

# **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, Shiyan Town, Baoan District, Shenzhen

City, Guangdong, China

Manufacturer / Factory : Shenzhen Fenda Technology Co., Ltd.

Address : Fenda Hi-Tech Park, Zhoushi Road, Shiyan Town, Baoan District, Shenzhen

City, Guangdong, China

E.U.T. : BLUETOOTH SPEAKER

Brand Name : F&D

Model No. : W4, 0102019014, OMA2120, W4MINI, W3, W3MINI

(For model difference, refer to section 2.1)

Measurement Standard: EN 55032: 2012+AC: 2013,

EN 55020: 2007+A11: 2011

(EN 61000-4-2: 2009)

Date of Receiver : April 29, 2016

Date of Test : April 29, 2016 to May 16, 2016

Date of Report : May 16, 2016

This Test Report is Issued Under the Authority of :

Prepared by

Alina Guo / Engineer

Approved Autograed Signer

Jori Fan Authorized Signatory

This report shows that the E.U.T. is technically compliant with the EN 55032 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.



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APPENDIX I (Photos of the E.U.T.) (4 pages)



# **Revision History of This Test Report**

Report Number	Description	Issued Date
NTC1604354E	Initial Issue	2016-05-16



## 1. SUMMARY OF TEST RESULTS

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

EMISSION							
Standard	Test Type	Result	Remarks				
	Mains Terminal Disturbance	PASS	Uncertainty: 2.7dB				
	Voltage Test		-				
EN 55032: 2012+AC:	Antenna Terminal	N/A	Not Applicable				
2013	Disturbance Voltage Test						
2013	Disturbance Power Emissions	N/A	Uncertainty: 2.8dB				
	Test		-				
	Radiated Emission Test	PASS	Not Applicable				

	IMMUNITY(EN 55020: 2007+A11: 2011)							
Standard	Test Type	Result	Remarks					
	Input immunity (S1)	N/A	Meets the requirements.					
	Immunity from conducted voltages (S2a)	PASS	Meets the requirements.					
EN 55020: 2007+A11: 2011	Immunity from conducted currents (S2b)	N/A	Meets the requirements.					
	Immunity from radiated fields (S3)	N/A	Meets the requirements.					
	Screening effectiveness (S4)	N/A	Meets the requirements.					
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)	N/A	Meets the requirements.					

Report No.: NTC1604354E



## 2. GENERAL INFORMATION

2.1 Details of E.U.T.

E.U.T. : BLUETOOTH SPEAKER

Model No. : W4, 0102019014, OMA2120, W4MINI, W3, W3MINI

(All tests were carried on model OMA2120)

Brand Name : F&D

Rating : DC 5V come from USB port,

DC 3.7V Li-ion battery

Adapter : None

Test Voltage : AC 230V / 50Hz(Adapter input), DC 3.7V Battery

(Only the worst case was recorded in this report.)

Cable : USB Line: 0.30m unshielded

Description of model difference

: These models have the same circuitry, electrical mechanical, PCB layout and physical construction.

Their differences in model name for trading purpose.

Remark : None

2.2 Description of Support Device

Adapter: M/N: BNP-AC(S050-100-JP)

Input: AC100-240V 50/60Hz 0.2A

Output: DC 5.0V 1.0A

SD Card : Manufacturer: Kingston

M/N: 8GB

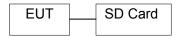
Report No.: NTC1604354E



## 2.3 Block Diagram of Test Setup

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

(1) Test mode: TF Card Playing



(2) Test mode: Charging+TF Card Playing



## 2.4 Test Facility

Site Description

EMC Lab : Listed by CNAS, August 14, 2015

The certificate is valid until August 13, 2018
The Laboratory has been assessed and proved to

be in compliance with CNAS/CL01

The Certificate Registration Number is L5795.

Listed by FCC, July 03, 2014 The Certificate Number is 665078.

