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**RSS-GEN, ISSUE 4, NOVEMBER 2014**  
**RSS-247, ISSUE 2, FEBRUARY 2017**

**TEST REPORT**

For

**SZ DJI Osmo Technology Co.,Ltd.**

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Nanshan District, Shenzhen, China

**FCC ID: 2ANDR-RXPRO11805**  
**IC: 23060-RXPRO11805**

|                                        |                                                                                                                                                                                                                                                       |
|----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Report Type:</b><br>Original Report | <b>Product Name:</b><br>DJI Pro Wireless Receiver                                                                                                                                                                                                     |
| <b>Report Number:</b> RDG180507002-00B |                                                                                                                                                                                                                                                       |
| <b>Report Date:</b> 2018-05-17         |                                                                                                                                                                                                                                                       |
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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. (Dongguan). This report must not be used by the customer to claim product certification, approval, or endorsement by A2LA\* or any agency of the Federal Government. \* This report may contain data that are not covered by the A2LA accreditation and are marked with an asterisk “\*”.

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## GENERAL INFORMATION

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

|                             |                                  |
|-----------------------------|----------------------------------|
| <b>EUT Name:</b>            | DJI Pro Wireless Receiver        |
| <b>EUT Model:</b>           | RXPRO1                           |
| <b>FCC ID:</b>              | 2ANDR-RXPRO11805                 |
| <b>IC:</b>                  | 23060-RXPRO11805                 |
| <b>Rated Input Voltage:</b> | DC 5V-15V                        |
| <b>External Dimension:</b>  | 63 mm (L) x 38 mm (W) x19 mm (H) |
| <b>Serial Number:</b>       | 180507002                        |
| <b>EUT Received Date:</b>   | 2018-05-07                       |

### Objective

This type approval report is prepared on behalf of **SZ DJI Osmo Technology Co.,Ltd.** in accordance with Part 2-Subpart J, Part 15-Subparts A and E of the Federal Communications Commission's rules. And RSS-247, Issue 2, February 2017, RSS-Gen Issue 4, November 2014 of the Innovation, Science and Economic Development Canada.

The tests were performed in order to determine compliance with FCC Rules Part 15, Subpart E, section 15.203, 15.205, 15.209 and 15.407 rules, and RSS-247, Issue 2, February 2017, RSS-Gen Issue 4, November 2014 of the Innovation, Science and Economic Development Canada.

The device's RF board is identical with the certified device: Force Pro, model: P1F1, FCC ID: 2ANDR-P1F11803, IC: 23060-P1F11803, and the changes not related with the RF parameters. All antenna port conducted tests were reduced, and please refer to the P1F1 report.

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

FCC submissions with Part 15.247 DSS, FCC ID: 2ANDR-RXPRO11805.

ISED submissions with RSS-247 FHSs, IC: 23060-RXPRO11805.

Part of system submissions with FCC ID: 2ANDR-RS11804, IC: 23060-RS11804;  
FCC ID: 2ANDR-R21708, IC: 23060-R21708.

## Test Methodology

All measurements detailed in this Test Report were performed in accordance with ANSI C63.10-2013 “American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices”. RSS-247, Issue 2, February 2017, RSS-Gen Issue 4, November 2014 of the Innovation, Science and Economic Development Canada. And KDB 789033 D02 General U-NII Test Procedures New Rules v02r01

All emissions measurement was performed and Bay Area Compliance Laboratories Corp. (Dongguan).

## Measurement Uncertainty

| Parameter                         | Measurement Uncertainty                                                                                                                                    |
|-----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Occupied Channel Bandwidth        | ±5 %                                                                                                                                                       |
| RF output power, conducted        | ±0.61dB                                                                                                                                                    |
| Power Spectral Density, conducted | ±0.61 dB                                                                                                                                                   |
| Unwanted Emissions, radiated      | 30M~200MHz: 4.58 dB for Horizontal, 4.59 dB for Vertical<br>200M~1GHz: 4.83 dB for Horizontal, 5.85 dB for Vertical<br>1G~6GHz: 4.45 dB, 6G~40GHz: 5.23 dB |
| Unwanted Emissions, Conducted     | ±1.5 dB                                                                                                                                                    |
| Temperature                       | ±1 °C                                                                                                                                                      |
| Humidity                          | ±5%                                                                                                                                                        |
| DC and low frequency voltages     | ±0.4%                                                                                                                                                      |
| Duty Cycle                        | 1%                                                                                                                                                         |
| AC Power Lines Conducted Emission | 3.12 dB (150 kHz to 30 MHz)                                                                                                                                |

## 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 Industry Area, Tangxia, Dongguan, Guangdong, China.

The test site has been approved by the FCC under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 897218,the FCC Designation No. : CN1220.

The test site has been registered with ISED Canada under ISED Canada Registration Number 3062D.

## SYSTEM TEST CONFIGURATION

### Description of Test Configuration

The EUT was configured for testing in an engineering mode which was provided by the manufacturer.

The system employed GFSK modulation in 5.8GHz band, total 58 channels was used:

| Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---------|-----------------|---------|-----------------|
| 1       | 5729            | 30      | 5787            |
| 2       | 5731            | 31      | 5789            |
| 3       | 5733            | 32      | 5791            |
| ...     | ...             | ...     | ...             |
| ...     | ...             | ...     | ...             |
| 24      | 5775            | 53      | 5833            |
| 25      | 5777            | 54      | 5835            |
| 26      | 5779            | 55      | 5837            |
| 27      | 5781            | 56      | 5839            |
| 28      | 5783            | 57      | 5841            |
| 29      | 5785            | 58      | 5843            |

Test was performed with Channel: 1, 24 and 58.

### Equipment Modifications

No modification was made to the EUT tested.

### EUT Exercise Software

The software “Certification\_HG330.exe” was used for testing, which was provided by manufacturer. The maximum power with maximum duty cycle was configured as below setting.

