



FCC PART 15.407

TEST REPORT

For

Autel Robotics Co., Ltd.

9th Floor, Bldg.B1, Zhiyuan, 1001 Xueyuan Rd., Xili, Nanshan, Shenzhen, China

FCC ID: 2AGNTRC5824A

| | |
|--|--------------------------------|
| Report Type: Original Report | Product Type: EZ-FLY |
| Test Engineer: <u>David Lee</u>  | |
| Report Number: <u>RSZ151201007-00B</u> | |
| Report Date: <u>2016-02-18</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.

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Autel Robotics Co., Ltd.*'s product, model number: *EF5B* (*FCC ID: 2AGNTRC5824A*) or the "EUT" in this report was a *EZ-FLY*, which was measured approximately: 49.3cm (L) x48.5cm (W) x 20.9cm (H), rated with input voltage: DC 3.7 V from battery or DC 16.8V from adapter.

Adapter information: Switching Adapter

Model: ADF029

Input: 100-240V~50/60 Hz, 1.4A

Output: DC 16.8V, 5.7A.

**All measurement and test data in this report was gathered from production sample serial number: 1507246 (Assigned by Shenzhen BACL). The EUT supplied by the applicant was received on 2015-12-01.*

Objective

This type approval report is prepared on behalf of *Autel Robotics Co., Ltd.* in accordance with Part 2-Subpart J, Part 15-Subparts A, B and E 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.

Related Submittal(s)/Grant(s)

FCC Part 15.247 DTS submissions with FCC ID: 2AGNTRC5824A.

FCC Part 15.247 DTS, FCC Part 15.407 NII submissions with FCC ID: 2AGNTAC5824A.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

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.

Measurement uncertainty with RF radiated emission is 5.81 dB for 30MHz-1GHz and 4.88 dB for above 1GHz, 1.95dB for conducted measurement.

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 October 31, 2013. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.10-2013.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 382179. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in an engineering mode, which was provided by manufacturer.

| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---------|-----------------|---------|-----------------|---------|-----------------|
| 1 | 5727 | 26 | 5752 | 51 | 5777 |
| 2 | 5728 | 27 | 5753 | 52 | 5778 |
| 3 | 5729 | 28 | 5754 | 53 | 5779 |
| 4 | 5730 | 29 | 5755 | 54 | 5780 |
| 5 | 5731 | 30 | 5756 | 55 | 5781 |
| 6 | 5732 | 31 | 5757 | 56 | 5782 |
| 7 | 5733 | 32 | 5758 | 57 | 5783 |
| 8 | 5734 | 33 | 5759 | 58 | 5784 |
| 9 | 5735 | 34 | 5760 | 59 | 5785 |
| 10 | 5736 | 35 | 5761 | 60 | 5786 |
| 11 | 5737 | 36 | 5762 | 61 | 5787 |
| 12 | 5738 | 37 | 5763 | 62 | 5788 |
| 13 | 5739 | 38 | 5764 | 63 | 5789 |
| 14 | 5740 | 39 | 5765 | 64 | 5790 |
| 15 | 5741 | 40 | 5766 | 65 | 5791 |
| 16 | 5742 | 41 | 5767 | 66 | 5792 |
| 17 | 5743 | 42 | 5768 | 67 | 5793 |
| 18 | 5744 | 43 | 5769 | 68 | 5794 |
| 19 | 5745 | 44 | 5770 | 69 | 5795 |
| 20 | 5746 | 45 | 5771 | 70 | 5796 |
| 21 | 5747 | 46 | 5772 | 71 | 5797 |
| 22 | 5748 | 47 | 5773 | 72 | 5798 |
| 23 | 5749 | 48 | 5774 | 73 | 5799 |
| 24 | 5750 | 49 | 5775 | | |
| 25 | 5751 | 50 | 5776 | | |

EUT was tested with Channel 1, 34 and 73.

EUT Exercise Software

No exercise software was used.

Equipment Modifications

No modification was made to the EUT tested.

Support Equipment List and Details

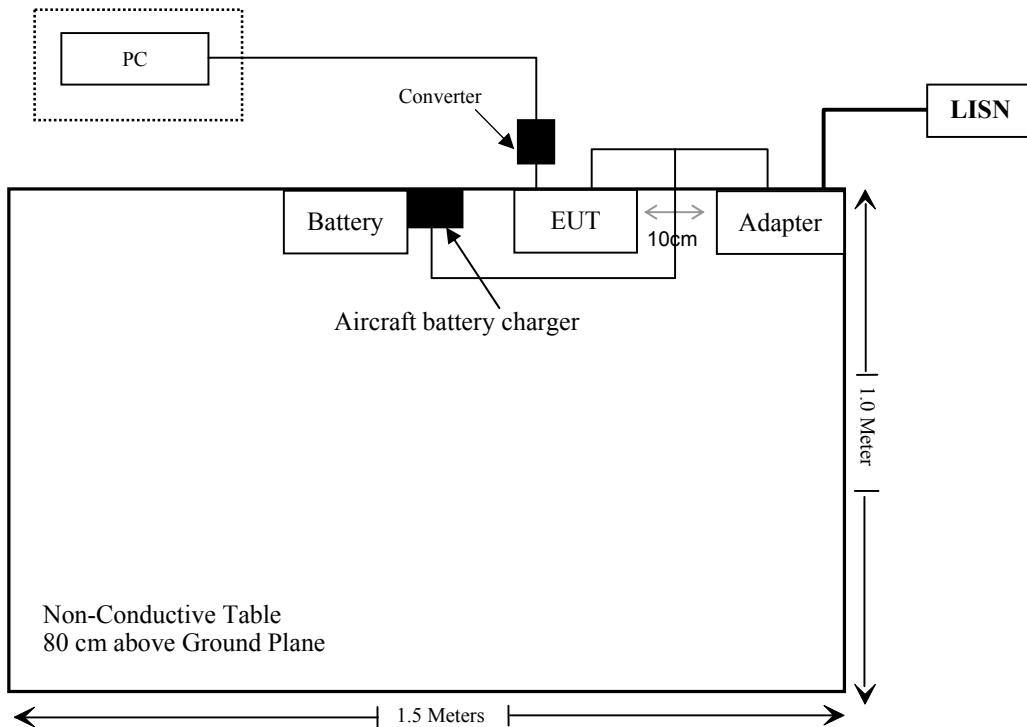
| Manufacturer | Description | Model | Serial Number |
|--------------|--|-------------|---------------|
| / | USB 2.0 to Fast Ethernet Adapter (Converter) | USB208B | 81RY52 |
| DELL | PC System | VOSTRO 220S | 127BP2X |

