



## RF Test Report

Applicant : Netgear Incorporated  
Product Type : Mobile Router  
Trade Name : NETGEAR  
Model Number : MR1100-320  
Test Specification : FCC 47 CFR PART 15 SUBPART E  
ANSI C63.10:2013  
Receive Date : Apr. 12, 2017  
Test Period : Jul. 17 ~ Aug. 31, 2017  
Issue Date : Sep. 05, 2017

### Issue by

A Test Lab Techno Corp.  
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Taiwan Accreditation Foundation accreditation number: 1330  
Test Firm MRA designation number: TW0010

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### **Revision History**

| Rev. | Issue Date    | Revisions                   | Revised By |
|------|---------------|-----------------------------|------------|
| 00   | Aug. 11, 2017 | Initial Issue               | Nina Lin   |
| 01   | Sep. 05, 2017 | Revised report information. | Nina Lin   |
|      |               |                             |            |
|      |               |                             |            |



## Verification of Compliance

Issued Date: Sep. 05, 2017

Applicant : Netgear Incorporated  
Product Type : Mobile Router  
Trade Name : NETGEAR  
Model Number : MR1100-320  
FCC ID : PY317200378  
EUT Rated Voltage : DC 5V, 2A  
Test Voltage : 120 Vac / 60 Hz, 3.85Vdc  
Applicable Standard : FCC 47 CFR PART 15 SUBPART E  
ANSI C63.10:2013  
Test Result : Complied

Performing Lab. : A Test Lab Techno Corp.  
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Taiwan Accreditation Foundation accreditation number: 1330  
<http://www.atl-lab.com.tw/e-index.htm>



A Test Lab Techno Corp. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by A Test Lab Techno Corp. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Approved By : Fly Lu Reviewed By : Eric Ou Yang  
(Manager) (Fly Lu) (Testing Engineer) (Eric Ou Yang)

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## 1 General Information

### 1.1. Summary of Test Result

| Standard                     | Item                           | Result    | Remark |
|------------------------------|--------------------------------|-----------|--------|
| FCC                          |                                |           |        |
| 15.407(b)(6)<br>15.207       | AC Power Conducted Emission    | PASS      | ---    |
| 15.407(b)<br>15.205 / 15.209 | Transmitter Radiated Emissions | PASS      | ---    |
| 15.407(a)                    | Maximum Conducted Output Power | PASS      | ---    |
| 15.407(a)                    | 26dB RF Bandwidth              | Reference | ---    |
| 15.407(e)                    | 6dB RF Bandwidth               | PASS      | -----  |
| 15.407(a)                    | Peak Power Spectral Density    | PASS      | ---    |
| 15.407(g)                    | Frequency Stability            | PASS      | ---    |
| 15.407(a)<br>15.203          | Antenna Requirement            | PASS      | ---    |

The test results of this report relate only to the tested sample(s) identified in this report. Manufacturer or whom it may concern should recognize the pass or fail of the test result.

### 1.2. Measurement Uncertainty

| Test Item              | Frequency Range     | Uncertainty (dB)                                          |
|------------------------|---------------------|-----------------------------------------------------------|
| Conducted Emission     | 9kHz ~ 150KHz       | 2.7                                                       |
|                        | 150kHz ~ 30MHz      | 2.7                                                       |
| Radiated Emission      | 9kHz ~ 30MHz        | 1.7                                                       |
|                        | 30MHz ~ 1000MHz     | 5.7                                                       |
|                        | 1000MHz ~ 18000MHz  | 5.5                                                       |
|                        | 18000MHz ~ 26500MHz | 4.8                                                       |
|                        | 26500MHz ~ 40000MHz | 4.8                                                       |
| Conducted Output Power |                     | +0.27 dB / -0.28 dB                                       |
| RF Bandwidth           |                     | 4.96%                                                     |
| Power Spectral Density |                     | +0.71 dB / -0.77 dB                                       |
| Frequency Stability    |                     | + 2.212 x 10 <sup>-7</sup> % / - 2.170 x 10 <sup>-7</sup> |
| Duty Cycle             |                     | 1.06%                                                     |
| Time Occupancy         |                     | 1.40%                                                     |



## 2 EUT Description

|                                   |                                                                                            |                |                       |
|-----------------------------------|--------------------------------------------------------------------------------------------|----------------|-----------------------|
| Applicant                         | Netgear Incorporated<br>350 East Plumeria Drive, San Jose, California, United States 95134 |                |                       |
| Manufacturer                      | Netgear Inc.<br>Suite 168 – 10760 Shellbridge Way, Richmond, BC Canada V6X 3H1             |                |                       |
| Product Type                      | Mobile Router                                                                              |                |                       |
| Trade Name                        | NETGEAR                                                                                    |                |                       |
| Model No.                         | MR1100-320                                                                                 |                |                       |
| FCC ID                            | PY317200378                                                                                |                |                       |
| Operate Frequency                 | Frequency Band                                                                             |                | Frequency Range (MHz) |
|                                   | IEEE 802.11a                                                                               | U-NII Band I   | 5180 – 5240           |
|                                   |                                                                                            | U-NII Band III | 5745 – 5825           |
|                                   | IEEE 802.11n 5GHz 20 MHz / IEEE 802.11ac 20 MHz                                            | U-NII Band I   | 5180 – 5240           |
|                                   |                                                                                            | U-NII Band III | 5745 – 5825           |
|                                   | IEEE 802.11n 5GHz 40 MHz / IEEE 802.11ac 40 MHz                                            | U-NII Band I   | 5190 – 5230           |
|                                   |                                                                                            | U-NII Band III | 5755 – 5795           |
|                                   | IEEE 802.11ac 80 MHz                                                                       | U-NII Band I   | 5210                  |
|                                   |                                                                                            | U-NII Band III | 5775                  |
| Modulation Type                   | OFDM                                                                                       |                |                       |
| Equipment Type                    | Master                                                                                     |                |                       |
| Antenna information               | Model                                                                                      | Type           | Max. Gain (dBi)       |
|                                   | XKAB-B12                                                                                   | PIFA Antenna   | 5.0                   |
| Antenna Delivery                  | Reference section 3.1                                                                      |                |                       |
| Frequency stability specification | ± 20 ppm                                                                                   |                |                       |
| Operate Temp. Range               | 0 ~ +50 °C                                                                                 |                |                       |



| Frequency Band       |                | RF Output Power (W) |
|----------------------|----------------|---------------------|
| IEEE 802.11a         | U-NII Band I   | 0.016               |
|                      | U-NII Band III | 0.015               |
| IEEE 802.11ac 20 MHz | U-NII Band I   | 0.015               |
|                      | U-NII Band III | 0.015               |
| IEEE 802.11ac 40 MHz | U-NII Band I   | 0.015               |
|                      | U-NII Band III | 0.015               |
| IEEE 802.11ac 80 MHz | U-NII Band I   | 0.015               |
|                      | U-NII Band III | 0.015               |

### 3 Test Methodology

#### 3.1. Mode of Operation

Decision of Test ATL has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

| Test Mode                                      |
|------------------------------------------------|
| Mode 1: Transmit mode                          |
| Mode 2: IEEE 802.11a Continuous TX mode        |
| Mode 3: IEEE 802.11ac 20MHz Continuous TX mode |
| Mode 4: IEEE 802.11ac 40MHz Continuous TX mode |
| Mode 5: IEEE 802.11ac 80MHz Continuous TX mode |

Software used to control the EUT for staying in continuous transmitting mode was programmed.

After verification, all tests were carried out with the worst case test modes as shown below except radiated spurious emission below 1GHz and power line conducted emissions below 30MHz, which worst case was in normal link mode only.

Note : worst case\_Battery Model:W-10a + Adapter Model: AD2037320.

| Equipment Type                     |     |
|------------------------------------|-----|
| Outdoor access point               | --- |
| Indoor access point                | --- |
| Fixed point-to-point access points | --- |
| Client devices                     | --- |
| Mobile access point                | V   |

| Test Mode | ANT-0 | ANT-1 | ANT-0+1 |
|-----------|-------|-------|---------|
| Mode 2    | V     | V     | V       |
| Mode 3    | V     | V     | V       |
| Mode 4    | V     | V     | V       |
| Mode 5    | V     | V     | V       |

| Test Mode | Antenna Delivery | Data Rate | Band           | Test Channel  |
|-----------|------------------|-----------|----------------|---------------|
| Mode 2    | 2TX / 2RX (MIMO) | 6M        | U-NII Band I   | 36, 40, 48    |
|           |                  |           | U-NII Band III | 149, 157, 165 |
| Mode 3    | 2TX / 2RX (MIMO) | 13M       | U-NII Band I   | 36, 40, 48    |
|           |                  |           | U-NII Band III | 149, 157, 165 |
| Mode 4    | 2TX / 2RX (MIMO) | 27M       | U-NII Band I   | 38, 46        |
|           |                  |           | U-NII Band III | 151,159       |
| Mode 5    | 2TX / 2RX (MIMO) | 58.6M     | U-NII Band I   | 42            |
|           |                  |           | U-NII Band III | 155           |





## Duty cycle

| Test Mode | Frequency (MHz) | on time (ms) | on+off time (ms) | Duty cycle | Duty Factor (dB) | 1/T Minimum VBW (kHz) |
|-----------|-----------------|--------------|------------------|------------|------------------|-----------------------|
| Mode 2    | 5180.0          | 2.100        | 2.170            | 0.968      | 0.142            | 0.476                 |
| Mode 3    | 5180.0          | 1.950        | 2.030            | 0.961      | 0.175            | 0.513                 |
| Mode 4    | 5190.0          | 0.970        | 1.050            | 0.924      | 0.344            | 1.031                 |
| Mode 5    | 5210.0          | 0.480        | 0.555            | 0.865      | 0.631            | 2.083                 |

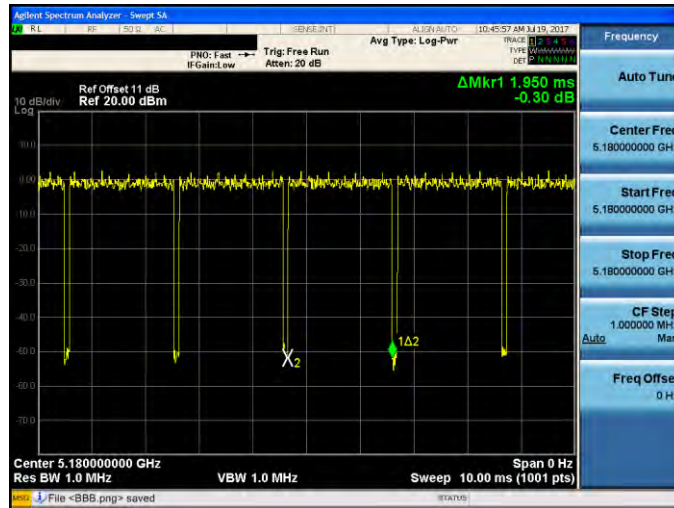
## Duty Cycle Graphs

| Mode 2: IEEE 802.11a Continuous TX mode |  |
|-----------------------------------------|--|
| On time                                 |  |
| On+off time                             |  |

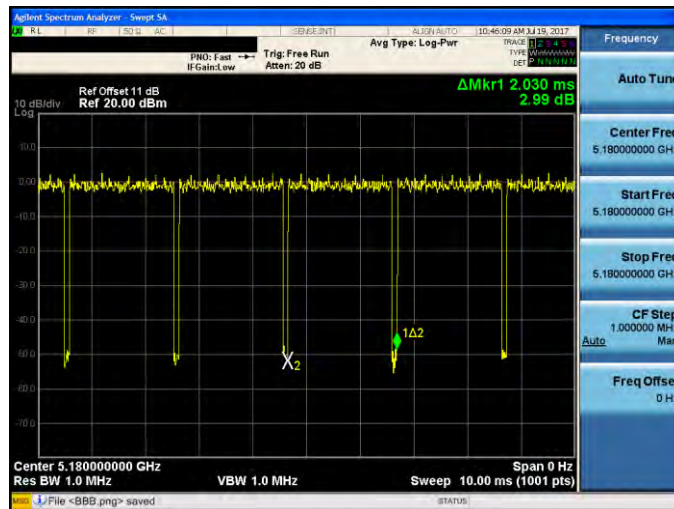


## Mode 3: IEEE 802.11ac 20MHz Continuous TX mode

On time

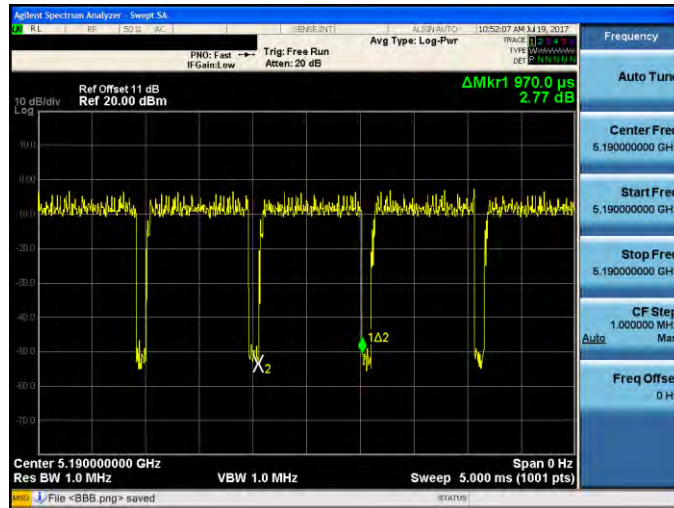


On+off time

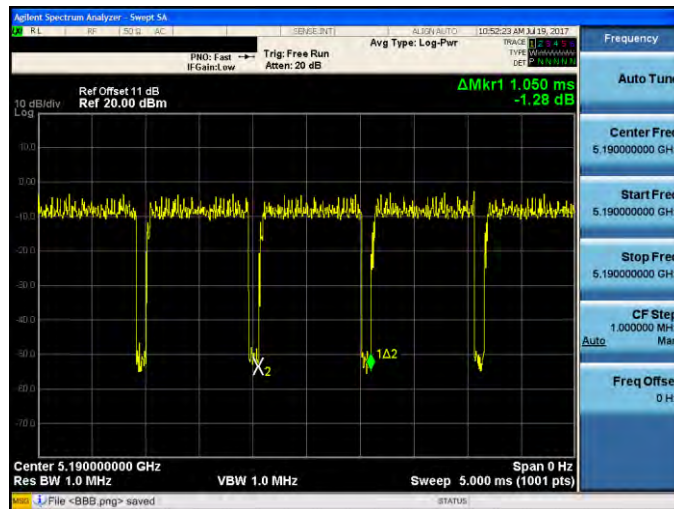


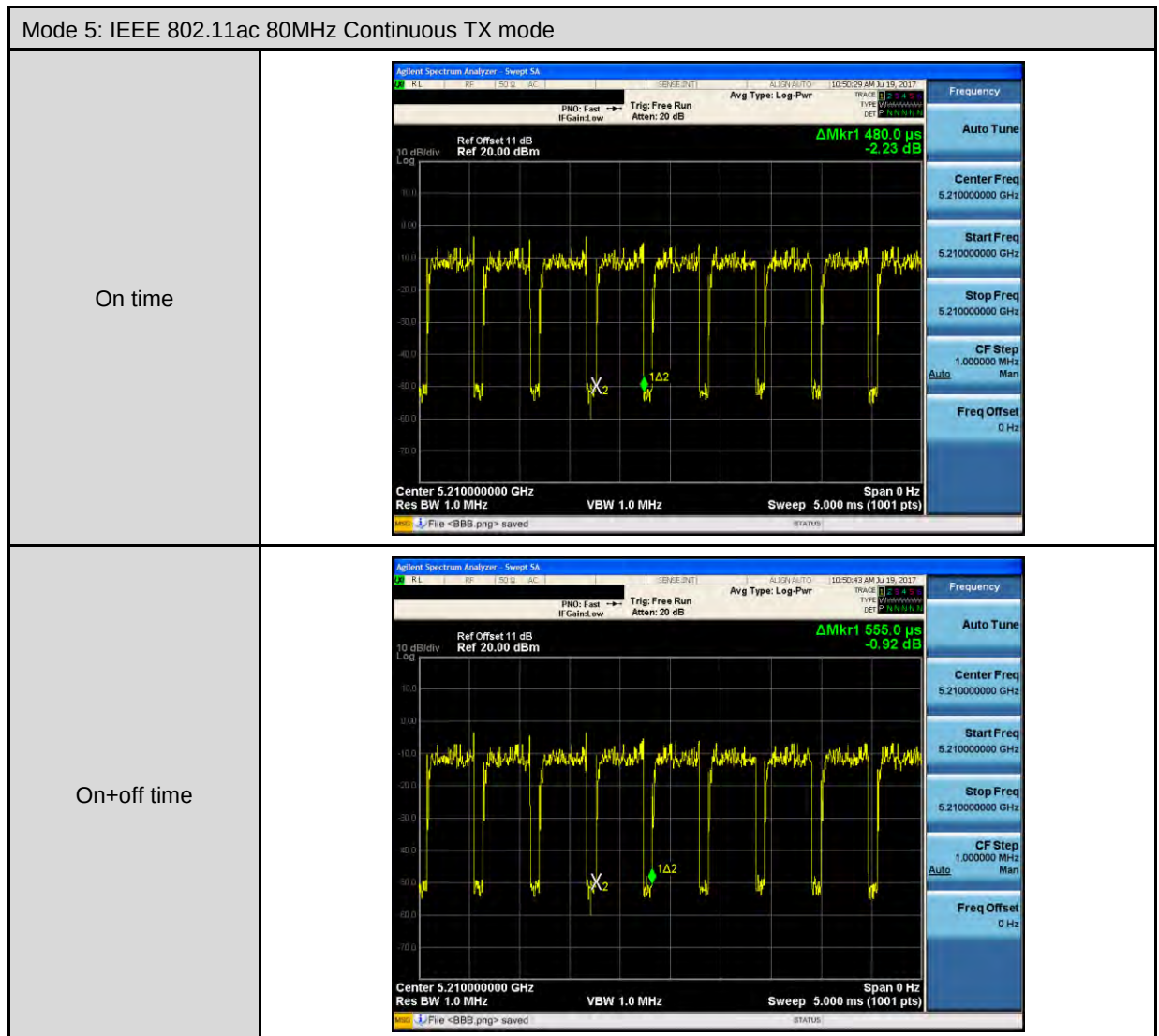
## Mode 4: IEEE 802.11ac 40MHz Continuous TX mode

On time



On+off time





### 3.2. EUT Exercise Software

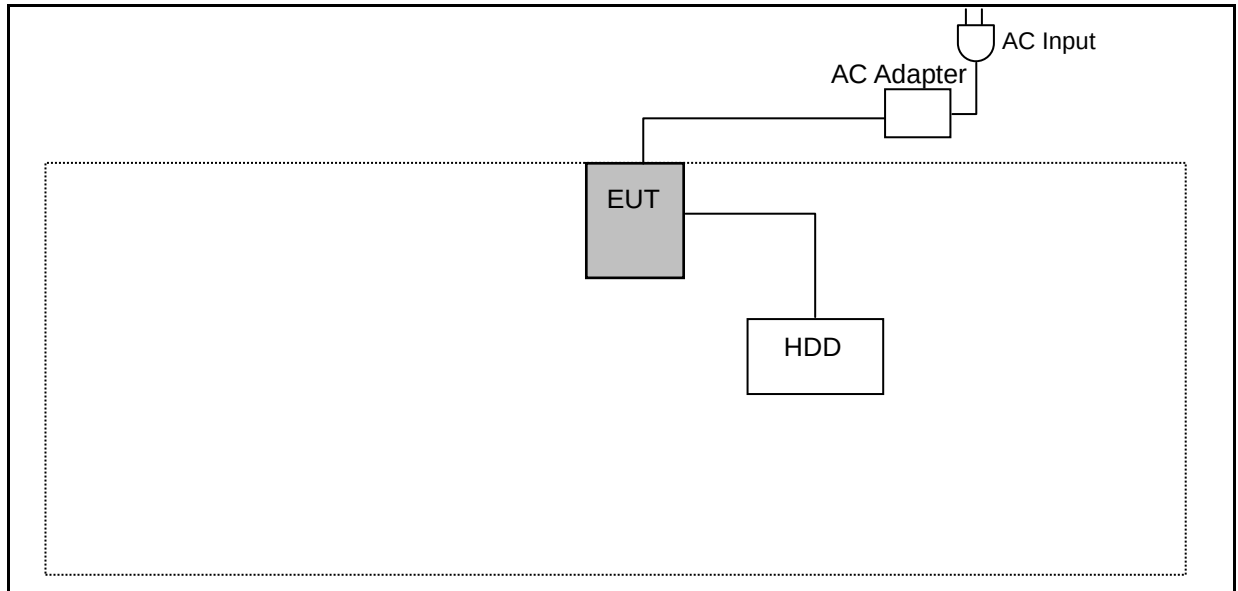
The EUT is operated in the engineering mode to fix the TX frequency for the purposes of measurement. According to its specifications, the EUT must comply with the requirements of Section 15.407 under the FCC Rules Part 15 Subpart E.

|    |                                     |
|----|-------------------------------------|
| 1. | Setup the EUT shown on 3.3.         |
| 2. | Turn on the power of all equipment. |
| 3. | EUT run test program.               |

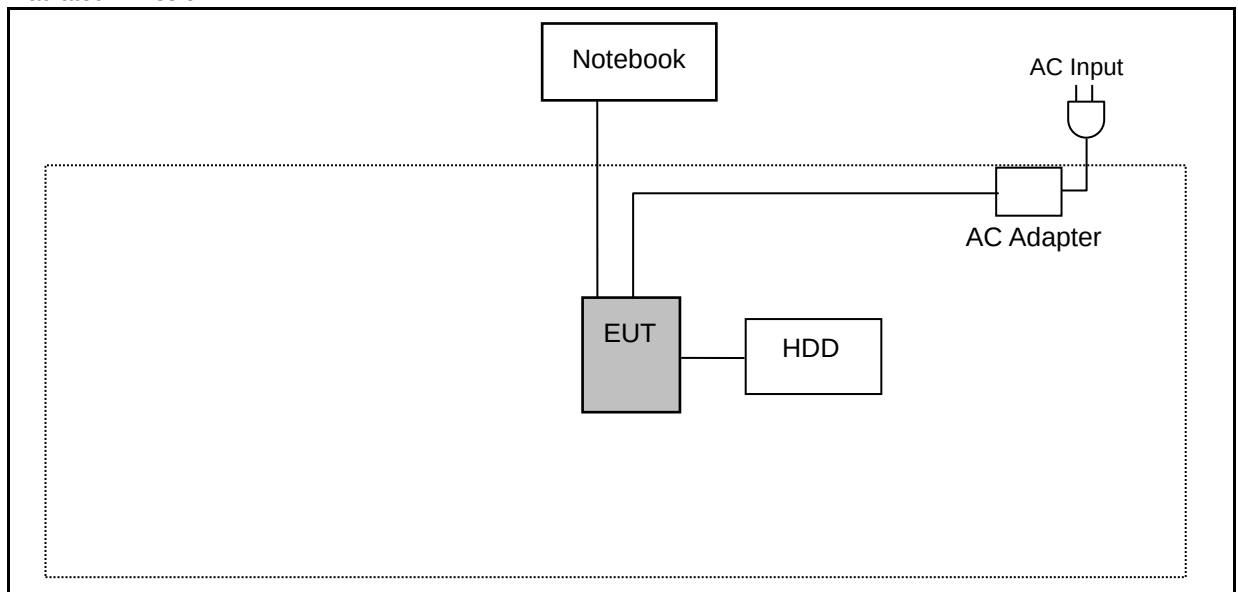
| Measurement Software |                          |
|----------------------|--------------------------|
| 1                    | EZ-EMC Ver. ATL-03A1-1   |
| 2                    | EZ-EMC Ver ATL-ITC-3A1-1 |

### 3.3. Configuration of Test System Details

#### Conducted Emission



#### Radiated Emission



### 3.4. Test Site Environment

| Items                      | Required (IEC 60068-1) | Actual |
|----------------------------|------------------------|--------|
| Temperature (°C)           | 15-35                  | 26     |
| Humidity (%RH)             | 25-75                  | 60     |
| Barometric pressure (mbar) | 860-1060               | 950    |

## 4 Test Results

### 4.1. AC Power Conducted Emission Measurement

#### ■ Limit

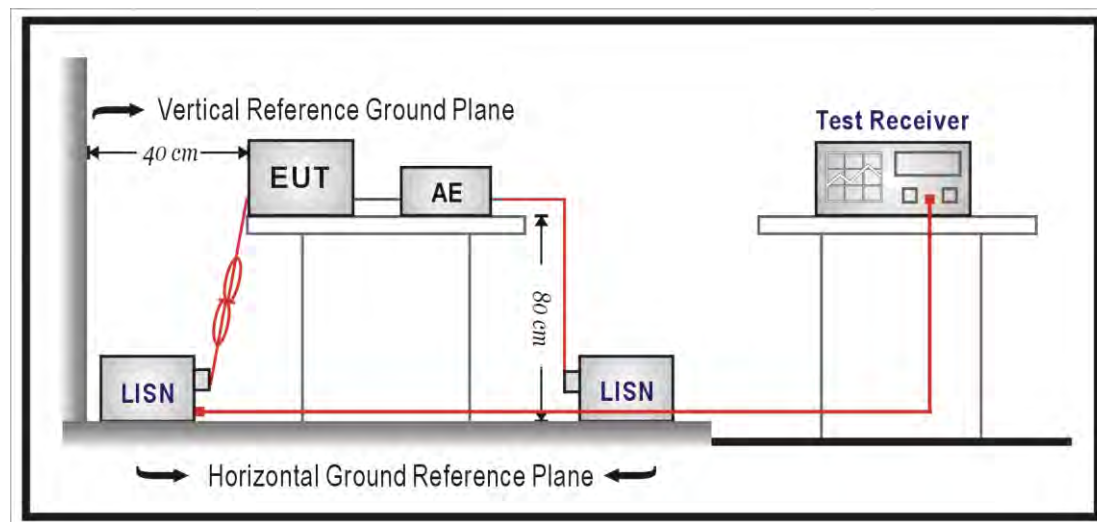
| Frequency (MHz) | Quasi-peak | Average  |
|-----------------|------------|----------|
| 0.15 - 0.5      | 66 to 56   | 56 to 46 |
| 0.50 - 5.0      | 56         | 46       |
| 5.0 - 30.0      | 60         | 50       |

#### ■ Test Instruments

| Describe      | Manufacturer | Model Number   | Serial Number | Cal. Date  | Remark |
|---------------|--------------|----------------|---------------|------------|--------|
| Test Receiver | R&S          | ESCI           | 100367        | 05/18/2017 | 1 year |
| LISN          | R&S          | ENV216         | 101040        | 04/01/2017 | 1 year |
| LISN          | R&S          | ENV216         | 101041        | 03/15/2017 | 1 year |
| RF Cable      | Woken        | 00100D1380194M | TE-02-02      | 05/19/2017 | 1 year |
| Test Site     | ATL          | TE02           | TE02          | N.C.R.     | -----  |

Note: N.C.R. = No Calibration Request.

#### ■ Test Setup





## 4.2. Test Procedure

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a  $50\Omega // 50\mu\text{H}$  coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a  $50\Omega // 50\mu\text{H}$  coupling impedance with 50ohm termination.

Tabletop device shall be placed on a non-conducting platform, of nominal size 1 m by 1.5 m, raised 80 cm above the reference ground plane. The wall of screened room shall be located 40cm to the rear of the EUT. Other surfaces of tabletop or floor standing EUT shall be at least 80cm from any other ground conducting surface including one or more LISNs. For floor-standing device shall be placed under the EUT with a 12mm insulating material.

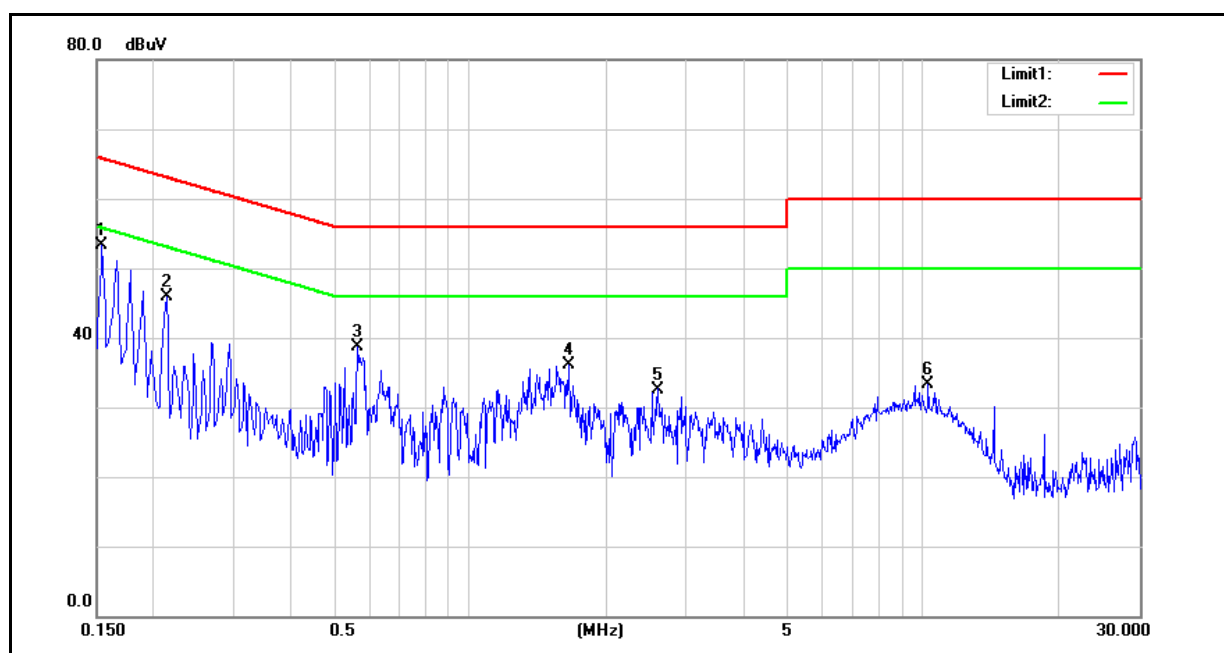
Conducted emissions were investigated over the frequency range from 0.15 MHz to 30 MHz using a resolution bandwidth of 9 kHz. The equipment under test (EUT) shall be meet the limits in section 4.1, as applicable, including the average limit and the quasi-peak limit when using respectively, an average detector and quasi-peak detector measured in accordance with the methods described of related standard. When all of peak value were complied with quasi-peak and average limit from 150kHz to 30MHz then quasi-peak and average measurement was unnecessary.

The AMN shall be placed 0,8 m from the boundary of the unit under test and bonded to a ground reference plane for AMNs mounted on top of the ground reference plane. This distance is between the closest points of the AMN and the EUT. All other units of the EUT and associated equipment shall be at least 0,8 m from the AMN. If the mains power cable is longer than 1m then the cable shall be folded back and forth at the centre of the lead to form a bundle no longer than 0.4m. All of interconnecting cables that hang closer than 40cm to the ground plane shall be folded back and forth in the center forming a bundle 30 cm to 40 cm long. All of EUT and AE shall be separate place more than 0.1m. All 50  $\Omega$  ports of the LISN shall be resistively terminated into 50  $\Omega$  loads when not connected to the measuring instrument.

If the reading of the measuring receiver shows fluctuations close to the limit, the reading shall be observed for at least 15 s at each measurement frequency; the higher reading shall be recorded with the exception of any brief isolated high reading which shall be ignored.

# Test Result

|              |                    |                      |              |
|--------------|--------------------|----------------------|--------------|
| Standard:    | FCC Part 15.407    | Line:                | L1           |
| Test item:   | Conducted Emission | Power:               | AC 120V/60Hz |
| Test Mode:   | Mode 1             | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
|              |                    | Date:                | 07/17/2017   |
| Description: |                    |                      |              |



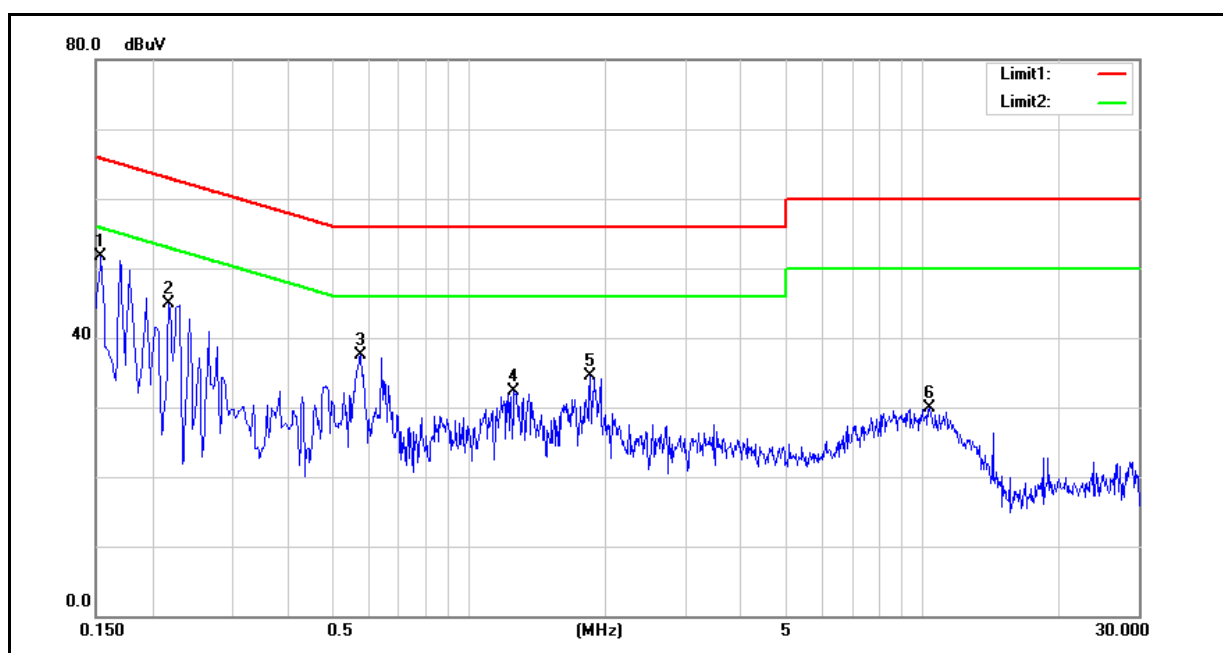
| No. | Frequency (MHz) | QP reading (dBuV) | AVG reading (dBuV) | Correction factor (dB) | QP result (dBuV) | AVG result (dBuV) | QP limit (dBuV) | AVG limit (dBuV) | QP margin (dB) | AVG margin (dB) | Remark |
|-----|-----------------|-------------------|--------------------|------------------------|------------------|-------------------|-----------------|------------------|----------------|-----------------|--------|
| 1   | 0.1540          | 37.40             | 23.65              | 9.54                   | 46.94            | 33.19             | 65.78           | 55.78            | -18.84         | -22.59          | Pass   |
| 2   | 0.2140          | 28.39             | 13.56              | 9.53                   | 37.92            | 23.09             | 63.05           | 53.05            | -25.13         | -29.96          | Pass   |
| 3   | 0.5660          | 23.75             | 16.60              | 9.54                   | 33.29            | 26.14             | 56.00           | 46.00            | -22.71         | -19.86          | Pass   |
| 4   | 1.6500          | 21.17             | 13.22              | 9.60                   | 30.77            | 22.82             | 56.00           | 46.00            | -25.23         | -23.18          | Pass   |
| 5   | 2.6020          | 15.92             | 6.43               | 9.63                   | 25.55            | 16.06             | 56.00           | 46.00            | -30.45         | -29.94          | Pass   |
| 6   | 10.2380         | 20.61             | 13.20              | 9.80                   | 30.41            | 23.00             | 60.00           | 50.00            | -29.59         | -27.00          | Pass   |

Note: 1. Result = Correction factor + Reading

2. Correction factor = Antenna Factor + Cable loss – Pre-Amplifier gain.



|              |                    |                      |              |
|--------------|--------------------|----------------------|--------------|
| Standard:    | FCC Part 15.407    | Line:                | N            |
| Test item:   | Conducted Emission | Power:               | AC 120V/60Hz |
| Test Mode:   | Mode 1             | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
|              |                    | Date:                | 07/17/2017   |
| Description: |                    |                      |              |



| No. | Frequency (MHz) | QP reading (dBuV) | AVG reading (dBuV) | Correction factor (dB) | QP result (dBuV) | AVG result (dBuV) | QP limit (dBuV) | AVG limit (dBuV) | QP margin (dB) | AVG margin (dB) | Remark |
|-----|-----------------|-------------------|--------------------|------------------------|------------------|-------------------|-----------------|------------------|----------------|-----------------|--------|
| 1   | 0.1540          | 37.43             | 22.40              | 9.63                   | 47.06            | 32.03             | 65.78           | 55.78            | -18.72         | -23.75          | Pass   |
| 2   | 0.2180          | 27.64             | 12.83              | 9.63                   | 37.27            | 22.46             | 62.89           | 52.89            | -25.62         | -30.43          | Pass   |
| 3   | 0.5780          | 26.69             | 20.61              | 9.64                   | 36.33            | 30.25             | 56.00           | 46.00            | -19.67         | -15.75          | Pass   |
| 4   | 1.2620          | 19.47             | 10.83              | 9.68                   | 29.15            | 20.51             | 56.00           | 46.00            | -26.85         | -25.49          | Pass   |
| 5   | 1.8500          | 18.49             | 11.28              | 9.71                   | 28.20            | 20.99             | 56.00           | 46.00            | -27.80         | -25.01          | Pass   |
| 6   | 10.3900         | 13.38             | 5.61               | 9.94                   | 23.32            | 15.55             | 60.00           | 50.00            | -36.68         | -34.45          | Pass   |

Note: 1. Result = Correction factor + Reading

2. Correction factor = Antenna Factor + Cable loss – Pre-Amplifier gain.

### 4.3. Transmitter Radiated Emissions Measurement

#### ■ Limit

(1)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:

(a)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.

(b)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.

(c)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.

(d)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.

(2)Limits of Radiated Emission Measurement

Emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

| Frequency Range (MHz) | Field Strength (microvolts/meter) | Measurement Distance (meters) |
|-----------------------|-----------------------------------|-------------------------------|
| 0.009 ~ 0.490         | 2400/F(kHz)                       | 300                           |
| 0.490 ~ 1.705         | 24000/F(kHz)                      | 30                            |
| 1.705 ~ 30.0          | 30                                | 30                            |
| 30 ~ 88               | 10                                | 3                             |
| 88 ~ 216              | 150                               | 3                             |
| 216 ~ 960             | 200                               | 3                             |
| Above 960             | 500                               | 3                             |

Note: 1. The lower limit shall apply at the transition frequencies.

2. Emission level (dBuV/m) = 20 log Emission level (uV/m).

3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

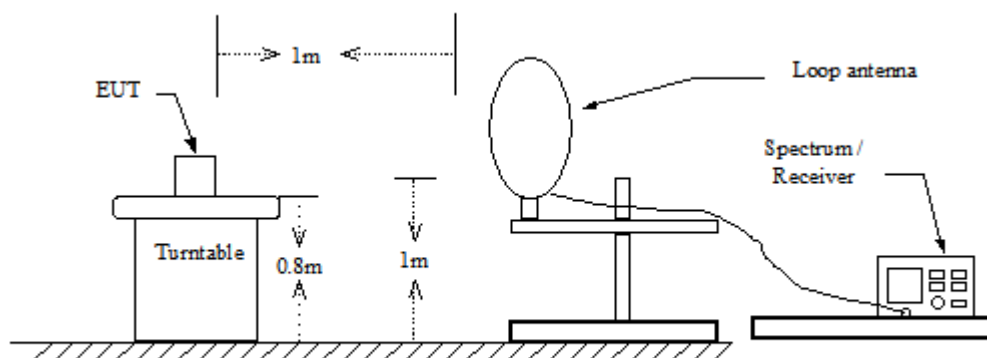
## ■ Test Instruments

| 3 Meter Chamber            |                                |                         |               |            |        |
|----------------------------|--------------------------------|-------------------------|---------------|------------|--------|
| Equipment                  | Manufacturer                   | Model Number            | Serial Number | Cal. Date  | Remark |
| RF Pre-selector            | Agilent                        | N9039A                  | MY46520256    | 04/24/2017 | 1 year |
| Spectrum Analyzer          | Agilent                        | E4446A                  | MY46180578    | 04/24/2017 | 1 year |
| Pre Amplifier              | Agilent                        | 8449B                   | 3008A02237    | 10/11/2016 | 1 year |
| Pre Amplifier              | Agilent                        | 8447D                   | 2944A11119    | 01/12/2017 | 1 year |
| Broadband Antenna          | Schwarzbeck                    | VULB9168                | 416           | 10/13/2016 | 1 year |
| Horn Antenna<br>(1~18GHz)  | SCHWARZBECK<br>MESS-ELEKTRONIK | BBHA9120D               | 9120D-550     | 06/22/2017 | 1 year |
| Horn Antenna<br>(18~40GHz) | ETS                            | 3116                    | 86467         | 09/05/2016 | 1 year |
| Loop Antenna               | COM-POWER<br>CORPORATION       | AL-130                  | 121014        | 01/26/2017 | 1 year |
| Microwave Cable            | EMCI                           | EMC102-KM-KM-1<br>4000  | 151001        | 02/20/2017 | 1 year |
| Microwave Cable            | EMCI                           | EMC-104-SM-SM-<br>14000 | 140202        | 02/20/2017 | 1 year |
| Microwave Cable            | EMCI                           | EMC104-SM-SM-6<br>00    | 140301        | 02/20/2017 | 1 year |

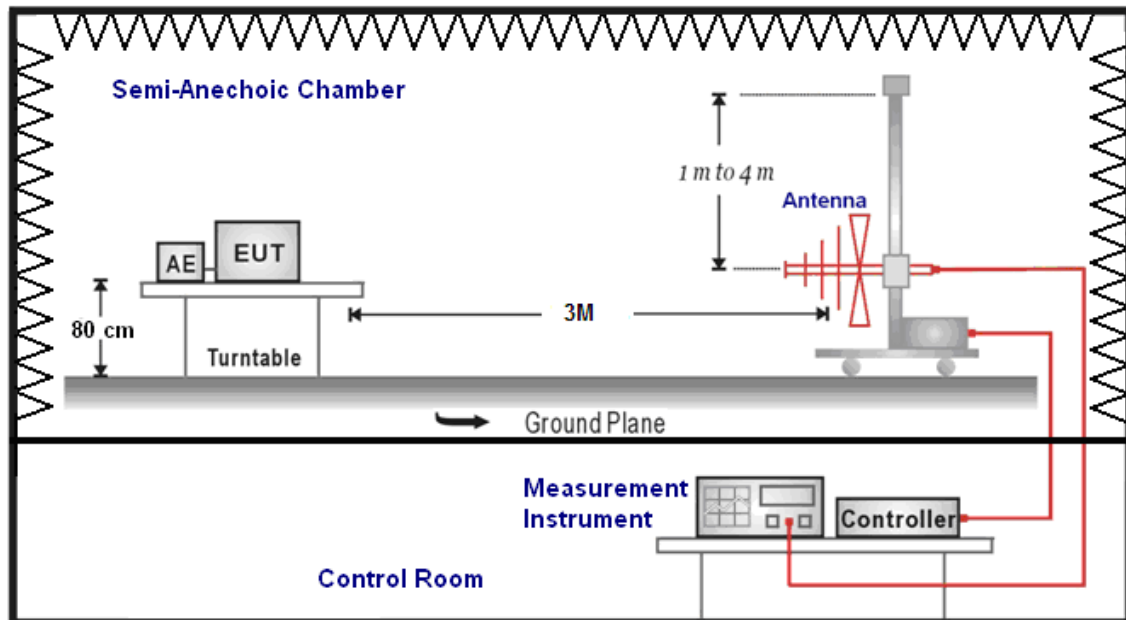
Note: N.C.R. = No Calibration Request.

## ■ Setup

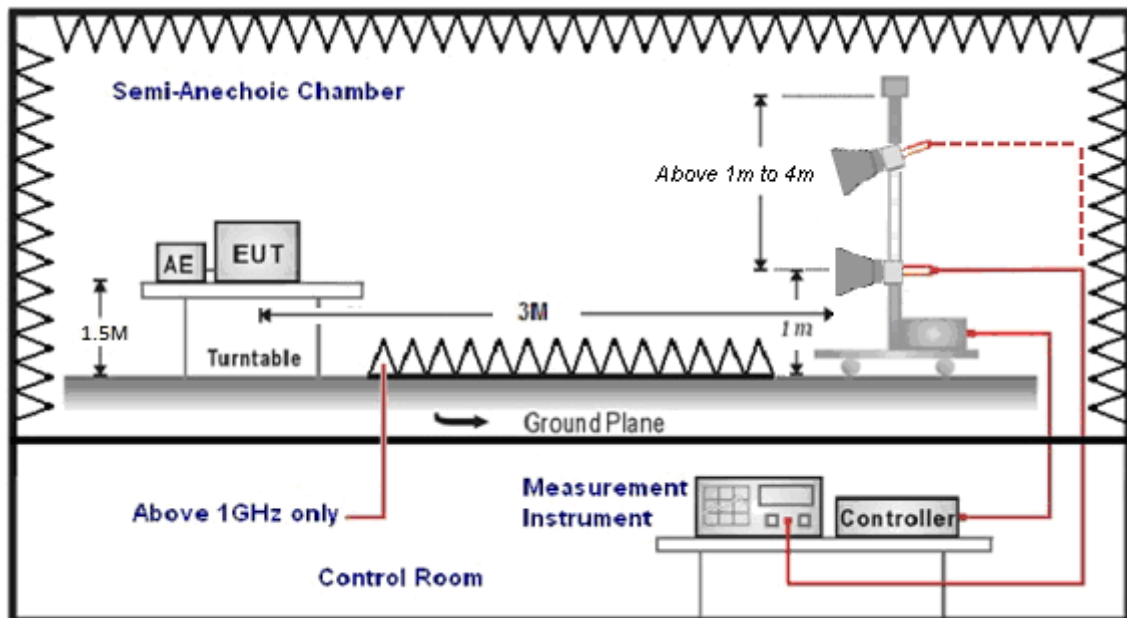
9kHz ~ 30MHz



30MHz ~ 1GHz



Above 1GHz



## ■ Test Procedure

Final radiation measurements were made on a three-meter, Semi Anechoic Chamber. The EUT system was placed on a nonconductive turntable which is 0.8 or 1.5 meters height (below 1GHz use 0.8m turntable / above 1GHz use 1.5m turntable), top surface 1.0 x 1.5 meter. The spectrum was examined from 250 MHz to 2.5 GHz in order to cover the whole spectrum below 10th harmonic which could generate from the EUT. During the test, EUT was set to transmit continuously & Measurements spectrum range from 9 kHz to 40 GHz is investigated.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For restricted measurements above 1 GHz the resolution bandwidth is set to 1 MHz, and then the video bandwidth is set to 3 MHz for peak measurements and 10 Hz for average measurements when Duty cycle > 0.98 / 1/T for average measurements when Duty cycle < 0.98.

