

# TEST REPORT

**Reference No.**..... : WTD24D01019176W003  
**FCC ID** ..... : 2AQRM-MF3  
**Applicant**..... : FOXX Development Inc.  
**Address**..... : 3480 Preston Ridge Road, Suite500, Alpharetta, GA 30005, USA  
**Manufacturer** ..... : FOXX Development Inc.  
**Address**..... : 3480 Preston Ridge Road, Suite500, Alpharetta, GA 30005, USA  
**Product**..... : LTE MiFi Router  
**Model(s)** ..... : MF3  
**Standards**..... : FCC CFR47 Part 22 Subpart H  
FCC CFR47 Part 24 Subpart E  
FCC CFR47 Part 27 Subpart L  
**Date of Receipt sample** .... : 2024-01-26  
**Date of Test** ..... : 2024-02-19 to 2024-04-01  
**Date of Issue**..... : 2024-04-01  
**Test Result**..... : **Pass**

**Remarks:**

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

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3 Revision History

| Test Report No.    | Date of Receipt Sample | Date of Test                   | Date of Issue | Purpose  | Comment | Approved |
|--------------------|------------------------|--------------------------------|---------------|----------|---------|----------|
| WTD24D01019176W003 | 2024-01-26             | 2024-02-19<br>to<br>2024-04-01 | 2024-04-01    | Original | -       | Valid    |

## 4 General Information

### 4.1 General Description of E.U.T.

|                                       |                  |
|---------------------------------------|------------------|
| Product:                              | LTE MiFi Router  |
| Model(s):                             | MF3              |
| Model Description:                    | N/A              |
| WCDMA Band(s):                        | FDD Band II/IV/V |
| Hardware Version:                     | Mobile.M47.H01   |
| Software Version:                     | Mobile.M47.B01   |
| Highest frequency<br>(Exclude Radio): | 26MHz            |
| Storage Location:                     | SD card Storage  |

### 4.2 Details of E.U.T.

|                       |                                                                                        |
|-----------------------|----------------------------------------------------------------------------------------|
| Operation Frequency:  | WCDMA Band II: 1850~1910MHz<br>WCDMA Band IV: 1710~1755MHz<br>WCDMA Band V: 824~849MHz |
| Max. RF output power: | WCDMA Band II: 22.71dBm<br>WCDMA Band IV: 22.95dBm<br>WCDMA Band V: 22.30dBm           |
| Type of Modulation:   | WCDMA: QPSK                                                                            |
| Antenna installation: | WCDMA: PCB printed antenna                                                             |
| Antenna Gain:         | WCDMA Band II: 3.1dBi<br>WCDMA Band V: 2.6dBi<br>WCDMA Band IV: 3.2dBi                 |

Note:

#: The antenna gain is provided by the applicant, and the applicant should be responsible for its authenticity, WALTERK lab has not verified the authenticity of its information.

|                   |                                                               |
|-------------------|---------------------------------------------------------------|
| Ratings:          | Battery: DC 3.7V, 3000mAh, 11.1Wh                             |
| Adapter:          | Input: 100-240V~, 50/60Hz, 0.2A<br>Output: 5.0V==1.0A         |
| Type of Emission: | WCDMA1900: 4M17F9W<br>WCDMA1700: 4M16F9W<br>WCDMA850: 4M17F9W |

### 4.3 Test Mode

All test mode(s) and condition(s) mentioned were considered and evaluated respectively by performing full tests, the worst data were recorded and reported.

| Support Band                                                     | Test Mode         | Channel Frequency | Channel Number |
|------------------------------------------------------------------|-------------------|-------------------|----------------|
| WCDMA Band V                                                     | WCDMA/HSUPA/HSDPA | 826.4 MHz         | 4132           |
|                                                                  |                   | 836.6 MHz         | 4183           |
|                                                                  |                   | 846.6 MHz         | 4233           |
| WCDMA Band II                                                    | WCDMA/HSUPA/HSDPA | 1852.4MHz         | 9262           |
|                                                                  |                   | 1880.0MHz         | 9400           |
|                                                                  |                   | 1907.6MHz         | 9538           |
| WCDMA Band IV                                                    | WCDMA/HSUPA/HSDPA | 1712.4MHz         | 1313           |
|                                                                  |                   | 1732.6MHz         | 1413           |
|                                                                  |                   | 1752.6MHz         | 1512           |
| Remark: All mode(s) were tested and the worst data was recorded. |                   |                   |                |

### 4.4 Test Facility

The test facility has a test site registered with the following organizations:

**ISED CAB identifier: CN0013. Test Firm Registration No.: 7760A.**

Waltek Testing Group Co., Ltd. Has been registered and fully described in a report filed with the Industry Canada. The acceptance letter from the Industry Canada is maintained in our files.

Registration number 7760A, October 15, 2016.

**FCC Designation No.: CN1201. Test Firm Registration No.: 523476.**

Waltek Testing Group Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration number 523476, September 10, 2019.

## 5 Test Summary

| Test Items                             | Test Requirement                                           | Result |
|----------------------------------------|------------------------------------------------------------|--------|
| RF Output Power                        | 2.1046<br>22.913 (a)<br>24.232 (c)<br>27.50(c)<br>27.50(d) | PASS   |
| Peak-to-Average Ratio                  | 24.232 (d)<br>27.50(d)                                     | PASS   |
| Bandwidth                              | 2.1049<br>22.905<br>22.917<br>24.238<br>27.53(a)           | PASS   |
| Spurious Emissions at Antenna Terminal | 2.1051<br>22.917 (a)<br>24.238 (a)<br>27.53(h)             | PASS   |
| Field Strength of Spurious Radiation   | 2.1053<br>22.917 (a)<br>24.238 (a)<br>27.53(h)             | PASS   |
| Out of band emission, Band Edge        | 22.917 (a)<br>24.238 (a)<br>27.53(h)                       | PASS   |
| Frequency Stability                    | 2.1055<br>22.355<br>24.235<br>27.5(h)<br>27.54             | PASS   |

## 6 Equipment Used during Test

### 6.1 Equipments List

| Item                                                       | Equipment                            | Manufacturer | Model No.             | Serial No. | Last Cal. Date | Calibration Due Date |
|------------------------------------------------------------|--------------------------------------|--------------|-----------------------|------------|----------------|----------------------|
| <b>3m Semi-anechoic Chamber for Radiation Emissions 1#</b> |                                      |              |                       |            |                |                      |
| 1                                                          | Spectrum Analyzer                    | R&S          | FSP30                 | 100091     | 2023-04-24     | 2024-04-23           |
| 2                                                          | Amplifier                            | Agilent      | 8447D                 | 2944A10178 | 2023-07-27     | 2024-07-26           |
| 3                                                          | Tri-log Broadband Antenna            | SCHWARZBECK  | VULB9163              | 336        | 2023-08-07     | 2024-08-06           |
| 4                                                          | Coaxial Cable                        | Top          | TYPE16(13M)           | -          | 2023-04-24     | 2024-04-23           |
| 5                                                          | Broad-band Horn Antenna              | SCHWARZBECK  | BBHA 9120D            | 667        | 2024-01-23     | 2025-01-22           |
| 6                                                          | Broad-band Horn Antenna              | SCHWARZBECK  | BBHA 9170             | 335        | 2023-07-27     | 2024-07-26           |
| 7                                                          | Broadband Preamplifier               | COMPLIANCE   | PAP-1G18              | 2004       | 2023-08-08     | 2024-08-07           |
| 8                                                          | Coaxial Cable                        | Top          | ZT26-NJ-NJ-8M/FA      | -          | 2023-04-24     | 2024-04-23           |
| 9                                                          | Microwave Amplifier                  | SCHWARZBECK  | BBV 9721              | 100472     | 2023-07-27     | 2024-07-26           |
| 10                                                         | Coaxial Cable                        | Top          | ZT40-2.92J-2.92J-2.0M | 17100919   | 2023-04-24     | 2024-04-23           |
| <b>3m Semi-anechoic Chamber for Radiation Emissions 2#</b> |                                      |              |                       |            |                |                      |
| 1                                                          | Test Receiver                        | R&S          | ESCI                  | 101296     | 2023-04-24     | 2024-04-23           |
| 2                                                          | Trilog Broadband Antenna             | SCHWARZBECK  | VULB9160              | 9160-3325  | 2023-11-04     | 2024-11-03           |
| 3                                                          | Active Loop Antenna                  | Com-Power    | AL-130R               | 10160007   | 2023-05-07     | 2024-05-06           |
| 4                                                          | Amplifier                            | ANRITSU      | MH648A                | M43381     | 2023-04-24     | 2024-04-23           |
| 5                                                          | Cable                                | HUBER+SUHNER | CBL2                  | 525178     | 2023-04-24     | 2024-04-23           |
| <b>RF Conducted Testing</b>                                |                                      |              |                       |            |                |                      |
| 1                                                          | EMC Analyzer (9k~26.5GHz)            | Agilent      | E7405A                | MY45114943 | 2023-04-24     | 2024-04-23           |
| 2                                                          | Spectrum Analyzer (9k-6GHz)          | R&S          | FSL6                  | 100959     | 2023-04-24     | 2024-04-23           |
| 3.                                                         | Universal Radio Communication Tester | R&S          | CMU 200               | 121315     | 2023-04-24     | 2024-04-23           |
| 4                                                          | Signal Analyzer (9k~26.5GHz)         | Agilent      | N9010A                | MY50520207 | 2023-04-24     | 2024-04-23           |
| 5                                                          | Universal Radio Communication Tester | R&S          | CMW 500               | 127818     | 2023-04-24     | 2024-04-23           |

#### Test Software:

| Test Item                                       | Software name | Software version  |
|-------------------------------------------------|---------------|-------------------|
| Conduction disturbance<br>Radiated Emission(3m) | EZ-EMC        | EZ-EMC(RA-03A1-1) |



## 6.2 Measurement Uncertainty

| Parameter                                       | Uncertainty                                 |
|-------------------------------------------------|---------------------------------------------|
| Conducted Emission                              | $\pm 3.64$ dB(AC mains 150KHz~30MHz)        |
| Radiated Spurious Emissions                     | $\pm 5.08$ dB (Bilog antenna 30M~1000MHz)   |
|                                                 | $\pm 5.47$ dB (Horn antenna 1000M~25000MHz) |
| Radio Frequency                                 | $\pm 1 \times 10^{-7}$ Hz                   |
| RF Power                                        | $\pm 0.42$ dB                               |
| RF Power Density                                | $\pm 0.7$ dB                                |
| Conducted Spurious Emissions                    | $\pm 2.76$ dB (9kHz~26500MHz)               |
| Confidence interval: 95%. Confidence factor:k=2 |                                             |

## 6.3 Test Equipment Calibration

All the test equipments used are valid and calibrated by CEPREI Certification Body that address is No.110 Dongguan Zhuang RD. Guangzhou, P.R.China.

## 7 RF Output Power

|                   |                                                                  |
|-------------------|------------------------------------------------------------------|
| Test Requirement: | FCC Part 2.1046, 22.913 (a), 24.232 (c), 27.50(c.10); 27.50(d.4) |
| Test Method:      | TIA/EIA-603-E:2016<br>ANSI C63.26:2015                           |
| Test Mode:        | TX transmitting                                                  |

### 7.1 EUT Operation

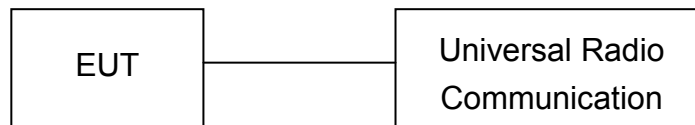
Operating Environment :

|                       |           |
|-----------------------|-----------|
| Temperature:          | 24.2 °C   |
| Humidity:             | 53.9 % RH |
| Atmospheric Pressure: | 101.4kPa  |

### 7.2 Test Procedure

Conducted method:

The RF output of the transmitter was connected to the wireless test set and the spectrum analyzer through sufficient attenuation.



