



Standard Technology Union Co., Ltd.

No.202, Building A, Jingye Sanjie, Yushu Industrial Park, Guangzhou Economic & Technology Development Zone, Guangzhou, Guangdong, China.

Telephone: +86 (0) 20 82019555
Fax: +86 (0) 20 82019556
Email: Marketing@stu-lab.com
Website: www.stu-lab.com

Report No.: STUEMO015062304148AV
Page: 1 of 36

TEST REPORT

Application No.: STUEMO015062304148AV
Applicant: Guangzhou Seer Audio Co., Ltd
Manufacturer: Guangzhou Seer Audio Co., Ltd
Factory: Guangzhou Seer Audio Co., Ltd

Equipment Under Test (EUT):

EUT Name: Amplifier
Trade Mark: Seer
Model No.: Refer to page 2~3

※ Please refer to section 2 of this report which indicates which model was actually tested and which models are electrically identical.

Standards: EN 55013: 2013
EN 55020: 2007+A11: 2011
EN 61000-3-2: 2014
EN 61000-3-3: 2013

Date of Receipt: 23 Feb 2012
Date of Test: 06 Mar 2012 to 09 Mar 2012
Date of Issue: 19 Apr 2012 (for original report: STUGZEMO120213966AV)
04 May 2015 (for new report)

Test Result :	PASS*
----------------------	--------------

* In the configuration tested, the EUT complied with the standards specified above.

The CE mark as shown below can be used, under the responsibility of the manufacturer, after completion of an EC Declaration of Conformity and compliance with all relevant EC Directives.



This report refers to the General Conditions for Inspection and Testing Services, printed overleaf.
This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product and does not permit the use of the STU PRODUCT CERTIFICATION MARK. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.
This report may only be reproduced and distributed in full. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of STU International Electrical Approvals or testing done by STU International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by STU International Electrical Approvals in writing.
All test results in this report can be traceable to National or International Standards.



2 Test Summary

Test	Test Requirement	Test Method	Class / Severity	Result
Conducted Emission, 150KHz to 30MHz	EN 55013: 203	EN 55013: 2013	Table 1	PASS
Disturbance Power, 30MHz to 300MHz	EN 55013: 203	EN 55013: 2013	Table 4	PASS
Harmonic Emission on AC, 50Hz	EN 61000-3-2: 2014	EN61000-3-2: 2014	Class A	PASS
Flicker Emission on AC	EN 61000-3-3: 2013	EN 61000-3-3: 2013	Clause 5 of EN 61000-3-3	PASS
ESD	EN 55020: 2007+A11:2011	EN 61000-4-2: 2009	Contact ± 4 kV Air ± 8 kV	PASS
Electrical Fast Transients (EFT) on AC	EN 55020: 2007+A11:2011	EN 61000-4-4: 2012	± 1.0 kV	PASS
Immunity for audio connectors, loudspeaker, headphone and power mains(S2a)	EN 55020: 2007+A11:2011	EN 55020: 2007+A11:2011	Table 9, 10, 11	PASS
Immunity to ambient electromagnetic fields (S3)	EN 55020: 2007+A11:2011	EN 55020: 2007+A11:2011	Table 16	PASS
Immunity to electromagnetic fields Keyed Carrier(S5)	EN 55020: 2007+A11:2011	EN 55020: 2007+A11:2011	Table 15	PASS



The models detail information please see below:

FA-8001	FA-601	FA-1201	FA-2401	FA-4801	FA-5001
MA-600	MA-1200	MA-2400	MA-3600	MA-5000	AMP-1200
AMP-1500	AMP-2000	DS-800	DS-1000	DS-1200	MH6.0
MH6.2	MH6.4	DSP-300	DSP-400	DSP-500	QA-400
QA-800	QA-1200	QA-1600	Q-0.6	Q-0.8	Q-1.2
Q-1.6	Q-2.0	Q-3800	Q-6000	Q-8000	Q-10000
D-500	D-700	D-900	D-1100	PA-350	PA-450
PA-650	PA-900	PA-1100	PV 1000	SK-200	SK-300
SK-500	SH-8150KA	SH-8200KA	SH-8330KA	GH1000	GH2000
GH3000	GH4000	GH5000	DK-902	DK-903	DK-905
SK-200	SK-300	SK-600	AK-2501	AK-3501	AK-5001
PDA-3500	PDA-4500	PDA-5500	PDA-6500	PDA-7500	PRO-5300
PRO-7300	PRO-8300	PRO-9300	MT-4	MT-6	MT-4A
MT-8A	MT-12A	S-6DII	S-8DII	PC204D	PC206D
PC408D	D-500	D-700	D-900	D-1100	D-1300
Q-400	Q-600	Q-800	Q-1000	CM-300	CM-400
CM-500	PLM8.0	PLM8.2	PLM8.4	CA6	CA8
CA12	CA16	CA18	CD1500	CD2000	CD3000
GX602	GX1202	GX2402	GX4802	GX5002	GX8002
GX608	GX609	SK-902	SK-903	SK-905	E-4
E-6	E-8	E-10	E-12	E-16	E-20
E-24	E-32	Live16	Live24	Live32	Live48
Live12	PM-12	PM-16	PM-12D	PM-16D	MSC1400D
MSC2000 D	MSC3000D	MSC3200D	MSC4000	MSC6000	MSC8000
MSC10000	WS2000	WS4000	WS8000	S-6	S-8
S-6D	S-8D	PC-36A	PC-36B	DX-24	DX-26
DX-48	DP-36	DP-48	DS204P	DS206P	DS408P
DSP224	DSP226	DSP448	SA-212	SA-822	SA-231
SA-131	SA-215	SA-266	SA-866	SA-2124	SA-223
SA-234	DC1024	DC1026	DC1048	DSP8-4	DSP12-4
DSP-16-4	DSP20-4	DSP-600A	DSP-1200A	MX-1604A	MX-2004A
MT-8	MT-12	MG-4	MG-6	MG-8	MG-12
MG-16	MG-20	MG-24	MG8-4	MG12-4	MG16-4
MG20-4	MG24-4	MG8-4A	MG12-4A	MG16-4A	MG20-4A
MG24-4A	SFE-862	EQ-131	EQ-231	EQ-215	SC-223
SC-234	PR-108	PR-208	SR-212	SD-866	EX-822
DSP2124	FCS131	FCS231	FCS215	SA-212	EX-228
SR-2231	SR-2131	SR-2215	SR-266	SR-866	SR-223
SR-234	DSP-2126	Xover2	Xover3	EQ-131A	EQ-231A
EQ-215A	GHA1.0	GHA1.2	GHA1.8	GHA2.4	GHA3.0
RV2000	SD-15	SD-18	SD-218	DP-24	DP-26



H-35	H-45	H-65	H-75	H-95	HD-power4
HD-power6	HD-power10	USB-V4	USB-V6	USB-V8	U-800
U-800S	U-400	U-400S	V1100	V1200	S100
S200	PS	BF	TS	R2	PSIII
RV-1000	MT-16	MT-6A	MT-16A	---	---

As declaration from the applicant the electrical circuit design, layout, components used and internal wiring were identical with the only difference being their outer, model number, external view, so model **FA-8001** was main tested.

This report STUEMO015062304148AV was an additional report based on the original report STUGZEMO120213966AV.
The updated information as below:

original test standard	updated test standard
EN 55013: 2001+A1: 2003+A2: 2006 EN 55020: 2007 EN 61000-3-2: 2006+A1: 2009+ A2: 2009 EN 61000-3-3: 2008	EN 55013: 2013 EN 55020: 2007+A11: 2011 EN 61000-3-2: 2014 EN 61000-3-3: 2013
Remark: No test item need to increase or decrease in this new report, all can date back to original report.	



3 Contents

	Page
1 COVER PAGE	1
2 TEST SUMMARY	2
3 CONTENTS	5
4 GENERAL INFORMATION	7
4.1 CLIENT INFORMATION	7
4.2 GENERAL DESCRIPTION OF E.U.T.....	7
4.3 DETAILS OF E.U.T.....	7
4.4 DESCRIPTION OF SUPPORT UNITS	7
4.5 TEST COMPANY	7
4.6 DEVIATION FROM STANDARDS	7
4.7 ABNORMALITIES FROM STANDARD CONDITIONS.....	7
4.8 MONITORING OF EUT FOR ALL IMMUNITY TEST.....	7
5 EQUIPMENT USED DURING TEST	8
5.1 CONDUCTED EMISSIONS MAINS TERMINALS, 150kHz TO 30MHz.....	9
5.1.1 <i>E.U.T. Operation</i>	9
5.1.2 <i>Plan View of Test Setup</i>	9
5.1.3 <i>Measurement Data</i>	9
5.2 DISTURBANCE POWER: 30MHz TO 300MHz.....	12
5.2.1 <i>E.U.T. Operation</i>	12
5.2.2 <i>Test Setup</i>	12
5.2.3 <i>Measurement Data</i>	13
5.3 HARMONICS TEST RESULTS.....	14
5.3.1 <i>E.U.T. Operation</i>	14
5.4 FLICKER TEST RESULTS.....	16
5.4.1 <i>E.U.T. Operation</i>	16
5.4.2 <i>Measurement Data</i>	16
6 IMMUNITY TEST RESULTS	17
6.1 PERFORMANCE CRITERIA DESCRIPTION IN CLAUSE 6 OF EN 55020	17
6.2 ESD.....	18
6.2.1 <i>E.U.T. Operation</i>	18
6.2.2 <i>Test Results</i>	18
6.3 ELECTRICAL FAST TRANSIENTS (EFT)	19
6.3.1 <i>E.U.T. Operation</i>	19
6.3.2 <i>Test Results On AC Supply</i>	19
6.4 IMMUNITY TO RF VOLTAGE OF MAINS, LOUDSPEAKER, HEADPHONE AND AUDIO CONNECTERS (S2A).....	20
6.4.1 <i>E.U.T. Operation</i>	20
6.4.2 <i>Test Setup</i>	21
6.4.3 <i>Test Results</i>	22
6.5 IMMUNITY TO AMBIENT ELECTROMAGNETIC FIELDS (S3)	26
6.5.1 <i>E.U.T. Operation</i>	26
6.5.2 <i>Test Results</i>	27
6.6 IMMUNITY TO ELECTROMAGNETIC FIELDS KEYED CARRIER (S5)	28
6.6.1 <i>E.U.T. Operation</i>	28
7 PHOTOGRAPHS	30
7.1 CONDUCTED EMISSION TEST SETUP	30
7.2 DISTURBANCE POWER TEST SETUP	30