External I/O Cable

| Cable Description | Length (m) | From/Port | To |
|--------------------------------------|------------|-----------|------|
| Un-shielding Un-detachable DC Cable | 0.8 | Adapter | EUT |
| Un-shielding Detachable AC Cable | 1.5 | Adapter | LISN |
| Un-shielding Un-detachable USB Cable | 0.2 | Converter | EUT |
| Un-shielding Detachable RJ45 Cable | 3.0 | Converter | PC |

Block Diagram of Test Setup

For conducted emission



SUMMARY OF TEST RESULTS

| FCC Rules | Description of Test | Result |
|--|------------------------------------|------------|
| §15.407 (f) &§2.1093 | RF EXPOSURE | Compliance |
| §15.203 | Antenna Requirement | Compliance |
| §15.407(b)(6) & §15.207(a) | Conducted Emissions | Compliance |
| FCC §15.205 & §15.209 & §15.407(b) (4),(6),(7) | Undesirable Emission | Compliance |
| §15.407(b) (4) | Band Edge | Compliance |
| §15.407 (e) | 6dB Emission Bandwidth | Compliance |
| §15.407(a) (3) | Conducted Transmitter Output Power | Compliance |
| §15.407 (a) (3) | Power Spectral Density | Compliance |

FCC §15.407 (f) &§2.1093 – RF EXPOSURE

Applicable Standard

FCC§1.1307, §2.1093.

Test Result

Compliance, please refer to the SAR report: RSZ151201007-20A

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 a dipole antenna arrangement for 5.8G transmitting, which was permanently attached and the antenna gain is 2.5 dBi, fulfill the requirement of this section. Please refer to the EUT photos.

Result: Compliance.

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

Applicable Standard

FCC §15.207, §15.407(b) (6)

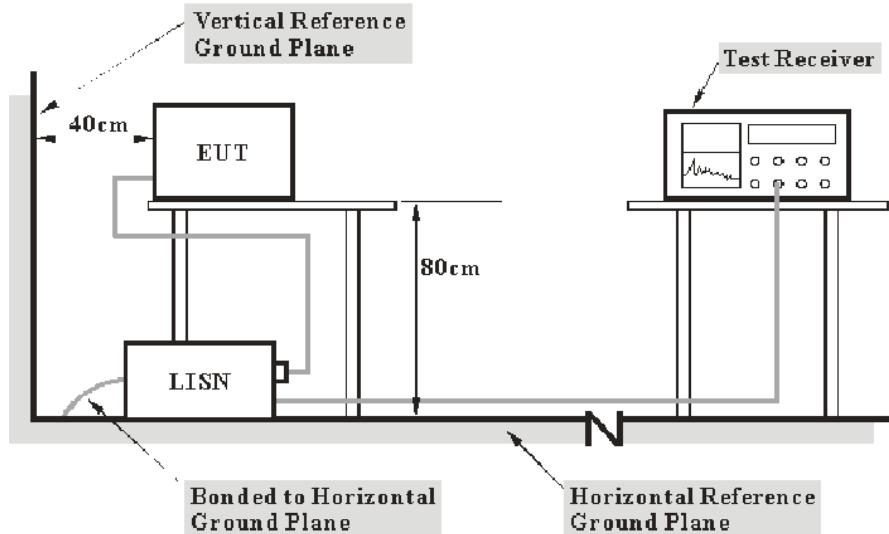
Measurement Uncertainty

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

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

| Port | Expanded Measurement uncertainty |
|----------|--|
| AC Mains | 3.34 dB (k=2, 95% level of confidence) |
| CAT 3 | 3.72 dB (k=2, 95% level of confidence) |
| CAT 5 | 3.74 dB (k=2, 95% level of confidence) |
| CAT 6 | 4.54 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 C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207 limits.

The spacing between the peripherals was 10 cm.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

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

| Frequency Range | IF B/W |
|------------------|--------|
| 150 kHz – 30 MHz | 9 kHz |

Test Procedure

During the conducted emission test, the adapter was connected to the LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All final data was recorded in the Quasi-peak and average detection mode.

Test Equipment List and Details

| Manufacturer | Description | Model | Serial Number | Calibration Date | Calibration Due Date |
|-----------------|-------------------|---------|------------------------|------------------|----------------------|
| Rohde & Schwarz | EMI Test Receiver | ESCS30 | 100176 | 2015-06-03 | 2016-06-03 |
| Rohde & Schwarz | LISN | ENV216 | 3560.6650.12-101613-Yb | 2015-12-01 | 2016-12-01 |
| Rohde & Schwarz | LISN | ESH2-Z5 | 892107/021 | 2015-06-09 | 2016-06-09 |
| Rohde & Schwarz | Transient Limitor | ESH3Z2 | DE25985 | 2015-05-14 | 2016-05-14 |
| Rohde & Schwarz | CE Test software | EMC 32 | V8.53 | NCR | NCR |

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

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 15.207, the worst margin reading as below:

15.5 dB at 0.229500 MHz in the **Neutral** conducted mode

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

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

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

Test Data

Environmental Conditions

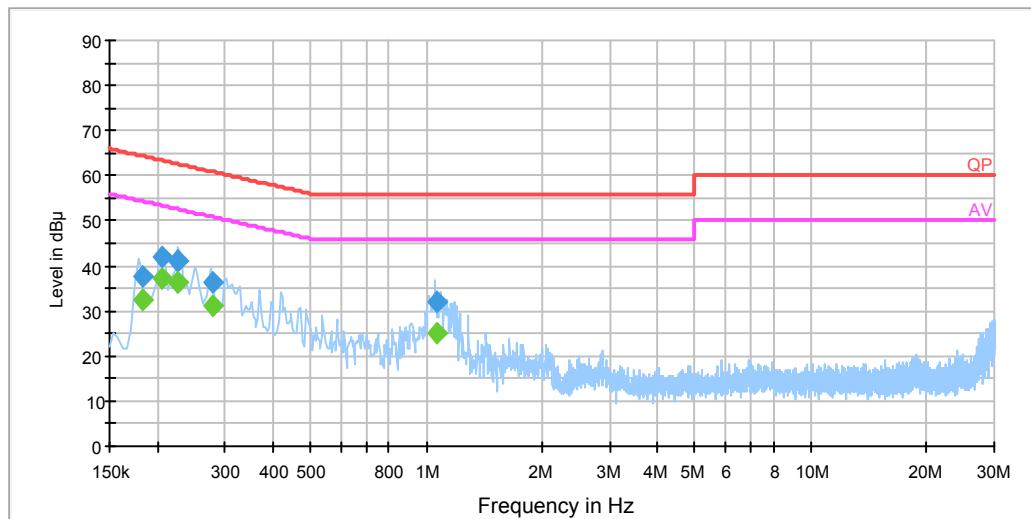
| | |
|---------------------------|-----------|
| Temperature: | 25 °C |
| Relative Humidity: | 50 % |
| ATM Pressure: | 101.0 kPa |

The testing was performed by David Lee on 2015-12-30.

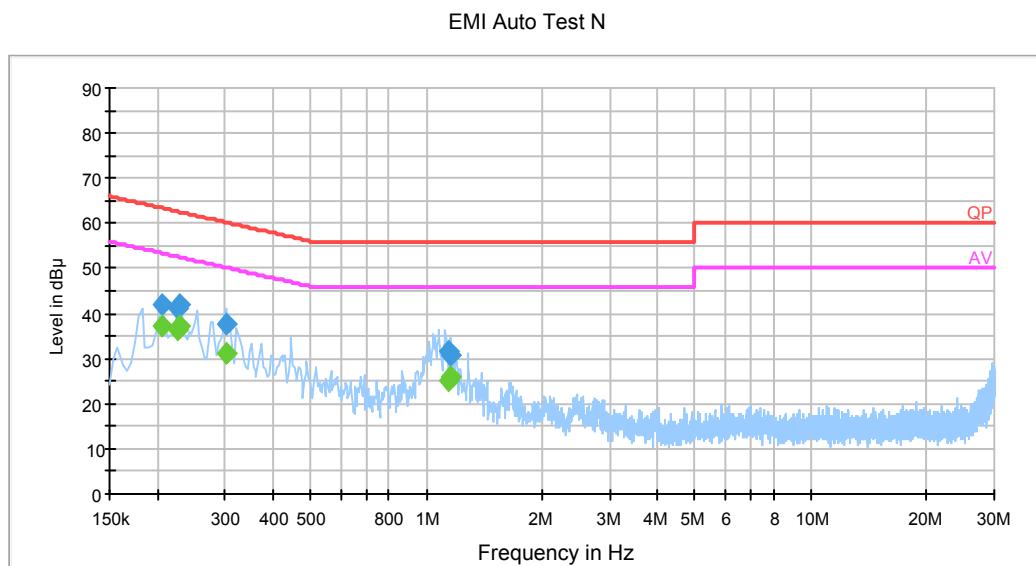
EUT operation mode: Transmitting

AC 120V/60 Hz, Line

EMI Auto Test L



| Frequency (MHz) | Corrected Amplitude (dB μ V) | Correction Factor (dB) | Limit (dB μ V) | Margin (dB) | Detector (PK/Ave./QP) |
|-----------------|----------------------------------|------------------------|--------------------|-------------|-----------------------|
| 0.182500 | 37.5 | 20.0 | 64.4 | 26.9 | QP |
| 0.182500 | 32.4 | 20.0 | 54.4 | 22.0 | Ave. |
| 0.205500 | 41.9 | 20.0 | 63.4 | 21.5 | QP |
| 0.205500 | 37.1 | 20.0 | 53.4 | 16.3 | Ave. |
| 0.225500 | 41.1 | 20.0 | 62.6 | 21.5 | QP |
| 0.225500 | 41.2 | 20.0 | 62.6 | 21.4 | QP |
| 0.225500 | 36.2 | 20.0 | 52.6 | 16.4 | Ave. |
| 0.225500 | 36.2 | 20.0 | 52.6 | 16.4 | Ave. |
| 0.277500 | 36.2 | 19.9 | 60.9 | 24.7 | QP |
| 0.277500 | 31.3 | 19.9 | 50.9 | 19.6 | Ave. |
| 1.069810 | 31.9 | 20.0 | 56.0 | 24.1 | QP |
| 1.069810 | 25.3 | 20.0 | 46.0 | 20.7 | Ave. |

AC120V, 60 Hz, Neutral:

| Frequency (MHz) | Corrected Amplitude (dB μ V) | Correction Factor (dB) | Limit (dB μ V) | Margin (dB) | Detector (PK/Ave./QP) |
|-----------------|----------------------------------|------------------------|--------------------|-------------|-----------------------|
| 0.205500 | 42.1 | 20.0 | 63.4 | 21.3 | QP |
| 0.205500 | 37.3 | 20.0 | 53.4 | 16.1 | Ave. |
| 0.225500 | 41.2 | 20.0 | 62.6 | 21.4 | QP |
| 0.225500 | 36.4 | 20.0 | 52.6 | 16.2 | Ave. |
| 0.229500 | 41.9 | 20.0 | 62.5 | 20.6 | QP |
| 0.229500 | 37.0 | 20.0 | 52.5 | 15.5 | Ave. |
| 0.301470 | 37.5 | 19.9 | 60.2 | 22.7 | QP |
| 0.301470 | 31.2 | 19.9 | 50.2 | 19.0 | Ave. |
| 1.138830 | 31.8 | 20.0 | 56.0 | 24.2 | QP |
| 1.138830 | 25.3 | 20.0 | 46.0 | 20.7 | Ave. |
| 1.152570 | 30.9 | 20.0 | 56.0 | 25.1 | QP |
| 1.152570 | 26.0 | 20.0 | 46.0 | 20.0 | Ave. |

Note:

- 1) Correction Factor = LISN VDF (Voltage Division Factor) + Cable Loss + Transient Limiter Attenuation
- 2) Corrected Amplitude = Reading + Correction Factor
- 3) Margin = Limit – Corrected Amplitude

FCC §15.205 & §15.209 & §15.407(B) (4),(6),(7) – UNDESIRABLE EMISSION & BAND EDGE

Applicable Standard

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

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.

