



## Aibo Standard Technology (Shenzhen) Co., Ltd.

101, Building B, Tuori New Energy Industrial Park, High-tech Park, Tianliao Community, Yutang Street, Guangming District,  
Shenzhen City, Guangdong Province, China

Tel.: +(86) 0755 85250797

E-mail: [Aibonorm@aibonorm.com](mailto:Aibonorm@aibonorm.com)

Website: [www.Aibonorm.com](http://www.Aibonorm.com)

# FCC TEST REPORT

Report No.....: AB25060016FW01  
FCC ID.....: **2A3GU-GS2PLUS**  
Applicant.....: tempmate GmbH  
Address.....: Wannenäckerstrasse 41, 74078 Heilbronn, Germany  
Manufacturer.....: tempmate GmbH  
Address.....: Wannenäckerstrasse 41, 74078 Heilbronn, Germany  
Product Name.....: tempmate-GS2+  
Trade Mark.....: tempmate  
Test Model.....: tempmate-GS2+ TH  
Additional Model(s).....: See section 1.1(page 6)  
Standard.....: FCC 47 CFR Part 22 Subpart H  
FCC 47 CFR Part 24 Subpart E  
Date of Receipt.....: 2025.06.05  
Date of Test Date.....: 2025.06.05-2025.06.26  
Date of Issue.....: 2025.06.26  
Test Result.....: Pass

|  |            |                   |
|--|------------|-------------------|
| Compiled by:<br>(Printed Name + Signature)   | Huaijie Li | <i>Huaijie Li</i> |
| Supervised by:<br>(Printed Name + Signature) | Jay Liu    | <i>Jay Liu</i>    |
| Approved by:<br>(Printed Name + Signature)   | Mic Cheng  | <i>Mic Cheng</i>  |

Testing Laboratory Name.....: Aibo Standard Technology (Shenzhen) Co., Ltd.  
Address.....: 101, Building B, Tuori New Energy Industrial Park, High-tech Park,  
Tianliao Community, Yutang Street, Guangming District, Shenzhen  
City, Guangdong Province, China

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|  |                                    |
|--|------------------------------------|
| <b>Test Report No.:</b> AB25060016FW01 | <u>2025.06.26</u><br>Date of issue |
|--|------------------------------------|

|                           |   |
|---------------------------|---|
| EUT.....                  | : tempmate-GS2+                                   |
| Test Model.....           | : tempmate-GS2+ TH                                |
| <b>Applicant</b> .....    | : <b>tempmate GmbH</b>                            |
| Address.....              | : Wannenäckerstrasse 41, 74078 Heilbronn, Germany |
| Telephone.....            | : 49-7131-6354-121                                |
| Fax.....                  | : /   |
| <b>Manufacturer</b> ..... | : <b>tempmate GmbH</b>                            |
| Address.....              | : Wannenäckerstrasse 41, 74078 Heilbronn, Germany |
| Telephone.....            | : 49-7131-6354-121                                |
| Fax.....                  | : /   |
| <b>Factory</b> .....      | : <b>tempmate GmbH</b>                            |
| Address.....              | : Wannenäckerstrasse 41, 74078 Heilbronn, Germany |
| Telephone.....            | : 49-7131-6354-121                                |
| Fax.....                  | : /   |

|                    |                 |
|--------------------|-----------------|
| <b>Test Result</b> | <b>Positive</b> |
|--------------------|-----------------|

The test report merely corresponds to the test sample.  
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

**REPORT VERSION**

| Version No. | Issue Date | Description   |
|-------------|------------|---------------|
| 01          | 2025.06.26 | Initial Issue |

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# 1. GENERAL INFORMATION

## 1.1. GENERAL DESCRIPTION OF EUT

|  |   |                     |
|--|---|---------------------|
| Product Name:  | tempmate-GS2+   |                     |
| Trade Mark:  | tempmate  |                     |
| Test Model:  | tempmate-GS2+ TH  |                     |
| Additional Model(s):                                 | tempmate-GS2+ T,tempmate-GS2+ TE,tempmate-GS2+ TH(Non Li), tempmate-GS2+ T(Non Li),tempmate-GS2+ TE(Non Li) |                     |
| Model Difference:                                    | All models are the same circuit and RF module, except the model name.                                       |                     |
| Hardware Version:                                    | V59MR41   |                     |
| Software Version:                                    | GS2LH_V3.1.2  |                     |
| Power Supply:  | DC 3.7V by battery(2400mAh) or DC 5V 1A from AC/DC adapter  |                     |
| EUT Supports Function:<br>(Provided by the customer) | GSM Bands:  | GSM 850 / PCS 1900  |
| Test Sample(s) Number:                               | AB25060016-01 (Engineer Sample)<br>AB25060016-02 (Normal Sample)  |                     |
| Radio Specification Subject to this Report           |   |                     |
| Support Networks:                                    | GPRS, EDGE  |                     |
| Frequency Range:                                     | GSM 850:  | 824.2MHz~848.8MHz   |
|  | GSM 1900:   | 1850.2MHz~1909.8MHz |
| Modulation Type:                                     | GPRS:   | GMSK                |
|  | EDGE:   | GMSK, 8PSK          |
| GPRS/EDGE Class:                                     | Class 12  |                     |
| Antenna Type:  | Integral Antenna  |                     |
| Antenna Gain:  | GSM 850:  | 0.3dBi (Max.)       |
|  | PCS 1900:   | 0.12dBi (Max.)      |

**1.2. DESCRIPTION OF SUPPORT EQUIPMENT**

| Description   | Manufacturer | Model     | Serial Number   | Supplied by |
|---------------|--------------|-----------|-----------------|-------------|
| AC/DC Adapter | Xiaomi       | MDY-11-EX | SA62212LA04358J | Applicant   |

