



FCC PART 15 CLASS B MEASUREMENT AND TEST REPORT

For

Gajah International (HK) Co., Ltd

18/F Bel Trade Commercial Building, 1-3, Burrows Street, Wan Chai, Hong Kong.

FCC ID: UFKMD700700

Report Type: Original Report	Product Type: 7" MID
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* This report contains data that are not covered by the NVLAP accreditation and are marked with an asterisk “★” (Rev.2)

TABLE OF CONTENTS

GENERAL INFORMATION	3
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT).....	3
OBJECTIVE	3
RELATED SUBMITTAL(S)/GRANT(S).....	3
TEST FACILITY.....	3
SYSTEM TEST CONFIGURATION	5
DESCRIPTION OF TEST CONFIGURATION	5
EUT EXERCISE SOFTWARE	5
EQUIPMENT MODIFICATIONS	5
SUPPORT EQUIPMENT LIST AND DETAILS	5
EXTERNAL I/O CABLE.....	5
BLOCK DIAGRAM OF TEST SETUP	6
SUMMARY OF TEST RESULTS	7
FCC §15.107 – AC LINE CONDUCTED EMISSIONS	8
MEASUREMENT UNCERTAINTY	8
EUT SETUP	8
EMI TEST RECEIVER SETUP.....	9
TEST PROCEDURE	9
TEST EQUIPMENT LIST AND DETAILS.....	9
CORRECTED FACTOR & MARGIN CALCULATION	9
TEST RESULTS SUMMARY	10
TEST DATA	10
FCC §15.109 - RADIATED EMISSIONS	15
MEASUREMENT UNCERTAINTY	15
EUT SETUP	15
EMI TEST RECEIVER SETUP.....	16
TEST PROCEDURE	16
TEST EQUIPMENT LIST AND DETAILS.....	16
CORRECTED AMPLITUDE & MARGIN CALCULATION	16
TEST RESULTS SUMMARY	17
TEST DATA	17

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Gajah International (HK) Co., Ltd*'s product, model number: *MD7007 (FCC ID: UFKMD700700)* or the "EUT" as referred to in this report was a *7" MID*, which was measured approximately: 19.7 cm (L) x 12.3 cm (W) x 10.5 cm (H), rated input voltage: DC 3.7V battery and DC 5V charging from adapter. The highest Operating Frequency is 512MHz.

Adapter information

Model: FLD0710-5.0V1.50A-Z
Input: AC100-240V~ 50/60Hz 0.3A
Output: DC 5.0V 1.5A

**All measurement and test data in this report was gathered from production sample serial number: 1207076 (Assigned by BACL, Shenzhen). The EUT was received on 2012-07-16.*

Objective

This report is prepared on behalf of *Gajah International (HK) Co., Ltd* in accordance with Part 2-Subpart J, Part 15- Subparts A and B of the Federal Communication Commissions rules.

The objective of the manufacturer is to determine the compliance of EUT with FCC Part 15 Class B.

Related Submittal(s)/Grant(s)

FCC Part 15.247 DTS submission with FCC ID: UFKMD700700.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp.(Shenzhen) to collect test data is located on the 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China.

Test site at Bay Area Compliance Laboratories Corp. (Shenzhen) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on December 06, 2010. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2009.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 382179. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, Bay Area Compliance Laboratories Corp. (Shenzhen) is an ISO/IEC 17025 accredited laboratory, and is accredited by National Voluntary Laboratory Accredited Program (Lab Code 200707-0).



The current scope of accreditations can be found at <http://ts.nist.gov/Standards/scopes/2007070.htm>

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in a typical mode which is provided by manufacturer.

Test mode 1: Downloading Mode

Test mode 2: Play-HDMI Mode

EUT Exercise Software

“winthrax” exercise software was used for downloading mode testing.

Equipment Modifications

No modification was made to the EUT tested.