7.3	HARMONIC & FLICKERS TEST SETUP.....	31
7.4	EUT CONSTRUCTIONAL DETAILS.....	31



4 General Information

4.1 Client Information

Applicant:	Guangzhou Seer Audio Co., Ltd
Address of Applicant:	No. 25 th , Second Street, Minying Industrial Part, Fulong Road, Shawan, Panyu Area, Guangzhou City, China
Manufacture:	Guangzhou Seer Audio Co., Ltd
Address of Manufacture:	No. 25 th , Second Street, Minying Industrial Part, Fulong Road, Shawan, Panyu Area, Guangzhou City, China
Factory:	Guangzhou Seer Audio Co., Ltd
Address of Factory:	No. 25 th , Second Street, Minying Industrial Part, Fulong Road, Shawan, Panyu Area, Guangzhou City, China

4.2 General Description of E.U.T.

EUT Name:	Amplifier
Model No.:	Refer to page 2~3
Trade Mark:	Seer

4.3 Details of E.U.T.

Power Supply:	230 V~, 50 Hz, Max:1800W
Power Cable:	3 wires unscreened AC mains cable

4.4 Description of Support Units

The EUT has been tested as an independent unit.

4.5 Test Company

All tests were performed at:

The test was performed by Standard Technology Union Co., Ltd.,

No.202, Building A, Jingye Sanjie, Yushu Industrial Park, Guangzhou Economic & Technology Development Zone, Guangzhou, Guangdong, China.

Tel: +86 20 82019555 Fax: +86 20 82019556 Email: marketing@stu-lab.com

No tests were sub-contracted.

4.6 Deviation from Standards

Monitor audio signal output with headphone when test at headphone port.

4.7 Abnormalities from Standard Conditions

N/A

4.8 Monitoring of EUT for All Immunity Test

Audio: Audio analyser and speaker

Visual: Monitor the LED of EUT.

5 Equipment Used during Test

Test Equipment	Manufacturer	Description	Cal.Date	Cal.Due date
EMI TEST Receiver	R/S	9KHz-3GHz	2011-6-15	2012-6-14
Power meter	BOOTON	0~18GHz	2011-6-9	2012-6-8
RF Amplifier	PRANA R&D	140W 10KHz-1GHz	2011-6-17	2012-6-16
RF Amplifier	PRANA R&D	50W 0.8-3GHz	2011-6-17	2012-6-16
CND	Liithi	150KHz-230MHz	2011-7-3	2012-7-2
CDN	Liithi	150KHz-230MHz	2011-7-3	2012-7-2
LISN	SCHWARZBECK	9KHz-30MHz	2011-7-3	2012-7-2
LISN	SCHWARZBECK	9KHz-30MHz	2011-7-3	2012-7-2
probe	Radcentre	DC~6GHz	2011-5-26	2012-5-25
filter	Telonic	30MHz~65MHz	2011-7-3	2012-7-2
filter	Telonic	65MHz~125MHz	2011-7-3	2012-7-2
filter	Telonic	125MHz~250MHz	2011-7-3	2012-7-2
filter	Telonic	250MHz~500MHz	2011-7-3	2012-7-2
filter	Telonic	500MHz~1GHz	2011-7-3	2012-7-2
filter	Telonic	1GHz~2.2GHz	2011-7-3	2012-7-2
filter	Telonic	2.2GHz~3.1GHz	2011-7-3	2012-7-2
V-dip Tester	EMC Partner	0%~100%U	2011-7-3	2012-7-2
SURGE Tester	EMC Partner	-4.1V~+4.1V	2011-7-3	2012-7-2
EFT TESTER	EMC Partner	-4.4kV~+4.4kV	2011-7-3	2012-7-2
EFT COUPER	EMC Partner	-4.4kV~+4.4kV	2011-6-14	2012-6-13
ESD Gun	EMC Partner	-30kV~+30kV	2011-6-17	2012-6-16
ESD Discharger module	EMC Partner	-30kV~+30kV	2011-6-17	2012-6-16
Power amplifier	BRYSTON	25Hz~150kHz	2011-6-17	2012-6-16
chamber	ETS	DC~18GHz	2011-4-11	2012-4-10
antenna	SCHWARZBECK	9kHz~30MHz	2011-6-20	2012-6-19
antenna	SCHWARZBECK	450MHz~6GHz	2011-6-4	2012-6-3
antenna	SCHWARZBECK	65MHz~3GHz	2011-6-17	2012-6-16
antenna	SCHWARZBECK	9kHz~30MHz	2011-7-4	2012-7-3
antenna	ETS	1GHz~18GHz	2011-7-4	2012-7-3
antenna	ETS	26MHz~3GHz	2011-7-4	2012-7-3

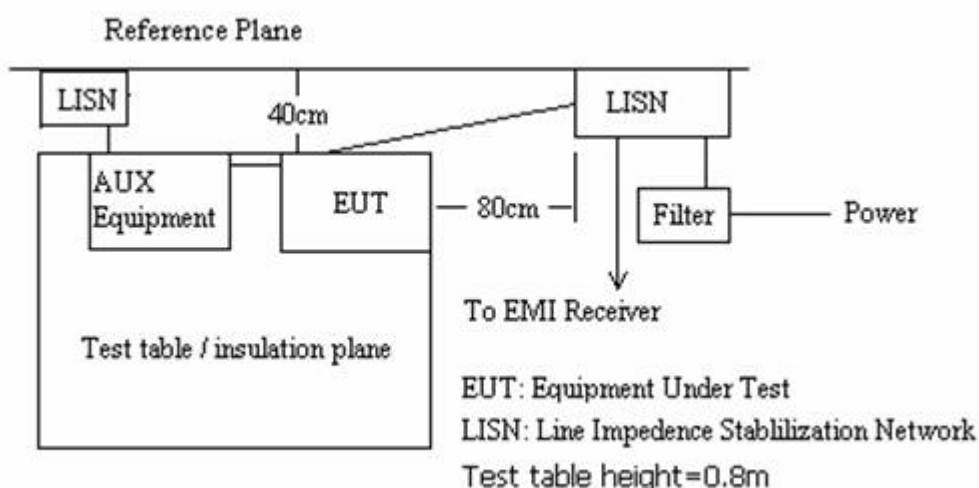
5.1 Conducted Emissions Mains Terminals, 150kHz to 30MHz

Test Requirement: EN 55013
 Test Method: EN 55013
 Test Date: 06 Mar 2012
 Frequency Range: 150KHz to 30MHz
 Class / Severity: Table 1
 Detector: Peak for pre-scan
 Quasi-Peak if maximised peak within 6dB of Quasi-Peak limit

5.1.1 E.U.T. Operation

Operating Environment:
 Temperature: 22.0 °C Humidity: 52% RH Atmospheric Pressure: 1008 mbar
 EUT Operation: Test in AUX in mode.

