

# Certificate of Test

May 2009

## Soaring Technology Co., LTD.

Product Type : Signal shifter  
Model Number : SCBX-4010-XXXX (X= -or 0~9 or A~Z or a~z or blank)  
Brand Name : SlimAGE  
Test Report Number : 0904009R-01  
Date of Test : April 08, 2009- April 16, 2009

This Product was tested to the following standards at the laboratory  
of Global EMC Standard Tech. Corp., and found Compliance.

**Standards:**

FCC Part 15 Subpart C Paragraph 15.239

ANSI C63.4: 2003

[http : //www.gestek.com.tw](http://www.gestek.com.tw)



Tonny Lin, President

Date: May 14, 2009

**GESTEK EMC LAB**

N0. 3, Pau-Tou-Tsuo Valley, Chia-Pau Tsuen,  
Lin Kou Hsiang, Taipei County, Taiwan, R.O.C.  
TEL:886-2-2603-5321  
FAX:886-2-2603-5325



NVLAP LAB CODE 200085-0





**Test Report  
Application for  
Certification  
On Behalf Of**

**Soaring Technology Co., LTD.**

**EUT:  
Signal shifter**

**Model Number:  
SCBX-4010-XXXX (X= -or 0~9 or A~Z or a~z or blank)**

**FCC ID: MXCSCBX4010-A**

**Prepared for:  
Soaring Technology Co., LTD.  
1F, No.34 Chung-Hsing Road, Hsichih City, Taipei Hsien 22161,  
Taiwan, R.O.C.**

**Report By :Global EMC Standard Tech. Corp.  
No.3 Pau-Tou-Tsuo Valley, Chia-Pau  
Tsuen, Lin Kou Hsiang, Taipei County,  
Taiwan, R.O.C.  
Tel : 886-2-2603-5321  
Fax : 886-2-2603-5325**

1. Test results given in this report only relate to the specimen(s) tested, measured.
2. This report is the property of GesTek, and shall not be reproduced, other than in full, without the written consent of GesTek.
3. The report must not be used by the client to claim product certification, approval, or endorsement by any agency of the federal government.
4. All data in this report are traceable to national standard or international standard.

# TABLE OF CONTENTS

DESCRIPTION	PAGE
<b>1. CERTIFICATION .....</b>	<b>3</b>
<b>2. GENERAL INFORMATION .....</b>	<b>4</b>
2.1 PRODUCTION DESCRIPTION .....	4
2.2 OPERATIONAL DESCRIPTION.....	5
2.3 TEST MODES & EUT COMPONENTS DESCRIPTION.....	5
2.4 SUMMARY OF TEST PROCEDURE AND TEST RESULTS .....	5
2.5 CONFIGURATION OF THE TESTED SYSTEM .....	6
2.6 TEST FACILITY.....	7
2.7 TEST SETUP .....	8
2.8 EUT OPERATING CONDITIONS.....	8
<b>3. RADIATION EMISSION DATA .....</b>	<b>9</b>
3.1 TEST EQUIPMENT .....	9
3.2 OPEN TEST SITE SETUP DIAGRAM.....	9
3.3 RADIATED EMISSION LIMIT .....	10
3.4 EUT CONFIGURATION .....	11
3.5 OPERATING CONDITION OF EUT .....	11
3.6 RADIATED EMISSION DATA .....	11
3.7 RADIATED EMISSIONS MEASUREMENT RESULTS .....	12
3.7.1 SPURIOUS RADIATED EMISSIONS .....	12
3.7.2 FUNDAMENTAL RADIATION EMISSION.....	18
3.7.3 BAND EDGE TEST .....	19
<b>4. OCCUPIED BANDWIDTH.....</b>	<b>20</b>
4.1 TEST EQUIPMENT .....	20
4.2 BLOCK DIAGRAM OF TEST SETUP.....	20
4.3 LIMIT .....	20
4.4 TEST RESULT .....	21
<b>5. PHOTOGRAPHS FOR TEST .....</b>	<b>23</b>
5.1 TEST PHOTOGRAPHS FOR RADIATION .....	23
<b>6. PHOTOGRAPHS FOR PRODUCT .....</b>	<b>24</b>
<b>7. EMI REDUCTION METHOD DURING COMPLIANCE TESTING .....</b>	<b>31</b>

# 1. CERTIFICATION

## Applicant

: **Soaring Technology Co., LTD.**

Applicant Address : 1F, No.34 Chung-Hsing Road, Hsichih City, Taipei Hsien 22161, Taiwan, R.O.C.

EUT Description : Signal shifter

Model Number : SCBX-4010-XXXX (X= -or 0~9 or A~Z or a~z or blank)

Serial Number : N/A

Brand Name : SlimAGE

FCC ID : MXCSCBX4010-A

Tested Power Supply : DC 12V

Manufacturer : 1.Soaring Technology Co., LTD.

2.CHANGZHOU SOARING TECHNOLOGY CO., LTD.

Manufacturer Address : 1.1F. No.34 Chung-Hsing Road, Hsichih City, Taipei Hsien 22161, Taiwan, R.O.C.

2.No.25, Xinke Road, Changzhou, Jiangsu 213031, China

## MEASUREMENT PROCEDURES USED:

☒ **CFR 47, Part 15** Radio Frequency Device Subpart C Paragraph 15.239 Intentional Radiators :2008

☒ **ANSI C63.4** Methods of Measurements of Radio-Noise Emissions from Low- Voltage Electrical and Electronic Equipment in the range of 9kHz To 40GHz. 2003

THE MEASUREMENT SHOWN IN THE ATTACHMENT WAS MADE IN ACCORDANCE WITH THE PROCEDURES INDICATED, AND THE MAXIMUM ENERGY EMITTED BY THE EQUIPMENT WAS FOUND TO BE WITHIN THE ABOVE LIMITS APPLICABLE.

**Sample Received Date** : April 02, 2009

**Date of Test** : April 08, 2009 – April 16, 2009

**Issue Date** : May 14, 2009

In order to ensure the quality and accuracy of this document, the contents have been thoroughly reviewed by the following qualified personnel from GesTek Lab.

**Documented By :**

*Rini Chen*

Rini Chen / Adm. Dept. Supervisor

**Tested By :**

*John Wu*

John Wu / Eng. Dept. Engineer

**Approved By :**

*Tony Tsai*

Tony Tsai / Eng. Dept. Manager

This test data shown below is traceable to National or international standard such as NIST/USA, etc. The laboratory's NVLAP accreditation in no way constitutes or implies product certification, approval, or endorsement by NVLAP or the United States government.

## 2. GENERAL INFORMATION

### 2.1 PRODUCTION DESCRIPTION

**Product Name** : Signal shifter  
**Model Number** : SCBX-4010-XXXX(X= -or 0~9 or A~Z or a~z or blank)  
**Serial Number** : N/A  
**FCC ID** : MXCSCBX4010-A  
**Modulation Type** : FM  
**Antenna Gain** : 0dBi  
**Antenna Type** : 28AWG WIRE CABLE  
**Type of Antenna Joint** : SJH2K-02HG  
**Frequencg Range** : FM 88-108MHz  
**Channel Number** : 6 Channel  
**Each Channel Separation** : 0.4MHz  
**Channel Control** : MCU Control  
**Working Voltage** : DC 12V

#### Frequency of Each Channel:

Ch	Frequency (MHz)
1	88.3
2	88.7
3	89.1
4	89.5
5	89.9
6	90.3

#### Note:

1. This device is a Signal shifter not include any receiver.
2. Test of channel was included the lowest 、middle and highest frequency in highest data rate and to perform the test, then record on this report.
3. The antenna of EUT is printed on PCB and conform to FCC 15.203.
4. These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15 Subpart C Paragraph 15.239.
5. The EUT has series model numbers, because of the requirement of marketing.

## 2.2 OPERATIONAL DESCRIPTION

The EUT is a Signal shifter and powered by DC 12V battery via vehicle adapter. The device is normally used in vehicle and transmits audio signals by AUX port or USB port input then receives audio signals via FM radio.

The other instruction and information please refer to user manual.