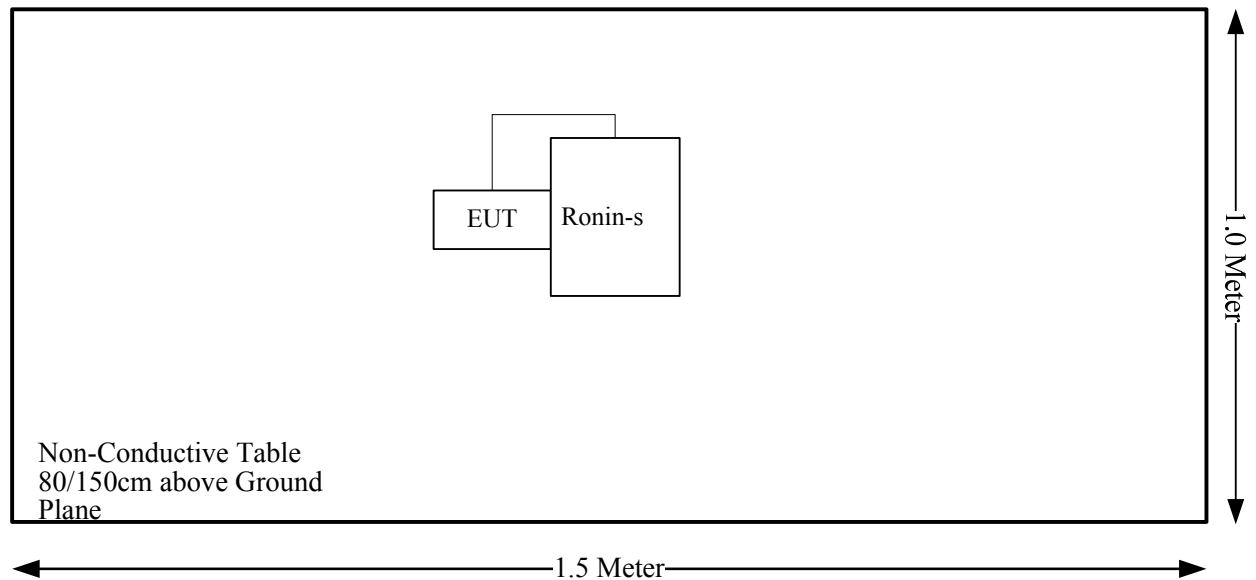
| Test Software Version | Certification_HG330.exe |         |         |
|-----------------------|-------------------------|---------|---------|
| Test Frequency        | 5729MHz                 | 5775MHz | 5843MHz |
| Power Level Setting   | 22                      | 22      | 22      |

### Support Equipment List and Details

| Manufacturer                    | Description | Model | Serial Number |
|---------------------------------|-------------|-------|---------------|
| SZ DJI Osmo Technology Co.,Ltd. | Ronin-s     | RSFW  | /             |

**Support Cable List and Details**

| Cable Description | Shielding Type | Ferrite Core | Length (m) | From Port | To  |
|-------------------|----------------|--------------|------------|-----------|-----|
| S-Bus Cable       | Yes            | No           | 0.6        | Ronin-s   | EUT |

**Block Diagram of Test Setup**

**SUMMARY OF TEST RESULTS**

| Rules                                              | Description of Test                                            | Result          |
|----------------------------------------------------|----------------------------------------------------------------|-----------------|
| FCC §15.407 (f) & §1.1310 & §2.1091                | Maximum Permissible Exposure (MPE)                             | Compliance      |
| RSS-102 § 2.5.2                                    | Exemption Limits For Routine Evaluation-RF Exposure Evaluation | Compliance      |
| FCC§15.203<br>RSS-GEN§8.3                          | Antenna Requirement                                            | Compliance      |
| FCC§15.207 (a)<br>RSS-Gen §8.8                     | AC Line Conducted Emissions                                    | Not Applicable* |
| FCC§15.205& §15.209<br>& §15.407(b)<br>RSS-247§6.2 | Undesirable Emission& Restricted Bands                         | Compliance      |
| FCC§15.407(b) (1),(2),(3),(4)<br>RSS-247§6.2       | Out Of Band Emissions                                          | Compliance*     |
| FCC§15.407(a)<br>RSS-247 §6.2<br>RSS-Gen§6.6       | Emission Bandwidth                                             | Compliance*     |
| FCC§15.407(a)<br>RSS-247 §6.2                      | Conducted Transmitter Output Power                             | Compliance*     |
| FCC§15.407 (a)<br>RSS-247 §6.2                     | Power Spectral Density                                         | Compliance*     |
| FCC§15.407(g)                                      | Frequency stability                                            | Compliance*     |

Not Applicable\*: The EUT was supplied by battery.

Compliance\*: RF module of this device is the same as the model: P1F1( FCC ID: 2ANDR-P1F11803, IC: 23060-P1F11803), the test results please refer to report NO. RDG180325002-00C.

## FCC §15.407 (f) & §1.1310 & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)

### Applicable Standard

According to subpart 15.407(f) and subpart §1.1310, 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 <sup>2</sup> ) | Averaging Time (minutes) |
| 0.3–1.34                                                | 614                           | 1.63                          | *(100)                              | 30                       |
| 1.34–30                                                 | 824/f                         | 2.19/f                        | *(180/f <sup>2</sup> )              | 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.

### Calculation formula:

Prediction of power density at the distance of the applicable MPE limit

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

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 output power including Tune-up Tolerance |        | Evaluation Distance (cm) | Power Density (mW/cm <sup>2</sup> ) | MPE Limit (mW/cm <sup>2</sup> ) |
|-----------------|--------------|-----------|----------------------------------------------------|--------|--------------------------|-------------------------------------|---------------------------------|
|                 | (dBi)        | (numeric) | (dBm)                                              | (mW)   |                          |                                     |                                 |
| 5729-5843       | 4.5          | 2.82      | 22.5                                               | 177.83 | 20.00                    | 0.1                                 | 1.0                             |

Note: 2.4GHz and 5.8GHz can't transmit simultaneously

**Result:** The device meet FCC MPE at 20 cm distance

## **RSS-102 § 2.5.2 - EXEMPTION LIMITS FOR ROUTINE EVALUATION – RF EXPOSURE EVALUATION**

### **Applicable Standard**

According to RSS-102 § (2.5.2):

RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operates as follows:

- below 20 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1 W (adjusted for tune-up tolerance);
- at or above 20 MHz and below 48 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than  $4.49/f^{0.5}$  W (adjusted for tune-up tolerance), where  $f$  is in MHz;
- at or above 48 MHz and below 300 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 0.6 W (adjusted for tune-up tolerance);
- at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than  $1.31 \times 10^{-2} f^{0.6834}$  W (adjusted for tune-up tolerance), where  $f$  is in MHz;
- at or above 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 5 W (adjusted for tune-up tolerance).

In these cases, the information contained in the RF exposure technical brief may be limited to information that demonstrates how the e.i.r.p. was derived.

### **Calculated Data:**

The maximum power including tune-up tolerance is 22.5dBm@ 5.8GHz band, the maximum antenna gain is 4.5 dBi, so the maximum e.i.r.p. is 27.0 dBm (0.50W)

Exemption from Routine Evaluation Limit is:

$$1.31 \times 10^{-2} f^{0.6834} = 1.31 \times 10^{-2} \times 5729^{0.6834} = 4.85 > 0.50W$$

So the device is compliance exemption from Routine Evaluation Limits –RF exposure Evaluation.

**Result:** Compliance

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**FCC §15.203 ,RSS-GEN§8.3- ANTENNA REQUIREMENT**

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**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.

