



NVLAP LAB CODE 200707-0



# FCC PART 15.249 EMI MEASUREMENT AND TEST REPORT

For

**Shenzhen Gospell Smarthome Electronic Co., Ltd**

West, 5F/Block2, Vision (SZ) Park, South HI-Tech Park,  
Nanshan, Shenzhen, P.R. of China.

**FCC ID: TW5GA8123**

|   |  |  |
|---|--|--|
| <b>This Report Concerns:</b><br><input checked="" type="checkbox"/> Original Report |  | <b>Equipment Type:</b><br>900MHz Outdoor Day/Night Wireless Camera |
| <b>Test Engineer:</b>   | Andy Yan <i>Andy Yan</i>   |  |
| <b>Report No.:</b>  | RSZ07081401  |  |
| <b>Test Date:</b>   | 2007-08-24 to 2007-09-18   |  |
| <b>Report Date:</b>   | 2007-09-24   |  |
| <b>Reviewed By:</b>   | EMC Manager: Boni Baniqued <i>Boni Baniqued</i>  |  |
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## GENERAL INFORMATION

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

The *Shenzhen Gospell Smarthome Electronic Co., Ltd*'s product, model number: *GA8123* or the "EUT" as referred to in this report is a *900MHz Outdoor Day/Night Wireless Camera*, which measures approximately 9.0cmL x 6.1cmW x 14.2cmH, rated input voltage: DC 12V adapter.

Adapter Manufacturer: Gospell, Model: GP006CU  
Input: 100-240V~50/60Hz 0.3A, Output: 12V—350mA 4.2VA Max LPS

*\* The test data gathered are from production sample, serial number: 0708020 provided by the manufacturer, we receive the EUT on 2007-08-14.*

### Objective

This Type approval report is prepared on behalf of *Shenzhen Gospell Smarthome Electronic Co., Ltd* in accordance with Part 2, Subpart J, and Part 15, Subparts A, B and C of the Federal Communication Commissions rules.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.207, 15.209 and 15.249 rules.

### 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 measurement was performed at Bay Area Compliance Laboratories Corp. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

### Test Facility

The Test site used by Bay Area Compliance Laboratory Corp. (Shenzhen) to collect test data is located in 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 Laboratory 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 November 04, 2004. 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 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 Laboratory Corp. (Shenzhen) is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200707-0).



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The current scope of accreditations can be found at  
<http://ts.nist.gov/ts/htdocs/210/214/scopes/2007070.htm>.

## SYSTEM TEST CONFIGURATION

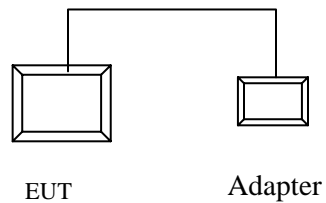
### Justification

The system was configured for testing in a typical fashion (as normally used by a typical user).

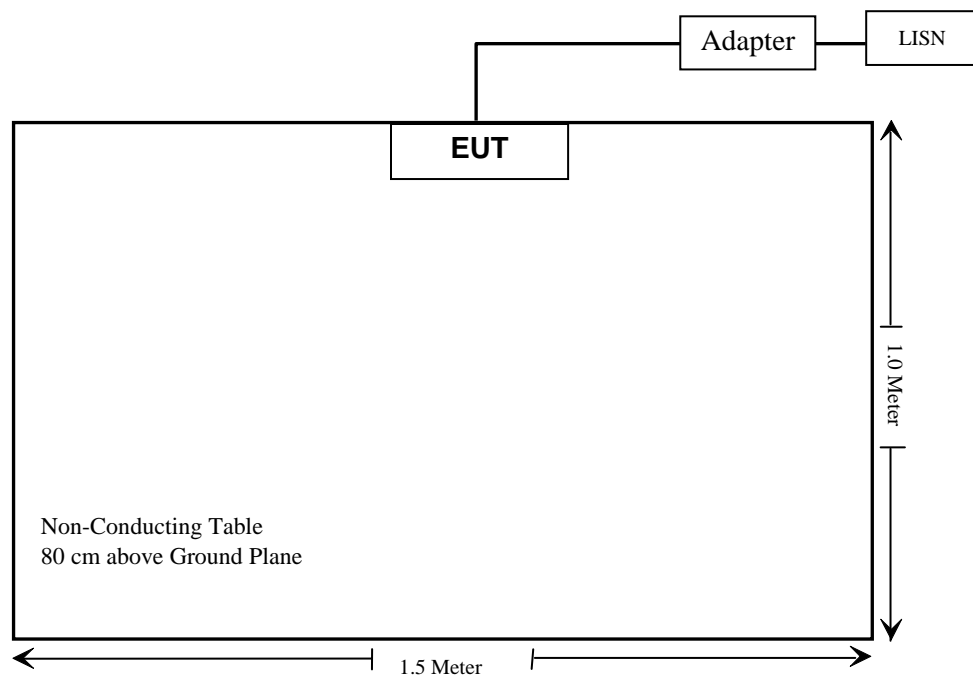
### Equipment Modifications

Bay Area Compliance Laboratories Corp. has not done any modification on the EUT.

