

## ***EMC TEST REPORT***

**Reference No.** : WT06122261-S-E

**Applicant** : Ovann Industrial Co.,Ltd.

**Address** : Bldg1, Shantang Industrial Park, Paibang Village, Henggang Town,  
Shenzhen 518115 China

**Equipment Under Test (EUT) :**

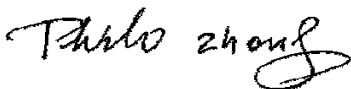
Product Name : Earphone

Model No : OV.S8/ OV.S9/ OV.S10/ OV.S11/ OV.S13/ OV.T13/ OV.S25/ OV.E161

**Standards** : EN 55022:1998+A2:2003  
EN 55024:1998+A2:2003

**Date of Test** : December 25, 2006

**Test Engineer** : Eddy Chen

**Reviewed By** : 

<b>Test Result :</b>	<b>PASS *</b>
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\* The sample detailed above has been tested to the requirements of Council Directives 89/336/EEC (as amended by Directives 92/31/EEC and 93/68/EEC). The test results have been reviewed against the Directives above and found to meet their essential requirements.

## 1 Test Summary

Test	Test Requirement	Test Method	Class / Severity	Result
Mains Terminal Disturbance Voltage, 150kHz to 30MHz	EN 55022:1998+A2-2003	EN 55022:1998+A2-2003	Class B	N/A
Radiation Emission, 30MHz to 1000MHz	EN 55022:1998+A2-2003	EN 55022:1998+A2-2003	Class B	PASS
Harmonic Emission on AC, 100Hz to 2kHz	EN 61000-3-2 : 2000/A2:2005	EN 61000-3-2 : 2000/A2:2005	Clause 7 of EN61000-3-2	N/A
Flicker Emission on AC	EN 61000-3-3 :1995 +A2:2005	EN 61000-3-3 :1995 +A2:2005	Clause 5 of EN61000-3-3	N/A
ESD	EN 55024 : 1998+A2:2003	EN 61000-4-2 :1995 + A1:2001	±4 kV Contact ±8 kV Air	PASS
Radiated Immunity (80MHz to 1GHz)	EN 55024 : 1998+A2:2003	EN 61000-4-3 : 2002 + A1:2002	3V/m, 80%, 1kHz, Amp. Mod.	PASS
Electrical Fast Transients (EFT) on AC and DC	EN 55024 : 1998+A2:2003	EN 61000-4-4 :2004	AC ±1.0kV DC ±0.5kV	N/A
Surge Immunity on AC	EN 55024 : 1998+A2:2003	EN 61000-4-5 :1995 +A1:1996	±1kV D.M.† ±2kV C.M.‡	N/A
Injected Currents on AC & DC, 150kHz to 80MHz	EN 55024 : 1998+A2:2003	EN 61000-4-6 :1996 +A1:2001	3Vrms(emf), 80%, 1kHz Amp. Mod.	N/A
Power-frequency magnetic field	EN 55024 : 1998+A2:2003	EN 61000-4-8 :1993 +A1:2001	3A/m	N/A
Voltage Dips and Interruptions on AC	EN 55024 : 1998+A2:2003	EN 61000-4-11:2004	>95 % U <sub>T</sub> * for 0.5per >95 % U <sub>T</sub> * for 250per 70 % U <sub>T</sub> * for 25per	N/A

### Remark:

A.M. Amplitude Modulation.

P.M. Pulse Modulation.

† D.M. – Differential Mode

\* U<sub>T</sub> is the nominal supply voltage

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### 3 General Information

#### 3.1 Client Information

Applicant: Ovann Industrial Co.,Ltd.  
 Address of Applicant: Bldg1, Shantang Industrial Park, Paibang Village, Henggang Town, Shenzhen 518115 China  
 Manufacturer: Ovann Industrial Co.,Ltd.  
 Address of Manufacturer: Bldg1, Shantang Industrial Park, Paibang Village, Henggang Town, Shenzhen 518115 China  
 Product Name: Earphone  
 Model No.: OV.S8/ OV.S9/ OV.S10/ OV.S11/ OV.S13/ OV.T13/ OV.S25/ OV.E161

#### 3.2 Details of E.U.T.

Power Supply: Audio Signal Input

#### 3.3 Description of Support Units

The EUT has been tested as an independent unit.