**1.3. DESCRIPTION OF EXTERNAL I/O**

| I/O Port Description | Quantity | Cable            |
|----------------------|----------|------------------|
| USB Type-C Interface | 1        | 0.8m, unshielded |
| Earphone Jack        | 1        | N/A              |

#### 1.4. GENERAL DESCRIPTION OF APPLIED STANDARDS

The tests were performed according to following standards:

[FCC 47 CFR Part 22 Subpart H](#) - Cellular Radiotelephone Service

[FCC 47 CFR Part 24 Subpart E](#) - Personal Communications Services

[FCC 47 CFR Part 2](#) - Frequency Allocations and Radio Treaty Matters; General Rules and Regulations

[ANSI C63.26-2015](#) - American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services

[KDB 971168 D01](#) - KDB 971168 D01 Power Meas License Digital Systems v03r01

[KDB 412172 D01 Determining ERP and EIRP v01r01](#) - Guidelines for determining the effective radiated power (ERP) and isotropically radiated power (EIRP) of an RF transmitting system

#### 1.5. DESCRIPTION OF TEST FACILITY

**Test Lab:** Aibo Standard Technology (Shenzhen) Co., Ltd.

**Address:** 101, Building B, Tuori New Energy Industrial Park, High-tech Park, Tianliao Community, Yutang Street, Guangming District, Shenzhen City, Guangdong Province, China

Tel.: +(86) 0755 85250797

E-mail: Aibonorm@aibonorm.com

Website: www.Aibonorm.com

The test facility is recognized, certified, or accredited by the following organizations:

**A2LA-Lab Certificate No.: 7514.01**

Aibo Standard Technology (Shenzhen) Co., Ltd. has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

**FCC Accredited Lab.**

Designation Number: CN1411

Test Firm Registration Number: 567066

**ISED Wireless Device Testing Laboratories**

CAB identifier: CN0185



## 1.6. MEASUREMENT UNCERTAINTY

The measurement data show herein meets or exceeds the CISPR measurement uncertainty values specified in CISPR 16-4-2 and can be compared directly to specified limit to determine compliance.

| Items                                      | Measurement Uncertainty |
|--|-------------------------|
| Radiated Spurious Emissions(9KHz~30MHz)    | ±2.70dB                 |
| Radiated Spurious Emissions(25MHz~1000MHz) | ±1.60dB                 |
| Radiated Spurious Emissions(1GHz~20GHz)    | ±2.29dB                 |
| Radiated Spurious Emissions(20GHz~40GHz)   | ±5.32dB                 |
| RF Conducted Power                         | ±0.57dB                 |
| Conducted Spurious Emissions               | ±1.60dB                 |
| RF Frequency                               | ±6.0 x 10 <sup>-7</sup> |
| Occupied Bandwidth                         | ±57.74 kHz              |

Note: All measurement uncertainty values are shown with a coverage factor of k = 2 to indicate a 95 % level of confidence.

## 1.7. ENVIRONMENTAL CONDITIONS

During the measurement the environmental conditions were within the listed ranges:

|                     |                |
|---------------------|----------------|
| Normal Temperature: | +15°C ~ +35°C  |
| Lative Humidity     | 20 % ~ 75 %    |
| Air Pressure        | 98KPa ~ 101KPa |

### Normal or Extreme Test Conditions

| Environment Parameter | Selected Values During Tests |             |                       |
|-----------------------|------------------------------|-------------|-----------------------|
| Test Condition        | Ambient                      |             |                       |
|                       | Temperature (°C)             | Voltage (V) | Relative Humidity (%) |
| NVNT                  | +15 to +35                   | 3.70        | 20 to 75              |
| NVLT                  | -30                          | 3.70        | 20 to 75              |
| NVHT                  | +50                          | 3.70        | 20 to 75              |
| LVLT                  | -30                          | 3.15        | 20 to 75              |
| HVHT                  | +50                          | 4.26        | 20 to 75              |

Remark:

1) The EUT just work in such extreme temperature of -30 °C to +50 °C, so here the EUT is tested in the temperature of -30 °C to +50 °C.

2) NV: Normal Voltage; NT: Normal Temperature

LV: Low Extreme Test Voltage; HV: High Extreme Test Voltage.

3) LT: Low Extreme Test Temperature; HT: High Extreme Test Temperature.

## 1.8. DESCRIPTION OF TEST MODES

| Band    | Tx/Rx Frequency         | RF Channel  |             |             |
|---------|-------------------------|-------------|-------------|-------------|
|         |                         | Low(L)      | Middle(M)   | High(H)     |
| GSM850  | Tx<br>(824MHz~849MHz)   | Channel 128 | Channel 190 | Channel 251 |
|         |                         | 824.2MHz    | 836.6MHz    | 848.8MHz    |
| GSM1900 | Tx<br>(1850MHz~1910MHz) | Channel 512 | Channel 661 | Channel 810 |
|         |                         | 1850.2MHz   | 1880.0MHz   | 1909.8MHz   |

### System Test Configuration:

For emissions testing, the equipment under test (EUT) setup to transmit continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing. During testing, radiated emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario. It was powered by a 3.85Vdc battery. Only the worst case data were recorded in this test report.

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

All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance. Analyzer resolution is 100 kHz or greater for frequencies below 1000MHz. The resolution is 1 MHz or greater for frequencies above 1000MHz. The spurious emissions more than 20 dB below the permissible value are not reported.

