



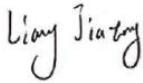
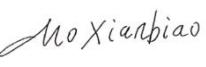
Test Report No.:  
**FCCSZ2024-0072-RF**

## RF Test Report

**FCC ID** : 2BLON-MAX3220  
**EUT** : Ultra-Wideband Transceiver Modules  
**MODEL** : MAX3220  
**BRAND NAME** : YCHIOT  
**APPLICANT** : Wenzhou Yanchuang Internet of Things Technology Co., Ltd.  
**Classification of Test** : N/A

**CVC Testing Technology (Shenzhen) Co., Ltd.**



|  |  |   |                       |
|--|--|---|-----------------------|
| <b>Applicant</b>   |  | <b>Name: Wenzhou Yanchuang Internet of Things Technology Co., Ltd.</b><br><b>Address: 2nd Floor, Smart Cube Student Workstation, No. 165, Gaoke Road, Chashan Street, Ouhai District, Wenzhou City, Zhejiang Province</b> |                       |
| <b>Manufacturer</b>  |  | <b>Name: Wenzhou Yanchuang Internet of Things Technology Co., Ltd.</b><br><b>Address: 2nd Floor, Smart Cube Student Workstation, No. 165, Gaoke Road, Chashan Street, Ouhai District, Wenzhou City, Zhejiang Province</b> |                       |
| <b>Equipment Under Test</b>  |  | <b>Name: Ultra-Wideband Transceiver Modules</b><br><b>Model/Type: MAX3220</b><br><b>Additional Model/Type: N/A</b><br><b>Brand: YCHIOT</b><br><b>Serial No.: N/A</b><br><b>Sample No.: 3-1</b>                            |                       |
| Date of Receipt.   | 2024.09.14   | Date of Testing   | 2024.09.14~2024.10.28 |
| <b>Test Specification</b>  |  | <b>Test Result</b>  |                       |
| FCC Part 15, Subpart F, Section 15.519   |  | PASS  |                       |
| <b>Evaluation of Test Result</b>   |  | The equipment under test was found to comply with the requirements of the standards applied.  |                       |
| <b>Issue Date: 2024.10.28</b>  |  |   |                       |
| Compiled by:<br><br><u>Liang Jiatong</u><br>Name      Signature | Reviewed by:<br><br><u>Mo Xianbiao</u><br>Name      Signature | Approved by:<br><br><u>Dong Sanbi</u><br>Name      Signature   |                       |
| <b>Other Aspects: NONE.</b>  |  |   |                       |
| Abbreviations:OK, Pass= passed      Fail = failed      N/A= not applicable      EUT= equipment, sample(s) under tested                             |  |   |                       |

This test report relates only to the EUT, and shall not be reproduced except in full, without written approval of CVC.



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### **RELEASE CONTROL RECORD**

| ISSUE NO.       | REASON FOR CHANGE | DATE ISSUED |
|-----------------|-------------------|-------------|
| FCC2024-0072-RF | Original release  | 2024.10.28  |



## 1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

| APPLIED STANDARD: FCC Part 15, Subpart F (Section 15.519) |  |        |                                |
|---|--|--------|--------------------------------|
| FCC STANDARD SECTION                                      | TEST TYPE AND LIMIT                      | RESULT | REMARK                         |
| 15.207  | AC Power Conducted Emission              | N/A    | DC supply,not applicable       |
| 15.519(a)(1)  | Cease Transmission Time                  | PASS   | Meet the requirement of limit. |
| 15.503<br>15.521(e)                                       | 10dB bandwidth                           | PASS   | Meet the requirement of limit. |
| -   | 99 % Bandwidth                           | PASS   | Meet the requirement of limit. |
| 15.209(a) 15.519(c)<br>15.519(d)                          | Radiated Emissions                       | PASS   | Meet the requirement of limit. |
| 15.519(e) 15.519(c)<br>15.521(a) 15.521(b)<br>15.521(g)   | Maximum Peak Power and Average Emissions | PASS   | Meet the requirement of limit. |
| 15.519(a2) 15.521(b)<br>15.203                            | Antenna Requirement                      | PASS   | Meet the requirement of limit. |



## 1.1 LIST OF TEST AND MEASUREMENT INSTRUMENTS

| Equipment                                 | Manufacturer  | Model No.          | Serial Number | Cal. interval | Cal. Due  |
|---|---------------|--------------------|---------------|---------------|-----------|
| Antenna Port Conducted Test               |               |                    |               |               |           |
| Signal&Spectrum Analyzer                  | Rohde&Schwarz | FSV 30             | 104408        | 1 year        | 2025.5.22 |
| #4 Shielding room                         | MORI          | 443                | N/A           | 3 year        | 2026.5.16 |
| Wideband radio communication tester       | Rohde&Schwarz | CMW 500            | 168588        | 1 year        | 2025.5.24 |
| Analog signal Generator(100kHz ~12.75GHz) | Rohde&Schwarz | SMB 100A           | 181882        | 1 year        | 2025.4.27 |
| Vector signal Generator(8kHz~6GHz)        | Rohde&Schwarz | SMBV 100B          | 101846        | 1 year        | 2025.4.28 |
| DC power supply                           | Rohde&Schwarz | HMC8041-G          | 101203        | 1 year        | 2025.4.29 |
| RF control unit(2/3/4/5G)                 | Tonscend      | JS0806-1           | CS0300027     | 1 year        | 2025.4.28 |
| Automatic filter bank(2/3/4G)             | Tonscend      | JS0806-F           | CS0300028     | 1 year        | 2025.4.28 |
| Automatic filter bank(5G)                 | Tonscend      | JS0806-F-5G NR     | N/A           | 1 year        | 2025.4.28 |
| Temperature and humidity meter            | UNI-T         | A10T               | C193561464    | 1 year        | 2025.4.27 |
| Radio Communication Analyzer              | Anritsu       | MT8821C            | 6272374548    | 1 year        | 2025.1.09 |
| Constant temperature humidity chamber     | TEELONG       | TL-HW-225B         | 20220518-01   | 1 year        | 2025.5.24 |
| Radio Communication Test Station          | Anritsu       | MT8000A            | 6272354169    | 1 year        | 2025.1.09 |
| Radiation Spurious                        |               |                    |               |               |           |
| Signal&Spectrum Analyzer                  | Rohde&Schwarz | FSV 40             | 101898        | 1 year        | 2025.4.28 |
| EMI Test Receiver                         | Rohde&Schwarz | ESR3               | 102693        | 1 year        | 2025.5.24 |
| Antenna(30MHz~1001MHz)                    | SCHWARZBECK   | VULB 9168          | 1133          | 1 year        | 2025.2.21 |
| Horn antenna(1GHz-18GHz)                  | ETS           | 3117               | 227611        | 1 year        | 2025.3.24 |
| Horn antenna(18GHz-40GHz)                 | QMS           | QMS-00880          | 22051         | 1 year        | 2025.3.24 |
| 3m anechoic chamber                       | MORI          | 966                | CS0300011     | 3 year        | 2026.5.18 |
| Filter group(RSE-BT/WiFi)                 | Rohde&Schwarz | WiFi /BT Variant 1 | 100820        | 1 year        | 2025.4.28 |
| Filter group(RSE-Cellular)                | Rohde&Schwarz | Cellular Variant 1 | 100768        | 1 year        | 2025.4.28 |
| Preamplifier(1GHz-18GHz)                  | Rohde&Schwarz | SCU-18F            | 100799        | 1 year        | 2025.4.28 |
| Preamplifier(1GHz-18GHz)                  | Rohde&Schwarz | SCU-18F            | 100801        | 1 year        | 2025.4.28 |
| Preamplifier(18Gz-40GHz)                  | Rohde&Schwarz | SCU-40A            | 101209        | 1 year        | 2025.4.28 |
| #2 control room                           | MORI          | 433                | CS0200059     | 3 year        | 2026.5.16 |
| Temperature and humidity meter            | /             | C193561517         | C193561517    | 1 year        | 2025.4.27 |
| RE Test - 3M Chamber                      |               |                    |               |               |           |
| EMI Test Receiver                         | Rohde&Schwarz | ESR 26             | 101718        | 1 year        | 2025.5.24 |
| Loop antenna (8.3k~30MHz)                 | Rohde&Schwarz | HFH2-Z2E           | 100951        | 1 year        | 2025/6/03 |
| Antenna(30MHz~1000MHz)                    | SCHWARZBECK   | VULB 9168          | 01132         | 1 year        | 2025.4.25 |
| Horn antenna(1GHz-18GHz)                  | ETS           | 3117               | 227634        | 1 year        | 2025.3.24 |
| Horn antenna(18GHz-40GHz)                 | SCHWARZBECK   | BBHA 9170          | 01003         | 1 year        | 2025.3.25 |
| 3m anechoic chamber                       | MORI          | 966                | CS0200019     | 3 year        | 2026.5.18 |
| Preamplifier(1GHz-18GHz)                  | Tonscend      | TAP-051845         | AP22G806257   | 1 year        | 2025.4.28 |
| Attenuator                                | /             | SJ-5dB             | 607684        | 1 year        | 2025.2.21 |
| #1 control room                           | MORI          | 433                | CS0300028     | 3 year        | 2026.5.16 |
| Temperature and humidity meter            | UNI-T         | A10T               | C193561473    | 1 year        | 2025.4.27 |

## 1.2 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

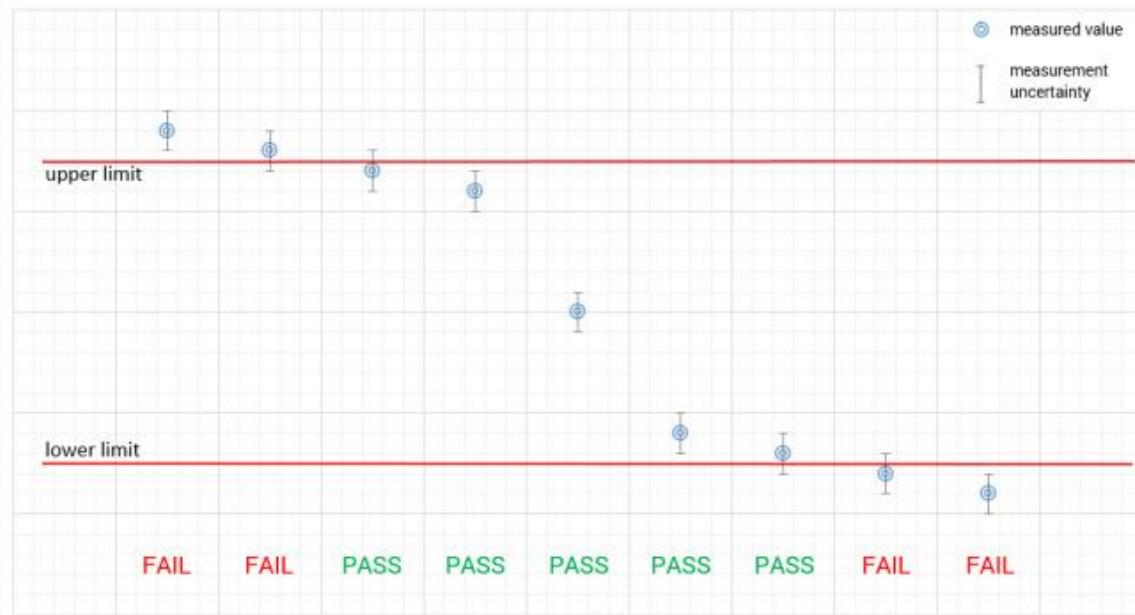
| No. | Item                              | Measurement Uncertainty |
|-----|-----------------------------------|-------------------------|
| 1   | Occupied Channel Bandwidth        | ±1.86 %                 |
| 2   | RF output power, conducted        | ±0.9 dB                 |
| 3   | Power Spectral Density, conducted | ±0.8 dB                 |
| 4   | Conducted emission test           | +/-2.7 dB               |
| 5   | Radiated emission 9kHz-30MHz      | +/-5.6 dB               |
|     | Radiated emission 30MHz-1GHz      | +/-4.6 dB               |
|     | Radiated emission 1GHz-18GHz      | +/-4.4 dB               |
|     | Radiated emission 18GHz-40GHz     | +/-5.1 dB               |
| 6   | Temperature                       | ±0.73 °C                |
| 7   | Humidity                          | ±3.90 %                 |
| 8   | Supply voltages                   | ±0.37 %                 |
| 9   | Time                              | ±0.27 %                 |

**Remark: 95% Confidence Levels, k=2.**

Only the measured values related to their corresponding limits will be used to decide whether the equipment under test meets the requirements of the test standards listed.

The measurement uncertainty is mentioned in this test report, but is not taken into account - neither to the limits nor to the measurement results. Measurement results with a smaller margin to the corresponding limits than the measurement uncertainty have a potential risk of more than 5% that the decision might be wrong.

measured value, measurement uncertainty, verdict





## 1.3 TEST LOCATION

The tests and measurements refer to this report were performed by EMC testing Lab. of CVC Testing Technology (Shenzhen) Co., Ltd.