Listed by Industry Canada, June 18, 2014

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, Dongquan 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	Mar. 07, 2016	1 Year
2.	L.I.S.N	Rohde & Schwarz	ENV 216	101317	Mar. 07, 2016	1 Year
3.	L.I.S.N	Schwarzbeck	NNLK8129	8129-212	Mar. 07, 2016	1 Year
4.	RF Switching	Compliance Direction	RSU-M2	38311	Mar. 07, 2016	1 Year
	Unit	Systems Inc.				

## 3.2 For Radiated Emission Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.
						Interval
1.	Test Receiver	Rohde & Schwarz	ESCI7	100837	Mar. 07, 2016	1 Year
2.	Antenna	Schwarzbeck	VULB9162	9162-010	Mar. 14, 2016	1 Year
3.	Positioning Controller	UC	UC 3000	N/A	N/A	N/A
4.	Color Monitor	SUNSPO	SP-140A	N/A	N/A	N/A
5.	Single Phase Power Line Filter	SAEMC	PF201A-32	110210	N/A	N/A
6.	3 Phase Power Line Filter	SAEMC	PF401A-200	110318	N/A	N/A
7.	DC Power Filter	SAEMC	PF301A-200	110245	N/A	N/A
8.	Cable	Huber+Suhner	CBL3-NN-9M	21490001	Mar. 07, 2016	1 Year
9.	Cable	Huber+Suhner	RG223U	N/A	Mar. 07, 2016	1 Year
10.	Power Amplifier	HP	HP 8447D	1145A00203	Mar. 07, 2016	1 Year

## 3.3 For Electrostatic Discharge Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	ESD Tester	TESEQ	NSG 437	432	Mar. 14, 2016	1 Year

Report No.: NTC1604354E



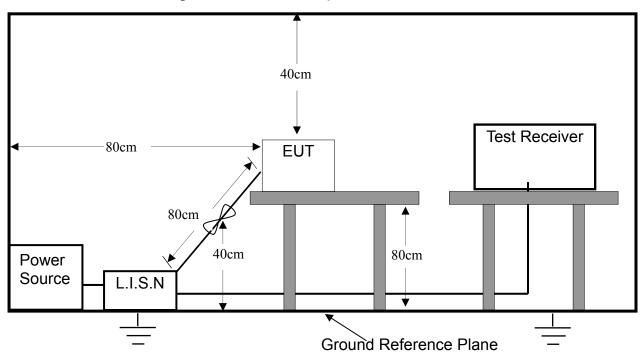
# 3.4 For EN55020 Immunity Test

Item	Equipment	Manufacturer	Model No. Serial No.		Last Cal.	Cal.
						Interval
1.	Broadcast Test System	Rohde&Schwarz	SFU	101543	May 14, 2016	1 Year
2.	TV Generator PAL	Rohde&Schwarz	SGPF	100200	May 14, 2016	1 Year
3.	Spectrum Analyzer	Rohde&Schwarz	FSL3	101507	May 14, 2016	1 Year
4.	Signal Generator	Rohde&Schwarz	SMB100A	102382	May 14, 2016	1 Year
5.	Signal Generator	Rohde&Schwarz	SMB100A	102383	May 14, 2016	1 Year
6.	Power Meter	Rohde&Schwarz	NRVS	101732	May 14, 2016	1 Year
7.	Audio Analyzer	Rohde&Schwarz	UPV	101346	May 14, 2016	1 Year
8.	Level Meter	Rohde&Schwarz	URV35	100335	May 14, 2016	1 Year
9.	100V Insertion Unit $50\Omega$	Rohde&Schwarz	URV5-Z4	100207	May 14, 2016	1 Year
10.	RF Probe	Rohde&Schwarz	URV5-Z7	100657	May 14, 2016	1 Year
11.	Absorbing Clamp	Rohde&Schwarz	MDS-21	100352	May 14, 2016	1 Year
12.	Test Software	Rohde&Schwarz	T80-K1	N/A	N/A	N/A



## 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 55032

1001 Olaridara. Ert 0000	103t Otalidard. EN 33032						
	Frequency	Limits					
Equipment type	range	(aB(	uV))				
	(MHz)	Quasi-peak	Average				
Television and sound	0.15 to 0.5	66 to 56*	56 to 46*				
receivers and associated	0.5 to 5	56	46				
equipment	5 to 30	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 EN55032 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 mode (Charging+TF Card Playing) and test it.

