

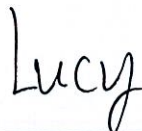
# EMC TEST REPORT

The device described below is tested by Dongguan Nore Testing Center Co., Ltd. to determine the maximum emission levels emanating from the device, the severe levels which the device can endure and E.U.T.'s performance criterion. The test results are contained in this test report. Dongguan Nore Testing Center Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these tests.

Applicant : Shenzhen Fenda Technology Co., Ltd.  
Address : Fenda Hi-Tech Park, Zhoushi Road, Shiyuan Town, Baoan District, Shenzhen City, Guangdong, China  
Manufacturer /Factory : Shenzhen Fenda Technology Co., Ltd.  
Address : Fenda Hi-Tech Park, Zhoushi Road, Shiyuan Town, Baoan District, Shenzhen City, Guangdong, China  
E.U.T. : 2.1 Multimedia Speaker  
Brand Name : F&D  
Model No. : A180X, A180BT, A180U, A180F, A190X, A190BT, A190U, A190F  
(For model differences, refer to Section 2.1)  
Measurement Standard : EN 55013: 2013  
EN 61000-3-2: 2006+A1: 2009+A2: 2009, EN 61000-3-3: 2013  
EN 55020: 2007+A11: 2011  
(EN 61000-4-2: 2009, EN 61000-4-3: 2006+A2: 2010,  
EN 61000-4-4: 2012)  
Date of Receiver : June 06, 2014  
Date of Test : June 06, 2014 to June 28, 2014  
Date of Report : November 27, 2015

This Test Report is Issued Under the Authority of :

Prepared by



Lucy Li / Engineer

Approved & Authorized Signer



Iori Fan / Authorized Signatory

This report shows that the E.U.T. is technically compliant with the EN 55013, EN 61000-3-2, EN 61000-3-3, and EN 55020. This report applies to above tested sample only and shall not be reproduced in part without written approval of Dongguan Nore Testing Center Co., Ltd.

## TABLE OF CONTENT

<b>1. SUMMARY OF TEST RESULTS .....</b>	<b>5</b>
<b>2. GENERAL INFORMATION.....</b>	<b>6</b>
2.1 Details of E.U.T.....	6
2.2 Description of Support Device .....	7
2.3 Block Diagram of Test Setup .....	7
2.4 Test Facility.....	8
2.5 Abnormalities from Standard Conditions .....	8
<b>3. MEASURING DEVICES AND TEST EQUIPMENT .....</b>	<b>9</b>
3.1 For Mains terminals Disturbance voltage test.....	9
3.2 For Disturbance Power Emission Test.....	9
3.3 For Harmonic Current / Flicker Measurement .....	9
3.4 For Electrostatic Discharge Immunity Test .....	9
3.5 For RF Electromagnetic Field Immunity Test.....	10
3.6 For Electrical Fast Transient /Burst Immunity Test .....	10
3.7 For EN55020 Immunity Test.....	11
<b>4. MAINS TERMINAL DISTURBANCE VOLTAGE MEASUREMENT .....</b>	<b>12</b>
4.1 Block Diagram of Test Setup .....	12
4.2 Limit of Mains Terminal Disturbance voltage measurement .....	12
4.3 Test Procedure .....	13
4.4 Operating Condition of E.U.T.....	13
4.5 Mains Terminal Disturbance Voltage Test Results .....	13
<b>5. DISTURBANCE POWER EMISSION TEST .....</b>	<b>16</b>
5.1 Block Diagram of Test Setup .....	16
5.2 Limit of Disturbance Power Emission Test .....	16
5.3 Test Procedure .....	17
5.4 Operating Condition of E.U.T.....	17
5.5 Disturbance Power Emission Test Result .....	17
<b>6 HARMONIC CURRENT EMISSION TEST .....</b>	<b>19</b>
6.1 Block Diagram of Test Setup .....	19
6.2 Limits of Harmonics current measurement .....	19
6.3 Test Procedure .....	20
6.4 Operating Condition of E.U.T.....	20
6.5 Test Results.....	20
<b>7. VOLTAGE FLUCTUATIONS &amp; FLICKER TEST.....</b>	<b>21</b>
7.1 Block Diagram of Test Setup .....	21
7.2 Limits of Voltage Fluctuations & Flicker Measurement .....	21
7.3 Test Procedure .....	21
7.4 Operating Condition of E.U.T.....	21
7.5 Test Results.....	22
<b>8. PERFORMANCE CRITERIA FOR IMMUNITY .....</b>	<b>24</b>
<b>9. ELECTROSTATIC DISCHARGE IMMUNITY TEST .....</b>	<b>25</b>
9.1 Block Diagram of Test Setup .....	25
9.2 Test Standard and Severity Levels .....	25
9.3 Test Procedure .....	26
9.4 Test Results.....	26
<b>10. RF FIELD (KEYED CARRIER) STRENGTH SUSCEPTIBILITY TEST (S5) .....</b>	<b>28</b>
10.1 Block Diagram of Test Setup .....	28
10.2 Test Standard and Severity Levels .....	28
10.3 Test Procedure .....	29
10.4 Test Results.....	29

---

<b>11. ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST .....</b>	<b>31</b>
11.1 Block Diagram of Test Setup .....	31
11.2 Test Standard and Severity Levels.....	31
11.3 Test Procedure .....	32
11.4 Test Result.....	32
<b>12. RF VOLTAGES IMMUNITY TEST(S2).....</b>	<b>34</b>
12.1 Test setup .....	34
12.2 Test Standard and Limits .....	36
12.3 Test Result.....	36
<b>13. AMBIENT ELECTROMAGNETIC FIELDS IMMUNITY TEST(S3).....</b>	<b>38</b>
13.1 Block Diagram of Test Setup .....	38
13.2 Test Standard and Limits .....	39
13.3 Test Result.....	40
<b>14. PHOTOGRAPHS .....</b>	<b>42</b>
14.1 Photo of Power Line Conducted Emission Measurement .....	42
14.2 Photo of Disturbance Power Measurement.....	42
14.3 Photo of Harmonic Current / Flicker Measurement .....	43
14.4 Photo of Electrostatic Discharge Immunity Measurement .....	43
14.5 Photo of Electrical Fast Transient /Burst Immunity Measurement .....	44
14.6 Photo of S2 Measurement.....	44
14.7 Photo of S3 Measurement.....	45

APPENDIX I (Photos of the E.U.T.) (9 pages)



## 1. SUMMARY OF TEST RESULTS

The E.U.T. has been tested according to the following specifications:

EMISSION			
Standard	Test Type	Result	Remarks
EN 55013: 2013	Mains Terminal Disturbance Voltage Test	PASS	Uncertainty: 2.7dB
	Antenna Terminal Disturbance Voltage Test	N/A	Not Applicable
	Disturbance Power Emissions Test	PASS	Uncertainty: 2.8dB
	Radiated Emission Test	N/A	Not Applicable
EN 61000-3-2: 2006+A1: 2009+A2: 2009	Harmonic current emission	N/A	Meets the requirements.
EN 61000-3-3: 2013	Voltage fluctuations & flicker	PASS	Meets the requirements.

IMMUNITY(EN 55020: 2007+A11: 2011)			
Standard	Test Type	Result	Remarks
EN 55020: 2007+A11: 2011	Input immunity (S1)	N/A	Not Applicable
	Immunity from conducted voltages (S2a)	PASS	Meets the requirements.
	Immunity from conducted currents (S2b)	N/A	Not Applicable
	Immunity from radiated fields (S3)	PASS	Meets the requirements.
	Screening effectiveness (S4)	N/A	Not Applicable
EN 61000-4-2: 2009	Electrostatic discharge immunity test	PASS	Meets the requirements of Performance Criterion B
EN 61000-4-3: 2006+A2: 2010	Radiated, radio-frequency, electromagnetic field immunity test(S5)	PASS	Meets the requirements of Performance Criterion A
EN 61000-4-4: 2012	Electrical fast transient/ burst immunity test	PASS	Meets the requirements of Performance Criterion B

## 2. GENERAL INFORMATION

### 2.1 Details of E.U.T.

E.U.T.	: 2.1 Multimedia Speaker
Model No.	: A180X, A180BT, A180U, A180F, A190X, A190BT, A190U, A190F (We prepare A180X for EMC test.)
Brand Name	: F&D
Rating	: AC 220-240V ~ 50/60Hz 0.3A
Test Voltage	: AC 230V 50Hz
Cable	: None
Description of model difference	: All models have the same circuitry, PCB layout, electrical mechanical and physical construction. Their differences in model name and the color of the enclosure for trading purpose.
Remark	: <ol style="list-style-type: none"><li>1. This report was an additional report based on original report NTC1406686E.</li><li>2. Both of reports are the same and this report has changed the appearance, product name and model name.</li><li>3. Model A180X and model W130X are the same except the appearance, product name and model name.</li><li>4. According to these changes, the original test data for model W130X were continued to be used.</li></ol>

## 2.2 Description of Support Device

iPod : Manufacturer: Apple  
M/N: A1446  
S/N: DCYK12V6F0GV  
USB Flash Disk : Manufacturer: Kingston  
M/N: 8GB  
SD Card : Manufacturer: Kingston  
M/N: 4GB

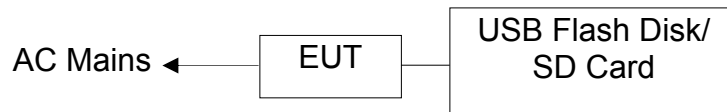
## 2.3 Block Diagram of Test Setup

Block diagram of connection between the E.U.T. and simulators

(1) AUX IN mode



(1) USB Playing, SD Card Playing





## 2.4 Test Facility

Site Description	
EMC Lab	: Listed by CNAS, August 16, 2012 The certificate is valid until August 15, 2015 The Laboratory has been assessed and proved to be in compliance with CNAS/CL01 The Certificate Registration Number is L5795.  Listed by FCC, August. 02, 2011 The Certificate Number is 665078.  Listed by Industry Canada, July 01, 2011 The Certificate Registration Number. Is 46405-9743
Name of Firm	: Dongguan Nore Testing Center Co., Ltd. (Dongguan NTC Co., Ltd.)
Site Location	: Building D, Gaosheng Science & Technology Park, Zhouxi Longxi Road, Nancheng District, Dongguan City, Guangdong Province, China

## 2.5 Abnormalities from Standard Conditions

None



### 3. MEASURING DEVICES AND TEST EQUIPMENT

#### 3.1 For Mains terminals Disturbance voltage test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESCI	101152	Nov. 25, 2013	1 Year
2.	L.I.S.N	Rohde & Schwarz	ENV 216	101317	Nov. 09, 2013	1 Year
3.	L.I.S.N	Schwarzbeck	NNLK8129	8129-212	Nov. 09, 2013	1 Year
4.	RF Switching Unit	Compliance Direction Systems Inc.	RSU-M2	38311	Nov. 09, 2013	1 Year
5.	Pulse Limiter	MTS-systemtechnik	MTS-IMP-136	261115-010-0022	Nov. 09, 2013	1 Year

#### 3.2 For Disturbance Power Emission Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESCI	101152	Nov. 25, 2013	1 Year
2.	Power Clamp	LUTHI	MDS21	4057	Nov. 10, 2013	1 Year
3.	RF Switching Unit	Compliance Direction Systems Inc.	RSU-M2	38311	Nov. 09, 2013	1 Year

#### 3.3 For Harmonic Current / Flicker Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Power Frequency Test System	California Instruments	CTS	72846	Nov. 05, 2013	1 Year
2.	Software	California Instruments	CTS30	N/A	N/A	N/A

#### 3.4 For Electrostatic Discharge Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	ESD Tester	TESEQ	NSG 437	432	Nov. 10, 2013	1 Year

### 3.5 For RF Electromagnetic Field Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Signal Generator	Agilent	N5181A	MY50142530	Sep.01,2013	1 Year
2.	Antenna Log-Periodic	CORAD	ATR80M6G	0337307	Sep.01,2013	1 Year
3.	Antenna Log-Periodic	CORAD	ATS700M11G	0336821	Sep.01,2013	1 Year
4.	Switch Controller	CORAD	SC1000	0337343	Sep.01,2013	1 Year
5.	RF Power Meter	ESE	4242	13984	Sep.01,2013	1 Year
6.	Power Sensor	ESE	51011EMC	35716	Sep.01,2013	1 Year
7.	Power Amplifier	TESEQ	CBA 1G-150	T44029	Sep.01,2013	1 Year
8.	Power Amplifier	TESEQ	CBA 3G-100	T44030	Sep.01,2013	1 Year
9.	Power Amplifier	TESEQ	CBA 6G-050	1041204	Sep.01,2013	1 Year
10.	Dual Directional Coupler	TESEQ	C5982	95208	Sep.01,2013	1 Year
11.	Dual Directional Coupler	TESEQ	C6187	95175	Sep.01,2013	1 Year
12.	Dual Directional Coupler	TESEQ	CPH-274F	M251304-01	Sep.01,2013	1 Year