### Configuration of Test Setup



### Block Diagram of Test Setup



**SUMMARY OF TEST RESULTS**

| FCC RULES  | DESCRIPTION OF TEST   | RESULT    |
|--|-----------------------|-----------|
| §15.203  | Antenna Requirement   | Compliant |
| §15.207(a)                                       | Conduction Emissions  | Compliant |
| §15.205(a), §15.209(a), 15.249(a),<br>§15.249(c) | Radiated Emissions    | Compliant |
| §15.249(d)                                       | Out of Band Emissions | Compliant |

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## **§15.203 - ANTENNA REQUIREMENT**

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### **Applicable Standard**

For intentional device, 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.

### **Antenna Connector Construction**

The EUT antenna is a permanently attached antenna, which in accordance to section 15.203, is considered sufficient to comply with the provisions of this section.

**Result:** Compliant.

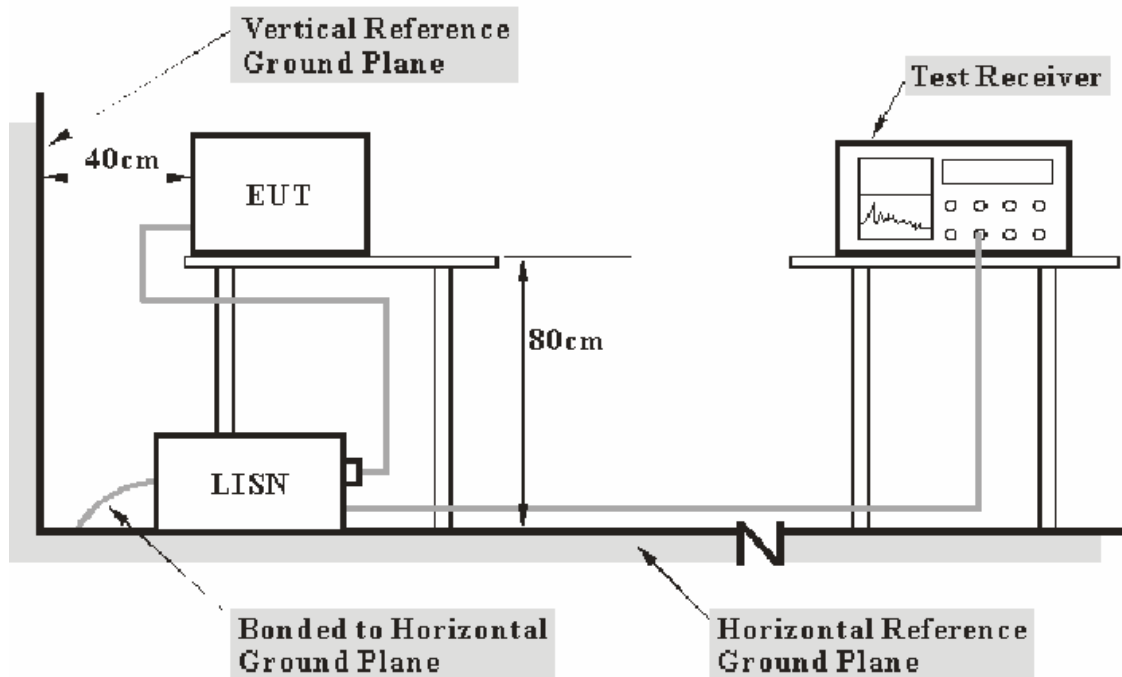
## §15.207 - CONDUCTED EMISSIONS

### 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 NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement at Bay Area Compliance Laboratories Corp. is  $\pm 2.4$  dB.

### 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 C63.4-2003 measurement procedure. The specification used was with the FCC Part 15 .207 limits.

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



## EMI Test Receiver Setup

The 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><b>Frequency Range</b></i> | <i><b>IFBW</b></i> |
|-------------------------------|--------------------|
| 150 kHz – 30 MHz              | 9 kHz              |

## Test Equipment List and Details

| <b>Manufacturer</b> | <b>Description</b> | <b>Model</b> | <b>Serial Number</b> | <b>Calibration Date</b> | <b>Calibration Due Date</b> |
|---------------------|--------------------|--------------|----------------------|-------------------------|-----------------------------|
| Com-Power           | L.I.S.N.           | LI-200       | 12005                | N/A                     | N/A                         |
| Com-Power           | L.I.S.N.           | LI-200       | 12208                | N/A                     | N/A                         |
| Rohde & Schwarz     | EMI Test Receiver  | ESCS30       | DE25330              | 2007-03-26              | 2008-03-26                  |
| Rohde & Schwarz     | L.I.S.N.           | ESH2-Z5      | 892107/021           | 2007-03-26              | 2008-03-26                  |

\* Com-Power's LISN were used as the supporting equipment.

\* **Statement of Traceability:** Bay Area Compliance Laboratories 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 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 15.207, with the worst margin reading of:

**6.30 dB at 28.4800 MHz in the Neutral conductor mode.**

**Test Data****Environmental Conditions**

|                    |          |
|--------------------|----------|
| Temperature:       | 22 ° C   |
| Relative Humidity: | 55%      |
| ATM Pressure:      | 100.0kPa |

The testing was performed by Andy Yan on 2007-08-24.