Radiated method:

1. The setup of EUT is according with per TIA/EIA Standard 603D measurement procedure.
2. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.
3. The frequency range up to tenth harmonic of the fundamental frequency was investigated.
4. Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

### 7.3 Test Result

#### Conducted Power

| WCDMA - Average Power (dBm) |               |              |        |              |       |       |               |        |        |
|-----------------------------|---------------|--------------|--------|--------------|-------|-------|---------------|--------|--------|
| Band                        | WCDMA Band II |              |        | WCDMA Band V |       |       | WCDMA Band IV |        |        |
| Channel                     | 9262          | 9400         | 9538   | 4132         | 4183  | 4233  | 1313          | 1413   | 1512   |
| Frequency (MHz)             | 1852.4        | 1880         | 1907.6 | 826.4        | 836.6 | 846.6 | 1712.4        | 1732.6 | 1752.6 |
| RMC 12.2k                   | 22.12         | <b>22.71</b> | 22.67  | <b>22.30</b> | 21.97 | 21.89 | <b>22.95</b>  | 22.56  | 22.81  |
| HSDPA Subtest-1             | 21.03         | 21.56        | 21.51  | 21.18        | 20.84 | 20.78 | 22.10         | 21.58  | 21.36  |
| HSDPA Subtest-2             | 21.01         | 21.48        | 21.36  | 21.05        | 20.71 | 20.66 | 22.04         | 21.41  | 21.27  |
| HSDPA Subtest-3             | 20.78         | 21.42        | 21.28  | 20.92        | 20.50 | 20.52 | 21.92         | 21.30  | 21.14  |
| HSDPA Subtest-4             | 20.73         | 21.24        | 21.16  | 20.86        | 20.41 | 20.33 | 21.81         | 21.26  | 21.02  |
| HSUPA Subtest-1             | 21.43         | 22.11        | 22.19  | 21.49        | 21.20 | 21.25 | 22.43         | 21.88  | 21.90  |
| HSUPA Subtest-2             | 21.31         | 21.89        | 22.00  | 21.43        | 21.15 | 21.02 | 22.24         | 21.73  | 21.78  |
| HSUPA Subtest-3             | 21.15         | 21.85        | 21.92  | 21.30        | 21.09 | 20.89 | 22.13         | 21.56  | 21.55  |
| HSUPA Subtest-4             | 21.10         | 21.63        | 21.80  | 21.16        | 20.85 | 20.73 | 22.09         | 21.44  | 21.37  |
| HSUPA Subtest-5             | 20.93         | 21.55        | 21.49  | 21.02        | 20.79 | 20.65 | 20.91         | 21.28  | 21.13  |

**Radiated Power**

ERP and EIRP

**WCDMA Band II (Part 24E)**

| Frequency                        | Receiver Reading | Turn table Angle | RX Antenna |       | Substituted |       |              | Absolute Level | Part 24E |        |
|----------------------------------|------------------|------------------|------------|-------|-------------|-------|--------------|----------------|----------|--------|
|                                  |                  |                  | Height     | Polar | SG Level    | Cable | Antenna Gain |                | Limit    | Margin |
| (MHz)                            | (dBμV)           | Degree           | (m)        | (H/V) | (dBm)       | (dB)  | (dB)         | (dBm)          | (dBm)    | (dB)   |
| WCDMA Band II Voice Channel 9262 |                  |                  |            |       |             |       |              |                |          |        |
| 1852.4                           | 89.32            | 81               | 2.3        | H     | 15.35       | 0.31  | 10.40        | 25.44          | 33       | -7.56  |
| 1852.4                           | 88.65            | 70               | 2.0        | V     | 15.37       | 0.31  | 10.40        | 25.46          | 33       | -7.54  |
| WCDMA Band II Voice Channel 9400 |                  |                  |            |       |             |       |              |                |          |        |
| 1880                             | 89.04            | 261              | 2.4        | H     | 15.19       | 0.31  | 10.40        | 25.28          | 33       | -7.72  |
| 1880                             | 88.75            | 45               | 1.1        | V     | 15.63       | 0.31  | 10.40        | <b>25.72</b>   | 33       | -7.28  |
| WCDMA Band II Voice Channel 9538 |                  |                  |            |       |             |       |              |                |          |        |
| 1907.6                           | 89.01            | 344              | 1.7        | H     | 15.28       | 0.32  | 10.40        | 25.36          | 33       | -7.64  |
| 1907.6                           | 88.43            | 205              | 1.3        | V     | 15.47       | 0.32  | 10.40        | 25.55          | 33       | -7.45  |
| WCDMA Band II HSDPA Channel 9262 |                  |                  |            |       |             |       |              |                |          |        |
| 1852.4                           | 87.96            | 251              | 2.0        | H     | 13.99       | 0.31  | 10.40        | 24.08          | 33       | -8.92  |
| 1852.4                           | 87.85            | 35               | 2.3        | V     | 14.57       | 0.31  | 10.40        | 24.66          | 33       | -8.34  |
| WCDMA Band II HSDPA Channel 9400 |                  |                  |            |       |             |       |              |                |          |        |
| 1880                             | 88.26            | 354              | 1.4        | H     | 14.41       | 0.31  | 10.40        | 24.50          | 33       | -8.50  |
| 1880                             | 87.89            | 306              | 2.1        | V     | 14.77       | 0.31  | 10.40        | 24.86          | 33       | -8.14  |
| WCDMA Band II HSDPA Channel 9538 |                  |                  |            |       |             |       |              |                |          |        |
| 1907.6                           | 88.03            | 157              | 2.4        | H     | 14.30       | 0.32  | 10.40        | 24.38          | 33       | -8.62  |
| 1907.6                           | 87.87            | 6                | 1.2        | V     | 14.91       | 0.32  | 10.40        | 24.99          | 33       | -8.01  |
| WCDMA Band II HSUPA Channel 9262 |                  |                  |            |       |             |       |              |                |          |        |
| 1852.4                           | 87.07            | 211              | 1.5        | H     | 13.10       | 0.31  | 10.40        | 23.19          | 33       | -9.81  |
| 1852.4                           | 86.97            | 43               | 1.1        | V     | 13.69       | 0.31  | 10.40        | 23.78          | 33       | -9.22  |
| WCDMA Band II HSUPA Channel 9400 |                  |                  |            |       |             |       |              |                |          |        |
| 1880                             | 87.08            | 152              | 1.9        | H     | 13.23       | 0.31  | 10.40        | 23.32          | 33       | -9.68  |
| 1880                             | 86.91            | 13               | 2.0        | V     | 13.79       | 0.31  | 10.40        | 23.88          | 33       | -9.12  |
| WCDMA Band II HSUPA Channel 9538 |                  |                  |            |       |             |       |              |                |          |        |
| 1907.6                           | 87.12            | 167              | 1.9        | H     | 13.39       | 0.32  | 10.40        | 23.47          | 33       | -9.53  |
| 1907.6                           | 87.00            | 339              | 1.5        | V     | 14.04       | 0.32  | 10.40        | 24.12          | 33       | -8.88  |

## WCDMA Band V (Part 22H)

| Frequency                       | Receiver Reading | Turn table Angle | RX Antenna |       | Substituted |       |              | Absolute Level | Part 22H |        |
|---------------------------------|------------------|------------------|------------|-------|-------------|-------|--------------|----------------|----------|--------|
|                                 |                  |                  | Height     | Polar | SG Level    | Cable | Antenna Gain |                | Limit    | Margin |
| (MHz)                           | (dBμV)           | Degree           | (m)        | (H/V) | (dBm)       | (dB)  | (dB)         | (dBm)          | (dBm)    | (dB)   |
| WCDMA Band V Voice Channel 4132 |                  |                  |            |       |             |       |              |                |          |        |
| 826.4                           | 92.45            | 176              | 1.7        | H     | 25.42       | 0.20  | 0.00         | <b>25.22</b>   | 38.45    | -13.23 |
| 826.4                           | 91.92            | 130              | 2.0        | V     | 24.82       | 0.20  | 0.00         | 24.62          | 38.45    | -13.83 |
| WCDMA Band V Voice Channel 4183 |                  |                  |            |       |             |       |              |                |          |        |
| 836.6                           | 92.16            | 161              | 1.3        | H     | 25.13       | 0.20  | 0.00         | 24.93          | 38.45    | -13.52 |
| 836.6                           | 92.07            | 235              | 1.2        | V     | 24.97       | 0.20  | 0.00         | 24.77          | 38.45    | -13.68 |
| WCDMA Band V Voice Channel 4233 |                  |                  |            |       |             |       |              |                |          |        |
| 846.6                           | 91.98            | 324              | 1.7        | H     | 24.95       | 0.20  | 0.00         | 24.75          | 38.45    | -13.70 |
| 846.6                           | 91.03            | 298              | 2.1        | V     | 23.93       | 0.20  | 0.00         | 23.73          | 38.45    | -14.72 |
| WCDMA Band V HSDPA Channel 4132 |                  |                  |            |       |             |       |              |                |          |        |
| 826.4                           | 91.19            | 101              | 1.7        | H     | 24.16       | 0.20  | 0.00         | 23.96          | 38.45    | -14.49 |
| 826.4                           | 92.18            | 336              | 2.1        | V     | 25.08       | 0.20  | 0.00         | 24.88          | 38.45    | -13.57 |
| WCDMA Band V HSDPA Channel 4183 |                  |                  |            |       |             |       |              |                |          |        |
| 836.6                           | 91.08            | 156              | 1.3        | H     | 24.05       | 0.20  | 0.00         | 23.85          | 38.45    | -14.60 |
| 836.6                           | 91.07            | 141              | 2.1        | V     | 23.97       | 0.20  | 0.00         | 23.77          | 38.45    | -14.68 |
| WCDMA Band V HSDPA Channel 4233 |                  |                  |            |       |             |       |              |                |          |        |
| 846.6                           | 91.26            | 76               | 1.4        | H     | 24.23       | 0.20  | 0.00         | 24.03          | 38.45    | -14.42 |
| 846.6                           | 91.09            | 307              | 1.9        | V     | 23.99       | 0.20  | 0.00         | 23.79          | 38.45    | -14.66 |
| WCDMA Band V HSUPA Channel 4132 |                  |                  |            |       |             |       |              |                |          |        |
| 826.4                           | 89.98            | 103              | 2.1        | H     | 22.95       | 0.20  | 0.00         | 22.75          | 38.45    | -15.70 |
| 826.4                           | 90.40            | 313              | 1.9        | V     | 23.30       | 0.20  | 0.00         | 23.10          | 38.45    | -15.35 |
| WCDMA Band V HSUPA Channel 4183 |                  |                  |            |       |             |       |              |                |          |        |
| 836.6                           | 90.03            | 20               | 1.5        | H     | 23.00       | 0.20  | 0.00         | 22.80          | 38.45    | -15.65 |
| 836.6                           | 90.24            | 60               | 2.4        | V     | 23.14       | 0.20  | 0.00         | 22.94          | 38.45    | -15.51 |
| WCDMA Band V HSUPA Channel 4233 |                  |                  |            |       |             |       |              |                |          |        |
| 846.6                           | 90.01            | 190              | 1.8        | H     | 22.98       | 0.20  | 0.00         | 22.78          | 38.45    | -15.67 |
| 846.6                           | 90.39            | 334              | 1.4        | V     | 23.29       | 0.20  | 0.00         | 23.09          | 38.45    | -15.36 |

## WCDMA Band IV (Part 27L)

| Frequency                        | Receiver Reading | Turntable Angle | RX Antenna |       | Substituted |       |              | Absolute Level | Part 27 |        |
|----------------------------------|------------------|-----------------|------------|-------|-------------|-------|--------------|----------------|---------|--------|
|                                  |                  |                 | Height     | Polar | SG Level    | Cable | Antenna Gain |                | Limit   | Margin |
| (MHz)                            | (dBμV)           | Degree          | (m)        | (H/V) | (dBm)       | (dB)  | (dB)         | (dBm)          | (dBm)   | (dB)   |
| WCDMA Band IV Voice Channel 1313 |                  |                 |            |       |             |       |              |                |         |        |
| 1712.4                           | 88.89            | 50              | 2.2        | H     | 14.92       | 0.30  | 9.40         | 24.02          | 30      | -5.98  |
| 1712.4                           | 88.42            | 215             | 1.1        | V     | 14.14       | 0.30  | 9.40         | 23.24          | 30      | -6.76  |
| WCDMA Band IV Voice Channel 1413 |                  |                 |            |       |             |       |              |                |         |        |
| 1732.6                           | 88.58            | 101             | 2.2        | H     | 14.73       | 0.30  | 9.40         | 23.83          | 30      | -6.17  |
| 1732.6                           | 88.55            | 268             | 1.6        | V     | 14.43       | 0.30  | 9.40         | 23.53          | 30      | -6.47  |
| WCDMA Band IV Voice Channel 1512 |                  |                 |            |       |             |       |              |                |         |        |
| 1752.6                           | 88.82            | 300             | 1.7        | H     | 15.09       | 0.30  | 9.40         | <b>24.19</b>   | 30      | -5.81  |
| 1752.6                           | 88.70            | 298             | 1.1        | V     | 13.74       | 0.30  | 9.40         | 22.84          | 30      | -7.16  |
| WCDMA Band IV HSDPA Channel 1313 |                  |                 |            |       |             |       |              |                |         |        |
| 1712.4                           | 88.41            | 196             | 1.1        | H     | 14.44       | 0.30  | 9.40         | 23.54          | 30      | -6.46  |
| 1712.4                           | 88.81            | 6               | 1.2        | V     | 14.53       | 0.30  | 9.40         | 23.63          | 30      | -6.37  |
| WCDMA Band IV HSDPA Channel 1413 |                  |                 |            |       |             |       |              |                |         |        |
| 1732.6                           | 88.49            | 221             | 2.1        | H     | 14.64       | 0.30  | 9.40         | 23.74          | 30      | -6.26  |
| 1732.6                           | 88.54            | 29              | 1.6        | V     | 14.42       | 0.30  | 9.40         | 23.52          | 30      | -6.48  |
| WCDMA Band IV HSDPA Channel 1512 |                  |                 |            |       |             |       |              |                |         |        |
| 1752.6                           | 88.68            | 189             | 1.7        | H     | 14.95       | 0.30  | 9.40         | 24.05          | 30      | -5.95  |
| 1752.6                           | 88.67            | 277             | 1.4        | V     | 13.71       | 0.30  | 9.40         | 22.81          | 30      | -7.19  |
| WCDMA Band IV HSUPA Channel 1313 |                  |                 |            |       |             |       |              |                |         |        |
| 1712.4                           | 88.54            | 44              | 1.0        | H     | 14.57       | 0.30  | 9.40         | 23.67          | 30      | -6.33  |
| 1712.4                           | 88.59            | 144             | 1.3        | V     | 14.31       | 0.30  | 9.40         | 23.41          | 30      | -6.59  |
| WCDMA Band IV HSUPA Channel 1413 |                  |                 |            |       |             |       |              |                |         |        |
| 1732.6                           | 88.52            | 222             | 1.4        | H     | 14.67       | 0.30  | 9.40         | 23.77          | 30      | -6.23  |
| 1732.6                           | 88.45            | 303             | 1.6        | V     | 14.33       | 0.30  | 9.40         | 23.43          | 30      | -6.57  |
| WCDMA Band IV HSUPA Channel 1512 |                  |                 |            |       |             |       |              |                |         |        |
| 1752.6                           | 88.66            | 216             | 1.1        | H     | 14.93       | 0.30  | 9.40         | 24.03          | 30      | -5.97  |
| 1752.6                           | 88.49            | 331             | 1.9        | V     | 13.53       | 0.30  | 9.40         | 22.63          | 30      | -7.37  |