Support Equipment List and Details

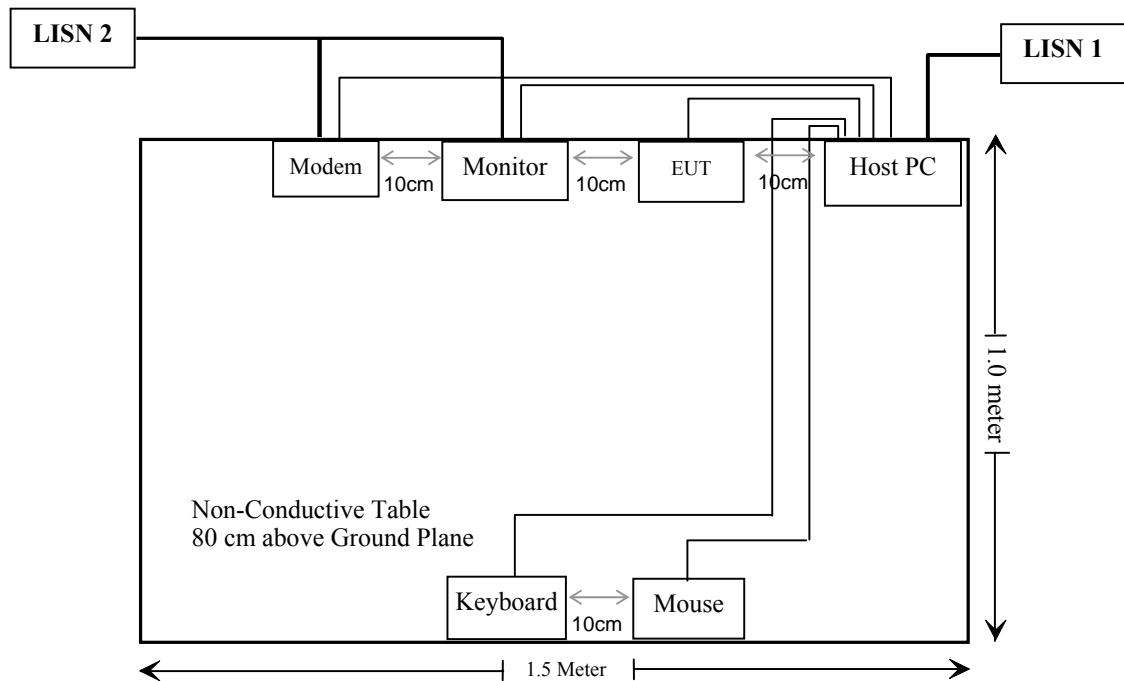
Manufacturer	Description	Model	Serial Number
DELL	PC	VOSTRO 220S	127BP2X
DELL	Keyboard	L100	CNORH656658907BL04TY
DELL	Mouse	MOC5UO	G1B0096D
DELL	LCD Monitor	E178WFPC	CN-OWY564-64180-7C4-2SQH
AST	Modem	AEM-2100	0293
SAMSUNG	Display	225MS	CR22HV2P401073M

