



# EMC TEST REPORT

EN 55013:2013

EN 55020:2007+A11:2011


EN 61000-3-2:2006+A1:2009+A2:2009

EN 61000-3-3:2013

MEASUREMENT AND TEST REPORT  
For

**Model:** BY-FXQ

Sep. 22, 2015

<b>This Report Concerns:</b> <input checked="" type="checkbox"/> Original Report	<b>Equipment Type:</b> Music Sharing Device
<b>Test Engineer:</b>	<u>Bill Jiang</u>
<b>Report Number:</b>	<u>POCE15091714SRE</u>
<b>Test Date:</b>	<u>Sep. 18, 2015 to Sep. 22, 2015</u>
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**Note:** This test report is limited to the above client company and the product model only. It may not be duplicated without prior written consent of Shenzhen POCE Technology Co., Ltd.

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## 1. GENERAL INFORMATION

### 1.1. Description of Device (EUT)

EUT : Music Sharing Device

Model : BY-FXQ

Supplementary Model : N/A

Test Voltage : /

Applicant :

Address :

Manufacturer :

Address :

Date of Receiver : Sep. 18, 2015

Date of Test : Sep. 18, 2015 to Sep. 22, 2015

### 1.2. Test Standards

Test Standards	
EN 55013:2013	Sound and television broadcast receivers and associated equipment - Radio disturbance characteristics - Limits and methods of measurement
EN 55020:2007+A11:2011	Sound and television broadcast receivers and associated equipment - Immunity characteristics - Limits and methods of measurement
EN61000-3-2:2006+A1:2009+A2:2009	Electromagnetic compatibility(EMC)-Part 3-2:Limits-Limits for harmonic current emissions(equipment input current $\leq 16\text{A}$ per phase)
EN61000-3-3:2013	Electromagnetic compatibility(EMC)-Part 3-3:Limits-Limitation of voltage changes,Voltage fluctuations and flicker in public low-voltage supply systems. For equipment with Rated current $\leq 16\text{A}$ per phase and not subject to conditional connection

### 1.3. Test Methodology

All measurements contained in this report were conducted with CISPR 16-1, radio disturbance and immunity measuring apparatus, and CISPR16-2, Method of measurement of disturbances and immunity.

All measurement required was performed at laboratory of Shenzhen POCE Technology Co., Ltd., at H Building, Hongfa Science and Technology Park, Tangtou, Shiyan, Bao'an District, Shenzhen, China

### 1.4. Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

**FCC – Registration No.: 222278**

EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 222278.

The facility also complies with the radiated and AC line conducted test site criteria set forth in CISPR 16-1, CISPR16-2.

### 1.5. Measurement Uncertainty

Radiation Uncertainty :  $U_r = \pm 3.84 \text{ dB}$

Conduction Uncertainty :  $U_c = \pm 2.72 \text{ dB}$

## 2. TEST INSTRUMENT USED

### 2.1. For Conducted Emission Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESHS30	828995/028	Nov. 20, 2014	1 Year
2.	L.I.S.N.	Rohde & Schwarz	ESH2-Z5	834559/003	Nov. 20, 2014	1 Year
3.	RF Cable	FUJIAKURA	3D-2W	No.3	Nov. 20, 2014	1 Year
4.	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100006	Nov. 20, 2014	1 Year
5.	Coaxial Switch	Anritsu	MP59B	M20331	Nov. 20, 2014	1 Year

### 2.2.For Radiated Emission Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analyzer	ANRITSU	MS2661C	6200140923	Nov. 20, 2014	1 Year
2.	Test Receiver	Rohde & Schwarz	ESCS30	828985/014	Nov. 20, 2014	1 Year
3.	Bilog Antenna	Schwarzbeck	VULB9163	142	Nov. 20, 2014	1 Year
4.	50 Coaxial Switch	Anritsu Corp	MP59B	6100237248	Nov. 20, 2014	1 Year
5.	EMI Power Line Filter	DUOJI EME	FNF 201 B16	N/A	Nov. 20, 2014	1 Year
6.	EMI Power Line Filter	JIANLI	DL-40C	N/A	Nov. 20, 2014	1 Year
7.	Cable	Schwarzbeck	AK9513	ACRX1	Nov. 20, 2014	1 Year
8.	Cable	Rosenberger	N/A	FP2RX2	Nov. 20, 2014	1 Year
9.	Cable	Schwarzbeck	AK9513	CRPX1	Nov. 20, 2014	1 Year
10.	Cable	Schwarzbeck	AK9513	CRRX2	Nov. 20, 2014	1 Year
11.	Signal Generator	HP	8648A	3625U0057 3	Nov. 20, 2014	1 Year

### 2.3.For Harmonic & Flicker Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Power Frequency System	HAEFELY	PHF555	080419-03	Nov. 20, 2014	1Year
2.	PC	N/A	P2L97	N/A	N/A	N/A

### 2.4.For Electrostatic Discharge Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	ESD Tester	HAEFELY	PESD1600	H708159	Nov. 20, 2014	1 Year

## 2.5.For RF Strength Susceptibility Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Signal Generator	HP	8648A	3625U00573	Nov. 20, 2014	1 Year
2.	Amplifier	AR	500A100	17034	NCR	NCR
3.	Amplifier	AR	100W/1000M1	17028	NCR	NCR
4.	Isotropic Field Monitor	AR	FM2000	16829	NCR	NCR
5.	Isotropic Field Probe	AR	FP2000	16755	Nov. 20, 2014	1 Year
6.	Biconic Antenna	EMCO	3108	9507-2534	NCR	NCR
7.	Log-periodic Antenna	AR	AT1080	16812	NCR	NCR
8.	PC	N/A	486DX2	N/A	N/A	N/A

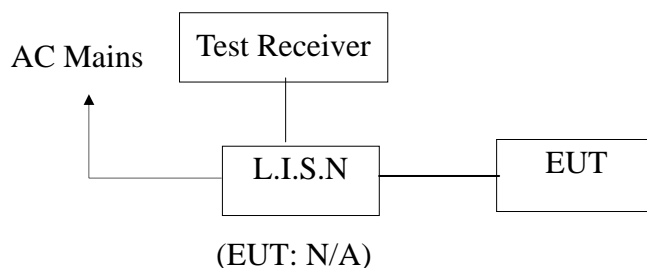
## 2.6.For Electrical Fast Transient /Burst Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Burst Tester	HAEFELY	PEFT4010	080981-16	Nov. 20, 2014	1 Year
2	Coupling Clamp	HAEFELY	IP-4A	147147	Nov. 20, 2014	1 Year



### 3. POWER LINE CONDUCTED EMISSION TEST

#### 3.1. Block Diagram of Test Setup



#### 3.2. Test Standard

EN55013

#### 3.3. Power Line Conducted Emission Limit

Frequency MHz	Limits dB(μV)	
	Quasi-peak Level	Average Level
0.15 ~ 0.50	66 ~ 56*	56 ~ 46*
0.50 ~ 5.00	56	46
5.00 ~ 30.00	60	50

Notes: 1. \*Decreasing linearly with logarithm of frequency.