According to RSS-Gen §8.3, The applicant for equipment certification, as per RSP-100, must provide a list of all antenna types that may be used with the licence-exempt transmitter, indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna.

Licence-exempt transmitters that have received equipment certification may operate with different types of antennas. However, it is not permissible to exceed the maximum equivalent isotropically radiated power (e.i.r.p.) limits specified in the applicable standard (RSS) for the licence-exempt apparatus.

Testing shall be performed using the highest gain antenna of each combination of licence-exempt transmitter and antenna type, with the transmitter output power set at the maximum level.<sup>9</sup> When a measurement at the antenna connector is used to determine RF output power, the effective gain of the device's antenna shall be stated, based on a measurement or on data from the antenna manufacturer.

User manuals for transmitters equipped with detachable antennas shall also contain the following notice in a conspicuous location:

*This radio transmitter (identify the device by certification number or model number if Category II) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.*

Immediately following the above notice, the manufacturer shall provide a list of all antenna types approved for use with the transmitter, indicating the maximum permissible antenna gain (in dBi).

**Antenna Connector Construction**

The EUT has a external antenna arrangement permanently attached to the unit, the antenna gain is 2.18 dBi in 2.4GHz band and 4.5 dBi in 5.8GHz band, fulfill the requirement of this section. Please refer to the EUT photos.

**Result:** Compliance.

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**FCC §15.209, §15.205 , §15.407(b) & RSS-247 §6.2, RSS-GEN§8.10–  
UNWANTED EMISSION**

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**Applicable Standard**

According to FCC §15.407; §15.209; §15.205;

(b) *Undesirable emission limits.* Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

(1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

(2) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

(3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

(4) For transmitters operating in the 5.725-5.85 GHz band:

(i) All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

(ii) Devices certified before March 2, 2017 with antenna gain greater than 10 dBi may demonstrate compliance with the emission limits in §15.247(d), but manufacturing, marketing and importing of devices certified under this alternative must cease by March 2, 2018. Devices certified before March 2, 2018 with antenna gain of 10 dBi or less may demonstrate compliance with the emission limits in §15.247(d), but manufacturing, marketing and importing of devices certified under this alternative must cease before March 2, 2020.

(5) The emission measurements shall be performed using a minimum resolution bandwidth of 1 MHz. A lower resolution bandwidth may be employed near the band edge, when necessary, provided the measured energy is integrated to show the total power over 1 MHz.

(6) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in §15.207.

(7) The provisions of §15.205 apply to intentional radiators operating under this section.

(8) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the upper and lower frequency band edges as the design of the equipment permits.

According to RSS-247§6.2

### **Frequency band 5150-5250 MHz**

#### **6.2.1.2 Unwanted emission limits**

For transmitters with operating frequencies in the band 5150-5250 MHz, all emissions outside the band 5150-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p. Any unwanted emissions that fall into the band 5250-5350 MHz shall be attenuated below the channel power by at least 26 dB, when measured using a resolution bandwidth between 1 and 5% of the occupied bandwidth (i.e. 99% bandwidth), above 5250 MHz. The 26 dB bandwidth may fall into the 5250-5350 MHz band; however, if the occupied bandwidth also falls within the 5250-5350 MHz band, the transmission is considered as intentional and the devices shall comply with all requirements in the band 5250-5350 MHz including implementing dynamic frequency selection (DFS) and TPC, on the portion of the emission that resides in the 5250-5350 MHz band.

### **Frequency band 5250-5350 MHz**

#### **6.2.2.2 Unwanted emission limits**

Devices shall comply with the following:

- a) All emissions outside the band 5250-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p.; or
- b) All emissions outside the band 5150-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p. and its power shall comply with the spectral power density for operation within the band 5150-5250 MHz. The device, except devices installed in vehicles, shall be labelled or include in the user manual the following text “for indoor use only.”

### **Frequency bands 5470-5600 MHz and 5650-5725 MHz:**

#### **6.2.3.2 Unwanted emission limits**

Emissions outside the band 5470-5600 MHz and 5650-5725 MHz shall not exceed -27 dBm/MHz e.i.r.p. However, devices with bandwidth overlapping the band edge of 5725 MHz can meet the emission limit of -27 dBm/MHz e.i.r.p. at 5850 MHz instead of 5725 MHz.

## Frequency band 5725-5850 MHz

### 6.2.4.2 Unwanted emission limits

Devices operating in the band 5725-5850 MHz with antenna gain greater than 10 dBi can have unwanted emissions that comply with either the limits in this section or in section 5.5 until six (6) months after the publication date of this standard for certification. Certified devices that do not comply with emission limits in this section shall not be manufactured, imported, distributed, leased, offered for sale or sold after April 1, 2018.

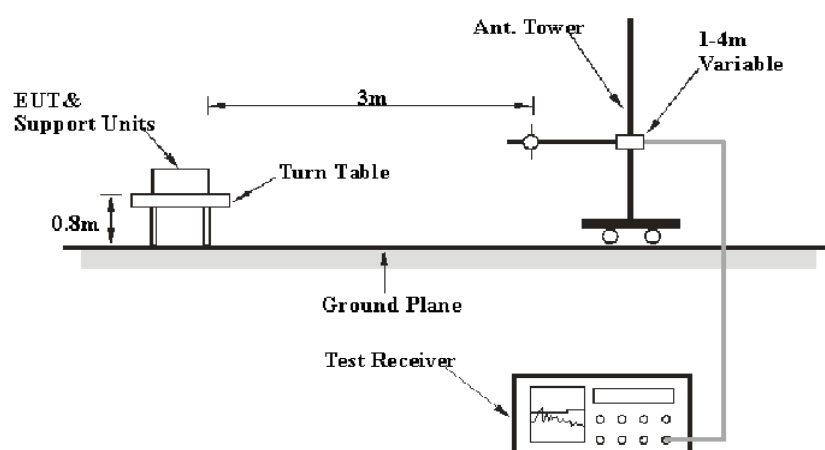
Devices operating in the band 5725-5850 MHz with antenna gain of 10 dBi or less can have unwanted emissions that comply with either the limits in this section or in section 5.5 until April 1, 2018 for certification. Certified devices that do not comply with emission limits in this section shall not be manufactured, imported, distributed, leased, offered for sale or sold after April 1, 2020.