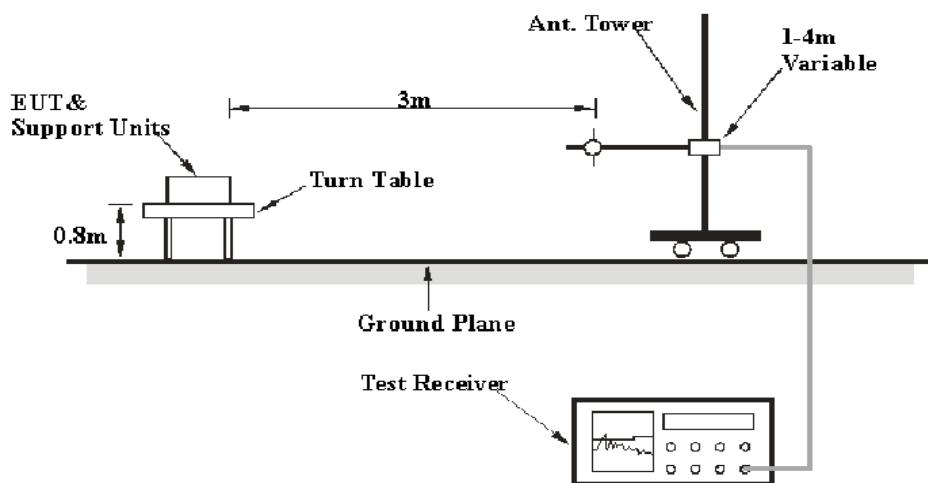
Measurement Uncertainty

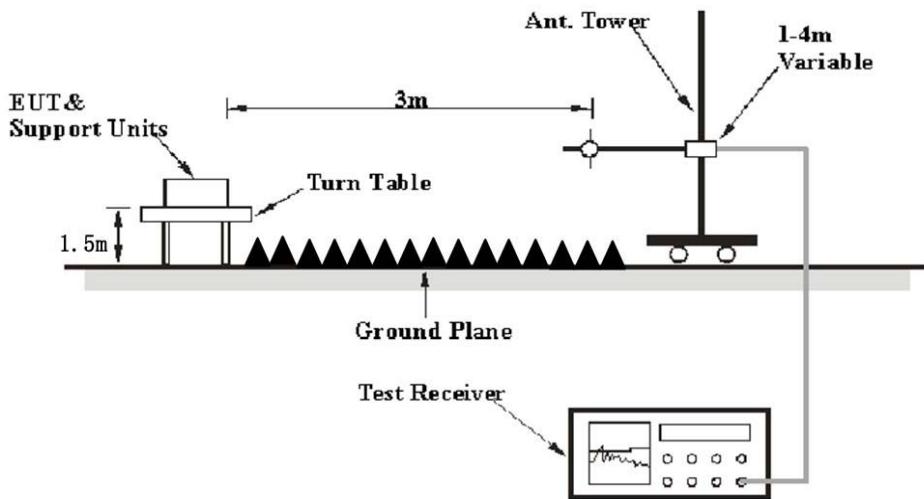
All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on CISPR 16-4-2:2011, the expended combined standard uncertainty of radiation emissions at Bay Area Compliance Laboratories Corp. (Shenzhen) is 5.81 dB for 30MHz-1GHz and 4.88 dB for above 1GHz, 1.95dB for conducted measurement at antenna port. And the uncertainty will not be taken into consideration for the test data recorded in the report

EUT Setup

Below 1GHz:



Above 1GHz:

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.209 limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

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 | IF B/W | Detector |
|-------------------|---------|-----------|---------|----------|
| 30 MHz – 1000 MHz | 100 kHz | 300 kHz | 120 kHz | QP |
| Above 1 GHz | 1 MHz | 3 MHz | / | PK |
| | 1 MHz | 10 Hz | / | Ave. |

Test Procedure**Radiated Spurious Emission**

During the radiated emission test, the adapter was connected to the AC floor outlet.

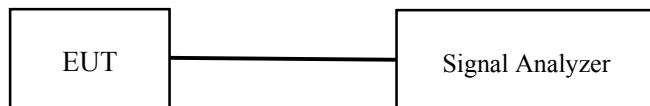
Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all the installation combinations.

Data was recorded in Quasi-peak detection mode for frequency range of 30 MHz-40GHz, peak and Average detection modes for frequencies above 1GHz.

The EUT is set 3.0 meter away from the testing antenna, which is varied from 1-4 meters, and the EUT is placed on a turntable, 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.

Conducted Spurious Emission at Antenna Port

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 \geq 1MHz, report the peak value out of the operating band.
3. Repeat above procedures until all frequencies measured were complete.



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 | HP8447E | 1937A01046 | 2015-05-06 | 2016-05-06 |
| Rohde & Schwarz | EMI Test Receiver | ESCI | 101120 | 2015-11-03 | 2016-11-03 |
| Sunol Sciences | Bi-log Antenna | JB1 | A040904-2 | 2014-12-07 | 2017-12-06 |
| Mini | Amplifier | ZVA-183-S+ | 5969001149 | 2015-04-23 | 2016-04-23 |
| A.H. System | Horn Antenna | SAS-200/571 | 135 | 2013-02-11 | 2016-02-10 |
| Rohde & Schwarz | Signal Analyzer | FSIQ26 | 8386001028 | 2015-12-11 | 2016-12-11 |
| DUCOMMUN | Pre-amplifier | ALN-22093530-01 | 991373-01 | 2015-08-03 | 2016-08-03 |
| Agilent | Spectrum Analyzer | 8564E | 3943A01781 | 2013-05-09 | 2016-05-08 |
| the electro-Mechanics Co. | Horn Antenna | 3116 | 9510-2270 | 2013-10-14 | 2016-10-13 |

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

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, the worst margin reading as below:

8.39 dB at 11520.00 MHz in the Vertical polarization for Middle Channel

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

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

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

Test Data

Environmental Conditions

| | |
|---------------------------|-----------|
| Temperature: | 25 °C |
| Relative Humidity: | 50 % |
| ATM Pressure: | 101.0 kPa |

The testing was performed by David Lee on 2015-12-30.

