

**Shenzhen Global Test Service Co.,Ltd.**

No.7-101 and 8A-104, Building 7 and 8, DCC Cultural and Creative Garden, No.98, Pingxin North Road, Shangmugu Community, Pinghu Street, Longgang District, Shenzhen, Guangdong

**FCC TEST REPORT****FCC Part 22/Part 24****Report Reference No.....: GTS20250313007-2-08****FCC ID.....: 2AYD5-I24M01**

Compiled by

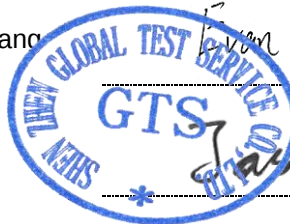
( position+printed name+signature)..: File administrators Peter Xiao

Supervised by

( position+printed name+signature)..: Test Engineer Evan Ouyang

Approved by

( position+printed name+signature)..: Manager Jason Hu



Date of issue.....: Apr.24, 2025

**Representative Laboratory Name ..: Shenzhen Global Test Service Co.,Ltd.**

Address .....: No.7-101 and 8A-104, Building 7 and 8, DCC Cultural and Creative Garden, No.98, Pingxin North Road, Shangmugu Community, Pinghu Street, Longgang District, Shenzhen, Guangdong

**Applicant's name .....: Imin Technology Pte Ltd**

Address .....: 11 Bishan Street 21 #03-05 Singapore 573943

**Test specification .....**

Standard .....: **FCC CFR Title 47 Part 2, Part 22H, Part 24E**  
**TIA-603-E**

TRF Originator.....: Shenzhen Global Test Service Co.,Ltd..

**Shenzhen Global Test Service Co.,Ltd. All rights reserved.**

This publication may be reproduced in whole or in part for non-commercial purposes as long as the Shenzhen Global Test Service Co.,Ltd. is acknowledged as copyright owner and source of the material. Shenzhen Global Test Service Co.,Ltd. takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context.

**Test item description .....: POS Device**

Trade Mark .....:

Manufacturer .....: Imin Technology Pte Ltd

Model/Type reference.....: I24M01

Listed Models .....: N/A

Modulation Type.....: QPSK

Hardware Version .....: N/A

Software Version .....: N/A

Rating .....: DC 7.7V by battery,  
Recharged by DC 9.0V

Result.....: **PASS**

**TEST REPORT**

|                          |                            |               |
|--------------------------|----------------------------|---------------|
| <b>Test Report No. :</b> | <b>GTS20250313007-2-08</b> | Apr.24, 2025  |
|                          |                            | Date of issue |

Equipment under Test : POS Device

Model /Type : I24M01

Listed model : N/A

**Applicant** : **Imin Technology Pte Ltd**

Address : 11 Bishan Street 21 #03-05 Singapore 573943

**Manufacturer** : **Imin Technology Pte Ltd**

Address : 11 Bishan Street 21 #03-05 Singapore 573943

| <b>Test result</b> | <b>Pass *</b> |
|--------------------|---------------|
|--------------------|---------------|

\* In the configuration tested, the EUT complied with the standards specified page 4.

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.

## Contents

|                                                                      |           |
|----------------------------------------------------------------------|-----------|
| <b>1 SUMMARY .....</b>                                               | <b>4</b>  |
| 1.1 TEST STANDARDS .....                                             | 4         |
| <b>2 GENERAL INFORMATION.....</b>                                    | <b>5</b>  |
| 2.1 General Remarks .....                                            | 5         |
| 2.2 Product Description .....                                        | 5         |
| 2.3 Equipment Under Test .....                                       | 8         |
| 2.4 Short description of the Equipment under Test (EUT) .....        | 8         |
| 2.5 Environmental conditions .....                                   | 8         |
| 2.6 Description of Test Modes .....                                  | 8         |
| 2.7 Block Diagram of Test Setup .....                                | 8         |
| 2.8 Special Accessories .....                                        | 8         |
| 2.9 Related Submittal(s) / Grant (s) .....                           | 8         |
| 2.10 Modifications .....                                             | 8         |
| <b>3 TEST ENVIRONMENT.....</b>                                       | <b>9</b>  |
| 3.1 Address of the test laboratory .....                             | 9         |
| 3.2 Test Facility .....                                              | 9         |
| 3.3 Environmental conditions .....                                   | 9         |
| 3.4 Statement of the measurement uncertainty .....                   | 9         |
| 3.5 Test Description .....                                           | 10        |
| 3.6 Equipments Used during the Test.....                             | 11        |
| <b>4 TEST CONDITIONS AND RESULTS .....</b>                           | <b>12</b> |
| 4.1 Output Power .....                                               | 12        |
| 4.2 Peak-to-Average Ratio (PAR) .....                                | 16        |
| 4.3 Occupied Bandwidth and Emission Bandwidth.....                   | 18        |
| 4.4 Band Edge compliance .....                                       | 21        |
| 4.5 Spurious Emission.....                                           | 23        |
| 4.6 Frequency Stability under Temperature & Voltage Variations ..... | 31        |
| <b>5 TEST SETUP PHOTOS OF THE EUT.....</b>                           | <b>33</b> |
| <b>6 EXTERNAL AND INTERNAL PHOTOS OF THE EUT .....</b>               | <b>33</b> |

# **1 SUMMARY**

## **1.1 TEST STANDARDS**

The tests were performed according to following standards:

[FCC Part 22](#) : PUBLIC MOBILE SERVICES

[FCC Part 24](#) : PERSONAL COMMUNICATIONS SERVICES

[TIA-603-E](#): Land Mobile FM or PM Communications Equipment Measurement and Performance Standards.

[FCC Part 2](#): FREQUENCY ALLOCA-TIONS AND RADIO TREATY MAT-TERS; GENERAL RULES AND REG-ULATIONS

[FCC KDB971168 D01](#) Power Meas License Digital Systems v03r01

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

## 2 GENERAL INFORMATION

### 2.1 General Remarks

|                                |   |              |
|--------------------------------|---|--------------|
| Date of receipt of test sample | : | Feb.01, 2025 |
|                                |   |              |
| Testing commenced on           | : | Feb.01, 2025 |
|                                |   |              |
| Testing concluded on           | : | Apr.23, 2025 |

### 2.2 Product Description

|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Product Name:             | POS Device                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Trade Mark:               |                                                                                                                                                                                                                                                                                                                                                    |
| Model/Type reference:     | I24M01                                                                                                                                                                                                                                                                                                                                                                                                                              |
| List Model:               | N/A                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Model Declaration         | N/A                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Power supply:             | DC 7.7V by battery,<br>Recharged by DC 9.0V                                                                                                                                                                                                                                                                                                                                                                                         |
| Hardware Version          | N/A                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Software Version          | N/A                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Sample ID                 | GTS20250313007-2-1#& GTS20250313007-2-2#                                                                                                                                                                                                                                                                                                                                                                                            |
| Bluetooth                 |                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Frequency Range           | 2402MHz ~ 2480MHz                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Channel Number            | 79 channels for Bluetooth (DSS)<br>40 channels for Bluetooth (DTS)                                                                                                                                                                                                                                                                                                                                                                  |
| Channel Spacing           | 1MHz for Bluetooth (DSS)<br>2MHz for Bluetooth (DTS)                                                                                                                                                                                                                                                                                                                                                                                |
| Modulation Type           | GFSK, $\pi/4$ -DQPSK, 8-DPSK for Bluetooth (DSS)<br>GFSK for Bluetooth (DTS)                                                                                                                                                                                                                                                                                                                                                        |
| 2.4GWLAN                  |                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| WLAN Operation frequency  | IEEE 802.11b:2412-2462MHz<br>IEEE 802.11g:2412-2462MHz<br>IEEE 802.11n HT20:2412-2462MHz                                                                                                                                                                                                                                                                                                                                            |
| WLAN Modulation Type      | IEEE 802.11b: DSSS(CCK,DQPSK,DBPSK)<br>IEEE 802.11g: OFDM(64QAM, 16QAM, QPSK, BPSK)<br>IEEE 802.11n HT20: OFDM (64QAM, 16QAM, QPSK,BPSK)                                                                                                                                                                                                                                                                                            |
| Channel number:           | 11 Channel for IEEE 802.11b/g/n(HT20)                                                                                                                                                                                                                                                                                                                                                                                               |
| Channel separation:       | 5MHz                                                                                                                                                                                                                                                                                                                                                                                                                                |
| WIFI(5.2G/5.3G/5.7G Band) |                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Frequency Range           | 5180MHz ~ 5240MHz, 5260MHz ~ 5320MHz, 5500MHz ~ 5700MHz                                                                                                                                                                                                                                                                                                                                                                             |
| Channel Number            | 4 Channels for 20MHz bandwidth(5180-5240MHz)<br>4 Channels for 20MHz bandwidth(5260-5320MHz)<br>11 Channels for 20MHz bandwidth(5500-5700MHz)<br>2 channels for 40MHz bandwidth(5190~5230MHz)<br>2 channels for 40MHz bandwidth(5270~5310MHz)<br>5 Channels for 40MHz bandwidth(5510-5670MHz)<br>1 channels for 80MHz bandwidth(5210MHz)<br>1 channels for 80MHz bandwidth(5290MHz)<br>2 Channels for 80MHz bandwidth(5530-5610MHz) |
| Modulation Type           | IEEE 802.11a: OFDM(64QAM, 16QAM, QPSK, BPSK)<br>IEEE 802.11n HT20: OFDM (64QAM, 16QAM, QPSK,BPSK)<br>IEEE 802.11ac VHT20: OFDM (256QAM,64QAM, 16QAM, QPSK,BPSK)<br>IEEE 802.11n HT40: OFDM (64QAM, 16QAM, QPSK,BPSK)<br>IEEE 802.11ac VHT40: OFDM (256QAM,64QAM, 16QAM, QPSK,BPSK)<br>IEEE 802.11ac VHT80: OFDM (256QAM,64QAM,16QAM, QPSK,BPSK)                                                                                     |
| WIFI (5.8G Band)          |                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Frequency Range           | 5745MHz ~ 5825MHz                                                                                                                                                                                                                                                                                                                                                                                                                   |

|                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Channel Number                | 5 channels for 20MHz bandwidth(5745-5825MHz)<br>2 channels for 40MHz bandwidth(5755~5795MHz)<br>1 channels for 80MHz bandwidth(5775MHz)                                                                                                                                                                                                                                                                                                                                     |
| Modulation Type               | IEEE 802.11a: OFDM(64QAM, 16QAM, QPSK, BPSK)<br>IEEE 802.11n HT20: OFDM (64QAM, 16QAM, QPSK,BPSK)<br>IEEE 802.11ac VHT20: OFDM (256QAM,64QAM, 16QAM, QPSK,BPSK)<br>IEEE 802.11n HT40: OFDM (64QAM, 16QAM, QPSK,BPSK)<br>IEEE 802.11ac VHT40: OFDM (256QAM,64QAM, 16QAM, QPSK,BPSK)<br>IEEE 802.11ac VHT80: OFDM (256QAM,64QAM,16QAM, QPSK,BPSK)                                                                                                                             |
| Antenna Description           | Internal Antenna, 2.00dBi(Max.) for 2.4G Band and 2.00dBi(Max.) for 5G Band                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>2G</b>                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Support Band                  | GPRS850/GPRS1900/EDGE850/EDGE1900                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Release Version               | R99                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| GPRS Class                    | Class 12                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| EGPRS Class                   | Class 12                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| GPRS/EDGE Multislot Class     | GPRS/EDGE: Multi-slot Class 12                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Type Of Modulation            | GMSK for GPRS; GMSK/8PSK for EGPRS                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Antenna Description           | Internal Antenna;<br>-3.37dBi (max.) For GPRS850/EDGE850;<br>2.51dBi (max.) For GPRS1900/EDGE1900;                                                                                                                                                                                                                                                                                                                                                                          |
| <b>3G</b>                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| UMTS Operation Frequency Band | UMTS FDD Band 2(1850 MHz -1910MHz)<br>UMTS FDD Band 5(824 MHz -849MHz)                                                                                                                                                                                                                                                                                                                                                                                                      |
| WCDMA Release Version         | R7                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| HSDPA Release Version         | Release 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| HSUPA Release Version         | Release 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| HSPA+ Release Version         | Release 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Modulation Type               | QPSK for UMTS                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Antenna Description           | Internal Antenna;<br>2.51dBi (max.) For WCDMA Band 2;<br>-3.37dBi (max.) For WCDMA Band 5;                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>LTE</b>                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| LTE Operation Frequency Band  | E-UTRA Band 2(1850 MHz -1910MHz)<br>E-UTRA Band 4(1710 MHz -1755MHz)<br>E-UTRA Band 5(824 MHz -849MHz)<br>E-UTRA Band 7(2500 MHz -2570MHz)<br>E-UTRA Band 12(699 MHz -716MHz)<br>E-UTRA Band 13(777 MHz -787MHz)<br>E-UTRA Band 14(788 MHz -798MHz)<br>E-UTRA Band 17(704 MHz -716MHz)<br>E-UTRA Band 25(1850 MHz -1915MHz)<br>E-UTRA Band 26(814 MHz -824MHz)<br>E-UTRA Band 26(824 MHz -849MHz)<br>E-UTRA Band 41(2496 MHz -2690MHz)<br>E-UTRA Band 66(1710 MHz -1780MHz) |
| LTE Release Version           | R10                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Type Of Modulation            | QPSK/16QAM                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Antenna Description           | Internal Antenna;<br>2.51dBi (max.) For LTE Band 2;<br>1.78dBi (max.) For LTE Band 4;                                                                                                                                                                                                                                                                                                                                                                                       |

|                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                               | -3.37dBi (max.) For LTE Band 5;<br>2.87dBi (max.) For LTE Band 7;<br>-7.38dBi (max.) For LTE Band 12;<br>-3.98dBi (max.) For LTE Band 13;<br>-4.62dBi (max.) For LTE Band 14;<br>-7.38dBi (max.) For LTE Band 17;<br>2.51dBi (max.) For LTE Band 25;<br>-3.37dBi (max.) For LTE Band 26;<br>2.87dBi (max.) For LTE Band 41;<br>2.57dBi (max.) For LTE Band 66; |
| RFID(13.56MHz) (Optional)                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                |
| Frequency Range                                                                                                                                                                               | 13.56MHz                                                                                                                                                                                                                                                                                                                                                       |
| Channel Number                                                                                                                                                                                | 1                                                                                                                                                                                                                                                                                                                                                              |
| Modulation Type                                                                                                                                                                               | ASK                                                                                                                                                                                                                                                                                                                                                            |
| Antenna Description                                                                                                                                                                           | Internal Antenna, 0dBi (Max.)                                                                                                                                                                                                                                                                                                                                  |
| GPS(RX)                                                                                                                                                                                       | Support                                                                                                                                                                                                                                                                                                                                                        |
| Remark:The I24M01 model has 3 versions;<br>Version A: With a scanning head (Manufacturer: ZEBRA) ;<br>Version B: With a scanning head (Manufacturer: Newland)<br>Version C: No scanning head; |                                                                                                                                                                                                                                                                                                                                                                |