## 2.3 TEST MODES & EUT COMPONENTS DESCRIPTION

EUT: Signal shifter, M/N: SCBX-4010-XXXX	
Test Mode	Mode 1
	Channel 1: 88.3MHz
	Channel 4: 89.5MHz
	Channel 6: 90.3MHz

## 2.4 SUMMARY OF TEST PROCEDURE AND TEST RESULTS

Test Item	Applied Standard Section	Test Result
Conduction Emission	15.207, ANSI C63.4 Section 7	Non Testing
Radiation Emission	15.209, ANSI C63.4 Section 8	Pass (refer to section 3.7.1)
Field Strength of Fundamental	15.239(b), ANSI C63.4 Section 13 & Annex H	Pass (refer to section 3.7.2)
Band Edge	15.239(c), ANSI C63.4 Section 13 & Annex H	Pass (refer to section 3.7.3)
Occupied Bandwidth	15.239(a), ANSI C63.4 Section 13 & Annex H	Pass (refer to section 4.4)

## 2.5 CONFIGURATION OF THE TESTED SYSTEM

The FCC IDs/Types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards, which have grants) are:

Item	Device	No.	Configuration
1	Headrest car display	-----	Manufacturer : Soaring Technology Co., LTD. Model Number : SSLM7BA1
2	Headrest car display	-----	Manufacturer : Soaring Technology Co., LTD. Model Number : SSLMBBA1
3	DC Battery	-----	Manufacturer : ACDelco Model Number : S55B24LS

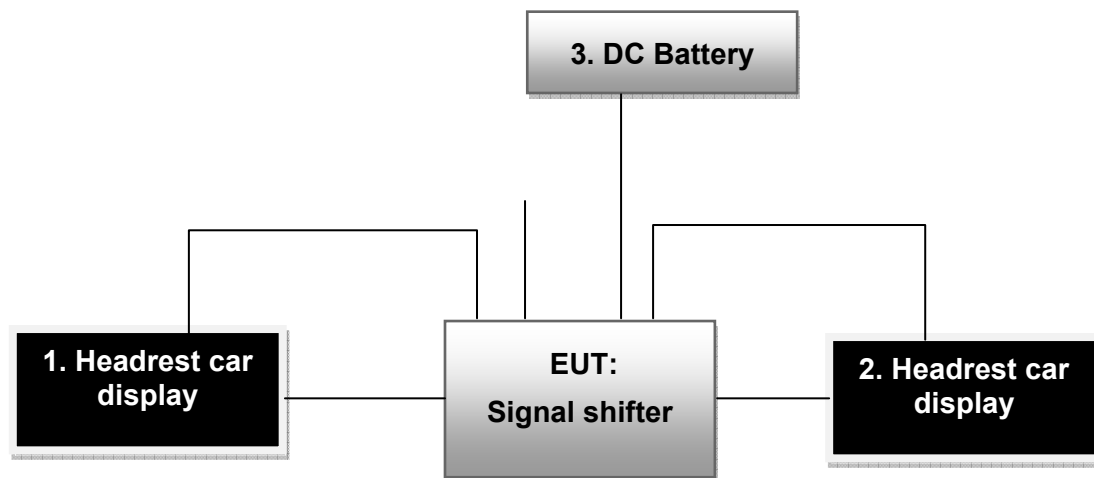
## 2.6 TEST FACILITY

Ambient conditions in the laboratory:

ITEMS	Requirement
TEMPERATURE (°C)	10-40
HUMIDITY (%RH)	10-90
BAROMETRIC PRESSURE (mbar)	860-1060
FCC SITE DESCRIPTION	Aug. 10, 1995 /Aug. 25, 1998 File on FCC Engineering Laboratory Federal Communication Commission 7435 Oakland Mills Road Columbia, MD 21046 Reference 31040/SIT1300F2
NVLAP LAB. CODE	200085-0 United States Department of commerce National Institute of Standards and Technology National Voluntary Laboratory Accreditation Program Accreditation on NVLAP effective through Sep. 30, 2009 For CISPR 22, FCC Method and AS/NZS CISPR 22 Measurement.
Taiwan Accreditation Foundation (TAF)	Recognized by the Council of Taiwan Accreditation Foundation and confirmed to meet the requirements of ISO/IEC 17025. Registration No.: 1082 Registration on TAF effective through Sep. 19, 2009



## 2.7 TEST SETUP



## 2.8 EUT OPERATING CONDITIONS

The EUT exercise program used during conducted testing was designed to exercise the EUT in a manner similar to a typical use. The exercise sequence is listed as below:

1. Setup the EUT and simulators as shown on 2.7.
2. Turn on the power of all equipments.
3. DVD player play 1kHz tone and turn volume to maximum (for USB mode: save MP3 file of 1kHz tone in USB Disk).
4. Ensure EUT have transmute RF signal and start test.
5. Repeat the above steps.

### 3. RADIATION EMISSION DATA

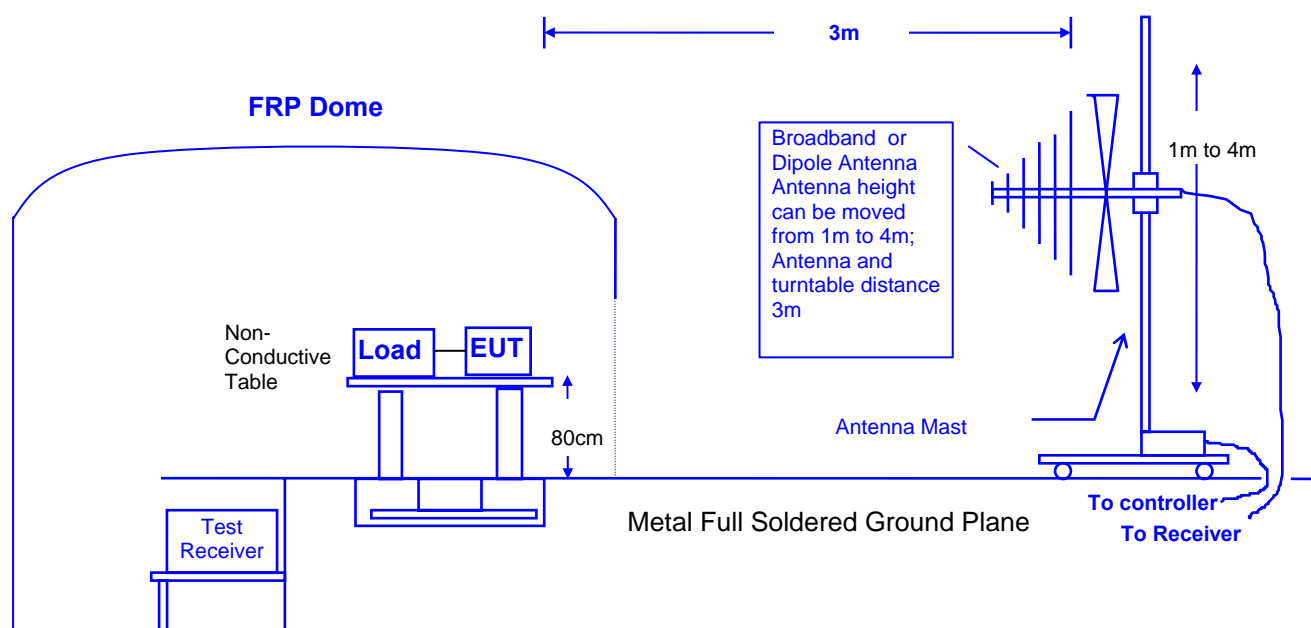
#### 3.1 TEST EQUIPMENT

The following test equipments are used during the radiated emission tests:

Item	Instrument	Manufacturer	Model	Serial No.	Next Cal. Date
1	Test Receiver	R & S	ESCS30	825022/003	2009.06.01
2	Spectrum Analyzer	ADVANTEST	R3172	150101278	2009.04.21
3	Power Meter	Rohde & Schwarz	NRVS	100666	2010.03.18
4	Peak Power Sensor	Rohde & Schwarz	NRV-Z32	836019-058	2010.03.18
5	Pre-Amplifier	EMV-Technik	PA303	N/A	2009.04.17
6	Trilog-Broadband Antenna	SCHWARZBECK	VULB 9168	9168-253	2010.03.04
7	CABLE	GTK	N/A	GTK-E-A344-01	2009.04.16
8	CHAMBER	GTK	N/A	A6	2009.11.29
9	Test Program Software	GesTek	N/A	GTK-E-S001-01	N/A

Note: All measurement critical items of test instrumentation were within their calibration period of 1 year.

#### 3.2 OPEN TEST SITE SETUP DIAGRAM



### 3.3 RADIATED EMISSION LIMIT

#### ☒ General Radiated Emission Limits

Emissions radiated outside of the specified frequency bands shall not exceed the general radiated emission limits in paragraph FCC15.209.

Frequency	Distance	Field Strength	
MHz	Meter	$\mu\text{V/M}$	$\text{dB}\mu\text{V/M}$
30 to 88	3	100	40.0
88 to 216	3	150	43.5
216 to 960	3	200	46.0
Above 960	3	500	54.0

Note:

1. RF Voltage ( $\text{dBuV/m}$ ) =  $20 \log \text{RF Voltage } (\mu\text{V/m})$
2. In the Above Table, the tighter limit applies at the band edges.
3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

#### ☒ FCC 15.239 Field Strength of Fundamental Limit

Frequency	Distance	Field Strength		Detector
MHz	Meter	$\mu\text{V/M}$	$\text{dB}\mu\text{V/M}$	
88 to 108	3	2500	68	Peak
		250	48	Average

### 3.4 EUT CONFIGURATION

The equipment, which is listed on 3.1 was, installed on radiated emission test to meet the commission requirement and operating in a manner which tends to maximize its emission characteristics in a normal application.

The device under test, installed in a representative system as described in section 3.2, was placed on a non-conductive table whose total height equaled 80 cm. This table can be rotated 360 degree. The measurement antenna was mounted to a non-conductive mast capable of moving the antenna vertically. Antenna height was varied from 1 meter to 4 meters and the system under test was rotated from 0 degree through 360 degrees relative to the antenna position and polarization (Horizontal and Vertical). The EUT was rotated through three orthogonal axes to determine the attitude that maximizes the emission. Also the I/O cable position was investigated to find the maximum emission condition.

### 3.5 OPERATING CONDITION OF EUT

Same as section 2.8.

