

# **TEST REPORT**

**Applicant:** Shenzhen Jumper Medical Equipment Co., Ltd.

**EUT Description:** Electronic Blood Pressure Monitor

**Model:** JPD-HA100

**FCC ID:** 2ADYL-JPDHA100

**Standards:** FCC CFR Title 47 Part 2  
FCC CFR Title 47 Part 22  
FCC CFR Title 47 Part 24  
FCC CFR Title 47 Part 27  
FCC CFR Title 47 Part 90

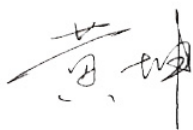
**Date of Receipt:** 2024/07/09

**Date of Test:** 2024/07/09 to 2024/10/28

**Date of Issue:** 2024/11/05

TOWE. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

the results documented in this report apply only the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility assure that additional production units of the model are manufactured with identical electrical and mechanical components. All sample tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise. without written approval of TOWE, the test report shall not be reproduced except in full.



**Huangkun**  
**Approved By:**



**ChenChengfu**  
**Reviewed By:**

## Revision History

| Rev. | Issue Date | Description | Revised by  |
|------|------------|-------------|-------------|
| 01   | 2024/11/05 | Original    | ChenChengfu |

## Summary of Test Results

| FCC Part                                                                                                                                       | Test Item                              | Test Result | Verdict |
|------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|-------------|---------|
| §2.1046<br>§90.635(b)                                                                                                                          | Transmitter Conducted Output Power     | Appendix    | Pass    |
| §2.1046<br>§22.913(a)(5)<br>§27.50(b)(10)<br>§27.50(c)(10)                                                                                     | Effective Radiated Power               | Appendix    | Pass    |
| §2.1046<br>§24.232(c)<br>§27.50(d)(4)                                                                                                          | Effective Isotropic Radiated Power     | Appendix    | Pass    |
| §22.913(d)<br>§24.232(d)<br>§27.50(d)(5)                                                                                                       | Peak-Average Ratio                     | Appendix    | Pass*   |
| §2.1049                                                                                                                                        | Occupied Bandwidth                     | Appendix    | Pass*   |
| §2.1051<br>§22.917(a)<br>§24.238(a)<br>§27.53(c)&(f)<br>§27.53(g)<br>§27.53(h)                                                                 | Band Edge                              | Appendix    | Pass*   |
| §2.1051<br>§90.691                                                                                                                             | Emission Mark                          | Appendix    | Pass*   |
| §2.1051<br>§22.917(a)<br>§24.238(a)<br>§27.53(h)<br>§27.53(g)<br>§27.53(c)&(f)<br>§90.691(a)                                                   | Spurious Emission at Antenna Terminals | Appendix    | Pass*   |
| §2.1053<br>§22.917(a)<br>§24.238(a)<br>§27.53(h)<br>§27.53(g)<br>§27.53(c)&(f)<br>§90.691(a)                                                   | Field Strength of Spurious Radiation   | Appendix    | Pass    |
| §2.1055<br>§22.355<br>§24.235<br>§27.54<br>§90.213                                                                                             | Frequency Stability                    | Appendix    | Pass*   |
| Remark:<br>1. Pass: Meet the requirement.<br>2. Pass*: Refer to Module FCC ID: XMR201910BG95M3, provided by TA Technology (Shanghai) Co., Ltd. |                                        |             |         |

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# 1 General Description

## 1.1 Lab Information

### 1.1.1 Testing Location

These measurements tests were conducted at the Sushi TOWE Wireless Testing(Shenzhen) Co., Ltd. facility located at F401 and F101, Building E, Hongwei Industrial Zone, Liuxian 3rd Road, Bao'an District, Shenzhen, China. The measurement facility is compliant with the test site requirements specified in ANSI C63.4-2014

Tel.: +86-755-27212361

Contact Email: info@towewireless.com

### 1.1.2 Test Facility / Accreditations

#### **A2LA (Certificate Number: 7088.01)**

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).

#### **FCC Designation No.: CN1353**

Sushi TOWE Wireless Testing (Shenzhen) Co., Ltd. has been recognized as an accredited testing laboratory. Designation Number: CN1353.

#### **ISED CAB identifier: CN0152**

Sushi TOWE Wireless Testing (Shenzhen) Co., Ltd. has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0152

Company Number: 31000

## 1.2 Client Information

### 1.2.1 Applicant

|            |                                                                                          |
|------------|------------------------------------------------------------------------------------------|
| Applicant: | Shenzhen Jumper Medical Equipment Co., Ltd.                                              |
| Address:   | D Building, No. 71, Xintian Road, Fuyong Street, Baoan,Shenzhen, Guangdong 518103, China |

### 1.2.2 Manufacturer

|               |                                                                                          |
|---------------|------------------------------------------------------------------------------------------|
| Manufacturer: | Shenzhen Jumper Medical Equipment Co., Ltd.                                              |
| Address:      | D Building, No. 71, Xintian Road, Fuyong Street, Baoan,Shenzhen, Guangdong 518103, China |