Radiated emission measurement were performed from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

## 2. SUMMARY OF TEST RESULT

| GSM850                                       |   |        |               |
|--|---|--------|---------------|
| FCC Rule                                     | Description of Test Item(s)                                     | Result | Test Engineer |
| §22.913(a)(5)                                | Conducted Output Power and Effective (Isotropic) Radiated Power | Pass   | Claire Lai    |
| §22.913(d)                                   | Peak-Average Ratio  | Pass   | Claire Lai    |
| §2.1049                                      | 99%&26dB Bandwidth  | Pass   | Claire Lai    |
| §2.1051,<br>§22.917(a)                       | Band Edges at Antenna Terminals                                 | Pass   | Claire Lai    |
| §2.1051,<br>§22.917(a)                       | Spurious Emission at Antenna Terminals                          | Pass   | Claire Lai    |
| §2.1053,<br>§22.917(a)                       | Field Strength of Spurious Radiation                            | Pass   | Claire Lai    |
| §2.1055(a)(1)(b)<br>§2.1055(d)(2)<br>§22.355 | Frequency Stability   | Pass   | Claire Lai    |

| PCS1900                                       |   |        |               |
|---|---|--------|---------------|
| FCC Rule                                      | Description of Test Item(s)                                     | Result | Test Engineer |
| §2.1046,<br>§24.232(c)                        | Conducted Output Power and Effective (Isotropic) Radiated Power | Pass   | Claire Lai    |
| §24.232(d)                                    | Peak-Average Ratio  | Pass   | Claire Lai    |
| §2.1049                                       | 99%&26dB Bandwidth  | Pass   | Claire Lai    |
| §2.1051,<br>§24.238(a)                        | Band Edges at Antenna Terminals                                 | Pass   | Claire Lai    |
| §2.1051,<br>§24.238(a)                        | Spurious Emission at Antenna Terminals                          | Pass   | Claire Lai    |
| §2.1053,<br>§24.238(a)                        | Field Strength of Spurious Radiation                            | Pass   | Claire Lai    |
| §2.1055(a)(1)(b)<br>§2.1055(d) (2)<br>§24.235 | Frequency Stability   | Pass   | Claire Lai    |

### 3. MEASUREMENT INSTRUMENTS LIST

| Item | Test Equipment                      | Manufacturer | Model No.      | Serial No.   | Cal. Date  | Cal. Until |
|------|-------------------------------------|--------------|----------------|--------------|------------|------------|
| 1    | Loop Antenna                        | Schwarzbeck  | FMZB 1519      | 1519-025     | 02/19/2025 | 02/18/2026 |
| 2    | Power Amplifier                     | HZEMC        | HPA-9K0133     | HYP A23029   | 02/19/2025 | 02/18/2026 |
| 3    | Broadband Antenna                   | Schwarzbeck  | VULB 9168      | 01763        | 02/19/2025 | 02/18/2026 |
| 4    | Attenuator                          | PRM          | ATT50-6-3      | ATT50-6-3    | 01/20/2025 | 01/19/2026 |
| 5    | Spectrum Analyzer                   | R&S          | FSV40-N        | 101365       | 01/20/2025 | 01/19/2026 |
| 6    | Horn Antenna                        | Schwarzbeck  | BBHA 9120 D    | 02786        | 02/19/2025 | 02/18/2026 |
| 7    | Horn Antenna                        | Schwarzbeck  | ZLB7-18-40G-77 | 072410839    | 02/19/2025 | 02/18/2026 |
| 8    | Power Amplifier                     | HZEMC        | PA0118-43      | HYP A23030   | 02/19/2025 | 02/18/2026 |
| 9    | Power Amplifier                     | HZEMC        | PA01840-45     | HYP A23031   | 02/19/2025 | 02/18/2026 |
| 10   | EMI Test Receiver                   | R&S          | ESCI           | 101196       | 01/20/2025 | 01/19/2026 |
| 11   | LISN                                | R&S          | ENV216         | 102374       | 01/20/2025 | 01/19/2026 |
| 12   | Pulse Limiter                       | Schwarzbeck  | ESH3-Z2        | 0357.8810.54 | 01/20/2025 | 01/19/2026 |
| 13   | MXA Signal Analyzer                 | Keysight     | N9020A         | MY52091389   | 01/20/2025 | 01/19/2026 |
| 14   | Power Sensor                        | Agilent      | U2021XA        | MY54110007   | 01/31/2025 | 01/30/2026 |
| 15   | Power Sensor                        | Agilent      | U2021XA        | MY54110009   | 01/31/2025 | 01/30/2026 |
| 16   | MXG Vector Signal Generator         | Agilent      | N5182A         | MY47070153   | 01/20/2025 | 01/19/2026 |
| 17   | Analog Signal Source                | Keysight     | N5173B         | MY60403029   | 01/20/2025 | 01/19/2026 |
| 18   | Vector Signal Generator             | R&S          | SMCV100B       | 106103       | 01/20/2025 | 01/19/2026 |
| 19   | WIDEBAND RADIO COMMUNICATION TESTER | R&S          | CMW500         | 118780       | 01/20/2025 | 01/19/2026 |
| 20   | DC POWER SUPPLY                     | MAISHENG     | MT-305DS       | 2021040016   | 02/28/2025 | 02/27/2026 |
| 21   | Const Temp. & Humidity Chamber      | GRT          | GR-HWX-150L    | GR25010601   | 01/20/2025 | 01/19/2026 |

| Test Software                               |          |          |
|---|----------|----------|
| Software name                               | Model    | Version  |
| Radiated Emission Measurement Software      | FASLAB   | V4.1     |
| RF Conducted Measurement Software(2G/3G/4G) | MTS 8200 | V2.0.0.0 |

