



Lab Code: 200167-0



# FCC PART 15.225

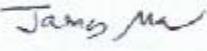
## MEASUREMENT AND TEST REPORT

For

### Mobicom Corporation

960 Holmdel Road  
Holmdel, NJ 08817, USA

**FCC ID: P8D-PLUSII**

<b>Report Type:</b>	<b>Product Type:</b>
<input checked="" type="checkbox"/> Original Report	GSM 850/1900 Dual-band Bar-type Cellular Phone with NFC
<b>Test Engineer:</b>	Xiao Ming Hu 
<b>Report Number:</b>	R0802053-225
<b>Testing Date(s):</b>	2008-02-15, 2008-02-12, 2008-02-22
<b>Report Date:</b>	2008-03-03
<b>Reviewed By:</b>	James Ma, RF Test Engineer 
<b>Prepared By:</b> (12)	Bay Area Compliance Laboratories Corp. (BACL) 1274 Anvilwood Avenue Sunnyvale, CA 94089 Tel: (408) 732-9162 Fax: (408) 732 9164

**Note:** This test report is for the customer shown above and their specific product only. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratory Corp. (Shenzhen). This report **must not** be used by the customer to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government

## TABLE OF CONTENTS

<b>GENERAL INFORMATION.....</b>	<b>4</b>
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT) .....	4
EUT PHOTO .....	4
MECHANICAL DESCRIPTION.....	4
OBJECTIVE .....	5
RELATED SUBMITTAL(S)/GRANT(S).....	5
TEST METHODOLOGY .....	5
MEASUREMENT UNCERTAINTY .....	5
TEST FACILITY .....	5
<b>SYSTEM TEST CONFIGURATION.....</b>	<b>7</b>
JUSTIFICATION .....	7
EUT EXERCISE SOFTWARE .....	7
SPECIAL ACCESSORIES .....	7
EQUIPMENT MODIFICATIONS .....	7
REMOTE SUPPORT EQUIPMENT .....	7
LOCAL SUPPORT EQUIPMENT.....	7
POWER SUPPLY AND LINE FILTERS .....	7
INTERFACE PORTS AND CABLING (THIS IS ONLY NEEDED FOR FCC15.225) .....	7
TEST SETUP BLOCK DIAGRAM.....	8
<b>SUMMARY OF TEST RESULTS .....</b>	<b>9</b>
<b>§ 15.203 – ANTENNA REQUIEMENT.....</b>	<b>10</b>
APPLICABLE STANDARD .....	10
APPLICABLE STANDARD .....	10
<b>§ 15.35, § 15.205, § 15.209, § 15.225 - RADIATED EMISSIONS.....</b>	<b>11</b>
APPLICABLE STANDARD .....	11
EUT SETUP .....	11
TEST EQUIPMENT LIST AND DETAILS.....	11
TEST PROCEDURE .....	12
CORRECTED AMPLITUDE & MARGIN CALCULATION .....	12
SUMMARY OF TEST RESULTS .....	12
RADIATED EMISSIONS TEST RESULT DATA @ 3METER (BELOW 30 MHz).....	13
<b>§ 15.207 – CONDUCTED EMISSIONS TEST .....</b>	<b>15</b>
EUT SETUP .....	15
TEST EQUIPMENT .....	15
TEST PROCEDURE .....	15
SUMMARY OF TEST RESULTS .....	15
CONDUCTED EMISSIONS TEST DATA .....	16
<b>§ 15.225(E) - FREQUENCY STABILITY MEASUREMENT .....</b>	<b>18</b>
STANDARD APPLICABLE .....	18
TEST PROCEDURE .....	18
TEST EQUIPMENT LIST AND DETAILS.....	18
TEST RESULTS .....	19
<b>EXHIBIT A - FCC ID LABEL INFORMATION .....</b>	<b>20</b>
APPLICABLE STANDARD .....	20