#### 3.4 Standards Applicable for Testing

The customer requested EMC tests for a Earphone. The standards used were EN55022 Class B for emissions & EN55024 for immunity.

**Table 1 : Tests Carried Out Under EN 55022:1998+A2:2003**

Standard		Status
EN 55022: 1998+A2:2003	Radiation Emission, 30MHz to 1000MHz	√
EN 55022: 1998+A2:2003	Mains Terminal Disturbance Voltage,150KHz to 30MHz	×

**Table 2 : Tests Carried Out Under EN 61000-3-2: 2000/A2:2005 & EN 61000-3-3: 1995 + A2: 2005**

EN 61000-3-2: 2000 + A2: 2005	Harmonic Emissions on AC	×
EN 61000-3-3: 1995 + A2: 2005	Flicker Emissions on AC	×

√ Indicates that the test is applicable  
 × Indicates that the test is not applicable

**Table 3 : Tests Carried Out Under EN 55024:1998+A2: 2003**

<b>Standard</b>		<b>Status</b>
EN 61000-4-2:1995 + A2:2001	Electro-static discharge	√
EN 61000-4-3:2002	Radio frequency EM fields (80MHz to 1GHz)	√
EN 61000-4-4:2004	Fast transients	×
EN 61000-4-5:1995 +A1:2001	Surges	×
EN 61000-4-6:1996+A1:2001	Radio frequency continuous conducted (150kHz to 80MHz)	×
EN 61000-4-8:1993+A1:2001	Power-frequency magnetic field (50Hz)	×
EN 61000-4-11:2004	Voltage dips & interruptions	×

√ Indicates that the test is applicable

× Indicates that the test is not applicable

### **3.5 Test Facility**

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

- **FCC – Registration No.: 759357**

Solid Industrial (Shenzhen) Co., Ltd. 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 759357, November 04, 2003.

### **3.6 Test Location**

All Emissions tests were performed at:-

Solid Industrial (Shenzhen) Co., Ltd. at 333 Bulong Highway Buji Longgang, Shenzhen, Guangdong, China.

#### 4 Equipment Used during Test

##### List Of Test Equipment For EMI

Equipment	Brand Name	Model	Cal. Int Months	Last Cal. Date
<b>3m Anechoic chamber</b>				
EMC Analyzer	Agilent	E7402A	12	2006-08
EMI Test Receiver	R&S	ESS	12	2006-08
Pre Amplifier	Anritsu	MH648A	12	2006-08
Bilog Antenna	SCHAFFNER	CBL6111C	12	2006-08
AM/FM Stereo Signal Generator	Panasonic	VP-8122A	12	2006-08
Signal Generator	R&S	SMG	12	2006-08
RF Selector	TOYO	NS4901A	-	-
Turn Disc	HD	DS4150S	-	-
Antenna Mast	HD	MA2400	-	-
<b>EMI Shielded Room</b>				
Spectrum analyzer	ADVANTEST	R3261C	12	2006-08
EMI Test Receiver	R&S	ESS	12	2006-08
Pre Amplifier	Anritsu	MH648A	12	2006-08
LISN	Kyoritsu	KNW-403D	12	2006-08
LISN	Kyoritsu	KNW-407	12	2006-08
LISN	Kyoritsu	KNW-242C	12	2006-08
Absorbing Clamp	R&S	MDS-21	12	2006-08
Absorbing Clamp	R&S	MDS-21	12	2006-08
Absorbing Clamp	Kyoritsu	KT-20	12	-
Distortion Meter	MEGURO	MAK-6578A	12	2006-09
AM/FM Stereo Signal Generator	Panasonic	VP-8122A	12	2006-08
Oscilloscope	LEADER	LS1020	12	2006-09

Function Generator	National	VP-7422A	12	2006-08
Signal Generator	R&S	SMG	12	2006-08
RF Selector	TOYO	NS4000	-	-
RF Selector	TOYO	NS4900	-	-
Remote Controller	TOYO	MAC	-	-

**Harmonic & Flicker Test**

Signal Conditioning Unit	SCHAFFNER	CCN1000-1	12	2006-08
Signal Phase Impedance Network	SCHAFFNER	INA2152		
5KVA AC Power Source	SCHAFFNER	NSG1007		