## 4. CONDUCTED OUTPUT POWER AND MAXIMUM ERP/EIRP

### 4.1. LIMIT

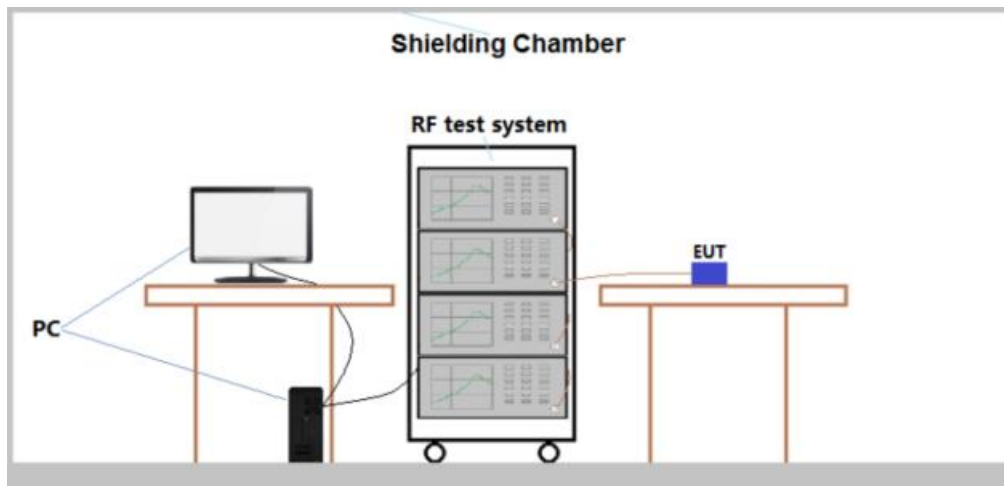
#### FCC 47 CFR Part 22.913(a)

The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

#### FCC 47 CFR Part 24.232(c)

Mobile and portable stations are limited to 2 watts EIRP.

### 4.2. TEST SETUP



### 4.3. TEST PROCEDURE

#### For Conducted Output Power Measurement:

Refer to KDB 971168 D01v03r01 & ANSI C63.26-2015 for test method.

The EUT was set up for the maximum power with GSM, GPRS, EDGE and link up with simulator (CMW500). Set the EUT to transmit under low, middle and high channel and record the power level.

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

#### For ERP/EIRP:

According to KDB 412172 D01 Power Approach,

- $ERP \text{ or } EIRP = PT + GT - LC$
- $ERP = EIRP - 2.15$

where

- PT = transmitter output power, expressed in dBW, dBm, or PSD;
- GT = gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP);
- LC = signal attenuation in the connecting cable between the transmitter and antenna, in dB.

#### 4.4. TEST RESULT

**Pass.**

Please refer to the Appendix A for GSM850 Test Data.

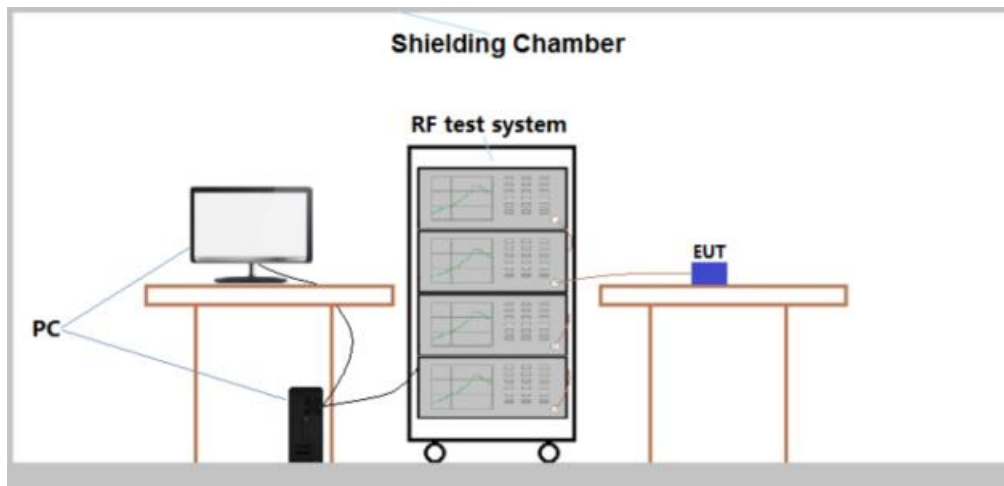
Please refer to the Appendix A for PCS1900 Test Data.

## 5. PEAK-AVERAGE RATIO

### 5.1. LIMIT

In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

### 5.2. TEST SETUP



### 5.3. TEST PROCEDURE

Refer to KDB 971168 D01v03r01 Section 5.7 for test method.

The transmitter output was connected to the RF test system.

- Set resolution/measurement bandwidth  $\geq$  signal's occupied bandwidth
- Set the number of counts to a value that stabilizes the measured CCDF curve
- Record the maximum PAPR level associated with a probability of 0.1 %

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

### 5.4. TEST RESULT

**Pass.**

Please refer to the Appendix A for GSM850 Test Data.

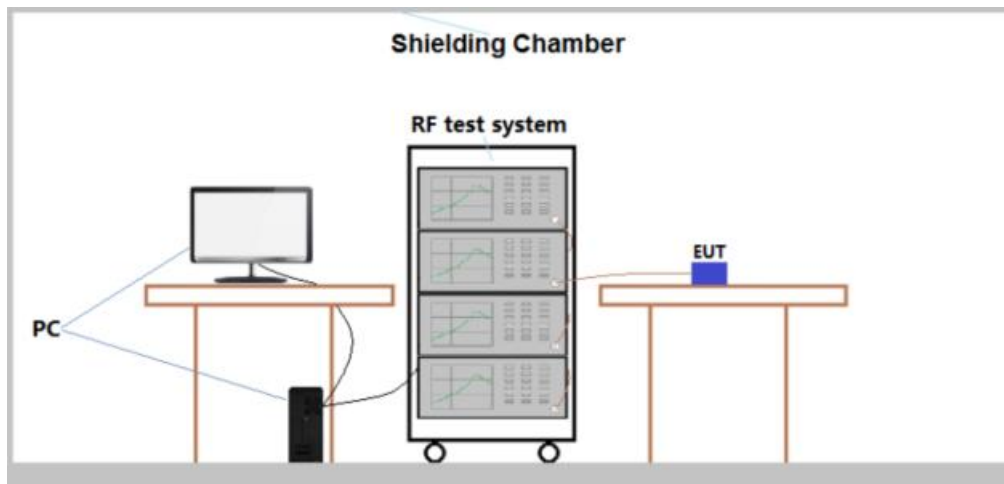
Please refer to the Appendix A for PCS1900 Test Data.