### 1.3 Product Information

|                            |                                                                                                                                      |                                                                                                                                                      |                 |
|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| EUT Description:           | Electronic Blood Pressure Monitor                                                                                                    |                                                                                                                                                      |                 |
| Model:                     | JPD-HA100                                                                                                                            |                                                                                                                                                      |                 |
| Hardware Version:          | V1.2                                                                                                                                 |                                                                                                                                                      |                 |
| Software Version:          | V1.5                                                                                                                                 |                                                                                                                                                      |                 |
| IMEI:                      | 863251072235562 (RF Test)<br>863251072017259 (Cat M-RSE Test)<br>863251072017250 (NB-IoT-RSE Test)<br>863251071939800 (GSM-RSE Test) |                                                                                                                                                      |                 |
| Device Capabilities:       |                                                                                                                                      |                                                                                                                                                      |                 |
| Modulation Type:           | GSM:                                                                                                                                 | <input checked="" type="checkbox"/> GSM/GPRS: GMSK, <input checked="" type="checkbox"/> EGPRS: 8PSK                                                  |                 |
|                            | Cat M:                                                                                                                               | <input checked="" type="checkbox"/> QPSK, <input checked="" type="checkbox"/> 16QAM, <input type="checkbox"/> 64QAM, <input type="checkbox"/> 256QAM |                 |
|                            | NB-IoT:                                                                                                                              | <input checked="" type="checkbox"/> BPSK, <input checked="" type="checkbox"/> QPSK                                                                   |                 |
| Operation Frequency Range: | Band                                                                                                                                 | TX Frequency                                                                                                                                         | RX Frequency    |
|                            | GSM 850                                                                                                                              | 824 ~ 849 MHz                                                                                                                                        | 869 ~ 894 MHz   |
|                            | PCS 1900                                                                                                                             | 1850 ~ 1910 MHz                                                                                                                                      | 1930 ~ 1990 MHz |
|                            | Cat M Band 2                                                                                                                         | 1850 ~ 1910 MHz                                                                                                                                      | 1930 ~ 1990 MHz |
|                            | Cat M Band 4                                                                                                                         | 1710 ~ 1755 MHz                                                                                                                                      | 2110 ~ 2155 MHz |
|                            | Cat M Band 5                                                                                                                         | 824 ~ 849 MHz                                                                                                                                        | 869 ~ 894 MHz   |
|                            | Cat M Band 12                                                                                                                        | 699 ~ 716 MHz                                                                                                                                        | 729 ~ 746 MHz   |
|                            | Cat M Band 13                                                                                                                        | 777 ~ 787 MHz                                                                                                                                        | 746 ~ 756 MHz   |
|                            | Cat M Band 25                                                                                                                        | 1850 ~ 1915 MHz                                                                                                                                      | 1930 ~ 1995 MHz |
|                            | Cat M Band 26                                                                                                                        | 814 ~ 849MHz                                                                                                                                         | 859 ~ 894MHz    |
|                            | Cat M Band 66                                                                                                                        | 1710 ~ 1780 MHz                                                                                                                                      | 2110 ~ 2200 MHz |
|                            | Cat M Band 85                                                                                                                        | 698 ~ 716 MHz                                                                                                                                        | 728 ~ 746 MHz   |
|                            | NB-IoT Band 2                                                                                                                        | 1850 ~ 1910 MHz                                                                                                                                      | 1930 ~ 1990 MHz |
|                            | NB-IoT Band 4                                                                                                                        | 1710 ~ 1755 MHz                                                                                                                                      | 2110 ~ 2155 MHz |
|                            | NB-IoT Band 5                                                                                                                        | 824 ~ 849 MHz                                                                                                                                        | 869 ~ 894 MHz   |
|                            | NB-IoT Band 12                                                                                                                       | 699 ~ 716 MHz                                                                                                                                        | 729 ~ 746 MHz   |
|                            | NB-IoT Band 13                                                                                                                       | 777 ~ 787 MHz                                                                                                                                        | 746 ~ 756 MHz   |
|                            | NB-IoT Band 25                                                                                                                       | 1850 ~ 1915 MHz                                                                                                                                      | 1930 ~ 1995 MHz |
|                            | NB-IoT Band 66                                                                                                                       | 1710 ~ 1780 MHz                                                                                                                                      | 2110 ~ 2200 MHz |
|                            | NB-IoT Band 71                                                                                                                       | 663 ~ 698 MHz                                                                                                                                        | 617 ~ 652 MHz   |
| NB-IoT Band 85             | 698 ~ 716 MHz                                                                                                                        | 728 ~ 746 MHz                                                                                                                                        |                 |
| Antenna Type:              | <input type="checkbox"/> External, <input checked="" type="checkbox"/> Integrated                                                    |                                                                                                                                                      |                 |
| Antenna Gain:              | Band                                                                                                                                 |                                                                                                                                                      |                 |
|                            | GSM 850:                                                                                                                             | 1.26dBi                                                                                                                                              |                 |
|                            | PCS 1900:                                                                                                                            | 1.54dBi                                                                                                                                              |                 |
|                            | Band 2:                                                                                                                              | 1.54dBi                                                                                                                                              |                 |
|                            | Band 4:                                                                                                                              | 0.97dBi                                                                                                                                              |                 |
|                            | Band 5:                                                                                                                              | 1.26dBi                                                                                                                                              |                 |
|                            | Band 12:                                                                                                                             | 1.05dBi                                                                                                                                              |                 |
|                            | Band 13:                                                                                                                             | 1.05dBi                                                                                                                                              |                 |
|                            | Band 25:                                                                                                                             | 1.54dBi                                                                                                                                              |                 |
|                            | Band 26:                                                                                                                             | 1.26dBi                                                                                                                                              |                 |

|                                                                                                                                                 |          |         |
|-------------------------------------------------------------------------------------------------------------------------------------------------|----------|---------|
|                                                                                                                                                 | Band 66: | 0.97dBi |
|                                                                                                                                                 | Band 71: | 0.76dBi |
|                                                                                                                                                 | Band 85: | 0.63dBi |
| Remark: The above EUT's information was declared by applicant, please refer to the specifications or user manual for more detailed description. |          |         |

