



FCC PART 15.407

TEST REPORT

For

Gefen, LLC

20600 Nordhoff Street Chatsworth, CA 91311 USA

FCC ID: UYYLRR12042502

| | |
|---|--|
| Report Type: Class II Permissive Change | Product Type: Wireless for HDMI Receiver |
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| Report Number: <u>R1DG120521001-00A2</u> | |
| Report Date: <u>2012-05-24</u> | |
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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. This report **must not** be used by the customer to claim product certification, approval, or endorsement by NVLAP*, or any agency of the Federal Government.

* 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

Product Description for Equipment under Test (EUT)

The *Gefen, LLC*'s product, model number: *GTV-WHD-1080P-SRR, GTV-WHD-1080P-LRR (FCC ID: UYYLRR12042502)* ("EUT") in this report is a transmitter of Wireless for HDMI Receiver, which was measured approximately 14.5 cm (L) x 9.5cm (W) x 2.3cm (H), the operating frequency is 5150~5250, 5725~5825MHz, rated input voltage: DC 5V from adapter.

Adapter information: GOSPELL

Model: GP302U-050-200

Input: 100-240VAC, 50/60Hz, 0.5A

Output: DC 5V 2.0A

Note: The series product, model number: GTV-WHD-1080P-SRR is electrically identical with the Model Number: GTV-WHD-1080P-LRR that was certified by BACL. Their only difference is the model name. The rest are the same. We select GTV-WHD-1080P-LRR for full test, the details was explained in the attached declaration letter.

** All measurement and test data in this report was gathered from production sample serial number: 120521001 (Assigned by BACL). The EUT was received on 2012-05-08.*

Objective

This type approval report is prepared on behalf of *Gefen, LLC* in accordance with Part 2-Subpart J, 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 E, section 15.203, 15.205, 15.207, 15.209 and 15.407 rules.

This is the C2PC application of the device. The difference between the original device and the current one is as follows:

| Part | Original | New |
|---------------------|-----------------|------------------------------------|
| Operating Frequency | 5150MHz~5250MHz | 5150MHz~5250MHz 5725MHz~5825MHz |

For the changes made to the device, all item testing of 5725MHz~5825MHz were performed.

Related Submittal(s)/Grant(s)

Original submission with FCC ID: UYYLRR12042502 which is granted on 2012-05-20

Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2009, 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 emissions measurement was performed and Bay Area Compliance Laboratories Corp. (Shenzhen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Dongguan) to collect test data is located on the No.69 Pulongcun, Puxinhu Industrial Zone, Tangxia, Dongguan, Guangdong, China

Test site at Bay Area Compliance Laboratories Corp. (Dongguan) 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 February 02, 2012. 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.: 273710. 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 EUT was configured for testing in an engineering mode which was provided by the manufacturer.

The operating frequency band is 5725-5825 MHz, 2 channels are provided:

| Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---------|-----------------|---------|-----------------|
| 1 | 5755 | 2 | 5795 |

EUT was tested with Channel 1, 2.

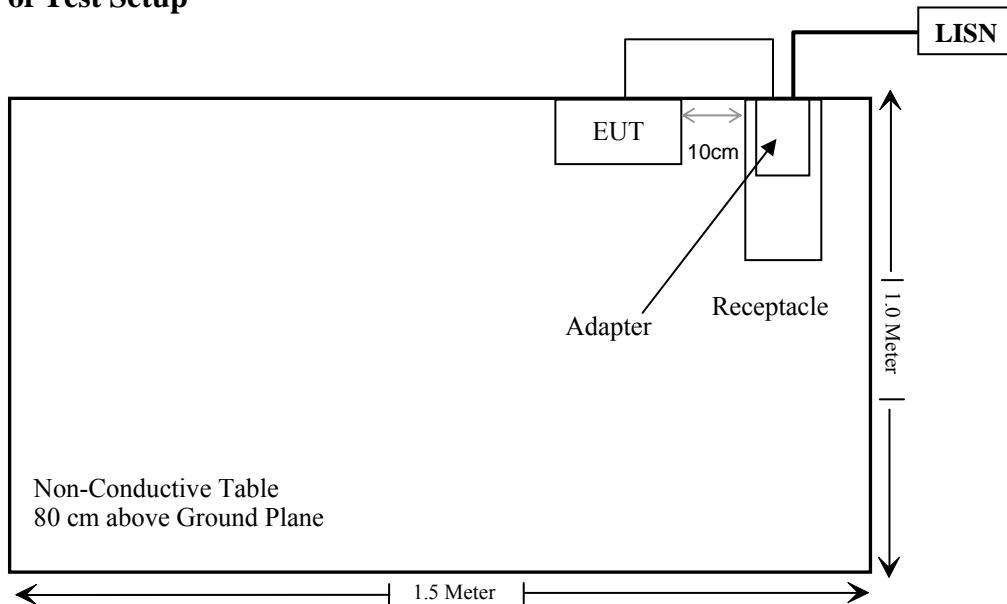
EUT Exercise Software

The test was performed under “AppCom_3.0.3.16”.

Equipment Modifications

No modification was made to the unit tested.

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

| FCC Rules | Description of Test | Result |
|--|--|------------|
| §15.407 (f), §2.1091, §1.1307(b)(1) | RF Exposure Evaluation | Compliance |
| §15.203 | Antenna Requirement | Compliance |
| §15.407(b)(6)& §15.207(a) | Conducted Emissions | Compliance |
| §15.205& §15.209 &§15.407(b) (1),(6),(7) | Undesirable Emission& Restricted Bands | Compliance |
| §15.407(a) (1) | 26 dB Bandwidth | Compliance |
| §15.407(a)(1), | Conducted Transmitter Output Power | Compliance |
| §15.407 (a)(1),(5) | Power Spectral Density | Compliance |
| §15.407(a)(6) | Peak Excursion Ratio | Compliance |
| §15.407(g) | Frequency Stability | Compliance |

FCC §15.407 (f), §2.1091, §1.1307(b) (1) – RF EXPOSURE EVALUATION

Applicable Standard

According to subpart 15.247(i) and subpart §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

Limits for Maximum Permissible Exposure (MPE) (§1.1310, §2.1091)

| (B) Limits for General Population/Uncontrolled Exposure | | | | |
|---|-------------------------------|-------------------------------|-------------------------------------|--------------------------|
| Frequency Range (MHz) | Electric Field Strength (V/m) | Magnetic Field Strength (A/m) | Power Density (mW/cm ²) | Averaging Time (minutes) |
| 0.3–1.34 | 614 | 1.63 | *(100) | 30 |
| 1.34–30 | 824/f | 2.19/f | *(180/f ²) | 30 |
| 30–300 | 27.5 | 0.073 | 0.2 | 30 |
| 300–1500 | / | / | f/1500 | 30 |
| 1500–100,000 | / | / | 1.0 | 30 |

f = frequency in MHz; * = Plane-wave equivalent power density;

According to §1.1310 and §2.1091 RF exposure is calculated.

Calculated Formulary:

Predication of MPE limit at a given distance

$S = PG/4\pi R^2$ = power density (in appropriate units, e.g. mW/cm²);

P = power input to the antenna (in appropriate units, e.g., mW);

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain;

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm);

Calculated Data:

| Frequency (MHz) | Antenna Gain | | Conducted Power | | Evaluation Distance (cm) | Power Density (mW/cm ²) | MPE Limit (mW/cm ²) |
|-----------------|--------------|-----------|-----------------|-------|--------------------------|-------------------------------------|---------------------------------|
| | (dBi) | (numeric) | (dBm) | (mW) | | | |
| 5795 | 2.9 | 1.95 | 15.32 | 34.04 | 20 | 0.0132 | 1.0 |

Result: The device meet FCC MPE at 20cm distance

FCC §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 user of a standard antenna jack or electrical connector is prohibited. The structure and application of the EUT were analyzed to determine compliance with section §15.203 of the rules. §15.203 state that the subject device must meet the following criteria:

- a. Antenna must be permanently attached to the unit.
- b. Antenna must use a unique type of connector to attach to the EUT.

Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.

And according to FCC 47 CFR section 15.407 (a), if the transmitting antennas of directional gain greater than 6dBi are used, the transmit power and power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Antenna Connector Construction

The EUT has five printed antennas on the PCB, only one for transmitting, the rest for receiving, which in accordance to section 15.203, the maximum gain is 2.9 dBi; please refer to the internal photos.

Result: Compliance.

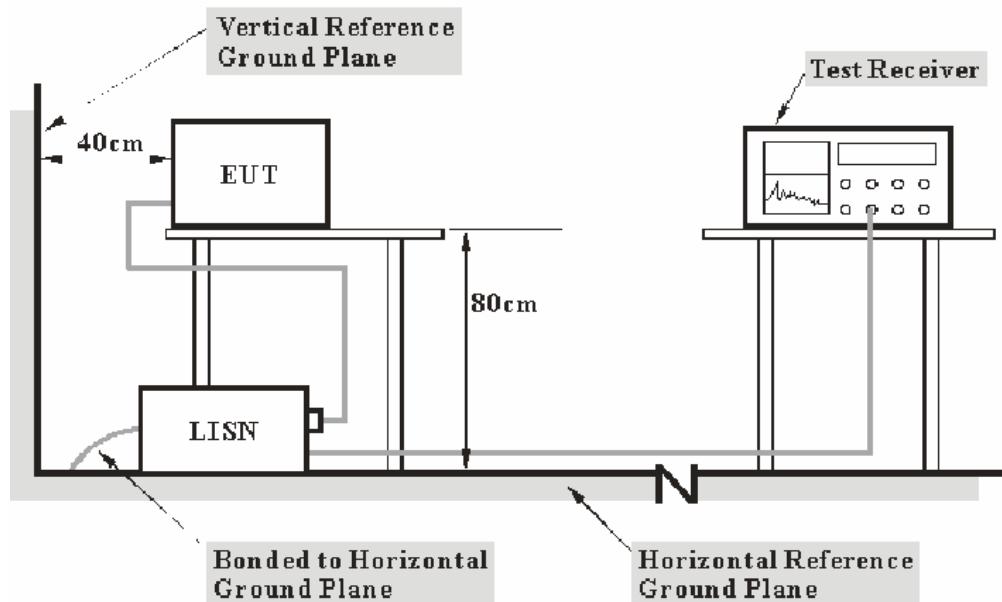
FCC §15.407 (b) (6) §15.207 (a) – CONDUCTED EMISSIONS**Applicable Standard**

FCC §15.207, §15.407(b) (6)

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 Laboratory Corp. (Shenzhen) is ± 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 C63.4-2009 measurement procedure. The specification used was with the FCC Part 15.207 limits.

The spacing between the peripherals was 10 cm.

The adapter was connected to a 120VAC/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:

| <u>Frequency Range</u> | <u>IF B/W</u> |
|-------------------------------|----------------------|
| 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.1 | ESH2-Z5 | 892107/021 | 2011-11-17 | 2012-11-16 |

***Statement of Traceability:** Bay Area Compliance Laboratory Corp. (Shenzhen) 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 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:

14.95 dB at 0.290 MHz in the Neutral conducted mode

Test Data

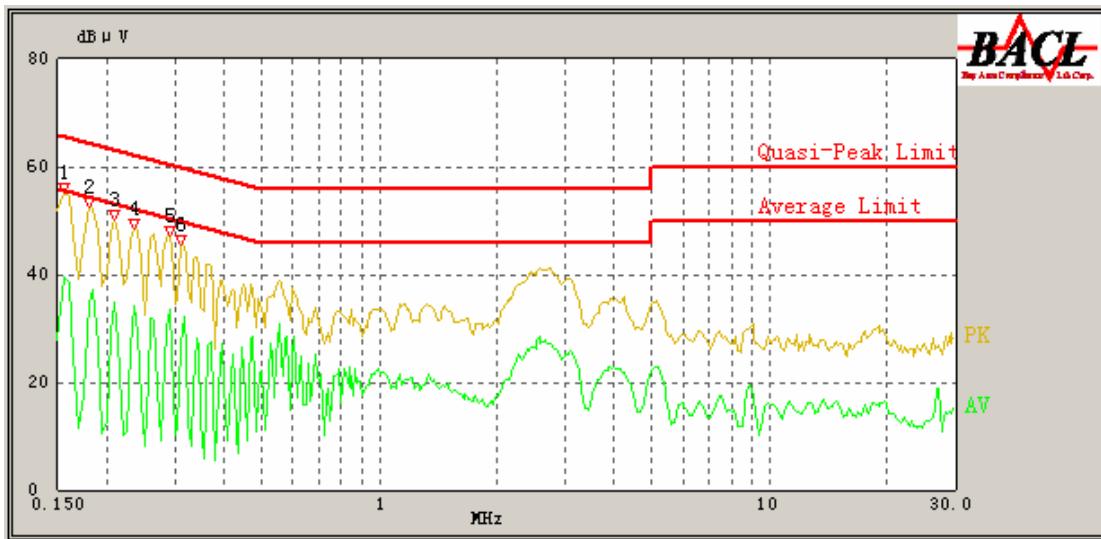
Environmental Conditions

| | |
|---------------------------|-----------|
| Temperature: | 25 °C |
| Relative Humidity: | 48 % |
| ATM Pressure: | 100.0 kPa |

The testing was performed by Ares Liu on 2012-05-14.