## 6. 26DB BANDWIDTH AND 99% OCCUPIED BANDWIDTH

### 6.1. LIMIT

No Limit, for reporting purposes only.

### 6.2. TEST SETUP



### 6.3. TEST PROCEDURE

Refer to ANSI C63.26-2015 & KDB 971168 D01v03r01 Section 4 for test method.

The transmitter output was connected to the RF test system. The occupied bandwidth was measured with the spectrum analyzer at the low, middle and high channel in each band. The 99% and -26dB bandwidths was also measured and recorded.

### 6.4. TEST RESULT

**Pass.**

Please refer to the Appendix A for GSM850 Test Data.

Please refer to the Appendix A for PCS1900 Test Data.

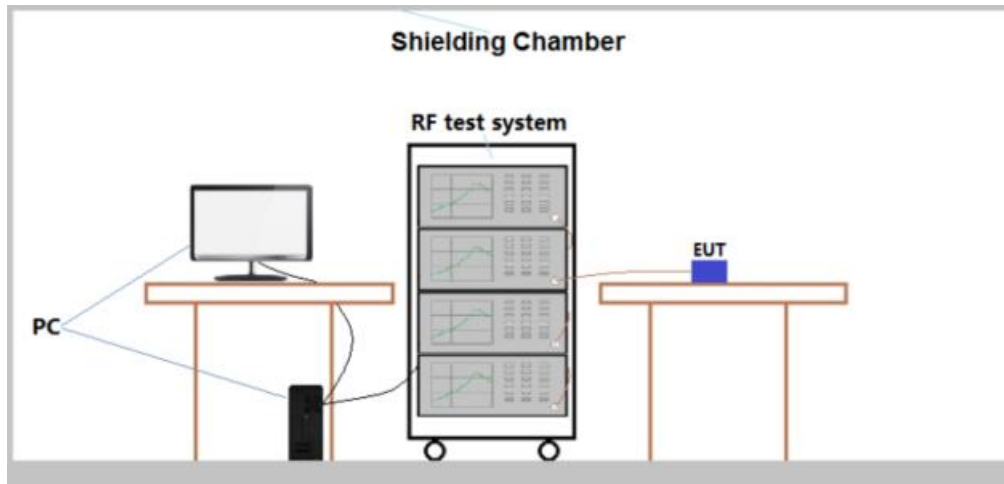


## 7. BAND EDGE AT ANTENNA TERMINALS

### 7.1. LIMIT

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB. The emission limit equal to -13 dBm.

### 7.2. TEST SETUP



### 7.3. TEST PROCEDURE

Refer to ANSI C63.26-2015 & KDB 971168 D01v03r01 for test method.

The transmitter output was connected to the RF test system.

For each band edge measurement:

- 1) Set the spectrum analyzer span to include the block edge frequency.
- 2) Set a marker to point the corresponding band edge frequency in each test case.
- 3) Set display line at -13 dBm
- 4) Set resolution bandwidth to at least 1% of emission bandwidth.
- 5) Set spectrum analyzer with RMS detector.
- 6) Record the max trace plot into the test report

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

### 7.4. TEST RESULT

**Pass.**

Please refer to the Appendix A for GSM850 Test Data.

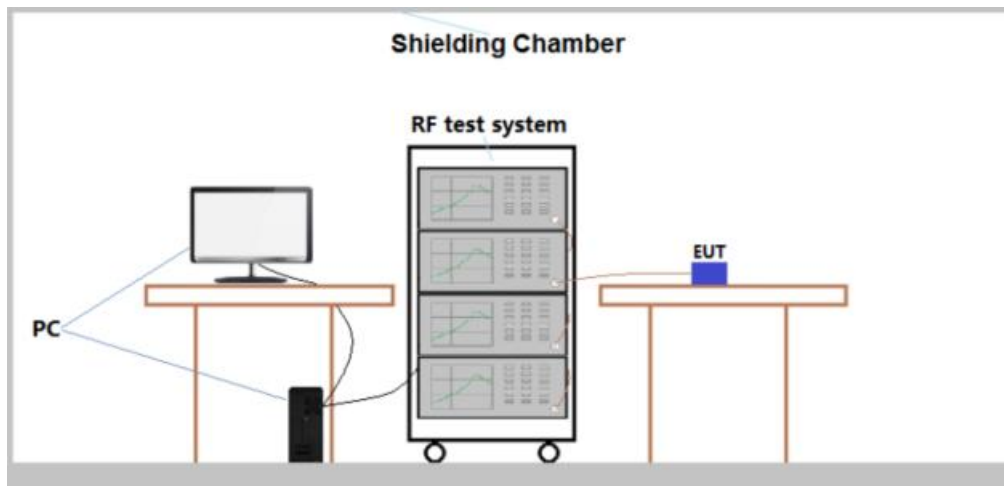
Please refer to the Appendix A for PCS1900 Test Data.

## 8. SPURIOUS EMISSIONS AT ANTENNA TERMINALS

### 8.1. LIMIT

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB. The emission limit equal to -13 dBm.

### 8.2. TEST SETUP



### 8.3. TEST PROCEDURE

Refer to ANSI C63.26-2015 & KDB 971168 D01v03r01 for test method.

The EUT was connect to the communication simulator. All measurements were done at low, middle and high operational frequency range. Measuring frequency range is from 30 MHz to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower. Set RBW & VBW to 100 kHz for the measurement below 1 GHz, and 1 MHz for the measurement above 1 GHz.