REQUIRED FCC ID LABEL CONTENTS .....	20
PROPOSED LABEL LOCATION ON EUT .....	21
<b>EXHIBIT B - TEST SETUP PHOTOGRAPHS .....</b>	<b>22</b>
CONDUCTED EMISSION – FRONT VIEW .....	22
CONDUCTED EMISSION – SIDE VIEW .....	22
RADIATED EMISSION BELOW 30MHz – FRONT VIEW .....	23
RADIATED EMISSION BELOW 30MHz – REAR VIEW .....	23
RADIATED EMISSION ABOVE 30MHz – FRONT VIEW .....	24
RADIATED EMISSION ABOVE 30MHz – REAR VIEW .....	24
<b>EXHIBIT C - EUT EXTERNAL PHOTOGRAPHS.....</b>	<b>25</b>
EUT- FRONT SIDE VIEW .....	25
EUT- BACK SIDE VIEW .....	25
EUT – BOTTOM/ INTERFACE PORT VIEW .....	26
EUT – TOP VIEW .....	26
EUT – RIGHT SIDE VIEW .....	27
EUT – LEFT SIDE VIEW .....	27
EUT – BATTERY COMPARTMENT VIEW (BACK COVER REMOVED).....	28
EUT BATTERY .....	28
EUT – USB INTERFACE CABLE .....	29
EUT AC/DC POWER ADAPTER.....	29
EUT INTERNAL – PCB SIDE ONE WITH LCD AND RF SIELDING .....	30
EUT INTERNAL – PCB SIDE ONE, LCD AND RF SHEILDING REMOVED .....	31
EUT INTERNAL – PCB SIDE TWO.....	32
EUT INTERNAL – PCB SIDE TWO, ANTENNA AND RF SHEILDING REMOVED .....	33
EUT INTERNAL – NFC ANTENNA .....	34
EUT INTERNAL – GSM 850/1900 ANTENNA .....	34

## GENERAL INFORMATION

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

This measurement and test report has been compiled on behalf of *Mobicom Corp.* and their product model: *PLUS II, FCC ID: P8D-PLUSII* which is a GSM 850/1900 Dual-band Bar Type Cellular Phone with NFC (near field communication) credit card payment capability. This measurement and test report only pertains to the NFC portion of the EUT; for measurement and test results pertaining to GSM 950/1900 please see BACL report R0802053-2224.

### EUT Photo



*Additional Photos in Exhibit C*

### Mechanical Description

The *Mobicom Corp.* product model: *PLUS II, FCC ID: P8D-PLUSII* or the "EUT" as referred to in this report is a mobile phone. The EUT measures approximately 68 mm (L) x 40.5 mm (W) x 13.4 mm (H), and weighs approximately 46 g.

*\* The test data gathered is from production samples, serial numbers: GP01J7A23AA0067 and GP01J7A23AA0001, assigned by the manufacturer.*

## Objective

This measurement and test report is prepared on behalf of *Mobicom Corp.* in accordance with Part 2, Subpart J, and Part 15 Subpart C of the Federal Communication Commissions rules.

The objective of the manufacturer is to demonstrate compliance with FCC rules, Part 15, sec 15.35, sec 15.203, sec 15.205, sec 15.207, sec 15.209 and sec 15.225.

This measurement and test report only pertains to the NFC portion of the EUT; for measurement and test results pertaining to GSM 850/1900 please see BACL report R0802053-2224.

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

No Related Submittals.

## Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

All radiated and conducted emissions measurements were performed at Bay Area Compliance Laboratory, Corp.

## 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 NIS 81, The Treatment of Uncertainty in EMC Measurements, the values range from  $\pm 2.0$  for Conducted Emissions tests and  $\pm 4.0$  dB for Radiated Emissions tests are the most accurate estimates pertaining to uncertainty of EMC measurements at BACL.

Detailed instrumentation measurement uncertainties can be found in BACL report QAP-018.

## Test Facility

The test site used by BACL Corp. to collect radiated and conducted emissions measurement data is located at its facility in Sunnyvale, California, USA.