### 3.6 For Electrical Fast Transient /Burst Immunity Test

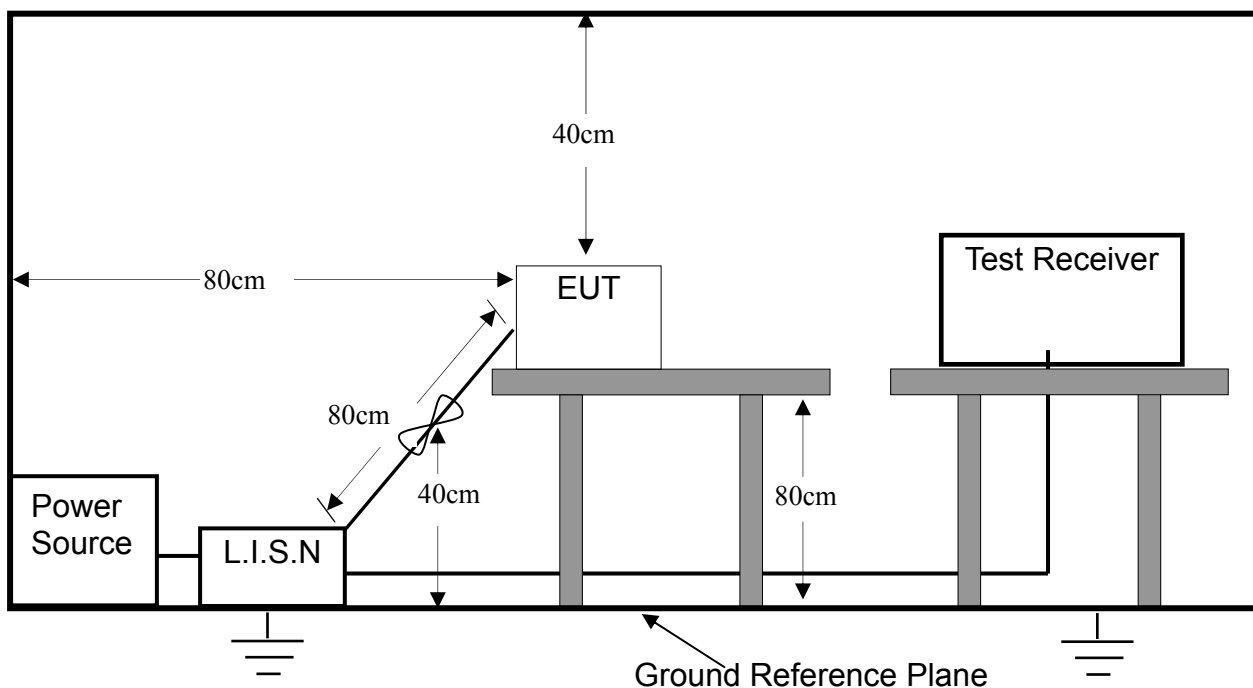
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Burst Tester	EM TEST	UCS 500N	V1104108683	Nov. 09, 2013	1 Year
2.	Coupling Clamp	EM TEST	HFK	0311-94	Nov. 09, 2013	1 Year
3.	Test Soft	EM TEST	lec. control	N/A	N/A	N/A

### 3.7 For EN55020 Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Broadcast System Test	Rohde&Schwarz	SFU	101543	May 25,2014	N/A
2.	TV Generator PAL	Rohde&Schwarz	SGPF	100200	May 25,2014	1 Year
3.	Spectrum Analyzer	Rohde&Schwarz	FSL3	101507	May 25,2014	1 Year
4.	Signal Generator	Rohde&Schwarz	SMB100A	102382	May 25,2014	1 Year
5.	Signal Generator	Rohde&Schwarz	SMB100A	102383	May 25,2014	1 Year
6.	Power Meter	Rohde&Schwarz	NRVS	101732	May 25,2014	1 Year
7.	Audio Analyzer	Rohde&Schwarz	UPV	101346	May 25,2014	N/A
8.	Level Meter	Rohde&Schwarz	URV35	100335	May 25,2014	1 Year
9.	100V Insertion Unit 50Ω	Rohde&Schwarz	URV5-Z4	100207	May 25,2014	1 Year
10.	RF Probe	Rohde&Schwarz	URV5-Z7	100657	May 25,2014	1 Year
11.	Absorbing Clamp	Rohde&Schwarz	MDS-21	100352	May 25,2014	1 Year

## 4. MAINS TERMINAL DISTURBANCE VOLTAGE MEASUREMENT

### 4.1 Block Diagram of Test Setup



### 4.2 Limit of Mains Terminal Disturbance voltage measurement

Test Standard: EN 55013

Equipment type	Frequency range	Limits (dB(uV))	
	(MHz)	Quasi-peak	Average
Television and sound receivers and associated equipment	0.15 to 0.5	66 to 56*	56 to 46*
	0.5 to 5	56	46
	5 to 30	60	50

\*Decreasing linearly with the logarithm of the frequency.

- Note:
1. If the limits for the average detector are met when using the quasi-peak detector, then the limits for the measurements with the average detector are considered to be met.
  2. The higher value measured with and without the outer conductor screen of the antenna terminal connected to earth is considered.
  3. Television receivers with teletext facilities should be tested in teletext mode with teletext picture.

### 4.3 Test Procedure

The E.U.T. is put on the 0.8 m high table and connected to the AC mains through a Artificial Mains Network (AMN). This provided a 50ohm coupling impedance for the tested equipments. Both sides of AC line are checked to find out the maximum conducted emission levels according to the EN 55013 regulations during conducted emission test.

The bandwidth of the test receiver (R&S Test Receiver ESCI) is set at 9 KHz.

### 4.4 Operating Condition of E.U.T.

4.4.1 Setup the E.U.T. and simulators as shown in Section 2.3.

4.4.2 Turn on the power of all equipments.

4.4.3 Let the E.U.T. work in test modes (AUX IN, USB Playing, SD Card Playing) and test it.

### 4.5 Mains Terminal Disturbance Voltage Test Results

**PASS.**

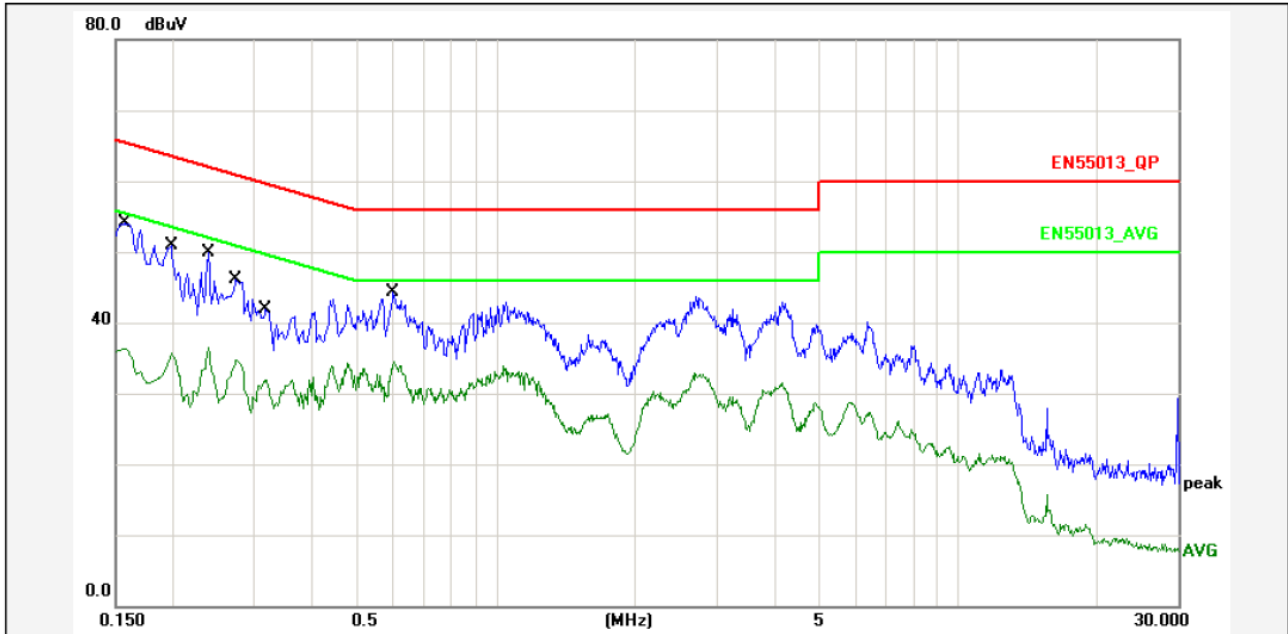
Please refer to the following pages of the worst case: USB Playing.



**Dongguan NTC Co., Ltd.**  
 Tel: +86-769-22022444 Fax: +86-769-22022799  
 Web: [Http://www.ntc-c.com](http://www.ntc-c.com)

Site: Conduction

Test Time: 2014-6-9 11:07:17



Report No.: W130X  
 Test Standard: EN55013\_QP  
 Test item: Conducted Emission  
 Applicant: FENDA  
 Product: Bluetooth Speaker  
 Model No.: W130X  
 Phase: L1  
 Temp.( )/Hum.(%): 21(C) / 49 %  
 Power Rating: AC 230V/50Hz  
 Test Engineer: Sance  
 Test Mode: USB Playing  
 Remark:

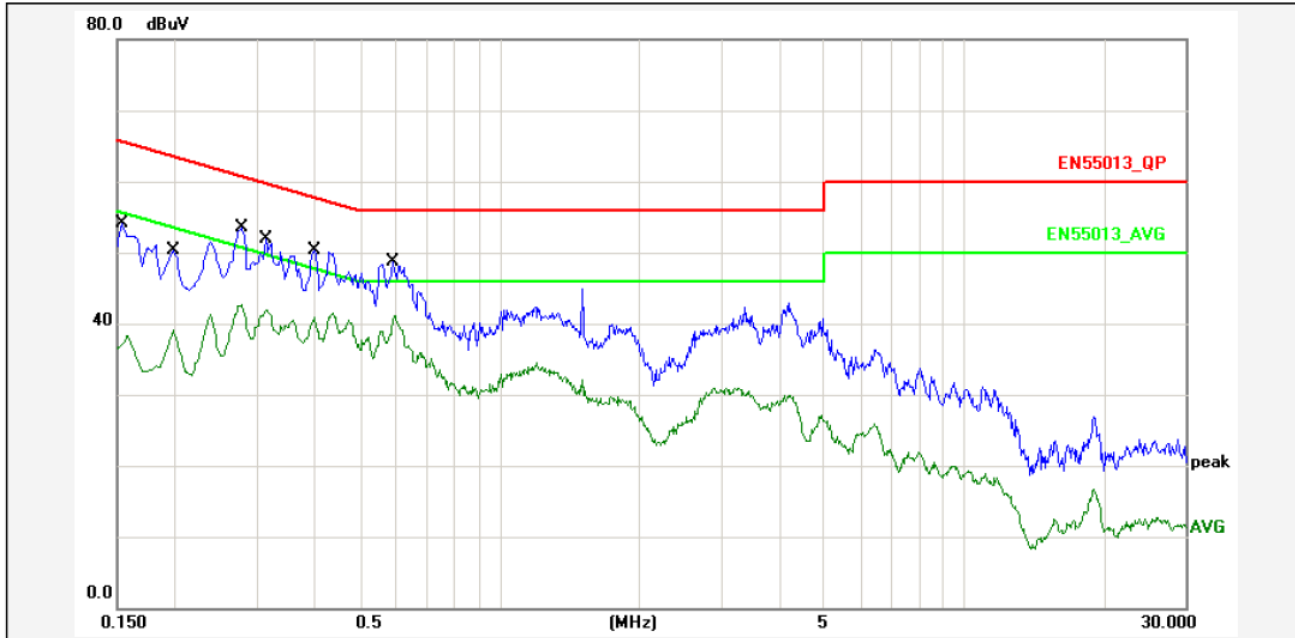
No.	Frequency (MHz)	Factor (dBuV)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1580	10.80	41.22	52.02	65.56	-13.54	QP	P	
2	0.1580	10.80	25.58	36.38	55.56	-19.18	AVG	P	
3	0.1980	10.80	38.07	48.87	63.69	-14.82	QP	P	
4	0.1980	10.80	24.94	35.74	53.69	-17.95	AVG	P	
5	0.2380	10.80	37.02	47.82	62.16	-14.34	QP	P	
6	0.2380	10.80	25.71	36.51	52.16	-15.65	AVG	P	
7	0.2740	10.80	33.34	44.14	60.99	-16.85	QP	P	
8	0.2740	10.80	23.96	34.76	50.99	-16.23	AVG	P	
9	0.3180	10.80	29.16	39.96	59.76	-19.80	QP	P	
10	0.3180	10.80	21.11	31.91	49.76	-17.85	AVG	P	
11	0.6020	10.80	31.55	42.35	56.00	-13.65	QP	P	
12	0.6020	10.80	23.68	34.48	46.00	-11.52	AVG	P	



**Dongguan NTC Co., Ltd.**  
 Tel: +86-769-22022444 Fax: +86-769-22022799  
 Web: [Http://www.ntc-c.com](http://www.ntc-c.com)