5.1.2 Plan View of Test Setup



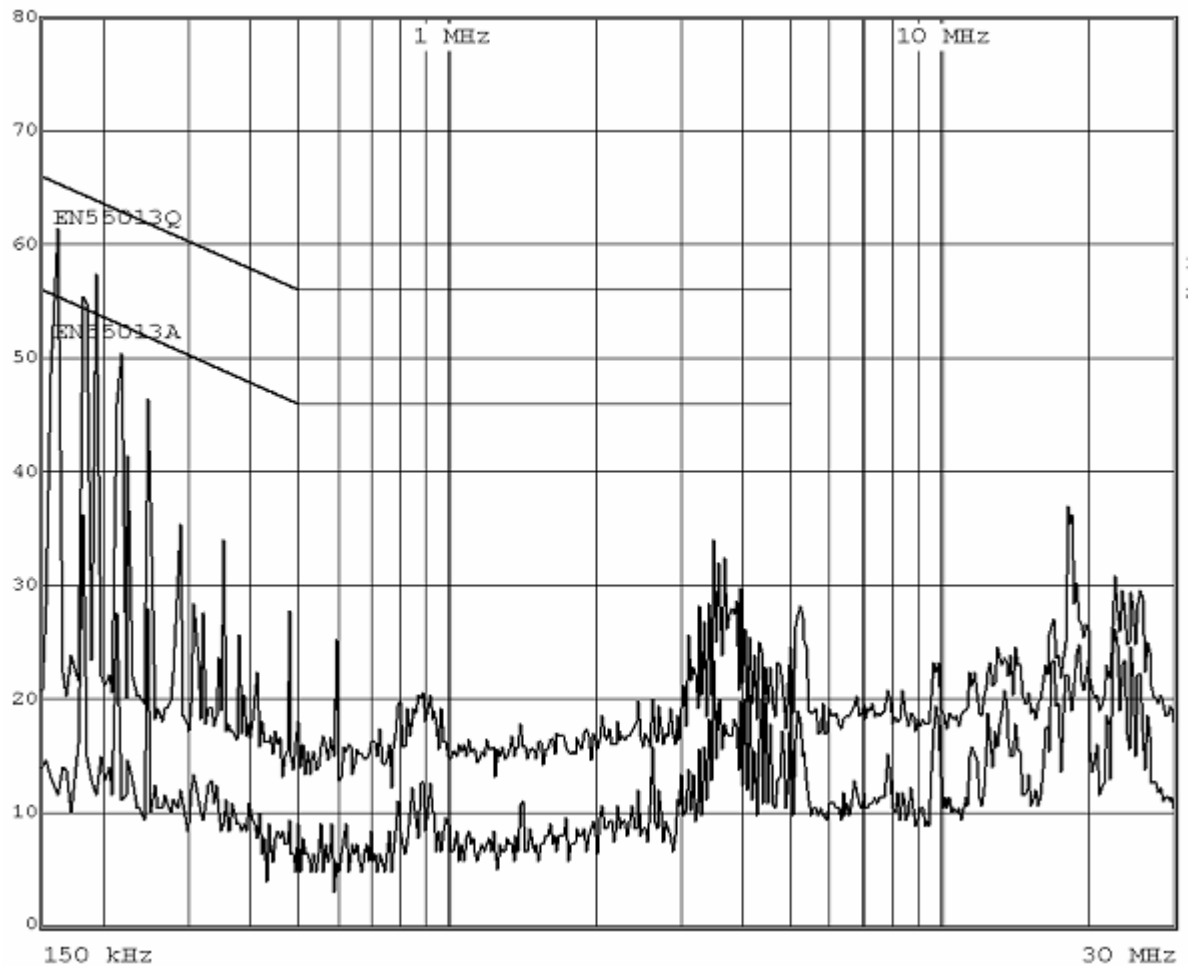
5.1.3 Measurement Data

An initial pre-scan was performed on the live and neutral lines with peak detector. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected. The following Quasi-Peak and Average measurements were performed on the EUT on 06 Mar, 2012.

Live Line:

Peak Scan:

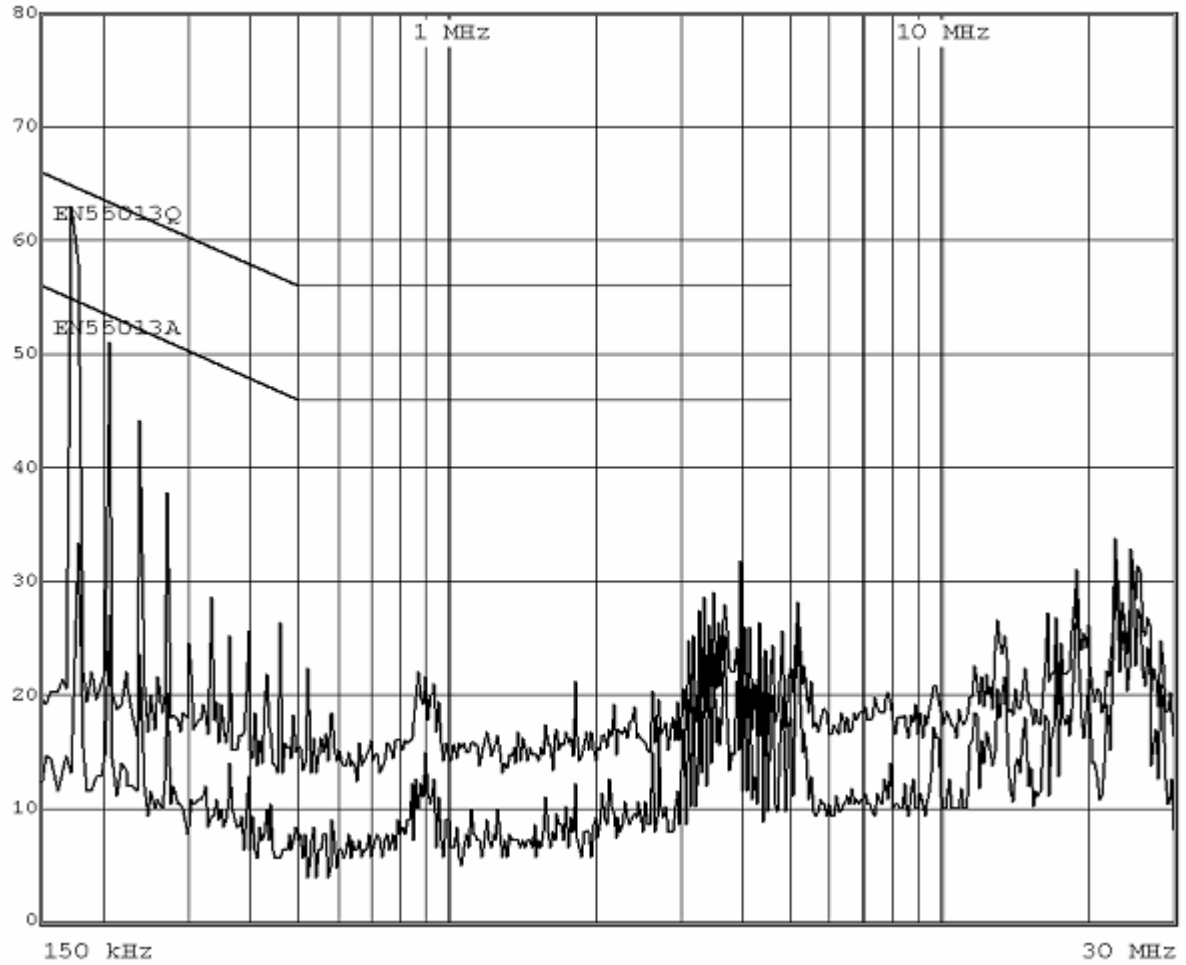
Level (dBµV)



Quasi-peak and Average measurement:

Trace1: EN55013Q		Trace2: EN55013A	
Trace3: ---		Trace4: ---	
TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
1 Quasi Peak	162.0000 kHz	54.30 L1 gnd	-11.05
1 Quasi Peak	182.0000 kHz	49.30 L1 gnd	-15.09
1 Quasi Peak	194.0000 kHz	46.31 L1 gnd	-17.54

Neutral Line:
 Peak Scan:
 Level (dB μ V)



Quasi-peak and Average measurement:

TRACE		FREQUENCY	LEVEL dB μ V		DELTA LIMIT dB
Trace1: EN55013Q		Trace2: EN55013A			
Trace3: ---		Trace4: ---			
1	Quasi Peak	174.0000 kHz	50.15	N gnd	-14.61
1	Quasi Peak	206.0000 kHz	43.33	N gnd	-20.03
1	Quasi Peak	238.0000 kHz	38.28	N gnd	-23.87
2	Average	3.9820 MHz	22.54	N gnd	-23.45
2	Average	22.8500 MHz	28.92	N gnd	-21.07
2	Average	24.6820 MHz	28.99	N gnd	-21.01

5.2 Disturbance Power: 30MHz to 300MHz

Test Requirement:	EN 55013
Test Method:	EN 55013
Test Date:	06 Mar 2012
Frequency Range:	30MHz to 300MHz
Class / Severity:	Table 4
Detector:	Peak for pre-scan Quasi-Peak & Average if pre-scan peak within 15dB of average limit.

5.2.1 E.U.T. Operation

Operating Environment:

Temperature: 21.0 °C Humidity: 52% RH Atmospheric Pressure: 1008 mbar

EUT Operation: Test EUT in AUX in mode.

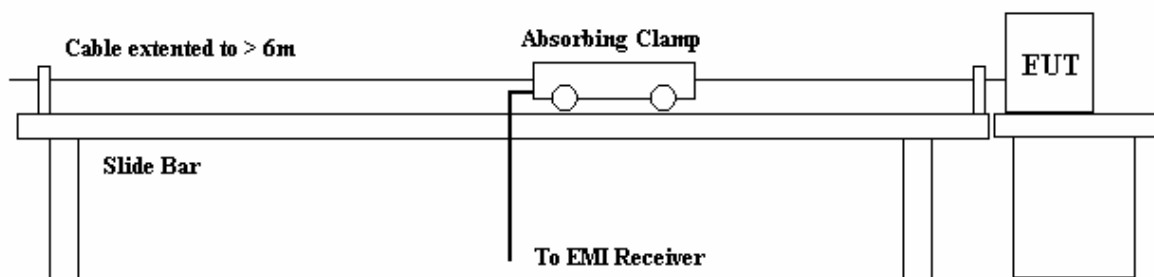
If any maximised peak emissions are detected within 15dB of the average limit line, then:

Perform Quasi-Peak and Average (if Quasi-Peak is within 15dB of Average Limit) measurement with the clamp next to the EUT (i.e. zero position). If both Quasi-Peak and Average measurement are greater than 15dB below the respective limit, then the test is terminated.

If either the Quasi-Peak and Average measurement are within 15dB of the respective limit, then extend the lead to 6m length.

Maximised all Quasi-Peak and Average measurement by moving clamp along cable.

