



## FCC PART 15B, CLASS B MEASUREMENT AND TEST REPORT

For

**Gajah International (HK) Co., Ltd.**

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**FCC ID: UFKMDX001B**

<b>Report Type:</b> Original Report	<b>Product Type:</b> MID
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\* This report may contain data that are not covered by the NVLAP accreditation and shall be marked with an asterisk “★”

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## GENERAL INFORMATION

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### Product Description for Equipment under Test (EUT)

The *Gajah International (HK) Co., Ltd.*'s product, model number: *MDX001B (FCC ID: UFKMDX001B)* or the "EUT" in this report was a MID, *named as MDX001B by applicant*, which was measured approximately: 27.0 cm (L) x 18.0 cm (W) x 1.3 cm (H), rated input voltage: 7.4V rechargeable Li-ion battery or DC 9V charging from adapter. The highest Operating Frequency is 1.5 GHz.

Adapter Information: AC-DC ADAPTER

Model: SK02G-0900200U;

Input: AC 100-240V~50/60Hz, 0.6A Max.

Output: DC 9V, 2A

*\*All measurement and test data in this report was gathered from production sample serial number: 1301088 (Assigned by BACL, Shenzhen). The EUT was received on 2012-12-25.*

### 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 15B, Class B.

### Related Submittal(s)/Grant(s)

FCC Part 15.247 DTS and Part 15.247 DSS submissions with FCC ID: UFKMDX001B.