## 2 Test Configuration

### 2.1 Test Channel

| Band     | TX Frequency |         |            | RX Frequency |         |            |
|----------|--------------|---------|------------|--------------|---------|------------|
|          | Range        | Channel | Frequency  | Range        | Channel | Frequency  |
| GSM 850  | Low          | 128     | 824.2 MHz  | Low          | 128     | 869.2 MHz  |
|          | Middle       | 190     | 836.6 MHz  | Middle       | 190     | 881.6 MHz  |
|          | High         | 251     | 848.8 MHz  | High         | 251     | 893.8 MHz  |
| PCS 1900 | Low          | 512     | 1850.2MHz  | Low          | 512     | 1930.2 MHz |
|          | Middle       | 661     | 1880.0 MHz | Middle       | 661     | 1960.0 MHz |
|          | High         | 810     | 1909.8 MHz | High         | 810     | 1989.8 MHz |

| Band       | Bandwidth | TX Frequency |         |            | RX Frequency |         |            |
|------------|-----------|--------------|---------|------------|--------------|---------|------------|
|            |           | Range        | Channel | Frequency  | Range        | Channel | Frequency  |
| LTE band 2 | 1.4MHz    | Low          | 18607   | 1850.7 MHz | Low          | 607     | 1930.7 MHz |
|            |           | Middle       | 18900   | 1880 MHz   | Middle       | 900     | 1960 MHz   |
|            |           | High         | 19193   | 1909.3 MHz | High         | 1193    | 1989.3 MHz |
|            | 3MHz      | Low          | 18615   | 1851.5 MHz | Low          | 615     | 1931.5 MHz |
|            |           | Middle       | 18900   | 1880 MHz   | Middle       | 900     | 1960 MHz   |
|            |           | High         | 19185   | 1908.5 MHz | High         | 1185    | 1988.5 MHz |
|            | 5MHz      | Low          | 18625   | 1852.5 MHz | Low          | 625     | 1932.5 MHz |
|            |           | Middle       | 18900   | 1880 MHz   | Middle       | 900     | 1960 MHz   |
|            |           | High         | 19175   | 1907.5 MHz | High         | 1175    | 1987.5 MHz |
|            | 10MHz     | Low          | 18650   | 1855 MHz   | Low          | 650     | 1935 MHz   |
|            |           | Middle       | 18900   | 1880 MHz   | Middle       | 900     | 1960 MHz   |
|            |           | High         | 19150   | 1935 MHz   | High         | 1150    | 1985 MHz   |
|            | 15MHz     | Low          | 18675   | 1857.5 MHz | Low          | 675     | 1937.5 MHz |
|            |           | Middle       | 18900   | 1880 MHz   | Middle       | 900     | 1960 MHz   |
|            |           | High         | 19125   | 1902.5 MHz | High         | 1125    | 1982.5 MHz |
|            | 20MHz     | Low          | 18700   | 1860 MHz   | Low          | 700     | 1940 MHz   |
|            |           | Middle       | 18900   | 1880 MHz   | Middle       | 900     | 1960 MHz   |
|            |           | High         | 19100   | 1900 MHz   | High         | 1100    | 1980 MHz   |
| LTE band 4 | 1.4MHz    | Low          | 19957   | 1710.7 MHz | Low          | 1975    | 2110.7 MHz |
|            |           | Middle       | 20175   | 1732.5 MHz | Middle       | 2175    | 2132.5MHz  |
|            |           | High         | 20393   | 1754.3 MHz | High         | 2375    | 2154.3 MHz |
|            | 3MHz      | Low          | 19965   | 1711.5 MHz | Low          | 2000    | 2115 MHz   |
|            |           | Middle       | 20175   | 1732.5 MHz | Middle       | 2175    | 2132.5MHz  |
|            |           | High         | 20385   | 1753.5 MHz | High         | 2350    | 2150 MHz   |
|            | 5MHz      | Low          | 19975   | 1712.5 MHz | Low          | 1975    | 2112.5 MHz |
|            |           | Middle       | 20175   | 1732.5 MHz | Middle       | 2175    | 2132.5MHz  |
|            |           | High         | 20375   | 1752.5 MHz | High         | 2375    | 2152.5 MHz |
|            | 10MHz     | Low          | 20000   | 1715 MHz   | Low          | 2115    | 2115 MHz   |
|            |           | Middle       | 20175   | 1732.5 MHz | Middle       | 2175    | 2132.5MHz  |
|            |           | High         | 20350   | 1750 MHz   | High         | 2350    | 2150 MHz   |
|            | 15MHz     | Low          | 20025   | 1717.5 MHz | Low          | 2025    | 2117.5 MHz |
|            |           | Middle       | 20175   | 1732.5 MHz | Middle       | 2175    | 2132.5MHz  |
|            |           | High         | 20325   | 1747.5 MHz | High         | 2325    | 2147.5 MHz |
|            | 20MHz     | Low          | 20050   | 1720 MHz   | Low          | 2050    | 2120 MHz   |
|            |           | Middle       | 20175   | 1732.5 MHz | Middle       | 2175    | 2132.5MHz  |
|            |           | High         | 20300   | 1745 MHz   | High         | 2300    | 2145 MHz   |
| LTE band 5 | 1.4MHz    | Low          | 20407   | 824.7 MHz  | Low          | 2407    | 869.7 MHz  |
|            |           | Middle       | 20525   | 836.5 MHz  | Middle       | 2525    | 881.5 MHz  |
|            |           | High         | 20643   | 848.3 MHz  | High         | 2643    | 893.3 MHz  |
|            | 3MHz      | Low          | 20415   | 825.5 MHz  | Low          | 2415    | 870.5 MHz  |
|            |           | Middle       | 20525   | 836.5 MHz  | Middle       | 2525    | 881.5 MHz  |
|            |           | High         | 20635   | 847.5 MHz  | High         | 2635    | 892.5 MHz  |

