



# RF TEST REPORT

**Applicant** Positec Technology (China)Co., Ltd  
**FCC ID** 2ASC3WA0866  
**Product** Anti-Theft GPS Tracker  
**Model** WA0866,WA0866.x  
**Brand** WORX  
**Report No.** R1812A0591-R2  
**Issue Date** January 31, 2019

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC CFR47 Part 2 (2018)/ FCC CFR 47 Part 24E (2018)**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

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## Summary of measurement results

| No.                                                                                                                                                             | Test Case                               | Clause in FCC rules        | Verdict                                |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|----------------------------|----------------------------------------|
| 1                                                                                                                                                               | RF power output                         | 2.1046                     | refer to Report No: RXA1706-0199RF02R1 |
| 2                                                                                                                                                               | Effective Isotropic Radiated power      | 24.232(c)                  | PASS                                   |
| 3                                                                                                                                                               | Occupied Bandwidth                      | 2.1049                     | refer to Report No: RXA1706-0199RF02R1 |
| 4                                                                                                                                                               | Band Edge Compliance                    | 2.1051 /24.238(a)          | refer to Report No: RXA1706-0199RF02R1 |
| 5                                                                                                                                                               | Peak-to-Average Power Ratio             | 24.232/KDB 971168 D01(5.7) | refer to Report No: RXA1706-0199RF02R1 |
| 6                                                                                                                                                               | Frequency Stability                     | 2.1055 / 24.235            | refer to Report No: RXA1706-0199RF02R1 |
| 7                                                                                                                                                               | Spurious Emissions at Antenna Terminals | 2.1051 / 24.238(a)         | refer to Report No: RXA1706-0199RF02R1 |
| 8                                                                                                                                                               | Radiates Spurious Emission              | 2.1053 / 24.238(a)         | PASS                                   |
| Date of Testing: December 28, 2018~ January 14,2019                                                                                                             |                                         |                            |                                        |
| Note: PASS: The EUT complies with the essential requirements in the standard.<br>FAIL: The EUT does not comply with the essential requirements in the standard. |                                         |                            |                                        |

**This report only tested Effective Radiated Power and Radiates Spurious Emission. For other test items, please refer to Report No: RXA1706-0199RF02R1.**

## 1. Test Laboratory

### 1.1. Notes of the test report

This report shall not be reproduced in full or partial, without the written approval of **TA technology (shanghai) co., Ltd.** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. Measurement Uncertainties were not taken into account and are published for informational purposes only. This report is written to support regulatory compliance of the applicable standards stated above.

### 1.2. Test facility

#### **CNAS (accreditation number: L2264)**

TA Technology (Shanghai) Co., Ltd. has obtained the accreditation of China National Accreditation Service for Conformity Assessment (CNAS).

#### **FCC (Designation number: CN1179, Test Firm Registration Number: 446626)**

TA Technology (Shanghai) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

#### **IC (recognition number is 8510A)**

TA Technology (Shanghai) Co., Ltd. has been listed by industry Canada to perform electromagnetic emission measurement.

#### **VCCI (recognition number is C-4595, T-2154, R-4113, G-10766)**

TA Technology (Shanghai) Co., Ltd. has been listed by industry Japan to perform electromagnetic emission measurement.

#### **A2LA (Certificate Number: 3857.01)**

TA Technology (Shanghai) Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.



### 1.3. Testing Location

Company: TA Technology (Shanghai) Co., Ltd.  
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## 2. General Description of Equipment under Test

### Client Information

|                      |                                                                   |
|----------------------|-------------------------------------------------------------------|
| Applicant            | Positec Technology (China)Co., Ltd                                |
| Applicant address    | 18,Dongwang Road,Suzhou Industrial park,Jiangsu 215123,P.R. China |
| Manufacturer         | Positec Technology (China)Co., Ltd                                |
| Manufacturer address | 18,Dongwang Road,Suzhou Industrial park,Jiangsu 215123,P.R. China |

### General information

| EUT Description                                                      |                                  |             |             |
|----------------------------------------------------------------------|----------------------------------|-------------|-------------|
| Model                                                                | WA0866,WA0866.x                  |             |             |
| IMEI                                                                 | /                                |             |             |
| Hardware Version                                                     | R1.0.3                           |             |             |
| Software Version                                                     | V1.60                            |             |             |
| Power Supply                                                         | Battery                          |             |             |
| Antenna Type                                                         | Internal Antenna                 |             |             |
| Antenna Gain                                                         | 3.41dBi                          |             |             |
| Test Mode(s)                                                         | GSM1900; LTE Band 2/25;          |             |             |
| Test Modulation                                                      | (GSM)GMSK,8PSK; (LTE)QPSK,16QAM  |             |             |
| LTE Category                                                         | M1                               |             |             |
| Maximum E.I.R.P                                                      | GSM 1900:                        | 28.67dBm    |             |
|                                                                      | LTE Band 2:                      | 25.29dBm    |             |
| Rated Power Supply Voltage                                           | 5V                               |             |             |
| Extreme Voltage                                                      | Minimum: 4.81V     Maximum: 7V   |             |             |
| Extreme Temperature                                                  | Lowest: -25°C     Highest: +75°C |             |             |
| Operating Frequency Range(s)                                         | Band                             | Tx (MHz)    | Rx (MHz)    |
|                                                                      | GSM1900                          | 1850 ~ 1910 | 1930 ~ 1990 |
|                                                                      | LTE Band 2                       | 1850 ~ 1910 | 1930 ~ 1990 |
| Note: 1. The information of the EUT is declared by the manufacturer. |                                  |             |             |