Test Mode: Transmitting

| Line Conducted Emissions |                  |                  |                      | FCC PART 15 .207 |             |
|--------------------------|------------------|------------------|----------------------|------------------|-------------|
| Frequency (MHz)          | Amplitude (dBμV) | Detector (QP/AV) | Phase (Live/Neutral) | Limit (dBμV)     | Margin (dB) |
| 28.4800                  | 53.70            | QP               | Neutral              | 60.00            | 6.30        |
| 0.4150                   | 44.30            | QP               | Neutral              | 57.55            | 13.25       |
| 0.4100                   | 43.80            | QP               | Live                 | 57.65            | 13.85       |
| 28.4400                  | 45.00            | QP               | Live                 | 60.00            | 15.00       |
| 4.5550                   | 39.50            | QP               | Live                 | 56.00            | 16.50       |
| 2.6900                   | 38.60            | QP               | Live                 | 56.00            | 17.40       |
| 28.6350                  | 32.50            | AV               | Neutral              | 50.00            | 17.50       |
| 0.6950                   | 38.20            | QP               | Neutral              | 56.00            | 17.80       |
| 4.6450                   | 37.70            | QP               | Neutral              | 56.00            | 18.30       |
| 0.8550                   | 37.70            | QP               | Neutral              | 56.00            | 18.30       |
| 0.7600                   | 37.50            | QP               | Live                 | 56.00            | 18.50       |
| 0.4150                   | 25.90            | AV               | Neutral              | 47.55            | 21.65       |
| 0.2100                   | 38.70            | QP               | Neutral              | 63.21            | 24.51       |
| 0.8600                   | 21.30            | AV               | Neutral              | 46.00            | 24.70       |
| 0.2200                   | 37.70            | QP               | Live                 | 62.82            | 25.12       |
| 0.6950                   | 20.70            | AV               | Neutral              | 46.00            | 25.30       |
| 4.6850                   | 20.10            | AV               | Neutral              | 46.00            | 25.90       |
| 0.4100                   | 20.10            | AV               | Live                 | 47.65            | 27.55       |
| 0.2100                   | 25.30            | AV               | Neutral              | 53.21            | 27.91       |
| 4.5850                   | 15.60            | AV               | Live                 | 46.00            | 30.40       |
| 0.7750                   | 15.00            | AV               | Live                 | 46.00            | 31.00       |
| 2.6900                   | 15.00            | AV               | Live                 | 46.00            | 31.00       |
| 0.2200                   | 18.40            | AV               | Live                 | 52.82            | 34.42       |
| 28.4400                  | 15.00            | AV               | Live                 | 50.00            | 35.00       |