|                       |        |        |       |            |        |       |            |
|-----------------------|--------|--------|-------|------------|--------|-------|------------|
| LTE band 12           | 5MHz   | Low    | 20425 | 826.5 MHz  | Low    | 2425  | 871.5 MHz  |
|                       |        | Middle | 20525 | 836.5 MHz  | Middle | 2525  | 881.5 MHz  |
|                       |        | High   | 20625 | 846.5 MHz  | High   | 2625  | 891.5 MHz  |
|                       | 10MHz  | Low    | 20450 | 829 MHz    | Low    | 2450  | 874 MHz    |
|                       |        | Middle | 20525 | 836.5 MHz  | Middle | 2525  | 881.5 MHz  |
|                       |        | High   | 20600 | 844 MHz    | High   | 2600  | 889 MHz    |
|                       | 1.4MHz | Low    | 23017 | 699.7 MHz  | Low    | 5017  | 729.7 MHz  |
|                       |        | Middle | 23095 | 707.5 MHz  | Middle | 5095  | 737.5 MHz  |
|                       |        | High   | 23173 | 715.3 MHz  | High   | 5173  | 745.3 MHz  |
| LTE band 13           | 3MHz   | Low    | 23025 | 700.5 MHz  | Low    | 5025  | 730.5 MHz  |
|                       |        | Middle | 23095 | 707.5 MHz  | Middle | 5095  | 737.5 MHz  |
|                       |        | High   | 23165 | 714.5 MHz  | High   | 5165  | 744.5 MHz  |
|                       | 5MHz   | Low    | 23035 | 701.5 MHz  | Low    | 5035  | 731.5 MHz  |
|                       |        | Middle | 23095 | 707.5 MHz  | Middle | 5095  | 737.5 MHz  |
|                       |        | High   | 23155 | 713.5 MHz  | High   | 5155  | 743.5 MHz  |
|                       | 10MHz  | Low    | 23060 | 704 MHz    | Low    | 5060  | 734 MHz    |
|                       |        | Middle | 23095 | 707.5 MHz  | Middle | 5095  | 737.5 MHz  |
|                       |        | High   | 23130 | 711 MHz    | High   | 5130  | 741 MHz    |
| LTE band 25           | 5MHz   | Low    | 23025 | 779.5 MHz  | Low    | 5205  | 748.5 MHz  |
|                       |        | Middle | 23230 | 782 MHz    | Middle | 5230  | 751 MHz    |
|                       |        | High   | 23255 | 784.5 MHz  | High   | 5255  | 753.5 MHz  |
|                       | 10MHz  | Low    | 23230 | 782 MHz    | Low    | 5230  | 751 MHz    |
|                       |        | Middle | 23230 | 782 MHz    | Middle | 5230  | 751 MHz    |
|                       |        | High   | 23230 | 782 MHz    | High   | 5230  | 751 MHz    |
|                       | 1.4MHz | Low    | 26047 | 1850.7 MHz | Low    | 8047  | 1930.7 MHz |
|                       |        | Middle | 26365 | 1882.5 MHz | Middle | 8365  | 1962.5 MHz |
|                       |        | High   | 26683 | 1914.3 MHz | High   | 8683  | 1994.3 MHz |
| LTE band 26 (814-824) | 3MHz   | Low    | 26055 | 1851.5 MHz | Low    | 8055  | 1931.5 MHz |
|                       |        | Middle | 26365 | 1882.5 MHz | Middle | 8365  | 1962.5 MHz |
|                       |        | High   | 26675 | 1913.5 MHz | High   | 8675  | 1993.5 MHz |
|                       | 5MHz   | Low    | 26065 | 1852.5 MHz | Low    | 8065  | 1932.5 MHz |
|                       |        | Middle | 26365 | 1882.5 MHz | Middle | 8365  | 1962.5 MHz |
|                       |        | High   | 26665 | 1912.5 MHz | High   | 8665  | 1992.5 MHz |
|                       | 10MHz  | Low    | 26090 | 1855 MHz   | Low    | 8090  | 1935 MHz   |
|                       |        | Middle | 26365 | 1882.5 MHz | Middle | 8365  | 1962.5 MHz |
|                       |        | High   | 26640 | 1910 MHz   | High   | 8640  | 1990 MHz   |
| LTE band 26 (814-824) | 15MHz  | Low    | 26115 | 1857.5 MHz | Low    | 8115  | 1937.5 MHz |
|                       |        | Middle | 26365 | 1882.5 MHz | Middle | 8365  | 1962.5 MHz |
|                       |        | High   | 26615 | 1907.5 MHz | High   | 8615  | 1987.5 MHz |
|                       | 20MHz  | Low    | 26140 | 1860 MHz   | Low    | 8140  | 1940 MHz   |
|                       |        | Middle | 26365 | 1882.5 MHz | Middle | 8365  | 1962.5 MHz |
|                       |        | High   | 26590 | 1905 MHz   | High   | 8590  | 1985 MHz   |
|                       | 1.4MHz | Low    | 26697 | 814.7 MHz  | Low    | 8697  | 859.7 MHz  |
|                       |        | Middle | 26740 | 819 MHz    | Middle | 8740  | 864MHz     |
|                       |        | High   | 26783 | 823.3 MHz  | High   | 8783  | 868.3 MHz  |
| LTE band 26 (814-824) | 3MHz   | Low    | 26705 | 815.5 MHz  | Low    | 8705  | 860.5 MHz  |
|                       |        | Middle | 26740 | 819 MHz    | Middle | 8740  | 864MHz     |
|                       |        | High   | 26775 | 822.5 MHz  | High   | 8775  | 867.5 MHz  |
|                       | 5MHz   | Low    | 26715 | 816.5 MHz  | Low    | 8715  | 861.5 MHz  |
|                       |        | Middle | 26740 | 819 MHz    | Middle | 8740  | 864MHz     |
|                       |        | High   | 26765 | 821.5 MHz  | High   | 8755  | 866.5 MHz  |
|                       | 10MHz  | Low    | 26740 | 819 MHz    | Low    | 8740  | 864MHz     |
|                       |        | Middle | 26740 | 819 MHz    | Middle | 8740  | 864MHz     |
|                       |        | High   | 26740 | 819 MHz    | High   | 8740  | 864MHz     |
| LTE band 26 (814-824) | 20MHz  | High   | 41515 | 2682.5 MHz | High   | 41515 | 2682.5 MHz |
|                       |        | Low    | 39750 | 2506 MHz   | Low    | 39750 | 2506 MHz   |
|                       |        | Middle | 40620 | 2593 MHz   | Middle | 40620 | 2593 MHz   |
|                       | 20MHz  | High   | 41490 | 2680 MHz   | High   | 41490 | 2680 MHz   |
|                       |        | Low    | 39750 | 2506 MHz   | Low    | 39750 | 2506 MHz   |
|                       |        | Middle | 40620 | 2593 MHz   | Middle | 40620 | 2593 MHz   |
|                       | 20MHz  | High   | 41490 | 2680 MHz   | High   | 41490 | 2680 MHz   |
|                       |        | Low    | 39750 | 2506 MHz   | Low    | 39750 | 2506 MHz   |
|                       |        | Middle | 40620 | 2593 MHz   | Middle | 40620 | 2593 MHz   |