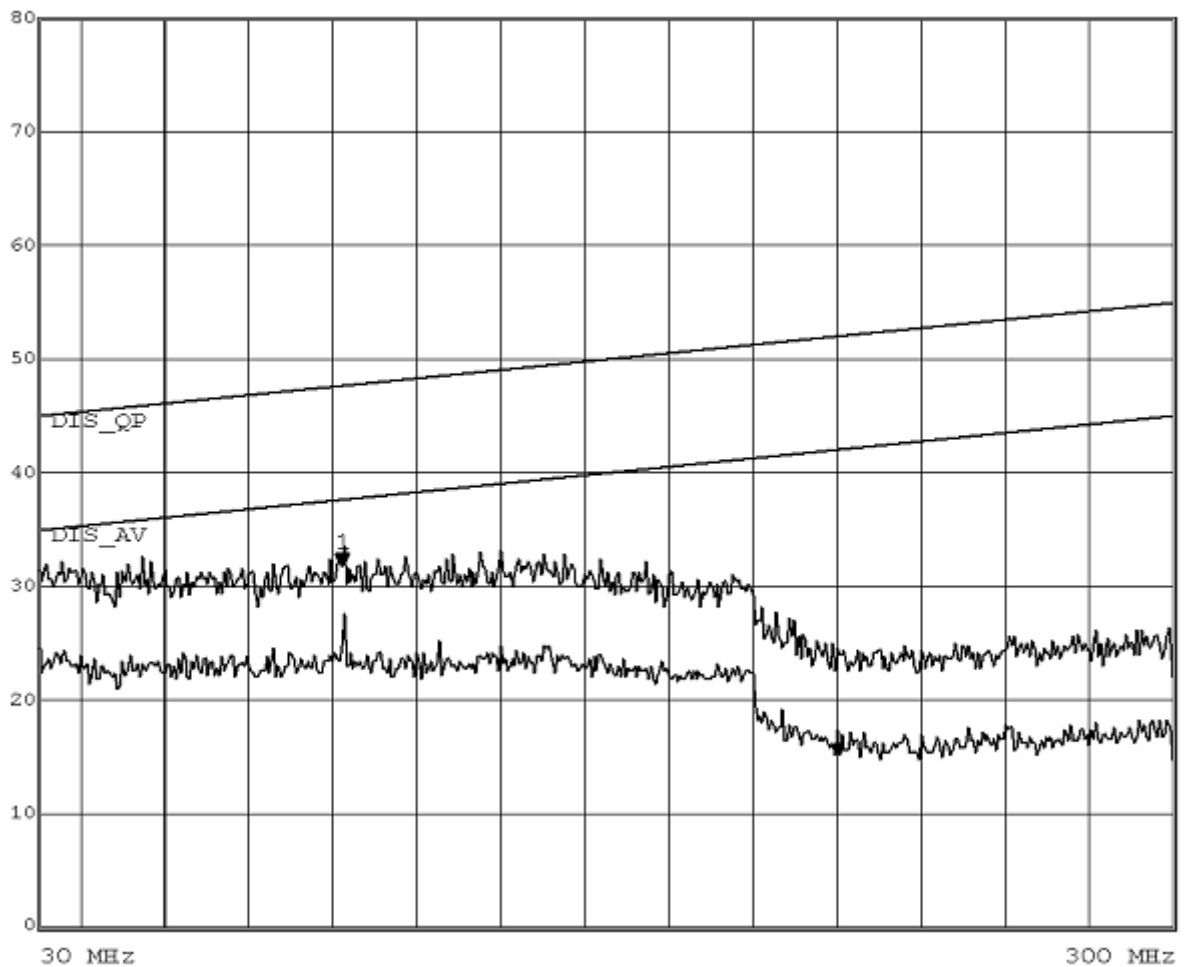
5.2.2 Test Setup



5.2.3 Measurement Data

AC Mains port:

Level (dBpW)



Quasi-peak and Average measurement:

Trace1: DIS_QP		Trace2: DIS_AV	
Trace3: ---		Trace4: ---	
TRACE	FREQUENCY	LEVEL dBpW	DELTA LIMIT dB
2 Average	30.2400 MHz	21.10	-13.90
2 Average	102.7600 MHz	23.51	-14.18
2 Average	34.2400 MHz	20.76	-14.39
2 Average	34.5200 MHz	20.73	-14.42
2 Average	36.3200 MHz	20.65	-14.57
1 Quasi Peak	35.8800 MHz	28.31	-16.90
1 Quasi Peak	31.7200 MHz	27.20	-17.85
1 Quasi Peak	37.2800 MHz	27.12	-18.14
1 Quasi Peak	40.4400 MHz	26.93	-18.45
1 Quasi Peak	54.8400 MHz	26.96	-18.95



5.3 Harmonics Test Results

Test Requirement: EN 61000-3-2
Test Method: EN 61000-3-2
Test Date: 07 Mar 2012
Frequency range: 100Hz to 2kHz
Class/Severity: Class A
Measurement Time: 3 min
Detector: As per EN 61000-3-2

5.3.1 E.U.T. Operation

Operating Environment:

Temperature: 24.0 °C Humidity: 53% RH Atmospheric Pressure: 1012 mbar

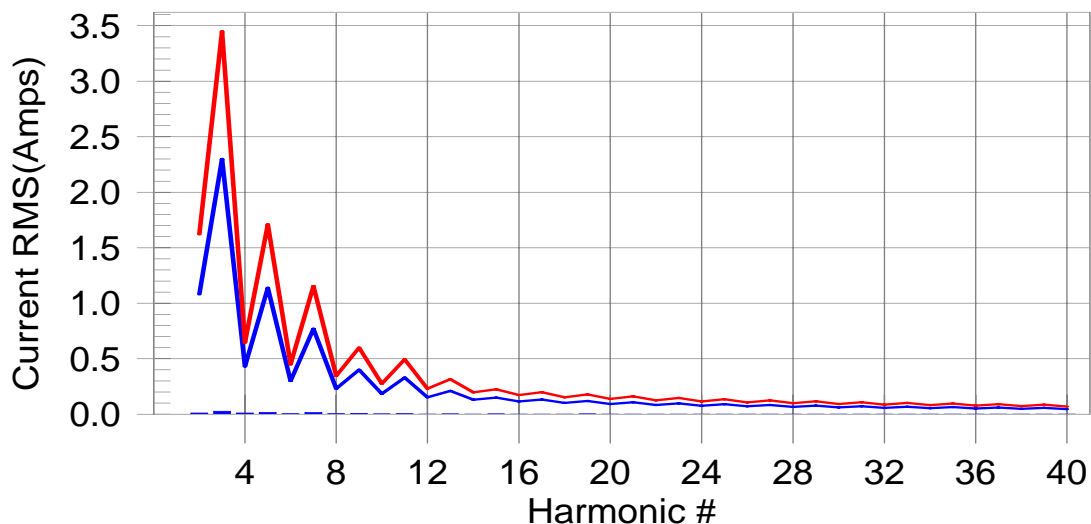
EUT Operation: Test the EUT in AUX mode.

Harmonics – Class-A per Ed. 2.2 (2004-11)(Run time)

Test Result: Pass

Source qualification: Normal

Harmonics and Class A limit line European Limits



Test result: Pass Worst harmonic was #4 with 1.64% of the limit.



Current Test Result Summary (Run time)

Test Result: Pass Source qualification: Normal
 THC(A): 0.03 I-THD(%): 0.25 POHC(A): 0.003 POHC Limit(A): 0.251
 Highest parameter values during test:
 V_RMS (Volts): 230.08 Frequency(Hz): 50.00

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.008	1.080	0.7	0.011	1.620	0.67	Pass
3	0.023	2.300	1.0	0.028	3.450	0.81	Pass
4	0.007	0.430	1.6	0.011	0.645	1.64	Pass
5	0.013	1.140	1.1	0.017	1.710	1.00	Pass
6	0.002	0.300	0.7	0.003	0.450	0.71	Pass
7	0.014	0.770	1.8	0.016	1.155	1.37	Pass
8	0.002	0.230	1.0	0.003	0.345	0.97	Pass
9	0.005	0.400	1.4	0.006	0.600	1.02	Pass
10	0.002	0.184	1.1	0.003	0.276	1.04	Pass
11	0.002	0.330	0.7	0.003	0.495	0.64	Pass
12	0.001	0.153	0.4	0.001	0.230	0.34	Pass
13	0.002	0.210	1.1	0.003	0.315	0.89	Pass
14	0.001	0.131	0.5	0.001	0.197	0.48	Pass
15	0.003	0.150	1.9	0.003	0.225	1.38	Pass
16	0.001	0.115	1.2	0.002	0.173	1.10	Pass
17	0.002	0.132	1.3	0.002	0.199	0.95	Pass
18	0.001	0.102	0.9	0.001	0.153	0.67	Pass
19	0.002	0.118	1.7	0.002	0.178	1.30	Pass
20	0.001	0.092	0.7	0.001	0.138	0.68	Pass
21	0.001	0.107	0.8	0.001	0.161	0.64	Pass
22	0.001	0.084	0.7	0.001	0.125	0.53	Pass
23	0.001	0.098	0.6	0.001	0.147	0.51	Pass
24	0.000	0.077	0.3	0.000	0.115	0.24	Pass
25	0.001	0.090	1.2	0.001	0.135	0.94	Pass
26	0.000	0.071	0.4	0.000	0.106	0.32	Pass
27	0.001	0.083	1.1	0.001	0.125	0.84	Pass
28	0.000	0.066	0.4	0.000	0.099	0.34	Pass
29	0.001	0.078	1.5	0.001	0.116	1.08	Pass
30	0.000	0.061	0.5	0.000	0.092	0.49	Pass
31	0.001	0.073	1.3	0.001	0.109	0.99	Pass
32	0.000	0.058	0.6	0.000	0.086	0.57	Pass
33	0.000	0.068	0.5	0.000	0.102	0.44	Pass
34	0.000	0.054	0.4	0.000	0.081	0.37	Pass
35	0.001	0.064	1.0	0.001	0.096	0.80	Pass
36	0.000	0.051	0.4	0.000	0.077	0.41	Pass
37	0.001	0.061	1.2	0.001	0.091	0.94	Pass
38	0.000	0.048	0.4	0.000	0.073	0.35	Pass
39	0.000	0.058	0.9	0.001	0.087	0.67	Pass
40	0.000	0.046	0.6	0.000	0.069	0.56	Pass



5.4 Flicker Test Results

Test Requirement: EN 61000-3-3
Test Method: EN 61000-3-3
Test Date: 07 Mar 2012
Class/Severity: Clause 5 of EN 61000-3-3
Measurement Time: 10 min
Detector: As per EN 61000-3-3

5.4.1 E.U.T. Operation

Operating Environment:
Temperature: 24.5 °C Humidity: 52% RH Atmospheric Pressure: 1015 mbar
EUT Operation: Test the EUT in AUX mode..