### **3. Applied Standards**

According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

**FCC CFR47 Part 2 (2018)**

**FCC CFR 47 Part 24E (2018)**

**ANSI C63.26 (2015)**

**KDB 971168 D01 Power Meas License Digital Systems v03r01**

## 4. Test Configuration

Radiated measurements are performed by rotating the EUT in three different orthogonal test planes. EUT stand-up position (Z axis), lie-down position (X, Y axis). Receiver antenna polarization (horizontal and vertical), the worst emission was found in position (X axis, horizontal polarization) and the worst case was recorded.

All mode and data rates and positions and RB size and modulations were investigated.

Subsequently, only the worst case emissions are reported.

The following testing in GSM /LTE is set based on the maximum RF Output Power.

Test modes are chosen to be reported as the worst case configuration below:

| Test items                         | Modes/Modulation                  |
|------------------------------------|-----------------------------------|
|                                    | GSM 1900                          |
| Effective Isotropic Radiated power | GPRS(1Tx slot)<br>EGPRS(1Tx slot) |
| Radiates Spurious Emission         | GPRS(1Tx slot)                    |

Test modes are chosen to be reported as the worst case configuration below for LTE Band 2:

| Test items                         | Bandwidth (MHz)                                                                                                                       |   |   |    |    |    | Modulation |       | RB |     |      | Test Channel |   |   |
|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|---|---|----|----|----|------------|-------|----|-----|------|--------------|---|---|
|                                    | 1.4                                                                                                                                   | 3 | 5 | 10 | 15 | 20 | QPSK       | 16QAM | 1  | 50% | 100% | L            | M | H |
| Effective Isotropic Radiated power | O                                                                                                                                     | O | O | O  | O  | O  | O          | O     | O  | O   | O    | O            | O | O |
| Radiates Spurious Emission         | O                                                                                                                                     | - | O | -  | -  | O  | O          | -     | O  | -   | -    | O            | O | O |
| Note                               | 1. The mark "O" means that this configuration is chosen for testing.<br>2. The mark "-" means that this configuration is not testing. |   |   |    |    |    |            |       |    |     |      |              |   |   |

## 5. Test Case Results

### 5.1. Effective Isotropic Radiated Power

#### Ambient condition

| Temperature | Relative humidity | Pressure |
|-------------|-------------------|----------|
| 23°C ~25°C  | 45%~50%           | 101.5kPa |

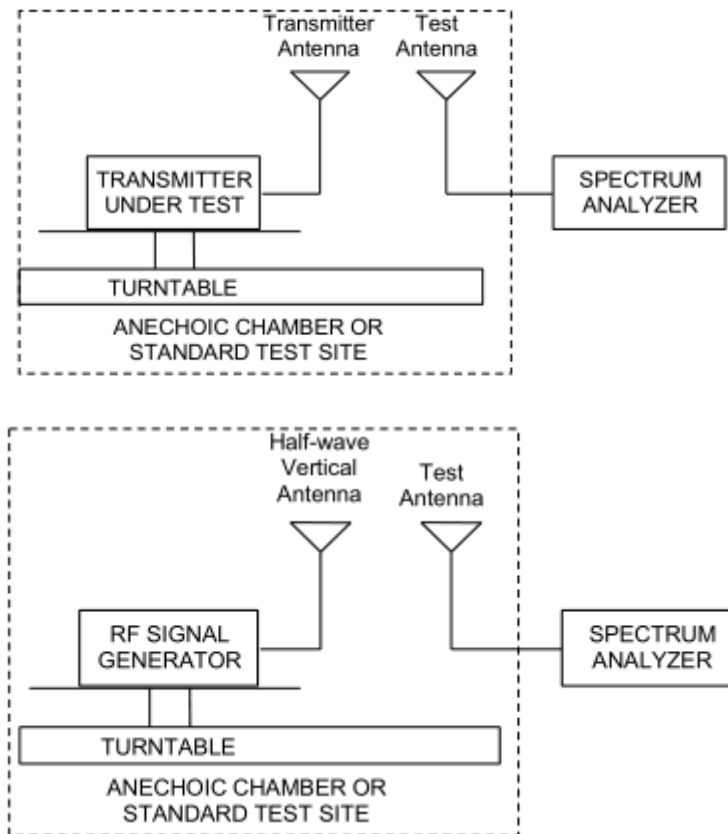
#### Methods of Measurement

The testing follows FCC KDB 971168 v03r01 Section 5.8 and ANSI C63.26 (2015).