|                          |        |        |        |            |        |       |            |
|--------------------------|--------|--------|--------|------------|--------|-------|------------|
| LTE band 26<br>(824-849) | 1.4MHz | Low    | 26797  | 824.7 MHz  | Low    | 8697  | 869.7 MHz  |
|                          |        | Middle | 26915  | 836.5 MHz  | Middle | 8915  | 881.5 MHz  |
|                          |        | High   | 27033  | 848.3 MHz  | High   | 9033  | 893.3 MHz  |
|                          | 3MHz   | Low    | 26805  | 825.5 MHz  | Low    | 8805  | 870.5 MHz  |
|                          |        | Middle | 26915  | 836.5 MHz  | Middle | 8915  | 881.5 MHz  |
|                          |        | High   | 27025  | 847.5 MHz  | High   | 9025  | 892.5 MHz  |
|                          | 5MHz   | Low    | 26815  | 826.5 MHz  | Low    | 8815  | 871.5 MHz  |
|                          |        | Middle | 26915  | 836.5 MHz  | Middle | 8915  | 881.5 MHz  |
|                          |        | High   | 27015  | 846.5 MHz  | High   | 9015  | 891.5 MHz  |
|                          | 10MHz  | Low    | 26840  | 829 MHz    | Low    | 8840  | 844 MHz    |
|                          |        | Middle | 26915  | 836.5 MHz  | Middle | 8915  | 881.5 MHz  |
|                          |        | High   | 26990  | 844 MHz    | High   | 8990  | 889 MHz    |
|                          | 15MHz  | Low    | 26865  | 831.5 MHz  | Low    | 8865  | 876.5 MHz  |
|                          |        | Middle | 26915  | 836.5 MHz  | Middle | 8915  | 881.5 MHz  |
|                          |        | High   | 26965  | 841.5 MHz  | High   | 8965  | 886.5 MHz  |
| LTE band 66              | 1.4MHz | Low    | 131979 | 1710.7 MHz | Low    | 66443 | 2110.7 MHz |
|                          |        | Middle | 132322 | 1745 MHz   | Middle | 66786 | 2145MHz    |
|                          |        | High   | 132665 | 1779.3 MHz | High   | 67329 | 2199.3 MHz |
|                          | 3MHz   | Low    | 131987 | 1711.5 MHz | Low    | 66451 | 2111.5 MHz |
|                          |        | Middle | 132322 | 1745 MHz   | Middle | 66786 | 2145MHz    |
|                          |        | High   | 132657 | 1778.5MHz  | High   | 67321 | 2198.5MHz  |
|                          | 5MHz   | Low    | 131997 | 1712.5 MHz | Low    | 66461 | 2112.5 MHz |
|                          |        | Middle | 132322 | 1745 MHz   | Middle | 66786 | 2145MHz    |
|                          |        | High   | 132647 | 1777.5 MHz | High   | 67311 | 2197.5 MHz |
|                          | 10MHz  | Low    | 132022 | 1715 MHz   | Low    | 66486 | 2115 MHz   |
|                          |        | Middle | 132322 | 1745 MHz   | Middle | 66786 | 2145MHz    |
|                          |        | High   | 132622 | 1775 MHz   | High   | 67286 | 2195 MHz   |
|                          | 15MHz  | Low    | 132047 | 1717.5 MHz | Low    | 66511 | 2117.5 MHz |
|                          |        | Middle | 132322 | 1745 MHz   | Middle | 66786 | 2145MHz    |
|                          |        | High   | 132597 | 1772.5 MHz | High   | 67261 | 2192.5 MHz |
|                          | 20MHz  | Low    | 132072 | 1720 MHz   | Low    | 66536 | 2120 MHz   |
|                          |        | Middle | 132322 | 1745 MHz   | Middle | 66786 | 2145MHz    |
|                          |        | High   | 132572 | 1770 MHz   | High   | 67236 | 2190 MHz   |
| LTE band 71              | 5MHz   | Low    | 133147 | 665.5 MHz  | Low    | 68611 | 619.5 MHz  |
|                          |        | Middle | 133297 | 680.5 MHz  | Middle | 68761 | 634.5 MHz  |
|                          |        | High   | 133447 | 695.5 MHz  | High   | 68911 | 649.5 MHz  |
|                          | 10MHz  | Low    | 133172 | 668 MHz    | Low    | 68636 | 622 MHz    |
|                          |        | Middle | 133297 | 680.5 MHz  | Middle | 68761 | 634.5 MHz  |
|                          |        | High   | 133422 | 693 MHz    | High   | 68886 | 647 MHz    |
|                          | 15MHz  | Low    | 133197 | 670.5 MHz  | Low    | 68661 | 624.5 MHz  |
|                          |        | Middle | 133297 | 680.5 MHz  | Middle | 68761 | 634.5 MHz  |
|                          |        | High   | 133397 | 690.5 MHz  | High   | 68861 | 644.5 MHz  |
| LTE band 85              | 1.4MHz | Low    | 133222 | 673 MHz    | Low    | 68686 | 627 MHz    |
|                          |        | Middle | 133297 | 680.5 MHz  | Middle | 68761 | 634.5 MHz  |
|                          |        | High   | 133372 | 688 MHz    | High   | 68836 | 642 MHz    |
|                          | 3MHz   | Low    | 23007  | 698.7 MHz  | Low    | 5007  | 728.7 MHz  |
|                          |        | Middle | 23090  | 707 MHz    | Middle | 5090  | 737 MHz    |
|                          |        | High   | 23173  | 715.3 MHz  | High   | 5173  | 745.3 MHz  |
|                          | 5MHz   | Low    | 23015  | 699.5 MHz  | Low    | 5015  | 729.5 MHz  |
|                          |        | Middle | 23090  | 707 MHz    | Middle | 5090  | 737 MHz    |
|                          |        | High   | 23165  | 714.5 MHz  | High   | 5165  | 744.5 MHz  |
|                          | 10MHz  | Low    | 23025  | 700.5 MHz  | Low    | 5025  | 730.5 MHz  |
|                          |        | Middle | 23090  | 707 MHz    | Middle | 5090  | 737 MHz    |
|                          |        | High   | 23155  | 713.5 MHz  | High   | 5155  | 743.5 MHz  |
|                          |        | Low    | 23050  | 703 MHz    | Low    | 5050  | 733 MHz    |
|                          |        | Middle | 23090  | 707 MHz    | Middle | 5090  | 737 MHz    |
|                          |        | High   | 23130  | 711 MHz    | High   | 5130  | 741 MHz    |
|                          |        | High   | 133372 | 688 MHz    | High   | 68836 | 642 MHz    |