2. The lower limit shall apply at the transition frequencies.

#### 3.4. EUT Configuration on Test

The following equipments are installed on conducted emission test to meet EN55013 requirement and operating in a manner which tends to maximize its emission characteristics in a normal application.

N/A(EUT)

Model Number : N/A  
 Serial Number : N/A  
 Manufacturer : N/A

### 3.5.Operating Condition of EUT

3.5.1 Setup the EUT and simulators as shown in Section 3.1.

3.5.2 Turn on the power of all equipments.

3.5.3 Let the EUT work in test modes (Receive mode) and test it.

### 3.6.Test Procedure

The EUT is put on the ground 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 EN55013 regulations during conducted emission test.

The bandwidth of the test receiver (R&S Test Receiver ESCS30) is set at 9KHz.

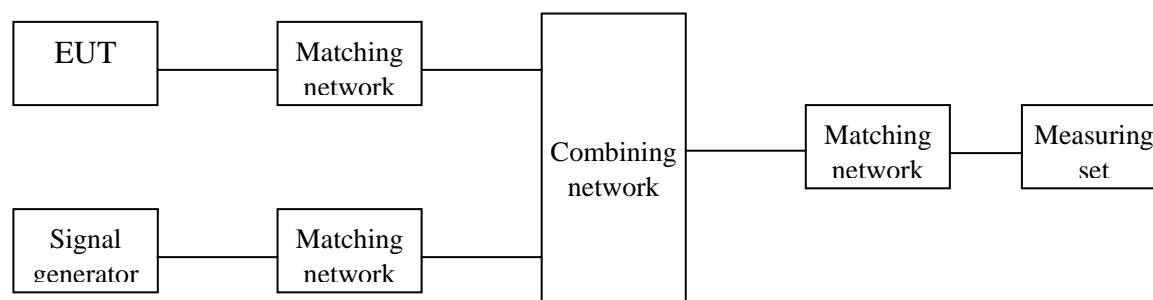
The frequency range from 150 KHz to 30 MHz is investigated.

### 3.7.Power Line Conducted Emission Test Results

N/A

## 4. Disturbance voltage at the antenna terminals test

### 4.1 Block diagram of test setup



(EUT: N/A)

### 4.2 Test standard

EN55013

### 4.3 Limits of disturbance voltage at the antenna terminals

Equipment	Source	Frequency(MHz)	Limit values dB(uV)75 $\Omega$ Quasi-peak <sup>a</sup>	
Television receivers for broadcast satellite transmissions and tuner units <sup>b</sup>	Local oscillator	950 to 2150	Fundamental	54
		950 to 2150	Harmonics	54
	Other	30 to 2150		46
<sup>a</sup> At frequencies above 1GHz the peak detector is used.				
<sup>b</sup> For tuner units, 'antenna terminal' means 'first intermediate frequency input terminal'.				

## 4.4 EUT Configuration on Test

The following equipments are installed on conducted emission test to meet EN55013 requirement and operating in a manner which tends to maximize its emission characteristics in a normal application.

### Music Sharing Device(EUT)

Model Number : N/A  
Serial Number : N/A  
Manufacturer : N/A

## 4.5 Operating Condition of EUT

4.5.1 Setup the EUT and simulators as shown in Section 4.1.

4.5.2 Turn on the power of all equipments.

4.5.3 Let the EUT work in test modes (Receive mode) and test it.

## 4.6 Test Procedure

When measurements are made at the antenna terminal of the equipment under test, an auxiliary signal generator shall be used to feed the receiver input with an RF signal at the receiver or associated equipment tuning frequency.

The output level of the auxiliary signal generator shall be set to give at the antenna input terminal of the receiver the value of 50 dB(uV)/VHF&54dB(uV)/UHF for Music Sharing Device, on 75  $\Omega$  impedance.

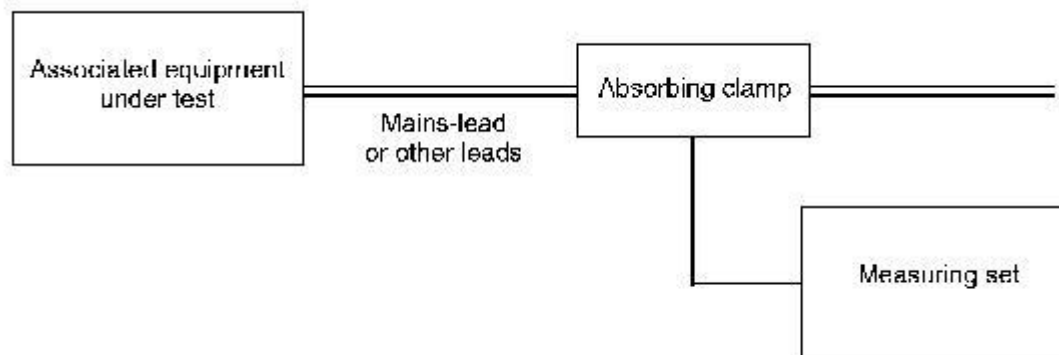
The frequency range from 30 MHz to 2150MHz is investigated.

## 4.7 Disturbance voltage at the antenna terminals test result

N/A

## 5. Wanted Signal and Disturbance Voltage at the RF output

### 5.1 Block diagram of test setup



## 5.2 Test standard

EN55013

### 5.3 Limits of wanted signal and disturbance voltage at the RF output

Equipment type	Source	Frequency MHz	Limit values dB(μV) 75 Ω Quasi-peak <sup>a</sup>
Equipment with RF video modulator (e.g. video recorders, camcorders and decoders)	Wanted signal		Carrier frequencies and sidebands 76
		30 to 950	Harmonics 46
		950 to 2 150	Harmonics 54
	Other	30 to 2 150	46

<sup>a</sup> At frequencies above 1 GHz the peak detector is used.

## 5.4 Test Procedure

The RF output of the equipment under test is connected to the input of the measuring set by means of a coaxial cable and a matching network(if necessary) as shown in figure 5.1. The characteristic impedance of the cable shall be equal to the nominal output impedance of the equipment under test.

The equipment under test shall produce an RF carrier modulated by a vertical colour bar video signal.

The RF output level can be obtained by adding the insertion loss of the matching network to the indication of the measuring set (tuned on the video carrier frequency and its harmonics) or of a spectrum analyser.