EUT operation mode: Transmitting

Undesirable Emission:**30 MHz-40 GHz:**

| Frequency (MHz) | Receiver | | Turntable Degree | Rx Antenna | | Corrected Factor (dB) | Corrected Amplitude (dB μ V/m) | FCC Part 15.407 | |
|---------------------------|-------------------------|------------------------|---------------------|---------------|------------------|-----------------------------|--|-------------------------|----------------|
| | Reading (dB μ V) | Detector (PK/QP/AV) | | Height (m) | Polar (H / V) | | | Limit (dB μ V/m) | Margin (dB) |
| Low Channel (5727 MHz) | | | | | | | | | |
| 172.8 | 44.72 | QP | 247 | 1.9 | V | -14.6 | 30.12 | 43.5 | 13.38 |
| 5727.0 | 60.41 | PK | 207 | 1.4 | H | 42.48 | 102.89 | / | / |
| 5727.0 | 47.12 | Ave. | 207 | 1.4 | H | 42.48 | 89.60 | / | / |
| 5727.0 | 63.05 | PK | 75 | 2.1 | V | 42.48 | 105.53 | / | / |
| 5727.0 | 50.13 | Ave. | 75 | 2.1 | V | 42.48 | 92.61 | / | / |
| 11454.0 | 33.85 | PK | 226 | 1.4 | H | 24.61 | 58.46 | 74 | 15.54 |
| 11454.0 | 16.30 | Ave. | 226 | 1.4 | H | 24.61 | 40.91 | 54 | 13.09 |
| 11454.0 | 35.13 | PK | 191 | 1.2 | V | 24.61 | 59.74 | 74 | 14.26 |
| 11454.0 | 17.96 | Ave. | 191 | 1.2 | V | 24.61 | 42.57 | 54 | 11.43 |
| Middle Channel (5760 MHz) | | | | | | | | | |
| 172.8 | 45.59 | QP | 58 | 1.5 | V | -14.6 | 30.99 | 43.5 | 12.51 |
| 5760.0 | 67.18 | PK | 223 | 1.2 | H | 42.39 | 109.57 | / | / |
| 5760.0 | 52.77 | Ave. | 223 | 1.2 | H | 42.39 | 95.16 | / | / |
| 5760.0 | 71.77 | PK | 144 | 2.5 | V | 42.39 | 114.16 | / | / |
| 5760.0 | 58.39 | Ave. | 144 | 2.5 | V | 42.39 | 100.78 | / | / |
| 11520.0 | 34.78 | PK | 313 | 1.2 | H | 24.61 | 59.39 | 74 | 14.61 |
| 11520.0 | 16.36 | Ave. | 313 | 1.2 | H | 24.61 | 40.97 | 54 | 13.03 |
| 11520.0 | 37.37 | PK | 199 | 1.5 | V | 24.61 | 61.98 | 74 | 12.02 |
| 11520.0 | 21.00 | Ave. | 199 | 1.5 | V | 24.61 | 45.61 | 54 | 8.39 |
| High Channel (5799 MHz) | | | | | | | | | |
| 172.8 | 45.45 | QP | 329 | 1.5 | V | -14.6 | 30.85 | 43.5 | 12.65 |
| 5799.0 | 60.55 | PK | 54 | 2.2 | H | 42.39 | 102.94 | / | / |
| 5799.0 | 46.65 | Ave. | 54 | 2.2 | H | 42.39 | 89.04 | / | / |
| 5799.0 | 63.78 | PK | 57 | 1.3 | V | 42.39 | 106.17 | / | / |
| 5799.0 | 50.11 | Ave. | 57 | 1.3 | V | 42.39 | 92.50 | / | / |
| 11598.0 | 33.50 | PK | 28 | 1.5 | H | 25.46 | 58.96 | 74 | 15.04 |
| 11598.0 | 16.83 | Ave. | 28 | 1.5 | H | 25.46 | 42.29 | 54 | 11.71 |
| 11598.0 | 35.63 | PK | 141 | 1.4 | V | 25.46 | 61.09 | 74 | 12.91 |
| 11598.0 | 17.29 | Ave. | 141 | 1.4 | V | 25.46 | 42.75 | 54 | 11.25 |

Note:

The fundamental test without Amplifier. And other spurious emissions are on the system noise floor level.

Corrected Amplitude = Corrected Factor + Reading

Corrected Factor=Antenna factor (RX) + Cable Loss – Amplifier Factor

Margin = Limit- Corr. Amplitude

Band Edge:

| Frequency (MHz) | Receiver | | Turntable Degree | Rx Antenna | | Corrected Factor (dB) | Corrected Amplitude (dB μ V/m) | FCC Part 15.407 | |
|---|-------------------------|------------------------|---------------------|---------------|------------------|-----------------------------|--|-------------------------|----------------|
| | Reading (dB μ V) | Detector (PK/QP/AV) | | Height (m) | Polar (H / V) | | | Limit (dB μ V/m) | Margin (dB) |
| Left Side Band(Test channel 5727 MHz) | | | | | | | | | |
| 5724.9 | 57.52 | PK | 310 | 1.7 | H | 2.72 | 60.24 | 74 | 13.76 |
| 5724.9 | 48.58 | Ave. | 310 | 1.7 | H | 2.72 | 51.30 | 54 | 2.70 |
| 5724.9 | 58.08 | PK | 302 | 2.4 | V | 2.72 | 60.80 | 74 | 13.20 |
| 5724.9 | 49.68 | Ave. | 302 | 2.4 | V | 2.72 | 52.40 | 54 | 1.60 |
| Right Side Band(Test channel 5799 MHz) | | | | | | | | | |
| 5852.2 | 41.02 | PK | 185 | 1.2 | H | 3.28 | 44.30 | 74 | 29.70 |
| 5852.2 | 37.90 | Ave. | 185 | 1.2 | H | 3.28 | 41.18 | 54 | 12.82 |
| 5852.2 | 43.25 | PK | 130 | 2.2 | V | 3.28 | 46.53 | 74 | 27.47 |
| 5852.2 | 38.77 | Ave. | 130 | 2.2 | V | 3.28 | 42.05 | 54 | 11.95 |

Note:

The Band Edge test with Amplifier.

