



EMC TEST REPORT  
For

Alitronika DVS B.V.

iMod-S

Model No.: AT290USB

FCC ID: ZA6AT290USB

Prepared for : Alitronika DVS B.V.  
Address : Kalmarweg 16/3, 9723 JG Groningen, The Netherlands

Prepared by : SHENZHEN EMTEK CO., LTD.  
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Report Number : ES101202013F  
Date of Test : January 28, 2011 to February 20, 2011  
Date of Report : February 21, 2011

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## TEST REPORT DESCRIPTION

Applicant : Alitronika DVS B.V.  
Manufacturer : MECALEC SMD  
Trade Mark : Alitronika  
EUT : iMod-S  
Model No. : AT290USB  
FCC ID : ZA6AT290USB  
Power Supply : AC 100-240V, 50-60Hz, 0.35A

Measurement Procedure Used:

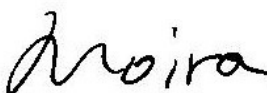
FCC Rules and Regulations Part 15 Subpart B Class B October 2009 &  
FCC / ANSI C63.4-2009

The device described above is tested by SHENZHEN EMTEK CO., LTD. to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and SHENZHEN EMTEK CO., LTD. is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the FCC requirements.

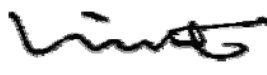
This report applies to above tested sample only and shall not be reproduced in part without written approval of SHENZHEN EMTEK CO., LTD.

Date of Test : January 28, 2011 to February 20, 2011

Prepared by

:   
(Engineer)

Reviewer

:   
(Quality Manager)



Approved & Authorized Signer :

  
(Manager)

## 1. SUMMARY OF TEST RESULT

<b>EMISSION</b>		
Description of Test Item	Standard & Limits	Results
Conducted Disturbance at Mains Terminals	FCC Part 15, Subpart B, Class B ANSI C63.4: 2009	Pass
Radiated Disturbance (30M-1GHz)	FCC Part 15, Subpart B, Class B ANSI C63.4: 2009	Pass
Radiated Disturbance (above 1GHz)	FCC Part 15, Subpart B, Class B ANSI C63.4: 2009	Pass
Note: N/A is an abbreviation for Not Applicable.		

## 2. GENERAL INFORMATION

### 2.1. Description of Device (EUT)

EUT : iMod-S

Model Number : AT290USB

FCC ID : ZA6AT290USB

Adapter : Model: GFP181DA-0530-1  
Input: AC 100-240V, 50-60Hz, 0.35A  
Output: DC 5V, 3A

Test Voltage : AC 120V/60Hz for Adapter

Applicant : Alitronika DVS B.V.

Address : Kalmarweg 16/3, 9723 JG Groningen, The Netherlands

Manufacturer : MECALEC SMD

Address : Rue Nicolas Fossoul 54, B4100 Boncelles, Belgium

Date of Received : January 27, 2011

Date of Test : January 28, 2011 to February 20, 2011

### 2.2. Description of Test Facility

#### Site Description

EMC Lab. : Accredited by CNAS, 2010.10.29  
The certificate is valid until 2013.10.28  
The Laboratory has been assessed and proved to be in compliance with CNAS-CL01:2006 (identical to ISO/IEC 17025:2005)  
The Certificate Registration Number is L2291.

Accredited by TUV Rheinland Shenzhen 2010.5.25  
The Laboratory has been assessed according to the requirements ISO/IEC 17025.

Accredited by FCC, October 28, 2010  
The Certificate Registration Number is 406365.

Accredited by Industry Canada, March 5, 2010  
The Certificate Registration Number is 46405-4480.