## 5.5 Wanted Signal and Disturbance Voltage at the RF output test result

N/A

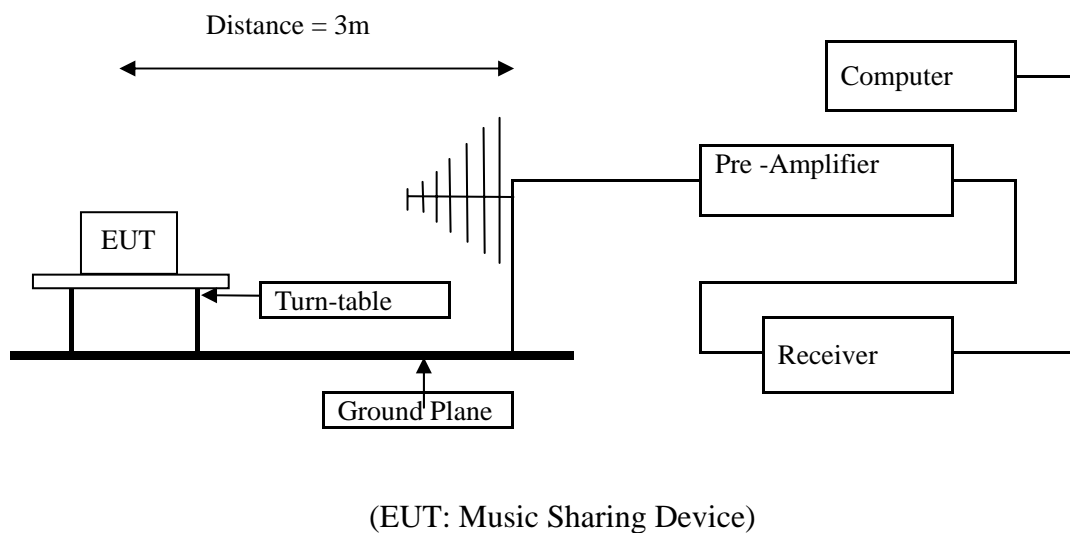
## 6. RADIATED EMISSION MEASUREMENT

### 6.1 Block Diagram of Test

#### 6.1.1 Block diagram of connection between the EUT and simulators



#### 6.1.2 Block diagram of test setup in chamber



## 6.2 Radiated Emission Limit

### 6.2.1 For EN55013

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		dB( $\mu$ V)/m	
	3	Fundamental	57
30 ~ 300	3	Harmonics	52
300 ~ 1000	3	Harmonics	56
Other	3	Harmonics	Same as EN55022B

- Remark:
- (1) Emission level (dB) $\mu$ V = 20 log Emission level  $\mu$ V/m
  - (2) The smaller limit shall apply at the cross point between two frequency bands.
  - (3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

## 6.3. EUT Configuration on Measurement

The following equipment are installed on Radiated Emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

Music Sharing Device (EUT)

Model Number : BY-FXQ

Serial Number : N/A

Manufacturer : ZHEJIANG TONGLU YUNSHAN PEN MANUFACTORY CO.LTD

## 6.4 Operating Condition of EUT

6.4.1. Setup the EUT as shown in Section 5.1.

6.4.2. Let the EUT work in test mode (Receive mode) and measure it.

## 6.5. Test Procedure

EUT and its simulators are placed on a turn table, which is 0.8 meter high above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. EUT 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 are set on measurement. In order to find the maximum emission levels, all of the interface cables must be manipulated according to ANSI C63.4-2002 on radiated emission measurement.

The bandwidth of the EMI test receiver (R&S ESCS30) is set at 120KHz.

The frequency range from 30MHz to 1000MHz is investigated.



## 6.6 Radiated Emission Noise Measurement Results

**PASS**

Please reference to the following pages

## Radiated Emission Test Data

Standard:	EN55013 Class B RE	Polarization:	Vertical
Test item:	Radiation Test	Date:	2015-09-20
EUT:	Music Sharing Device	Test By:	Bill
Model:	BY-FXQ	Distance:	3m
Note:			



Site: Chamber #1

Limit: EN55022 Class B RE 3m

EUT: music share

M/N: BY-FXQ

Mode: On

Note:

Polarization: **Vertical**

Power: DC 5V

Distance: 3m

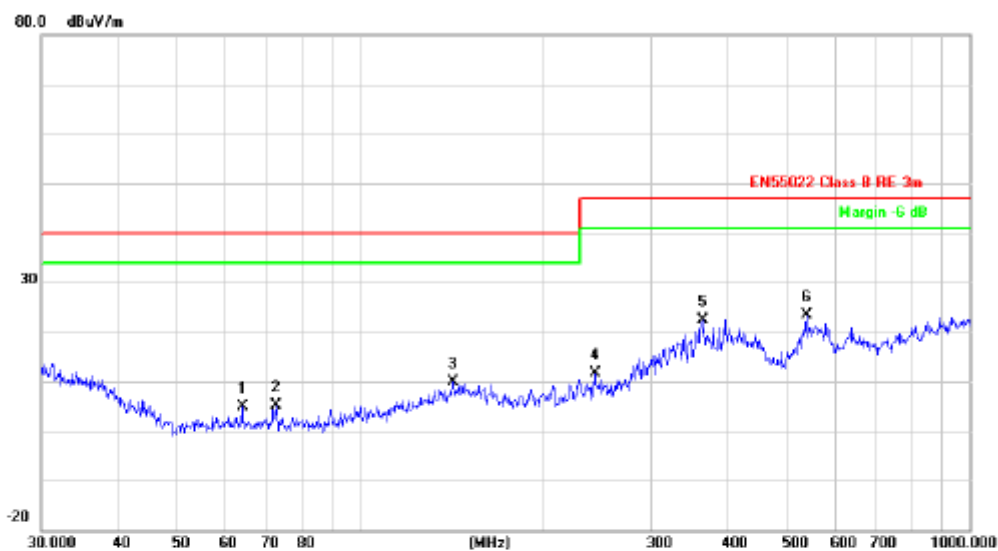
Temperature:

Humidity: %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		47.9839	27.64	-19.74	7.90	40.00	-32.10	peak		
2		72.8485	31.77	-20.72	11.05	40.00	-28.95	peak		
3		104.1701	26.91	-18.04	8.87	40.00	-31.13	peak		
4		156.4577	23.35	-14.10	9.25	40.00	-30.75	peak		
5		389.3548	26.56	-11.08	15.48	47.00	-31.52	peak		
6	*	588.9050	26.28	-8.43	19.85	47.00	-27.15	peak		

## Radiated Emission Test Data

Standard:	EN55013 Class B RE	Polarization:	Horizontal
Test item:	Radiation Test	Date:	2015-09-21
EUT:	Music Sharing Device	Test By:	Bill
Model:	BY-FXQ	Distance:	3m
Note:			



Site: Chamber #1

Polarization: **Horizontal**

Temperature:

Limit: EN55022 Class B RE 3m

Power: DC 5V

Humidity: %

EUT: music share

Distance: 3m

M/N: BY-FXQ

Mode: On

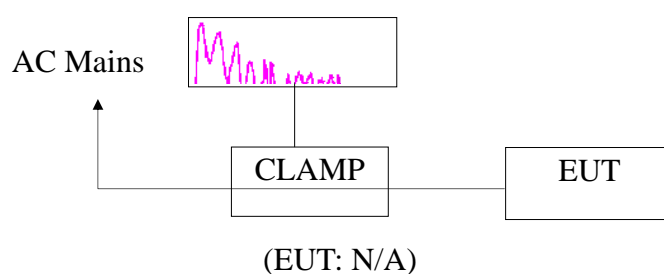
Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree
1		63.9928	25.48	-20.68	4.82	40.00	-35.18	peak		
2		72.8466	25.85	-20.72	5.13	40.00	-34.87	peak		
3		141.8262	23.78	-13.84	9.94	40.00	-30.06	peak		
4		242.5253	26.83	-15.13	11.70	47.00	-35.30	peak		
5		364.2595	34.16	-11.71	22.45	47.00	-24.55	peak		
6	*	539.4775	31.01	-7.52	23.49	47.00	-23.51	peak		

## 7. DISTURBANCE POWER TEST

### 7.1 Block Diagram of Test Setup

#### 7.1.1 For AC Mains



### 7.2 Test Standard

EN55013

### 7.3 Disturbance Power Limit

All emanations from devices or system including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified below:

Frequency MHz	Interference Power Limits dB(pW)	
	Quasi-peak Value	Average Value
30 ~ 300	45 Increasing Linearly with Frequency to 55 (Q.P.)	35 Increasing Linearly with Frequency to 45 (A.V.)