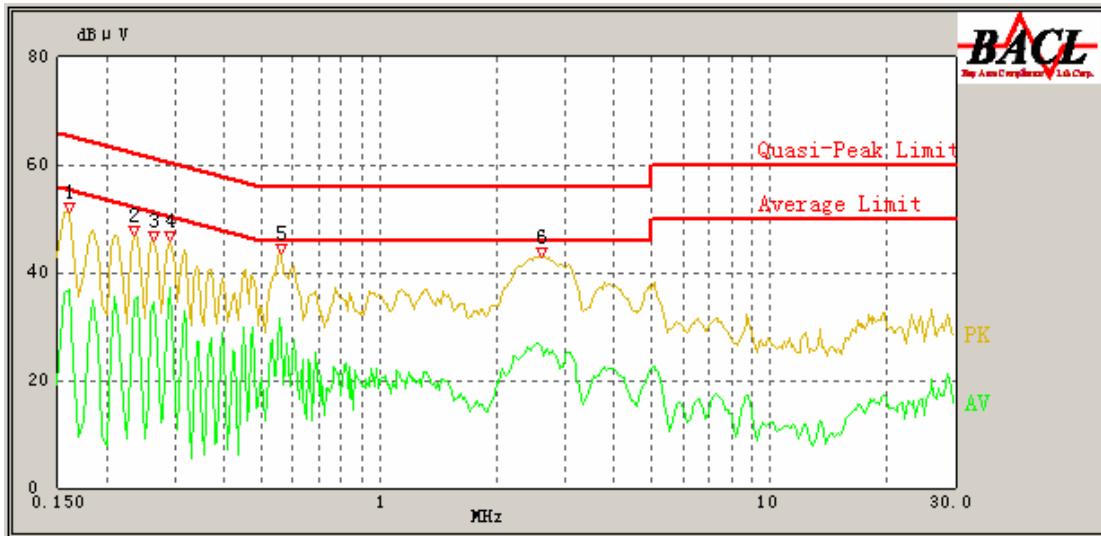
Test Mode: Transmitting

120 V, 50 Hz, Line:



| Frequency (MHz) | Corrected Result (dB μ V) | Correction Factor (dB) | Limit (dB μ V) | Margin (dB) | Detector (PK /QP/Ave.) |
|-----------------|-------------------------------|------------------------|--------------------|-------------|------------------------|
| 0.155 | 39.61 | 0.40 | 55.86 | 16.25 | Ave. |
| 0.155 | 49.39 | 0.40 | 65.86 | 16.47 | QP |
| 0.290 | 33.35 | 0.42 | 52.00 | 18.65 | Ave. |
| 0.290 | 43.23 | 0.42 | 62.00 | 18.77 | QP |
| 0.210 | 44.98 | 0.42 | 64.29 | 19.31 | QP |
| 0.235 | 34.15 | 0.42 | 53.57 | 19.42 | Ave. |
| 0.210 | 34.71 | 0.42 | 54.29 | 19.58 | Ave. |
| 0.180 | 34.82 | 0.41 | 55.14 | 20.32 | Ave. |
| 0.235 | 43.03 | 0.42 | 63.57 | 20.54 | QP |
| 0.180 | 43.85 | 0.41 | 65.14 | 21.29 | QP |
| 0.310 | 26.99 | 0.42 | 51.43 | 24.44 | Ave. |
| 0.310 | 36.39 | 0.42 | 61.43 | 25.04 | QP |

120V, 50 Hz, Neutral:



| Frequency (MHz) | Corrected Result (dB μ V) | Correction Factor (dB) | Limit (dB μ V) | Margin (dB) | Detector (PK /QP/Ave.) |
|-----------------|-------------------------------|------------------------|--------------------|-------------|------------------------|
| 0.290 | 37.05 | 0.42 | 52.00 | 14.95 | Ave. |
| 0.560 | 39.39 | 0.43 | 56.00 | 16.61 | QP |
| 0.560 | 28.90 | 0.43 | 46.00 | 17.10 | Ave. |
| 0.160 | 47.66 | 0.40 | 65.71 | 18.05 | QP |
| 0.265 | 34.37 | 0.42 | 52.71 | 18.34 | Ave. |
| 0.290 | 43.61 | 0.42 | 62.00 | 18.39 | QP |
| 2.595 | 37.56 | 0.49 | 56.00 | 18.44 | QP |
| 0.235 | 34.86 | 0.42 | 53.57 | 18.71 | Ave. |
| 0.160 | 36.99 | 0.40 | 55.71 | 18.72 | Ave. |
| 2.600 | 26.15 | 0.49 | 46.00 | 19.85 | Ave. |
| 0.235 | 43.11 | 0.42 | 63.57 | 20.46 | QP |
| 0.265 | 42.09 | 0.42 | 62.71 | 20.62 | QP |

FCC §15.209, §15.205 & §15.407(b) (1) (6) (7) – UNDESIRABLE EMISSION & RESTRICTED BANDS

Applicable Standard

FCC §15.407 (b) (4), (6), (7); §15.209; §15.205;

For transmitters operating in the 5.725–5.825 GHz band: all emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an EIRP of -17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an EIRP of -27 dBm/MHz.

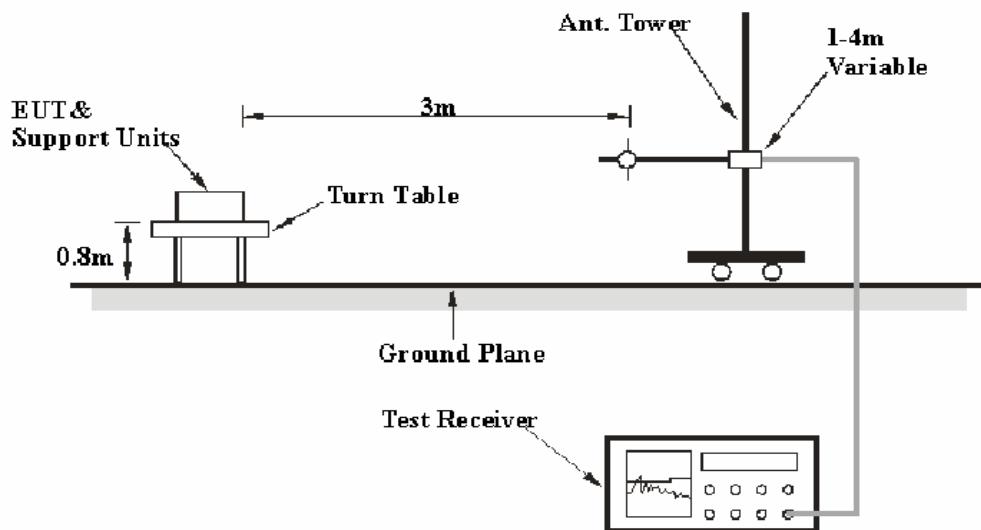
Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209.

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. (Shenzhen) is ± 4.0 dB.

EUT Setup



The radiated emission tests were performed in the 3 meters, using the setup accordance with the ANSI C63.4-2009. The specification used was the FCC 15.209, and FCC 15.407 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 & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 40 GHz.

During the radiated emission test, the EMI test receiver & Spectrum Analyzer Setup were set with the following configurations:

| Frequency Range | RBW | Video B/W | Detector |
|------------------------|------------|------------------|-----------------|
| 30 MHz – 1000 MHz | 100 kHz | 300 kHz | QP |
| 1000 MHz – 40 GHz | 1 MHz | 3 MHz | PK |
| 1000 MHz – 40 GHz | 1 MHz | 10 Hz | Ave. |

Test Procedure

During the radiated emission test, the adapter 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.

Data was recorded in Quasi-peak detection mode for frequency range of 30 MHz-1GHz, peak and Average detection modes for frequencies above 1GHz.

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 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 Equipment List and Details

| Manufacturer | Description | Model | Serial Number | Calibration Date | Calibration Due Date |
|---------------------|--------------------|--------------|----------------------|-------------------------|-----------------------------|
| HP | Amplifier | HP8447D | 2944A09795 | 2011-08-02 | 2012-08-01 |
| Rohde & Schwarz | EMI Test Receiver | ESCI | 100035 | 2011-11-11 | 2012-11-10 |
| Sunol Sciences | Broadband Antenna | JB1 | A040904-1 | 2011-07-05 | 2012-07-04 |
| Sunol Sciences | Horn Antenna | DRH-118 | A052604 | 2011-12-01 | 2012-11-30 |
| HP | Spectrum Analyzer | 8593A | 51475684 | 2011-07-08 | 2012-07-07 |
| Rohde & Schwarz | Spectrum Analyzer | FSEM30 | 849720/019 | 2011-07-08 | 2012-07-07 |
| Rohde & Schwarz | Spectrum Analyzer | FSP38 | 100479 | 2012-05-27 | 2013-05-26 |

*** 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.

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Title 47, Part 15, Subpart C, Section 15.205, 15.209 and 15.407, with the worst margin reading of:

2.58 dB at 11590 MHz in the **Horizontal** polarization

Test Data

Environmental Conditions

| | |
|---------------------------|-----------|
| Temperature: | 25 ° C |
| Relative Humidity: | 56 % |
| ATM Pressure: | 100.0 kPa |

The testing was performed by Ares Liu from 2012-05-22 to 2012-05-25.