For out of band measurements above 1 GHz the resolution bandwidth is set to 1 MHz, and then the video bandwidth is set to 3 MHz for peak measurements.

A nonconductive material surrounded the EUT to supporting the EUT for standing on three orthogonal planes. At each condition, the EUT was rotated 360 degrees, and the antenna was raised and lowered from one to four meters to find the maximum emission levels. Measurements were taken using both horizontal and vertical antenna polarization.

SCHWARZBECK MESS-ELEKTRONIK Trilog-Broadband Antenna at 3 Meter and the ETS-Lindgren Double-Ridged Waveguide Horn antenna Schwarzbeck Mess-Elektronik Broadband Horn Antenna was used in frequencies 1 – 40 GHz at a distance of 3 meter. The antenna at an angle toward the source of the emission. All test results were extrapolated to equivalent signal at 3 meters utilizing an inverse linear distance extrapolation Factor (20dB/decade).

For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

Appropriate preamplifiers were used for improving sensitivity and precautions were taken to avoid overloading or desensitizing the spectrum analyzer. No post – detector video filters were used in the test.

The spectrum analyzer's 6 dB bandwidth was set to 1 MHz, and the analyzer was operated in the peak detection mode, for frequencies both below and up 1 GHz. The average levels were obtained by subtracting the duty cycle correction factor from the peak readings.

The following procedures were used to convert the emission levels measured in decibels referenced to 1 microvolt (dBuV) into field intensity in micro volts per meter (uV/m).

The actual field intensity in decibels referenced to 1 microvolt in to field intensity in micro volts per meter (dBuV/m).

The actual field intensity in referenced to 1 microvolt per meter (dBuV/m) is determined by algebraically adding the measured reading in dBuV, the antenna factor (dB), and cable loss (dB) and Subtracting the gain of preamplifier (dB) is auto calculate in spectrum analyzer.

$$(1) \text{ Amplitude (dBuV/m) = FI (dBuV) + AF (dBuV) + CL (dBuV) - Gain (dB)}$$

FI= Reading of the field intensity.

AF= Antenna factor.

CL= Cable loss.

P.S Amplitude is auto calculate in spectrum analyzer.

$$(2) \text{ Actual Amplitude (dBuV/m) = Amplitude (dBuV) - Dis(dB)}$$

The FCC specified emission limits were calculated according the EUT operating frequency and by following linear interpolation equations:

(a) For fundamental frequency : Transmitter Output < +30dBm

(b) For spurious frequency : Spurious emission limits = fundamental emission limit /10

#### Measuring Instruments and setting

The following table is the setting of spectrum analyzer and receiver.

| Spectrum Parameter                       | Setting                                          |
|------------------------------------------|--------------------------------------------------|
| Attenuation                              | Auto                                             |
| Start Frequency                          | 1000MHz                                          |
| Stop Frequency                           | 40GHz                                            |
| RBW/VBW(Emission in restricted band)     | 1MHz / 3MHz for Peak<br>1MHz / (1/T) for Average |
| RBW/VBW(Emission in non-restricted band) | 1MHz / 3MHz for Peak                             |



## ■ Test Result

Below 1GHz

|                    |                   |                          |                    |                      |                |              |                     |
|--------------------|-------------------|--------------------------|--------------------|----------------------|----------------|--------------|---------------------|
| Standard:          |                   | FCC Part 15.407          |                    | Test Distance:       |                | 3m           |                     |
| Test item:         |                   | Harmonic                 |                    | Power:               |                | AC 120V/60Hz |                     |
| Test Mode:         |                   | Mode 1                   |                    | Temp.(°C)/Hum.(%RH): |                | 26(°C)/60%RH |                     |
| Description:       |                   |                          |                    | Date:                |                | 07/23/2017   |                     |
| Internal Antenna   |                   |                          |                    |                      |                |              |                     |
| Frequency<br>(MHz) | Reading<br>(dBuV) | Correct Factor<br>(dB/m) | Result<br>(dBuV/m) | Limit<br>(dBuV/m)    | Margin<br>(dB) | Remark       | Ant.Polar.<br>H / V |
| 259.8900           | 45.44             | -4.27                    | 41.17              | 46.00                | -4.83          | QP           | H                   |
| 323.9100           | 41.43             | -2.30                    | 39.13              | 46.00                | -6.87          | QP           | H                   |
| 388.9000           | 37.11             | -1.03                    | 36.08              | 46.00                | -9.92          | QP           | H                   |
| 600.3600           | 33.55             | 3.34                     | 36.89              | 46.00                | -9.11          | QP           | H                   |
| 744.8900           | 32.22             | 6.10                     | 38.32              | 46.00                | -7.68          | QP           | H                   |
| 889.4200           | 30.88             | 8.80                     | 39.68              | 46.00                | -6.32          | QP           | H                   |
| 210.4200           | 41.97             | -6.37                    | 35.60              | 43.50                | -7.90          | QP           | V                   |
| 399.5700           | 38.01             | -0.80                    | 37.21              | 46.00                | -8.79          | QP           | V                   |
| 518.8800           | 35.53             | 1.60                     | 37.13              | 46.00                | -8.87          | QP           | V                   |
| 600.3600           | 32.60             | 3.34                     | 35.94              | 46.00                | -10.06         | QP           | V                   |
| 697.3600           | 31.06             | 4.98                     | 36.04              | 46.00                | -9.96          | QP           | V                   |
| 915.6100           | 29.22             | 9.28                     | 38.50              | 46.00                | -7.50          | QP           | V                   |

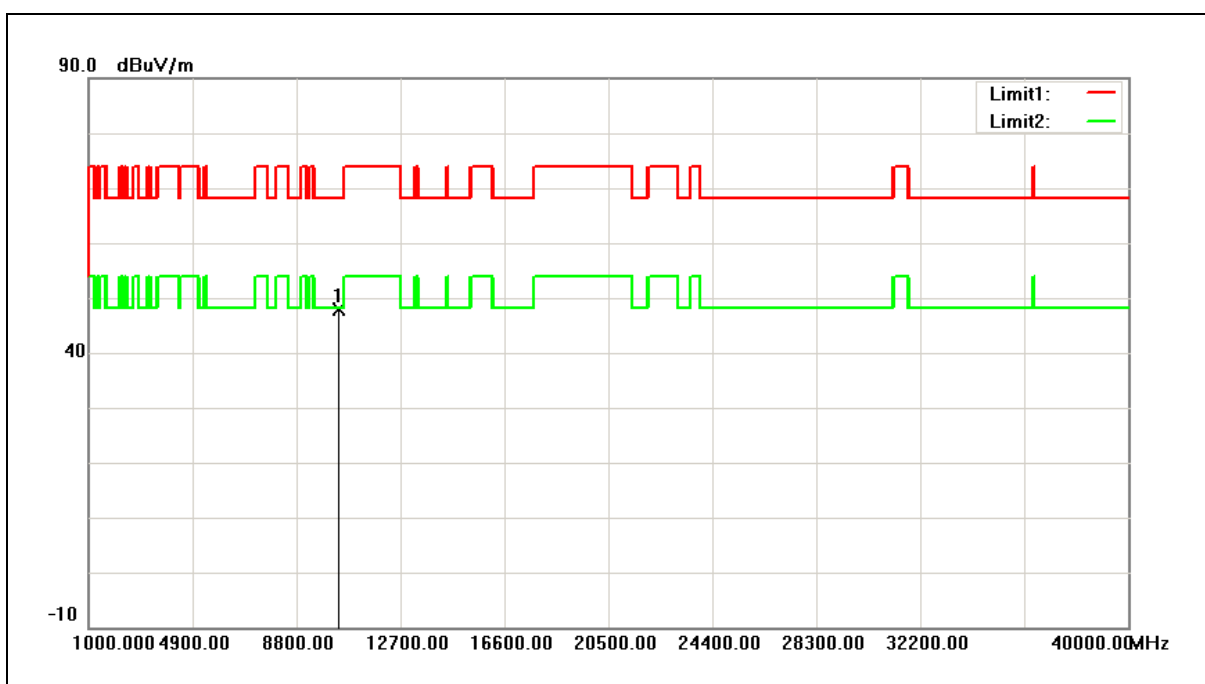
Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.

Above 1GHz

|             |                 |                       |              |
|-------------|-----------------|-----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:        | 3m           |
| Test item:  | Harmonic        | Power:                | AC 120V/60Hz |
| Frequency:  | 5180MHz         | Temp.(°C)/Hum. (%RH): | 26(°C)/60%RH |
| Mode:       | Mode 2          | Date:                 | 08/06/2017   |
| Ant.Polar.: | Horizontal      |                       |              |



| No. | Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-----------------------|-----------------|----------------|-------------|--------|
| 1   | 10360.000       | 41.80          | 6.13                  | 47.93           | 68.20          | -20.27      | peak   |

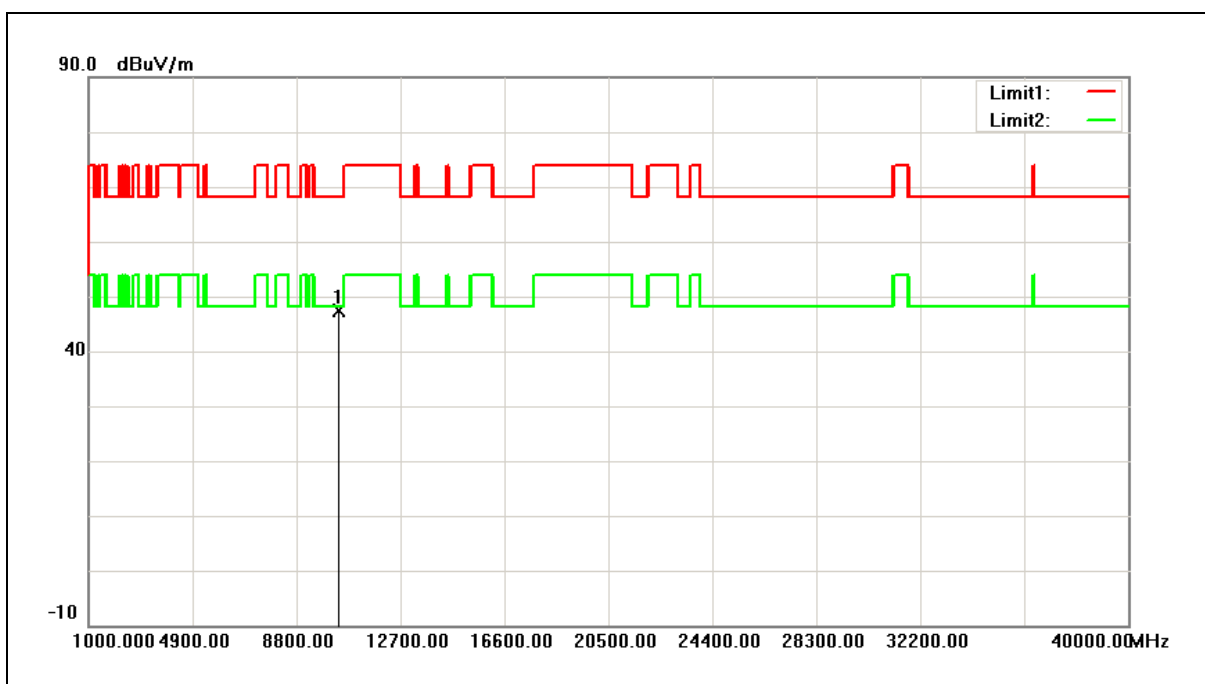
Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.



|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Harmonic        | Power:               | AC 120V/60Hz |
| Frequency:  | 5180MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 2          | Date:                | 08/06/2017   |
| Ant.Polar.: | Vertical        |                      |              |



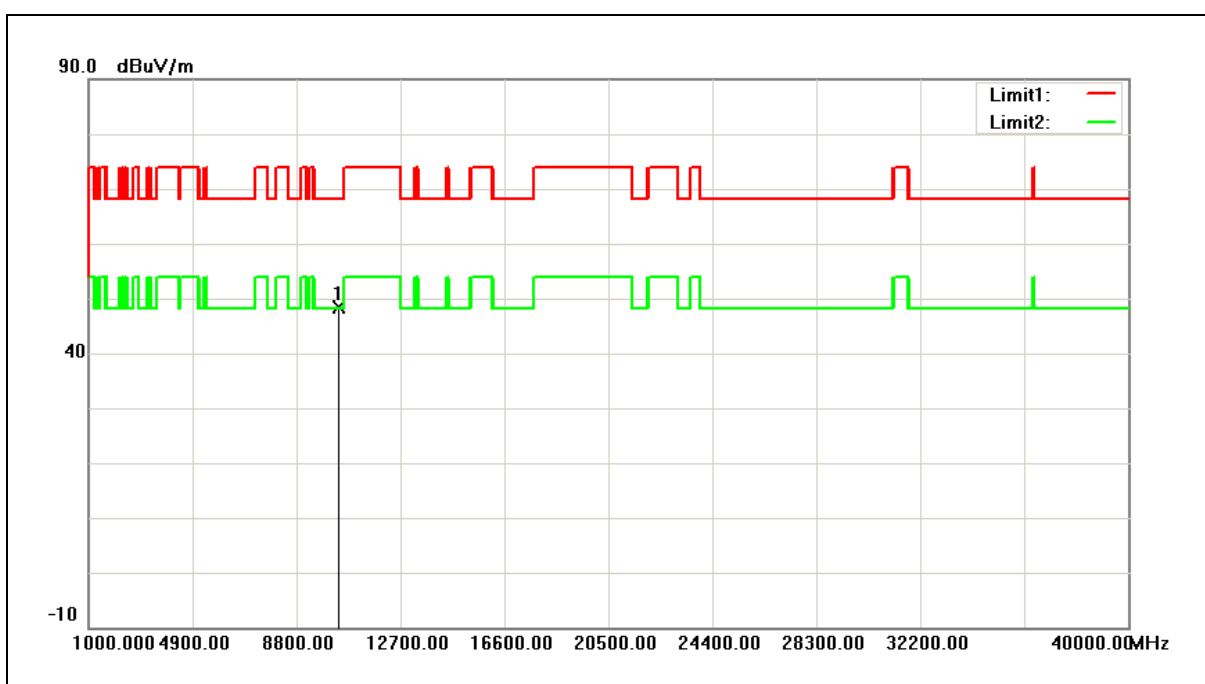
| No. | Frequency<br>(MHz) | Reading<br>(dBuV) | Correct Factor<br>(dB/m) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|-----|--------------------|-------------------|--------------------------|--------------------|-------------------|----------------|--------|
| 1   | 10360.000          | 41.23             | 6.13                     | 47.36              | 68.20             | -20.84         | peak   |

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.

|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Harmonic        | Power:               | AC 120V/60Hz |
| Frequency:  | 5200MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 2          | Date:                | 08/06/2017   |
| Ant.Polar.: | Horizontal      |                      |              |



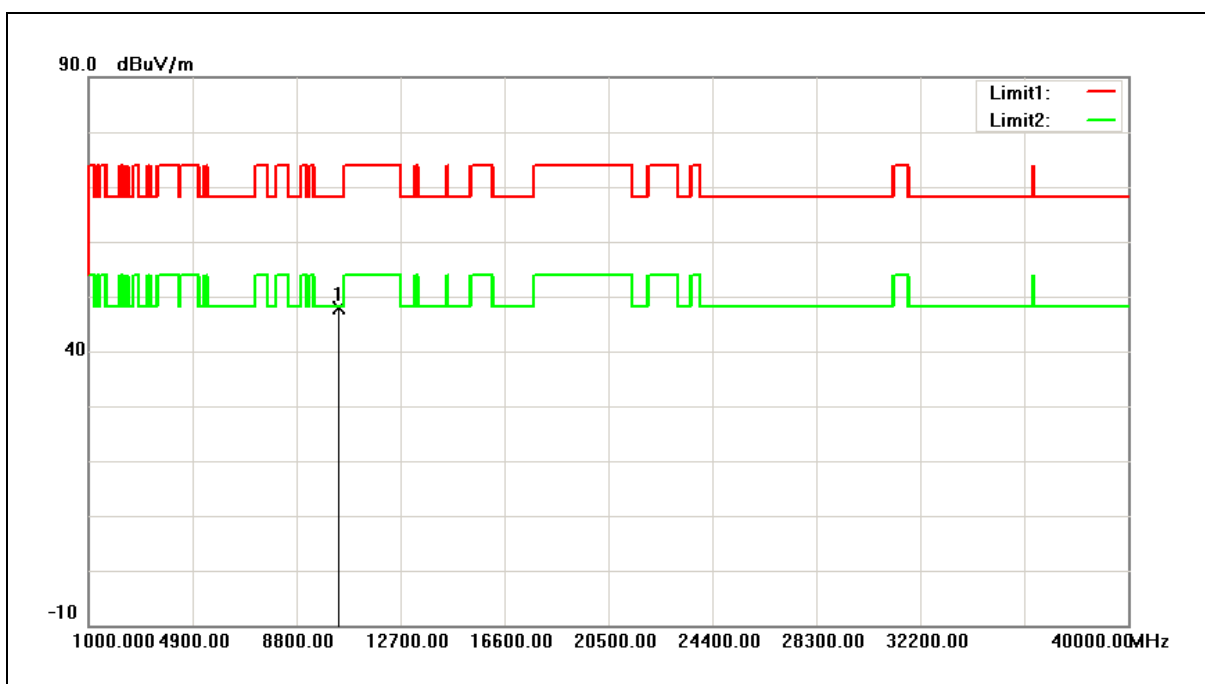
| No. | Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-----------------------|-----------------|----------------|-------------|--------|
| 1   | 10400.000       | 42.25          | 6.22                  | 48.47           | 68.20          | -19.73      | peak   |

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.

|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Harmonic        | Power:               | AC 120V/60Hz |
| Frequency:  | 5200MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 2          | Date:                | 08/06/2017   |
| Ant.Polar.: | Vertical        |                      |              |



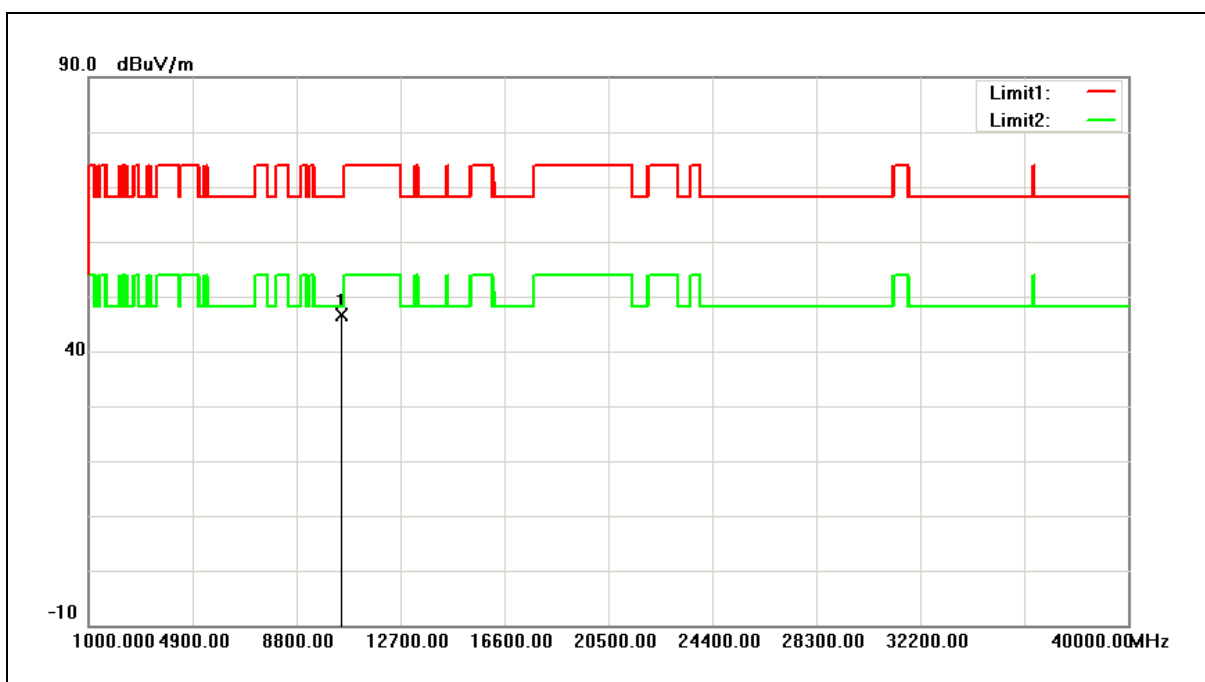
| No. | Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-----------------------|-----------------|----------------|-------------|--------|
| 1   | 10400.000       | 41.66          | 6.22                  | 47.88           | 68.20          | -20.32      | peak   |

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.

|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Harmonic        | Power:               | AC 120V/60Hz |
| Frequency:  | 5240MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 2          | Date:                | 08/06/2017   |
| Ant.Polar.: | Horizontal      |                      |              |



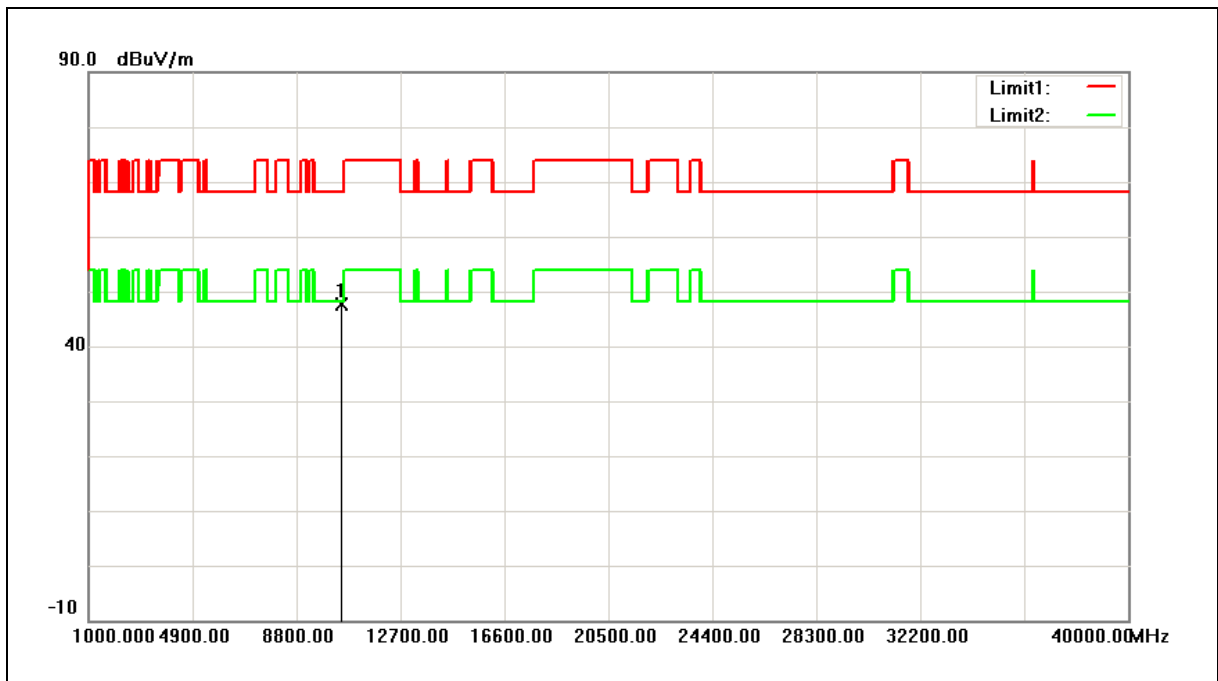
| No. | Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-----------------------|-----------------|----------------|-------------|--------|
| 1   | 10480.000       | 40.29          | 6.40                  | 46.69           | 68.20          | -21.51      | peak   |

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.

|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Harmonic        | Power:               | AC 120V/60Hz |
| Frequency:  | 5240MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 2          | Date:                | 08/06/2017   |
| Ant.Polar.: | Vertical        |                      |              |



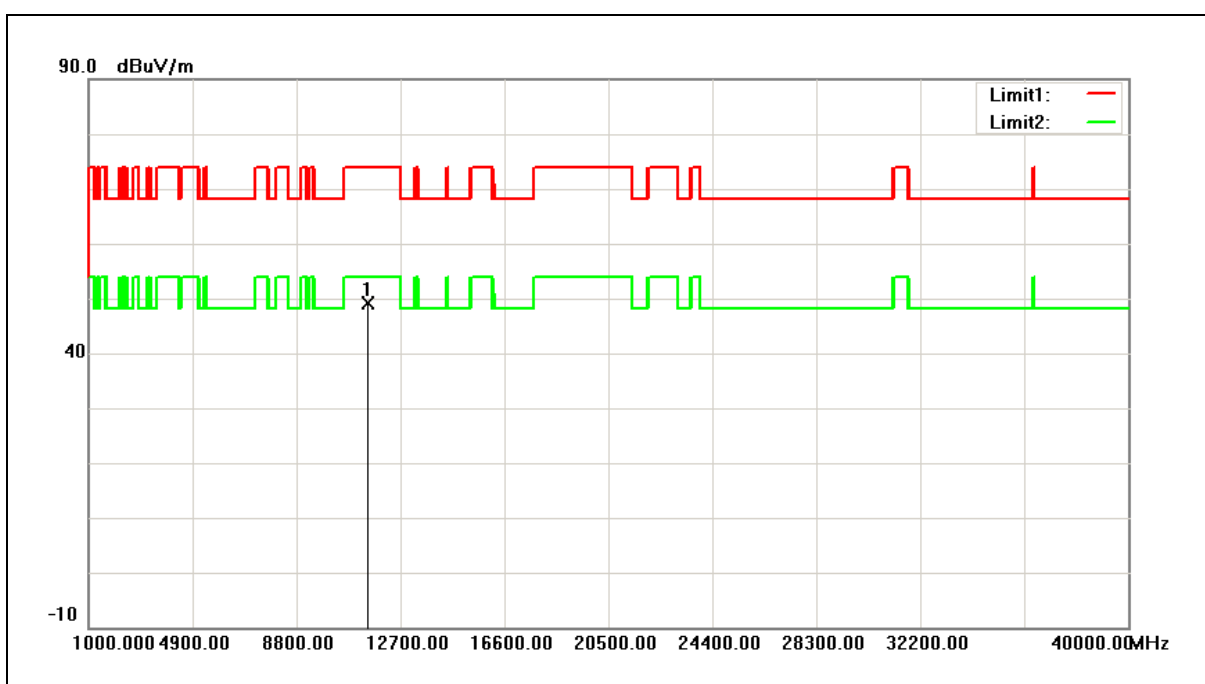
| No. | Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-----------------------|-----------------|----------------|-------------|--------|
| 1   | 10480.000       | 41.32          | 6.40                  | 47.72           | 68.20          | -20.48      | peak   |

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.

|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Harmonic        | Power:               | AC 120V/60Hz |
| Frequency:  | 5745MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 2          | Date:                | 08/06/2017   |
| Ant.Polar.: | Horizontal      |                      |              |



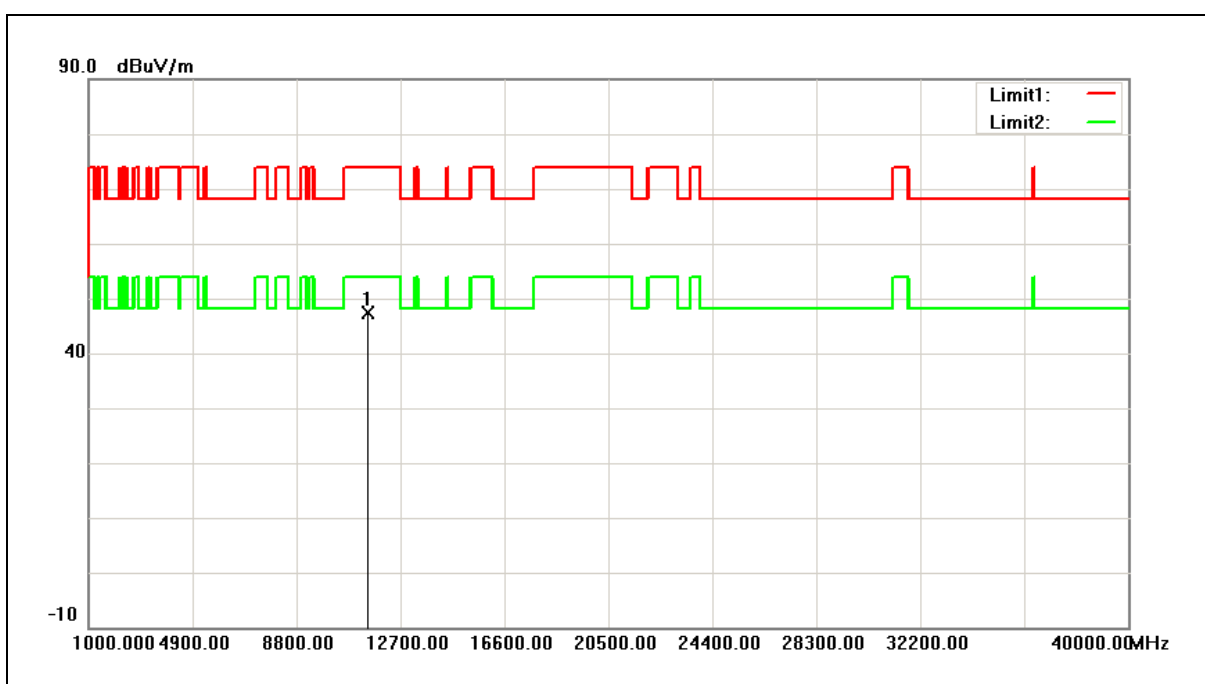
| No. | Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-----------------------|-----------------|----------------|-------------|--------|
| 1   | 11490.000       | 41.81          | 7.35                  | 49.16           | 74.00          | -24.84      | peak   |

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.

|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Harmonic        | Power:               | AC 120V/60Hz |
| Frequency:  | 5745MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 2          | Date:                | 08/06/2017   |
| Ant.Polar.: | Vertical        |                      |              |



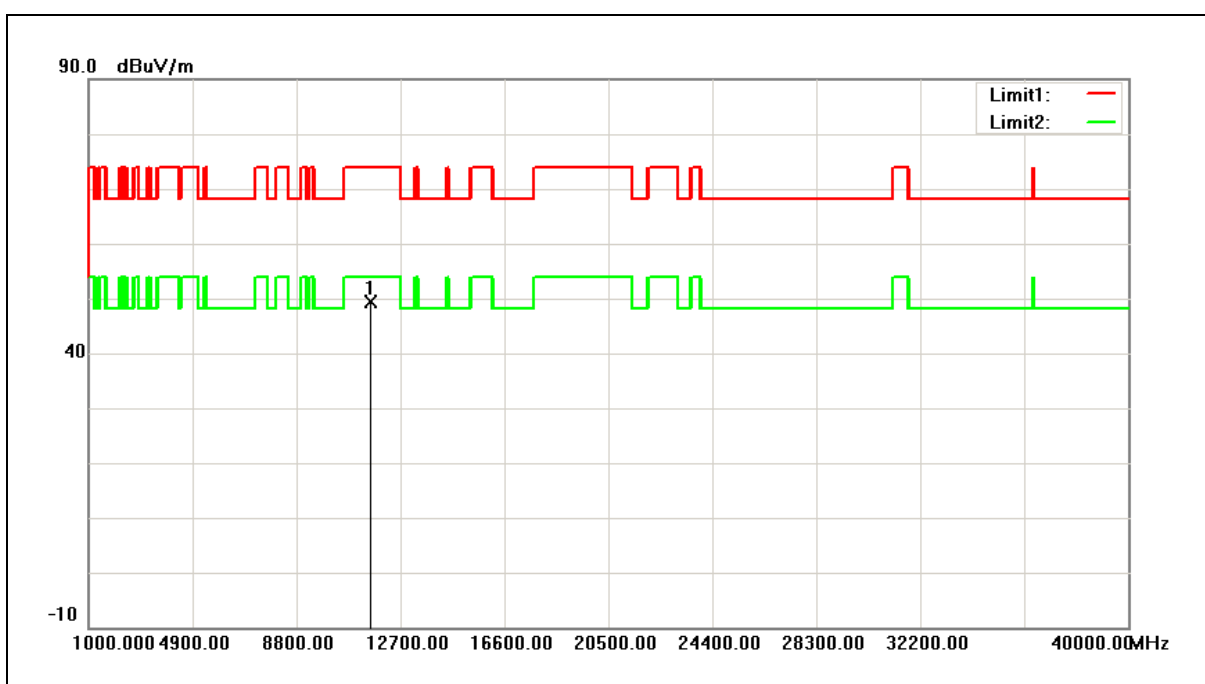
| No. | Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-----------------------|-----------------|----------------|-------------|--------|
| 1   | 11490.000       | 39.95          | 7.35                  | 47.30           | 74.00          | -26.70      | peak   |

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.

|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Harmonic        | Power:               | AC 120V/60Hz |
| Frequency:  | 5785MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 2          | Date:                | 08/31/2017   |
| Ant.Polar.: | Horizontal      |                      |              |



| No. | Frequency<br>(MHz) | Reading<br>(dBuV) | Correct Factor<br>(dB/m) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|-----|--------------------|-------------------|--------------------------|--------------------|-------------------|----------------|--------|
| 1   | 11570.000          | 45.54             | 3.96                     | 49.50              | 74.00             | -24.50         | peak   |

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

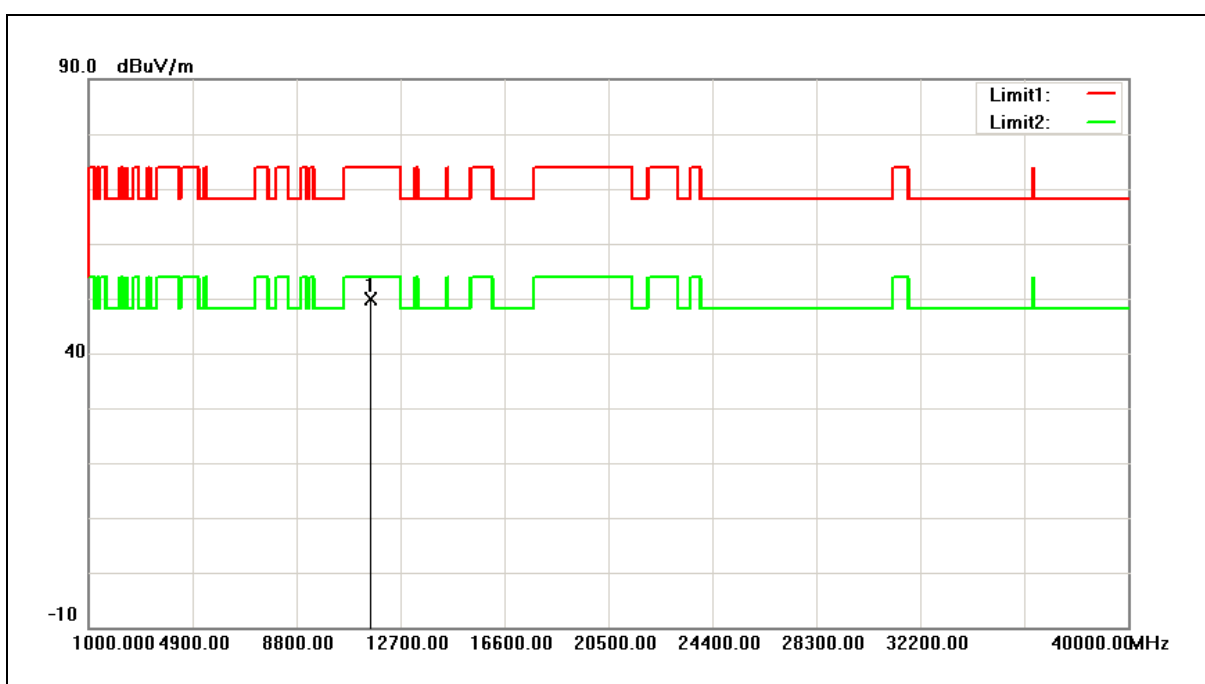
2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.





|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Harmonic        | Power:               | AC 120V/60Hz |
| Frequency:  | 5785MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 2          | Date:                | 08/31/2017   |
| Ant.Polar.: | Vertical        |                      |              |



| No. | Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-----------------------|-----------------|----------------|-------------|--------|
| 1   | 11570.000       | 45.93          | 3.96                  | 49.89           | 74.00          | -24.11      | peak   |

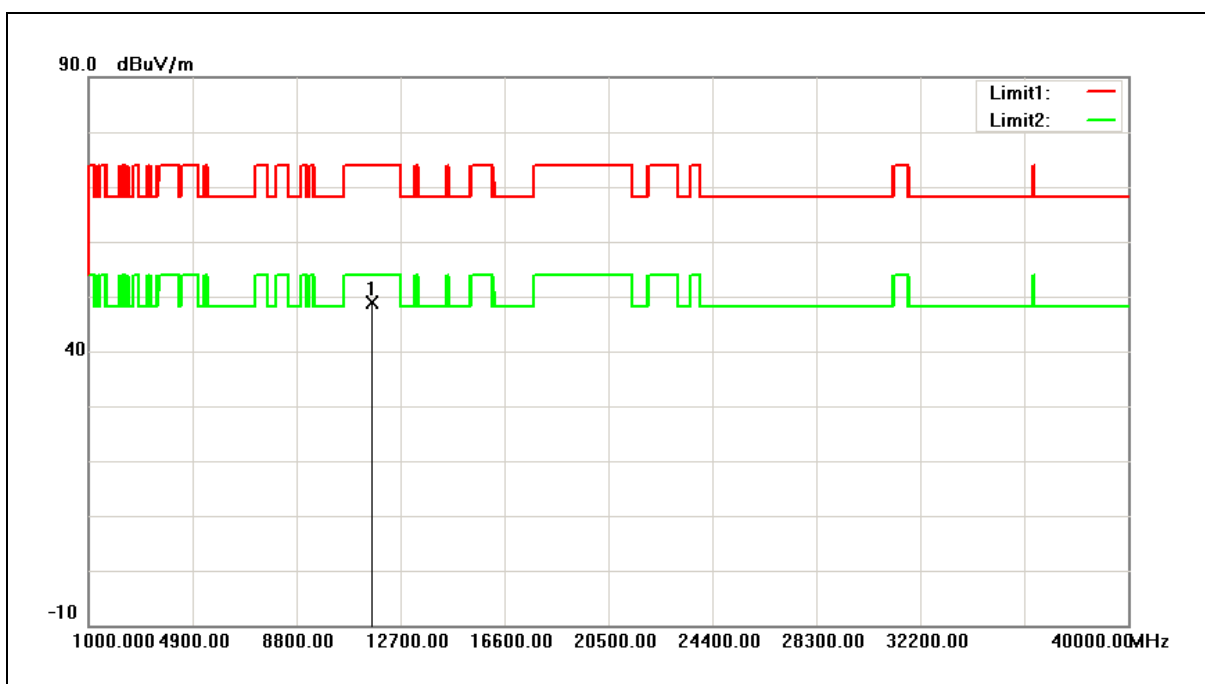
Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.



|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Harmonic        | Power:               | AC 120V/60Hz |
| Frequency:  | 5825MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 2          | Date:                | 08/06/2017   |
| Ant.Polar.: | Horizontal      |                      |              |



| No. | Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-----------------------|-----------------|----------------|-------------|--------|
| 1   | 11650.000       | 41.63          | 7.17                  | 48.80           | 74.00          | -25.20      | peak   |

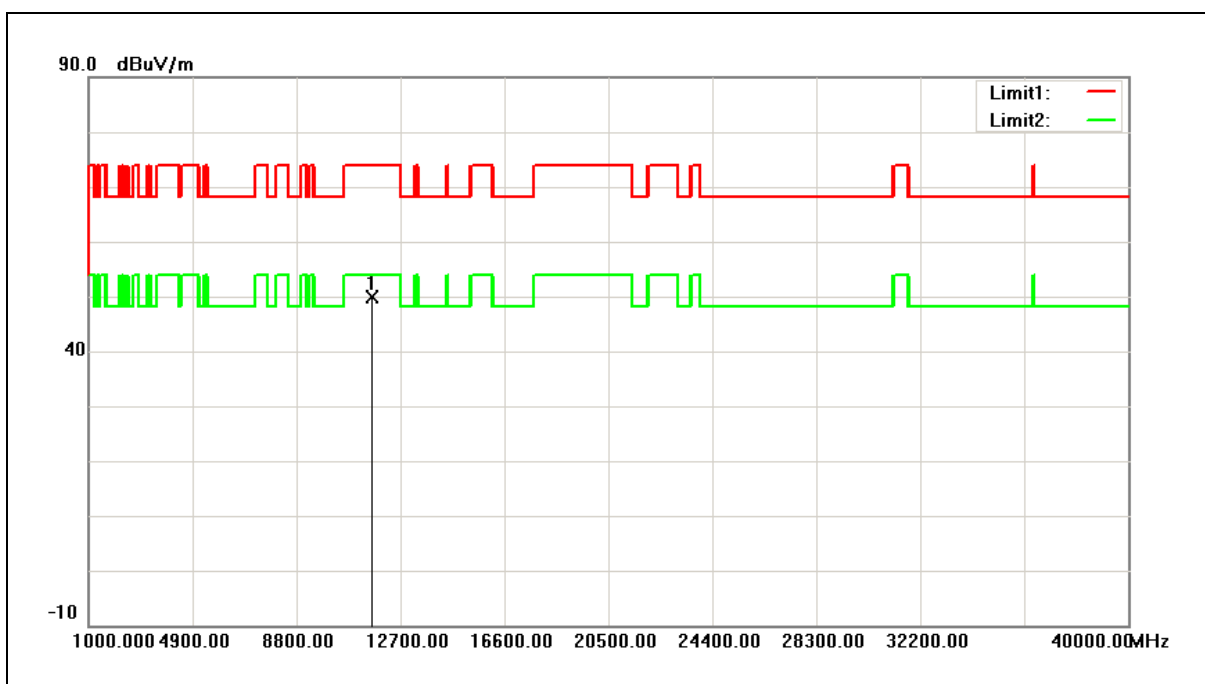
Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.



|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Harmonic        | Power:               | AC 120V/60Hz |
| Frequency:  | 5825MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 2          | Date:                | 08/06/2017   |
| Ant.Polar.: | Vertical        |                      |              |



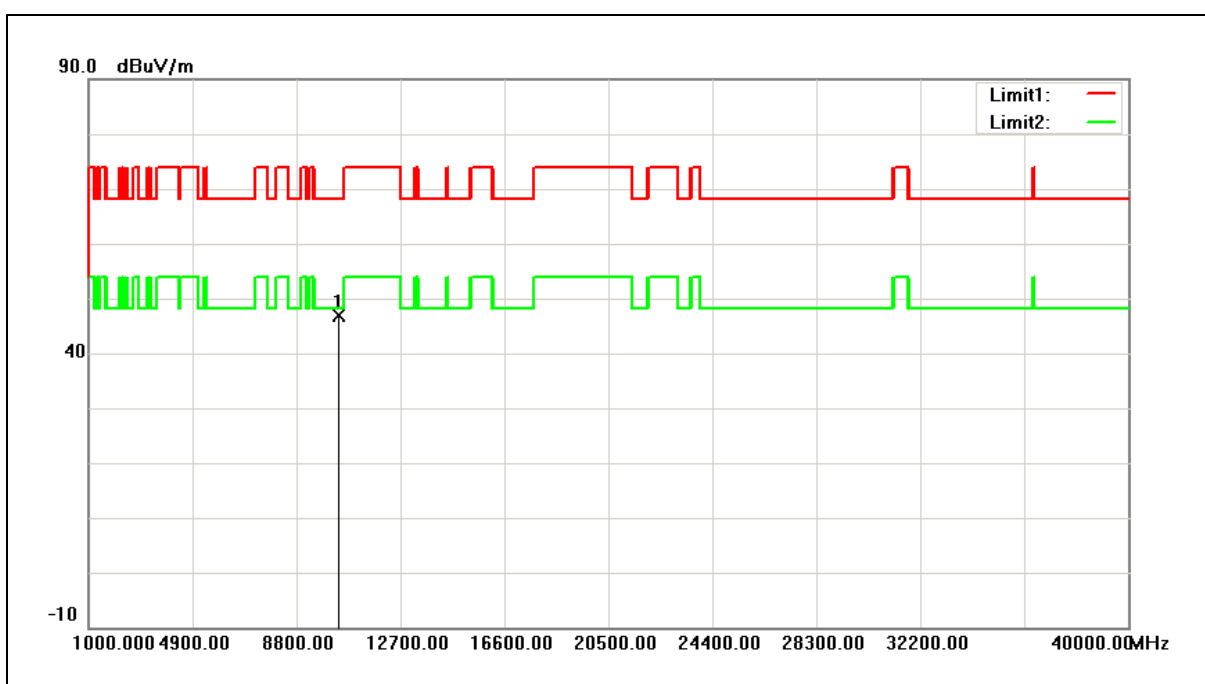
| No. | Frequency<br>(MHz) | Reading<br>(dBuV) | Correct Factor<br>(dB/m) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|-----|--------------------|-------------------|--------------------------|--------------------|-------------------|----------------|--------|
| 1   | 11650.000          | 42.61             | 7.17                     | 49.78              | 74.00             | -24.22         | peak   |