Lab Address: No. 1301-14&16, Guanguang Road, Xinlan Community, Guanlan Subdistrict, Longhua District, Shenzhen, Guangdong, China

Post Code: 518110 Tel: 0755-23763060-8805

Fax: 0755-23763060 E-mail: sz-kf@cvc.org.cn

FCC(Test firm designation number: CN1363)

IC(Test firm CAB identifier number: CN0137)

CNAS(Test firm designation number: L16091)



## 2 GENERAL INFORMATION

### 2.1 GENERAL PRODUCT INFORMATION

|                     |  |
|---------------------|--|
| PRODUCT             | Ultra-Wideband Transceiver Modules           |
| BRAND               | YCHIOT                                       |
| TEST MODEL          | MAX3220                                      |
| ADDITIONAL MODEL    | N/A  |
| POWER SUPPLY        | DC 3.0 V – 3.6 V                             |
| MODULATION TYPE     | BPM/BPSK                                     |
| OPERATING FREQUENCY | See section 2.2                              |
| NUMBER OF CHANNEL   | 2  |
| ANTENNA TYPE        | Double copper tube Antenna with 2.72dBm gain |
| I/O PORTS           | Refer to user's manual                       |

Note:

1. For more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
2. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.
3. Since the above data and/or information is provided by the client relevant results or conclusions of this report are only made for these data and/or information, CVC is not responsible for the authenticity, integrity and results of the data and information and/or the validity of the conclusion
4. EUT photo refer to the report (Report NO.: FCCSZ2024-0072-EUT).
5. According to 15.519(a). antennas mounted on outdoor structures such., as antennas mounted on the outside of a building or on a telephone pole or any fixed outdoors infrastructure are prohibited for use with this device.
6. According to 15.521(a), UWB devices may not be employed for the operation of toys. Operation onboard aircraft. a ship or a satellite is prohibited.

### 2.2 OTHER INFORMATION

The EUT only have two channels.

| CHANNEL | FREQUENCY (MHz) | CHANNEL | FREQUENCY (MHz) |
|---------|-----------------|---------|-----------------|
| 5       | 6489.6          | 9       | 7987.2          |



## 2.3 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports

The worst case was found when positioned on X axis for radiated emission. Following channel(s) was (were) selected for the final test as listed below:

| TEST MODE |         |                 |           |
|-----------|---------|-----------------|-----------|
| MODE      | UWB ANT | FREQUENCY (MHz) | PREAM_LEN |
| CH5       | 1       | 6489.6          | 128       |
| CH9       | 1       | 7987.2          | 128       |

| EUT<br>CONFIGURE<br>MODE | APPLICABLE TO |         |     |    |    |     | DESCRIPTION       |
|--------------------------|---------------|---------|-----|----|----|-----|-------------------|
|                          | RE $\geq$ 1G  | RE < 1G | PLC | BW | MP | CTT |                   |
| CH5,CH9                  | ✓             | ✓       | ✓   | ✓  | ✓  | ✓   | 3.6V power supply |

Where **RE  $\geq$  1G**: Radiated Emission above 1GHz      **RE < 1G**: Radiated Emission below 1GHz

**PLC**: Power Line Conducted Emission

**BW**: 10dB Bandwidth measurement

**MP**: Maximum Peak Power and Average Emissions

**CTT**: Cease Transmission Time

### TEST CONDITION:

| APPLICABLE TO                | ENVIRONMENTAL CONDITIONS | TEST VOLTAGE | TESTED BY |
|------------------------------|--------------------------|--------------|-----------|
| <b>RE&lt;1G</b>              | 23deg. C, 53%RH          | DC 3.6V      | Liu Yuan  |
| <b>RE<math>\geq</math>1G</b> | 23deg. C, 53%RH          | DC 3.6V      | Liu Yuan  |
| <b>PLC</b>                   | 23deg. C, 53%RH          | DC 3.6V      | Liu Yuan  |
| <b>BW</b>                    | 20deg. C, 55%RH          | DC 3.6V      | Liu Yuan  |
| <b>MP</b>                    | 23deg. C, 53%RH          | DC 3.6V      | Liu Yuan  |
| <b>CTT</b>                   | 23deg. C, 53%RH          | DC 3.6V      | Liu Yuan  |



## 2.4 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF product, according to the specifications of the manufacturers. It must comply with the requirements of the following standards:

**FCC PART 15, SUBPART F, SECTION 15.519**

**ANSI C63.10:2020**

All test items have been performed and recorded as per the above standards

## 2.5 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

| Support Equipment |                   |                   |            |                      |                    |
|-------------------|-------------------|-------------------|------------|----------------------|--------------------|
| NO                | Description       | Brand             | Model No.  | Serial Number        | Supplied by        |
| 1                 | Power bank        | N/A               | TKM5000    | N/A                  | Client             |
| Support Cable     |                   |                   |            |                      |                    |
| NO                | Description       | Quantity (Number) | Length (m) | Detachable (Yes/ No) | Shielded (Yes/ No) |
| 1                 | Power supply cord | 1                 | 1          | Yes                  | No                 |
|                   |                   |                   |            |                      | N/A                |
|                   |                   |                   |            |                      | Client             |



## 3 TEST TYPES AND RESULTS

### 3.1 RADIATED EMISSIONS

#### 3.1.1 Limits

(a) The radiated emissions at or below 960 MHz from a device operating under the provisions of this section shall not exceed the emission levels in §15.209:

| FREQUENCIES (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           | 100                               | 3                             |
| 88 ~ 216          | 150                               | 3                             |
| 216 ~ 960         | 200                               | 3                             |

**NOTE:**

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dB<sub>UV</sub>/m) = 20 log Emission level (uV/m).

(b) The radiated emissions above 960 MHz from a device operating under the provisions of this section shall not exceed the following average limits when measured using a resolution bandwidth of 1 MHz:

| Frequency in MHz | EIRP in dBm | dB <sub>UV</sub> /m |
|------------------|-------------|---------------------|
| 960-1610         | -75.3       | 19.93               |
| 1610-1990        | -63.3       | 31.93               |
| 1990-3100        | -61.3       | 33.93               |
| 3100-10600       | -41.3       | 53.93               |
| Above 10600      | -61.3       | 33.93               |

**NOTE:** (dB<sub>UV</sub>/m) = EIRP(dBm)+95.23, E(dB<sub>UV</sub>/m)=-75.3+95.23=19.93dB<sub>UV</sub>/m

(c) In addition to the radiated emission limits specified in the table in paragraph (a)(b) of this section, UWB transmitters operating under the provisions of this section shall not exceed the following average limits when measured using a resolution bandwidth of no less than 1 kHz:

| Frequency in MHz | EIRP in dBm | dB <sub>UV</sub> /m |
|------------------|-------------|---------------------|
| 1164-1240        | -85.3       | 9.93                |
| 1559-1610        | -85.3       | 9.93                |

**NOTE:** (dB<sub>UV</sub>/m) = EIRP(dBm)+95.23, E(dB<sub>UV</sub>/m)=-85.3+95.23=9.93dB<sub>UV</sub>/m



### 3.1.2 Measurement procedure

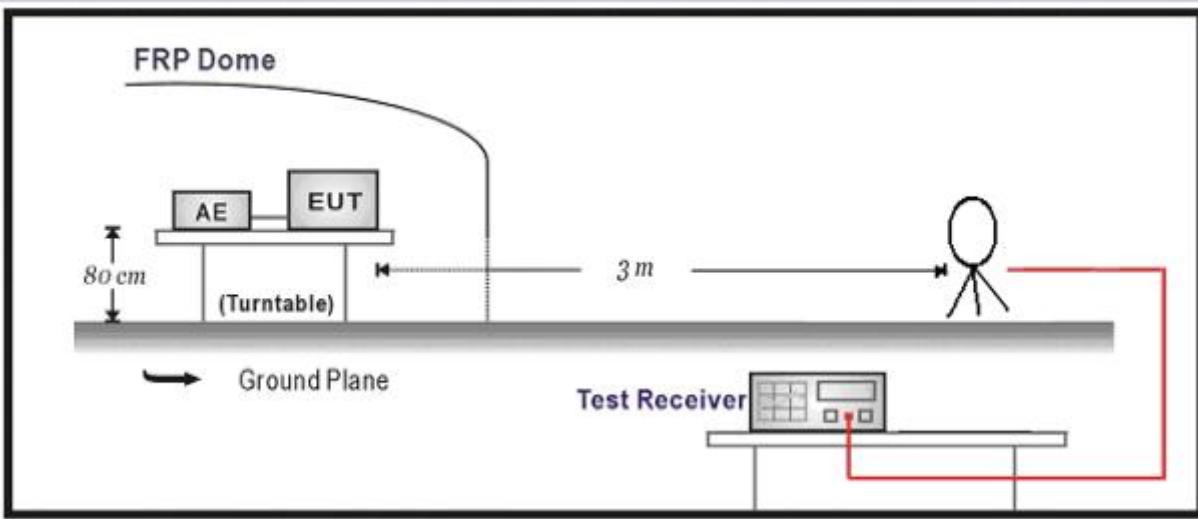
- a. The EUT was placed on the top of a rotating table 1.5 meters(above 1GHz) and 0.8 meters(below 1GHz) above the ground at a 3 meters semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. For below 1GHz was used bilog antenna, and above 1GHz was used horn antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. For below 30MHz, a loop antenna with its vertical plane is place 3m from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. And the centre of the loop shall be 1m above the ground.
- g. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, For battery operated equipment, the equipment tests shall be perform using fresh batteries. The turntable was rotated to maximize the emission level.

#### NOTE:

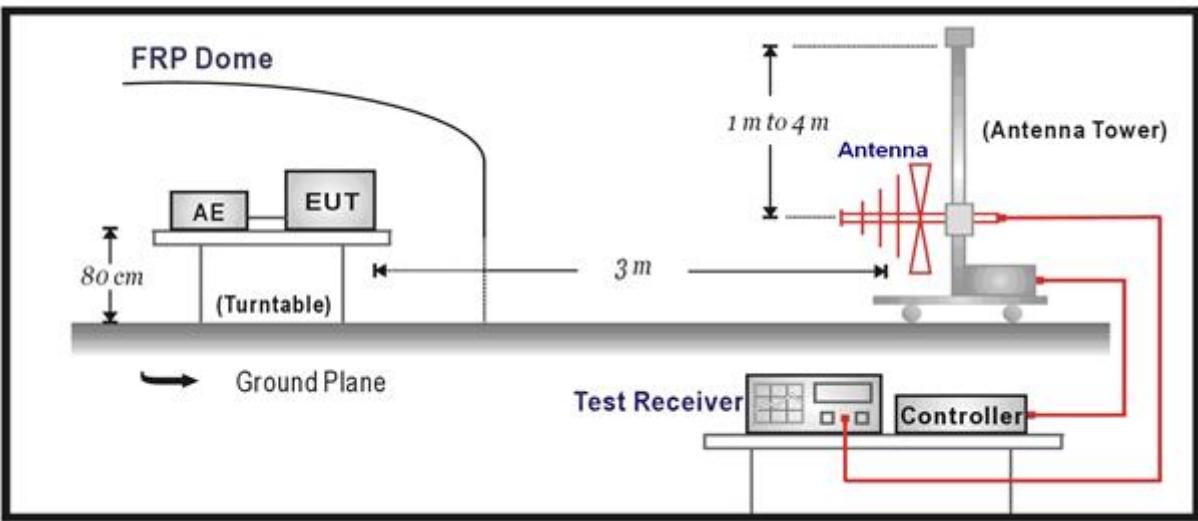
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is  $\geq 1/T$  (Duty cycle < 98%) or 10Hz(Duty cycle > 98%) for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.
5. The testing of the EUT was performed on all 3 orthogonal axes; the worst-case test configuration was reported on the file test setup photo.

### 3.1.3 Test setup

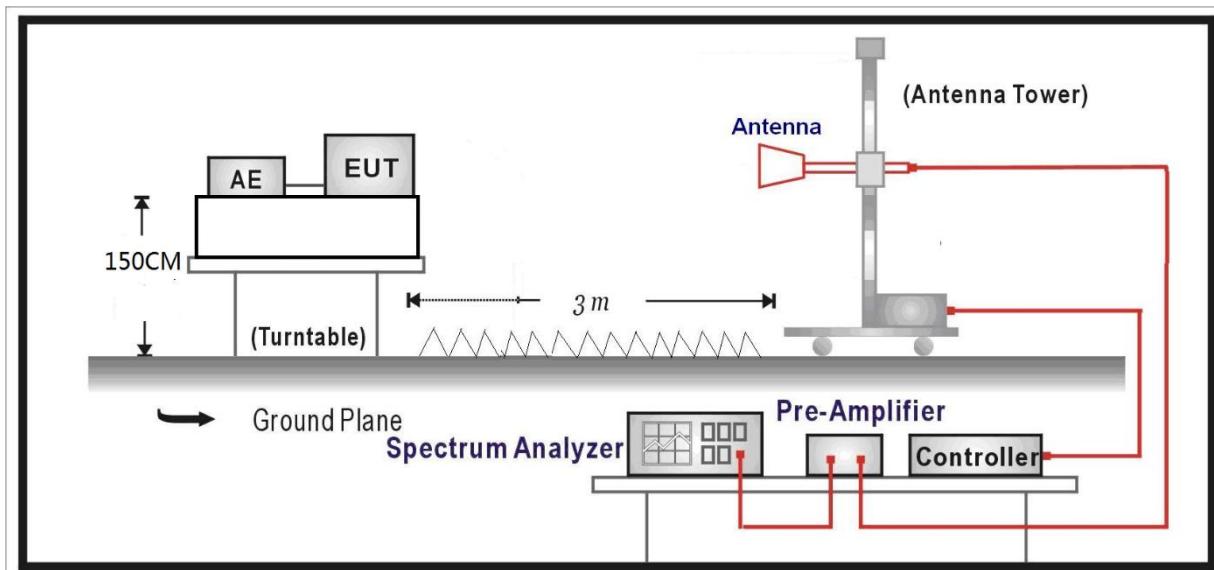
Below 30MHz Test Setup:



Below 960MHz Test Setup:



Above 960MHz Test Setup:



### 3.1.4 Test results

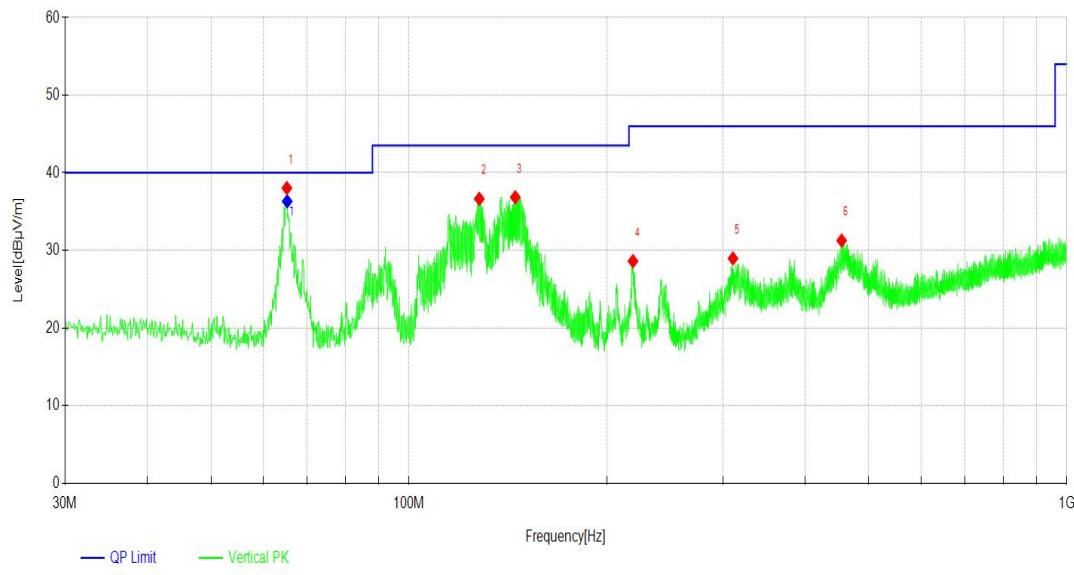
BELOW 1GHz WORST-CASE DATA:

|                          |                 |                   |                |       |       |       |       |       |
|--------------------------|-----------------|-------------------|----------------|-------|-------|-------|-------|-------|
| Test Mode:               | CH5             | Frequency Range   | 30-1000MHz     |       |       |       |       |       |
| Test Voltage             | DC 3.6V         | Detector Function | Quasi-Peak(QP) |       |       |       |       |       |
| Environmental Conditions | 25deg. C,60% RH | Tested By         | Zhou Ye        |       |       |       |       |       |
| <b>Horizontal</b>        |                 |                   |                |       |       |       |       |       |
| 1                        | 22.5            | 21.5              | 20.5           | 20.0  | 19.5  | 19.0  | 18.5  | 18.0  |
| 2                        | 30.0            | 28.0              | 26.0           | 24.0  | 22.0  | 20.0  | 18.0  | 16.0  |
| 3                        | 29.5            | 27.5              | 25.5           | 23.5  | 21.5  | 20.0  | 18.0  | 16.0  |
| 4                        | 31.0            | 29.0              | 27.0           | 25.0  | 23.0  | 21.0  | 19.0  | 17.0  |
| 5                        | 35.0            | 33.0              | 31.0           | 29.0  | 27.0  | 25.0  | 23.0  | 21.0  |
| 6                        | 31.0            | 29.0              | 27.0           | 25.0  | 23.0  | 21.0  | 19.0  | 17.0  |
| 7                        | 22.0            | 21.0              | 20.0           | 19.0  | 18.0  | 17.0  | 16.0  | 15.0  |
| 8                        | 23.0            | 22.0              | 21.0           | 20.0  | 19.0  | 18.0  | 17.0  | 16.0  |
| 9                        | 24.0            | 23.0              | 22.0           | 21.0  | 20.0  | 19.0  | 18.0  | 17.0  |
| 10                       | 25.0            | 24.0              | 23.0           | 22.0  | 21.0  | 20.0  | 19.0  | 18.0  |
| 11                       | 26.0            | 25.0              | 24.0           | 23.0  | 22.0  | 21.0  | 20.0  | 19.0  |
| 12                       | 27.0            | 26.0              | 25.0           | 24.0  | 23.0  | 22.0  | 21.0  | 20.0  |
| 13                       | 28.0            | 27.0              | 26.0           | 25.0  | 24.0  | 23.0  | 22.0  | 21.0  |
| 14                       | 29.0            | 28.0              | 27.0           | 26.0  | 25.0  | 24.0  | 23.0  | 22.0  |
| 15                       | 30.0            | 29.0              | 28.0           | 27.0  | 26.0  | 25.0  | 24.0  | 23.0  |
| 16                       | 31.0            | 30.0              | 29.0           | 28.0  | 27.0  | 26.0  | 25.0  | 24.0  |
| 17                       | 32.0            | 31.0              | 30.0           | 29.0  | 28.0  | 27.0  | 26.0  | 25.0  |
| 18                       | 33.0            | 32.0              | 31.0           | 30.0  | 29.0  | 28.0  | 27.0  | 26.0  |
| 19                       | 34.0            | 33.0              | 32.0           | 31.0  | 30.0  | 29.0  | 28.0  | 27.0  |
| 20                       | 35.0            | 34.0              | 33.0           | 32.0  | 31.0  | 30.0  | 29.0  | 28.0  |
| 21                       | 36.0            | 35.0              | 34.0           | 33.0  | 32.0  | 31.0  | 30.0  | 29.0  |
| 22                       | 37.0            | 36.0              | 35.0           | 34.0  | 33.0  | 32.0  | 31.0  | 30.0  |
| 23                       | 38.0            | 37.0              | 36.0           | 35.0  | 34.0  | 33.0  | 32.0  | 31.0  |
| 24                       | 39.0            | 38.0              | 37.0           | 36.0  | 35.0  | 34.0  | 33.0  | 32.0  |
| 25                       | 40.0            | 39.0              | 38.0           | 37.0  | 36.0  | 35.0  | 34.0  | 33.0  |
| 26                       | 41.0            | 40.0              | 39.0           | 38.0  | 37.0  | 36.0  | 35.0  | 34.0  |
| 27                       | 42.0            | 41.0              | 40.0           | 39.0  | 38.0  | 37.0  | 36.0  | 35.0  |
| 28                       | 43.0            | 42.0              | 41.0           | 40.0  | 39.0  | 38.0  | 37.0  | 36.0  |
| 29                       | 44.0            | 43.0              | 42.0           | 41.0  | 40.0  | 39.0  | 38.0  | 37.0  |
| 30                       | 45.0            | 44.0              | 43.0           | 42.0  | 41.0  | 40.0  | 39.0  | 38.0  |
| 31                       | 46.0            | 45.0              | 44.0           | 43.0  | 42.0  | 41.0  | 40.0  | 39.0  |
| 32                       | 47.0            | 46.0              | 45.0           | 44.0  | 43.0  | 42.0  | 41.0  | 40.0  |
| 33                       | 48.0            | 47.0              | 46.0           | 45.0  | 44.0  | 43.0  | 42.0  | 41.0  |
| 34                       | 49.0            | 48.0              | 47.0           | 46.0  | 45.0  | 44.0  | 43.0  | 42.0  |
| 35                       | 50.0            | 49.0              | 48.0           | 47.0  | 46.0  | 45.0  | 44.0  | 43.0  |
| 36                       | 51.0            | 50.0              | 49.0           | 48.0  | 47.0  | 46.0  | 45.0  | 44.0  |
| 37                       | 52.0            | 51.0              | 50.0           | 49.0  | 48.0  | 47.0  | 46.0  | 45.0  |
| 38                       | 53.0            | 52.0              | 51.0           | 50.0  | 49.0  | 48.0  | 47.0  | 46.0  |
| 39                       | 54.0            | 53.0              | 52.0           | 51.0  | 50.0  | 49.0  | 48.0  | 47.0  |
| 40                       | 55.0            | 54.0              | 53.0           | 52.0  | 51.0  | 50.0  | 49.0  | 48.0  |
| 41                       | 56.0            | 55.0              | 54.0           | 53.0  | 52.0  | 51.0  | 50.0  | 49.0  |
| 42                       | 57.0            | 56.0              | 55.0           | 54.0  | 53.0  | 52.0  | 51.0  | 50.0  |
| 43                       | 58.0            | 57.0              | 56.0           | 55.0  | 54.0  | 53.0  | 52.0  | 51.0  |
| 44                       | 59.0            | 58.0              | 57.0           | 56.0  | 55.0  | 54.0  | 53.0  | 52.0  |
| 45                       | 60.0            | 59.0              | 58.0           | 57.0  | 56.0  | 55.0  | 54.0  | 53.0  |
| 46                       | 61.0            | 60.0              | 59.0           | 58.0  | 57.0  | 56.0  | 55.0  | 54.0  |
| 47                       | 62.0            | 61.0              | 60.0           | 59.0  | 58.0  | 57.0  | 56.0  | 55.0  |
| 48                       | 63.0            | 62.0              | 61.0           | 60.0  | 59.0  | 58.0  | 57.0  | 56.0  |
| 49                       | 64.0            | 63.0              | 62.0           | 61.0  | 60.0  | 59.0  | 58.0  | 57.0  |
| 50                       | 65.0            | 64.0              | 63.0           | 62.0  | 61.0  | 60.0  | 59.0  | 58.0  |
| 51                       | 66.0            | 65.0              | 64.0           | 63.0  | 62.0  | 61.0  | 60.0  | 59.0  |
| 52                       | 67.0            | 66.0              | 65.0           | 64.0  | 63.0  | 62.0  | 61.0  | 60.0  |
| 53                       | 68.0            | 67.0              | 66.0           | 65.0  | 64.0  | 63.0  | 62.0  | 61.0  |
| 54                       | 69.0            | 68.0              | 67.0           | 66.0  | 65.0  | 64.0  | 63.0  | 62.0  |
| 55                       | 70.0            | 69.0              | 68.0           | 67.0  | 66.0  | 65.0  | 64.0  | 63.0  |
| 56                       | 71.0            | 70.0              | 69.0           | 68.0  | 67.0  | 66.0  | 65.0  | 64.0  |
| 57                       | 72.0            | 71.0              | 70.0           | 69.0  | 68.0  | 67.0  | 66.0  | 65.0  |
| 58                       | 73.0            | 72.0              | 71.0           | 70.0  | 69.0  | 68.0  | 67.0  | 66.0  |
| 59                       | 74.0            | 73.0              | 72.0           | 71.0  | 70.0  | 69.0  | 68.0  | 67.0  |
| 60                       | 75.0            | 74.0              | 73.0           | 72.0  | 71.0  | 70.0  | 69.0  | 68.0  |
| 61                       | 76.0            | 75.0              | 74.0           | 73.0  | 72.0  | 71.0  | 70.0  | 69.0  |
| 62                       | 77.0            | 76.0              | 75.0           | 74.0  | 73.0  | 72.0  | 71.0  | 70.0  |
| 63                       | 78.0            | 77.0              | 76.0           | 75.0  | 74.0  | 73.0  | 72.0  | 71.0  |
| 64                       | 79.0            | 78.0              | 77.0           | 76.0  | 75.0  | 74.0  | 73.0  | 72.0  |
| 65                       | 80.0            | 79.0              | 78.0           | 77.0  | 76.0  | 75.0  | 74.0  | 73.0  |
| 66                       | 81.0            | 80.0              | 79.0           | 78.0  | 77.0  | 76.0  | 75.0  | 74.0  |
| 67                       | 82.0            | 81.0              | 80.0           | 79.0  | 78.0  | 77.0  | 76.0  | 75.0  |
| 68                       | 83.0            | 82.0              | 81.0           | 80.0  | 79.0  | 78.0  | 77.0  | 76.0  |
| 69                       | 84.0            | 83.0              | 82.0           | 81.0  | 80.0  | 79.0  | 78.0  | 77.0  |
| 70                       | 85.0            | 84.0              | 83.0           | 82.0  | 81.0  | 80.0  | 79.0  | 78.0  |
| 71                       | 86.0            | 85.0              | 84.0           | 83.0  | 82.0  | 81.0  | 80.0  | 79.0  |
| 72                       | 87.0            | 86.0              | 85.0           | 84.0  | 83.0  | 82.0  | 81.0  | 80.0  |
| 73                       | 88.0            | 87.0              | 86.0           | 85.0  | 84.0  | 83.0  | 82.0  | 81.0  |
| 74                       | 89.0            | 88.0              | 87.0           | 86.0  | 85.0  | 84.0  | 83.0  | 82.0  |
| 75                       | 90.0            | 89.0              | 88.0           | 87.0  | 86.0  | 85.0  | 84.0  | 83.0  |
| 76                       | 91.0            | 90.0              | 89.0           | 88.0  | 87.0  | 86.0  | 85.0  | 84.0  |
| 77                       | 92.0            | 91.0              | 90.0           | 89.0  | 88.0  | 87.0  | 86.0  | 85.0  |
| 78                       | 93.0            | 92.0              | 91.0           | 90.0  | 89.0  | 88.0  | 87.0  | 86.0  |
| 79                       | 94.0            | 93.0              | 92.0           | 91.0  | 90.0  | 89.0  | 88.0  | 87.0  |
| 80                       | 95.0            | 94.0              | 93.0           | 92.0  | 91.0  | 90.0  | 89.0  | 88.0  |
| 81                       | 96.0            | 95.0              | 94.0           | 93.0  | 92.0  | 91.0  | 90.0  | 89.0  |
| 82                       | 97.0            | 96.0              | 95.0           | 94.0  | 93.0  | 92.0  | 91.0  | 90.0  |
| 83                       | 98.0            | 97.0              | 96.0           | 95.0  | 94.0  | 93.0  | 92.0  | 91.0  |
| 84                       | 99.0            | 98.0              | 97.0           | 96.0  | 95.0  | 94.0  | 93.0  | 92.0  |
| 85                       | 100.0           | 99.0              | 98.0           | 97.0  | 96.0  | 95.0  | 94.0  | 93.0  |
| 86                       | 101.0           | 100.0             | 99.0           | 98.0  | 97.0  | 96.0  | 95.0  | 94.0  |
| 87                       | 102.0           | 101.0             | 100.0          | 99.0  | 98.0  | 97.0  | 96.0  | 95.0  |
| 88                       | 103.0           | 102.0             | 101.0          | 100.0 | 99.0  | 98.0  | 97.0  | 96.0  |
| 89                       | 104.0           | 103.0             | 102.0          | 101.0 | 100.0 | 99.0  | 98.0  | 97.0  |
| 90                       | 105.0           | 104.0             | 103.0          | 102.0 | 101.0 | 100.0 | 99.0  | 98.0  |
| 91                       | 106.0           | 105.0             | 104.0          | 103.0 | 102.0 | 101.0 | 100.0 | 99.0  |
| 92                       | 107.0           | 106.0             | 105.0          | 104.0 | 103.0 | 102.0 | 101.0 | 100.0 |
| 93                       | 108.0           | 107.0             | 106.0          | 105.0 | 104.0 | 103.0 | 102.0 | 101.0 |
| 94                       | 109.0           | 108.0             | 107.0          | 106.0 | 105.0 | 104.0 | 103.0 | 102.0 |
| 95                       | 110.0           | 109.0             | 108.0          | 107.0 | 106.0 | 105.0 | 104.0 | 103.0 |
| 96                       | 111.0           | 110.0             | 109.0          | 108.0 | 107.0 | 106.0 | 105.0 | 104.0 |
| 97                       | 112.0           | 111.0             | 110.0          | 109.0 | 108.0 | 107.0 | 106.0 | 105.0 |
| 98                       | 113.0           | 112.0             | 111.0          | 110.0 | 109.0 | 108.0 | 107.0 | 106.0 |
| 99                       | 114.0           | 113.0             | 112.0          | 111.0 | 110.0 | 109.0 | 108.0 | 107.0 |
| 100                      | 115.0           | 114.0             | 113.0          | 112.0 | 111.0 | 110.0 | 109.0 | 108.0 |
| 101                      | 116.0           | 115.0             | 114.0          | 113.0 | 112.0 | 111.0 | 110.0 | 109.0 |
| 102                      | 117.0           | 116.0             | 115.0          | 114.0 | 113.0 | 112.0 | 111.0 | 110.0 |
| 103                      | 118.0           | 117.0             | 116.0          | 115.0 | 114.0 | 113.0 | 112.0 | 111.0 |
| 104                      | 119.0           | 118.0             | 117.0          | 116.0 | 115.0 | 114.0 | 113.0 | 112.0 |
| 105                      | 120.0           | 119.0             | 118.0          | 117.0 | 116.0 | 115.0 | 114.0 | 113.0 |
| 106                      | 121.0           | 120.0             | 119.0          | 118.0 | 117.0 | 116.0 | 115.0 | 114.0 |
| 107                      | 122.0           | 121.0             | 120.0          | 119.0 | 118.0 | 117.0 | 116.0 | 115.0 |
| 108                      | 123.0           | 122.0             | 121.0          | 120.0 | 119.0 | 118.0 | 117.0 | 116.0 |
| 109                      | 124.0           | 123.0             | 122.0          | 121.0 | 120.0 | 119.0 | 118.0 | 117.0 |
| 110                      | 125.0           | 124.0             | 123.0          | 122.0 | 121.0 | 120.0 | 119.0 | 118.0 |
| 111                      | 126.0           | 125.0             | 124.0          | 123.0 | 122.0 | 121.0 | 120.0 | 119.0 |
| 112                      | 127.0           | 126.0             | 125.0          | 124.0 | 123.0 | 122.0 | 121.0 | 120.0 |
| 113                      | 128.0           | 127.0             | 126.0          | 125.0 | 124.0 | 123.0 | 122.0 | 121.0 |
| 114                      | 129.0           | 128.0             | 127.0          | 126.0 | 125.0 | 124.0 | 123.0 | 122.0 |
| 115                      | 130.0           | 129.0             | 128.0          | 127.0 | 126.0 | 125.0 | 124.0 | 123.0 |
| 116                      | 131.0           | 130.0             | 129.0          | 128.0 | 127.0 | 126.0 | 125.0 | 124.0 |
| 117                      | 132.0           | 131.0             | 130.0          | 129.0 | 128.0 | 127.0 | 126.0 | 125.0 |
| 118                      | 133.0           | 132.0             | 131.0          | 130.0 | 129.0 | 128.0 | 127.0 | 126.0 |
| 119                      | 134.0           | 133.0             | 132.0          | 131.0 | 130.0 | 129.0 | 128.0 | 127.0 |
| 120                      | 135.0           | 134.0             | 133.0          | 132.0 | 131.0 | 130.0 | 129.0 | 128.0 |
| 121                      | 136.0           | 135.0             | 134.0          | 133.0 | 132.0 | 131.0 | 130.0 | 129.0 |
| 122                      |                 |                   |                |       |       |       |       |       |



