


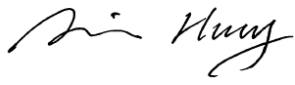
FCC PART 15 CLASS B  
MEASUREMENT AND TEST REPORT

For

**SAGEMCOM SAS**

250 Route de l'Empereur- RUEIL MALMAISON CEDEX 92848 France

**FCC ID: VW3FAST2704R**

<b>Report Type:</b> Original Report	<b>Product Type:</b> Wireless ADSL Router
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<b>Report Number:</b> RSZ120621005-00B	
<b>Report Date:</b> 2012-09-05	
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\* This report contains data that are not covered by the NVLAP accreditation and are marked with an asterisk "★" (Rev.2)

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## GENERAL INFORMATION

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

The SAGEMCOM SAS's product, model number: *F@ST 2704R (FCC ID: VW3FAST2704R)* or the "EUT" as referred to in this report is a *Wireless ADSL Router*, which measures approximately: 13.8 cm (L) x 4.2 cm (W) x 12.0 cm (H), rated input voltage: DC 12V adapter. The highest operating frequency is 320 MHz.

Adapter Information: Switching power supply  
Model: S012NU1200100;  
Input: 100-240V~50/60Hz 500mA;  
Output: 12.0V 1000mA.

*\* All measurement and test data in this report was gathered from production sample serial number: 1206076 (Assigned by BACL, Shenzhen). The EUT was received on 2012-06-21.*

### Objective

This report is prepared on behalf of SAGEMCOM SAS 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 submissions with FCC ID: VW3FAST2704R.

### 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 manufacture.

### EUT Exercise Software

Open page (<http://192.168.1.1>) and disable wireless function

### Equipment Modifications

No modification was made to the unit tested.

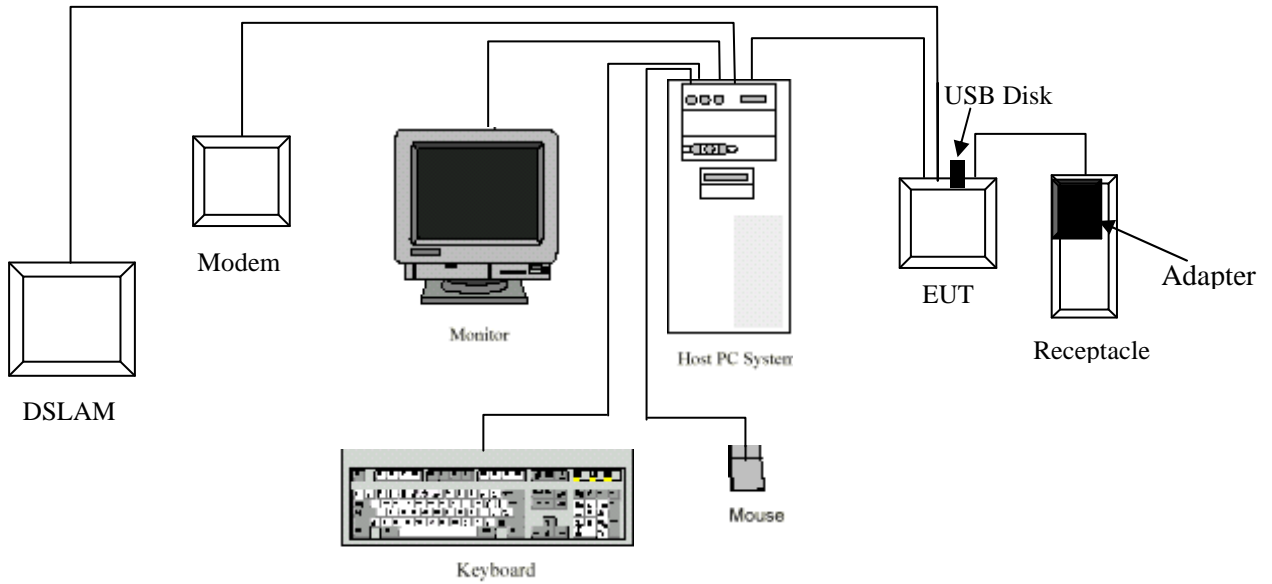
### Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
DELL	PC	VOSTRO 220S	127BP2X
DELL	Keyboard	L100	CNORH656658907BL05DC
DELL	Mouse	MOC5UO	G1900NKD
DELL	LCD Monitor	E178WFPC	CN-OWY564-64180-7C4-2SQH
SAST	Modem	AEM-2100	0293
Kingston	USB Disk	2 GB	N/A
Huawei	DSLAM	MA5105	N/A