## 8 Peak-to-Average Ratio

|                   |                      |
|-------------------|----------------------|
| Test Requirement: | 24.232 (d), 27.50(d) |
| Test Method:      | N/A                  |
| Test Mode:        | TX transmitting      |

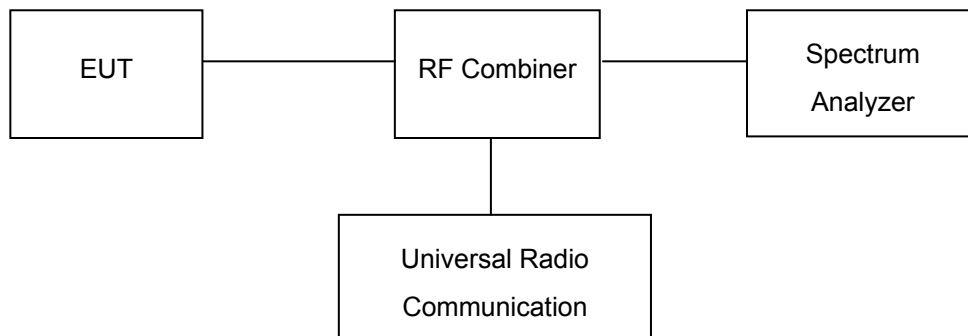
### 8.1 EUT Operation

Operating Environment :

|                       |           |
|-----------------------|-----------|
| Temperature:          | 24.2 °C   |
| Humidity:             | 53.9 % RH |
| Atmospheric Pressure: | 101.4kPa  |

### 8.2 Test Procedure

1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
2. Set EUT to transmit at maximum output power.
3. When the duty cycle is less than 98%, then signal gating will be implemented on the spectrum analyzer by triggering from the system simulator.
4. Set the CCDF (Complementary Cumulative Distribution Function) option of the spectrum analyzer. Record the maximum PAPR level associated with a probability of 0.1%.



### 8.3 Test Result

Remark: All test data were reported and only the worst case (middle channel mode) test graphs were showed in test report.

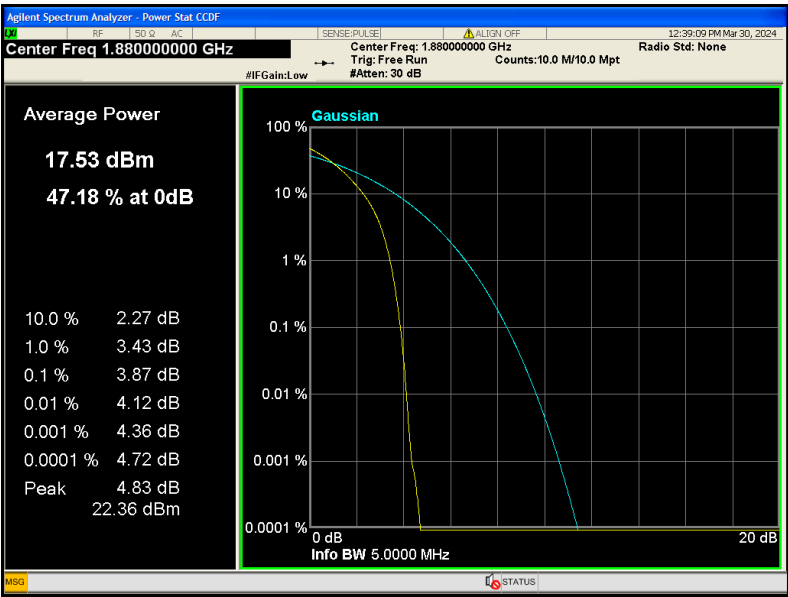
Cellular Band (Part 24E&Part 27L)

| Mode                          | WCDMA Band II |        |        | WCDMA Band IV |        |        | Limit<br>(dB) |
|-------------------------------|---------------|--------|--------|---------------|--------|--------|---------------|
| Channel                       | 9262          | 9400   | 9538   | 1313          | 1413   | 1512   |               |
| Frequency<br>(MHz)            | 1852.4        | 1880.0 | 1907.6 | 1712.4        | 1732.6 | 1752.6 |               |
| Peak-to-Average<br>Ratio (dB) | 3.84          | 3.87   | 2.96   | 3.93          | 3.97   | 3.88   | 13            |



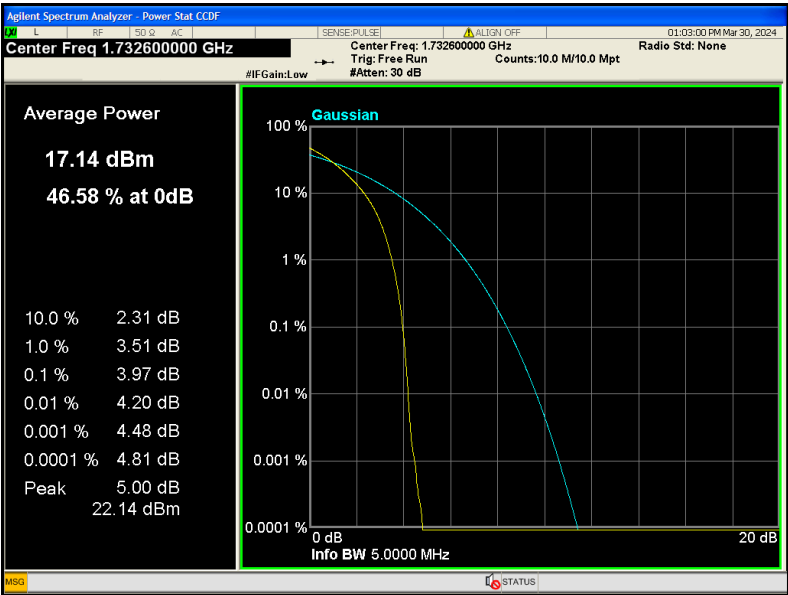
Test Plots (Part 24E)

WCDMA Band II Middle Channel



Test Plots (Part 27L)

WCDMA Band IV Middle Channel



## 9 Bandwidth

|                   |                                                   |
|-------------------|---------------------------------------------------|
| Test Requirement: | FCC Part 2.1049, 22.917, 22.905, 24.238, 27.53(a) |
| Test Method:      | TIA/EIA-603-E:2016<br>ANSI C63.26:2015            |
| Test Mode:        | TX transmitting                                   |

### 9.1 EUT Operation

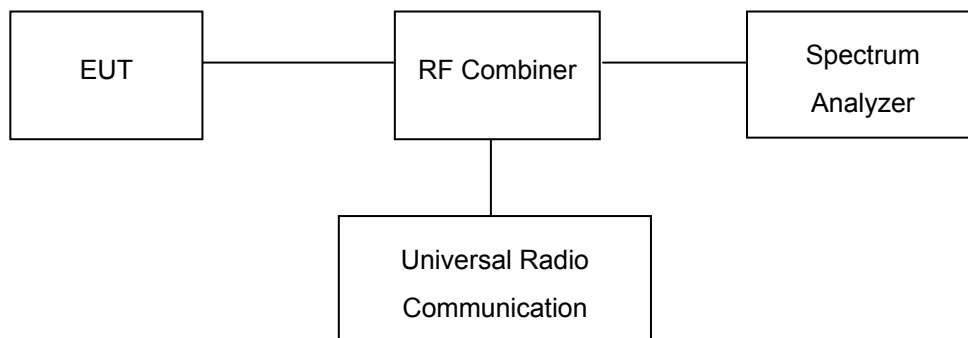
Operating Environment :

|                       |           |
|-----------------------|-----------|
| Temperature:          | 24.2 °C   |
| Humidity:             | 53.9 % RH |
| Atmospheric Pressure: | 101.4kPa  |

### 9.2 Test Procedure

The RF output of the transmitter was connected to the wireless test set and the spectrum analyzer through sufficient attenuation.

The resolution bandwidth of the spectrum analyzer was set in the range of 1 to 5 % of the anticipated OBW (Cellular /PCS) and the 26 dB & 99%bandwidth was recorded.



### 9.3 Test Result

Remark: All test data were reported and only the worst case (middle channel mode) test graphs were showed in test report.

Cellular Band (Part 22H)

| Test Mode       |              | Channel | Frequency<br>(MHz) | 99% Occupied<br>Bandwidth(MHz) | 26 dB Emission<br>Bandwidth(MHz) |
|-----------------|--------------|---------|--------------------|--------------------------------|----------------------------------|
| WCDMA<br>Band V | RMC12.2k     | 4132    | 826.4              | 4.14                           | 4.67                             |
|                 |              | 4183    | 836.6              | 4.15                           | 4.69                             |
|                 |              | 4233    | 846.6              | 4.13                           | 4.68                             |
|                 | HSDPA(16QAM) | 4132    | 826.4              | 4.17                           | 4.67                             |
|                 |              | 4183    | 836.6              | 4.17                           | 4.68                             |
|                 |              | 4233    | 846.6              | 4.17                           | 4.67                             |
|                 | HSUPA(BPSK)  | 4132    | 826.4              | 4.15                           | 4.67                             |
|                 |              | 4183    | 836.6              | 4.16                           | 4.67                             |
|                 |              | 4233    | 846.6              | 4.16                           | 4.67                             |

Cellular Band (Part 24E)

| Test Mode        |              | Channel | Frequency<br>(MHz) | 99% Occupied<br>Bandwidth(MHz) | 26 dB Emission<br>Bandwidth(MHz) |
|------------------|--------------|---------|--------------------|--------------------------------|----------------------------------|
| WCDMA<br>Band II | RMC12.2k     | 9262    | 1852.4             | 4.13                           | 4.69                             |
|                  |              | 9400    | 1880.0             | 4.15                           | 4.70                             |
|                  |              | 9538    | 1907.6             | 4.14                           | 4.69                             |
|                  | HSDPA(16QAM) | 9262    | 1852.4             | 4.14                           | 4.69                             |
|                  |              | 9400    | 1880.0             | 4.16                           | 4.69                             |
|                  |              | 9538    | 1907.6             | 4.15                           | 4.69                             |
|                  | HSUPA(BPSK)  | 9262    | 1852.4             | 4.16                           | 4.65                             |
|                  |              | 9400    | 1880.0             | 4.17                           | 4.66                             |
|                  |              | 9538    | 1907.6             | 4.15                           | 4.65                             |

Cellular Band (Part 27L)