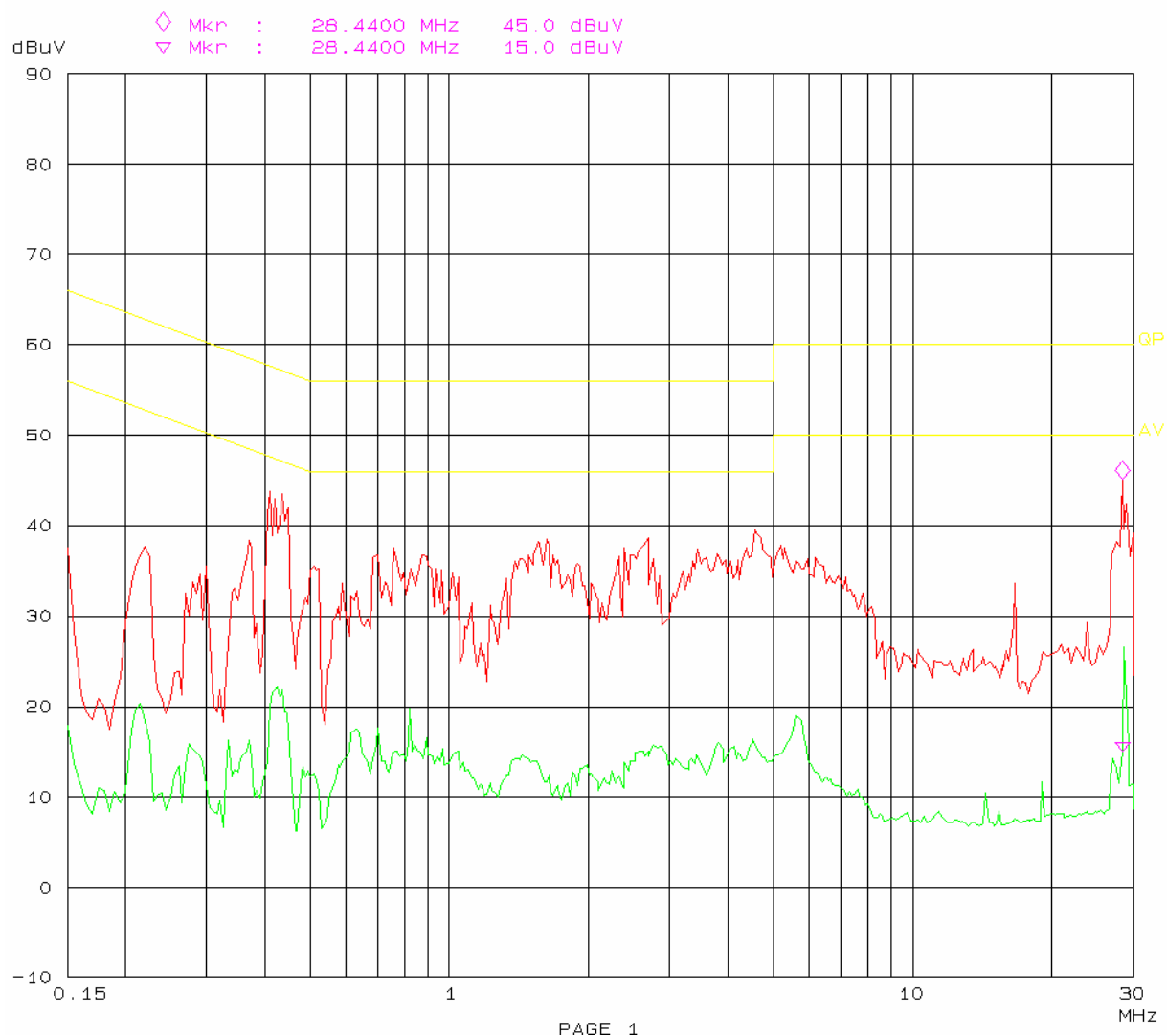
**Plot(s) of Test Data**

Plot(s) of Test Data is presented hereinafter as reference.

Conducted Emission Test  
FCC Part15 B

24. Aug 07 09:00

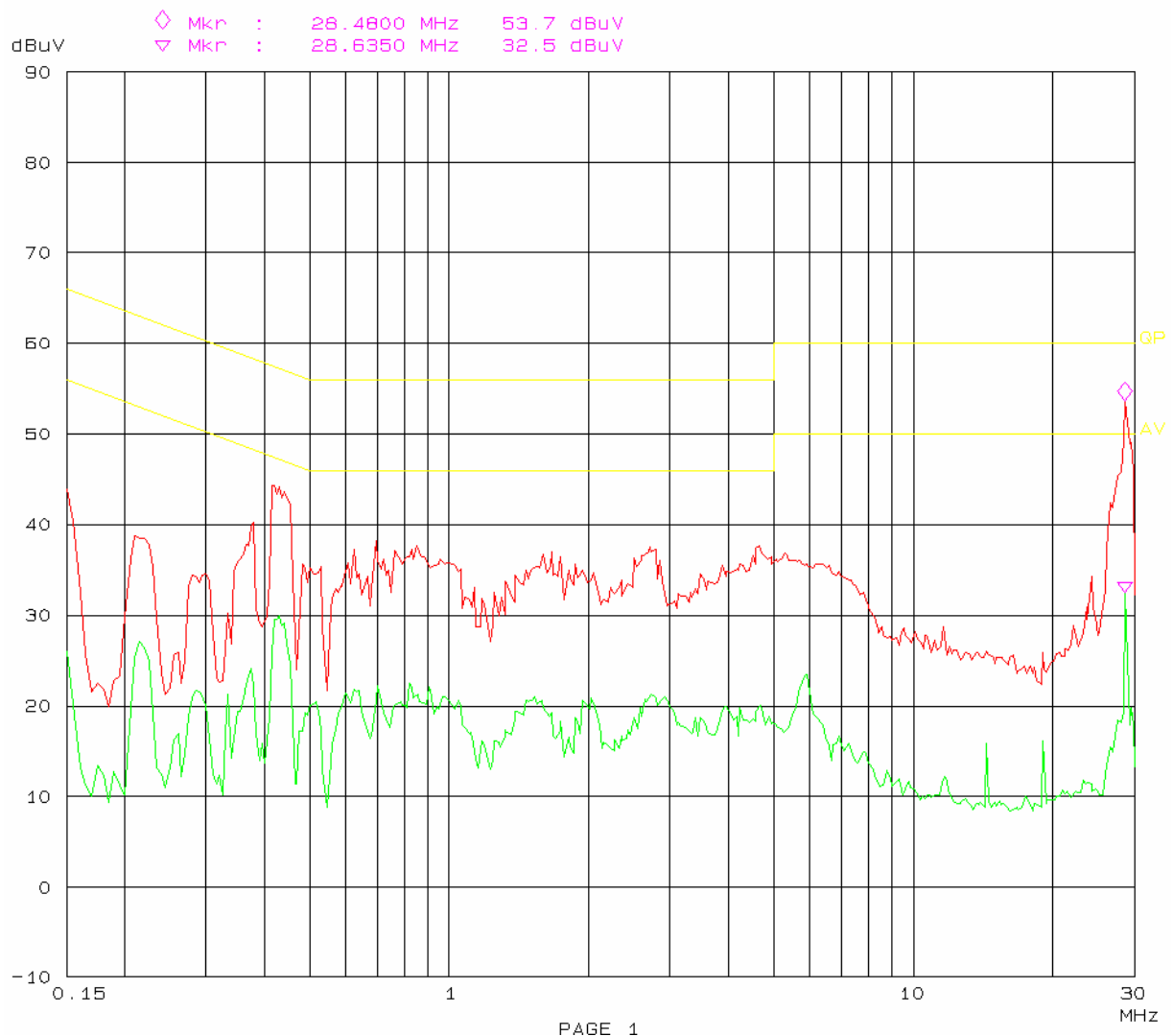
EUT: 900MHz Outdoor Day/Night Wireless Camera  
Manuf: Gospell M/N: GA8123  
Op Cond: Transmitting  
Operator: Andy  
Test Spec: AC 120V/60Hz L  
Comment: Temp: 25 Humi: 56%