The test sites at BACL have been fully described in reports submitted to the Federal Communication Commission (FCC) and Voluntary Control Council for Interference (VCCI). The details of these reports has been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 11 and December 10, 1997 and Article 8 of the VCCI regulations on December 25, 1997. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2003.

The Federal Communications Commission, Industry Canada, and Voluntary Control Council for Interference has the reports on file and is listed under FCC registration number: 90464, IC registration

number: 3062A, and VCCI Registration Number: C-2463 and R-2698. The test site has been approved by the FCC, IC, and VCCI for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, BACL is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200167-0). The current scope of accreditations can be found at <http://ts.nist.gov/ts/htdocs/210/214/scopes/2001670.htm>.

## SYSTEM TEST CONFIGURATION

### Justification

The EUT was configured for testing according to ANSI C63.4-2003.

### EUT Exercise Software

An RFID simulation program was provided by the customer.

### Special Accessories

N/A

### Equipment Modifications

No modifications were made to the EUT

### Remote Support Equipment

N/A

### Local Support Equipment

Manufacturer	Description	Model	Serial Number
Philips	RF ID Reader	Mifare Pegoda	70103966
Dell	Laptop	Inspiron 1300	-

### Power Supply and Line Filters

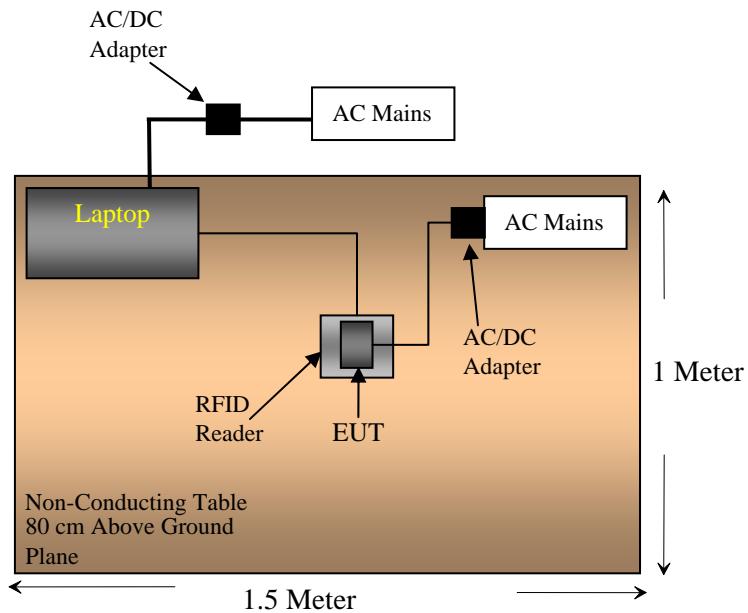
Manufacturer	Description	Model	Serial Number
AC/DC Adapter	USB version AC/DC Adapter	ZXTSC01	Shenzhen ZhongXinTong Industrial Co. Ltd.

### Interface Ports and Cabling (this is only needed for FCC15.225)

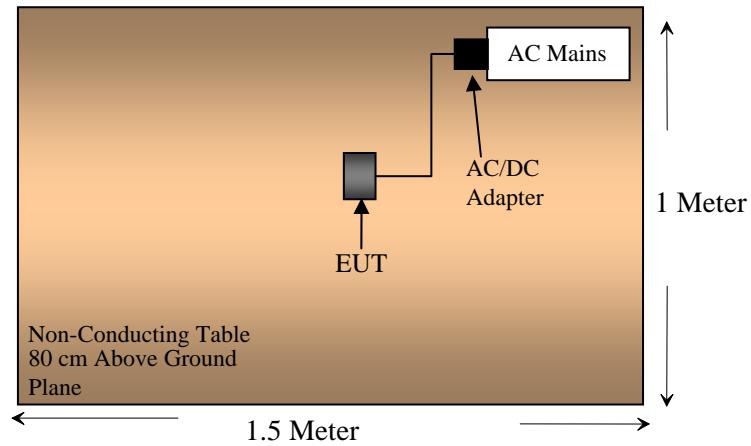
Cable Description	Length (M)	From	To
USB cable	1m	EUT	Laptop USB port