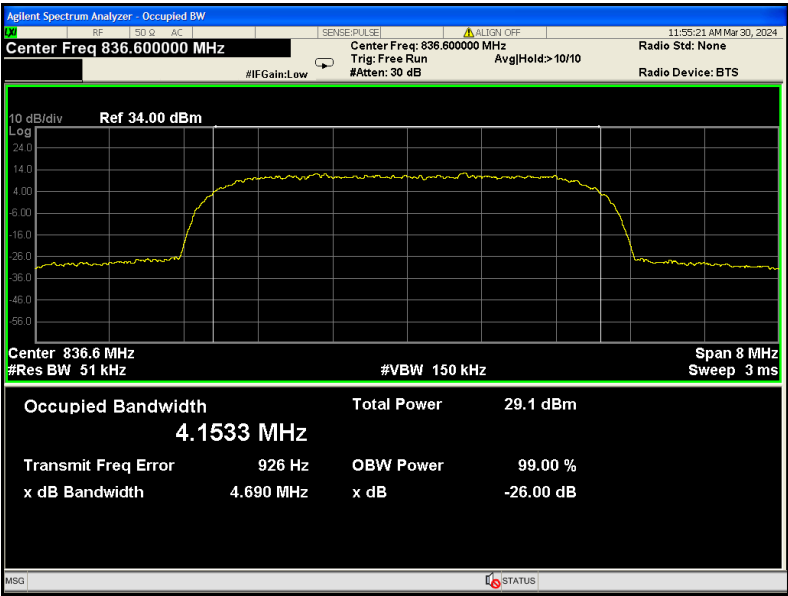
| Test Mode        |          | Channel | Frequency<br>(MHz) | 99% Occupied<br>Bandwidth(MHz) | 26 dB Emission<br>Bandwidth(MHz) |
|------------------|----------|---------|--------------------|--------------------------------|----------------------------------|
| WCDMA<br>Band IV | RMC12.2k | 1313    | 1712.6             | 4.08                           | 4.57                             |
|                  |          | 1413    | 1732.6             | 4.15                           | 4.68                             |
|                  |          | 1512    | 1752.4             | 4.09                           | 4.58                             |
|                  | HSDPA    | 1313    | 1712.6             | 4.12                           | 4.59                             |
|                  |          | 1413    | 1732.6             | 4.15                           | 4.68                             |
|                  |          | 1512    | 1752.4             | 4.09                           | 4.67                             |
|                  | HSUPA    | 1313    | 1712.6             | 4.12                           | 4.65                             |
|                  |          | 1413    | 1732.6             | 4.16                           | 4.67                             |
|                  |          | 1512    | 1752.4             | 4.14                           | 4.61                             |

Test Plots (worst case)

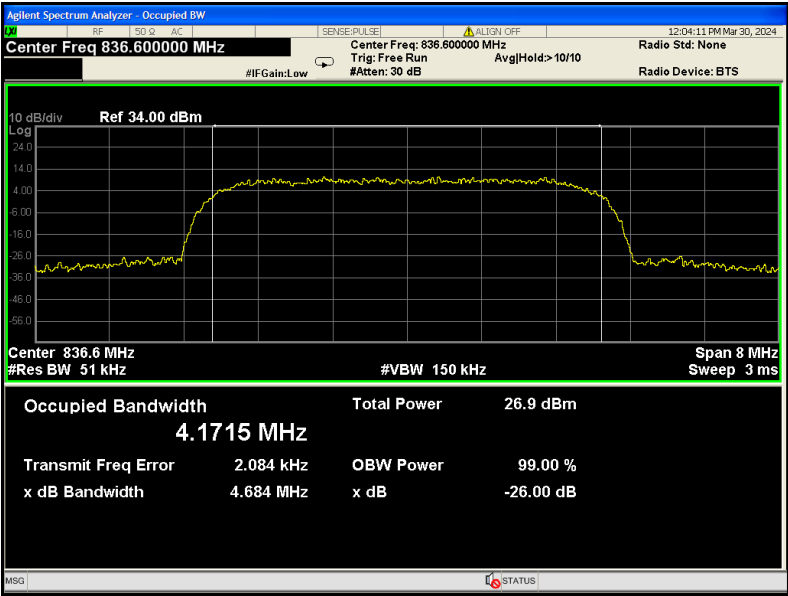
Cellular Band (Part 22H)

WCDMA band V

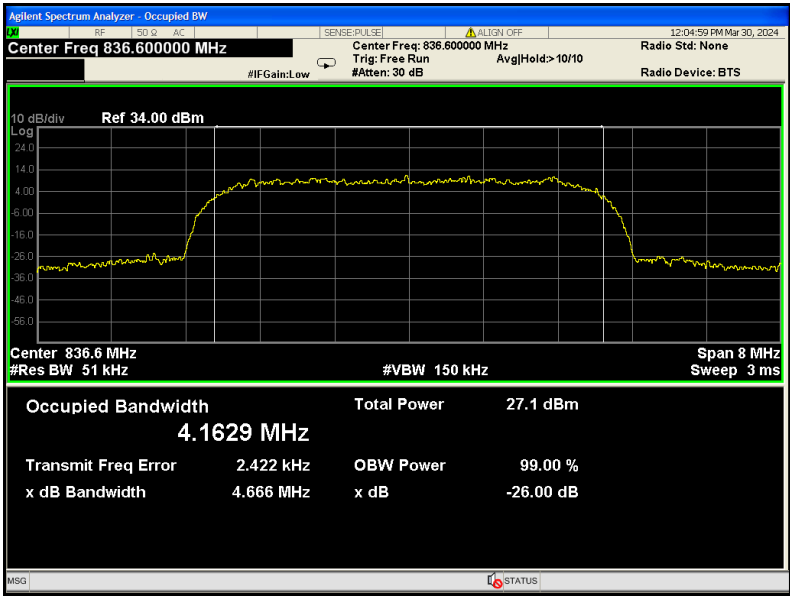
RMC12.2k



HSDPA



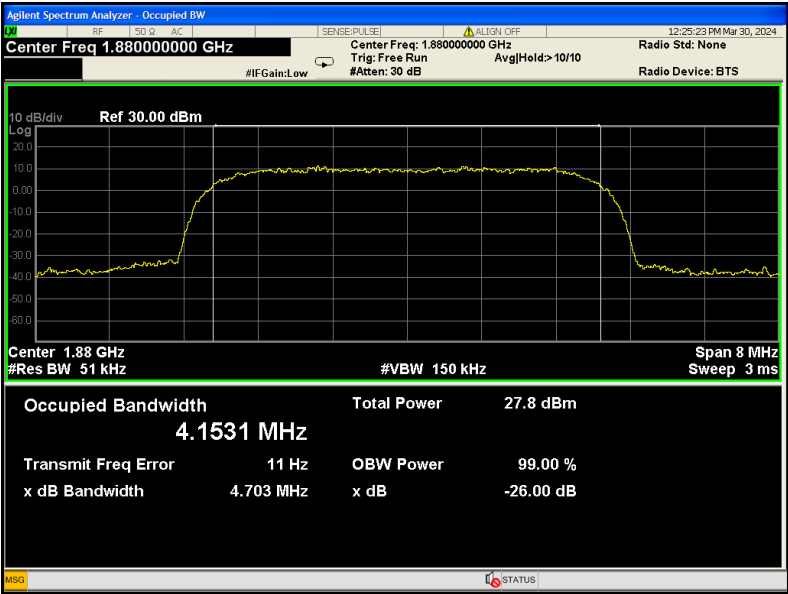
HSUPA



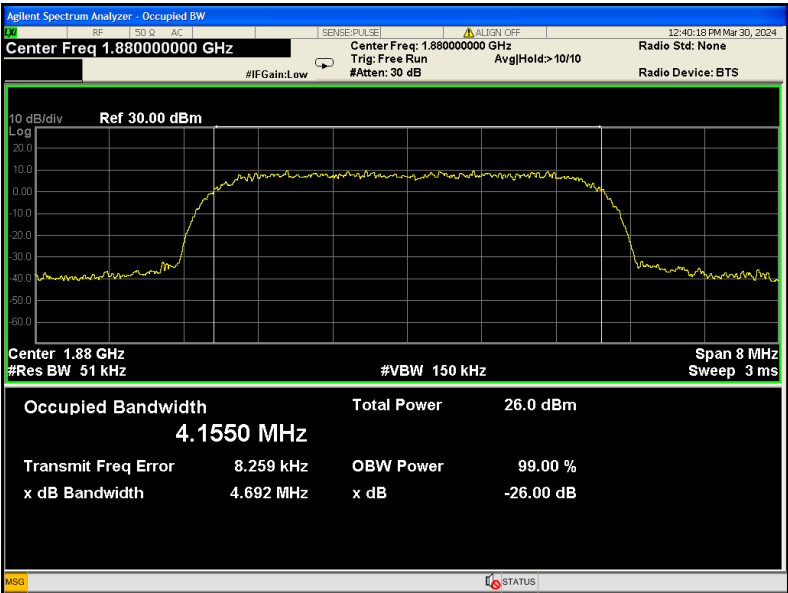
Cellular Band (Part 24E)