Conducted Emission Test  
FCC Part15 B

24. Aug 07 08:15

EUT: 900MHz Outdoor Day/Night Wireless Camera  
Manuf: Gospell M/N: GA8123  
Op Cond: Transmitting  
Operator: Andy  
Test Spec: AC 120V/60Hz N  
Comment: Temp: 25 Humi: 56%



## §15.205(a) §15.209(a) §15.249(a) §15.249(d) - RADIATED EMISSIONS

### Applicable Standard

As per §15.249 (a), except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

| Fundamental frequency | Field strength of fundamental (millivolts/meter) | Field strength of harmonics (microvolts/meter) |
|-----------------------|--|--|
| 902–928 MHz           | 50   | 500  |
| 2400–2483.5 MHz       | 50   | 500  |
| 5725–5875 MHz         | 50   | 500  |
| 24.0–24.25 GHz        | 250  | 2500   |

As per §15.249 (c), Field strength limits are specified at a distance of 3 meters.

(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

### 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 best estimate of the uncertainty of a radiation emissions measurement at Bay Area Compliance Laboratories Corp. is  $\pm 4.0$  dB.

### Test Equipment Setup

The spectrum analyzer or receiver is set as:

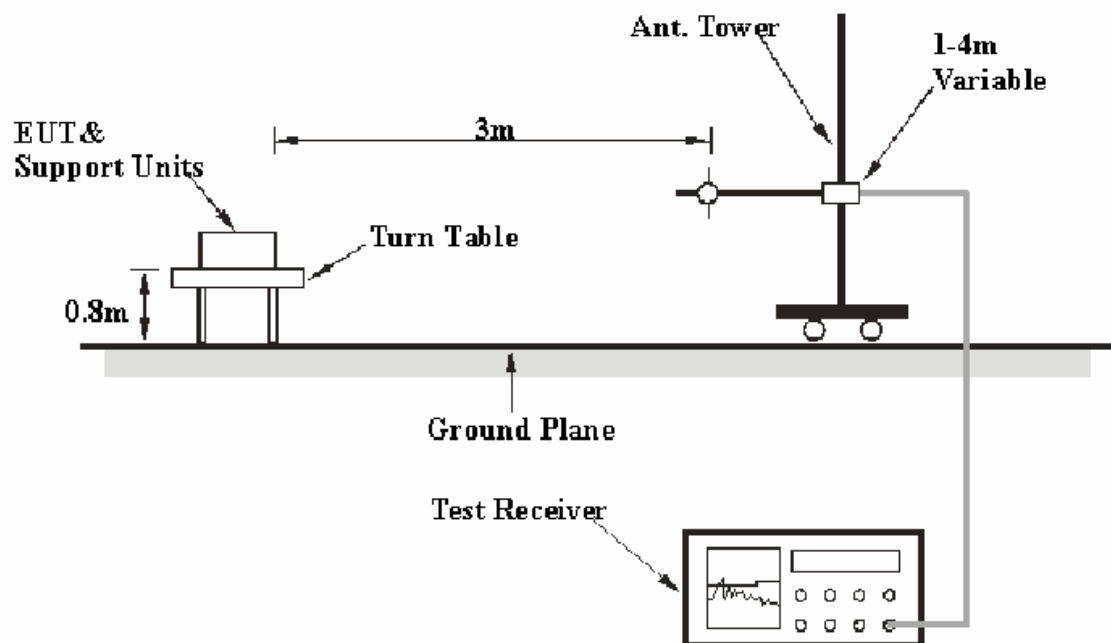
Below 1000MHz:

RBW = 100 kHz / VBW = 300 kHz / Sweep = Auto

Above 1000MHz:

- (1) Peak: RBW = 1MHz / VBW = 1MHz / Sweep = Auto
- (2) Average: RBW = 1MHz / VBW = 10Hz / Sweep = Auto

## EUT Setup



The radiated emission and out of band emission tests were performed in the 3 meters chamber B, using the setup accordance with the ANSI C63.4-2003. The specification used was the FCC 15.209 and FCC 15.249 limits.