Name of Firm : SHENZHEN EMTEK CO., LTD.  
Site Location : Bldg 69, Majialong Industry Zone,  
Nanshan District, Shenzhen, Guangdong, China

### 2.3.Description of Support Device

PC	:	Manufacturer: LENOVO M/N: 9702 S/N: L3C4410 CE, FCC: DOC
LCD Monitor	:	Manufacturer: LENOVO M/N: 9227-AE6 S/N:4M0293084302824 CE, FCC: DOC
Keyboard	:	Manufacturer: LENOVO M/N: KU-0225 S/N:0585494 CE, FCC: DOC
Mouse	:	Manufacturer: LENOVO M/N: MO28UOL S/N:44G7862 068 CE, FCC: DOC
TV	:	Manufacturer: JIAYU M/N: TV-1903 S/N: N/A CE , FCC: DOC
Set Top Box	:	Manufacturer: SMT M/N: DVB-S S/N: 4244222S

### 2.4.Measurement Uncertainty

Conducted Emission Uncertainty : 2.8dB

Radiated Emission Uncertainty : 3.3dB (3m Chamber)

### 3. MEASURING DEVICE AND TEST EQUIPMENT

#### 3.1. For Power Line Conducted Emission Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESCS30	828985/018	May 29, 2010	1 Year
2.	L.I.S.N.	Schwarzbeck	NNLK8129	8129203	May 29, 2010	1 Year
3.	50Ω Coaxial Switch	Anritsu	MP59B	M20531	N/A	N/A
4.	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100006	May 29, 2010	1 Year
5.	Voltage Probe	Rohde & Schwarz	TK9416	N/A	May 29, 2010	1 Year
6.	I.S.N	Rohde & Schwarz	ENY22	1109.9508.02	May 29, 2010	1 Year

#### 3.2. For Antenna Power Conduction Emission Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EMI Test Receiver	Rohde & Schwarz	ESU26	1302.6005.26	May 29, 2010	1 Year
2	Matching network	Weinschel	1506A	PM203	May 29, 2010	1 Year

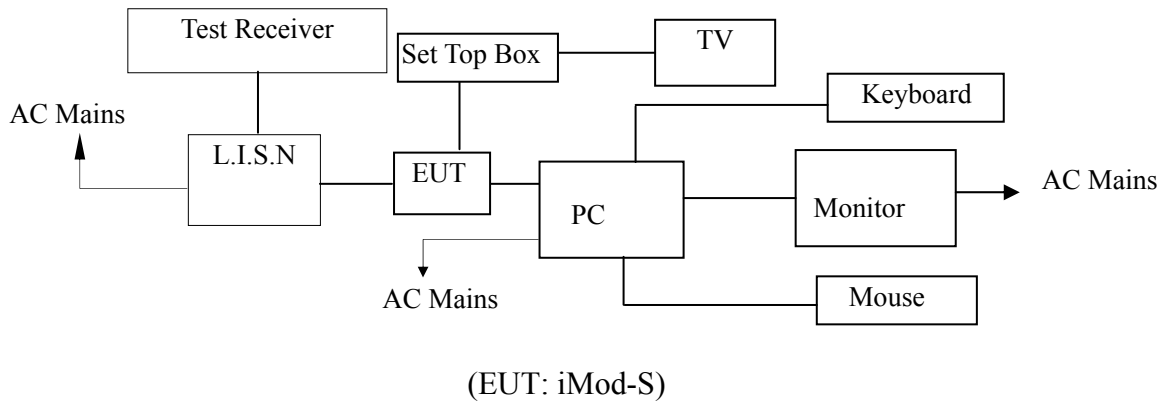
#### 3.3. For Radiated Emission Measurement (3m)