|                          |                 |                   |                |
|--------------------------|-----------------|-------------------|----------------|
| Test Mode:               | CH5             | Frequency Range   | 30-1000MHz     |
| Test Voltage             | DC 3.6V         | Detector Function | Quasi-Peak(QP) |
| Environmental Conditions | 25deg. C,60% RH | Tested By         | Zhou Ye        |

### Vertical



| NO. | Freq. [MHz] | Reading [dB $\mu$ V/m] | Factor [dB] | Level [dB $\mu$ V/m] | Limit [dB $\mu$ V/m] | Margin [dB] | Height [cm] | Angle [°] |
|-----|-------------|------------------------|-------------|----------------------|----------------------|-------------|-------------|-----------|
| 1   | 65.215      | 20.38                  | 17.65       | 38.03                | 40.00                | 1.97        | 100         | 245       |
| 2   | 127.883     | 17.35                  | 19.30       | 36.65                | 43.50                | 6.85        | 100         | 22        |
| 3   | 145.054     | 16.51                  | 20.33       | 36.84                | 43.50                | 6.66        | 100         | 248       |
| 4   | 219.072     | 11.09                  | 17.52       | 28.61                | 46.00                | 17.39       | 100         | 118       |
| 5   | 310.843     | 8.88                   | 20.07       | 28.95                | 46.00                | 17.05       | 100         | 93        |
| 6   | 454.708     | 7.86                   | 23.40       | 31.26                | 46.00                | 14.74       | 100         | 357       |

Remark: 1. Level (dB $\mu$ V/m) = Reading (dB $\mu$ V/m) + Factor (dB).  
2. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).  
3. Margin(dB) = Limit[dB $\mu$ V/m] - Level [dB $\mu$ V/m]  
4. Emission level (dB $\mu$ V/m) = 20 log Emission level (uV/m).  
5. 9KHz~30MHz have been test and test data more than 20dB margin.



Radiated Emissions above 960 MHz:

|                 |          |           |           |
|-----------------|----------|-----------|-----------|
| Channel         | CH 5     | Frequency | 6489.6MHz |
| Frequency Range | Above 1G |           |           |

### Horizontal

| NO. | Freq. [MHz] | Reading [dB $\mu$ V] | Factor [dB/m] | Level [dB $\mu$ V/m] | Limit [dB $\mu$ V/m] | Margin [dB] | Polarity   |
|-----|-------------|----------------------|---------------|----------------------|----------------------|-------------|------------|
| 1   | 985.56      | 50.72                | -37.81        | 12.91                | 19.93                | 7.02        | Horizontal |
| 2   | 1713.24     | 50.69                | -36.19        | 14.50                | 31.93                | 17.43       | Horizontal |
| 3   | 3035.68     | 51.44                | -34.27        | 17.17                | 33.93                | 16.76       | Horizontal |
| 4   | 6444.02     | 57.48                | -30.11        | 27.37                | 53.93                | 26.56       | Horizontal |
| 5   | 11544.60    | 51.83                | -24.92        | 26.91                | 33.93                | 7.02        | Horizontal |
| 6   | 17008.17    | 51.73                | -21.44        | 30.29                | 33.93                | 3.64        | Horizontal |
| 7   | 18880.09    | 28.08                | -5.66         | 22.42                | 33.93                | 11.51       | Horizontal |
| 8   | 21203.52    | 26.05                | -4.91         | 21.14                | 33.93                | 12.79       | Horizontal |
| 9   | 23190.32    | 23.13                | -5.15         | 17.98                | 33.93                | 15.95       | Horizontal |
| 10  | 27188.12    | 23.05                | -3.40         | 19.65                | 33.93                | 14.28       | Horizontal |
| 11  | 33218.92    | 23.28                | -1.12         | 22.16                | 33.93                | 11.77       | Horizontal |
| 12  | 37005.50    | 27.16                | 1.17          | 28.33                | 33.93                | 5.60        | Horizontal |

### Vertical

| NO. | Freq. [MHz] | Reading [dB $\mu$ V] | Factor [dB/m] | Level [dB $\mu$ V/m] | Limit [dB $\mu$ V/m] | Margin [dB] | Polarity |
|-----|-------------|----------------------|---------------|----------------------|----------------------|-------------|----------|
| 1   | 1121.90     | 50.10                | -37.56        | 12.54                | 19.93                | 7.39        | Vertical |
| 2   | 1735.40     | 50.61                | -36.14        | 14.47                | 31.93                | 17.46       | Vertical |
| 3   | 3417.41     | 53.79                | -34.02        | 19.77                | 53.93                | 34.16       | Vertical |
| 4   | 6490.03     | 64.81                | -30.06        | 34.75                | 53.93                | 19.18       | Vertical |
| 5   | 10735.12    | 51.89                | -26.25        | 25.64                | 33.93                | 8.29        | Vertical |
| 6   | 16815.60    | 50.85                | -21.70        | 29.15                | 33.93                | 4.78        | Vertical |
| 7   | 19269.53    | 27.80                | -5.48         | 22.32                | 33.93                | 11.61       | Vertical |
| 8   | 21392.74    | 25.44                | -4.87         | 20.57                | 33.93                | 13.36       | Vertical |
| 9   | 25914.19    | 20.81                | -3.64         | 17.17                | 33.93                | 16.76       | Vertical |
| 10  | 27672.17    | 23.21                | -3.05         | 20.16                | 33.93                | 13.77       | Vertical |
| 11  | 33324.53    | 22.95                | -1.12         | 21.83                | 33.93                | 12.10       | Vertical |
| 12  | 36948.29    | 26.77                | 1.03          | 27.80                | 33.93                | 6.13        | Vertical |

Remark: 1. The emission levels of other frequencies were greater than 20dB margin.

2. Level (dB $\mu$ V/m) = Reading (dB $\mu$ V/m) + Factor (dB).

3. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).

4. Margin(dB) = Limit[dB $\mu$ V/m] - Level [dB $\mu$ V/m]



| Channel           | CH 9        |                      | Frequency     | 7987.2MHz            |                      |             |            |
|-------------------|-------------|----------------------|---------------|----------------------|----------------------|-------------|------------|
| Frequency Range   | Above 1G    |                      |               |                      |                      |             |            |
| <b>Horizontal</b> |             |                      |               |                      |                      |             |            |
| NO.               | Freq. [MHz] | Reading [dB $\mu$ V] | Factor [dB/m] | Level [dB $\mu$ V/m] | Limit [dB $\mu$ V/m] | Margin [dB] | Polarity   |
| 1                 | 1208.81     | 49.89                | -37.39        | 12.50                | 19.93                | 7.43        | Horizontal |
| 2                 | 1962.05     | 50.52                | -35.53        | 14.99                | 31.93                | 16.94       | Horizontal |
| 3                 | 2519.32     | 52.10                | -34.71        | 17.39                | 33.93                | 16.54       | Horizontal |
| 4                 | 5165.89     | 51.12                | -31.90        | 19.22                | 53.93                | 34.71       | Horizontal |
| 5                 | 8030.60     | 59.29                | -29.15        | 30.14                | 53.93                | 23.79       | Horizontal |
| 6                 | 13052.79    | 52.12                | -23.44        | 28.68                | 33.93                | 5.25        | Horizontal |
| 7                 | 20041.80    | 26.85                | -5.31         | 21.54                | 33.93                | 12.39       | Horizontal |
| 8                 | 23168.32    | 23.23                | -5.16         | 18.07                | 33.93                | 15.86       | Horizontal |
| 9                 | 25898.79    | 21.47                | -3.66         | 17.81                | 33.93                | 16.12       | Horizontal |
| 10                | 27711.77    | 22.40                | -3.16         | 19.24                | 33.93                | 14.69       | Horizontal |
| 11                | 32072.61    | 24.09                | -1.97         | 22.12                | 33.93                | 11.81       | Horizontal |
| 12                | 37045.10    | 26.85                | 1.06          | 27.91                | 33.93                | 6.02        | Horizontal |
| <b>Vertical</b>   |             |                      |               |                      |                      |             |            |
| NO.               | Freq. [MHz] | Reading [dB $\mu$ V] | Factor [dB/m] | Level [dB $\mu$ V/m] | Limit [dB $\mu$ V/m] | Margin [dB] | Polarity   |
| 1                 | 1094.63     | 50.23                | -37.62        | 12.61                | 19.93                | 7.32        | Vertical   |
| 2                 | 1919.45     | 51.25                | -35.65        | 15.60                | 31.93                | 16.33       | Vertical   |
| 3                 | 3035.68     | 51.41                | -34.27        | 17.14                | 33.93                | 16.79       | Vertical   |
| 4                 | 4370.05     | 51.37                | -32.54        | 18.83                | 53.93                | 35.10       | Vertical   |
| 5                 | 8115.81     | 60.44                | -29.04        | 31.40                | 53.93                | 22.53       | Vertical   |
| 6                 | 13025.53    | 51.75                | -23.42        | 28.33                | 33.93                | 5.60        | Vertical   |
| 7                 | 18644.66    | 27.98                | -5.65         | 22.33                | 33.93                | 11.60       | Vertical   |
| 8                 | 22182.62    | 24.91                | -5.06         | 19.85                | 33.93                | 14.08       | Vertical   |
| 9                 | 26613.86    | 23.62                | -3.40         | 20.22                | 33.93                | 13.71       | Vertical   |
| 10                | 29612.76    | 20.92                | -2.01         | 18.91                | 33.93                | 15.02       | Vertical   |
| 11                | 34842.68    | 26.67                | -1.23         | 25.44                | 33.93                | 8.49        | Vertical   |
| 12                | 39625.96    | 24.57                | 1.81          | 26.38                | 33.93                | 7.55        | Vertical   |

Remark: 1. The emission levels of other frequencies were greater than 20dB margin.

