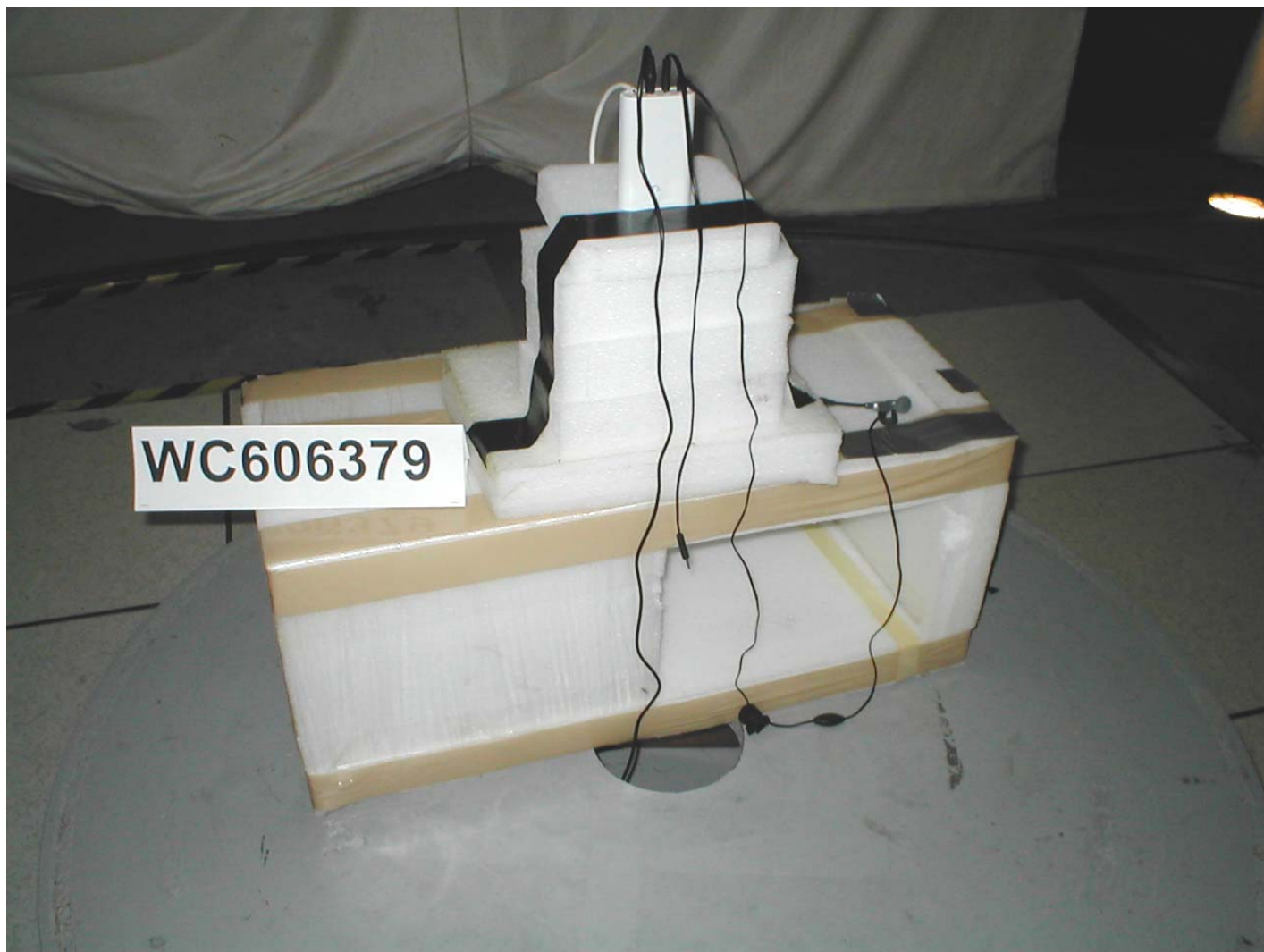
1. Items shown in dotted lines are located on the floor below the test area. It is 5 meters vertically from the ground floor to the test area.
2. 50 Hz, 60 Hz, and 400 Hz are power panels for alternating current.
3. The antenna may be positioned horizontally 3, 10 or 30 meters from the center of the turntable.
4. The circle is a 6.7 meter diameter turntable.
5. A ground plane is in the plane of this sheet.
6. The test sample is shown in the azimuthal position representing zero degrees.