## Test Equipment List and Details

| Manufacturer    | Description       | Model   | Serial Number | Calibration Date | Calibration Due Date |
|-----------------|-------------------|---------|---------------|------------------|----------------------|
| Rohde & Schwarz | EMI Test Receiver | ESCI    | 100224        | 2006-09-29       | 2007-09-29           |
| HP              | Amplifier         | 8447E   | 1937A01046    | 2006-11-15       | 2007-11-15           |
| Sunol Sciences  | Bilog Antenna     | JB1     | A040904-2     | 2007-08-14       | 2008-08-14           |
| HP              | Amplifier         | 8449B   | 3008A00277    | 2006-09-29       | 2007-09-29           |
| Sunol Sciences  | Horn Antenna      | DRH-118 | A052604       | 2007-07-20       | 2008-07-20           |
| Agilent         | Spectrum Analyzer | 8564E   | 3943A01781    | 2006-11-22       | 2007-11-22           |

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

## Test Procedure

For the radiated emissions test, the EUT, and all support equipment power cords 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.

The EUT is set 3 meter away from the testing antenna, which is varied from 1-4 mete, and the EUT is placed on a turntable, which is 0.8 meter above ground plane, the table shall be rotated for 360 degrees to find out the highest emission. The receiving antenna should be changed the polarization both of horizontal and vertical.

## 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:

$$\text{Corr. Amp.} = \text{Meter Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

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

$$\text{Margin} = \text{Limit} - \text{Corr. Amp.}$$

## Test Results Summary

According to the data in the following table, the EUT complied with the FCC Part 15.209 & 15.249, with the worst margin reading of:

30-1000MHz:

**4.9 dB at 157.511675 MHz** in the **Horizontal** polarization.

Above 1GHz:

**4.43 dB at 2724 MHz** in the **Vertical** polarization, for Channel (908MHz).

**3.18 dB at 2766 MHz** in the **Vertical** polarization, for Channel (922MHz).

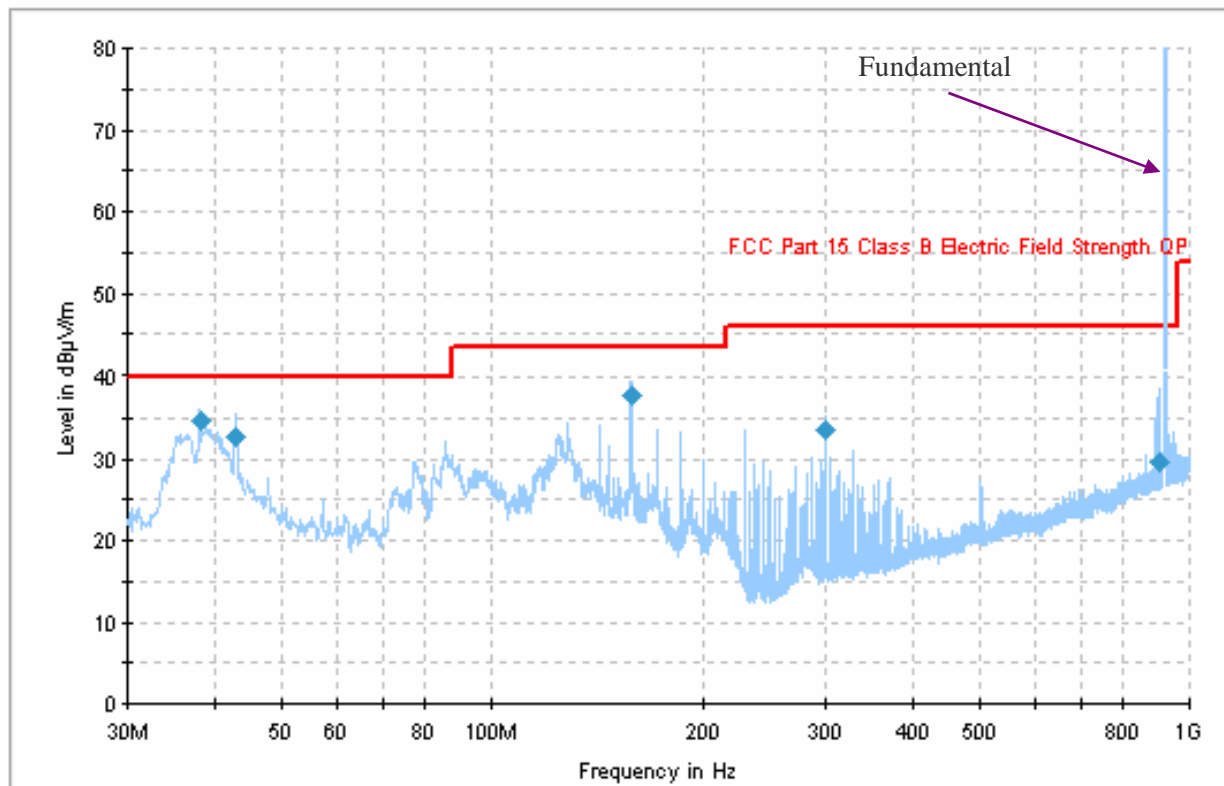
## Test Data

### Environmental Conditions

|                    |          |
|--------------------|----------|
| Temperature:       | 25 ° C   |
| Relative Humidity: | 53%      |
| ATM Pressure:      | 100.9kPa |

