ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART C REQUIREMENT

OF

"9" TFT LCD OVERHEAD MONITOR WITH DVD PLAYER / USB PORT & SD / MMC

MODEL NO.: AVOHD900

BRAND NAME: N/A

FCC ID: UJZAVOHD900

REPORT NO: SZE06080310932R

ISSUE DATE: Aug. 29, 2006

Prepared for

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VERIFICATION OF COMPLIANCE

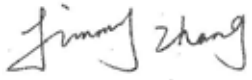
Applicant:	AVANA TECHNOLOGIES (M) SDN BHD LOT 12070-E JALAN USAHAJAYA, PERMATANG TINGGI, 14000 BUKIT MERTAJAM, PENANG, MALAYSIA
Manufacturer:	AVANA TECHNOLOGIES (M) SDN BHD LOT 12070-E JALAN USAHAJAYA, PERMATANG TINGGI, 14000 BUKIT MERTAJAM, PENANG, MALAYSIA
Product Description:	"9" TFT LCD OVERHEAD MONITOR WITH DVD PLAYER / USB PORT & SD / MMC
Brand Name:	N/A
Model Number:	AVOHD900
Serial Number:	N/A
File Number:	SZE06080310932R
Date of Test:	Aug. 16, 2006 ~ Aug. 24, 2006

We hereby certify that:

The EUT was assessed by Centre Testing International Co., Ltd. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4 (2003) and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15.239.

The test results of this report relate only to the tested sample identified in this report.

Approved By



Jimmy Zhang / Lab. Director
Centre Testing International (CTI)

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1. GENERAL INFORMATION

1.1 Product Description

The AVANA TECHNOLOGIES (M) SDN BHD, Model: AVOHD900 (referred to as the EUT in this report) The EUT is an short range, lower power, Audio FM Transmitter designed as an " Output Device". It is designed by way of utilizing the FM modulation achieves the system operating.

A major technical descriptions of EUT is described as following:

A). Operation Frequency: 88.1 MHz ~ 88.9 MHz
B). Modulation: FM
C). Antenna Designation: Integral
D). Power Supply: DC 12V POWER BY BATTERY

1.2 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: UJTAVOHD900 filing to comply with Section 15.239 of the FCC Part 15, Subpart C Rules.

1.3 Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 (2003). Radiated testing was performed at an antenna to EUT distance 3 meters.

1.4 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located on No. 6, Jinao industrial park, No.35 Jukeng Road, Dashuikeng Village, Guanlan Town, Baoan District, Shenzhen, China. The Open Area Test Sites and the Line Conducted labs are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 2003 and CISPR 22/EN 55022 requirements.

1.5 Special Accessories

Not available for this EUT intended for grant.

1.6 Equipment Modifications

Not available for this EUT intended for grant.

2. System Test Configuration

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT Exercise

The Transmitter was operated in the normal operating mode. the TX frequency was fixed which was for the purpose of the measurements.

2.3 Test Procedure

2.3.1 Conducted Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4-2001.Conducted emissions from the EUT measured in the **frequency range between 0.15 MHz and 30MHz** using **CISPR Quasi-Peak and average detector mode**.

2.3.2 Radiated Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission.

2.4 Limitation

(1) Conducted Emission

According to section 15.207(a) Conducted Emission Limits is as following.

Frequency range MHz	Limits dB(uV)	
	Quasi-peak	**Average**
0.15 to 0.50	**66 to 56**	**56 to 46**
0.50 to 5	**56**	**46**
5 to 30	**60**	**50**

Note
1.The lower limit shall apply at the transition frequencies
2.The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

(2) Radiated Emission

a. The field strength of any emission within this band (section 15.239 frequency between 88MHz –108MHz) shall not exceed 250 micro volts/meter at 3 meters. (47.96dBμV at 3m) The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in section 15.35 for limiting peak emissions apply.

b. The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in section 15.209(Intentional Radiators general limit).as below.

Frequency (MHz)	Field strength μV/m	Distance(m)	Field strength at 3m dBμV/m
1.705-30	30	30	69.54
30-88	100	3	40
88-216	150	3	43.5
216-960	200	3	46
Above 960	500	3	54

Remark: 1. Emission level in dBuV/m=20 log (uV/m)
2. Measurement was performed at an antenna to the closed point of EUT distance of meters.
3. Only spurious frequency is permitted to locate within the Restricted Bands specified in provision of ξ 15.205
4. Emission spurious frequency which appearing within the Restricted Bands specified in provision of ξ15.205, then the general radiated emission limits in ξ 15.209 apply.