## 2.3 Equipment Under Test

### Power supply system utilised

|                      |   |                                  |                                  |                       |           |
|----------------------|---|----------------------------------|----------------------------------|-----------------------|-----------|
| Power supply voltage | : | <input type="radio"/>            | 230V/ 50 Hz                      | <input type="radio"/> | 120V/60Hz |
|                      |   | <input type="radio"/>            | 12 V DC                          | <input type="radio"/> | 24 V DC   |
|                      |   | <input checked="" type="radio"/> | Other (specified in blank below) |                       |           |

DC 7.7V

## 2.4 Short description of the Equipment under Test (EUT)

This is a POS Device. For more details, refer to the user's manual of the EUT.

## 2.5 Environmental conditions

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

|                     |         |
|---------------------|---------|
| Normal Temperature: | 25°C    |
| Relative Humidity:  | 55 %    |
| Air Pressure:       | 101 kPa |

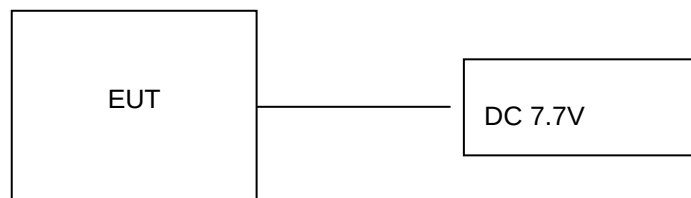
## 2.6 Description of Test Modes

The EUT has been tested under typical operating condition. The CMW500 used to control the EUT staying in continuous transmitting and receiving mode for testing. Regards to the frequency band operation: the lowest, middle and highest frequency of channel were selected to perform the test, then shown on this report.

Note:

1. For the ERP/EIRP and radiated emission test, every axis (X, Y, Z) was verified, and show the worst result on this report.
2. Test method and refer to 3GPP TS134 121.

## 2.7 Block Diagram of Test Setup



## 2.8 Special Accessories

| Manufacturer                          | Description       | Model              | Serial Number | Certificate |
|---------------------------------------|-------------------|--------------------|---------------|-------------|
| SHENZHEN TIANYIN ELECTRONICS CO.,LTD. | Adapter           | TPD-203A120167UF01 | --            | SDOC        |
| --                                    | Swift2-Ultra Dock | I24M0122           | --            | SDOC        |

## 2.9 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is filing to comply with of the FCC Part 22, Part 24, Part 27 Rules.

## 2.10 Modifications

No modifications were implemented to meet testing criteria.

### 3 TEST ENVIRONMENT

#### 3.1 Address of the test laboratory

##### **Shenzhen Global Test Service Co.,Ltd.**

No.7-101 and 8A-104, Building 7 and 8, DCC Cultural and Creative Garden, No.98, Pingxin North Road, Shangmugu Community, Pinghu Street, Longgang District, Shenzhen, Guangdong, China.

The sites are constructed in conformance with the requirements of ANSI C63.4 (2014) and CISPR Publication 22.

#### 3.2 Test Facility

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

CNAS (No. CNAS L8169)

Shenzhen Global Test Service Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2019 General Requirements) for the Competence of Testing and Calibration Laboratories.

A2LA (Certificate No. 4758.01)

Shenzhen Global Test Service Co., Ltd. has been assessed by the American Association for Laboratory Accreditation (A2LA). Certificate No. 4758.01.

Industry Canada Registration Number. is 24189.

FCC Designation Number is CN1234.

FCC Registered Test Site Number is 165725.

#### 3.3 Environmental conditions

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

|                       |              |
|-----------------------|--------------|
| Temperature:          | 15-35 ° C    |
| Humidity:             | 30-60 %      |
| Atmospheric pressure: | 950-1050mbar |

#### 3.4 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the Shenzhen Global Test Service Co.,Ltd quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Shenzhen GTS laboratory is reported:

| Test                  | Range      | Measurement Uncertainty | Notes |
|-----------------------|------------|-------------------------|-------|
| Radiated Emission     | 30~1000MHz | 4.10 dB                 | (1)   |
| Radiated Emission     | 1~18GHz    | 4.32 dB                 | (1)   |
| Radiated Emission     | 18-40GHz   | 5.54 dB                 | (1)   |
| Conducted Disturbance | 0.15~30MHz | 3.12 dB                 | (1)   |

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

### 3.5 Test Description

| Test Item                              | Section in CFR 47                               | Test Sample                                | Result |
|----------------------------------------|-------------------------------------------------|--------------------------------------------|--------|
| RF Output Power                        | Part 2.1046<br>Part 22.913(a)<br>Part 24.232(c) | GTS20250313007-2-1#                        | Pass   |
| Peak-to-Average Ratio                  | Part 2.1046<br>Part 24.232                      | GTS20250313007-2-1#                        | Pass   |
| 99% & -26 dB Occupied Bandwidth        | Part 2.1049                                     | GTS20250313007-2-1#                        | Pass   |
| Spurious Emissions at Antenna Terminal | Part 2.1051<br>Part 22.917<br>Part 24.238       | GTS20250313007-2-1#<br>GTS20250313007-2-2# | Pass   |
| Field Strength of Spurious Radiation   | Part 2.1053<br>Part 22.917(b)<br>Part 24.238    | GTS20250313007-2-1#                        | Pass   |
| Out of band emission, Band Edge        | Part 2.1051<br>Part 22.917(b)<br>Part 24.238    | GTS20250313007-2-1#                        | Pass   |
| Frequency stability                    | Part 2.1055<br>Part 22.355<br>Part 24.235       | GTS20250313007-2-1#                        | Pass   |

Remark:

1. The measurement uncertainty is not included in the test result.
2. NA = Not Applicable; NP = Not Performed
3. Note 1 – Test results inside test report;
4. Note 2 – Test results in other test report (SAR Report).
5. We tested all test mode and recorded worst case in report

### 3.6 Equipments Used during the Test

| Test Equipment                | Manufacturer                      | Model No.          | Serial No.      | Calibration Date | Calibration Due Date |
|-------------------------------|-----------------------------------|--------------------|-----------------|------------------|----------------------|
| LISN                          | CYBERTEK                          | EM5040A            | E1850400105     | 2024/07/15       | 2025/07/14           |
| LISN                          | R&S                               | ESH2-Z5            | 893606/008      | 2024/07/15       | 2025/07/14           |
| EMI Test Receiver             | R&S                               | ESPI3              | 101841-cd       | 2024/07/15       | 2025/07/14           |
| EMI Test Receiver             | R&S                               | ESCI7              | 101102          | 2024/07/15       | 2025/07/14           |
| Spectrum Analyzer             | Agilent                           | N9020A             | MY48010425      | 2024/07/15       | 2025/07/14           |
| Spectrum Analyzer             | R&S                               | FSV40-N            | 101800          | 2024/07/15       | 2025/07/14           |
| Vector Signal generator       | Agilent                           | N5181A             | MY49060502      | 2024/07/15       | 2025/07/14           |
| Signal generator              | Agilent                           | N5182A             | 3610AO1069      | 2024/07/15       | 2025/07/14           |
| Climate Chamber               | ESPEC                             | EL-10KA            | A20120523       | 2024/07/15       | 2025/07/14           |
| Controller                    | EM Electronics                    | Controller EM 1000 | N/A             | N/A              | N/A                  |
| Horn Antenna                  | Schwarzbeck                       | BBHA 9120D         | 01622           | 2024/12/16       | 2025/12/15           |
| Active Loop Antenna           | Beijing Da Ze Technology Co.,Ltd. | ZN30900C           | 15006           | 2024/07/15       | 2025/07/14           |
| Bilog Antenna                 | Schwarzbeck                       | VULB9163           | 000976          | 2024/07/15       | 2025/07/14           |
| Broadband Horn Antenna        | SCHWARZBECK                       | BBHA 9170          | 791             | 2024/07/15       | 2025/07/14           |
| Amplifier                     | SKET                              | LAPA_30M01G-32     | SK20240104001   | 2025/01/21       | 2026/01/20           |
| Amplifier                     | EMCI                              | EMC012645SE        | 980340          | 2025/01/21       | 2026/01/20           |
| Amplifier                     | Schwarzbeck                       | BBV9179            | 9719-025        | 2025/01/21       | 2026/01/20           |
| Temperature/Humidity Meter    | Gangxing                          | CTH-608            | 02              | 2024/07/15       | 2025/07/14           |
| High-Pass Filter              | HUBER+SUHNER                      | RG214              | RE01            | 2024/07/15       | 2025/07/14           |
| High-Pass Filter              | HUBER+SUHNER                      | RG214              | RE02            | 2024/07/15       | 2025/07/14           |
| RF Cable(below 1GHz)          | HUBER+SUHNER                      | RG214              | RE01            | 2024/07/15       | 2025/07/14           |
| RF Cable(above 1GHz)          | HUBER+SUHNER                      | RG214              | RE02            | 2024/07/15       | 2025/07/14           |
| Data acquisition card         | Agilent                           | U2531A             | TW53323507      | 2024/07/15       | 2025/07/14           |
| Power Sensor                  | Agilent                           | U2021XA            | MY5365004       | 2024/07/15       | 2025/07/14           |
| Test Control Unit             | Tonscend                          | JS0806-1           | 178060067       | 2024/07/15       | 2025/07/14           |
| Automated filter bank         | Tonscend                          | JS0806-F           | 19F8060177      | 2024/07/15       | 2025/07/14           |
| Wireless Communication Tester | Rohde&Schwarz                     | CMW500             | 125408          | 2024/07/15       | 2025/07/14           |
| EMI Test Software             | Tonscend                          | JS1120-1           | Ver 2.6.8.0518  | /                | /                    |
| EMI Test Software             | Tonscend                          | JS1120-3           | Ver 2.5.77.0418 | /                | /                    |
| EMI Test Software             | Tonscend                          | JS32-CE            | Ver 2.5         | /                | /                    |
| EMI Test Software             | Tonscend                          | JS32-RE            | Ver 2.5.1.8     | /                | /                    |

Note: The Cal.Interval was one year.

## 4 TEST CONDITIONS AND RESULTS

### 4.1 Output Power

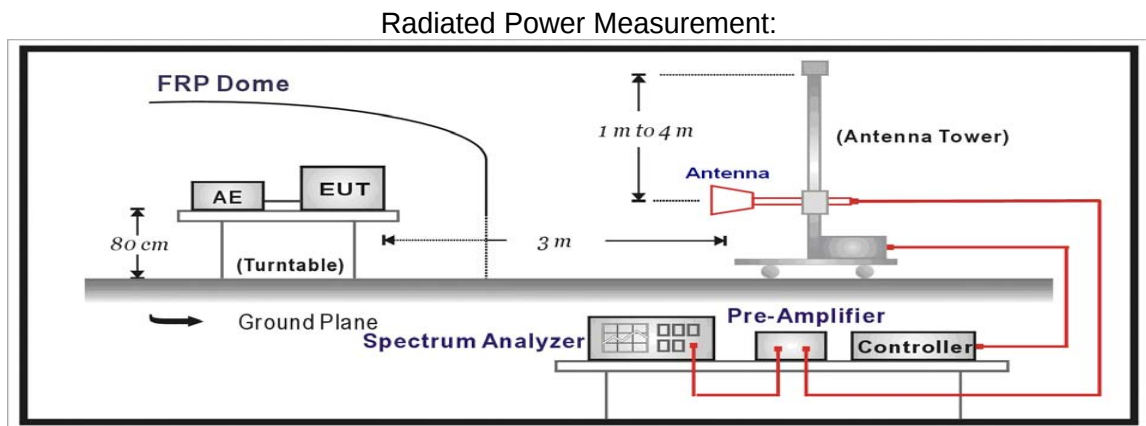
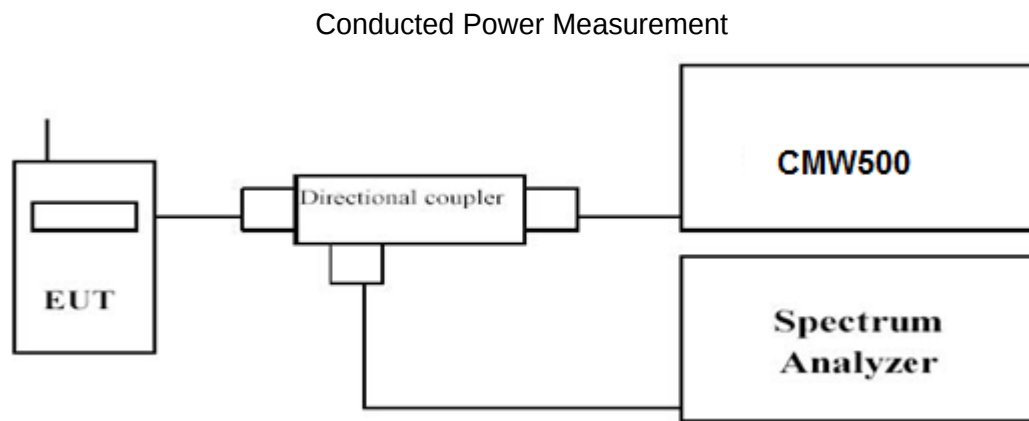
#### LIMIT

This is the test for the maximum radiated power from the EUT.