- Connect the equipment as illustrated. Mount the equipment with the manufacturer specified antenna in a vertical orientation on a manufacturer specified mounting surface located on a non-conducting rotating platform of a RF anechoic chamber (preferred) or a standard radiation site.
- Key the transmitter, then rotate the EUT 360° azimuthally and record spectrum analyzer power level (LVL) measurements at angular increments that are sufficiently small to permit resolution of all peaks. If a standard radiation test site is used, raise and lower the test antenna to obtain a maximum reading at each angular increment. (Note: several batteries may be needed to offset the effect of battery voltage droop, which should not exceed 5% of the manufactured specified battery voltage during transmission).
- Replace the transmitter under test with a vertically polarized half-wave dipole (or an antenna whose gain is known relative to an ideal half-wave dipole). The center of the antenna should be at the same location as the center of the antenna under test.
- Connect the antenna to a signal generator with a known output power and record the path loss (in dB) as LOSS. If a standard radiation test site is used, raise and lower the test antenna to obtain a maximum reading.  $LOSS = \text{Generator Output Power (dBm)} - \text{Analyzer reading (dBm)}$
- Determine the effective radiated output power at each angular position from the readings in steps b) and d) using the following equation:  $ERP \text{ (dBm)} = LVL \text{ (dBm)} + LOSS \text{ (dB)}$
- The maximum ERP is the maximum value determined in the preceding step.
- When calculating ERP, in addition to knowing the antenna radiation and matching characteristics, it is necessary to know the loss values of all elements (e.g. transmission line attenuation, mismatches, filters, combiners) interposed between the point where transmitter output power is measured, and the point where power is applied to the antenna. ERP can then be calculated as follows:  
 $EIRP \text{ (dBm)} = \text{Output Power (dBm)} - \text{Losses (dB)} + \text{Antenna Gain (dBi)}$   
where: dBd refers to gain relative to an ideal dipole.  
 $EIRP \text{ (dBm)} = ERP \text{ (dBm)} + 2.15 \text{ (dB)}$

The RB allocation refers to section 5.1, using the maximum output power configuration.

## Test setup



## Limits

Rule Part 24.232(c) Mobile and portable stations are limited to 2 watts EIRP.

Rule Part 24.232(e) Peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage.

|       |                             |
|-------|-----------------------------|
| Limit | $\leq 2 \text{ W}$ (33 dBm) |
|-------|-----------------------------|

## Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor  $k = 2$ ,  $U = 1.19 \text{ dB}$

**Test Results:**

The measurement is performed for both of horizontal and vertical antenna Polarization, and only the data of worst mode is recorded in this report.

| Mode              | Channel | Frequency (MHz) | Polarization | EIRP (dBm) | Limit (dBm) | Conclusion |
|-------------------|---------|-----------------|--------------|------------|-------------|------------|
| <b>GPRS 1900</b>  | Low     | 1850.2          | Horizontal   | 28.67      | 33          | Pass       |
|                   | Mid     | 1880            | Horizontal   | 28.64      | 33          | Pass       |
|                   | High    | 1909.8          | Horizontal   | 28.49      | 33          | Pass       |
| <b>EGPRS 1900</b> | Low     | 1850.2          | Horizontal   | 25.01      | 33          | Pass       |
|                   | Mid     | 1880            | Horizontal   | 24.87      | 33          | Pass       |
|                   | High    | 1909.8          | Horizontal   | 25.73      | 33          | Pass       |



| LTE Band 2      |                            |              |     |       |           |       |            |
|-----------------|----------------------------|--------------|-----|-------|-----------|-------|------------|
| Bandwidth       | Channel/<br>Frequency(MHz) | Polarization | RB  | Index | EIRP(dBm) | Limit | Conclusion |
| 1.4MHz<br>QPSK  | 18607/1850.7               | H            | 1#0 | 0     | 25.09     | 33    | Pass       |
|                 | 18900/1880                 | H            | 1#2 | 0     | 24.89     | 33    | Pass       |
|                 | 19193/1909.3               | H            | 1#5 | 0     | 24.58     | 33    | Pass       |
| 3MHz<br>QPSK    | 18615/1851.5               | H            | 1#0 | 0     | 25.13     | 33    | Pass       |
|                 | 18900/1880                 | H            | 1#5 | 0     | 24.98     | 33    | Pass       |
|                 | 19185/1908.5               | H            | 1#5 | 1     | 24.67     | 33    | Pass       |
| 5MHz<br>QPSK    | 18625/1852.5               | H            | 1#0 | 0     | 25.23     | 33    | Pass       |
|                 | 18900/1880                 | H            | 1#5 | 1     | 25.11     | 33    | Pass       |
|                 | 19175/1907.5               | H            | 1#5 | 3     | 24.87     | 33    | Pass       |
| 10MHz<br>QPSK   | 18650/1855                 | H            | 4#0 | 0     | 25.19     | 33    | Pass       |
|                 | 18900/1880                 | H            | 4#2 | 3     | 25.03     | 33    | Pass       |
|                 | 19150/1905                 | H            | 4#2 | 7     | 24.59     | 33    | Pass       |
| 15MHz<br>QPSK   | 18675/1857.5               | H            | 1#0 | 0     | 25.29     | 33    | Pass       |
|                 | 18900/1880                 | H            | 1#5 | 5     | 25.07     | 33    | Pass       |
|                 | 19125/1902.5               | H            | 1#5 | 11    | 24.97     | 33    | Pass       |
| 20MHz<br>QPSK   | 18700/1860                 | H            | 6#0 | 0     | 25.17     | 33    | Pass       |
|                 | 18900/1880                 | H            | 6#0 | 7     | 25.11     | 33    | Pass       |
|                 | 19100/1900                 | H            | 6#0 | 15    | 24.97     | 33    | Pass       |
| 1.4MHz<br>16QAM | 18607/1850.7               | H            | 1#0 | 0     | 24.67     | 33    | Pass       |
|                 | 18900/1880                 | H            | 1#2 | 0     | 24.47     | 33    | Pass       |
|                 | 19193/1909.3               | H            | 1#5 | 0     | 24.11     | 33    | Pass       |
| 3MHz<br>16QAM   | 18615/1851.5               | H            | 1#0 | 0     | 24.68     | 33    | Pass       |
|                 | 18900/1880                 | H            | 1#5 | 0     | 24.43     | 33    | Pass       |
|                 | 19185/1908.5               | H            | 1#5 | 1     | 24.27     | 33    | Pass       |
| 5MHz<br>16QAM   | 18625/1852.5               | H            | 1#0 | 0     | 24.76     | 33    | Pass       |
|                 | 18900/1880                 | H            | 1#5 | 1     | 24.53     | 33    | Pass       |
|                 | 19175/1907.5               | H            | 1#5 | 3     | 24.32     | 33    | Pass       |
| 10MHz<br>16QAM  | 18650/1855                 | H            | 4#0 | 0     | 24.65     | 33    | Pass       |
|                 | 18900/1880                 | H            | 4#2 | 3     | 24.51     | 33    | Pass       |
|                 | 19150/1905                 | H            | 4#2 | 7     | 24.13     | 33    | Pass       |
| 15MHz<br>16QAM  | 18675/1857.5               | H            | 1#0 | 0     | 24.68     | 33    | Pass       |
|                 | 18900/1880                 | H            | 1#5 | 5     | 24.56     | 33    | Pass       |
|                 | 19125/1902.5               | H            | 1#5 | 11    | 24.43     | 33    | Pass       |
| 20MHz<br>16QAM  | 18700/1860                 | H            | 6#0 | 0     | 24.68     | 33    | Pass       |
|                 | 18900/1880                 | H            | 6#0 | 7     | 24.67     | 33    | Pass       |
|                 | 19100/1900                 | H            | 6#0 | 15    | 24.51     | 33    | Pass       |