## 2.2 Test Mode

| Test Mode | Description                                                  |
|-----------|--------------------------------------------------------------|
| TM 1      | EUT communication with simulated station in GMSK mode        |
| TM 2      | EUT communication with simulated station in 8PSK mode        |
| TM 3      | EUT communication with simulated station in LTE/QPSK mode    |
| TM 4      | EUT communication with simulated station in LTE/16QAM mode   |
| TM 5      | EUT communication with simulated station in NB-IoT/BPSK mode |
| TM 6      | EUT communication with simulated station in NB-IoT/QPSK mode |

## 2.3 Support Unit used in test

The EUT has been tested as an independent unit.

## 2.4 Test Environment

|                   |                     |
|-------------------|---------------------|
| Temperature:      | Normal: 15°C ~ 35°C |
| Relative Humidity | 45-56 % RH Ambient  |
| Voltage:          | DC 5V (4*AA)        |

## 2.5 Test RF Cable

**For all conducted test items:** The offset level is set spectrum analyzer to compensate the RF cable loss and attenuator factor between RF conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level will be exactly the RF output level.

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

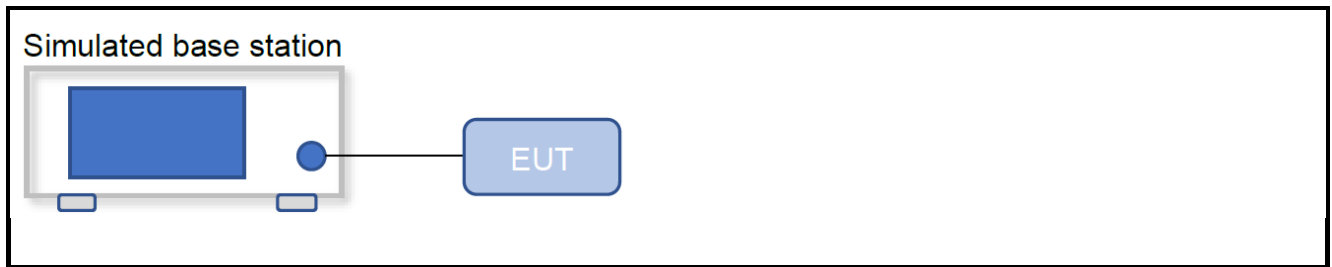
*Offset = RF cable loss + attenuator factor.*

## 2.6 Modifications

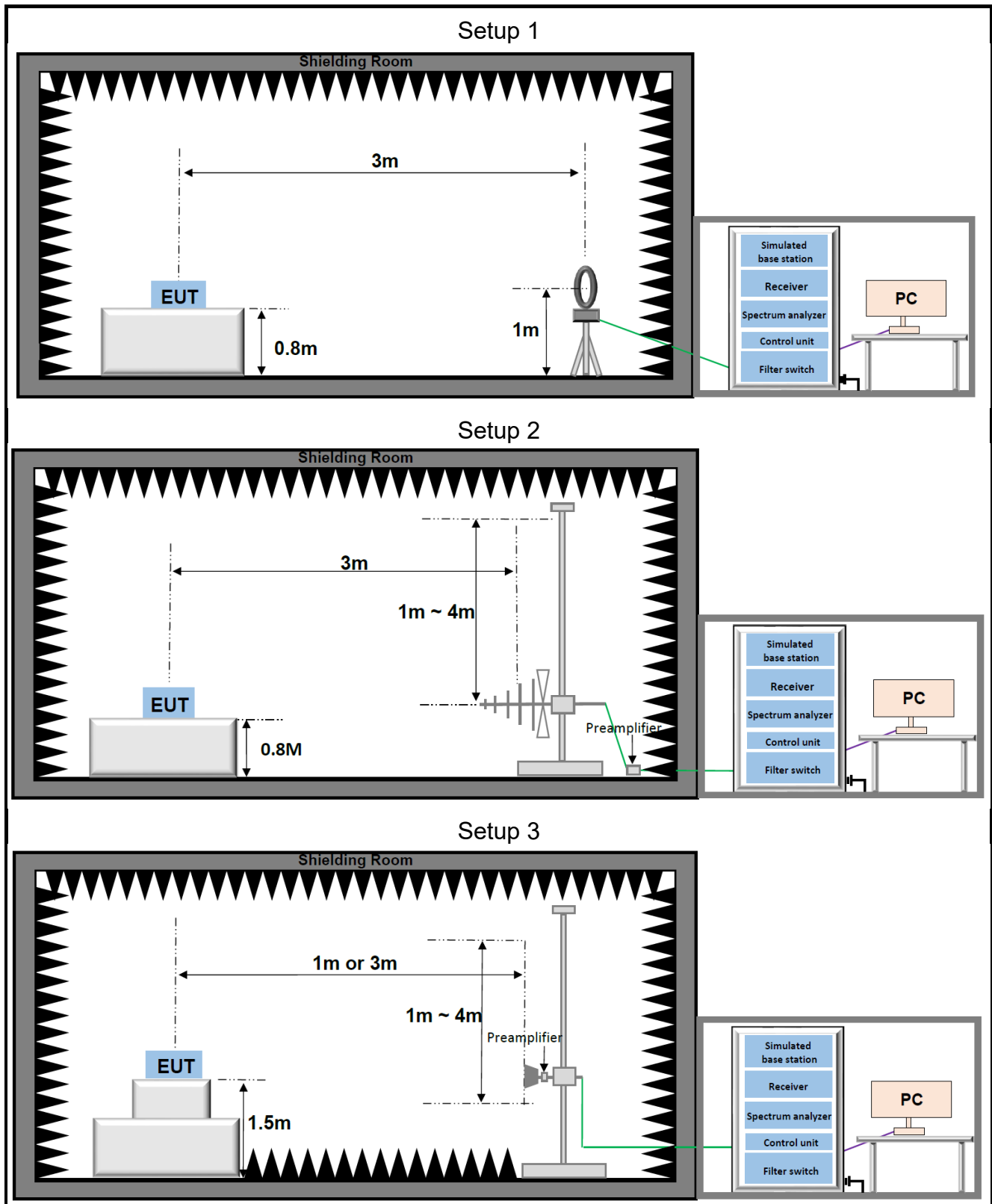
No modifications were made during testing.