External I/O Cable

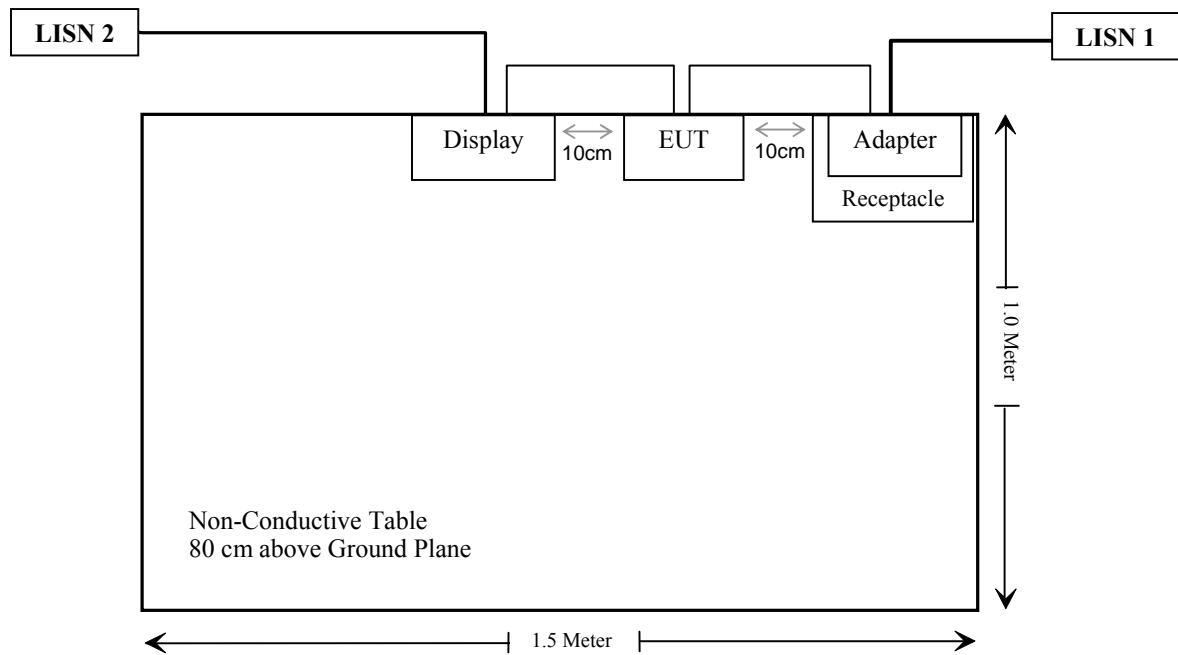
Cable Description	Length (m)	From/Port	To
Shielded Detachable K/B Cable	1.5	Host PC	Keyboard
Shielded Detachable Mouse Cable	1.5	Host PC	Mouse
Shielded Detachable Serial Cable	1.2	Host PC	Modem
Shielded Detachable VGA Cable	1.5	Host PC	Monitor
Shielded Detachable USB Cable	1.0	Host PC	EUT
Shielded Detachable USB Cable	1.0	EUT	Adapter
Shielded Detachable HDMI Cable	1.0	HDMI Port	EUT

Block Diagram of Test Setup

Test mode 1: Downloading Mode:



Test mode 2: Play-HDMI Mode:



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Results
§15.107	AC Line Conducted Emissions	Compliance
§15.109	Radiated Emissions	Compliance

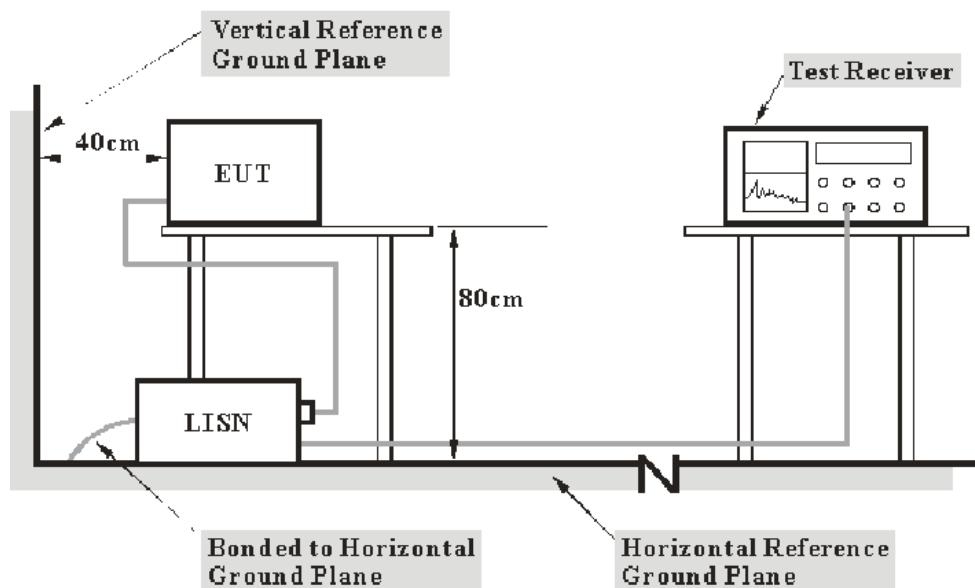
FCC §15.107 – AC LINE CONDUCTED EMISSIONS

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, and LISN.