## 5.2.Radiates Spurious Emission

### Ambient condition

| Temperature | Relative humidity | Pressure |
|-------------|-------------------|----------|
| 23°C ~25°C  | 45%~50%           | 101.5kPa |

### Method of Measurement

1. The testing follows FCC KDB 971168 v03r01 Section 5.8 and ANSI C63.26 (2015).
2. Below 1GHz: The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H). Above 1GHz: (Note: the FCC's permission to use 1.5m as an alternative per TCBC Conf call of Dec. 2, 2014.) The EUT is placed on a turntable 1.5 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).
3. A loop antenna, A log-periodic antenna or horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.
4. The EUT is then put into continuously transmitting mode at its maximum power level during the test. Set Test Receiver or Spectrum RBW=200Hz,VBW=600Hz for 9kHz150kHz , RBW=10kHz, VBW=30kHz 150kHz-30MHz , RBW=100kHz,VBW=300kHz for 30MHz to 1GHz and RBW=1MHz, VBW=3MHz for above 1GHz, And the maximum value of the receiver should be recorded as (Pr).
5. The EUT shall be replaced by a substitution antenna. In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (PMea) is applied to the input of the substitution antenna, and adjust the level of the signal generator output until the value of the receiver reach the previously recorded (Pr). The power of signal source (PMea) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.
6. A amplifier should be connected to the Signal Source output port. And the cable should be connect between the Amplifier and the Substitution Antenna. The cable loss (Pcl) ,the Substitution Antenna Gain (Ga) and the Amplifier Gain (PAg) should be recorded after test.
7. The measurement results are obtained as described below:  

$$\text{Power(EIRP)} = \text{PMea} - \text{PAg} - \text{Pcl} + \text{Ga}$$
The measurement results are amend as described below:  

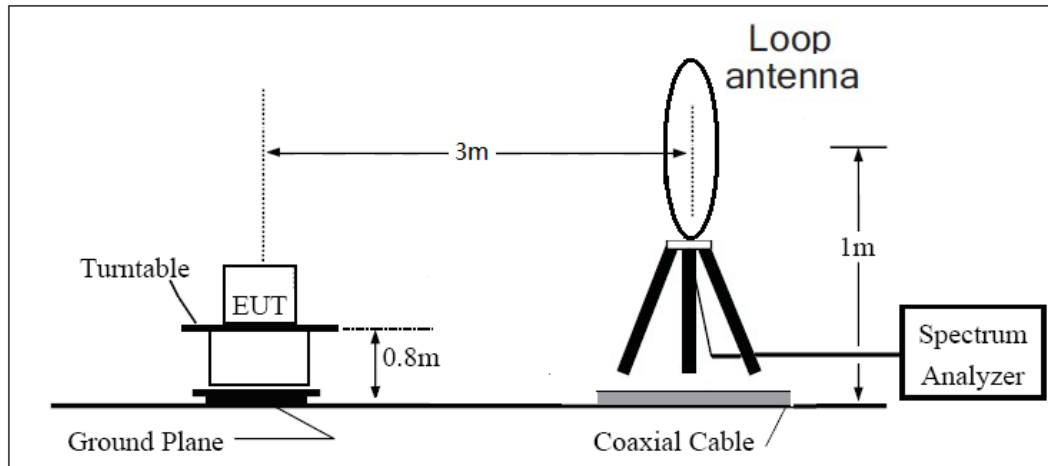
$$\text{Power(EIRP)} = \text{PMea} - \text{Pcl} + \text{Ga}$$
8. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power. ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP

= EIRP-2.15dBi.