# 4.5 Mains Terminal Disturbance Voltage Test Results **PASS**.

Please refer to the following pages.

Report No.: NTC1604354E



Site: Conduction



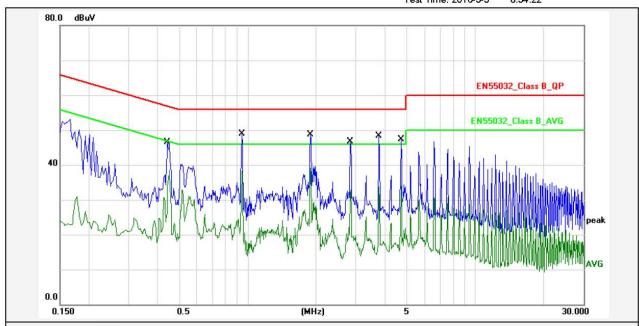
Dongguan NTC Co., Ltd. Tel: +86-769-22022444 Fax: +86-769-22022799

gCenter Web: Http://www.ntc-c.com

Test Time: 2016-5-3 8:54:22

L1

Phase:



Report No.: OMA2120

Test Standard: EN55032\_Class B\_QP

Test item: **Conducted Emission** 

Applicant: **FENDA** Temp.( )/Hum.(%): 22(C) / 50 % Product: **BLUETOOTH SPEAKER** DC 5V(From Adapter) Power Rating:

Model No.: OMA2120 Test Engineer: chilaw

Test Mode: Charging + TF Card Playing

Remark:

No.	Frequency (MHz)	Factor (dBuV)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.4460	10.80	33.60	44.40	56.95	-12.55	QP	Р	
2	0.4460	10.80	25.60	36.40	46.95	-10.55	AVG	Р	
3	0.9460	10.80	36.10	46.90	56.00	-9.10	QP	Р	
4	0.9460	10.80	25.40	36.20	46.00	-9.80	AVG	Р	
5	1.8940	10.80	35.50	46.30	56.00	-9.70	QP	Р	
6	1.8940	10.80	26.30	37.10	46.00	-8.90	AVG	Р	
7	2.8380	10.80	33.80	44.60	56.00	-11.40	QP	Р	
8	2.8380	10.80	20.00	30.80	46.00	-15.20	AVG	Р	
9	3.7900	10.80	35.50	46.30	56.00	-9.70	QP	Р	
10	3.7900	10.80	20.90	31.70	46.00	-14.30	AVG	Р	
11	4.7299	10.80	34.50	45.30	56.00	-10.70	QP	Р	
12	4.7299	10.80	21.00	31.80	46.00	-14.20	AVG	Р	

Note: Level=Reading+Factor.

Margin=Limit-Level.