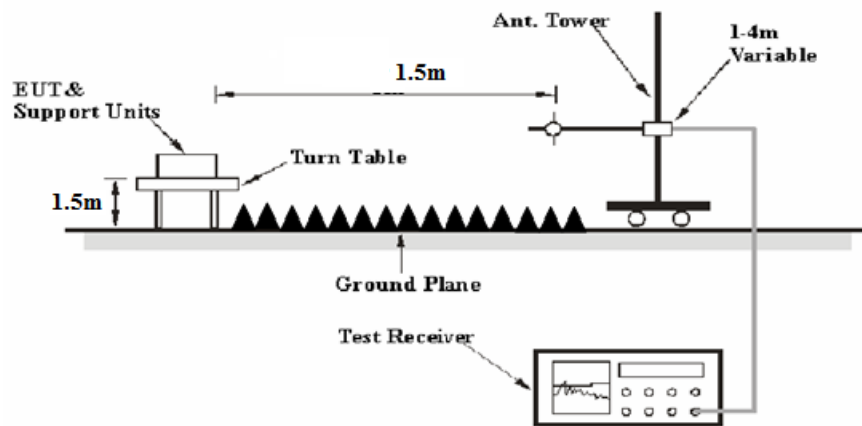
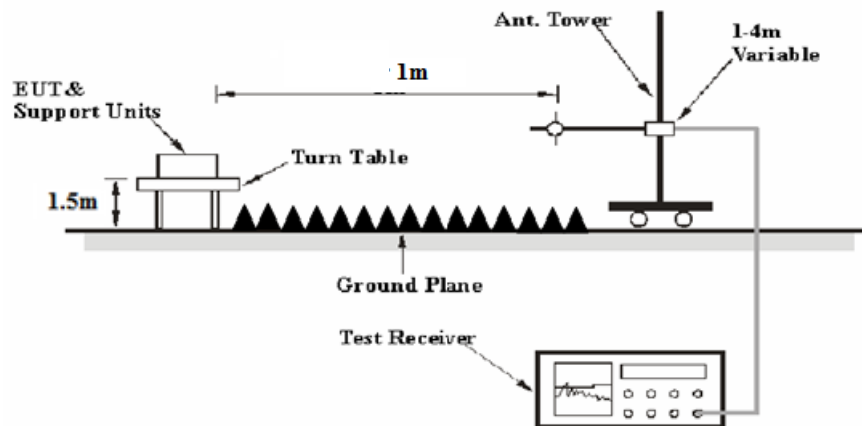
Devices operating in the band 5725-5850 MHz shall have e.i.r.p. of unwanted emissions comply with the following:

- 27 dBm/MHz at frequencies from the band edges decreasing linearly to 15.6 dBm/MHz at 5 MHz above or below the band edges;
- 15.6 dBm/MHz at 5 MHz above or below the band edges decreasing linearly to 10 dBm/MHz at 25 MHz above or below the band edges;
- 10 dBm/MHz at 25 MHz above or below the band edges decreasing linearly to -27 dBm/MHz at 75 MHz above or below the band edges; and
- 27 dBm/MHz at frequencies more than 75 MHz above or below the band edges.

## EUT Setup

### Below 1 GHz:



**1-26.5 GHz:****26.5-40 GHz:**

The radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209, FCC 15.407 and RSS-247, RSS-Gen 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.

**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:

30-1000MHz:

| Measurement | RBW     | Video B/W | IF B/W |
|-------------|---------|-----------|--------|
| QP          | 120 kHz | 300 kHz   | 120kHz |

1GHz- 40GHz:

| Measurement | Duty cycle | RBW  | Video B/W |
|-------------|------------|------|-----------|
| PK          | Any        | 1MHz | 3 MHz     |
| Ave.        | >98%       | 1MHz | 10 Hz     |
|             | <98%       | 1MHz | 1/T       |

### Test Procedure

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.

According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01, emission shall be computed as:  $E [dB\mu V/m] = EIRP[dBm] + 95.2$ , for  $d = 3$  meters.

According to C63.10, the above 1G test result shall be extrapolated to the specified distance using an extrapolation factor of 20dB/decade from 3m to 1.5m or 1m

Distance extrapolation factor =  $20 \log (\text{specific distance} [3m]/\text{test distance} [1.5m])$  dB= 6.02 dB  
or

Distance extrapolation factor =  $20 \log (\text{specific distance} [3m]/\text{test distance} [1m])$  dB= 9.54 dB

All emissions under the average limit and under the noise floor have not recorded in the report.

### Corrected Amplitude & Margin Calculation

For the range 30MHz-1GHz, 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:

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

For the range 1GHz-40GHz, Test performed at 1.5m, the Corrected Amplitude is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading and the Distance extrapolation factor. The basic equation is as follows:

Extrapolation result

$$= \text{Meter Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} - \text{Distance extrapolation factor}$$

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:

$$\text{Margin} = \text{Limit} - \text{Extrapolation result}$$

**Test Equipment List and Details**

| Manufacturer          | Description          | Model                  | Serial Number  | Calibration Date | Calibration Due Date |
|-----------------------|----------------------|------------------------|----------------|------------------|----------------------|
| Sunol Sciences        | Antenna              | JB3                    | A060611-1      | 2017-11-10       | 2020-11-10           |
| R&S                   | EMI Test Receiver    | ESCI                   | 100224         | 2017-12-11       | 2018-12-11           |
| HP                    | Amplifier            | 8447D                  | 2727A05902     | 2017-09-05       | 2018-09-05           |
| N/A                   | Coaxial Cable        | 4m                     | C-0400-01      | 2017-09-05       | 2018-09-05           |
| N/A                   | Coaxial Cable        | 0.75m                  | C-0075-01      | 2017-09-05       | 2018-09-05           |
| N/A                   | Coaxial Cable        | 10m                    | C-1000-01      | 2017-09-05       | 2018-09-05           |
| Agilent               | Spectrum Analyzer    | E4440A                 | SG43360054     | 2018-01-04       | 2019-01-04           |
| ETS-Lindgren          | Horn Antenna         | 3115                   | 000 527 35     | 2016-01-05       | 2019-01-05           |
| MITEQ                 | Amplifier            | AFS42-00101800-25-S-42 | 2001271        | 2017-09-05       | 2018-09-05           |
| Ducommun Technologies | Horn Antenna         | ARH-4223-02            | 1007726-021304 | 2017-06-16       | 2020-06-15           |
| Ducommun Technologies | Horn Antenna         | ARH-2823-02            | 1007726-011302 | 2016-11-18       | 2019-11-18           |
| Quinstar              | Amplifier            | QLW-18405536-JO        | 15964001001    | 2017-06-27       | 2018-06-27           |
| unknown               | Coaxial Cable        | 8m                     | C0800/01       | 2017-09-05       | 2018-09-05           |
| R&S                   | Spectrum Analyzer    | FSP 38                 | 100478         | 2017-12-08       | 2018-12-08           |
| Chengdu OuLi          | Bandrejection Filter | 5725-5850              | 005            | 2017-09-05       | 2018-09-05           |
| Farad                 | Test Software        | EZ-EMC                 | V1.1.4.2       | N/A              | N/A                  |