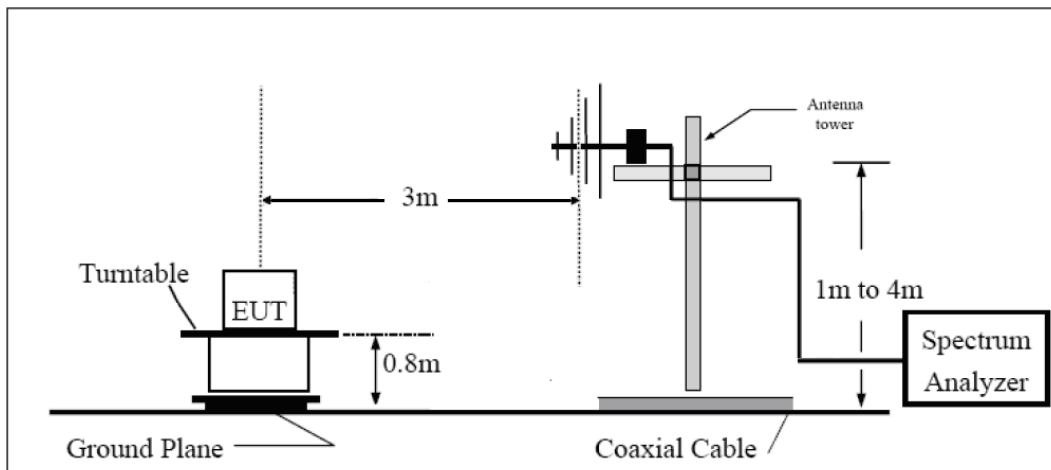
The modulation mode and RB allocation refer to section 5.1, using the maximum output power configuration.

### Test setup

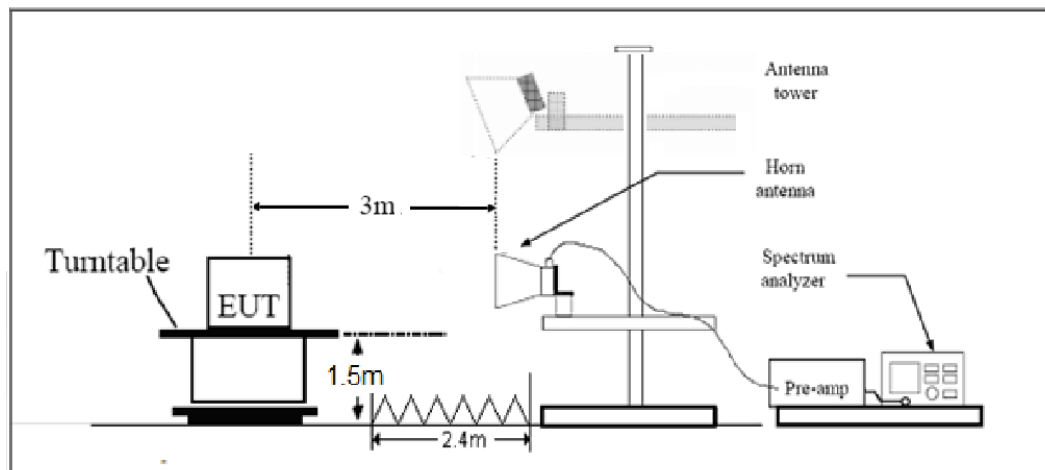
#### 9KHz ~ 30MHz



#### 30MHz ~ 1GHz



#### Above 1GHz



Note: Area side: 2.4mX3.6m

**Limits**

Rule Part 24.238(a) specifies that “on any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log_{10} (P)$  dB.”

|       |         |
|-------|---------|
| Limit | -13 dBm |
|-------|---------|

**Measurement Uncertainty**

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor  $k = 1.96$ ,  $U = 3.55$  dB.

## Test Result

Sweep the whole frequency band through the range from 9kHz to the 10th harmonic of the carrier, the emissions below the noise floor will not be recorded in the report.

### GSM 1900 CH-Low

| Harmonic | Frequency (MHz) | SG (dBm) | Cable Loss (dB) | Gain (dBi) | Antenna Polarization | EIRP Level (dBm) | Limit (dBm) | Margin (dB) | Azimuth (deg) |
|----------|-----------------|----------|-----------------|------------|----------------------|------------------|-------------|-------------|---------------|
| 2        | 3700.4          | -56.49   | 5.10            | 11.05      | Horizontal           | -50.54           | -13.00      | 37.54       | 225           |
| 3        | 5550.6          | -59.44   | 5.42            | 12.65      | Horizontal           | -52.21           | -13.00      | 39.21       | 180           |
| 4        | 7400.8          | -54.43   | 6.70            | 13.85      | Horizontal           | -47.28           | -13.00      | 34.28       | 180           |
| 5        | 9251.0          | -54.29   | 7.01            | 14.75      | Horizontal           | -46.55           | -13.00      | 33.55       | 45            |
| 6        | 11101.2         | -51.89   | 7.48            | 15.95      | Horizontal           | -43.42           | -13.00      | 30.42       | 135           |
| 7        | 12951.4         | -52.63   | 7.51            | 16.55      | Horizontal           | -43.59           | -13.00      | 30.59       | 90            |
| 8        | 14801.6         | -51.03   | 8.24            | 15.35      | Horizontal           | -43.92           | -13.00      | 30.92       | 225           |
| 9        | 16651.8         | -50.38   | 8.41            | 14.95      | Horizontal           | -43.84           | -13.00      | 30.84       | 135           |
| 10       | 18502.0         | -        | -               | -          | -                    | -                | -           | -           | -             |

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

2.The worst emission was found in the antenna is Horizontal position.