Report No.: NTC1604354E

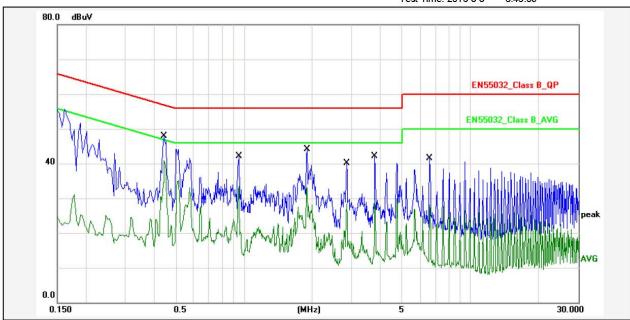


Site: Conduction

Dongguan NTC Co., Ltd. Tel: +86-769-22022444 Fax: +86-769-22022799

g Center Web: Http://www.ntc-c.com

8:48:09 Test Time: 2016-5-3



Report No.: OMA2120

Test Standard: EN55032\_Class B\_QP

Test item: **Conducted Emission** 

22(C) / 50 % Applicant: **FENDA** Temp.( )/Hum.(%): Product: **BLUETOOTH SPEAKER** Power Rating: DC 5V(From Adapter)

Phase:

Model No.: OMA2120 Test Engineer: chilaw

Test Mode: Charging + TF Card Playing

Remark:

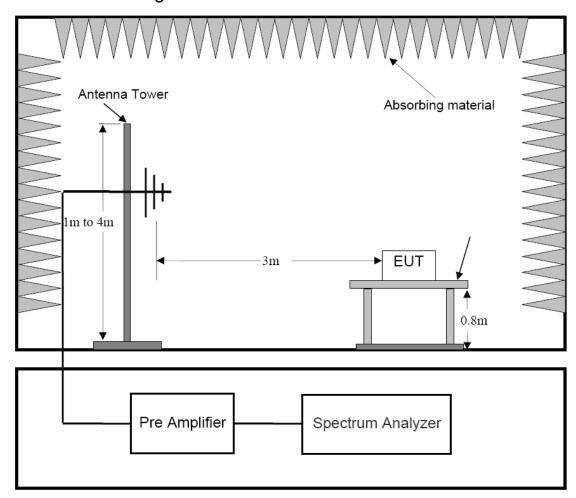
No.	Frequency (MHz)	Factor (dBuV)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.4460	10.80	35.10	45.90	56.95	-11.05	QP	Р	
2	0.4460	10.80	28.00	38.80	46.95	-8.15	AVG	Р	
3	0.9500	10.80	29.30	40.10	56.00	-15.90	QP	Р	
4	0.9500	10.80	20.60	31.40	46.00	-14.60	AVG	Р	
5	1.8980	10.80	31.20	42.00	56.00	-14.00	QP	Р	
6	1.8980	10.80	20.30	31.10	46.00	-14.90	AVG	Р	
7	2.8460	10.80	27.20	38.00	56.00	-18.00	QP	Р	
8	2.8460	10.80	15.40	26.20	46.00	-19.80	AVG	Р	
9	3.7940	10.80	29.30	40.10	56.00	-15.90	QP	Р	
10	3.7940	10.80	16.70	27.50	46.00	-18.50	AVG	Р	
11	6.6259	10.80	28.60	39.40	60.00	-20.60	QP	Р	
12	6.6259	10.80	15.20	26.00	50.00	-24.00	AVG	Р	

Note: Level=Reading+Factor. Margin=Limit-Level.



## 5. RADIATED EMISSION MEASUREMENT

## 5.1 Block Diagram of Test



### 5.1 Limit of Radiated Emission Measurement

Test Standard: EN 55032

Limits for radiated disturbance of class B ITE at a measuring distance of 3m

Quasi-peak limits dB(uV/m)
40
47

Note 1 The lower limit shall apply at the transition frequency.

Note 2 Additional provisions may be required for cases where interference occurs.

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#### 5.2 Test Procedure

E.U.T. and its simulators are placed on a turntable, which is 0.8 meter high above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. E.U.T. is set 3.0 meters away from the receiving antenna, which is mounted on a antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bilog antenna) is used as receiving antenna. Both horizontal and vertical polarization of the antenna is set on measurement. In order to find the maximum emission levels, all of the interface cables must be manipulated according to EN 55032 on radiated emission measurement.

The bandwidth of the EMI test receiver (R&S ESCI7) is set at 120 KHz. The frequency range from 30 MHz to 1000 MHz is checked.