5.4.2 Measurement Data

Flicker Test Summary per EN/IEC61000-3-3 (Run time)

Test Result: Pass Status: Test Completed

Pst_i and limit line European Limits



Parameter values recorded during the test:

Vrms at the end of test (Volt):	230.12		
Highest dt (%):	2.38	Test limit (%):	3.30 Pass
Time(mS) > dt:	0.0	Test limit (mS):	500.0 Pass
Highest dc (%):	2.37	Test limit (%):	3.30 Pass
Highest dmax (%):	-2.21	Test limit (%):	4.00 Pass
Highest Pst (10 min. period):	0.728	Test limit:	1.000 Pass

6 Immunity Test Results

6.1 Performance Criteria Description in Clause 6 of EN 55020

Criterion A:

The equipment shall continue to operate as intended during the test.

No change of actual operating state (for example change of channel) is allowed as a result of the application of the test.

The equipment is supposed to operated as intended if the criteria of Evaluation of audio quality and picture quality are fulfilled.

Evaluation of audio quality

A wanted to unwanted audio signal ratio of $\geq 40\text{dB}$ at a wanted audio signal level of 50mW. If the S/N ratio is less than 43dB, the performance criterion for audio assessment is the actual S/N minus 3 dB.

Criterion B:

The equipment shall continue to operate as intended after the test. No loss of function is allowed after the test when the apparatus is used as intended, but failures which are recovered automatically but which casue temporary delay in processing, are permissible. No change of actual operating state for example change of channel or stored data and settings is allowed as a result of the test. During the test, degradation of performance is allowed.



6.2 ESD

Test Requirement: EN 55020
Test Method: EN 61000-4-2
Criterion Required: B
Test Date: 08 Mar 2012
Discharge Impedance: 330 Ω / 150 pF
Discharge Voltage: Air Discharge: 2, 4, 8 kV
VCP, HCP: 2, 4 kV
Polarity: Positive & Negative
Number of Discharge: Minimum 10 times at each test point
Discharge Mode: Single Discharge
Discharge Period: 1 second minimum

6.2.1 E.U.T. Operation

Operating Environment:

Temperature: 20.0 °C Humidity: 40% RH Atmospheric Pressure: 1015 mbar

EUT Operation: Test the EUT in AUX in mode.

6.2.2 Test Results

Direct Application Test Results

Observations: Test Point: 1. All insulated Enclosure & Seams;
2. All accessible metallic parts with discharge resistor used.

Direct Application			Test Results	
Discharge Level (kV)	Polarity (+/-)	Test Point	Contact Discharge	Air Discharge
2, 4, 8	+/-	1	N/A	A
2, 4	+/-	2	A	N/A

Indirect Application Test Results

Observations: Test Point: 1. All sides.

Indirect Application			Test Results	
Discharge Level (Kv)	Polarity (+/-)	Test Point	Horizontal Coupling	Vertical Coupling
2, 4	+/-	1	A	A

Results:

A: No degradation in the performance of the EUT was observed.

N/A: Not applicable (Not requested by Standard).



6.3 Electrical Fast Transients (EFT)

Test Requirement: EN 55020
Test Method: EN 61000-4-4
Criterion Required: B
Test Date: 08 Mar 2012
Test Level: 0.5kV, 1.0kV on AC
Polarity: Positive & Negative
Repetition Frequency: 5kHz
Burst Duration: 300ms
Test Duration: 2 minute per level & polarity

6.3.1 E.U.T. Operation

Operating Environment:

Temperature: 22.0 °C Humidity: 50% RH Atmospheric Pressure: 1005 mbar

EUT Operation: Test the EUT in AUX in mode.

6.3.2 Test Results On AC Supply:

Lead under Test	Level (±kV)	Coupling Direct/Clamp	EUT operating mode	Observations (Performance Criterion)
Live	± 1.0	Direct	AUX in mode	(A)
Neutral	± 1.0	Direct	AUX in mode	(A)
Live & Neutral & Earth	± 1.0	Direct	AUX in mode	(A)

A: No loss of function.

6.4 Immunity to RF Voltage of Mains, Loudspeaker, headphone and audio connectors (S2a)

Test Requirement: EN 55020
 Test Method: EN 55020
 Criterion Required: A
 Test Date: 08 Mar 2012
 Wanted Signal: 1KHz Test sine wave for AUX mode.
 Unwanted Signal: 1KHz AM 80% AM at the frequency listed below.
 Exemption frequencies:

Unwanted signal and immunity limit for Mains, Loudspeaker and Headphone terminals.

Frequency MHz	Level dB(μ V) (e.m.f.)
0,15 to 30	130
30 to 100	120
100 to 150	120 – 110 ^a

^a Decreasing linearly with the logarithm of the frequency.

Unwanted signal and immunity limit for audio input / output terminals.

Frequency MHz	Level dB(μ V) (e.m.f.)
0,15 to 1,6	80 – 90 ^a
1,6 to 20	90 – 120 ^a
20 to 100	120
100 to 150	120 – 110 ^b

^a Increasing linearly with the logarithm of the frequency.
^b Decreasing linearly with the logarithm of the frequency.

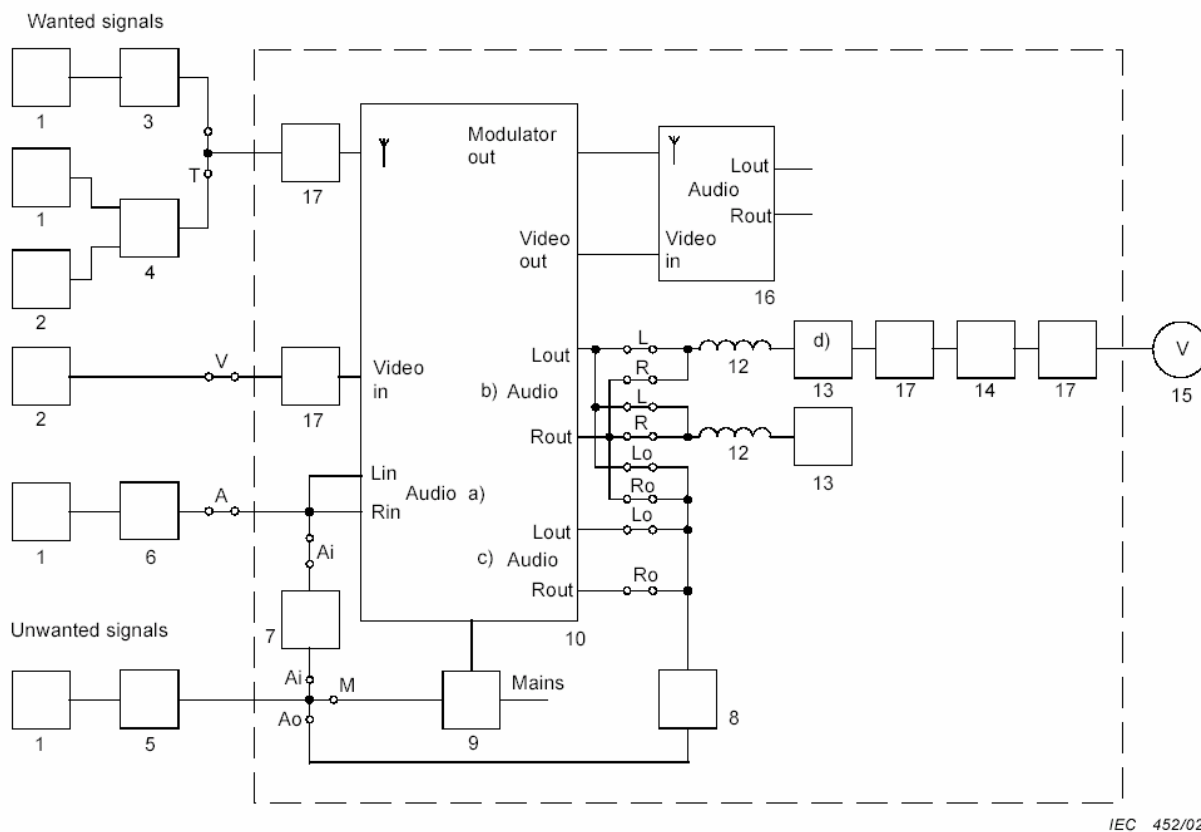
6.4.1 E.U.T. Operation

Operating Environment:

Temperature: 22.0 °C Humidity: 53% RH Atmospheric Pressure: 1002 mbar

EUT Operation: Test the EUT in AUX mode.

6.4.2 Test Setup



- a) Channels 1 and 2 in the case of two channel sound television equipment.
- b) Audio power output provided for adjusting and measurement.
- c) Other audio outputs.
- d) To be left out in case of high-resistance ($>10\text{ k}\Omega$) audio output impedance.