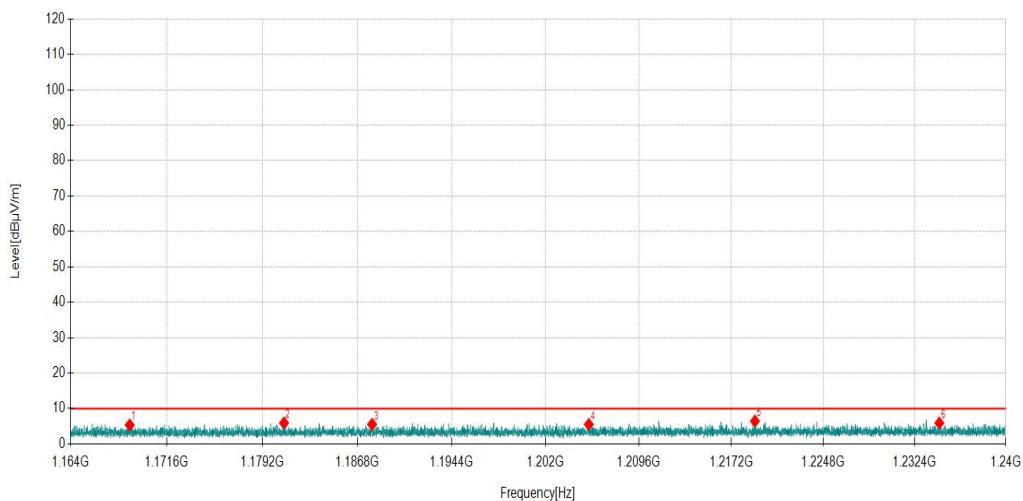
2. Level (dB $\mu$ V/m) = Reading (dB $\mu$ V/m) + Factor (dB).
3. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
4. Margin(dB) = Limit[dB $\mu$ V/m] - Level [dB $\mu$ V/m]



Radiated Emissions in GPS band:

|                          |                 |                   |                  |
|--------------------------|-----------------|-------------------|------------------|
| Test Mode:               | CH 5            | Frequency Range   | GPS-1164-1240MHz |
| Test Voltage             | DC 3.6V         | Detector Function | Quasi-Peak(QP)   |
| Environmental Conditions | 25deg. C,60% RH | Tested By         | Zhou Ye          |

**Horizonta**



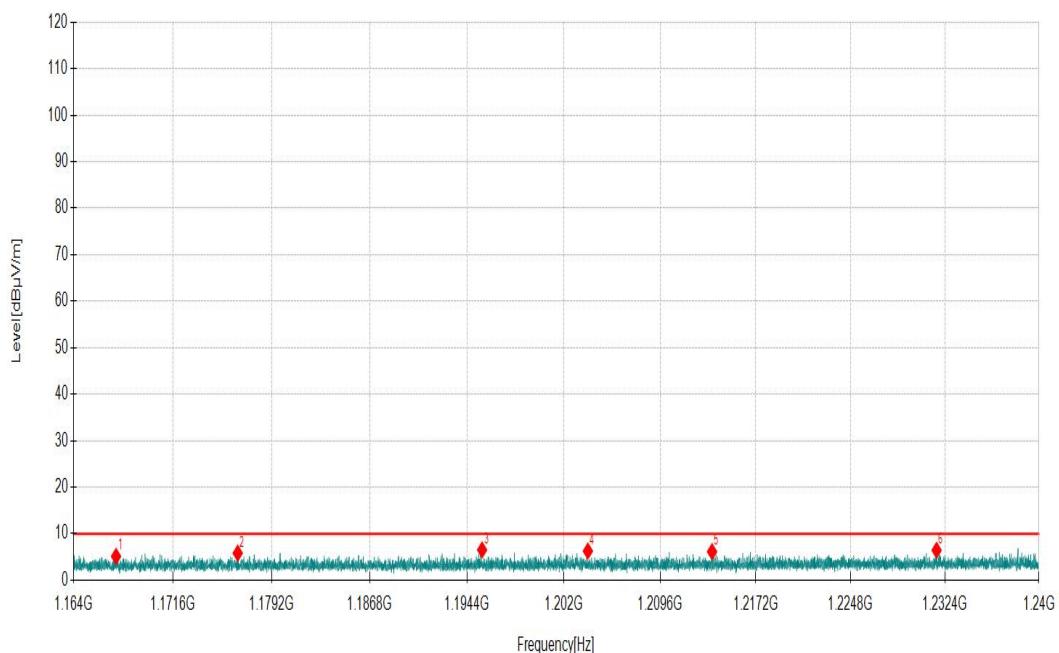
| NO. | Freq. [MHz] | Reading [dB $\mu$ V] | Factor [dB/m] | Level [dB $\mu$ V/m] | Limit [dB $\mu$ V/m] | Margin [dB] | Polarity   |
|-----|-------------|----------------------|---------------|----------------------|----------------------|-------------|------------|
| 1   | 1168.67     | 42.79                | -37.46        | 5.33                 | 9.93                 | 4.60        | Horizontal |
| 2   | 1180.93     | 43.35                | -37.44        | 5.91                 | 9.93                 | 4.02        | Horizontal |
| 3   | 1187.99     | 42.96                | -37.43        | 5.53                 | 9.93                 | 4.40        | Horizontal |
| 4   | 1205.53     | 42.90                | -37.39        | 5.51                 | 9.93                 | 4.42        | Horizontal |
| 5   | 1219.15     | 43.82                | -37.37        | 6.45                 | 9.93                 | 3.48        | Horizontal |
| 6   | 1234.45     | 43.23                | -37.34        | 5.89                 | 9.93                 | 4.04        | Horizontal |

Remark: 1. Level (dB $\mu$ V/m) = Reading (dB $\mu$ V/m) + Factor (dB).  
2. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).  
3. Margin(dB) = Limit[dB $\mu$ V/m] - Level [dB $\mu$ V/m]  
4. Emission level (dB $\mu$ V/m) = 20 log Emission level (uV/m).  
5. 9KHz~30MHz have been test and test data more than 20dB margin.



|                          |                 |                   |                  |
|--------------------------|-----------------|-------------------|------------------|
| Test Mode:               | CH 5            | Frequency Range   | GPS-1164-1240MHz |
| Test Voltage             | DC 3.6V         | Detector Function | Quasi-Peak(QP)   |
| Environmental Conditions | 25deg. C,60% RH | Tested By         | Zhou Ye          |

### Vertical



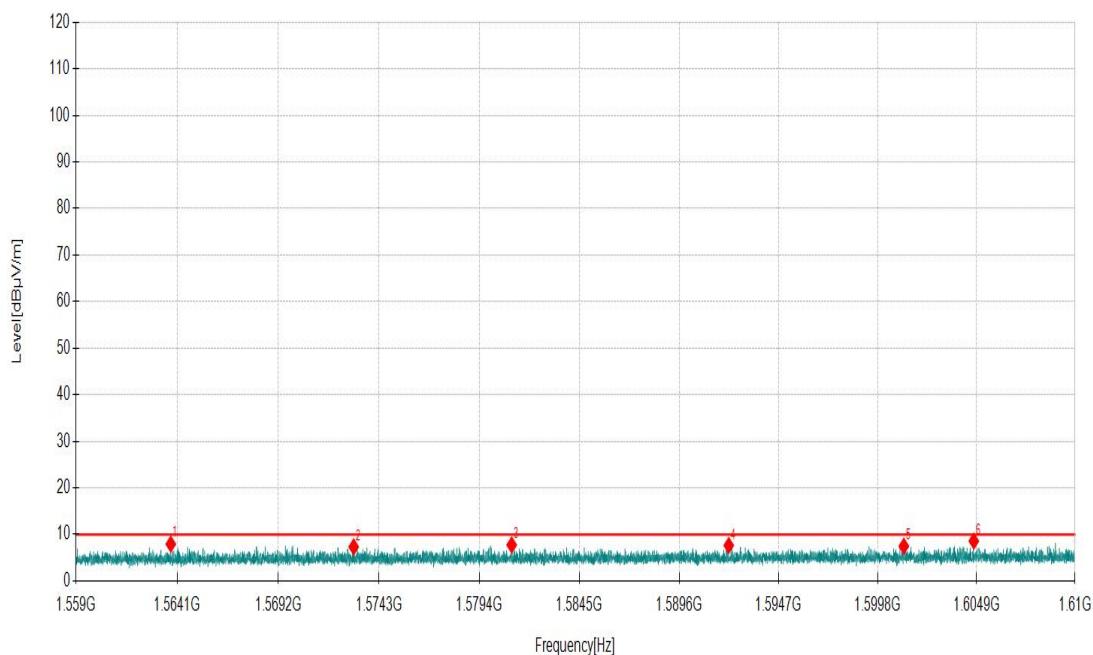
| NO. | Freq. [MHz] | Reading [dB $\mu$ V] | Factor [dB/m] | Level [dB $\mu$ V/m] | Limit [dB $\mu$ V/m] | Margin [dB] | Polarity |
|-----|-------------|----------------------|---------------|----------------------|----------------------|-------------|----------|
| 1   | 1167.25     | 42.60                | -37.47        | 5.13                 | 9.93                 | 4.80        | Vertical |
| 2   | 1176.59     | 43.26                | -37.45        | 5.81                 | 9.93                 | 4.12        | Vertical |
| 3   | 1195.58     | 43.93                | -37.41        | 6.52                 | 9.93                 | 3.41        | Vertical |
| 4   | 1203.90     | 43.66                | -37.39        | 6.27                 | 9.93                 | 3.66        | Vertical |
| 5   | 1213.73     | 43.50                | -37.37        | 6.13                 | 9.93                 | 3.80        | Vertical |
| 6   | 1231.72     | 43.79                | -37.35        | 6.44                 | 9.93                 | 3.49        | Vertical |

Remark: 1. Level (dB $\mu$ V/m) = Reading (dB $\mu$ V/m) + Factor (dB).  
2. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).  
3. Margin(dB) = Limit[dB $\mu$ V/m] - Level [dB $\mu$ V/m]  
4. Emission level (dB $\mu$ V/m) = 20 log Emission level (uV/m).  
5. 9KHz~30MHz have been test and test data more than 20dB margin.



|                          |                 |                   |                  |
|--------------------------|-----------------|-------------------|------------------|
| Test Mode:               | CH 9            | Frequency Range   | GPS-1559-1610MHz |
| Test Voltage             | DC 3.6V         | Detector Function | Quasi-Peak(QP)   |
| Environmental Conditions | 25deg. C,60% RH | Tested By         | Zhou Ye          |

### Horizontal



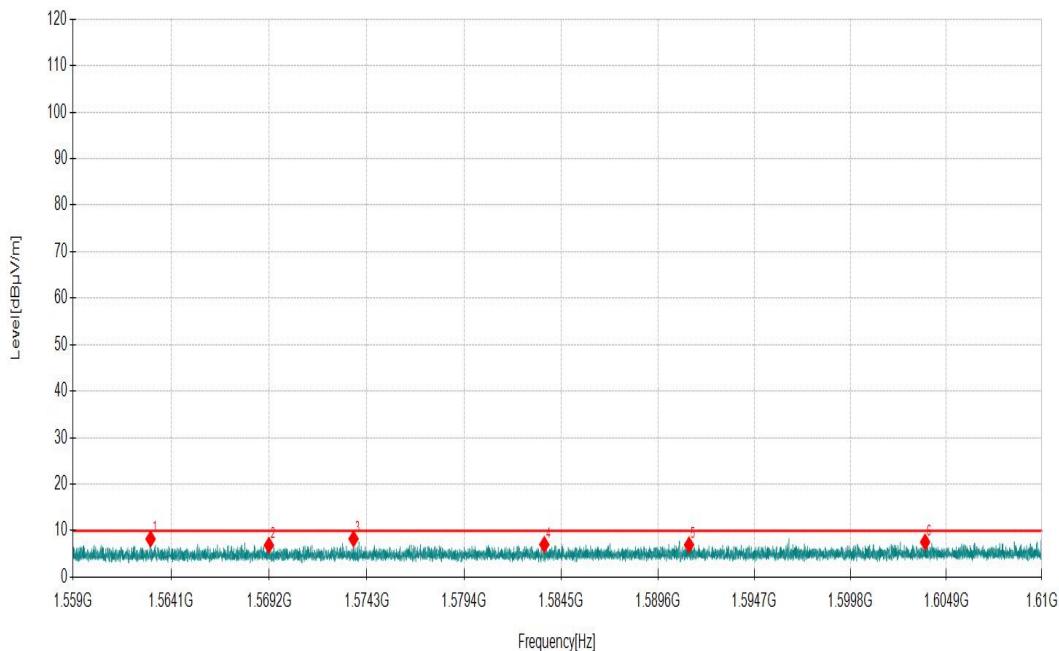
| NO. | Freq. [MHz] | Reading [dB $\mu$ V] | Factor [dB/m] | Level [dB $\mu$ V/m] | Limit [dB $\mu$ V/m] | Margin [dB] | Polarity   |
|-----|-------------|----------------------|---------------|----------------------|----------------------|-------------|------------|
| 1   | 1563.78     | 44.55                | -36.63        | 7.92                 | 9.93                 | 2.01        | Horizontal |
| 2   | 1573.02     | 43.93                | -36.61        | 7.32                 | 9.93                 | 2.61        | Horizontal |
| 3   | 1581.05     | 44.31                | -36.58        | 7.73                 | 9.93                 | 2.20        | Horizontal |
| 4   | 1592.14     | 44.19                | -36.56        | 7.63                 | 9.93                 | 2.30        | Horizontal |
| 5   | 1601.15     | 44.00                | -36.53        | 7.47                 | 9.93                 | 2.46        | Horizontal |
| 6   | 1604.76     | 45.08                | -36.51        | 8.57                 | 9.93                 | 1.36        | Horizontal |