Mode: Transmitting

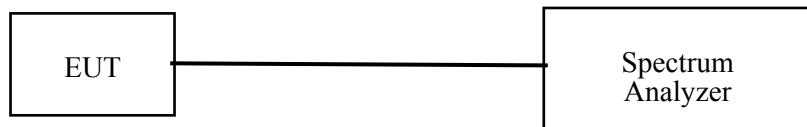
| Frequency (MHz) | S.A. Reading (dB μ V) | Detector (PK/QP /Ave.) | Polar (H/V) | Correction Factor (dB/m) | Cord. Amp. (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Comment |
|--------------------|---------------------------------|------------------------------|----------------|--------------------------------|---------------------------------|-------------------------|----------------|-------------|
| Channel (5755MHz) | | | | | | | | |
| 11510 | 42.72 | PK | H | 22.76 | 65.48 | 68.3 | 2.82* | Harmonic |
| 11510 | 23.81 | Ave. | V | 22.76 | 46.57 | 54 | 7.43 | Harmonic |
| 11510 | 37.5 | PK | V | 22.76 | 60.26 | 68.3 | 8.04 | Harmonic |
| 11510 | 21.45 | Ave. | H | 22.76 | 44.21 | 54 | 9.79 | Harmonic |
| 610 | 40.01 | QP | H | -5.62 | 34.39 | 46 | 11.61 | spurious |
| 610 | 39.19 | QP | V | -5.62 | 33.57 | 46 | 12.43 | spurious |
| 5714 | 27.29 | PK | H | 12.95 | 40.24 | 68.3 | 28.06 | spurious |
| 5714 | 27.25 | PK | V | 12.95 | 40.2 | 68.3 | 28.1 | spurious |
| 5755 | 69.3 | PK | H | 39.87 | 109.17 | N/A | N/A | Fundamental |
| 5755 | 42.72 | Ave. | H | 39.87 | 82.59 | N/A | N/A | Fundamental |
| 5755 | 65.29 | PK | V | 39.87 | 105.16 | N/A | N/A | Fundamental |
| 5755 | 42.23 | Ave. | V | 39.87 | 82.1 | N/A | N/A | Fundamental |
| Channel (5795MHz) | | | | | | | | |
| 11590 | 42.55 | PK | H | 23.17 | 65.72 | 68.3 | 2.58* | Harmonic |
| 11590 | 23.71 | Ave. | H | 23.17 | 46.88 | 54 | 7.12 | Harmonic |
| 11590 | 37.35 | PK | V | 23.17 | 60.52 | 68.3 | 7.78 | Harmonic |
| 11590 | 21.3 | Ave. | V | 23.17 | 44.47 | 54 | 9.53 | Harmonic |
| 610 | 39.87 | QP | H | -5.62 | 34.25 | 46 | 11.75 | spurious |
| 610 | 39 | QP | V | -5.62 | 33.38 | 46 | 12.62 | spurious |
| 5839 | 27.16 | PK | V | 13.88 | 41.04 | 68.3 | 27.26 | spurious |
| 5839 | 27.03 | PK | H | 13.88 | 40.91 | 68.3 | 27.39 | spurious |
| 5795 | 69.17 | PK | H | 39.84 | 109.01 | N/A | N/A | Fundamental |
| 5795 | 42.59 | Ave. | H | 39.84 | 82.43 | N/A | N/A | Fundamental |
| 5795 | 65.16 | PK | V | 39.84 | 105 | N/A | N/A | Fundamental |
| 5795 | 42.04 | Ave. | V | 39.84 | 81.88 | N/A | N/A | Fundamental |

*Within measurement uncertainty!

Conducted Spurious Emission at Antenna Port

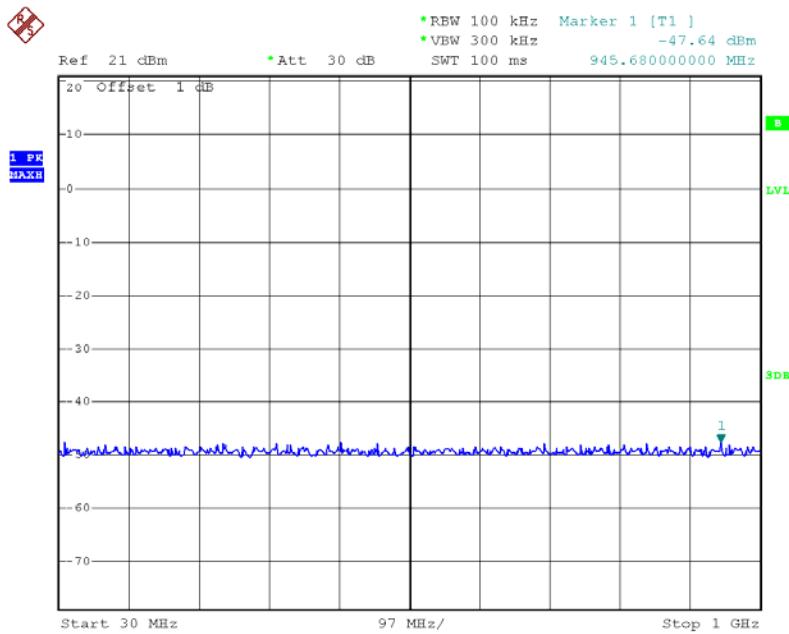
Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. The Resolution bandwidth is set to 1MHz, The Video bandwidth is set to 1MHz, report the peak value out of the operating band.
3. Repeat above procedures until all frequencies measured were complete.

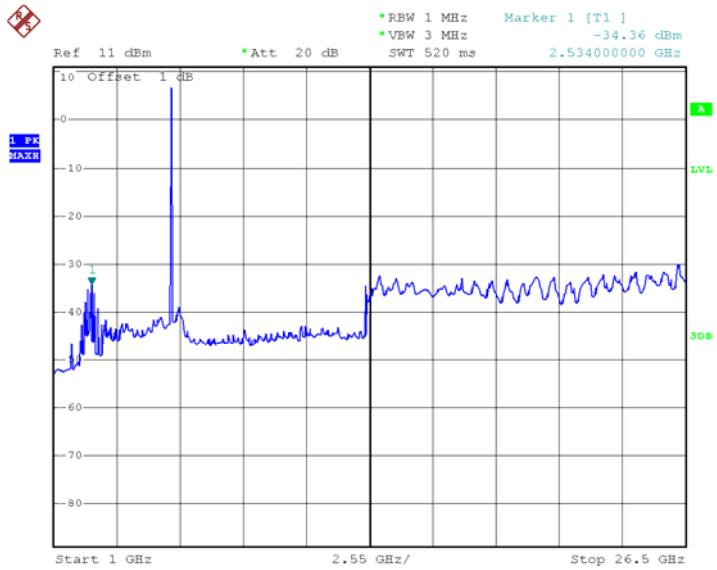


Test data

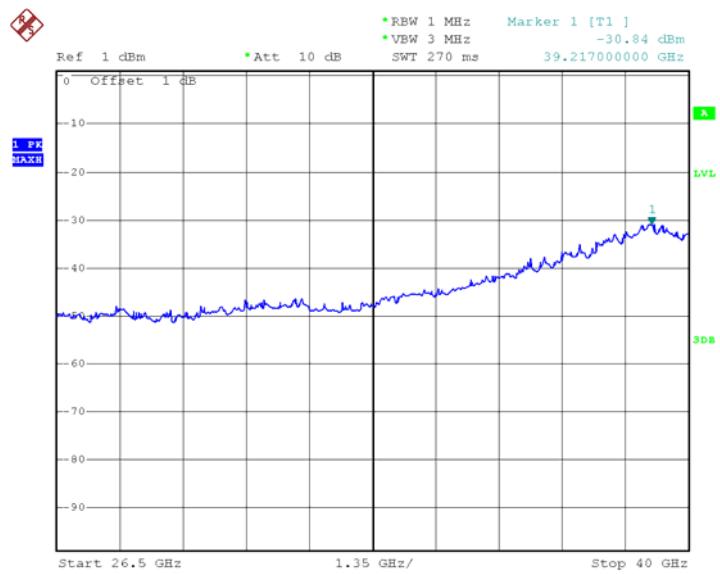
Please refer to the following plots.