Based on CISPR 16-4-2, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement at Bay Area Compliance Laboratories Corp. (Shenzhen) is 2.4 dB.(k=2, 95% level of confidence)

EUT Setup



Note:

1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The measurement procedure of EUT setup is according with ANSI C63.4-2009. The related limit was specified in FCC Part 15.107 Class B.

The spacing between the peripherals was 10 cm.

The host PC was connected to a 120 VAC/60 Hz power source for downloading mode.

The receptacle was connected to a 120V/60Hz AC power source for play-HDMI mode.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

Test Procedure

During the conducted emission test, for downloading mode, the host PC was connected to the outlet of the LISN. For play-HDMI mode, the receptacle was connected to the outlet of the LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and average detection mode.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCS30	100176	2011-11-24	2012-11-23
Rohde & Schwarz	L.I.S.N.	ESH2-Z5	892107/021	2011-11-17	2012-11-16
Rohde & Schwarz	Attenuator	ESH3Z2	DE25985	2011-07-08	2012-07-07
BACL	CE Test software	BACL-CE	V1.0	-	-

* **Statement of Traceability:** Bay Area Compliance Laboratory Corp. attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Corrected Factor & Margin Calculation

The Corrected factor is calculated by adding LISN/ISN VDF (Voltage Division Factor), Cable Loss and Pulse Limiter Attenuation. The basic equation is as follows:

$$\text{Correction Factor} = \text{LISN VDF} + \text{Cable Loss} + \text{Pulse Limiter Attenuation}$$

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

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

Test Results Summary

According to the recorded data in following table, the worst margin reading of:

4.89 dB at 1.585 MHz in the Line conducted mode for Play-HDMI mode

Refer to CISPR16-4-2:2011 and CISPR 16-4-1:2009, the measured level is in compliance with the limit if

$$L_m + U_{(L_m)} \leq L_{\text{lim}} + U_{\text{cisp}} \\ \text{or } U_{(L_m)} \leq \text{Margin} + U_{\text{cisp}}$$

The measurement result of EUT is below the limit level by a margin 4.89 dB and
 $U_{(L_m)}(2.4\text{dB}) \leq \text{Margin}(4.89 \text{ dB}) + U_{\text{cisp}}(3.4 \text{ dB})$,
so the EUT complies with the limit of the FCC Part 15.107 Class B.

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	48 %
ATM Pressure:	100.0 kPa

The testing was performed by Jimmy Xiao on 2012-08-06.