Key

- | | |
|---------------------------------------|---|
| 1 AF generator 1 kHz G1 | 10 Equipment under test |
| 2 Video generator G2 | 11 Metal plate $P = 2\text{ m} \times 1\text{ m}$ |
| 3 RF generator G3 for FM | 12 RF choke $L = 100\text{ }\mu\text{H}$ |
| 4 RF generator G4 for TV | 13 Rated load impedance of the audio output RL |
| 5 RF generator G5 for unwanted signal | 14 Band-pass filter BP (input impedance $10\text{ k}\Omega$) |
| 6 Impedance (R_s to RG1) | 15 Audio frequency voltmeter V |
| 7 RC network for audio inputs RC_i | 16 Test-TV-set TTS |
| 8 RC network for audio outputs RC_o | 17 Sheath current choke Sh (ferrite cores) |
| 9 Mains stop filter MSF | |

(12, 13, 14 and 15 may be replaced by figure 2b or 2c if appropriate.)

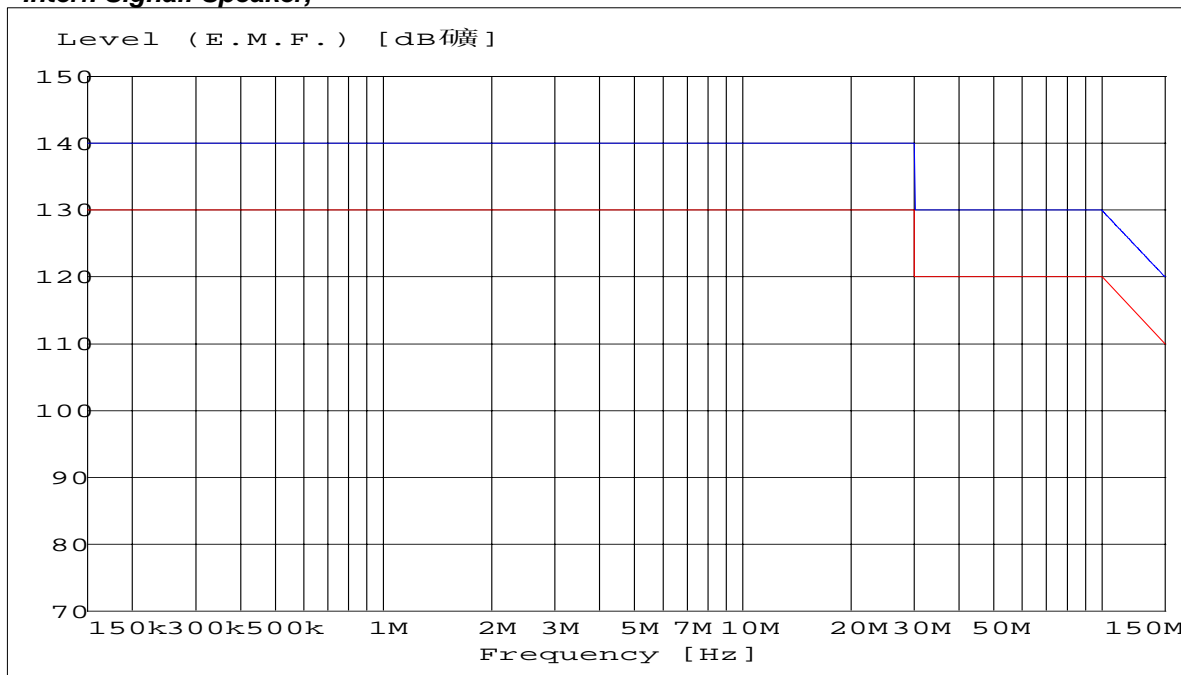
R_s rated source impedance of the audio input ($1\text{ k}\Omega$ in the case of video tape equipment).



6.4.3 Test Results

Test Mode: Receiver - Monitor: Speaker
Operating Mode: AUX S/N: 65.4 dB
Frequency: - AF Level: 53.5 mW

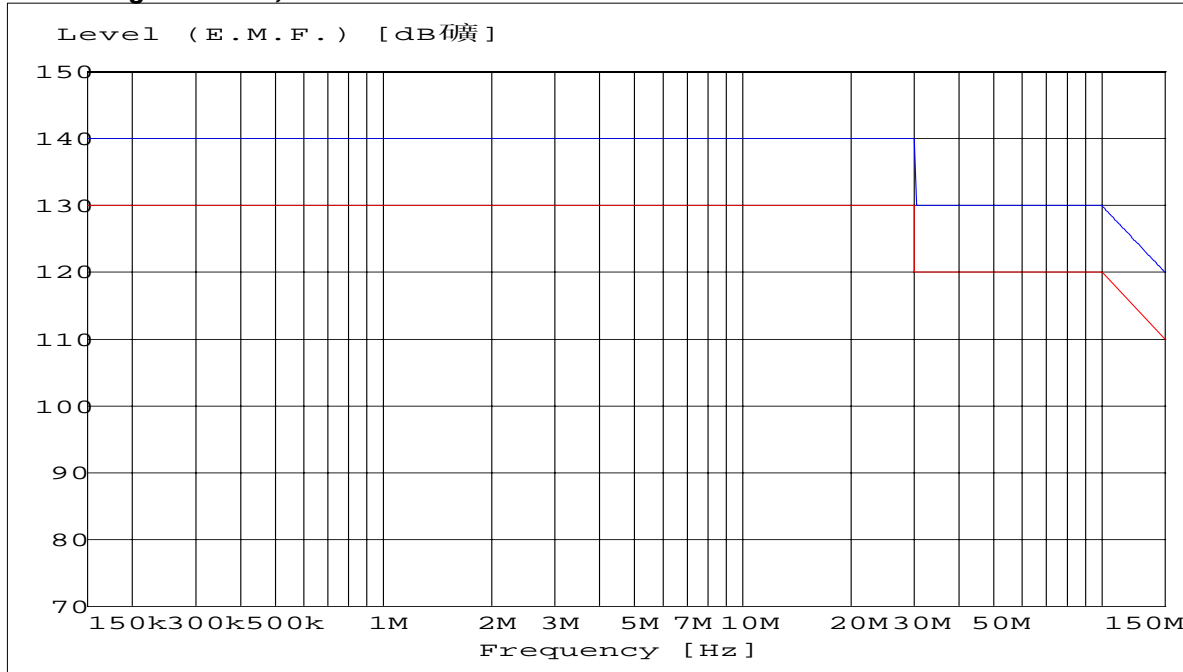
Interf. Signal: Speaker,





Test Mode: Receiver - Monitor: Speaker
Operating Mode: AUX S/N: 65.4 dB
Frequency: - AF Level: 53.5 mW

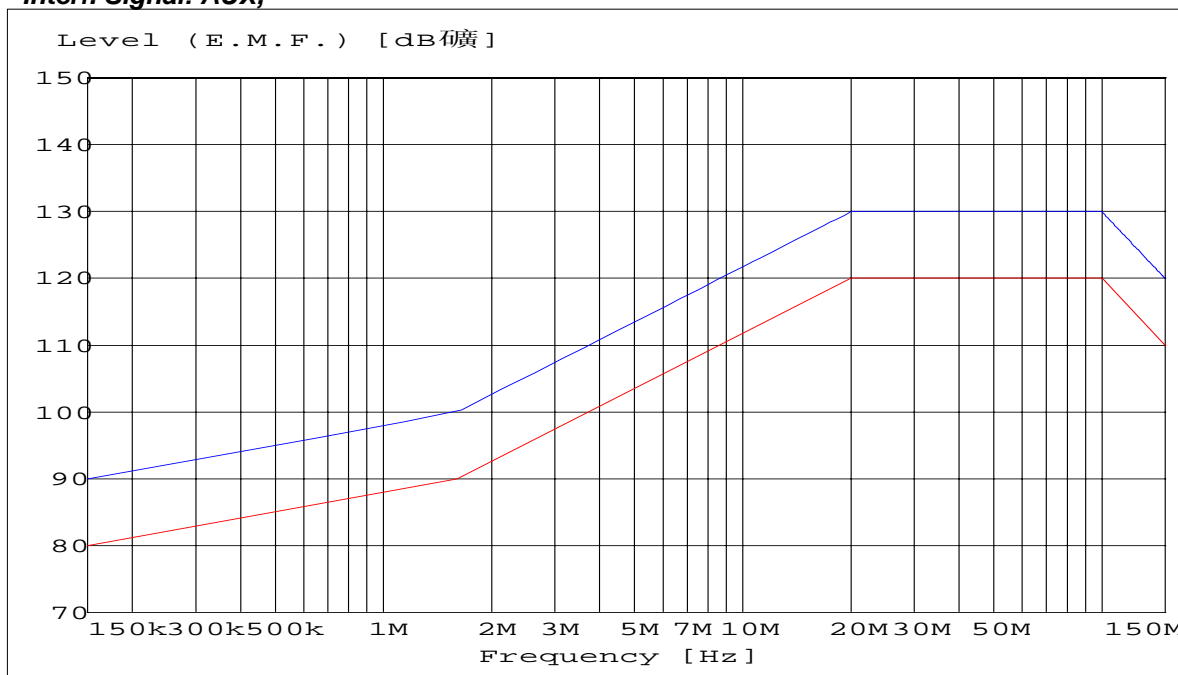
Interf. Signal: Mains,





Test Mode: Receiver - Monitor: Speaker
Operating Mode: AUX S/N: 65.4 dB
Frequency: - AF Level: 53.5 mW