2.5 Configuration of Tested System

Fig. 2-1 Configuration of Tested System Powered By Battery

Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/Type No.	FCC ID	Series No.	Note
E-1	"9" TFT LCD OVERHEAD MONITOR WITH DVD PLAYER / USB PORT & SD / MMC	N/A	AVOHD900	UJZAVOHD900	N/A	***EUT***

3. Summary Of Test Results

FCC Rules	Description Of Test	Result
§ 15.207	Conducted Emission	N/A
§ 15.239	Radiated Emission	Compliant
§ 15.239	26 dB Bandwidth	Compliant

4. Description of test modes

FM MODE:

1. The EUT (Wireless FM transmitter) has been tested under condition that powered either by battery or by adapter.
2. The EUT stay in continuous transmitting mode.

DVD MODE:

1. Connect the peripheric devices (TV, earphone).
2. Power on the EUT, play DVD disc.
3. Make sure the EUT work normally during test.

AV IN MODE:

Connect the DVD, play DVD disc so that signal be sent to the EUT.

AUX IN MODE:

Connect the audio signal generator, then send signal to the EUT.

SD/USB MODE:

Connect the SD card or USB device, press the control button to select SD or USB on the DVD mode.

5. Conducted Emissions Test (Not Applicable)

5.1 Measurement Procedure:

1. The EUT powered by adapter was placed on a table which is 0.8m above ground plane.

2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.

3. Repeat above procedures until all frequency measured were complete.

5.2 Test SET-UP (Block Diagram of Configuration)

N/A

5.3 Measurement Equipment Used:

Shielding Room No. 3 — Conduction Test Site					
Equipment Type	**Manufacturer**	**Model Number**	**Serial Number**	**Last Calibration**	**Calibration Due**
Spectrum Analyzer	Agilent	E4440A	N/A	06/29/2006	06/28/2007
LISN	ETS	3816	N/A	02/27/2006	02/26/2007

Note: *The measure uncertainty is less than +/-2.2318dB, which is evaluated as per the UKAS LAB34 and CISPR/A/291/CDV.*

The calibrations of the measuring instruments, including any accessories that may effect such calibration, are checked frequently to assure their accuracy. Adjustments are made and correction factors applied in accordance with instructions contained in the manual for the measuring instrument.

5.4 Measurement Result:

Conducted Emission Test Result													
Frequency	Reading Level (dBuV)			Factor	Emission Level (dBuV)			Limits		Margin		Result	Remarks
(MHz)	Peak	Q.P.	Avg.	dB	Peak	Q.P.	Avg.	Q.P.	Avg.	Q.P.	Avg.	(P/F)	(L/N)
													L
													L
													L
													L
													L
													L
													L
													N
													N
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Freq. = Emission frequency in MHz
Reading level = Uncorrected Analyzer/Receiver reading
Factor = Cable loss + LISN inserting loss
Emission level = Reading level + Factor
Limit = Limit stated in standard
Margin = Reading in reference to limit
"---" = The emission level complied with the Average limits, with at least 2 dB margin, so no further recheck.