**List Of Test Equipment For EMS**

Equipment	Brand Name	Model	Cal. Int Months	Last Cal. Date
<b>3m Anechoic chamber</b>				
EMC Analyzer	Agilent	E7402A	12	2006-08
EMI Test Receiver	R&S	ESS	12	2006-08
Pre Amplifier	Anritsu	MH648A	12	2006-08
Bilog Antenna	CHASE	CBL6111A	12	2006-09
Signal Generator	R&S	SMG	12	2006-08
Power Reflection Meter	R&S	NAP	12	2006-08
RF Power Amplifier	TOYO	AS300SSS	12	2006-08
Distortion Meter	HM-250	KNEWOOD	12	2006-09
Synthesized Function Generator	FC110	YOKOGAWA	12	2006-08
Noise Meter	MEGURO	MN-446A	12	2006-01



AM/FM Stereo Signal Generator	Panasonic	VP-8122A	12	2006-08
Oscilloscope	LEADER	LS1020	12	2006-10
Function Generator	National	VP-7422A	12	2006-08
Signal Generator	R&S	SMG	12	2006-08
Turn Disc	HD	DS4150S	-	-
Isotropic Field Monitor	AR	FM2000	-	-
Antenna Mast	HD	MA2400	-	-
RF Selector	TOYO	NS4901A	-	-
Remote Controller	TOYO	MAC	-	-

**TEST Room**

Fast Transient Burst Generator	SCHAFFENR	NSG3025	12	2006-08
AC Power Supply	KIKUSUI	PCR2000L	12	2006-10
Electrostatic Discharge Simulator	Noiseken	ESS-200AX	12	2006-08
AM/FM Stereo Signal Generator	Panasonic	VP-8122A	12	2006-08
Function Generator	National	VP-7422A	12	2006-08
AC Power Supply	KIKUSUI	PCR4000L	12	2006-10

**Shielded Room**

Spectrum analyzer	ADVANTEST	R3261C	12	2006-08
EMI Test Receiver	R&S	ESS	12	2006-08
Absorbing Clamp	R&S	MDS-21	12	2006-08
Milli-Voltmeter	R&S	URV3	12	2006-02
Absorbing Clamp	Kyoritsu	KT-20	12	-
Signal Generator	R&S	SMG	12	2006-08
Oscilloscope	LEADER	LS8022	12	2006-10
Audio Analyzer	R&S	UPA	12	2006-08
Milli-voltmeter	R&S	URV5	12	2006-08
Filter Unit	TOYO	NF8900	12	2006-08

WALTEK SERVICES

Reference No.: WT06122261-S-E

RF Power Amplifier	EN	411LA	12	2006-08
RF Selector	TOYO	NS8900	-	-
RF Selector	TOYO	NS4000	-	-
RF Selector	TOYO	NS4900	-	-
Injection&Output Network for Audio Output	Kyoritsu	KSI-5104U	-	-
Mains Rejection Network	Kyoritsu	KSI-2004S	-	-
Mains Rejection Network	Kyoritsu	KSI-2005	-	-
Coupling Network”L”	Erika Fiedler	-	-	-
Coupling Network”A”	Erika Fiedler	-	-	-
Coupling Network”M”	Erika Fiedler	-	-	-
Rco Network(8Ω)	Erika Fiedler	-	-	-
Mains Filter	Erika Fiedler	-	-	-

**Common Used Equipment**

Notebook	SONY	VGN-SZ22CP/B	N/A	N/A
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## 5 Emission Test Results

### 5.1 Radiation Emission Data

Test Requirement:	EN 55022 Class B
Test Method:	EN 55022 Class B
Test Date:	December 25, 2006
Frequency Range:	30MHz to 1000MHz
Class/Severity:	Table 1 of EN55022
Detector:	Peak for pre-scan (120kHz Resolution Bandwidth) Quasi-Peak & Average if maximised peak within 6dB of Average Limit

#### 5.1.1 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in the field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at Solid is  $\pm 4.0$  dB.

#### 5.1.2 EUT Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the CISPR16-1, The specification used in this report was the EN55022 Class B limits.

The EUT was placed on the test table in ON mode and connected with the Notebook.

#### 5.1.3 Spectrum Analyzer Setup

According to EN55022 Class B Rules, the system was tested to 1000 MHz.