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.

|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Harmonic        | Power:               | AC 120V/60Hz |
| Frequency:  | 5180MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 3          | Date:                | 08/06/2017   |
| Ant.Polar.: | Horizontal      |                      |              |



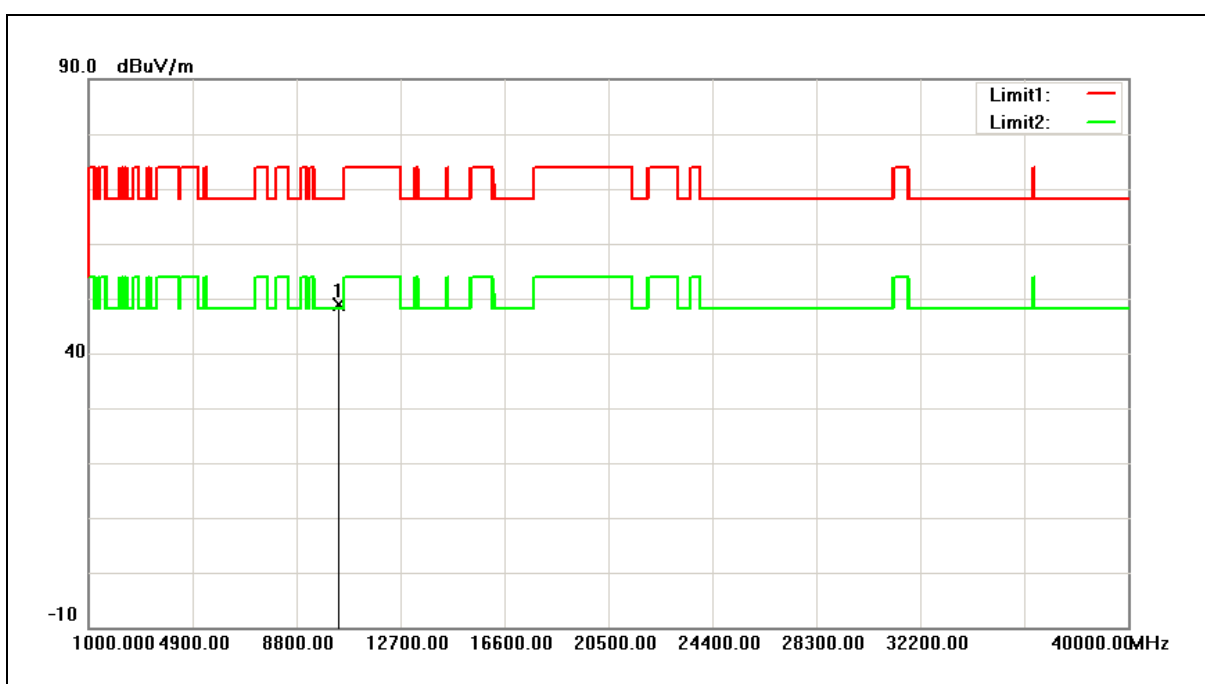
| No. | Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-----------------------|-----------------|----------------|-------------|--------|
| 1   | 10360.000       | 40.74          | 6.13                  | 46.87           | 68.20          | -21.33      | peak   |

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.

|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Harmonic        | Power:               | AC 120V/60Hz |
| Frequency:  | 5180MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 3          | Date:                | 08/06/2017   |
| Ant.Polar.: | Vertical        |                      |              |



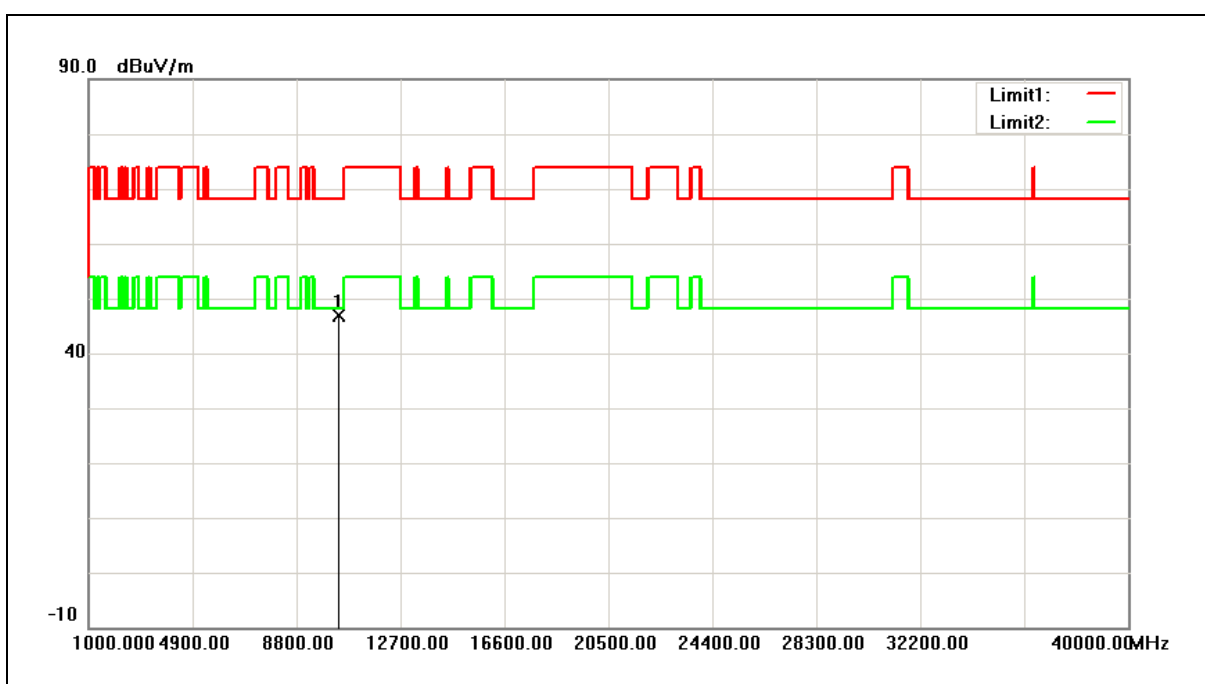
| No. | Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-----------------------|-----------------|----------------|-------------|--------|
| 1   | 10360.000       | 42.65          | 6.13                  | 48.78           | 68.20          | -19.42      | peak   |

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.

|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Harmonic        | Power:               | AC 120V/60Hz |
| Frequency:  | 5200MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 3          | Date:                | 08/06/2017   |
| Ant.Polar.: | Horizontal      |                      |              |



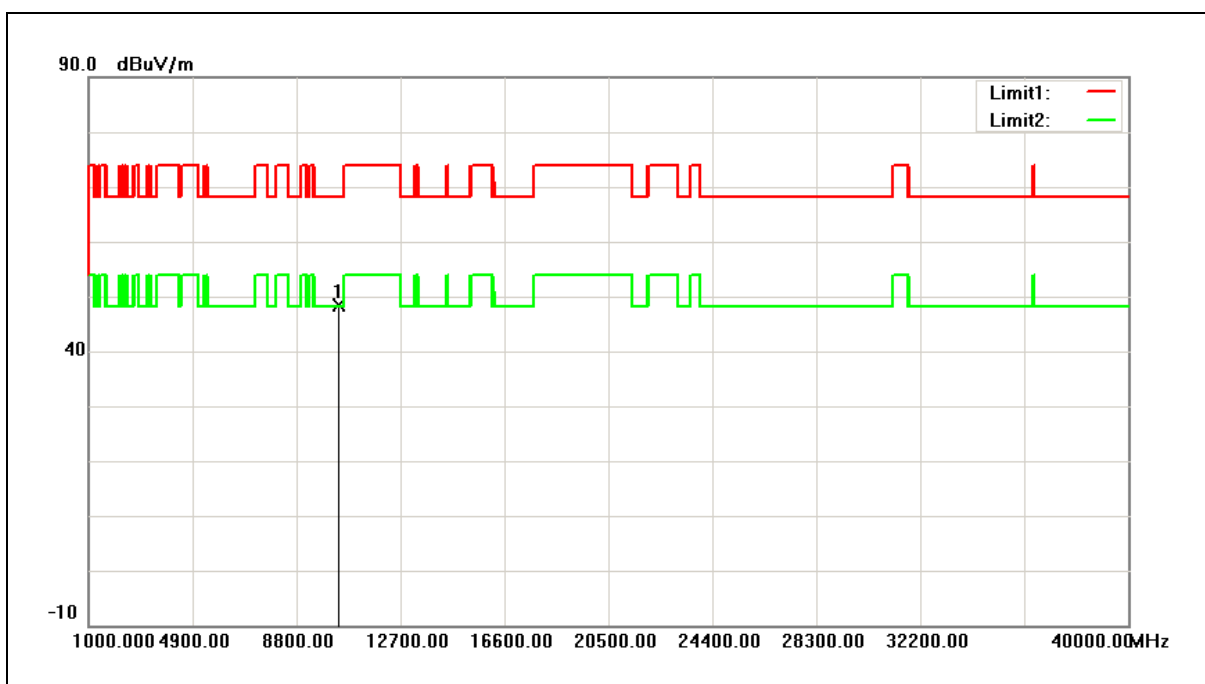
| No. | Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-----------------------|-----------------|----------------|-------------|--------|
| 1   | 10400.000       | 40.55          | 6.22                  | 46.77           | 68.20          | -21.43      | peak   |

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.

|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Harmonic        | Power:               | AC 120V/60Hz |
| Frequency:  | 5200MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 3          | Date:                | 08/06/2017   |
| Ant.Polar.: | Vertical        |                      |              |



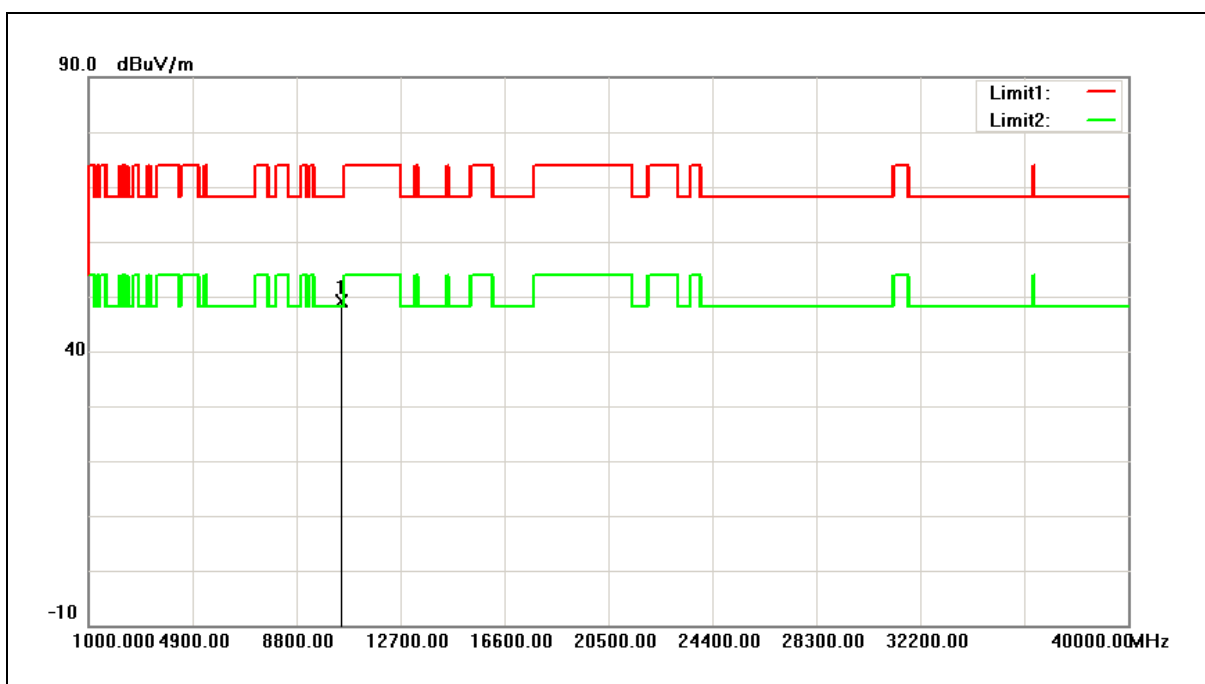
| No. | Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-----------------------|-----------------|----------------|-------------|--------|
| 1   | 10400.000       | 42.22          | 6.22                  | 48.44           | 68.20          | -19.76      | peak   |

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.

|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Harmonic        | Power:               | AC 120V/60Hz |
| Frequency:  | 5240MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 3          | Date:                | 08/06/2017   |
| Ant.Polar.: | Horizontal      |                      |              |



| No. | Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-----------------------|-----------------|----------------|-------------|--------|
| 1   | 10480.000       | 42.73          | 6.40                  | 49.13           | 68.20          | -19.07      | peak   |

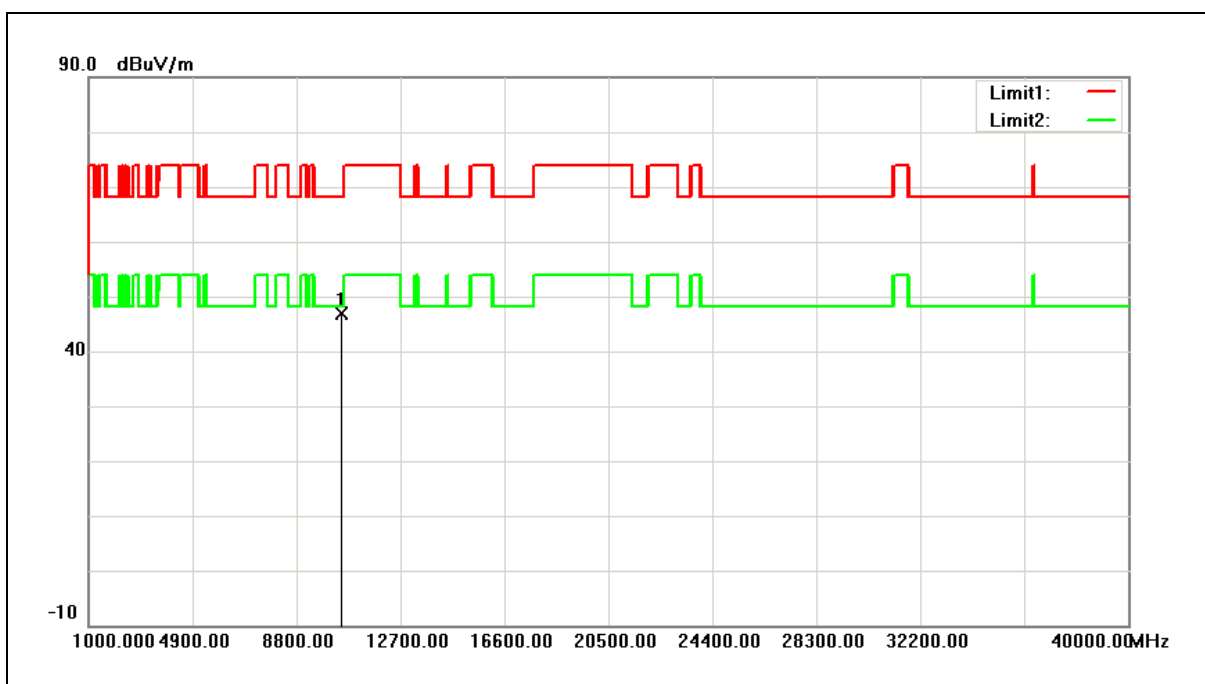
Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.



|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Harmonic        | Power:               | AC 120V/60Hz |
| Frequency:  | 5240MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 3          | Date:                | 08/06/2017   |
| Ant.Polar.: | Vertical        |                      |              |



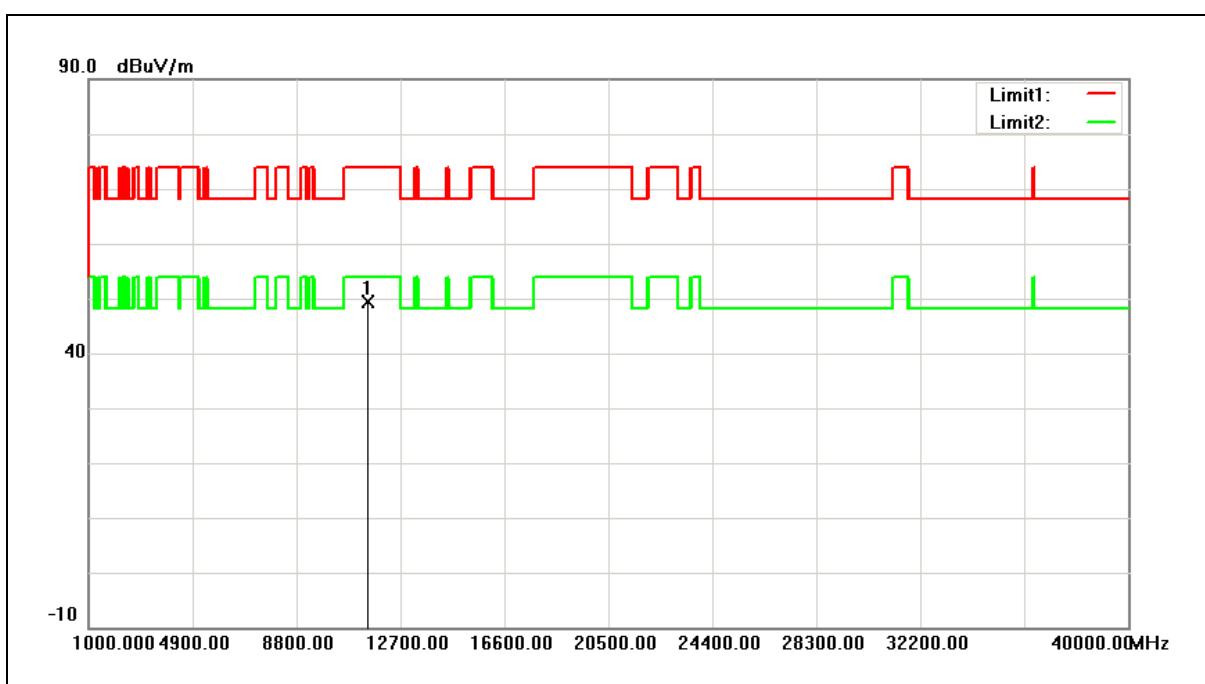
| No. | Frequency<br>(MHz) | Reading<br>(dBuV) | Correct Factor<br>(dB/m) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|-----|--------------------|-------------------|--------------------------|--------------------|-------------------|----------------|--------|
| 1   | 10480.000          | 40.42             | 6.40                     | 46.82              | 68.20             | -21.38         | peak   |

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.

|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Harmonic        | Power:               | AC 120V/60Hz |
| Frequency:  | 5745MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 3          | Date:                | 08/06/2017   |
| Ant.Polar.: | Horizontal      |                      |              |



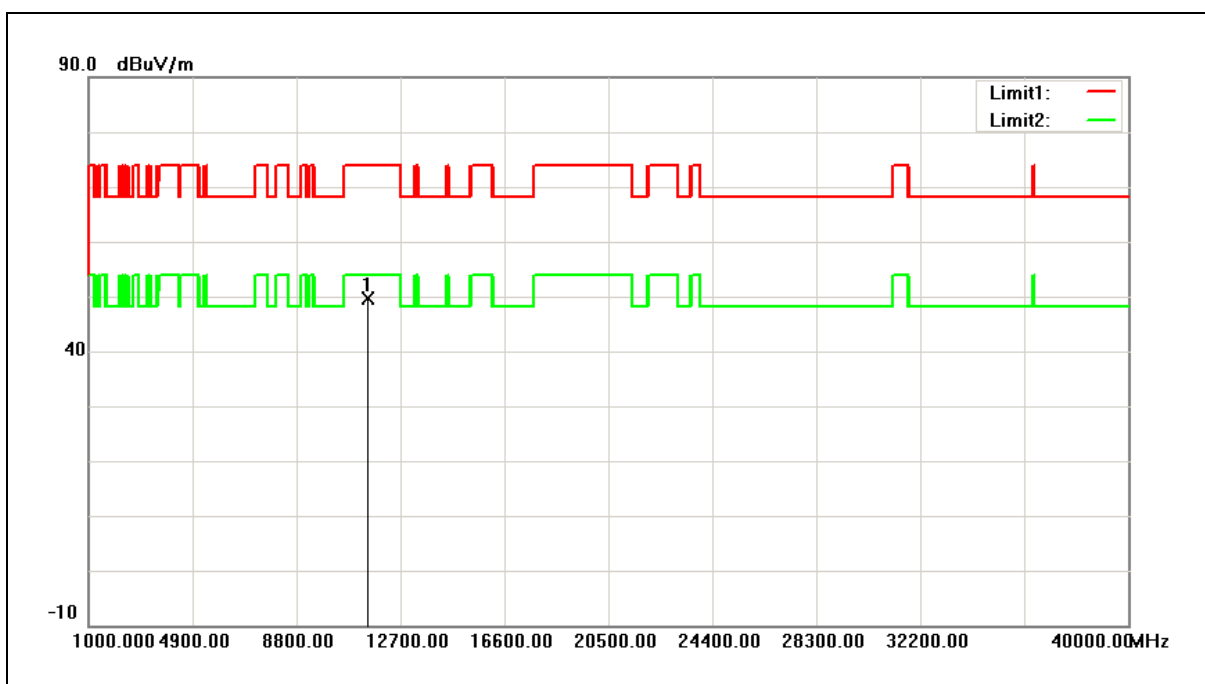
| No. | Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-----------------------|-----------------|----------------|-------------|--------|
| 1   | 11490.000       | 41.95          | 7.35                  | 49.30           | 74.00          | -24.70      | peak   |

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.

|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Harmonic        | Power:               | AC 120V/60Hz |
| Frequency:  | 5745MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 3          | Date:                | 08/06/2017   |
| Ant.Polar.: | Vertical        |                      |              |



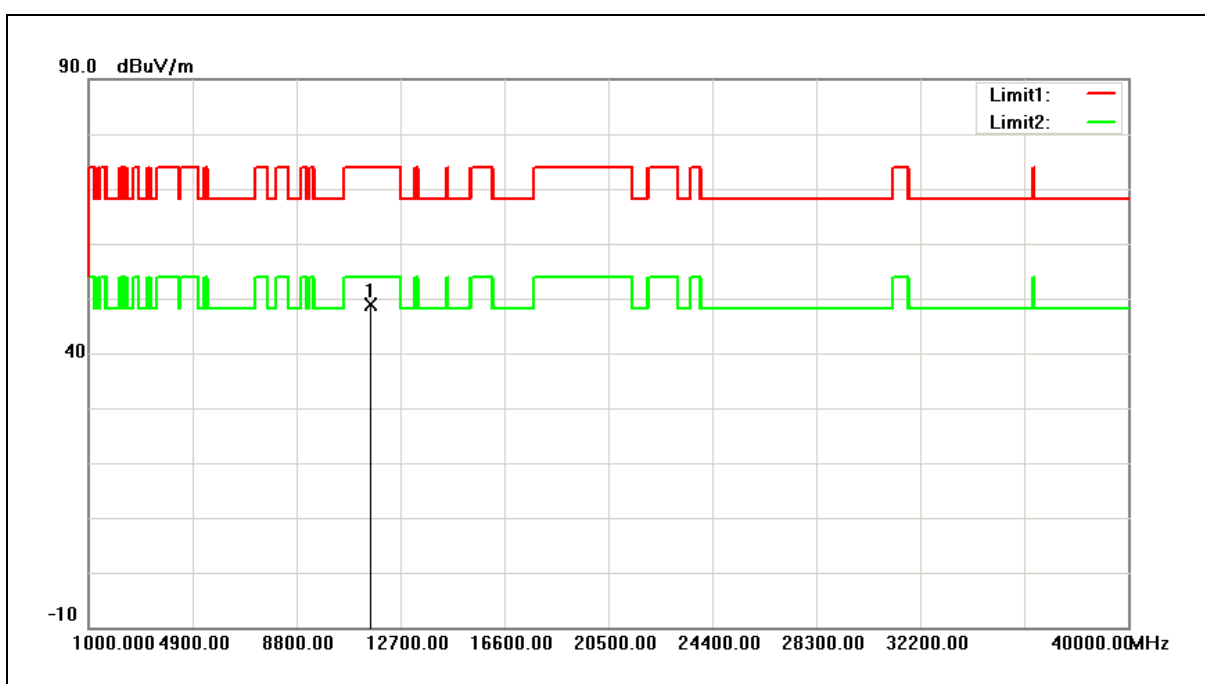
| No. | Frequency<br>(MHz) | Reading<br>(dBuV) | Correct Factor<br>(dB/m) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|-----|--------------------|-------------------|--------------------------|--------------------|-------------------|----------------|--------|
| 1   | 11490.000          | 42.34             | 7.35                     | 49.69              | 74.00             | -24.31         | peak   |

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.

|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Harmonic        | Power:               | AC 120V/60Hz |
| Frequency:  | 5785MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 3          | Date:                | 08/31/2017   |
| Ant.Polar.: | Horizontal      |                      |              |



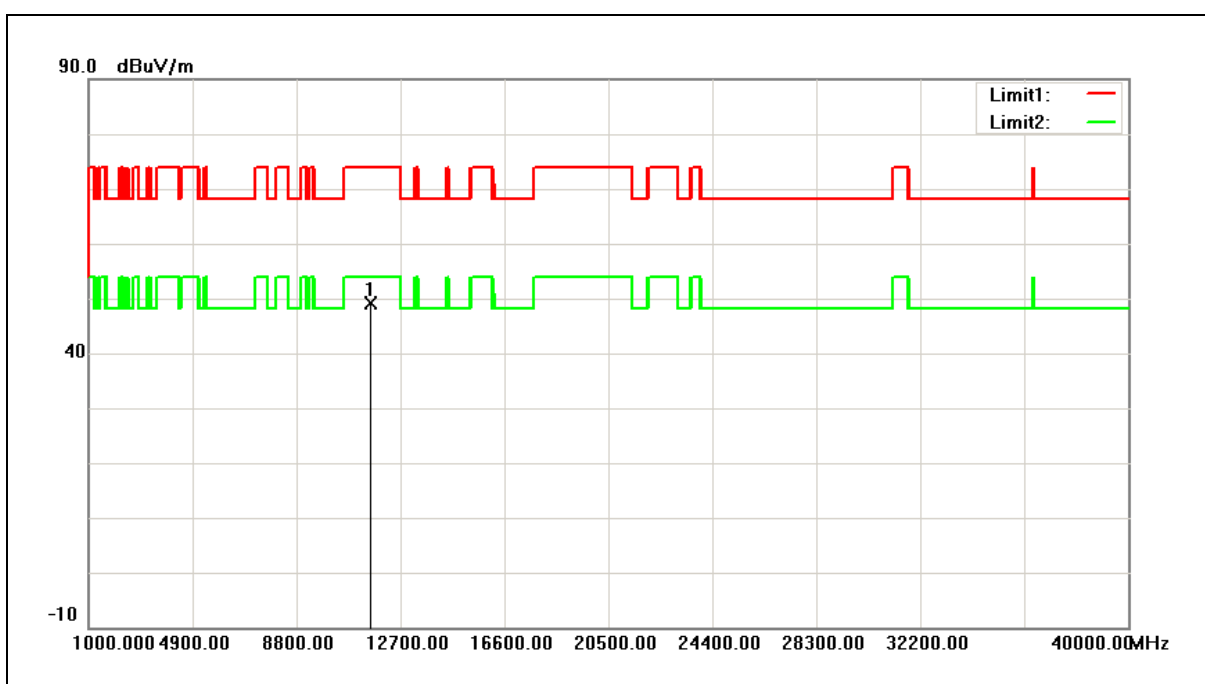
| No. | Frequency<br>(MHz) | Reading<br>(dBuV) | Correct Factor<br>(dB/m) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|-----|--------------------|-------------------|--------------------------|--------------------|-------------------|----------------|--------|
| 1   | 11570.000          | 44.80             | 3.96                     | 48.76              | 74.00             | -25.24         | peak   |

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.

|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Harmonic        | Power:               | AC 120V/60Hz |
| Frequency:  | 5785MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 3          | Date:                | 08/31/2017   |
| Ant.Polar.: | Vertical        |                      |              |



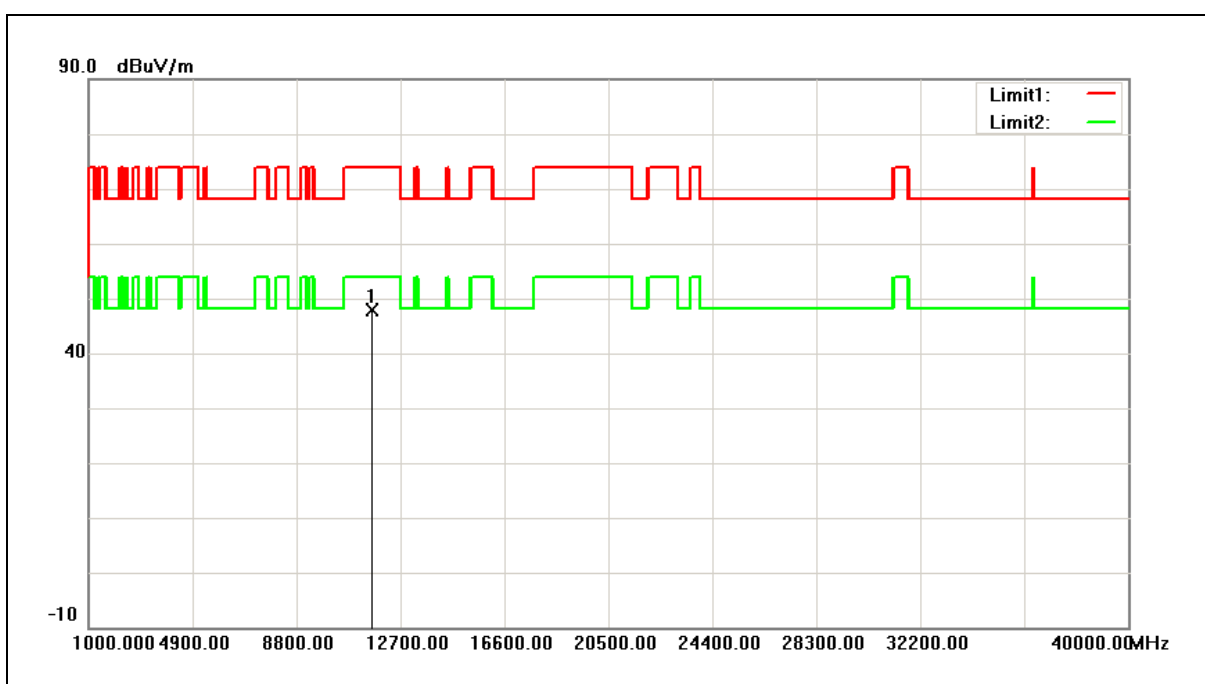
| No. | Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-----------------------|-----------------|----------------|-------------|--------|
| 1   | 11570.000       | 45.15          | 3.96                  | 49.11           | 74.00          | -24.89      | peak   |

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.

|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Harmonic        | Power:               | AC 120V/60Hz |
| Frequency:  | 5825MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 3          | Date:                | 08/06/2017   |
| Ant.Polar.: | Horizontal      |                      |              |



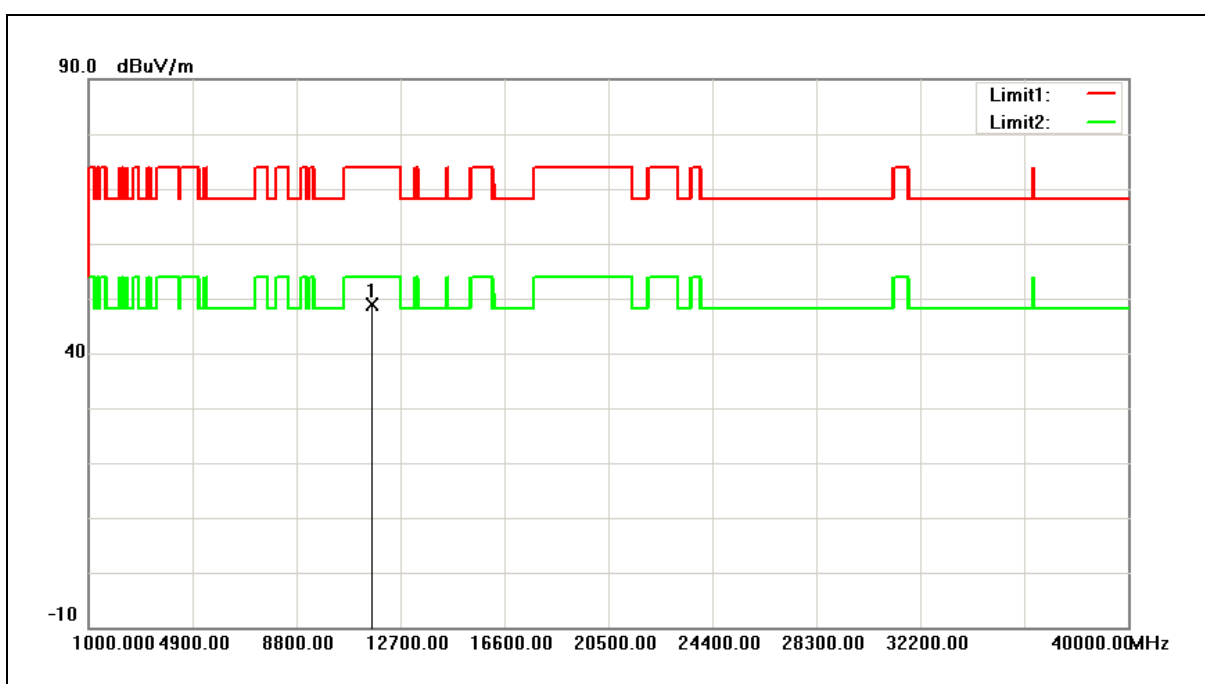
| No. | Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-----------------------|-----------------|----------------|-------------|--------|
| 1   | 11650.000       | 40.78          | 7.17                  | 47.95           | 74.00          | -26.05      | peak   |

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.

|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Harmonic        | Power:               | AC 120V/60Hz |
| Frequency:  | 5825MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 3          | Date:                | 08/06/2017   |
| Ant.Polar.: | Vertical        |                      |              |



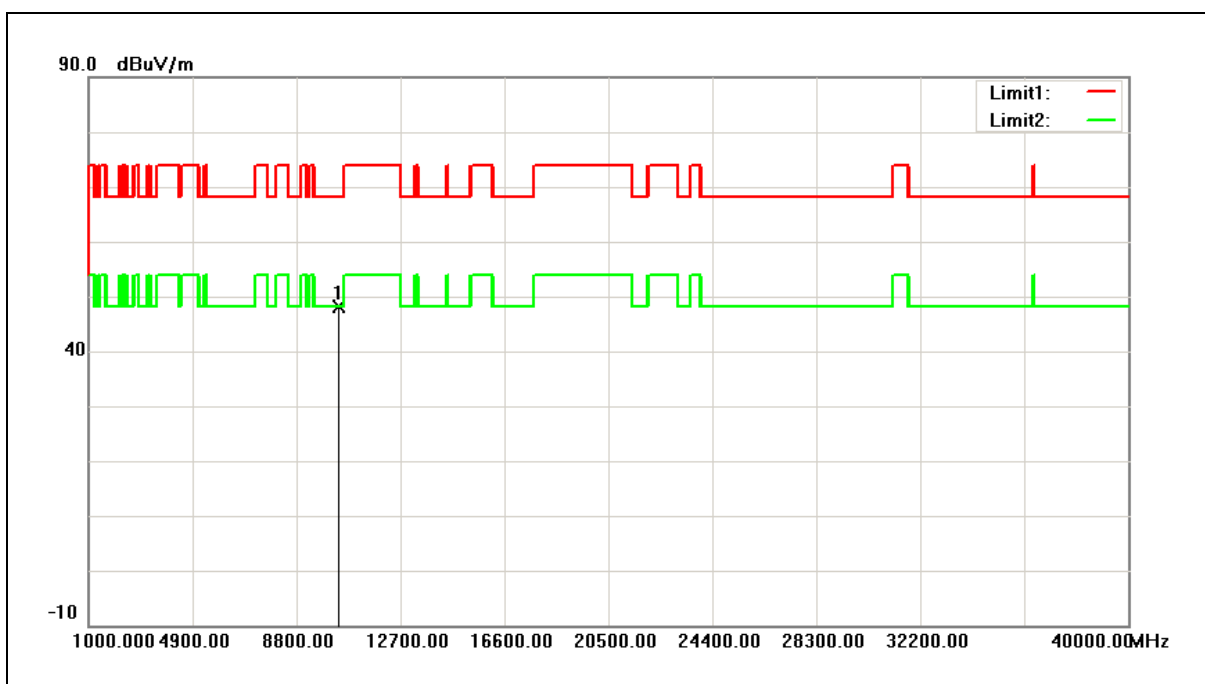
| No. | Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-----------------------|-----------------|----------------|-------------|--------|
| 1   | 11650.000       | 41.68          | 7.17                  | 48.85           | 74.00          | -25.15      | peak   |

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.

|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Harmonic        | Power:               | AC 120V/60Hz |
| Frequency:  | 5190MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 4          | Date:                | 08/06/2017   |
| Ant.Polar.: | Horizontal      |                      |              |



| No. | Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-----------------------|-----------------|----------------|-------------|--------|
| 1   | 10380.000       | 42.07          | 6.16                  | 48.23           | 68.20          | -19.97      | peak   |

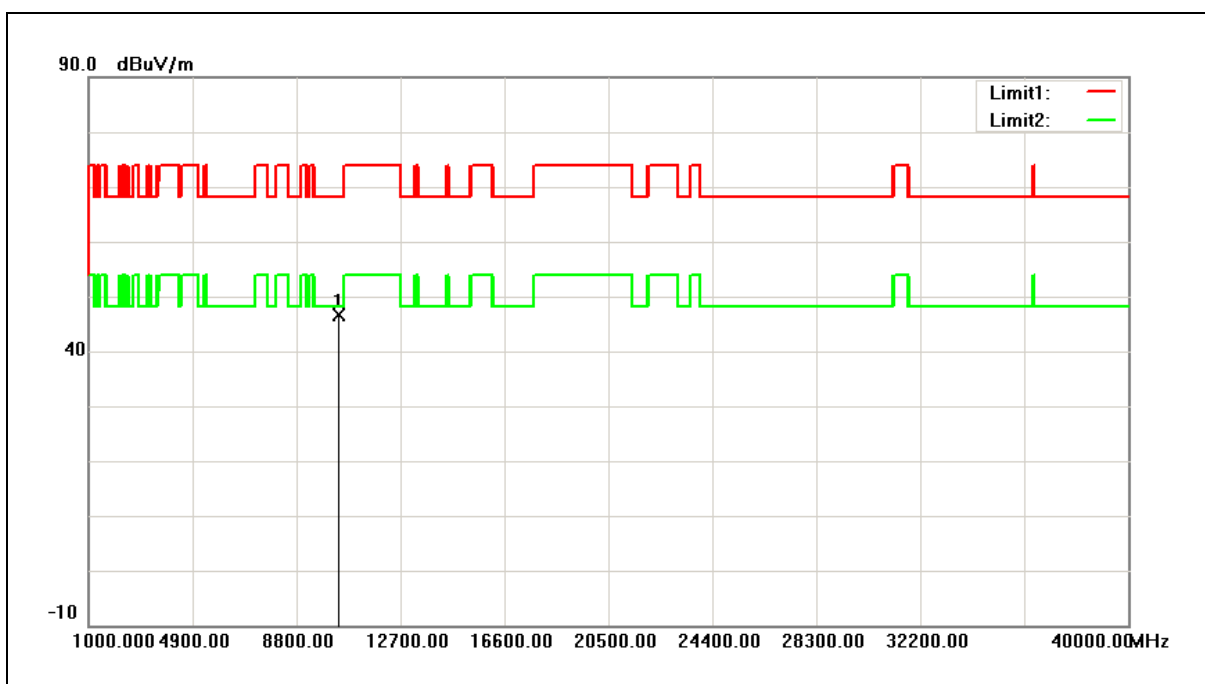
Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.



|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Harmonic        | Power:               | AC 120V/60Hz |
| Frequency:  | 5190MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 4          | Date:                | 08/06/2017   |
| Ant.Polar.: | Vertical        |                      |              |



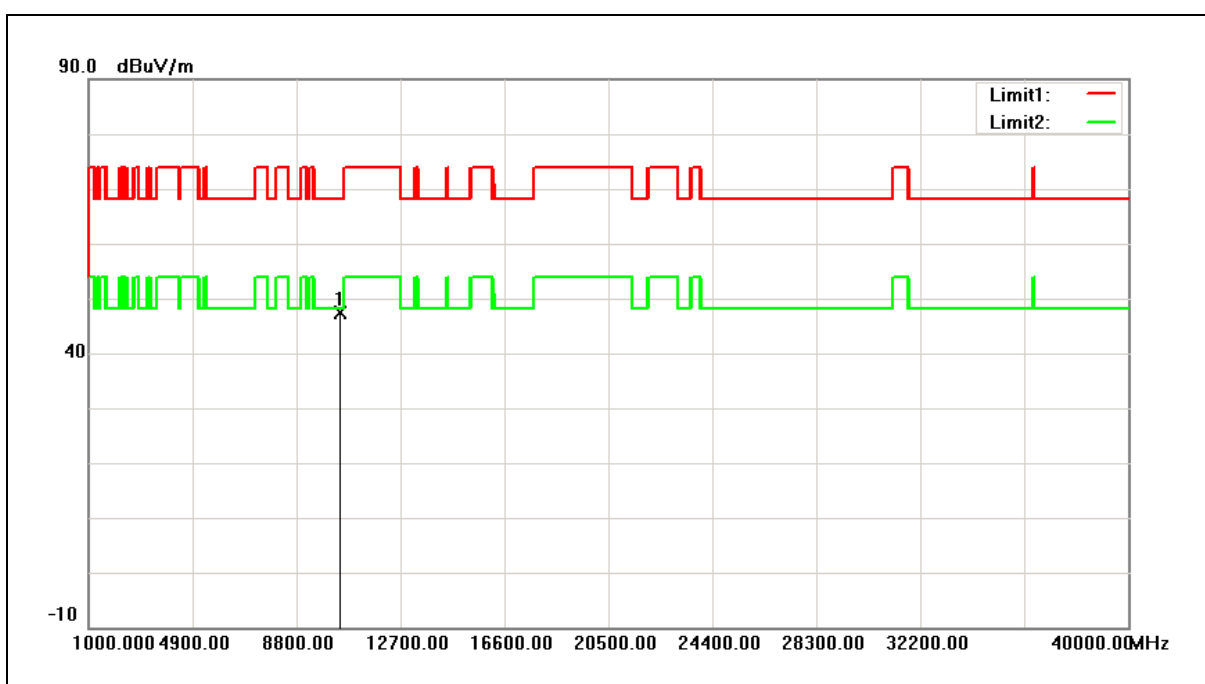
| No. | Frequency<br>(MHz) | Reading<br>(dBuV) | Correct Factor<br>(dB/m) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|-----|--------------------|-------------------|--------------------------|--------------------|-------------------|----------------|--------|
| 1   | 10380.000          | 40.50             | 6.16                     | 46.66              | 68.20             | -21.54         | peak   |

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.

|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Harmonic        | Power:               | AC 120V/60Hz |
| Frequency:  | 5230MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 4          | Date:                | 08/06/2017   |
| Ant.Polar.: | Horizontal      |                      |              |



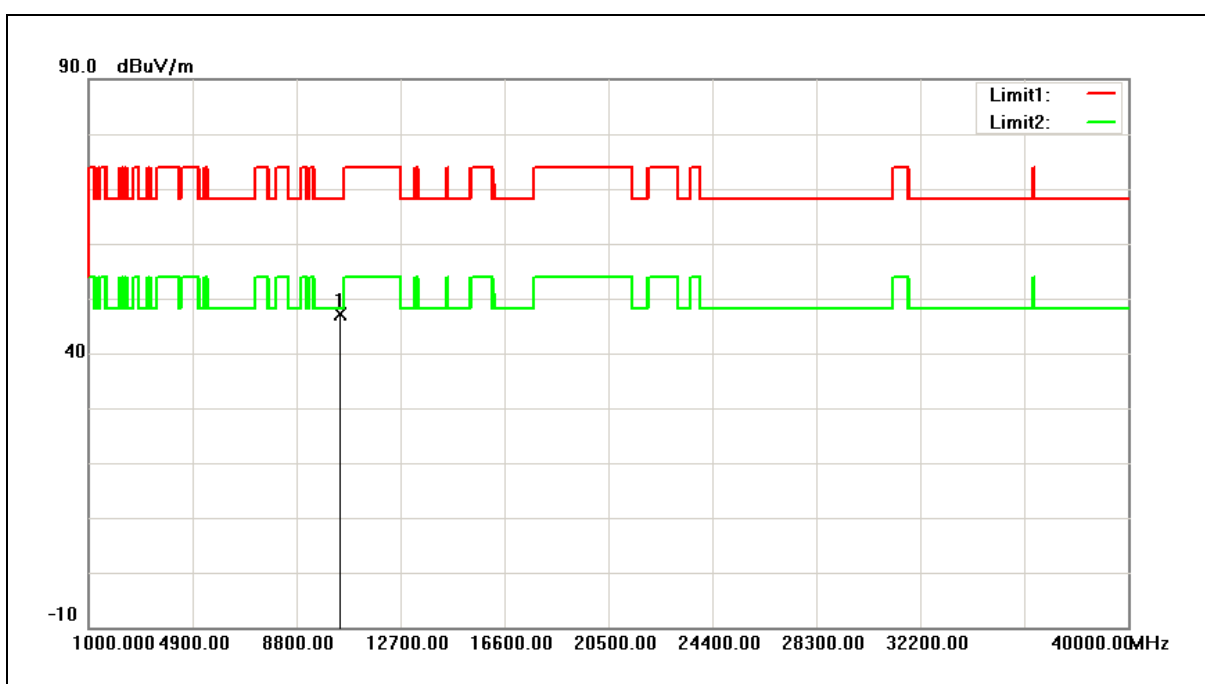
| No. | Frequency<br>(MHz) | Reading<br>(dBuV) | Correct Factor<br>(dB/m) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|-----|--------------------|-------------------|--------------------------|--------------------|-------------------|----------------|--------|
| 1   | 10460.000          | 41.00             | 6.35                     | 47.35              | 68.20             | -20.85         | peak   |