### 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 : Downloading (data transfer)

### EUT Exercise Software

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

### Equipment Modifications

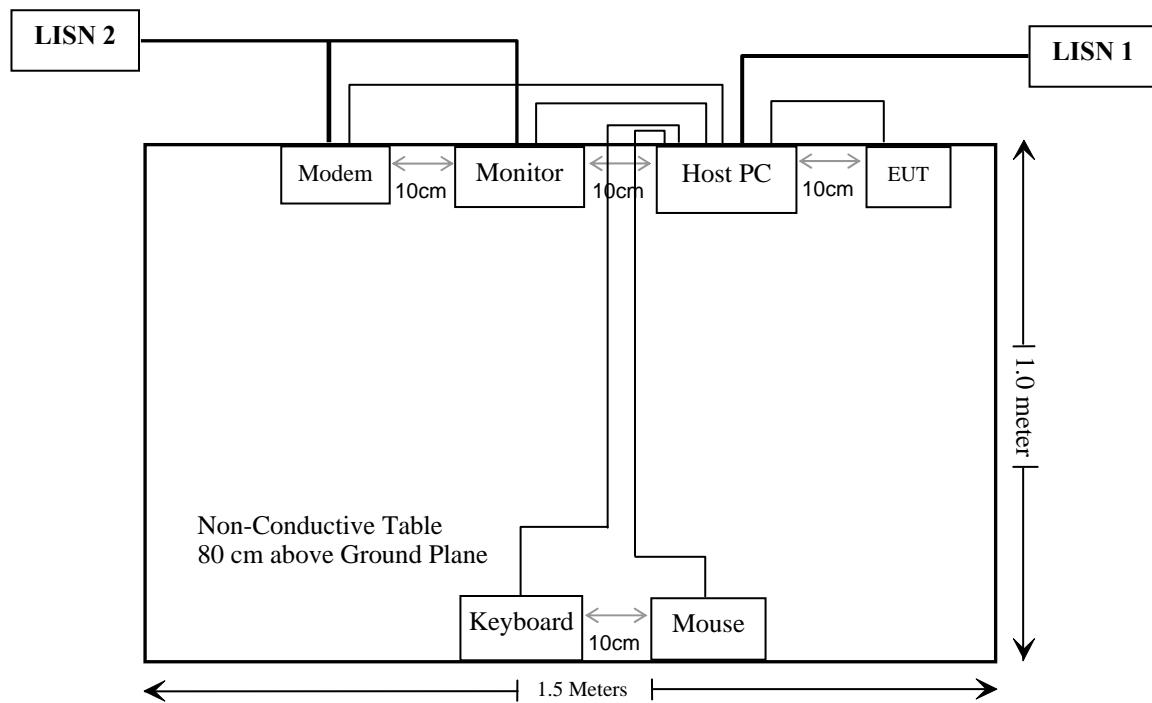
No modification was made to the EUT

### 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
ECOM	Modem	5600pbs	N/A

### 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	LCD Monitor
Unshielded Detachable USB Cable	1.0	Host PC	EUT

**Block Diagram of Test Setup**

**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

### Applicable Standard

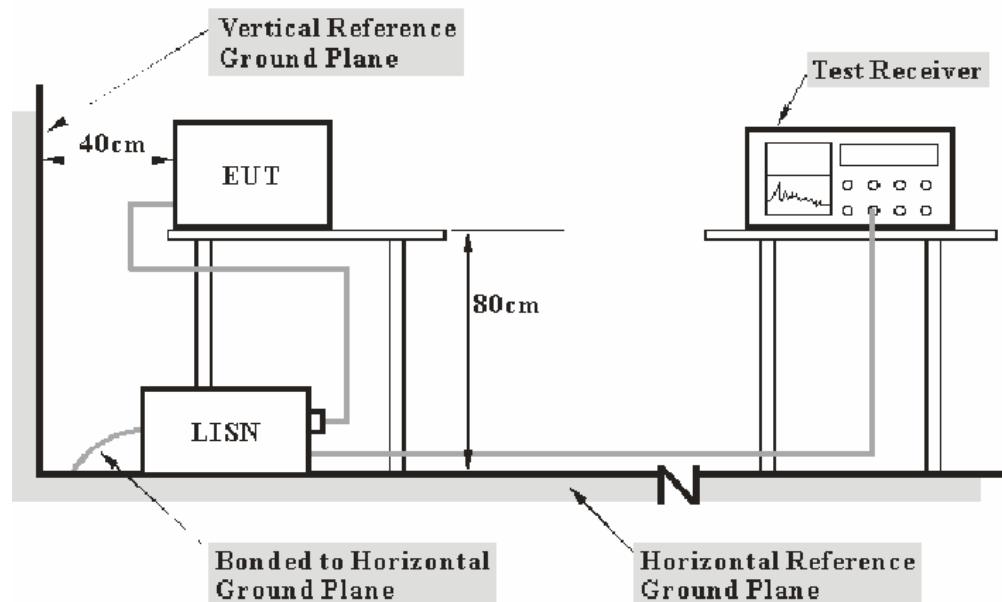
FCC §15.107

### 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), and the uncertainty will not be taken into consideration for all the test data recorded in the report.

### 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 setup of EUT is according with per ANSI C63.4-2009 measurement procedure. The specification used was with the FCC Part 15.107 Class B limits.

The spacing between the peripherals was 10 cm.

The host PC was connected to a 120 VAC/60 Hz power source

## 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 Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCS30	100176	2012-11-24	2013-11-23
Rohde & Schwarz	L.I.S.N.	ESH2-Z5	892107/021	2012-08-22	2013-08-21
Rohde & Schwarz	Attenuator	ESH3Z2	DE25985	2012-07-08	2013-07-07
BACL	CE Test software	BACL-CE	V1.0	-	-

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to National Primary Standards and International System of Units (SI).

## Test Procedure

During the conducted emission test, the host PC 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 Results Summary

According to the recorded data in following table, the EUT complied with the [FCC Part 15.107](#), with the worst margin reading of:

**10.31 dB at 8.855 MHz in the Line conducted mode**

## Test Data

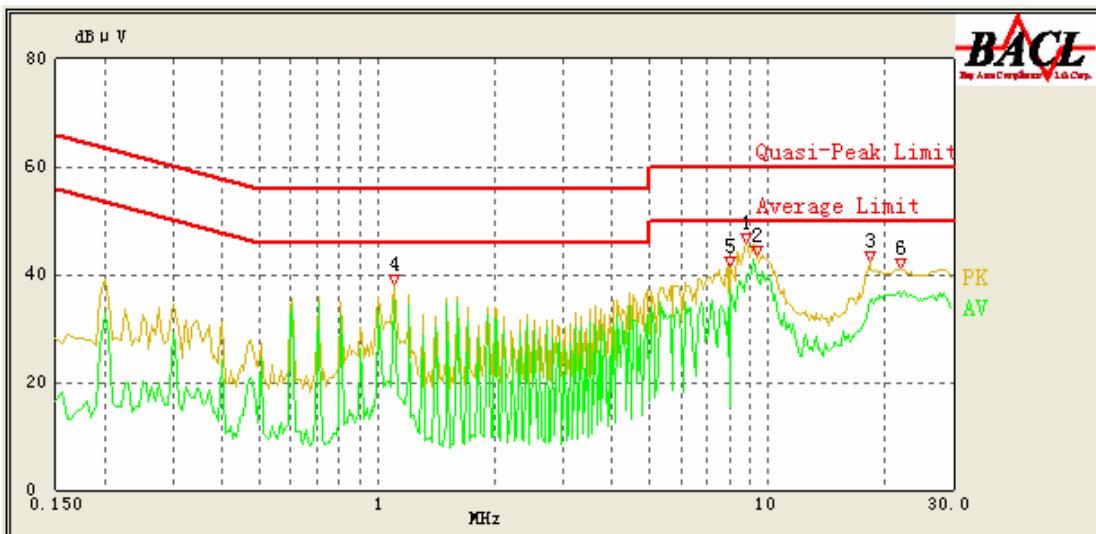
### Environmental Conditions

Temperature:	24 °C
Relative Humidity:	55 %
ATM Pressure:	101.0 kPa

*The testing was performed by Tiger Ye on 2013-01-23.*

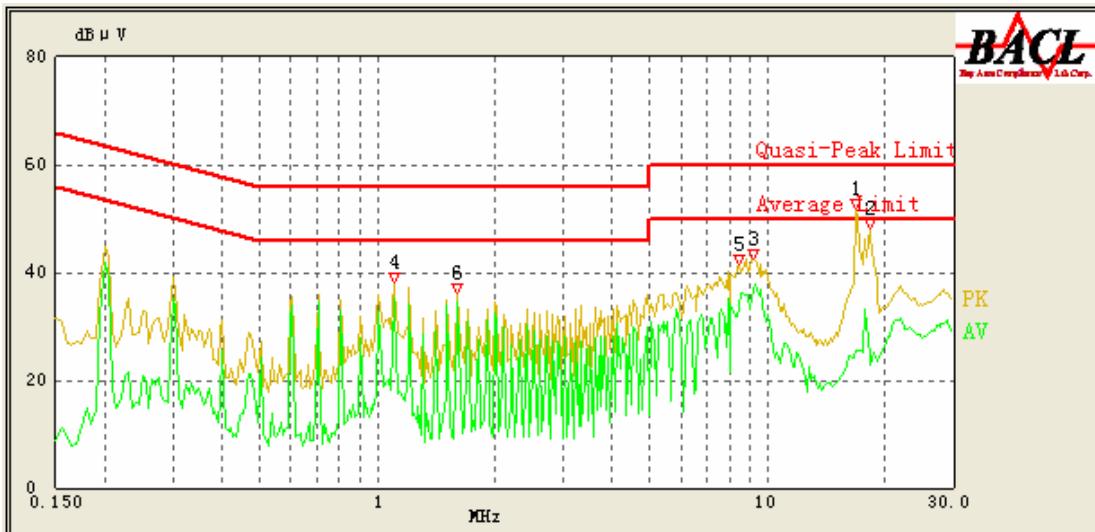
*Test Mode: Downloading*

**AC 120V/60 Hz, Line**



Frequency (MHz)	Corrected Amplitude (dB $\mu$ V)	Correction Factor (dB)	Limit (dB $\mu$ V)	Margin (dB)	Detector (PK/ QP/Ave.)
8.855	39.69	10.45	50.00	10.31	Ave.
9.355	39.47	10.47	50.00	10.53	Ave.
1.105	35.32	10.17	46.00	10.68	Ave.
8.050	37.25	10.42	50.00	12.75	Ave.
21.930	35.72	12.49	50.00	14.28	Ave.
18.210	34.13	12.26	50.00	15.87	Ave.
8.850	41.32	10.45	60.00	18.68	QP
9.355	40.52	10.47	60.00	19.48	QP
1.105	36.00	10.17	56.00	20.00	QP
22.035	37.95	12.48	60.00	22.05	QP
8.050	37.74	10.42	60.00	22.26	QP
18.300	35.40	12.29	60.00	24.60	QP

## AC 120V/60 Hz, Neutral



Frequency (MHz)	Corrected Amplitude (dB $\mu$ V)	Correction Factor (dB)	Limit (dB $\mu$ V)	Margin (dB)	Detector (PK/ QP/Ave.)
1.105	35.24	10.17	46.00	10.76	Ave.
1.610	34.56	10.19	46.00	11.44	Ave.
9.350	37.77	10.46	50.00	12.23	Ave.
8.445	33.66	10.43	50.00	16.34	Ave.
1.105	35.48	10.17	56.00	20.52	QP
9.245	39.20	10.46	60.00	20.80	QP
1.610	35.15	10.19	56.00	20.85	QP
8.445	37.59	10.43	60.00	22.41	QP
16.790	25.60	11.72	50.00	24.40	Ave.
18.305	24.98	12.12	50.00	25.02	Ave.
16.915	29.79	11.75	60.00	30.21	QP
18.360	27.69	12.13	60.00	32.31	QP