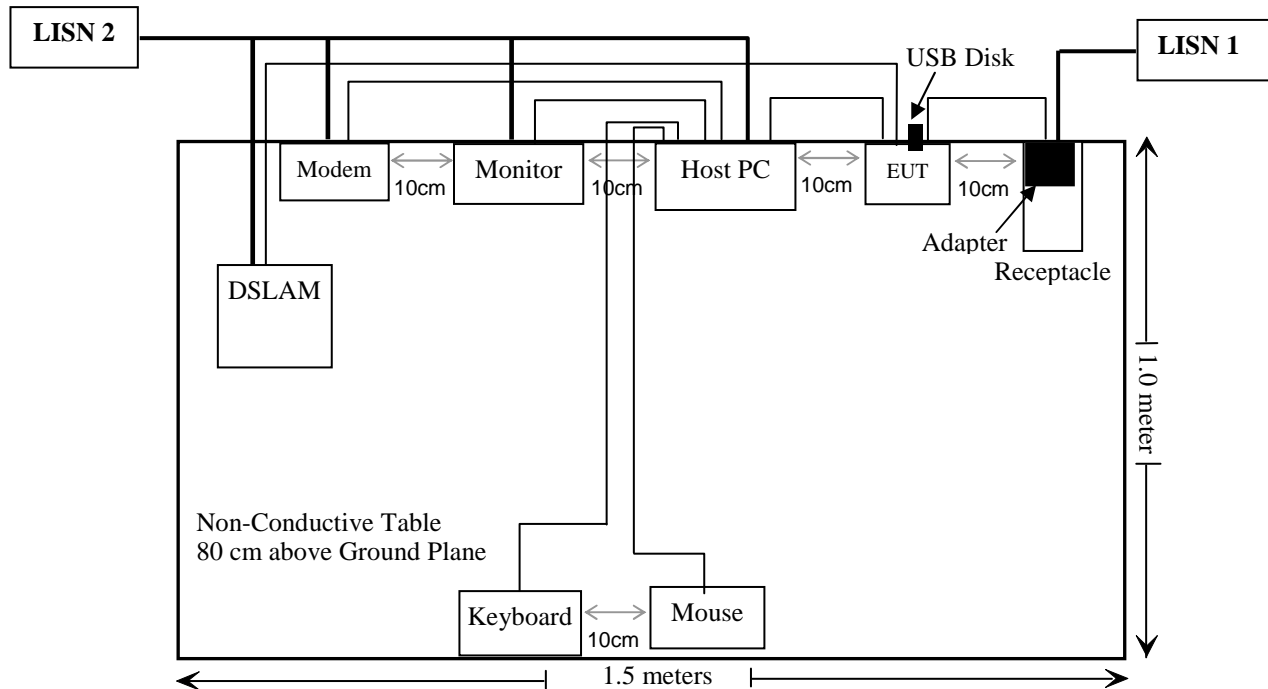
### External I/O Cable

Cable Description	Length (m)	From/Port	To
Shielded Detachable Mouse Cable	1.5	Host PC	Mouse
Shielded Detachable Serial Cable	1.2	Host PC	Modem
Shielded Detachable K/B Cable	1.5	Host PC	Keyboard
Shielded Detachable VGA Cable	1.5	Host PC	Monitor
Unshielded Detachable RJ45 Cable	1.5	EUT	Host PC
Unshielded Detachable RJ11 Cable	2.0	EUT	DSLAM