Test-setup photo(s):
Radiated emissions test



Test-setup photo(s):
Radiated emissions test



Equipment Under Test (EUT) Test Operation Mode:

The device under test was operated under the following conditions during immunity testing :

- ☐ - Standby
- ☐ - Test program (H - Pattern)
- ☐ - Test program (color bar)
- ☐ - Test program (customer specific)
- ☐ - Practice operation
- ☐ - Normal mode with carrier signal only - no modulation by mp3 player or other device
- ☒ - Normal mode. Device input driven by music from an MP3 player set for maximum output. Device transmitter output level set to maximum.

Configuration of the device under test:

- ☒ - See Appendix A and test setup photo(s)
- ☐ - See Product Information Form(s) in Appendix B

DEVIATIONS FROM STANDARD:

None.

GENERAL REMARKS:

None

Modifications required to pass:

- ☐ None
- ☒ As indicated in Appendix A.

Test Specification Deviations: Additions to or Exclusions from:

- ☒ None
- ☐ As indicated in the Test Plan

SUMMARY:

The requirements according to the technical regulations are

- ☒ - met and the device under test does fulfill the general approval requirements.
- ☐ - **not** met and the device under test does **not** fulfill the general approval requirements..

EUT Received Date: 3 November 2006

Condition of EUT: Normal

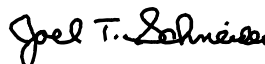
Testing Start Date: 3 November 2006

Testing End Date: 22 March 2007

TÜV SÜD AMERICA INC



Ross Johnson
Senior EMC Technician



Joel Schneider
Sr. EMC Engineer

Appendix A

Constructional Data Form
and
Block Diagram





EMC Test Plan and Constructional Data Form

PLEASE COMPLETE THIS DOCUMENT IN FULL, ENTERING N/A IF THE FIELD IS NOT APPLICABLE. IF TESTING RESULTS IN MODIFICATIONS TO THE EQUIPMENT, PLEASE SUBMIT A REVISED TP/CDF INDICATING THOSE MODIFICATIONS.
NOTE: This information will be input into your test report as shown below. Press the F1 key at any time to get HELP for the current field selected.

Company: Cool and Useful Products LLC
 Address: 640 West St.
Carlisle, MA 01741
 Contact: Steve Nelson Position: VP Sales
 Phone: 617-285-0170 Fax: 978-369-0121
 E-mail Address: sknorth@aol.com

General Equipment Description -- NOTE: This information will be input into your test report as shown below.

EUT Description mp3/cell phone/microphone FM transmitter
 EUT Name iHear
 Model No.: iHear Serial No.: _____
 Product Options: _____
 Configurations to be tested: cell patch cable, earbud/microphone/mp3 player attached

Equipment Modification (If applicable, indicate modifications since EUT was last tested. If modifications are made during this testing, submit revised TP/CDF after testing is complete.)

Modifications since last test: _____
 Modifications made during test: changed resistor value (R19 to 49.9 ohm) to reduce power output to below FCC limits. Changed resistor values (R59 & R62 to 4.7k ohm) to reduce the signal input levels, which in turn reduces the bandwidth below FCC limits.

Test Objective(s): Please indicate the tests to be performed, entering the applicable standard(s) where noted.

- | | |
|--|---|
| <input type="checkbox"/> EMC Directive 89/336/EEC (EMC)
Std: _____ | <input checked="" type="checkbox"/> FCC: Class <input type="checkbox"/> A <input type="checkbox"/> B Part <u>15</u> |
| <input type="checkbox"/> Machinery Directive 89/392/EEC (EMC)
Std: _____ | <input type="checkbox"/> VCCI: Class <input type="checkbox"/> A <input type="checkbox"/> B |
| <input type="checkbox"/> Medical Device Directive 93/42/EEC (EMC)
Std: _____ | <input type="checkbox"/> BSMI: Class <input type="checkbox"/> A <input type="checkbox"/> B |
| <input type="checkbox"/> Vehicle Directive 72/245/EEC (EMC)
Std: _____ | <input type="checkbox"/> Canada: Class <input type="checkbox"/> A <input type="checkbox"/> B |
| <input type="checkbox"/> FDA Reviewers Guidance for Premarket Notification Submissions (EMC) | <input type="checkbox"/> Australia: Class <input type="checkbox"/> A <input type="checkbox"/> B |
| | <input type="checkbox"/> Other: _____ |