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EMI Test Receiver	Rohde & Schwarz	ESU26	1302.6005.26	May 29, 2010	1 Year
2.	Pre-Amplifier	HP	8447D	2944A07999	May 29, 2010	1 Year
3.	Bilog Antenna	Schwarzbeck	VULB9163	142	May 29, 2010	1 Year
4.	Loop Antenna	ARA	PLA-1030/B	1029	May 29, 2010	1 Year
5.	Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170399	May 29, 2010	1 Year
6.	Horn Antenna	Schwarzbeck	BBHA 9120	D143	May 29, 2010	1 Year
7.	Cable	Schwarzbeck	AK9513	ACRX1	May 29, 2010	1 Year
8.	Cable	Rosenberger	N/A	FP2RX2	May 29, 2010	1 Year
9.	Cable	Schwarzbeck	AK9513	CRPX1	May 29, 2010	1 Year
10.	Cable	Schwarzbeck	AK9513	CRRX2	May 29, 2010	1 Year

## 4. POWER LINE CONDUCTED EMISSION MEASUREMENT

### 4.1. Block Diagram of Test Setup

#### 4.1.1. For AC Mains Test



### 4.2. Measuring Standard

FCC Part 15, Subpart B, Class B ANSI C63.4: 2009

Power Line Conducted Emission Limits (Class B)

Frequency (MHz)	Limit (dB $\mu$ V)	
	Quasi-peak Level	Average Level
0.15 ~ 0.50	66.0 ~ 56.0 *	56.0 ~ 46.0 *
0.50 ~ 5.00	56.0	46.0
5.00 ~ 30.00	60.0	50.0
NOTE1-The lower limit shall apply at the transition frequencies. NOTE2-The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.50MHz.		

### 4.3. EUT Configuration on Measurement

The following equipments are installed on Conducted Emission Measurement to meet FCC requirements and operating in a manner which tends to maximize its emission characteristics in a normal application.

EUT : iMod-S  
 Model Number : AT290USB  
 Serial Number : N/A



#### 4.4.Operating Condition of EUT

4.4.1.Setup the EUT as shown on Section 4.1.

4.4.2.Turn on the power of all equipments.

4.4.3.Let the EUT work in measuring mode (DTV) and measure it.

#### 4.5.Test Procedure

The EUT is put on the plane 0.8m high above the ground by insulating support and connected to the AC mains through Line Impedance Stability Network (L.I.S.N). This provided a 50ohm coupling impedance for the tested equipments. Both sides of AC line are investigated to find out the maximum conducted emission according to the FCC regulations during conducted emission measurement.

The bandwidth of the field strength meter (R&S Test Receiver ESCS30) is set at 9kHz in 150kHz~30MHz and 200Hz in 9kHz~150kHz.

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

#### 4.6.Measuring Results

**PASS.**

Please refer to the following pages.

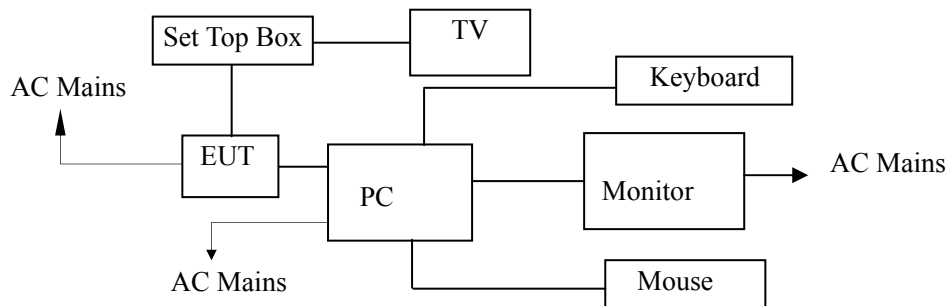
Date of Test: February 14, 2011      Temperature: 22  
 Frequency Detector: 0.15~30MHz      Humidity: 50%  
 Test Result: PASS      Test Mode: DTV