### Configuration of Test Setup



### Block Diagram of Test Setup



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## SUMMARY OF TEST RESULTS

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

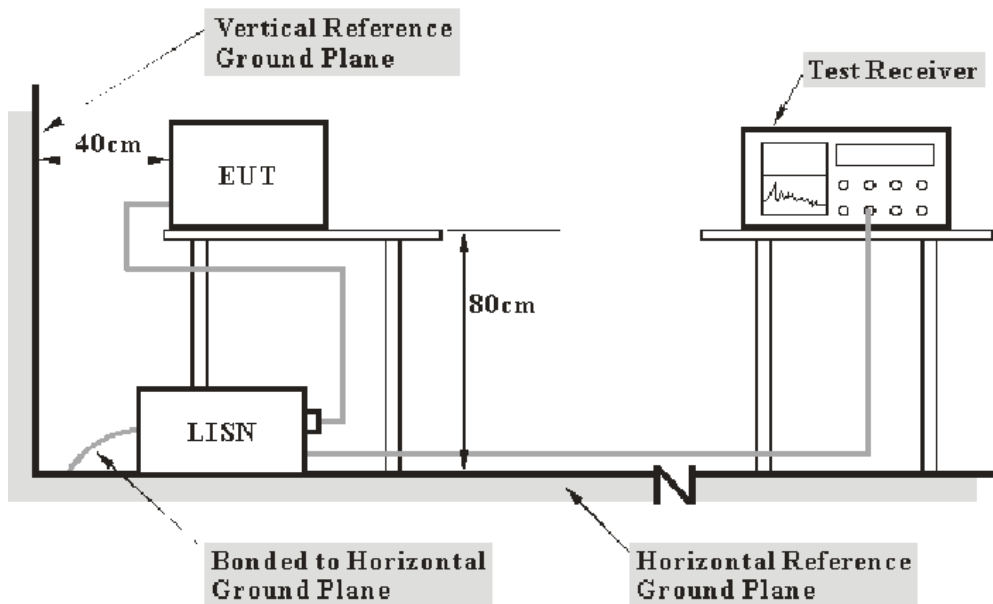
## FCC §15.107 – AC LINE CONDUCTED EMISSIONS

### 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 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 adapter 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:

<i>Frequency Range</i>	<i>IF B/W</i>
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	2011-11-24	2012-11-23
Rohde & Schwarz	L.I.S.N.	ESH2-Z5	892107/021	2011-11-17	2012-11-16
Com-Power	L.I.S.N.	LI-200	12208	N/A	N/A
Com-Power	L.I.S.N.	LI-200	12208	N/A	N/A
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.

## Test Procedure

During the conducted emission test, the adapter was connected to the outlet of the first LISN, and the other relevant equipments were connected to the outlet of 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 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:

**13.15 dB at 0.375 MHz** in the **Line** conducted mode

## Test Data

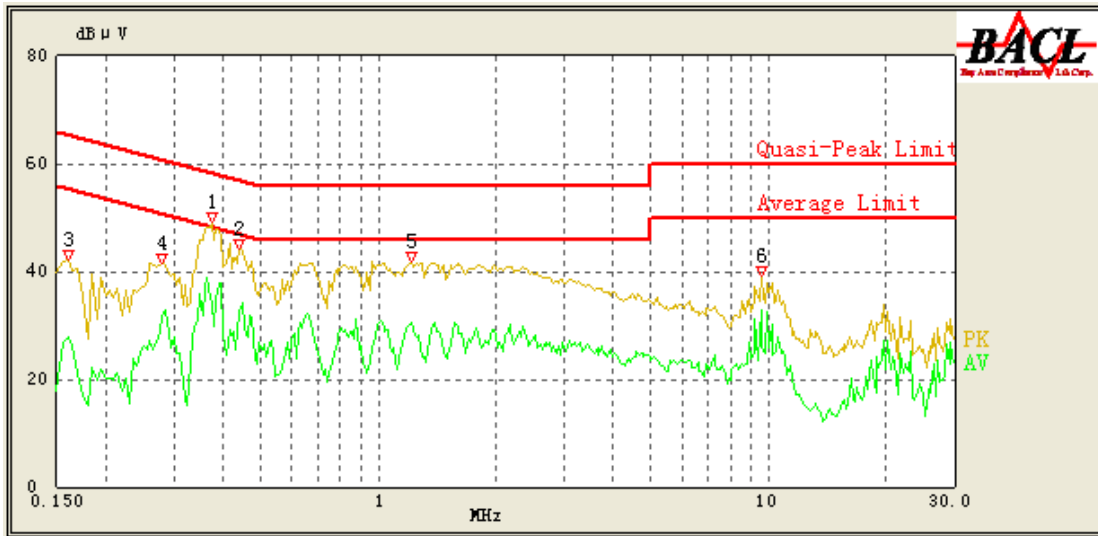
### Environmental Conditions

<b>Temperature:</b>	25 °C
<b>Relative Humidity:</b>	48 %
<b>ATM Pressure:</b>	100.0 kPa

