



FCC PART 15 B, CLASS B  
TEST REPORT

For

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

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

**FCC ID: UFKBK3502B0**

<b>Report Type:</b> Original Report	<b>Product Type:</b> InkCase
<b>Test Engineer:</b> Bell Hu	<i>Bell Hu</i>
<b>Report Number:</b> RSZ131126005-00A	
<b>Report Date:</b> 2013-12-12	
<b>Reviewed By:</b> Sula Huang RF Engineer	<i>Sula Huang</i>
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**Note:** This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp.

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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: *BK3502B* or the "EUT" in this report was an *Ink Case*, which was measured approximately: 12.73 cm (L) x 6.18 cm (W) x 1.36 cm (H), rated with input voltage: DC 3.7 V rechargeable Li-Polymer battery or DC 5.0V charging from USB or USB adapter. The highest operating frequency is 600 MHz.

*Note: the product, series model BK3502B, Oaxis InkCase i5 and BK3501B are electrically identical; they are just different in model number and appearance, model BK3502B was selected for fully testing. The detailed information can be referred to the attached declaration which was stated and guaranteed by the applicant.*

*\*All measurement and test data in this report was gathered from production sample serial number: 1311114 (Assigned by BACL, Shenzhen). The EUT supplied by the applicant was received on 2013-11-26.*

### Objective

This test 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 the EUT with FCC Part 15 B.

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

FCC Part 15.247 DSS submission with FCC ID: UFKBK3502B0.

### 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.

## SYSTEM TEST CONFIGURATION

### Description of Test Configuration

The system was configured for testing in a manufacturer testing fashion.

EUT operation mode: Downloading (data transforms with computer)

### EUT Exercise Software

“BurnIn test v5.3” exercise software was used.

### Equipment Modifications

No modification was made to the EUT tested.

### Support Equipment List and Details

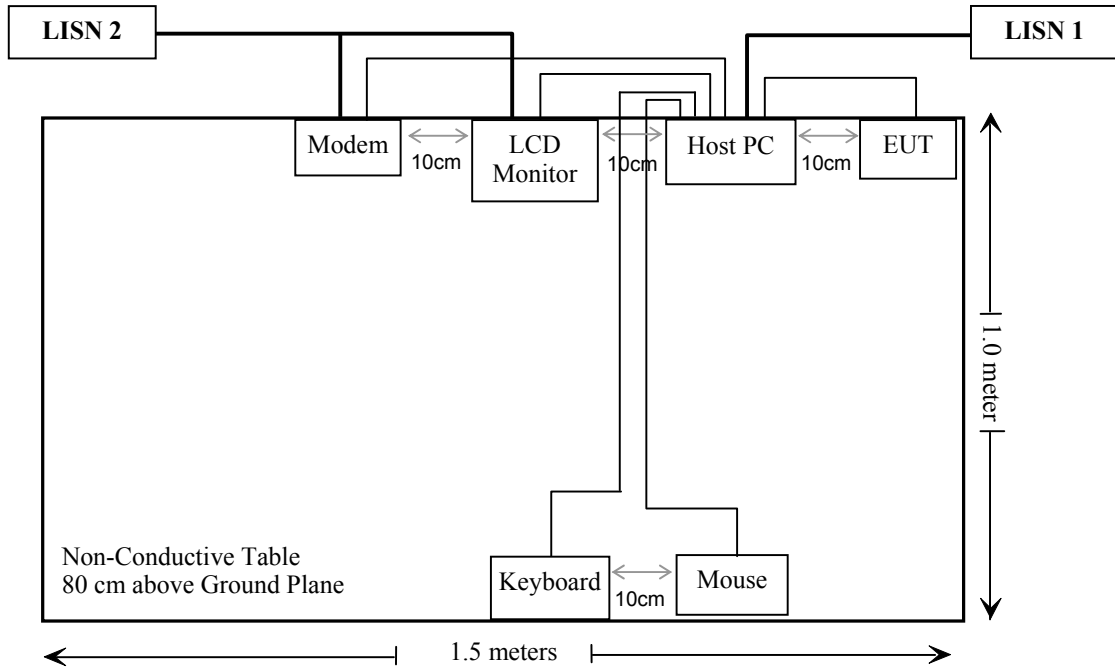
Manufacturer	Description	Model	Serial Number
DELL	PC	1#	N/A
DELL	Keyboard	1#	N/A
DELL	Mouse	1#	N/A
DELL	LCD Monitor	1#	N/A
SAST	Modem	AEM-2100	0293