Low Channel 30MHz-1GHz

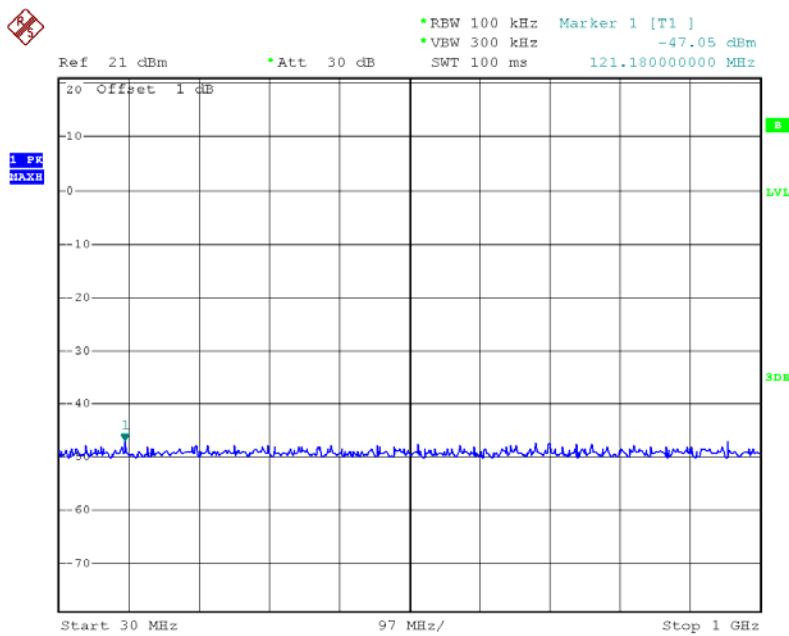
Date: 22.MAY.2012 13:13:13

Low Channel 1GHz-26.5GHz

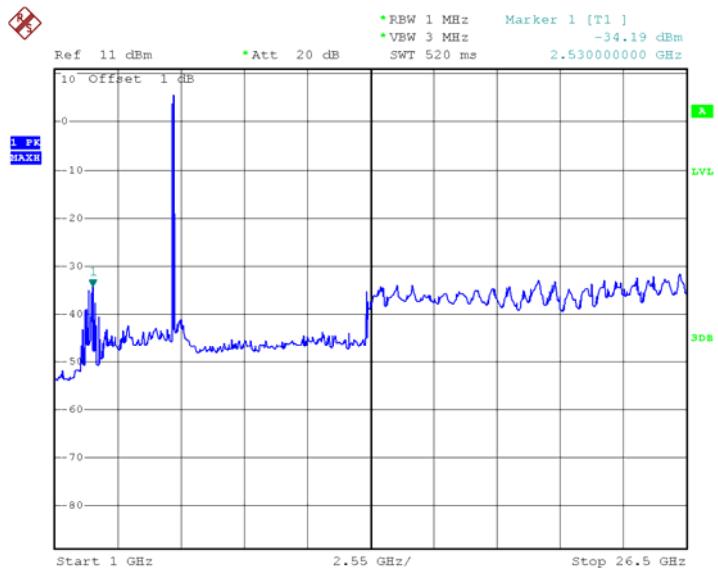
Date: 25.MAY.2012 09:45:06

Low Channel 26.5GHz-40GHz

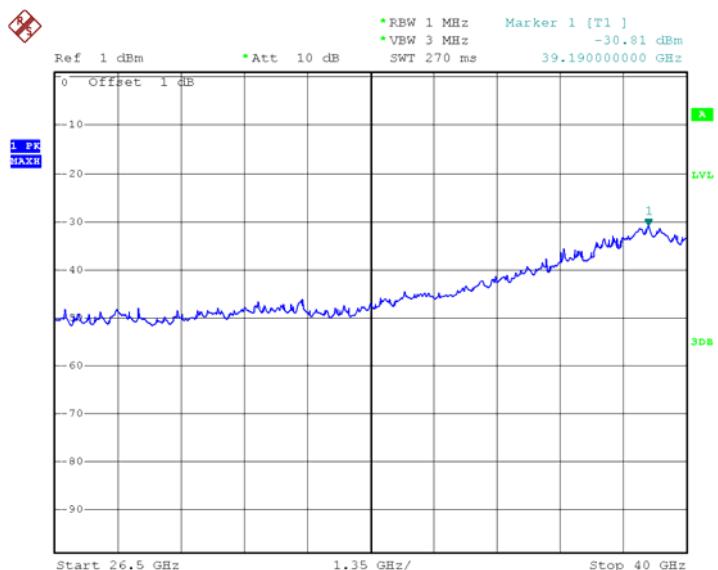
Date: 25.MAY.2012 09:47:10

High Channel 30MHz-1GHz

Date: 22.MAY.2012 13:25:08

High Channel 1GHz-26.5GHz

Date: 25.MAY.2012 09:51:36

High Channel 26.5GHz-40GHz

Date: 25.MAY.2012 09:53:13

FCC §15.407(a) (1) – 26 dB OCCUPIED BANDWIDTH

Applicable Standard

For the band 5.725–5.825 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 1 W or $17 \text{ dBm} + 10 \log B$, where B is the 26-dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 17 dBm in any 1-MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain up to 23 dBi without any corresponding reduction in the transmitter peak output power or peak power spectral density. For fixed, point-to-point U-NII transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in peak transmitter power and peak power spectral density for each 1 dB of antenna gain in excess of 23 dBi would be required. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

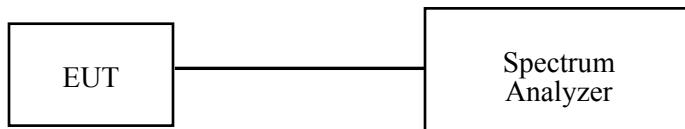
Test Equipment List and Details

| Manufacturer | Description | Model | Serial Number | Calibration Date | Calibration Due Date |
|-----------------|-------------------|--------|---------------|------------------|----------------------|
| Rohde & Schwarz | Spectrum Analyzer | FSEM30 | 849720/019 | 2011-07-08 | 2012-07-07 |

* **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.

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 it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Use a RBW = approximately 1% of the emission bandwidth. Set the VBW > RBW. Use a peak detector. Do not use the Max Hold function. Rather, use the viewbutton to capture the emission. Measure maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.
4. Repeat above procedures until all frequencies measured were complete.