### 3.6 RADIATED EMISSION DATA

The measurement range of radiated emissions from **30 MHz to 1000MHz** was investigated. All readings below 1GHz are quasi-peak values with a resolution bandwidth of 120 KHz.

**Above 1GHz** are peak and avg. values with a resolution bandwidth of 1MHz. The initial step in collecting radiated emission data is a spectrum analyzer peak scans of the measurement range for all the test modes and then use test receiver for final measurement. Then the worst modes were reported the following data pages..

### 3.7 RADIATED EMISSIONS MEASUREMENT RESULTS

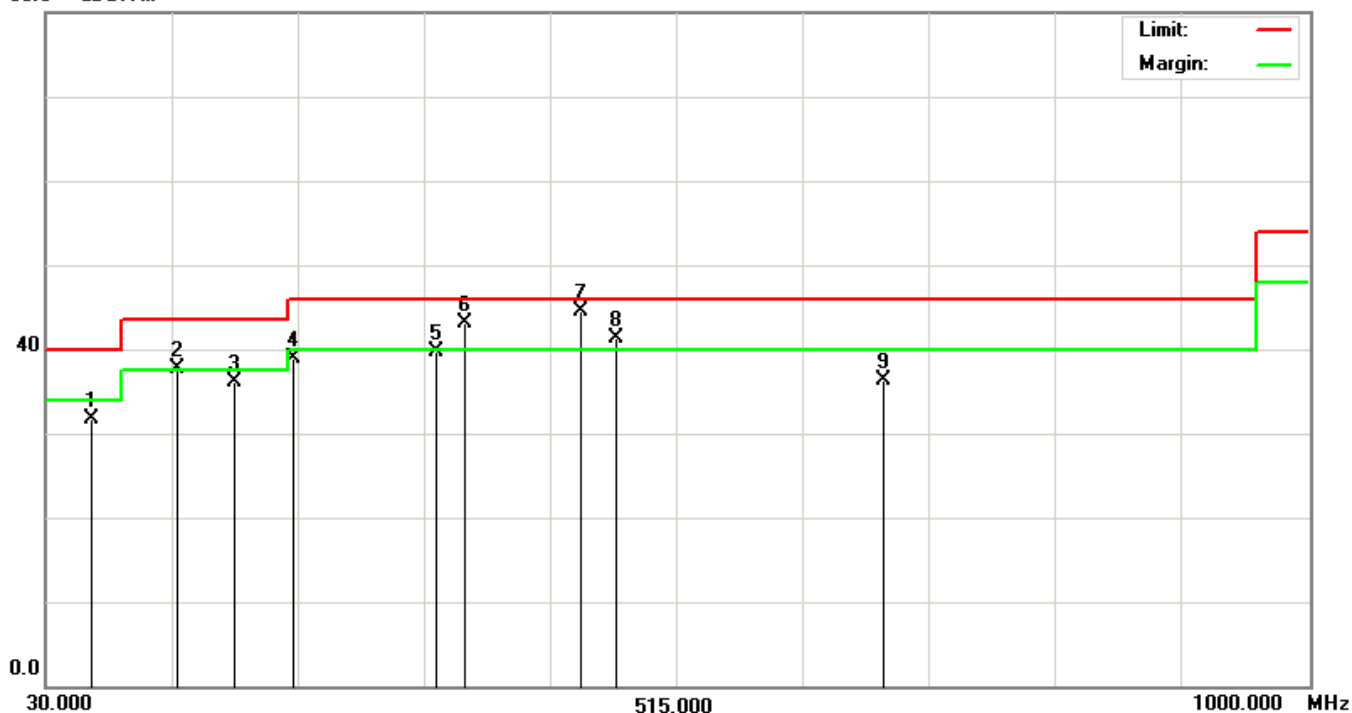
#### 3.7.1 SPURIOUS RADIATED EMISSIONS

Date of Test	April 09, 2009	Temperature	23.5 deg/C
EUT	Signal shifter	Humidity	59 %RH
Working Cond.	Mode 1-88.3MHz		
Antenna distance	3m at Horizontal	Frequency Range	30-1000MHz

No.	Frequency MHz	Reading Level dB $\mu$ V	Factor dB	Measurement dB $\mu$ V/m	Limit dB $\mu$ V/m	Over Limit dB	Detector
1	64.9200	48.16	-16.55	31.61	40.00	-8.39	QP
2	130.8800	53.87	-16.09	37.78	43.50	-5.72	QP
3	175.5000	51.71	-15.56	36.15	43.50	-7.35	QP
4	220.1200	55.00	-16.07	38.93	46.00	-7.07	QP
5	330.7000	51.98	-12.36	39.62	46.00	-6.38	QP
6	352.0400	54.84	-11.65	43.19	46.00	-2.81	QP
7	★440.4960	53.60	-9.12	44.48	46.00	-1.52	QP
8	468.4400	49.70	-8.49	41.21	46.00	-4.79	QP
9	674.0800	40.64	-4.36	36.28	46.00	-9.72	QP

#### Remarks:

1. All Readings below 1GHz are Quasi-Peak.
2. Measurement = Reading + Factor (Could have  $\pm 0.01$  tolerance due to computer automatically round off calculation).
3. Over Limit (Margin Value)=Measurement level-Limit value.
4. Factor = antenna factor + cable loss – amplifier gain.
5. “★” means that this data is the worse case measurement level.
6. The emission level of other frequencies are very lower than the limit.

80.0 dB $\mu$ V/m

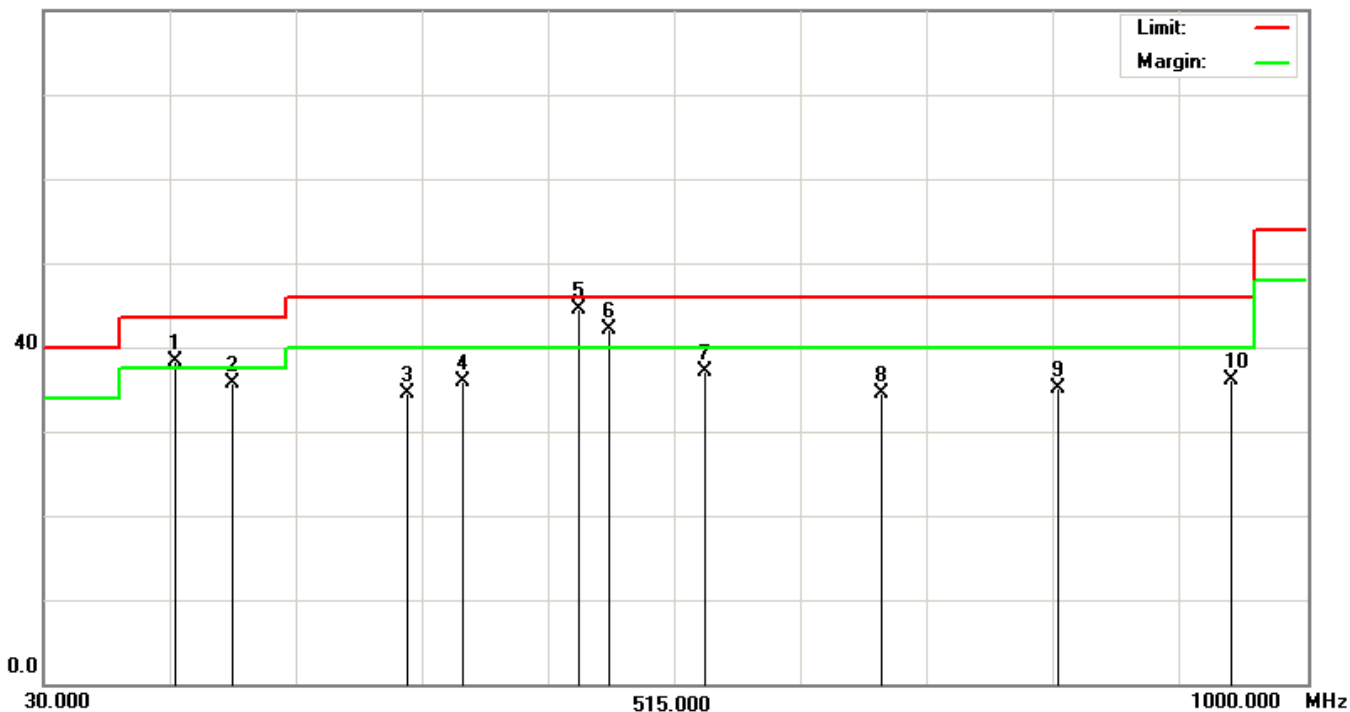
Remark: 1. The "Limit" in right-up corner in above diagram refers to Quasi-peak ; "Margin" refers to the data under 6dB.