### 7.4 EUT Configuration on Test

The EN55013 regulations test method must be used to find the maximum emission during radiated emission test.

The configuration of EUT is the same as used in conducted emission test.

Please refer to Section 3.4.

### 7.5 Operating Condition of EUT

Same as conducted emission test, which is listed in Section 3.5 except the test set up replaced as Section 6.1.

## 7.6 Test Procedure

The EUT is placed on the ground and away from other metallic surface at least 0.4m. 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 EUT to measure the disturbing energy emitted from the cord.

The bandwidth of the test receiver(R&S ESCS30) is set at 120kHz.  
The frequency spectrum from 30 MHz to 300 MHz is investigated.

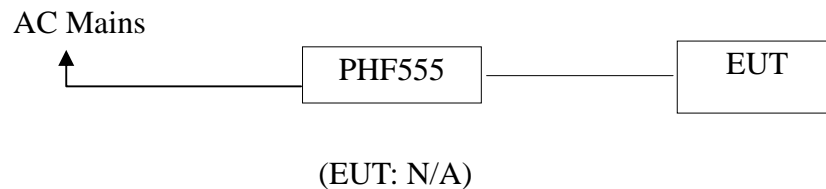
## 7.7 Disturbance Power Test Result

N/A

\*N/A-- not apply

## 8. HARMONIC CURRENT EMISSION TEST

### 8.1 Block Diagram of Test Setup



### 8.2 Test Standard

EN61000-3-2 Class A

### 8.3 Operating Condition of EUT

Same as Section 3.5 except the test setup replaced by Section 7.1.

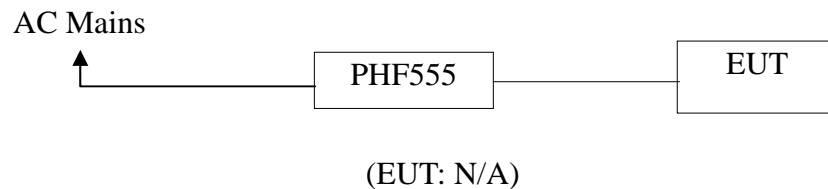
### 8.4 Test Results

N/A

\*N/A-- not apply

## 9. VOLTAGE FLUCTUATIONS & FLICKER TEST

### 9.1 Block Diagram of Test Setup



### 9.2 Test Standard

EN61000-3-3

### 9.3 Operating Condition of EUT

9.3.1 Setup the EUT and simulators as shown in Section 8.1.

9.3.2 Turn on the power of all equipments.

9.3.3 Let the EUT work in test modes (Receive mode) and test it.

### 9.4 Test Results

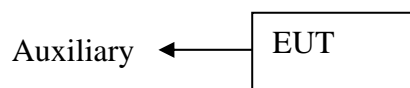
N/A

\*N/A-- not apply

## 10. ELECTROSTATIC DISCHARGE IMMUNITY TEST

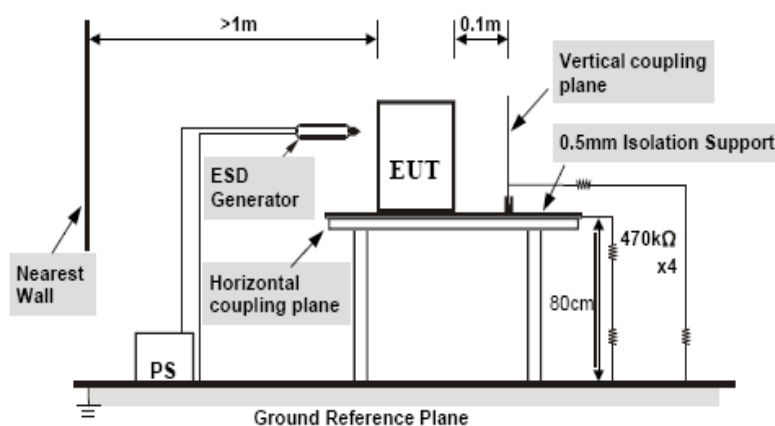
### 10.1 Block Diagram of Test Setup

#### 10.1.1. Block Diagram of the EUT and the simulators



(EUT: Music Sharing Device)

#### 10.1.2. Test Setup



(EUT: Music Sharing Device)

### 10.2 Test Standard

EN55020 (EN61000-4-2Severity Level: 3 / Air Discharge:  
 $\pm 8\text{KV}$ Level: 2 / Contact Discharge:  $\pm 4\text{KV}$ )

### 10.3 Severity Levels and Performance Criterion

#### 10.3.1 Severity level

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



### 10.3.2 Performance criterion : **B**

## 10.4 EUT Configuration

The configuration of EUT are listed in Section 3.4.

## 10.5 Operating Condition of EUT

Same as conducted emission measurement, which is listed in Section 3.5 except the test set up replaced by Section 9.1.

## 10.6 Test Procedure

### 10.6.1 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 EUT.

After each discharge, the discharge electrode shall be removed from the EUT.

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

### 10.6.2 Contact Discharge:

All the procedure shall be same as Section 8.6.1. except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

### 10.6.3 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 EUT and 0.1m from the front of the EUT. The long axis of the discharge electrode shall be in the plane of the HCP and perpendicular to its front edge during the discharge.

### 10.6.4 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 EUT. Discharges shall be applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.

## 10.7 Test Results

**PASS**

Please refer to the following page.

# Electrostatic Discharge Test Results

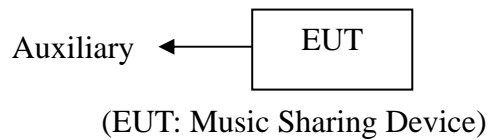
SHENZHEN POCE TECHNOLOGY CO., LTD

Applicant :		Test Date : 2015-09-21
EUT	: Music Sharing Device	Temperature: 20°C
M/N	: BY-FXQ	Humidity : 50%
Power Supply	: /	Test Mode : Normal Working
Test Engineer : Bill		
Air Discharge: $\pm$ 8KV Contact Discharge: $\pm$ 4KV # For each point positive 10 times and negative 10 times discharge		
Location	Kind A-Air Discharge C-Contact Discharge	Result
Gaps	A	PASS
Button	A	PASS
HCP of the front	C	PASS
HCP of the rear	C	PASS
HCP of the left	C	PASS
HCP of the right	C	PASS
VCP of the front	C	PASS
VCP of the rear	C	PASS
VCP of the left	C	PASS
VCP of the right	C	PASS
Note: (The Criterion) A:Normal performance within the specification limits; B:Temporary degradation or loss of function or performance which is self-recoverable; C:Temporary degradation or loss of function or performance which requires operator intervention or system reset; D:Degradation or loss of function which is not recoverable due to damage of equipment (components) or software,or loss of data.		Test Equipment : ESD Tester (HAEFELY, PESD1600)