### External I/O Cable

Cable Description	Length (m)	From/Port	To
Shielded Detachable Mouse Cable	1.5	Mouse Port / Host	Mouse
Shielded Detachable Serial Cable	1.2	Serial Port / Host	Modem
Shielded Detachable K/B Cable	1.5	Keyboard Port / Host	Keyboard
Shielded Detachable VGA Cable	1.5	VGA Port / Host	Monitor
Shielded Detachable USB Cable	1.1	EUT	Host PC

### Block Diagram of Test Setup

For conducted emission



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## **SUMMARY OF TEST RESULTS**

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<b>FCC Rules</b>	<b>Description of Test</b>	<b>Results</b>
§15.107	AC Line Conducted Emissions	Compliance
§15.109	Radiated Spurious Emissions	Compliance

## FCC §15.107 – AC LINE CONDUCTED EMISSIONS

### Applicable Standard

According to FCC §15.107

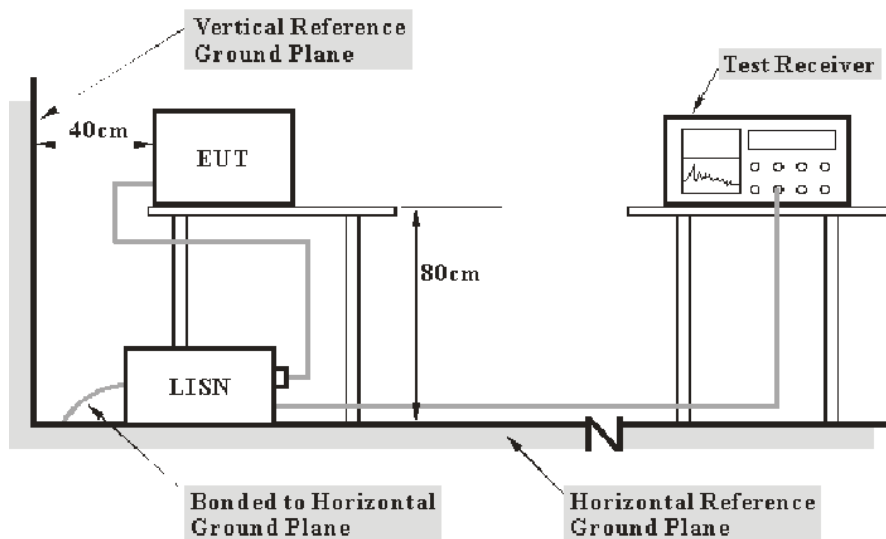
### Measurement Uncertainty

Input quantities to be considered for conducted disturbance measurements maybe receiver reading, attenuation of the connection between AMN/ISN and receiver, AMN/ISN voltage division factor, AMN/ISN VDF frequency interpolation and receiver related input quantities, etc.

Based on CISPR 16-4-2:2011, the expended combined standard uncertainty of conducted disturbance test at Bay Area Compliance Laboratories Corp. (Shenzhen) is shown as below. And the uncertainty will not be taken into consideration for the test data recorded in the report

Port	Measurement uncertainty
AC Mains	3.26 dB (k=2, 95% level of confidence)
CAT 3	3.70 dB (k=2, 95% level of confidence)
CAT 5	3.86 dB (k=2, 95% level of confidence)
CAT 6	4.64 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 per 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.