Site: Conduction

Test Time: 2014-6-9 11:04:21



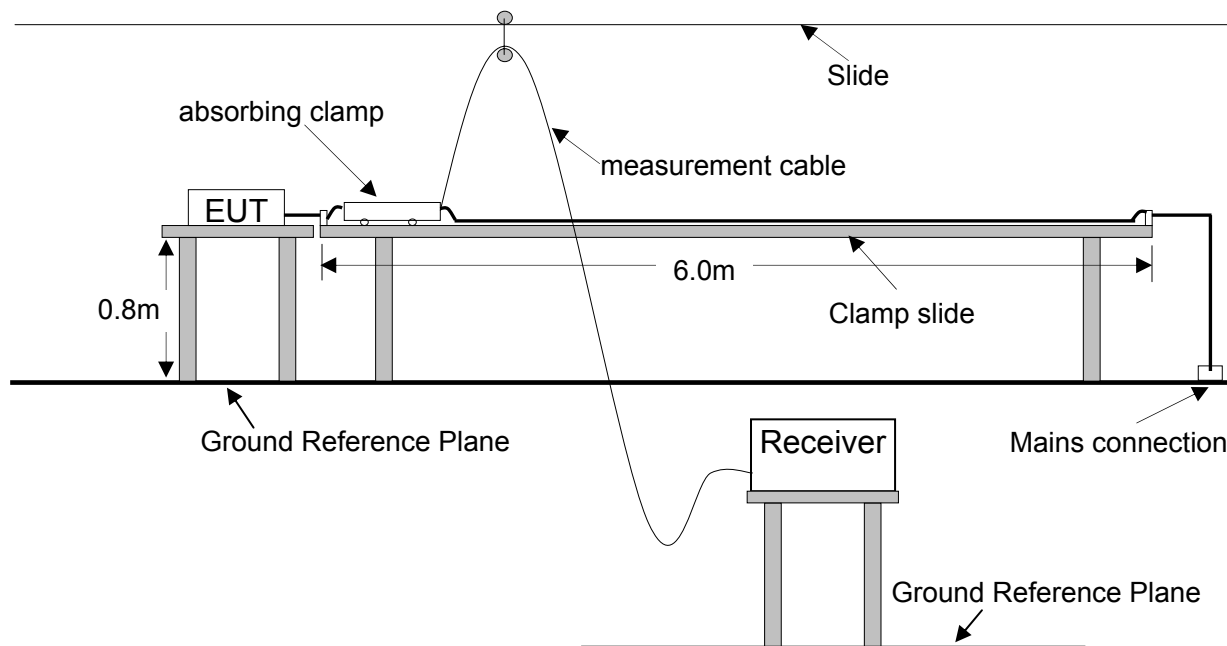
Report No.: W130X  
 Test Standard: EN55013\_QP  
 Test item: Conducted Emission  
 Applicant: FENDA  
 Product: Bluetooth Speaker  
 Model No.: W130X  
 Phase: N  
 Temp.( )/Hum.(%): 21(C) / 49 %  
 Power Rating: AC 230V/50Hz  
 Test Engineer: Sance  
 Test Mode: USB Playing  
 Remark:

No.	Frequency (MHz)	Factor (dBuV)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1539	10.80	39.30	50.10	65.78	-15.68	QP	P	
2	0.1539	10.80	26.50	37.30	55.78	-18.48	AVG	P	
3	0.1980	10.80	37.45	48.25	63.69	-15.44	QP	P	
4	0.1980	10.80	28.38	39.18	53.69	-14.51	AVG	P	
5	0.2779	10.80	40.73	51.53	60.88	-9.35	QP	P	
6	0.2788	10.80	31.62	42.42	50.85	-8.43	AVG	P	
7	0.3140	10.80	39.11	49.91	59.86	-9.95	QP	P	
8	0.3140	10.80	31.13	41.93	49.86	-7.93	AVG	P	
9	0.3980	10.80	37.54	48.34	57.89	-9.55	QP	P	
10	0.3980	10.80	30.02	40.82	47.89	-7.07	AVG	P	
11	0.5940	10.80	35.84	46.64	56.00	-9.36	QP	P	
12	0.5940	10.80	30.28	41.08	46.00	-4.92	AVG	P	



## 5. DISTURBANCE POWER EMISSION TEST

### 5.1 Block Diagram of Test Setup



### 5.2 Limit of Disturbance Power Emission Test

Test Standard: EN 55013

Equipment type	Frequency range	Limits(dB(pW))	
	(MHz)	Quasi-peak	Average
Associated equipment (video recorders excluded)	30 to 300	45 to 55 <sup>b</sup>	35 to 45 <sup>b</sup>
<sup>b</sup> Increasing linearly with the frequency.			

Note: If the limits for the average detector are met when using the quasi-peak detector, then the limits for the measurement with the average detector are considered to be met.

### 5.3 Test Procedure

The E.U.T. was placed on the 0.8 m high table and away from other metallic surface at least 0.8m. It is connected to the power mains through an extension cord of 6m min. The absorber clamp clamps the cord and moves from the far end to the E.U.T. to measure the disturbing energy emitted from the cord.

The bandwidth of the test receiver(R&S ESCI) is set at 120kHz.

### 5.4 Operating Condition of E.U.T.

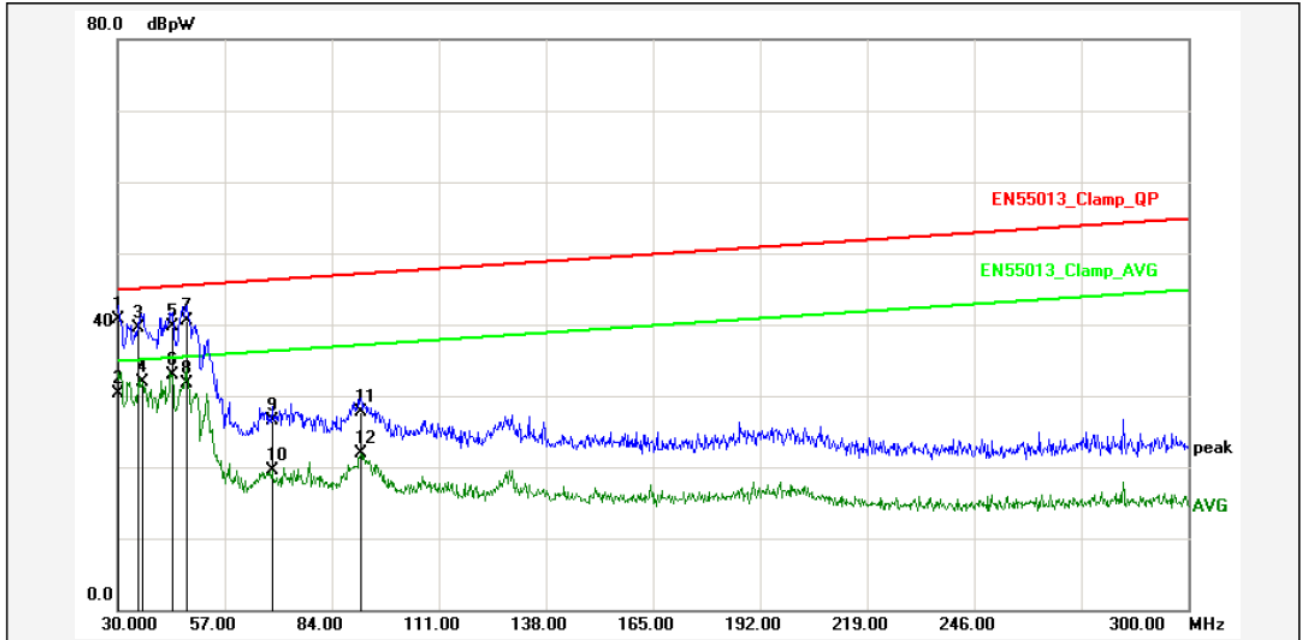
5.4.1 Turn on the power of all equipments.

5.4.2 Let the E.U.T. work in test modes (AUX IN, USB Playing, SD Card Playing) and test it.

### 5.5 Disturbance Power Emission Test Result

**PASS.**

Please refer to the following page of the worst case: SD Card Playing, USB Line

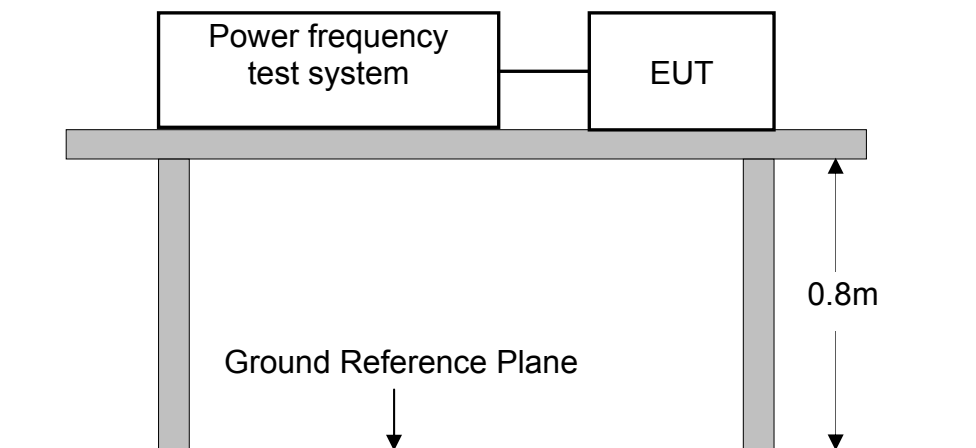


Report No.: W130X  
 Test Standard: EN55013\_Clamp\_QP  
 Test item: Disturbance Power Emission  
 Applicant: FENDA  
 Product: Bluetooth Speaker  
 Model No.: W130X  
 Temp.( )/Hum.(%): 23(C) / 50 %  
 Power Rating: AC 230V/50Hz  
 Test Engineer: Sance  
 Test Mode: SD Card Playing  
 Remark: AC Mains

No.	Frequency (MHz)	Factor (dBpW)	Reading (dBuV)	Level (dBpW)	Limit (dBpW)	Margin (dB)	Detector	P/F	Remark
1	30.3200	10.13	30.57	40.70	45.01	-4.31	QP	P	
2	30.3200	10.13	20.27	30.40	35.01	-4.61	AVG	P	
3	35.2799	9.09	30.35	39.44	45.20	-5.76	QP	P	
4	36.2799	8.88	23.08	31.96	35.23	-3.27	AVG	P	
5	43.7999	7.57	32.13	39.70	45.51	-5.81	QP	P	
6	43.7999	7.57	25.41	32.98	35.51	-2.53	AVG	P	
7	47.4800	7.05	33.55	40.60	45.65	-5.05	QP	P	
8	47.4800	7.05	24.75	31.80	35.65	-3.85	AVG	P	
9	69.0000	6.09	20.37	26.46	46.44	-19.98	QP	P	
10	69.0000	6.09	13.48	19.57	36.44	-16.87	AVG	P	
11	91.3200	5.74	22.01	27.75	47.27	-19.52	QP	P	
12	91.3200	5.74	16.07	21.81	37.27	-15.46	AVG	P	

## 6 HARMONIC CURRENT EMISSION TEST

### 6.1 Block Diagram of Test Setup



### 6.2 Limits of Harmonics current measurement

Test Standard: EN 61000-3-2

Limits for Class A equipment	
Harmonics Order n	Max. permissible harmonics current A
Odd harmonics	
3	2.30
5	1.14
7	0.77
9	0.40
11	0.33
13	0.21
$15 < n <= 39$	$0.15 \times 15/n$
Even harmonics	
2	1.08
4	0.43
6	0.30
$8 < n <= 40$	$0.23 \times 8/n$

For the following categories of equipment limits are not specified in this edition of the standard.

Note: Equipment with a rated power of 75W or less, other than lighting equipment.

### 6.3 Test Procedure

The E.U.T. was put on the top of a wooden table 0.8m above the ground and operated to produce the maximum harmonic components under normal operating conditions for each successive harmonic component in turn.

The E.U.T. is classified as follows:

**Class A:**

Balanced three-phase equipment, Household appliances excluding equipment as Class D, Tools excluding portable tools, Dimmers for incandescent lamps, audio equipment, equipment not specified in one of the three other classes.

**Class B:**

Portable tools; Arc welding equipment which is not professional equipment.

**Class C:**

Lighting equipment.

**Class D:**

Equipment having a specified power less than or equal to 600W of the following types: Personal computers and personal computer monitors and television receivers.

### 6.4 Operating Condition of E.U.T.

6.4.1 Setup the E.U.T. and simulators as shown in Section 2.3.

6.4.2 Turn on the power of all equipments.

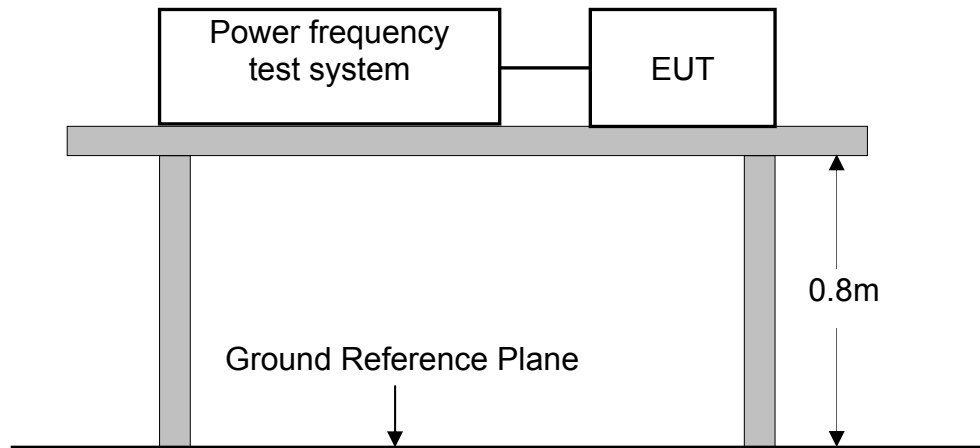
6.4.3 Let the E.U.T. work in test modes (AUX IN, USB Playing, SD Card Playing) and test it.