Remark: 1. Level (dB $\mu$ V/m) = Reading (dB $\mu$ V/m) + Factor (dB).  
2. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).  
3. Margin(dB) = Limit[dB $\mu$ V/m] - Level [dB $\mu$ V/m]  
4. Emission level (dB $\mu$ V/m) = 20 log Emission level (uV/m).  
5. 9KHz~30MHz have been test and test data more than 20dB margin.



|                          |                 |                   |                  |
|--------------------------|-----------------|-------------------|------------------|
| Test Mode:               | CH 9            | Frequency Range   | GPS-1559-1610MHz |
| Test Voltage             | DC 3.6V         | Detector Function | Quasi-Peak(QP)   |
| Environmental Conditions | 25deg. C,60% RH | Tested By         | Zhou Ye          |

**Vertical**



| NO. | Freq. [MHz] | Reading [dB $\mu$ V] | Factor [dB/m] | Level [dB $\mu$ V/m] | Limit [dB $\mu$ V/m] | Margin [dB] | Polarity |
|-----|-------------|----------------------|---------------|----------------------|----------------------|-------------|----------|
| 1   | 1563.03     | 44.86                | -36.64        | 8.22                 | 9.93                 | 1.71        | Vertical |
| 2   | 1569.19     | 43.49                | -36.62        | 6.87                 | 9.93                 | 3.06        | Vertical |
| 3   | 1573.61     | 44.86                | -36.61        | 8.25                 | 9.93                 | 1.68        | Vertical |
| 4   | 1583.62     | 43.60                | -36.59        | 7.01                 | 9.93                 | 2.92        | Vertical |
| 5   | 1591.25     | 43.50                | -36.56        | 6.94                 | 9.93                 | 2.99        | Vertical |
| 6   | 1603.78     | 44.07                | -36.52        | 7.55                 | 9.93                 | 2.38        | Vertical |

Remark: 1. Level (dB $\mu$ V/m) = Reading (dB $\mu$ V/m) + Factor (dB).  
2. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).  
3. Margin(dB) = Limit[dB $\mu$ V/m] - Level [dB $\mu$ V/m]  
4. Emission level (dB $\mu$ V/m) = 20 log Emission level (uV/m).  
5. 9KHz~30MHz have been test and test data more than 20dB margin.



## 3.2 10DB BANDWIDTH

### 3.2.1 LIMIT

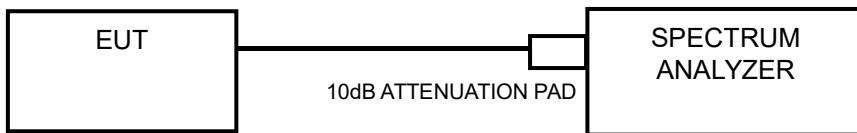
FCC 15.503(d) Has a fractional bandwidth equal to or greater than 0.20 or has a UWB bandwidth equal to or greater than 500 MHz, regardless of the fractional bandwidth.

FCC 15.519(3)(b) The UWB bandwidth of a device operating under the provisions of this section must be contained between 3100 MHz and 10,600 MHz.

### 3.2.2 TEST PROCEDURES

1. Set the centre frequency of the channel under test
2. Set resolution bandwidth (RBW) = 1MHz
3. Set the video bandwidth (VBW)  $\geq 3 \times$  RBW, Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 10 dB relative to the maximum level measured in the fundamental emission.

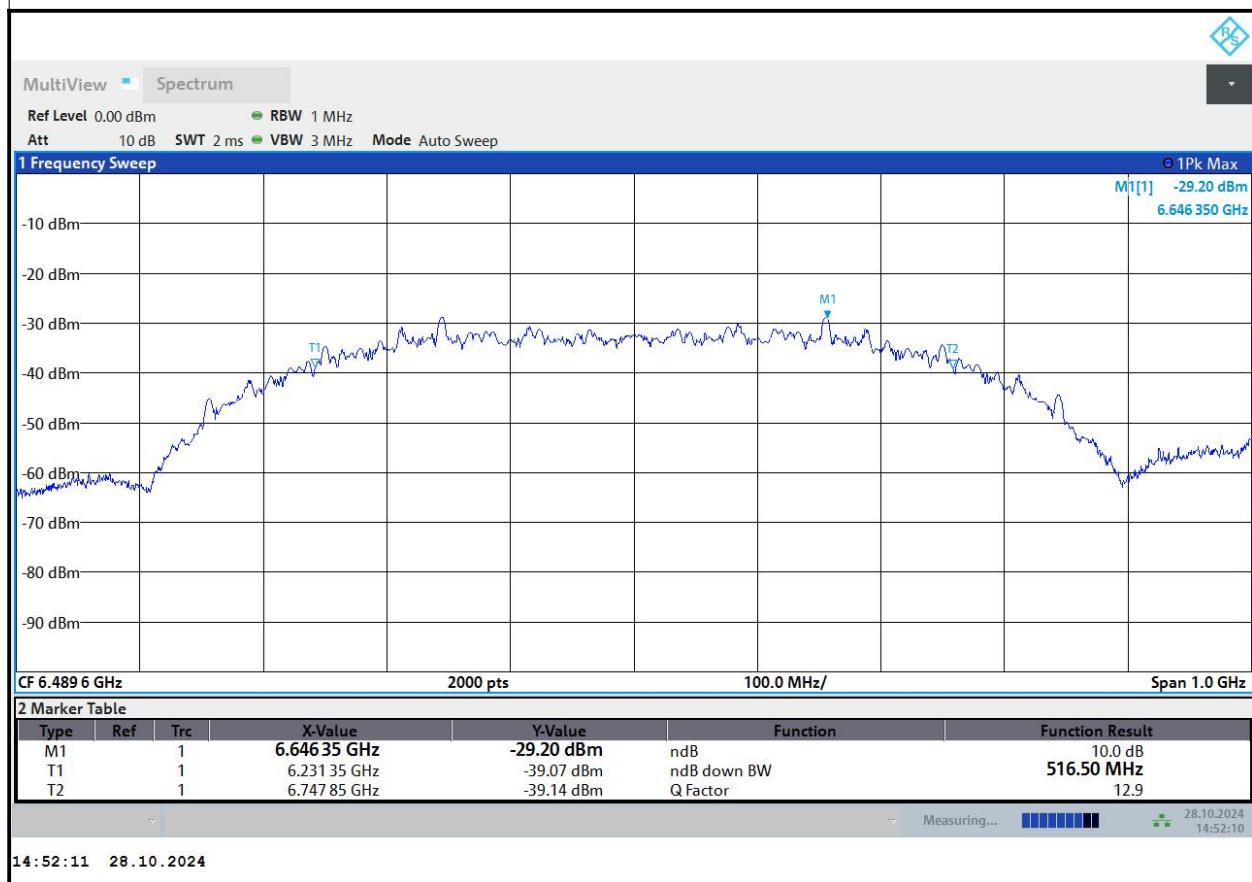
### 3.2.3 TEST SETUP





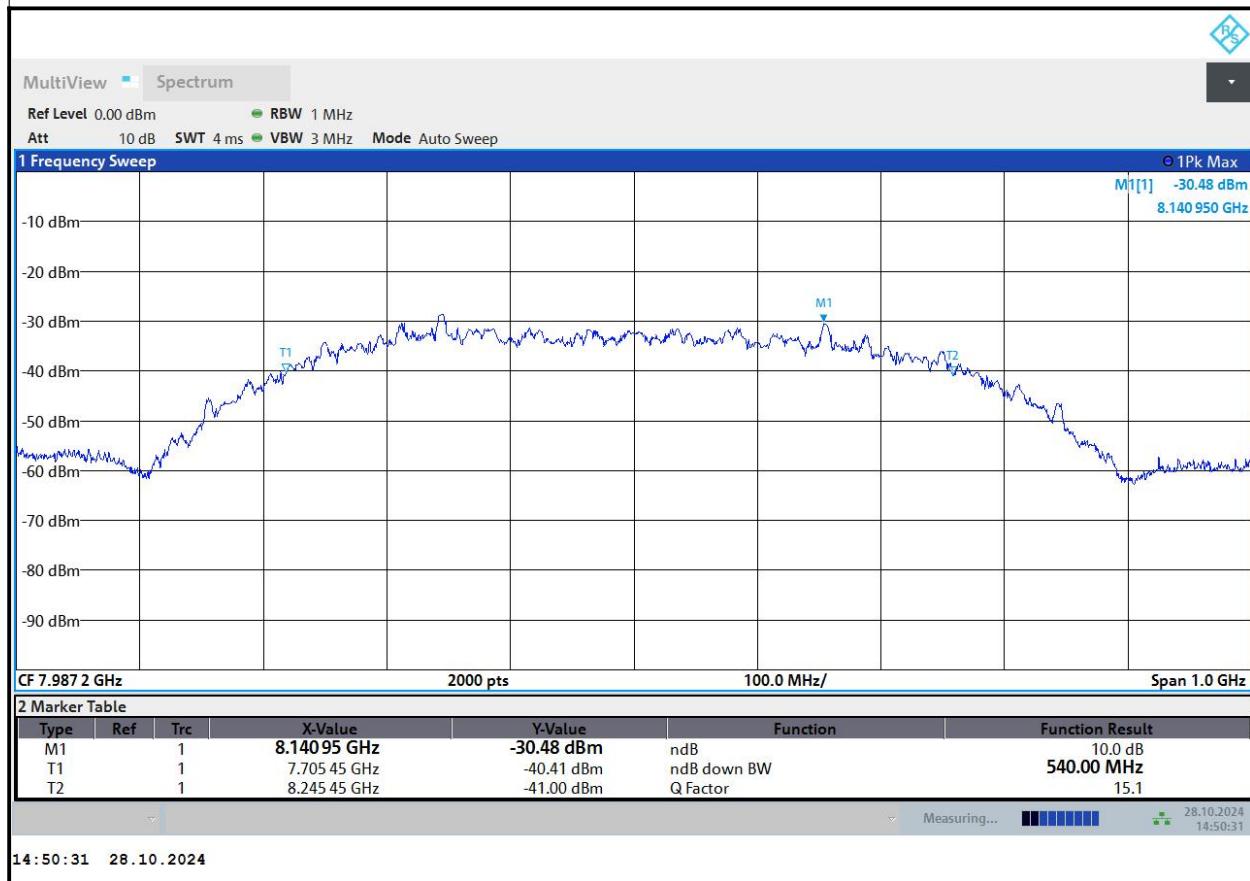
### 3.2.4 TEST RESULTS

| Mode | Measured Frequencies |          | 10dB Bandwidth (MHz) | Operating Limit (MHz)    | OBW Limit (MHz) | Pass/Fail |
|------|----------------------|----------|----------------------|--------------------------|-----------------|-----------|
|      | FL (MHz)             | FH (MHz) |                      |                          |                 |           |
| CH5  | 6231.35              | 6747.85  | 516.5                | FL > 3100 and FH < 10600 | 500             | Pass      |





| Mode | Measured Frequencies |          | 10dB Bandwidth (MHz) | Operating Limit (MHz)    | OBW Limit (MHz) | Pass/Fail |
|------|----------------------|----------|----------------------|--------------------------|-----------------|-----------|
|      | FL (MHz)             | FH (MHz) |                      |                          |                 |           |
| CH9  | 7705.45              | 8245.45  | 540                  | FL > 3100 and FH < 10600 | 500             | Pass      |



### 3.3 99% OCCUPIED BANDWIDTH

#### 3.3.1 LIMIT

Only report

#### 3.3.2 Measurement procedure

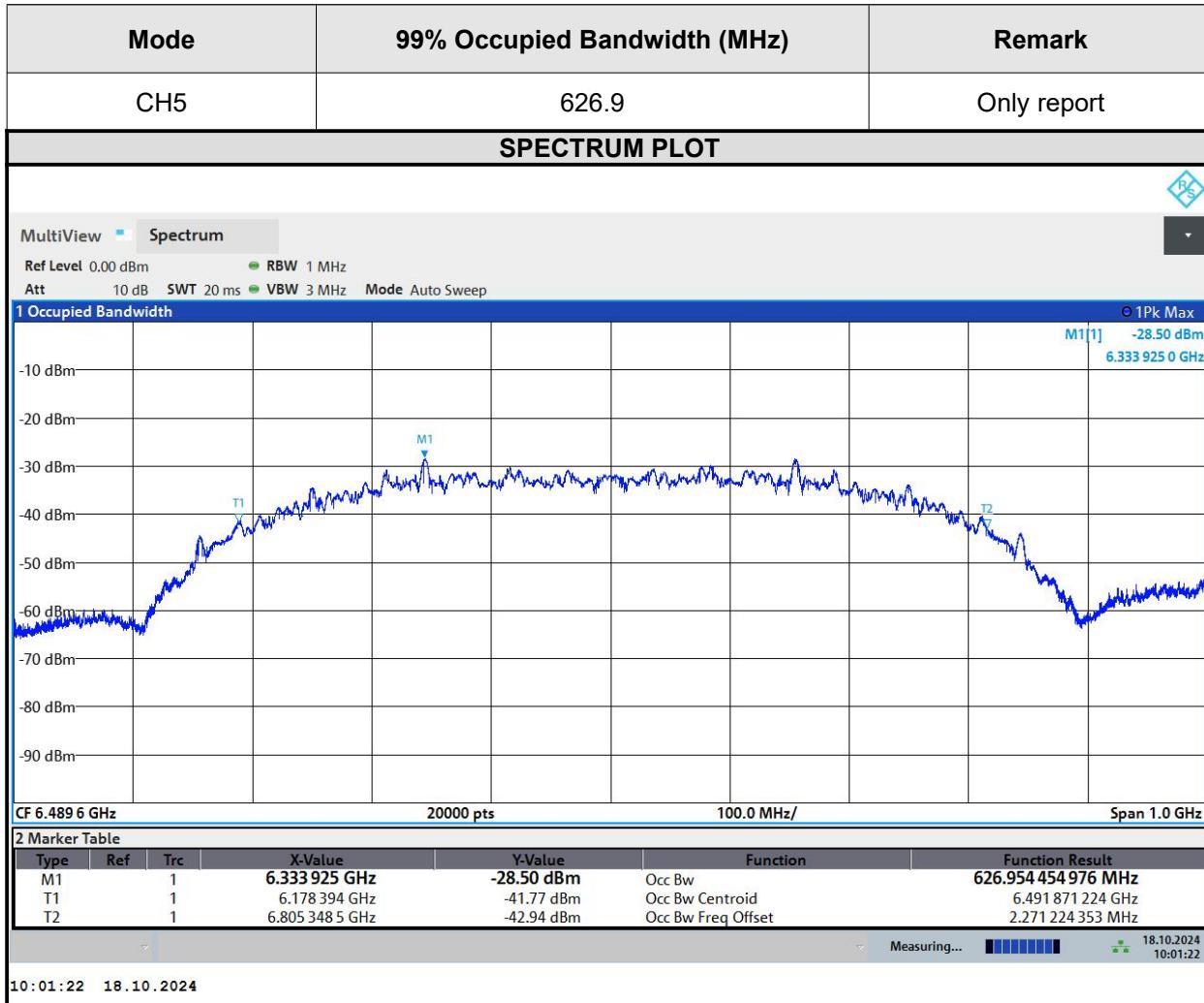
The transmitter antenna output was connected to the spectrum analyzer through an attenuator. The resolution bandwidth shall be set to the range of 1% to 5% of the anticipated emission bandwidth, and a video bandwidth at least 3x the resolution bandwidth. below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 % of the total mean power of a given emission.