Per rule Part 24.232(c) specifies, "Mobile/portable stations are limited to 2 watts e.i.r.p. Peak power" and 24.232(e) specifies that "Peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage."

Per rule Part 22.913(a) specifies "The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts."

#### TEST CONFIGURATION



#### TEST PROCEDURE

The EUT was setup according to EIA/TIA 603D

##### **Conducted Power Measurement:**

- Place the EUT on a bench and set it in transmitting mode.
- Connect a low loss RF cable from the antenna port to a spectrum analyzer and CMW500 by a Directional Couple.
- EUT Communicate with CMW500, then select a channel for testing.
- Add a correction factor to the display of spectrum, and then test.

**Radiated Power Measurement:**

- a. The EUT shall be placed at the specified height on a support, and in the position closest to normal use as declared by provider.
- b. The test antenna shall be oriented initially for vertical polarization and shall be chosen to correspond to the frequency of the transmitter
- c. The output of the test antenna shall be connected to the measuring receiver.
- d. The transmitter shall be switched on and the measuring receiver shall be tuned to the frequency of the
- e. transmitter under test.
- f. The test antenna shall be raised and lowered through the specified range of height until a maximum signal level is detected by the measuring receiver.
- g. The transmitter shall then be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
- h. The test antenna shall be raised and lowered again through the specified range of height until a maximum signal level is detected by the measuring receiver.
- i. The maximum signal level detected by the measuring receiver shall be noted.
- j. The transmitter shall be replaced by a substitution antenna.
- k. The substitution antenna shall be orientated for vertical polarization and the length of the substitution antenna shall be adjusted to correspond to the frequency of the transmitter.
- l. The substitution antenna shall be connected to a calibrated signal generator.
- m. If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
- n. The test antenna shall be raised and lowered through the specified range of height to ensure that the maximum signal is received.
- o. The input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuator setting of the measuring receiver.
- p. The measurement shall be repeated with the test antenna and the substitution antenna orientated for horizontal polarization.
- q. The measure of the effective radiated power is the larger of the two levels recorded at the input to the substitution antenna, corrected for gain of the substitution antenna if necessary.
- r. Test site anechoic chamber refer to ANSI C63.26.

**TEST RESULTS**

|               |             |                |       |
|---------------|-------------|----------------|-------|
| Temperature   | 24.5°C      | Humidity       | 53.7% |
| Test Engineer | Evan Ouyang | Configurations | WCDMA |

**Conducted Measurement:****WCDMA Band II**

| Mode   | 3GPP Sub Test | Low Channel     | Middle Channel  | High Channel     |
|--------|---------------|-----------------|-----------------|------------------|
|        |               | Ave.Power (dBm) | Ave.Power (dBm) | Ave. Power (dBm) |
| Rel 99 | 1             | 23.51           | 23.57           | 23.51            |
| HSDPA  | 1             | 23.54           | 23.56           | 23.59            |
|        | 2             | 22.57           | 22.61           | 22.60            |
|        | 3             | 22.53           | 22.61           | 22.62            |
|        | 4             | 22.53           | 22.57           | 22.54            |
| HSUPA  | 1             | 22.50           | 22.53           | 22.58            |
|        | 2             | 22.63           | 22.57           | 22.62            |
|        | 3             | 22.58           | 22.66           | 22.63            |
|        | 4             | 22.59           | 22.63           | 22.65            |
|        | 5             | 22.67           | 22.67           | 22.51            |

**WCDMA Band V**

| Mode   | 3GPP Sub Test | Low Channel     | Middle Channel  | High Channel     |
|--------|---------------|-----------------|-----------------|------------------|
|        |               | Ave.Power (dBm) | Ave.Power (dBm) | Ave. Power (dBm) |
| Rel 99 | 1             | 23.54           | 23.46           | 23.61            |
| HSDPA  | 1             | 23.48           | 23.57           | 23.53            |
|        | 2             | 22.68           | 22.55           | 22.62            |
|        | 3             | 22.56           | 22.66           | 22.53            |
|        | 4             | 22.63           | 22.56           | 22.53            |
| HSUPA  | 1             | 22.51           | 22.55           | 22.57            |
|        | 2             | 22.64           | 22.60           | 22.66            |
|        | 3             | 22.57           | 22.52           | 22.66            |
|        | 4             | 22.64           | 22.59           | 22.53            |
|        | 5             | 22.64           | 22.54           | 22.64            |

**Radiated Measurement:**

Remark:

1. We were tested all RB Configuration refer 3GPP TS134 121 for each Channel Bandwidth of WCDMA Band II, WCDMA Band V; recorded worst case for each Channel Bandwidth of WCDMA Band II, WCDMA Band V.
2.  $ERP = EIRP - 2.15\text{dBi}$  as EIRP by subtracting the gain of the dipole.
3. The unit of Antenna Gain is dBd for frequency below 1GHz, and the unit of Antenna Gain is dBi for frequency above 1GHz.
4. Absolute Level = Substituted Level - Cable loss + Antenna Gain
5. Margin = Limit-Absolute Level

|               |             |                |       |
|---------------|-------------|----------------|-------|
| Temperature   | 24.5℃       | Humidity       | 53.7% |
| Test Engineer | Evan Ouyang | Configurations | WCDMA |

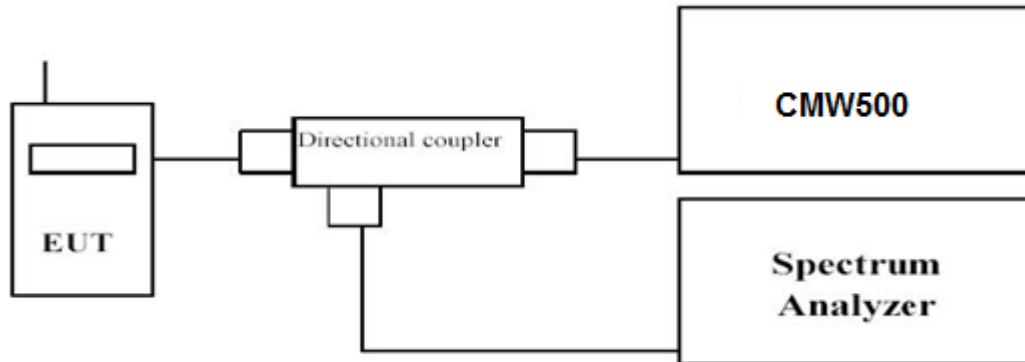
| Frequency<br>(MHz)           | Polar<br>(H/V) | Receiver<br>Reading<br>(dBμV) | Substituted Method            |                              |                   | Absolute<br>Level<br>EIRP/ERP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) |
|------------------------------|----------------|-------------------------------|-------------------------------|------------------------------|-------------------|----------------------------------------|----------------|----------------|
|                              |                |                               | Substituted<br>Level<br>(dBm) | Antenna<br>Gain<br>(dBd/dBi) | Cable<br>Loss(dB) |                                        |                |                |
| WCDMA Band II Low Channel    |                |                               |                               |                              |                   |                                        |                |                |
| 1,852.40                     | H              | 86.47                         | 13.87                         | 11.59                        | 2.11              | 23.35                                  | 33.00          | 9.65           |
| 1,852.40                     | V              | 86.03                         | 11.77                         | 11.59                        | 2.11              | 21.25                                  | 33.00          | 11.75          |
| WCDMA Band II Middle Channel |                |                               |                               |                              |                   |                                        |                |                |
| 1,880.00                     | H              | 85.15                         | 13.09                         | 11.56                        | 2.14              | 22.51                                  | 33.00          | 10.49          |
| 1,880.00                     | V              | 85.75                         | 12.55                         | 11.56                        | 2.14              | 21.97                                  | 33.00          | 11.03          |
| WCDMA Band II High Channel   |                |                               |                               |                              |                   |                                        |                |                |
| 1,907.60                     | H              | 84.76                         | 12.68                         | 11.52                        | 2.18              | 22.02                                  | 33.00          | 10.98          |
| 1,907.60                     | V              | 85.57                         | 11.67                         | 11.52                        | 2.18              | 21.01                                  | 33.00          | 11.99          |
| WCDMA Band V Low Channel     |                |                               |                               |                              |                   |                                        |                |                |
| 826.40                       | H              | 85.65                         | 20.74                         | 1.65                         | 0.58              | 21.81                                  | 38.45          | 16.64          |
| 826.40                       | V              | 85.85                         | 19.98                         | 1.65                         | 0.58              | 21.05                                  | 38.45          | 17.40          |
| WCDMA Band V Middle Channel  |                |                               |                               |                              |                   |                                        |                |                |
| 836.60                       | H              | 85.63                         | 21.16                         | 1.59                         | 0.65              | 22.10                                  | 38.45          | 16.35          |
| 836.60                       | V              | 84.69                         | 20.11                         | 1.59                         | 0.65              | 21.05                                  | 38.45          | 17.40          |
| WCDMA Band V High Channel    |                |                               |                               |                              |                   |                                        |                |                |
| 846.60                       | H              | 86.29                         | 19.66                         | 1.53                         | 0.71              | 20.48                                  | 38.45          | 17.97          |
| 846.60                       | V              | 84.36                         | 21.22                         | 1.53                         | 0.71              | 22.04                                  | 38.45          | 16.41          |

## 4.2 Peak-to-Average Ratio (PAR)

### LIMIT

The Peak-to-Average Ratio (PAR) of the transmission may not exceed 13 dB.

### TEST CONFIGURATION



### TEST PROCEDURE

1. Refer to instrument's analyzer instruction manual for details on how to use the power statistics/CCDF function;
2. Set resolution/measurement bandwidth  $\geq$  signal's occupied bandwidth;
3. Set the number of counts to a value that stabilizes the measured CCDF curve;
4. Set the measurement interval as follows:
  - 1). for continuous transmissions, set to 1 ms,
  - 2). for burst transmissions, employ an external trigger that is synchronized with the EUT burst tN/Ag sequence, or use the internal burst trigger with a trigger level that allows the burst to stabilize and set the measurement interval to a time that is less than or equal to the burst duration.
5. Record the maximum PAPR level associated with a probability of 0.1%.

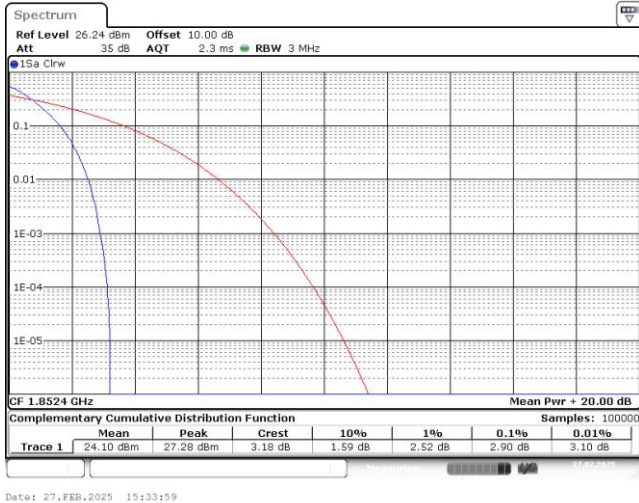
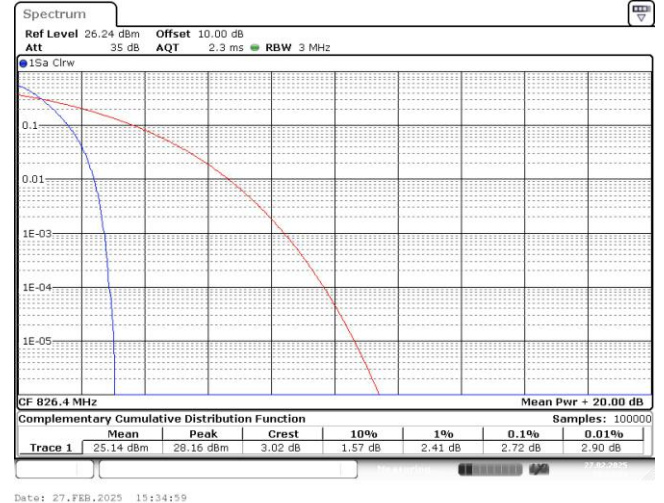
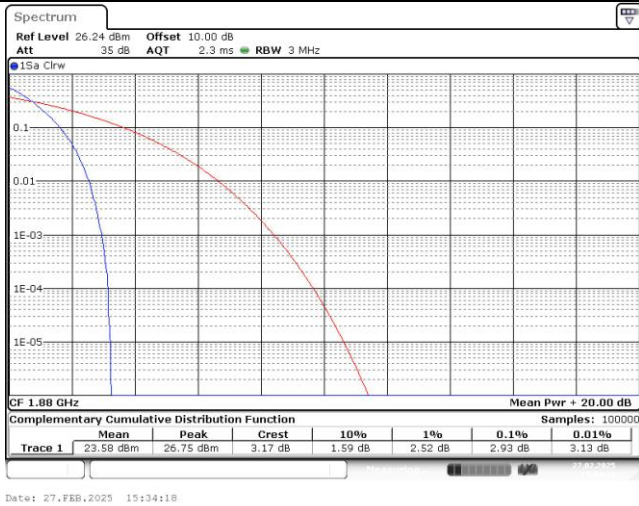
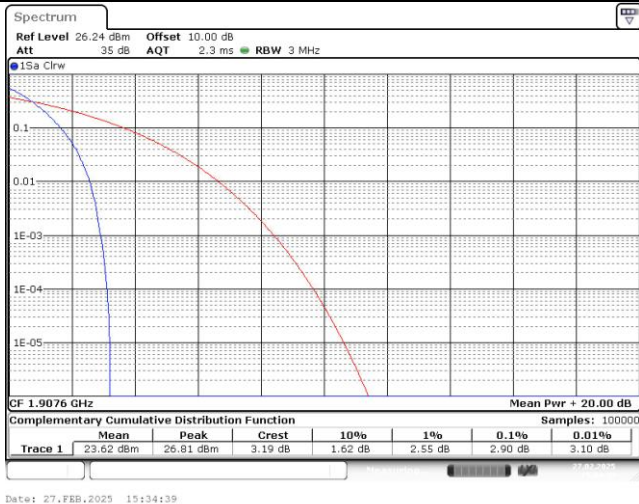
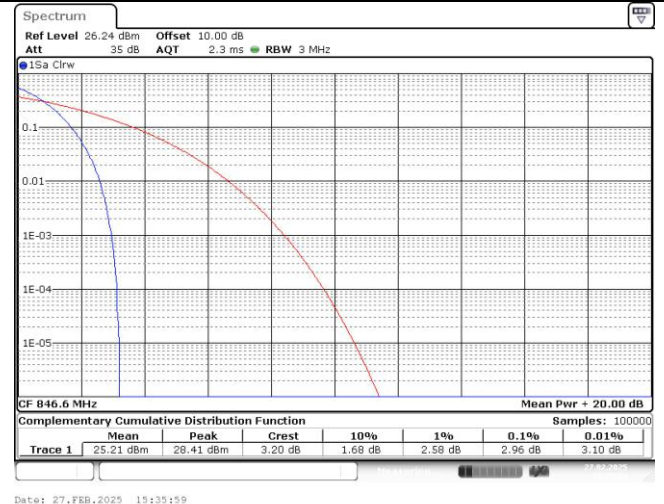
### TEST RESULTS