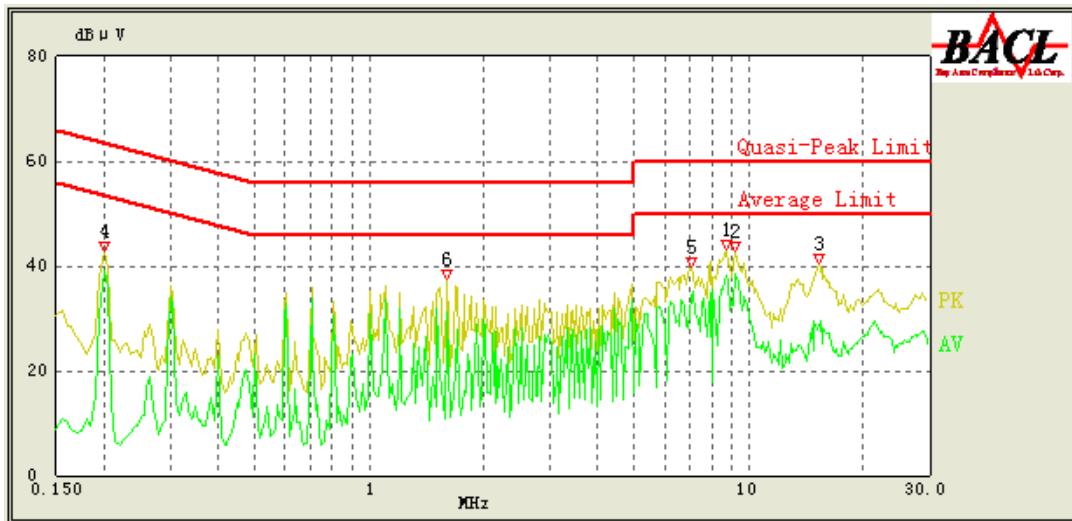
Test Mode 1: Downloading

AC 120V/60 Hz, Line



Frequency (MHz)	Corrected Amplitude (dB μ V)	Correction Factor (dB)	Limit (dB μ V)	Margin (dB)	Detector (PK/ QP/Ave.)
1.105	37.00	10.17	46.00	9.00	Ave.
8.850	40.25	10.45	50.00	9.75	Ave.
1.610	35.65	10.19	46.00	10.35	Ave.
2.010	34.64	10.20	46.00	11.36	Ave.
5.330	33.39	10.31	50.00	16.61	Ave.
8.845	42.34	10.45	60.00	17.66	QP
1.105	37.93	10.17	56.00	18.07	QP
1.610	36.07	10.19	56.00	19.93	QP
2.010	35.43	10.20	56.00	20.57	QP
5.330	35.61	10.31	60.00	24.39	QP
0.200	37.45	10.27	64.57	27.12	QP
0.200	25.58	10.27	54.57	28.99	Ave.

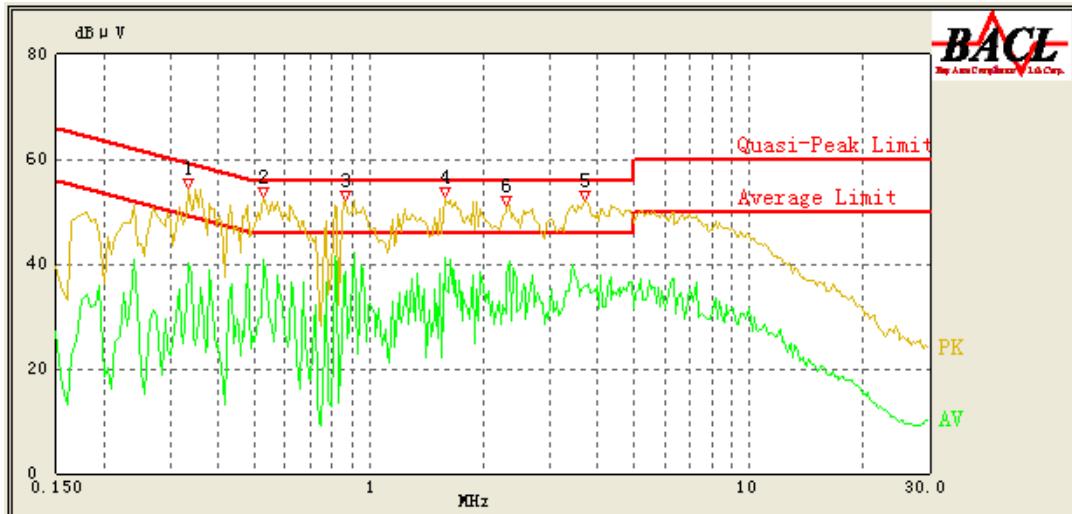
AC 120V/60 Hz, Neutral



Frequency (MHz)	Corrected Amplitude (dB μ V)	Correction Factor (dB)	Limit (dB μ V)	Margin (dB)	Detector (PK/ QP/Ave.)
9.250	38.53	10.46	50.00	11.47	Ave.
8.745	38.11	10.44	50.00	11.89	Ave.
1.610	31.10	10.19	46.00	14.90	Ave.
0.200	39.28	10.24	54.57	15.29	Ave.
7.035	34.33	10.37	50.00	15.67	Ave.
8.745	41.08	10.44	60.00	18.92	QP
9.250	40.06	10.46	60.00	19.94	QP
15.415	29.63	11.35	50.00	20.37	Ave.
1.610	32.68	10.19	56.00	23.32	QP
0.200	40.84	10.24	64.57	23.73	QP
15.340	36.15	11.33	60.00	23.85	QP
7.035	35.90	10.37	60.00	24.10	QP