## Test Setup Block Diagram

### Radiated Emissions



### Conducted Emissions



## **SUMMARY OF TEST RESULTS**

---

<b>FCC Rules</b>	<b>Description of Test</b>	<b>Results</b>
§ 15.203	Antenna Requirement	Compliant
§ 15.35 § 15.205 § 15.209 § 15.225(a)(b)(c)(d)	Radiated Emission	Compliant
§ 15.207	Conducted Emission	Compliant
§ 15.225(e)	Frequency Stability	Compliant

## **§ 15.203 – ANTENNA REQUIREMENT**

### **Applicable Standard**

According to § 15.203, An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

### **Applicable Standard**

**Result:** Compliant, the antenna is permanently attached within the EUT and cannot be accessed or modified by the end user without resulting in permanent damage to the device. Please see photo below for details.



## **§ 15.35, § 15.205, § 15.209, § 15.225 - RADIATED EMISSIONS**

### **Applicable Standard**

§15.225 (a) the field strength of any emissions within the band 13.553-13.567 MHz shall not exceed 15848 microvolts/meter at 30 meters.

§15.225 (b) within the band 13.410-13.553 MHz and 13.567-13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.

§15.225 (c) Within the band 13.110-13.410 MHz and 13.710-14.010 MHz, the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.

§15.225 (d) The field strength of any emissions appearing outside of the 13.110–14.010 MHz band shall not exceed the general radiated emission limits in §15.209.

### **EUT Setup**

The radiated emission tests were performed in the open area 3-meter test site, using the setup accordance with the ANSI C63.4-2003. The specification used was the FCC 15 Subpart C limits.

The spacing between the peripherals was 10 centimeters.

External I/O cables were draped along the edge of test table and bundle when necessary.

The EUT was placed on the center of the back edge on the test table.

### **Test Equipment List and Details**

Manufacturer	Description	Model	Serial Number	Calibration Date
HP	Amplifier, Pre (0.1~1300MHz)	8447D	2944A10198	2007-01-20**
Rohde & Schwarz	EMI Test Receiver	ESCI 1166.5950 K03	100337	2007-03-08
Com-Power	Active Loop Antenna (10KHz-30MHz)	AL-130	17043	2006-03-16**
Sunol Sciences	30MHz~2GHz Antenna	JB1	A03105-3	2007-03-15

\* **Statement of Traceability:** BACL Corp. attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

\*\* 2 year calibration cycle

## Test Procedure

Maximizing procedure was performed on the six (6) highest emissions to ensure EUT is compliant with all installation combination.

All data was recorded in the peak detection mode. Quasi-peak readings performed only when an emission was found to be marginal (within -4 dB of specification limitation), and are distinguished with a "QP" in the data table.

The EUT was operating at normal to represent worst case during final qualification test. Therefore, this configuration was used for final test data recorded in the following table of this report.

## Corrected Amplitude & Margin Calculation

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

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

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 maximum limit for Class B. The equation for margin calculation is as follows:

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

## Environmental Conditions

Temperature:	22.1 °C
Relative Humidity:	49 %
ATM Pressure:	101.7 kPa

\* Testing was performed by Xiao Ming Hu 2008-02-15.