### 8.4. TEST RESULT

**Pass.**

Please refer to the Appendix A for GSM850 Test Data.

Please refer to the Appendix A for PCS1900 Test Data.

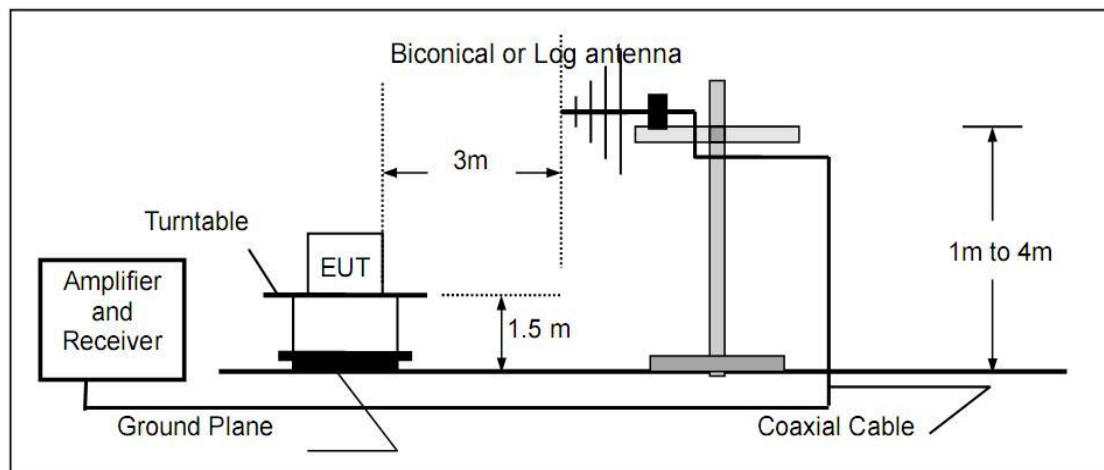
## 9. FIELD STRENGTH OF SPURIOUS RADIATION

### 9.1. LIMIT

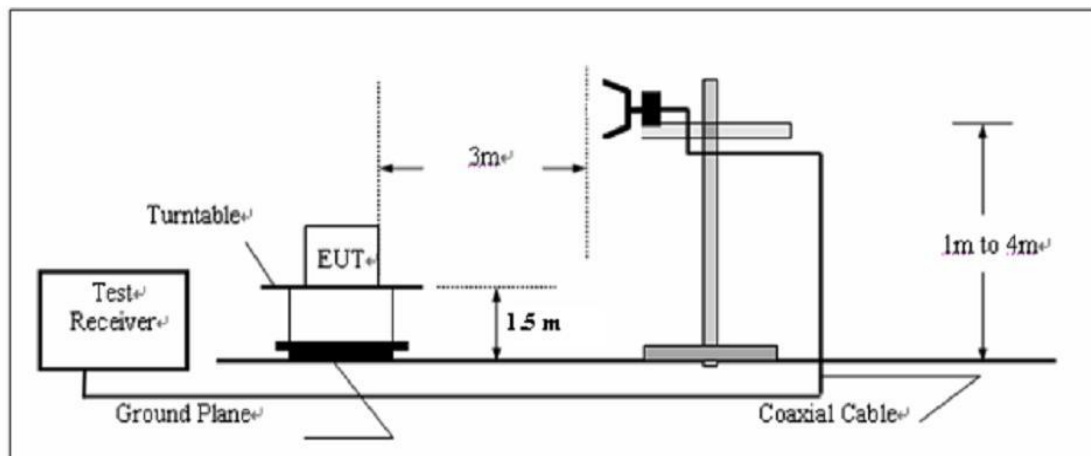
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB. The emission limit equal to -13 dBm.