*The testing was performed by Andy Yan on 2007-09-18.*

*Test Mode: Transmitting*

**30-1000 MHz**

| Frequency (MHz) | Quasi Peak (dBµV/m) | Antenna Height (cm) | Polarity (H/V) | Turntable Position (deg) | Corr. (dB) | Limit (dBµV/m) | Margin (dB) |
|-----------------|---------------------|---------------------|----------------|--------------------------|------------|----------------|-------------|
| 157.511675      | 38.6                | 227.0               | H              | 242.0                    | -10.8      | 43.5           | 4.9         |
| 38.168525       | 34.8                | 101.0               | V              | 285.0                    | -9.5       | 40.0           | 5.2         |
| 42.946175       | 32.6                | 101.0               | V              | 233.0                    | -12.8      | 40.0           | 7.4         |
| 300.926475      | 34.7                | 101.0               | H              | 292.0                    | 3.3        | 46.0           | 11.3        |
| 916.753025      | 29.9                | 316.0               | H              | 289.0                    | 3.4        | 46.0           | 16.1        |



Above 1GHz:

| Freq.<br>(MHz)        | Meter<br>Reading<br>(dBuV) | Detector<br>PK/ AV | Direction<br>Degree | Ant.<br>Height<br>(m) | Ant.<br>Polar<br>H / V | Antenna<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Pre-Amp.<br>Gain<br>(dB) | Corr.<br>Amp.<br>(dBuV/m) | FCC Part 15.209 & 15.249 |                |          |
|-----------------------|----------------------------|--------------------|---------------------|-----------------------|------------------------|-----------------------------|-----------------------|--------------------------|---------------------------|--------------------------|----------------|----------|
|                       |                            |                    |                     |                       |                        |                             |                       |                          |                           | Limit<br>(dBuV/m)        | Margin<br>(dB) | Comment  |
| Low Channel (908MHz)  |                            |                    |                     |                       |                        |                             |                       |                          |                           |                          |                |          |
| 2724                  | 47.77                      | AV                 | 45                  | 1.0                   | V                      | 30.8                        | 4.40                  | 33.4                     | 49.57                     | 54                       | 4.43           | Harmonic |
| 1816                  | 52.72                      | AV                 | 268                 | 1.6                   | V                      | 28.8                        | 2.82                  | 35.0                     | 49.34                     | 54                       | 4.66           | Harmonic |
| 2724                  | 45.62                      | AV                 | 270                 | 1.6                   | H                      | 31.3                        | 4.40                  | 33.4                     | 47.92                     | 54                       | 6.08           | Harmonic |
| 1816                  | 51.24                      | AV                 | 168                 | 1.6                   | H                      | 28.7                        | 2.82                  | 35.0                     | 47.76                     | 54                       | 6.24           | Harmonic |
| 3632                  | 42.48                      | AV                 | 180                 | 1.6                   | H                      | 32.8                        | 4.04                  | 32.9                     | 46.42                     | 54                       | 7.58           | Harmonic |
| 2724                  | 62.29                      | PK                 | 268                 | 1.6                   | H                      | 31.3                        | 4.40                  | 33.4                     | 64.59                     | 74                       | 9.41           | Harmonic |
| 3632                  | 40.02                      | AV                 | 18                  | 1.6                   | V                      | 32.1                        | 4.04                  | 32.9                     | 43.26                     | 54                       | 10.74          | Harmonic |
| 1816                  | 65.87                      | PK                 | 263                 | 1.8                   | V                      | 28.8                        | 2.82                  | 35.0                     | 62.49                     | 74                       | 11.51          | Harmonic |
| 1816                  | 65.49                      | PK                 | 358                 | 1.3                   | H                      | 28.7                        | 2.82                  | 35.0                     | 62.01                     | 74                       | 11.99          | Harmonic |
| 3632                  | 58.05                      | PK                 | 250                 | 1                     | V                      | 32.1                        | 4.04                  | 32.9                     | 61.29                     | 74                       | 12.71          | Harmonic |
| 2724                  | 59.15                      | PK                 | 49                  | 1.2                   | V                      | 30.8                        | 4.40                  | 33.4                     | 60.95                     | 74                       | 13.05          | Harmonic |
| 908                   | 80.5                       | QP                 | 149                 | 1.8                   | V                      | 22.9                        | 3.45                  | 26.5                     | 80.35                     | 94                       | 13.65          | Fund.    |
| 3632                  | 54.90                      | PK                 | 360                 | 1.6                   | H                      | 32.8                        | 4.04                  | 32.9                     | 58.84                     | 74                       | 15.16          | Harmonic |
| 908                   | 78.7                       | QP                 | 230                 | 1.8                   | H                      | 22.9                        | 3.45                  | 26.5                     | 78.55                     | 94                       | 15.45          | Fund.    |
| High Channel (922MHz) |                            |                    |                     |                       |                        |                             |                       |                          |                           |                          |                |          |
| 2766                  | 48.92                      | AV                 | 268                 | 1.6                   | V                      | 30.9                        | 4.40                  | 33.4                     | 50.82                     | 54                       | 3.18           | Harmonic |
| 2766                  | 47.65                      | AV                 | 270                 | 1.6                   | H                      | 31.4                        | 4.40                  | 33.4                     | 50.05                     | 54                       | 3.95           | Harmonic |
| 1844                  | 51.43                      | AV                 | 49                  | 1.2                   | V                      | 28.9                        | 2.82                  | 35.0                     | 48.15                     | 54                       | 5.85           | Harmonic |
| 1844                  | 49.76                      | AV                 | 268                 | 1.6                   | H                      | 28.8                        | 2.82                  | 35.0                     | 46.38                     | 54                       | 7.62           | Harmonic |
| 2766                  | 61.67                      | PK                 | 180                 | 1.6                   | H                      | 31.4                        | 4.40                  | 33.4                     | 64.07                     | 74                       | 9.93           | Harmonic |
| 922                   | 82.7                       | QP                 | 149                 | 1.8                   | V                      | 22.9                        | 3.87                  | 26.5                     | 82.97                     | 94                       | 11.03          | Fund.    |
| 922                   | 82.0                       | QP                 | 360                 | 1.6                   | H                      | 22.9                        | 3.87                  | 26.5                     | 82.27                     | 94                       | 11.73          | Fund.    |
| 2766                  | 60.31                      | PK                 | 230                 | 1.8                   | V                      | 30.9                        | 4.40                  | 33.4                     | 62.21                     | 74                       | 11.79          | Harmonic |
| 3688                  | 37.94                      | AV                 | 250                 | 1.0                   | H                      | 32.9                        | 4.04                  | 32.9                     | 41.98                     | 54                       | 12.02          | Harmonic |
| 1844                  | 64.62                      | PK                 | 358                 | 1.3                   | V                      | 28.9                        | 2.82                  | 35.0                     | 61.34                     | 74                       | 12.66          | Harmonic |
| 3688                  | 37.77                      | AV                 | 18                  | 1.6                   | V                      | 32.2                        | 4.04                  | 32.9                     | 41.11                     | 54                       | 12.89          | Harmonic |
| 1844                  | 64.30                      | PK                 | 263                 | 1.8                   | H                      | 28.8                        | 2.82                  | 35.0                     | 60.92                     | 74                       | 13.08          | Harmonic |
| 3688                  | 55.50                      | PK                 | 45                  | 1.0                   | H                      | 32.9                        | 4.04                  | 32.9                     | 59.54                     | 74                       | 14.46          | Harmonic |
| 3688                  | 55.68                      | PK                 | 168                 | 1.6                   | V                      | 32.2                        | 4.04                  | 32.9                     | 59.02                     | 74                       | 14.98          | Harmonic |