|               |             |                |       |
|---------------|-------------|----------------|-------|
| Temperature   | 24.5°C      | Humidity       | 53.7% |
| Test Engineer | Evan Ouyang | Configurations | WCDMA |

Remark:

We were tested all RB Configuration refer 3GPP TS134 121 for each Channel Bandwidth of WCDMA Band II, WCDMA Band V; recorded worst case for each Channel Bandwidth of WCDMA Band II, WCDMA Band V.

| Test Mode                  | Channel | Frequency (MHz) | PAPR Value (dB) | Limits (dB) | Verdict |
|----------------------------|---------|-----------------|-----------------|-------------|---------|
| UMTS/TM1/<br>WCDMA Band II | 9262    | 1852.4          | 2.90            | 13.0        | PASS    |
|                            | 9400    | 1880.0          | 2.93            | 13.0        | PASS    |
|                            | 9538    | 1907.6          | 2.90            | 13.0        | PASS    |
| UMTS/TM1/<br>WCDMA Band V  | 4132    | 826.4           | 2.72            | 13.0        | PASS    |
|                            | 4182    | 836.4           | 2.96            | 13.0        | PASS    |
|                            | 4233    | 846.6           | 2.96            | 13.0        | PASS    |

**Peak-to-Average Ratio (PAR)****UMTS/TM1/ WCDMA Band II****UMTS/TM1/ WCDMA Band V****Channel 9262 / 1852.4 MHz****Channel 4132/ 826.4 MHz****Channel 9400 / 1880.0 MHz****Channel 4182/ 836.4 MHz****Channel 9538 / 1907.6 MHz****Channel 4233/ 846.6 MHz**

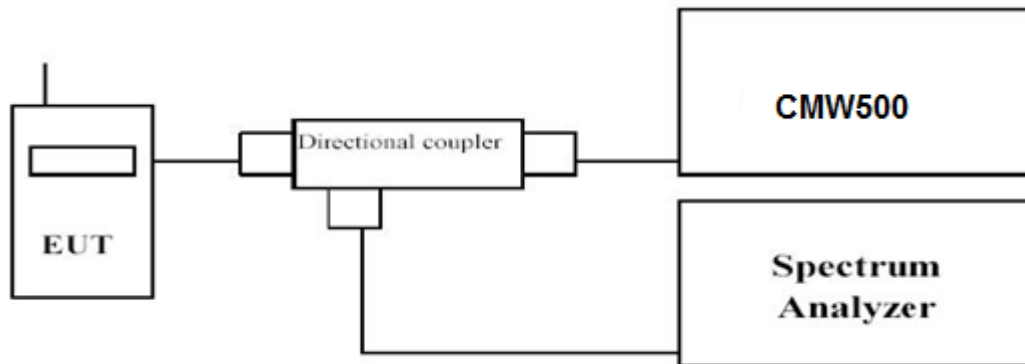
NOTE: We measured all modes and only recorded the worst case.

### 4.3 Occupied Bandwidth and Emission Bandwidth

#### LIMIT

FCC §2.1049, §22.917, §24.238.

#### TEST CONFIGURATION



#### TEST PROCEDURE

The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer. The occupied bandwidth was measured with the spectrum analyzer at low, middle and high channel in each band. The -26dBc Emission bandwidth was also measured and recorded. Set RBW was set to about 1% of emission BW, VBW≥3 times RBW. -26dBc display line was placed on the screen (or 99% bandwidth), the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace.

#### TEST RESULTS

|               |             |                |       |
|---------------|-------------|----------------|-------|
| Temperature   | 24.5°C      | Humidity       | 53.7% |
| Test Engineer | Evan Ouyang | Configurations | WCDMA |

Remark:

We were tested all RB Configuration refer 3GPP TS134 121 for each Channel Bandwidth of WCDMA Band II, WCDMA Band V; recorded worst case for each Channel Bandwidth of WCDMA Band II, WCDMA Band V.

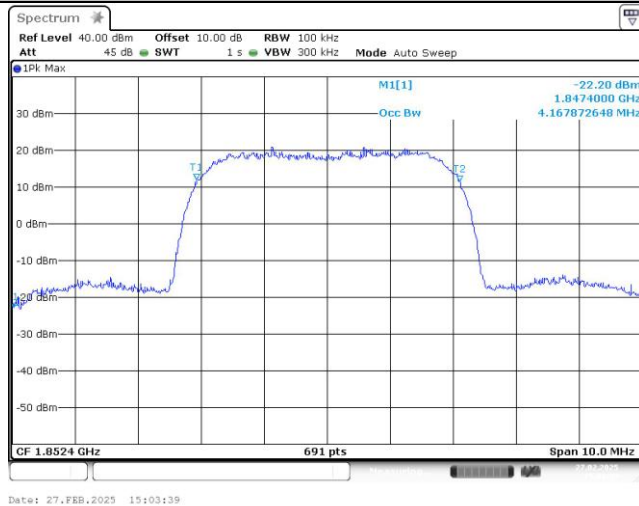
| Test Mode                  | Channel | Frequency (MHz) | Occupied Bandwidth (99% BW) (MHz) | Emission Bandwidth (-26 dBc BW) (MHz) | Verdict |
|----------------------------|---------|-----------------|-----------------------------------|---------------------------------------|---------|
| UMTS/TM1/<br>WCDMA Band II | 9262    | 1852.4          | 4.168                             | 4.790                                 | PASS    |
|                            | 9400    | 1880.0          | 4.197                             | 4.761                                 | PASS    |
|                            | 9538    | 1907.6          | 4.182                             | 4.747                                 | PASS    |
| UMTS/TM1/<br>WCDMA Band V  | 4132    | 826.4           | 4.197                             | 4.776                                 | PASS    |
|                            | 4182    | 836.4           | 4.182                             | 4.747                                 | PASS    |
|                            | 4233    | 846.6           | 4.182                             | 4.776                                 | PASS    |

Remark:

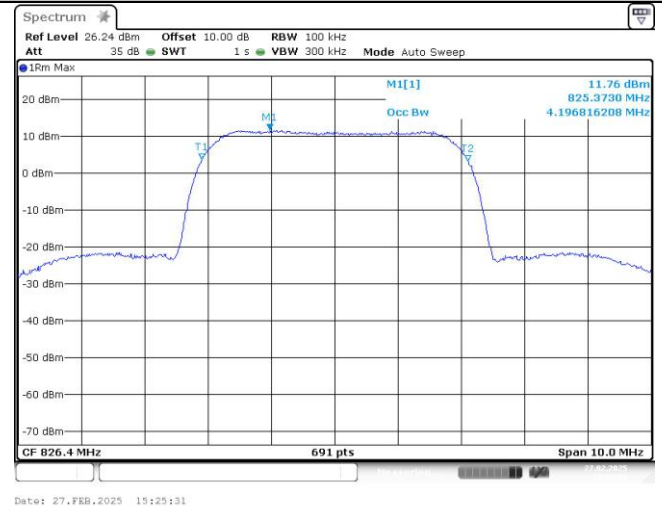
1. Test results including cable loss;
2. Please refer to following plots;