Date of Test	April 09, 2009	Temperature	23.5 deg/C
EUT	Signal shifter	Humidity	59 %RH
Working Cond.	Mode 1-88.3MHz		
Antenna distance	3m at Vertical	Frequency Range	30-1000MHz

No.	Frequency MHz	Reading Level dB $\mu$ V	Factor dB	Measurement dB $\mu$ V/m	Limit dB $\mu$ V/m	Over Limit dB	Detector
1	130.8800	54.30	-16.09	38.21	43.50	-5.29	QP
2	175.5000	51.20	-15.56	35.64	43.50	-7.86	QP
3	309.3600	47.61	-13.08	34.53	46.00	-11.47	QP
4	352.0400	47.53	-11.65	35.88	46.00	-10.12	QP
5	★440.5280	53.56	-9.12	44.44	46.00	-1.56	QP
6	464.5600	50.67	-8.57	42.10	46.00	-3.90	QP
7	538.2800	44.02	-6.96	37.06	46.00	-8.94	QP
8	674.0800	38.85	-4.36	34.49	46.00	-11.51	QP
9	809.8800	37.44	-2.31	35.13	46.00	-10.87	QP
10	943.7400	36.50	-0.33	36.17	46.00	-9.83	QP

**Remarks:**

1. All Readings below 1GHz are Quasi-Peak.
2. Measurement = Reading + Factor (Could have  $\pm 0.01$  tolerance due to computer automatically round off calculation).
3. Over Limit (Margin Value)=Measurement level-Limit value.
4. Factor = antenna factor + cable loss – amplifier gain.
5. “★” means that this data is the worse case measurement level.
6. The emission level of other frequencies are very lower than the limit.

80.0 dB $\mu$ V/m

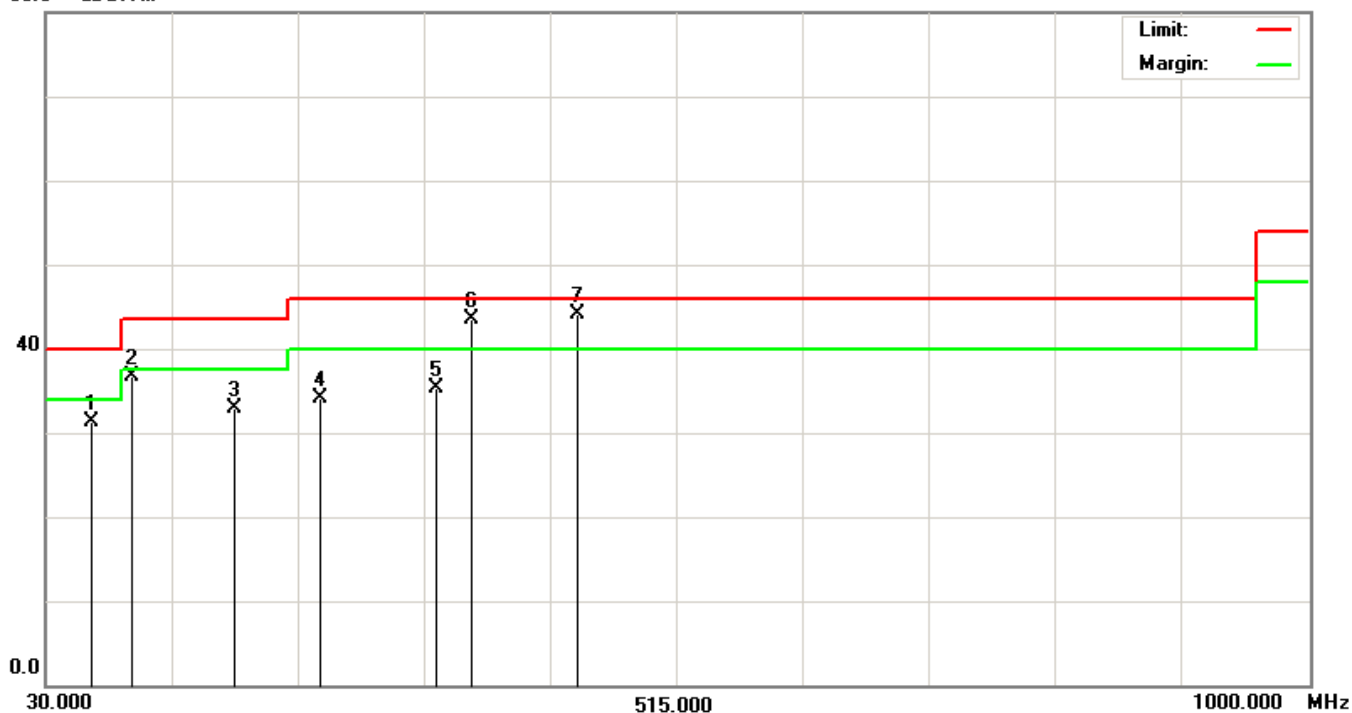
Remark: 1. The "Limit" in right-up corner in above diagram refers to Quasi-peak ; "Margin" refers to the data under 6dB.

Date of Test	April 09, 2009	Temperature	23.5 deg/C
EUT	Signal shifter	Humidity	59 %RH
Working Cond.	Mode 1-89.5MHz		
Antenna distance	3m at Horizontal	Frequency Range	30-1000MHz

No.	Frequency MHz	Reading Level dB $\mu$ V	Factor dB	Measurement dB $\mu$ V/m	Limit dB $\mu$ V/m	Over Limit dB	Detector
1	64.9200	47.84	-16.55	31.29	40.00	-8.71	QP
2	95.9600	57.14	-20.48	36.66	43.50	-6.84	QP
3	175.5000	48.50	-15.56	32.94	43.50	-10.56	QP
4	241.4600	49.75	-15.73	34.02	46.00	-11.98	QP
5	330.7000	47.69	-12.36	35.33	46.00	-10.67	QP
6	357.8600	55.05	-11.45	43.60	46.00	-2.40	QP
7	★439.3400	53.32	-9.15	44.17	46.00	-1.83	QP

**Remarks:**

1. All Readings below 1GHz are Quasi-Peak.
2. Measurement = Reading + Factor (Could have  $\pm 0.01$  tolerance due to computer automatically round off calculation).
3. Over Limit (Margin Value)=Measurement level-Limit value.
4. Factor = antenna factor + cable loss – amplifier gain.
5. “★” means that this data is the worse case measurement level.
6. The emission level of other frequencies are very lower than the limit.

80.0 dB $\mu$ V/m

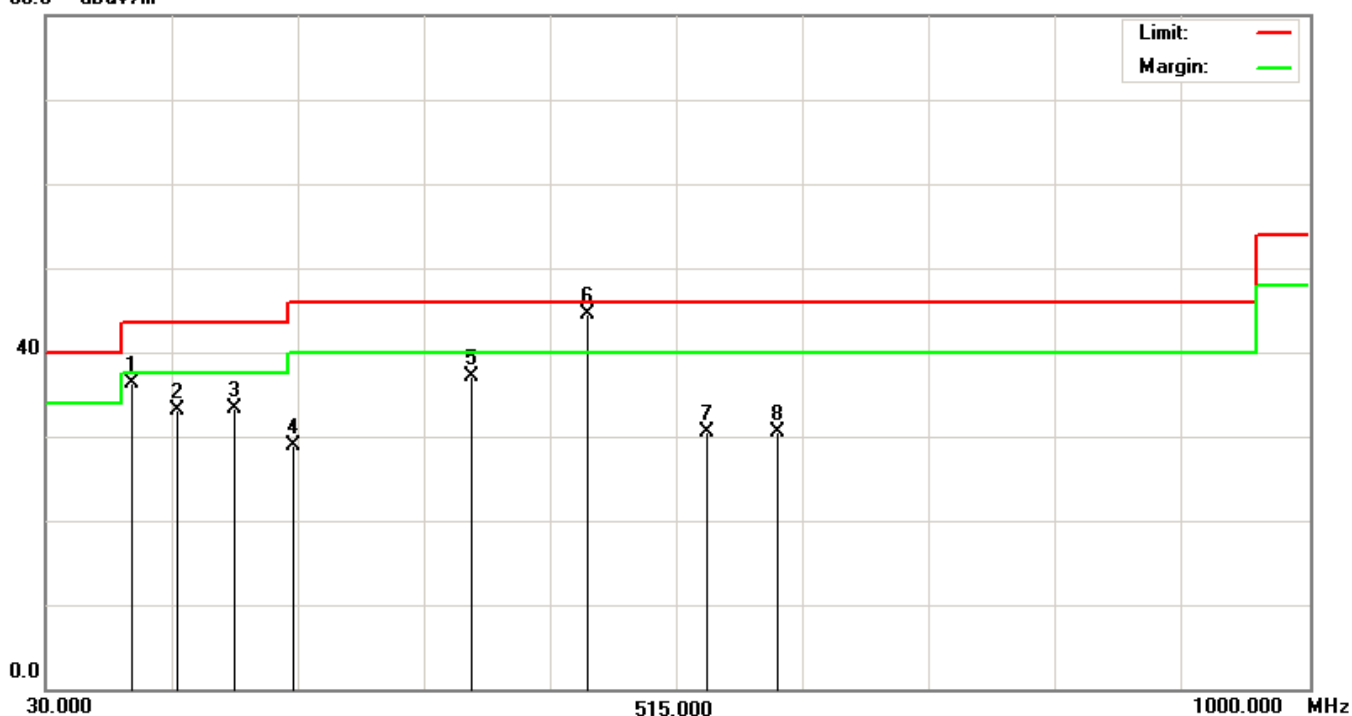
Remark: 1. The "Limit" in right-up corner in above diagram refers to Quasi-peak ; "Margin" refers to the data under 6dB.