## §15.249(d) – OUT OF BAND EMISSIONS

### Applicable Standard

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

### Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set the RBW to 100 kHz and VBW of spectrum analyzer to 300 kHz with a convenient frequency span including the specified frequencies of band edges.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

### Test Equipment List and Details

| Manufacturer    | Description       | Model   | Serial Number | Calibration Date | Calibration Due Date |
|-----------------|-------------------|---------|---------------|------------------|----------------------|
| Rohde & Schwarz | EMI Test Receiver | ESCI    | 100224        | 2006-09-29       | 2007-09-29           |
| HP              | Amplifier         | 8449B   | 3008A00277    | 2006-09-29       | 2007-09-29           |
| Sunol Sciences  | Horn Antenna      | DRH-118 | A052604       | 2007-07-20       | 2008-07-20           |

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

### Test Data

#### Environmental Conditions

|                    |          |
|--------------------|----------|
| Temperature:       | 25 ° C   |
| Relative Humidity: | 53%      |
| ATM Pressure:      | 100.9kPa |

*The testing was performed by Andy Yan on 2007-09-18.*

*Test Mode: Transmitting*

**Test Result:** Compliant.

Please refer to the following tabular data.

| Frequency<br>(MHz)    | Receiver<br>Reading<br>(dBμV) | Detector<br>PK//QP | Direction<br>Degree | Ant.<br>Height<br>(m) | Ant.<br>Polar<br>H / V | Antenna<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Pre-Amp.<br>Gain<br>(dB) | Corr.<br>Amp.<br>(dBμV/m) | FCC 15.249&209        |                |
|-----------------------|-------------------------------|--------------------|---------------------|-----------------------|------------------------|-----------------------------|-----------------------|--------------------------|---------------------------|-----------------------|----------------|
|                       |                               |                    |                     |                       |                        |                             |                       |                          |                           | Limit<br>(dBμV/<br>m) | Margin<br>(dB) |
| Low Channel (908MHz)  |                               |                    |                     |                       |                        |                             |                       |                          |                           |                       |                |
| 901.648               | 34.30                         | QP                 | 263                 | 1.4                   | V                      | 20.4                        | 3.45                  | 26.5                     | 31.65                     | 46                    | 14.35          |
| 901.216               | 34.20                         | QP                 | 49                  | 1.2                   | H                      | 20.4                        | 3.45                  | 26.5                     | 31.55                     | 46                    | 14.45          |
| High Channel (922MHz) |                               |                    |                     |                       |                        |                             |                       |                          |                           |                       |                |
| 928.568               | 33.01                         | QP                 | 168                 | 1.6                   | V                      | 20.6                        | 3.87                  | 26.5                     | 30.98                     | 46                    | 15.02          |
| 928.082               | 33.32                         | QP                 | 268                 | 1.6                   | H                      | 20.6                        | 3.87                  | 26.5                     | 31.29                     | 46                    | 14.71          |

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