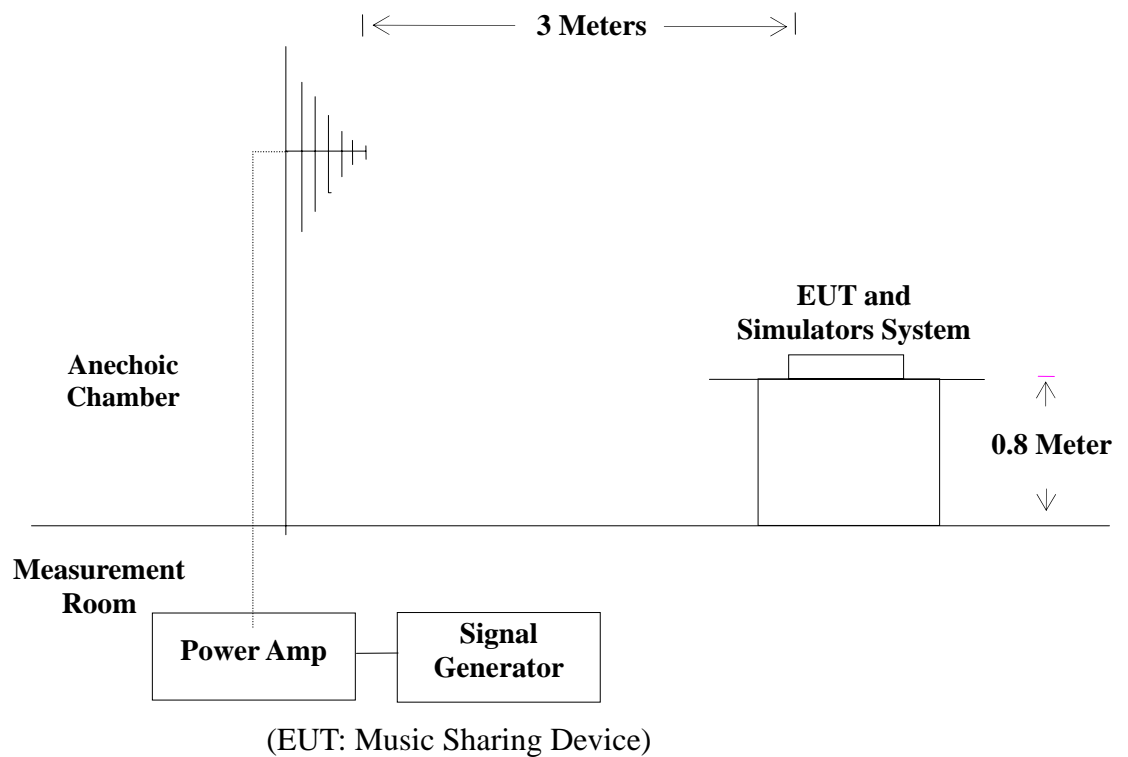
## 11. RADIATED FIELD KEYED CARRIER

### 11.1 Block Diagram of Test Setup

#### 11.1.1. Block Diagram of the EUT and the simulators



#### 11.1.2. R/S Test Setup



### 11.2 Test Standard

EN55020 (EN61000-4-3: 2006, Severity Level: 2, 3V / m)

### 11.3 Severity Levels and Performance Criterion

#### 11.3.1. Severity level

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

#### 11.3.2. Performance criterion : A

### 11.4 EUT Configuration

The configuration of EUT are listed in Section 3.4.

### 11.5 Operating Condition of EUT

11.5.1. Setup the EUT as shown in Section 10.1.

11.5.2. Turn on the power of all equipments.

11.5.3. Let the EUT work in test mode (Receive mode) and measure it.

### 11.6 Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. EUT 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 EUT must be faced this transmitting antenna and measured individually. In order to judge the EUT performance, a CCD camera is used to monitor EUT screen. All the scanning conditions are as follows :

Condition of Test	Remarks
1. Fielded Strength	3 V/m (Severity Level 2)
2. Radiated Signal	Unmodulated
3. Scanning Frequency	80 - 1000 MHz
4. Dwell time of radiated	0.0015 decade/s
5. Waiting Time	1 Sec.

### 11.7 Test Results

**PASS**

Please refer to the following page.

## Radiated Field Keyed Carrier Test Results

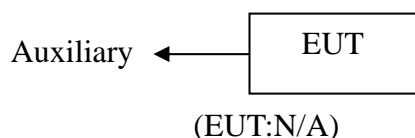
SHENZHEN POCE TECHNOLOGY CO., LTD

Applicant:  EUT : <u>Music Sharing Device</u> M/N : <u>BY-FXQ</u> Field Strength: <u>3 V/m</u> Power Supply: <u>/</u> Test Engineer: <u>Bill</u>		Test Date : <u>2015-09-21</u> Temperature : <u>20°C</u> Humidity : <u>50%</u> Criterion: <u>A</u> Frequency Range: <u>900 MHz</u>	
Modulation: <input type="checkbox"/> AM <input type="checkbox"/> Pulse <input checked="" type="checkbox"/> duty cycle 1/8m 217 Hz repetition frequency			
Test Mode : <u>Receive mode</u>			
		Frequency Rang : 900MHz	
Steps	1 %		
	Horizontal	Vertical	
Front	PASS	PASS	
Right	PASS	PASS	
Rear	PASS	PASS	
Left	PASS	PASS	
Test Equipment : 1. Signal Generator : 2031 (MARCONI) 2. Power Amplifier : 500A/ 100; 100W/1000M (A&R) 3. Power Antenna : 3108 (EMCO)/ AT-1080 (A&R) 4. Field Monitor : FM2000 (A&R)			
Note:			

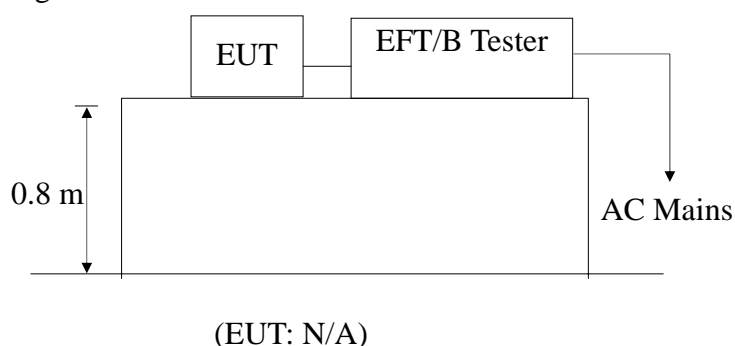
## 12. ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST

### 12.1 Block Diagram of Test Setup

#### 12.1.1 Block Diagram of the EUT



#### 12.1.2 Block Diagram of the AC Mains



### 12.2 Test Standard

EN55020 (EN61000-4-4, Severity Level, Level 2 : 1KV & 0.5KV)

### 12.3 Severity Levels and Performance Criterion

#### 12.3.1Severity level

Open Circuit Output Test Voltage $\pm 10\%$		
Level	On Power Supply Lines	On I/O (Input/Output) Signal data and control lines
1.	0.50 KV	0.25 KV
2.	1.00KV	0.50 KV
3.	2.00KV	1.00KV
4.	4.00KV	2.00 KV
X	Special	Special

#### 12.3.2 Performance criterion : B

### 12.4 EUT Configuration

The configuration of EUT are listed in Section 3.4.