### 6.5 Test Results

The E.U.T. is not required to meet this test item as its power consumption is lower than 75W.

## 7. VOLTAGE FLUCTUATIONS & FLICKER TEST

### 7.1 Block Diagram of Test Setup



### 7.2 Limits of Voltage Fluctuations & Flicker Measurement

Test Standard: EN 61000-3-3

Test Item	Limit
$P_{st}$ (Short-term flicker indicator.)	1.0
$P_{lt}$ (Long-term flicker indicator.)	0.65
$T_{d(t)}$ (ms) ( Maximum time that $d(t)$ exceeds 3.3%)	500
$d_{max}$ (%) (Maximum relative voltage change.)	4
$d_c$ (%) (Relative steady-state voltage change)	3.3

### 7.3 Test Procedure

The E.U.T. was put on the top of a wooden table 0.8m above the ground and operated to produce the most unfavorable sequence of voltage changes under normal operating conditions.

### 7.4 Operating Condition of E.U.T.

7.4.1 Setup the E.U.T. and simulators as shown in Section 2.3.

7.4.2 Turn on the power of all equipments.

7.4.3 Let the E.U.T. work in test modes (AUX IN, USB Playing, SD Card Playing) and test it.

## 7.5 Test Results

**PASS.**

Please refer to the following page.



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

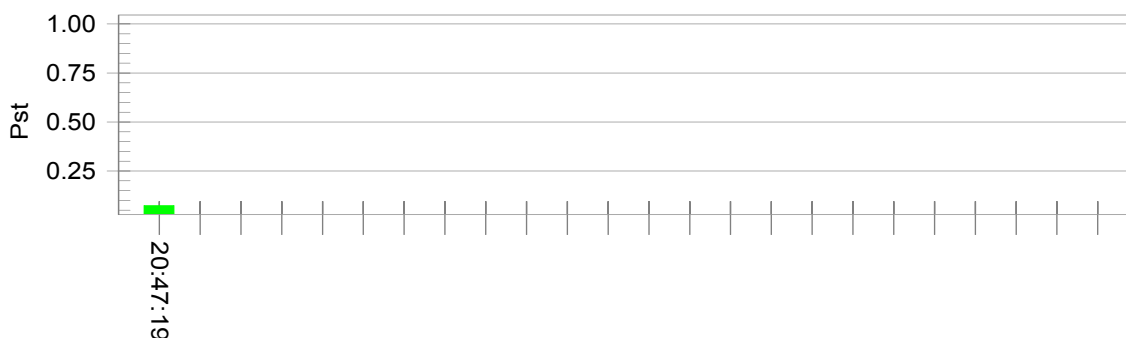
EUT: Bluetooth Speaker  
 Test category: All parameters (European limits)  
 Test date: 2014-6-12  
 Test duration (min): 10  
 Comment: USB Playing  
 Customer: FENDA  
 Model: W130X  
 Test Result: Pass

Tested by: Sance  
 Test Margin: 100  
 End time: 20:47:20  
 Data file name: F-000108.cts\_data

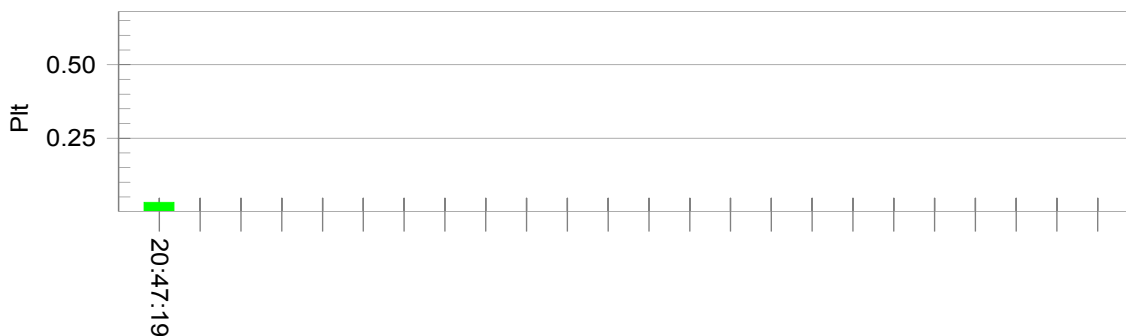
Status: Test Completed

Pst<sub>t</sub> and limit line

European Limits



Plt and limit line



Parameter values recorded during the test:

Vrms at the end of test (Volt):	230.21		
Highest dt (%):	0.27	Test limit (%):	3.30 Pass
Tmax(mS) > dt:	0	Test limit (mS):	500.0 Pass
Highest dc (%):	0.00	Test limit (%):	3.30 Pass
Highest dmax (%):	0.28	Test limit (%):	4.00 Pass
Highest Pst (10 min. period):	0.073	Test limit:	1.000 Pass
Highest Plt (2 hr. period):	0.032	Test limit:	0.650 Pass

## 8. PERFORMANCE CRITERIA FOR IMMUNITY

The performance criteria are referred to the test standard: EN 55020

### Performance Criteria 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. Multifunction equipment shall for each function meet the relevant requirements. Evaluation is carried out for audio and video functions.

### Evaluation of Audio Quality

The criterion of compliance with the requirement is a wanted to unwanted audio signal ratio of  $\geq 40$ dB at a wanted audio signal level of 50mW, or at another audio signal level specified by the manufacturer. If the S/N ratio is less than 43dB, the performance criterion for audio assessment is the actual S/N ratio minus 3dB. For AM sound receivers the criterion is  $\geq 26$ dB at 50mW; and is  $\geq 26$ dB at 500mW for the AM/FM car radios or broadcast receiver cards for computers.

### Evaluation of Video Quality

In the evaluation of picture interference the wanted test signal produces a standard picture (in the case of video tape equipment on the screen of the test-tv-set) and the unwanted signal produces a degradation of the picture. The degradation may be in a number of forms, such as a superposed pattern, disturbance of synchronization, geometrical distortion, loss of picture contrast, of colour, etc.

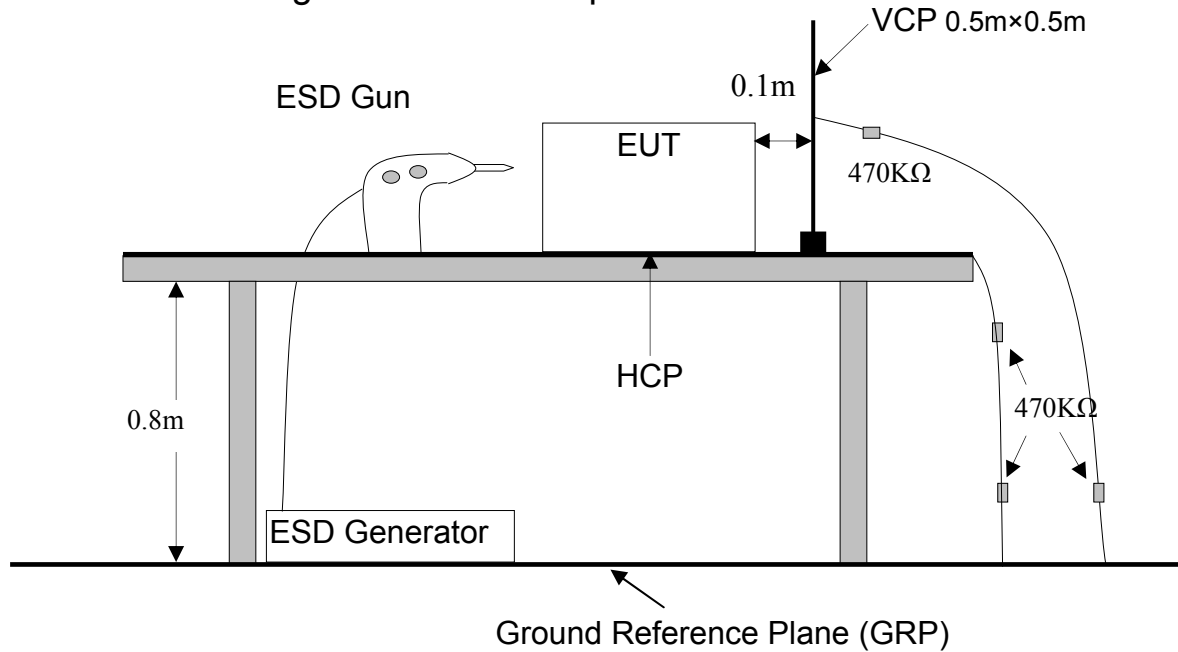
The criterion of compliance with the requirement is just perceptible degradation by observation of the picture. The screen shall be observed under normal viewing conditions (brightness 15 lx to 20 lx), at a viewing distance of six times the height of the screen.

### Performance 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 cause 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 application of the test. During the test, degradation of performance is allowed.

## 9. ELECTROSTATIC DISCHARGE IMMUNITY TEST

### 9.1 Block Diagram of Test Setup



### 9.2 Test Standard and Severity Levels

#### 9.2.1 Test Standard:

EN 55020

(EN 61000-4-2 Air Discharge: Severity Level: 3,  $\pm 8$ KV;  
 Contact Discharge: Level: 2,  $\pm 4$ KV)

#### 9.2.2 Severity Levels:

Level	Test Voltage Contact Discharge (KV)	Test Voltage Air Discharge (KV)
1.	$\pm 2$	$\pm 2$
2.	$\pm 4$	$\pm 4$
3.	$\pm 6$	$\pm 8$
4.	$\pm 8$	$\pm 15$
X	Special	Special

## 9.3 Test Procedure

### 9.3.1 Air Discharge:

This test is done on a non-conductive surface. The round discharge tip of the discharge electrode shall be approached as fast as possible to touch the E.U.T.. After each discharge, the discharge electrode shall be removed from the E.U.T.. The generator is then re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed

### 9.3.2 Contact Discharge:

All the procedure shall be same as Section 9.3.1. except that the tip of the discharge electrode shall touch the E.U.T..

### 9.3.3 Indirect discharge for horizontal coupling plane

At least 10 single discharges(in the most sensitive polarity) shall be applied at the front edge of each HCP opposite the center point of each unit(if applicable) of the E.U.T. and 0.1m from the front of the E.U.T.. The long axis of the discharge electrode shall be in the plane of the HCP and perpendicular to its front edge during the discharge.

### 9.3.4 Indirect discharge for vertical coupling plane

At least 10 single discharge (in the most sensitive polarity) shall be applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m X 0.5m, is placed parallel to, and positioned at a distance of 0.1m from the E.U.T.. Discharges shall be applied to the coupling plane, with this plane in sufficient different positions that the four faces of the E.U.T. are completely illuminated.

## 9.4 Test Results

**PASS.**

Please refer to the following page.