Third Party Certification, if applicable (*Signature on Page 6 Required)

- | | |
|---|---|
| <input type="checkbox"/> Attestation of Conformity (AoC)* | <input type="checkbox"/> EMC Certification (used with Octagon Mark)* |
| <input type="checkbox"/> Certificate of Conformity (CoC)* | <input type="checkbox"/> Compliance Document* |
| Protection Class (N/A for vehicles) | <input type="checkbox"/> Class I <input type="checkbox"/> Class II <input type="checkbox"/> Class III |
- (Press F1 when field is selected to show additional information on Protection Class.)



EMC Test Plan and Constructional Data Form

America

- ☒ FCC / TCB Certification
☐ E-Mark Certification

- ☐ Industry Canada / FCB Certification
☐ Taiwan Certification

Attendance

Test will be: ☒ Attended by the customer ☐ Unattended by the customer

Failure - Complete this section if testing will not be attended by the customer.

If a failure occurs, TÜV America should:

- ☐ Call contact listed above, if not available then stop testing. (After hrs phone): _____
☐ Continue testing to complete test series.
☐ Continue testing to define corrective action.
☐ Stop testing.

EUT Specifications and Requirements

Length: 4.5" Width: 2.3" Height: 0.8" Weight: 12oz

Power Requirements

Regulations require testing to be performed at typical power ratings in the countries of intended use. (i.e., European power is typically 230 VAC 50 Hz or 400 VAC 50 Hz, single and three phase, respectively)

Voltage: 5VDC (If battery powered, make sure battery life is sufficient to complete testing.)

of Phases: _____

Current (Amps/phase(max)): 0.065 Current (Amps/phase(nominal)): 0.045

Other _____

Other Special Requirements

Typical Installation and/or Operating Environment

(ie. Hospital, Small Business, Industrial/Factory, etc.)
 home/automobile

EUT Power Cable

- ☐ Permanent OR ☐ Removable Length (in meters): 1
☐ Shielded OR ☐ Unshielded
☒ Not Applicable



EMC Test Plan and Constructional Data Form

EUT Interface Ports and Cables														
Type	Analog	Digital	During Test		Qty	Shielding		Termination	Connector Type	Port Termination	Length tested (in meters)	Removable	Permanent	
			Active	Passive		Yes	No							Type
EXAMPLE:														
RS232	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Foil over braid	Coaxial	Metallized 9-pin D-Sub	Characteristic Impedance	6	<input checked="" type="checkbox"/>	<input type="checkbox"/>
cell patch cable	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	braid		2.5mm stereo		0	<input checked="" type="checkbox"/>	<input type="checkbox"/>
audio/antenna cable	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	braid		3.5mm stereo			<input type="checkbox"/>	<input checked="" type="checkbox"/>
earbud/microp hone	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	braid		2.5mm stereo			<input checked="" type="checkbox"/>	<input type="checkbox"/>
12VDC power adaptor	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1	<input type="checkbox"/>	<input checked="" type="checkbox"/>			2.5mm			<input checked="" type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>

**EMC Test Plan and Constructional Data Form****EUT Software.**

Revision Level: Rev A

Description: Basic firmware to operate device

Equipment Under Test (EUT) Operating Modes to be Tested -- list the operating modes to be used during test. It is recommended the equipment be tested while operating in a typical operation mode. FCC testing of personal computers and/or peripherals requires that a simple program generate a complete line of upper case H's. Provide a general description of all software, firmware, and PLD algorithms used in the equipment. List all code modules as described above, with the revision level used during testing. Consult with your TÜV Product Service Representative if additional assistance is required.

1. normal mode with carrier signal modulated by mp3 player
- 2.
- 3.