## Occupied Bandwidth

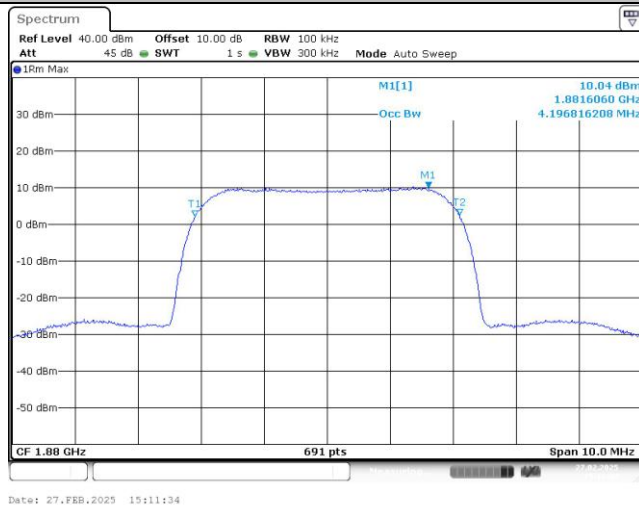
## UMTS/TM1/ WCDMA Band II



## UMTS/TM1/ WCDMA Band V



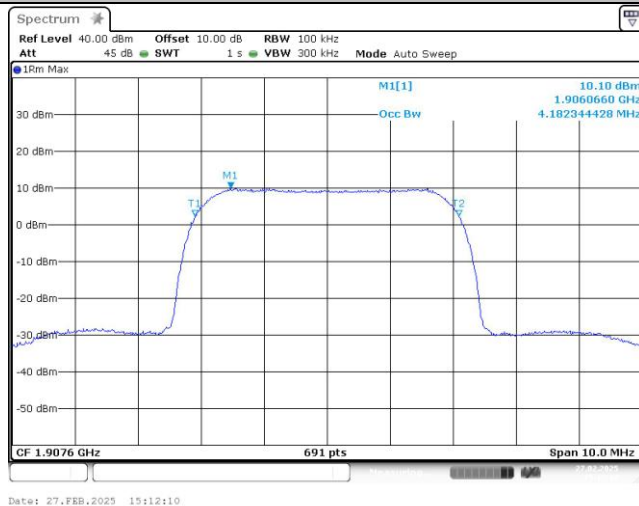
## Channel 9262 / 1852.4 MHz



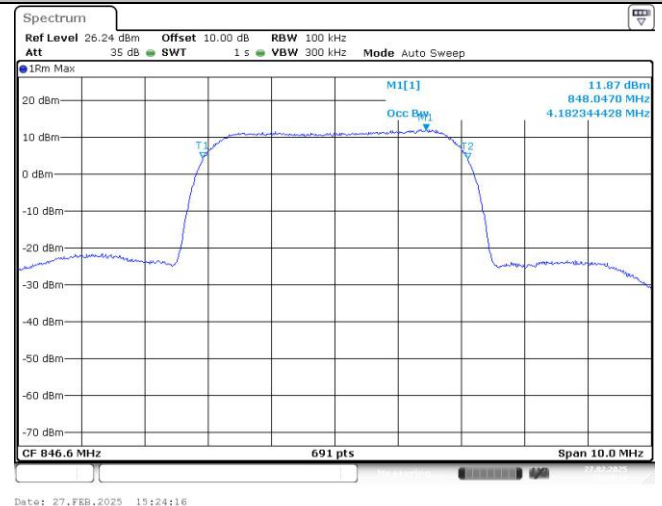
## Channel 4132/ 826.4 MHz



## Channel 9400 / 1880.0 MHz



## Channel 4182/ 836.4 MHz



## Channel 9538 / 1907.6 MHz

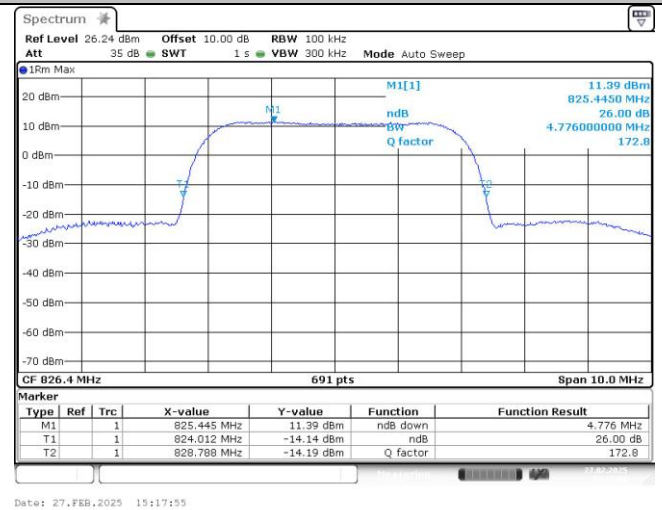
## Channel 4233/ 846.6 MHz

## Emission Bandwidth

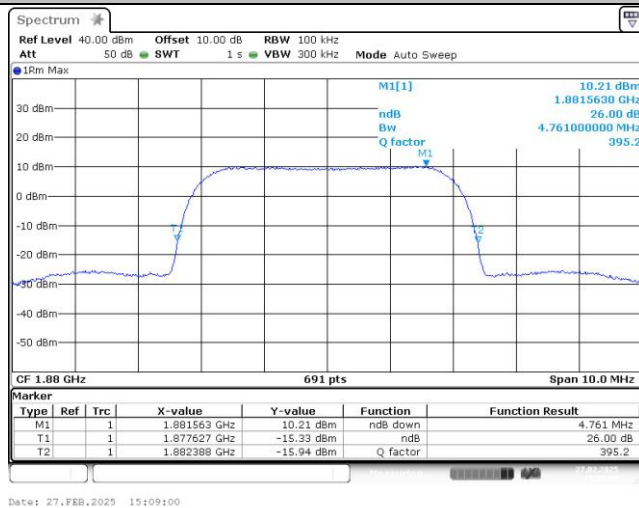
## UMTS/TM1/ WCDMA Band II



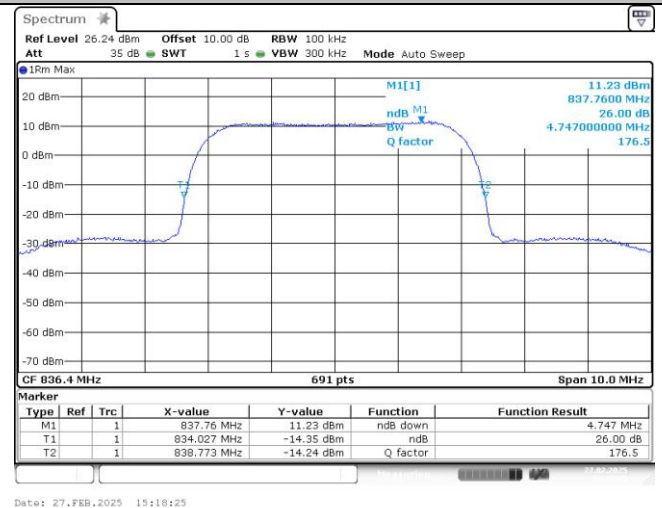
## UMTS/TM1/ WCDMA Band V



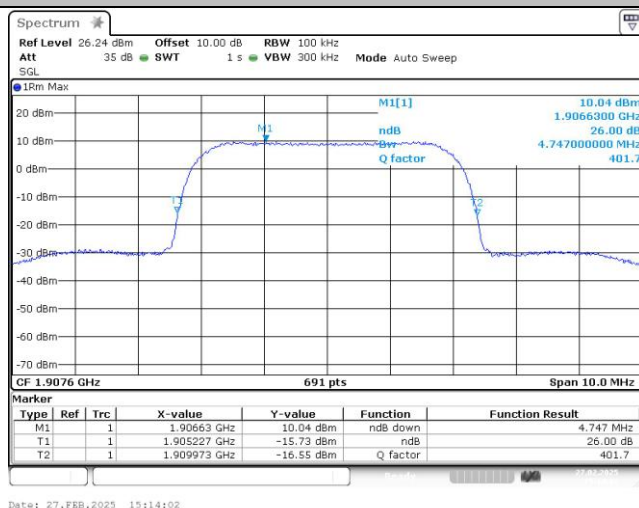
## Channel 9262 / 1852.4 MHz



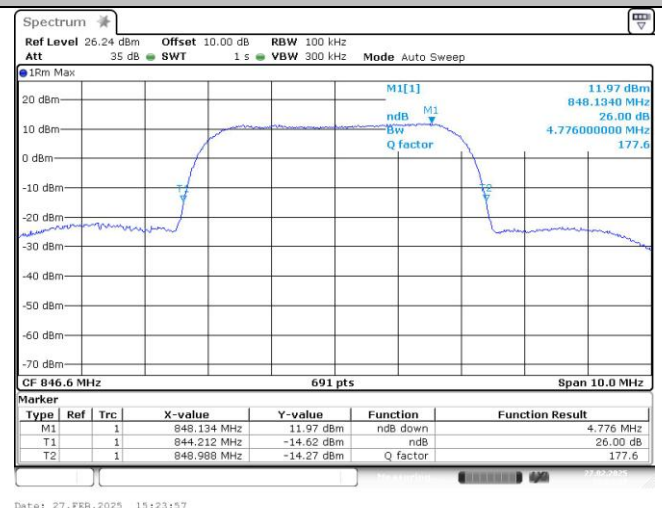
## Channel 4132/ 826.4 MHz



## Channel 9400 / 1880.0 MHz



## Channel 4182/ 836.4 MHz



## Channel 9538 / 1907.6 MHz

## Channel 4233/ 846.6 MHz

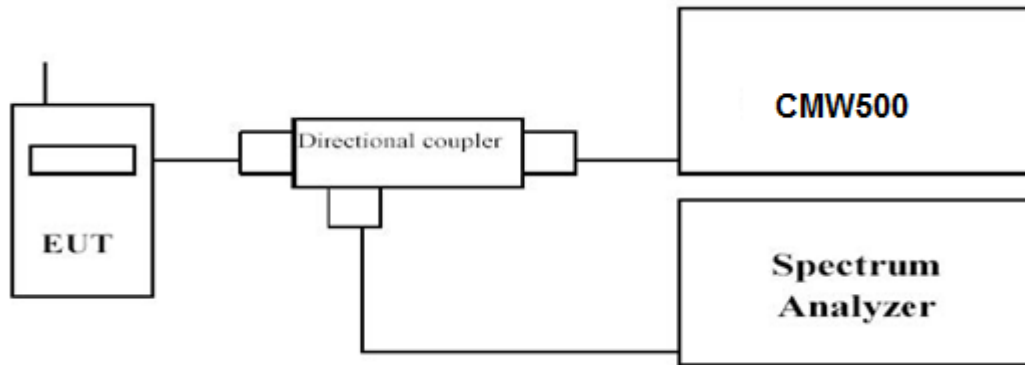
NOTE: We measured all modes and only recorded the worst case.

#### 4.4 Band Edge compliance

##### LIMIT

FCC § 2.1053, §22.917, § 24.238.

##### TEST CONFIGURATION



##### TEST PROCEDURE

1. The transmitter output port was connected to base station.
2. The RF output of EUT was connected to the power meter by RF cable and attenuator, the path loss was compensated to the results for each measurement.
3. Set EUT at maximum power through base station.
4. Select lowest and highest channels for each band and different modulation.
5. Measure Band edge using RMS (Average) detector by spectrum

##### TEST RESULTS

|               |             |                |       |
|---------------|-------------|----------------|-------|
| Temperature   | 24.5°C      | Humidity       | 53.7% |
| Test Engineer | Evan Ouyang | Configurations | WCDMA |

Remark:

We were tested all RB Configuration refer 3GPP TS134 121 for each Channel Bandwidth of WCDMA Band II, WCDMA Band V; recorded worst case for each Channel Bandwidth of WCDMA Band II, WCDMA Band V.

| Test Mode              | Channel | Frequency (MHz) | Band Edg Compliance (dBm) | Limits (dBm) | Verdict |
|------------------------|---------|-----------------|---------------------------|--------------|---------|
| UMTS/TM1/WCDMA Band II | 9262    | 1852.40         | -15.98                    | -13dBm       | PASS    |
|                        | 9538    | 1907.60         | -23.01                    | -13dBm       |         |
| UMTS/TM1/WCDMA Band V  | 4132    | 826.40          | -21.59                    | -13dBm       | PASS    |
|                        | 4233    | 846.60          | -24.45                    | -13dBm       |         |

Remark:

1. Test results including cable loss;
2. Please refer to following plots;

## Band-edge Compliance

## UMTS/TM1/WCDMA Band II



## UMTS/TM1/WCDMA Band V



## Channel 9262 / 1852.4 MHz



## Channel 4132 / 826.4 MHz



## Channel 9538 / 1907.6 MHz

## Channel 4233 / 846.6 MHz

NOTE: We measured all modes and only recorded the worst case.

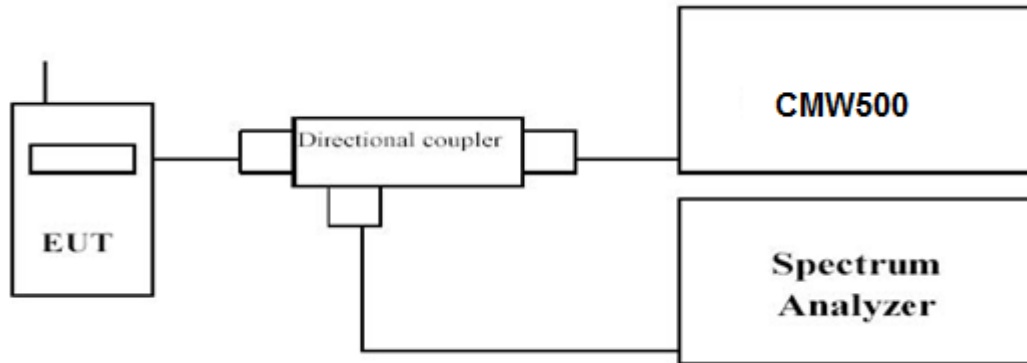
## 4.5 Spurious Emission

### LIMIT

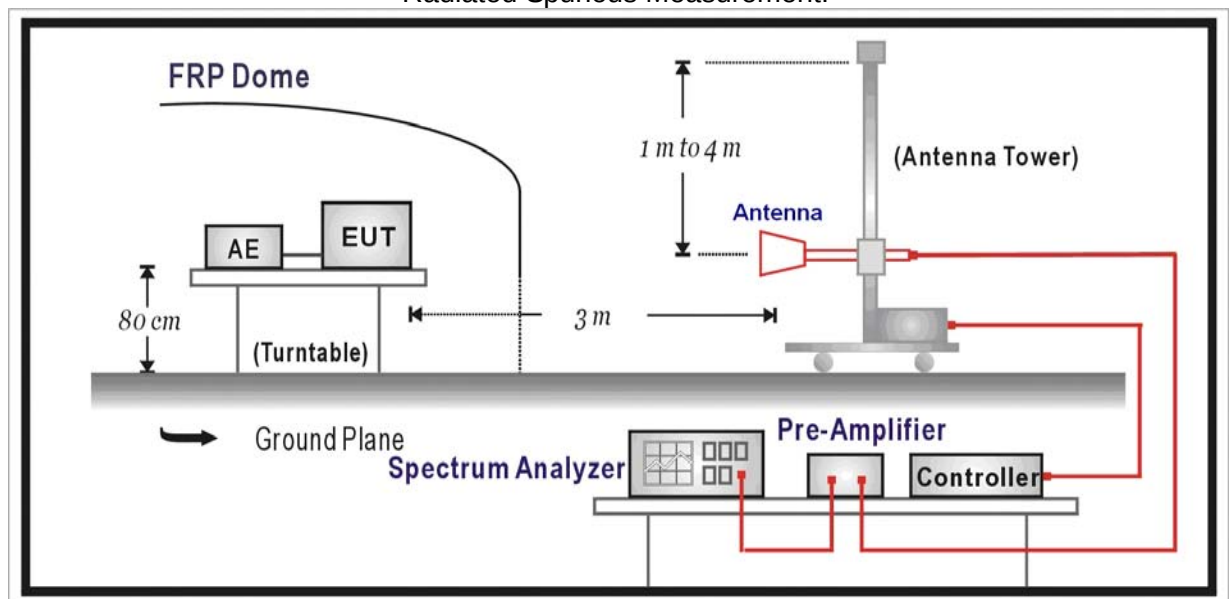
FCC § 2.1053, §22.917, § 24.238.

### TEST CONFIGURATION

Conducted Spurious Measurement:



Radiated Spurious Measurement:



### TEST PROCEDURE

The EUT was setup according to EIA/TIA 603-E

#### **Conducted Spurious Measurement:**

- Place the EUT on a bench and set it in transmitting mode.
- Connect a low loss RF cable from the antenna port to a spectrum analyzer and CMW500 by a Directional Coupler.
- EUT Communicate with CMW500, then select a channel for testing.
- Add a correction factor to the display of spectrum, and then test.
- The resolution bandwidth of the spectrum analyzer was set sufficient scans were taken to show the out of band Emission if any up to 10<sup>th</sup> harmonic.
- Please refer to following tables for test antenna conducted emissions.