5.5 Conducted Measurement Photos:

N/A

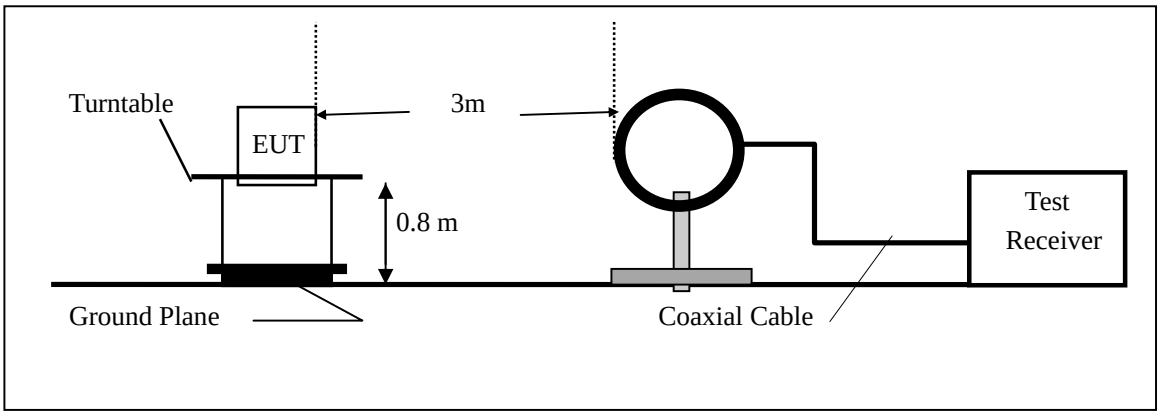
6. Radiated Emission Test

6.1 Measurement Procedure

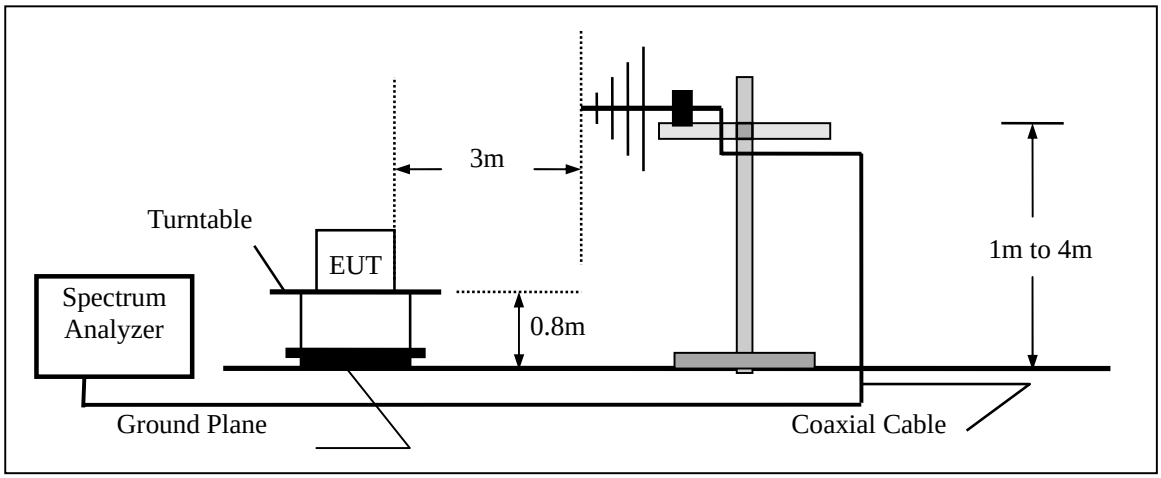
1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Maximum procedure was performed on at least twelve highest emissions to ensure EUT compliance.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequencies measured were completed.

6.2 Test SET-UP (Block Diagram of Configuration)

(A) Radiated Emission Test Set-Up, Frequency Below 30MHz



(B) Radiated Emission Test Set-Up, Frequency Below 1000MHz



6.3 Measurement Equipment Used:

Open Area Test Site # 3					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
Spectrum Analyzer	ADVANTEST	R3132	120901472	06/07/2006	06/06/2007
EMI Test Receiver	R&S	ESCI 30	N/A	06/07/2006	06/06/2007
Pre-Amplifier	HP	8447D	2944A07999	06/07/2006	06/06/2007
Bi-log Antenna	EMCO	3142	9910-1436	06/07/2006	06/06/2007

6.4 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CL - AG

Where	FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
	RA = Reading Amplitude	AG = Amplifier Gain
	AF = Antenna Factor	

6.5 Measurement Result

Operation Mode: FM MODE
Fundamental Frequency: FM88.5 MHz
Temperature : 26 ℃
Humidity : 60 %
Test Date : Aug. 23, 2006
Test By: Forrest
Pol: Ver & Hor

Judgement：Passed by -1.9 dB at 88.5 MHz Ant.Pol. Ver.

Radiated Emission Test Result													
Frequency	**Reading Level (dBuv)**			**Factor**	**Emission Level (dBuV/m)**			**Limits (dBuV/m)**			**Margin**	**Result**	**Remarks**
(MHz)	**Peak**	**Q.P.**	**Avg.**	**dB**	**Peak**	**Q.P.**	**Avg.**	**Peak**	**Q.P.**	**Avg.**	**QP(dB)**	**(P/F)**	**(H/V)**
67.1833	25.19	--	--	8.09	33.28	--	--	--	40	--	-6.72	P	H
88.5	36.27	--	--	9.79	46.06	--		--	48	--	-1.9	P	H
105.9833	21.55	--	--	10.03	31.58	--	--	--	43.5	--	-11.9	P	H
128.6167	23.76	--	--	9.07	32.83	--	--	--	43.5	--	-10.7	P	H
215.9167	25.42	--	--	12.72	38.14	--	--	--	43.5	--	-5.36	P	H
256.333	20.28	--		14.31	34.59	--			46		-11.4	P	H
67.1833	20.94	--	--	8.09	29.03	--	--	--	40	--	-11	P	V
88.5	29.39	--	--	9.79	39.18	--	--	--	48	--	-8.78	P	V
105.9833	22.1	--	--	10.03	32.13	--	--	--	43.5	--	-11.4	P	V
128.6167	29.23	--	--	9.07	38.3	--	--	--	43.5	--	-5.2	P	V
215.9167	19.35	--	--	12.72	32.07	--	--	--	43.5	--	-11.4	P	V
256.324	19.26	--	--	14.29	33.55	--	--	--	46	--	-12.5	P	V

Remark：

(1) Measuring frequencies from 25 MHz to the 1GHz。

(2) “F” denotes fundamental frequency; “H” denotes spurious frequency. “E” denotes band edge frequency.