Start Frequency.....	30 MHz
Stop Frequency.....	1000 MHz
Sweep Speed	Auto
IF Bandwidth.....	1 MHz
Video Bandwidth.....	1 MHz
Quasi-Peak Adapter Bandwidth .....	120 kHz
Quasi-Peak Adapter Mode .....	Normal
Resolution Bandwidth .....	1MHz

#### 5.1.4 Test procedure

For the radiated emissions test, since the EUT does not have a power source, there was no connection to AC outlets.

Maximizing procedure was performed on the six (6) highest emissions to ensure EUT is compliant with all installation combinations.

All data was recorded in the peak detection mode. Quasi-peak readings was performed only when an emission was found to be marginal (within -4 dBμV of specification limits), and are distinguished with a "Qp" in the data table.

The EUT was under normal mode during the final qualification test and the configuration was used to represent the worst case results.

#### 5.1.5 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Amplifier Gain}$$

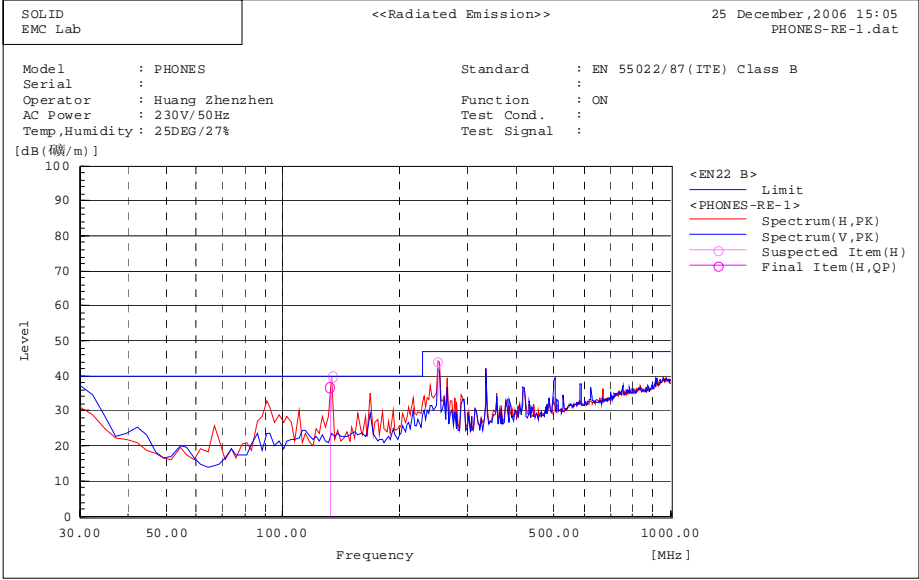
The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dBμV means the emission is 7dBμV below the maximum limit for Class B. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{Class B Limit}$$

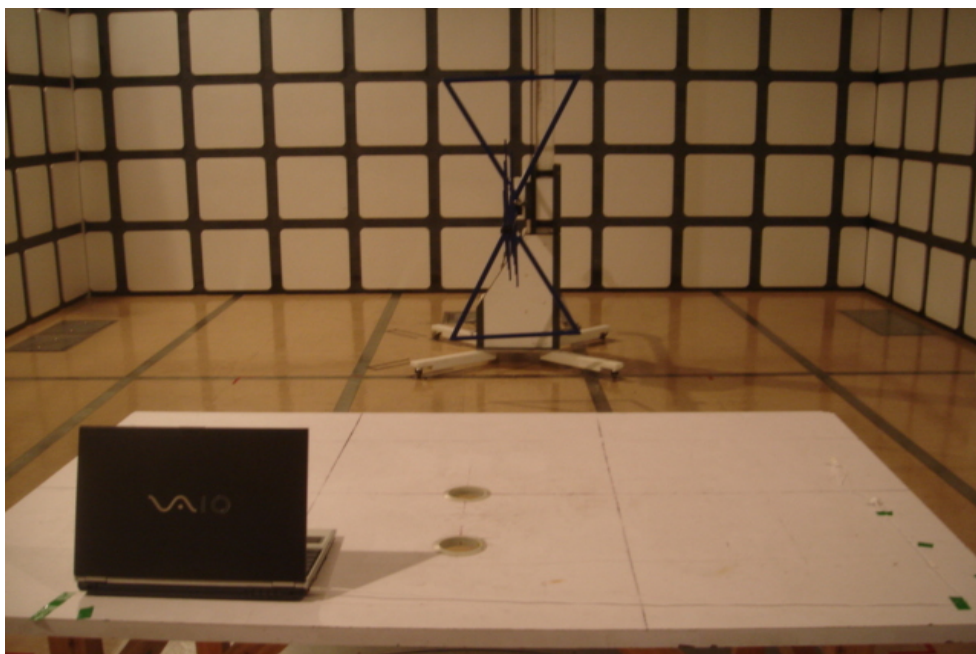
#### 5.1.6 Summary of Test Results

According to the data in section 5.1.7, the EUT complied with the EN55022 Class B standards, and had the worst margin of:

5.1.7 Radiated Emissions Test Data



### 5.1.8 Photographs – Radiation Emission Test Setup



## 6 Immunity Test Results

### 6.1 Performance Criteria Description

Criterion A: The apparatus shall continue to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended.

Criterion B: The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended.

Criterion C: Temporary loss of function is allowed, provided the function is self recoverable or can be restored by the operation of the controls.

**For further details, please refer to of EN55024.**

### 6.2 ESD

Test Requirement:	EN55024
Test Method:	EN61000-4-2
Test Date:	December 25, 2006
Discharge Impedance:	330 $\Omega$ / 150 pF
Discharge Voltage:	Air Discharge: 8 kV Contact Discharge: 4 kV HCP & VCP: 4 kV
Polarity:	Positive & Negative
Number of Discharge:	Minimum 10 times at each test point
Discharge Mode:	Single Discharge
Discharge Period:	1 second minimum

#### 6.2.1 E.U.T. Operation

Operating Environment:

Temperature :	24.0 °C
Humidity :	52 % RH
Barometric Pressure :	1012 mbar

EUT Operation:

The EUT was placed on the test table in ON mode and connected with the Notebook.

**6.2.2 Direct Application Test Results**

**Observations :** Test points : 1. All Exposed Surface & Seams;  
2. All metallic part

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

**Results**

A: No degradation in the performance of the E.U.T. was observed.

N/A: Not applicable.

**6.2.3 Indirect Application Test Results**

**Observations :** Test points : 1. All sides.

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

**Results**

A: No degradation in the performance of the E.U.T. was observed.



#### 6.2.4 Photographs - ESD Test Setup



### 6.3 Radiated Immunity

Test Requirement: EN55024  
 Test Method: EN61000-4-3  
 Frequency Range: 80MHz–1GHz  
 Face Under Test: Three Mutually Orthogonal Faces  
 Severity: 3V/m, 1kHz, 80% Amp. Mod. from 80MHz to 1GHz  
 Test Date: December 25, 2006

#### 6.3.1 E.U.T. Operation

Operating Environment:  
 Temperature: 24.0 °C  
 Humidity: 52 % RH  
 Barometric Pressure: 1012 mbar

EUT Operation:

The EUT was placed on the test table in ON mode and connected with the Notebook.

#### 6.3.2 Test Results

Frequency	Level	Modulation	EUT Face	Result / Observations
80MHz-1GHz	3V/m	1kHz, 80%, Amp. Mod.	X Y Z	During test, noise can be heard. After test EUT recovers to normal (A).

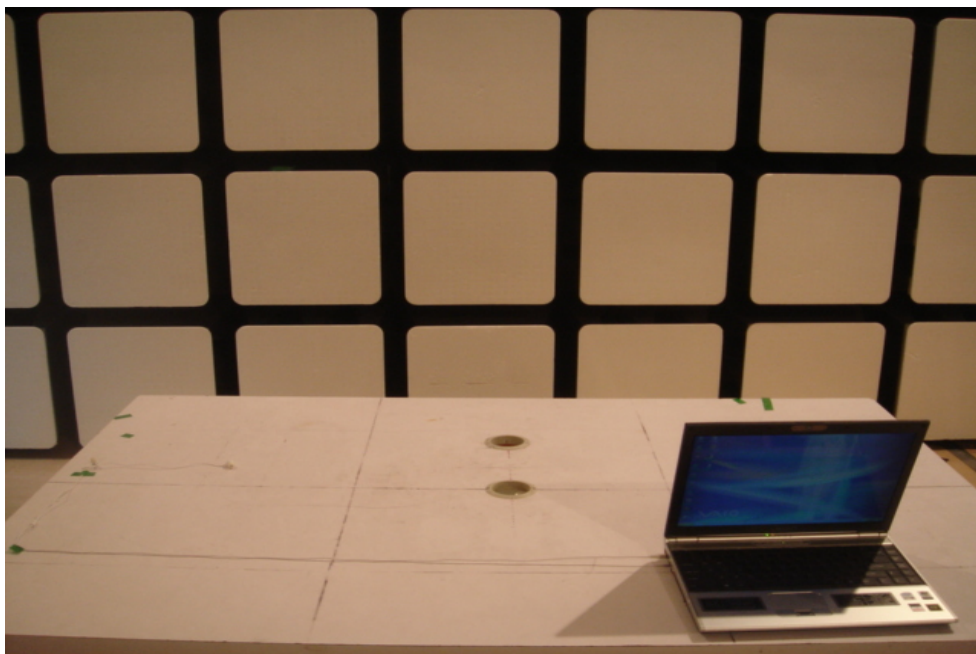
#### Remarks:

AM : Amplitude Modulation.  
 PM : Pulse Modulation.  
 X : EUT as per photograph in section 6.3.3 of this report.  
 Y : As X, but rotate EUT by 90° clockwise.  
 Z : As Y, but rotate EUT by 90° vertically.

#### Results

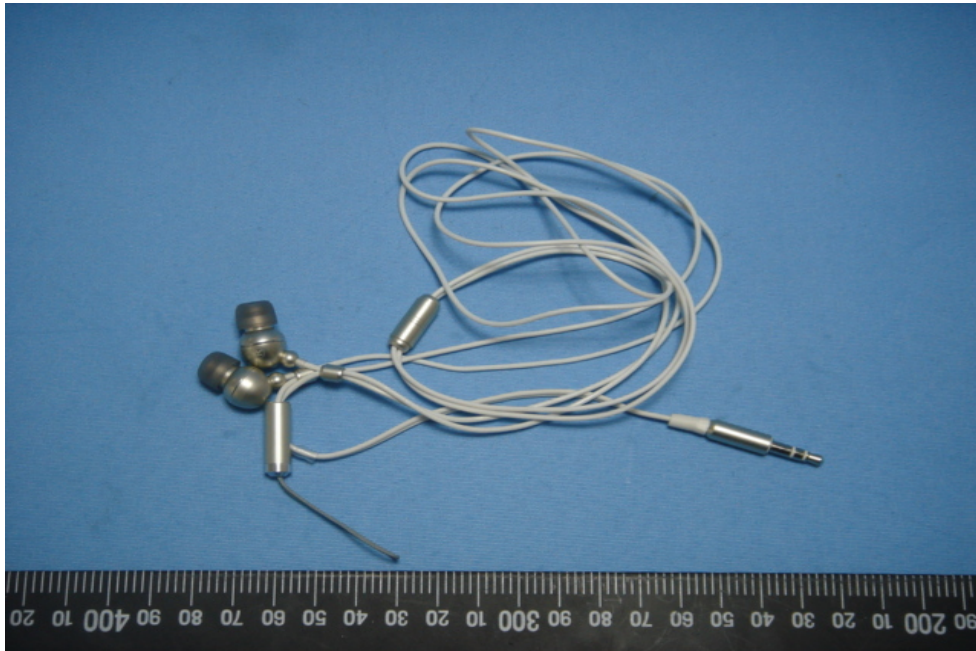
A : No degradation in the performance of the E.U.T. was observed.

