

**FCC PART 15.407**  
**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-P1F11803**  
**IC: 23060-P1F11803**

<b>Report Type:</b> Original Report	<b>Product Name:</b> Force Pro
<b>Report Number:</b>	RDG180325002-00C
<b>Report Date:</b>	2018-04-13
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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).

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FINAL

## GENERAL INFORMATION

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

<b>EUT Name:</b>	Force Pro
<b>EUT Model:</b>	PIF1
<b>FCC ID:</b>	2ANDR-PIF11803
<b>IC:</b>	23060-PIF11803
<b>Rated Input Voltage:</b>	5Vdc from USB port or 9-26Vdc form DC power port
<b>External Dimension:</b>	73.5 mm (L) x 42 mm (W) x 288.7 mm (H)
<b>Serial Number:</b>	180325002
<b>EUT Received Date:</b>	2018-03-25

### 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, 15.207, 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.

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

FCC submissions with Part 15.247 DSS, FCC ID: 2ANDR-PIF11803.

FCC submissions with Part 15B JAB, FCC ID: 2ANDR-PIF11803.

ISED submissions with RSS-247 FHSs, IC: 23060-PIF11803.

Part of system submissions with 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 200M~1GHz: 4.83 dB for Horizontal, 5.85 dB for Vertical 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.

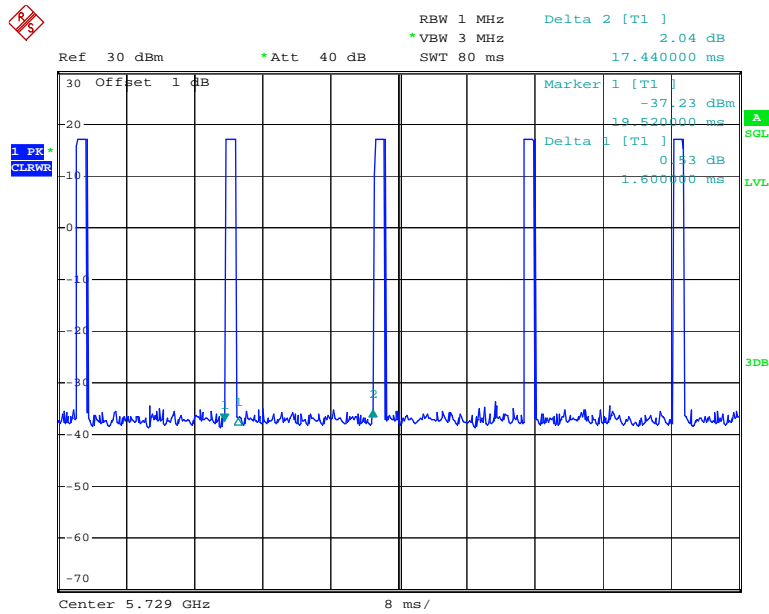
### EUT Exercise Software

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

The duty cycle as below:

T <sub>on</sub> (ms)	T <sub>on+off</sub> (ms)	Duty Cycle (%)
1.60	17.44	9.17



Date: 27.MAR.2018 14:10:52

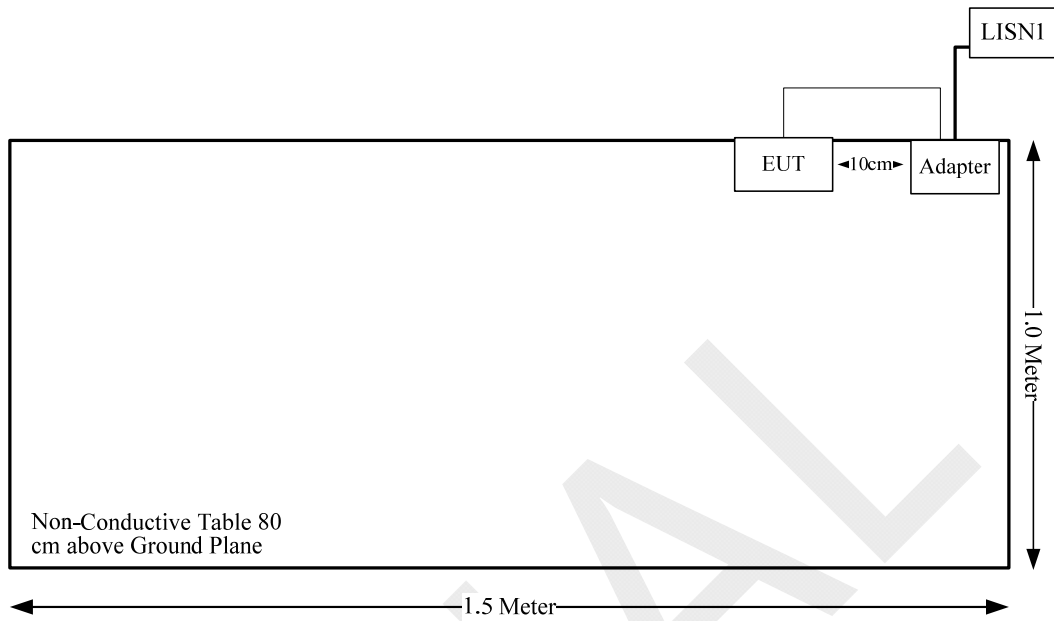
**Support Equipment List and Details**

Manufacturer	Description	Model	Serial Number
HUAWEI	Adapter	HW-050000C01	N/A

**Support Cable List and Details**

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
USB Cable	Yes	No	1.2	Adapter	EUT

### Block Diagram of Test Setup





**SUMMARY OF TEST RESULTS**

<b>Rules</b>	<b>Description of Test</b>	<b>Result</b>
FCC §15.407 (f) & §1.1310 & §2.1093 RSS-102 §4	RF Exposure	Compliance
FCC§15.203 RSS-GEN§8.3	Antenna Requirement	Compliance
FCC§15.207 (a) RSS-Gen §8.8	AC Line Conducted Emissions	Compliance
FCC§15.205& §15.209 &§15.407(b) RSS-247§6.2	Undesirable Emission& Restricted Bands	Compliance
FCC§15.407(b) (1),(2),(3),(4) RSS-247§6.2	Out Of Band Emissions	Compliance
FCC§15.407(a) RSS-247 §6.2 RSS-Gen§6.6	Emission Bandwidth	Compliance
FCC§15.407(a) RSS-247 §6.2	Conducted Transmitter Output Power	Compliance
FCC§15.407 (a) RSS-247 §6.2	Power Spectral Density	Compliance
FCC§15.407(g)	Frequency stability	Compliance

**FCC §15.407 (f) & §1.1310 & §2.1093 , RSS-102 §4- RF EXPOSURE****Applicable Standard**

According to subpart 15.407(f), §1.1310 and §2.1093.

According to RSS-102 §4 Table 3, SAR limits for device used by the general public

Body Region	Average SAR (W/Kg)	Averaging Time (minutes)	Mass Average (g)
Whole Body	0.08	6	Whole Body
Localized Head, Neck and Trunk	1.6	6	1
Localized Limbs	4	6	10

**Test Result**

Compliant, please refer to the SAR report: RDG180325002-20.

## **FCC §15.203 ,RSS-GEN§8.3- 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.

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 use a unique type of connector to attach 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.

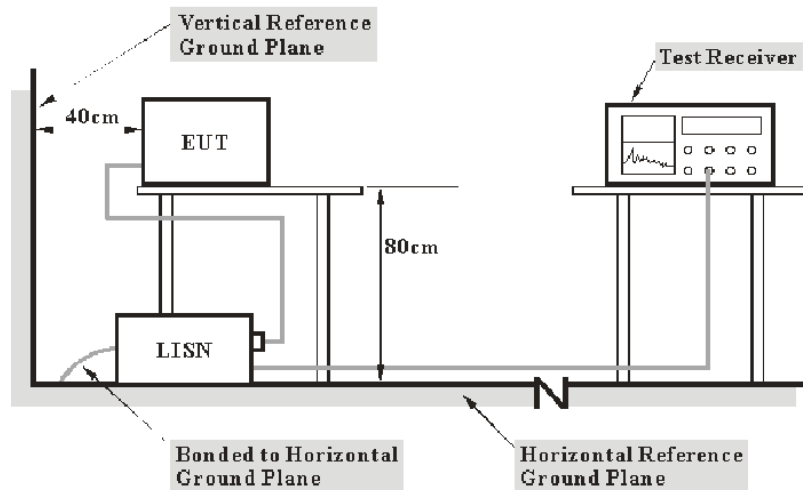
**Result:** Compliance.

**FCC §15.207(a) RSS-GEN CLAUSE 8.8– AC Line Conducted Emissions**

**Applicable Standard**

FCC §15.207(a), §15.407(b) (6), RSS-GEN CLAUSE 8.8.