Date of Test	April 09, 2009	Temperature	23.5 deg/C
EUT	Signal shifter	Humidity	59 %RH
Working Cond.	Mode 1-89.5MHz		
Antenna distance	3m at Vertical	Frequency Range	30-1000MHz

No.	Frequency MHz	Reading Level dB $\mu$ V	Factor dB	Measurement dB $\mu$ V/m	Limit dB $\mu$ V/m	Over Limit dB	Detector
1	95.9600	56.73	-20.48	36.25	43.50	-7.25	QP
2	130.8800	49.21	-16.09	33.12	43.50	-10.38	QP
3	175.5000	48.90	-15.56	33.34	43.50	-10.16	QP
4	220.1200	44.94	-16.07	28.87	46.00	-17.13	QP
5	357.8600	48.53	-11.45	37.08	46.00	-8.92	QP
6	★447.1000	53.49	-8.97	44.52	46.00	-1.48	QP
7	538.2800	37.48	-6.96	30.52	46.00	-15.48	QP
8	592.6000	36.22	-5.81	30.41	46.00	-15.59	QP

**Remarks:**

1. All Readings below 1GHz are Quasi-Peak.
2. Measurement = Reading + Factor (Could have  $\pm 0.01$  tolerance due to computer automatically round off calculation).
3. Over Limit (Margin Value)=Measurement level-Limit value.
4. Factor = antenna factor + cable loss – amplifier gain.
5. “★” means that this data is the worse case measurement level.
6. The emission level of other frequencies are very lower than the limit.

80.0 dB $\mu$ V/m

Remark: 1. The “Limit” in right-up corner in above diagram refers to Quasi-peak ; “Margin” refers to the data under 6dB.

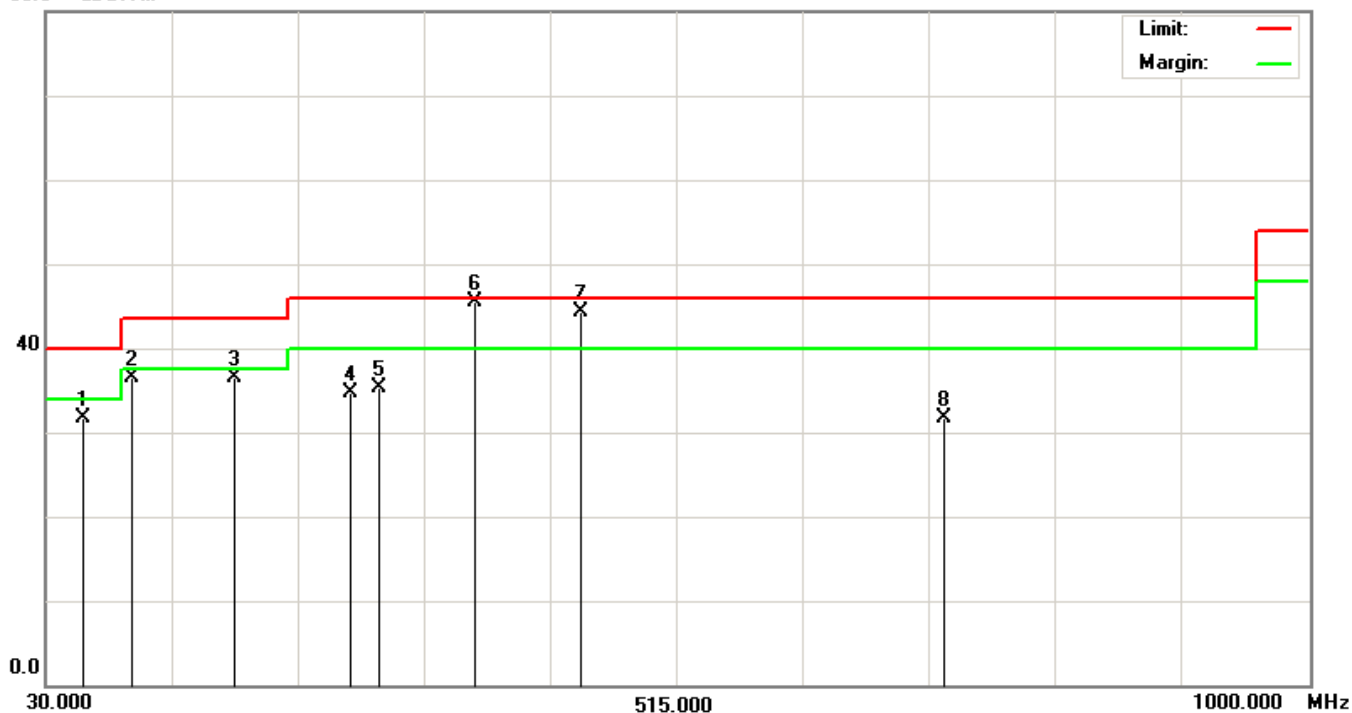


Date of Test	April 09, 2009	Temperature	23.5 deg/C
EUT	Signal shifter	Humidity	59 %RH
Working Cond.	Mode 1-90.3MHz		
Antenna distance	3m at Horizontal	Frequency Range	30-1000MHz

No.	Frequency MHz	Reading Level dB $\mu$ V	Factor dB	Measurement dB $\mu$ V/m	Limit dB $\mu$ V/m	Over Limit dB	Detector
1	59.1000	47.16	-15.43	31.73	40.00	-8.27	QP
2	95.9600	56.93	-20.48	36.45	43.50	-7.05	QP
3	175.5000	52.05	-15.56	36.49	43.50	-7.01	QP
4	264.7400	49.61	-14.94	34.67	46.00	-11.33	QP
5	286.0800	49.34	-14.00	35.34	46.00	-10.66	QP
6	★359.8000	56.82	-11.39	45.43	46.00	-0.57	QP
7	440.2200	53.51	-9.13	44.38	46.00	-1.62	QP
8	720.6400	35.38	-3.61	31.77	46.00	-14.23	QP

**Remarks:**

1. All Readings below 1GHz are Quasi-Peak.
2. Measurement = Reading + Factor (Could have  $\pm 0.01$  tolerance due to computer automatically round off calculation).
3. Over Limit (Margin Value)=Measurement level-Limit value.
4. Factor = antenna factor + cable loss – amplifier gain.
5. “★” means that this data is the worse case measurement level.
6. The emission level of other frequencies are very lower than the limit.

80.0 dB $\mu$ V/m

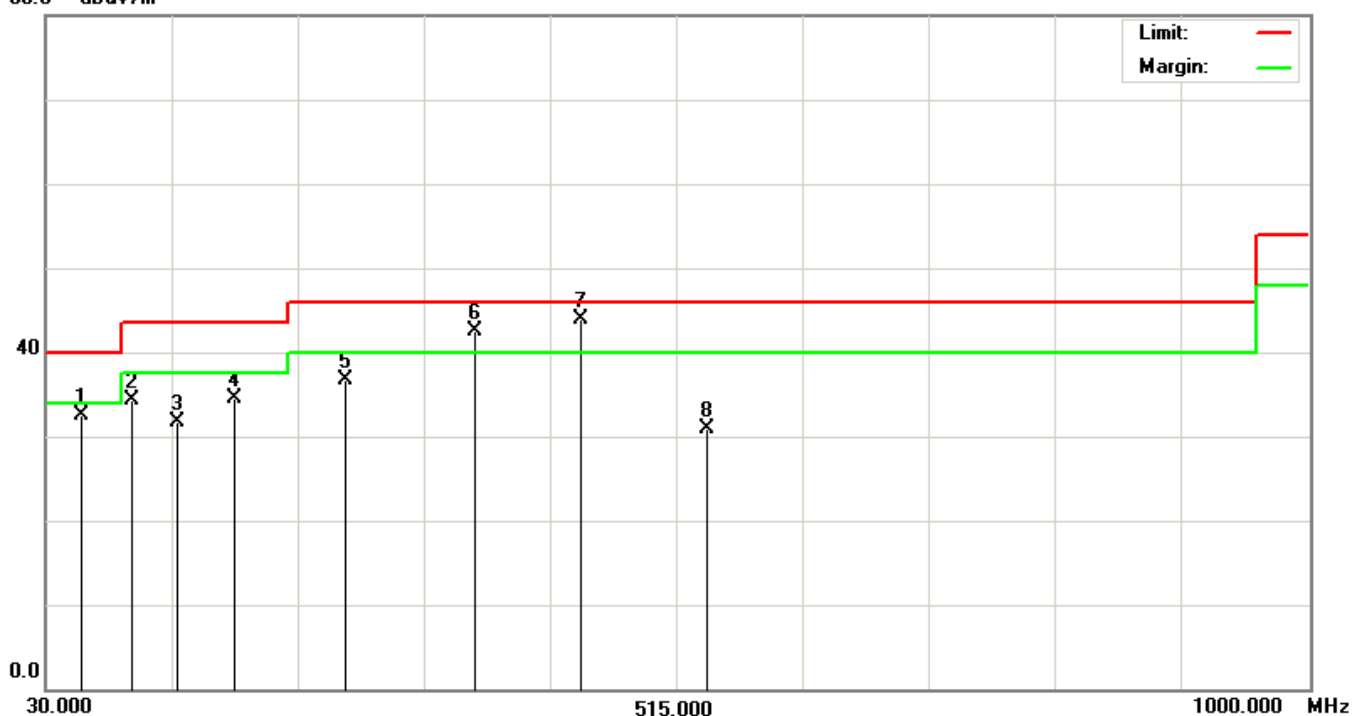
Remark: 1. The "Limit" in right-up corner in above diagram refers to Quasi-peak ; "Margin" refers to the data under 6dB.