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

- 5.4.1 Setup the E.U.T. and simulators as shown in Section 2.3.
- 5.4.2 Turn on the power of all equipments.
- 5.4.3 Let the E.U.T. work in test modes (TF Card Playing, Charging+TF Card Playing) and test it.

## 5.4 Radiated Emission Measurement Result

#### PASS.

Please refer to the following pages of the worst case: Charging+TF Card Playing.

Report No.: NTC1604354E



Site: Radiation



Test Distance:

Power Rating:

Test Engineer:

Ant. Polarization:

Temp.(C)/Hum.(%):

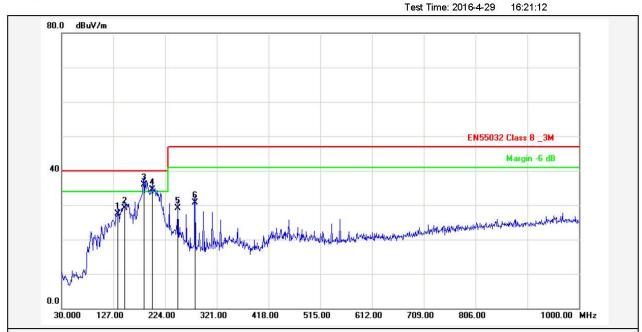
3m

Horizontal

DC 5V(From Adapter)

Anson

22(C) / 54 %



Report No.: OMA2120

Test Standard: EN55032 Class B \_3M

Test item: Radiation Emission
Applicant: FENDA

Product: BLUETOOTH SPEAKER

Model No.: OMA2120

Test Mode: Charging+TF Card Playing

Remark:

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	135.7300	-15.40	42.90	27.50	40.00	-12.50	QP			Р	
2	148.3400	-15.54	44.74	29.20	40.00	-10.80	QP			Р	
3	184.2300	-13.88	49.88	36.00	40.00	-4.00	QP			Р	
4	199.7500	-13.43	48.03	34.60	40.00	-5.40	QP			Р	
5	248.2500	-11.76	40.96	29.20	47.00	-17.80	QP			Р	
6	280.2600	-10.97	41.67	30.70	47.00	-16.30	QP			Р	

 $\label{lem:note:level=Reading+Factor.} \textbf{Note: Level=Reading+Factor.}$ 

Margin=Limit-Level.

Report No.: NTC1604354E



Site: Radiation



# Dongguan NTC Co., Ltd. Tel:+86-769-22022444 Fax:+86-769-22022799

Web: Http://www.ntc-c.com

Test Time: 2016-4-29 16:14:27

Test Distance:

Power Rating:

Ant. Polarization:

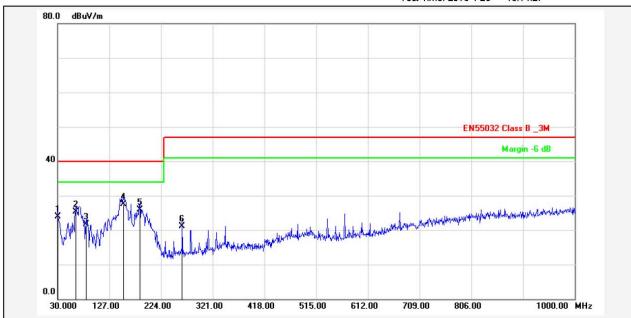
Temp.(C)/Hum.(%):

3m

Vertical

22(C) / 54 %

DC 5V(From Adapter)



Report No.: OMA2120

Test Standard: EN55032 Class B \_3M

Test item: Radiation Emission

Applicant: FENDA
Product: BLUETOOTH SPEAKER

Model No.: OMA2120 Test Engineer: Anson

Test Mode: Charging+TF Card Playing

Remark:

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)		Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	30.0000	-15.90	39.80	23.90	40.00	-16.10	QP			Р	
2	63.9500	-15.30	40.70	25.40	40.00	-14.60	QP			Р	
3	84.3198	-18.31	40.01	21.70	40.00	-18.30	QP			Р	
4	153.1900	-18.40	45.90	27.50	40.00	-12.50	QP			Р	
5	184.2300	-16.88	42.78	25.90	40.00	-14.10	QP			Р	
6	263.7700	-13.34	34.44	21.10	47.00	-25.90	QP			Р	

Note: Level=Reading+Factor.