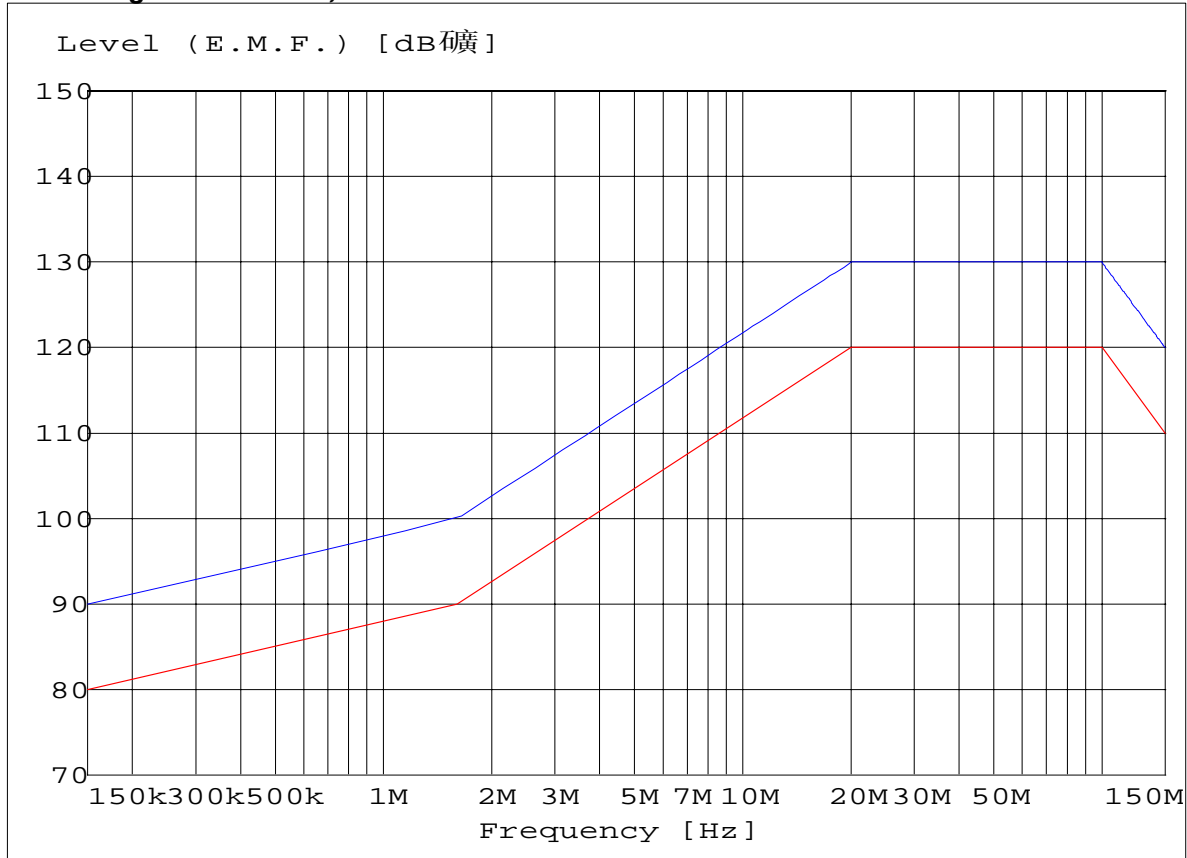
Interf. Signal: AUX,





Test Mode: Receiver - Monitor: Speaker
Operating Mode: AUX S/N: 65.4 dB
Frequency: - AF Level: 53.5 mW

Interf. Signal: Audio Out,





6.5 Immunity to ambient electromagnetic fields (S3)

Test Requirement: EN 55020
Test Method: EN 55020
Criterion Required: A
Test Date: 09 Mar 2012
Wanted Signal: 1KHz Test sine wave for AUX mode.
Unwanted Signal: 1KHz AM 80% AM at the frequency listed below.
Unwanted signal and immunity limit for AUX mode.

Frequency MHz	Level dB(μ V/m)
0,15 to 150	125

6.5.1 E.U.T. Operation

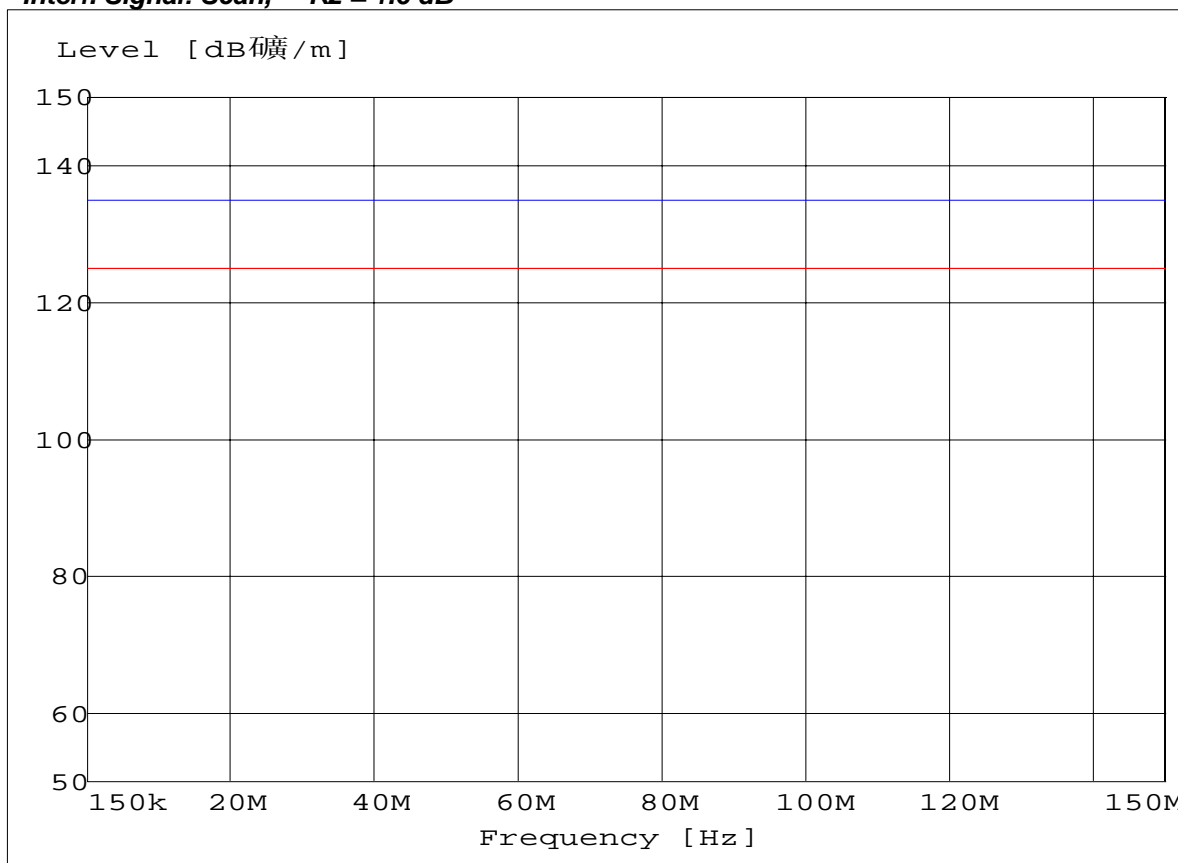
Operating Environment:
Temperature: 23.0 °C Humidity: 50 % RH Atmospheric Pressure: 1007 mbar
EUT Operation: Test the EUT in AUX mode.



6.5.2 Test Results

Test Mode: Receiver - Monitor: Speaker
Operating Mode: AUX S/N: 68.3 dB
Frequency: - AF Level: 62.5 mW

Interf. Signal: Scan, K2 = 1.6 dB





6.6 Immunity to electromagnetic fields Keyed Carrier (S5)

Test Requirement: EN 55020
Test Method: EN 55020
Criterion Required: A
Test Date: 09 Mar 2012
Wanted Signal: 1KHz Test sine wave for AUX mode.
Unwanted Signal: 900MHz, 3V/m, duty cycle 1/8, 217Hz repetition frequency

6.6.1 E.U.T. Operation

Operating Environment:

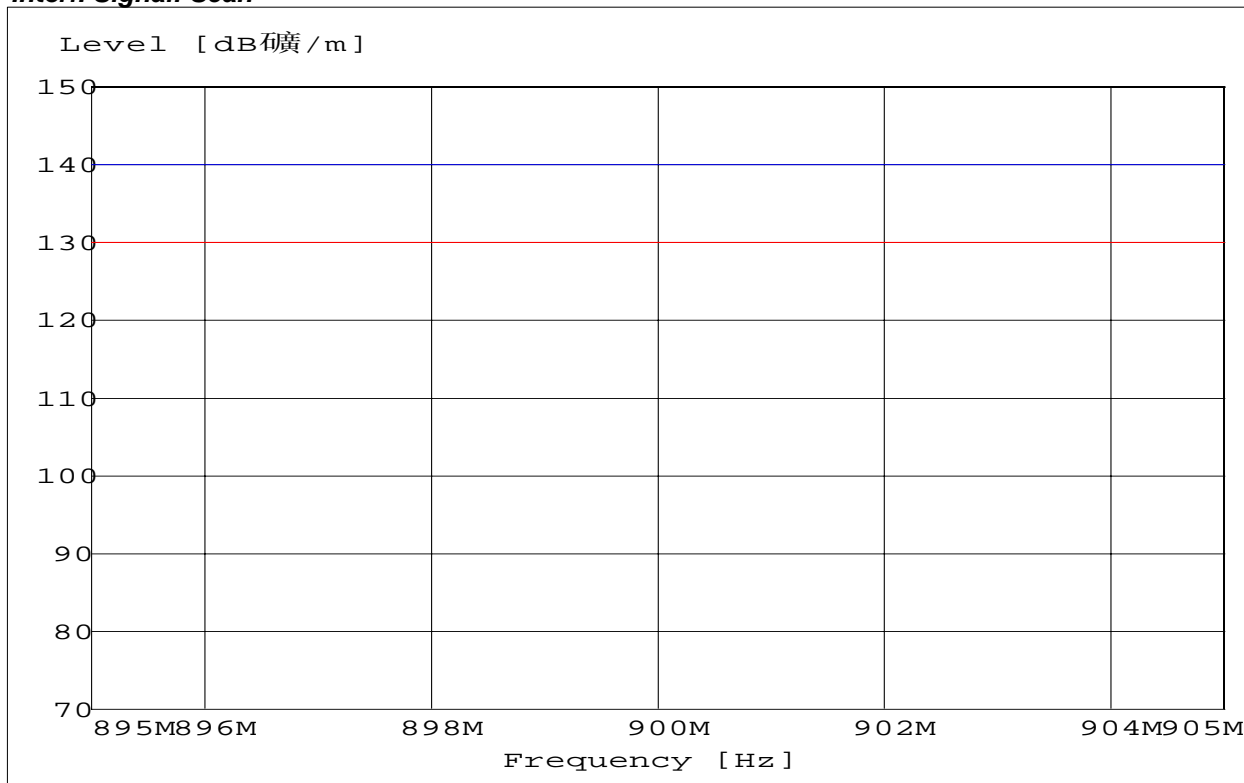
Temperature: 23.0 °C Humidity: 50% RH Atmospheric Pressure: 1007 mbar

EUT Operation: Test the EUT in AUX mode.