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.

|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Harmonic        | Power:               | AC 120V/60Hz |
| Frequency:  | 5230MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 4          | Date:                | 08/06/2017   |
| Ant.Polar.: | Vertical        |                      |              |



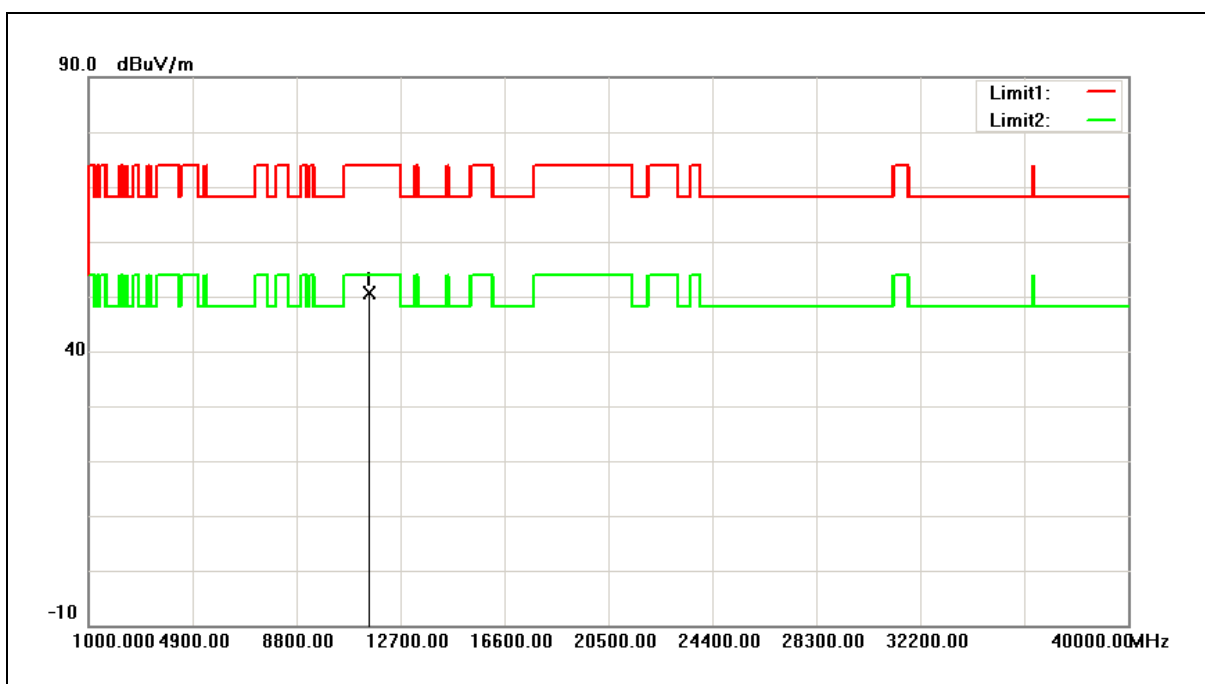
| No. | Frequency<br>(MHz) | Reading<br>(dBuV) | Correct Factor<br>(dB/m) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|-----|--------------------|-------------------|--------------------------|--------------------|-------------------|----------------|--------|
| 1   | 10460.000          | 40.89             | 6.35                     | 47.24              | 68.20             | -20.96         | peak   |

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.

|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Harmonic        | Power:               | AC 120V/60Hz |
| Frequency:  | 5755MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 4          | Date:                | 08/06/2017   |
| Ant.Polar.: | Horizontal      |                      |              |



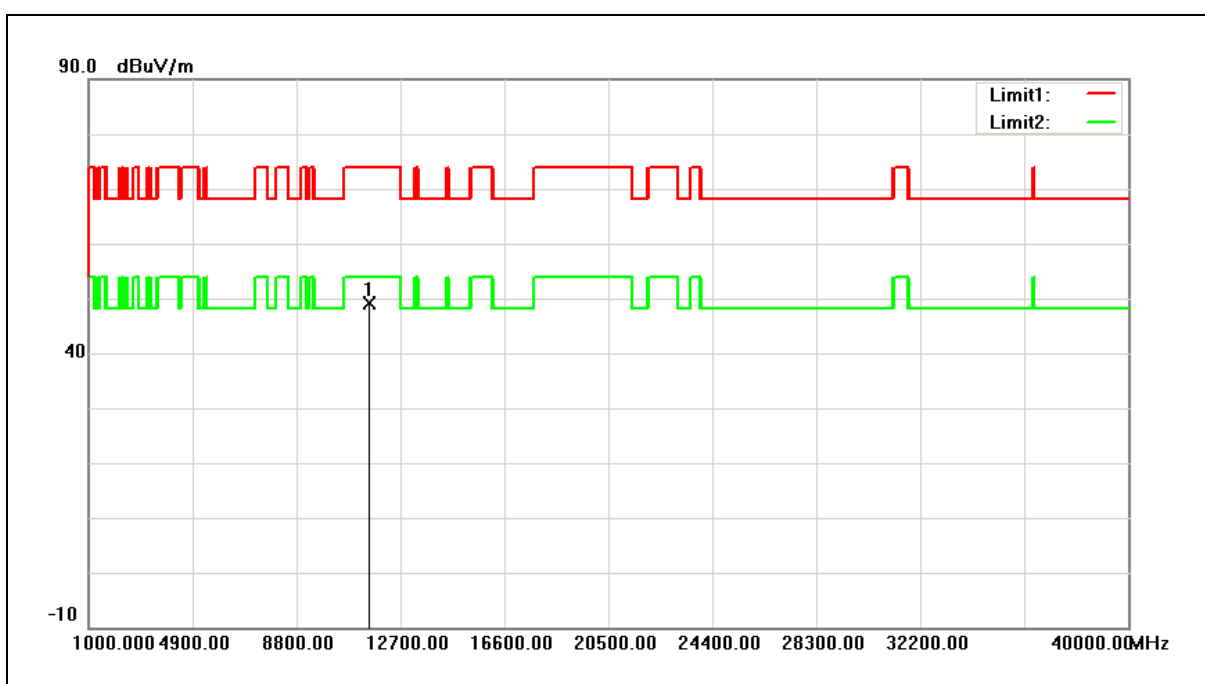
| No. | Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-----------------------|-----------------|----------------|-------------|--------|
| 1   | 11510.000       | 43.36          | 7.34                  | 50.70           | 74.00          | -23.30      | peak   |

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.

|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Harmonic        | Power:               | AC 120V/60Hz |
| Frequency:  | 5755MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 4          | Date:                | 08/06/2017   |
| Ant.Polar.: | Vertical        |                      |              |



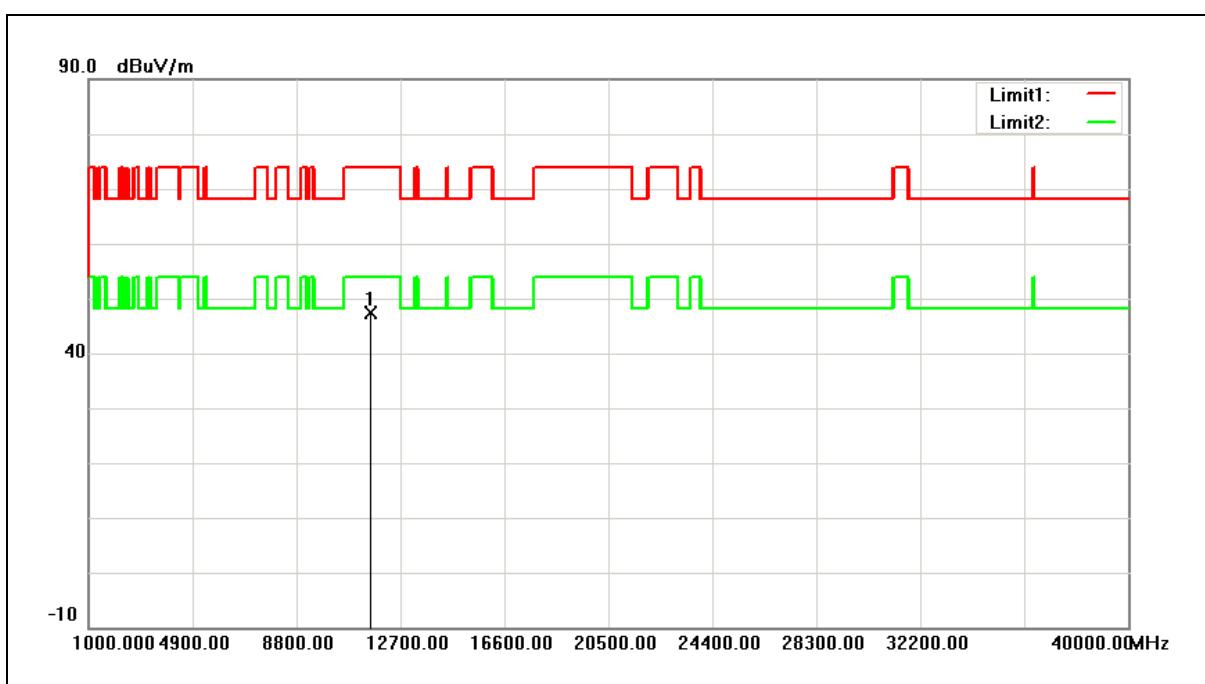
| No. | Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-----------------------|-----------------|----------------|-------------|--------|
| 1   | 11510.000       | 41.88          | 7.34                  | 49.22           | 74.00          | -24.78      | peak   |

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.

|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Harmonic        | Power:               | AC 120V/60Hz |
| Frequency:  | 5795MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 4          | Date:                | 08/06/2017   |
| Ant.Polar.: | Horizontal      |                      |              |



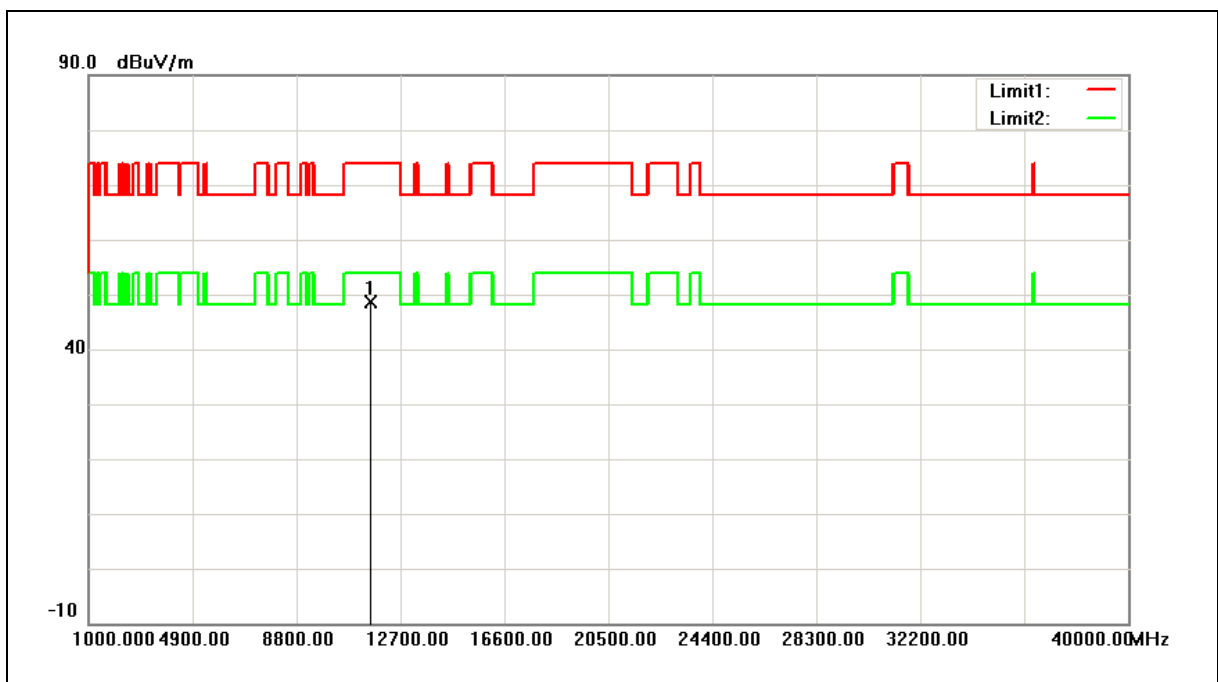
| No. | Frequency<br>(MHz) | Reading<br>(dBuV) | Correct Factor<br>(dB/m) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|-----|--------------------|-------------------|--------------------------|--------------------|-------------------|----------------|--------|
| 1   | 11590.000          | 40.19             | 7.25                     | 47.44              | 74.00             | -26.56         | peak   |

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.

|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Harmonic        | Power:               | AC 120V/60Hz |
| Frequency:  | 5795MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 4          | Date:                | 08/06/2017   |
| Ant.Polar.: | Vertical        |                      |              |



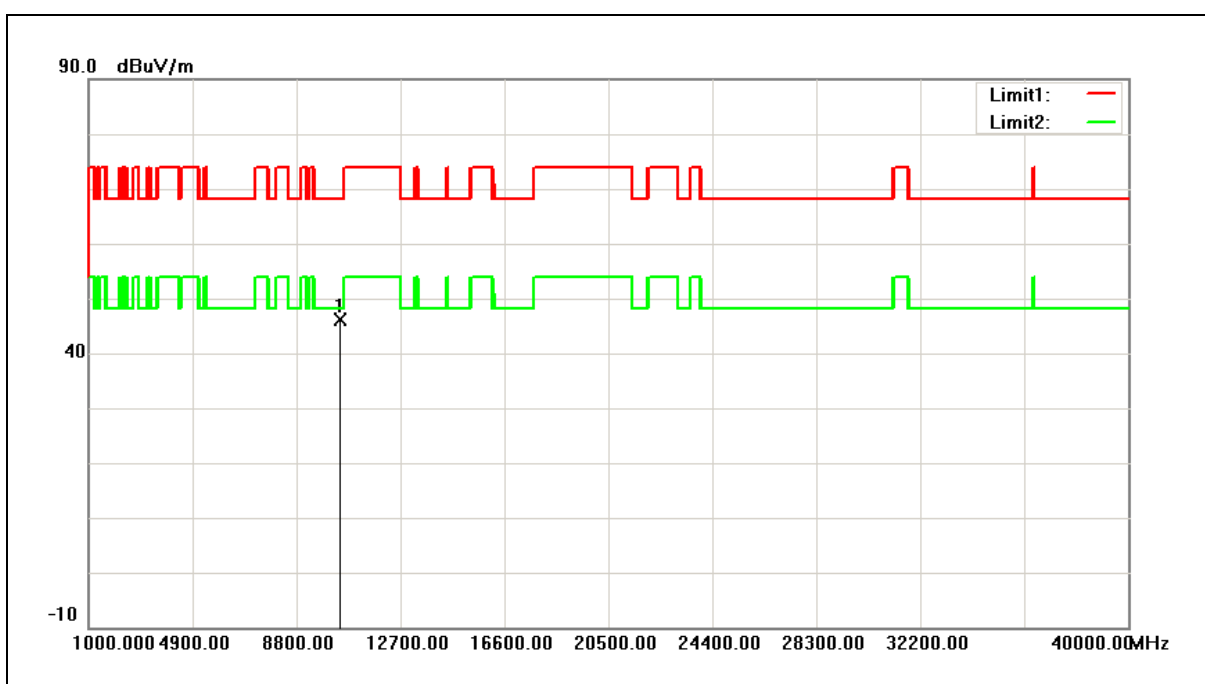
| No. | Frequency<br>(MHz) | Reading<br>(dBuV) | Correct Factor<br>(dB/m) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|-----|--------------------|-------------------|--------------------------|--------------------|-------------------|----------------|--------|
| 1   | 11590.000          | 41.33             | 7.25                     | 48.58              | 74.00             | -25.42         | peak   |

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.

|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Harmonic        | Power:               | AC 120V/60Hz |
| Frequency:  | 5210MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 5          | Date:                | 08/06/2017   |
| Ant.Polar.: | Horizontal      |                      |              |



| No. | Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-----------------------|-----------------|----------------|-------------|--------|
| 1   | 10420.000       | 39.97          | 6.26                  | 46.23           | 68.20          | -21.97      | peak   |

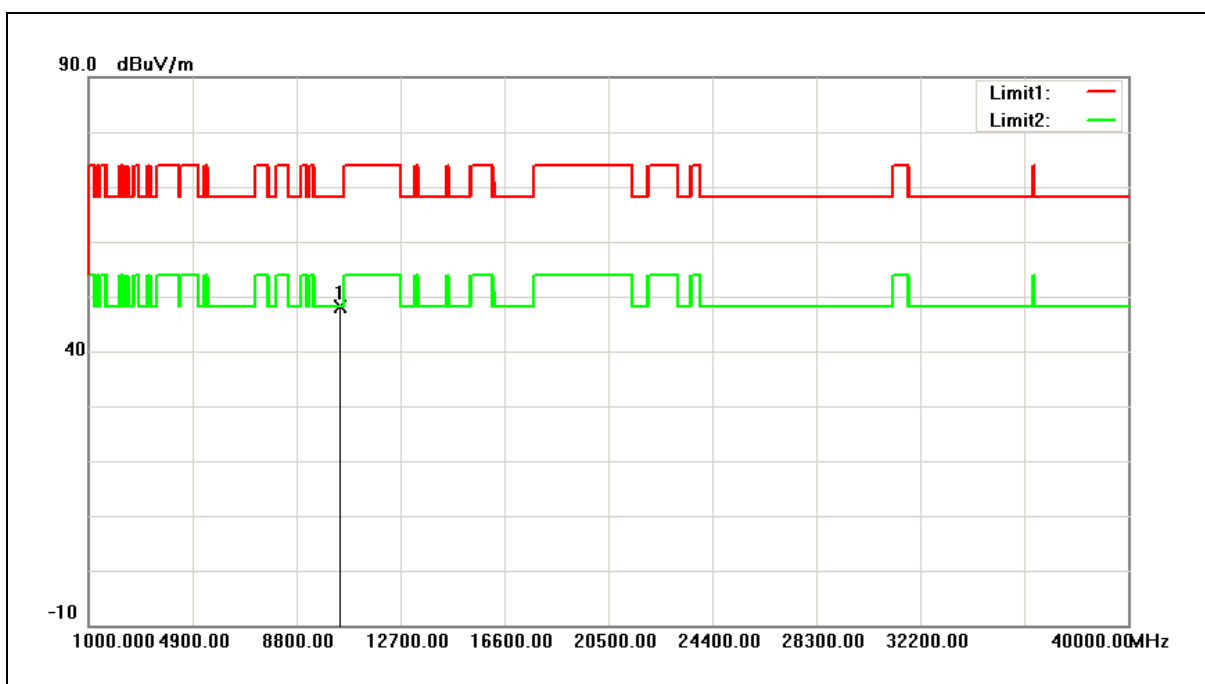
Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.



|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Harmonic        | Power:               | AC 120V/60Hz |
| Frequency:  | 5210MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 5          | Date:                | 08/06/2017   |
| Ant.Polar.: | Vertical        |                      |              |



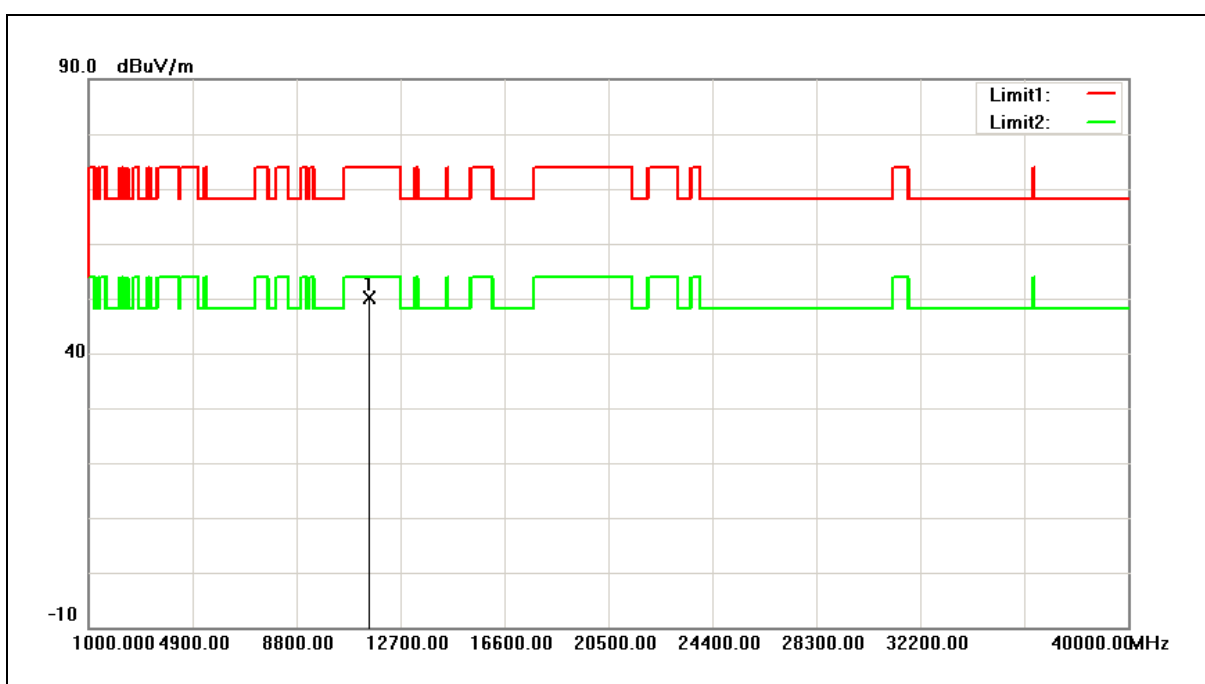
| No. | Frequency<br>(MHz) | Reading<br>(dBuV) | Correct Factor<br>(dB/m) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|-----|--------------------|-------------------|--------------------------|--------------------|-------------------|----------------|--------|
| 1   | 10420.000          | 41.77             | 6.26                     | 48.03              | 68.20             | -20.17         | peak   |

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.

|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Harmonic        | Power:               | AC 120V/60Hz |
| Frequency:  | 5775MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 5          | Date:                | 08/06/2017   |
| Ant.Polar.: | Horizontal      |                      |              |



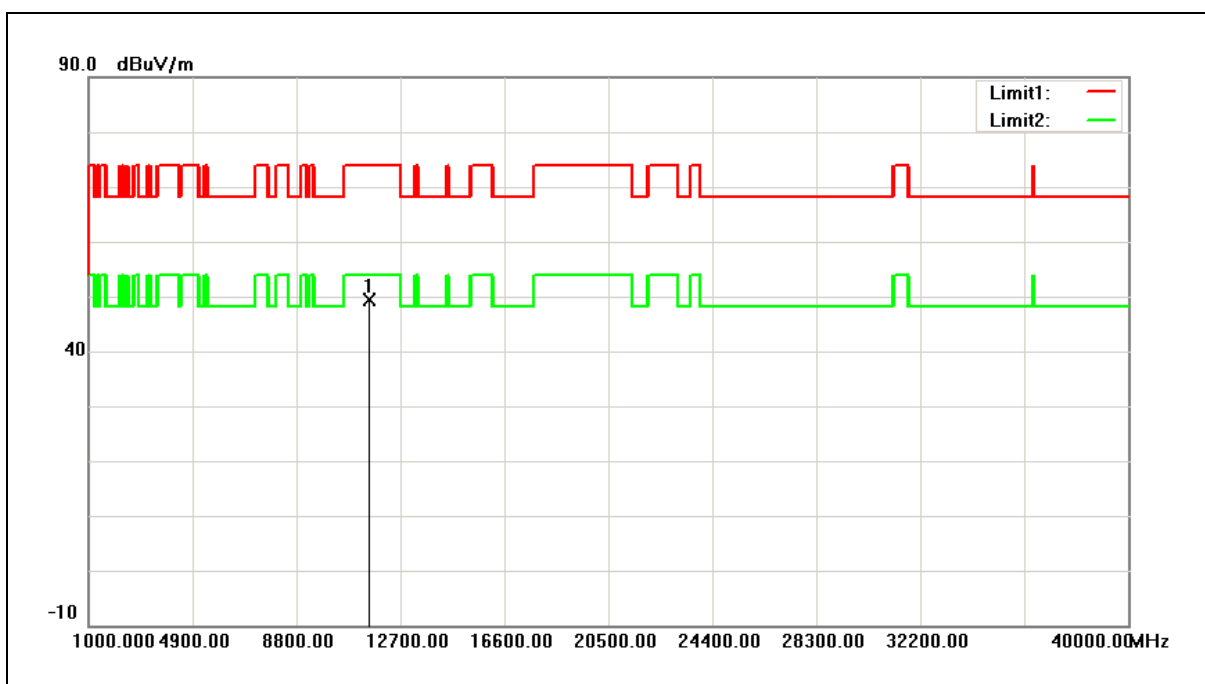
| No. | Frequency<br>(MHz) | Reading<br>(dBuV) | Correct Factor<br>(dB/m) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|-----|--------------------|-------------------|--------------------------|--------------------|-------------------|----------------|--------|
| 1   | 11550.000          | 42.88             | 7.29                     | 50.17              | 74.00             | -23.83         | peak   |

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.

|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Harmonic        | Power:               | AC 120V/60Hz |
| Frequency:  | 5775MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 5          | Date:                | 08/06/2017   |
| Ant.Polar.: | Vertical        |                      |              |



| No. | Frequency<br>(MHz) | Reading<br>(dBuV) | Correct Factor<br>(dB/m) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|-----|--------------------|-------------------|--------------------------|--------------------|-------------------|----------------|--------|
| 1   | 11550.000          | 41.99             | 7.29                     | 49.28              | 74.00             | -24.72         | peak   |

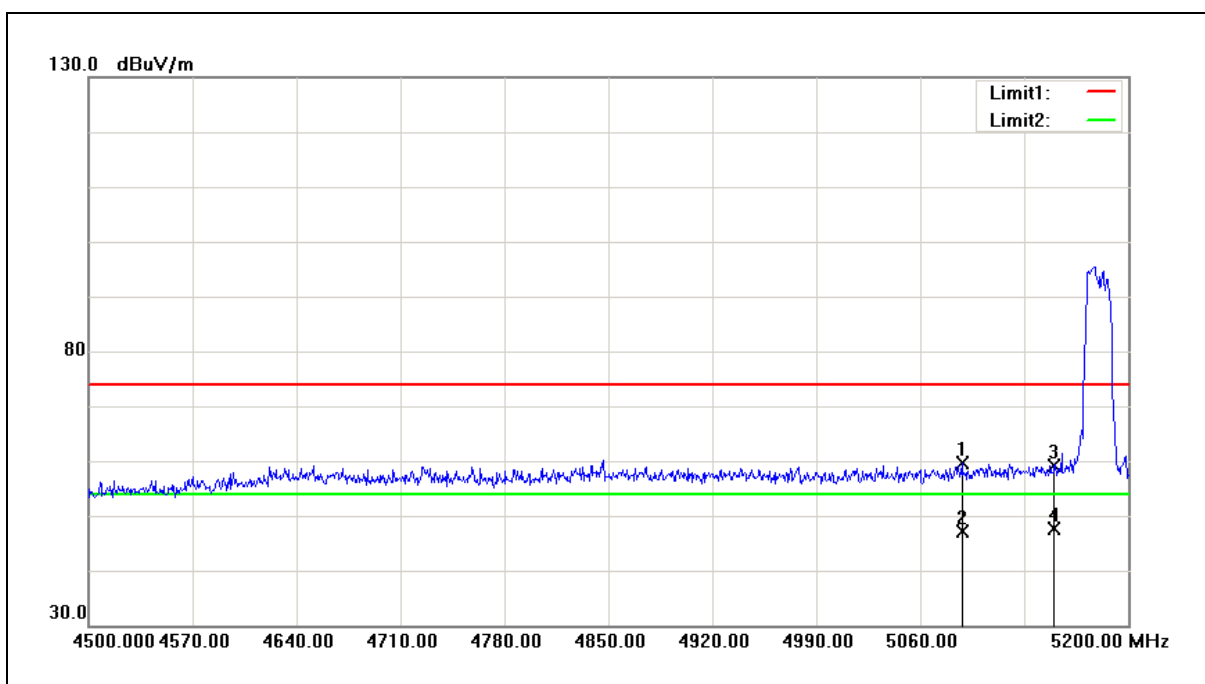
Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.

## Band Edge

|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Band edge       | Power:               | AC 120V/60Hz |
| Frequency:  | 5180MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 2          | Date:                | 08/05/2017   |
| Ant.Polar.: | Horizontal      |                      |              |



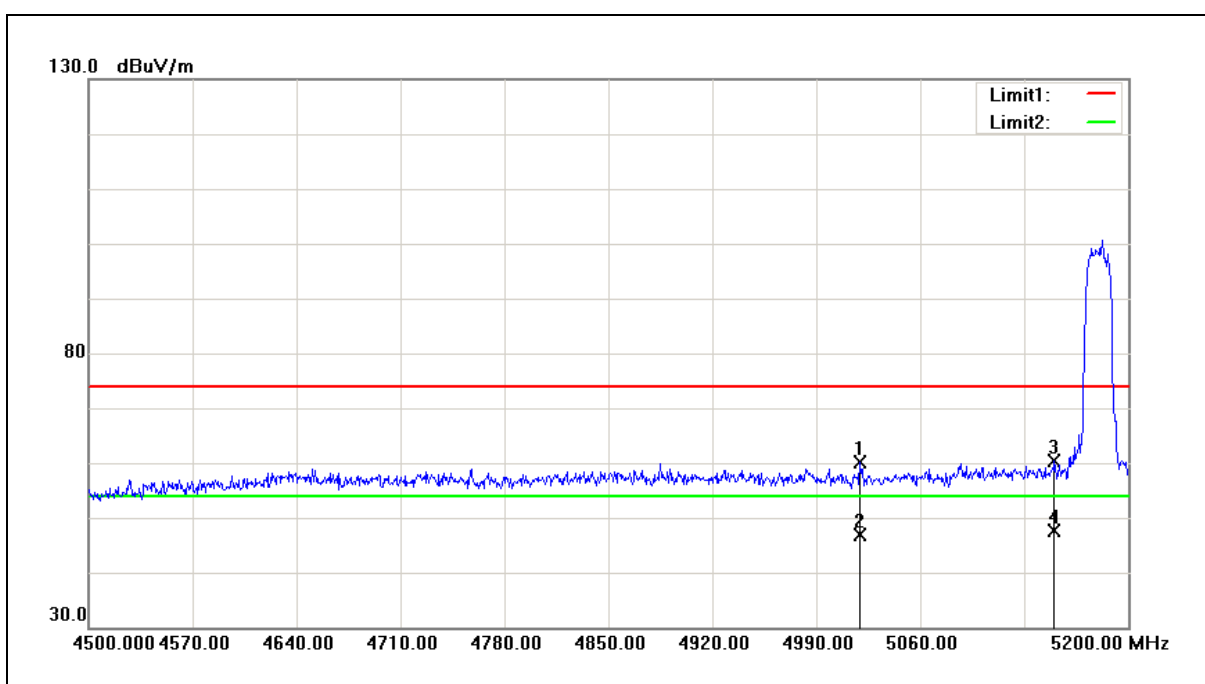
| No. | Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-----------------------|-----------------|----------------|-------------|--------|
| 1   | 5088.000        | 50.74          | 8.93                  | 59.67           | 74.00          | -14.33      | peak   |
| 2   | 5088.000        | 38.28          | 8.93                  | 47.21           | 54.00          | -6.79       | AVG    |
| 3   | 5150.000        | 50.04          | 8.97                  | 59.01           | 74.00          | -14.99      | peak   |
| 4   | 5150.000        | 38.55          | 8.97                  | 47.52           | 54.00          | -6.48       | AVG    |

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.

|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Band edge       | Power:               | AC 120V/60Hz |
| Frequency:  | 5180MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 2          | Date:                | 08/05/2017   |
| Ant.Polar.: | Vertical        |                      |              |



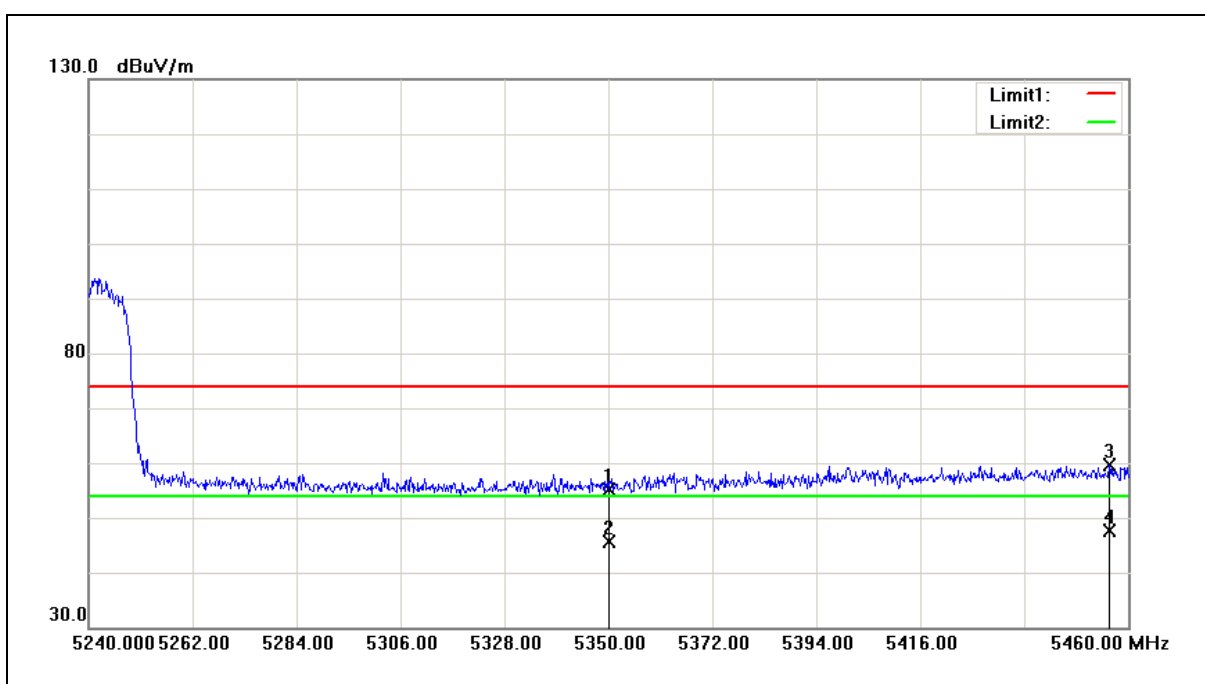
| No. | Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-----------------------|-----------------|----------------|-------------|--------|
| 1   | 5019.400        | 51.24          | 8.88                  | 60.12           | 74.00          | -13.88      | peak   |
| 2   | 5019.400        | 38.03          | 8.88                  | 46.91           | 54.00          | -7.09       | AVG    |
| 3   | 5150.000        | 51.48          | 8.97                  | 60.45           | 74.00          | -13.55      | peak   |
| 4   | 5150.000        | 38.60          | 8.97                  | 47.57           | 54.00          | -6.43       | AVG    |

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.

|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Band edge       | Power:               | AC 120V/60Hz |
| Frequency:  | 5240MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 2          | Date:                | 08/05/2017   |
| Ant.Polar.: | Horizontal      |                      |              |



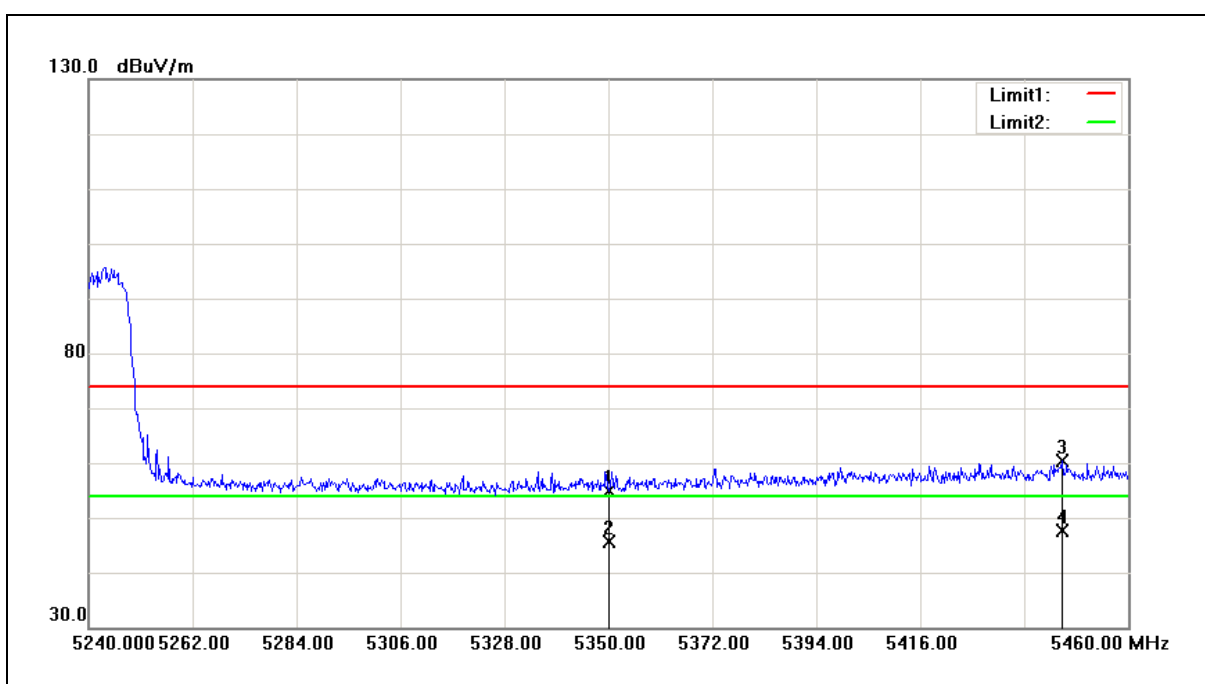
| No. | Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-----------------------|-----------------|----------------|-------------|--------|
| 1   | 5350.000        | 46.13          | 9.08                  | 55.21           | 74.00          | -18.79      | peak   |
| 2   | 5350.000        | 36.49          | 9.08                  | 45.57           | 54.00          | -8.43       | AVG    |
| 3   | 5456.040        | 50.42          | 9.15                  | 59.57           | 74.00          | -14.43      | peak   |
| 4   | 5456.040        | 38.53          | 9.15                  | 47.68           | 54.00          | -6.32       | AVG    |

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.

|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Band edge       | Power:               | AC 120V/60Hz |
| Frequency:  | 5240MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 2          | Date:                | 08/05/2017   |
| Ant.Polar.: | Vertical        |                      |              |



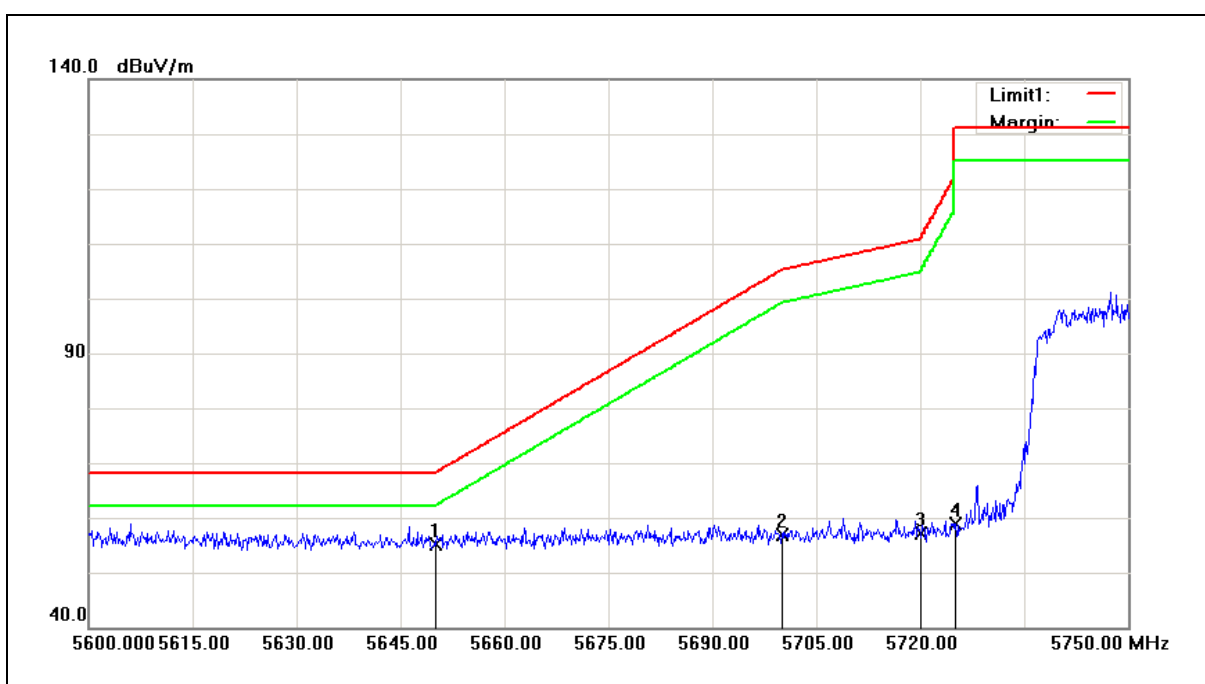
| No. | Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-----------------------|-----------------|----------------|-------------|--------|
| 1   | 5350.000        | 45.84          | 9.08                  | 54.92           | 74.00          | -19.08      | peak   |
| 2   | 5350.000        | 36.56          | 9.08                  | 45.64           | 54.00          | -8.36       | AVG    |
| 3   | 5446.140        | 51.20          | 9.15                  | 60.35           | 74.00          | -13.65      | peak   |
| 4   | 5446.140        | 38.53          | 9.15                  | 47.68           | 54.00          | -6.32       | AVG    |

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.

|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Band edge       | Power:               | AC 120V/60Hz |
| Frequency:  | 5745MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 2          | Date:                | 08/05/2017   |
| Ant.Polar.: | Horizontal      |                      |              |



| No. | Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-----------------------|-----------------|----------------|-------------|--------|
| 1   | 5650.000        | 45.64          | 9.53                  | 55.17           | 68.20          | -13.03      | peak   |
| 2   | 5700.000        | 47.32          | 9.64                  | 56.96           | 105.20         | -48.24      | peak   |
| 3   | 5720.000        | 47.51          | 9.69                  | 57.20           | 110.80         | -53.60      | peak   |
| 4   | 5725.000        | 49.28          | 9.70                  | 58.98           | 122.20         | -63.22      | peak   |

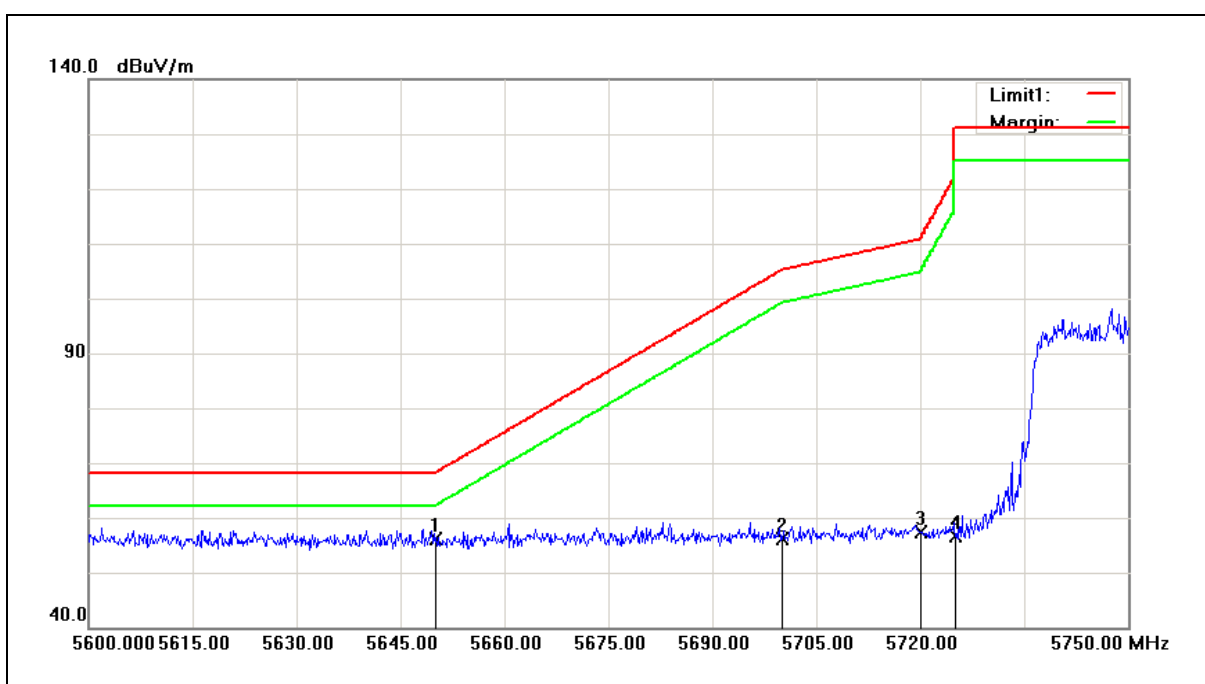
Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.



|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Band edge       | Power:               | AC 120V/60Hz |
| Frequency:  | 5745MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 2          | Date:                | 08/05/2017   |
| Ant.Polar.: | Vertical        |                      |              |