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

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

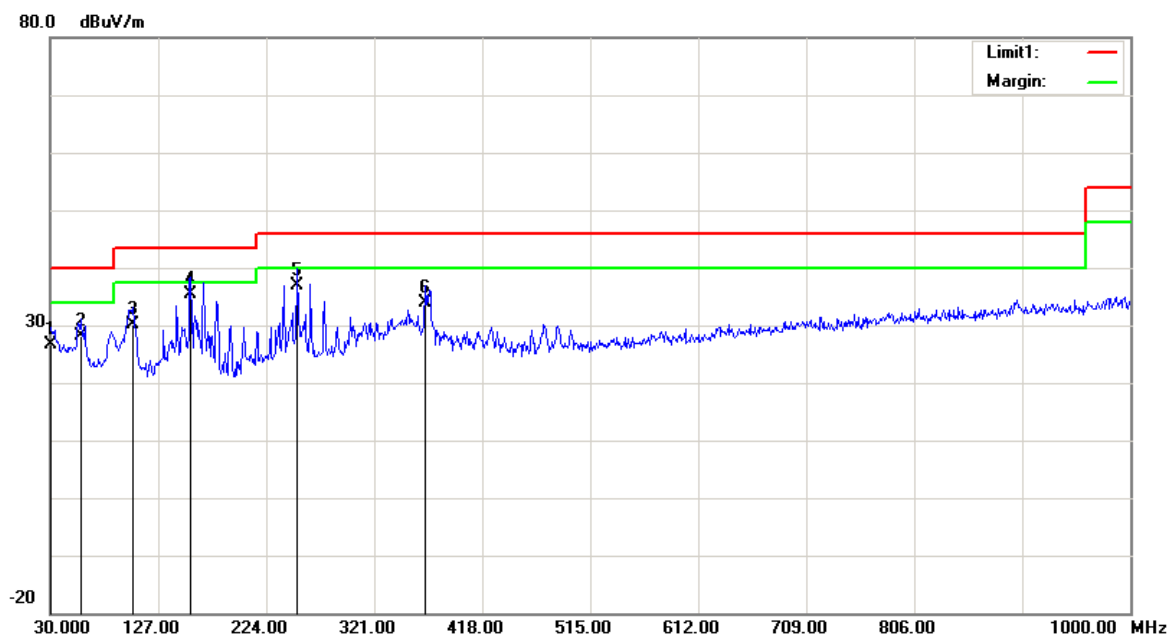
|                           |                |
|---------------------------|----------------|
| <b>Temperature:</b>       | 25 ~ 25.1 °C   |
| <b>Relative Humidity:</b> | 49 ~ 50 %      |
| <b>ATM Pressure:</b>      | 100.9 ~101 kPa |

The testing was performed by Vern Shen & Harry Yang on 2018-05-13 & 2018-05-14.

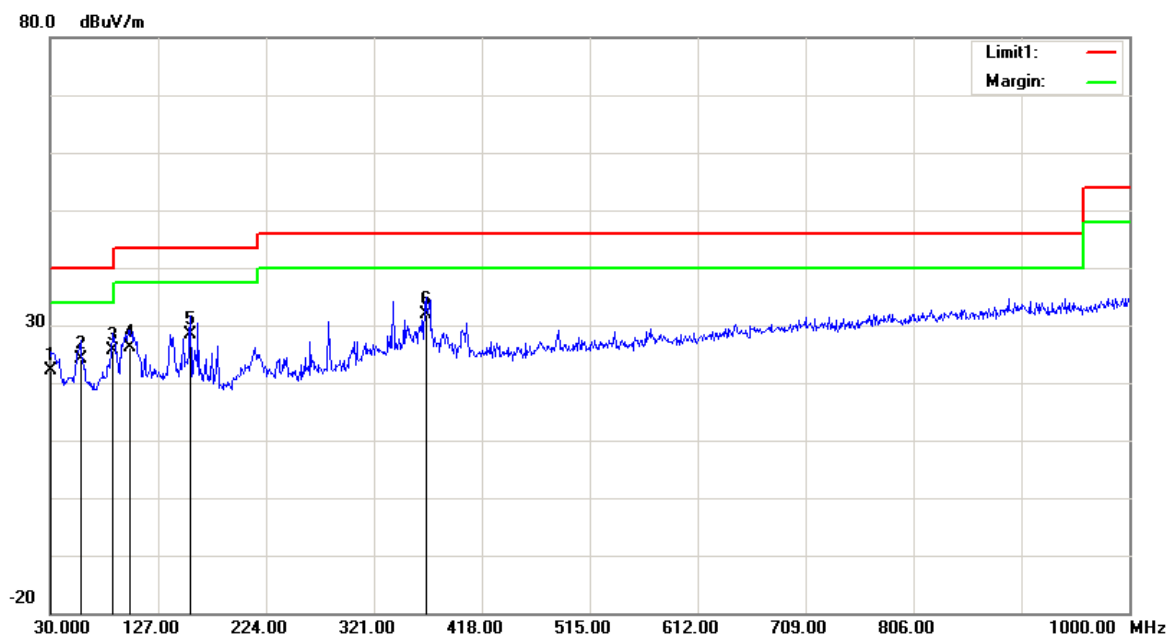
Test Mode: Transmitting

## 1) 30MHz-1GHz(Middle channel was the worst):

## Horizontal:



| Frequency (MHz) | Receiver Reading (dBμV) | Detector | Correction Factor (dB/m) | Cord. Amp. (dBμV/m) | Limit (dBμV/m) | Margin (dB) |
|-----------------|-------------------------|----------|--------------------------|---------------------|----------------|-------------|
| 30.9700         | 25.79                   | QP       | 0.81                     | 26.60               | 40.00          | 13.40       |
| 57.1600         | 40.45                   | QP       | -12.35                   | 28.10               | 40.00          | 11.90       |
| 103.7200        | 38.01                   | QP       | -7.91                    | 30.10               | 43.50          | 13.40       |
| 156.1000        | 41.24                   | QP       | -5.94                    | 35.30               | 43.50          | 8.20        |
| 252.1300        | 42.95                   | QP       | -6.15                    | 36.80               | 46.00          | 9.20        |
| 366.5900        | 36.57                   | QP       | -2.77                    | 33.80               | 46.00          | 12.20       |