WCDMA band II

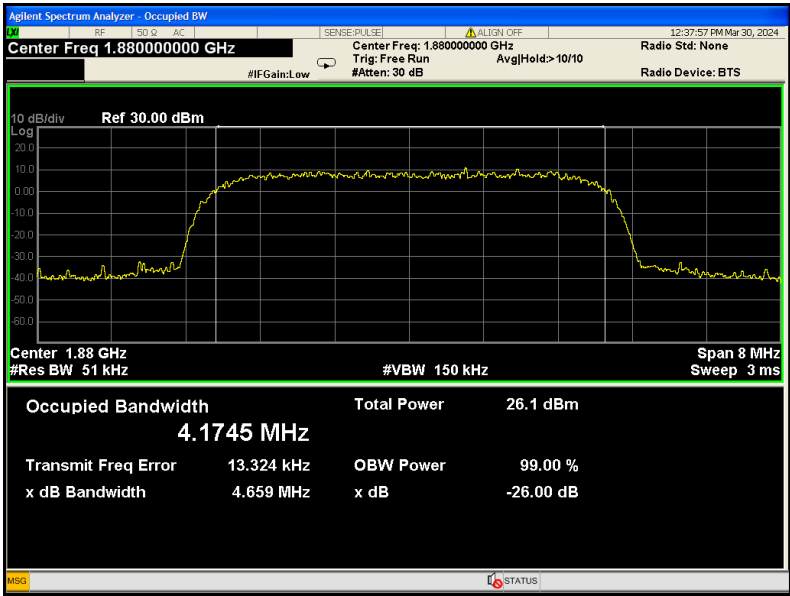
RMC12.2k



HSDPA

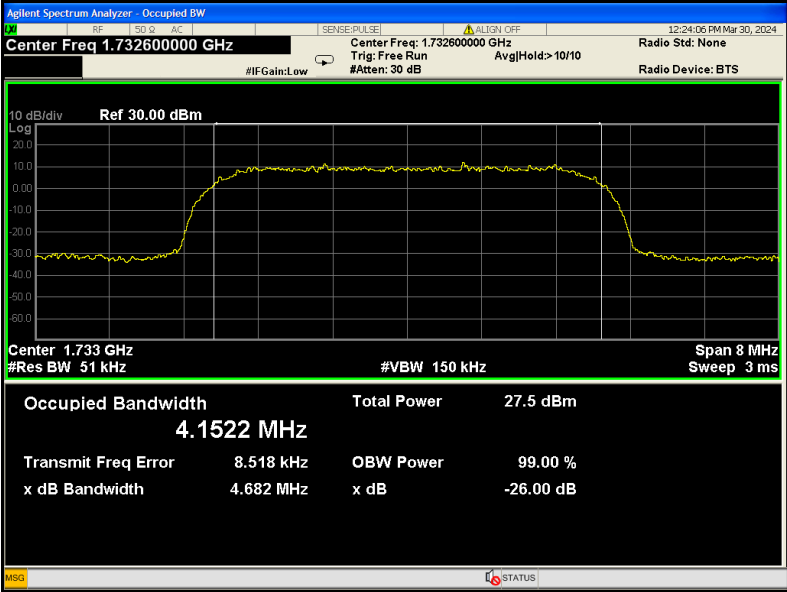


HSUPA

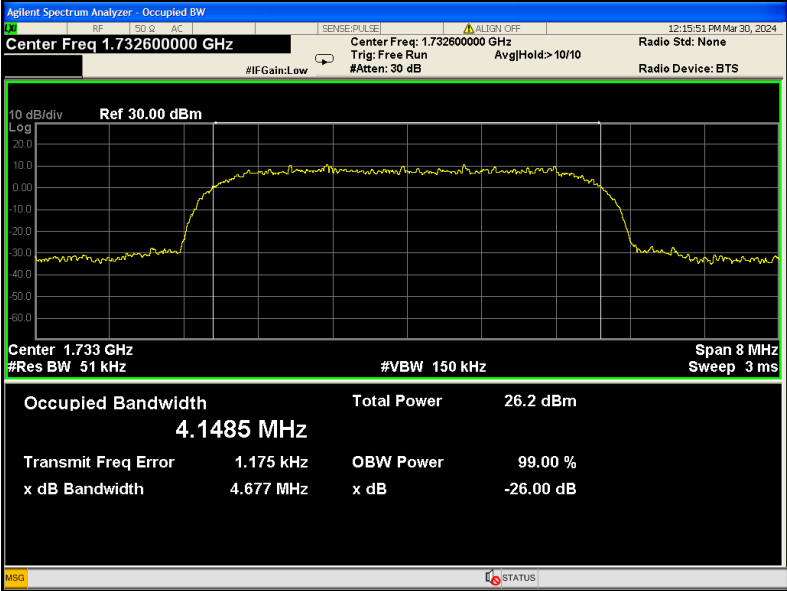




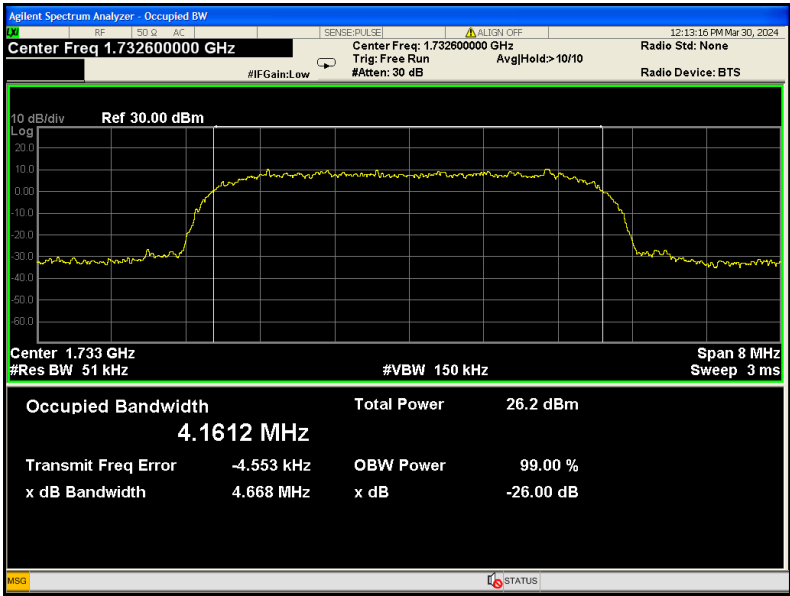
(Part 27L)  
WCDMA band IV  
RMC12.2k



HSDPA



HSUPA



## 10 Spurious Emissions at Antenna Terminals

|                   |                                                 |
|-------------------|-------------------------------------------------|
| Test Requirement: | FCC Part 2.1051, 22.917(a), 24.238(a), 27.53(h) |
| Test Method:      | TIA/EIA-603-E:2016<br>ANSI C63.26:2015          |
| Test Mode:        | TX transmitting                                 |

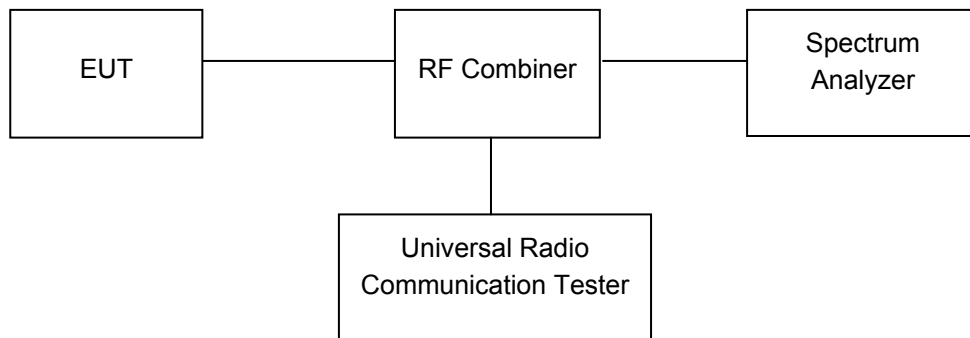
### 10.1 EUT Operation

Operating Environment :

|                       |           |
|-----------------------|-----------|
| Temperature:          | 24.4 °C   |
| Humidity:             | 55.7 % RH |
| Atmospheric Pressure: | 101.5kPa  |

### 10.2 Test Procedure

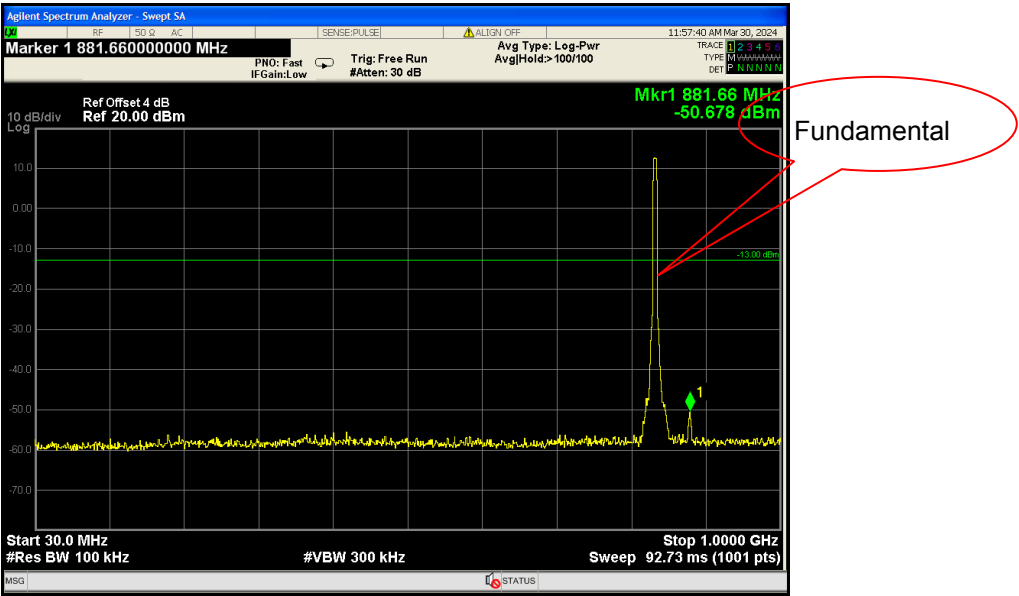
The RF output of the transceiver was connected to a spectrum analyzer and simulator through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 1MHz. Sufficient scans were taken to show any out of band emissions up to 10th harmonics.



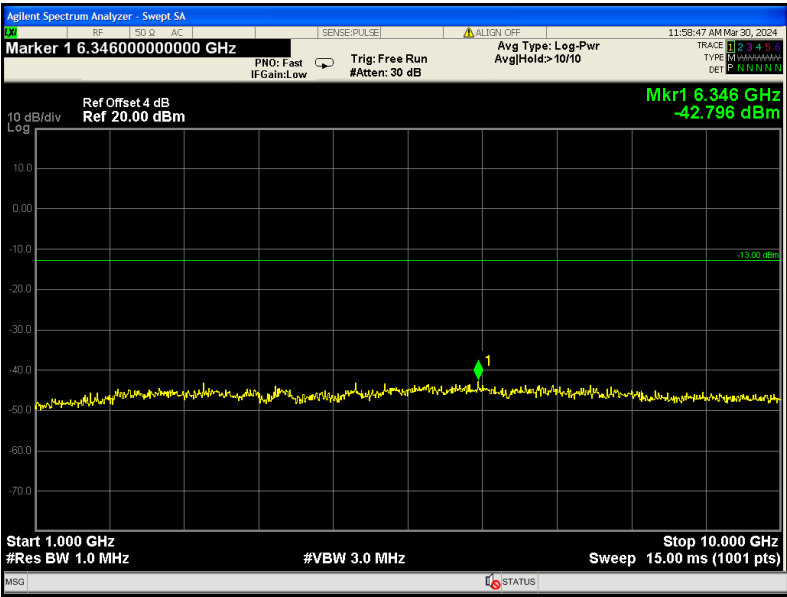
10.3 Test Result

Remark: All test data were reported and only the worst case (middle channel mode) test graphs were showed in test report.

Cellular Band (Part 22H)  
WCDMA band V - channel 4183  
30MHz-1GHz

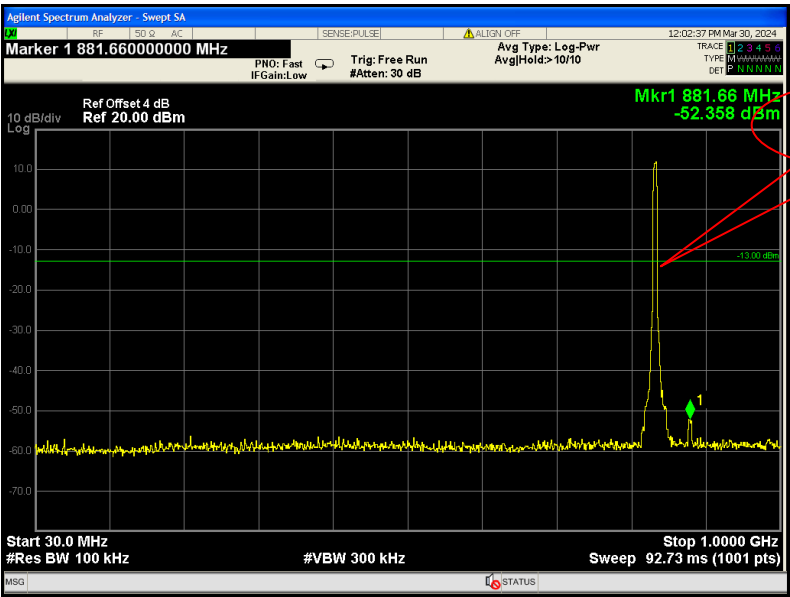


Above 1GHz

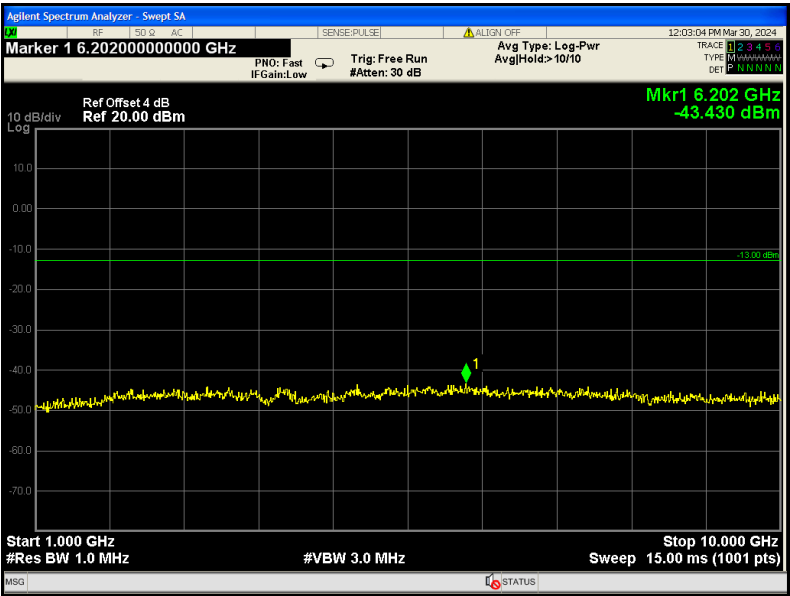


WCDMA band V - channel 4183 (HSDPA)

30MHz-1GHz

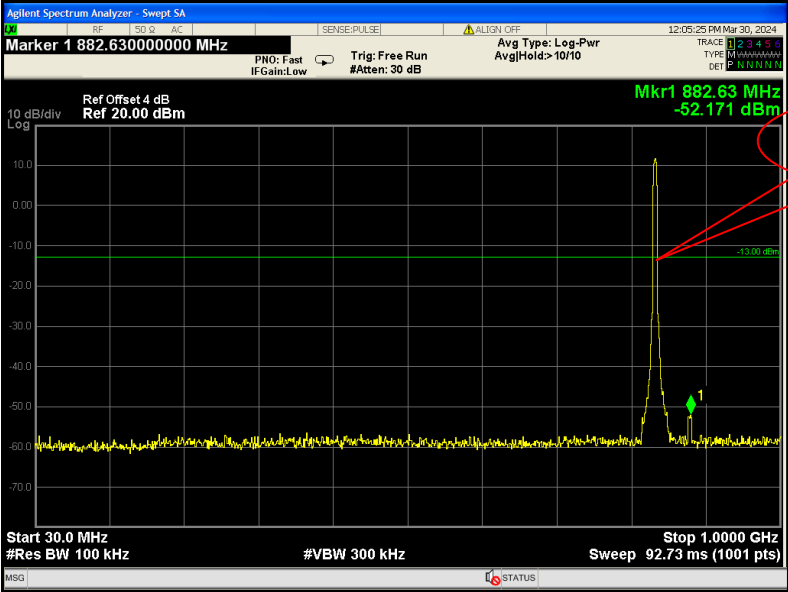


Above 1GHz

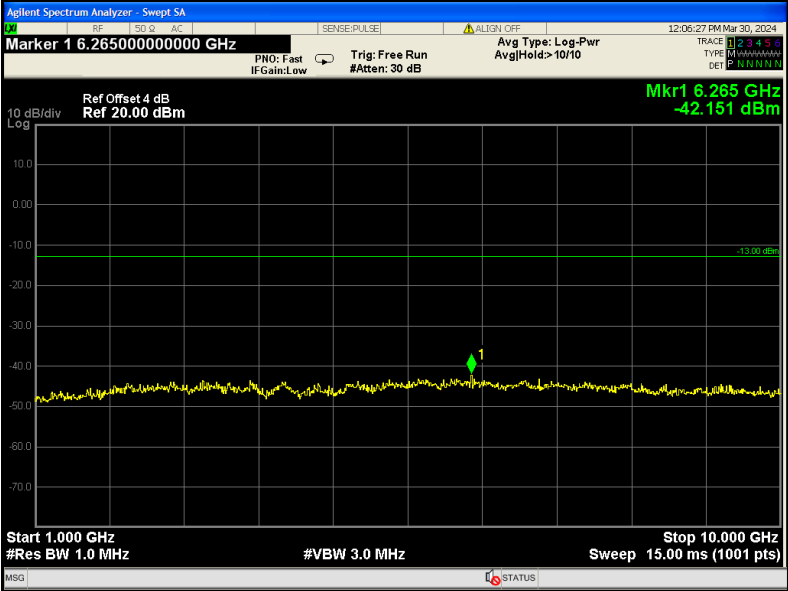


WCDMA band V - channel 4183 (HSUPA)