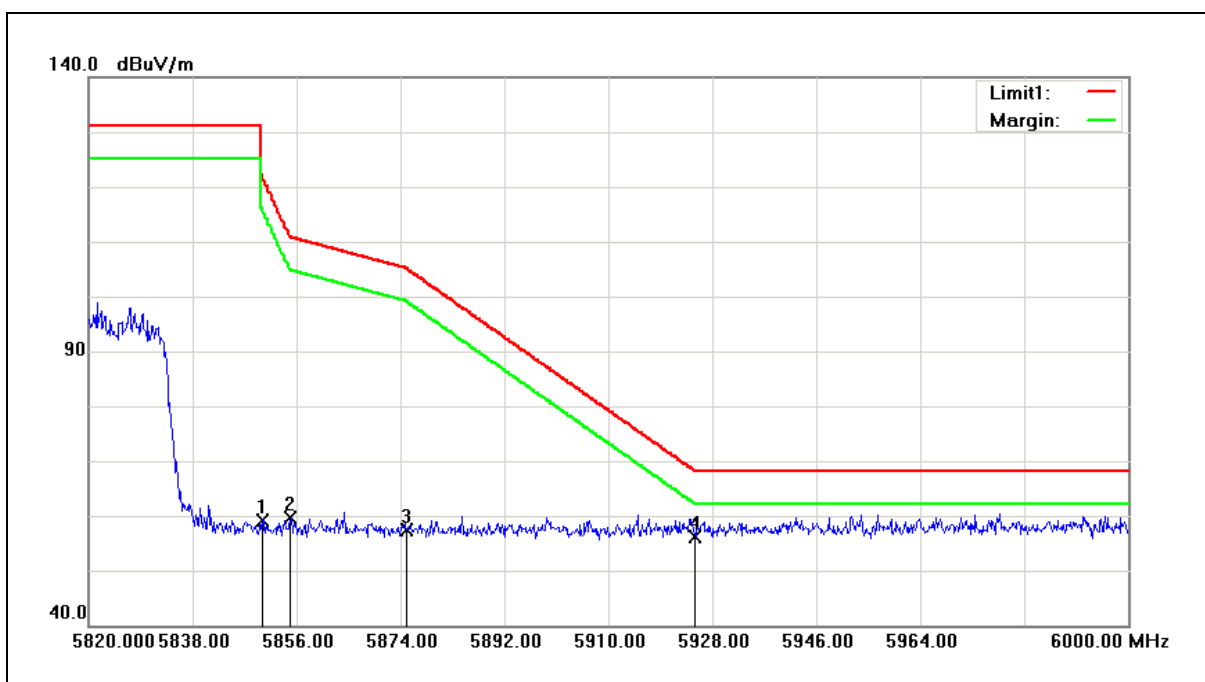
| No. | Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-----------------------|-----------------|----------------|-------------|--------|
| 1   | 5650.000        | 46.53          | 9.53                  | 56.06           | 68.20          | -12.14      | peak   |
| 2   | 5700.000        | 46.38          | 9.64                  | 56.02           | 105.20         | -49.18      | peak   |
| 3   | 5720.000        | 47.69          | 9.69                  | 57.38           | 110.80         | -53.42      | peak   |
| 4   | 5725.000        | 47.04          | 9.70                  | 56.74           | 122.20         | -65.46      | peak   |

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.

|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Band edge       | Power:               | AC 120V/60Hz |
| Frequency:  | 5825MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 2          | Date:                | 08/05/2017   |
| Ant.Polar.: | Horizontal      |                      |              |



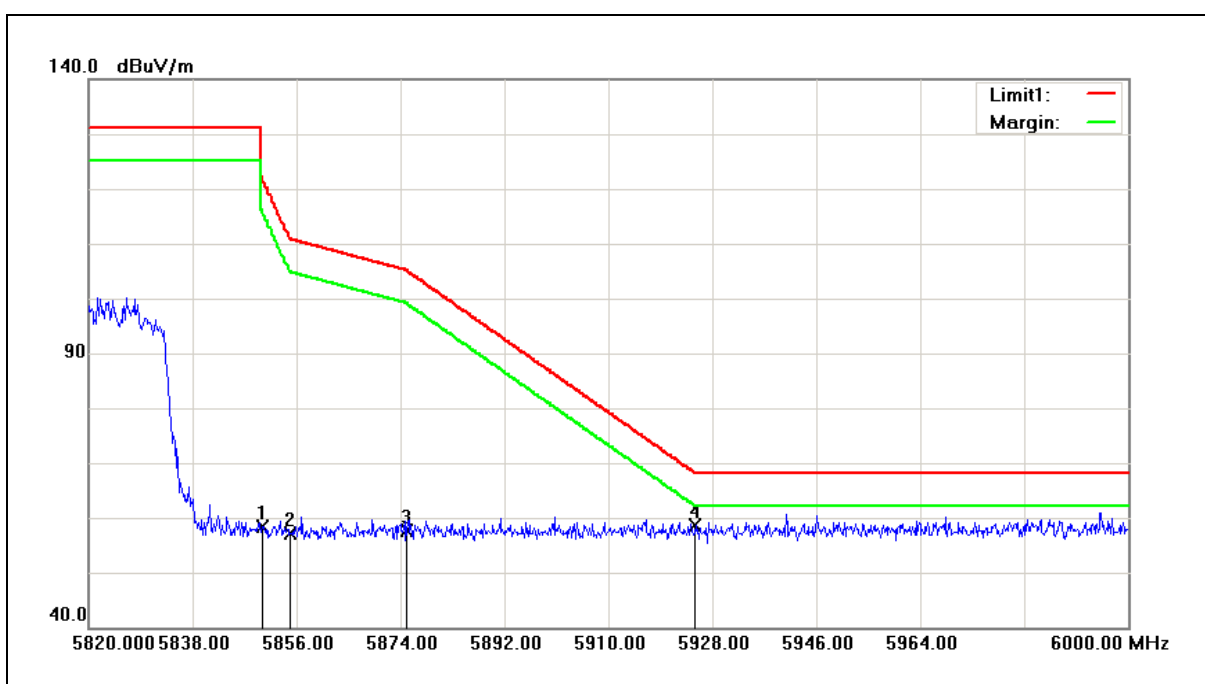
| No. | Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-----------------------|-----------------|----------------|-------------|--------|
| 1   | 5850.000        | 49.12          | 9.98                  | 59.10           | 122.20         | -63.10      | peak   |
| 2   | 5855.000        | 49.53          | 9.99                  | 59.52           | 110.80         | -51.28      | peak   |
| 3   | 5875.000        | 47.42          | 10.04                 | 57.46           | 105.20         | -47.74      | peak   |
| 4   | 5925.000        | 46.05          | 10.16                 | 56.21           | 68.20          | -11.99      | peak   |

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.

|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Band edge       | Power:               | AC 120V/60Hz |
| Frequency:  | 5825MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 2          | Date:                | 08/05/2017   |
| Ant.Polar.: | Vertical        |                      |              |



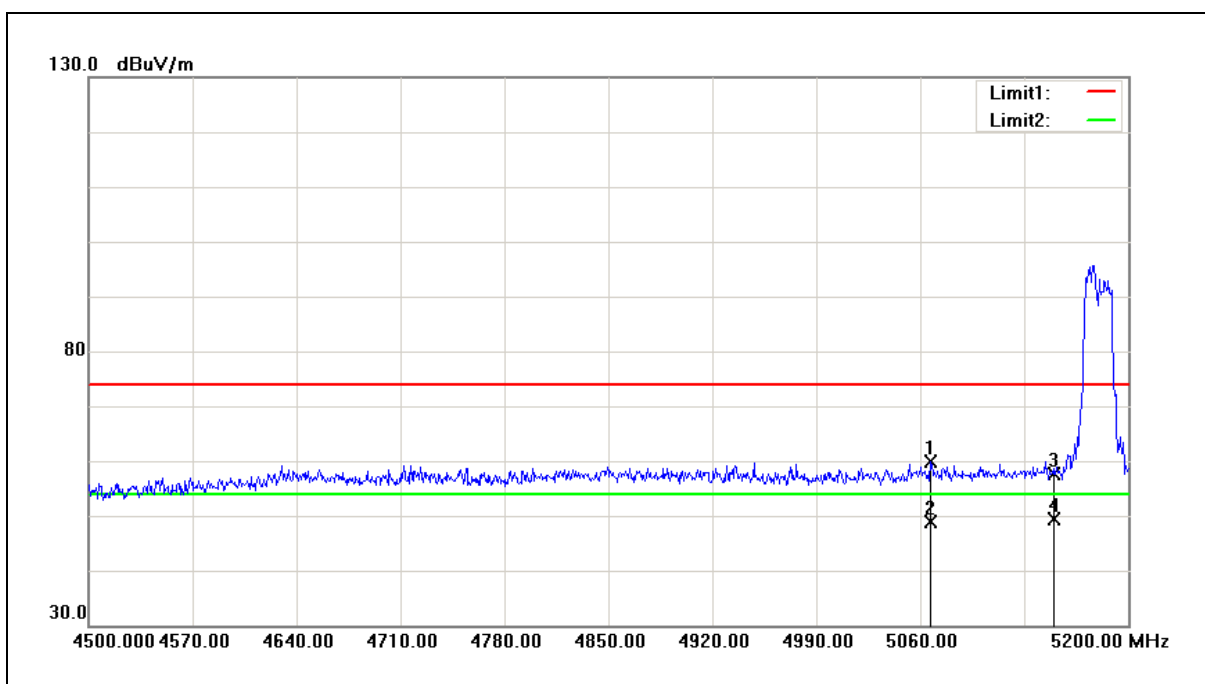
| No. | Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-----------------------|-----------------|----------------|-------------|--------|
| 1   | 5850.000        | 48.35          | 9.98                  | 58.33           | 122.20         | -63.87      | peak   |
| 2   | 5855.000        | 47.21          | 9.99                  | 57.20           | 110.80         | -53.60      | peak   |
| 3   | 5875.000        | 47.68          | 10.04                 | 57.72           | 105.20         | -47.48      | peak   |
| 4   | 5925.000        | 48.45          | 10.16                 | 58.61           | 68.20          | -9.59       | peak   |

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.

|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Band edge       | Power:               | AC 120V/60Hz |
| Frequency:  | 5180MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 3          | Date:                | 08/05/2017   |
| Ant.Polar.: | Horizontal      |                      |              |



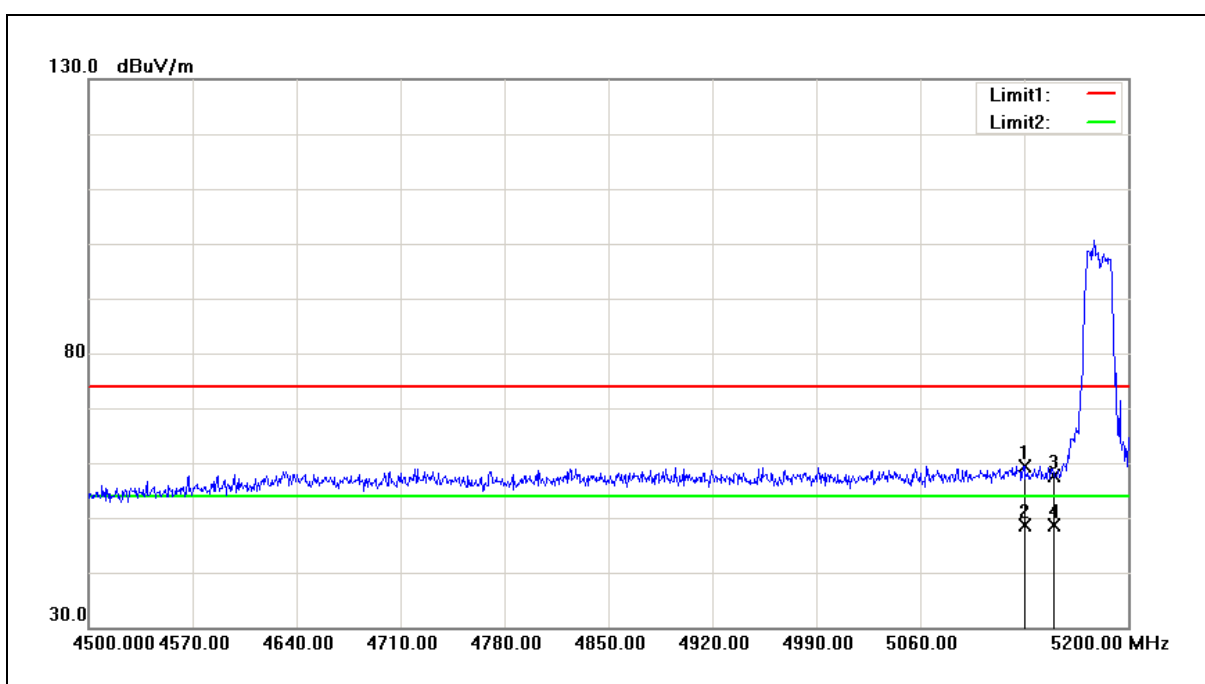
| No. | Frequency<br>(MHz) | Reading<br>(dBuV) | Correct Factor<br>(dB/m) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|-----|--------------------|-------------------|--------------------------|--------------------|-------------------|----------------|--------|
| 1   | 5067.000           | 50.97             | 8.91                     | 59.88              | 74.00             | -14.12         | peak   |
| 2   | 5067.000           | 39.95             | 8.91                     | 48.86              | 54.00             | -5.14          | AVG    |
| 3   | 5150.000           | 48.69             | 8.97                     | 57.66              | 74.00             | -16.34         | peak   |
| 4   | 5150.000           | 40.33             | 8.97                     | 49.30              | 54.00             | -4.70          | AVG    |

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.

|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Band edge       | Power:               | AC 120V/60Hz |
| Frequency:  | 5180MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 3          | Date:                | 08/05/2017   |
| Ant.Polar.: | Vertical        |                      |              |



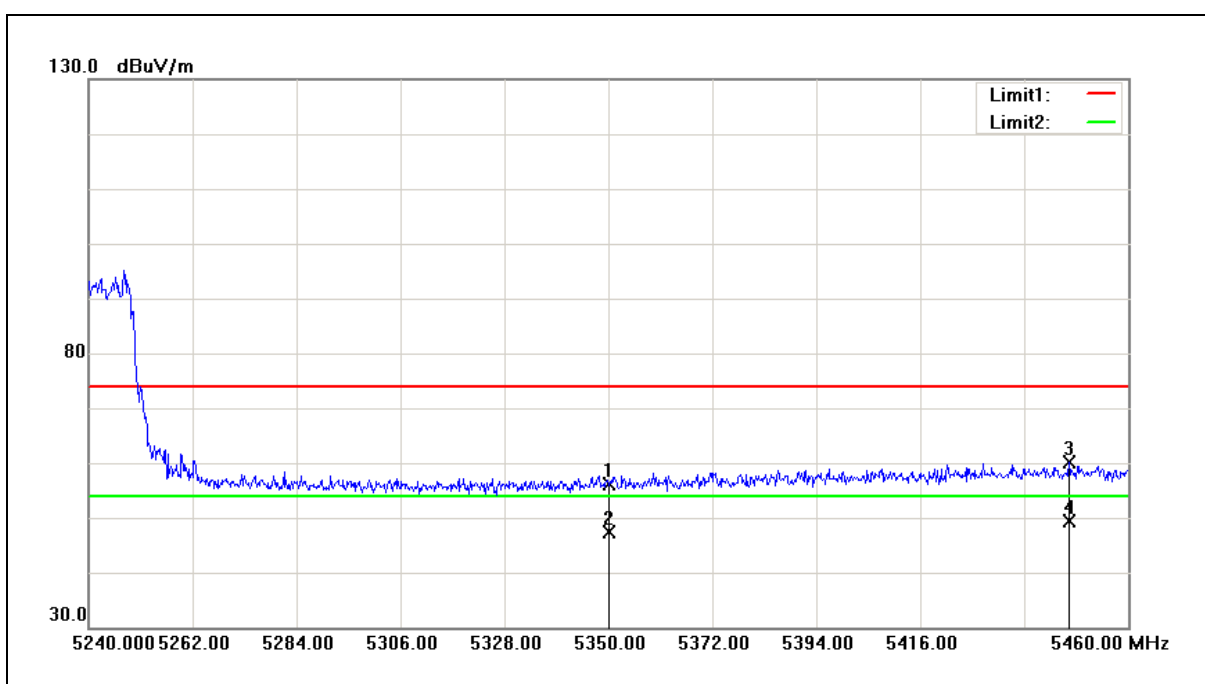
| No. | Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-----------------------|-----------------|----------------|-------------|--------|
| 1   | 5130.000        | 50.55          | 8.95                  | 59.50           | 74.00          | -14.50      | peak   |
| 2   | 5130.000        | 39.64          | 8.95                  | 48.59           | 54.00          | -5.41       | AVG    |
| 3   | 5150.000        | 48.56          | 8.97                  | 57.53           | 74.00          | -16.47      | peak   |
| 4   | 5150.000        | 39.67          | 8.97                  | 48.64           | 54.00          | -5.36       | AVG    |

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.

|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Band edge       | Power:               | AC 120V/60Hz |
| Frequency:  | 5240MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 3          | Date:                | 08/05/2017   |
| Ant.Polar.: | Horizontal      |                      |              |



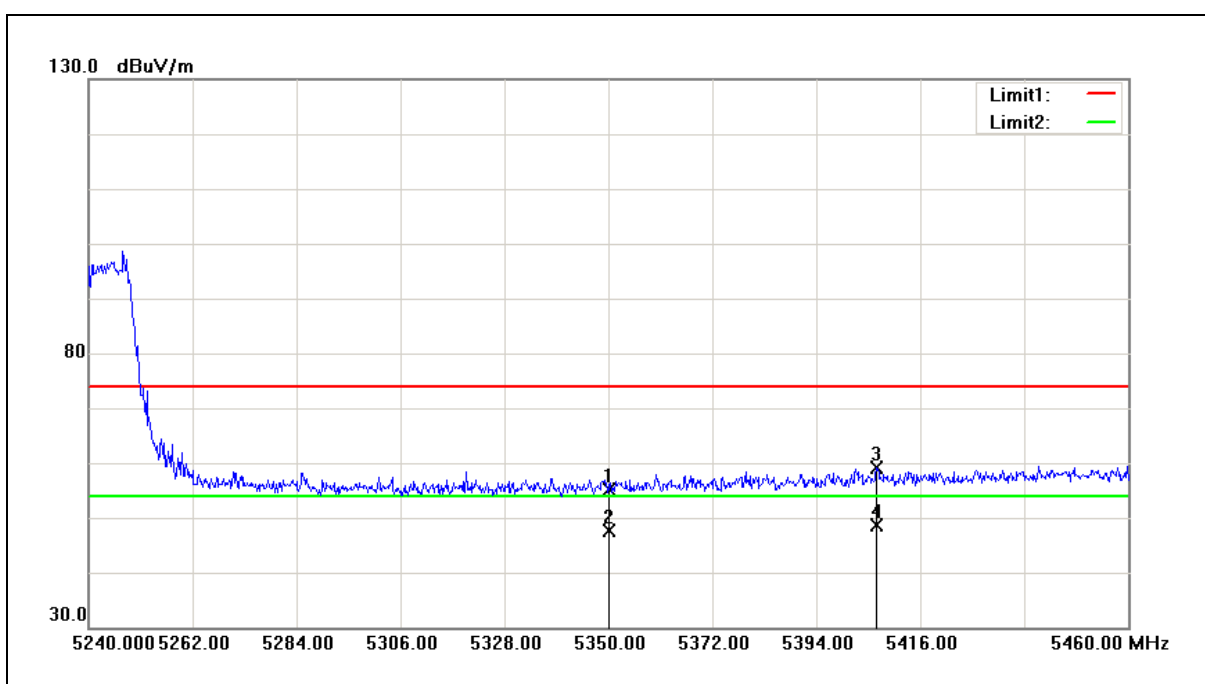
| No. | Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-----------------------|-----------------|----------------|-------------|--------|
| 1   | 5350.000        | 47.09          | 9.08                  | 56.17           | 74.00          | -17.83      | peak   |
| 2   | 5350.000        | 38.41          | 9.08                  | 47.49           | 54.00          | -6.51       | AVG    |
| 3   | 5447.460        | 51.08          | 9.15                  | 60.23           | 74.00          | -13.77      | peak   |
| 4   | 5447.460        | 40.23          | 9.15                  | 49.38           | 54.00          | -4.62       | AVG    |

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.

|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Band edge       | Power:               | AC 120V/60Hz |
| Frequency:  | 5240MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 3          | Date:                | 08/05/2017   |
| Ant.Polar.: | Vertical        |                      |              |



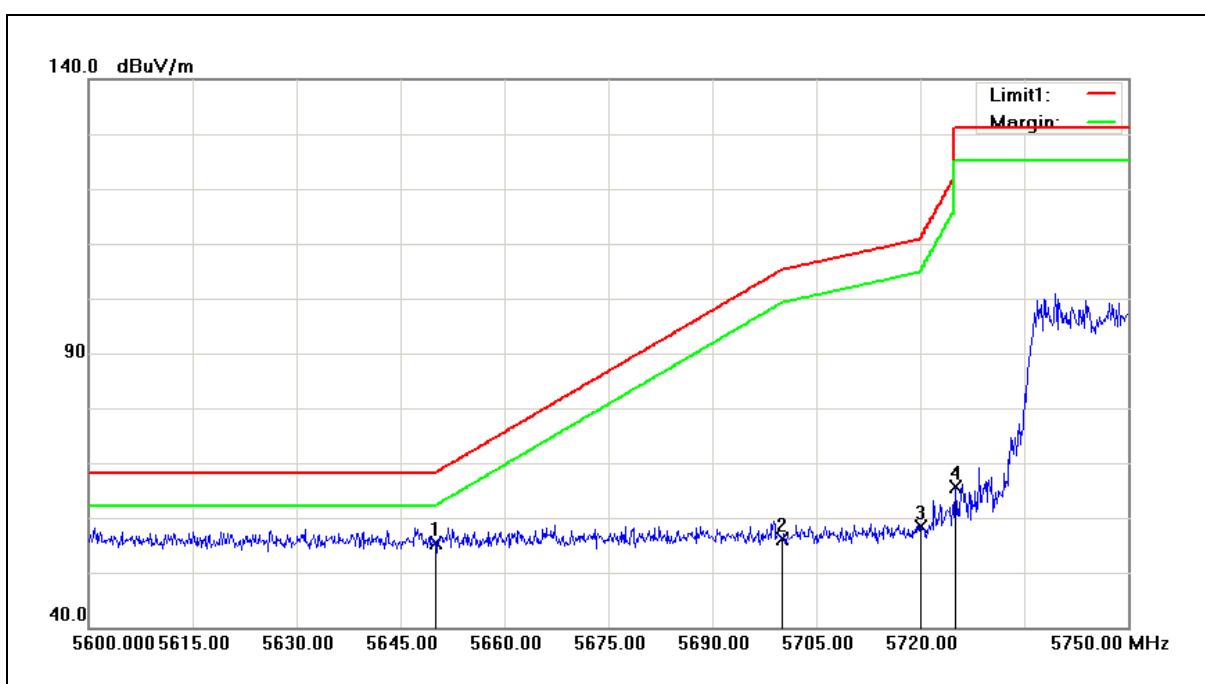
| No. | Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-----------------------|-----------------|----------------|-------------|--------|
| 1   | 5350.000        | 46.15          | 9.08                  | 55.23           | 74.00          | -18.77      | peak   |
| 2   | 5350.000        | 38.58          | 9.08                  | 47.66           | 54.00          | -6.34       | AVG    |
| 3   | 5406.760        | 50.06          | 9.12                  | 59.18           | 74.00          | -14.82      | peak   |
| 4   | 5406.760        | 39.49          | 9.12                  | 48.61           | 54.00          | -5.39       | AVG    |

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.

|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Band edge       | Power:               | AC 120V/60Hz |
| Frequency:  | 5745MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 3          | Date:                | 08/05/2017   |
| Ant.Polar.: | Horizontal      |                      |              |



| No. | Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-----------------------|-----------------|----------------|-------------|--------|
| 1   | 5650.000        | 45.87          | 9.53                  | 55.40           | 68.20          | -12.80      | peak   |
| 2   | 5700.000        | 46.37          | 9.64                  | 56.01           | 105.20         | -49.19      | peak   |
| 3   | 5720.000        | 48.74          | 9.69                  | 58.43           | 110.80         | -52.37      | peak   |
| 4   | 5725.000        | 55.86          | 9.70                  | 65.56           | 122.20         | -56.64      | peak   |

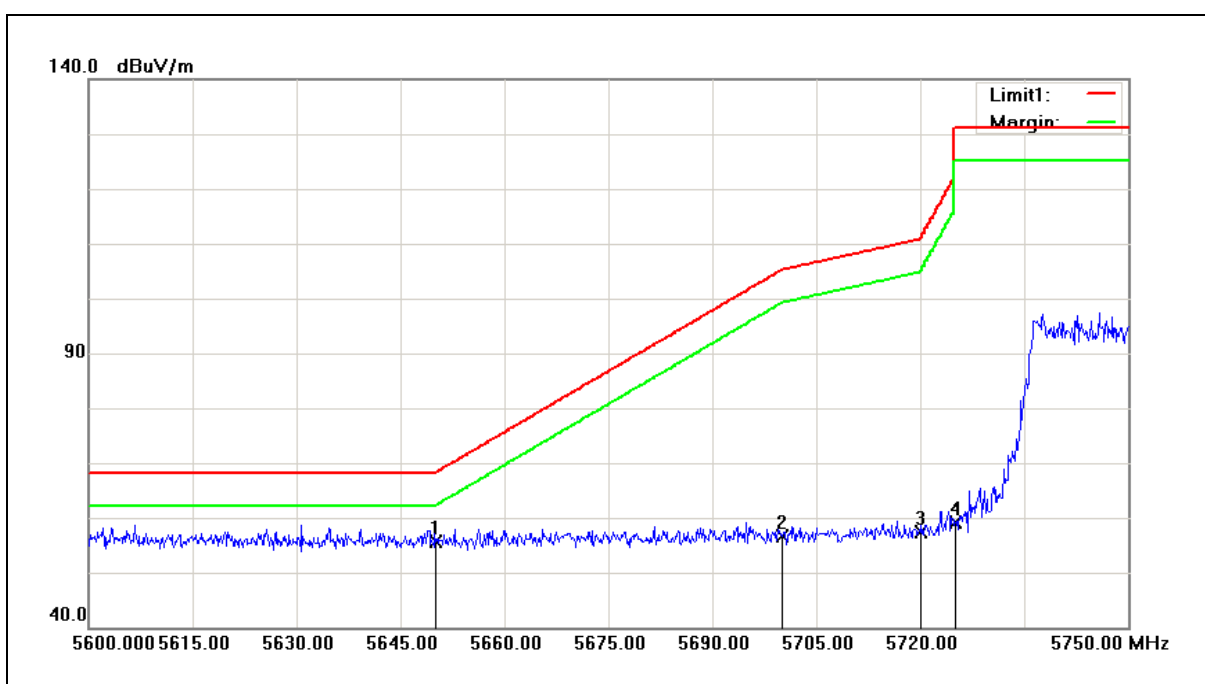
Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.



|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Band edge       | Power:               | AC 120V/60Hz |
| Frequency:  | 5745MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 3          | Date:                | 08/05/2017   |
| Ant.Polar.: | Vertical        |                      |              |



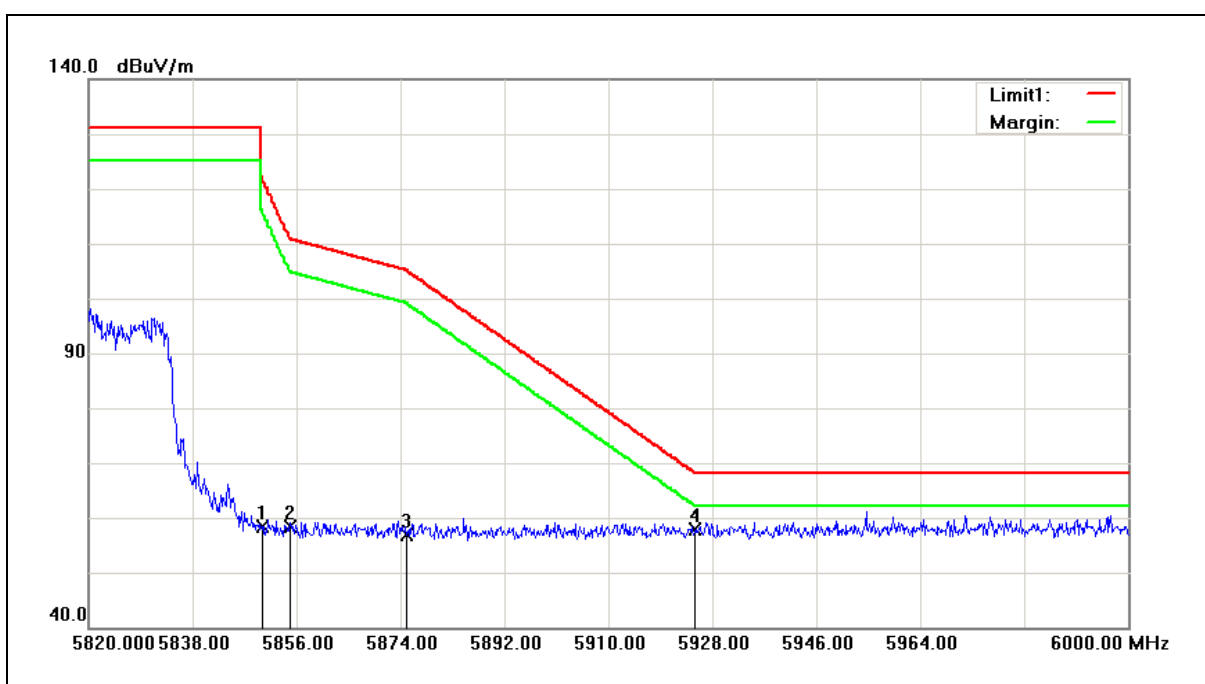
| No. | Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-----------------------|-----------------|----------------|-------------|--------|
| 1   | 5650.000        | 46.15          | 9.53                  | 55.68           | 68.20          | -12.52      | peak   |
| 2   | 5700.000        | 47.09          | 9.64                  | 56.73           | 105.20         | -48.47      | peak   |
| 3   | 5720.000        | 47.70          | 9.69                  | 57.39           | 110.80         | -53.41      | peak   |
| 4   | 5725.000        | 49.36          | 9.70                  | 59.06           | 122.20         | -63.14      | peak   |

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.

|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Band edge       | Power:               | AC 120V/60Hz |
| Frequency:  | 5825MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 3          | Date:                | 08/05/2017   |
| Ant.Polar.: | Horizontal      |                      |              |



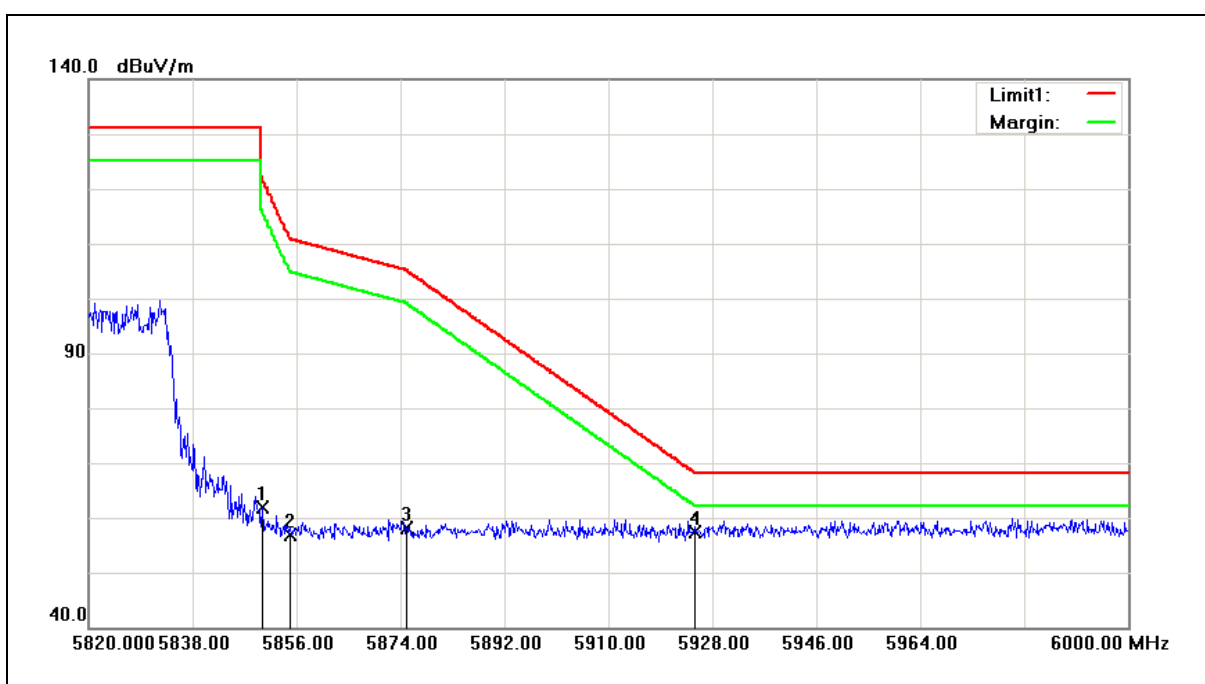
| No. | Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-----------------------|-----------------|----------------|-------------|--------|
| 1   | 5850.000        | 48.48          | 9.98                  | 58.46           | 122.20         | -63.74      | peak   |
| 2   | 5855.000        | 48.47          | 9.99                  | 58.46           | 110.80         | -52.34      | peak   |
| 3   | 5875.000        | 46.73          | 10.04                 | 56.77           | 105.20         | -48.43      | peak   |
| 4   | 5925.000        | 47.82          | 10.16                 | 57.98           | 68.20          | -10.22      | peak   |

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.

|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Band edge       | Power:               | AC 120V/60Hz |
| Frequency:  | 5825MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 3          | Date:                | 08/05/2017   |
| Ant.Polar.: | Vertical        |                      |              |



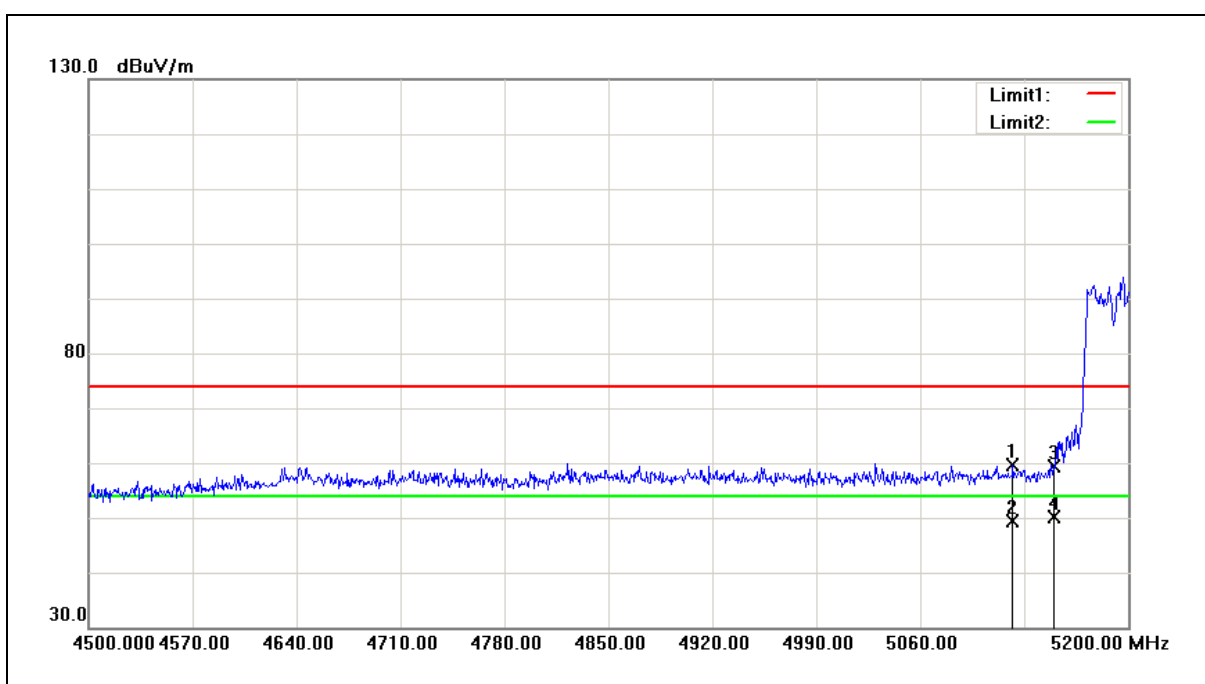
| No. | Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-----------------------|-----------------|----------------|-------------|--------|
| 1   | 5850.000        | 51.93          | 9.98                  | 61.91           | 122.20         | -60.29      | peak   |
| 2   | 5855.000        | 47.01          | 9.99                  | 57.00           | 110.80         | -53.80      | peak   |
| 3   | 5875.000        | 48.20          | 10.04                 | 58.24           | 105.20         | -46.96      | peak   |
| 4   | 5925.000        | 47.25          | 10.16                 | 57.41           | 68.20          | -10.79      | peak   |

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.

|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Band edge       | Power:               | AC 120V/60Hz |
| Frequency:  | 5190MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 4          | Date:                | 08/05/2017   |
| Ant.Polar.: | Horizontal      |                      |              |



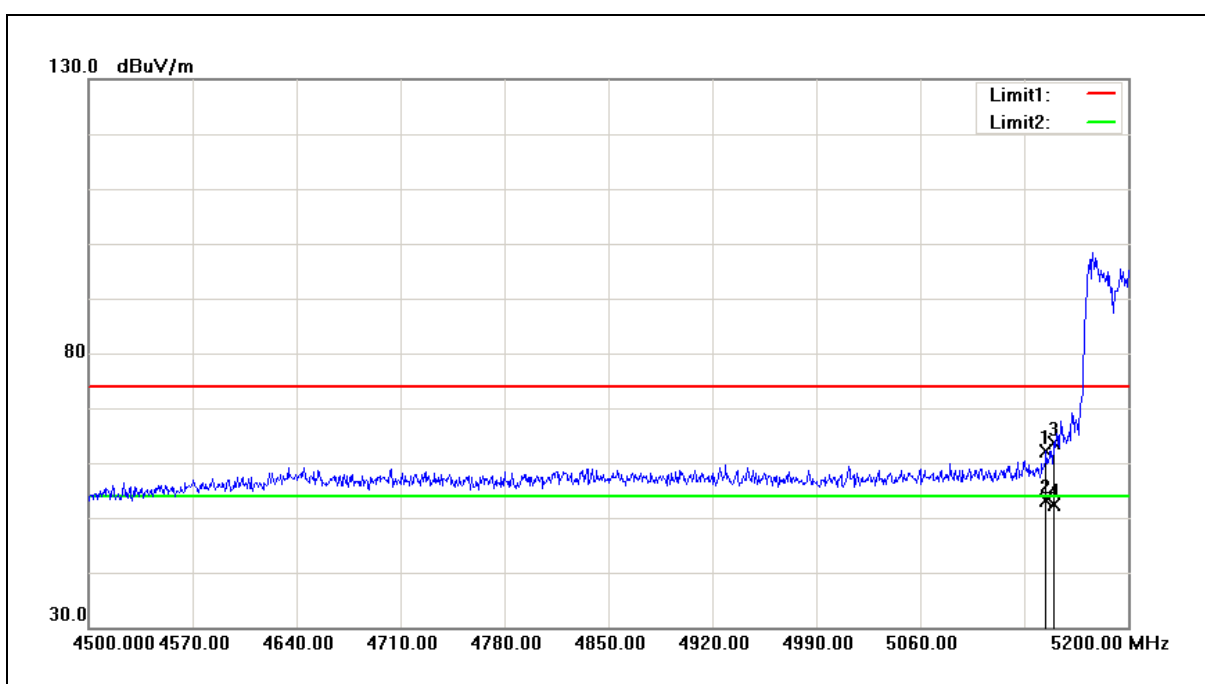
| No. | Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-----------------------|-----------------|----------------|-------------|--------|
| 1   | 5122.300        | 50.77          | 8.94                  | 59.71           | 74.00          | -14.29      | peak   |
| 2   | 5122.300        | 40.44          | 8.94                  | 49.38           | 54.00          | -4.62       | AVG    |
| 3   | 5150.000        | 50.30          | 8.97                  | 59.27           | 74.00          | -14.73      | peak   |
| 4   | 5150.000        | 41.28          | 8.97                  | 50.25           | 54.00          | -3.75       | AVG    |

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.

|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Band edge       | Power:               | AC 120V/60Hz |
| Frequency:  | 5190MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 4          | Date:                | 08/05/2017   |
| Ant.Polar.: | Vertical        |                      |              |



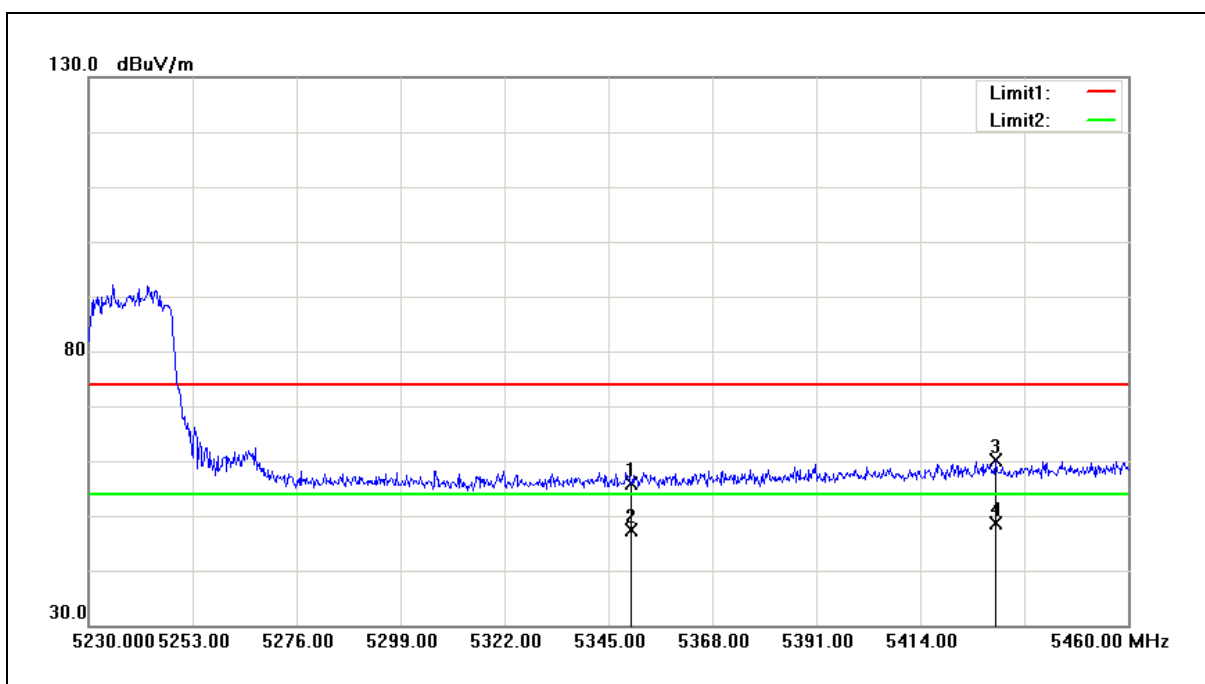
| No. | Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-----------------------|-----------------|----------------|-------------|--------|
| 1   | 5144.700        | 53.27          | 8.97                  | 62.24           | 74.00          | -11.76      | peak   |
| 2   | 5144.700        | 44.27          | 8.97                  | 53.24           | 54.00          | -0.76       | AVG    |
| 3   | 5150.000        | 54.62          | 8.97                  | 63.59           | 74.00          | -10.41      | peak   |
| 4   | 5150.000        | 43.41          | 8.97                  | 52.38           | 54.00          | -1.62       | AVG    |

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.

|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Band edge       | Power:               | AC 120V/60Hz |
| Frequency:  | 5230MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 4          | Date:                | 08/05/2017   |
| Ant.Polar.: | Horizontal      |                      |              |



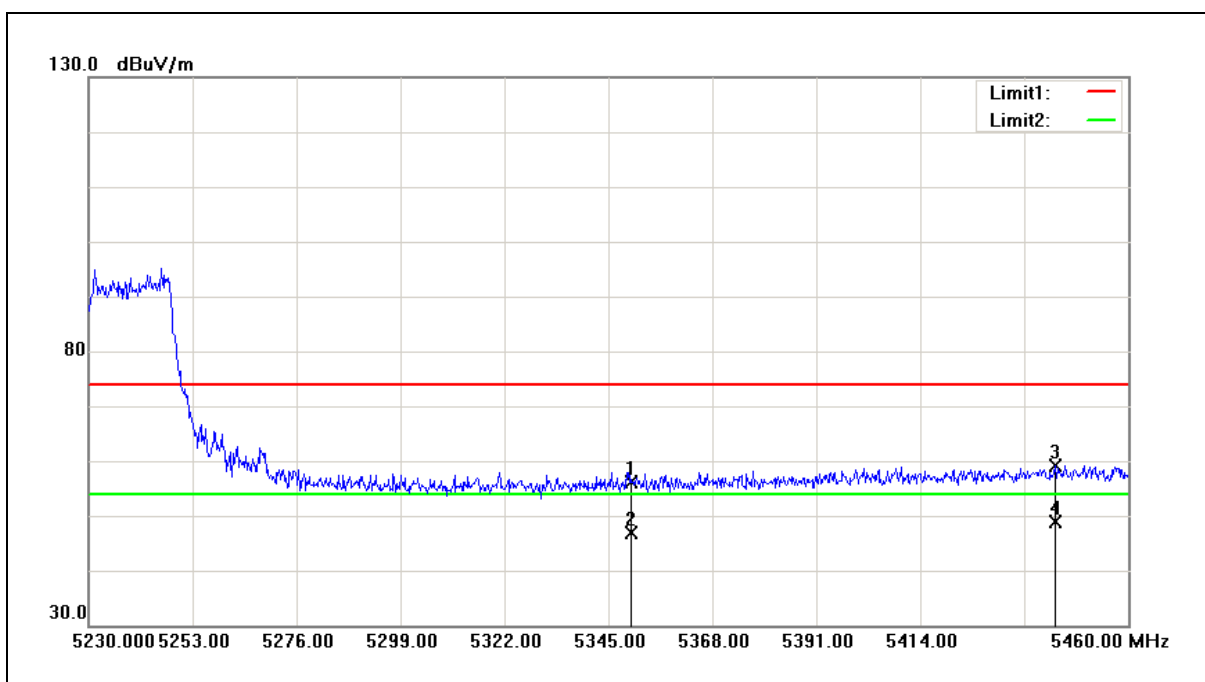
| No. | Frequency<br>(MHz) | Reading<br>(dBuV) | Correct Factor<br>(dB/m) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|-----|--------------------|-------------------|--------------------------|--------------------|-------------------|----------------|--------|
| 1   | 5350.000           | 46.76             | 9.08                     | 55.84              | 74.00             | -18.16         | peak   |
| 2   | 5350.000           | 38.23             | 9.08                     | 47.31              | 54.00             | -6.69          | AVG    |
| 3   | 5430.790           | 50.91             | 9.14                     | 60.05              | 74.00             | -13.95         | peak   |
| 4   | 5430.790           | 39.50             | 9.14                     | 48.64              | 54.00             | -5.36          | AVG    |