### 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, the host PC was connected to the first LISN and the other relevant equipments were connected to the second 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	2013-06-17	2014-06-17
Rohde & Schwarz	LISN	ENV216	3560.6650.12-101613-Yb	2013-05-07	2014-05-07
Rohde & Schwarz	2 <sup>nd</sup> LISN	ESH2-Z5	892107/021	2013-10-15	2014-10-15
Rohde & Schwarz	CE Test software	EMC 32	V8.53	-	-

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

### Corrected Factor & Margin Calculation

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

$$\text{Correction Factor} = \text{LISN VDF} + \text{Cable Loss} + \text{Transient Limitor}$$

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, with the worst margin reading of:

**7.9 dB at 8.954000 MHz** in the **Neutral** conducted mode

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

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

in BAACL.,  $U_{(L_m)}$  is less than  $U_{cispr}$ , if  $L_m$  is less than  $L_{lim}$ , it implies that the EUT complies with the limit.

## Test Data

### Environmental Conditions

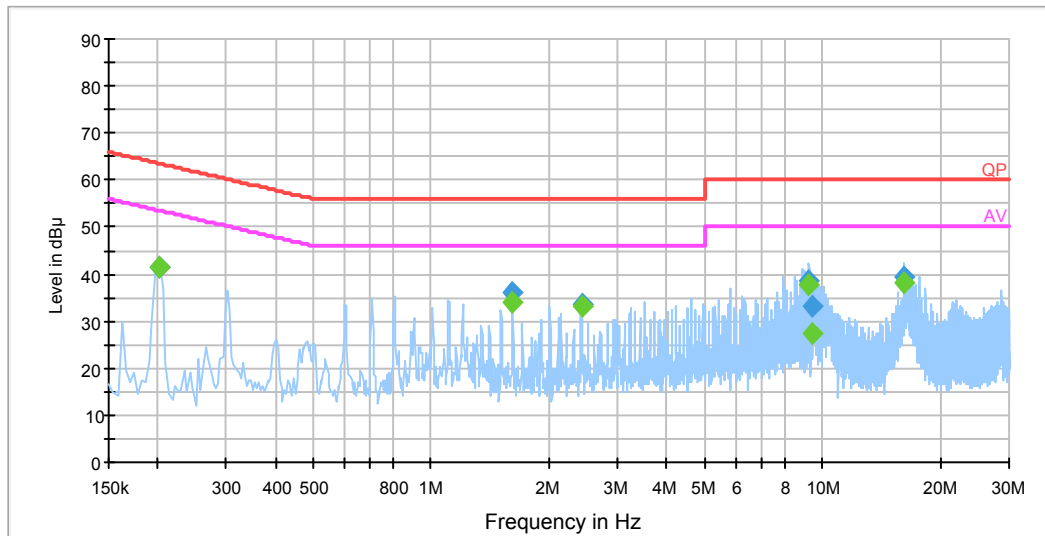
<b>Temperature:</b>	26 °C
<b>Relative humidity:</b>	51 %
<b>ATM Pressure:</b>	101.0 kPa

*The testing was performed by Bell Hu on 2013-12-10.*

EUT Operation Mode: Downloading (data transforms with Computer)