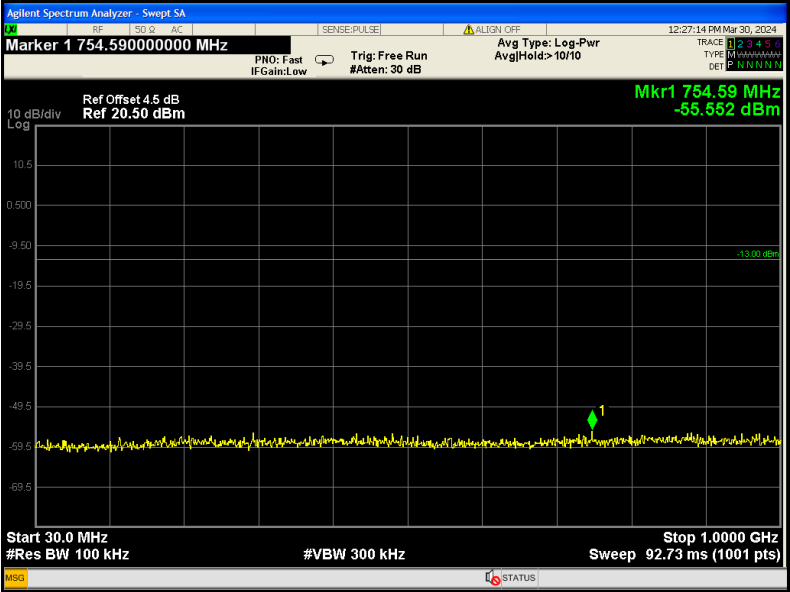
30MHz-1GHz



Above 1GHz

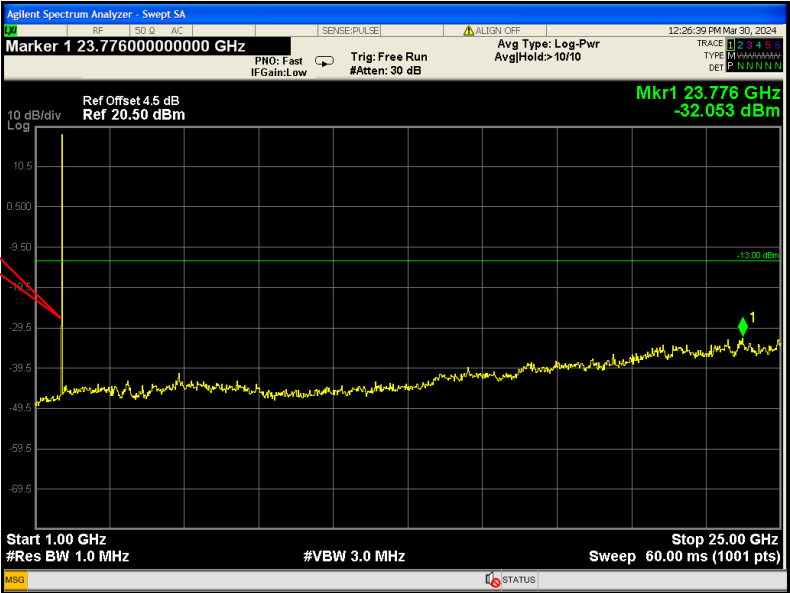


Cellular Band (Part 24E)  
WCDMA band II - channel 9400  
30MHz-1GHz

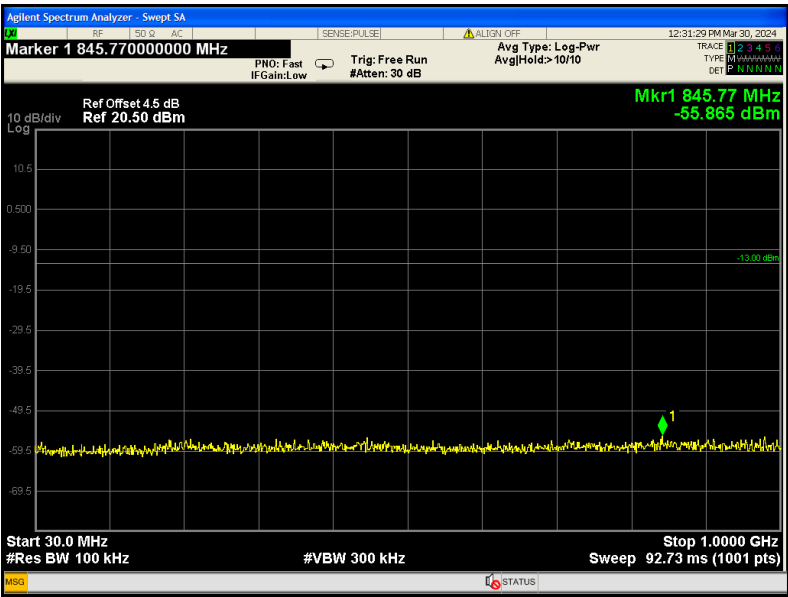


Above 1GHz

Fundamental

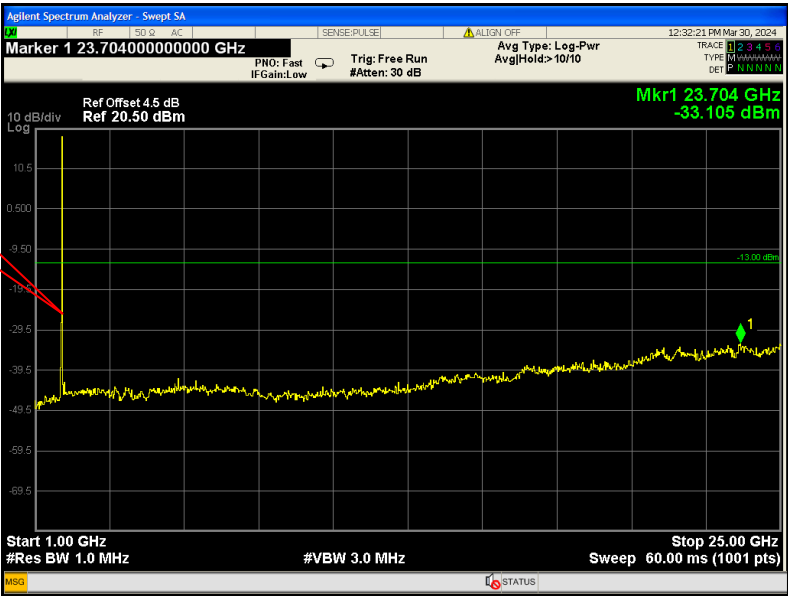


WCDMA band II - channel 9400 (HSDPA)  
30MHz-1GHz



Above 1GHz

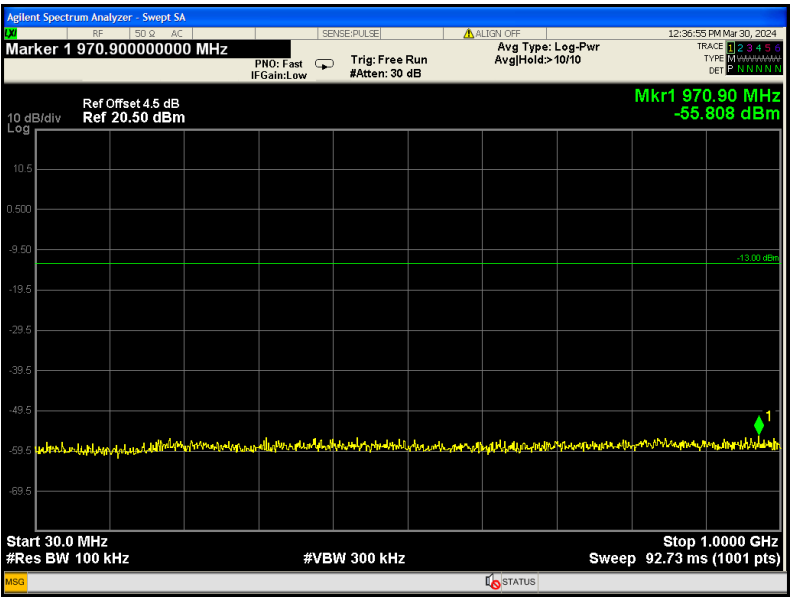
Fundamental





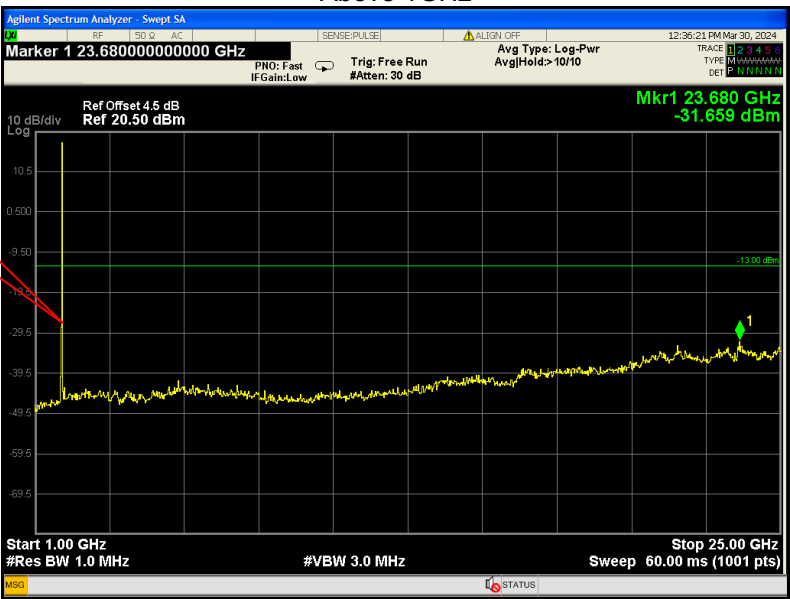
WCDMA band II - channel 9400 (HSUPA)

30MHz-1GHz



Above 1GHz

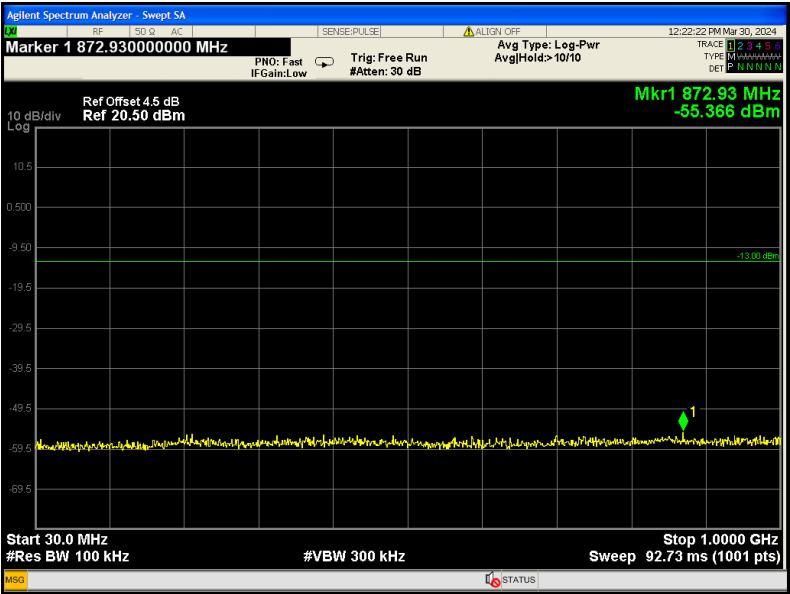
Fundamental



(Part 27L)