Equipment Under Test (EUT) System Components -- List and describe all components which are part of the EUT. For FCC & Taiwan testing a minimum configuration is required. (ie. Mouse, Printer, Monitor, External Disk Drive, Motherboard, etc)

Description	Model #	Serial #	FCC ID #



EMC Test Plan and Constructional Data Form

Support Equipment -- List and describe all support equipment which is not part of the EUT. (i.e. peripherals, simulators, etc)
This information is required for FCC & Taiwan testing.

<i>Description</i>	<i>Model #</i>	<i>Serial #</i>	<i>FCC ID #</i>

Oscillator Frequencies

<i>Frequency</i>	<i>Derived Frequency</i>	<i>Component # / Location</i>	<i>Description of Use</i>
7.60MHz	88.1 to 107.9 MHz	Y1	transmitter chip crystal oscillator
1MHz		internal to microprocessor	drive microprocessor
70kHz		U4	DC to DC convertor

Power Supply

<i>Manufacturer</i>	<i>Model #</i>	<i>Serial #</i>	<i>Type</i>
			<input type="checkbox"/> Switched-mode: (Frequency) _____ <input type="checkbox"/> Linear <input type="checkbox"/> Other: _____
			<input type="checkbox"/> Switched-mode: (Frequency) _____ <input type="checkbox"/> Linear <input type="checkbox"/> Other: _____

Power Line Filters

<i>Manufacturer</i>	<i>Model #</i>	<i>Location in EUT</i>

**EMC Test Plan and Constructional Data Form****Critical EMI Components (Capacitors, ferrites, etc.)**

<i>Description</i>	<i>Manufacturer</i>	<i>Part # or Value</i>	<i>Qty</i>	<i>Component # / Location</i>

EMC Critical Detail -- Describe other EMC Design details used to reduce high frequency noise.

(PLEASE INSERT "ELECTRONIC SIGNATURE" BELOW IF POSSIBLE)

Authorization Signatures (Signature Required for Certifications checked on pg 1)

Customer authorization to perform tests
according to this test plan.

Steve K. Nelson

Test Plan/CDF Prepared By (please print)