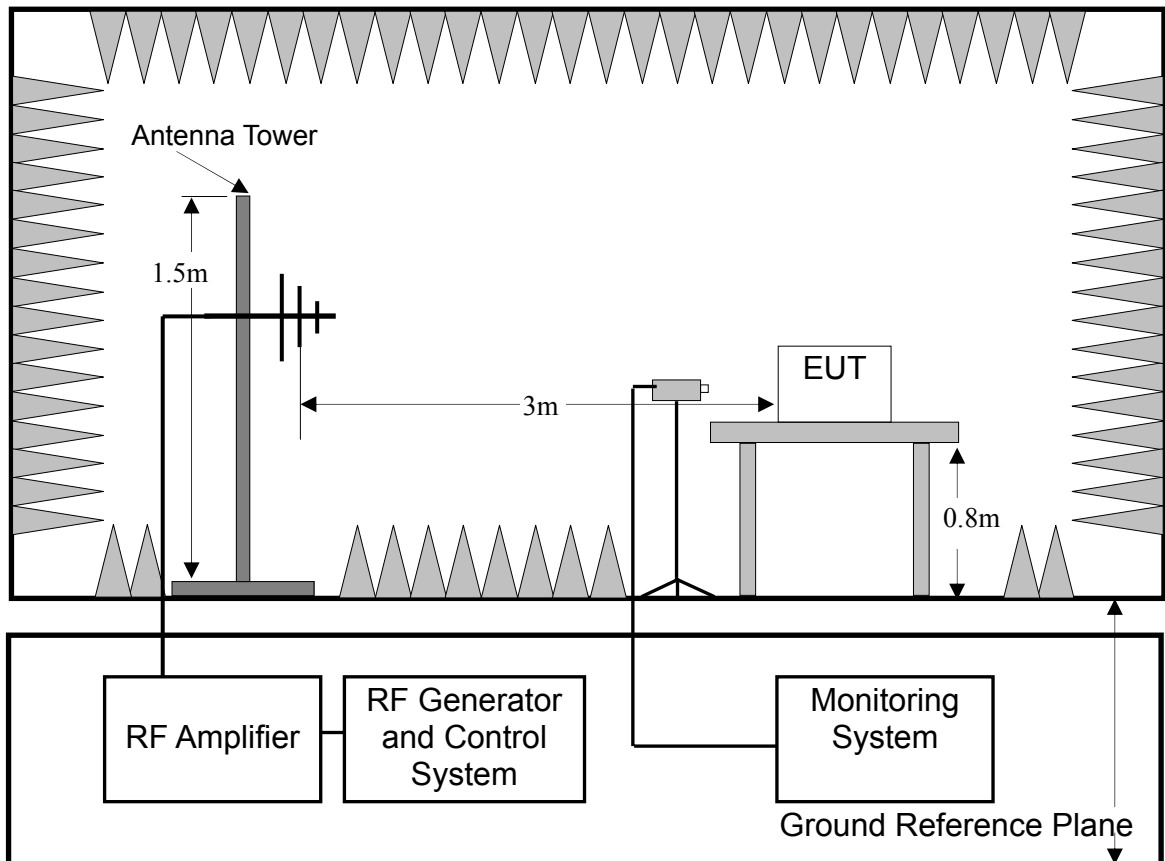
## Electrostatic Discharge Test Results

Ambient Condition:	Temp.: 21 °C	R.H.: 49%	Air Pressure: 101 kPa
Power Supply:	AC 230V 50Hz	Required Performance Criterion: B	
Test Level:	±2, 4 kV Contact Discharge; ±2, 4, 8 kV Air Discharge For each point positive 10 times and negative 10 times		
Tested mode:	AUX IN, USB Playing, SD Card Playing		
<b>Test Point</b>	<b>Kind</b> A-Air Discharge C-Contact Discharge		<b>Result</b> (Performance Criterion)
Slot of EUT	A		A
I/O Port	C		B
USB/ SD Card Port	A		B
Screw	C		A
Indirect Discharge (HCP)	C		A
Indirect Discharge (VCP)	C		A
<p>Note: The EUT stop working during the test, but it can be resumed to normal operation by users after test. After consider with client's confirmation that relevant instruction will be mentioned in the manual, so the test result was considered to be passed.</p>			
Test Equipment : ESD Tester (TESEQ, NSG 437)		Test Engineer : Stan	

## 10. RF FIELD (KEYED CARRIER) STRENGTH SUSCEPTIBILITY

### TEST (S5)

#### 10.1 Block Diagram of Test Setup



#### 10.2 Test Standard and Severity Levels

##### 10.2.1 Test Standard

EN 55020  
 (EN 61000-4-3, Severity Level: 2, 3V / m)

##### 10.2.2 Severity Levels

Level	Field Strength V/m
1.	1
2.	3
3.	10
X	Special

### 10.3 Test Procedure

The E.U.T. and its simulators are placed on a turn table which is 0.8 meter above ground. E.U.T. is set 3 meter away from the transmitting antenna which is mounted on an antenna tower. Both horizontal and vertical polarization of the antenna are set on test. Each of the four sides of E.U.T. must be faced this transmitting antenna and measured individually.

All the scanning conditions are as follows :

Condition of Test	Remarks
1. Fielded Strength	3 V/m (Severity Level 2)
2. Radiated Signal	Modulated
3. Scanning Frequency	895 - 905 MHz
4. Dwell time of radiated	0.0015 decade/s
5. Waiting Time	1 Sec.

### 10.4 Test Results

**PASS.**

Please refer to the following page of the worst case.

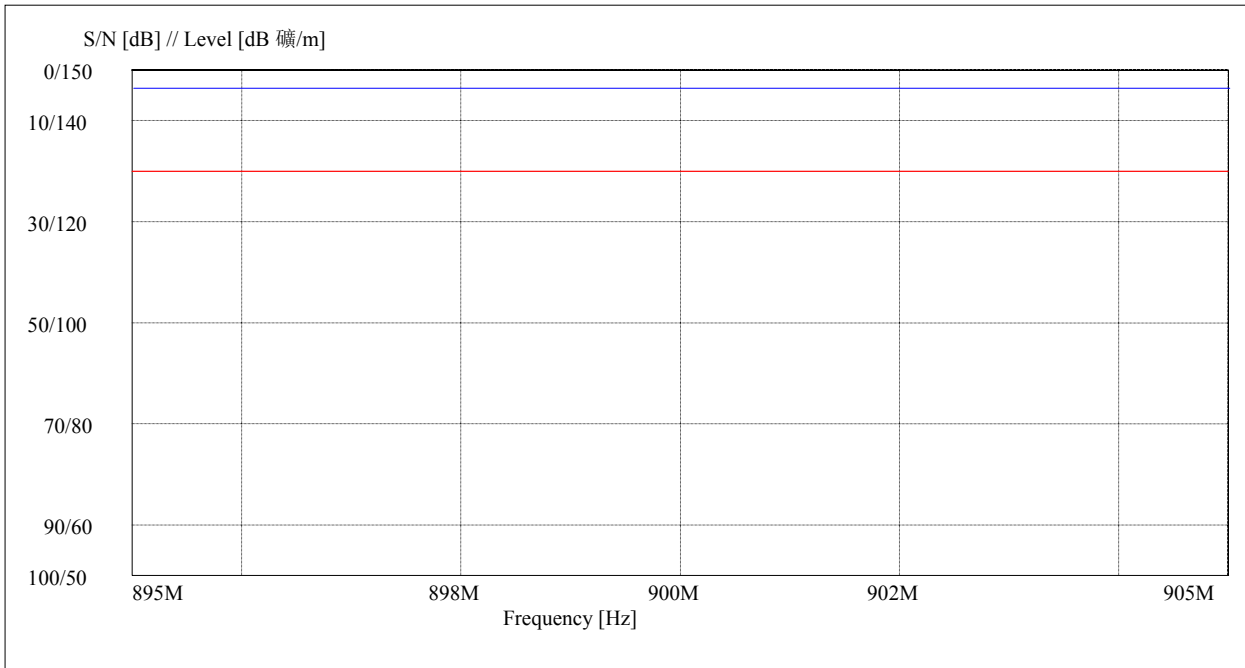


**Test: Keyed Carrier S5 <W130X>**

Test Mode: Amplifier -  
Operating Mode: AUX  
Frequency: -

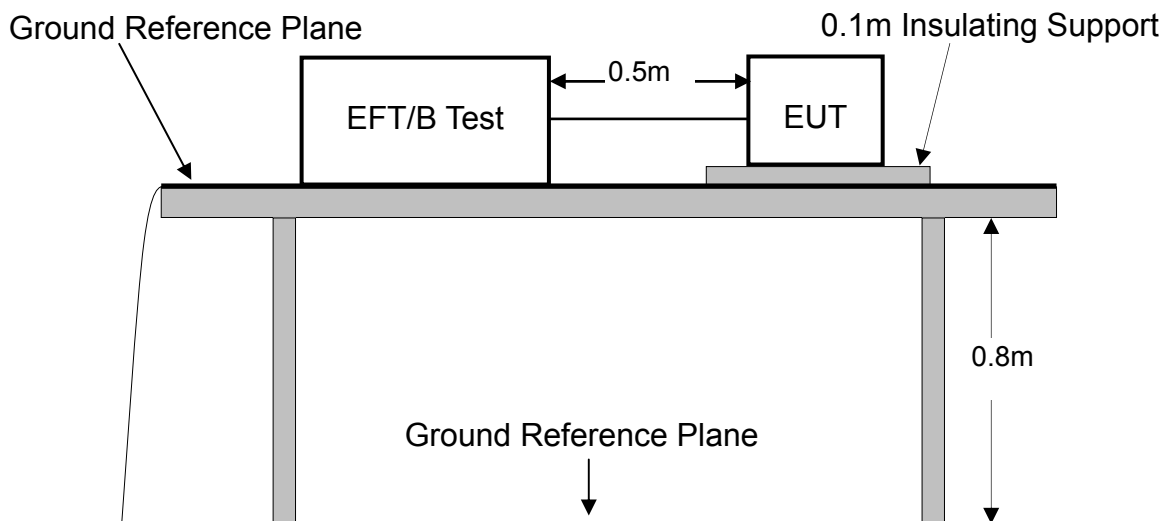
Monitor: Speaker  
S/N: 71.8 dB  
AF Level: 49.1 mW

Interf. Signal: Scan, 130614-00012-001, 6/13/2014, 2:52:44PM



## 11. ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST

### 11.1 Block Diagram of Test Setup



### 11.2 Test Standard and Severity Levels

#### 11.2.1 Test Standard

EN 55020

(EN 61000-4-4, Severity Level, Level 2: 1KV)

#### 11.2.2 Severity level

Open circuit output test voltage and repetition rate of the impulses				
Level	On power port, PE		On I/O (Input/Output) Signal data and control ports	
	Voltage peak KV	Repetition rate KHz	Voltage peak KV	Repetition rate KHz
1.	0.5 KV	5 or 100	0.25 KV	5 or 100
2.	1 KV	5 or 100	0.5 KV	5 or 100
3.	2 KV	5 or 100	1 KV	5 or 100
4.	4 KV	5 or 100	2 KV	5 or 100
X	Special	Special	Special	Special

Note 1 Use of 5 KHz repetition rates is traditional; however, 100 KHz is closer to reality. Product committees should determine which frequencies are relevant for specific products or product types.

Note 2 With some products, there may be no clear distinction, between power ports and I/O ports, in which case it is up to product committees to make this determination for test purposes.

Note 3 "X" is an open level. The level has to be specified in the dedicated equipment specification.

### 11.3 Test Procedure

The E.U.T. is put on the table which is 0.8 meter high above the ground. This reference ground plane shall project beyond the E.U.T. by at least 0.1m on all sides and the minimum distance between E.U.T. and all other conductive structure, except the ground plane beneath the E.U.T., shall be more than 0.5m.

#### 11.3.1 For input and output AC power ports:

The E.U.T. is connected to the power mains by using a coupling device which couples the EFT interference signal to AC power lines. Both polarities of the test voltage should be applied during compliance test and the duration of the test is 2 minutes.

#### 11.3.2 For signal lines ports:

It's unnecessary to test.

#### 11.3.3 For DC ports:

It's unnecessary to test.

### 11.4 Test Result

**PASS.**

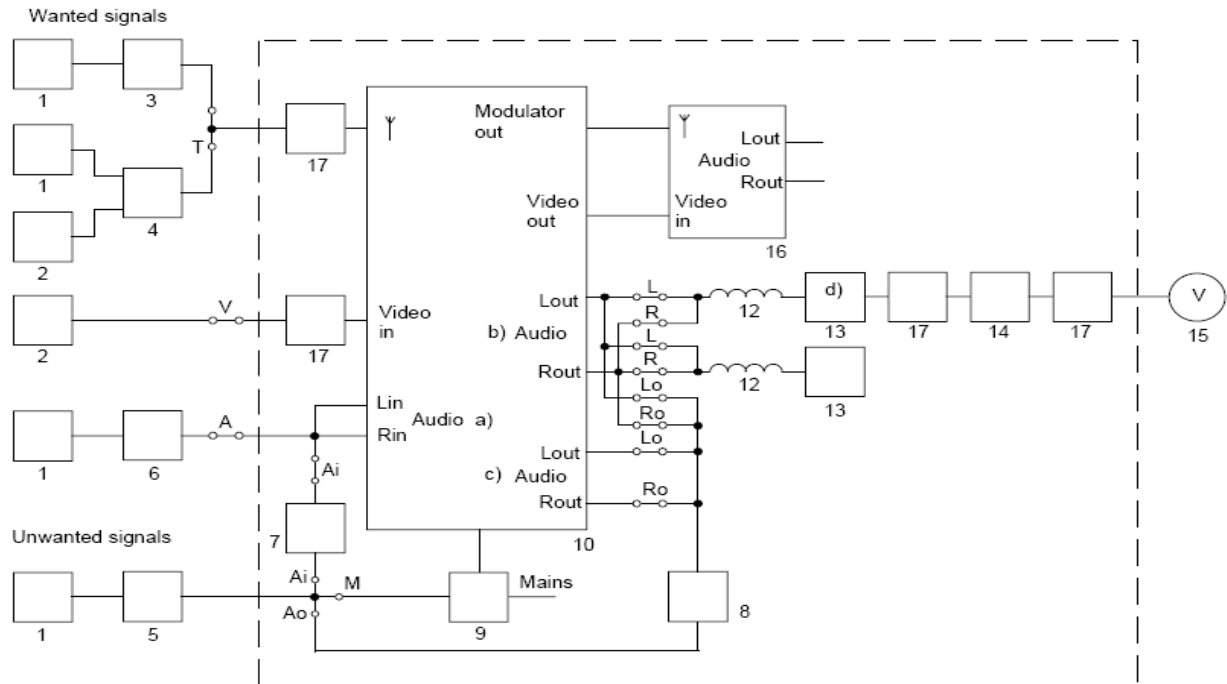
Please refer to the following page.