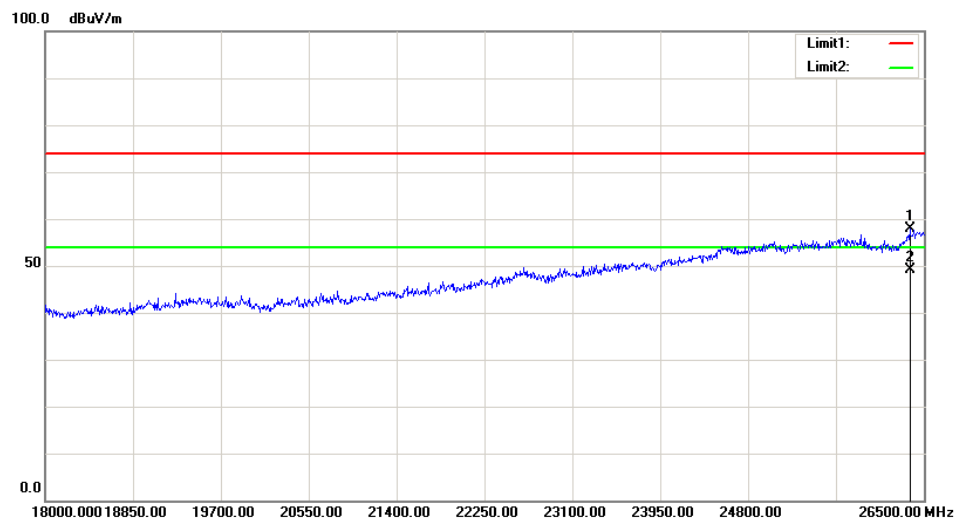
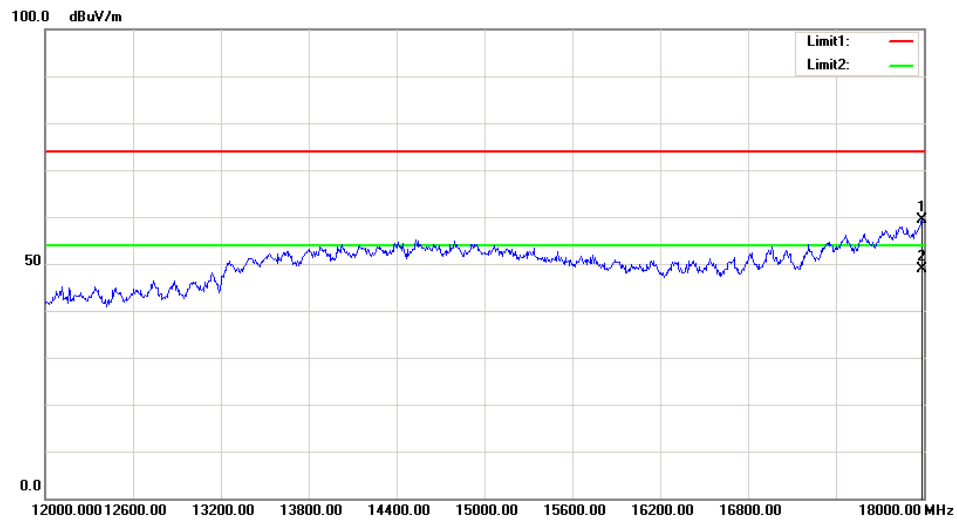
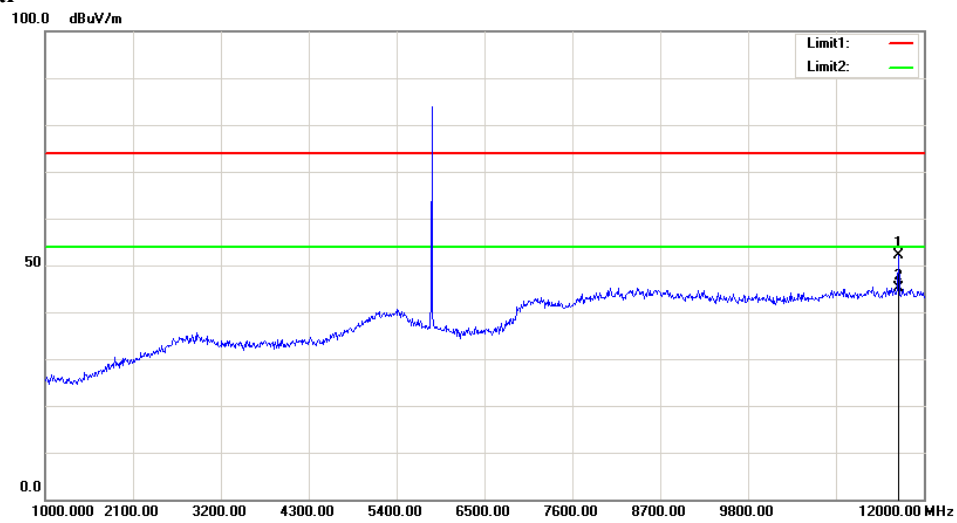
**Vertical:**

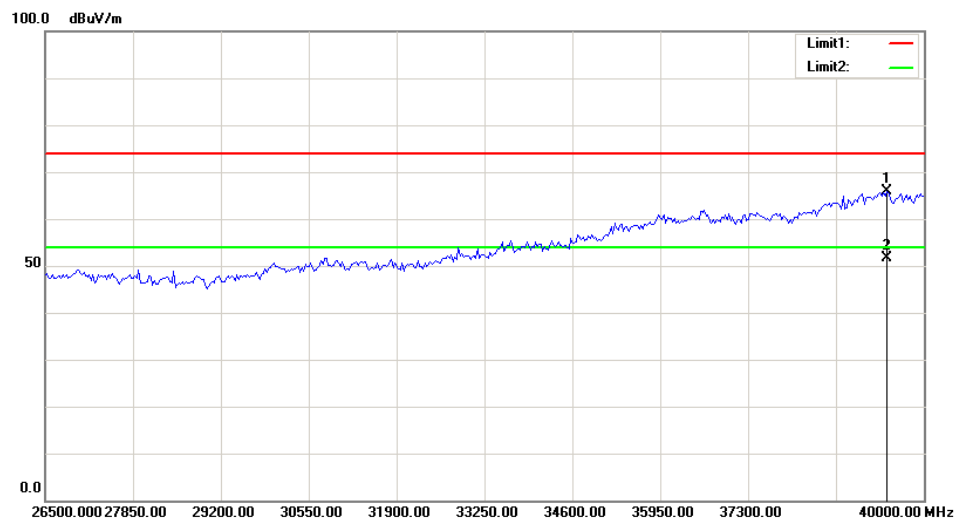
| Frequency (MHz) | Receiver Reading (dB $\mu$ V) | Detector | Correction Factor (dB/m) | Cord. Amp. (dB $\mu$ V/m) | Limit (dB $\mu$ V/m) | Margin (dB) |
|-----------------|-------------------------------|----------|--------------------------|---------------------------|----------------------|-------------|
| 30.0000         | 20.66                         | QP       | 1.54                     | 22.20                     | 40.00                | 17.80       |
| 57.1600         | 36.55                         | QP       | -12.35                   | 24.20                     | 40.00                | 15.80       |
| 86.2600         | 37.22                         | QP       | -11.52                   | 25.70                     | 40.00                | 14.30       |
| 101.7800        | 34.61                         | QP       | -8.41                    | 26.20                     | 43.50                | 17.30       |
| 156.1000        | 34.44                         | QP       | -5.94                    | 28.50                     | 43.50                | 15.00       |
| 367.5600        | 34.67                         | QP       | -2.77                    | 31.90                     | 46.00                | 14.10       |