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.

|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Band edge       | Power:               | AC 120V/60Hz |
| Frequency:  | 5230MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 4          | Date:                | 08/05/2017   |
| Ant.Polar.: | Vertical        |                      |              |



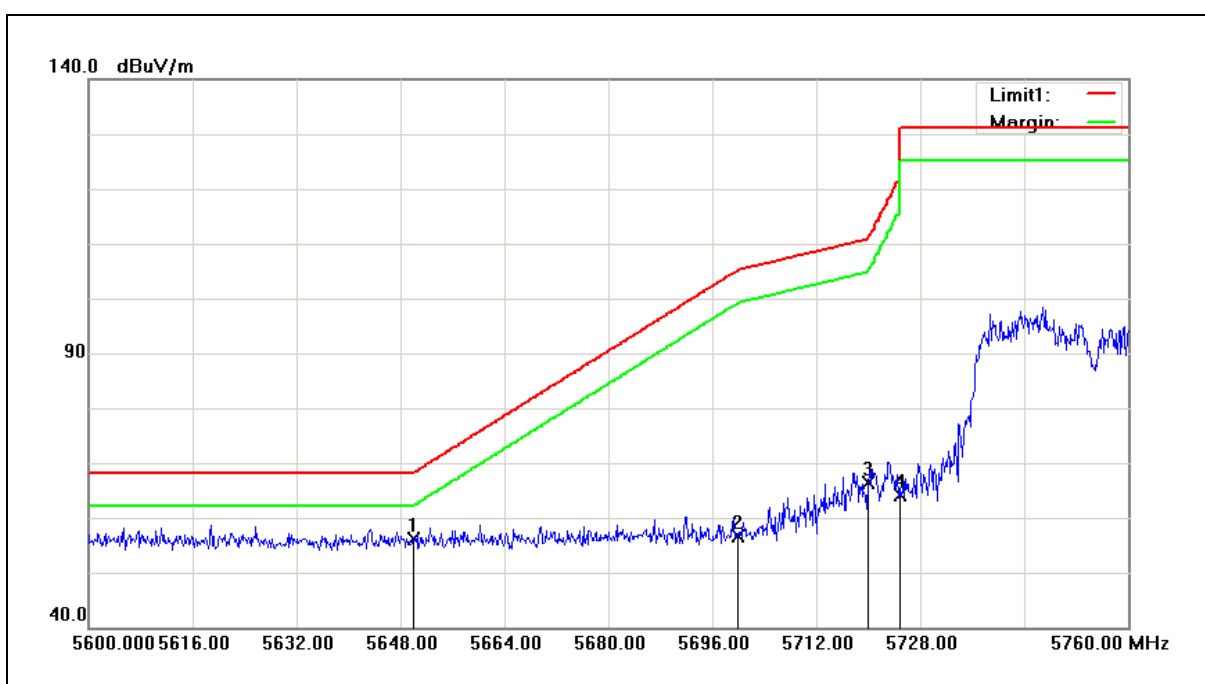
| No. | Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-----------------------|-----------------|----------------|-------------|--------|
| 1   | 5350.000        | 46.95          | 9.08                  | 56.03           | 74.00          | -17.97      | peak   |
| 2   | 5350.000        | 37.68          | 9.08                  | 46.76           | 54.00          | -7.24       | AVG    |
| 3   | 5443.900        | 49.96          | 9.15                  | 59.11           | 74.00          | -14.89      | peak   |
| 4   | 5443.900        | 39.69          | 9.15                  | 48.84           | 54.00          | -5.16       | AVG    |

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.

|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Band edge       | Power:               | AC 120V/60Hz |
| Frequency:  | 5755MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 4          | Date:                | 08/05/2017   |
| Ant.Polar.: | Horizontal      |                      |              |



| No. | Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-----------------------|-----------------|----------------|-------------|--------|
| 1   | 5650.000        | 46.65          | 9.53                  | 56.18           | 68.20          | -12.02      | peak   |
| 2   | 5700.000        | 47.02          | 9.64                  | 56.66           | 105.20         | -48.54      | peak   |
| 3   | 5720.000        | 56.58          | 9.69                  | 66.27           | 110.80         | -44.53      | peak   |
| 4   | 5725.000        | 54.50          | 9.70                  | 64.20           | 122.20         | -58.00      | peak   |

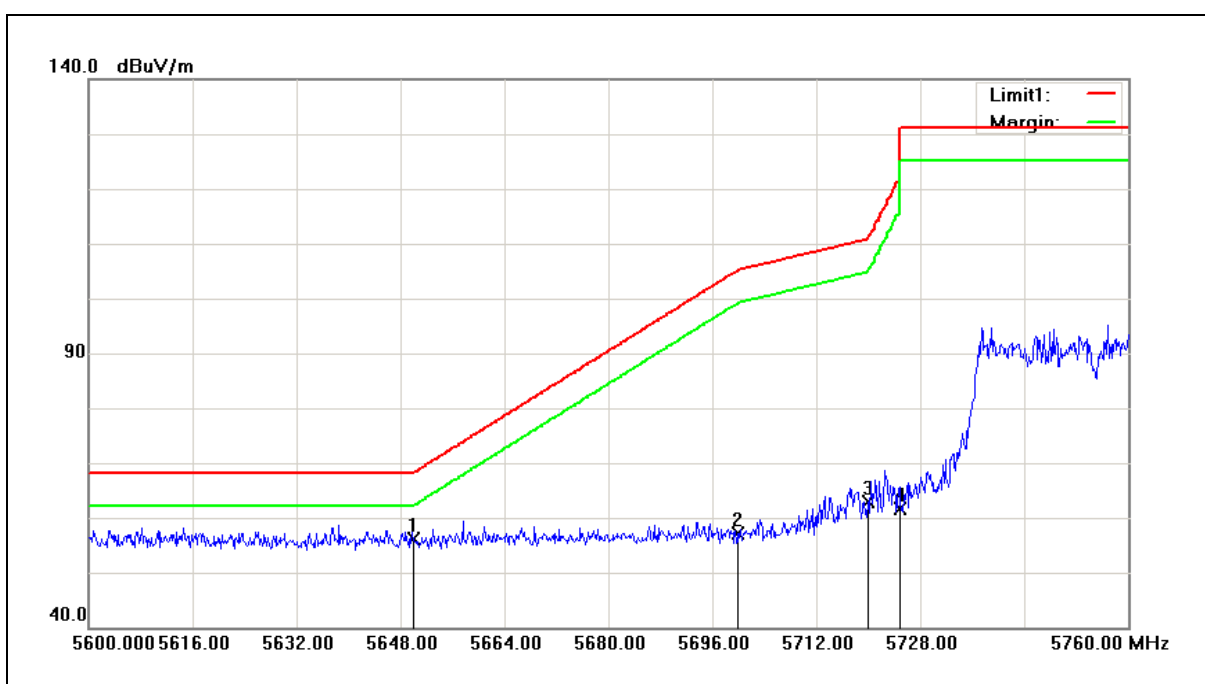
Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.



|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Band edge       | Power:               | AC 120V/60Hz |
| Frequency:  | 5755MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 4          | Date:                | 08/05/2017   |
| Ant.Polar.: | Vertical        |                      |              |



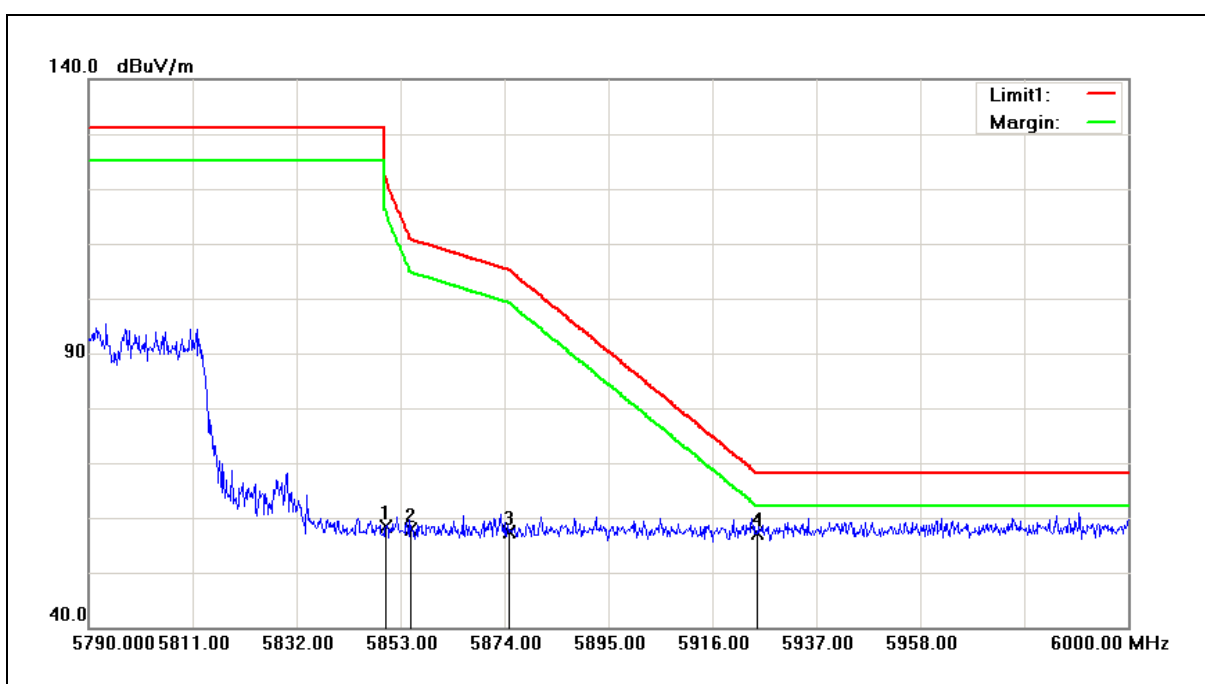
| No. | Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-----------------------|-----------------|----------------|-------------|--------|
| 1   | 5650.000        | 46.57          | 9.53                  | 56.10           | 68.20          | -12.10      | peak   |
| 2   | 5700.000        | 47.44          | 9.64                  | 57.08           | 105.20         | -48.12      | peak   |
| 3   | 5720.000        | 53.27          | 9.69                  | 62.96           | 110.80         | -47.84      | peak   |
| 4   | 5725.000        | 52.04          | 9.70                  | 61.74           | 122.20         | -60.46      | peak   |

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.

|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Band edge       | Power:               | AC 120V/60Hz |
| Frequency:  | 5795MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 4          | Date:                | 08/05/2017   |
| Ant.Polar.: | Horizontal      |                      |              |



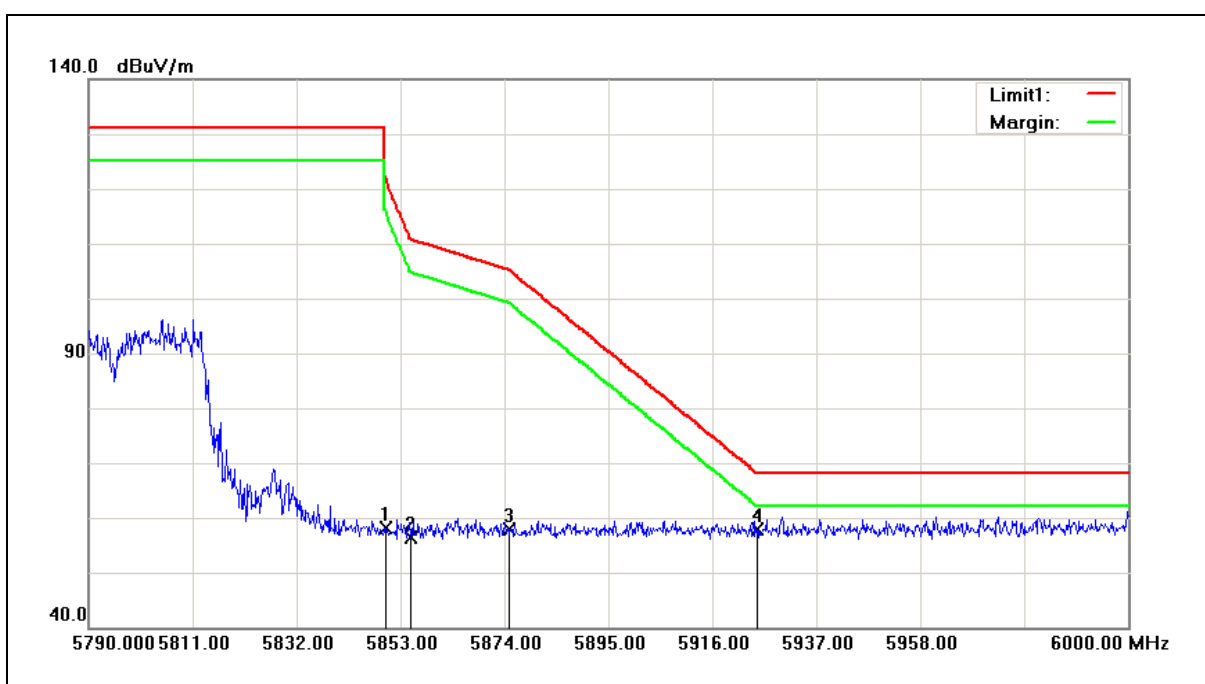
| No. | Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-----------------------|-----------------|----------------|-------------|--------|
| 1   | 5850.000        | 48.51          | 9.98                  | 58.49           | 122.20         | -63.71      | peak   |
| 2   | 5855.000        | 47.89          | 9.99                  | 57.88           | 110.80         | -52.92      | peak   |
| 3   | 5875.000        | 47.43          | 10.04                 | 57.47           | 105.20         | -47.73      | peak   |
| 4   | 5925.000        | 46.94          | 10.16                 | 57.10           | 68.20          | -11.10      | peak   |

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.

|             |                 |                       |              |
|-------------|-----------------|-----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:        | 3m           |
| Test item:  | Band edge       | Power:                | AC 120V/60Hz |
| Frequency:  | 5795MHz         | Temp.(°C)/Hum. (%RH): | 26(°C)/60%RH |
| Mode:       | Mode 4          | Date:                 | 08/05/2017   |
| Ant.Polar.: | Vertical        |                       |              |



| No. | Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-----------------------|-----------------|----------------|-------------|--------|
| 1   | 5850.000        | 48.15          | 9.98                  | 58.13           | 122.20         | -64.07      | peak   |
| 2   | 5855.000        | 46.45          | 9.99                  | 56.44           | 110.80         | -54.36      | peak   |
| 3   | 5875.000        | 47.73          | 10.04                 | 57.77           | 105.20         | -47.43      | peak   |
| 4   | 5925.000        | 47.83          | 10.16                 | 57.99           | 68.20          | -10.21      | peak   |

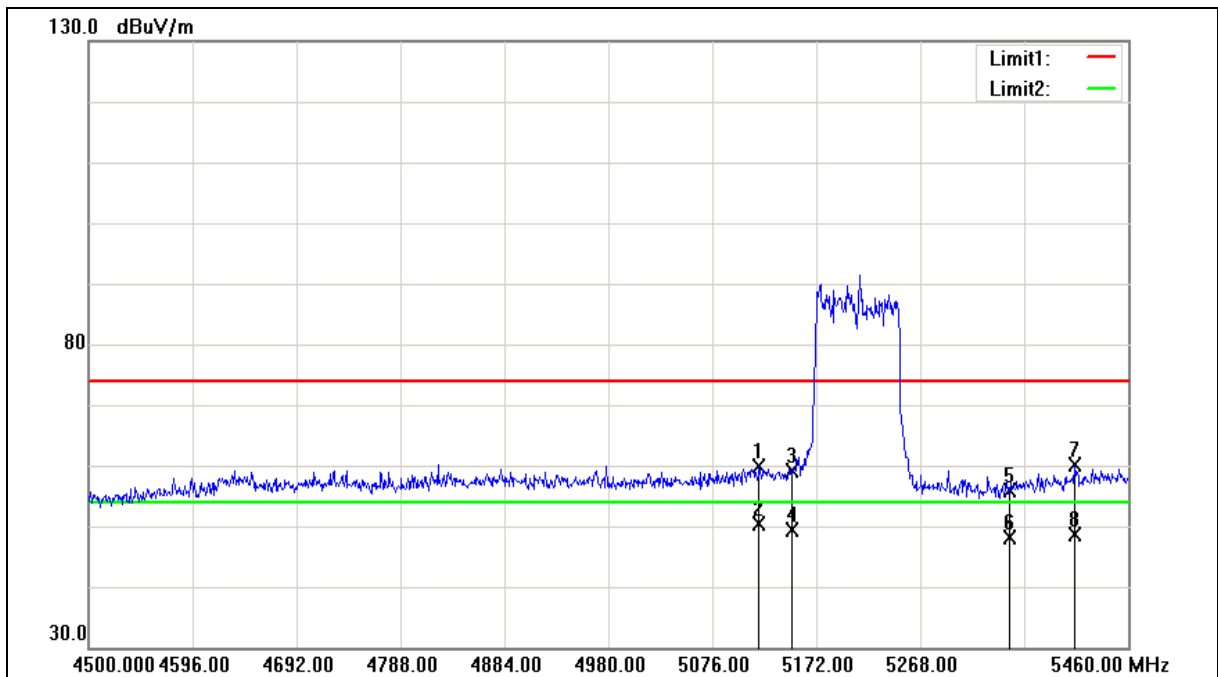
Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.



|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Band edge       | Power:               | AC 120V/60Hz |
| Frequency:  | 5210MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 5          | Date:                | 08/05/2017   |
| Ant.Polar.: | Horizontal      |                      |              |





|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Band edge       | Power:               | AC 120V/60Hz |
| Frequency:  | 5210MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 5          | Date:                | 08/05/2017   |
| Ant.Polar.: | Horizontal      |                      |              |

| No. | Frequency<br>(MHz) | Reading<br>(dBuV) | Correct Factor<br>(dB/m) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|-----|--------------------|-------------------|--------------------------|--------------------|-------------------|----------------|--------|
| 1   | 5119.200           | 50.84             | 8.94                     | 59.78              | 74.00             | -14.22         | peak   |
| 2   | 5119.200           | 41.49             | 8.94                     | 50.43              | 54.00             | -3.57          | AVG    |
| 3   | 5150.000           | 50.28             | 8.97                     | 59.25              | 74.00             | -14.75         | peak   |
| 4   | 5150.000           | 40.39             | 8.97                     | 49.36              | 54.00             | -4.64          | AVG    |
| 5   | 5350.000           | 46.83             | 9.08                     | 55.91              | 74.00             | -18.09         | peak   |
| 6   | 5350.000           | 39.14             | 9.08                     | 48.22              | 54.00             | -5.78          | AVG    |
| 7   | 5411.040           | 51.07             | 9.12                     | 60.19              | 74.00             | -13.81         | peak   |
| 8   | 5411.040           | 39.50             | 9.12                     | 48.62              | 54.00             | -5.38          | AVG    |

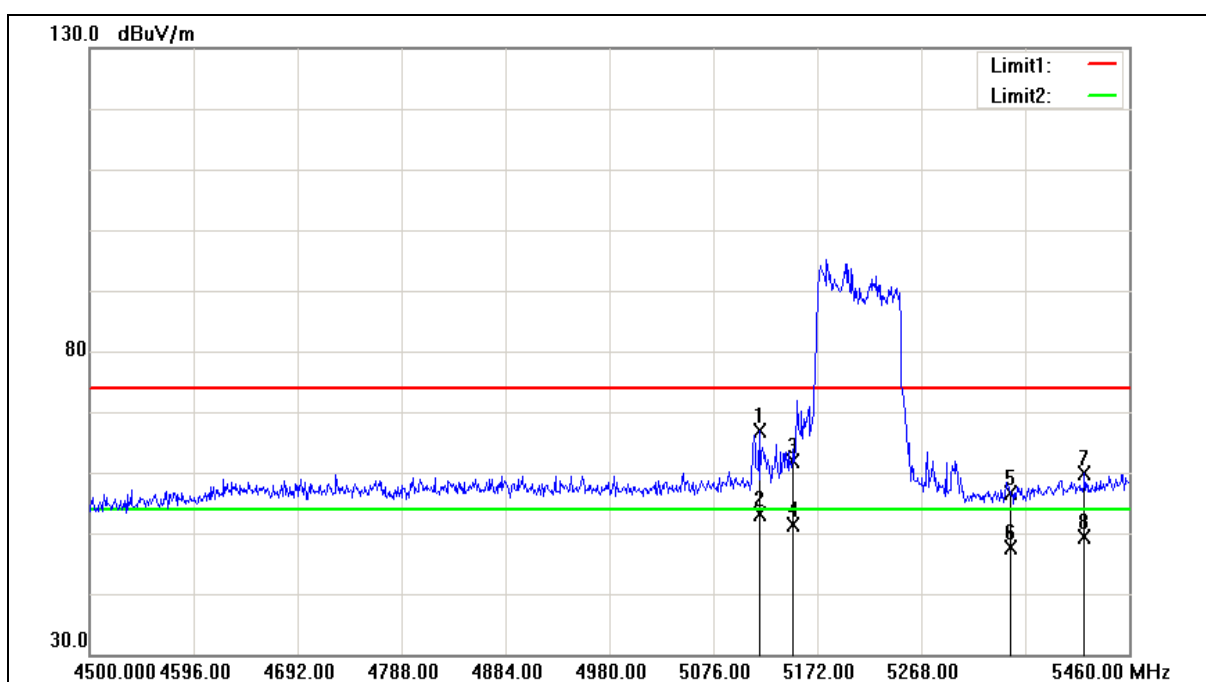
Note:1. Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2. Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.



|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Band edge       | Power:               | AC 120V/60Hz |
| Frequency:  | 5210MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 5          | Date:                | 08/05/2017   |
| Ant.Polar.: | Vertical        |                      |              |





|             |                 |                       |              |
|-------------|-----------------|-----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:        | 3m           |
| Test item:  | Band edge       | Power:                | AC 120V/60Hz |
| Frequency:  | 5210MHz         | Temp.(°C)/Hum. (%RH): | 26(°C)/60%RH |
| Mode:       | Mode 5          | Date:                 | 08/05/2017   |
| Ant.Polar.: | Vertical        |                       |              |

| No. | Frequency<br>(MHz) | Reading<br>(dBuV) | Correct Factor<br>(dB/m) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|-----|--------------------|-------------------|--------------------------|--------------------|-------------------|----------------|--------|
| 1   | 5118.240           | 57.88             | 8.94                     | 66.82              | 74.00             | -7.18          | peak   |
| 2   | 5118.240           | 44.26             | 8.94                     | 53.20              | 54.00             | -0.80          | AVG    |
| 3   | 5150.000           | 52.91             | 8.97                     | 61.88              | 74.00             | -12.12         | peak   |
| 4   | 5150.000           | 42.53             | 8.97                     | 51.50              | 54.00             | -2.50          | AVG    |
| 5   | 5350.000           | 47.60             | 9.08                     | 56.68              | 74.00             | -17.32         | peak   |
| 6   | 5350.000           | 38.46             | 9.08                     | 47.54              | 54.00             | -6.46          | AVG    |
| 7   | 5418.720           | 50.65             | 9.14                     | 59.79              | 74.00             | -14.21         | peak   |
| 8   | 5418.720           | 40.15             | 9.14                     | 49.29              | 54.00             | -4.71          | AVG    |

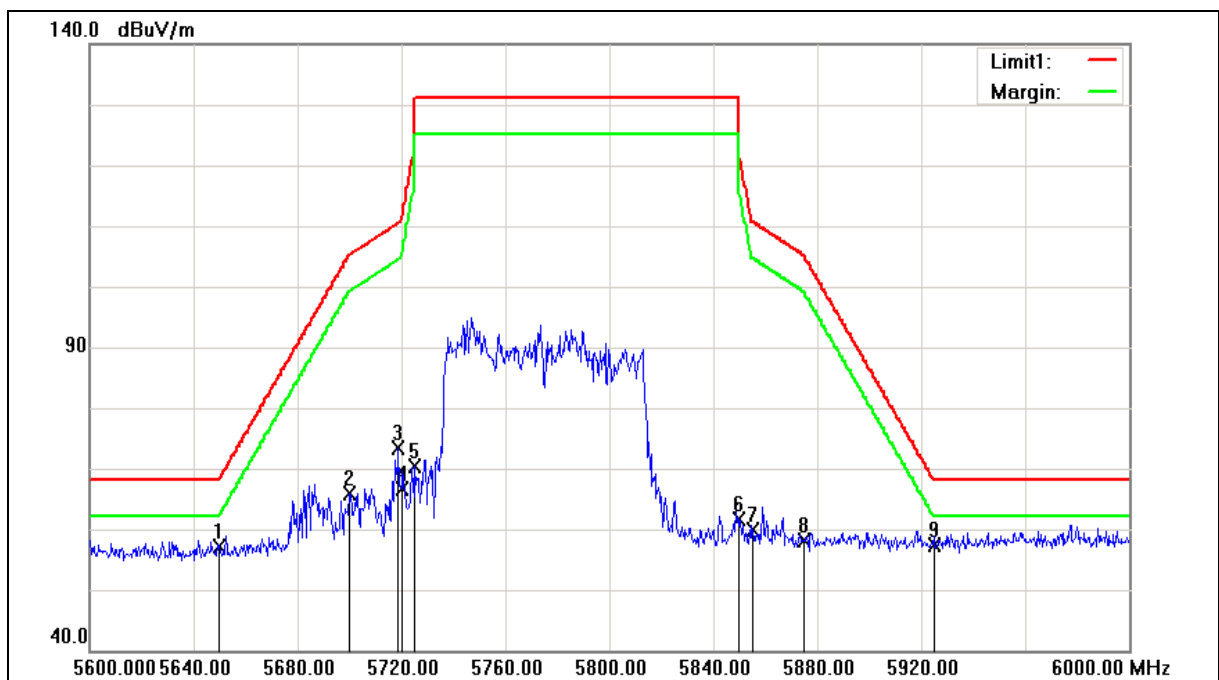
Note:1. Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2. Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.



|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Band edge       | Power:               | AC 120V/60Hz |
| Frequency:  | 5775MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 5          | Date:                | 08/05/2017   |
| Ant.Polar.: | Horizontal      |                      |              |







|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Band edge       | Power:               | AC 120V/60Hz |
| Frequency:  | 5775MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 5          | Date:                | 08/05/2017   |
| Ant.Polar.: | Horizontal      |                      |              |

| No. | Frequency<br>(MHz) | Reading<br>(dBuV) | Correct Factor<br>(dB/m) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|-----|--------------------|-------------------|--------------------------|--------------------|-------------------|----------------|--------|
| 1   | 5650.000           | 47.63             | 9.53                     | 57.16              | 68.20             | -11.04         | peak   |
| 2   | 5700.000           | 56.28             | 9.64                     | 65.92              | 105.20            | -39.28         | peak   |
| 3   | 5718.800           | 63.79             | 9.68                     | 73.47              | 110.46            | -36.99         | peak   |
| 4   | 5720.000           | 56.94             | 9.69                     | 66.63              | 110.80            | -44.17         | peak   |
| 5   | 5725.000           | 60.70             | 9.70                     | 70.40              | 122.20            | -51.80         | peak   |
| 6   | 5850.000           | 51.59             | 9.98                     | 61.57              | 122.20            | -60.63         | peak   |
| 7   | 5855.000           | 49.80             | 9.99                     | 59.79              | 110.80            | -51.01         | peak   |
| 8   | 5875.000           | 48.12             | 10.04                    | 58.16              | 105.20            | -47.04         | peak   |
| 9   | 5925.000           | 47.11             | 10.16                    | 57.27              | 68.20             | -10.93         | peak   |

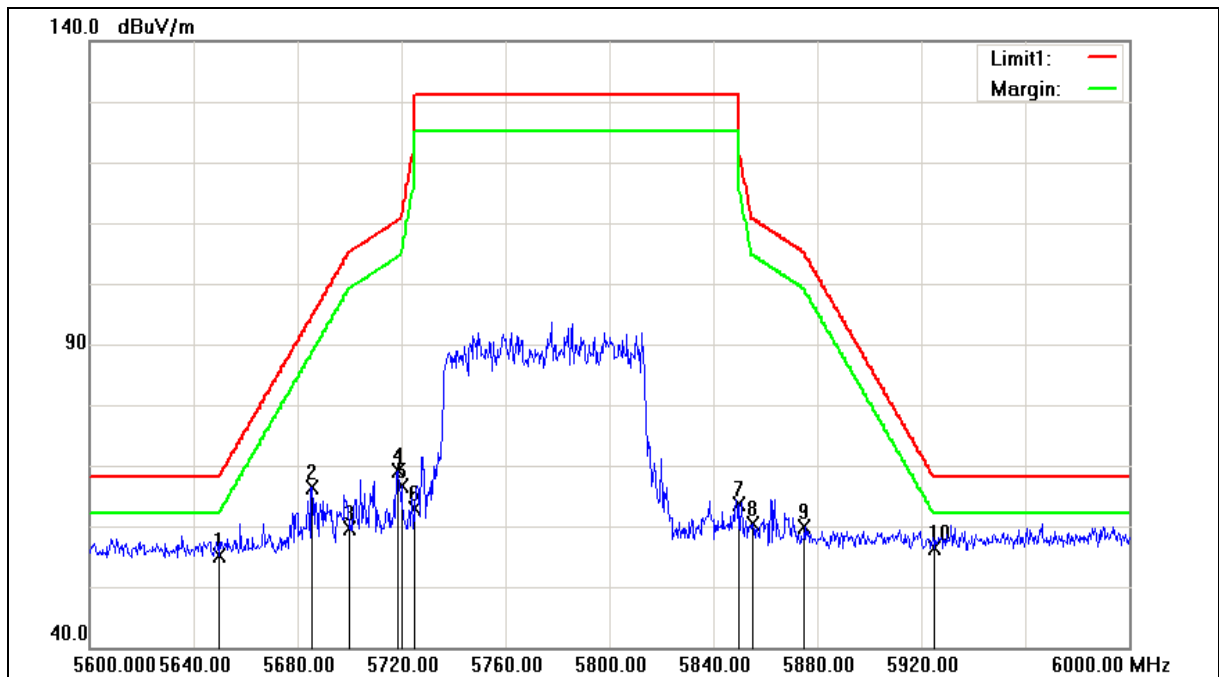
Note:1. Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2. Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.



|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Band edge       | Power:               | AC 120V/60Hz |
| Frequency:  | 5775MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 5          | Date:                | 08/05/2017   |
| Ant.Polar.: | Vertical        |                      |              |





|             |                 |                      |              |
|-------------|-----------------|----------------------|--------------|
| Standard:   | FCC Part 15.407 | Test Distance:       | 3m           |
| Test item:  | Band edge       | Power:               | AC 120V/60Hz |
| Frequency:  | 5775MHz         | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:       | Mode 5          | Date:                | 08/05/2017   |
| Ant.Polar.: | Vertical        |                      |              |

| No. | Frequency<br>(MHz) | Reading<br>(dBuV) | Correct Factor<br>(dB/m) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|-----|--------------------|-------------------|--------------------------|--------------------|-------------------|----------------|--------|
| 1   | 5650.000           | 45.52             | 9.53                     | 55.05              | 68.20             | -13.15         | peak   |
| 2   | 5685.600           | 56.68             | 9.61                     | 66.29              | 94.54             | -28.25         | peak   |
| 3   | 5700.000           | 49.91             | 9.64                     | 59.55              | 105.20            | -45.65         | peak   |
| 4   | 5718.400           | 59.42             | 9.68                     | 69.10              | 110.35            | -41.25         | peak   |
| 5   | 5720.000           | 56.97             | 9.69                     | 66.66              | 110.80            | -44.14         | peak   |
| 6   | 5725.000           | 53.21             | 9.70                     | 62.91              | 122.20            | -59.29         | peak   |
| 7   | 5850.000           | 53.67             | 9.98                     | 63.65              | 122.20            | -58.55         | peak   |
| 8   | 5855.000           | 50.42             | 9.99                     | 60.41              | 110.80            | -50.39         | peak   |
| 9   | 5875.000           | 49.72             | 10.04                    | 59.76              | 105.20            | -45.44         | peak   |
| 10  | 5925.000           | 46.18             | 10.16                    | 56.34              | 68.20             | -11.86         | peak   |

Note:1. Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2. Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.

#### 4.4. Maximum Conducted Output Power

##### ■ Limit

| Frequency Range (MHz) | FCC Maximum Conducted Output Power Limit |
|-----------------------|------------------------------------------|
|                       | Master                                   |
| 5.150 ~ 5.250 GHz     | The lesser of 1W (30dBm)                 |
| 5.725 ~ 5.850 GHz     | The lesser of 1W (30dBm)                 |

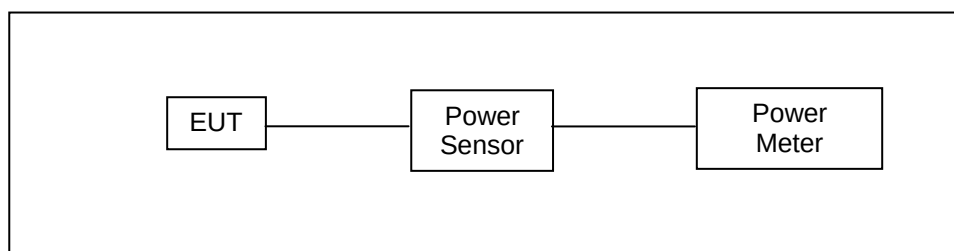
According FCC KDB 662911 D01 v02r01 – for power measurements on IEEE802.11 devices,

\* MIMO mode : Directional Gain =  $10 \cdot \log\{[10^{G1/20} + 10^{G2/20} + \dots + 10^{Gn/20}]^2 / NANT\} = 8.01 \text{ dBi} > 6 \text{ dBi}$

MIMO mode power limit shall be reduced =  $30 - 2.01 = 27.99 \text{ dBm}$  (5.150 ~ 5.250 GHz)

MIMO mode power limit shall be reduced =  $30 - 2.01 = 27.99 \text{ dBm}$  (5.725 ~ 5.850 GHz)

##### ■ Test Setup



##### ■ Test Instruments

| Equipment       | Manufacturer | Model Number      | Serial Number | Cal. Date  | Remark |
|-----------------|--------------|-------------------|---------------|------------|--------|
| Power Sensor    | Anritsu      | MA2411B           | 1126022       | 08/29/2016 | 1 year |
| Power Meter     | Anritsu      | ML2495A           | 1135009       | 08/29/2016 | 1 year |
| Microwave Cable | EMCI         | EMC104-SM-SM-1500 | 140303        | 02/22/2017 | 1 year |
| Test Site       | ATL          | TE05              | TE05          | N.C.R.     | -----  |

Note: N.C.R. = No Calibration Request.

##### ■ Test Procedure

The test is performed in accordance with KDB789033: D02 General UNII Test Procedures New Rules v01r04, Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices

Section (E) Maximum Conducted Output Power

3. Measurement using a Power Meter (PM)

b) Method PM-G (Measurement using a gated RF average power meter)



# Test Result

| Test Item          |              | Maximum Conducted Output Power          |       |       |       |              |              |                    |
|--------------------|--------------|-----------------------------------------|-------|-------|-------|--------------|--------------|--------------------|
| Test Mode          |              | Mode 2: IEEE 802.11a Continuous TX mode |       |       |       |              |              |                    |
| Frequency<br>(MHz) | Data<br>Rate | ANT-0                                   |       | ANT-1 |       | ANT-0+1      |              | FCC Limit<br>(dBm) |
|                    |              | Max. Outup Power                        |       |       |       |              |              |                    |
|                    |              | (dBm)                                   | (W)   | (dBm) | (W)   | (dBm)        | (W)          |                    |
| 5180               | 6M           | 8.93                                    | 0.008 | 8.98  | 0.008 | <b>11.97</b> | <b>0.016</b> | ≤ 27.99            |
| 5200               |              | 8.53                                    | 0.007 | 8.89  | 0.008 | 11.72        | 0.015        |                    |
| 5220               |              | 8.57                                    | 0.007 | 8.85  | 0.008 | 11.72        | 0.015        |                    |
| 5240               |              | 8.34                                    | 0.007 | 8.86  | 0.008 | 11.62        | 0.015        |                    |
| 5745               |              | 8.38                                    | 0.007 | 8.92  | 0.008 | 11.67        | 0.015        | ≤ 27.99            |
| 5765               |              | 8.41                                    | 0.007 | 8.71  | 0.007 | 11.57        | 0.014        |                    |
| 5785               |              | 8.54                                    | 0.007 | 8.74  | 0.007 | 11.65        | 0.015        |                    |
| 5805               |              | 8.56                                    | 0.007 | 8.81  | 0.008 | <b>11.70</b> | <b>0.015</b> |                    |
| 5825               |              | 8.38                                    | 0.007 | 8.81  | 0.008 | 11.61        | 0.014        |                    |
| 5180               | 54M          | 8.80                                    | 0.008 | 8.87  | 0.008 | 11.85        | 0.015        | ≤ 27.99            |
| 5200               |              | 8.43                                    | 0.007 | 8.77  | 0.008 | 11.61        | 0.014        |                    |
| 5220               |              | 8.51                                    | 0.007 | 8.81  | 0.008 | 11.67        | 0.015        |                    |
| 5240               |              | 8.28                                    | 0.007 | 8.80  | 0.008 | 11.56        | 0.014        |                    |
| 5745               |              | 8.31                                    | 0.007 | 8.84  | 0.008 | 11.59        | 0.014        | ≤ 27.99            |
| 5765               |              | 8.36                                    | 0.007 | 8.64  | 0.007 | 11.51        | 0.014        |                    |
| 5785               |              | 8.50                                    | 0.007 | 8.67  | 0.007 | 11.60        | 0.014        |                    |
| 5805               |              | 8.48                                    | 0.007 | 8.73  | 0.007 | 11.62        | 0.015        |                    |
| 5825               |              | 8.34                                    | 0.007 | 8.74  | 0.007 | 11.55        | 0.014        |                    |



| Test Item          |              | Maximum Conducted Output Power                 |       |       |       |              |              |                    |
|--------------------|--------------|------------------------------------------------|-------|-------|-------|--------------|--------------|--------------------|
| Test Mode          |              | Mode 3: IEEE 802.11ac 20MHz Continuous TX mode |       |       |       |              |              |                    |
| Frequency<br>(MHz) | Data<br>Rate | ANT-0                                          |       | ANT-1 |       | ANT-0+1      |              | FCC Limit<br>(dBm) |
|                    |              | Max. Outup Power                               |       |       |       |              |              |                    |
|                    |              | (dBm)                                          | (W)   | (dBm) | (W)   | (dBm)        | (W)          |                    |
| 5180               | 13M          | 8.34                                           | 0.007 | 8.83  | 0.008 | 11.60        | 0.014        | ≤ 27.99            |
| 5200               |              | 8.41                                           | 0.007 | 8.80  | 0.008 | 11.62        | 0.015        |                    |
| 5220               |              | 8.70                                           | 0.007 | 8.88  | 0.008 | <b>11.80</b> | <b>0.015</b> |                    |
| 5240               |              | 8.13                                           | 0.007 | 8.90  | 0.008 | 11.54        | 0.014        |                    |
| 5745               |              | 8.20                                           | 0.007 | 8.88  | 0.008 | 11.56        | 0.014        | ≤ 27.99            |
| 5765               |              | 8.40                                           | 0.007 | 8.81  | 0.008 | 11.62        | 0.015        |                    |
| 5785               |              | 8.37                                           | 0.007 | 8.92  | 0.008 | <b>11.66</b> | <b>0.015</b> |                    |
| 5805               |              | 8.32                                           | 0.007 | 8.87  | 0.008 | 11.61        | 0.015        |                    |
| 5825               |              | 8.29                                           | 0.007 | 8.72  | 0.007 | 11.52        | 0.014        |                    |
| 5180               | 173.4M       | 8.30                                           | 0.007 | 8.75  | 0.007 | 11.54        | 0.014        | ≤ 27.99            |
| 5200               |              | 8.31                                           | 0.007 | 8.69  | 0.007 | 11.51        | 0.014        |                    |
| 5220               |              | 8.59                                           | 0.007 | 8.79  | 0.008 | 11.70        | 0.015        |                    |
| 5240               |              | 8.10                                           | 0.006 | 8.84  | 0.008 | 11.50        | 0.014        |                    |
| 5745               |              | 8.11                                           | 0.006 | 8.80  | 0.008 | 11.48        | 0.014        | ≤ 27.99            |
| 5765               |              | 8.33                                           | 0.007 | 8.70  | 0.007 | 11.53        | 0.014        |                    |
| 5785               |              | 8.30                                           | 0.007 | 8.83  | 0.008 | 11.58        | 0.014        |                    |
| 5805               |              | 8.28                                           | 0.007 | 8.81  | 0.008 | 11.56        | 0.014        |                    |
| 5825               |              | 8.23                                           | 0.007 | 8.66  | 0.007 | 11.46        | 0.014        |                    |



| Test Item          |              | Maximum Conducted Output Power                 |       |       |       |              |              |                    |
|--------------------|--------------|------------------------------------------------|-------|-------|-------|--------------|--------------|--------------------|
| Test Mode          |              | Mode 4: IEEE 802.11ac 40MHz Continuous TX mode |       |       |       |              |              |                    |
| Frequency<br>(MHz) | Data<br>Rate | ANT-0                                          |       | ANT-1 |       | ANT-0+1      |              | FCC Limit<br>(dBm) |
|                    |              | Max. Outup Power                               |       |       |       |              |              |                    |
|                    |              | (dBm)                                          | (W)   | (dBm) | (W)   | (dBm)        | (W)          |                    |
| 5190               | 27M          | 8.84                                           | 0.008 | 8.36  | 0.007 | <b>11.62</b> | <b>0.015</b> | ≤ 27.99            |
| 5230               |              | 8.78                                           | 0.008 | 8.23  | 0.007 | 11.52        | 0.014        |                    |
| 5755               |              | 8.76                                           | 0.008 | 8.58  | 0.007 | <b>11.68</b> | <b>0.015</b> | ≤ 27.99            |
| 5795               |              | 8.83                                           | 0.008 | 8.34  | 0.007 | 11.60        | 0.014        |                    |
| 5190               | 400M         | 8.80                                           | 0.008 | 8.30  | 0.007 | 11.57        | 0.014        | ≤ 27.99            |
| 5230               |              | 8.73                                           | 0.007 | 8.11  | 0.006 | 11.44        | 0.014        |                    |
| 5755               |              | 8.74                                           | 0.007 | 8.49  | 0.007 | 11.63        | 0.015        | ≤ 27.99            |
| 5755               |              | 8.77                                           | 0.008 | 8.28  | 0.007 | 11.54        | 0.014        |                    |

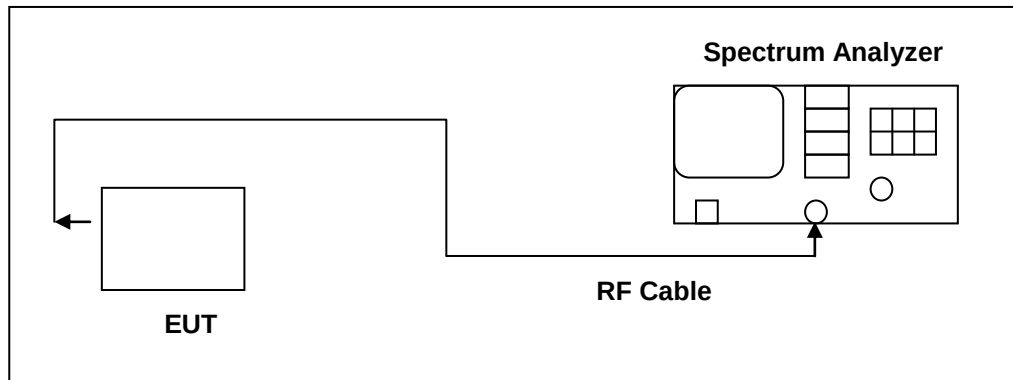
| Test Item       |           | Maximum Conducted Output Power                 |       |       |       |              |              |                 |
|-----------------|-----------|------------------------------------------------|-------|-------|-------|--------------|--------------|-----------------|
| Test Mode       |           | Mode 5: IEEE 802.11ac 80MHz Continuous TX mode |       |       |       |              |              |                 |
| Frequency (MHz) | Data Rate | ANT-0                                          |       | ANT-1 |       | ANT-0+1      |              | FCC Limit (dBm) |
|                 |           | Max. Outup Power                               |       |       |       |              |              |                 |
|                 |           | (dBm)                                          | (W)   | (dBm) | (W)   | (dBm)        | (W)          |                 |
| 5210            | 58.6M     | 8.54                                           | 0.007 | 8.78  | 0.008 | <b>11.67</b> | <b>0.015</b> | ≤ 27.99         |
| 5775            |           | 8.50                                           | 0.007 | 8.87  | 0.008 | <b>11.70</b> | <b>0.015</b> | ≤ 27.99         |
| 5210            | 866.6M    | 8.50                                           | 0.007 | 8.71  | 0.007 | 11.62        | 0.015        | ≤ 27.99         |
| 5775            |           | 8.44                                           | 0.007 | 8.80  | 0.008 | 11.63        | 0.015        | ≤ 27.99         |

#### 4.5. 26dB RF Bandwidth & 99 % Occupied Bandwidth Measurement

##### ■ Limit

N/A

##### ■ Test Setup



##### ■ Test Instruments

| Equipment         | Manufacturer | Model Number      | Serial Number | Cal. Date  | Remark |
|-------------------|--------------|-------------------|---------------|------------|--------|
| Spectrum Analyzer | Agilent      | E4445A            | MY45300744    | 12/19/2016 | 1 year |
| Microwave Cable   | EMCI         | EMC104-SM-SM-1500 | 140303        | 02/22/2017 | 1 year |
| Test Site         | ATL          | TE05              | TE05          | N.C.R.     | -----  |

Note: N.C.R. = No Calibration Request.