Corrected Amplitude = Corrected Factor + Reading

Corrected Factor=Antenna factor (RX) + Cable Loss – Amplifier Factor

Margin = Limit- Corr. Amplitude

FCC §15.407(e) – 6dB EMISSION BANDWIDTH

Applicable Standard

The maximum 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 in the 5.725-5.85 GHz band are made over a reference bandwidth of 500 kHz or the 26 dB emission bandwidth of the device, whichever is less. Measurements in the 5.15-5.25 GHz, 5.25-5.35 GHz, and the 5.47-5.725 GHz bands are made over a bandwidth of 1 MHz or the 26 dB emission bandwidth of the device, whichever is less. A narrower resolution bandwidth can be used, provided that the measured power is integrated over the full reference bandwidth.

Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

Test Procedure

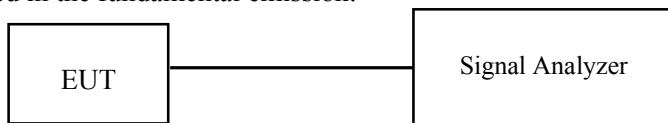
1. Emission Bandwidth (EBW)

- a) Set RBW = approximately 1% of the emission bandwidth.
- b) Set the VBW > RBW.
- c) Detector = Peak.
- d) Trace mode = max hold.
- e) Measure the maximum width of the emission that is 26 dB down from the maximum 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%.

2. Minimum Emission Bandwidth for the band 5.725-5.85 GHz

Section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500 kHz for the band 5.715-5.85 GHz. The following procedure shall be used for measuring this bandwidth:

- a) Set RBW = 100 kHz.
- b) Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
- c) Detector = Peak.
- d) Trace mode = max hold.
- e) Sweep = auto couple.
- f) Allow the trace to stabilize.
- g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.



Test Equipment List and Details

| Manufacturer | Description | Model | Serial Number | Calibration Date | Calibration Due Date |
|-----------------|-----------------|--------|---------------|------------------|----------------------|
| Rohde & Schwarz | Signal Analyzer | FSIQ26 | 8386001028 | 2015-12-11 | 2016-12-11 |

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

Test Data

Environmental Conditions

| | |
|---------------------------|-----------|
| Temperature: | 26 °C |
| Relative Humidity: | 51 % |
| ATM Pressure: | 101.0 kPa |

The testing was performed by David Lee on 2015-12-21.

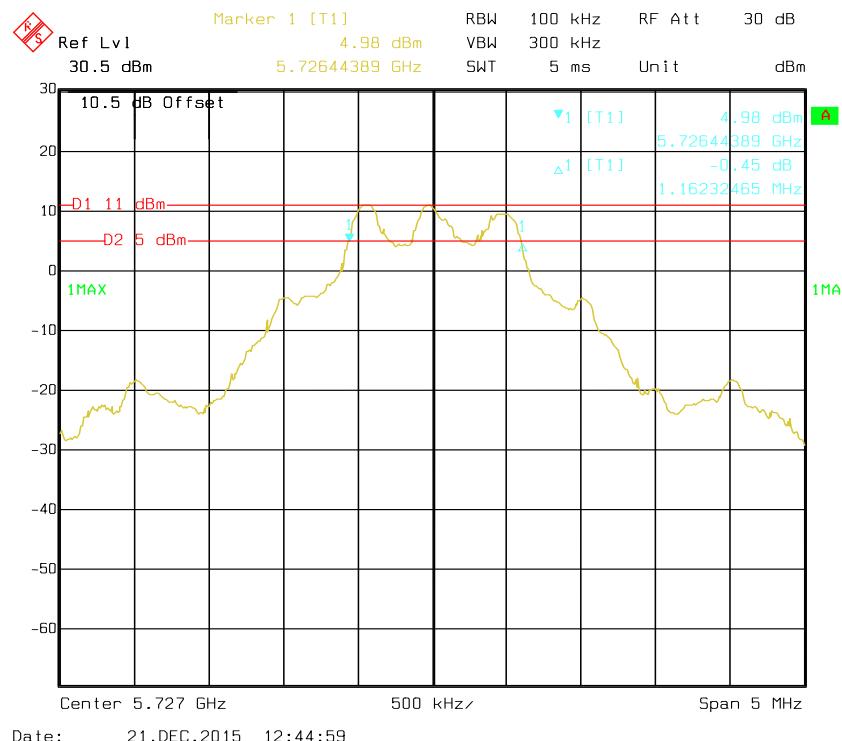
EUT operation mode: Transmitting

Test Result: Pass

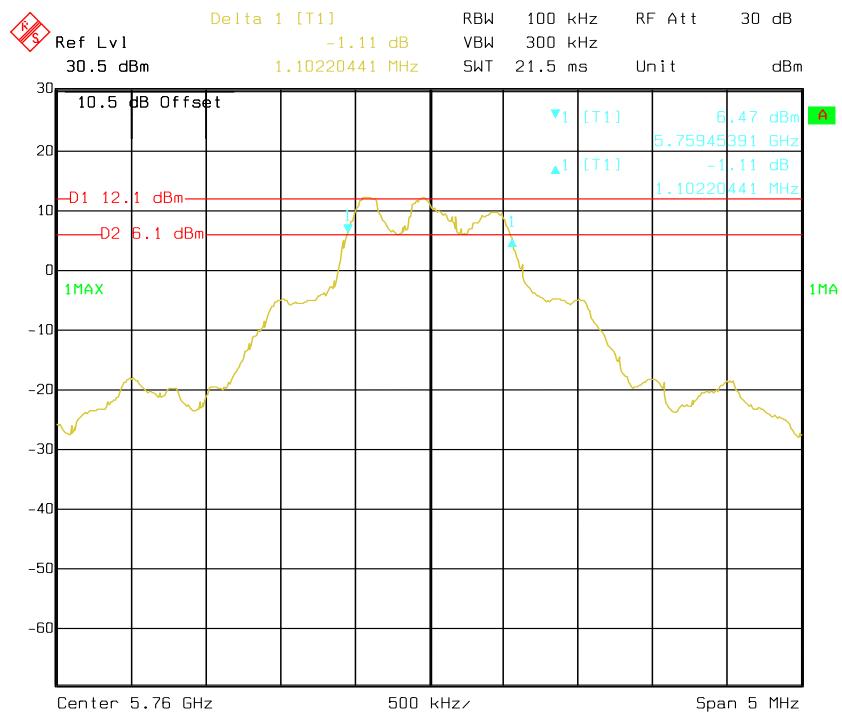
Please refer to the following tables and plots.