**EUT Setup**



- Note: 1. Support units were connected to second LISN.  
 2. Both of LISNs (AMN) 80 cm from EUT and at 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 and RSS-Gen clause 8.8 limits.

The spacing between the peripherals was 10 cm.

The adapter was connected to the main lisen with a 120 V/60 Hz AC 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:

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

## Corrected Amplitude & Margin Calculation

The basic equation is as follows:

$$V_C = V_R + A_C + VDF$$

$$C_f = A_C + VDF$$

Herein,

$V_C$  (cord. Reading): corrected voltage amplitude

$V_R$ : reading voltage amplitude

$A_C$ : attenuation caused by cable loss

VDF: voltage division factor of AMN

$C_f$ : Correction Factor

The “**Margin**” column of the following data tables indicates the degree of compliance within 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 Procedure

During the conducted emission test, the adapter was connected to the first 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 Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESCS 30	830245/006	2017-12-11	2018-12-11
R&S	L.I.S.N	ESH2-Z5	892107/021	2017-09-25	2018-09-25
R&S	Two-line V-network	ENV 216	101614	2017-12-08	2018-12-08
R&S	Test Software	EMC32	Version8.53.0	N/A	N/A
N/A	Coaxial Cable	C-NJNJ-50	C-0200-01	2017-09-05	2018-09-05

\* **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

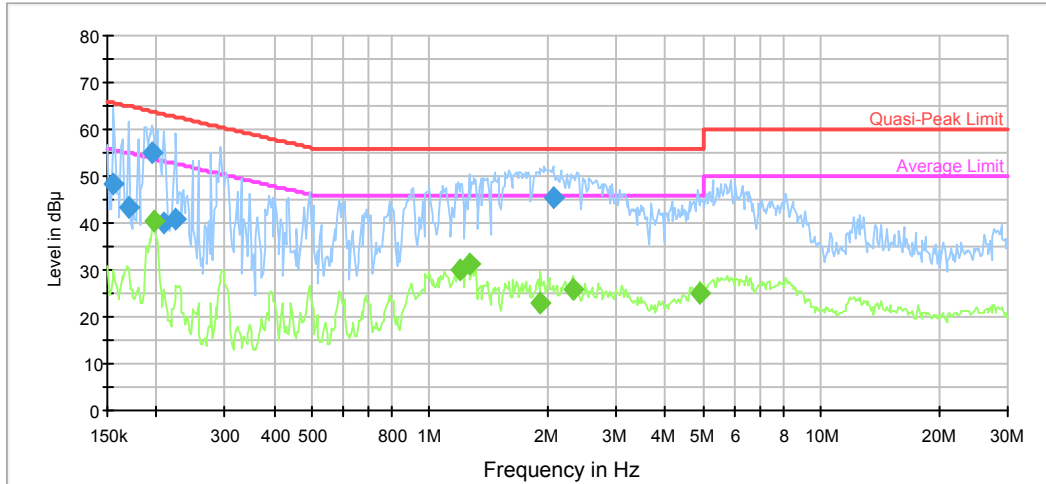
### Environmental Conditions

Temperature:	25.8 °C
Relative Humidity:	43 %
ATM Pressure:	100.8 kPa

*The testing was performed by Jim Zhang on 2018-03-29.*

Test Mode: Transmitting

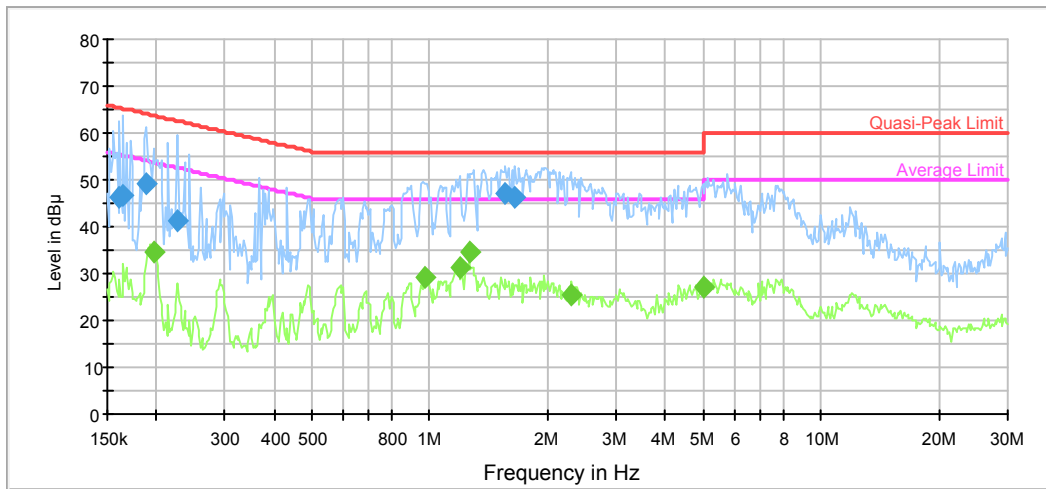
AC120 V, 60 Hz, Line:



Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.156097	48.3	9.000	L1	11.1	17.4	65.7	Compliance
0.170396	43.3	9.000	L1	10.9	21.6	64.9	Compliance
0.195114	54.9	9.000	L1	10.7	8.9	63.8	Compliance
0.209621	40.1	9.000	L1	10.6	23.1	63.2	Compliance
0.225205	40.8	9.000	L1	10.5	21.8	62.6	Compliance
2.063510	45.4	9.000	L1	9.7	10.6	56.0	Compliance

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.198249	40.6	9.000	L1	10.6	13.1	53.7	Compliance
1.190776	30.1	9.000	L1	9.8	15.9	46.0	Compliance
1.259081	31.1	9.000	L1	9.8	14.9	46.0	Compliance
1.920710	23.0	9.000	L1	9.7	23.0	46.0	Compliance
2.325491	26.0	9.000	L1	9.8	20.0	46.0	Compliance
4.918182	24.8	9.000	L1	9.8	21.2	46.0	Compliance

**AC120 V, 60 Hz, Neutral:**



Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.161152	46.2	9.000	N	11.0	19.2	65.4	Compliance
0.165051	46.5	9.000	N	11.0	18.7	65.2	Compliance
0.188994	49.3	9.000	N	10.7	14.8	64.1	Compliance
0.227007	41.4	9.000	N	10.5	21.2	62.6	Compliance
1.561306	47.2	9.000	N	9.7	8.8	56.0	Compliance
1.650866	46.2	9.000	N	9.7	9.8	56.0	Compliance

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.196675	34.4	9.000	N	10.6	19.3	53.7	Compliance
0.975701	29.0	9.000	N	9.8	17.0	46.0	Compliance
1.190776	31.1	9.000	N	9.8	14.9	46.0	Compliance
1.259081	34.5	9.000	N	9.8	11.5	46.0	Compliance
2.307034	25.6	9.000	N	9.8	20.4	46.0	Compliance
4.997188	27.0	9.000	N	9.8	19.0	46.0	Compliance

## **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.

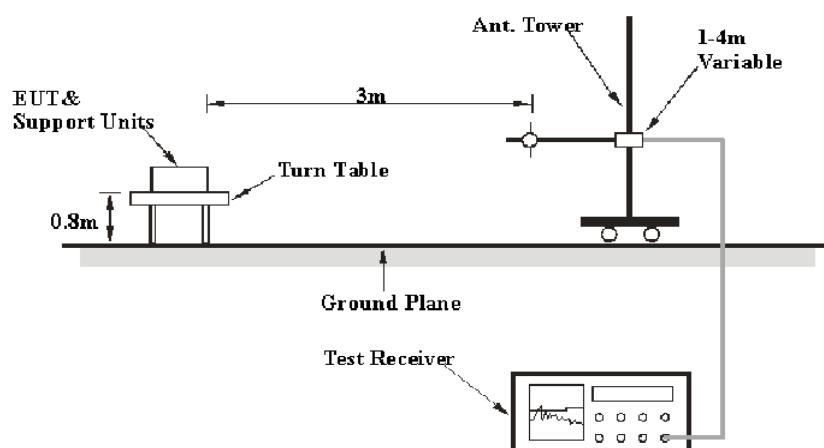
Devices operating in the band 5725-5850 MHz with antenna gain of 10 dBi or less can have unwanted emissions that comply with either the limits in this section or in section 5.5 until April 1, 2018 for certification. Certified devices that do not comply with emission limits in this section shall not be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