Test Line	Frequency MHz	Emission Level QP dB(μV)	Emission Level AV dB(μV)	Limits QP dB(μV)	Limits AV dB(μV)	Margin QP dB(μV)	Margin AV dB(μV)
Line	0.2750	52.70	48.05	60.97	50.97	-8.27	-2.92
	0.4100	47.50	41.97	57.65	47.65	-10.15	-5.68
	0.6700	48.70	43.21	56.00	46.00	-7.30	-2.79
	0.8250	48.30	42.80	56.00	46.00	-7.70	-3.20
	1.3750	47.40	39.88	56.00	46.00	-8.60	-6.12
	1.7450	48.90	38.52	56.00	46.00	-7.10	-7.48
Neutral	0.2750	52.92	47.54	60.97	50.97	-8.05	-3.43
	0.4150	47.34	41.32	57.55	47.55	-10.21	-6.23
	0.6800	48.50	43.59	56.00	46.00	-7.50	-2.41
	0.8300	45.40	42.22	56.00	46.00	-10.60	-3.78
	1.3800	46.90	38.53	56.00	46.00	-9.10	-7.47
	3.6400	46.80	34.24	56.00	46.00	-9.20	-11.76

## 5. RADIATED EMISSION MEASUREMENT

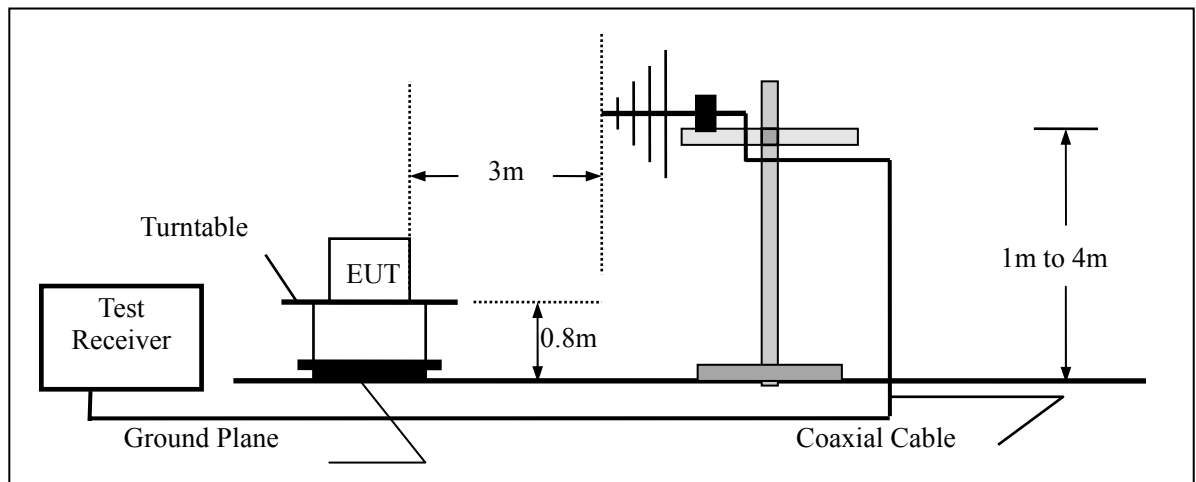
### 5.1. Block Diagram of Test Setup

#### 5.1.1. Block diagram of connection between the EUT and simulators



(EUT: iMod-S)

#### 5.1.2. Block diagram of test setup (In chamber)



(EUT: iMod-S)

### 5.2. Measuring Standard

FCC Part 15, Subpart B, Class B ANSI C63.4: 2009

### 5.3. Radiated Emission Limits (Class B)

#### 5.3.1. Limit bellow 1GHz:

Frequency MHz	Distance Meters	Field Strengths Limit	
		$\mu\text{V/m}$	$\text{dB}(\mu\text{V})/\text{m}$
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0

- Note:
- (1) Emission level  $(\text{dB})\mu\text{V} = 20 \log \text{Emission level } \mu\text{V/m}$
  - (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.

#### 5.3.2. Limit above 1GHz:

Frequency (GHz)	Distance (Meters)	Field Strengths Limit	
		Average $(\text{dB})\mu\text{V/m}$	Peak $(\text{dB})\mu\text{V/m}$
Above 1GHz	3	54	74

- Note:
- (1) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the EUT.