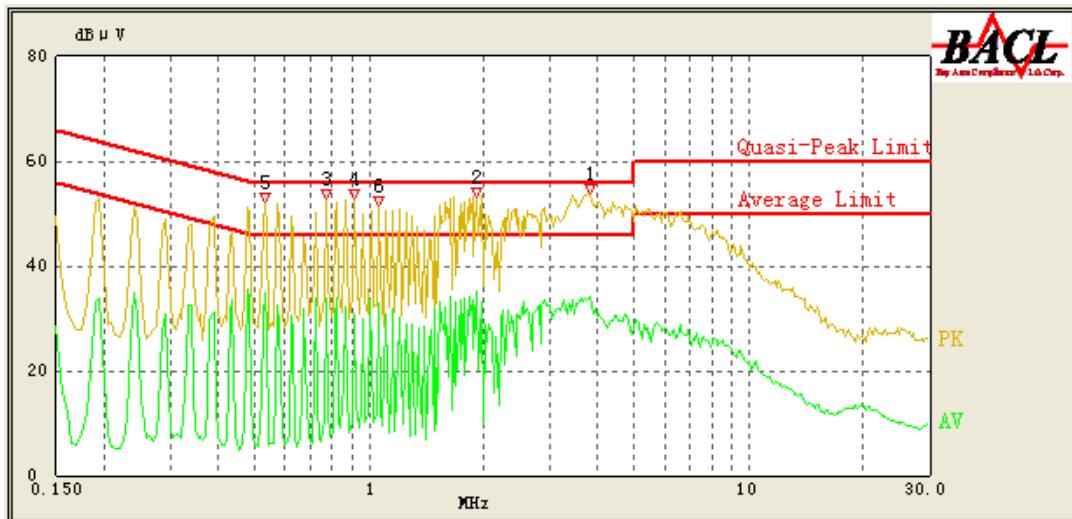
Test Mode 2: Play-HDMI

AC 120V/60 Hz, Line



Frequency (MHz)	Corrected Amplitude (dB μ V)	Correction Factor (dB)	Limit (dB μ V)	Margin (dB)	Detector (PK/ QP/Ave.)
1.585	41.11	10.19	46.00	4.89	Ave.
0.525	40.84	10.25	46.00	5.16	Ave.
0.525	49.90	10.25	56.00	6.10	QP
0.865	38.41	10.19	46.00	7.59	Ave.
2.300	37.81	10.21	46.00	8.19	Ave.
3.685	35.95	10.26	46.00	10.05	Ave.
0.335	40.18	10.26	50.71	10.53	Ave.
1.585	45.45	10.19	56.00	10.55	QP
3.685	45.00	10.26	56.00	11.00	QP
0.335	48.38	10.26	60.71	12.33	QP
0.865	43.12	10.19	56.00	12.88	QP
2.300	42.90	10.21	56.00	13.10	QP

AC 120V/60 Hz, Neutral



Frequency (MHz)	Corrected Amplitude (dB μ V)	Correction Factor (dB)	Limit (dB μ V)	Margin (dB)	Detector (PK/ QP/Ave.)
0.530	46.84	10.24	56.00	9.16	QP
3.805	46.82	10.25	56.00	9.18	QP
1.925	35.08	10.20	46.00	10.92	Ave.
0.915	44.90	10.18	56.00	11.10	QP
0.530	34.68	10.24	46.00	11.32	Ave.
1.060	44.51	10.17	56.00	11.49	QP
3.805	34.21	10.25	46.00	11.79	Ave.
1.925	44.21	10.20	56.00	11.79	QP
0.770	33.82	10.20	46.00	12.18	Ave.
1.060	32.78	10.17	46.00	13.22	Ave.
0.770	41.18	10.20	56.00	14.82	QP
0.915	30.83	10.18	46.00	15.17	Ave.