## 2) 1-40GHz:

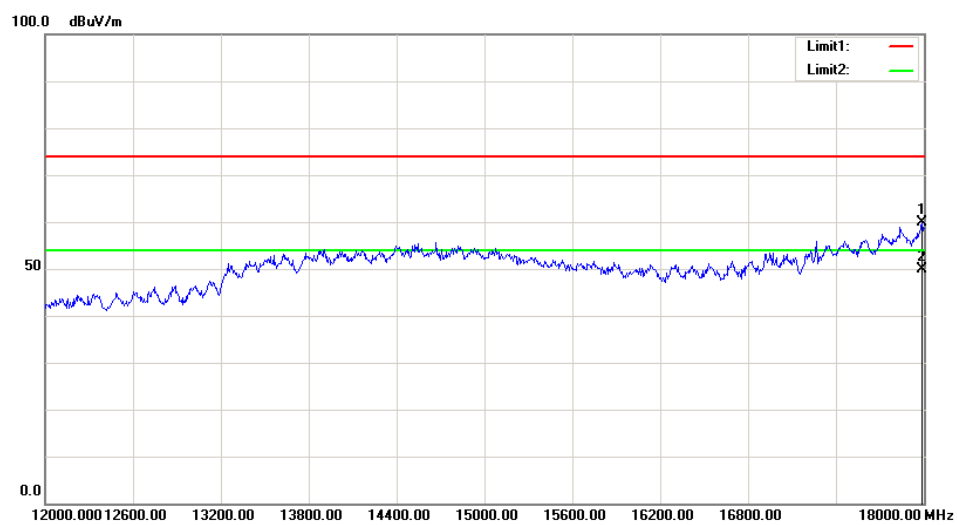
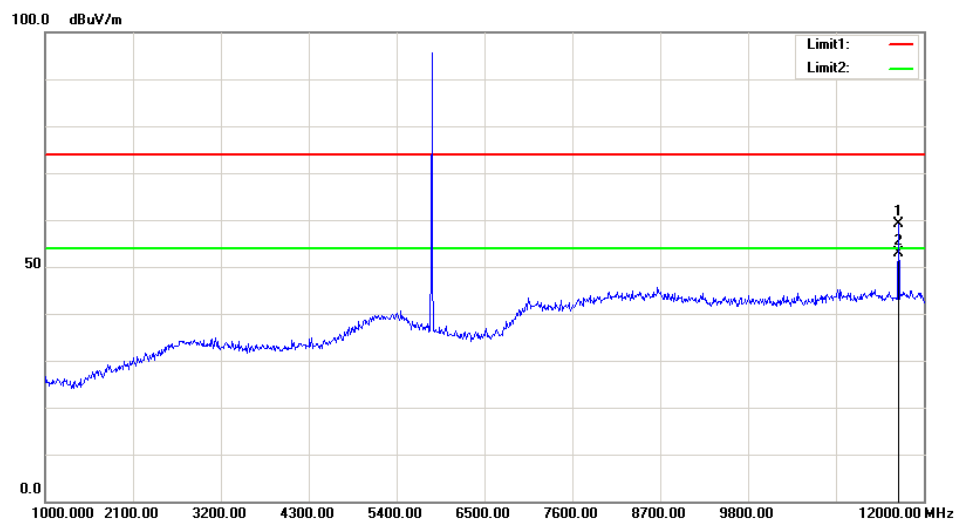
| Frequency<br>(MHz)       | Receiver          |          | Rx Antenna     |                  | Cable<br>loss<br>(dB) | Amplifier<br>Gain<br>(dB) | Corrected<br>Amplitude<br>(dBμV/m) | Extrapolation<br>result<br>(dBμV/m) | Limit<br>(dBμV/m) | Margin<br>(dB) |
|--------------------------|-------------------|----------|----------------|------------------|-----------------------|---------------------------|------------------------------------|-------------------------------------|-------------------|----------------|
|                          | Reading<br>(dBμV) | Detector | Polar<br>(H/V) | Factor<br>(dB/m) |                       |                           |                                    |                                     |                   |                |
| Low Channel: 5729 MHz    |                   |          |                |                  |                       |                           |                                    |                                     |                   |                |
| 5729.00                  | 78.13             | PK       | H              | 34.19            | 3.69                  | 0.00                      | 116.01                             | 109.99                              | N/A               | N/A            |
| 5729.00                  | 76.64             | AV       | H              | 34.19            | 3.69                  | 0.00                      | 114.52                             | 108.5                               | N/A               | N/A            |
| 5729.00                  | 91.25             | PK       | V              | 34.19            | 3.69                  | 0.00                      | 129.13                             | 123.11                              | N/A               | N/A            |
| 5729.00                  | 89.81             | AV       | V              | 34.19            | 3.69                  | 0.00                      | 127.69                             | 121.67                              | N/A               | N/A            |
| 5725.00                  | 57.81             | PK       | V              | 34.19            | 3.69                  | 0.00                      | 95.69                              | 89.67                               | 122.20            | 32.53          |
| 5720.00                  | 42.36             | PK       | V              | 34.19            | 3.69                  | 0.00                      | 80.24                              | 74.22                               | 110.80            | 36.58          |
| 5700.00                  | 28.44             | PK       | V              | 34.18            | 3.68                  | 0.00                      | 66.30                              | 60.28                               | 105.20            | 44.92          |
| 5650.00                  | 25.43             | PK       | V              | 34.16            | 3.63                  | 0.00                      | 63.22                              | 57.2                                | 68.20             | 11.00          |
| 11458.00                 | 56.14             | PK       | V              | 38.96            | 6.59                  | 37.33                     | 64.36                              | 58.34                               | 74.00             | 15.66          |
| 11458.00                 | 50.45             | AV       | V              | 38.96            | 6.59                  | 37.33                     | 58.67                              | 52.65                               | 54.00             | 1.35           |
| 17187.00                 | 50.66             | PK       | V              | 41.28            | 8.77                  | 38.64                     | 62.07                              | 56.05                               | 74.00             | 17.95          |
| 17187.00                 | 44.38             | AV       | V              | 41.28            | 8.77                  | 38.64                     | 55.79                              | 49.77                               | 54.00             | 4.23           |
| Middle Channel: 5775 MHz |                   |          |                |                  |                       |                           |                                    |                                     |                   |                |
| 5775.00                  | 75.76             | PK       | H              | 34.21            | 3.70                  | 0.00                      | 113.67                             | 107.65                              | N/A               | N/A            |
| 5775.00                  | 74.11             | AV       | H              | 34.21            | 3.70                  | 0.00                      | 112.02                             | 106                                 | N/A               | N/A            |
| 5775.00                  | 89.62             | PK       | V              | 34.21            | 3.70                  | 0.00                      | 127.53                             | 121.51                              | N/A               | N/A            |
| 5775.00                  | 88.17             | AV       | V              | 34.21            | 3.70                  | 0.00                      | 126.08                             | 120.06                              | N/A               | N/A            |
| 11550.00                 | 54.83             | PK       | V              | 39.00            | 6.61                  | 37.42                     | 63.02                              | 57                                  | 74.00             | 17.00          |
| 11550.00                 | 47.85             | AV       | V              | 39.00            | 6.61                  | 37.42                     | 56.04                              | 50.02                               | 54.00             | 3.98           |
| 17325.00                 | 50.65             | PK       | V              | 42.09            | 8.80                  | 38.54                     | 63.00                              | 56.98                               | 74.00             | 17.02          |
| 17325.00                 | 44.68             | AV       | V              | 42.09            | 8.80                  | 38.54                     | 57.03                              | 51.01                               | 54.00             | 2.99           |
| High Channel: 5843 MHz   |                   |          |                |                  |                       |                           |                                    |                                     |                   |                |
| 5843.00                  | 74.33             | PK       | H              | 34.24            | 3.74                  | 0.00                      | 112.31                             | 106.29                              | N/A               | N/A            |
| 5843.00                  | 72.91             | AV       | H              | 34.24            | 3.74                  | 0.00                      | 110.89                             | 104.87                              | N/A               | N/A            |
| 5843.00                  | 88.96             | PK       | V              | 34.24            | 3.74                  | 0.00                      | 126.94                             | 120.92                              | N/A               | N/A            |
| 5843.00                  | 87.36             | AV       | V              | 34.24            | 3.74                  | 0.00                      | 125.34                             | 119.32                              | N/A               | N/A            |
| 5850.00                  | 43.90             | PK       | V              | 34.24            | 3.75                  | 0.00                      | 81.89                              | 75.87                               | 122.20            | 46.33          |
| 5855.00                  | 35.18             | PK       | V              | 34.24            | 3.75                  | 0.00                      | 73.17                              | 67.15                               | 110.80            | 43.65          |
| 5875.00                  | 26.48             | PK       | V              | 34.25            | 3.77                  | 0.00                      | 64.50                              | 58.48                               | 105.20            | 46.72          |
| 5925.00                  | 24.73             | PK       | V              | 34.27            | 3.80                  | 0.00                      | 62.80                              | 56.78                               | 68.20             | 11.42          |
| 11686.00                 | 57.63             | PK       | V              | 39.00            | 6.65                  | 37.57                     | 65.71                              | 59.69                               | 74.00             | 14.31          |
| 11686.00                 | 50.75             | AV       | V              | 39.00            | 6.65                  | 37.57                     | 58.83                              | 52.81                               | 54.00             | 1.19           |
| 17529.00                 | 51.33             | PK       | V              | 43.28            | 8.85                  | 38.39                     | 65.07                              | 59.05                               | 74.00             | 14.95          |
| 17529.00                 | 44.95             | AV       | V              | 43.28            | 8.85                  | 38.39                     | 58.69                              | 52.67                               | 54.00             | 1.33           |