##### ■ Test Procedure

The test is performed in accordance with KDB789033: D02 General UNII Test Procedures New Rules v01r04, Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - Part 15, Subpart E.

| Spectrum Parameter | Setting                                    |
|--------------------|--------------------------------------------|
| Attenuation        | Auto                                       |
| Span Frequency     | >26dB Bandwidth                            |
| RBW                | Approximately 1% of the emission bandwidth |
| VBW                | VBW > RBW                                  |
| Detector           | Peak                                       |
| Trace              | Max Hold                                   |
| Sweep Time         | Auto                                       |



# Test Result

|                 |                                                         |                      |                              |                              |
|-----------------|---------------------------------------------------------|----------------------|------------------------------|------------------------------|
| Test Item       | 26dB RF Bandwidth & 99 % Occupied Bandwidth Measurement |                      |                              |                              |
| Test Mode       | Mode 2: IEEE 802.11a Continuous TX mode                 |                      |                              |                              |
| Frequency (MHz) | Ant-0                                                   | Ant-1                | Ant-0                        | Ant-1                        |
|                 | 26dB Bandwidth (MHz)                                    | 26dB Bandwidth (MHz) | 99% Occupied Bandwidth (MHz) | 99% Occupied Bandwidth (MHz) |
| 5180            | 18.760                                                  | 19.070               | 16.260                       | 16.297                       |
| 5200            | 19.520                                                  | 19.820               | 16.282                       | 16.295                       |
| 5240            | 18.890                                                  | 19.170               | 16.281                       | 16.279                       |

|                 |                                                         |                      |                              |                              |
|-----------------|---------------------------------------------------------|----------------------|------------------------------|------------------------------|
| Test Item       | 26dB RF Bandwidth & 99 % Occupied Bandwidth Measurement |                      |                              |                              |
| Test Mode       | Mode 3: IEEE 802.11ac 20MHz Continuous TX mode          |                      |                              |                              |
| Frequency (MHz) | Ant-0                                                   | Ant-1                | Ant-0                        | Ant-1                        |
|                 | 26dB Bandwidth (MHz)                                    | 26dB Bandwidth (MHz) | 99% Occupied Bandwidth (MHz) | 99% Occupied Bandwidth (MHz) |
| 5180            | 20.660                                                  | 20.190               | 17.386                       | 17.389                       |
| 5200            | 20.600                                                  | 20.170               | 17.399                       | 17.424                       |
| 5240            | 20.620                                                  | 20.230               | 17.396                       | 17.404                       |

|                 |                                                         |                      |                              |                              |
|-----------------|---------------------------------------------------------|----------------------|------------------------------|------------------------------|
| Test Item       | 26dB RF Bandwidth & 99 % Occupied Bandwidth Measurement |                      |                              |                              |
| Test Mode       | Mode 4: IEEE 802.11ac 40MHz Continuous TX mode          |                      |                              |                              |
| Frequency (MHz) | Ant-0                                                   | Ant-1                | Ant-0                        | Ant-1                        |
|                 | 26dB Bandwidth (MHz)                                    | 26dB Bandwidth (MHz) | 99% Occupied Bandwidth (MHz) | 99% Occupied Bandwidth (MHz) |
| 5190            | 45.110                                                  | 47.630               | 35.972                       | 35.979                       |
| 5230            | 42.350                                                  | 44.050               | 35.950                       | 35.963                       |

|                 |                                                         |                      |                              |                              |
|-----------------|---------------------------------------------------------|----------------------|------------------------------|------------------------------|
| Test Item       | 26dB RF Bandwidth & 99 % Occupied Bandwidth Measurement |                      |                              |                              |
| Test Mode       | Mode 5: IEEE 802.11ac 80MHz Continuous TX mode          |                      |                              |                              |
| Frequency (MHz) | Ant-0                                                   | Ant-1                | Ant-0                        | Ant-1                        |
|                 | 26dB Bandwidth (MHz)                                    | 26dB Bandwidth (MHz) | 99% Occupied Bandwidth (MHz) | 99% Occupied Bandwidth (MHz) |
| 5210            | 82.830                                                  | 80.720               | 74.915                       | 74.979                       |

Note: The 99% occupied bandwidth not crossed 5250MHz.



## ■ Test Graphs

Mode 2: IEEE 802.11a Continuous TX mode\_ Ant-0

5180 MHz



5200 MHz

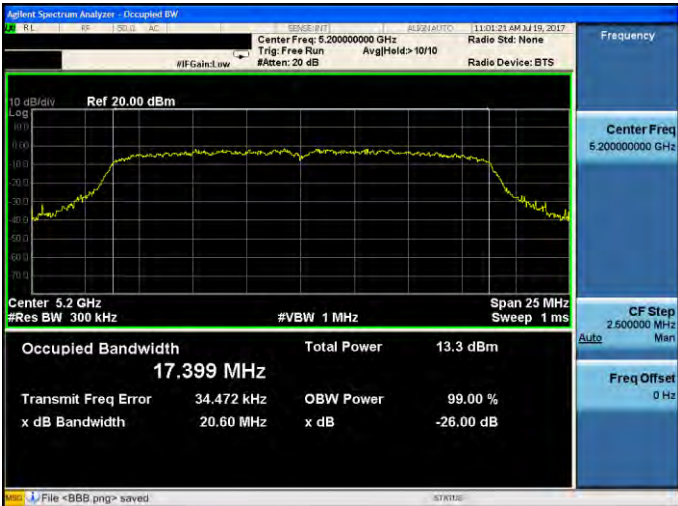


5240 MHz





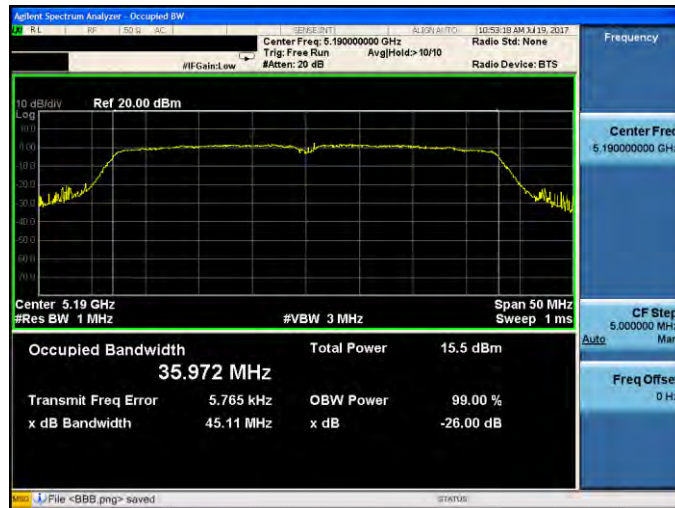
## Mode 3: IEEE 802.11ac 20MHz Continuous TX mode\_ ANT-0

|          |                                                                                      |
|----------|--------------------------------------------------------------------------------------|
| 5180 MHz |    |
| 5200 MHz |   |
| 5240 MHz |  |



## Mode 4: IEEE 802.11ac 40MHz Continuous TX mode\_ ANT-0

5190 MHz



5230 MHz



## Mode 5: IEEE 802.11ac 80MHz Continuous TX mode\_ ANT-0

5210 MHz

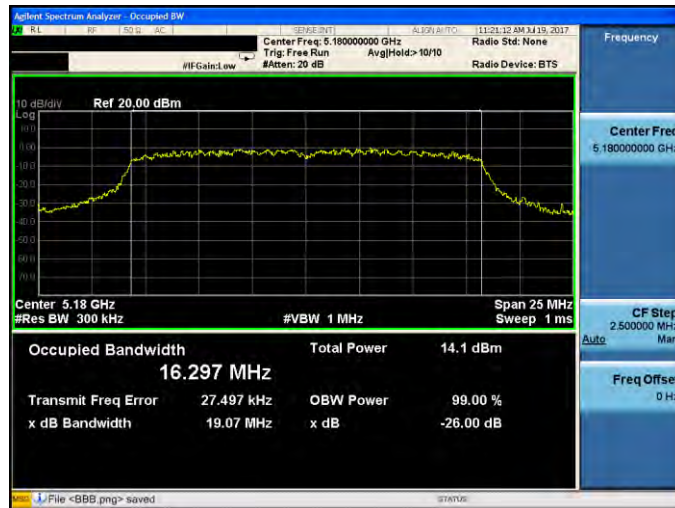






## Mode 2: IEEE 802.11a Continuous TX mode\_ Ant-1

5180 MHz



5200 MHz

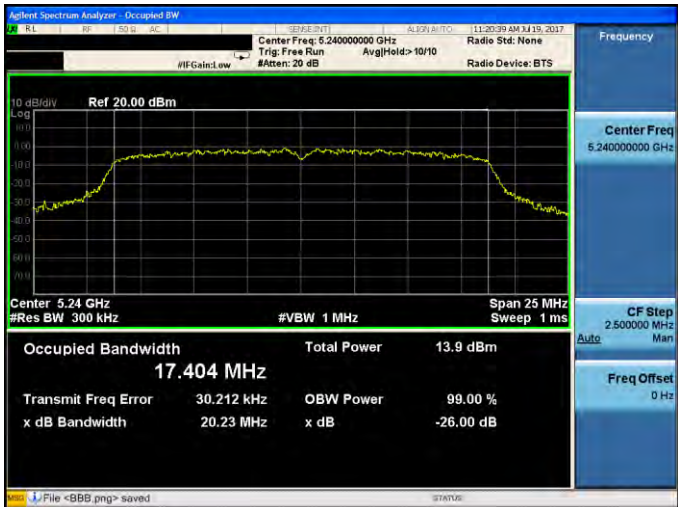


5240 MHz





## Mode 3: IEEE 802.11ac 20MHz Continuous TX mode\_ ANT-1

|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5180 MHz |  <p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 5.18000000 GHz<br/>Trig: Free Run<br/>#Atten: 20 dB<br/>Radio Std: None<br/>Radio Device: BTS</p> <p>Ref 20.00 dBm</p> <p>Center 5.18 GHz<br/>#Res BW 300 kHz<br/>#VBW 1 MHz<br/>Span 25 MHz<br/>Sweep 1 ms</p> <p>Occupied Bandwidth 17.389 MHz<br/>Total Power 13.9 dBm<br/>Transmit Freq Error 27.020 kHz<br/>OBW Power 99.00 %<br/>x dB Bandwidth 20.19 MHz<br/>x dB -26.00 dB</p> <p>File &lt;SBS.png&gt; saved</p>   |
| 5200 MHz |  <p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 5.20000000 GHz<br/>Trig: Free Run<br/>#Atten: 20 dB<br/>Radio Std: None<br/>Radio Device: BTS</p> <p>Ref 20.00 dBm</p> <p>Center 5.2 GHz<br/>#Res BW 300 kHz<br/>#VBW 1 MHz<br/>Span 25 MHz<br/>Sweep 1 ms</p> <p>Occupied Bandwidth 17.424 MHz<br/>Total Power 13.6 dBm<br/>Transmit Freq Error 22.344 kHz<br/>OBW Power 99.00 %<br/>x dB Bandwidth 20.17 MHz<br/>x dB -26.00 dB</p> <p>File &lt;SBS.png&gt; saved</p>   |
| 5240 MHz |  <p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 5.24000000 GHz<br/>Trig: Free Run<br/>#Atten: 20 dB<br/>Radio Std: None<br/>Radio Device: BTS</p> <p>Ref 20.00 dBm</p> <p>Center 5.24 GHz<br/>#Res BW 300 kHz<br/>#VBW 1 MHz<br/>Span 25 MHz<br/>Sweep 1 ms</p> <p>Occupied Bandwidth 17.404 MHz<br/>Total Power 13.9 dBm<br/>Transmit Freq Error 30.212 kHz<br/>OBW Power 99.00 %<br/>x dB Bandwidth 20.23 MHz<br/>x dB -26.00 dB</p> <p>File &lt;SBS.png&gt; saved</p> |



## Mode 4: IEEE 802.11ac 40MHz Continuous TX mode \_ ANT-1

5190 MHz



5230 MHz



## Mode 5: IEEE 802.11ac 80MHz Continuous TX mode \_ ANT-1

5210 MHz



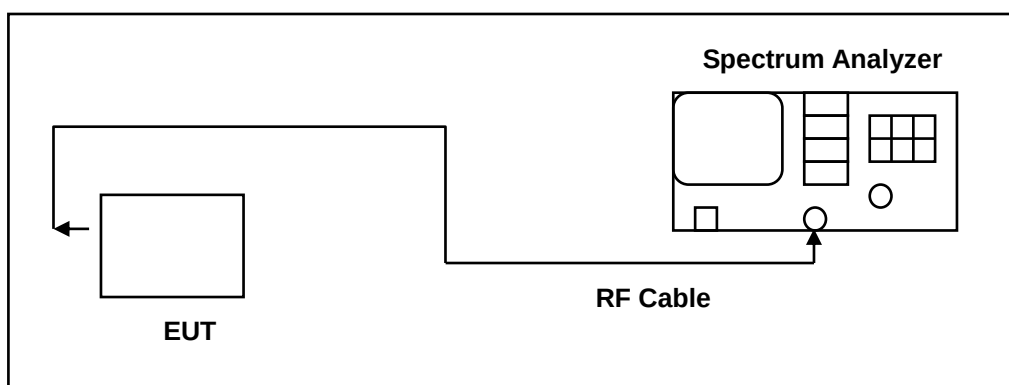
## 4.6. 6dB RF Bandwidth Measurement

### ■ Limit

#### 6dB RF Bandwidth

Systems using digital modulation techniques may operate in the 5725~5850MHz bands. The minimum 6 dB band-width shall be at least 500 kHz.

### ■ Test Setup



### ■ Test Instruments

| Equipment         | Manufacturer | Model Number | Serial Number | Cal. Date  | Cal. Period |
|-------------------|--------------|--------------|---------------|------------|-------------|
| Spectrum Analyzer | Agilent      | E4445A       | MY45300744    | 12/19/2016 | 1 year      |
| Test Site         | ATL          | TE05         | TE05          | N.C.R.     | -----       |

Note: N.C.R. = No Calibration Request.

### ■ Test Procedure

#### 6dB RF Bandwidth

The EUT tested to UNII test procedure of KDB789033 D02 v01r04 for compliance to FCC 47CFR 15.407 requirements.

The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer RES BW was set to 100 kHz. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. A peak output reading was taken, a DISPLAY line was drawn 6 dB lower than peak level. The 6 dB bandwidth was determined from where the channel output spectrum intersected the display line.

The test was performed at 3 channels.



# Test Result

| Test Item       | 6dB RF Bandwidth                        |       |             |
|-----------------|-----------------------------------------|-------|-------------|
| Test Mode       | Mode 2: IEEE 802.11a Continuous TX mode |       |             |
| Frequency (MHz) | 6dB Bandwidth (kHz)                     |       | Limit (kHz) |
|                 | ANT-0                                   | ANT-1 |             |
| 5745            | 15160                                   | 15100 | > 500       |
| 5785            | 15160                                   | 15130 | > 500       |
| 5825            | 15520                                   | 15090 | > 500       |

| Test Item       | 6dB RF Bandwidth                               |       |             |
|-----------------|------------------------------------------------|-------|-------------|
| Test Mode       | Mode 3: IEEE 802.11ac 20MHz Continuous TX mode |       |             |
| Frequency (MHz) | 6dB Bandwidth (kHz)                            |       | Limit (kHz) |
|                 | ANT-0                                          | ANT-1 |             |
| 5745            | 14470                                          | 15040 | > 500       |
| 5785            | 15390                                          | 15110 | > 500       |
| 5825            | 15110                                          | 15120 | > 500       |

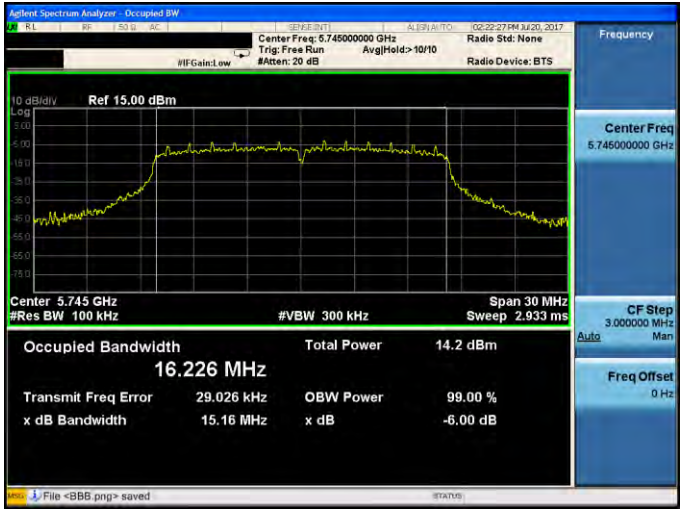
| Test Item       | 6dB RF Bandwidth                               |       |             |
|-----------------|------------------------------------------------|-------|-------------|
| Test Mode       | Mode 4: IEEE 802.11ac 40MHz Continuous TX mode |       |             |
| Frequency (MHz) | 6dB Bandwidth (kHz)                            |       | Limit (kHz) |
|                 | ANT-0                                          | ANT-1 |             |
| 5755            | 32900                                          | 35120 | > 500       |
| 5795            | 34110                                          | 33860 | > 500       |

| Test Item       | 6dB RF Bandwidth                               |       |             |
|-----------------|------------------------------------------------|-------|-------------|
| Test Mode       | Mode 5: IEEE 802.11ac 80MHz Continuous TX mode |       |             |
| Frequency (MHz) | 6dB Bandwidth (kHz)                            |       | Limit (kHz) |
|                 | ANT-0                                          | ANT-1 |             |
| 5775            | 75150                                          | 75100 | > 500       |



## ■ Test Graphs

Mode 2: IEEE 802.11a Continuous TX mode\_ANT-0

|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5745 MHz |  <p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 5.74500000 GHz<br/>Trig: Free Run<br/>#Att: 20 dB<br/>Radio Std: None<br/>Radio Device: BTS</p> <p>Ref 15.00 dBm</p> <p>Center 5.745 GHz<br/>#Res BW 100 kHz<br/>#VBW 300 kHz<br/>Span 30 MHz<br/>Sweep 2.933 ms</p> <p>Occupied Bandwidth 16.226 MHz<br/>Total Power 14.2 dBm</p> <p>Transmit Freq Error 29.026 kHz<br/>OBW Power 99.00 %<br/>x dB Bandwidth 15.16 MHz<br/>x dB -6.00 dB</p> <p>File &lt;BBB.png&gt; saved</p>   |
| 5785 MHz |  <p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 5.78500000 GHz<br/>Trig: Free Run<br/>#Att: 20 dB<br/>Radio Std: None<br/>Radio Device: BTS</p> <p>Ref 15.00 dBm</p> <p>Center 5.785 GHz<br/>#Res BW 100 kHz<br/>#VBW 300 kHz<br/>Span 30 MHz<br/>Sweep 2.933 ms</p> <p>Occupied Bandwidth 16.242 MHz<br/>Total Power 14.0 dBm</p> <p>Transmit Freq Error 29.618 kHz<br/>OBW Power 99.00 %<br/>x dB Bandwidth 15.16 MHz<br/>x dB -6.00 dB</p> <p>File &lt;BBB.png&gt; saved</p>  |
| 5825 MHz |  <p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 5.82500000 GHz<br/>Trig: Free Run<br/>#Att: 20 dB<br/>Radio Std: None<br/>Radio Device: BTS</p> <p>Ref 15.00 dBm</p> <p>Center 5.825 GHz<br/>#Res BW 100 kHz<br/>#VBW 300 kHz<br/>Span 30 MHz<br/>Sweep 2.933 ms</p> <p>Occupied Bandwidth 16.267 MHz<br/>Total Power 13.1 dBm</p> <p>Transmit Freq Error 32.570 kHz<br/>OBW Power 99.00 %<br/>x dB Bandwidth 15.52 MHz<br/>x dB -6.00 dB</p> <p>File &lt;BBB.png&gt; saved</p> |

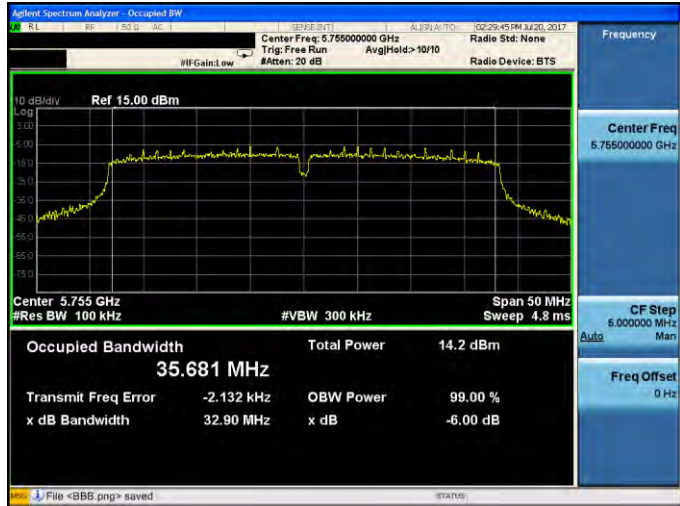


## Mode 3: IEEE 802.11ac 20MHz Continuous TX mode\_ANT-0

|          |                                                                                      |
|----------|--------------------------------------------------------------------------------------|
| 5745 MHz |    |
| 5785 MHz |   |
| 5825 MHz |  |



## Mode 4: IEEE 802.11ac 40MHz Continuous TX mode\_ANT-0

|          |                                                                                     |
|----------|-------------------------------------------------------------------------------------|
| 5755 MHz |   |
| 5795 MHz |  |

## Mode 5: IEEE 802.11ac 80MHz Continuous TX mode\_ANT-0

|          |                                                                                      |
|----------|--------------------------------------------------------------------------------------|
| 5775 MHz |  |
|----------|--------------------------------------------------------------------------------------|





## Mode 2: IEEE 802.11a Continuous TX mode\_ANT-1

5745 MHz



5785 MHz



5825 MHz





## Mode 3: IEEE 802.11ac 20MHz Continuous TX mode\_ANT-1

5745 MHz



5785 MHz

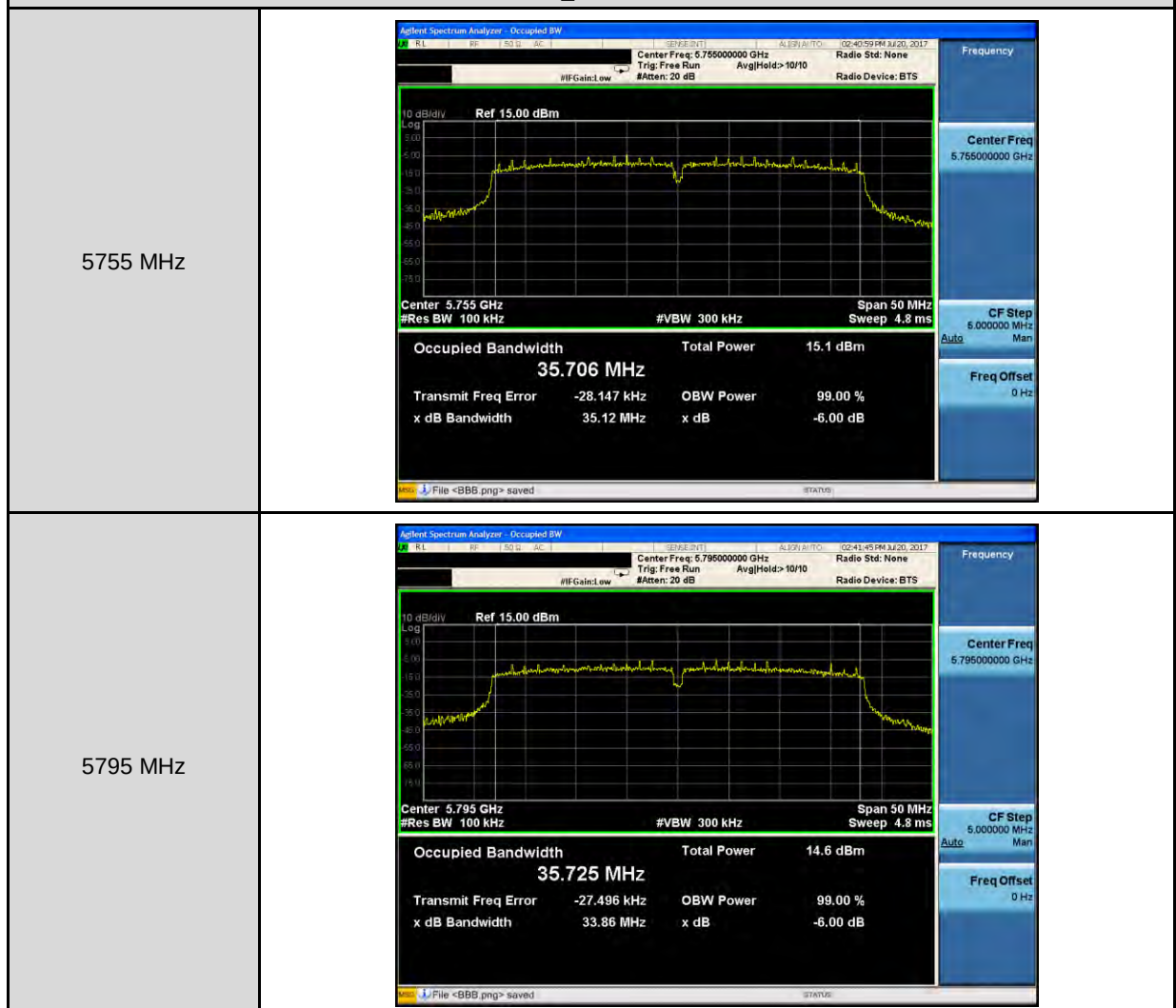


5825 MHz

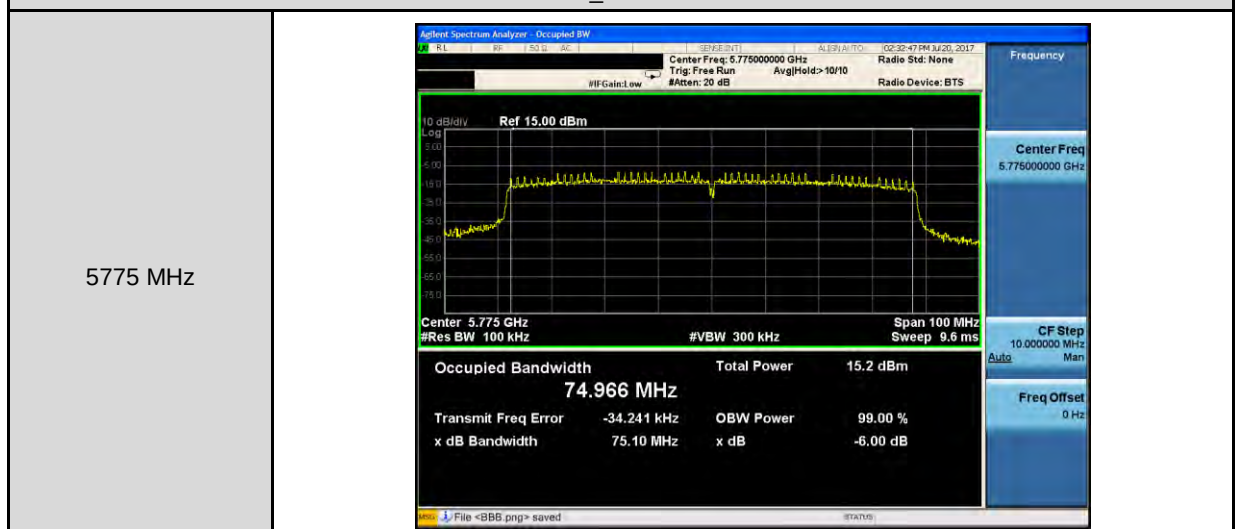




## Mode 4: IEEE 802.11ac 40MHz Continuous TX mode\_ANT-1



## Mode 5: IEEE 802.11ac 80MHz Continuous TX mode\_ANT-1



## 4.7. Peak Power Spectral Density Measurement

### ■ Limit

Conducted power spectral density

| Frequency Range<br>(MHz) | FCC Limit     |
|--------------------------|---------------|
|                          | Master        |
| 5.150 ~ 5.250 GHz        | 17 dBm/MHz    |
| 5.725 ~ 5.850 GHz        | 30 dBm/500KHz |

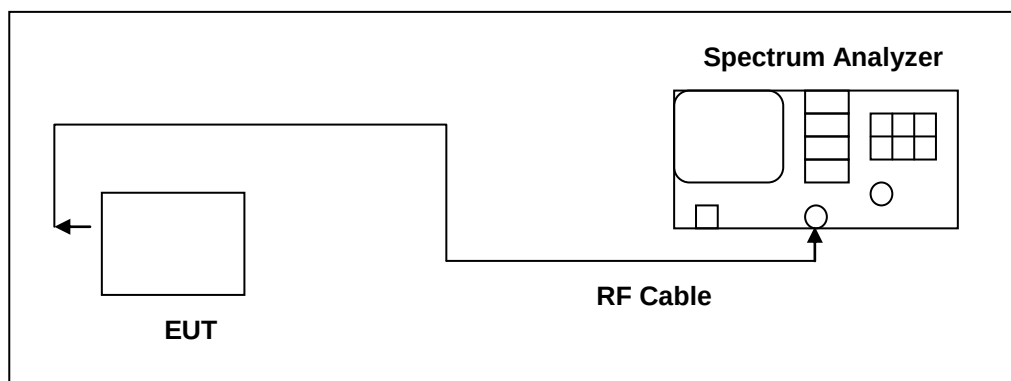
According FCC KDB 662911 D01 v02r01 – for power spectral density measurements on IEEE802.11 devices,

\* MIMO mode : Directional Gain =  $10 \cdot \log\{[10^{(G1/20)} + 10^{(G2/20)} + \dots + 10^{(Gn/20)}]^2 / N_{ANT}\}$  = 8.01 dBi > 6dBi

MIMO mode power limit shall be reduced = 17 - 2.01 = 14.99 dBm/MHz (5.150 ~ 5.250 GHz)

MIMO mode power limit shall be reduced = 30 - 2.01 = 27.99 dBm/500KHz (5.725 ~ 5.850 GHz)

### ■ Test Setup



### ■ Test Instruments

| Equipment         | Manufacturer | Model Number | Serial Number | Cal. Date  | Remark |
|-------------------|--------------|--------------|---------------|------------|--------|
| Spectrum Analyzer | Agilent      | E4445A       | MY45300744    | 12/19/2016 | 1 year |
| Test Site         | ATL          | TE05         | TE05          | N.C.R.     | -----  |

Note: N.C.R. = No Calibration Request.



**■ Test Procedure**

The test is performed in accordance with KDB789033: D02 General UNII Test Procedures New Rules v01r04, Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - Part 15, Subpart E.

| Spectrum Parameter                                                                                                                       | Setting                                                      |
|------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|
| Attenuation                                                                                                                              | Auto                                                         |
| Span Frequency                                                                                                                           | Encompass the entire emissions bandwidth (EBW) of the signal |
| RBW                                                                                                                                      | 1 MHz<br>(5725 ~ 5850MHz use 100 kHz)                        |
| VBW                                                                                                                                      | 3 MHz<br>(5725 ~ 5850MHz use 300 kHz)                        |
| Detector                                                                                                                                 | RMS                                                          |
| Trace                                                                                                                                    | AVERAGE                                                      |
| Sweep Time                                                                                                                               | Auto                                                         |
| Trace Average                                                                                                                            | 100 times                                                    |
| Note: If measurement bandwidth of Maximum PSD is specified in 500 kHz, add $10\log(500\text{kHz}/100\text{kHz})$ to the measured result. |                                                              |

# Test Result

|                 |                                  |                  |                      |                 |
|-----------------|----------------------------------|------------------|----------------------|-----------------|
| Test Item       | Conducted power spectral density |                  |                      |                 |
| Test Mode       | Mode 2: IEEE 802.11a link mode   |                  |                      |                 |
| Frequency (MHz) | ANT-0                            |                  |                      |                 |
|                 | Measurement (dBm/MHz)            | Duty Factor (dB) | Calculated (dBm/MHz) | Limit (dBm/MHz) |
| 5180            | -3.760                           | 0.142            | -3.618               | < 14.99         |
| 5200            | -3.671                           | 0.142            | -3.529               |                 |
| 5240            | -3.523                           | 0.142            | -3.381               |                 |
| Frequency (MHz) | ANT-1                            |                  |                      |                 |
|                 | Measurement (dBm/MHz)            | Duty Factor (dB) | Calculated (dBm/MHz) | Limit (dBm/MHz) |
| 5180            | -3.070                           | 0.142            | -2.928               | < 14.99         |
| 5200            | -3.250                           | 0.142            | -3.108               |                 |
| 5240            | -3.040                           | 0.142            | -2.898               |                 |
| Frequency (MHz) | ANT-0+1                          |                  |                      | Limit (dBm/MHz) |
|                 | Calculated (dBm/MHz)             |                  |                      |                 |
| 5180            | -0.249                           |                  |                      | < 14.99         |
| 5200            | -0.303                           |                  |                      |                 |
| 5240            | -0.122                           |                  |                      |                 |

Note: Method SA-2, Power density = measured result + 10log(1/duty cycle) + Conversion ratio = measured result + duty factor.

|                 |                                  |                  |                         |                    |
|-----------------|----------------------------------|------------------|-------------------------|--------------------|
| Test Item       | Conducted power spectral density |                  |                         |                    |
| Test Mode       | Mode 2: IEEE 802.11a link mode   |                  |                         |                    |
| Frequency (MHz) | ANT-0                            |                  |                         |                    |
|                 | Measurement (dBm/100KHz)         | Duty Factor (dB) | Calculated (dBm/500KHz) | Limit (dBm/500KHz) |
| 5745            | -11.89                           | 0.142            | -4.76                   | < 27.99            |
| 5785            | -12.47                           | 0.142            | -5.33                   |                    |
| 5825            | -12.77                           | 0.142            | -5.64                   |                    |
| Frequency (MHz) | ANT-1                            |                  |                         |                    |
|                 | Measurement (dBm/100KHz)         | Duty Factor (dB) | Calculated (dBm/500KHz) | Limit (dBm/500KHz) |
| 5745            | -11.66                           | 0.142            | -4.53                   | < 27.99            |
| 5785            | -12.17                           | 0.142            | -5.03                   |                    |
| 5825            | -12.17                           | 0.142            | -5.04                   |                    |
| Frequency (MHz) | ANT-0+1                          |                  |                         | Limit (dBm/500KHz) |
|                 | Calculated (dBm/500KHz)          |                  |                         |                    |
| 5745            | -1.63                            |                  |                         | < 27.99            |
| 5785            | -2.17                            |                  |                         |                    |
| 5825            | -2.32                            |                  |                         |                    |

Note: Method SA-2, Power density = measured result + 10log(1/duty cycle) + Conversion ratio = measured result + duty factor.

Conversion ratio = 10\*Log(500k/100k)



|                 |                                       |                  |                      |                 |
|-----------------|---------------------------------------|------------------|----------------------|-----------------|
| Test Item       | Conducted power spectral density      |                  |                      |                 |
| Test Mode       | Mode 3: IEEE 802.11ac 20MHz link mode |                  |                      |                 |
| Frequency (MHz) | ANT-0                                 |                  |                      |                 |
|                 | Measurement (dBm/MHz)                 | Duty Factor (dB) | Calculated (dBm/MHz) | Limit (dBm/MHz) |
| 5180            | -3.892                                | 0.175            | -3.717               | < 14.99         |
| 5200            | -4.089                                | 0.175            | -3.914               |                 |
| 5240            | -3.950                                | 0.175            | -3.775               |                 |
| Frequency (MHz) | ANT-1                                 |                  |                      |                 |
|                 | Measurement (dBm/MHz)                 | Duty Factor (dB) | Calculated (dBm/MHz) | Limit (dBm/MHz) |
| 5180            | -3.408                                | 0.175            | -3.233               | < 14.99         |
| 5200            | -3.588                                | 0.175            | -3.413               |                 |
| 5240            | -3.563                                | 0.175            | -3.388               |                 |
| Frequency (MHz) | ANT-0+1                               |                  |                      | Limit (dBm/MHz) |
|                 | Calculated (dBm/MHz)                  |                  |                      |                 |
| 5180            | -0.458                                |                  |                      | < 14.99         |
| 5200            | -0.646                                |                  |                      |                 |
| 5240            | -0.567                                |                  |                      |                 |

Note: Method SA-2, Power density = measured result + 10log(1/duty cycle) + Conversion ratio = measured result + duty factor.



|                 |                                       |                  |                         |                    |
|-----------------|---------------------------------------|------------------|-------------------------|--------------------|
| Test Item       | Conducted power spectral density      |                  |                         |                    |
| Test Mode       | Mode 3: IEEE 802.11ac 20MHz link mode |                  |                         |                    |
| Frequency (MHz) | ANT-0                                 |                  |                         |                    |
|                 | Measurement (dBm/100KHz)              | Duty Factor (dB) | Calculated (dBm/500KHz) | Limit (dBm/500KHz) |
| 5745            | -12.86                                | 0.175            | -5.70                   | < 27.99            |
| 5785            | -12.95                                | 0.175            | -5.79                   |                    |
| 5825            | -12.92                                | 0.175            | -5.76                   |                    |
| Frequency (MHz) | ANT-1                                 |                  |                         |                    |
|                 | Measurement (dBm/100KHz)              | Duty Factor (dB) | Calculated (dBm/500KHz) | Limit (dBm/500KHz) |
| 5745            | -12.30                                | 0.175            | -5.14                   | < 27.99            |
| 5785            | -12.48                                | 0.175            | -5.32                   |                    |
| 5825            | -12.60                                | 0.175            | -5.43                   |                    |
| Frequency (MHz) | ANT-0+1                               |                  |                         | Limit (dBm/500KHz) |
|                 | Calculated (dBm/500KHz)               |                  |                         |                    |
| 5745            | -2.40                                 |                  |                         | < 27.99            |
| 5785            | -2.54                                 |                  |                         |                    |
| 5825            | -2.58                                 |                  |                         |                    |

Note: Method SA-2, Power density = measured result + 10log(1/duty cycle) + Conversion ratio = measured result + duty factor.

Conversion ratio = 10\*Log(500k/100k)



|                 |                                       |                  |                      |                 |
|-----------------|---------------------------------------|------------------|----------------------|-----------------|
| Test Item       | Conducted power spectral density      |                  |                      |                 |
| Test Mode       | Mode 4: IEEE 802.11ac 40MHz link mode |                  |                      |                 |
| Frequency (MHz) | ANT-0                                 |                  |                      |                 |
|                 | Measurement (dBm/MHz)                 | Duty Factor (dB) | Calculated (dBm/MHz) | Limit (dBm/MHz) |
| 5190            | -6.540                                | 0.344            | -6.196               | < 14.99         |
| 5230            | -6.560                                | 0.344            | -6.216               |                 |
| Frequency (MHz) | ANT-1                                 |                  |                      |                 |
|                 | Measurement (dBm/MHz)                 | Duty Factor (dB) | Calculated (dBm/MHz) | Limit (dBm/MHz) |
| 5190            | -6.288                                | 0.344            | -5.944               | < 14.99         |
| 5230            | -6.207                                | 0.344            | -5.863               |                 |
| Frequency (MHz) | ANT-0+1                               |                  |                      | Limit (dBm/MHz) |
|                 | Calculated (dBm/MHz)                  |                  |                      |                 |
| 5190            | -3.058                                |                  |                      | < 14.99         |
| 5230            | -3.025                                |                  |                      |                 |

Note: Method SA-2, Power density = measured result + 10log(1/duty cycle) + Conversion ratio = measured result + duty factor.



|                    |                                       |                     |                            |                       |
|--------------------|---------------------------------------|---------------------|----------------------------|-----------------------|
| Test Item          | Conducted power spectral density      |                     |                            |                       |
| Test Mode          | Mode 4: IEEE 802.11ac 40MHz link mode |                     |                            |                       |
| Frequency<br>(MHz) | ANT-0                                 |                     |                            |                       |
|                    | Measurement<br>(dBm/100KHz)           | Duty Factor<br>(dB) | Calculated<br>(dBm/500KHz) | Limit<br>(dBm/500KHz) |
| 5755               | -15.28                                | 0.344               | -7.95                      | < 27.99               |
| 5795               | -15.47                                | 0.344               | -8.14                      |                       |
| Frequency<br>(MHz) | ANT-1                                 |                     |                            |                       |
|                    | Measurement<br>(dBm/100KHz)           | Duty Factor<br>(dB) | Calculated<br>(dBm/500KHz) | Limit<br>(dBm/500KHz) |
| 5755               | -14.69                                | 0.344               | -7.36                      | < 27.99               |
| 5795               | -15.34                                | 0.344               | -8.00                      |                       |
| Frequency<br>(MHz) | ANT-0+1                               |                     |                            | Limit<br>(dBm/500KHz) |
|                    | Calculated<br>(dBm/500KHz)            |                     |                            |                       |
| 5755               | -4.63                                 |                     |                            | < 27.99               |
| 5795               | -5.06                                 |                     |                            |                       |

Note: Method SA-2, Power density = measured result + 10log(1/duty cycle) + Conversion ratio = measured result + duty factor.

Conversion ratio = 10\*Log(500k/100k)



|                 |                                       |                  |                      |                 |
|-----------------|---------------------------------------|------------------|----------------------|-----------------|
| Test Item       | Conducted power spectral density      |                  |                      |                 |
| Test Mode       | Mode 5: IEEE 802.11ac 80MHz link mode |                  |                      |                 |
| Frequency (MHz) | ANT-0                                 |                  |                      |                 |
|                 | Measurement (dBm/MHz)                 | Duty Factor (dB) | Calculated (dBm/MHz) | Limit (dBm/MHz) |
| 5210            | -10.270                               | 0.631            | -9.639               | < 14.99         |
| Frequency (MHz) | ANT-1                                 |                  |                      |                 |
|                 | Measurement (dBm/MHz)                 | Duty Factor (dB) | Calculated (dBm/MHz) | Limit (dBm/MHz) |
| 5210            | -10.127                               | 0.631            | -9.496               | < 14.99         |
| Frequency (MHz) | ANT-0+1                               |                  |                      | Limit (dBm/MHz) |
|                 | Calculated (dBm/MHz)                  |                  |                      |                 |
| 5210            | -6.557                                |                  |                      | < 14.99         |

Note: Method SA-2, Power density = measured result + 10log(1/duty cycle) + Conversion ratio = measured result + duty factor.

|                 |                                       |                  |                         |                 |
|-----------------|---------------------------------------|------------------|-------------------------|-----------------|
| Test Item       | Conducted power spectral density      |                  |                         |                 |
| Test Mode       | Mode 5: IEEE 802.11ac 80MHz link mode |                  |                         |                 |
| Frequency (MHz) | ANT-0                                 |                  |                         |                 |
|                 | Measurement (dBm/100KHz)              | Duty Factor (dB) | Calculated (dBm/500KHz) | Limit (dBm/MHz) |
| 5775            | -18.90                                | 0.631            | -11.28                  | < 27.99         |
| Frequency (MHz) | ANT-1                                 |                  |                         |                 |
|                 | Measurement (dBm/100KHz)              | Duty Factor (dB) | Calculated (dBm/500KHz) | Limit (dBm/MHz) |
| 5775            | -18.51                                | 0.631            | -10.89                  | < 27.99         |
| Frequency (MHz) | ANT-0+1                               |                  |                         | Limit (dBm/MHz) |
|                 | Calculated (dBm/500KHz)               |                  |                         |                 |
| 5775            | -8.07                                 |                  |                         | < 27.99         |

Note: Method SA-2, Power density = measured result + 10log(1/duty cycle) + Conversion ratio = measured result + duty factor.