| Channel | Frequency (MHz) | 6dB Bandwidth (MHz) | Limit (kHz) |
|---------|-----------------|---------------------|-------------|
| Low | 5727 | 1.162 | ≥500 |
| Middle | 5760 | 1.102 | ≥500 |
| High | 5799 | 1.192 | ≥500 |

6dB Emission Bandwidth, Low Channel

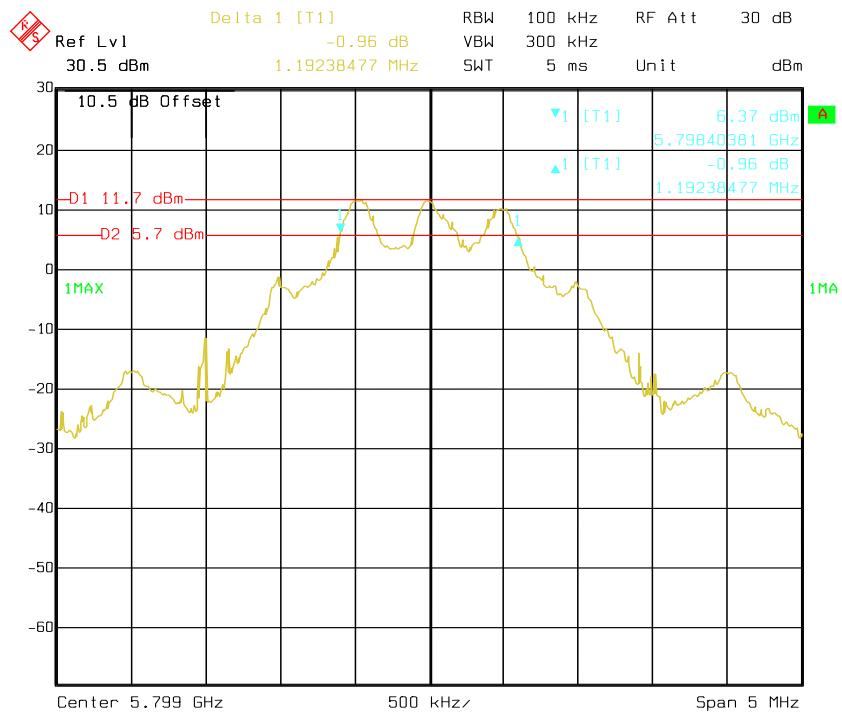


6dB Emission Bandwidth, Middle Channel



Date: 21.DEC.2015 11:50:34

6dB Emission Bandwidth, High Channel



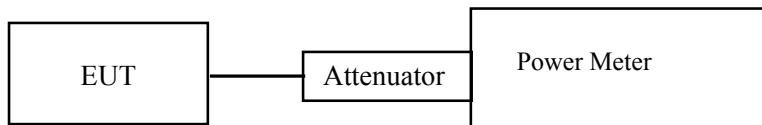
Date: 21.DEC.2015 12:58:09

FCC §15.407(a) (3) – CONDUCTED TRANSMITTER OUTPUT POWER**Applicable Standard**

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum 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 greater than 6 dBi without any corresponding reduction in transmitter conducted power. 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 Procedure

1. Place the EUT on a bench and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to one test equipment.
3. Add a correction factor to the display.

**Test Equipment List and Details**

| Manufacturer | Description | Model | Serial Number | Calibration Date | Calibration Due Date |
|--------------|--------------|--------|---------------|------------------|----------------------|
| HP | Power Meter | N1912A | MY5000448 | 2015-11-03 | 2016-11-03 |
| HP | Power Sensor | N1921A | MY54210016 | 2015-11-03 | 2016-11-03 |

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

Test Data**Environmental Conditions**

| | |
|---------------------------|-----------|
| Temperature: | 25 °C |
| Relative Humidity: | 51 % |
| ATM Pressure: | 101.0 kPa |

The testing was performed by David Lee on 2016-02-03.

EUT operation mode: Transmitting

Test Result: Pass

| Channel | Frequency (MHz) | Max Conducted Peak Output Power (dBm) | Max Conducted Average Output Power (dBm) | Limit (dBm) |
|---------|-----------------|---------------------------------------|--|-------------|
| Low | 5727 | 12.41 | 11.56 | 30 |
| Middle | 5760 | 13.30 | 12.24 | 30 |
| High | 5799 | 13.55 | 12.39 | 30 |

FCC §15.407(a) (3) – POWER SPECTRAL DENSITY**Applicable Standard**

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum 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 greater than 6 dBi without any corresponding reduction in transmitter conducted power. 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 Procedure

Set span to encompass the entire EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal.

- a) Set RBW = 500 kHz.
- b) Set VBW \geq 2 MHz.
- c) Detector = RMS.
- d) Trace mode = max hold.
- e) Sweep = auto couple.
- f) Allow the trace to stabilize.
- g) Measure the maximum value.

Test Equipment List and Details

| Manufacturer | Description | Model | Serial Number | Calibration Date | Calibration Due Date |
|-----------------|-----------------|--------|---------------|------------------|----------------------|
| Rohde & Schwarz | Signal Analyzer | FSIQ26 | 8386001028 | 2015-12-11 | 2016-12-11 |

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

Test Data

Environmental Conditions

| | |
|---------------------------|-----------|
| Temperature: | 26 °C |
| Relative Humidity: | 51 % |
| ATM Pressure: | 101.0 kPa |

The testing was performed by David Lee from 2016-02-03.