### 9.2. TEST SETUP

Radiated Below 1GHz

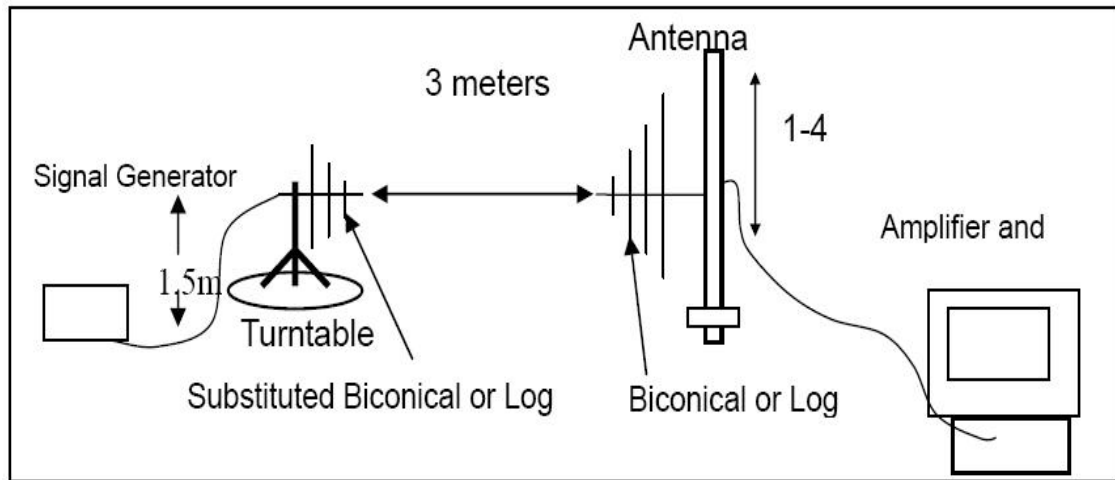


Radiated Above 1GHz

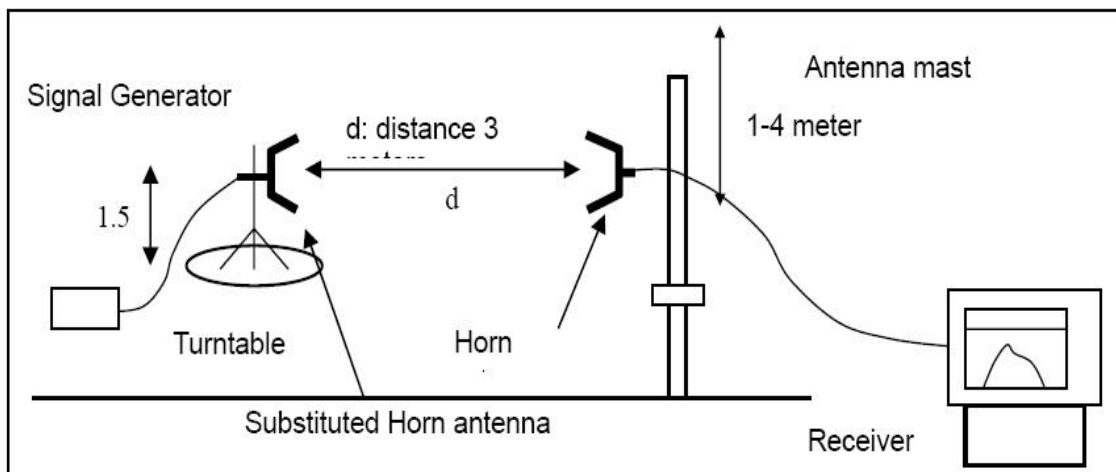


### Substitution Method

Radiated Below 1GHz



Radiated Above 1 GHz



### 9.3. TEST PROCEDURE

Refer to KDB 971168 D01 v03r01 Section 7 for test method.

(1) EUT was placed on a 1.50 meter high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT for emission measurements. The height of receiving antenna is 1.50m. Detected emissions were maximized at each frequency by rotating the EUT through 360° and adjusting the receiving antenna polarization. The radiated emission measurements of all transmit frequencies in three channels (High, Middle, Low) were measured with peak detector.

(2) A log-periodic antenna or double-ridged waveguide 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.

(3) The EUT is then put into continuously transmitting mode at its maximum power level during the test. Set Test Receiver or Spectrum RBW=1MHz, VBW=3MHz, and the maximum value of the receiver should be recorded as ( $P_r$ ).

(4) 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 ( $P_{Mea}$ ) is applied to the input of the substitution antenna, and adjusts the level of the signal generator output until the value of the receiver reach the previously recorded ( $P_r$ ). The power of signal source ( $P_{Mea}$ ) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.

(5) An amplifier should be connected to the Signal Source output port. And the cable should be connecting between the Amplifier and the Substitution Antenna. The cable loss ( $P_{cl}$ ), the Substitution Antenna Gain ( $G_a$ ) and the Amplifier Gain ( $P_{Ag}$ ) should be recorded after test.

(6) The measurement results are obtained as described below:

$$\text{Power(EIRP)} = P_{Mea} - P_{Ag} - P_{cl} + G_a$$

We used signal generator which signal level can up to 33dBm, so we not used power Amplifier for substitution test;

The measurement results are amend as described below:

$$\text{Power(EIRP)} = P_{Mea} - P_{cl} + G_a$$

(7) 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,  $ERP = EIRP - 2.15\text{dBi}$ .

(8) Test frequency range should extend to 10th harmonic of highest fundamental frequency.

## 9.4. TEST RESULT

**Pass.**

Remark:

a) By preliminary testing and verifying three axis (X, Y and Z) position of EUT transmitted status, it was found that "Y axis" position was the worst, and test data recorded in this report.

b) Pre-scan all modes and recorded the worst case in this report.

c) Radiated spurious emission test from 9KHz to 10th harmonic of fundamental was verified, and the emission levels from 9kHz to 30MHz are attenuated 20dB below the limit and not recorded in report.

The worst measurement data as follows:

| GSM 850_Low Channel    |                  |               |                |                |                |                 |      |
|------------------------|------------------|---------------|----------------|----------------|----------------|-----------------|------|
| Freq.<br>(MHz)         | Reading<br>(dBm) | Corr.<br>(dB) | Meas.<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Distance<br>(m) | Pol. |
| 1767.80                | -74              | 1.54          | -34.67         | -13            | 21.67          | 3               | H    |
| 2401.60                | -70.09           | 13.86         | -37.96         | -13            | 24.96          | 3               | H    |
| 1782.20                | -56.38           | 5.24          | -34.74         | -13            | 21.74          | 3               | V    |
| 2537.10                | -63.34           | 14.64         | -39.50         | -13            | 26.50          | 3               | V    |
| GSM 850_Middle Channel |                  |               |                |                |                |                 |      |
| Freq.<br>(MHz)         | Reading<br>(dBm) | Corr.<br>(dB) | Meas.<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Distance<br>(m) | Pol. |
| 1782.30                | -67.21           | 2.19          | -35.75         | -13            | 22.75          | 3               | H    |
| 2411.80                | -66.73           | 14.50         | -39.34         | -13            | 26.34          | 3               | H    |
| 1744.80                | -63.65           | 5.45          | -36.18         | -13            | 23.18          | 3               | V    |
| 2591.20                | -68.61           | 14.00         | -41.39         | -13            | 28.39          | 3               | V    |
| GSM 850_High Channel   |                  |               |                |                |                |                 |      |
| Freq.<br>(MHz)         | Reading<br>(dBm) | Corr.<br>(dB) | Meas.<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Distance<br>(m) | Pol. |
| 1615.20                | -67.64           | 3.06          | -37.88         | -13            | 24.88          | 3               | H    |
| 2390.70                | -65.42           | 13.21         | -43.73         | -13            | 30.73          | 3               | H    |
| 1677.20                | -57.7            | 4.23          | -35.04         | -13            | 22.04          | 3               | V    |
| 2415.20                | -63.11           | 14.40         | -35.13         | -13            | 22.13          | 3               | V    |