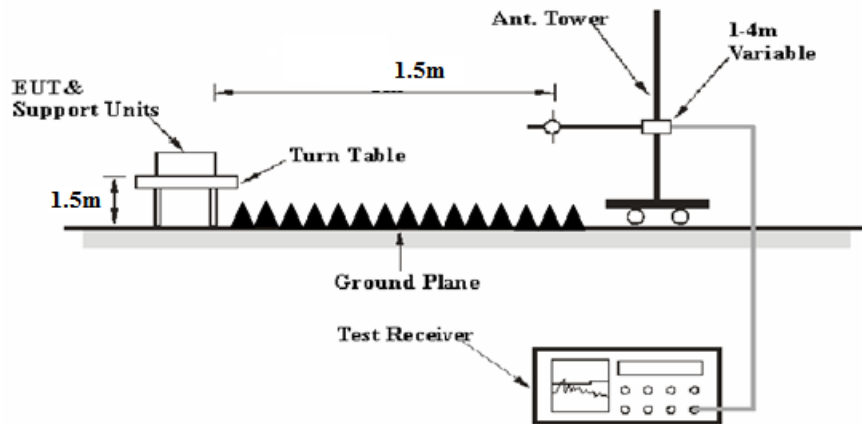
- a) 27 dBm/MHz at frequencies from the band edges decreasing linearly to 15.6 dBm/MHz at 5 MHz above or below the band edges;
- b) 15.6 dBm/MHz at 5 MHz above or below the band edges decreasing linearly to 10 dBm/MHz at 25 MHz above or below the band edges;
- c) 10 dBm/MHz at 25 MHz above or below the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

## EUT Setup

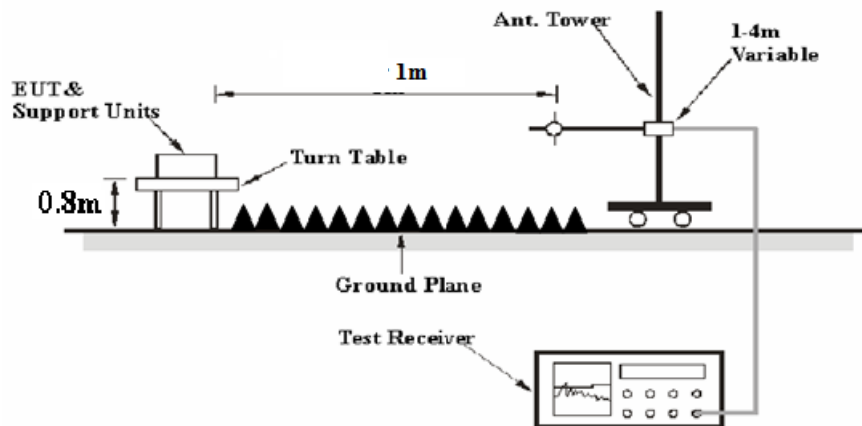
### Below 1 GHz:



**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:

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

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
R&S	EMI Test Receiver	ESCI	100224	2017-09-01	2018-09-01
Sunol Sciences	Antenna	JB3	A060611-2	2017-08-25	2020-08-25
HP	Amplifier	8447D	2727A05902	2017-09-05	2018-09-05
unknown	Coaxial Cable	4m	C0400/01	2017-09-05	2018-09-05
unknown	Coaxial Cable	0.75m	C0075/01	2017-09-05	2018-09-05
unknown	Coaxial Cable	10m	Force Pro000/01	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	1007726-02 1304	2017-06-16	2020-06-15
Ducommun Technologies	Horn Antenna	ARH-2823-02	1007726-01 1302	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	Bandrejector 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**

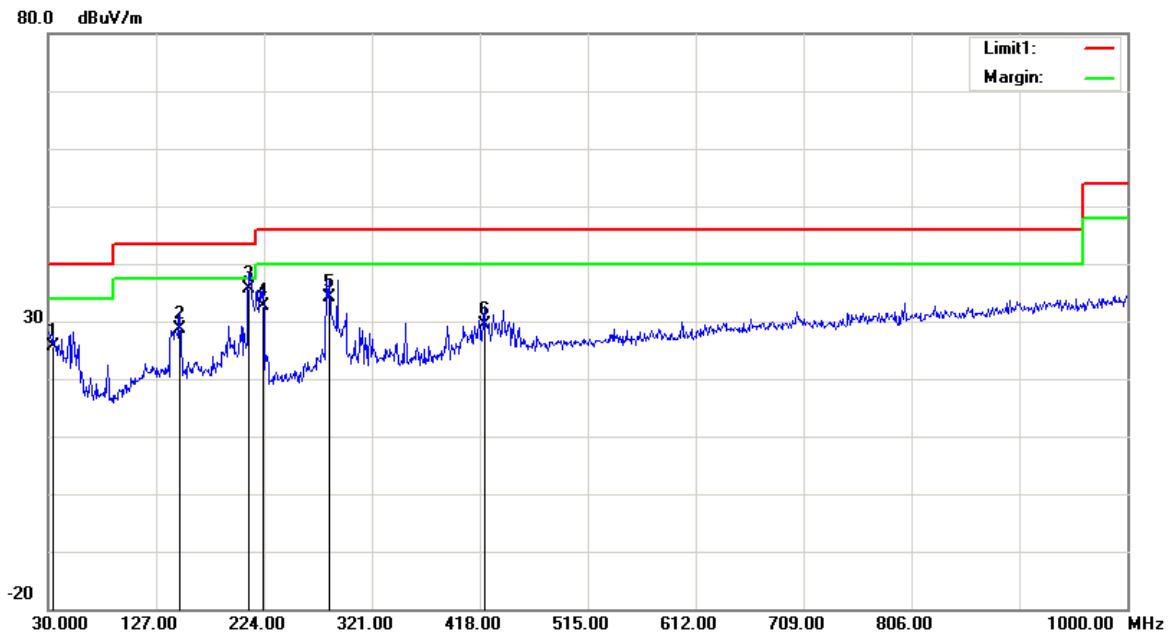
<b>Temperature:</b>	22.6 ~ 25.1 °C
<b>Relative Humidity:</b>	42 ~ 49 %
<b>ATM Pressure:</b>	100.8 ~100.9 kPa

*The testing was performed by Vern Shen & Harry Yang on 2018-03-28 & 2018-03-29.*

*Test Mode: Transmitting*

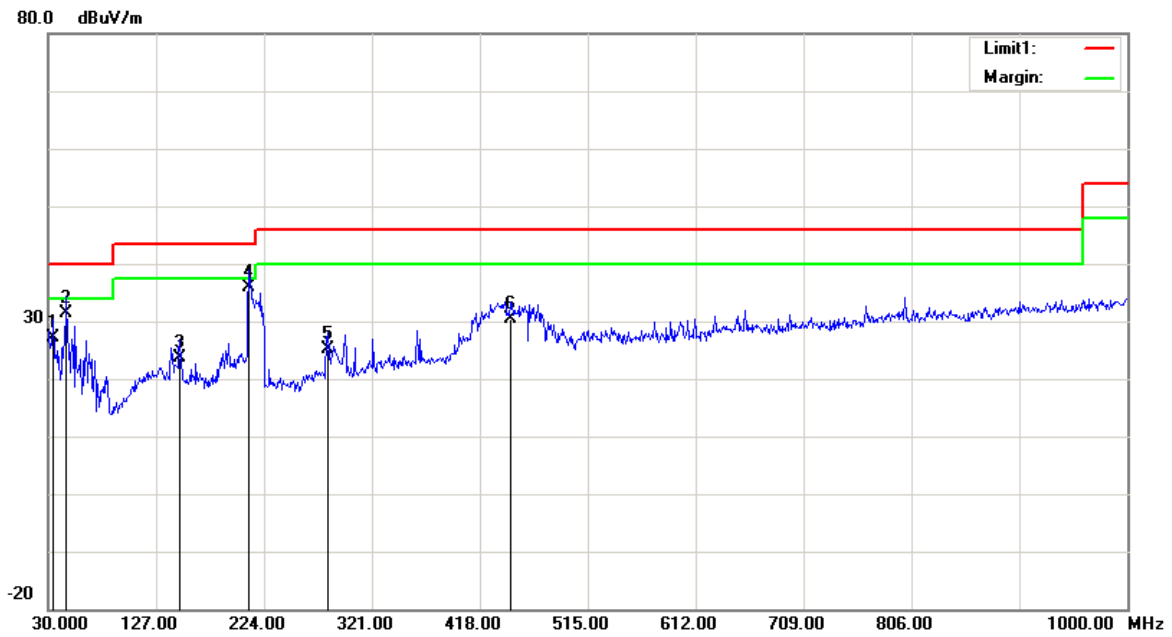
1) 30MHz-1GHz(Middle channel was the worst):

Horizontal:



Frequency (MHz)	Receiver Reading (dBμV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
34.8500	27.64	QP	-2.04	25.60	40.00	14.40
148.3400	34.64	QP	-6.04	28.60	43.50	14.90
210.4200	43.03	QP	-7.43	35.60	43.50	7.90
223.0300	39.46	QP	-6.86	32.60	46.00	13.40
282.2000	38.19	QP	-4.09	34.10	46.00	11.90
421.8800	31.11	QP	-1.61	29.50	46.00	16.50

**Vertical:**



Frequency (MHz)	Receiver Reading (dBµV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
34.8500	29.24	QP	-2.04	27.20	40.00	12.80
46.4900	41.40	QP	-9.90	31.50	40.00	8.50
148.3400	29.74	QP	-6.04	23.70	43.50	19.80
210.4200	43.33	QP	-7.43	35.90	43.50	7.60
281.2300	29.20	QP	-4.10	25.10	46.00	20.90
446.1300	31.66	QP	-1.26	30.40	46.00	15.60

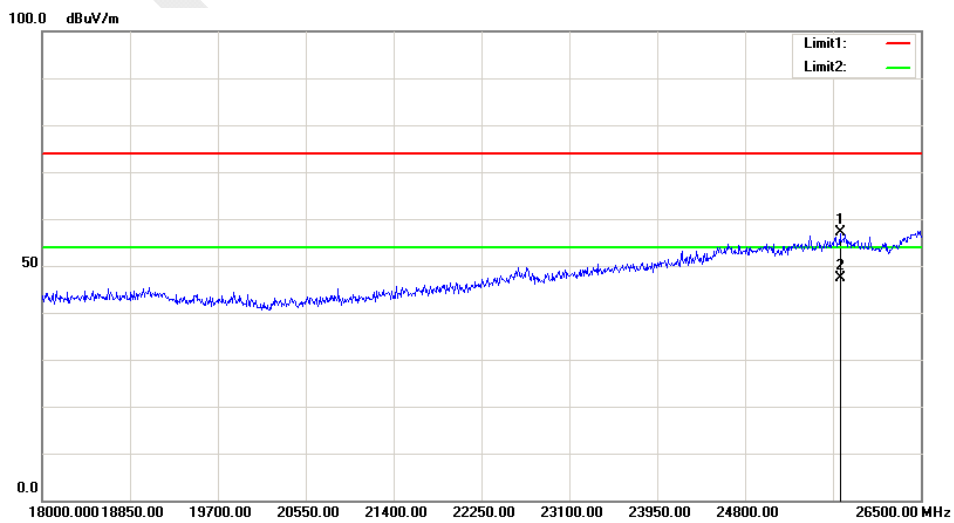
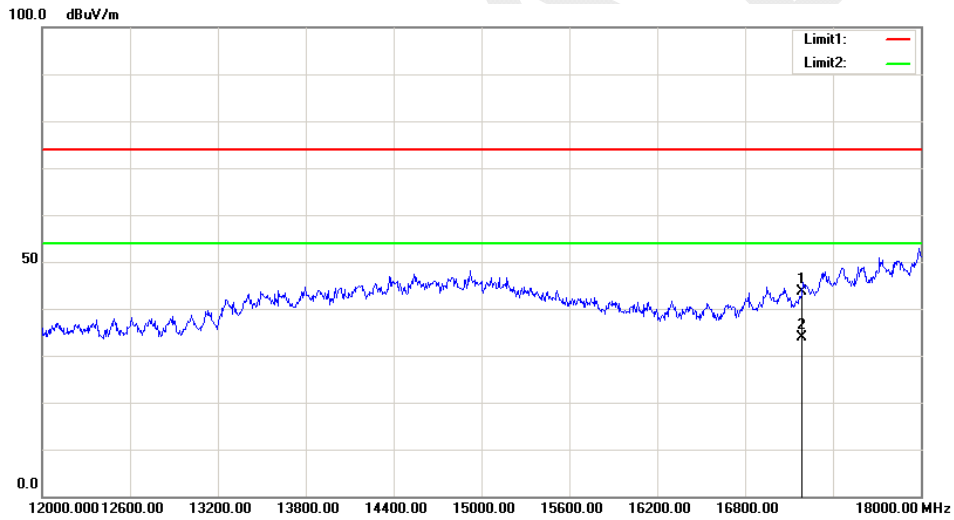
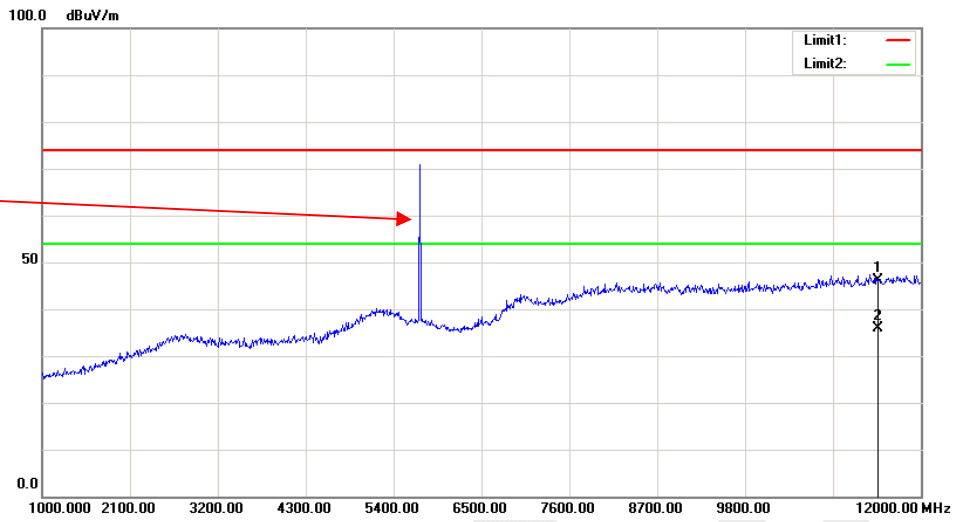
2) 1-40GHz:

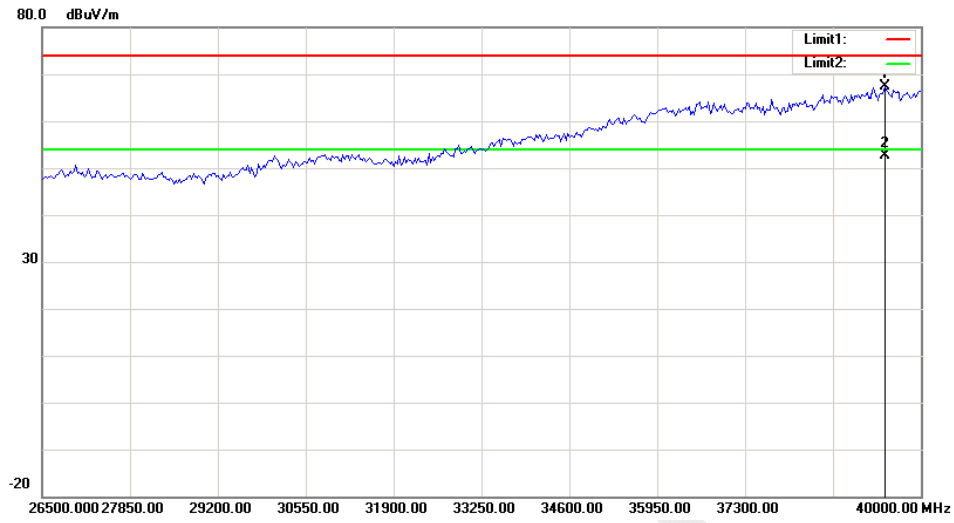
Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBµV/m)	Extrapolation result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	Detector	Polar (H/V)	Factor (dB/m)						
Low Channel: 5729 MHz										
5729.00	68.69	PK	H	34.19	3.69	0.00	106.57	100.55	N/A	N/A
5729.00	54.84	AV	H	34.19	3.69	0.00	92.72	86.7	N/A	N/A
5729.00	90.15	PK	V	34.19	3.69	0.00	128.03	122.01	N/A	N/A
5729.00	76.46	AV	V	34.19	3.69	0.00	114.34	108.32	N/A	N/A
5725.00	56.27	PK	V	34.19	3.69	0.00	94.15	88.13	122.20	34.07
5720.00	40.39	PK	V	34.19	3.69	0.00	78.27	72.25	110.80	38.55
5700.00	26.75	PK	V	34.18	3.68	0.00	64.61	58.59	105.20	46.61
5650.00	25.68	PK	V	34.16	3.63	0.00	63.47	57.45	68.20	10.75
11458.00	59.76	PK	V	38.96	6.59	37.33	67.98	61.96	74.00	12.04
11458.00	46.75	AV	V	38.96	6.59	37.33	54.97	48.95	54.00	5.05
17187.00	51.82	PK	V	41.28	8.77	38.64	63.23	57.21	74.00	16.79
17187.00	38.46	AV	V	41.28	8.77	38.64	49.87	43.85	54.00	10.15
Middle Channel: 5775 MHz										
5775.00	68.32	PK	H	34.21	3.70	0.00	106.23	100.21	N/A	N/A
5775.00	54.67	AV	H	34.21	3.70	0.00	92.58	86.56	N/A	N/A
5775.00	90.04	PK	V	34.21	3.70	0.00	127.95	121.93	N/A	N/A
5775.00	76.28	AV	V	34.21	3.70	0.00	114.19	108.17	N/A	N/A
11550.00	59.32	PK	V	39.00	6.61	37.42	67.51	61.49	74.00	12.51
11550.00	47.57	AV	V	39.00	6.61	37.42	55.76	49.74	54.00	4.26
17325.00	51.62	PK	V	42.09	8.80	38.54	63.97	57.95	74.00	16.05
17325.00	38.29	AV	V	42.09	8.80	38.54	50.64	44.62	54.00	9.38
High Channel: 5843 MHz										
5843.00	69.28	PK	H	34.24	3.74	0.00	107.26	101.24	N/A	N/A
5843.00	55.36	AV	H	34.24	3.74	0.00	93.34	87.32	N/A	N/A
5843.00	90.12	PK	V	34.24	3.74	0.00	128.10	122.08	N/A	N/A
5843.00	76.34	AV	V	34.24	3.74	0.00	114.32	108.3	N/A	N/A
5850.00	46.17	PK	V	34.24	3.75	0.00	84.16	78.14	122.20	44.06
5855.00	37.72	PK	V	34.24	3.75	0.00	75.71	69.69	110.80	41.11
5875.00	28.16	PK	V	34.25	3.77	0.00	66.18	60.16	105.20	45.04
5925.00	26.39	PK	V	34.27	3.80	0.00	64.46	58.44	68.20	9.76
11686.00	59.12	PK	V	39.00	6.65	37.57	67.20	61.18	74.00	12.82
11686.00	46.37	AV	V	39.00	6.65	37.57	54.45	48.43	54.00	5.57
17529.00	51.45	PK	V	43.28	8.85	38.39	65.19	59.17	74.00	14.83
17529.00	38.64	AV	V	43.28	8.85	38.39	52.38	46.36	54.00	7.64