## Summary of Test Results

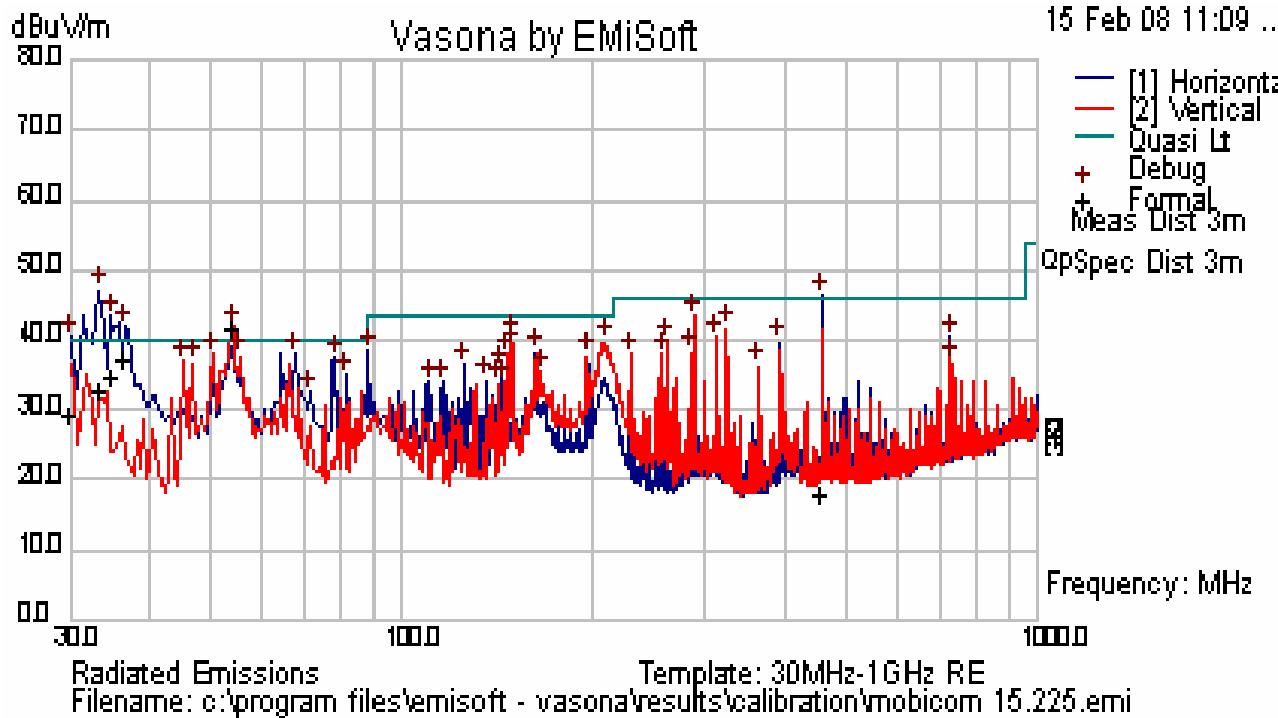
According to the data in the following table and plot, the EUT complied with FCC Title 47, Part 15, Subpart C, and section 15.225. The EUT measurement results were outside the measurement uncertainty of ±4.0 dB, and had the worst margin reading of:

- 25.20 dB at 24.412 MHz** from 9 kHz to 30 MHz
- 0.72 dB at 54.239 MHz** in the **Vertical** polarization (30 -1000 MHz)

**Radiated Emissions Test Result Data @ 3meter (below 30 MHz)**

Frequency (MHz)	Receiver Reading (dBuV)	Table Azimuth Degrees	Ant. Height (m)	Ant. Factor (dB/m)	Cable Loss (dB)*	Distance Factor (dB)	Corrected Reading (dBuV/m)	FCC 15C	
								Limit (dBuV/m)	Margin (dB)
24.412	23	80	1	11.2	10.1	40	4.3	29.5	-25.20
13.769	28.8	133	1	11.2	10.1	40	10.1	40.5	-30.40
24.304	27.61	180	1	11.2	10.1	40	8.91	29.5	-20.59
27.12	11.27	170	1	11.2	10.1	40	-7.43	29.5	-36.93
13.56	45.07	193	1	11.2	10.1	40	26.37	84	-57.63

## Radiated Emissions Test Result Data @ 3meter (30 – 1000 MHz)



## Quasi-Peak

Frequency (MHz)	Quasi Peak (dB $\mu$ V/m)	Antenna Height (cm)	Polarity (H/V)	Azimuth (deg)	Limit (dB $\mu$ V/m)	Margin (dB)
54.239	39.28	317	V	200	40	-0.72
36.67	34.68	98	H	349	40	-5.32
35.024	32.64	106	H	1	40	-7.36
33.58	30.25	161	H	95	40	-9.75
30	27.05	98	H	141	40	-12.95
456.653	15.47	196	H	266	46	-30.53

For §15.225 (b) and §15.225 (c):

No emissions were detected that were within 20dB of the specification limit.