### 5.4. EUT Configuration on Test

The FCC Class B regulations test method must be used to find the maximum emission during radiated emission measurement.

### 5.5. Operating Condition of EUT

5.5.1. Turn on the power.

5.5.2. After that, let the EUT work in test mode (DTV) and measure it.

### 5.6. Test Procedure

The EUT is placed on a turntable which is 0.8 meter high above the ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna that is mounted on a antenna tower. The antenna can be moved up and down from 1 to 4 meters to find out the maximum emission level. Bilog antenna (calibrated by Dipole Antenna) is used as a receiving antenna. Both horizontal and vertical polarization of the antenna is set on test.

The bandwidth of the Receiver (ESU26) is set at 120kHz.

## 5.7.Measuring Results

### **PASS.**

The frequency range from 30MHz to 6GHz is investigated.

Please refer to the following pages.

Operation Mode:	DTV 1295 MHz	Test Date :	February 14, 2011
Frequency Range:	30~1000MHz	Temperature :	28
Test Result:	PASS	Humidity :	65 %
Measured Distance:	3m	Test By:	WOLF

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV)	Limit 3m (dBuV/m)	Margin (dB)	Note
30	V	26.63	40	-13.37	QP
143.4	V	28.12	43.5	-15.38	QP
191.66	V	28.58	43.5	-14.92	QP
432.61	V	28.28	46	-17.72	QP
493.23	V	30.59	46	-15.41	QP
692.21	V	35.19	46	-10.81	QP
38.48	H	24.85	40	-15.15	QP
87.11	H	26.40	40	-13.6	QP
240.00	H	37.90	46	-8.1	QP
308.91	H	40.80	46	-5.2	QP
355.42	H	40.00	46	-6	QP
810.26	H	37.56	46	-8.44	QP

Operation Mode:	DTV 1685 MHz	Test Date :	February 14, 2011
Frequency Range:	30~1000MHz	Temperature :	28
Test Result:	PASS	Humidity :	65 %
Measured Distance:	3m	Test By:	WOLF

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV)	Limit 3m (dBuV/m)	Margin (dB)	Note
30.85	V	32.73	40	-7.27	QP
52.02	V	30.48	40	-9.52	QP
143.82	V	32.3	43.5	-11.2	QP
239.98	V	40.86	46	-5.14	QP
311.08	V	38.43	46	-7.57	QP
364.25	V	39.06	46	-6.94	QP
239.52	H	31.64	46	-14.36	QP
312.27	H	32.51	46	-13.49	QP
353.01	H	37.02	46	-8.98	QP
400.54	H	37.11	46	-8.89	QP
810.85	H	39	46	-7	QP
900.09	H	40.37	46	-5.63	QP

Operation Mode:	DTV 2010 MHz	Test Date :	February 14, 2011
Frequency Range:	30~1000MHz	Temperature :	28
Test Result:	PASS	Humidity :	65 %
Measured Distance:	3m	Test By:	WOLF

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV)	Limit 3m (dBuV/m)	Margin (dB)	Note
99.87	V	31.7	43.5	-11.8	QP
300.36	V	41.5	46	-4.5	QP
312.17	V	40	46	-6	QP
400.43	V	38.77	46	-7.23	QP
416.17	V	36.79	46	-9.21	QP
454.31	V	35.02	46	-10.98	QP
239.98	H	28.92	46	-17.08	QP
309.99	H	36.16	46	-9.84	QP
351.70	H	35.27	46	-10.73	QP
400.43	H	38.71	46	-7.29	QP
419.10	H	36.78	46	-9.22	QP
533.83	H	39.55	46	-6.45	QP

Operation Mode:	DTV 1295 MHz	Test Date :	February 14, 2011
Frequency Range:	Above 1GHz	Temperature :	28
Test Result:	PASS	Humidity :	65 %
Measured Distance:	3m	Test By:	WOLF