### GSM 1900 CH-Middle

| Harmonic | Frequency (MHz) | SG (dBm) | Cable Loss (dB) | Gain (dBi) | Antenna Polarization | EIRP Level (dBm) | Limit (dBm) | Margin (dB) | Azimuth (deg) |
|----------|-----------------|----------|-----------------|------------|----------------------|------------------|-------------|-------------|---------------|
| 2        | 3760.0          | -59.00   | 5.10            | 11.05      | Horizontal           | -53.05           | -13.00      | 40.05       | 225           |
| 3        | 5640.0          | -59.04   | 5.42            | 12.65      | Horizontal           | -51.81           | -13.00      | 38.81       | 270           |
| 4        | 7520.0          | -55.84   | 6.70            | 13.85      | Horizontal           | -48.69           | -13.00      | 35.69       | 135           |
| 5        | 9400.0          | -54.65   | 7.01            | 14.75      | Horizontal           | -46.91           | -13.00      | 33.91       | 225           |
| 6        | 11280.0         | -52.83   | 7.48            | 15.95      | Horizontal           | -44.36           | -13.00      | 31.36       | 180           |
| 7        | 13160.0         | -51.91   | 7.51            | 16.55      | Horizontal           | -42.87           | -13.00      | 29.87       | 180           |
| 8        | 15040.0         | -52.47   | 8.24            | 15.35      | Horizontal           | -45.36           | -13.00      | 32.36       | 45            |
| 9        | 16920.0         | -49.37   | 8.41            | 14.95      | Horizontal           | -42.83           | -13.00      | 29.83       | 135           |
| 10       | 18800.0         | -        | -               | -          | -                    | -                | -           | -           | -             |

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

2. The worst emission was found in the antenna is Horizontal position.



## GSM 1900 CH-High

| Harmonic | Frequency (MHz) | SG (dBm) | Cable Loss (dB) | Gain (dBi) | Antenna Polarization | EIRP Level (dBm) | Limit (dBm) | Margin (dB) | Azimuth (deg) |
|----------|-----------------|----------|-----------------|------------|----------------------|------------------|-------------|-------------|---------------|
| 2        | 3819.6          | -58.85   | 5.10            | 11.05      | Horizontal           | -52.90           | -13.00      | 39.90       | 225           |
| 3        | 5729.4          | -58.83   | 5.42            | 12.65      | Horizontal           | -51.60           | -13.00      | 38.60       | 90            |
| 4        | 7639.2          | -55.26   | 6.70            | 13.85      | Horizontal           | -48.11           | -13.00      | 35.11       | 225           |
| 5        | 9549.0          | -55.06   | 7.01            | 14.75      | Horizontal           | -47.32           | -13.00      | 34.32       | 315           |
| 6        | 11458.8         | -52.36   | 7.48            | 15.95      | Horizontal           | -43.89           | -13.00      | 30.89       | 135           |
| 7        | 13368.6         | -52.45   | 7.51            | 16.55      | Horizontal           | -43.41           | -13.00      | 30.41       | 45            |
| 8        | 15278.4         | -52.22   | 8.24            | 15.35      | Horizontal           | -45.11           | -13.00      | 32.11       | 0             |
| 9        | 17188.2         | -49.11   | 8.41            | 14.95      | Horizontal           | -42.57           | -13.00      | 29.57       | 135           |
| 10       | 19098.0         | -        | -               | -          | -                    | -                | -           | -           | -             |

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

2. The worst emission was found in the antenna is Horizontal position.

## LTE Band 2 CH-Low

| Harmonic | Frequency (MHz) | SG (dBm) | Cable Loss (dB) | Gain (dBi) | Antenna Polarization | EIRP Level (dBm) | Limit (dBm) | Margin (dB) | Azimuth (deg) |
|----------|-----------------|----------|-----------------|------------|----------------------|------------------|-------------|-------------|---------------|
| 2        | 3702.0          | -58.27   | 5.10            | 11.05      | Horizontal           | -52.32           | -13.00      | 39.32       | 45            |
| 3        | 5553.4          | -60.02   | 5.42            | 12.65      | Horizontal           | -52.79           | -13.00      | 39.79       | 90            |
| 4        | 7440.0          | -53.51   | 6.70            | 13.85      | Horizontal           | -46.36           | -13.00      | 33.36       | 135           |
| 5        | 9300.0          | -55.42   | 7.01            | 14.75      | Horizontal           | -47.68           | -13.00      | 34.68       | 315           |
| 6        | 11160.0         | -54.48   | 7.48            | 15.95      | Horizontal           | -46.01           | -13.00      | 33.01       | 225           |
| 7        | 13020.0         | -53.79   | 7.51            | 16.55      | Horizontal           | -44.75           | -13.00      | 31.75       | 90            |
| 8        | 14880.0         | -50.62   | 8.24            | 15.35      | Horizontal           | -43.51           | -13.00      | 30.51       | 180           |
| 9        | 16740.0         | -49.04   | 8.41            | 14.95      | Horizontal           | -42.50           | -13.00      | 29.50       | 315           |
| 10       | 18600.0         | -        | -               | -          | -                    | -                | -           | -           | -             |