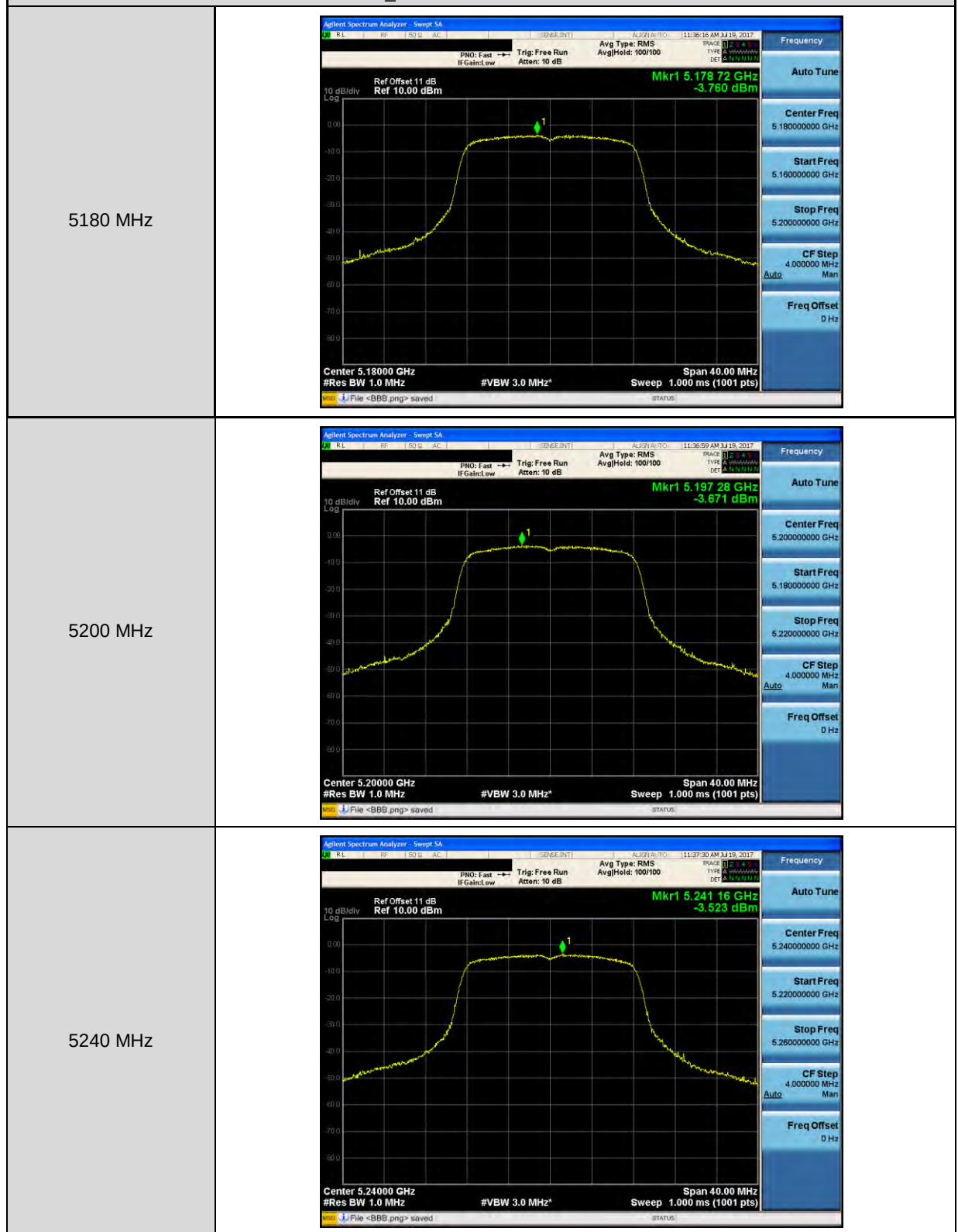
Conversion ratio = 10\*Log(500k/100k)





## ■ Test Graphs

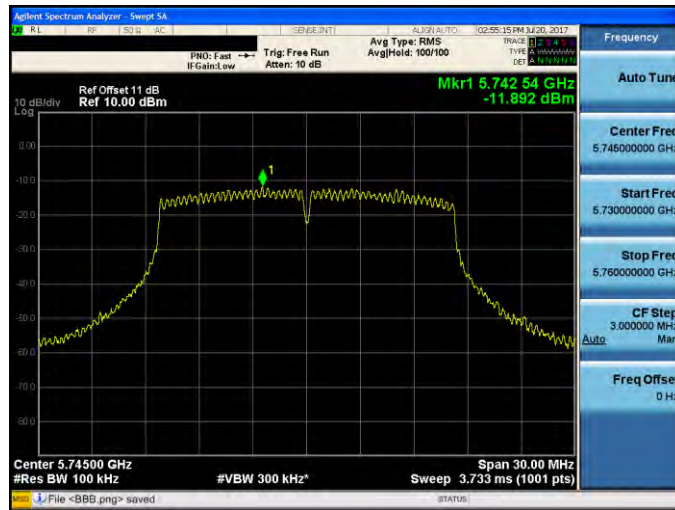
Mode 2: IEEE 802.11a Continuous TX mode\_ ANT-0



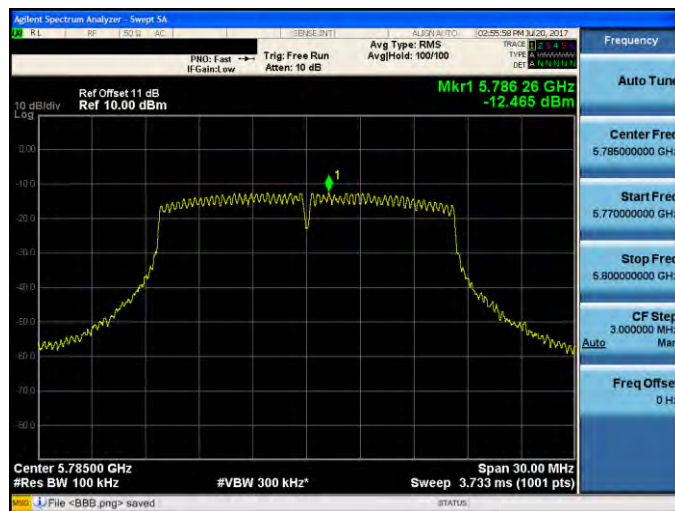


## Mode 2: IEEE 802.11a Continuous TX mode\_ ANT-0

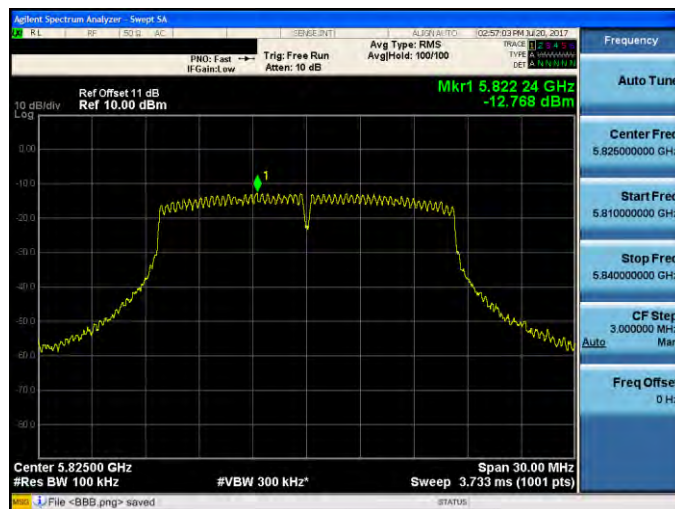
5745 MHz



5785 MHz

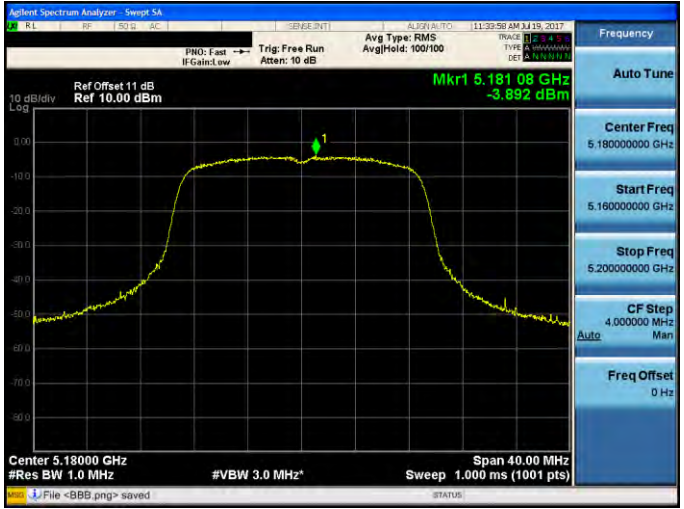
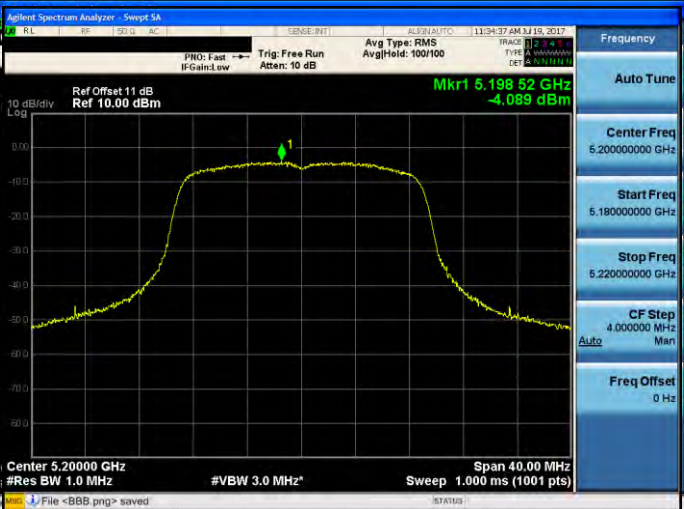
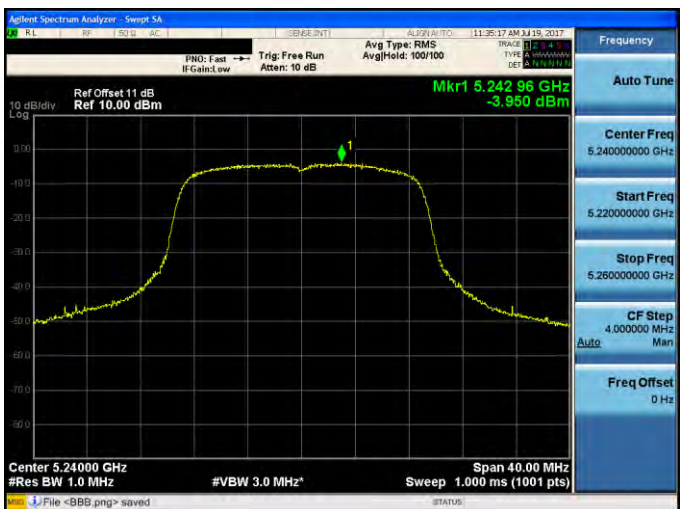


5825 MHz



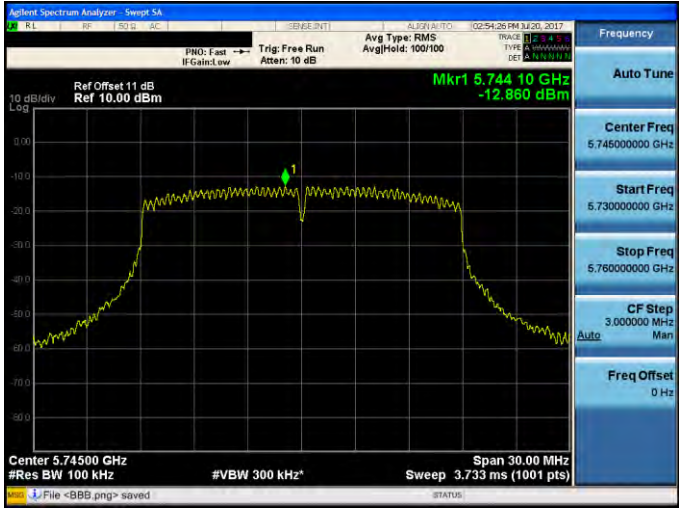
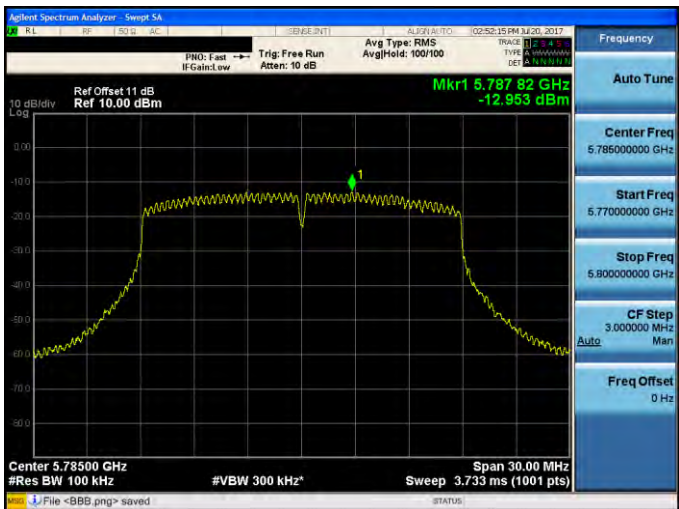
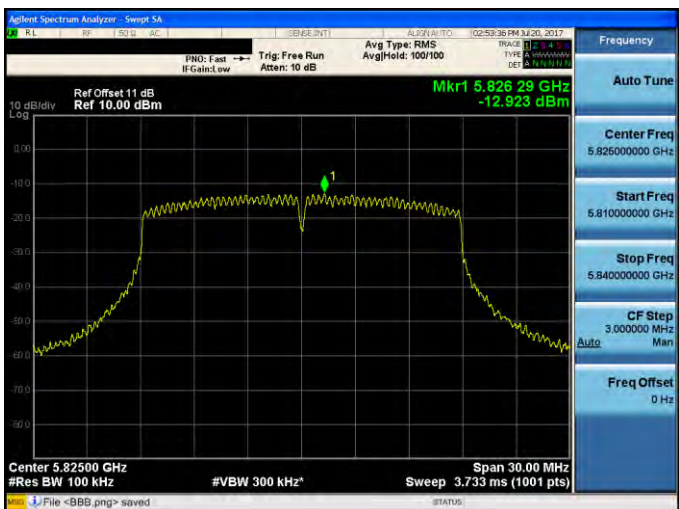


## Mode 3: IEEE 802.11ac 20MHz Continuous TX mode \_ ANT-0

|          |                                                                                      |
|----------|--------------------------------------------------------------------------------------|
| 5180 MHz |    |
| 5200 MHz |   |
| 5240 MHz |  |



## Mode 3: IEEE 802.11ac 20MHz Continuous TX mode \_ ANT-0

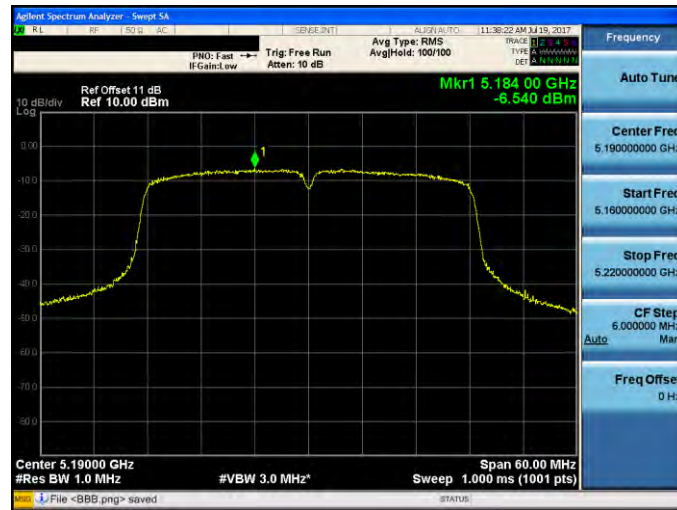
|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5745 MHz |  <p>Agilent Spectrum Analyzer - Sweep 5A</p> <p>Ref Offset 11 dB<br/>Ref 10.00 dBm</p> <p>Mkr1 5.744 10 GHz<br/>-12.880 dBm</p> <p>Center 5.74500 GHz<br/>#Res BW 100 kHz<br/>#VBW 300 kHz*<br/>Span 30.00 MHz<br/>Sweep 3.733 ms (1001 pts)</p> <p>File &lt;888.png&gt; saved</p> <p>Frequency</p> <p>Auto Tune</p> <p>Center Freq<br/>5.745000000 GHz</p> <p>Start Freq<br/>5.730000000 GHz</p> <p>Stop Freq<br/>5.760000000 GHz</p> <p>CF Step<br/>3.000000 MHz<br/>Auto</p> <p>Freq Offset<br/>0 Hz</p>   |
| 5785 MHz |  <p>Agilent Spectrum Analyzer - Sweep 5A</p> <p>Ref Offset 11 dB<br/>Ref 10.00 dBm</p> <p>Mkr1 5.787 82 GHz<br/>-12.953 dBm</p> <p>Center 5.78500 GHz<br/>#Res BW 100 kHz<br/>#VBW 300 kHz*<br/>Span 30.00 MHz<br/>Sweep 3.733 ms (1001 pts)</p> <p>File &lt;888.png&gt; saved</p> <p>Frequency</p> <p>Auto Tune</p> <p>Center Freq<br/>5.785000000 GHz</p> <p>Start Freq<br/>5.770000000 GHz</p> <p>Stop Freq<br/>5.800000000 GHz</p> <p>CF Step<br/>3.000000 MHz<br/>Auto</p> <p>Freq Offset<br/>0 Hz</p>  |
| 5825 MHz |  <p>Agilent Spectrum Analyzer - Sweep 5A</p> <p>Ref Offset 11 dB<br/>Ref 10.00 dBm</p> <p>Mkr1 5.826 29 GHz<br/>-12.923 dBm</p> <p>Center 5.82500 GHz<br/>#Res BW 100 kHz<br/>#VBW 300 kHz*<br/>Span 30.00 MHz<br/>Sweep 3.733 ms (1001 pts)</p> <p>File &lt;888.png&gt; saved</p> <p>Frequency</p> <p>Auto Tune</p> <p>Center Freq<br/>5.825000000 GHz</p> <p>Start Freq<br/>5.810000000 GHz</p> <p>Stop Freq<br/>5.840000000 GHz</p> <p>CF Step<br/>3.000000 MHz<br/>Auto</p> <p>Freq Offset<br/>0 Hz</p> |



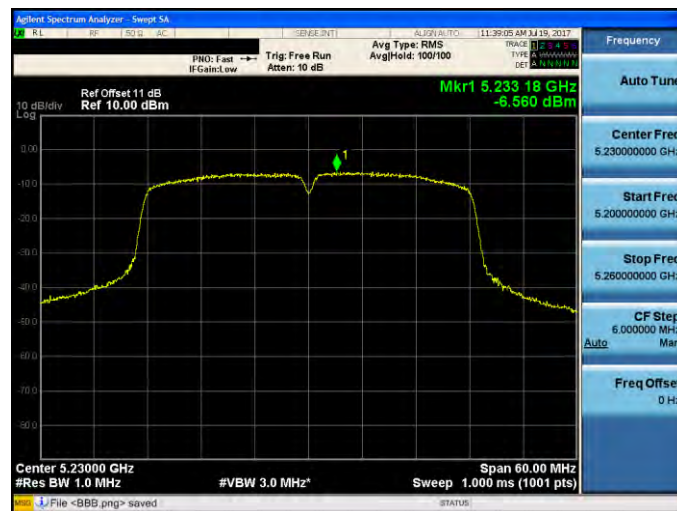


## Mode 4: IEEE 802.11ac 40MHz Continuous TX mode\_ ANT-0

5190 MHz

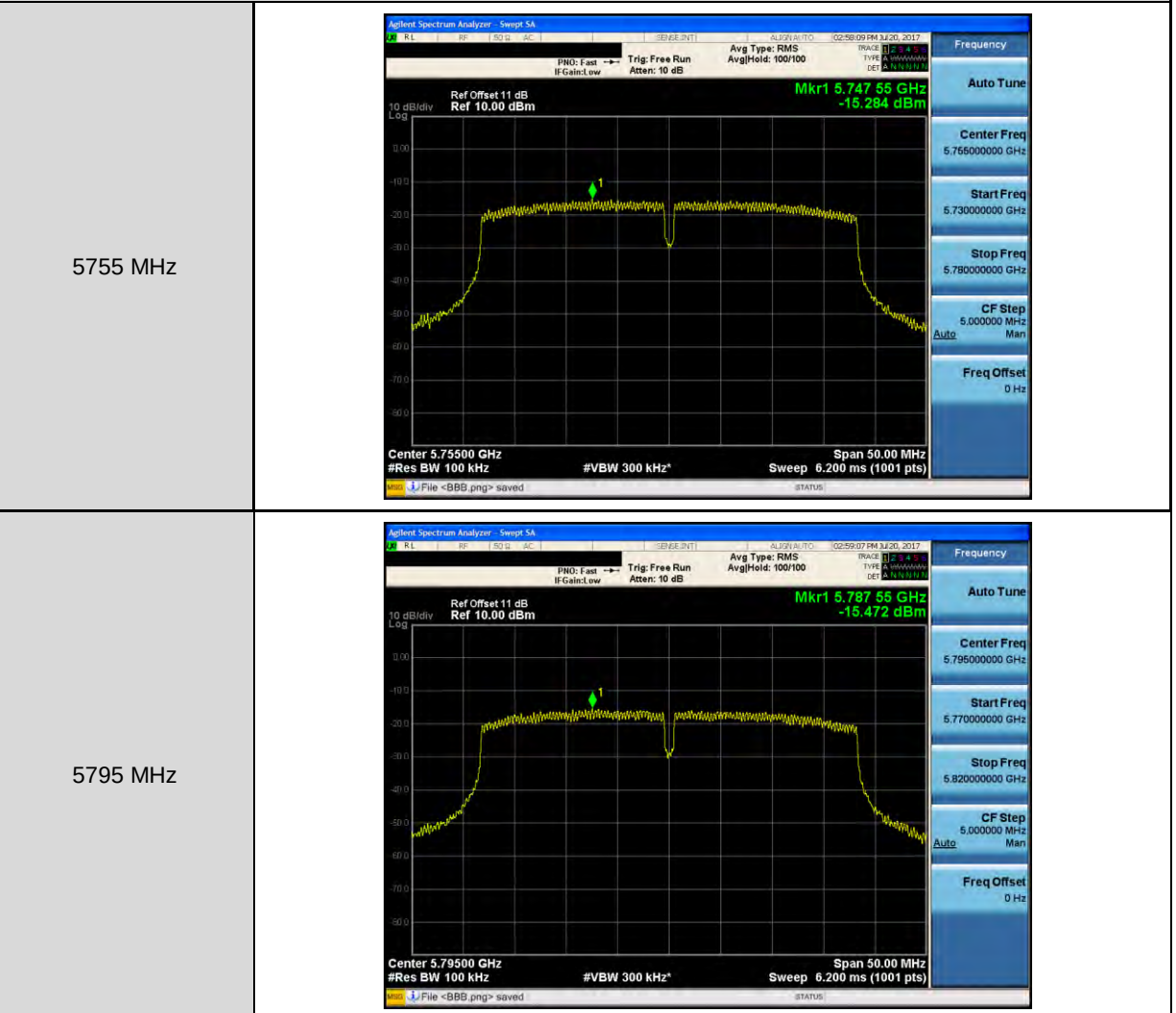


5230 MHz



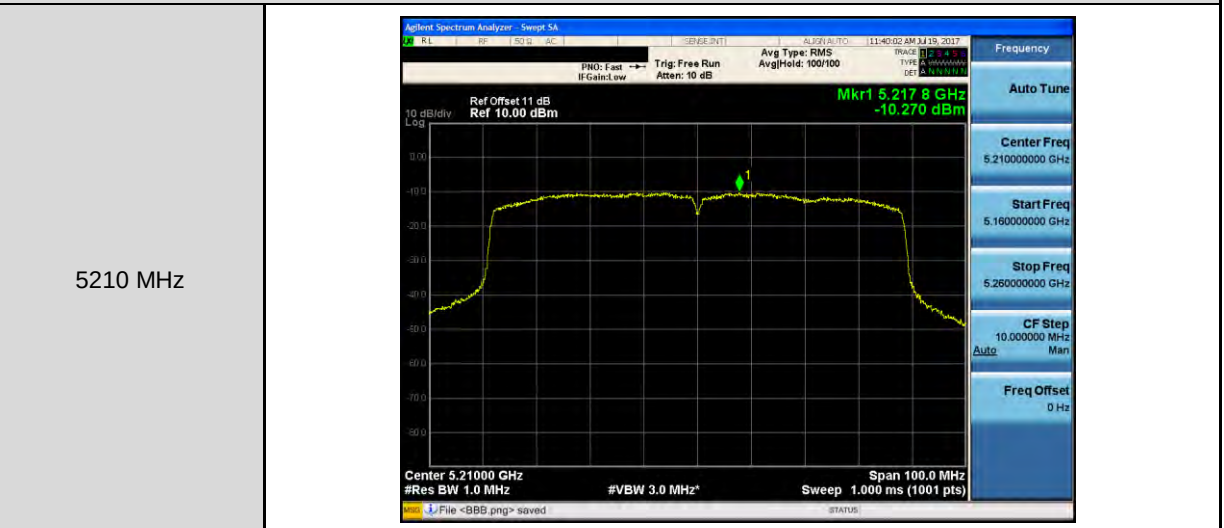


Mode 4: IEEE 802.11ac 40MHz Continuous TX mode\_ ANT-0

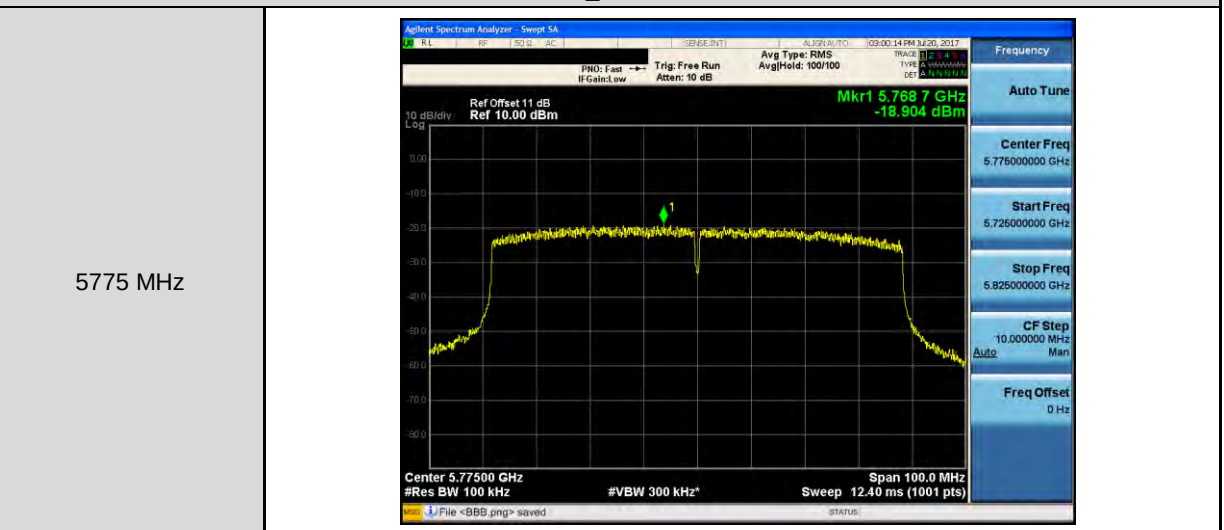




## Mode 5: IEEE 802.11ac 80MHz Continuous TX mode \_ANT-0

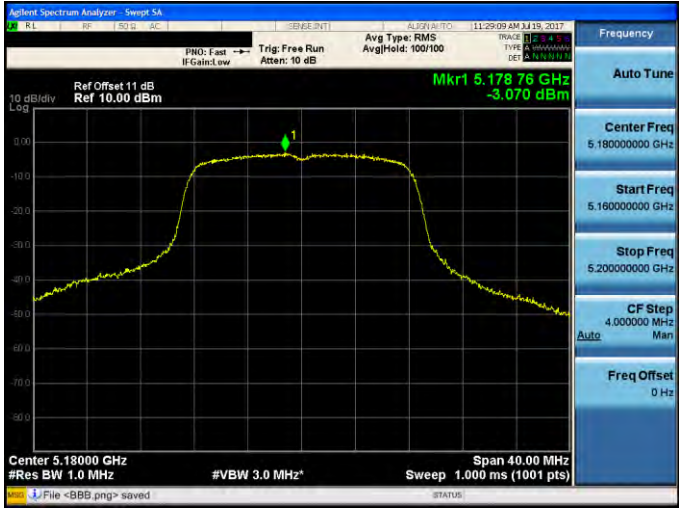
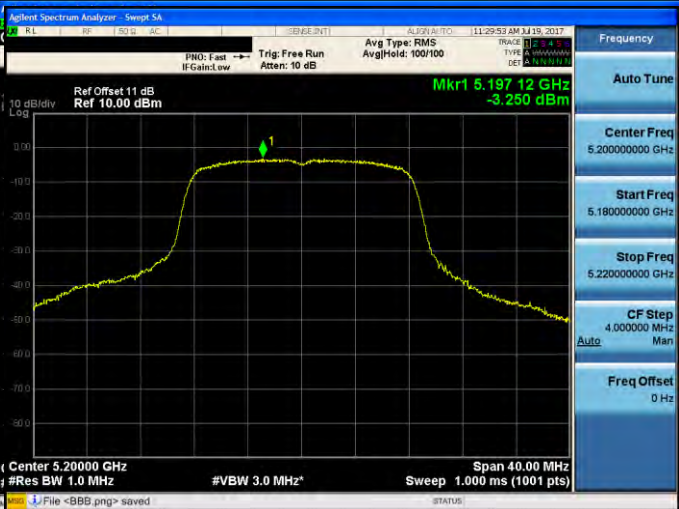
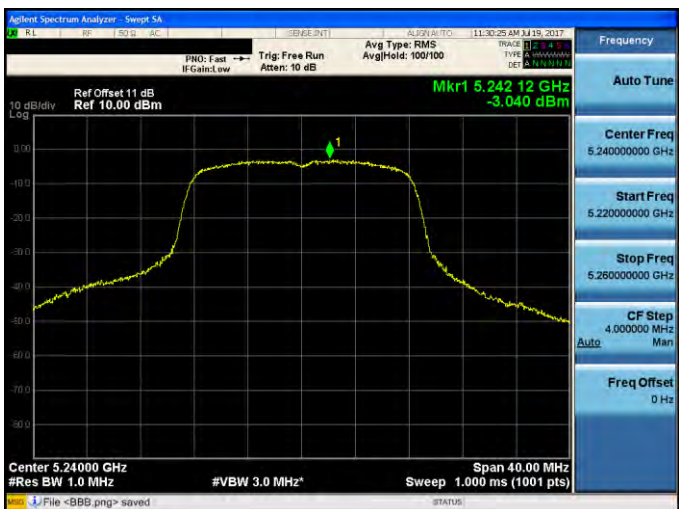


## Mode 5: IEEE 802.11ac 80MHz Continuous TX mode \_ANT-0





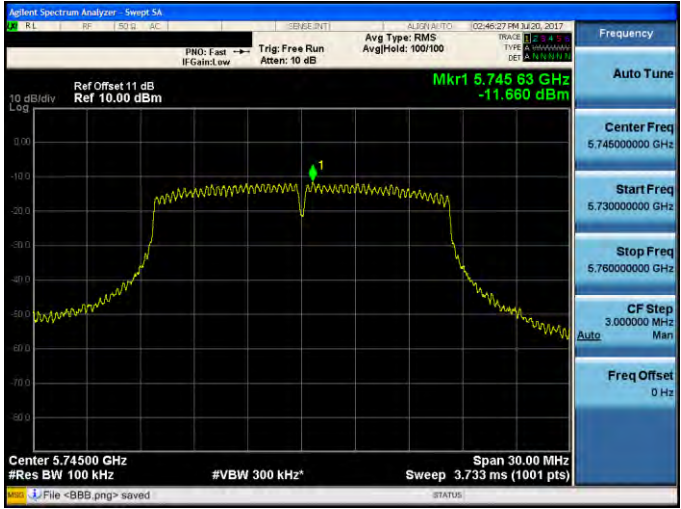
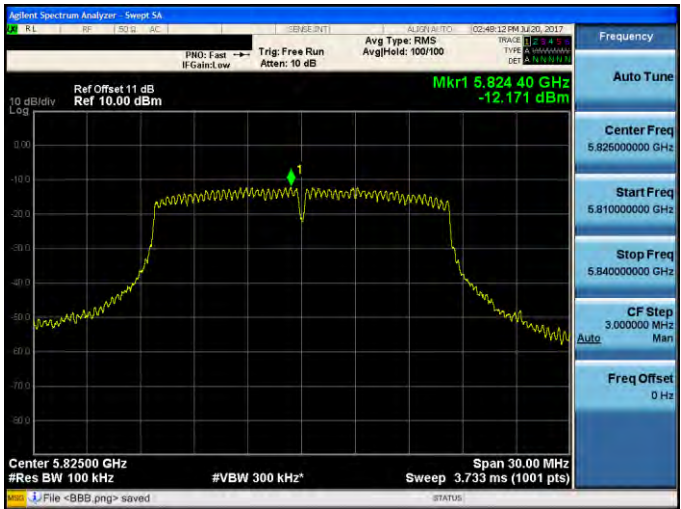
## Mode 2: IEEE 802.11a Continuous TX mode\_ ANT-1

|          |                                                                                                                                                                                                                                                                                                                           |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5180 MHz |  <p>Ref Offset 11 dB<br/>Ref 10.00 dBm</p> <p>Mkr1 5.178 76 GHz<br/>-3.070 dBm</p> <p>Center 5.18000 GHz<br/>#Res BW 1.0 MHz<br/>#VBW 3.0 MHz*<br/>Span 40.00 MHz<br/>Sweep 1.000 ms (1001 pts)</p> <p>File &lt;888.png&gt; saved</p>   |
| 5200 MHz |  <p>Ref Offset 11 dB<br/>Ref 10.00 dBm</p> <p>Mkr1 5.197 12 GHz<br/>-3.250 dBm</p> <p>Center 5.20000 GHz<br/>#Res BW 1.0 MHz<br/>#VBW 3.0 MHz*<br/>Span 40.00 MHz<br/>Sweep 1.000 ms (1001 pts)</p> <p>File &lt;888.png&gt; saved</p>  |
| 5240 MHz |  <p>Ref Offset 11 dB<br/>Ref 10.00 dBm</p> <p>Mkr1 5.242 12 GHz<br/>-3.040 dBm</p> <p>Center 5.24000 GHz<br/>#Res BW 1.0 MHz<br/>#VBW 3.0 MHz*<br/>Span 40.00 MHz<br/>Sweep 1.000 ms (1001 pts)</p> <p>File &lt;888.png&gt; saved</p> |





## Mode 2: IEEE 802.11a Continuous TX mode\_ ANT-1

|          |                                                                                      |
|----------|--------------------------------------------------------------------------------------|
| 5745 MHz |    |
| 5785 MHz |   |
| 5825 MHz |  |

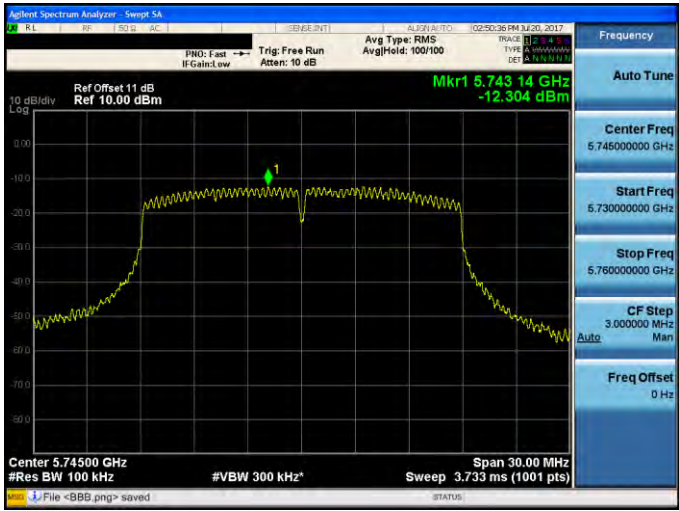


## Mode 3: IEEE 802.11ac 20MHz Continuous TX mode \_ ANT-1

|          |                                                                                      |
|----------|--------------------------------------------------------------------------------------|
| 5180 MHz |    |
| 5200 MHz |   |
| 5240 MHz |  |



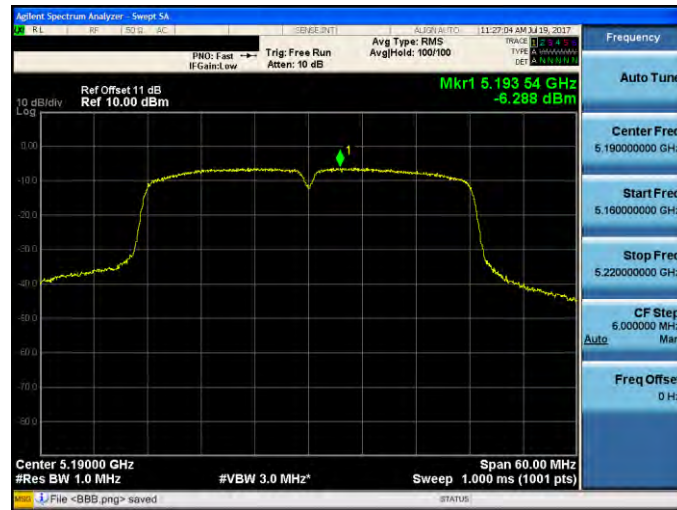
## Mode 3: IEEE 802.11ac 20MHz Continuous TX mode \_ ANT-1

|          |                                                                                      |
|----------|--------------------------------------------------------------------------------------|
| 5745 MHz |    |
| 5785 MHz |   |
| 5825 MHz |  |

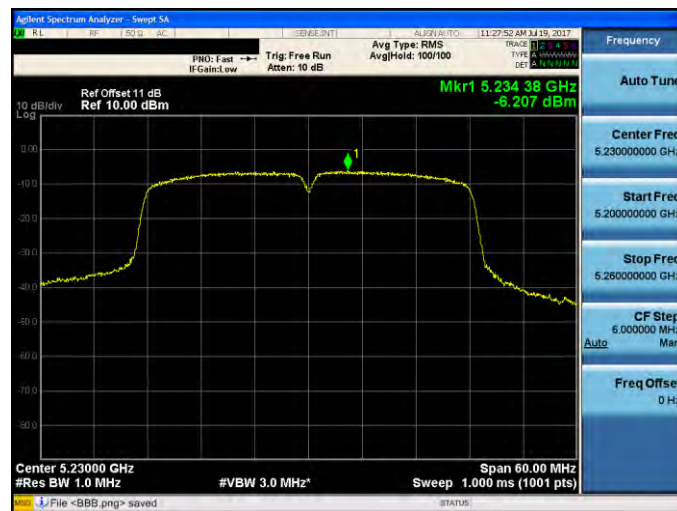


## Mode 4: IEEE 802.11ac 40MHz Continuous TX mode\_ ANT-1

5190 MHz



5230 MHz

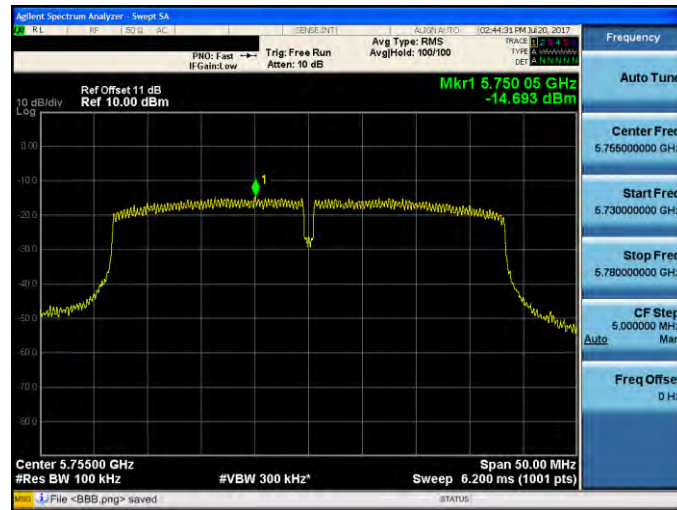






## Mode 4: IEEE 802.11ac 40MHz Continuous TX mode\_ ANT-1

5755 MHz



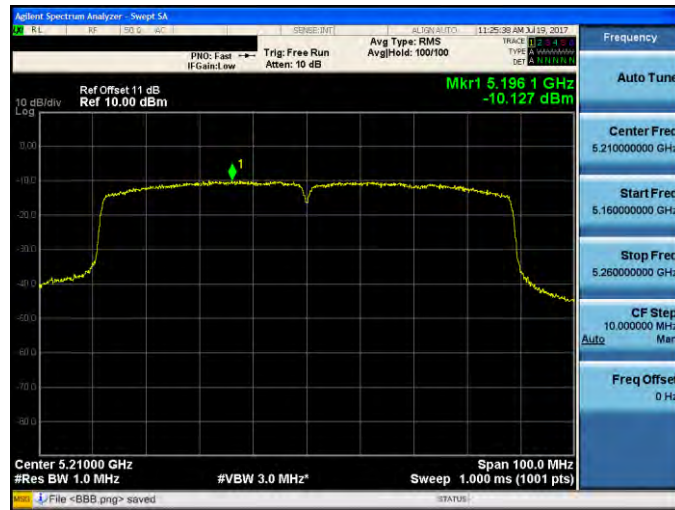
5795 MHz





## Mode 5: IEEE 802.11ac 80MHz Continuous TX mode \_ANT-1

5210 MHz



## Mode 5: IEEE 802.11ac 80MHz Continuous TX mode \_ANT-1

5775 MHz

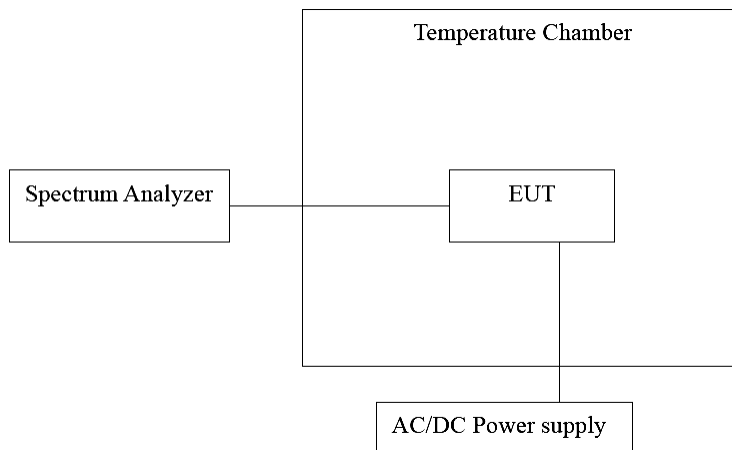


## 4.8. Frequency Stability Measurement

### ■ Limit

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the users manual.

### ■ Test Setup



### ■ Test Instruments

| Equipment                      | Manufacturer | Model Number | Serial Number | Cal. Date  | Remark |
|--------------------------------|--------------|--------------|---------------|------------|--------|
| Spectrum Analyzer              | Agilent      | E4408B       | MY45107753    | 08/08/2016 | 1 year |
| Temperature & Humidity Chamber | TAICHY       | MHU-225LA    | 980729        | 04/17/2017 | 1 year |
| Test Site                      | ATL          | TE05         | TE05          | N.C.R.     | -----  |

Note: N.C.R. = No Calibration Request.

### ■ Test Procedure

1. The EUT was placed inside the environmental test chamber and powered by nominal AC/DC voltage.
2. Turn the EUT on and couple its output to a spectrum analyzer.
3. Turn the EUT off and set the chamber to the highest temperature specified.
4. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize.
5. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
6. The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.



## ■ Test Result

## Temperature Variations

| Test Item | Frequency Stability |               |                      |                  |                 |                    |
|-----------|---------------------|---------------|----------------------|------------------|-----------------|--------------------|
| Frequency | Temp. (°C)          | Voltage (Vdc) | Measured Freq. (MHz) | Delta Freq. (Hz) | Tolerance (ppm) | Result (Pass/Fail) |
| 5200 MHz  | 0                   | 3.85          | 5200.0029            | 2900             | 0.558           | Pass               |
|           | 10                  |               | 5200.0136            | 13600            | 2.615           | Pass               |
|           | 20                  |               | 5200.0246            | 24600            | 4.731           | Pass               |
|           | 30                  |               | 5200.0336            | 33600            | 6.462           | Pass               |
|           | 40                  |               | 5200.0461            | 46100            | 8.865           | Pass               |
|           | 50                  |               | 5200.0619            | 61900            | 11.904          | Pass               |
| 5785 MHz  | 0                   | 3.85          | 5785.01              | 10000            | 1.729           | Pass               |
|           | 10                  |               | 5785.02              | 20000            | 3.457           | Pass               |
|           | 20                  |               | 5785.029             | 29000            | 5.013           | Pass               |
|           | 30                  |               | 5785.0415            | 41500            | 7.174           | Pass               |
|           | 40                  |               | 5785.0573            | 57300            | 9.905           | Pass               |
|           | 50                  |               | 5785.065             | 65000            | 11.236          | Pass               |

## Voltage Variations

| Test Item | Frequency Stability |               |                      |                  |                 |                    |
|-----------|---------------------|---------------|----------------------|------------------|-----------------|--------------------|
| Frequency | Temp. (°C)          | Voltage (Vdc) | Measured Freq. (MHz) | Delta Freq. (Hz) | Tolerance (ppm) | Result (Pass/Fail) |
| 5200 MHz  | 20                  | 5.75          | 5200.0269            | 26900            | 5.173           | Pass               |
|           |                     | 5.00          | 5200.039             | 39000            | 7.500           | Pass               |
|           |                     | 4.25          | 5200.0509            | 50900            | 9.788           | Pass               |
| 5785 MHz  | 20                  | 5.75          | 5785.0268            | 26800            | 4.633           | Pass               |
|           |                     | 5.00          | 5785.031             | 31000            | 5.359           | Pass               |
|           |                     | 4.25          | 5785.0503            | 50300            | 8.695           | Pass               |

Note: The manufacturer's frequency stability specification is better than 20ppm.





## 4.9. Antenna Requirement

### ■ Limit

For intentional device, according to 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And According to 15.407 (a), if transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

### ■ Antenna Connector Construction

See section 2 – antenna information.

### ■ Directional Gain Calculated

Directional Gain =  $10 \cdot \log\{[10^{(G1/20)} + 10^{(G2/20)} + \dots + 10^{(Gn/20)}]^2 / NANT\}$  = 8.01 dBi > 6dBi

| Operate Freq. Band  |                | Directional Gain<br>(dBi) |
|---------------------|----------------|---------------------------|
| IEEE 802.11a        | U-NII Band I   | 8.01                      |
|                     | U-NII Band III | 8.01                      |
| IEEE 802.11ac 20MHz | U-NII Band I   | 8.01                      |
|                     | U-NII Band III | 8.01                      |
| IEEE 802.11ac 40MHz | U-NII Band I   | 8.01                      |
|                     | U-NII Band III | 8.01                      |
| IEEE 802.11ac 80MHz | U-NII Band I   | 8.01                      |
|                     | U-NII Band III | 8.01                      |