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

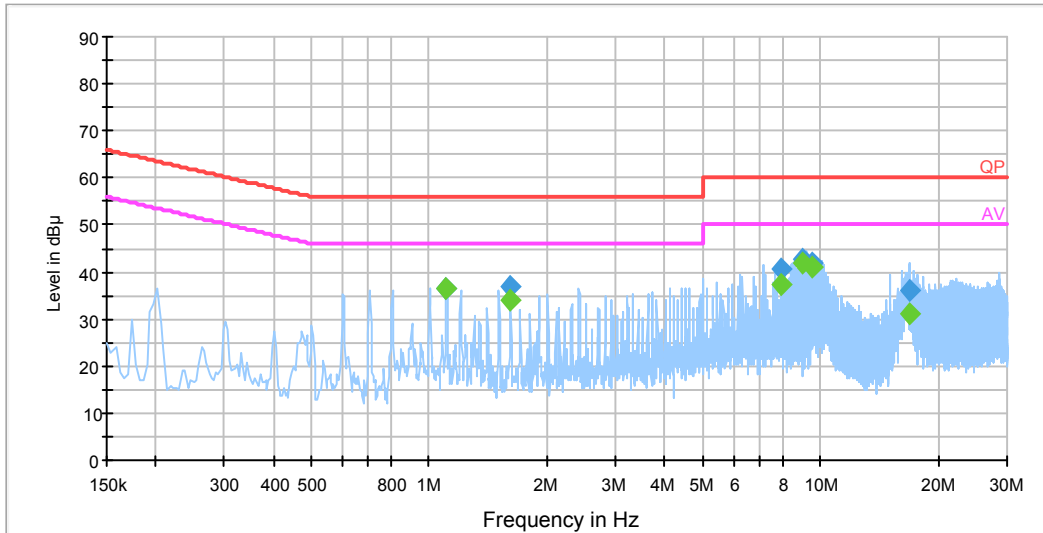
EMI Auto Test L



Frequency (MHz)	Corrected Amplitude (dBμV)	Corrected Factor (dB)	Limit (dBμV)	Margin (dB)	Remark (PK/QP/Ave)
0.202000	41.4	19.6	63.5	22.1	QP
0.202000	41.6	19.6	53.5	11.9	Ave.
1.614000	36.2	19.5	56.0	19.8	QP
1.614000	34.1	19.5	46.0	11.9	Ave.
2.422000	33.8	19.6	56.0	22.2	QP
2.422000	33.1	19.6	46.0	12.9	Ave.
9.258000	38.8	19.7	60.0	21.2	QP
9.258000	37.8	19.7	50.0	12.2	Ave.
9.466000	33.0	19.7	60.0	27.0	QP
9.466000	27.5	19.7	50.0	22.5	Ave.
16.226000	39.4	19.8	60.0	20.6	QP
16.226000	38.2	19.8	50.0	11.8	Ave.

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

Copy of EMI Auto Test N



Frequency (MHz)	Corrected Amplitude (dBµV)	Corrected Factor (dB)	Limit (dBµV)	Margin (dB)	Remark (PK/QP/Ave)
1.106000	36.3	19.5	56.0	19.7	QP
1.106000	36.7	19.5	46.0	9.3	Ave.
1.614000	36.8	19.6	56.0	19.2	QP
1.614000	34.1	19.6	46.0	11.9	Ave.
7.946000	40.7	19.8	60.0	19.3	QP
7.946000	37.4	19.8	50.0	12.6	Ave.
8.954000	42.6	19.8	60.0	17.4	QP
8.954000	42.1	19.8	50.0	7.9	Ave.
9.558000	42.0	19.8	60.0	18.0	QP
9.558000	41.2	19.8	50.0	8.8	Ave.
16.894000	36.0	19.9	60.0	24.0	QP
16.894000	31.1	19.9	50.0	18.9	Ave.