## § 15.207 – CONDUCTED EMISSIONS TEST

### EUT Setup

The measurement was performed in the shielded room, using the same setup per ANSI C63.4-2003 measurement procedure. The specification used was FCC 15 Class B limits.

The EUT was placed on the test table and connected to the DC power supply, which connected to 120Vac/60Hz power source.

External I/O cables were draped along the edge of the test table and bundle when necessary.

### Test Equipment

Manufacturer	Description	Model	Serial Number	Calibration Date
Rohde & Schwarz	EMI Test Receiver	ESCI 1166.5950 K03	100337	2007-03-08
Solar Electronics Co.	LISN	9252-50-R-24N	0511213	2006-07-07**

\*\* 2 year calibration cycle

\* **Statement of Traceability:** BACL Corp. attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

### Test Procedure

During the conducted emission test, the power cord of the host system was connected to the mains outlet of the LISN-1.

Maximizing procedure was performed on the six (6) highest emissions of each modes tested to ensure EUT is compliant with all installation combination.

All data was recorded in the peak detection mode. Quasi-peak readings were only performed when an emission was found to be marginal (within -4 dB of specification limits). Quasi-peak readings are distinguished with a "QP".

### Summary of Test Results

According to the data in the following tables and plots, the EUT complied with the FCC 15 Conducted margin for Class B devices, and these test results are deemed as satisfactory evidence of compliance with the worst margin reading of:

**-8.5dB at 0.496500 MHz in the Hot conductor**

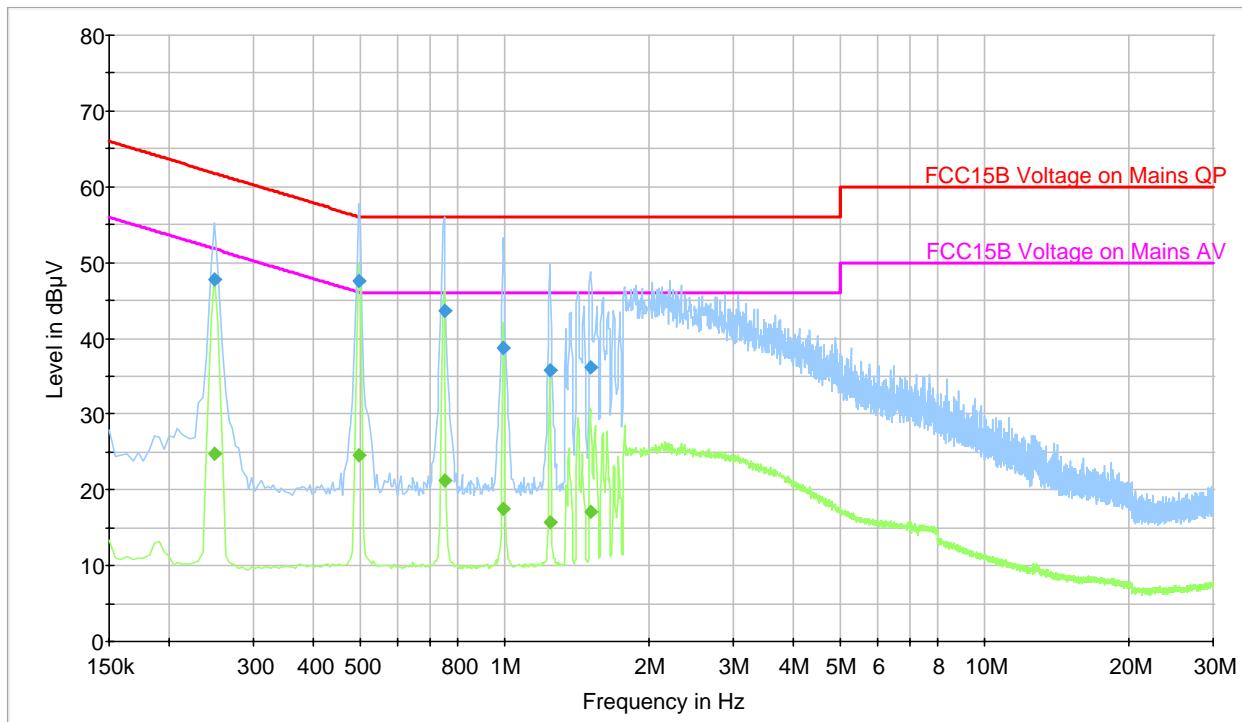
### Environmental Conditions

Temperature:	22.5 °C
Relative Humidity:	48 %
ATM Pressure:	102.1 kPa

*Testing was performed by Xiao Ming Hu on 2008-02-22.*

## Conducted Emissions Test Data

**Hot**

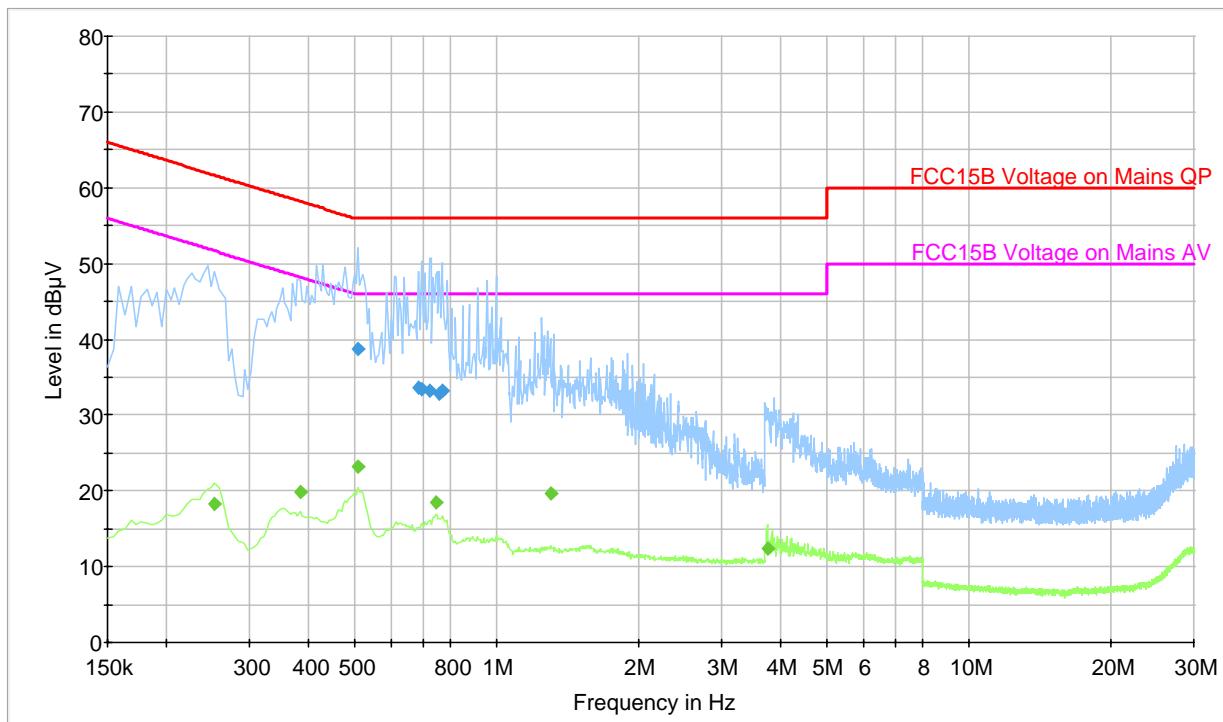


### QP Measurements

Frequency (MHz)	Quasi-Peak (dB $\mu$ V)	Conductor (Hot/Neutral)	Limit (dB $\mu$ V)	Margin (dB)
0.496500	47.6	Hot	56.1	-8.5
0.748500	43.6	Hot	56.0	-12.4
0.249000	47.9	Hot	61.8	-13.9
0.996000	38.7	Hot	56.0	-17.3
1.513500	36.1	Hot	56.0	-19.9
1.243500	35.7	Hot	56.0	-20.3