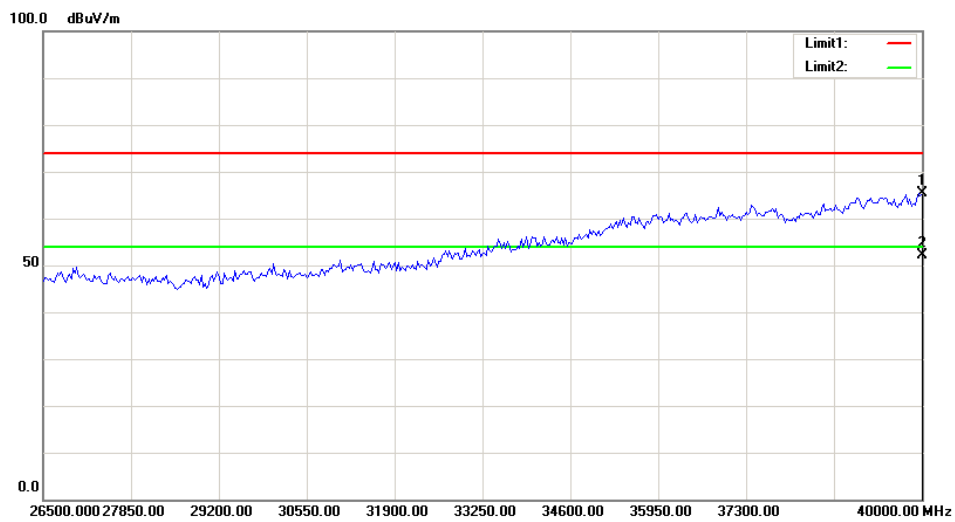
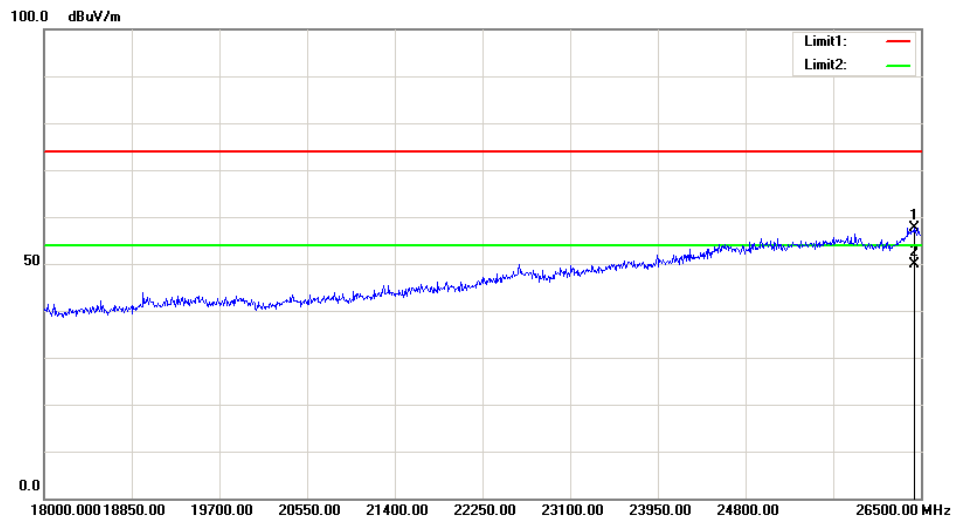
# **Worst plots(Middle channel)** **Horizontal**





## Vertical





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