## Electrical Fast Transient/Burst Test Results

Ambient Condition:	Temp.: 21 °C	R.H.: 49 %	Air Pressure: 101 kPa
Power Supply:	AC 230V 50Hz	Required Performance Criterion: B	
Test Level:	Repetition Frequency: 5kHz; Duration: 15ms; Period: 300ms		
Test mode:	AUX IN, USB Playing, SD Card Playing		
Line :	<input checked="" type="checkbox"/> AC Mains	<input type="checkbox"/> Signal line	<input type="checkbox"/> DC line
Coupling :	<input checked="" type="checkbox"/> Direct	<input type="checkbox"/> Capacitive	
<b>Line</b>	<b>Test Voltage</b>	<b>Result</b> (Performance Criterion)	
L	±1KV	A	
N	±1KV	A	
PE			
L、N	±1KV	A	
L、PE			
N、PE			
L、N、PE			
Signal line			
DC line			
Note:			
Test Equipment : Burst Tester(EM TEST, UCS500N)		Test Engineer : Stan	



Other terminals:



IEC 452/02

- 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 kΩ) 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 $L = 100 \mu\text{H}$                   |
| 4 RF generator G4 for TV                 | 13 Rated load impedance of the audio output $R_L$   |
| 5 RF generator G5 for unwanted signal    | 14 Band-pass filter BP (input impedance 10 kΩ)      |
| 6 Impedance ( $R_s$ to $R_{G1}$ )        | 15 Audio frequency voltmeter V                      |
| 7 RC network for audio inputs $R_{C_i}$  | 16 Test-TV-set TTS                                  |
| 8 RC network for audio outputs $R_{C_o}$ | 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 kΩ in the case of video tape equipment).

## 12.2 Test Standard and Limits

### 12.2.1 Test Standard EN 55020

### 12.2.2 Limits

Table 1 Limits of immunity of RF voltages of mains, loudspeaker and headphone terminals

Frequency MHz	Level dB( $\mu$ V)(e.m.f.)
0.15 to 30	130
30 to 100	120
100 to 150	120-110 <sup>a</sup>
<sup>a</sup> Decreasing linearly with the logarithm of frequency	

Table 2 Limits of immunity to RF voltages of audio input and output terminals (except loudspeaker and headphone terminals)(S2)

Frequency MHz	Level dB( $\mu$ V)(e.m.f.)
0.15 to 1.6	80-90 <sup>a</sup>
1.6 to 20	90-120 <sup>a</sup>
20 to 100	120
100 to 150	120-110 <sup>b</sup>
<sup>a</sup> Increasing linearly with the logarithm of frequency	
<sup>b</sup> Decreasing linearly with the logarithm of frequency	

## 12.3 Test Result

**PASS.**

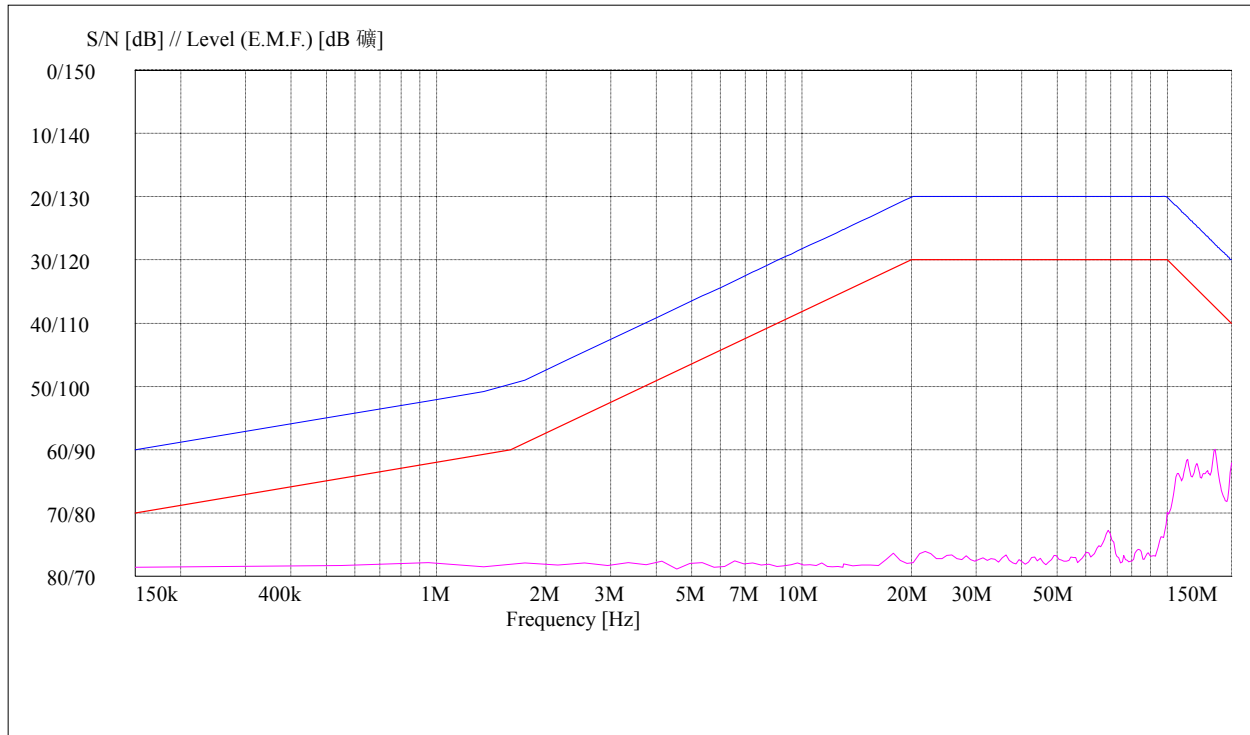
Please refer to the following page of the worst case.



**Test: Immunity Conducted Voltages S2a <W130X>**

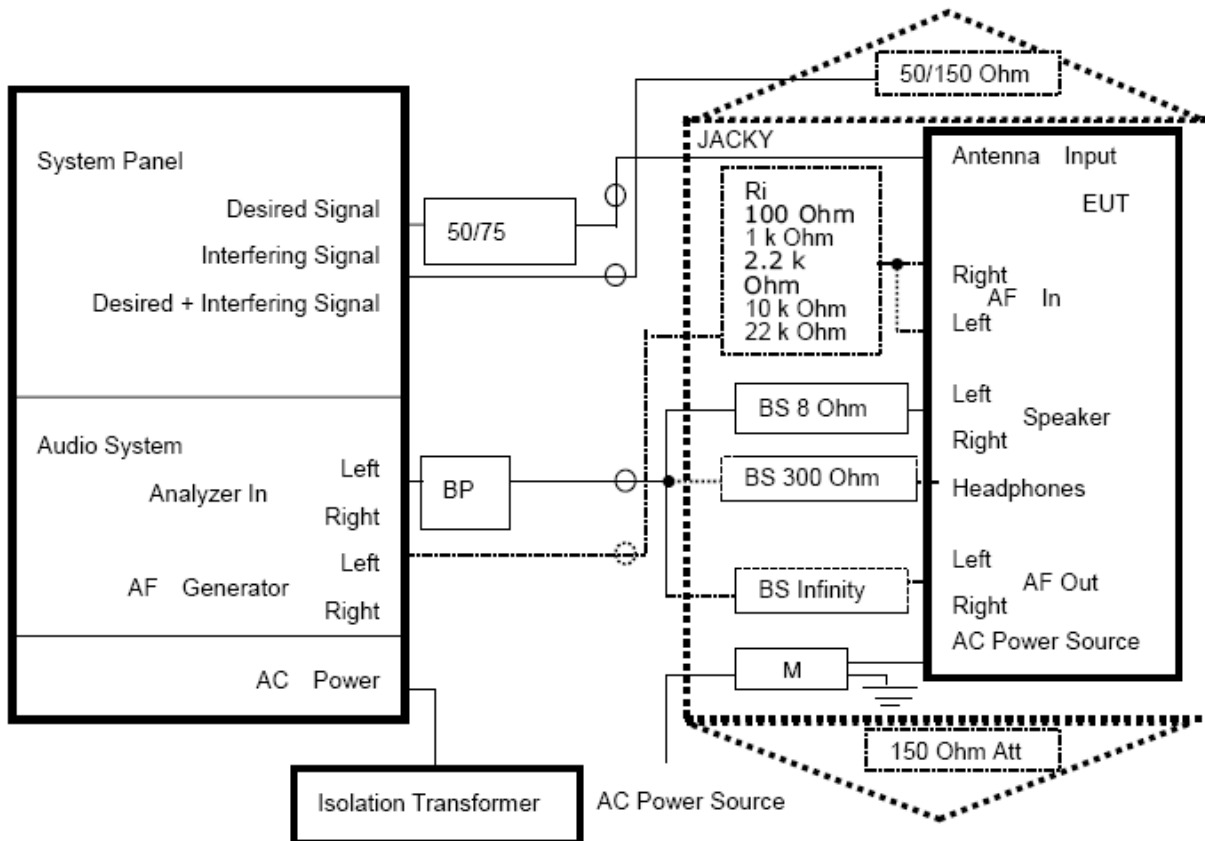
Test Mode:	Amplifier -	Monitor:	Speaker
Operating Mode:	AUX	S/N:	73.5 dB
Frequency:	-	AF Level:	48.8 mW

Interf. Signal: AUX, 130614-00014-001, 6/13/2014, 3:11:36PM



### 13. AMBIENT ELECTROMAGNETIC FIELDS IMMUNITY TEST(S3)

#### 13.1 Block Diagram of Test Setup



## 13.2 Test Standard and Limits

### 13.2.1 Test Standard EN 55020

### 13.2.2 Limits

Limits of immunity to ambient electromagnetic fields of Television reception functions of sound receivers

Frequency MHz	Level dB( $\mu$ V/m)
0,15 to 47 Except frequency bands: $(f_c - 1,5)$ to $(f_c + 1,5)$ $(f_s - 0,5)$ to $(f_s + 0,5)$ $(f_i - 2)$ to $(f_v + 2)$ <sup>a</sup> $(f_v - 2)$ to $(f_i + 2)$ <sup>b</sup>	125  101 101 101 101
For non-European countries and Russia 47 to 150 <sup>c</sup> Except the tuned channel $\pm 0,5$	109 <sup>d</sup>
For European countries 47 to 87 87 to 108 108 to 144 144 to 150 Except the tuned channel $\pm 0,5$	109 125 109 125
NOTE $f_i$ is the sound intermediate frequency $f_v$ is the vision intermediate frequency $f_s$ is the intercarrier sound frequency $f_c$ is the colour subcarrier frequency	
<sup>a</sup> For systems B, D, G, K, I, L, M. <sup>b</sup> Only for system L'. <sup>c</sup> The frequency 47 MHz can be varied on a national basis depending on the use of this frequency range. <sup>d</sup> For television receivers with reception function in this frequency range. For television receivers without reception function in this frequency range a level of 125 dB( $\mu$ V/m) shall apply.	

### 13.3 Test Result

**PASS.**

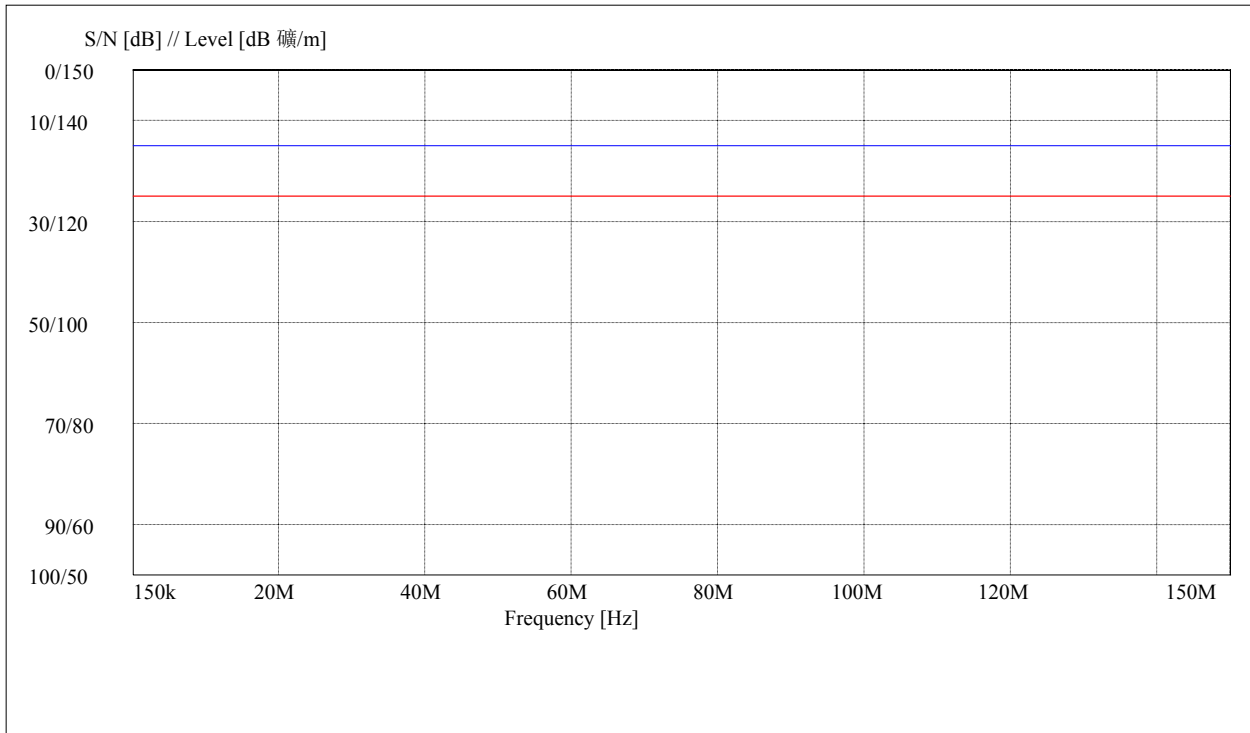
Please refer to the following page of the worst case.