## 12.5 Operating Condition of EUT

12.5.1 Setup the EUT as shown in Section 11.1.

12.5.2 Turn on the power of all equipments.

12.5.3 Let the EUT work in test mode (Receive mode) and measure it.

## 12.6 Test Procedure

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

12.6.1 For input and output AC power ports:

The EUT 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 mins.

12.6.2 For signal lines ports:

It's unnecessary to test.

12.6.3 For DC ports:

It's unnecessary to test.

## 12.7 Test Result

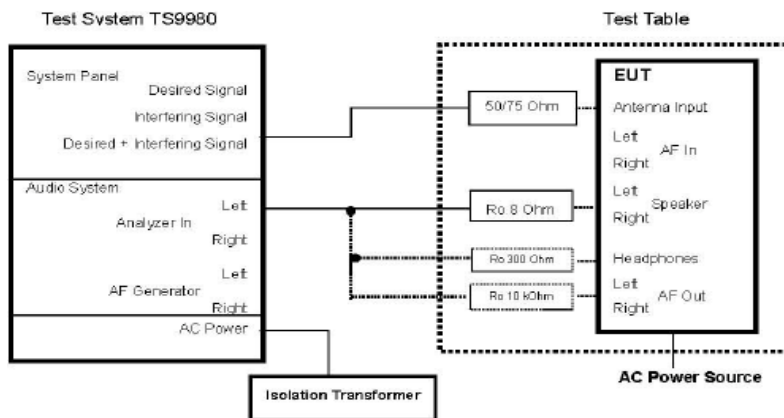
N/A

## 13. IMMUNITY AGAINST INPUT INTERFERENCE TEST(S1)

### 13.1 General conditions during testing

Television receivers, video tape equipment with built-in television broadcast receiving facility in the RF recording mode and other associated video equipment with tuner shall be tested at a tuned television channel N and subjected to an unwanted signal in channel M, level  $n_f$ , and of the following types, Unwanted signal types: A, B, C, D, E. The immunity against unwanted signals present at the antenna input terminal. Propagation by line (antenna/tuner input)

### 13.2 Block Diagram of Test Setup



### 13.3 Test Standard

EN55020



## 13.4 Limits

### 13.4.1 Limits of immunity of television receivers for systems B,G and I (S1)

Wanted Channel N	Unwanted signal in channel M						Type
	Level dB(μV)						
	M=N-5	N-1	N+1	N+5 <sup>a</sup>	N+9 <sup>a</sup>	N+11	
N <sub>I</sub> and N <sub>II</sub> and N <sub>H</sub>	-	73	73	-	68 <sup>b</sup>	-	A
	-	61	61	-	56 <sup>b</sup>	-	B
	70	73-x	73-x	70	68-x <sup>b</sup>	68	C or C1
	63	73-y	73-y	63	68-y <sup>b</sup>	61	C2
	70	-	-	70	-	68	D
N <sub>IV</sub>	-	77	77	-	68	-	A
	-	65	65	-	56	-	B
	74	77-x	77-x	80-x	68-x <sup>b</sup>	-	C or C1
	67	77-y	77-y	80-y	68-y <sup>b</sup>	-	C2
	74	-	-	70	-	-	D
N <sub>V</sub>	80	77	77	80	-	-	A
	68	65	65	68	-	-	B
	80-x	77-x	77-x	80-x	62	-	C or C1
	80-y	77-y	77-y	80-y	65	-	C2
	-	-	-	-	62	-	D
For systems B and G For system I(monophonic only)							
x=13dB, y=20dB x=10dB							
NOTE 1 “X” is the relative level (dB) of the first sound carrier (mono sound channel) with respect to the picture carrier. ”y” is the relative level (dB) of the second sound carrier (stereo sound channel) with respect to the picture carrier							
NOTE 2 (For China only). For systems D-PAL and K-PAL, Table applies with the addition of channels (M) N –4 and N+4, with the same limits of channels N-5 and N+5 and X=10dB.							
NOTE 3 N±m indicates the frequency of the picture carrier of the tuned television channel, plus or minus m times the channel frequency bandwidth. The test signal shall be applied at this frequency if a limit value is tabulated.							
<sup>a</sup> These levels only apply for television systems with a channel spacing of 8MHz and an IF of 38.9MHz. For other channel spacing and IF frequencies different image channel or local oscillator.							
<sup>b</sup> Only for hyperband N <sub>H</sub> .							

## 13.4.2 Limits of input immunity of television receivers for system B,G and I

Wanted channel N	Unwanted signal		
	Frequency MHz	Level dB( $\mu$ V) nf, (75 $\Omega$ )	Type
N <sub>I</sub>	26 to 30	89	E
N <sub>III</sub>	26 to 30	104	E
NOTE The limits for the wanted channel N <sub>I</sub> apply also to the wanted channel N <sub>III</sub> when band II is used for systems D-SECAM, K-SECAM.			

## 13.5 Test Result

N/A

## 14. Immunity Against RFI Voltages/Current Test (S2)

### 14.1 General conditions during testing

For equipment for which the wanted signals are not explicitly described in the EN55020, the nominal signals as specified by the manufacturer shall be applied during the tests, in case a sound signal other than 1 KHz is used as a wanted signal, an appropriate band pass filter shall be used, instead of the filter specified, The input signal applied during the test shall be included in the technical report. The signal level refers in all other cases to the r.m.s. value of the carrier at the peak of the modulation.

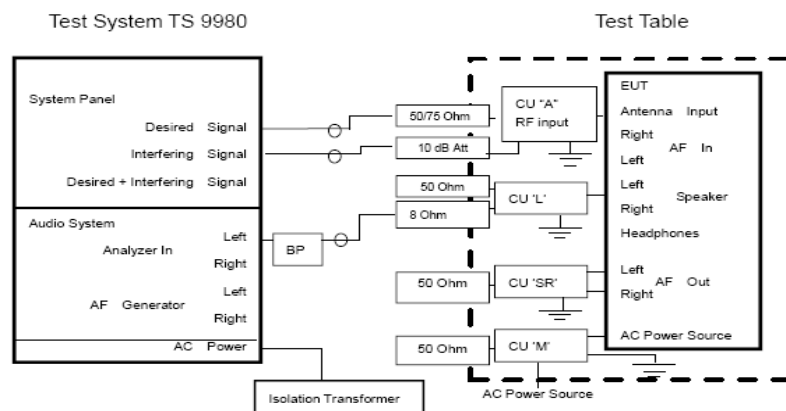
#### 14.1.1 Immunity Against RFI Voltage