Note:

- 1) Corrected Amplitude = Reading + Correction Factor
- 2) Correction Factor = LISN/ISN VDF (Voltage Division Factor) + Cable Loss + Pulse Limiter Attenuation
- The corrected factor has been input into the transducer of the test software.
- 3) Margin = Limit – Corrected Amplitude

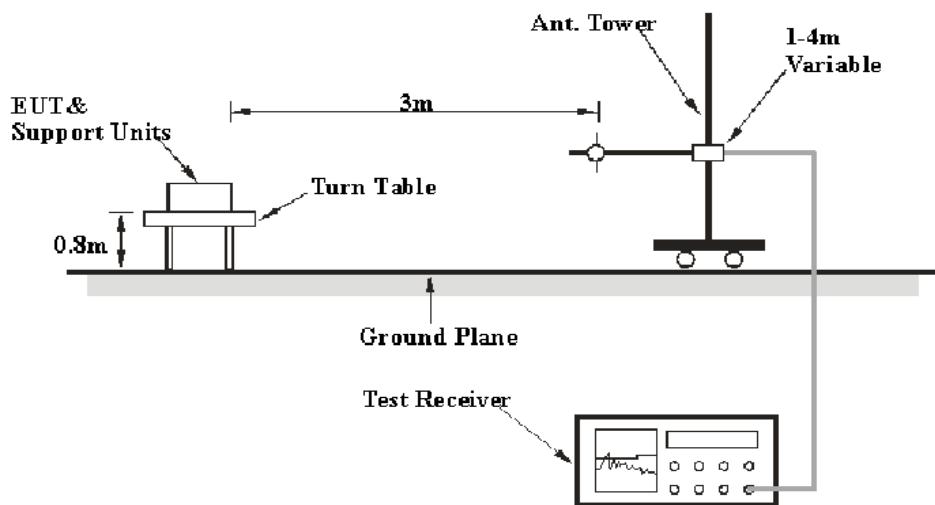
FCC §15.109 - RADIATED EMISSIONS

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in 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 CISPR 16-4-2, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at Bay Area Compliance Laboratories Corp. (Shenzhen) is 4.0 dB. (k=2, 95% level of confidence)

EUT Setup



The radiated emission tests were performed in the 3 meters test site, using the setup accordance with the ANSI C63.4-2009. The specification used was the FCC Part 15.109 Class B limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

The host PC was connected to a 120 VAC/60 Hz power source for downloading mode.

The receptacle was connected to a 120V/60Hz AC power source for play-HDMI mode.

EMI Test Receiver Setup

The system was investigated from 30 MHz to 5000 MHz.

During the radiated emission test, the EMI test receiver was set with the following configurations:

Frequency Range	RBW	Video B/W	Detector
30MHz – 1000 MHz	100 kHz	300 kHz	QP
Above 1 GHz	1MHz	3 MHz	Peak
Above 1 GHz	1MHz	10 Hz	Ave.

Test Procedure

During the radiated emissions test, for downloading mode, the host PC was connected to AC floor outlet. For play-HDMI mode, the receptacle was connected to the AC floor outlet.

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

All data was recorded in the Quasi-peak detection mode from 30 MHz to 1 GHz, Peak and average detection mode above 1 GHz.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	101122	2011-11-17	2012-11-16
HP	Amplifier	8447E	1937A01046	2011-11-24	2012-11-23
Sunol Sciences	Broadband Antenna	JB1	A040904-2	2011-11-28	2012-11-27
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2011-11-24	2012-11-23
Mini-Circuits	Amplifier	ZVA-213+	T-E27H	2012-03-08	2013-03-08
Sunol Sciences	Horn Antenna	DRH-118	A052304	2011-12-01	2012-11-30
R&S	Auto test Software	EMC32	V6.30	-	-

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp (Shenzhen). attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Corrected Amplitude & Margin Calculation

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

$$\text{Correction Factor} = \text{Antenna Loss} + \text{Cable Loss} - \text{Amplifier Gain}$$

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

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

Test Results Summary

According to the data in the following table, the worst margin reading is below:

6.85 dB at 1262.5 MHz in the Vertical polarization for play-HDMI mode

Refer to CISPR16-4-2:2011 and CISPR 16-4-1:2009, the measured level is in compliance with the limit if

$$L_{\text{m}} + U_{(L_{\text{m}})} \leq L_{\text{lim}} + U_{\text{cispr}}$$

or $U_{(L_{\text{m}})} \leq \text{Margin} + U_{\text{cispr}}$

The measurement result of EUT is below the limit level by a margin 6.85 dB and $U_{(L_{\text{m}})}(4\text{dB}) \leq \text{Margin}(6.85 \text{ dB}) + U_{\text{cispr}}(6.3\text{dB})$, so the EUT complies with the limit of the FCC Part 15.109 Class B.