*The testing was performed by Sula Huang on 2012-06-29.*

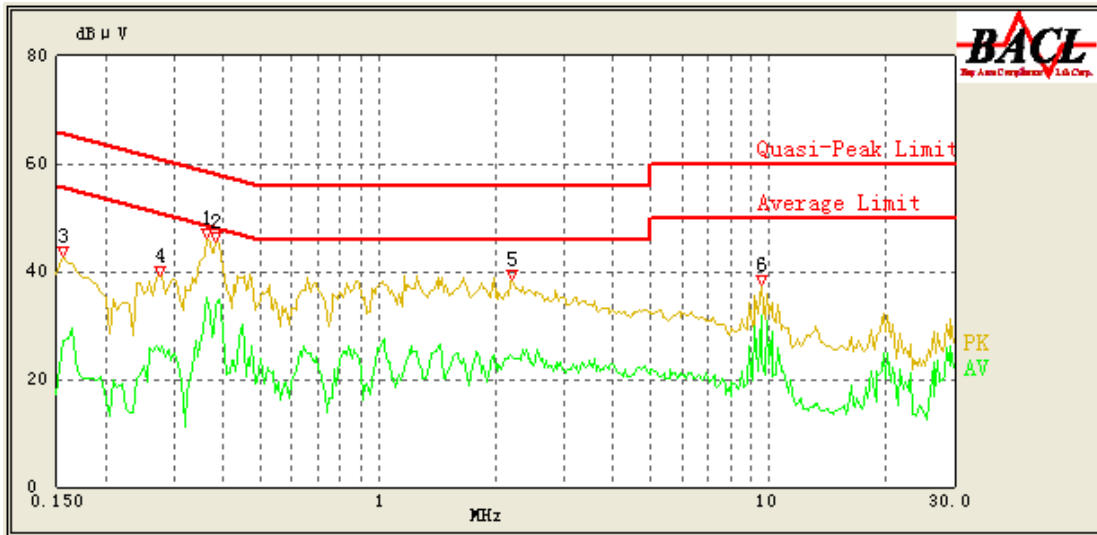
Test Mode: Operating (ADSL Access & LAN Access)

AC 120V/60 Hz, Line:



Frequency (MHz)	Corrected Amplitude (dBμV)	Correction Factor (dB)	Limit (dBμV)	Margin (dB)	Detector (PK/ QP/Ave.)
0.375	46.42	9.66	59.57	13.15	QP
0.440	32.44	9.67	47.71	15.27	Ave.
0.375	34.23	9.66	49.57	15.34	Ave.
0.440	41.51	9.67	57.71	16.20	QP
1.225	29.42	9.88	46.00	16.58	Ave.
9.560	32.94	10.26	50.00	17.06	Ave.
1.220	38.68	9.88	56.00	17.32	QP
0.280	31.35	9.66	52.29	20.94	Ave.
0.280	39.63	9.66	62.29	22.66	QP
9.570	35.30	10.27	60.00	24.70	QP
0.160	39.26	9.67	65.71	26.45	QP
0.160	27.91	9.67	55.71	27.80	Ave.

AC 120V/60 Hz, Neutral



Frequency (MHz)	Corrected Amplitude (dBµV)	Correction Factor (dB)	Limit (dBµV)	Margin (dB)	Detector (PK/ QP/Ave.)
0.365	35.18	9.66	49.86	14.68	Ave.
0.385	33.82	9.66	49.29	15.47	Ave.
0.365	42.69	9.66	59.86	17.17	QP
0.385	42.10	9.66	59.29	17.19	QP
9.565	31.71	10.26	50.00	18.29	Ave.
2.210	35.98	9.91	56.00	20.02	QP
2.215	23.96	9.91	46.00	22.04	Ave.
9.570	36.02	10.26	60.00	23.98	QP
0.275	36.21	9.65	62.43	26.22	QP
0.155	39.21	9.64	65.86	26.65	QP
0.275	25.02	9.65	52.43	27.41	Ave.
0.155	27.27	9.64	55.86	28.59	Ave.