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)		Note
		PK	AV	PK	AV	PK	AV	
1200	V	45.23	34.35	74	54	-28.77	-19.65	others
1295	V	46.89	35.65	74	54	-27.11	-18.35	others
5230	V	50.68	39.13	74	54	-23.32	-14.87	others
6446	V	57.57	47.26	74	54	-16.43	-6.74	Fundamental
8692	V	51.59	40.43	74	54	-22.41	-13.57	others
1291	H	46.55	35.43	74	54	-27.45	-18.57	others
1372	H	47.32	36.54	74	54	-26.68	-17.46	others
3263	H	48.42	37.86	74	54	-25.58	-16.14	others
6445	H	58.9	48.54	74	54	-15.1	-5.46	Fundamental

**All emissions not reported were more than 20dB below the specified limit or in the noise floor.**

- Note:**
- (1) All Readings are Peak Value and AV.
  - (2) Emission Level= Reading Level+Probe Factor +Cable Loss.
  - (3) Data of measurement within this frequency range shown “ -- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

Operation Mode:	DTV 1685 MHz	Test Date :	February 14, 2011
Frequency Range:	Above 1GHz	Temperature :	28
Test Result:	PASS	Humidity :	65 %
Measured Distance:	3m	Test By:	WOLF

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)		Note
		PK	AV	PK	AV	PK	AV	
1215	V	45.43	35.44	74	54	-28.57	-18.56	others
1684	V	48.55	37.53	74	54	-25.45	-16.47	others
3463	V	49.43	38.55	74	54	-24.57	-15.45	others
6835	V	59.44	48.42	74	54	-14.56	-5.58	Fundamental
1252	H	47.44	37.84	74	54	-26.56	-16.16	others
1686	H	46.33	37.45	74	54	-27.67	-16.55	others
3737	H	52.22	41.33	74	54	-21.78	-12.67	others
6836	H	57.60	46.54	74	54	-16.4	-7.46	Fundamental

**All emissions not reported were more than 20dB below the specified limit or in the noise floor.**

- Note:**
- (1) All Readings are Peak Value and AV.
  - (2) Emission Level= Reading Level+Probe Factor +Cable Loss.
  - (3) Data of measurement within this frequency range shown “ -- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.



Operation Mode:	DTV 2010 MHz	Test Date :	February 14, 2011
Frequency Range:	Above 1GHz	Temperature :	28
Test Result:	PASS	Humidity :	65 %
Measured Distance:	3m	Test By:	WOLF

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)		Note
		PK	AV	PK	AV	PK	AV	
1244	V	48.33	36.22	74	54	-25.67	-17.78	others
1294	V	47.39	38.32	74	54	-26.61	-15.68	others
3145	V	50.22	40.32	74	54	-23.78	-13.68	others
7160	V	54.42	41.22	74	54	-19.58	-12.78	Fundamental
1125	H	45.36	35.44	74	54	-28.64	-18.56	others
1200	H	44.55	33.18	74	54	-29.45	-20.82	others
1750	H	51.22	40.32	74	54	-22.78	-13.68	others
7160	H	55.33	42.33	74	54	-18.67	-11.67	Fundamental