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

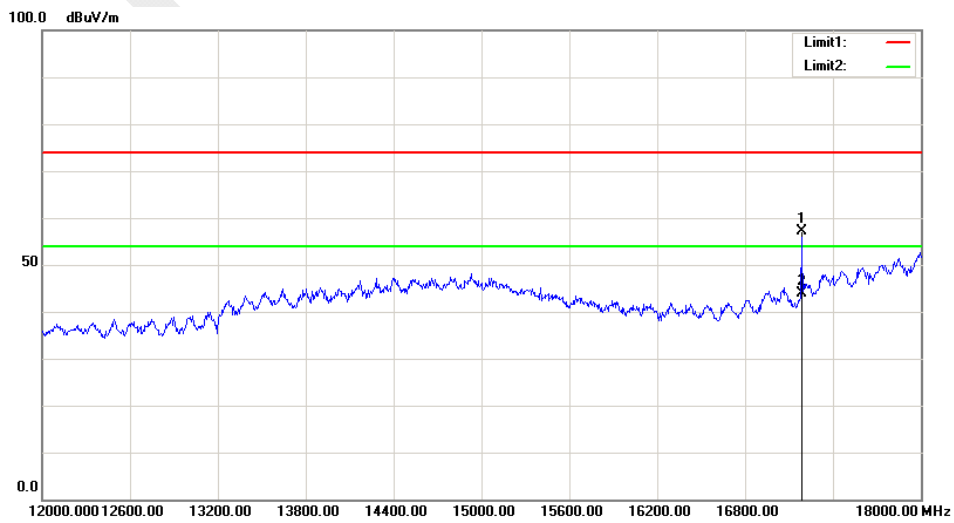
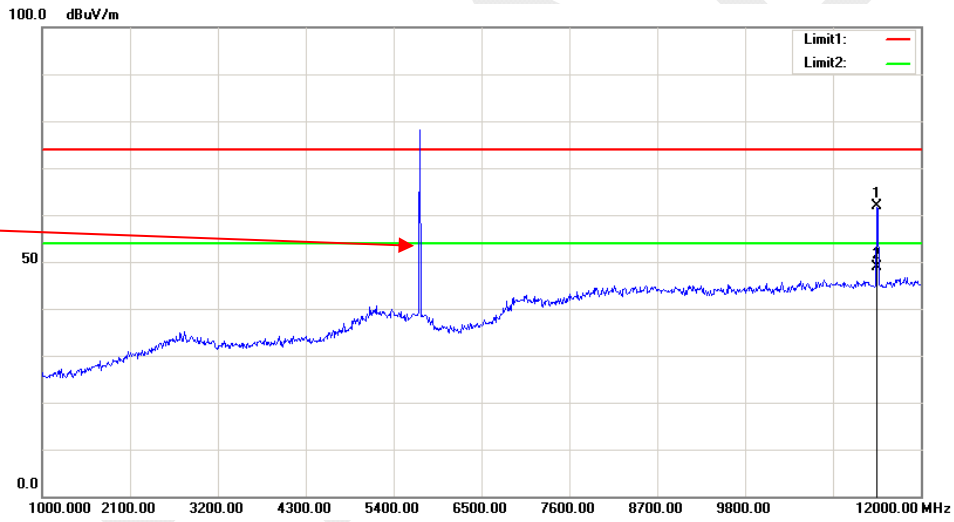
Fundamental  
Test with Band  
Rejection Filter

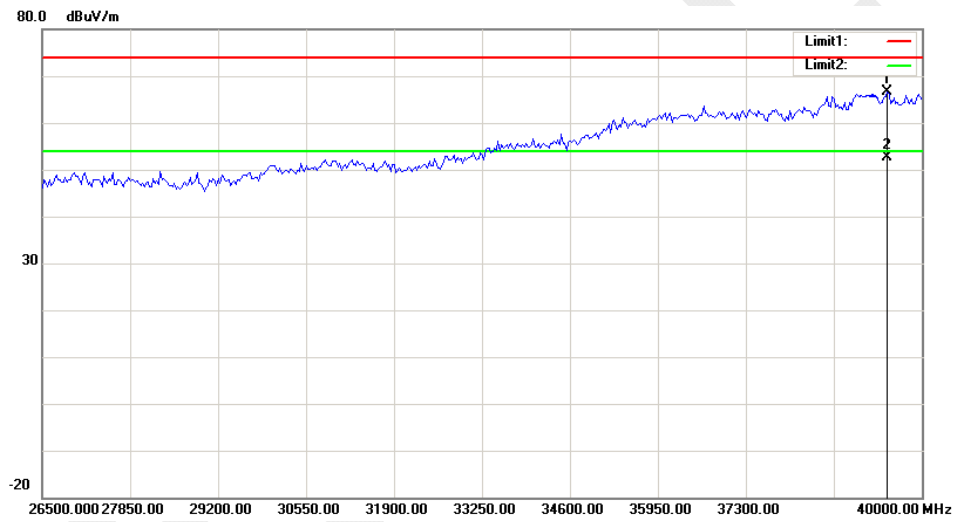
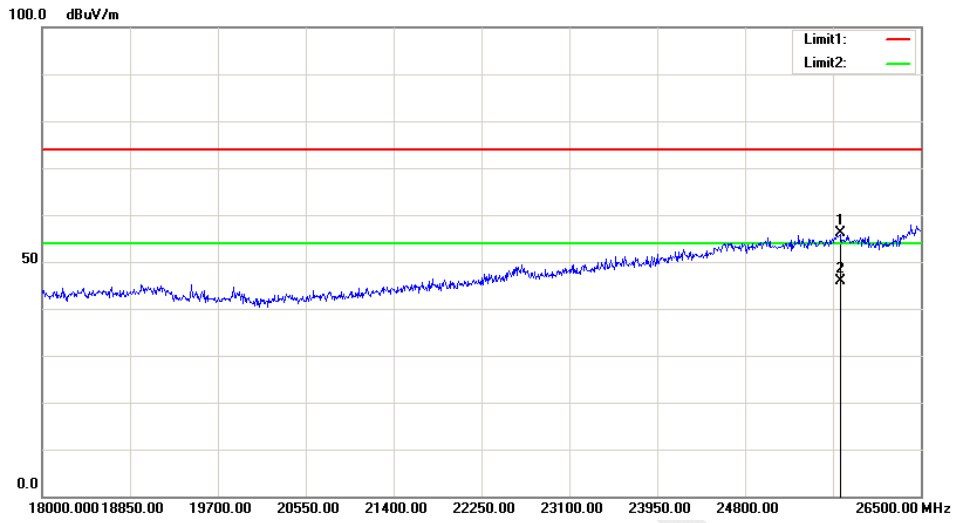




Vertical

Fundamental Test with Band Rejection Filter





**FCC §15.407(a)& RSS-247 §6.2,RSS-Gen §6.6– EMISSION BANDWIDTH****Applicable Standard**

15.407(a), RSS-247 §6.2 and RSS-Gen §6.6

**Test Equipment List and Details**

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSP 38	100478	2017-12-08	2018-12-08
Unknown	Coaxial Cable	C-SJ00-0010	C0010/05	Each time	/

\* **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 Procedure**

According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01 .