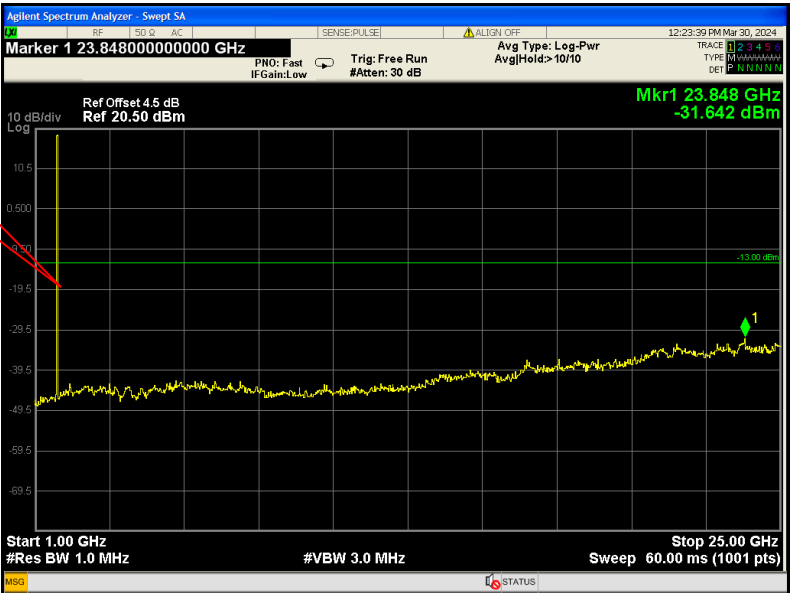
WCDMA band IV - channel 1413

30MHz-1GHz



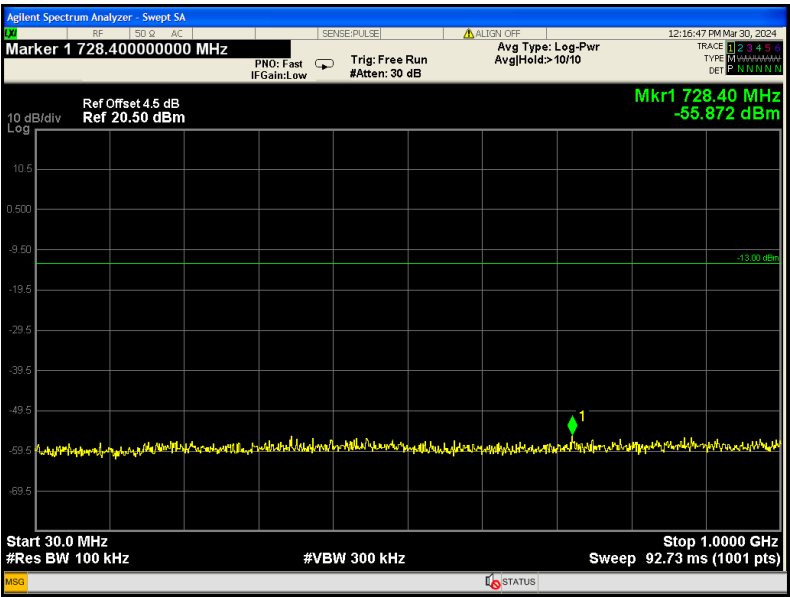
Above 1GHz

Fundamental



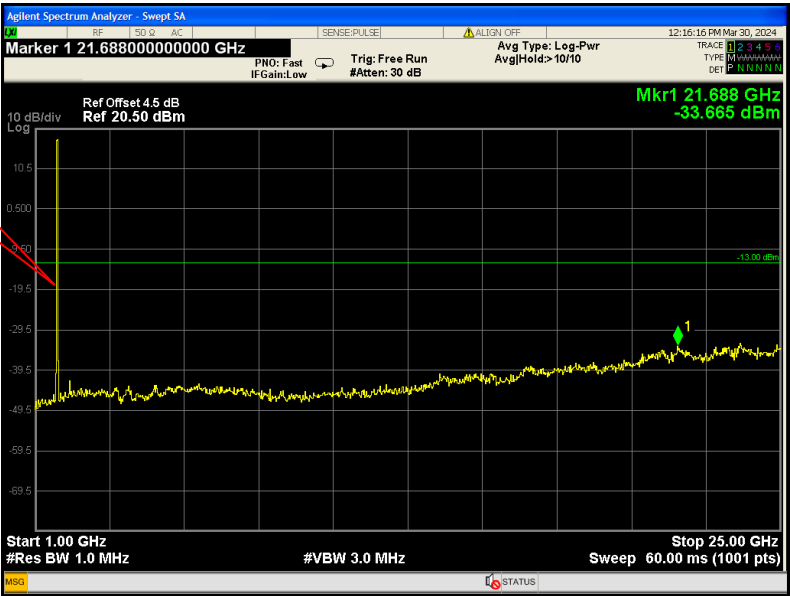
WCDMA band IV - channel 1413 (HSDPA)

30MHz-1GHz



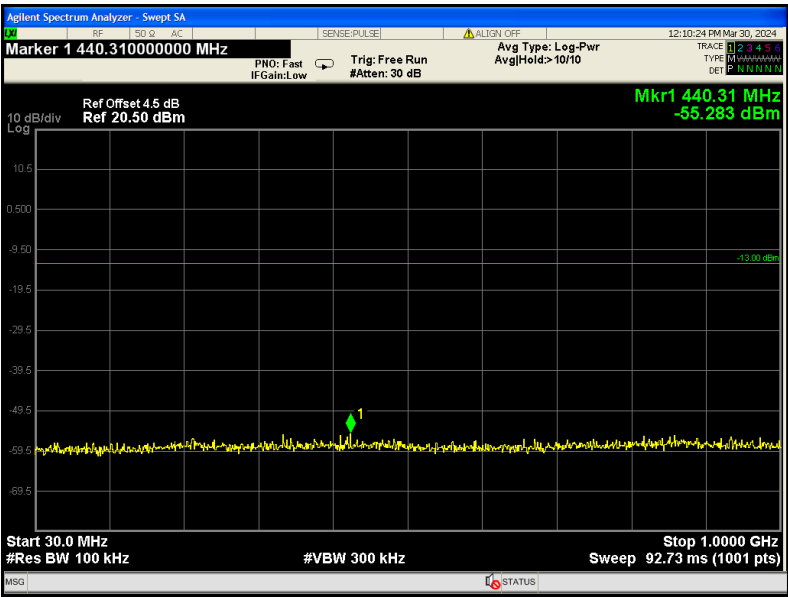
Above 1GHz

Fundamental



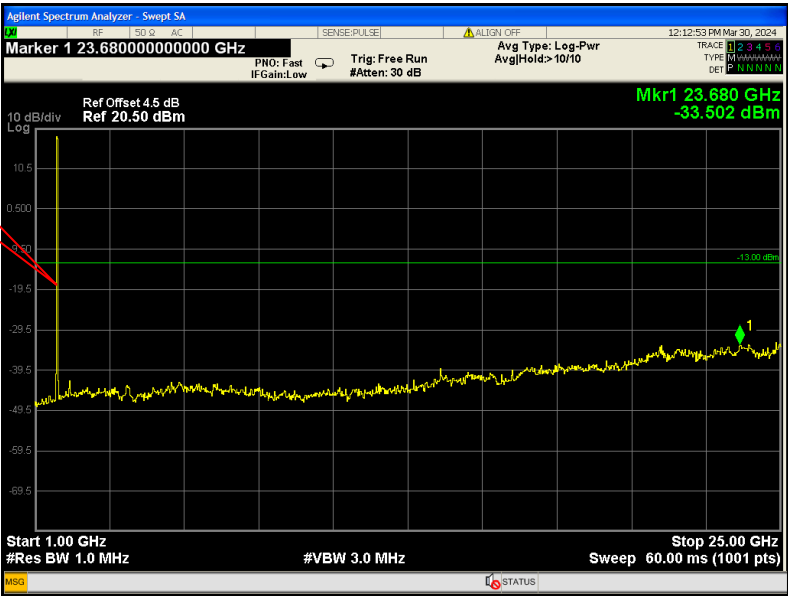
WCDMA band IV - channel 1413 (HSUPA)

30MHz-1GHz



Above 1GHz

Fundamental



## 11 Spurious Radiated Emissions

Test Requirement: FCC Part 2.1053, 22.917, 24.238, 27.53(h)

Test Method: TIA/EIA-603-E:2016

ANSI C63.26:2015

Test Mode: TX transmitting

### 11.1 EUT Operation

Operating Environment :

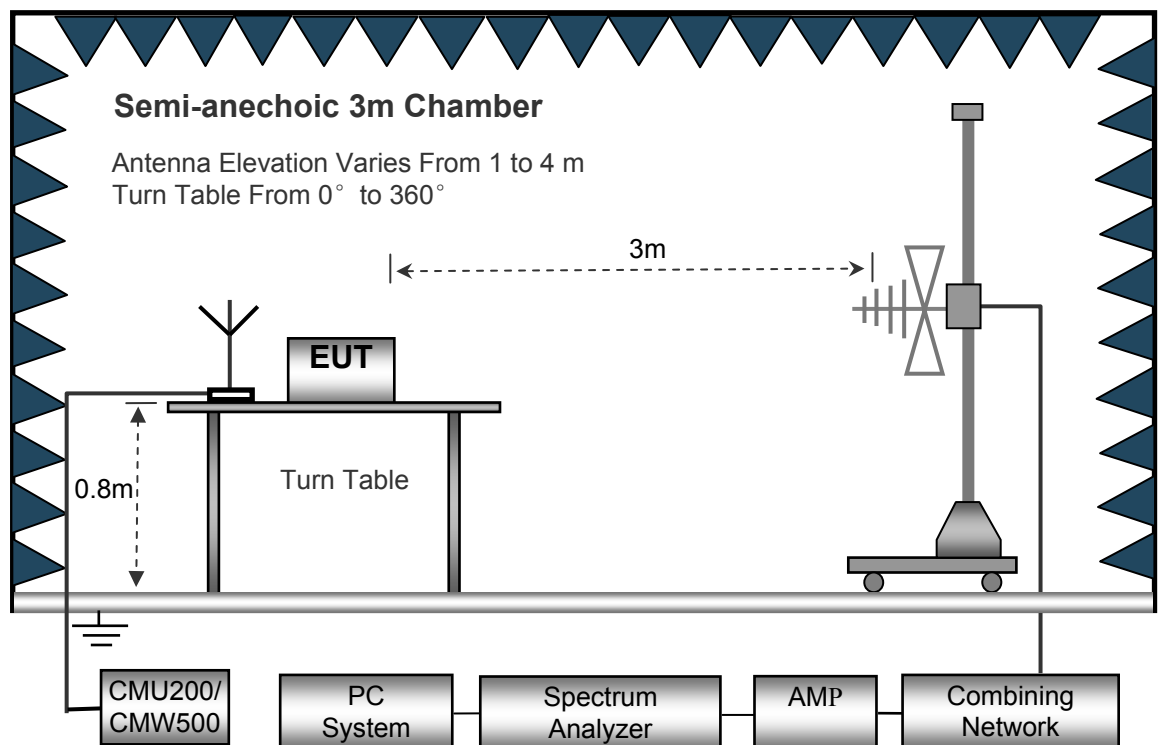
Temperature: 23.8 °C

Humidity: 56.3 % RH

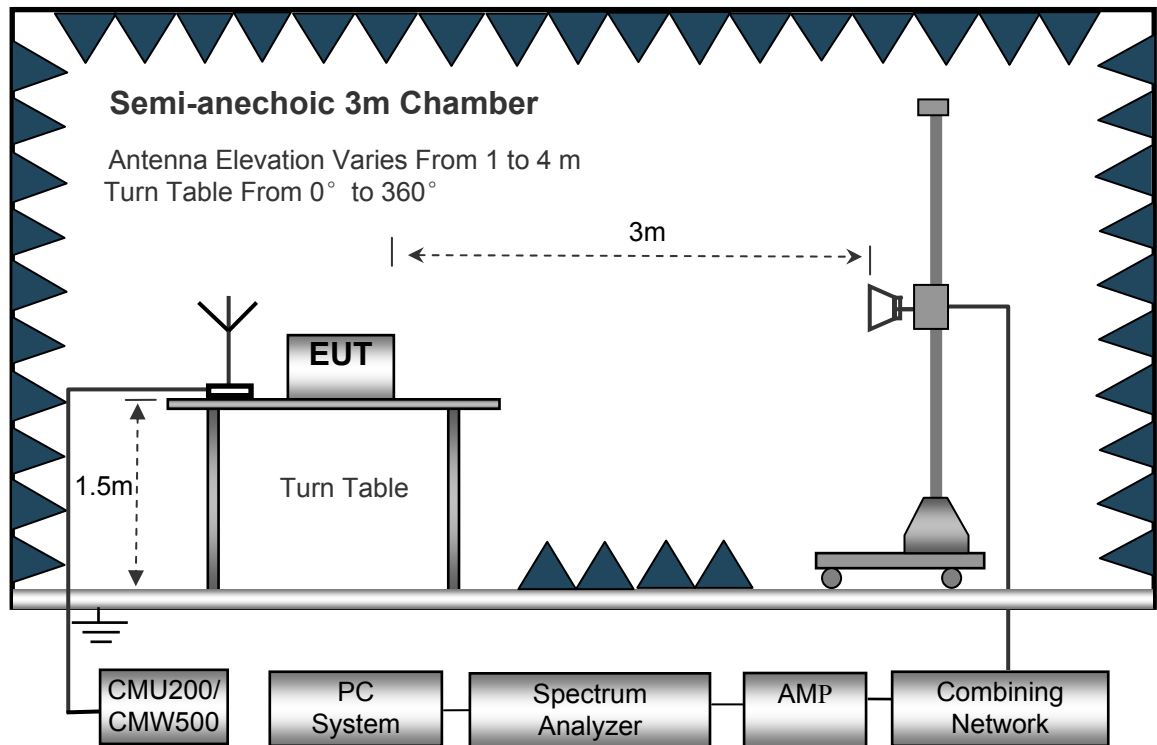
Atmospheric Pressure: 101.2kPa

### 11.2 Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the test setup for emission measurement from 30 MHz to 1 GHz.