**Note:**

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

## FCC §15.109 - RADIATED SPURIOUS EMISSIONS

### Applicable Standard

FCC §15.109

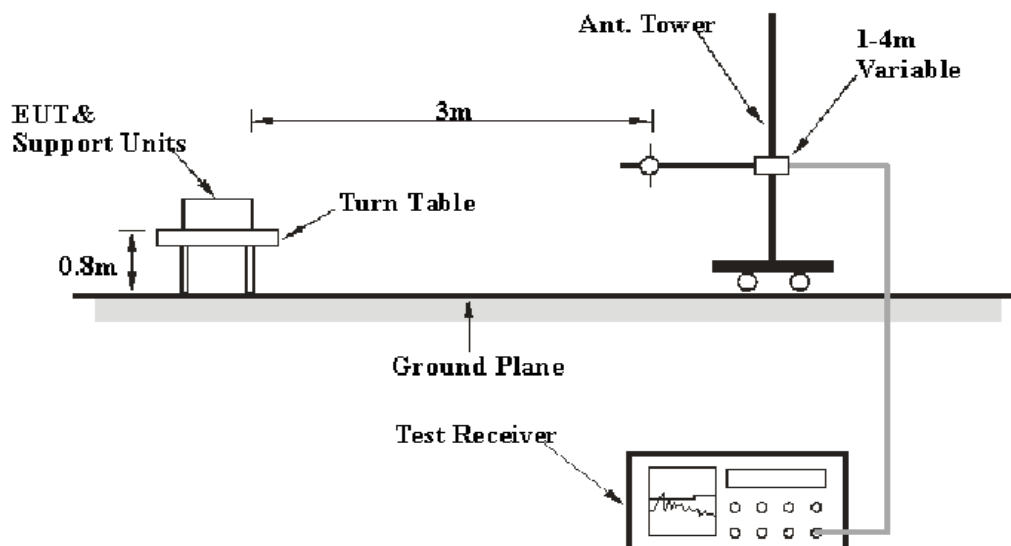
### Measurement Uncertainty

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 16-4-2:2011, the expended combined standard uncertainty of radiation emissions at Bay Area Compliance Laboratories Corp. (Shenzhen) is shown in below table. And the uncertainty will not be taken into consideration for the test data recorded in the report

Frequency	Polarity	Measurement uncertainty
30MHz~200MHz	Horizontal	4.62 dB (k=2, 95% level of confidence)
	Vertical	4.54 dB (k=2, 95% level of confidence)
200MHz~1GHz	Horizontal	4.84 dB (k=2, 95% level of confidence)
	Vertical	5.91 dB (k=2, 95% level of confidence)
1 GHz~6 GHz	Horizontal / Vertical	4.68 dB (k=2, 95% level of confidence)
Above 6 GHz	Horizontal / Vertical	4.92 dB (k=2, 95% level of confidence)

### EUT Setup



The radiated emission tests were performed in the 3 meters chamber 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 GHz.

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	100 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1MHz	3 MHz	/	PK
	1MHz	10 Hz	/	Ave.

### Test Procedure

For the radiated emissions test, the host PC and relevant equipments were connected to AC floor outlet.

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

### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Amplifier	HP8447E	1937A01046	2013-09-30	2014-09-30
Rohde & Schwarz	EMI Test Receiver	ESCI	101122	2013-09-17	2014-09-17
Sunol Sciences	Broadband Antenna	JB1	A040904-2	2011-11-28	2014-11-27
Mini	Pre-amplifier	ZVA-183-S+	5969001149	2013-04-03	2014-04-03
Sunol Sciences	Horn Antenna	DRH-118	A052304	2011-12-01	2014-11-30
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2013-11-12	2014-11-12
Rohde & Schwarz	CE Test software	EMC 32	V8.53	-	-

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

## Corrected Amplitude & Margin Calculation

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

$$\text{Corrected Amplitude} = \text{Meter Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7 dB 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 data in the following table, the EUT complied with the FCC §15.109 Class B, with the worst margin reading of:

**8.9 dB at 179.972125 MHz in the Vertical polarization**

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

$$L_m + U_{(Lm)} \leq L_{lim} + U_{cispr}$$

in BACL.,  $U_{(Lm)}$  is less than  $U_{cispr}$ , if  $L_m$  is less than  $L_{lim}$ , it implies that the EUT complies with the limit.