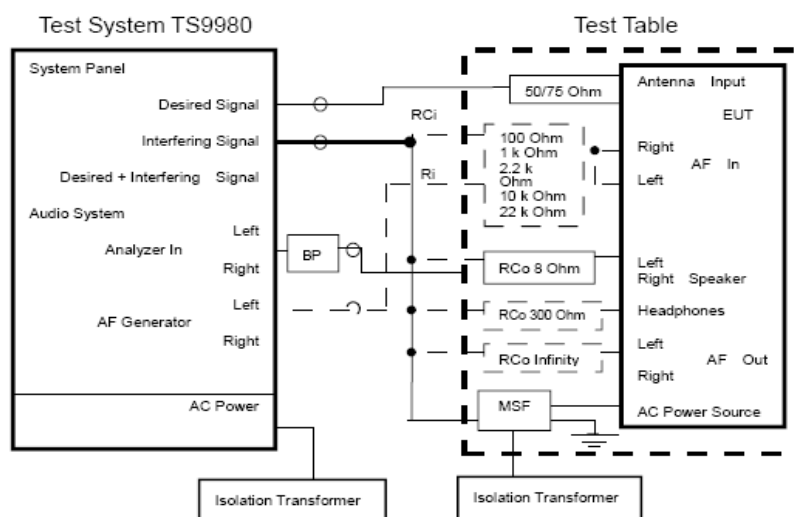
The immunity against unwanted signal voltages present at the audio and mains input terminals and audio output terminal. Propagation by capacitive coupling (mains, loudspeaker, headphone, audio in/out.).

#### 14.1.2 Immunity Against RFI Current

The immunity from unwanted signal (common mode) currents present in cables connected to the equipment. Propagation by inductive coupling (antenna/tuner input).

### 14.2 Test Setup





### 14.3 Test Standard

EN55020

### 14.4 Limits

#### 14.4.1 Limits of immunity of RF voltages of mains, loudspeaker and headphone terminals(S2a)

Frequency MHz	Level dB( $\mu$ V)(e.m.f.)
0.15 to 30	130
30 to 100	120
100 to 150	120-110a

<sup>a</sup> Decreasing linearly with the logarithm of frequency

#### 14.4.2 Limits of immunity to RF voltages of audio input and output terminals (except loudspeaker and headphone terminals)(S2a)

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

## 14.4.3 Limits of immunity to RF currents of antenna terminals (S2b)

Frequency MHz	Level dB( $\mu$ V)(e.m.f.)
26 to 30	126
NOTE 1 For system L the test level in the frequency range 28 MHz to 30MHz is 116 dB( $\mu$ V)(e.m.f) NOTE 2 According to the measuring procedure the immunity from conducted currents is expressed by the e.m.f. level of the unwanted signal generator.	

## 14.5 Test Results

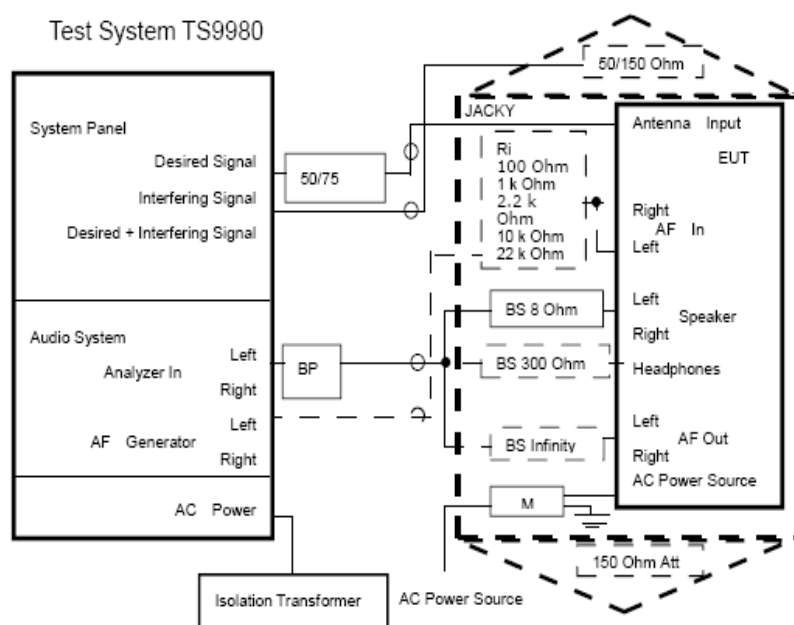
N/A

## 15. Ambient Electromagnetic Fields Immunity Test (S3)

## 15.1 Test Standard

EN55020

## 15.2 Test Setup



### 15.3 Limits

Receivers and multifunction equipment operating in the monitor mode shall also meet the requirement of 125dB( $\mu$ V/m) in the frequency range 150 kHz to 150MHz . For the frequency range  $f_c \pm 1.5$ MHz the limit of 101dB( $\mu$ V/m) applies.

Frequency MHz	Level dB( $\mu$ V/m)
0.15 to 47	125
Except frequency bands:	
( $f_c-1.5$ ) to ( $f_c+1.5$ )	101
( $f_s-0.5$ ) to ( $f_s+0.5$ )	101
( $f_i-2$ ) to ( $f_v+2$ ) <sup>a</sup>	101
( $f_v-2$ ) to ( $f_i+2$ ) <sup>b</sup>	101
For non-European countries and Russia	
47 to 87	109 <sup>d</sup>
Except the tuned channel $\pm 0.5$	
For European countries	109
47 to 87	125
87 to 108	109
108 to 144	125
144 to 150	

Except the tuned channel $\pm 0.5$	
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 color subcarrier frequency	
a	For systems B,D, G, K, I ,L,M.
b	Only for system L.
c	The frequency 47 MHz cab be varied on a national basis depending on the use of this frequency range.
D	For television receivers with reception function in frequency range. For television receivers without reception function in this frequency range a level of 125 dB( $\mu$ V/m) shall apply.

For equipment with audio or video functions other than related to broadcast reception, for instance infrared headphones, For infrared headphones the frequency band  $f_{\text{mod}} \pm f_{\text{diff}}$  is exempted.

Limits of Immunity to ambient electromagnetic fields of equipment with audio or video functions (S3)