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

2. The worst emission was found in the antenna is Horizontal position.



## LTE Band 2 CH-Middle

| Harmonic | Frequency (MHz) | SG (dBm) | Cable Loss (dB) | Gain (dBi) | Antenna Polarization | EIRP Level (dBm) | Limit (dBm) | Margin (dB) | Azimuth (deg) |
|----------|-----------------|----------|-----------------|------------|----------------------|------------------|-------------|-------------|---------------|
| 2        | 3742.1          | -58.07   | 5.10            | 11.05      | Horizontal           | -52.12           | -13.00      | 39.12       | 135           |
| 3        | 5613.4          | -61.41   | 5.42            | 12.65      | Horizontal           | -54.18           | -13.00      | 41.18       | 225           |
| 4        | 7484.6          | -52.41   | 6.70            | 13.85      | Horizontal           | -45.26           | -13.00      | 32.26       | 270           |
| 5        | 9400.0          | -55.48   | 7.01            | 14.75      | Horizontal           | -47.74           | -13.00      | 34.74       | 0             |
| 6        | 11280.0         | -53.20   | 7.48            | 15.95      | Horizontal           | -44.73           | -13.00      | 31.73       | 135           |
| 7        | 13160.0         | -52.89   | 7.51            | 16.55      | Horizontal           | -43.85           | -13.00      | 30.85       | 45            |
| 8        | 15040.0         | -53.04   | 8.24            | 15.35      | Horizontal           | -45.93           | -13.00      | 32.93       | 135           |
| 9        | 16920.0         | -49.96   | 8.41            | 14.95      | Horizontal           | -43.42           | -13.00      | 30.42       | 225           |
| 10       | 18800.0         | -        | -               | -          | -                    | -                | -           | -           | -             |

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

2. The worst emission was found in the antenna is Horizontal position.

## LTE Band 2 CH-High

| Harmonic | Frequency (MHz) | SG (dBm) | Cable Loss (dB) | Gain (dBi) | Antenna Polarization | EIRP Level (dBm) | Limit (dBm) | Margin (dB) | Azimuth (deg) |
|----------|-----------------|----------|-----------------|------------|----------------------|------------------|-------------|-------------|---------------|
| 2        | 3781.9          | -57.97   | 5.10            | 11.05      | Horizontal           | -52.02           | -13.00      | 39.02       | 180           |
| 3        | 5673.8          | -59.67   | 5.42            | 12.65      | Horizontal           | -52.44           | -13.00      | 39.44       | 315           |
| 4        | 7564.1          | -51.76   | 6.70            | 13.85      | Horizontal           | -44.61           | -13.00      | 31.61       | 225           |
| 5        | 9500.0          | -55.34   | 7.01            | 14.75      | Horizontal           | -47.60           | -13.00      | 34.60       | 135           |
| 6        | 11400.0         | -53.89   | 7.48            | 15.95      | Horizontal           | -45.42           | -13.00      | 32.42       | 225           |
| 7        | 13300.0         | -54.11   | 7.51            | 16.55      | Horizontal           | -45.07           | -13.00      | 32.07       | 270           |
| 8        | 15200.0         | -50.98   | 8.24            | 15.35      | Horizontal           | -43.87           | -13.00      | 30.87       | 0             |
| 9        | 17100.0         | -49.59   | 8.41            | 14.95      | Horizontal           | -43.05           | -13.00      | 30.05       | 135           |
| 10       | 19000.0         | -        | -               | -          | -                    | -                | -           | -           | -             |

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

2. The worst emission was found in the antenna is Horizontal position.

## 6. Main Test Instruments

| Name                                 | Manufacturer | Type         | Serial Number | Calibration Date | Expiration Date |
|--------------------------------------|--------------|--------------|---------------|------------------|-----------------|
| Base Station Simulator               | R&S          | CMU200       | 118133        | 2018-05-13       | 2019-05-12      |
| Base Station Simulator               | R&S          | CMW500       | 113824        | 2018-05-20       | 2019-05-19      |
| Power Splitter                       | Hua Xiang    | SHX-GF2-2-13 | 10120101      | /                | /               |
| Spectrum Analyzer                    | Key sight    | N9010A       | MY50210259    | 2018-05-20       | 2019-05-19      |
| Universal Radio Communication Tester | Key sight    | E5515C       | MY48367192    | 2018-05-20       | 2019-05-19      |
| Signal Analyzer                      | R&S          | FSV30        | 100815        | 2018-12-16       | 2019-12-15      |
| EMI Test Receiver                    | R&S          | ESCI         | 100948        | 2018-05-20       | 2019-05-19      |
| Loop Antenna                         | SCHWARZBECK  | FMZB1519     | 1519-047      | 2017-09-26       | 2019-09-25      |
| Trilog Antenna                       | SCHWARZBECK  | VUBL 9163    | 9163-201      | 2017-11-18       | 2019-11-17      |
| Horn Antenna                         | R&S          | HF907        | 100126        | 2018-07-07       | 2020-07-06      |
| Horn Antenna                         | ETS-Lindgren | 3160-09      | 00102643      | 2018-06-20       | 2020-06-19      |
| Signal generator                     | R&S          | SMB 100A     | 102594        | 2018-05-20       | 2019-05-19      |
| Climatic Chamber                     | ESPEC        | SU-242       | 93000506      | 2017-12-17       | 2020-12-16      |
| Preamplifier                         | R&S          | SCU18        | 102327        | 2018-05-20       | 2019-05-19      |
| MOB COMMS DC SUPPLY                  | Keysight     | 66319D       | MY43004105    | 2018-05-07       | 2019-05-06      |
| RF Cable                             | Agilent      | SMA 15cm     | 0001          | /                | /               |
| Software                             | R&S          | EMC32        | 9.26.0        | /                | /               |