**Radiated Spurious Measurement:**

- a. The EUT shall be placed at the specified height on a support, and in the position closest to normal use as declared by provider.
- b. The test antenna shall be oriented initially for vertical polarization and shall be chosen to correspond to the frequency of the transmitter
- c. The output of the test antenna shall be connected to the measuring receiver.
- d. The transmitter shall be switched on and the measuring receiver shall be tuned to the frequency of the transmitter under test.
- e. The test antenna shall be raised and lowered through the specified range of height until a maximum signal level is detected by the measuring receiver.
- f. The transmitter shall then be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
- g. The test antenna shall be raised and lowered again through the specified range of height until a maximum signal level is detected by the measuring receiver.
- h. The maximum signal level detected by the measuring receiver shall be noted.
- i. The transmitter shall be replaced by a substitution antenna.
- j. The substitution antenna shall be orientated for vertical polarization and the length of the substitution antenna shall be adjusted to correspond to the frequency of the transmitter.
- k. The substitution antenna shall be connected to a calibrated signal generator.
- l. If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
- m. The test antenna shall be raised and lowered through the specified range of height to ensure that the maximum signal is received.
- n. The input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuator setting of the measuring receiver.
- o. The measurement shall be repeated with the test antenna and the substitution antenna orientated for horizontal polarization.
- p. The measure of the effective radiated power is the larger of the two levels recorded at the input to the substitution antenna, corrected for gain of the substitution antenna if necessary.
- q. The resolution bandwidth of the spectrum analyzer was set at 100 kHz for Part 22 and 1MHz for Part 24. The frequency range was checked up to 10th harmonic.
- r. Test site anechoic chamber refer to ANSI C63.4:2014.

**TEST RESULTS**

|               |             |                |       |
|---------------|-------------|----------------|-------|
| Temperature   | 24.5°C      | Humidity       | 53.7% |
| Test Engineer | Evan Ouyang | Configurations | WCDMA |

**Conducted Measurement:**

Remark:

We were tested all RB Configuration refer 3GPP TS134 121 for each Channel Bandwidth of WCDMA Band II, WCDMA Band V; recorded worst case for each Channel Bandwidth of WCDMA Band II, WCDMA Band V.

| Test Mode              | Channel | Frequency (MHz) | Spurious RF Conducted Emission (dBm) | Limits (dBm) | Verdict |
|------------------------|---------|-----------------|--------------------------------------|--------------|---------|
| UMTS/TM1/WCDMA Band II | 9262    | 1852.4          | -32.27                               | -13dBm       | PASS    |
|                        | 9400    | 1880.0          | -31.86                               | -13dBm       |         |
|                        | 9538    | 1907.6          | -32.14                               | -13dBm       |         |
| UMTS/TM1/WCDMA Band V  | 4132    | 826.4           | -25.59                               | -13dBm       | PASS    |
|                        | 4182    | 836.4           | -26.13                               | -13dBm       |         |
|                        | 4233    | 846.6           | -25.92                               | -13dBm       |         |

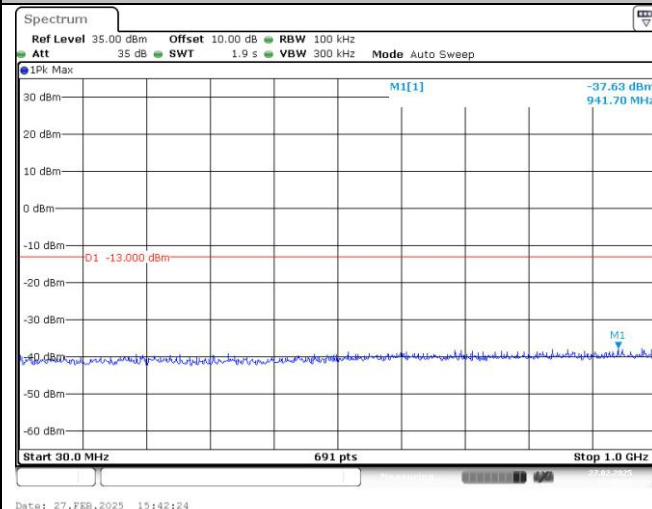
Remark:

1. Test results including cable loss;
2. Please refer to following plots;
3. We measured all modes and only recorded the worst case.

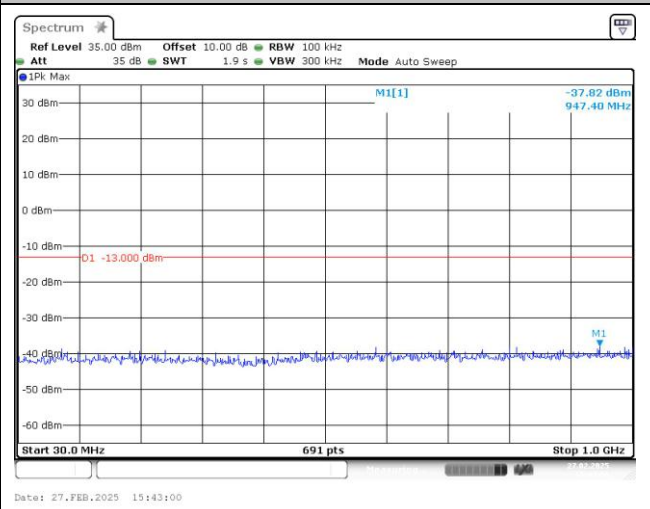
## Spurious Emission on Antenna Port

## UMTS/TM1/WCDMA Band II

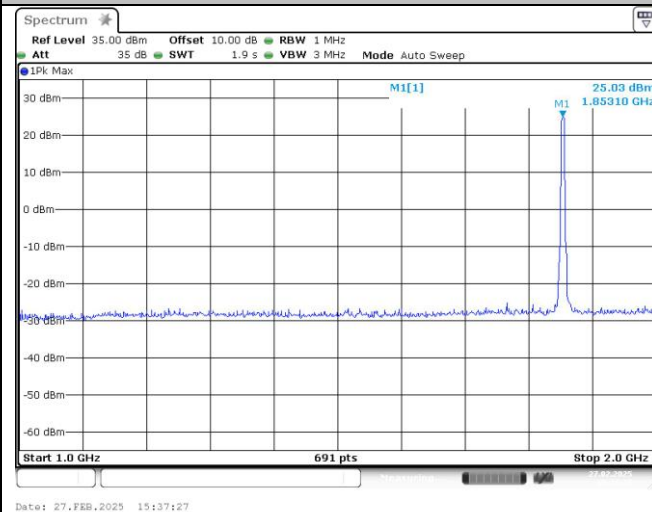
## Channel 9262 / 1852.4 MHz



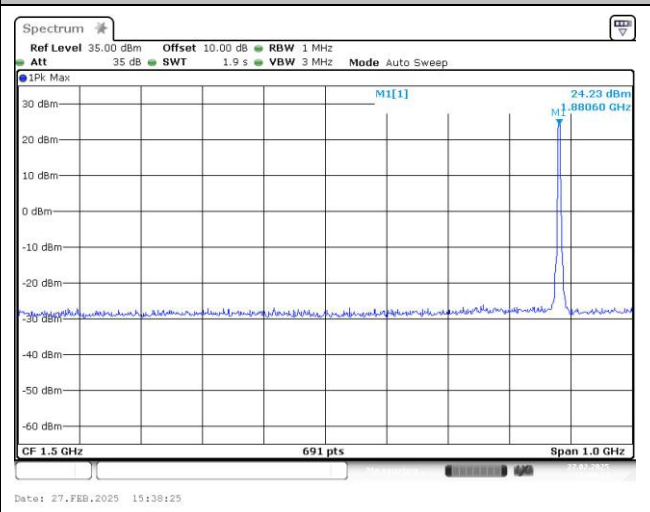
## Channel 9400 / 1880 MHz



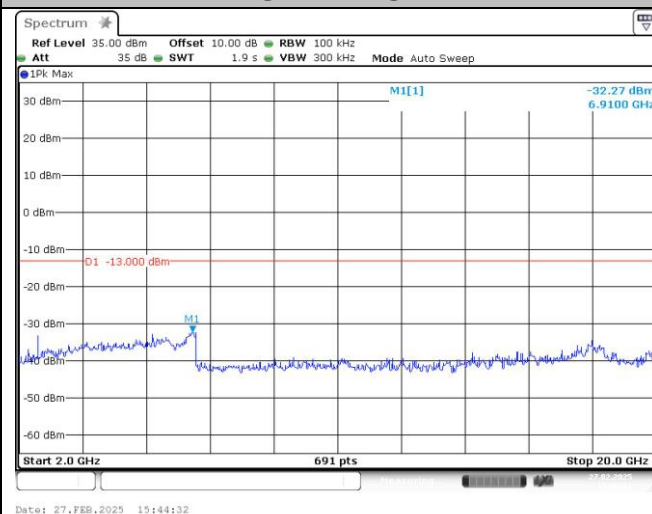
## 30 MHz – 1000 MHz



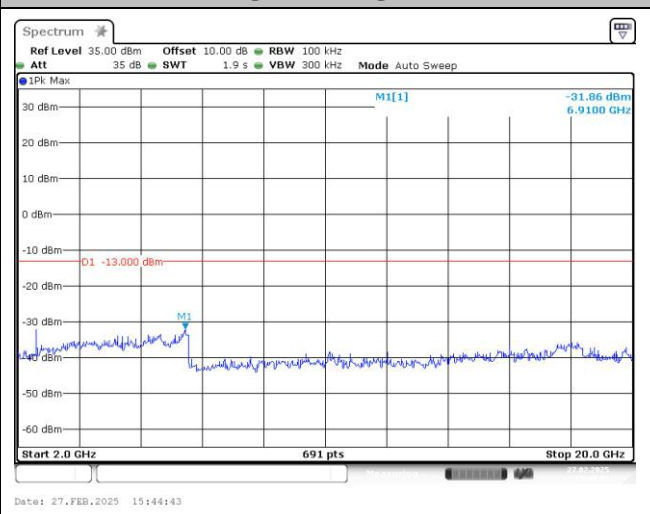
## 30 MHz – 1000 MHz



## 1 GHz – 2 GHz

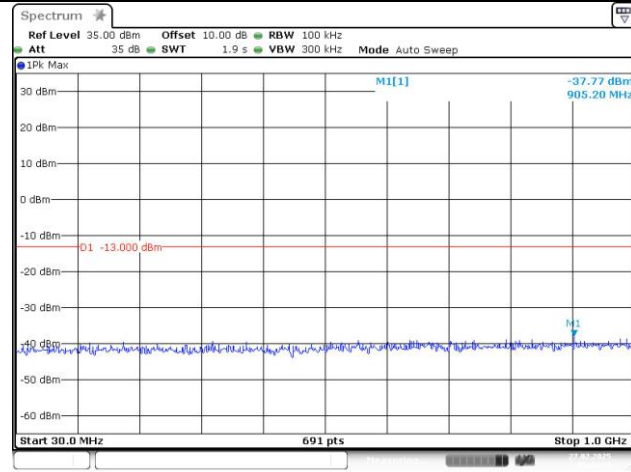
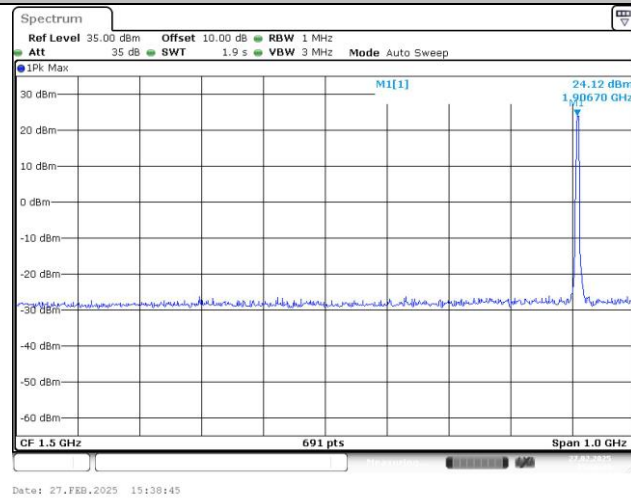
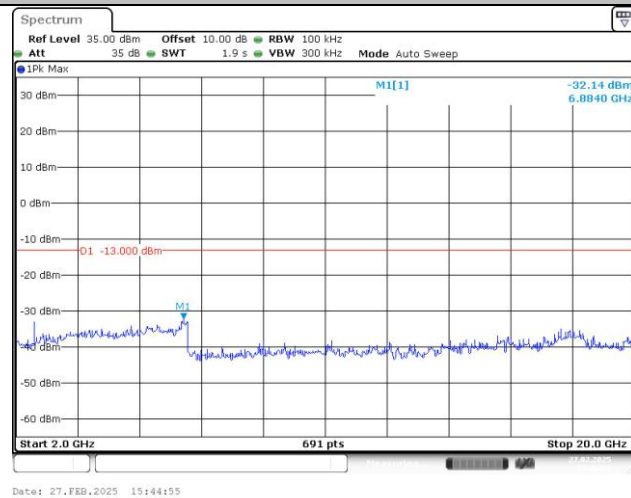