## 2.7 Test Setup Diagram

### 2.7.1 Conducted Configuration



## 2.7.2 Radiated Configuration



### 3 Equipment and Measurement Uncertainty

All test and measuring equipment utilized to perform the tests documented in this report are calibrated on a regular basis, whichever is less, and where applicable is traceable recognized national standards.

#### 3.1 Test Equipment List

| Description                  | Manufacturer | Model             | SN         | Last Due   | Cal Due    |
|------------------------------|--------------|-------------------|------------|------------|------------|
| Radio Communication Analyzer | Anritsu      | MT8821C           | 6262170436 | 2024/03/25 | 2025/03/24 |
| Signal Analyzer              | Keysight     | N9020A            | US46470468 | 2024/03/25 | 2025/03/24 |
| Measurement Software         | Tonscend     | JS1120<br>V3.1.46 | 10636      | N/A        | N/A        |

| Radiated Emission                                           |                 |             |                |            |            |
|-------------------------------------------------------------|-----------------|-------------|----------------|------------|------------|
| Description                                                 | Manufacturer    | Model       | S.N.           | Last Due   | Cal Due    |
| Biconic Logarithmic Periodic Antennas                       | Schwarzbeck     | VULB9163    | 1643           | 2023/06/25 | 2025/06/24 |
| Double-Ridged Horn Antennas                                 | Schwarzbeck     | BBHA 9120D  | 2809           | 2023/06/25 | 2025/06/24 |
| Broad-Band Horn Antenna                                     | Schwarzbeck     | BBHA 9170   | 1290           | 2023/06/25 | 2025/06/24 |
| Signal Analyzer                                             | Keysight        | N9020A      | MY49100252     | 2024/03/25 | 2025/03/24 |
| EMI Tester Receiver                                         | Rohde & Schwarz | ESR7        | 102719         | 2024/05/31 | 2025/05/30 |
| Low Noise Amplifier                                         | Tonscend        | TAP9K3G40   | AP23A8060273   | 2023/04/08 | 2025/04/07 |
| Low Noise Amplifier                                         | Tonscend        | TAP01018050 | AP22G806258    | 2023/04/08 | 2025/04/07 |
| Band Reject Filter Group                                    | Townshend       | JS0806-F    | 23A806F0652    | N/A        | N/A        |
| Test Software                                               | Tonscend        | TS+         | Version: 5.0.0 | N/A        | N/A        |
| N/A: Not applicable, confirmed internally by the laboratory |                 |             |                |            |            |

### 3.2 Measurement Uncertainty

| Parameter                         | U <sub>lab</sub> |
|-----------------------------------|------------------|
| Output power                      | 0.76dB           |
| Radiated Emissions(30MHz~1000MHz) | 4.66dB           |
| Radiated Emissions(1GHz~18GHHz)   | 5.42dB           |
| Radiated Emissions(18GHz~40GHHz)  | 5.46dB           |

Uncertainty figures are valid to a confidence level of 95%

## 4 Test Results

### 4.1 Output Power (ERP / EIRP / Conducted Power)

#### Limits

| FCC Part      | Test Band                         | Limit                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------------|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| §22.913(a)(5) | GSM 850/LTE Band 5/26(824-849MHz) | The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7watts.                                                                                                                                                                                                                                                                                                                                                                                          |
| §90.635       | LTE Band 26(814-824MHz)           | The maximum output power of the transmitter for mobile stations is 100 watts (20 dBw).                                                                                                                                                                                                                                                                                                                                                                                          |
| §24.232(c)    | PCS 1900/LTE Band 2/25            | Mobile and portable stations are limited to 2 watts EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications.                                                                                                                                                                                                                                                                                                       |
| §27.50(d)(4)  | LTE Band 4/66                     | Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755MHz band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780MHz bands are limited to 1watt EIRP. Fixed stations operating in the 1710-1755MHz band are limited to a maximum antenna height of 10 meters above ground. Mobile and portable stations operating in these bands must employ a means for limiting power to the minimum necessary for successful communications. |
| §27.50(c)(10) | LTE Band 12/71/85                 | Portable stations (hand-held devices) in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3watts ERP.                                                                                                                                                                                                                                                                                                  |
| §27.50(b)(10) | LTE Band 13                       | Portable stations (hand-held devices) transmitting in the 746-757 MHz, 776-788MHz, and 805-806 MHz bands are limited to 3 watts ERP.                                                                                                                                                                                                                                                                                                                                            |