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

<b>Temperature:</b>	25.6 °C
<b>Relative Humidity:</b>	51 %
<b>ATM Pressure:</b>	100.8 kPa

*The testing was performed by Harry Yang on 2018-03-27.*

**Test Result:** Pass.

Please refer to the following tables and plots.

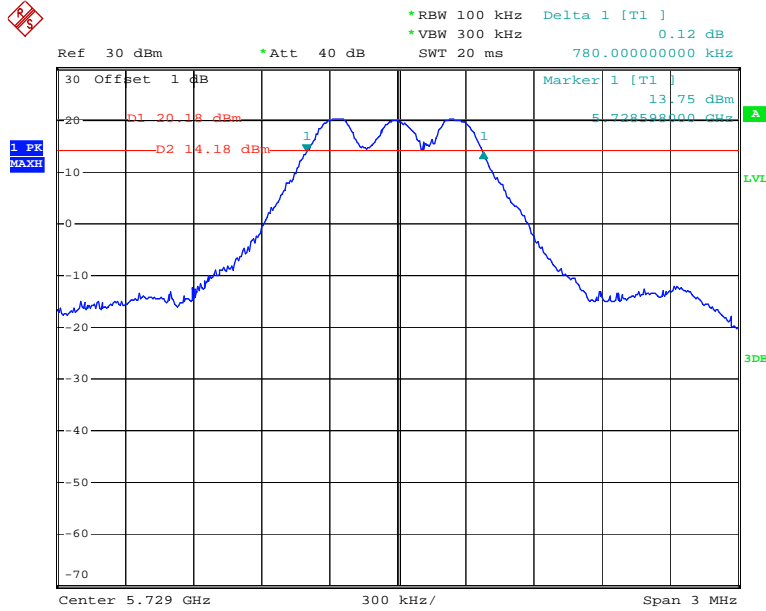
*Test mode: Transmitting*

Channel	Frequency (MHz)	6 dB Emission Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	6 dB Emission Bandwidth Limits (MHz)
Low	5729	0.780	0.918	≥0.5
Middle	5775	0.756	0.882	≥0.5
High	5843	0.762	0.924	≥0.5

Note: the 99% Occupied bandwidth are not fall into 5470-5725MHz band

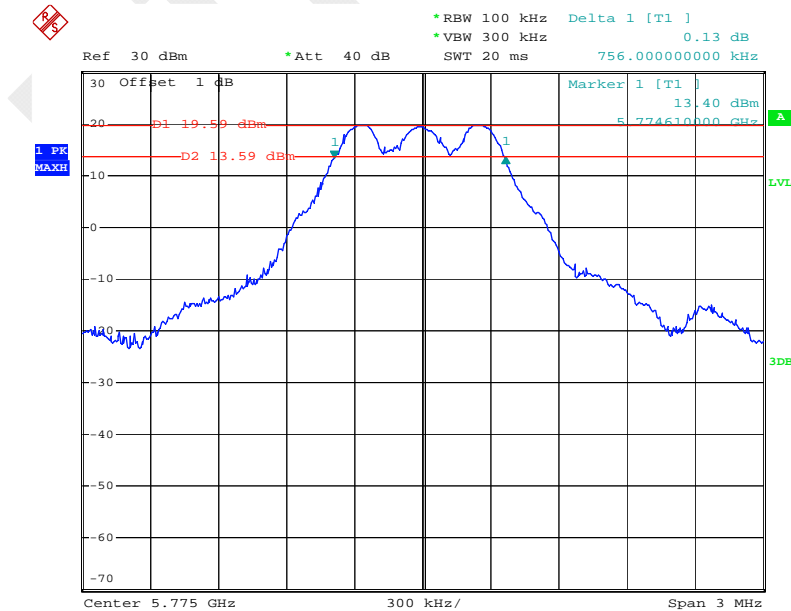
6dB Bandwidth:

Low Channel



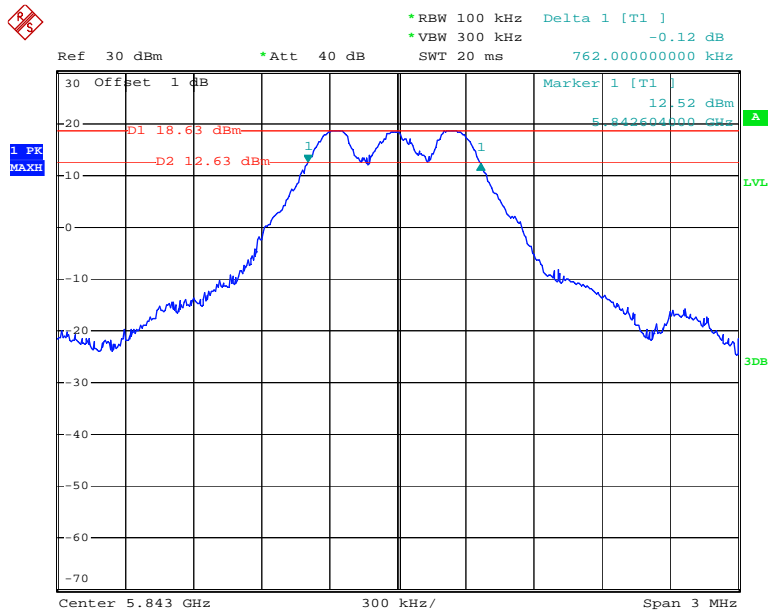
Date: 27.MAR.2018 14:18:13

Middle Channel



Date: 27.MAR.2018 14:20:22

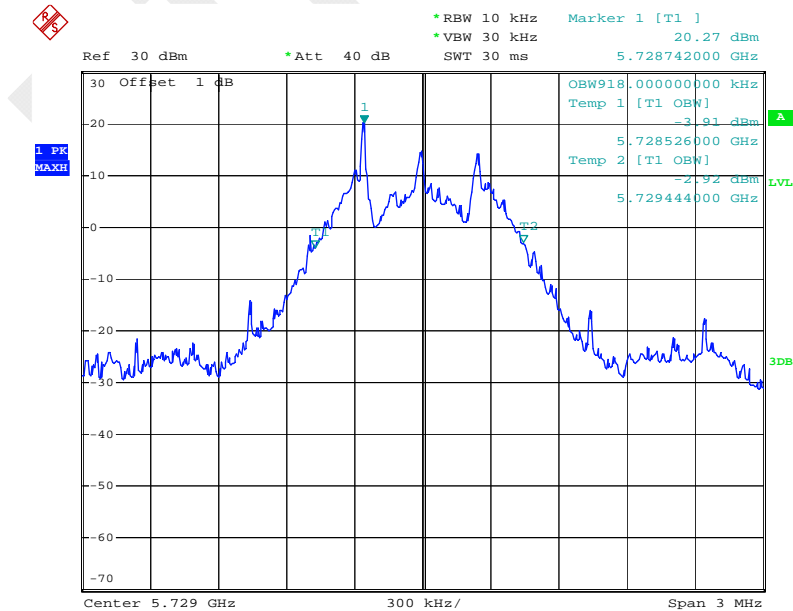
### High Channel



Date: 27.MAR.2018 14:22:43

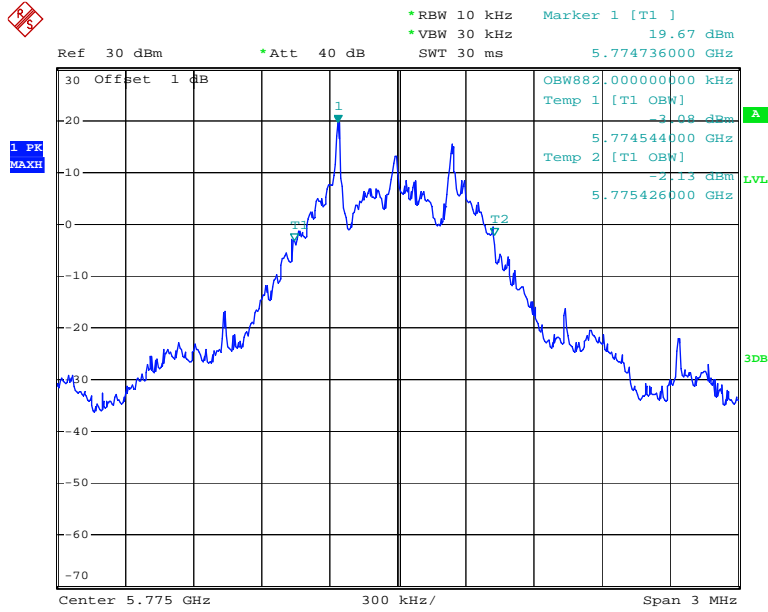
99% Occupied Bandwidth:

### Low Channel



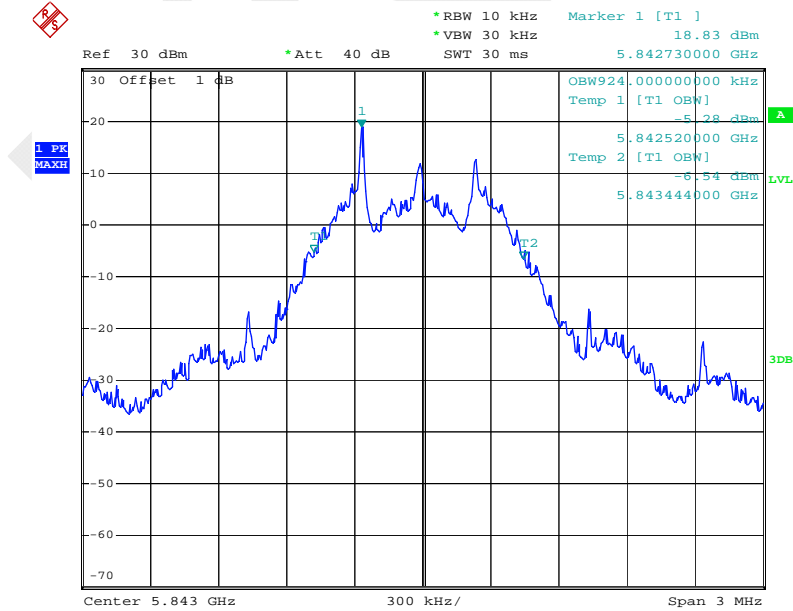
Date: 27.MAR.2018 14:28:50

### Middle Channel



Date: 27.MAR.2018 14:26:40

### High Channel



Date: 27.MAR.2018 14:25:31

## **FCC §15.407(a) & RSS-247 §6.2– MAXIMUM CONDUCTED OUTPUT POWER**

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### **Applicable Standard**

According to FCC §15.407(a)

(a) Power limits:

(1) For the band 5.15-5.25 GHz.

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz 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. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz 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.

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. 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.

(iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz 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.

(2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or  $11 \text{ dBm} + 10 \log B$ , where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum



power spectral density shall not exceed 11 dBm in any 1 megahertz 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.

(3) 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.

(4) The maximum conducted output power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage.

According to RSS-247 §6.2:

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

#### **6.2.1.1 Power limits**

For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or  $1.76 + 10 \log_{10}B$ , dBm, whichever is less stringent. Devices shall implement transmitter power control (TPC) in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.

For other devices, the maximum e.i.r.p. shall not exceed 200 mW or  $10 + 10 \log_{10}B$ , dBm, whichever power is less. B is the 99% emission bandwidth in megahertz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

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

#### **6.2.2.1 Power limits**

For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or  $1.76 + 10 \log_{10}B$ , dBm, whichever is less. Devices shall implement TPC in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.

Devices, other than devices installed in vehicles, shall comply with the following:

- a) The maximum conducted output power shall not exceed 250 mW or  $11 + 10 \log_{10}B$ , dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band;
- b) The maximum e.i.r.p. shall not exceed 1.0 W or  $17 + 10 \log_{10}B$ , dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

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

### 6.2.3.1 Power limits

The maximum conducted output power shall not exceed 250 mW or  $11 + 10 \log_{10}B$ , dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.

The maximum e.i.r.p. shall not exceed 1.0 W or  $17 + 10 \log_{10}B$ , dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

## Frequency band 5725-5850 MHz

### 6.2.4.1 Power limits

For equipment operating in the band 5725-5850 MHz, the minimum 6 dB bandwidth shall be at least 500 kHz.

The maximum conducted output power shall not exceed 1 W. The output 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 output 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 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<sup>3</sup> systems, omnidirectional applications and multiple collocated transmitters transmitting the same information.

## Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	USB Wideband Power Sensor	U2022XA	MY5417006	2017-12-11	2018-12-11
Unknown	Coaxial Cable	C-SJ00-0010	C0010/05	Each Time	/

\* **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 Procedure

According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01

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

<b>Temperature:</b>	25.6 °C
<b>Relative Humidity:</b>	51 %
<b>ATM Pressure:</b>	100.8 kPa

*The testing was performed by Harry Yang on 2018-03-27.*

*Test Mode: Transmitting*

<b>Frequency (MHz)</b>	<b>Maximum Conducted Average Output Power (dBm)</b>	<b>Limit (dBm)</b>
5729	22.20	30
5775	22.07	30
5843	21.93	30

Note: the power sensor is a gated RF average power meter.

## **FCC §15.407(a)& RSS-247 §6.2 - POWER SPECTRAL DENSITY**

### **Applicable Standard**

According to FCC §15.407(a)

(a) Power limits:

(1) For the band 5.15-5.25 GHz.

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz 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. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz 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.

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. 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.

(iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz 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.

(2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or  $11 \text{ dBm} + 10 \log B$ , where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz 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.

(3) 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.

According to RSS-247 §6.2:

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

#### **6.2.1.1 Power limits**

For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or  $1.76 + 10 \log_{10}B$ , dBm, whichever is less stringent. Devices shall implement transmitter power control (TPC) in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.

For other devices, the maximum e.i.r.p. shall not exceed 200 mW or  $10 + 10 \log_{10}B$ , dBm, whichever power is less. B is the 99% emission bandwidth in megahertz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

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

#### **6.2.2.1 Power limits**

For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or  $1.76 + 10 \log_{10}B$ , dBm, whichever is less. Devices shall implement TPC in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.

Devices, other than devices installed in vehicles, shall comply with the following:

- a) The maximum conducted output power shall not exceed 250 mW or  $11 + 10 \log_{10}B$ , dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band;
- b) The maximum e.i.r.p. shall not exceed 1.0 W or  $17 + 10 \log_{10}B$ , dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

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

### 6.2.3.1 Power limits

The maximum conducted output power shall not exceed 250 mW or  $11 + 10 \log_{10}B$ , dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.

The maximum e.i.r.p. shall not exceed 1.0 W or  $17 + 10 \log_{10}B$ , dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

## Frequency band 5725-5850 MHz

### 6.2.4.1 Power limits

For equipment operating in the band 5725-5850 MHz, the minimum 6 dB bandwidth shall be at least 500 kHz.

The maximum conducted output power shall not exceed 1 W. The output 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 output 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 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<sup>3</sup> systems, omnidirectional applications and multiple collocated transmitters transmitting the same information.