## 1 GHz – 2 GHz



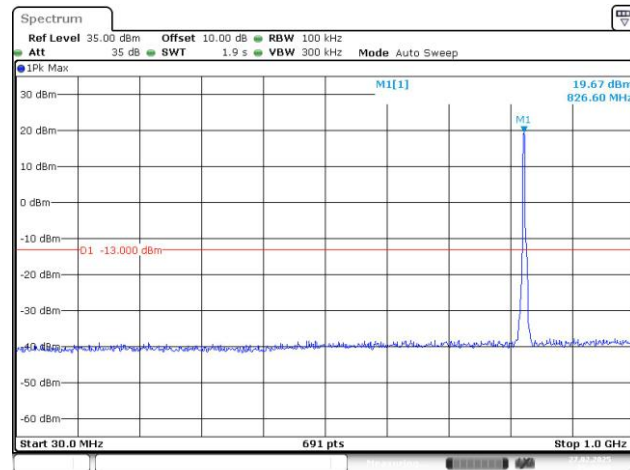
## 2 GHz – 20 GHz

## 2 GHz – 20 GHz

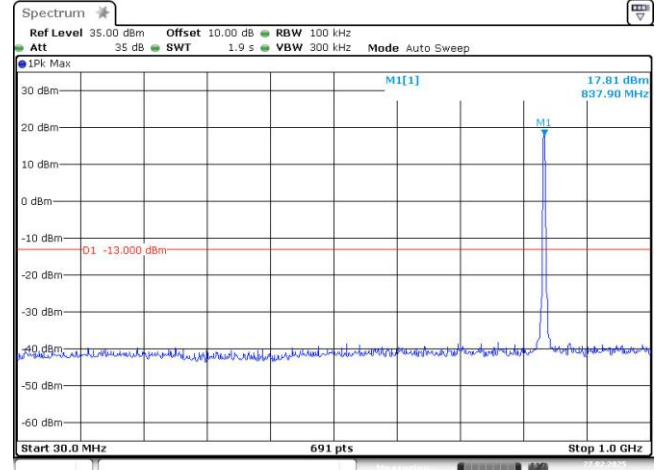
**Spurious Emssion on Antenna Port****UMTS/TM1/WCDMA Band II****Channel 9538 / 1907.6 MHz****30 MHz – 1000 MHz****1 GHz – 2 GHz****2 GHz – 20 GHz**

### Spurious Emssion on Antenna Port UMTS/TM1/WCDMA Band V

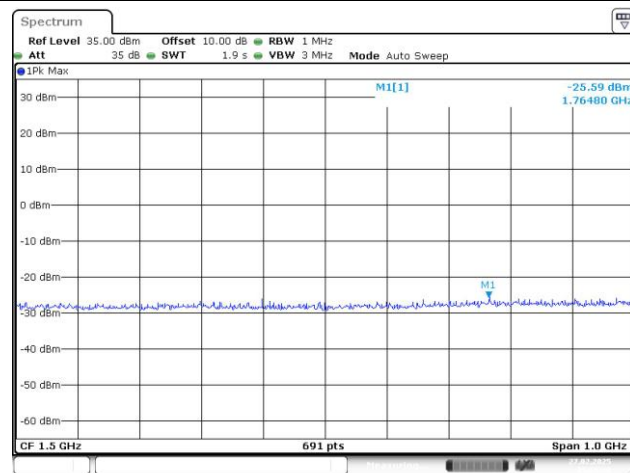
#### Channel 4132 / 826.4 MHz



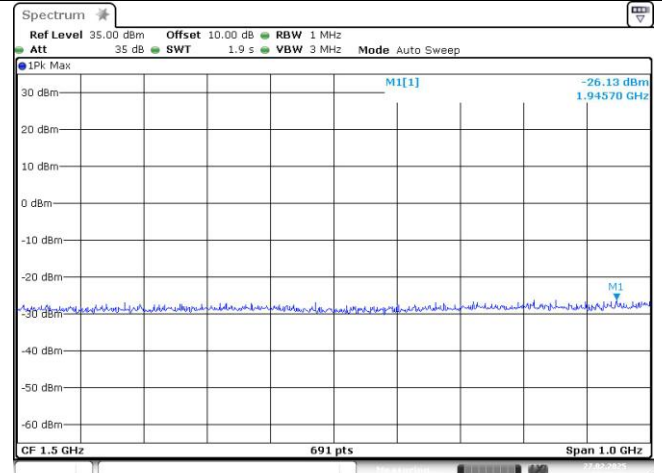
#### Channel 4182 / 836.4 MHz



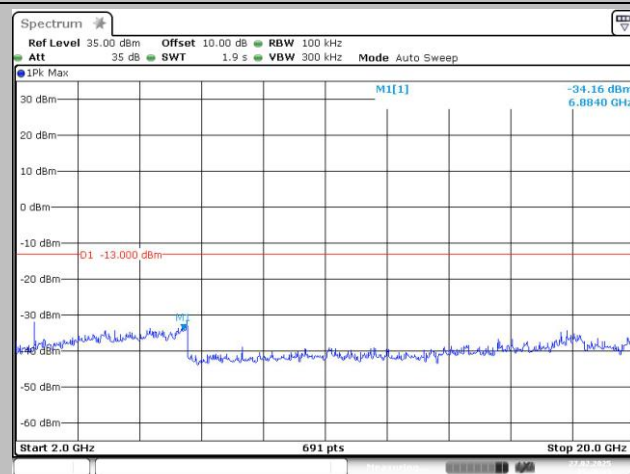
#### 30 MHz – 1000 MHz



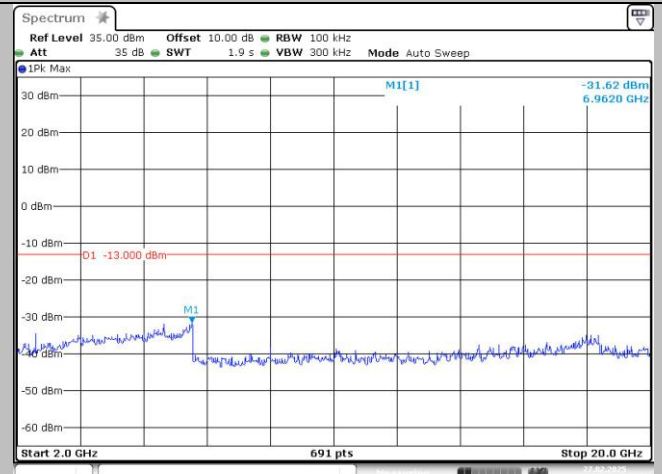
#### 30 MHz – 1000 MHz



#### 1 GHz – 10 GHz



#### 1 GHz – 10 GHz

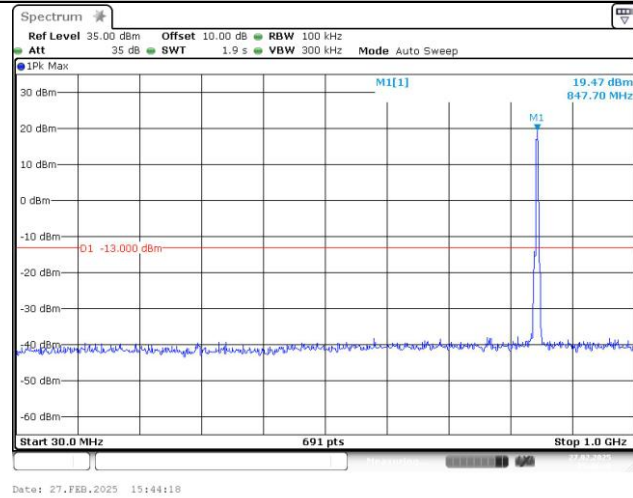


#### 2 GHz – 20 GHz

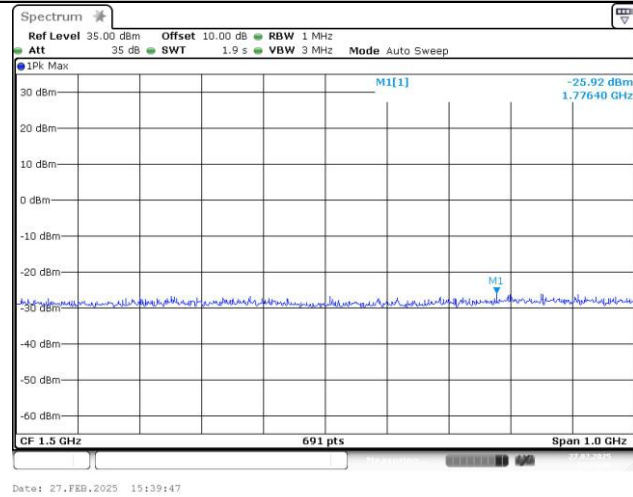
#### 2 GHz – 20 GHz

*Spurious Emssion on Antenna Port*  
*UMTS/TM1/WCDMA Band V*

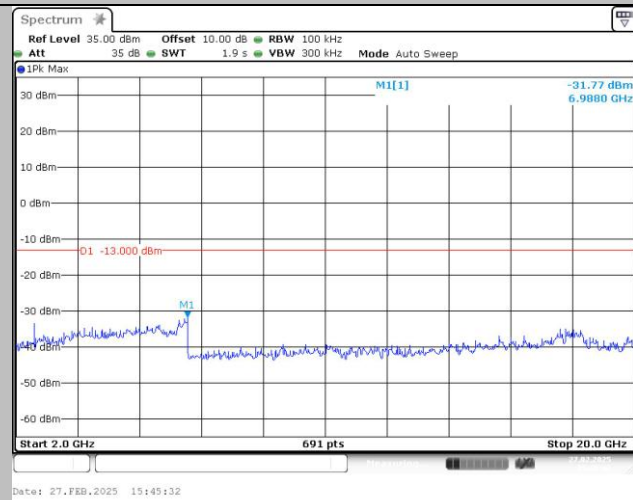
*Channel 4233 / 846.6 MHz*



*30 MHz – 1000 MHz*



*1 GHz – 10 GHz*



*2 GHz – 20 GHz*

**Radiated Measurement:**

Remark:

We were tested all RB Configuration refer 3GPP TS134 121 for each Channel Bandwidth of WCDMA Band II, WCDMA Band V; recorded worst case for each Channel Bandwidth of WCDMA Band II, WCDMA Band V.

|               |             |                |       |
|---------------|-------------|----------------|-------|
| Temperature   | 24.5°C      | Humidity       | 53.7% |
| Test Engineer | Evan Ouyang | Configurations | WCDMA |

**For Less than 1 GHz:***UMTS/TM1/ WCDMA Band II \_ Low Channel*

| Frequency (MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB) | Diatance | G <sub>a</sub> Antenna Gain(dB) | Peak EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|-----------------|------------------------|----------------------|----------|---------------------------------|-----------------|-------------|-------------|--------------|
| 151.71          | -45.81                 | 3.87                 | 3.00     | 8.53                            | -41.16          | -13.00      | -28.16      | H            |
| 233.64          | -45.97                 | 4.16                 | 3.00     | 7.12                            | -43.01          | -13.00      | -30.01      | H            |
| 559.32          | -41.72                 | 3.86                 | 3.00     | 8.45                            | -37.13          | -13.00      | -24.13      | V            |
| 904.65          | -43.38                 | 4.20                 | 3.00     | 6.88                            | -40.69          | -13.00      | -27.69      | V            |

*UMTS/TM1/ WCDMA Band II \_ Middle Channel*

| Frequency (MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB) | Diatance | G <sub>a</sub> Antenna Gain(dB) | Peak EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|-----------------|------------------------|----------------------|----------|---------------------------------|-----------------|-------------|-------------|--------------|
| 148.98          | -45.76                 | 3.66                 | 3.00     | 8.37                            | -41.06          | -13.00      | -28.06      | H            |
| 237.19          | -46.82                 | 4.45                 | 3.00     | 7.04                            | -44.23          | -13.00      | -31.23      | H            |
| 559.66          | -42.81                 | 3.84                 | 3.00     | 8.36                            | -38.28          | -13.00      | -25.28      | V            |
| 898.27          | -44.41                 | 4.38                 | 3.00     | 6.87                            | -41.93          | -13.00      | -28.93      | V            |

*UMTS/TM1/ WCDMA Band II \_ High Channel*

| Frequency (MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB) | Diatance | G <sub>a</sub> Antenna Gain(dB) | Peak EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|-----------------|------------------------|----------------------|----------|---------------------------------|-----------------|-------------|-------------|--------------|
| 149.04          | -47.40                 | 3.86                 | 3.00     | 8.46                            | -42.80          | -13.00      | -29.80      | H            |
| 237.09          | -45.65                 | 4.25                 | 3.00     | 7.04                            | -42.86          | -13.00      | -29.86      | H            |
| 551.83          | -44.29                 | 3.93                 | 3.00     | 8.73                            | -39.50          | -13.00      | -26.50      | V            |
| 905.35          | -45.17                 | 4.20                 | 3.00     | 6.79                            | -42.58          | -13.00      | -29.58      | V            |

*UMTS/TM1/ WCDMA Band V \_ Low Channel*

| Frequency (MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB) | Diatance | G <sub>a</sub> Antenna Gain(dB) | Peak EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|-----------------|------------------------|----------------------|----------|---------------------------------|-----------------|-------------|-------------|--------------|
| 151.05          | -45.73                 | 3.98                 | 3.00     | 8.50                            | -41.20          | -13.00      | -28.20      | H            |
| 240.05          | -45.87                 | 4.40                 | 3.00     | 7.04                            | -43.23          | -13.00      | -30.23      | H            |
| 556.07          | -41.76                 | 3.98                 | 3.00     | 8.42                            | -37.32          | -13.00      | -24.32      | V            |
| 906.49          | -43.40                 | 4.35                 | 3.00     | 6.96                            | -40.79          | -13.00      | -27.79      | V            |

*UMTS/TM1/ WCDMA Band V \_ Middle Channel*

| Frequency (MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB) | Diatance | G <sub>a</sub> Antenna Gain(dB) | Peak EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|-----------------|------------------------|----------------------|----------|---------------------------------|-----------------|-------------|-------------|--------------|
| 154.91          | -45.78                 | 3.89                 | 3.00     | 8.62                            | -41.04          | -13.00      | -28.04      | H            |
| 237.60          | -46.50                 | 4.13                 | 3.00     | 7.03                            | -43.60          | -13.00      | -30.60      | H            |
| 559.32          | -42.82                 | 3.85                 | 3.00     | 8.38                            | -38.29          | -13.00      | -25.29      | V            |
| 905.54          | -44.61                 | 4.49                 | 3.00     | 6.95                            | -42.14          | -13.00      | -29.14      | V            |