| PCS 1900_Low Channel    |                  |               |                |                |                |                 |      |
|-------------------------|------------------|---------------|----------------|----------------|----------------|-----------------|------|
| Freq.<br>(MHz)          | Reading<br>(dBm) | Corr.<br>(dB) | Meas.<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Distance<br>(m) | Pol. |
| 3772.00                 | -58.41           | 2.73          | -43.54         | -13            | 30.54          | 3               | H    |
| 5536.80                 | 63.59            | 2.94          | -39.01         | -13            | 26.01          | 3               | H    |
| 3622.10                 | -55.22           | 5.03          | -36.73         | -13            | 23.73          | 3               | V    |
| 5443.80                 | -70.92           | 12.95         | -39.68         | -13            | 26.68          | 3               | V    |
| PCS 1900_Middle Channel |                  |               |                |                |                |                 |      |
| Freq.<br>(MHz)          | Reading<br>(dBm) | Corr.<br>(dB) | Meas.<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Distance<br>(m) | Pol. |
| 3839.60                 | -64.26           | 1.77          | -40.16         | -13            | 27.16          | 3               | H    |
| 5577.40                 | 69.37            | 4.62          | -37.36         | -13            | 24.36          | 3               | H    |
| 3682.20                 | -60.51           | 7.39          | -38.43         | -13            | 25.43          | 3               | V    |
| 5575.50                 | -62.79           | 14.48         | -39.25         | -13            | 26.25          | 3               | V    |
| PCS 1900_High Channel   |                  |               |                |                |                |                 |      |
| Freq.<br>(MHz)          | Reading<br>(dBm) | Corr.<br>(dB) | Meas.<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Distance<br>(m) | Pol. |
| 3722.00                 | -60.31           | 3.12          | -36.65         | -13            | 23.65          | 3               | H    |
| 5571.40                 | 64.66            | 3.30          | -41.92         | -13            | 28.92          | 3               | H    |
| 3541.70                 | -58.24           | 5.79          | -35.16         | -13            | 22.16          | 3               | V    |
| 5699.50                 | -65.24           | 15.33         | -41.98         | -13            | 28.98          | 3               | V    |

## 10. FREQUENCY STABILITY

### 10.1. LIMIT

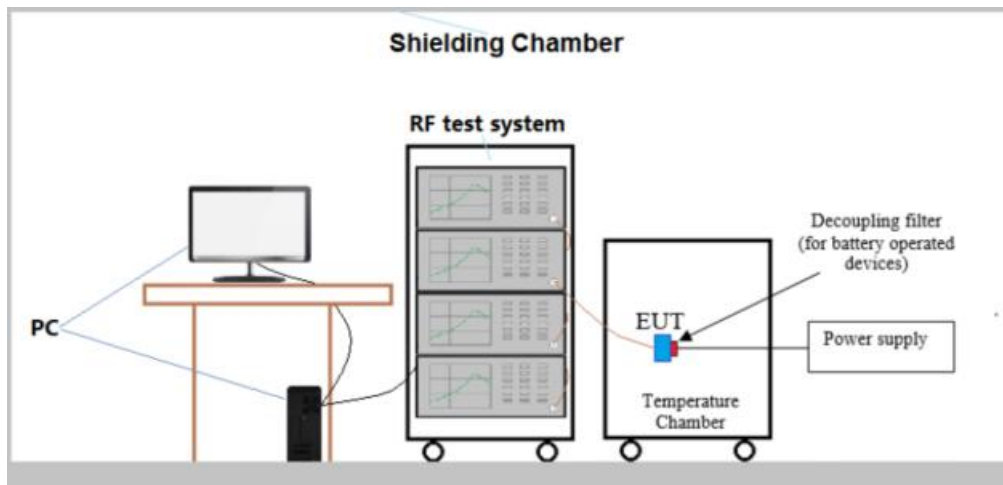
#### FCC 47 CFR Part 22.355,

The carrier frequency shall not depart from the reference frequency in excess of  $\pm 2.5$  ppm for mobile stations.

#### FCC 47 CFR Part 24.235,

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

### 10.2. TEST SETUP



### 10.3. TEST PROCEDURE

Refer to ANSI C63.26-2015 & KDB 971168 D01v03r01 for test method.

1) The transmitter output was connected to the RF test system.

a) Temp. =  $-30^{\circ}$  to  $+50^{\circ}\text{C}$

b) Voltage = low voltage, Normal voltage and High voltage.

2) Frequency Stability vs Temperature:

The EUT is placed inside a temperature chamber. The temperature is set to  $20^{\circ}\text{C}$  and allowed to stabilize. After sufficient soak time, the transmitting frequency error is measured. The temperature is increased by 10 degrees, allowed to stabilize and soak, and then the measurement is repeated. This is repeated until  $+50^{\circ}\text{C}$  is reached.

3) Frequency Stability vs Voltage:

The peak frequency error is recorded (worst-case).

### 10.4. TEST RESULT

**Pass.**

Please refer to the Appendix A for GSM850 Test Data.

Please refer to the Appendix A for PCS1900 Test Data.



## 11. PHOTOGRAPHS OF TEST SETUP

Please refer to separated files for Test Setup Photos of the EUT.

## 12. EXTERNAL PHOTOGRAPHS OF THE EUT

Please refer to separated files for External Photos of the EUT.

## 13. INTERNAL PHOTOGRAPHS OF THE EUT

Please refer to separated files for Internal Photos of the EUT.

\*\*\*\*\*THE END\*\*\*\*\*