(3) * denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.

(4) Datas of measurement within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

(5) The IF bandwidth of EMI Test Receiver between 30MHz to 1GHz was 120KHz.

Operation Mode: DVD Play Test Date : Aug. 24, 2006
Fundamental Frequency: FCC Class B 3M Radiation Test By: Forrest
Temperature : 26 ℃ Pol: Ver & Hor
Humidity : 60 %
Judgement：Passed by -0.88 dB at 215.9167 MHz Ant.Pol. Ver.

Radiated Emission Test Result

Frequency	Reading Level (dBuv)			Factor	Emission Level (dBuV/m)			Limits (dBuV/m)			Margin	Result	Remarks
(MHz)	Peak	Q.P.	Avg.	dB	Peak	Q.P.	Avg.	Peak	Q.P.	Avg.	QP(dB)	(P/F)	(H/V)
128.6167	26.42	--	--	9.07	35.49	--	--	--	43.5	--	-8.01	P	H
162.5667	25.2	--		11.26	36.46	--		--	43.5	--	-7.04	P	H
215.9167	30.25	29.9	--	12.72	42.97	42.62	--	--	43.5	--	-0.88	P	H
256.3333	22.08	--	--	14.31	36.39	--	--	--	46	--	-9.61	P	H
379.2	24.67	--	--	18.12	42.79	--	--	--	46	--	-3.21	P	H
513.3833	19.4	--	--	20.41	39.81	--	--	--	46	--	-6.19	P	H
128.6167	29.18	--	--	9.07	38.25	--	--	--	43.5	--	-5.25	P	V
215.9167	27.97	--	--	12.72	40.69		--	--	43.5	--	-2.81	P	V
257.95	20.16	--	--	14.35	34.51	--	--	--	46	--	-11.5	P	V
384.05	24.36	--	--	18.18	42.54	--	--	--	46	--	-3.46	P	V
513.3833	18.52	--	--	20.41	38.93	--	--	--	46	--	-7.07	P	V

Remark：

(1) Measuring frequencies from 25 MHz to the 1GHz。

(2) “F” denotes fundamental frequency; “H” denotes spurious frequency. “E” denotes band edge frequency.

(3) * denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.

(4) Datas of measurement within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

(5) The IF bandwidth of EMI Test Receiver between 30MHz to 1GHz was 120KHz.

7. Occupied Bandwidth

7.1 Measurement Procedure

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Set the EUT to FM mode, measurements have been performed according to two ways of audio Source, external audio input and internal DVD audio signal
3. For external audio input, 1KHz audio signal was sented to the input of L&R channels of EUT to achieve the 60% rated deviation, recording the level of the audio signal generator, then regulate the volume control of the EUT to make the audio output equal to 50% maximum output power. Increasing the level of the audio signal generator to 20 dB above the recorded level. Then the maximum bandwidth of the RF signal shall be measured. Then set SPA Center Frequency = Fundamental Frequency , RBW,VBW= 1KHz, Span =200KHz, Trace: Max Hold, Mark: Delta Mark
4. For Internal DVD aduio signal, the DVD Player shall paly a DVD disk as normal, adjust the volumn regulater to maximum the audio output Level, Then set SPA Center Frequency = Fundamental Frequency , RBW,VBW= 1KHz, Span =200KHz, Trace: Max Hold, Mark: Delta Mark

7.2 Test SET-UP (Block Diagram of Configuration)

Same as 6.2 Radiated Emission Measurement.

7.3 Measurement Equipment Used:

Same as 6.3 Radiated Emission Measurement.