Margin=Limit-Level.

Report No.: NTC1604354E



## 6. 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≥40dB 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≥26dB at 50mW; and is≥26dB 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.

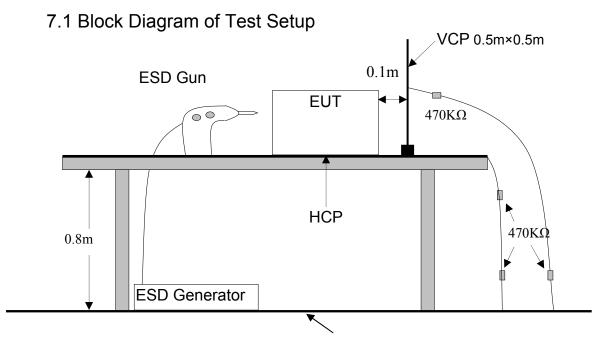
The criterion of compliance with the requirement is just perceptible degradation by observation of the picture. The screen shall be observed under normal viewing conditions (brightness 15 lx to 20 lx), at a viewing distance of six times the height of the screen.

#### 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.



## 7. ELECTROSTATIC DISCHARGE IMMUNITY TEST



Ground Reference Plane (GRP)

## 7.2 Test Standard and Severity Levels

#### 7.2.1 Test Standard:

EN 55020

(EN 61000-4-2: 2009 Air Discharge: Severity Level: 3, ± 8KV;

Contact Discharge: Level: 2, ± 4KV)

## 7.2.2 Severity Levels:

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

Report No.: NTC1604354E



#### 7.3 Test Procedure

#### 7.3.1 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

#### 7.3.2 Contact Discharge:

All the procedure shall be same as Section 7.3.1. except that the tip of the discharge electrode shall touch the E.U.T..

#### 7.3.3 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.

#### 7.3.4 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.

#### 7.4 Test Results

PASS.

Please refer to the following page.

Dongguan Nore Testing Center Co., Ltd. Report No.: NTC1604354E



# Electrostatic Discharge Test Results

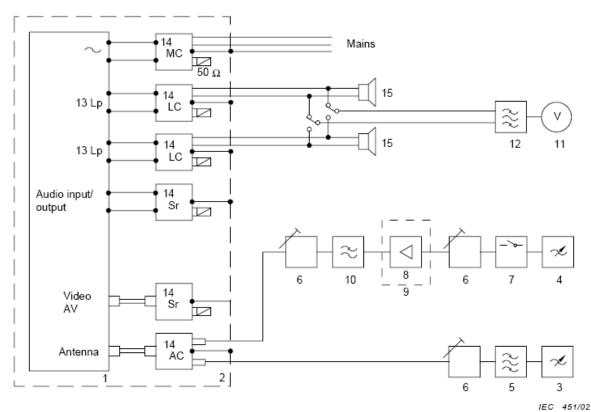
Ambient Condition:	Temp.: 25°C	R.H.: 53%	Air Pressure: 101 kPa			
Power Supply:	AC 230V 50Hz (Adapter input), DC 3.7V Battery	Required Performance Criterion: B				
Test Level:		Discharge; ±2, 4, 8 KV Air Discharge ve 10 times and negative 10 times				
Tested mode:	TF Card Playing, Ch	arging+TF Card Playing				
Test P	oint	Kind A-Air Discharge C-Contact Discharge	Result (Performance Criterion)			
Slot of EUT		A	A			
DC Input port		A,C	A			
Metal		С	A			
TF Card port		A	Α			
Indirect Discharge (HCP)		С	A			
Indirect Discharge (VCP)		С	A			
Note:						
Test Equipment : ES	D Tester (TESEQ, NS	G 437)	Test Engineer : Steven			