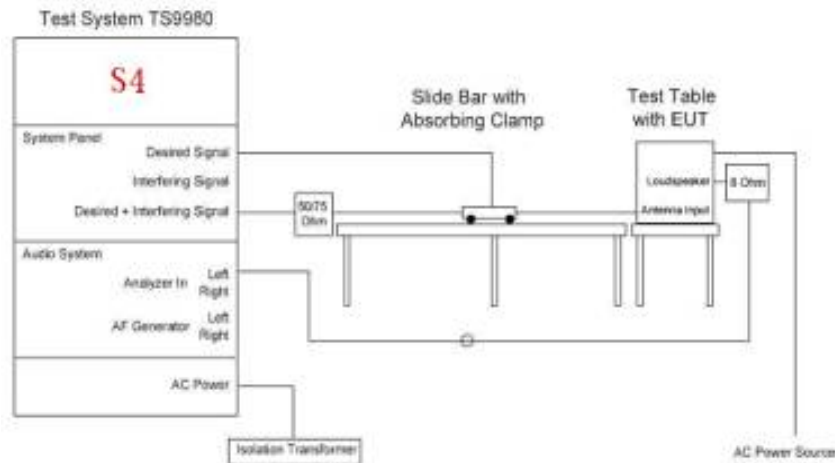
Frequency MHz	Level
0.15 to 150	125

## 15.4 Test Results

N/A

## 16. SCREENING EFFECTIVENESS TEST(S4)

### 16.1 Block diagram of test setup



### 16.2 Test Standard

EN55020

### 16.3 Limits

Limit=50dB

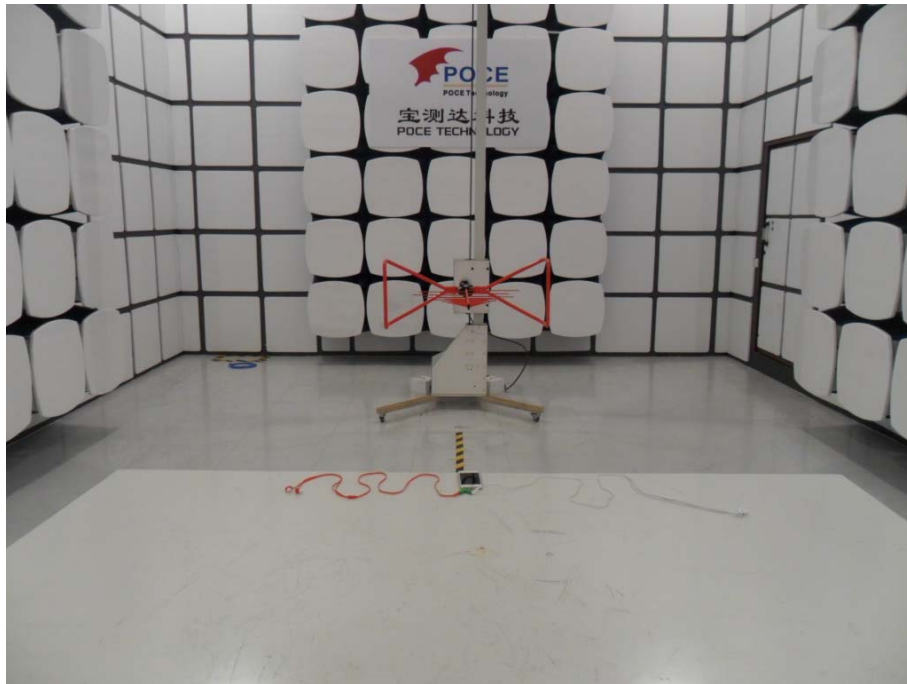
### 16.4 Test Result

N/A



## 17. PHOTOGRAPHS

### 17.1 Photo of Radiation Emission Measurement



# APPENDIX I (PHOTOS OF EUT)

**FIGURE**  
GENERAL APPEARANCE OF EUT

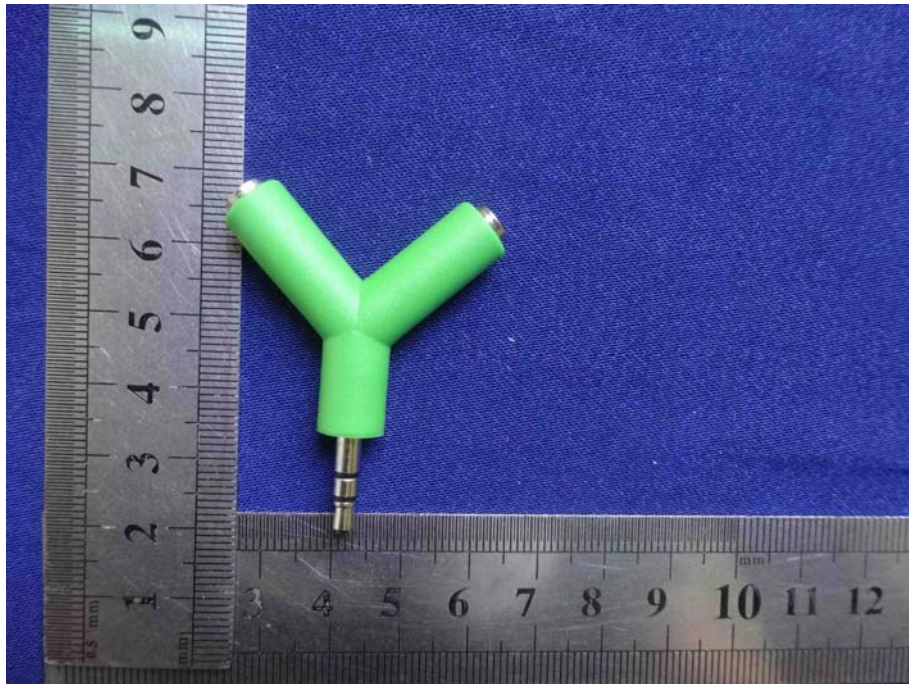


Fig. 1

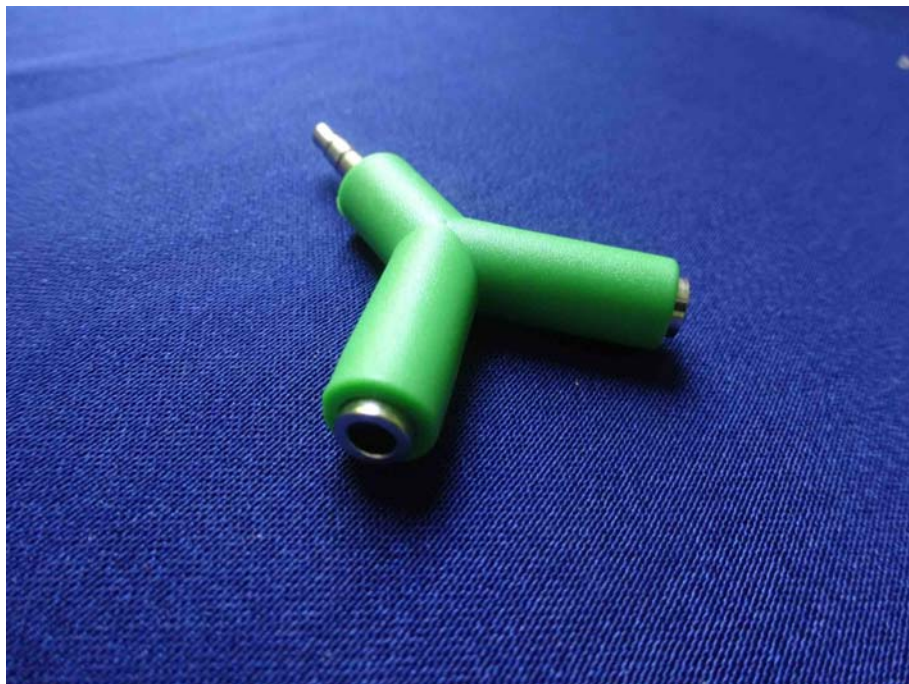


Fig. 2



Fig. 3



Fig. 4

\*\*\*\*\*THE END\*\*\*\*\*