7.4 Measurement Results:

Measurement Result of External Audio Source for the Middle Channel(88.5 MHz)

26 dB Bandwidth =140.2 KHz

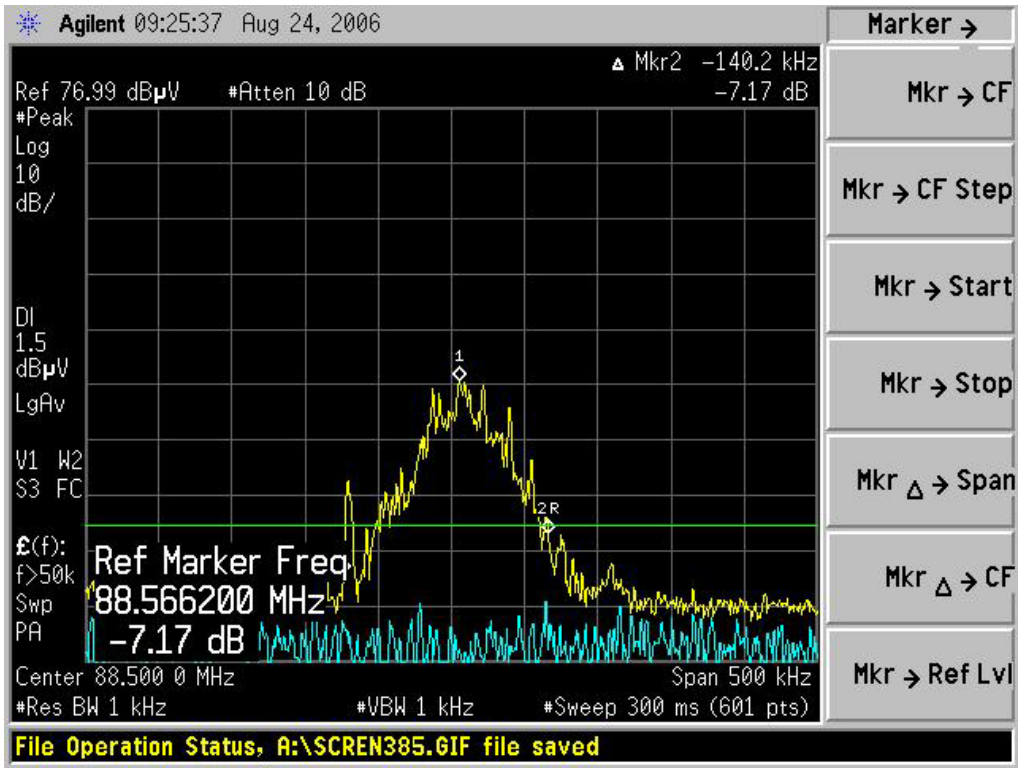
Measurement Result of External Audio Source for the Middle Channel(88.5 MHz)

26 dB Bandwidth =120.9 KHz

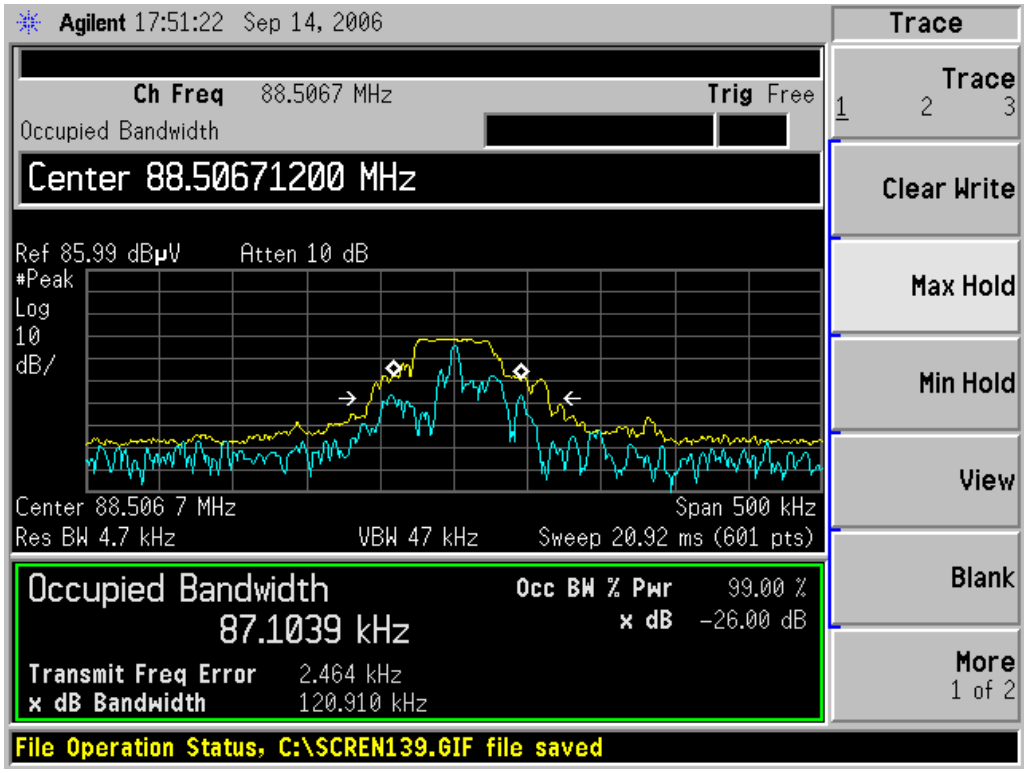
The bottom frequency covered by the 26 dB bandwidth is 88.0361 MHz
The top frequency covered y the 26 dB bandwidth is 88.9745 MHz.