Test Data**Environmental Conditions**

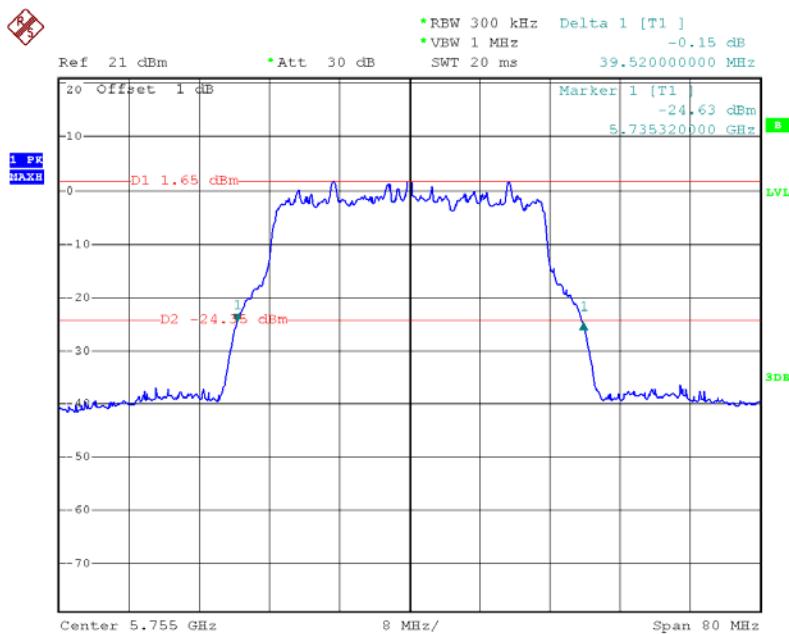
| | |
|---------------------------|----------|
| Temperature: | 25 °C |
| Relative Humidity: | 56% |
| ATM Pressure: | 100.0kPa |

The testing was performed by Ares Liu on 2012-05-22 .

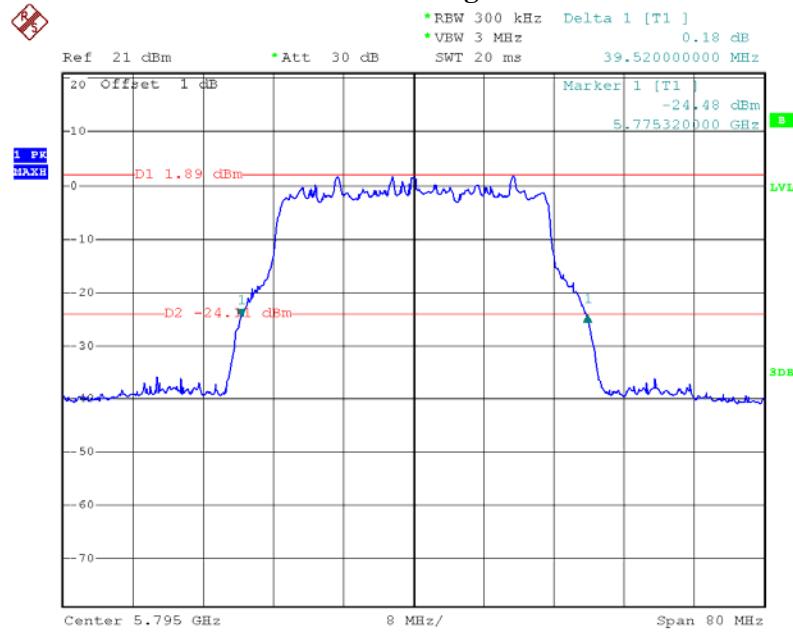
Test Result: Pass.

Please refer to the following tables and plots.

| Channel | Frequency (MHz) | 26dB Bandwidth (MHz) |
|---------|-----------------|----------------------|
| Low | 5755 | 39.52 |
| High | 5795 | 39.52 |

Chain 1 : Low Channel

Date: 22.MAY.2012 11:34:27

Chain 1 : High Channel

Date: 22.MAY.2012 13:17:07

FCC §15.407(a) (1) – CONDUCTED TRANSMITTER OUTPUT POWER

Applicable Standard

For the band 5.725–5.825 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 1 W or $17 \text{ dBm} + 10 \log B$, where B is the 26-dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 17 dBm in any 1-MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain up to 23 dBi without any corresponding reduction in the transmitter peak output power or peak power spectral density. For fixed, point-to-point U-NII transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in peak transmitter power and peak power spectral density for each 1 dB of antenna gain in excess of 23 dBi would be required. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations

Test Equipment List and Details

| Manufacturer | Description | Model | Serial Number | Calibration Date | Calibration Due Date |
|-----------------|-------------------|--------|---------------|------------------|----------------------|
| Rohde & Schwarz | Spectrum Analyzer | FSEM30 | 849720/019 | 2011-07-08 | 2012-07-07 |

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

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 was set 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 span to encompass the entire emission bandwidth (EBW) of the signal. Set RBW = 1 MHz. Set $\text{VBW} \geq 3 \text{ MHz}$. Use sample detector mode. Use a video trigger with the trigger level set to enable triggering only on full power pulses. Transmitter must operate at full control power for entire sweep of every sweep. If the device transmits continuously, with no off intervals or reduced power intervals, the trigger may be set to “free run”. Trace average 100 traces in power averaging mode. Compute power by integrating the spectrum across the 26 dB EBW of the signal. The integration can be performed using the spectrum analyzer’s band power measurement function with band limits set equal to the EBW band edges or by summing power levels in each 1 MHz band in linear power terms. The 1 MHz band power levels to be summed can be obtained by averaging, in linear power terms, power levels in each frequency bin across the 1 MHz.
4. Repeat above procedures until all frequencies measured were complete.

Test Data**Environmental Conditions**

| | |
|---------------------------|----------|
| Temperature: | 25 °C |
| Relative Humidity: | 56% |
| ATM Pressure: | 100.0kPa |

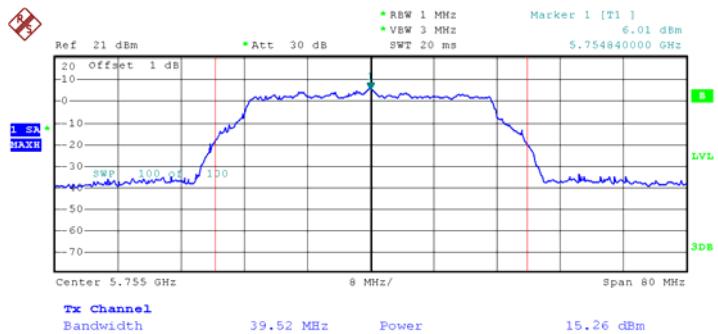
The testing was performed by Ares Liu on 2012-05-22

Test Mode: Transmitting

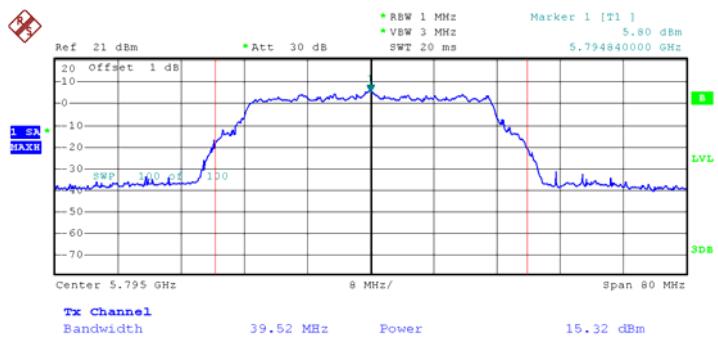
Test Result: Pass Please refer to the following tables and plots.

| Channel | Frequency (MHz) | Output Power (dBm) | Limit (dBm) |
|---------|-----------------|--------------------|-------------|
| Low | 5755 | 15.26 | 30 |
| High | 5795 | 15.32 | 30 |

*Note: The antenna Gain is 2.9dBi.