Test Mode: Receiver - Monitor: Speaker
Operating Mode: AUX S/N: 64.2 dB
Frequency: AF Level: 48.4 mW

Interf. Signal: Scan



7 Photographs

7.1 Conducted Emission Test Setup



7.2 Disturbance Power Test Setup



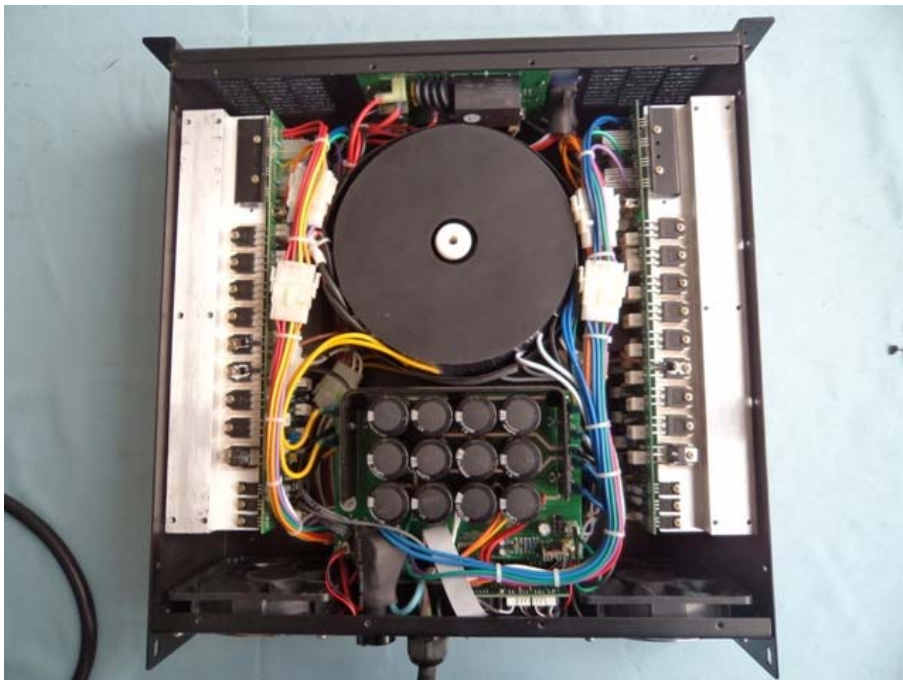
7.3 Harmonic & Flickers Test Setup



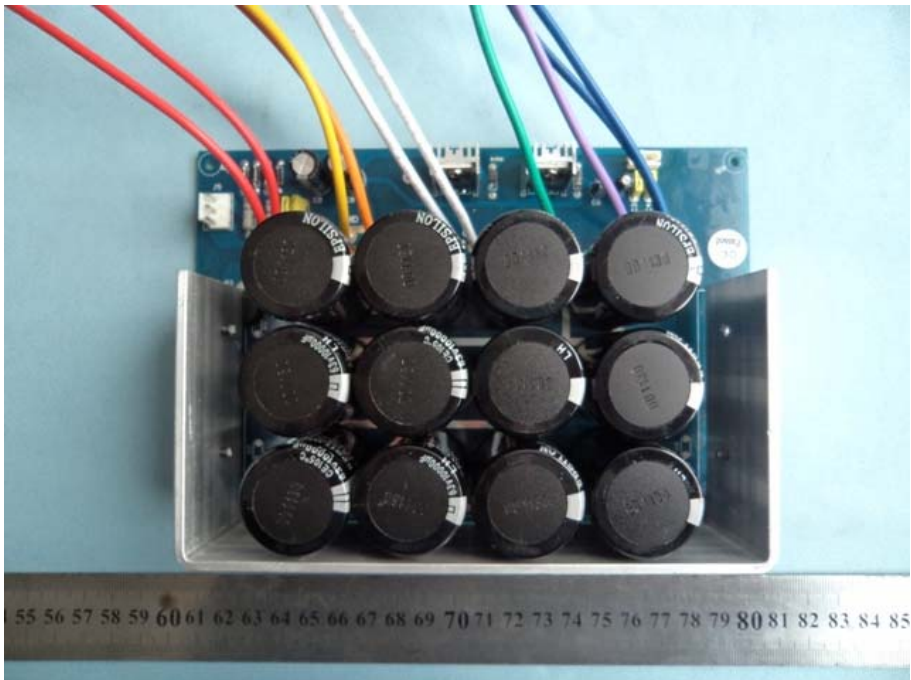
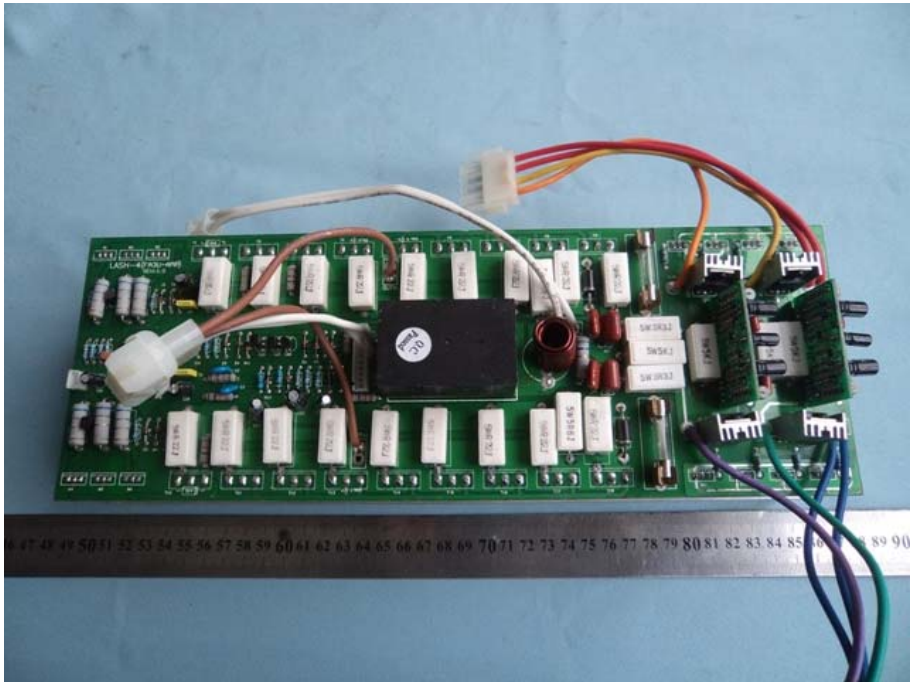
7.4 EUT Constructional Details

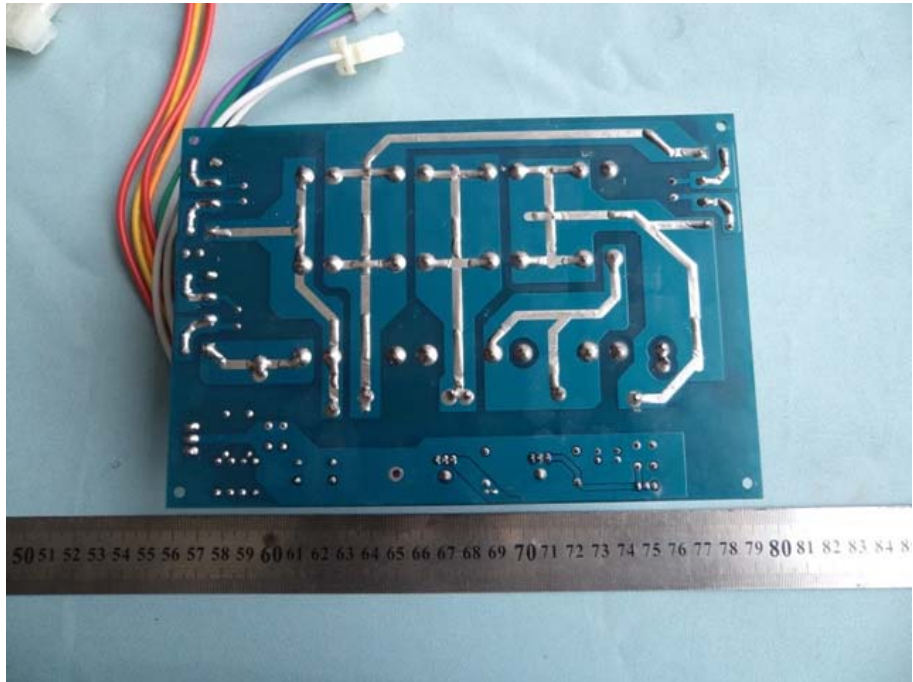












***** End of Report *****