Refer to attached data chart.

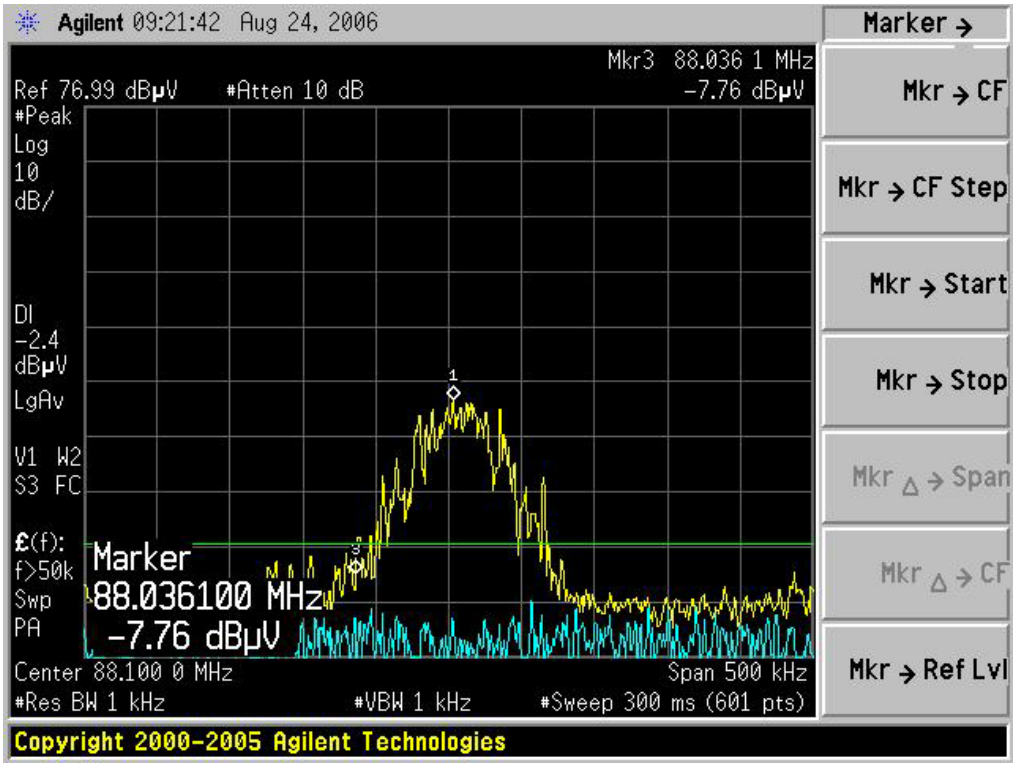
26dB Bandwidth Test Data for External Audio Source:

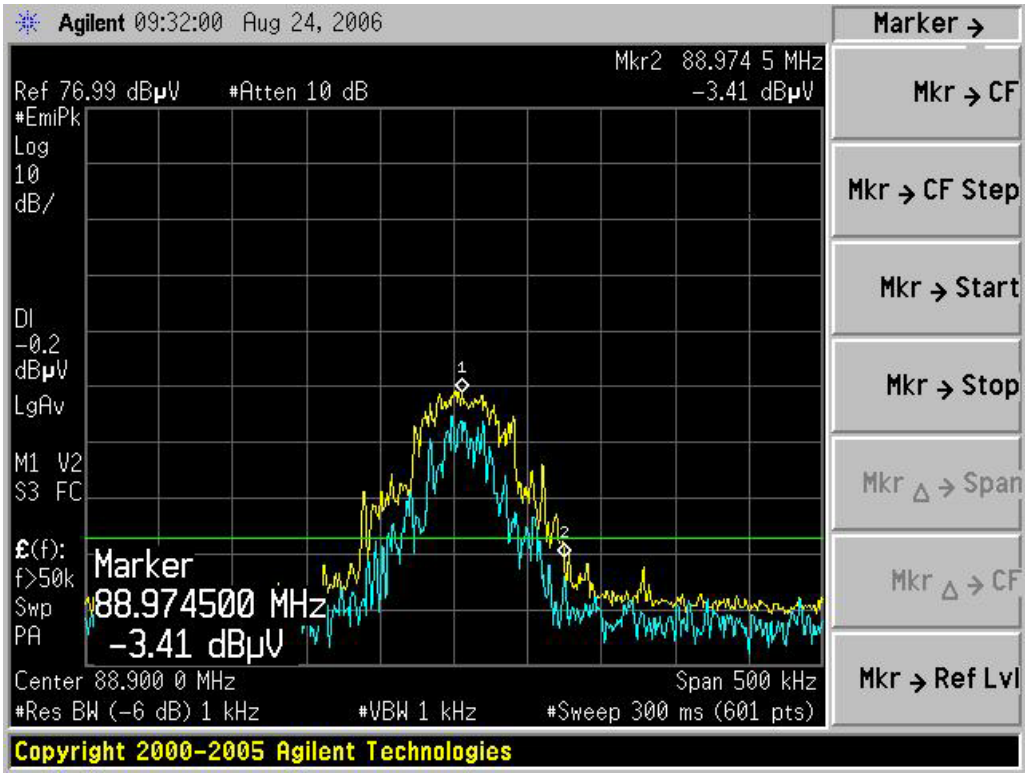


26dB Bandwidth Test Data for External Audio Source:



Frequency Range of Operation Frequency





APPENDIX 1

PHOTOGRAPHS OF SET UP

Radiated Emission Setup Photo

APPENDIX 2

PHOTOGRAPHS OF EUT

Top View of EUT-1

Top View of EUT-2

Front View of EUT

Back View of EUT

Bottom View of EUT

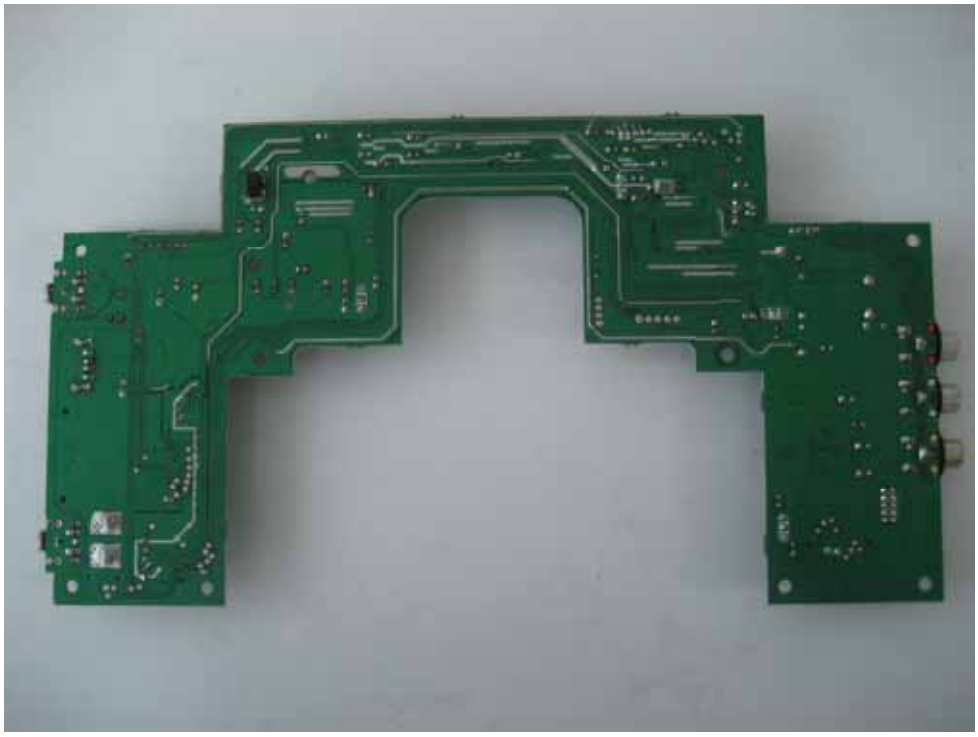
Left View of EUT

Right View of EUT

System View of EUT

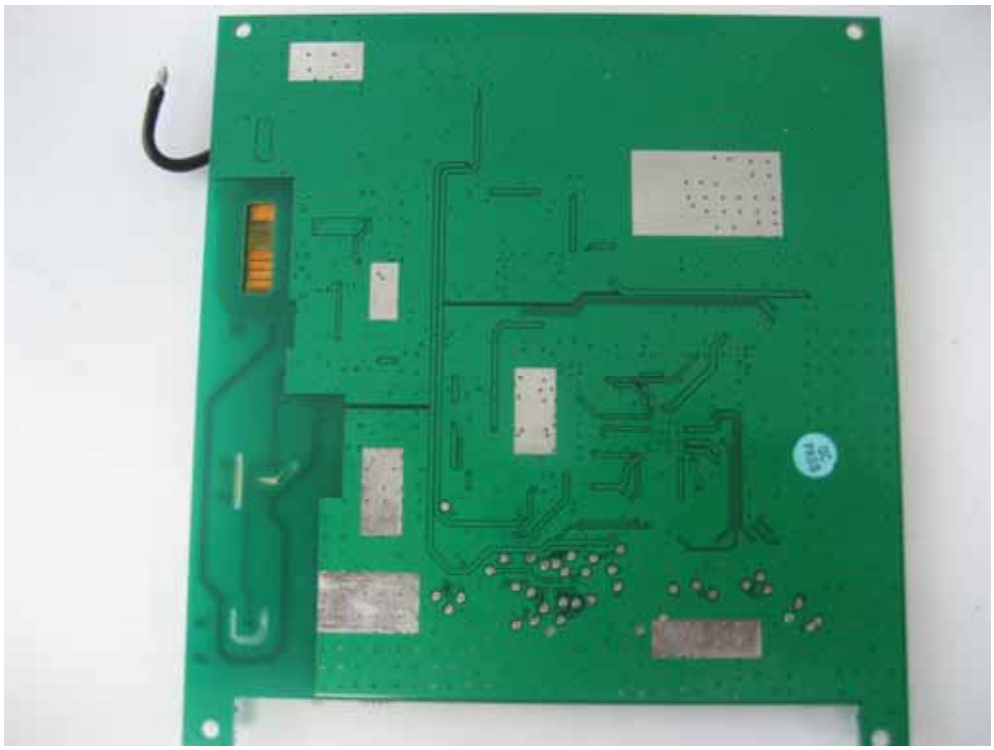
Decode Internal View of EUT-1

Decode Internal View of EUT-2

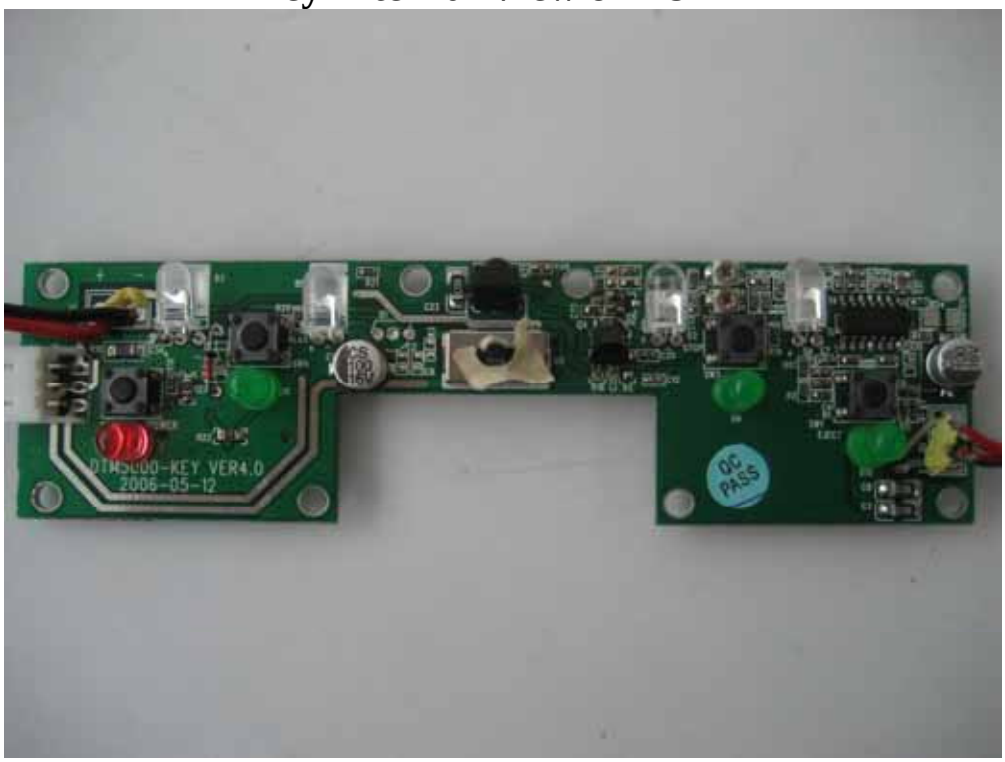


Monitor Internal View of EUT-1

Monitor Internal View of EUT-2



Key Internal View of EUT-1



Key Internal View of EUT-2