**Test: Immunity Radiated Fields S3 <W130X>**

Test Mode: Amplifier -  
Operating Mode: AUX  
Frequency: -

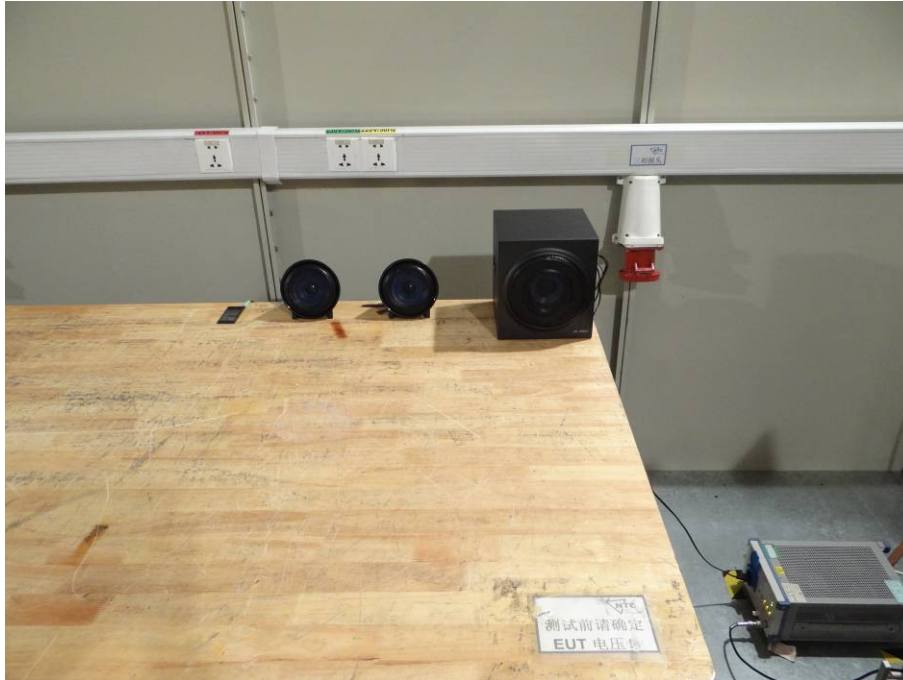
Monitor: Speaker  
S/N: 74.9 dB  
AF Level: 50.1 mW

**Interf. Signal: Scan, 130614-00015-001, 6/13/2014, 3:29:17AM K2 = 1.6 dB**



## 14. PHOTOGRAPHS

### 14.1 Photo of Power Line Conducted Emission Measurement



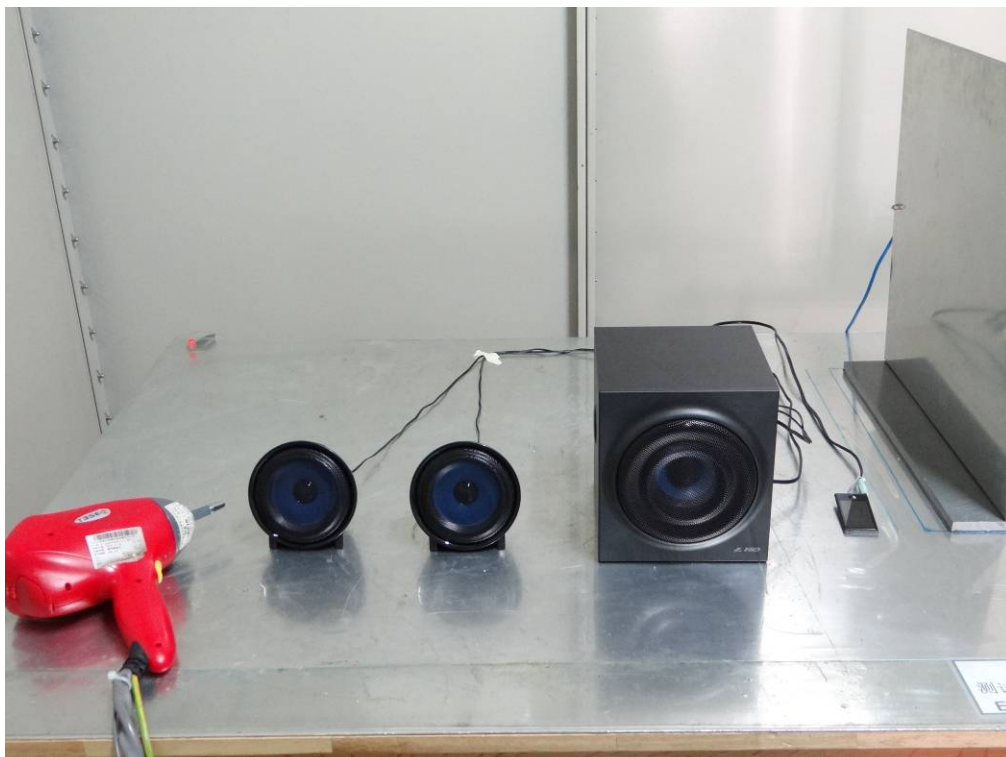
### 14.2 Photo of Disturbance Power Measurement



### 14.3 Photo of Harmonic Current / Flicker Measurement



### 14.4 Photo of Electrostatic Discharge Immunity Measurement

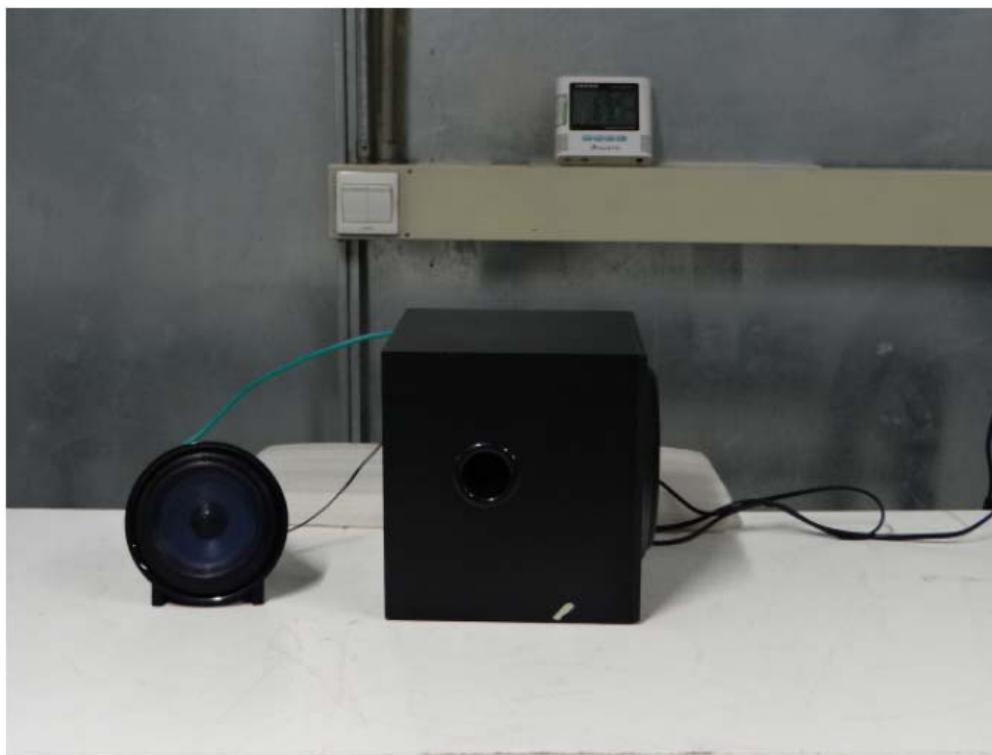




### 14.5 Photo of Electrical Fast Transient /Burst Immunity Measurement



### 14.6 Photo of S2 Measurement





### 14.7 Photo of S3 Measurement



# APPENDIX I (PHOTOS OF E.U.T.)

**Figure 1**  
General Appearance of the E.U.T.  
M/N: W130X



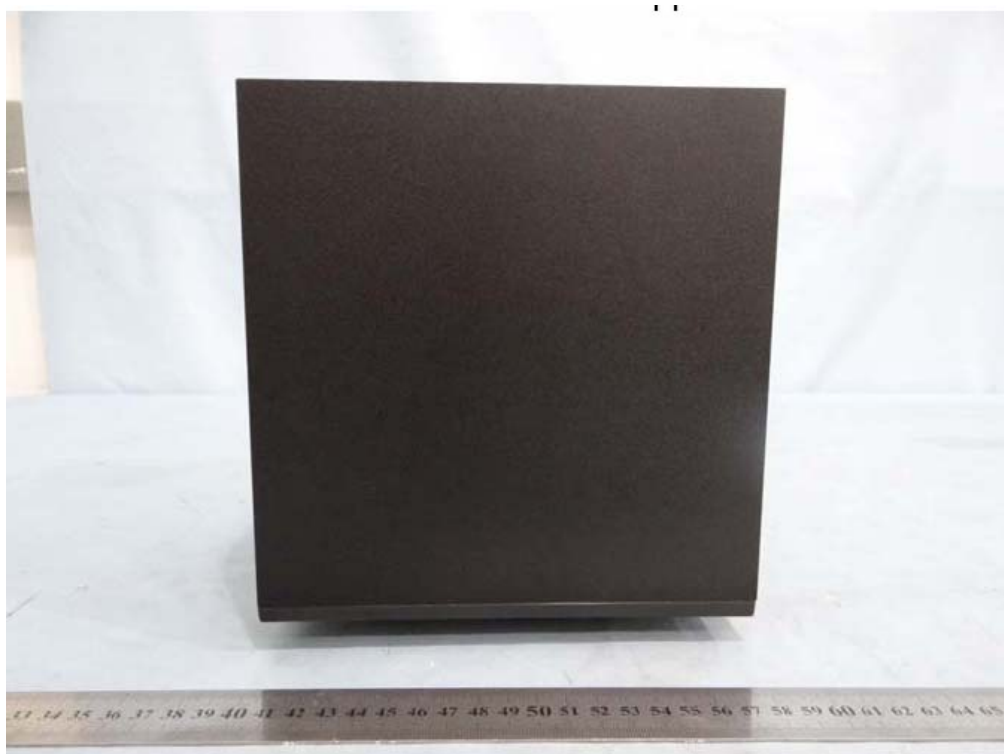
**Figure 2**  
General Appearance of the E.U.T.  
M/N: W130X



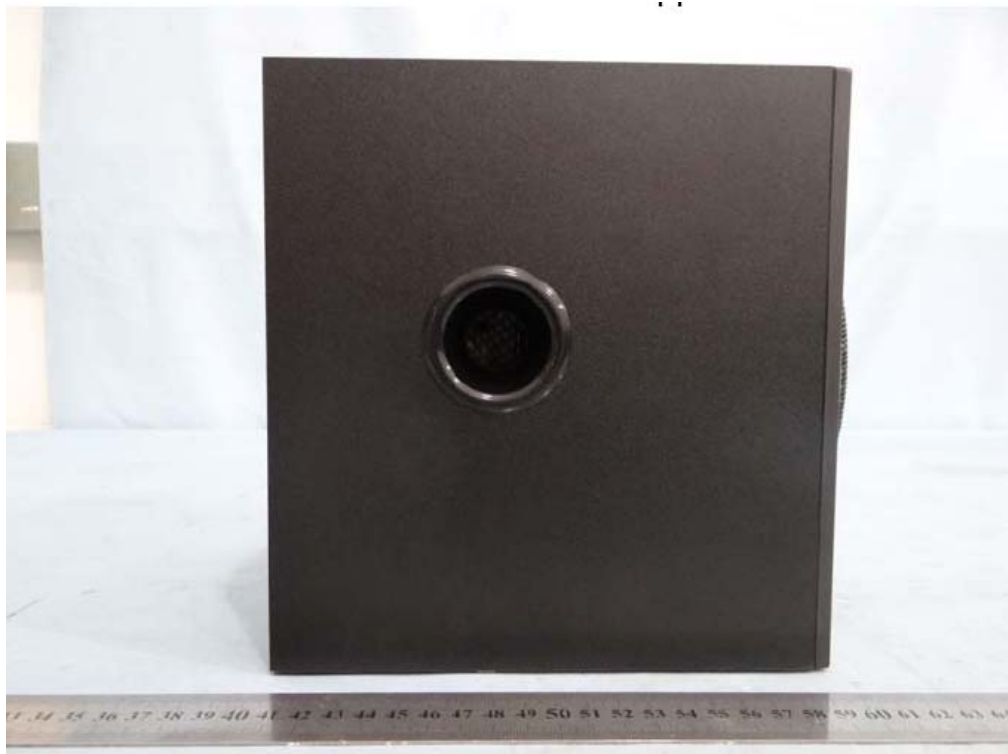
**Figure 3**  
General Appearance of the E.U.T.  
M/N: W130X