Date of Test	April 09, 2009	Temperature	23.5 deg/C
EUT	Signal shifter	Humidity	59 %RH
Working Cond.	Mode 1-90.3MHz		
Antenna distance	3m at Vertical	Frequency Range	30-1000MHz

No.	Frequency MHz	Reading Level dB $\mu$ V	Factor dB	Measurement dB $\mu$ V/m	Limit dB $\mu$ V/m	Over Limit dB	Detector
1	57.1600	47.86	-15.27	32.59	40.00	-7.41	QP
2	95.9600	54.77	-20.48	34.29	43.50	-9.21	QP
3	130.8800	47.79	-16.09	31.70	43.50	-11.80	QP
4	175.5000	50.07	-15.56	34.51	43.50	-8.99	QP
5	260.8600	51.78	-15.11	36.67	46.00	-9.33	QP
6	359.8000	53.96	-11.39	42.57	46.00	-3.43	QP
7	★440.3600	53.09	-9.12	43.97	46.00	-2.03	QP
8	538.2800	37.77	-6.96	30.81	46.00	-15.19	QP

**Remarks:**

1. All Readings below 1GHz are Quasi-Peak.
2. Measurement = Reading + Factor (Could have  $\pm 0.01$  tolerance due to computer automatically round off calculation).
3. Over Limit (Margin Value)=Measurement level-Limit value.
4. Factor = antenna factor + cable loss – amplifier gain.
5. “★” means that this data is the worse case measurement level.
6. The emission level of other frequencies are very lower than the limit.

80.0 dB $\mu$ V/m

Remark: 1. The “Limit” in right-up corner in above diagram refers to Quasi-peak ; “Margin” refers to the data under 6dB.

## 3.7.2 FUNDAMENTAL RADIATION EMISSION

Date of Test	April 09, 2009	Temperature	23.5 deg/C
EUT	Signal shifter	Humidity	59 %RH
Working Cond.	Mode 1	Antenna distance	3m

## Horizontal

No.	Frequency MHz	Reading Level dBuV/m	Factor dB	Measurement dBuV/m	Limit dBuV/m	Over Limit dB	Detector
1	88.3000	36.62	9.09	45.71	68.00	-22.29	peak
2	88.3040	35.22	9.09	44.31	48.00	-3.69	AVG
3	89.5000	36.75	8.87	45.62	68.00	-22.38	peak
4	89.5020	35.44	8.87	44.31	48.00	-3.69	AVG
5	90.3060	36.84	8.82	45.66	68.00	-22.34	peak
6	90.3060	35.02	8.82	43.84	48.00	-4.16	AVG

## Vertical

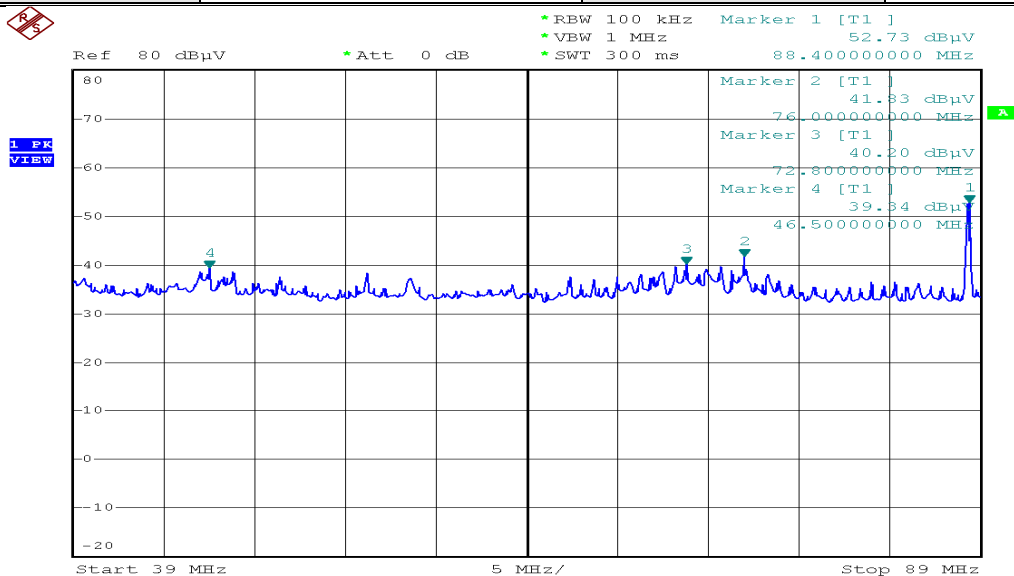
No.	Frequency MHz	Reading Level dBuV/m	Factor dB	Measurement dBuV/m	Limit dBuV/m	Over Limit dB	Detector
1	88.3000	30.27	9.09	39.36	48.00	-8.64	AVG
2	88.3020	33.10	9.09	42.19	68.00	-25.81	peak
3	89.5000	31.68	8.87	40.55	48.00	-7.45	AVG
4	89.5020	33.45	8.87	42.32	68.00	-25.68	peak
5	90.2960	32.22	8.82	41.04	68.00	-26.96	peak
6	90.3020	31.58	8.82	40.40	48.00	-7.60	AVG

## Remark

1. The Fundamental test detector are peak or average.
2. Spectrum Analyzer Setting(Peak Detector): RBW=100KHz, VBW=1MHZ, Span=10MHz.
3. Spectrum Analyzer Setting(AVG Detector): RBW=100KHz, VBW=30HZ, Span=10MHz.
4. Measurement = Reading + Correction Factor (Could have  $\pm 0.01$  tolerance due to computer automatically round off calculation).
5. Correction Factor= Antenna Factor + Cable Loss – Amplifier Factor
6. Over Limit (Margin Value)=Emission level-Limit value.
7. The average measurement was not performed when the peak measured data under the limit of average detection. If the average value is measured, peak measurement should also be supplied.

### 3.7.3 BAND EGDE TEST

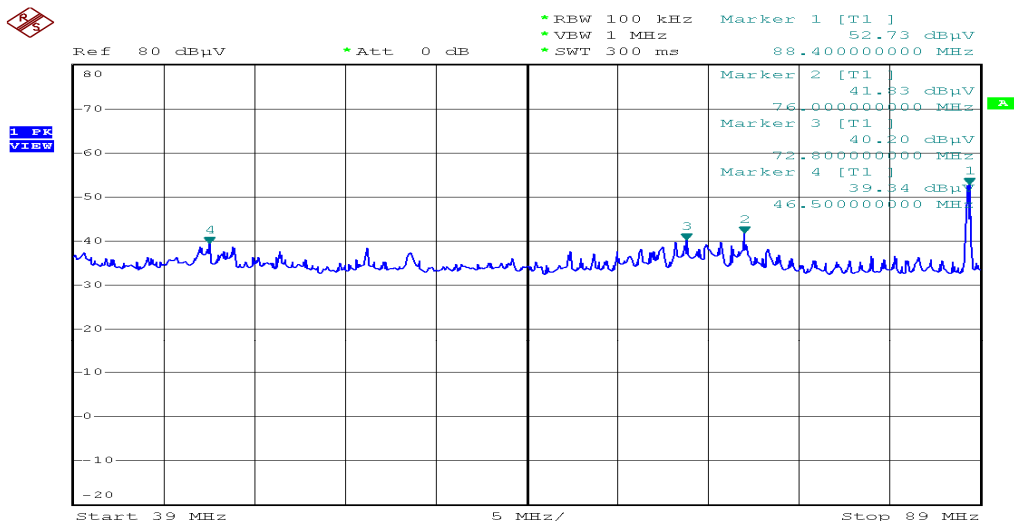
Date of Test	April 16, 2009	Temperature	23.4 deg/C
EUT	Signal shifter	Humidity	53 %RH
Working Cond.	Mode 1	Test Band	Lower



175K2

Date: 15.APR.2009 17:04:19

Date of Test	April 16, 2009	Temperature	23.4 deg/C
EUT	Signal shifter	Humidity	53 %RH
Working Cond.	Mode 1	Test Band	High Band



175K2

Date: 15.APR.2009 17:04:19

## 4. OCCUPIED BANDWIDTH

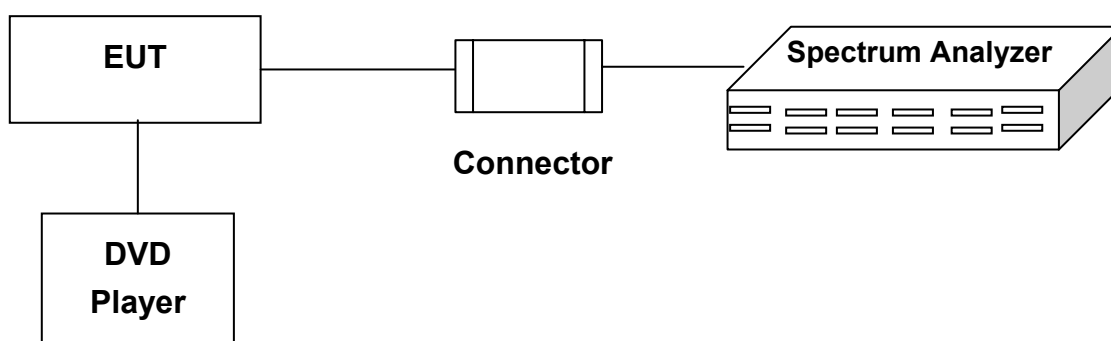
### 4.1 TEST EQUIPMENT

The following test equipments are used during the radiated emission tests:

Item	Instrument	Manufacturer	Model	Serial No.	Next Cal. Date
1	Spectrum Analyzer	Rohde & Schwarz	FSP40	100061	2010.04.12
2	Spectrum Analyzer	HP	E4407B	US39240339	2009.08.20

Note: All measurement critical items of test instrumentation were within their calibration period of 1 year.