### 6.3.3 Photographs - Radiated Immunity Test Setup For X-Direction



## **7 Photographs - Constructional Details**

### **7.1 EUT 1 – Appearance View**



### **7.2 EUT 2 – Appearance View**



### 7.3 EUT 3 – Appearance View

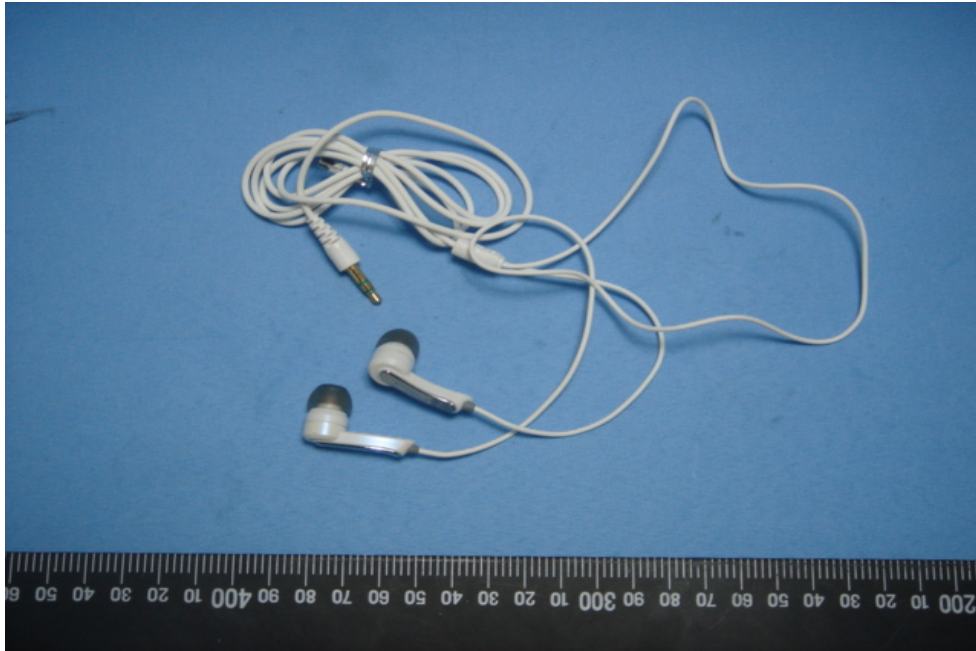


### 7.4 EUT 4 – Appearance View





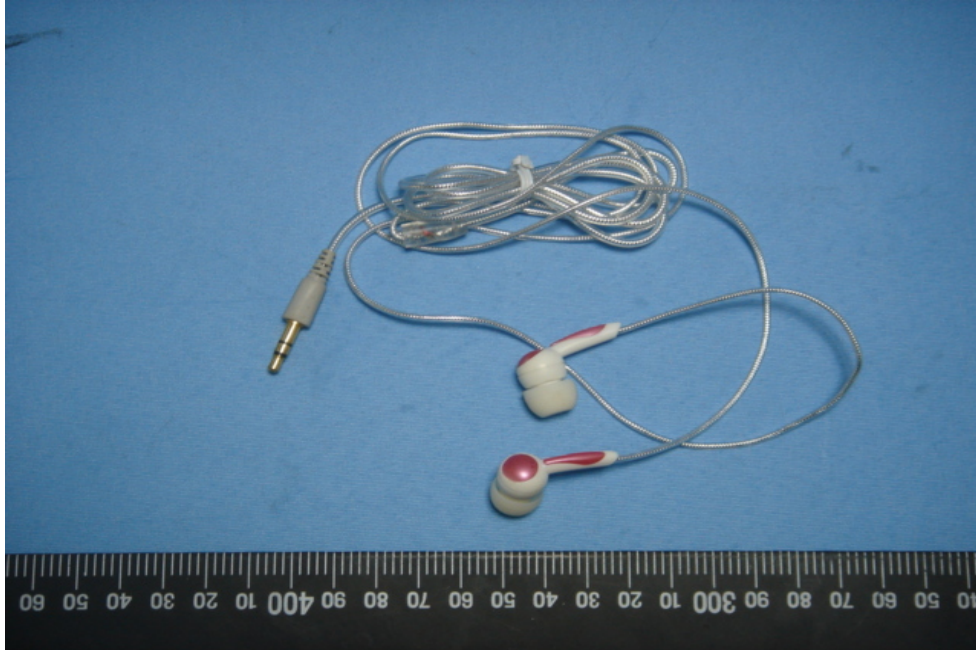
### 7.5 EUT 5 – Appearance View



### 7.6 EUT 6 – Appearance View



### 7.7 EUT 7 – Appearance View



### 7.8 EUT 8 – Appearance View



## 8 CE Label

1. The CE conformity marking must consist of the initials 'CE' taking the following form:  
If the CE marking is reduced or enlarged, the proportions given in the above graduated drawing must be respected.
2. The CE marking must have a height of at least 5 mm except where this is not possible on account of the nature of the apparatus.
3. The CE marking must be affixed to the product or to its data plate. Additionally it must be affixed to the packaging, if any, and to the accompanying documents.
4. The CE marking must be affixed visibly, legibly and indelibly.  
It must have the same height as the initials 'CE'

Proposed Label Location on EUT  
EUT Bottom View/proposed CE Mark Location