#### Test Procedure

KDB 971168 D01 V03r01 Section 5.2.1, for Conducted Output Power

KDB 971168 D01 V03r01 Section 5.2, for Effective (Isotropic) Radiated Power

#### Test Settings

Conducted Output Power:

The transmitter output was connected to a calibrated attenuator, the other end of which was connected to the simulated base station. The simulated station was set to force the EUT to its maximum power setting, Transmitter output power was read off in dBm, read values have added cable loss and attenuation.

Radiated Power:

The formula for calculating ERP/EIRP based on conduction power is as follows:

$EIRP (dBm) = \text{Conducted Power (dBm)} + \text{antenna gain (dBi)}$

$ERP = EIRP - 2.15dB$

### **Test Setup**

Refer to section 2.7.1 Setup 1

### **Measuring Instruments**

The measuring equipment is listed in the section 3.1 of this test report.

### **Test Results**

The detailed test data see: **Appendix**.

## 4.2 Field Strength of Spurious Radiation

### Limits

| FCC part                                           | Test Band                                                  | Limit                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|----------------------------------------------------|------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| §22.917(a)<br>§24.238(a)<br>§27.53(g)<br>§27.53(h) | GSM 850/PCS 1900/LTE Band 2/4/5/26(824-849MHz)/12/66/71/85 | 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| §90.691                                            | LTE Band 26(814~824MHz)                                    | The power of any emission shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log(P)$ decibels or 80 decibels, whichever is the lesser attenuation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| §27.53(c)(f)                                       | LTE Band 13                                                | On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log(P)$ dB;<br>For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation. |

### Test Procedure

KDB 971168 D01 V03r01 Section 7

### Test Settings

- For radiated emissions measurements performed at frequencies less than or equal to 1GHz, the EUT shall be placed on a RF-transparent table or support at a nominal height of 80cm above the reference ground plane.
- For radiated emissions measurements performed at frequencies above 1GHz, the EUT shall be placed on a RF-transparent table or support at a nominal height of 150cm above the ground plane.
- Radiated measurements shall be made with the measurement antenna positioned in both horizontal and vertical polarization. The measurement antenna shall be varied from 1m to 4m in height above the reference ground in a search for the relative positioning that produces the maximum radiated signal level (i.e, field strength or received power), when orienting the measurement antenna in vertical polarization, the minimum height of the lowest element of the antenna shall clear the site reference ground plane by at least 25cm.
- For each suspected emission, the EUT was ranged its worst case and then tune the antenna tower(from 1~4m) and turntable(from 0~360°) find the maximum reading. Preamplifier and a high pass filter are used for the test in order get better signal level comply with the guidelines.
- The simulated base station was set to force the EUT to its maximum transmitting power.
- spectrum analyzer setting:  
Measurements 9KHz~150KHz: RBW = 300Hz; VBW ≥ 3 kHz; Detector = RMS  
Measurements 150KHz~30MHz: RBW = 10KHz; VBW ≥ 30 kHz; Detector = RMS  
Measurements 30MHz~1000MHz: RBW = 100KHz or 1MHz; VBW ≥ 1MHz or 3MHz; Detector = RMS  
Measurements Above 1000MHz: RBW = 1 MHz; VBW ≥ 3 MHz; Detector = RMS
- The field strength is calculated by adding the Antenna Factor, Cable Factor. The basic equation with a sample calculation is as follows:  
 $E(\text{dB}\mu\text{V/m}) = \text{Measured amplitude level (dB}\mu\text{V)} + \text{Cable Loss (dB)} + \text{Antenna Factor (dB/m)}.$   
 $E(\text{dB}\mu\text{V/m}) = \text{Measured amplitude level (dBm)} + 107 + \text{Cable Loss (dB)} + \text{Antenna Factor (dB/m)}.$   
 $E(\text{dB}\mu\text{V/m}) = \text{EIRP(dBm)} - 20\log(D) + 104.8;$  where D is the measurement distance(in the far field region) in m.

$EIRP(dBm) = E(dB\mu V/m) + 20\log(D) - 104.8$ ; where D is the measurement distance(in the far field region) in m.

*So, from d: The measuring distance is usually at 3m, then  $20*\log(3)=9.5424$*

*Then,  $EIRP(dBm) = E(dB\mu V/m) + 9.5424 - 104.8 = E(dB\mu V/m) - 95.2576$*

8. Repeat above procedures until all frequencies measured was complete.
9. Measure and record the results in the test report.

### **Test notes**

1. This device employs GSM, GPRS, and EGPRS capabilities. The EUT was tested under all configurations and the highest powers is reported in GPRS mode while transmitting with one slot active.
2. The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst-case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.
3. Radiated spurious emissions were investigated from 9kHz to 30MHz, 30MHz-1GHz and above 1GHz. the disturbance between 9KHz to 30MHz and 18GHz to 40GHz was very low. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be recorded, so only the harmonics had been displayed.
4. The "/" shown in the following RSE tables are used to denote a noise floor measurement.

### **Test Setup**

Refer to section 2.7.2 for details.

### **Measuring Instruments**

The measuring equipment is listed in the section 3.1 of this test report.

### **Test Result**

The detailed test data see: **Appendix.**

## 5 Test Setup Photos

The detailed test data see: **Appendix B-Test Setup Photos**

# Appendix

|                   |
|-------------------|
| Appendix-A CatM   |
| Appendix-A NB-IoT |
| Appendix-A GSM    |

~The End~