RF Output Power, Low Channel

Date: 22.MAY.2012 11:45:13

RF Output Power, High Channel

Date: 22.MAY.2012 13:20:39

FCC §15.407(a) (1) (5) - POWER SPECTRAL DENSITY

Applicable Standard

For the band 5.725–5.825 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 1 W or $17 \text{ dBm} + 10 \log B$, where B is the 26-dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 17 dBm in any 1-MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain up to 23 dBi without any corresponding reduction in the transmitter peak output power or peak power spectral density. For fixed, point-to-point U-NII transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in peak transmitter power and peak power spectral density for each 1 dB of antenna gain in excess of 23 dBi would be required. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

The peak power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test. If the device cannot be connected directly, alternative techniques acceptable to the Commission may be used. Measurements are made over a bandwidth of 1 MHz or the 26 dB emission bandwidth of the device, whichever is less. A resolution bandwidth less than the measurement bandwidth can be used, provided that the measured power is integrated to show total power over the measurement bandwidth. If the resolution bandwidth is approximately equal to the measurement bandwidth, and much less than the emission bandwidth of the equipment under test, the measured results shall be corrected to account for any difference between the resolution bandwidth of the test instrument and its actual noise bandwidth.

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 was set 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. Use sample detector and power averaging (not video averaging) mode. Set RBW= 1 MHz*, VBW > 1 MHz. The PPSD is the highest level found across the emission in any 1-MHz band after 100 sweeps of averaging. This method is permitted only if the transmission pulse or sequence of pulses remains at maximum transmits power throughout each of the 100 sweeps of averaging and that the interval between pulses is not included in any of the sweeps.
4. Repeat above procedures until all frequencies measured were complete.

Test Equipment List and Details

| Manufacturer | Description | Model | Serial Number | Calibration Date | Calibration Due Date |
|-----------------|-------------------|--------|---------------|------------------|----------------------|
| Rohde & Schwarz | Spectrum Analyzer | FSEM30 | 849720/019 | 2011-07-08 | 2012-07-07 |

* **Statement of Traceability:** Bay Area Compliance Lab Corp. (ShenZhen) 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: | 56 % |
| ATM Pressure: | 100.0 kPa |

The testing was performed by Ares Liu on 2012-05-22.

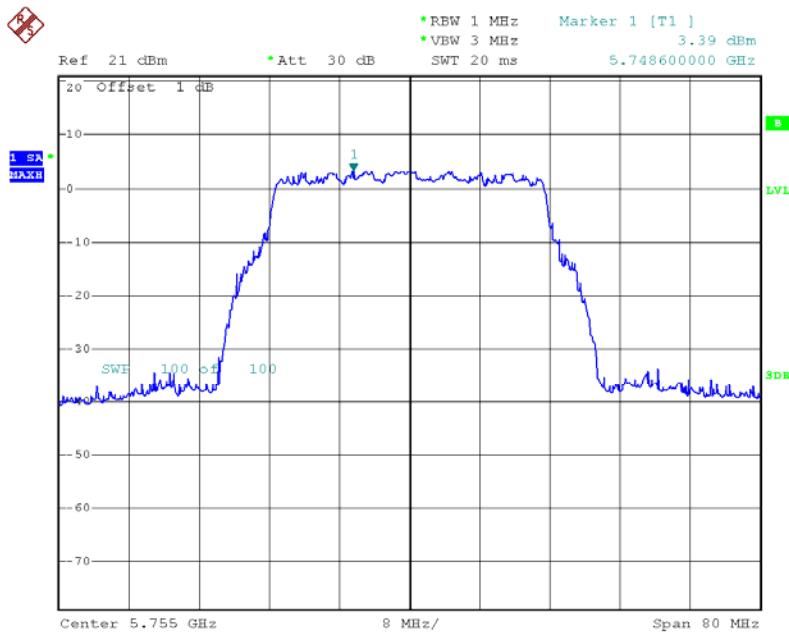
Test Mode: Transmitting

Test Result: Pass

| Channel | Frequency (MHz) | Power Spectral Density (dBm/MHz) | Limit (dBm/MHz) | Result |
|---------|-----------------|----------------------------------|-----------------|--------|
| Low | 5755 | 3.39 | 17 | Pass |
| High | 5795 | 3.50 | 17 | Pass |

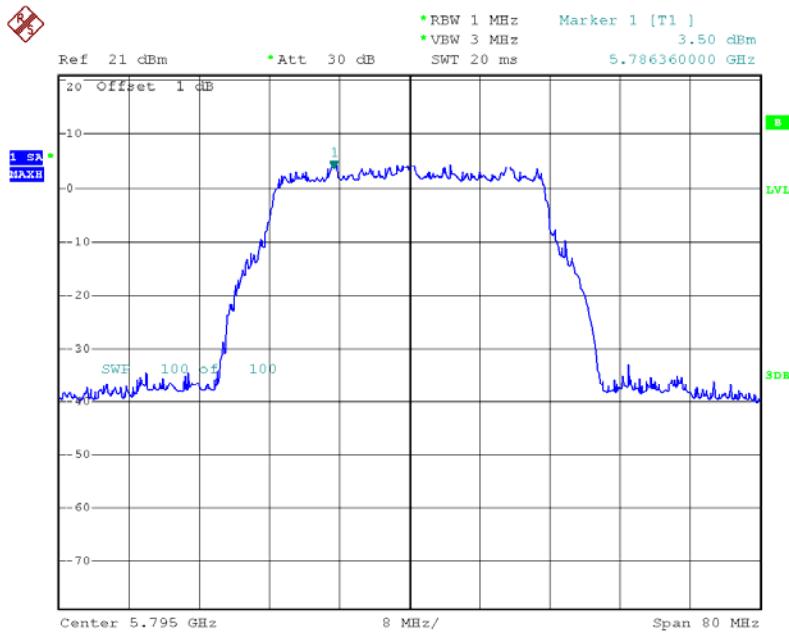
*Note: The antenna Gain is 2.9dBi.

Power Spectral Density, Low Channel



Date: 22.MAY.2012 11:51:39

Power Spectral Density, High Channel



Date: 22.MAY.2012 13:21:36

FCC §15.407(a) (6) – PEAK EXCURSION RATIO

Applicable Standard

According to §15.407(a) (6), the ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the maximum conducted output power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

Test Procedure

Set the spectrum analyzer span to view the entire emission bandwidth.

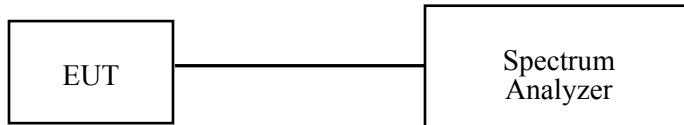
The largest difference between the following two traces must be ≤ 13 dB for all frequencies across the emission bandwidth. Submit a plot.

1st Trace:

- Set RBW = 1 MHz, VBW \geq 3 MHz with peak detector and maxhold settings.

2nd Trace:

- create the 2nd trace using the settings described in the section “FCC §15.407(a)(1)(2) – CONDUCTED TRANSMITTER OUTPUT POWER”.



Test Equipment List and Details

| Manufacturer | Description | Model | Serial Number | Calibration Date | Calibration Due Date |
|-----------------|-------------------|--------|---------------|------------------|----------------------|
| Rohde & Schwarz | Spectrum Analyzer | FSEM30 | 849720/019 | 2011-07-08 | 2012-07-07 |

* **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.