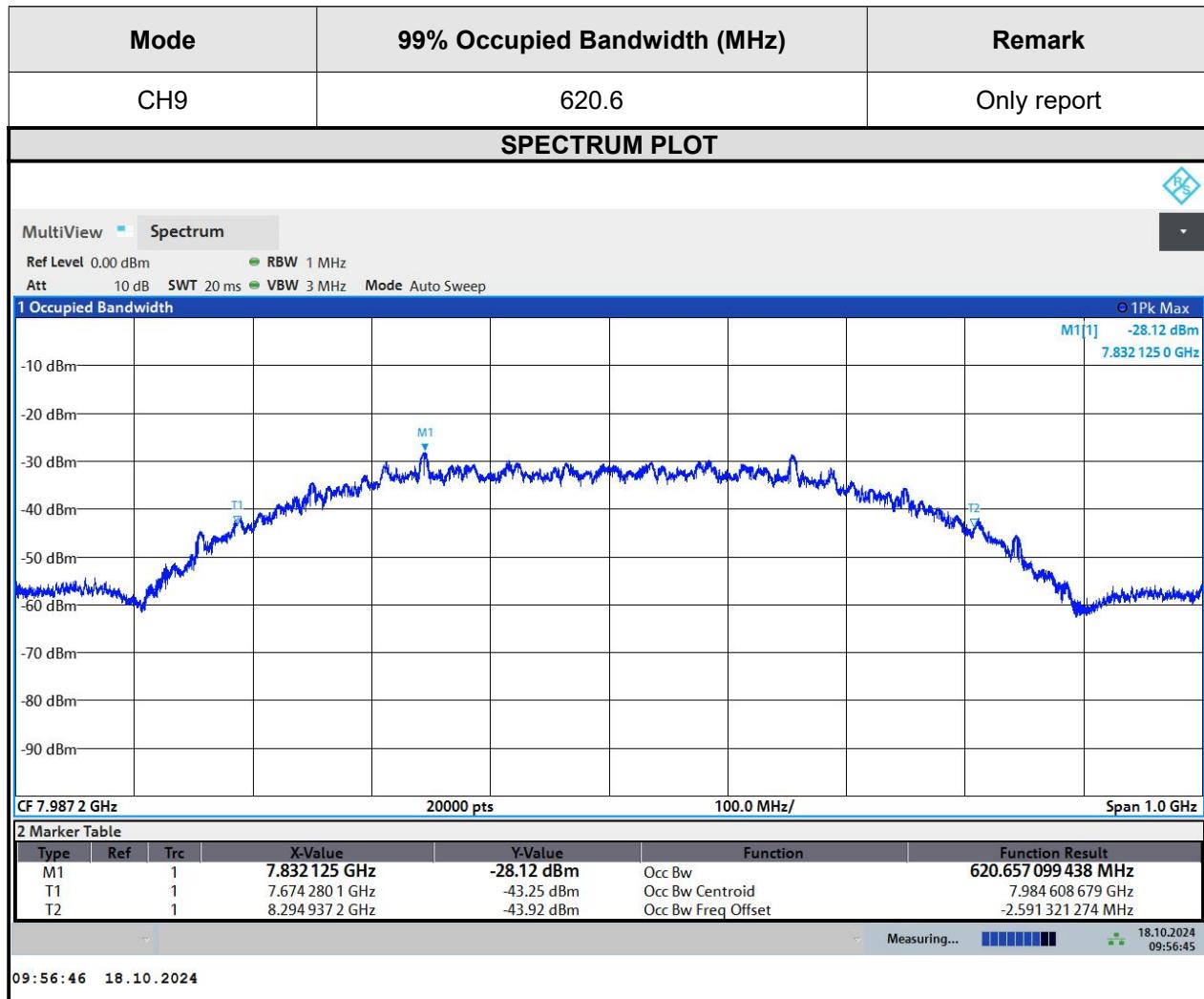
#### 3.3.3 TEST SETUP





### 3.3.4 TEST RESULTS







## 3.4 MAXIMUM PEAK POWER AND AVERAGE EMISSIONS

### 3.4.1 LIMITS

There is a limit on the peak level of the emissions contained within a 50 MHz bandwidth centered on the frequency at which the highest radiated emission occurs, fM. That limit is 0 dBm EIRP.

When a peak measurement is required, it is acceptable to use a resolution bandwidth other than the 50 MHz specified in this subpart. This resolution bandwidth shall not be lower than 1 MHz or greater than 50 MHz, and the measurement shall be centered on the frequency at which the highest radiated emission occurs, fM. If a resolution bandwidth other than 50 MHz is employed, the peak EIRP limit shall be  $20 \log(RBW/50)$  dBm where RBW is the resolution bandwidth in megahertz that is employed. This converted to a peak field strength level at 3 meters using  $E(dBuV/m) = P(dBm EIRP) + 95.2$ .

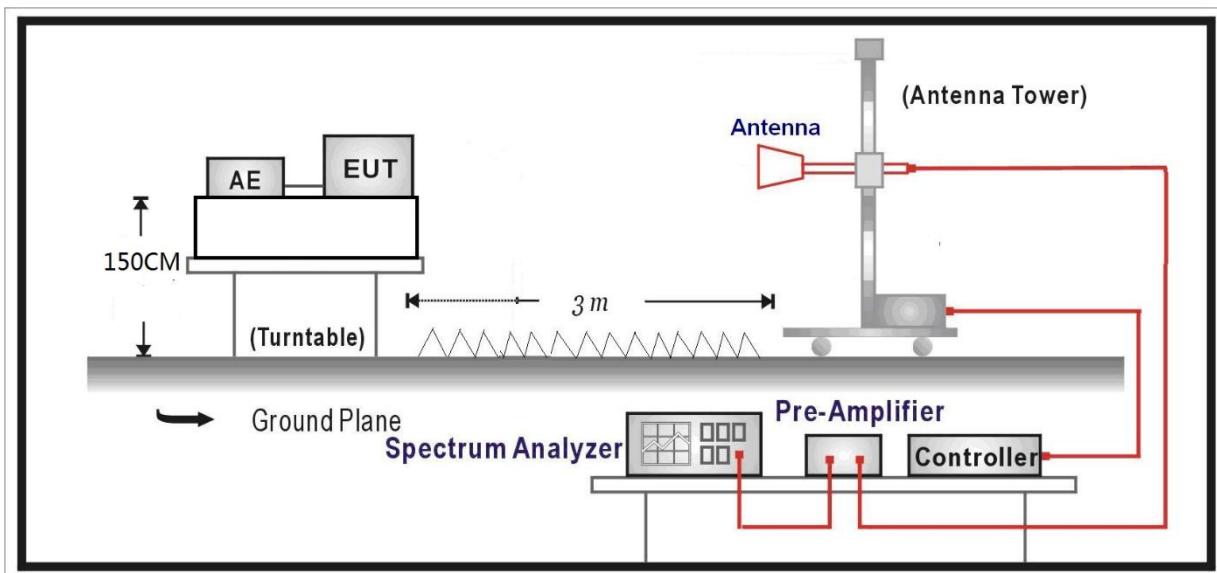
| ITEM               | LIMIT        |
|--------------------|--------------|
| AVERAGE EMISSIONS  | -41.3dBm/MHz |
| MAXIMUM PEAK POWER | 0 dBm/50MHz  |

### 3.4.2 TEST PROCEDURE

- a. The EUT was placed on the top of a rotating table 1.5 meters(above 1GHz) and 0.8 meters(below 1GHz) above the ground at a 3 meters semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. For below 1GHz was used bilog antenna, and above 1GHz was used horn antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. For below 30MHz, a loop antenna with its vertical plane is place 3m from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. And the centre of the loop shall be 1m above the ground.
- g. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, For battery operated equipment, the equipment tests shall be perform using fresh batteries. The turntable was rotated to maximize the emission level.

**NOTE:**

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is  $\geq 1/T$  (Duty cycle < 98%) or 10Hz(Duty cycle > 98%) for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.
5. The testing of the EUT was performed on all 3 orthogonal axes; the worst-case test configuration was reported on the file test setup photo.

**3.4.3 TEST SETUP**

**3.4.4 TEST RESULTS**

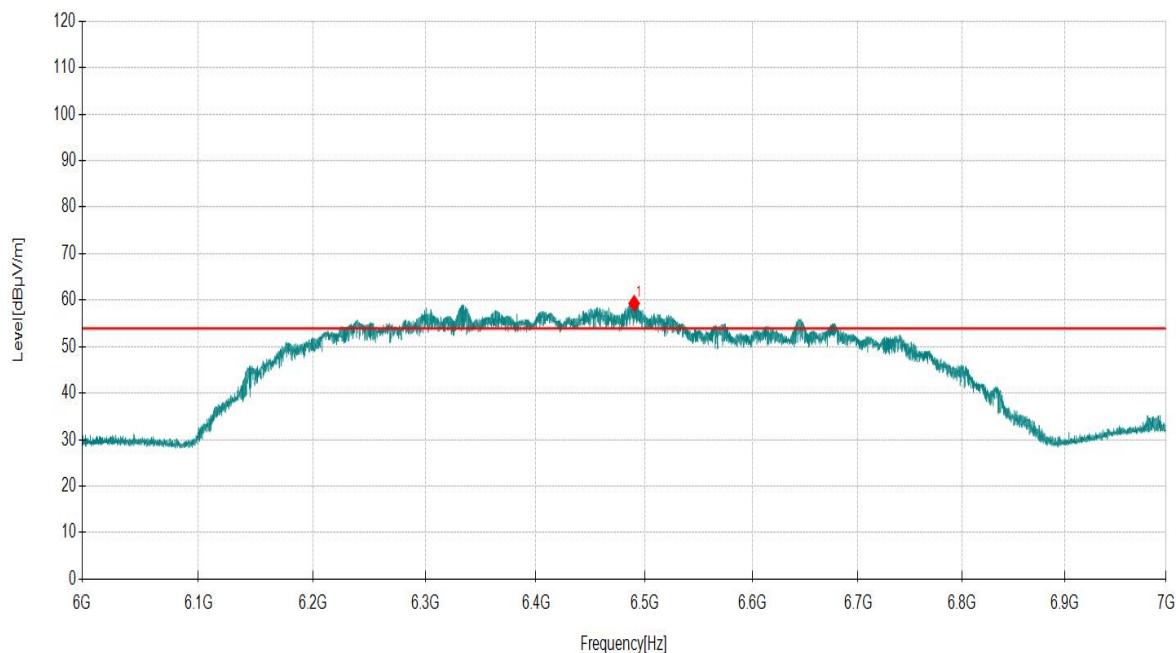
| Mode | Pol(H/V) | Frequency (MHz) | Maximum Peak Power (dBuV/10MHz) | Maximum Peak Power (dBuV/50MHz) | Maximum Peak Power (dBm/50MHz) | (dBm/50MHz) | Pass/Fail |
|------|----------|-----------------|---------------------------------|---------------------------------|--------------------------------|-------------|-----------|
| 1    | V        | 6489.05         | 46.30                           | 60.28                           | -34.92                         | 0           | Pass      |
| 1    | H        | 6490.05         | 59.30*                          | 73.28                           | -21.92                         | 0           | Pass      |
| 2    | V        | 7832.63         | 48.54                           | 62.52                           | -32.68                         | 0           | Pass      |
| 2    | H        | 7986.55         | 57.98                           | 71.96                           | -23.24                         | 0           | Pass      |