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	48 %
ATM Pressure:	100.0 kPa

The testing was performed by Jimmy Xiao on 2012-08-06.

Test Mode 1: Downloading Mode

30 MHz-5 GHz:

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna			Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dB μ V/m)	FCC Part 15B	
	Reading (dB μ V/m)	Detector (PK/QP/Ave.)		Height (m)	Polar (H/V)	Factor (dB)				Limit (dB μ V/m)	Margin (dB)
933.31	41.28	QP	79	1.2	V	22.4	0.72	26.50	37.9	46	8.1
499.06	44.79	QP	253	1.2	V	17.5	0.51	26.50	36.3	46	9.7
799.61	38.23	QP	305	1.3	V	21.2	0.67	26.50	33.6	46	12.4
480.06	41.91	QP	270	1.2	V	17.5	0.49	26.50	33.4	46	12.6
699.86	37.98	QP	253	1.1	V	20.0	0.62	26.50	32.1	46	13.9
30.52	27.54	QP	231	1.1	V	21.5	0.26	26.50	22.8	40	17.2
1258.4	36.06	Ave.	68	1.1	H	24.6	2.06	26.50	36.22	54	17.78
1364.1	34.73	Ave.	117	1.3	V	25.0	2.18	26.50	35.41	54	18.59
1258.4	53.97	PK	68	1.1	H	24.6	2.06	26.50	54.13	74	19.87
1364.1	51.00	PK	117	1.3	V	25.0	2.18	26.50	51.68	74	22.32

Test Mode 2: Play-HDMI Mode

30 MHz-5 GHz:

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna			Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dB μ V/m)	FCC Part 15B	
	Reading (dB μ V/m)	Detector (PK/QP/Ave.)		Height (m)	Polar (H /V)	Factor (dB)				Limit (dB μ V/m)	Margin (dB)
1262.5	46.99	Ave.	235	1.3	V	24.6	2.06	26.50	47.15	54	6.85
352.37	50.59	QP	263	1.1	H	13.8	0.41	26.50	38.3	46	7.7
318.79	48.72	QP	113	1.2	H	13.7	0.38	26.50	36.3	46	9.7
557.97	43.35	QP	174	1.1	H	18.3	0.55	26.50	35.7	46	10.3
1851.7	39.31	Ave.	13	1.2	H	26.6	2.53	26.50	41.94	54	12.06
287.75	46.24	QP	43	1.1	H	13.1	0.36	26.50	33.2	46	12.8
31.69	30.84	QP	129	1.1	V	20.3	0.26	26.50	24.9	40	15.1
1113.7	38.77	Ave.	334	1.0	V	23.9	2.02	26.50	38.19	54	15.81
1113.7	38.70	Ave.	46	1.1	H	23.9	2.02	26.50	38.12	54	15.88
1851.7	53.02	PK	13	1.2	H	26.6	2.53	26.50	55.65	74	18.35
1113.7	55.72	PK	334	1.0	V	23.9	2.02	26.50	55.14	74	18.86
1262.5	54.40	PK	235	1.3	V	24.6	2.06	26.50	54.56	74	19.44
264.29	39.68	QP	54	1.1	H	12.5	0.32	26.50	26.0	46	20.0
1113.7	54.52	PK	46	1.1	H	23.9	2.02	26.50	53.94	74	20.06

Note:

Corrected Amplitude = Receiver Reading + Cable loss + Antenna Factor – Amplifier Gain

Margin = Limit- Corr. Amplitude

***** END OF REPORT *****