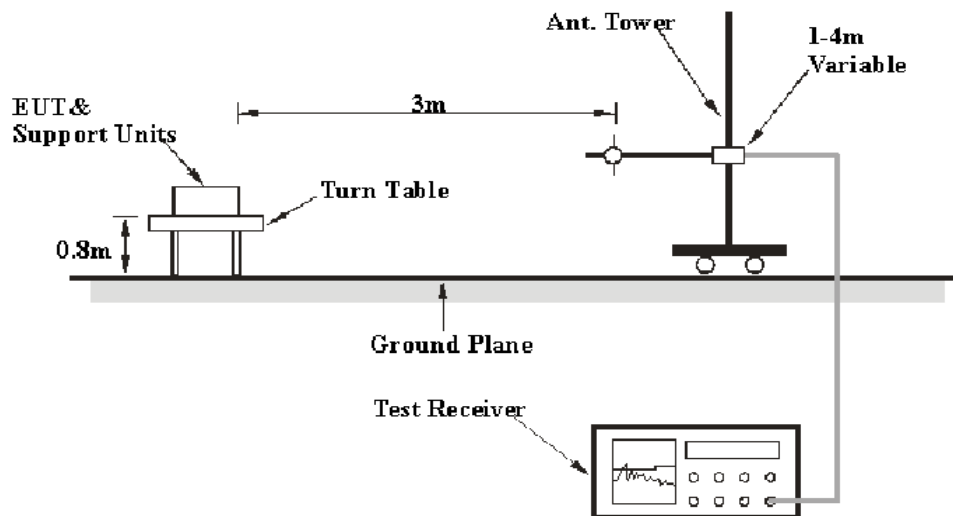
## FCC §15.109 - RADIATED EMISSIONS

### 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 adapter was connected to a 120 VAC/60 Hz power source.

## EMI Test Receiver Setup

The system was investigated from 30 MHz to 2000 MHz.

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

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

## Test Procedure

For the radiated emissions test, the adapter and other 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.

The data was recorded in Quasi-peak detection mode for frequency from 30 MHz to 1 GHz, peak and average detection mode for frequency from 1 GHz to 2 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 EUT complied with the FCC §15.109 Class B, with the worst margin reading of:

**4.00 dB at 320.00 MHz in the Horizontal polarization**

## Test Data

### Environmental Conditions

<b>Temperature:</b>	26 °C
<b>Relative Humidity:</b>	48 %
<b>ATM Pressure:</b>	100.0 kPa

*The testing was performed by Sula Huang on 2012-09-05.*

*Test Mode: Operating (ADSL Access & LAN Access)*

### 30 MHz-2 GHz:

Frequency (MHz)	Meter Reading (dB $\mu$ V/m)	Detector (PK/QP/Ave.)	Direction (Degree)	Height (Meter)	Polar (H/V)	Antenna Factor (dB/m)	Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
320.00	53.38	QP	323	1.0	H	12.30	1.52	25.20	42.00	46.00	4.00*
50.47	54.36	QP	7	1.1	V	7.10	0.36	25.92	35.90	40.00	4.10
55.89	54.74	QP	78	1.0	V	6.10	0.38	25.82	35.40	40.00	4.60
39.47	46.87	QP	184	1.0	V	12.90	0.32	25.89	34.20	40.00	5.80
60.81	50.88	QP	60	1.1	V	6.10	0.38	25.76	31.60	40.00	8.40
789.93	38.72	QP	164	1.0	H	19.40	3.78	26.10	35.80	46.00	10.20
1601.2	49.48	PK	98	1.3	V	25.90	2.37	26.50	51.25	74.00	22.75
1601.2	49.03	PK	174	1.2	H	25.90	2.37	26.50	50.80	74.00	23.20
1498.99	46.13	PK	78	1.2	H	25.40	2.25	26.50	47.28	74.00	26.72
1498.99	44.98	PK	113	1.3	V	25.40	2.25	26.50	46.13	74.00	27.87
1601.2	23.69	Ave.	98	1.3	V	25.90	2.37	26.50	25.46	54.00	28.54
1601.2	22.41	Ave.	174	1.2	H	25.90	2.37	26.50	24.18	54.00	29.82
1498.99	22.32	Ave.	78	1.2	H	25.40	2.25	26.50	23.47	54.00	30.53
1498.99	21.73	Ave.	113	1.3	V	25.40	2.25	26.50	22.88	54.00	31.12

\*Within measurement uncertainty.

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