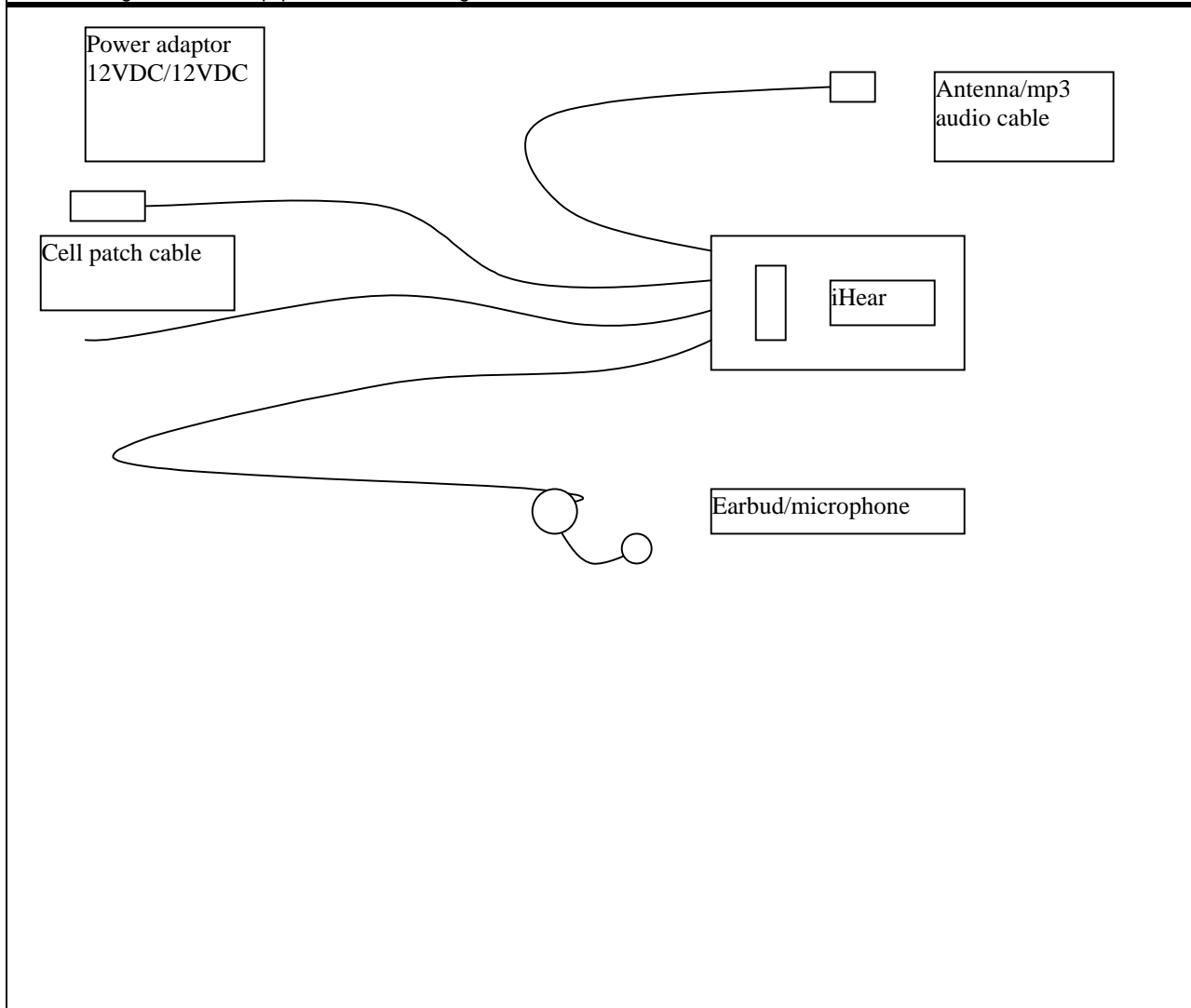
Date

Nov 3, 2006

Date

EMC Block Diagram Form

System Configuration Block Diagram -- Provide a line drawing identifying the EUT, simulators, support equipment, I/O cables, power cables, and any other pertinent components to be used during testing. Use a dashed line to separate the equipment in the testing field versus equipment outside testing field.



Authorization Signatures

Customer authorization to perform tests
according to this test plan.

Dan Pehrson

Test Plan/CDF Prepared By (please print)

Date

Nov 3, 2006

Date

Appendix B

Measurement Protocol



MEASUREMENT PROTOCOL

GENERAL INFORMATION

Test Methodology

Emissions testing is performed according to the procedures in ANSI C63.4-2003.

Measurement Uncertainty

The test system for conducted emissions is defined as the LISN, tuned receiver or spectrum analyzer, and coaxial cable. The test system has a measurement uncertainty of ± 1.8 dB. The test system for radiated emissions is defined as the antenna, the pre-amplifier, the spectrum analyzer and the coaxial cable. The test system has a measurement uncertainty of ± 4.8 dB. The equipment comprising the test systems is calibrated on an annual basis.

Justification

The Equipment Under Test (EUT) is configured in a typical user arrangement in accordance with the manufacturer's instructions. A cable is connected to each available port and either terminated with a peripheral into its characteristic impedance or left unterminated. When appropriate, the cables are manually manipulated with respect to each other to obtain maximum emissions from the unit.

Conducted Emissions

The final level, in dB μ V, equals the EMI receiver level plus the cable loss and LISN factor.

Radiated Emissions

The final level, in dB μ V/m, equals the reading from the spectrum analyzer (Level dB μ V), adding the antenna correction factor and cable loss factor (Factor dB) to it, and subtracting the preamp gain (and duty cycle correction factor, if applicable). This result then has the limit subtracted from it to provide the Delta, which gives the tabular data as shown in the data sheets in Attachment A. Transmitter fundamental signal measurements include rotation of the EUT through three orthogonal axes to determine the attitude that maximizes the emissions.

Example:

FREQ (MHz)	LEVEL (dB μ V)	CABLE/ANT/PREAMP			FINAL (dB μ V/m)	POL/HGT/AZ			DELTA1
		(dB)	(dB/m)	(dB)		(m)	(deg)		
60.80	42.5Qp +	1.2	+ 10.9	- 25.5 =	29.1	V	1.0	0.0	-10.9

Test Equipment

All measurement instrumentation is traceable to the National Institute of Standards and Technology and is calibrated according to internal procedure.