# 8. RF VOLTAGES IMMUNITY TEST(S2)

## 8.1 Test setup

### Antenna terminals:



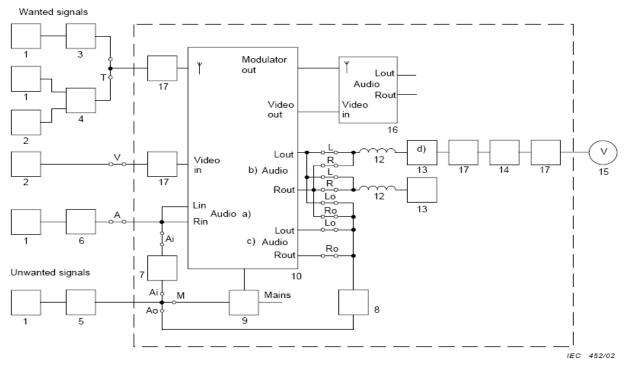
#### Key

- Equipment under test
- Metal plate P = 2 m × 1 m
- Generator of wanted signal G1
- Generator of unwanted signal G2
- Channel filter Fc Attenuators T1, T2, T3
- Switch S1
- Amplifier Am

- Shielded box Sh
- 10 Low-pass filter F
- 11 Audio frequency voltmeter V 12 Band-pass filter 0,5 kHz to 3 kHz (see annex B)
- 13 Loudspeaker connectors Lp 14 Coupling units MC, LC, Sr, AC (see annex C) of the loudspeaker
- 15 Dummy load simulating the nominal impedance of the loudspeaker



#### Other terminals:



- 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 k $\Omega$ ) audio output impedance.

#### Key

- AF generator 1 kHz G1
- Video generator G2
- RF generator G3 for FM RF generator G4 for TV 3 4
- RF generator G5 for unwanted signal

- Impedance (Rs to RG1) RC network for audio inputs RC<sub>i</sub> RC network for audio outputs RC<sub>o</sub>
- Mains stop filter MSF

- 10 Equipment under test

- 11 Metal plate P = 2 m × 1 m
  12 RF choke L = 100 μH
  13 Rated load impedance of the audio output RL
  14 Band-pass filter BP (input impedance 10 kΩ)
- 15 Audio frequency voltmeter V 16 Test-TV-set TTS
- Sheath current choke Sh (ferrite cores)

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

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



#### 8.2 Test Standard and Limits

#### 8.2.1 Test Standard EN 55020

#### 8.2.2 Limits

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

Frequency	Level			
MHz	dB(μV)(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	Level				
MHz	dB(μV)(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>				

### 8.3 Test Result

#### PASS.

Please refer to the following pages of the worst case.

<sup>&</sup>lt;sup>a</sup> Increasing linearly with the logarithm of frequency <sup>b</sup> Decreasing linearly with the logarithm of frequency

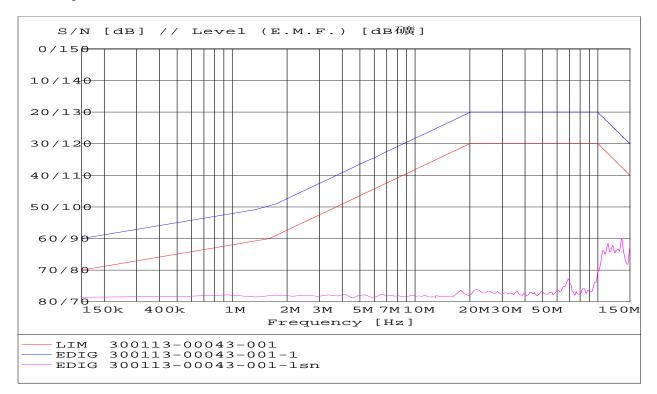
Report No.: NTC1604354E



Test: Immunity Conducted Voltages S2a < OMA2120>

Test Mode: Receiver - Monitor: Speaker
Operating Mode: AUX S/N: 85.2 dB
Frequency: - AF Level: 59.2 mW