### 4.2 BLOCK DIAGRAM OF TEST SETUP



### 4.3 LIMIT

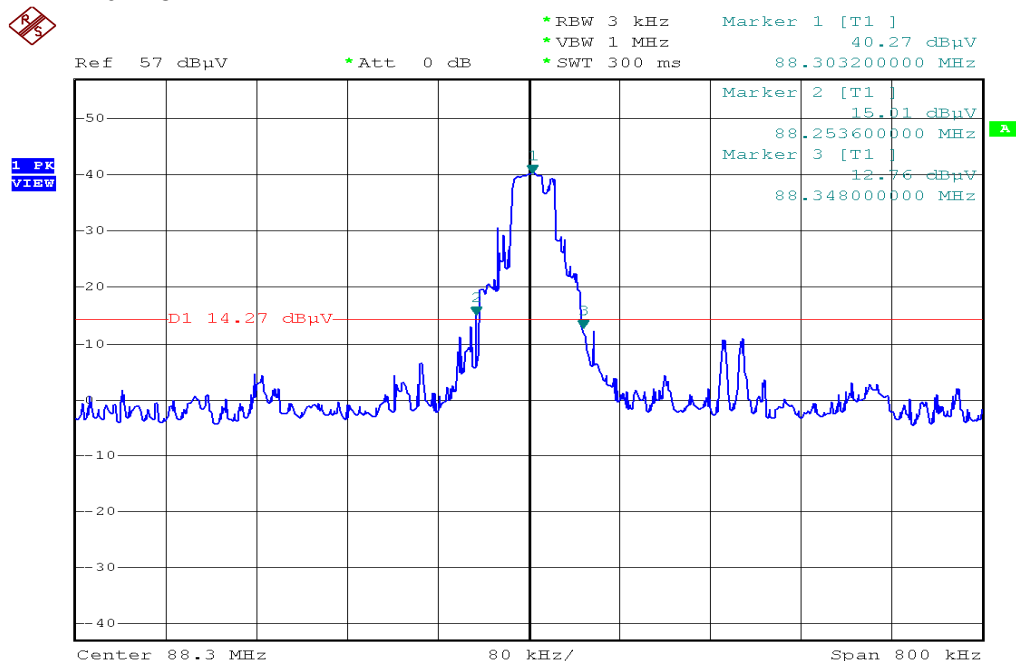
The occupied bandwidth shall not exceed 200kHz.

## 4.4 TEST RESULT

Date of Test	April 15, 2009	Temperature	24.4 deg/C
EUT	Signal shifter	Humidity	53 %RH
Working Cond.	Mode 1		

Channel No.	Frequency (MHz)	Bandwidth (kHz)	Required limit (KHz)	Result
1	88.3	95	<200	Pass
4	89.5	83	<200	Pass
6	90.3	107	<200	Pass

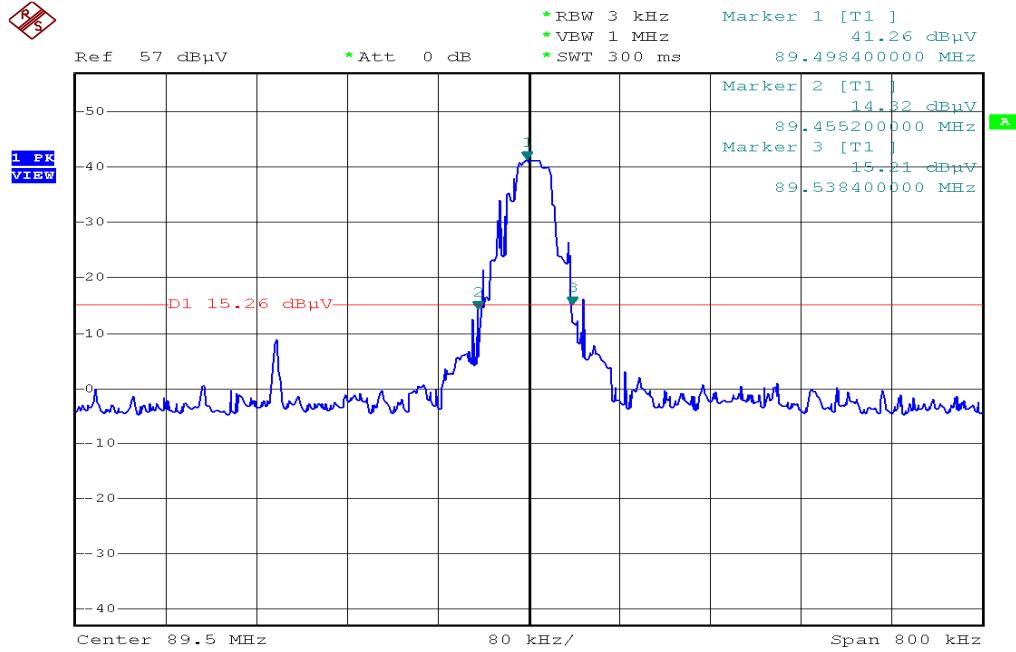
### Channel 1:



175K2

Date: 15.APR.2009 16:06:36

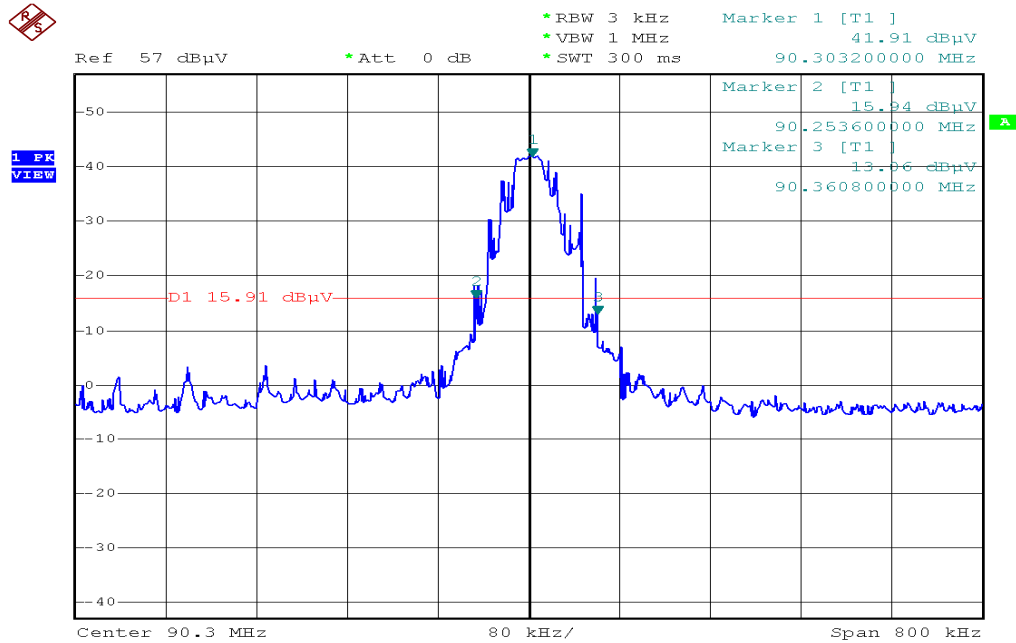
### Channel 4:



175K2

Date: 15.APR.2009 16:15:42

### Channel 6:



175K2

Date: 15.APR.2009 16:21:46

## 5. PHOTOGRAPHS FOR TEST

### 5.1 TEST PHOTOGRAPHS FOR RADIATION





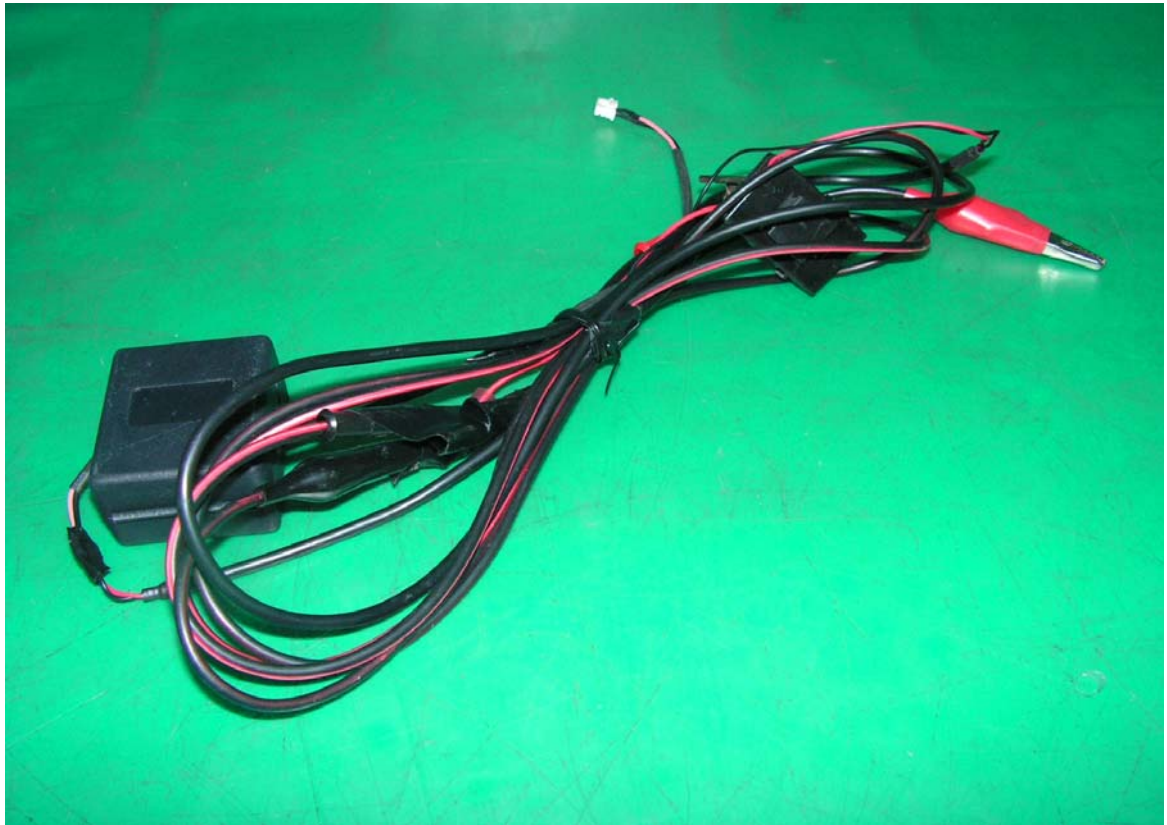
## 6. PHOTOGRAPHS FOR PRODUCT

1.

2. Accessories



3. Power Wire
4. Antenna Cable





5. Remote Controller+

6. Remote Controller-



7. EUT+ AND EMI Solution

8. EUT- AND EMI Solution





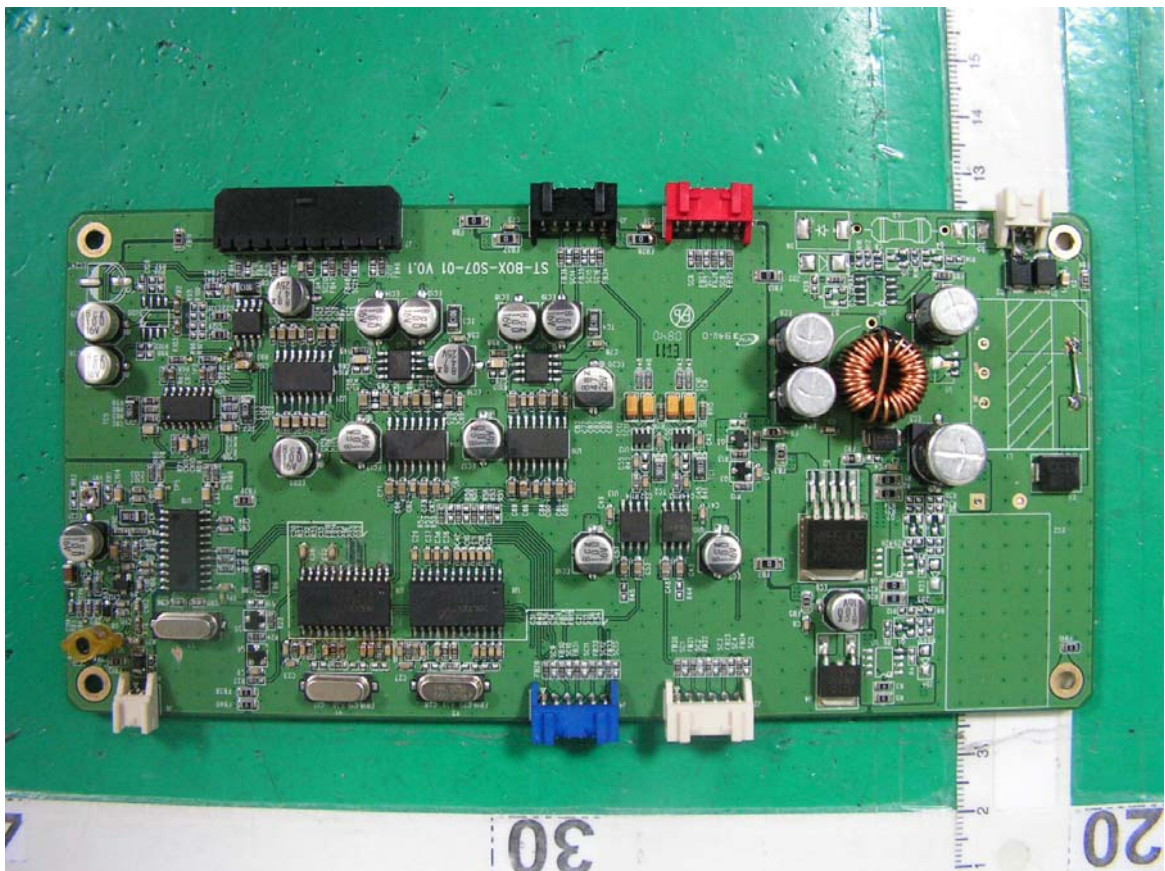
9. Label Here

10.



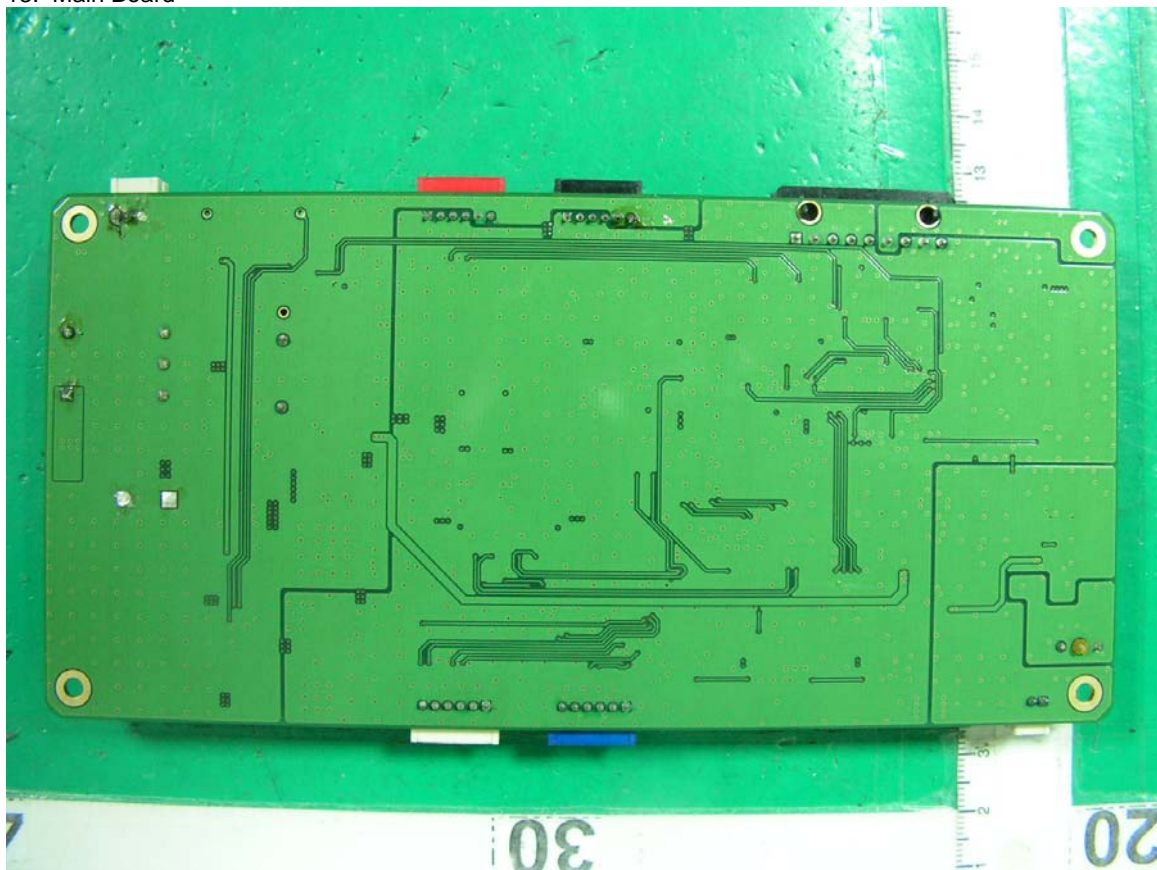
11.

12. Main Board+





## 13. Main Board-



## 7. EMI REDUCTION METHOD DURING COMPLIANCE TESTING

No modification was made during testing.



## **Appendix A**

### **Circuit (Block) Diagram**

(Shall be added by Applicant)

## **Appendix B**

## **User Manual**

(Shall be added by Applicant)