**All emissions not reported were more than 20dB below the specified limit or in the noise floor.**

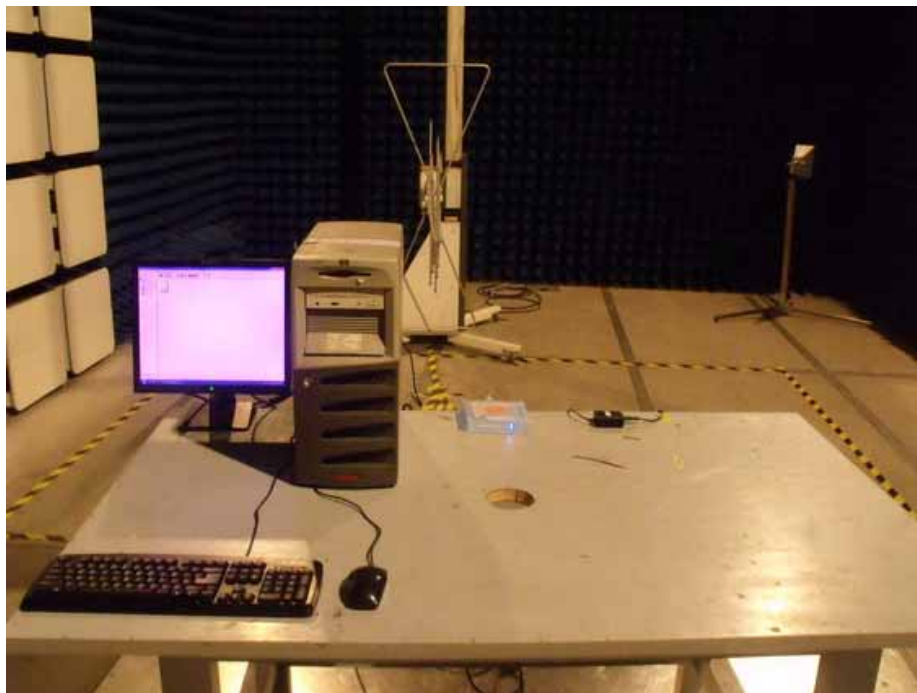
- Note:**
- (1) All Readings are Peak Value and AV.
  - (2) Emission Level= Reading Level+Probe Factor +Cable Loss.
  - (3) Data of measurement within this frequency range shown “ -- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

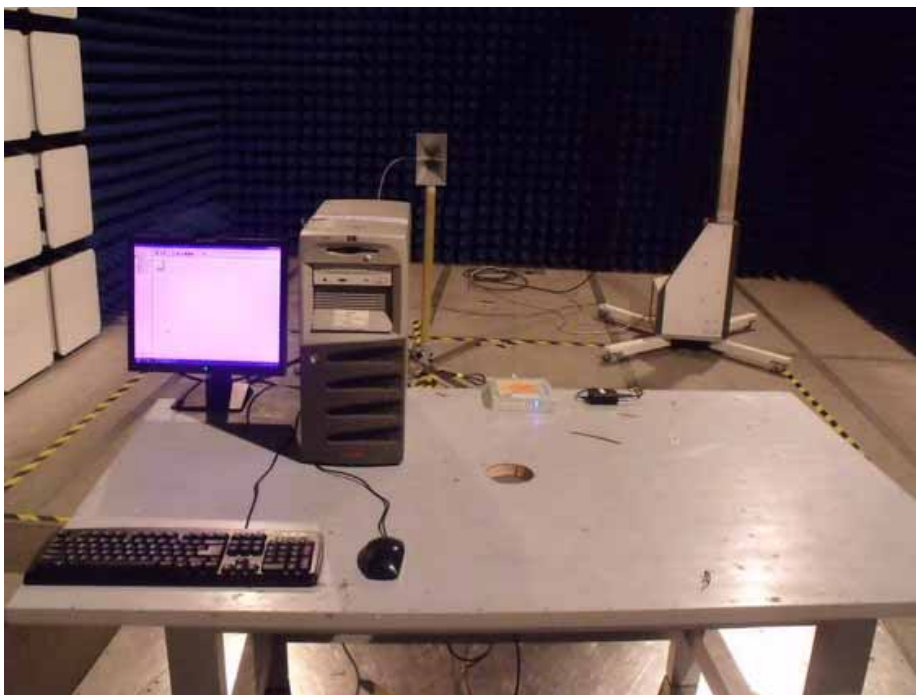
## 6. PHOTOGRAPHS

### 6.1.Photos of Power Line Conducted Emission Measurement



### 6.2.Photos of Radiation Emission Measurement





# APPENDIX I

## (Photos of EUT)