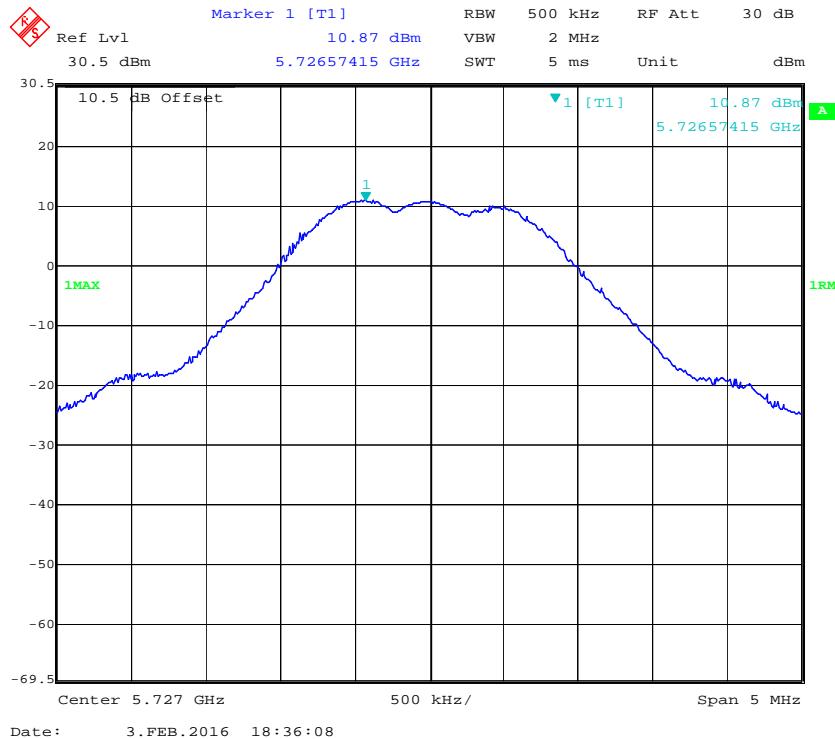
EUT operation mode: Transmitting

Test Result: Pass

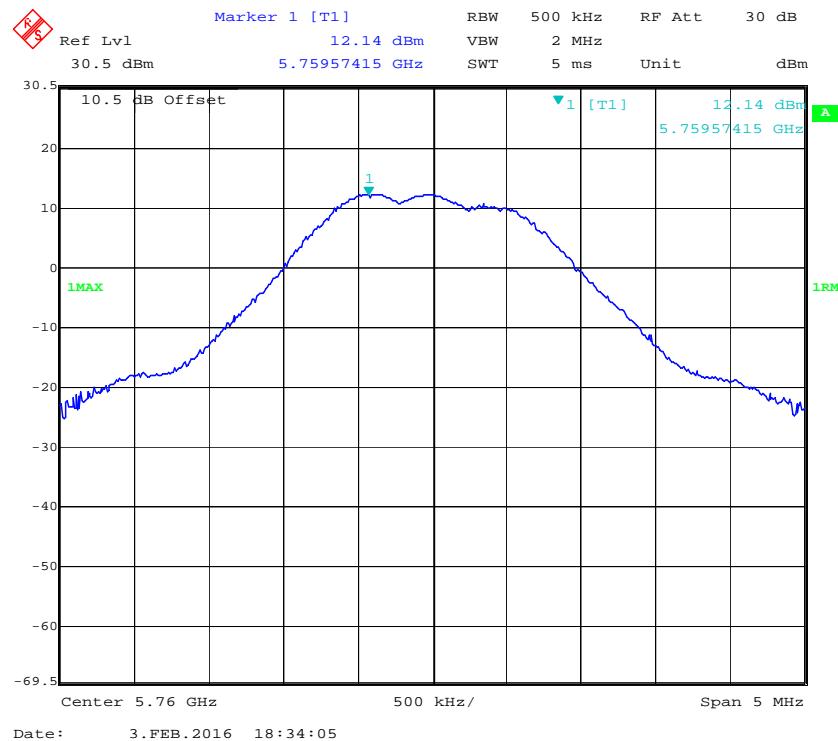
Please refer to the following tables and plots.

| Channel | Frequency | PSD | Limit |
|---------|-----------|--------------|--------------|
| | (MHz) | (dBm/500kHz) | (dBm/500kHz) |
| Low | 5727 | 10.87 | ≤30 |
| Middle | 5760 | 12.14 | ≤30 |
| High | 5799 | 12.09 | ≤30 |

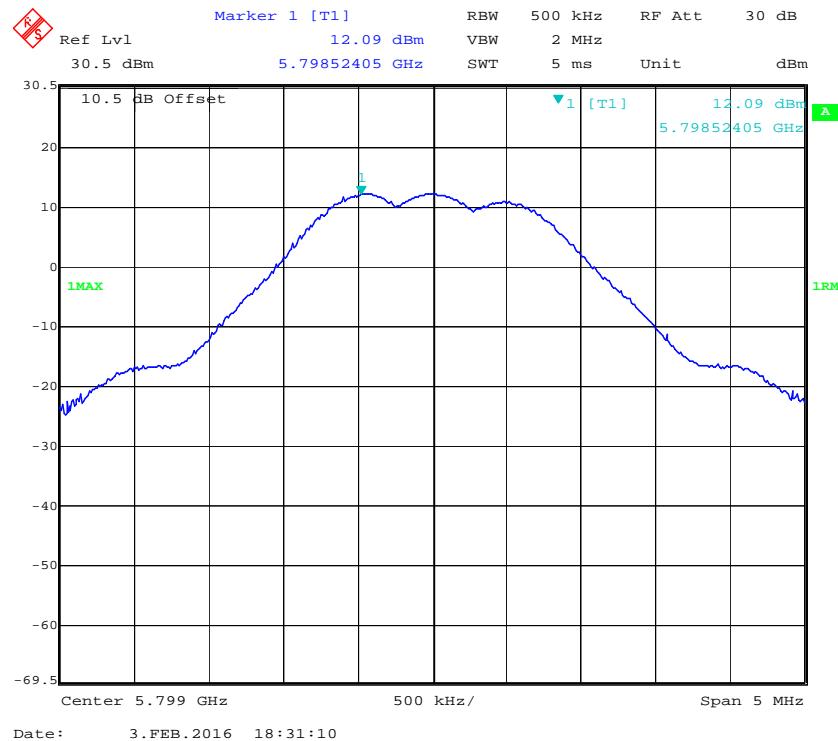
Power Spectral Density, Low Channel



Power Spectral Density, Middle Channel



Power Spectral Density, High Channel



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