*UMTS/TM1/ WCDMA Band V \_ High Channel*

| Frequency (MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB) | Diatance | G <sub>a</sub> Antenna Gain(dB) | Peak EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|-----------------|------------------------|----------------------|----------|---------------------------------|-----------------|-------------|-------------|--------------|
| 154.48          | -47.73                 | 3.92                 | 3.00     | 8.44                            | -43.22          | -13.00      | -30.22      | H            |
| 238.36          | -45.92                 | 4.35                 | 3.00     | 7.14                            | -43.12          | -13.00      | -30.12      | H            |
| 557.70          | -44.35                 | 4.00                 | 3.00     | 8.58                            | -39.77          | -13.00      | -26.77      | V            |
| 905.61          | -45.35                 | 4.46                 | 3.00     | 6.92                            | -42.89          | -13.00      | -29.89      | V            |

**For More than 1 GHz:***UMTS/TM1/ WCDMA Band II \_ Low Channel*

| Frequency (MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB) | Diatance | G <sub>a</sub> Antenna Gain(dB) | Peak EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|-----------------|------------------------|----------------------|----------|---------------------------------|-----------------|-------------|-------------|--------------|
| 3704.80         | -43.87                 | 5.26                 | 3.00     | 9.88                            | -39.25          | -13.00      | -26.25      | H            |
| 5557.20         | -47.76                 | 6.11                 | 3.00     | 11.36                           | -42.51          | -13.00      | -29.51      | H            |
| 3704.80         | -47.16                 | 5.26                 | 3.00     | 9.88                            | -42.54          | -13.00      | -29.54      | V            |
| 5557.20         | -51.04                 | 6.11                 | 3.00     | 11.36                           | -45.79          | -13.00      | -32.79      | V            |

*UMTS/TM1/ WCDMA Band II \_ Middle Channel*

| Frequency (MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB) | Diatance | G <sub>a</sub> Antenna Gain(dB) | Peak EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|-----------------|------------------------|----------------------|----------|---------------------------------|-----------------|-------------|-------------|--------------|
| 3760.00         | -42.95                 | 5.32                 | 3.00     | 10.03                           | -38.24          | -13.00      | -25.24      | H            |
| 5640.00         | -46.05                 | 6.19                 | 3.00     | 11.41                           | -40.83          | -13.00      | -27.83      | H            |
| 3760.00         | -46.96                 | 5.32                 | 3.00     | 10.03                           | -42.25          | -13.00      | -29.25      | V            |
| 5640.00         | -51.43                 | 6.19                 | 3.00     | 11.41                           | -46.21          | -13.00      | -33.21      | V            |

*UMTS/TM1/ WCDMA Band II \_ High Channel*

| Frequency (MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB) | Diatance | G <sub>a</sub> Antenna Gain(dB) | Peak EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|-----------------|------------------------|----------------------|----------|---------------------------------|-----------------|-------------|-------------|--------------|
| 3815.20         | -41.41                 | 5.36                 | 3.00     | 9.62                            | -37.15          | -13.00      | -24.15      | H            |
| 5722.80         | -44.38                 | 6.24                 | 3.00     | 11.46                           | -39.16          | -13.00      | -26.16      | H            |
| 3815.20         | -45.75                 | 5.36                 | 3.00     | 9.62                            | -41.49          | -13.00      | -28.49      | V            |
| 5722.80         | -47.41                 | 6.24                 | 3.00     | 11.46                           | -42.19          | -13.00      | -29.19      | V            |

*UMTS/TM1/ WCDMA Band V \_ Low Channel*

| Frequency (MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB) | Diatance | G <sub>a</sub> Antenna Gain(dB) | Peak EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|-----------------|------------------------|----------------------|----------|---------------------------------|-----------------|-------------|-------------|--------------|
| 1652.80         | -46.01                 | 3.86                 | 3.00     | 8.56                            | -41.31          | -13.00      | -28.31      | H            |
| 2479.20         | -47.12                 | 4.29                 | 3.00     | 6.98                            | -44.43          | -13.00      | -31.43      | H            |
| 1652.80         | -45.26                 | 3.86                 | 3.00     | 8.56                            | -40.56          | -13.00      | -27.56      | V            |
| 2479.20         | -48.62                 | 4.29                 | 3.00     | 6.98                            | -45.93          | -13.00      | -32.93      | V            |

*UMTS/TM1/ WCDMA Band V \_ Middle Channel*

| Frequency (MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB) | Diatance | G <sub>a</sub> Antenna Gain(dB) | Peak EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|-----------------|------------------------|----------------------|----------|---------------------------------|-----------------|-------------|-------------|--------------|
| 1672.80         | -46.32                 | 3.90                 | 3.00     | 8.58                            | -41.64          | -13.00      | -28.64      | H            |
| 2509.20         | -46.86                 | 4.32                 | 3.00     | 6.80                            | -44.38          | -13.00      | -31.38      | H            |
| 1672.80         | -46.41                 | 3.90                 | 3.00     | 8.58                            | -41.73          | -13.00      | -28.73      | V            |
| 2509.20         | -49.75                 | 4.32                 | 3.00     | 6.80                            | -47.27          | -13.00      | -34.27      | V            |

*UMTS/TM1/ WCDMA Band V \_ High Channel*

| Frequency (MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB) | Diatance | G <sub>a</sub> Antenna Gain(dB) | Peak EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|-----------------|------------------------|----------------------|----------|---------------------------------|-----------------|-------------|-------------|--------------|
| 1693.20         | -44.14                 | 3.91                 | 3.00     | 9.06                            | -38.99          | -13.00      | -25.99      | H            |
| 2539.80         | -45.33                 | 4.32                 | 3.00     | 6.65                            | -43.00          | -13.00      | -30.00      | H            |
| 1693.20         | -46.11                 | 3.91                 | 3.00     | 9.06                            | -40.96          | -13.00      | -27.96      | V            |
| 2539.80         | -47.91                 | 4.32                 | 3.00     | 6.65                            | -45.58          | -13.00      | -32.58      | V            |

**Notes:**

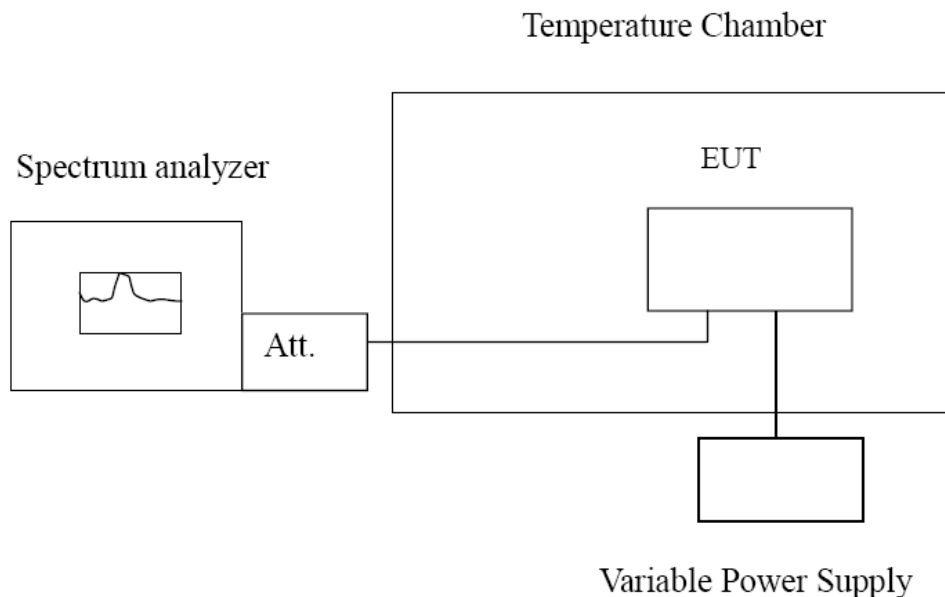
1. All channel bandwidth were tested, the report recorded the worst data.
2.  $EIRP = P_{Mea}(dBm) - P_{cl}(dB) + P_{Ag}(dB) + G_a(dBi)$
3.  $ERP = EIRP - 2.15dBi$  as EIRP by subtracting the gain of the dipole.
4.  $Margin = EIRP - Limit$
5. We measured all modes and only recorded the worst case.

## 4.6 Frequency Stability under Temperature & Voltage Variations

### LIMIT

FCC § 2.1055 (a), § 2.1055 (d), §22.355, §24.235.

### TEST CONFIGURATION



### TEST PROCEDURE

The EUT was setup according to EIA/TIA 603D

#### **Frequency Stability Under Temperature Variations:**

In order to measure the carrier frequency under the condition of AFC lock, it is necessary to make measurements with the EUT in a "call mode". This is accomplished with the use of R&S CMW500 DIGITAL RADIO COMMUNICATION TESTER.

1. Measure the carrier frequency at room temperature.
2. Subject the EUT to overnight soak at -30°C.
3. With the EUT, powered via nominal voltage, connected to the CMW500 and in a simulated call on middle channel for LTE band 5, measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.
4. Repeat the above measurements at 10°C increments from -30°C to +50°C. Allow at least 1.5 hours at each temperature, unpowered, before making measurements.
5. Re-measure carrier frequency at room temperature with nominal voltage. Vary supply voltage from minimum voltage to maximum voltage, in 0.1Volt increments re-measuring carrier frequency at each voltage. Pause at nominal voltage for 1.5 hours unpowered, to allow any self-heating to stabilize, before continuing.
6. Subject the EUT to overnight soak at +50°C.
7. With the EUT, powered via nominal voltage, connected to the CMW500 and in a simulated call on the centre channel, measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.
8. Repeat the above measurements at 10 °C increments from +50°C to -30°C. Allow at least 1.5 hours at each temperature, unpowered, before making measurements
9. At all temperature levels hold the temperature to +/- 0.5°C during the measurement procedure.

#### **Frequency Stability Under Voltage Variations:**

Set chamber temperature to 20°C. Use a variable AC power supply / DC power source to power the EUT and set the voltage to rated voltage. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency.

Reduce the input voltage to specify extreme voltage variation ( $\pm 15\%$ ) and endpoint, record the maximum frequency change.

**TEST RESULTS**

Remark:

We were tested all RB Configuration refer 3GPP TS134 121 for each Channel Bandwidth of WCDMA Band II, WCDMA Band V; recorded worst case for each Channel Bandwidth of WCDMA Band II, WCDMA Band V.

|               |             |                |       |
|---------------|-------------|----------------|-------|
| Temperature   | 24.5℃       | Humidity       | 53.7% |
| Test Engineer | Evan Ouyang | Configurations | WCDMA |

| UMTS/TM1/WCDMA Band II |                 |                     |                      |             |         |
|------------------------|-----------------|---------------------|----------------------|-------------|---------|
| DC Power               | Temperature (℃) | Frequency error(Hz) | Frequency error(ppm) | Limit (ppm) | Verdict |
| DC 6.9V                | 25              | -17                 | -0.009               | ±2.50       | PASS    |
| DC 8.4V                | 25              | 10                  | 0.005                | ±2.50       | PASS    |
| DC 7.7V                | 25              | -13                 | -0.007               | ±2.50       | PASS    |
| DC 7.7V                | -30             | 9                   | 0.005                | ±2.50       | PASS    |
| DC 7.7V                | -20             | -19                 | -0.010               | ±2.50       | PASS    |
| DC 7.7V                | -10             | 18                  | 0.010                | ±2.50       | PASS    |
| DC 7.7V                | 0               | 5                   | 0.003                | ±2.50       | PASS    |
| DC 7.7V                | 10              | -11                 | -0.006               | ±2.50       | PASS    |
| DC 7.7V                | 20              | 7                   | 0.004                | ±2.50       | PASS    |
| DC 7.7V                | 30              | -18                 | -0.010               | ±2.50       | PASS    |
| DC 7.7V                | 40              | -9                  | -0.005               | ±2.50       | PASS    |
| DC 7.7V                | 50              | 9                   | 0.005                | ±2.50       | PASS    |

| UMTS/TM1/WCDMA Band V |                 |                     |                      |             |         |
|-----------------------|-----------------|---------------------|----------------------|-------------|---------|
| DC Power              | Temperature (℃) | Frequency error(Hz) | Frequency error(ppm) | Limit (ppm) | Verdict |
| DC 6.9V               | 25              | -4                  | -0.005               | ±2.50       | PASS    |
| DC 8.4V               | 25              | 13                  | 0.016                | ±2.50       | PASS    |
| DC 7.7V               | 25              | -18                 | -0.022               | ±2.50       | PASS    |
| DC 7.7V               | -30             | 4                   | 0.005                | ±2.50       | PASS    |
| DC 7.7V               | -20             | 20                  | 0.024                | ±2.50       | PASS    |
| DC 7.7V               | -10             | 18                  | 0.022                | ±2.50       | PASS    |
| DC 7.7V               | 0               | 11                  | 0.013                | ±2.50       | PASS    |
| DC 7.7V               | 10              | 2                   | 0.002                | ±2.50       | PASS    |
| DC 7.7V               | 20              | 17                  | 0.021                | ±2.50       | PASS    |
| DC 7.7V               | 30              | -18                 | -0.022               | ±2.50       | PASS    |
| DC 7.7V               | 40              | -1                  | -0.001               | ±2.50       | PASS    |
| DC 7.7V               | 50              | 20                  | 0.024                | ±2.50       | PASS    |

NOTE:We measured all modes and only recorded the worst case.

## **5 TEST SETUP PHOTOS OF THE EUT**

Reference to the Test Report: GTS20250313007-2-07.

## **6 EXTERNAL AND INTERNAL PHOTOS OF THE EUT**

Reference to the Test Report: GTS20250313007-2-01.

.....End of Report.....