Bandwidth correction factor (BWCF)=  $20\log(50\text{MHz}/10\text{MHz}) = 13.98$ 

Maximum Peak Power (dBuV/50MHz) = Maximum Peak Power (dBuV/10MHz) + BWCF

Maximum Peak Power (dBm/50MHz) = Maximum Peak Power (dBuV/50MHz) - 95.2

\*Note: Only the worst test plot



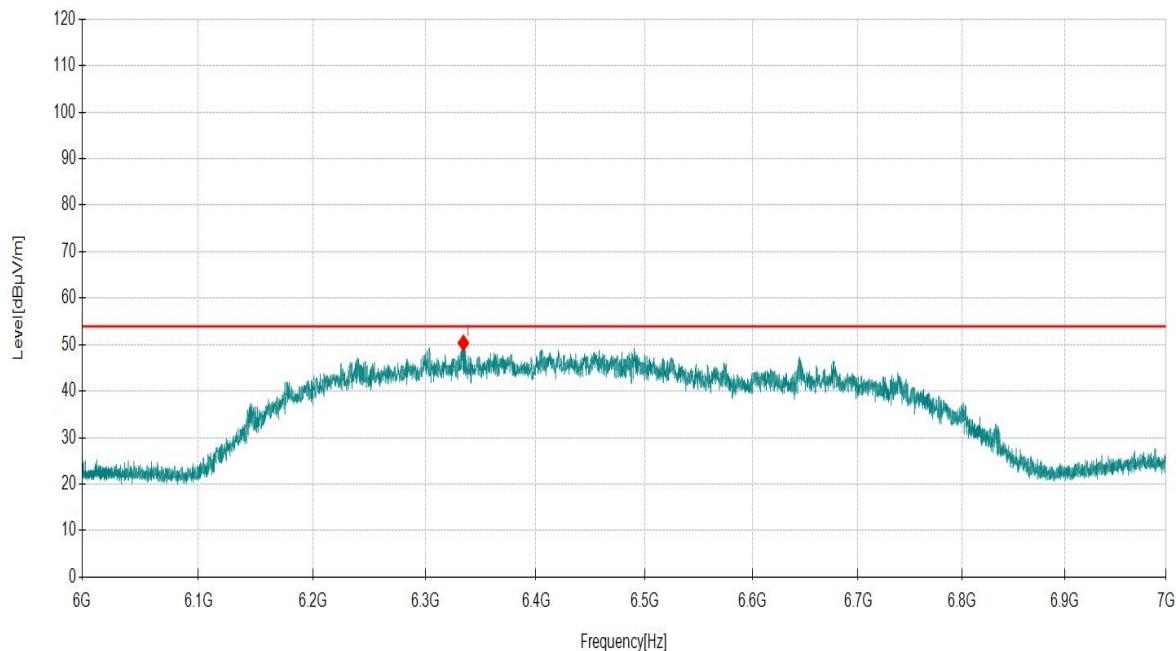
| NO. | Freq. [MHz] | Reading [dBμV] | Factor [dB/m] | Level [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Detector | Polarity |
|-----|-------------|----------------|---------------|----------------|----------------|-------------|----------|----------|
| 1   | 6490.05     | 89.36          | -30.06        | 59.30          | /              | /           | RMS      | Vertical |



| Mode | Frequency (MHz) | Average Emissions (dBuV/MHz) | Average Emissions (dBm/MHz) | Limit(dBm/MHz) | Pass/Fail |
|------|-----------------|------------------------------|-----------------------------|----------------|-----------|
| 1    | H               | 34.38                        | -60.82                      | -41.3          | Pass      |
| 1    | V               | 50.36*                       | -44.84                      | -41.3          | Pass      |
| 2    | H               | 48.58                        | -46.62                      | -41.3          | Pass      |
| 2    | V               | 38.20                        | -57.00                      | -41.3          | Pass      |

Average Emissions (dBm/MHz) = Average Emissions (dBuV/MHz) -95.2

\*Note: Only the worst test plot



| NO. | Freq. [MHz] | Reading [dB $\mu$ V] | Factor [dB/m] | Level [dB $\mu$ V/m] | Limit [dB $\mu$ V/m] | Margin [dB] | Detector | Polarity |
|-----|-------------|----------------------|---------------|----------------------|----------------------|-------------|----------|----------|
| 1   | 6334.33     | 80.61                | -30.25        | 50.36                | 53.93                | 3.57        | RMS      | Vertical |

## 3.5 CEASE TRANSMISSION TIME

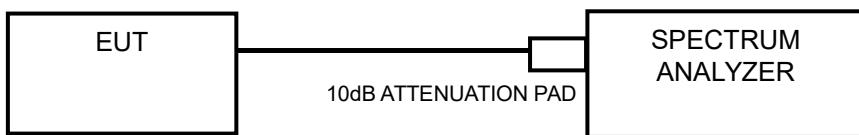
### 3.5.1 LIMIT

The UWB intentional radiator shall cease transmission within 10 seconds unless it receives an acknowledgement from the associated receiver that its transmission is being received. An acknowledgment of reception must continue to be received by the UWB intentional radiator at least every 10 seconds or the UWB device must cease transmitting.

### 3.5.2 TEST PROCEDURES

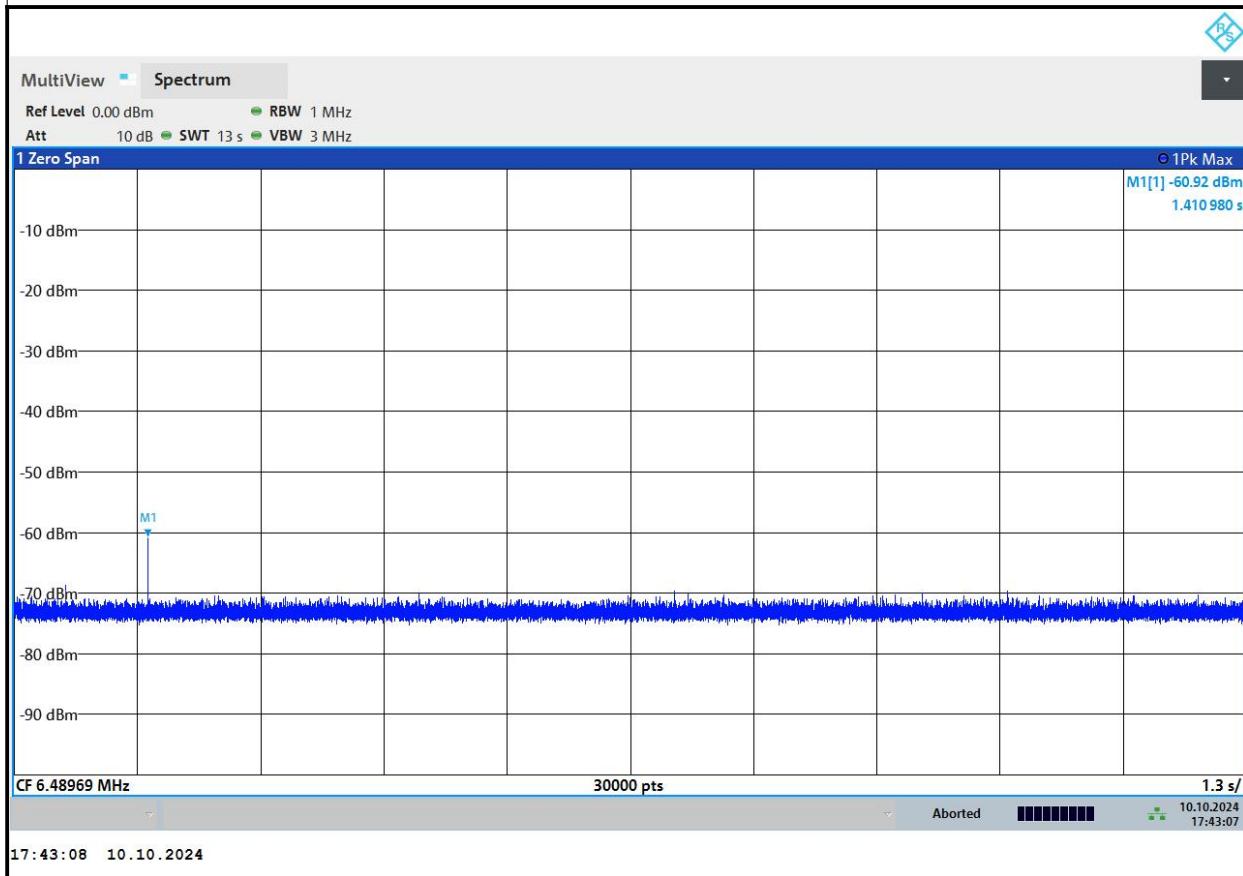
With the EUT's antenna attached, the EUT's output signal was received by the test antenna, which was connected to the spectrum analyzer set the center frequency, than set the spectrum analyzer to Zero Span for the release time reading. During the testing, the transmission duration was measured and recorded.

### 3.5.3 TEST SETUP



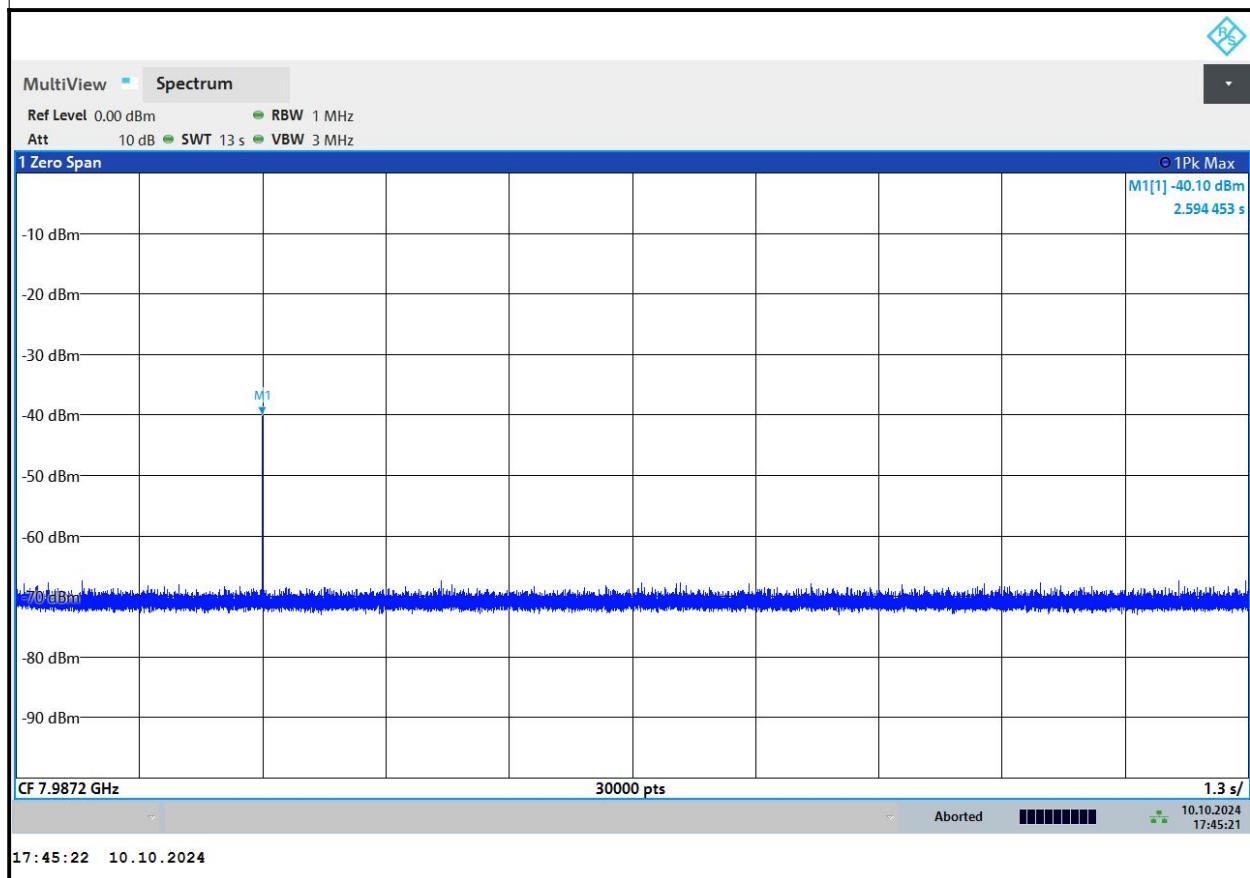


| FREQUENCY (MHz) | MEASUREMENT RESULT (sec) | MAXIMUM LIMIT (sec) | PASS/FAIL |
|-----------------|--------------------------|---------------------|-----------|
| 6489.6          | 1.41098                  | 13                  | PASS      |





| FREQUENCY (MHz) | MEASUREMENT RESULT (sec) | MAXIMUM LIMIT (sec) | PASS/FAIL |
|-----------------|--------------------------|---------------------|-----------|
| 7.9872          | 2.594453                 | 13                  | PASS      |





## 3.6 ANTENNA REQUIREMENT

### 3.6.1 LIMITS OFFREQUENCY STABILITY

For intentional device, according to FCC 47 CFR Section 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 FCC 47 CFR Section 15.247 (b) , 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 6 dBi.

### 3.6.2 ANTENNA ANTI-REPLACEMENT CONSTRUCTION

The antenna used for this product is Double copper tube Antenna and that no antenna other than that furnished by the responsible party shall be used with the device

### 3.6.3 ANTENNA GAIN

UWB share a single antenna maximum peak value is 2.72dBm



## 4 PHOTOGRAPHS OF TEST SETUP

Please refer to the attached file (Test Photos).



## 5 PHOTOGRAPHS OF THE EUT

Please refer to the attached file (External Photos report and Internal Photos).



## Important

- (1) The test report is invalid without the official stamp of CVC;
- (2) Any part photocopies of the test report are forbidden without the written permission from CVC;
- (3) The test report is invalid without the signatures of Approval and Reviewer;
- (4) The test report is invalid if altered;
- (5) Objections to the test report must be submitted to CVC within 15 days.
- (6) Generally, commission test is responsible for the tested samples only.
- (7) As for the test result “-” or “N” means “not applicable”, “/” means “not test”, “P” means “pass” and “F” means “fail”

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<http://www.cvc.org.cn>