### Average Measurements

Frequency (MHz)	Average (dB $\mu$ V)	Conductor (Hot/Neutral)	Limit (dB $\mu$ V)	Margin (dB)
0.496500	24.6	Hot	46.1	-21.5
0.748500	21.2	Hot	46.0	-24.8
0.249000	24.8	Hot	51.8	-27.0
0.996000	17.6	Hot	46.0	-28.4
1.513500	17.1	Hot	46.0	-28.9
1.243500	15.8	Hot	46.0	-30.2

**Neutral****QP Measurements**

Frequency (MHz)	Quasi-Peak (dBµV)	Conductor (Hot/Neutral)	Limit (dBµV)	Margin (dB)
0.510000	38.8	Neutral	56.0	-17.2
0.685500	33.5	Neutral	56.0	-22.5
0.694500	33.5	Neutral	56.0	-22.5
0.721500	33.3	Neutral	56.0	-22.7
0.766500	33.3	Neutral	56.0	-22.7
0.757500	32.9	Neutral	56.0	-23.1

**Average Measurements**

Frequency (MHz)	Average (dBµV)	Conductor (Hot/Neutral)	Limit (dBµV)	Margin (dB)
0.510000	23.2	Neutral	46.0	-22.8
1.302000	19.6	Neutral	46.0	-26.4
0.744000	18.5	Neutral	46.0	-27.5
0.384000	19.8	Neutral	48.2	-28.4
0.253500	18.2	Neutral	51.6	-33.4
3.745500	12.3	Neutral	46.0	-33.7

## § 15.225(e) - FREQUENCY STABILITY MEASUREMENT

### Standard Applicable

According to FCC §15.225(e), the frequency tolerance of the carrier signal shall be maintained within  $\pm$  0.01% of the operating frequency over a temperature variation of -20 degrees to + 50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

### Test Procedure

#### Frequency stability versus environmental temperature

The equipment under test was connected to an external AC power supply and the RF output was connected to a frequency counter via feed through attenuators. The EUT was placed inside the temperature chamber.

After the temperature stabilized for approximately 20 minutes, the frequency of the output signal was recorded from the counter.

#### Frequency Stability versus Input Voltage

At room temperature ( $25 \pm 5^\circ\text{C}$ ), an external variable DC power supply was connected to the EUT. The frequency of the transmitter was measured for 115%, 100% and 85% of the nominal operating input voltage.

### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date
Agilent	Analyzer, Spectrum	E4446A	US44300386	2007-04-26
ESPEC	Oven, Temperature	ESL-4CA	18010	2007-12-12
Dickson	Thermometer	THDX	3346008	2007-11-28

\* **Statement of Traceability:** **BACL Corp.** attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

### Environmental Conditions

Temperature:	22 °C
Relative Humidity:	40 %
ATM Pressure:	101.6 kPa

Testing was performed by Xiao Ming Hu on 2008-02-12.

**Test Results**

Condition Voltage (V)	Temperature (°C)	Reference Freq. (Hz)	Measured Freq. (Hz)	Freq. Error (Hz)	Limit (Hz)
3.7	-20	13560000	13560970	970	$\pm$ 1356
3.7	-10	13560000	13560820	820	$\pm$ 1356
3.7	0	13560000	13560830	830	$\pm$ 1356
3.7	20	13560000	13560880	880	$\pm$ 1356
3.7	30	13560000	13560920	920	$\pm$ 1356
3.7	50	13560000	13560750	750	$\pm$ 1356
3.145	20	13560000	13560850	850	$\pm$ 1356
4.255	20	13560000	13560800	800	$\pm$ 1356