## FCC §15.109 - RADIATED EMISSIONS

### Applicable Standard

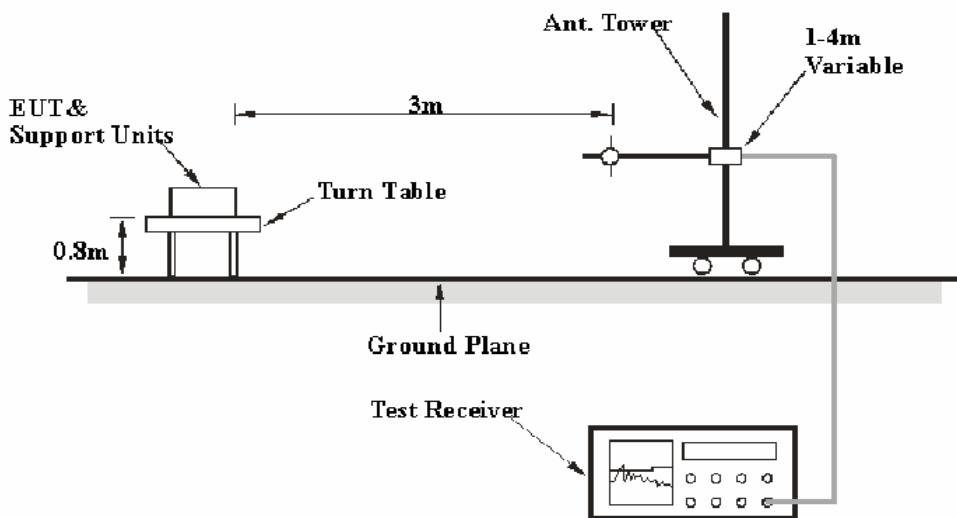
FCC §15.109

### 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), and the uncertainty will not be taken into consideration for all the test data recorded in the report.

### 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.

## EMI Test Receiver Setup

The system was investigated from 30 MHz to 5<sup>th</sup> harmonic of the highest frequency.

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

Frequency Range	RBW	Video B/W	IF B/W	Detector
30MHz – 1000 MHz	120 kHz	300 kHz	120kHz	QP
1 GHz – 7.5 GHz	1MHz	3 MHz	/	PK
	1MHz	10 Hz	/	Ave.

## Test Procedure

During the radiated emissions test, the host PC was connected to 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
HP	Amplifier	8447E	1937A01046	2012-11-24	2013-11-23
Rohde & Schwarz	EMI Test Receiver	ESCI	101122	2012-08-08	2013-08-07
Sunol Sciences	Broadband Antenna	JB1	A040904-2	2011-11-28	2014-11-27
Mini-Circuits	Amplifier	ZVA-213+	N/A	2012-11-24	2013-11-23
Sunol Sciences	Horn Antenna	DRH-118	A052304	2011-12-01	2014-11-30
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2012-11-24	2013-11-23

**\* Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to National Primary Standards and International System of Units (SI).

## 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 EUT complied with the FCC §15.109 Class B, with the worst margin reading of:

**8.6 dB at 691.2 MHz in the Vertical polarization**

## Test Data

### Environmental Conditions

Temperature:	24 °C
Relative Humidity:	55 %
ATM Pressure:	101.0 kPa

*The testing was performed by Tiger Ye on 2013-01-23.*

*Test Mode: Downloading*

**30 MHz-7.5 GHz:**

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dB $\mu$ V/m)	FCC Part 15B, Class B	
	Reading (dB $\mu$ V)	Detector (PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit (dB $\mu$ V/m)	Margin (dB)
691.2	37.40	QP	151	1.1	V	-7.20	37.40	46.0	8.60
48.0	28.40	QP	1	1.1	V	-19.30	28.40	40.0	11.60
1657.0	37.04	Ave.	345	1.9	V	1.77	38.81	54.0	15.19
465.2	29.90	QP	271	1.8	V	-10.60	29.90	46.0	16.20
498.7	28.30	QP	169	1.2	V	-10.10	28.30	46.0	17.70
195.2	23.80	QP	0	2.1	V	-15.40	23.80	43.5	19.70
30.6	19.90	QP	355	1.1	V	-7.20	19.90	40.0	20.10
1328.3	33.42	Ave.	27	1.8	H	0.19	33.61	54.0	20.39
1328.3	45.54	PK	343	1.8	H	0.19	45.73	74.0	28.27
1657.0	41.98	PK	12	1.9	V	1.77	43.75	74.0	30.25

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