Test Data

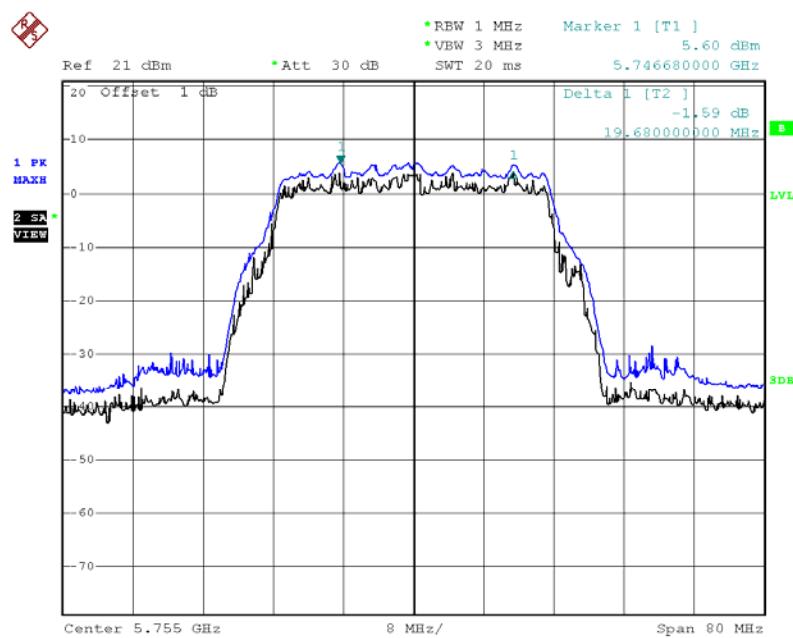
Environmental Conditions

| | |
|--------------------|-----------|
| Temperature: | 25 °C |
| Relative Humidity: | 56 % |
| ATM Pressure: | 100.0 kPa |

The testing was performed by Ares Liu on 2012-05-22.

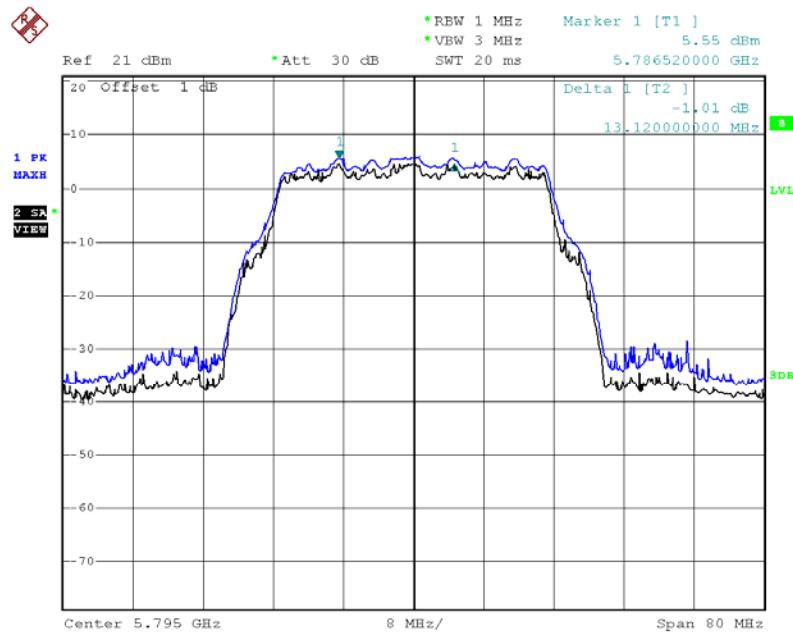
Test Mode: Transmitting

| Channel Frequency (MHz) | Peak Excursion Ratio (dB) | Limit (dB) |
|-------------------------|---------------------------|------------|
| 5190 | 1.59 | 13 |
| 5230 | 1.01 | 13 |

Chain 1: Low Channel

Date: 22.MAY.2012 13:07:22

Chain 1: High Channel



Date: 22.MAY.2012 13:24:08

FCC §407(g) - FREQUENCY STABILITY

Applicable Standards

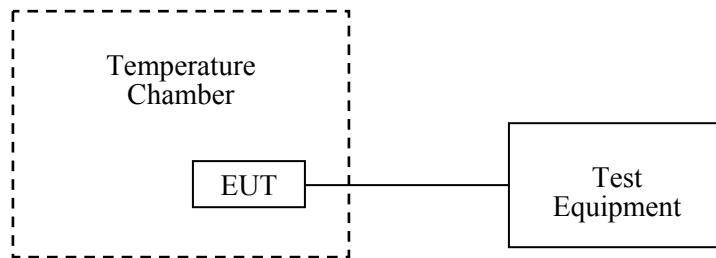
FCC§407(g), manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the users manual.

Test Procedure

Frequency Stability vs. Temperature: The equipment under test was connected to an external AC power supply and the RF output was connected to communication test set via feed-through attenuators. The EUT was placed inside the temperature chamber. The AC leads and RF output cable exited the chamber through an opening made for the purpose.

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the communication test set.

Frequency Stability vs. Voltage: An external variable AC power supply was connected to the adaptor terminals of the equipment under test. The voltage was set to 80% and 115% of the nominal value and was then decreased until the transmitter light no longer illuminated. The output frequency was recorded for each voltage.



Test Equipment List and Details

| Manufacturer | Description | Model | Serial Number | Calibration Date | Calibration Due Date |
|-----------------|--------------------------------|--------|---------------|------------------|----------------------|
| WUHUAN | Temperature & Humidity Chamber | HTP205 | 20021115 | 2011-06-04 | 2012-06-03 |
| Rohde & Schwarz | Spectrum Analyzer | FSEM30 | 849720/019 | 2011-07-08 | 2012-07-07 |

* **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.

Test Data**Environmental Conditions**

| | |
|---------------------------|-----------|
| Temperature: | 25 °C |
| Relative Humidity: | 56 % |
| ATM Pressure: | 100.0 kPa |

The testing was performed by Ares Liu on 2012-05-22.

Test Mode:Transmitting at Carrier only mode

| Channel Frequency (MHz) | Power supply (V _{AC}) | Temperature (°C) | Measurement Frequency (MHz) |
|-------------------------|---------------------------------|------------------|-----------------------------|
| 5755 | 120 | -30 | 5755.025 |
| | | -20 | 5755.010 |
| | | -10 | 5755.013 |
| | | +0 | 5755.005 |
| | | +10 | 5755.013 |
| | | +20 | 5755.012 |
| | | +30 | 5755.011 |
| | | +40 | 5755.023 |
| | | +50 | 5755.011 |
| | | 138 | +20 |
| | | 102 | +20 |
| | | | 5755.015 |

DECLARATION LETTER



Gefen, LLC
Address: 20600 Nordhoff Street Chatsworth, CA 91311 USA
Tel: 818-772-9100 Fax: 818-772-9120

Product Similarity Declaration

Date: 2012-05-09

To Whom It May Concern,

We, Gefen, LLC, hereby declare that our product Wireless for HDMI Receiver, Model Number: GTV-WHD-1080P-SRR is electrically identical with the Model Number: GTV-WHD-1080P-LRR. Their only difference is the model name.

The rest are the same.

Please contact me if you have any question.

Signature:

A handwritten signature in blue ink, appearing to read "Gaston Santiago".

Gaston Santiago
Project Manager

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