## Test Procedure

According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01

## Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSP 38	100478	2017-12-08	2018-12-08
Unknown	Coaxial Cable	C-SJ00-0010	C0010/05	Each time	/

\* **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>	25.6 °C
<b>Relative Humidity:</b>	51 %
<b>ATM Pressure:</b>	100.8 kPa

*The testing was performed by Harry Yang on 2018-04-13.*

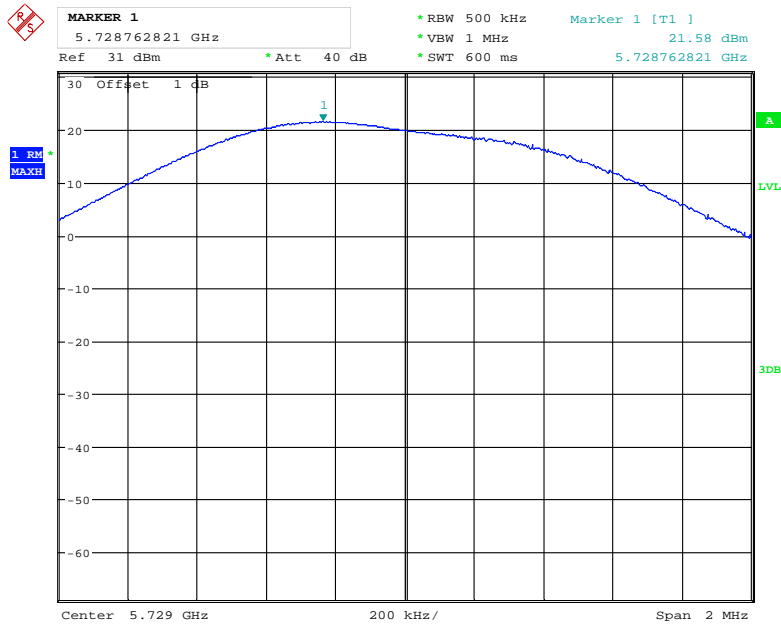
*Test Mode: Transmitting*

*Test Result: Compliance. Please refer to the following table and plot.*

<b>Frequency (MHz)</b>	<b>Result (dBm/500kHz)</b>	<b>Limit (dBm/500kHz)</b>
5729	21.58	30
5775	21.56	30
5843	21.53	30

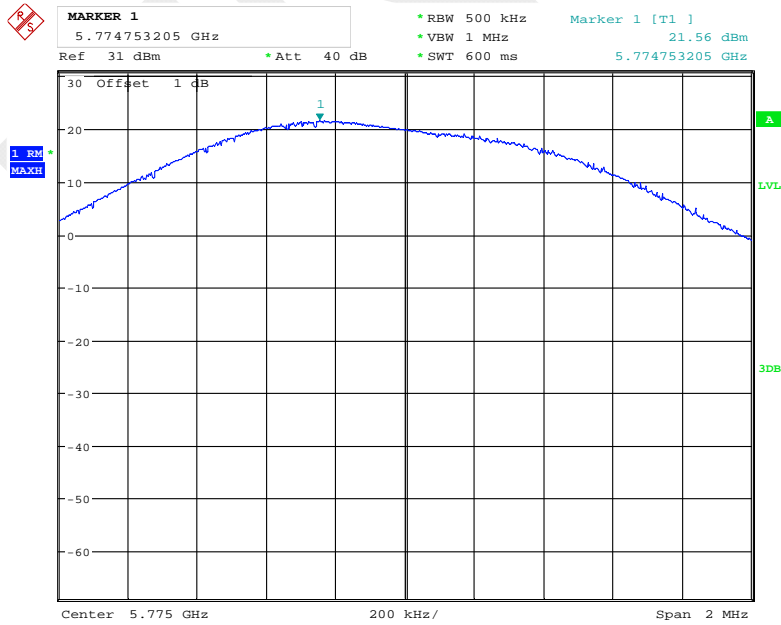
Note: SA-3 in KDB 789033 D02 General UNII Test Procedures New Rules v02r01 was used for PSD test.

### Low Channel



Date: 13.APR.2018 20:06:04

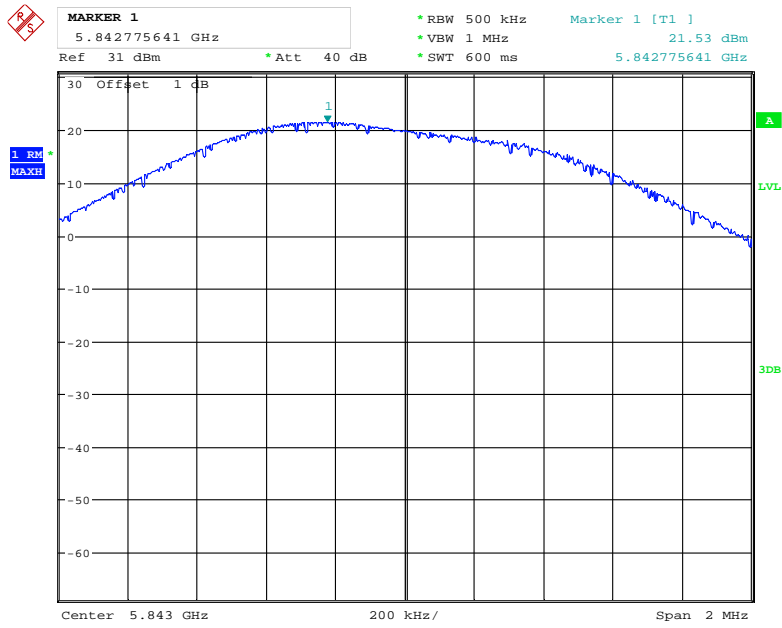
### Middle Channel



Date: 13.APR.2018 20:07:25



### High Channel



Date: 13.APR.2018 20:08:43

FEM

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**FCC §15.407(b)& RSS-247 §6.2 – OUT- OF-BAND EMISSIONS**

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**Applicable Standard**

FCC §15.407

(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.

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:

- a) 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;
- b) 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;
- c) 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
- d) -27 dBm/MHz at frequencies more than 75 MHz above or below the band edges.

## Test Procedure

According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01 .

## Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSP 38	100478	2017-12-08	2018-12-08
Unknown	Coaxial Cable	C-SJ00-0010	C0010/05	Each time	/

\* **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

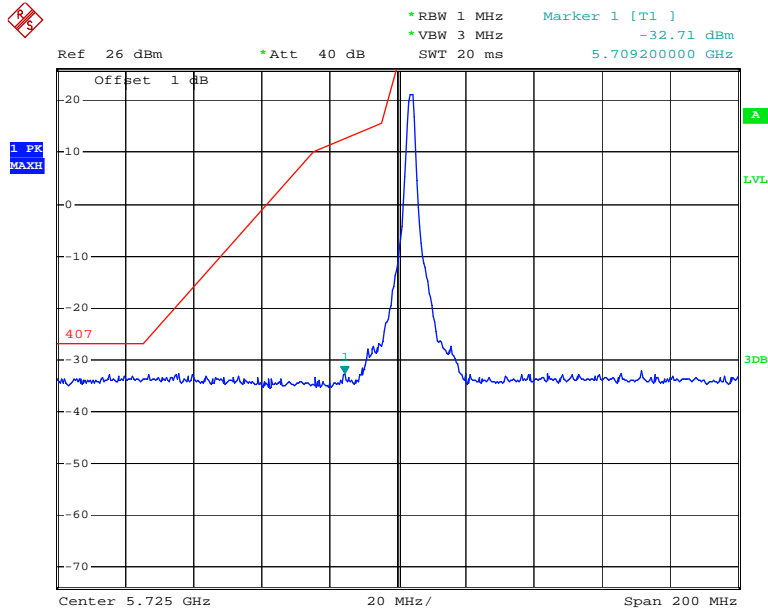
Temperature:	25.6 °C
Relative Humidity:	51%
ATM Pressure:	100.8 kPa

*The testing was performed by Harry Yang on 2018-03-27.*

**Test Result:** Pass.

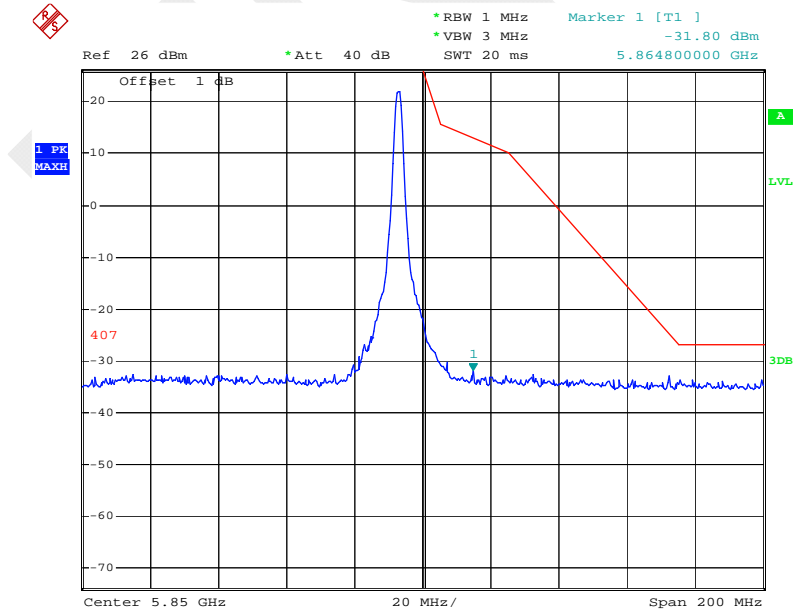
All emissions are under limit more than 4.5dB(antenna gain 4.5dBi). Please refer to the following plots.

### Low Channel



Date: 27.MAR.2018 14:58:52

### High Channel



Date: 27.MAR.2018 14:59:43

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