## Test Data

### Environmental Conditions

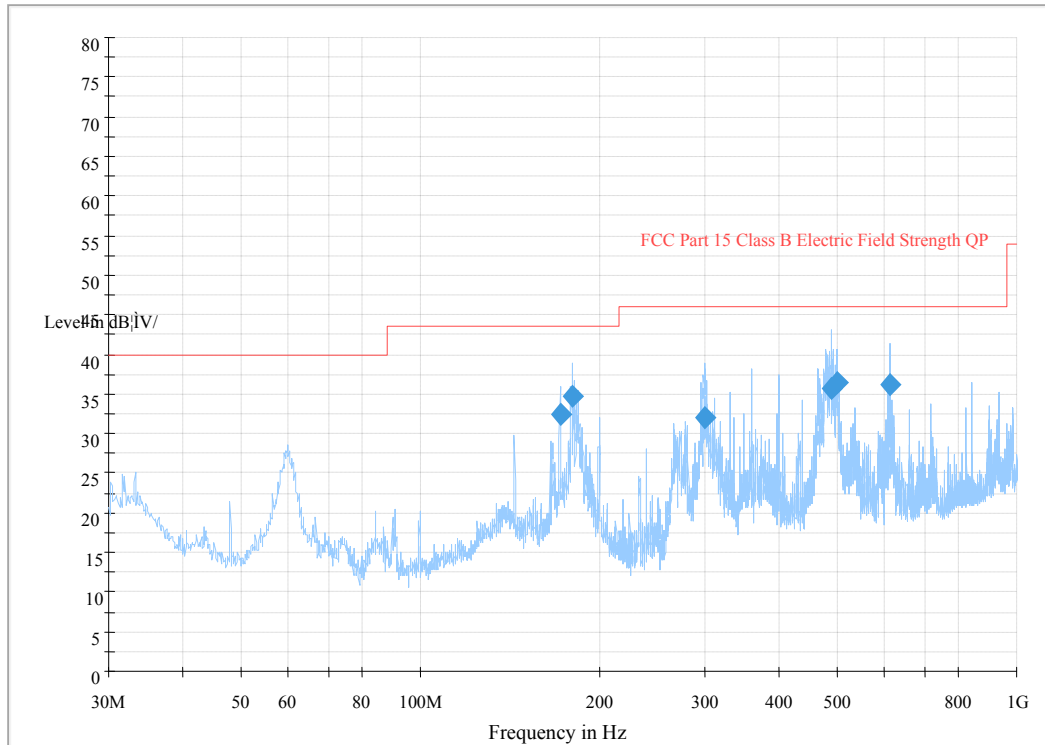
<b>Temperature:</b>	26 °C
<b>Relative Humidity:</b>	51 %
<b>ATM Pressure:</b>	101.0 kPa

*The testing was performed by Bell Hu on 2013-12-10.*

*EUT Operation Mode: Downloading (data transforms with Computer)*

**1) 30 MHz -1 GHz:**

Auto Test (FCC part 15 Class B)



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna height (cm)	Antenna Polarity	Turntable position (degree)	Correction Factor (dB/m)	Limit (dBµV/m)	Margin (dB)
171.298000	32.5	219.0	H	79.0	-15.3	43.5	11.0
179.972125	34.6	100.0	V	267.0	-15.6	43.5	8.9
299.574125	32.0	100.0	H	272.0	-13.0	46.0	14.0
489.105250	35.6	100.0	H	322.0	-9.5	46.0	10.4
499.807500	36.5	100.0	H	310.0	-9.5	46.0	9.5
612.239875	36.1	100.0	V	265.0	-8.4	46.0	9.9

Note:

- 1) Corrected Amplitude = Corrected Factor + Reading
- 2) Corrected Factor = Antenna factor (RX) + Cable loss – Amplifier factor  
The corrected factor has been input into the transducer of the test software.
- 3) Margin = Limit - Corrected Amplitude

**2) 1 GHz – 5 GHz:**

All radiated emissions are 20 dB below the limit or are on the system noise floor level.

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## **PRODUCT SIMILARITY DECLARATION LETTER**

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

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518048 China

Tel: +852 63265997

2013-12-20

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### **Product Similarity Declaration**

To Whom It May Concern,

We, Gajah International (HK) Co.,Ltd, hereby declare that our InkCase, Model Number: BK3501B,Oaxis InkCase i5 are electrically identical with the BK3502B that was certified by BACL. They are only different in model numbers and apperance.

Please contact me if you have any question.

Signature:

A handwritten signature in red ink, appearing to read 'Ying Keong Chaw'.

Ying Keong Chaw  
General Manager

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