**Figure 4**  
General Appearance of the E.U.T.  
M/N: W130X



**Figure 5**  
General Appearance of the E.U.T.  
M/N: W130X

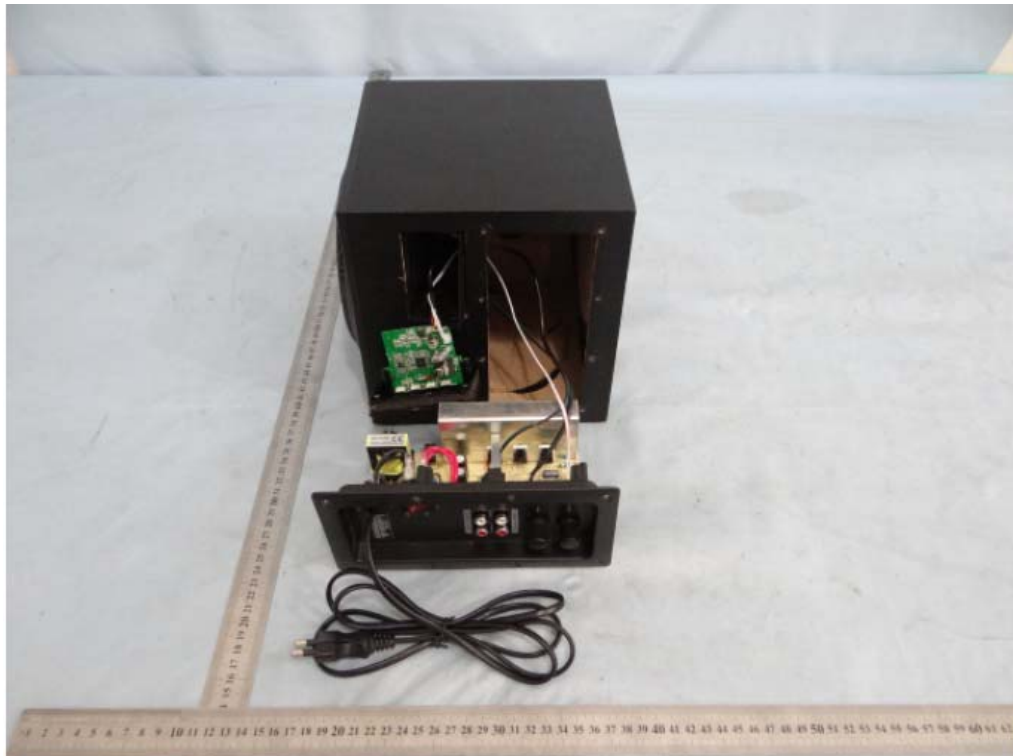


**Figure 6**  
General Appearance of the E.U.T.  
M/N: W130X

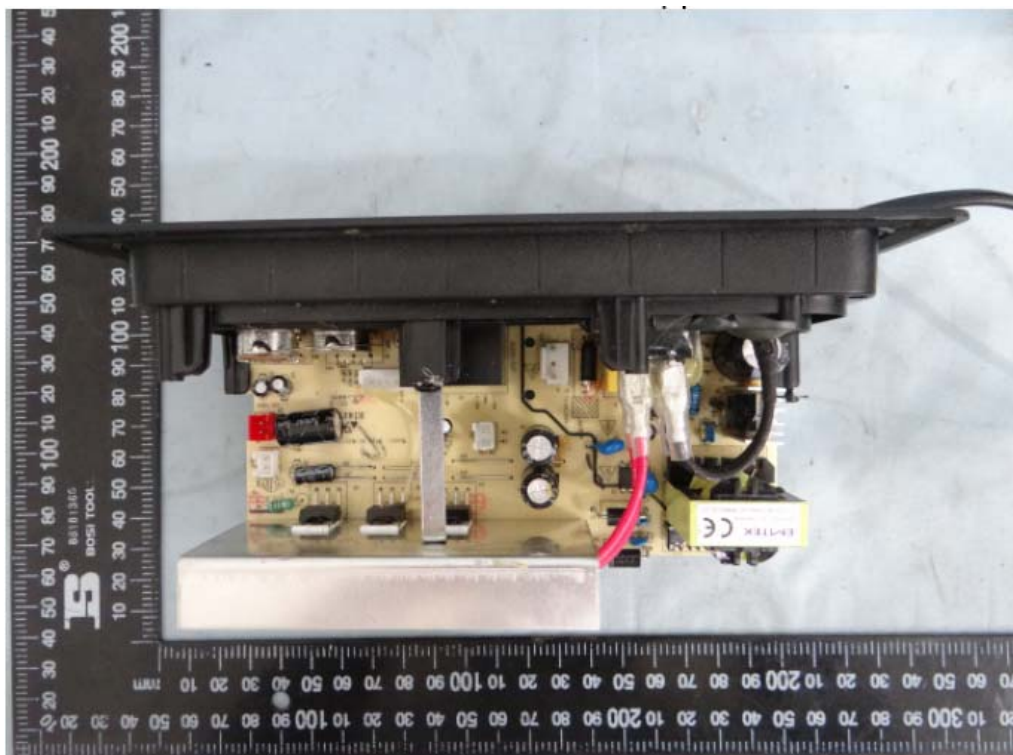




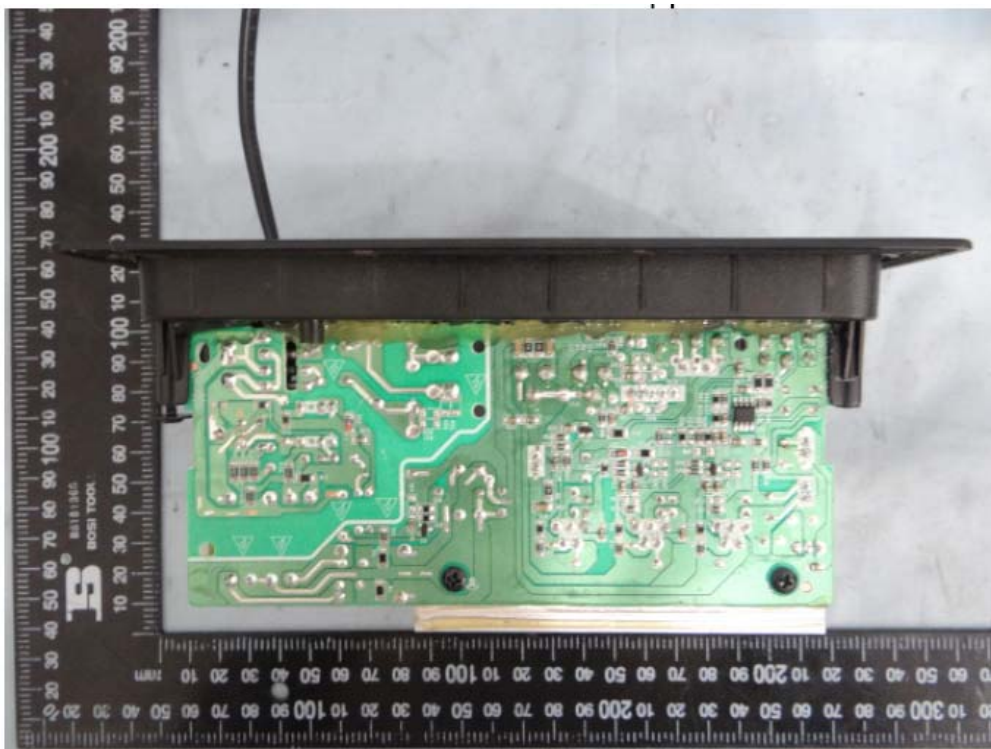
**Figure 7**  
General Internal of the E.U.T.  
M/N: W130X



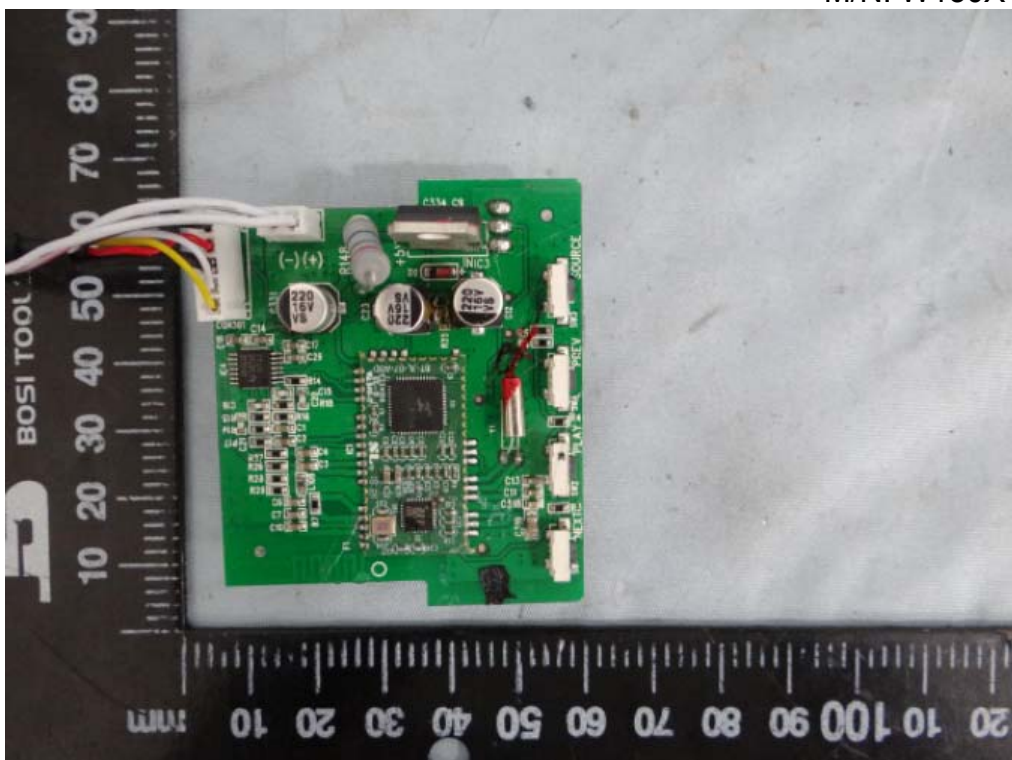
**Figure 8**  
General Appearance of the PCB  
M/N: W130X



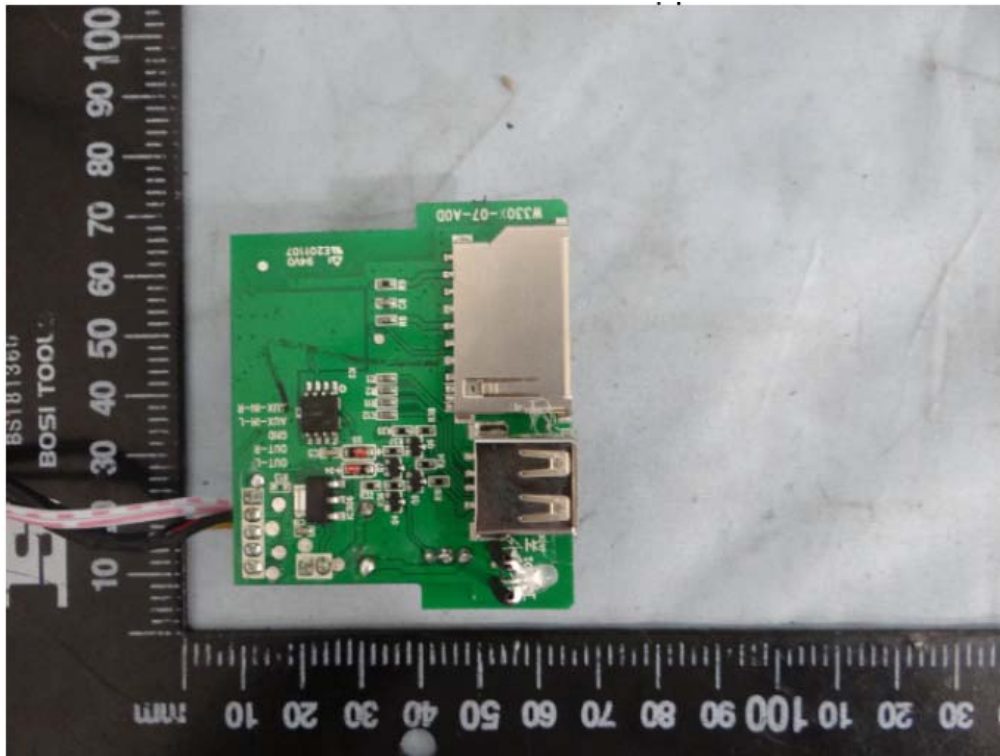
**Figure 9**  
General Appearance of the PCB  
M/N: W130X



**Figure 10**  
General Appearance of the PCB  
M/N: W130X



**Figure 11**  
General Appearance of the PCB  
M/N: W130X



**Figure 12**  
General Appearance of the E.U.T.  
M/N: A180X





**Figure 13**  
General Appearance of the E.U.T.  
M/N: A180X



**Figure 14**  
General Appearance of the E.U.T.  
M/N: A180X



**Figure 15**  
General Appearance of the E.U.T.  
M/N: A180X



**Figure 16**  
General Appearance of the E.U.T.  
M/N: A180X



**Figure 17**  
General Appearance of the E.U.T.  
M/N: A180X



--- End ---