Interf. Signal: AUX, 270416-01905-001, 5/03/2016, 1:38:47PM



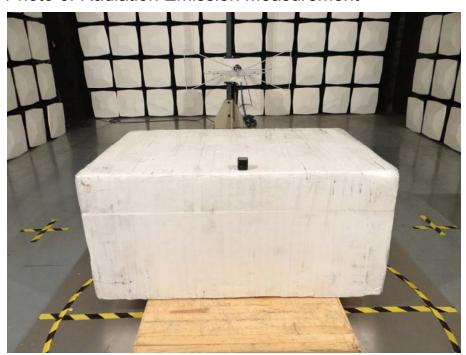


## 9. PHOTOGRAPHS

## 9.1 Photo Conducted Emission Measurement

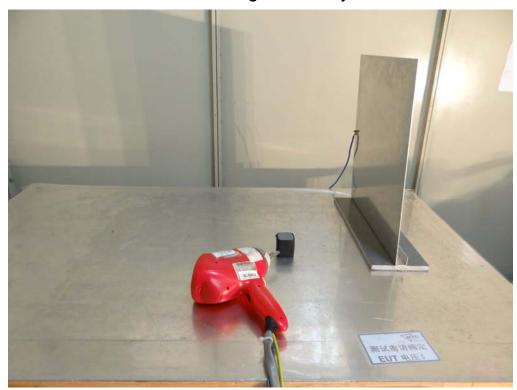


## 9.2 Photo of Radiation Emission Measurement

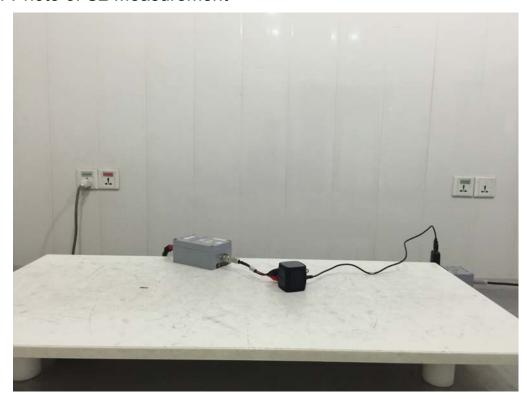




# 9.3 Photo of Electrostatic Discharge Immunity Measurement



## 9.4 Photo of S2 Measurement



Dongguan Nore Testing Center Co., Ltd. Report No.: NTC1604354E



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



**Figure 1** General Appearance of the E.U.T.



**Figure 2** General Appearance of the E.U.T.





Figure 3 General Appearance of the E.U.T.



**Figure 4** General Appearance of the E.U.T.





Figure 5
General Internal of the E.U.T.



Figure 6
General Appearance of the PCB

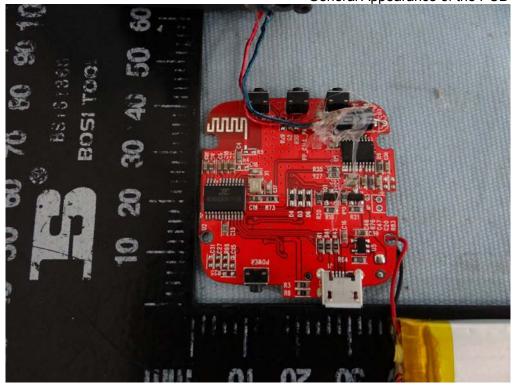




Figure 7
General Appearance of the PCB