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

## ANNEX A: EUT Appearance and Test Setup

### A.1 EUT Appearance



Front Side

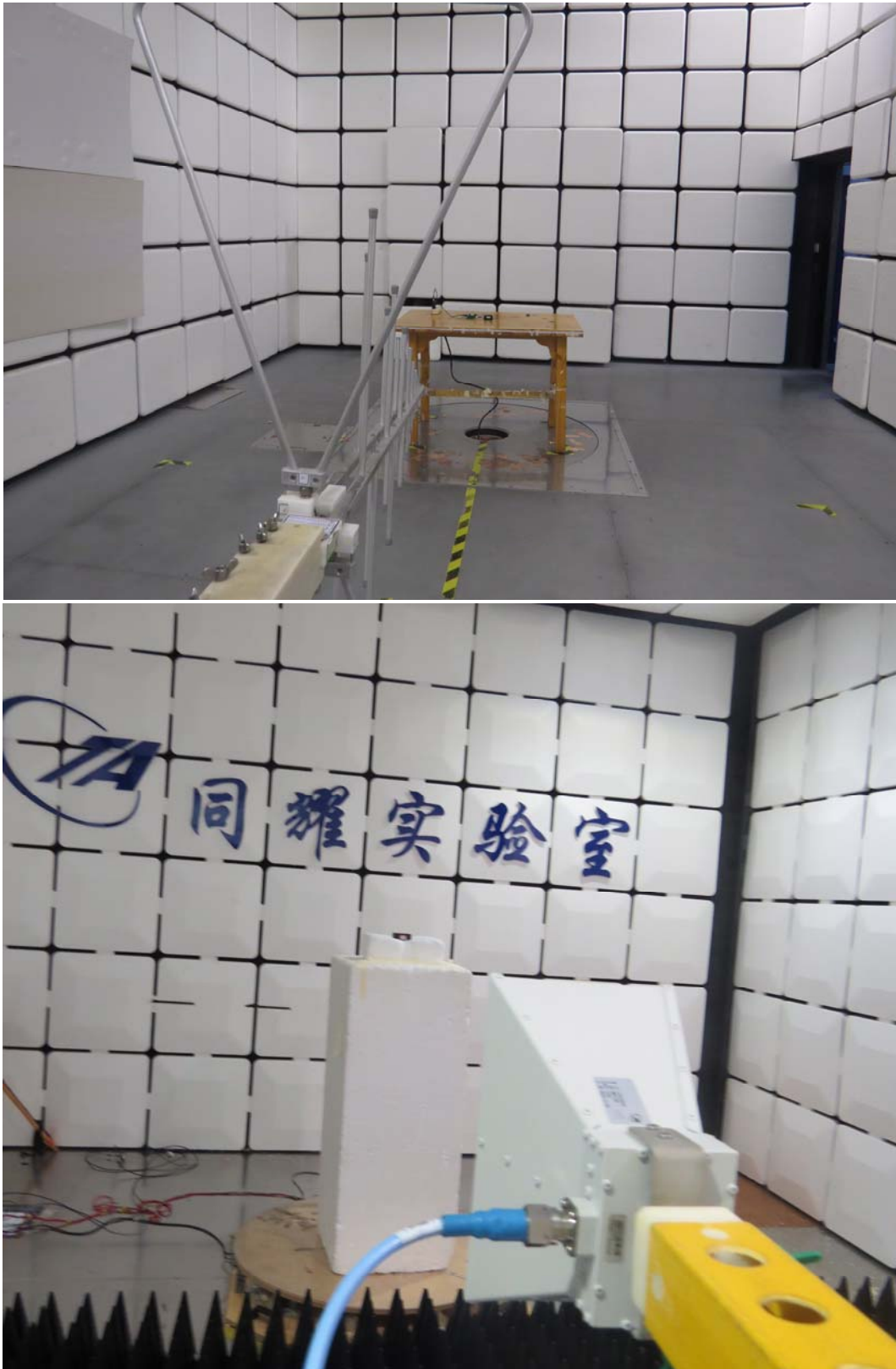


Back Side

a: EUT

Picture 1 EUT and Accessory

## A.2 Test Setup



Picture 2 Radiated Spurious Emissions Test setup