The test setup for emission measurement above 1 GHz.



11.3 Spectrum Analyzer Setup

- 30MHz ~ 1GHz
- Sweep Speed ..... Auto
  - Detector ..... PK
  - Resolution Bandwidth..... 100kHz
  - Video Bandwidth..... 300kHz
- Above 1GHz
- Sweep Speed ..... Auto
  - Detector ..... PK
  - Resolution Bandwidth..... 1MHz
  - Video Bandwidth..... 3MHz
  - Detector ..... Ave.
  - Resolution Bandwidth..... 1MHz
  - Video Bandwidth..... 10Hz

## 11.4 Test Procedure

1. The EUT is placed on a turntable, which is 0.8m for below 1GHz and 1.5m for above 1GHz above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions. The spectrum was investigated from 30MHz up to the tenth harmonic of the highest fundamental frequency.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. The radiation measurements are tested under 3-axes(X,Y,Z) position(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand), After pre-test, It was found that the worse radiation emission was get at the Z position. So the data shown was the Z position only.
7. Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.  
  
Spurious emissions in dB =  $10 \lg (\text{TXpwr in Watts}/0.001)$  – the absolute level  
Spurious attenuation limit in dB =  $43 + 10 \lg (\text{power out in Watts})$
8. Repeat above procedures until the measurements for all frequencies are completed.

## 11.5 Summary of Test Results

For 26MHz~30MHz,

The measurements were more than 20 dB below the limit and not reported.

Remark: Test performed from 30MHz to 10<sup>th</sup> harmonics with low/middle/high channels, only the worst data were recorded.

Cellular Band (Part 22H)

| Frequency                 | Receiver Reading | Turn table Angle | RX Antenna |       | Substituted |       |              | Absolute Level | Result |        |
|---------------------------|------------------|------------------|------------|-------|-------------|-------|--------------|----------------|--------|--------|
|                           |                  |                  | Height     | Polar | SG Level    | Cable | Antenna Gain |                | Limit  | Margin |
| (MHz)                     | (dBμV)           | Degree           | (m)        | (H/V) | (dBm)       | (dB)  | (dB)         | (dBm)          | (dBm)  | (dB)   |
| WCDMA Band V Channel 4233 |                  |                  |            |       |             |       |              |                |        |        |
| 207.65                    | 42.67            | 63               | 1.6        | H     | -67.84      | 0.15  | 0.00         | -67.99         | -13.00 | -54.99 |
| 207.65                    | 49.22            | 113              | 1.8        | V     | -58.37      | 0.15  | 0.00         | -58.52         | -13.00 | -45.52 |
| 1693.20                   | 59.74            | 295              | 1.1        | H     | -54.23      | 0.30  | 9.40         | -45.13         | -13.00 | -32.13 |
| 1693.20                   | 49.07            | 97               | 1.2        | V     | -64.46      | 0.30  | 9.40         | -55.36         | -13.00 | -42.36 |
| 2539.80                   | 49.50            | 125              | 2.2        | H     | -64.50      | 0.43  | 10.60        | -54.33         | -13.00 | -41.33 |
| 2539.80                   | 39.72            | 340              | 2.1        | V     | -70.56      | 0.43  | 10.60        | -60.39         | -13.00 | -47.39 |



## Cellular Band (Part 24E/27L)

| Frequency                  | Receiver Reading | Turn table Angle | RX Antenna |       | Substituted |       |              | Absolute Level | Result |        |
|----------------------------|------------------|------------------|------------|-------|-------------|-------|--------------|----------------|--------|--------|
|                            |                  |                  | Height     | Polar | SG Level    | Cable | Antenna Gain |                | Limit  | Margin |
| (MHz)                      | (dBμV)           | Degree           | (m)        | (H/V) | (dBm)       | (dB)  | (dB)         | (dBm)          | (dBm)  | (dB)   |
| WCDMA Band II Channel 9400 |                  |                  |            |       |             |       |              |                |        |        |
| 207.65                     | 48.44            | 259              | 1.5        | H     | -62.07      | 0.15  | 0.00         | -62.22         | -13.00 | -49.22 |
| 207.65                     | 40.27            | 66               | 2.0        | V     | -67.32      | 0.15  | 0.00         | -67.47         | -13.00 | -54.47 |
| 3760.00                    | 59.13            | 237              | 1.9        | H     | -52.41      | 2.37  | 12.50        | -42.28         | -13.00 | -29.28 |
| 3760.00                    | 53.61            | 301              | 1.8        | V     | -56.20      | 2.37  | 12.50        | -46.07         | -13.00 | -33.07 |
| 5640.00                    | 46.57            | 316              | 1.9        | H     | -63.04      | 2.86  | 12.90        | -53.00         | -13.00 | -40.00 |
| 5640.00                    | 37.83            | 219              | 1.2        | V     | -71.05      | 2.86  | 12.90        | -61.01         | -13.00 | -48.01 |
| WCDMA Band IV Channel 1313 |                  |                  |            |       |             |       |              |                |        |        |
| 207.65                     | 50.04            | 275              | 1.8        | H     | -60.47      | 0.15  | 0.00         | -60.62         | -13.00 | -47.62 |
| 207.65                     | 36.96            | 48               | 2.0        | V     | -70.63      | 0.15  | 0.00         | -70.78         | -13.00 | -57.78 |
| 3424.80                    | 51.39            | 197              | 1.1        | H     | -60.15      | 2.37  | 12.50        | -50.02         | -13.00 | -37.02 |
| 3424.80                    | 45.57            | 100              | 2.2        | V     | -64.24      | 2.37  | 12.50        | -54.11         | -13.00 | -41.11 |
| 5137.20                    | 38.85            | 196              | 1.7        | H     | -70.76      | 2.86  | 12.90        | -60.72         | -13.00 | -47.72 |
| 5137.20                    | 32.25            | 274              | 1.2        | V     | -76.63      | 2.86  | 12.90        | -66.59         | -13.00 | -53.59 |

Note: 1) Absolute Level = SG Level - Cable loss + Antenna Gain

2) Margin = Absolute Level - Limit

## 12 Band Edge Measurement

|                   |                                                 |
|-------------------|-------------------------------------------------|
| Test Requirement: | FCC Part 2.1051, 22.917(a), 24.238(a), 27.53(h) |
| Test Method:      | TIA/EIA-603-E:2016<br>ANSI C63.26:2015          |
| Test Mode:        | TX transmitting                                 |

### 12.1 EUT Operation

Operating Environment :

|                       |           |
|-----------------------|-----------|
| Temperature:          | 24.2 °C   |
| Humidity:             | 53.9 % RH |
| Atmospheric Pressure: | 101.4kPa  |

### 12.2 Test Procedure

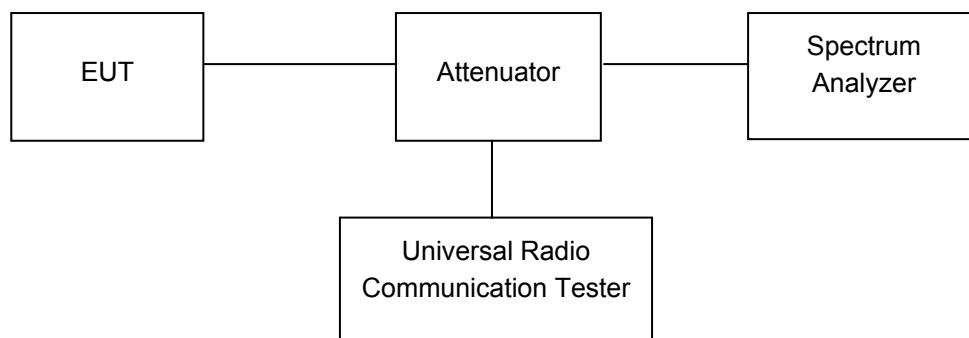
The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.

According to FCC Part 22.917(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB.

According to FCC Part 24.238(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB.

According to FCC Part 27.53(h), Except as otherwise specified below, for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least  $43 + 10 \log_{10}(P)$  dB.

The center of the spectrum analyzer was set to block edge frequency

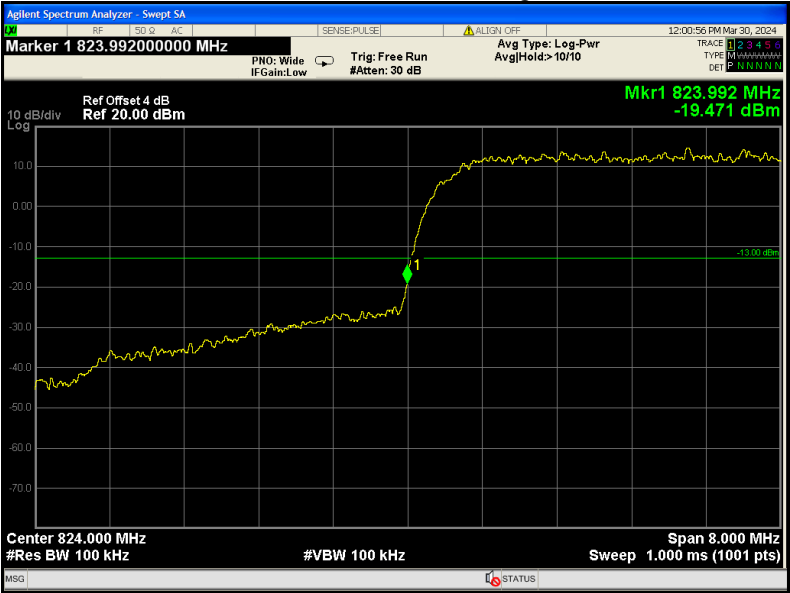


12.3 Test Result

Test plots

Cellular Band (Part 22H)

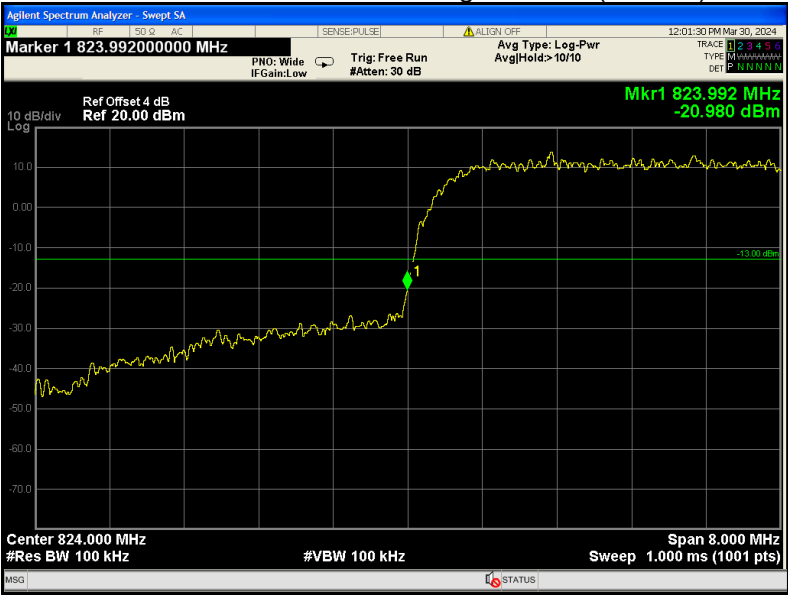
WCDMA band V band edge-left side



WCDMA band V band edge-right side



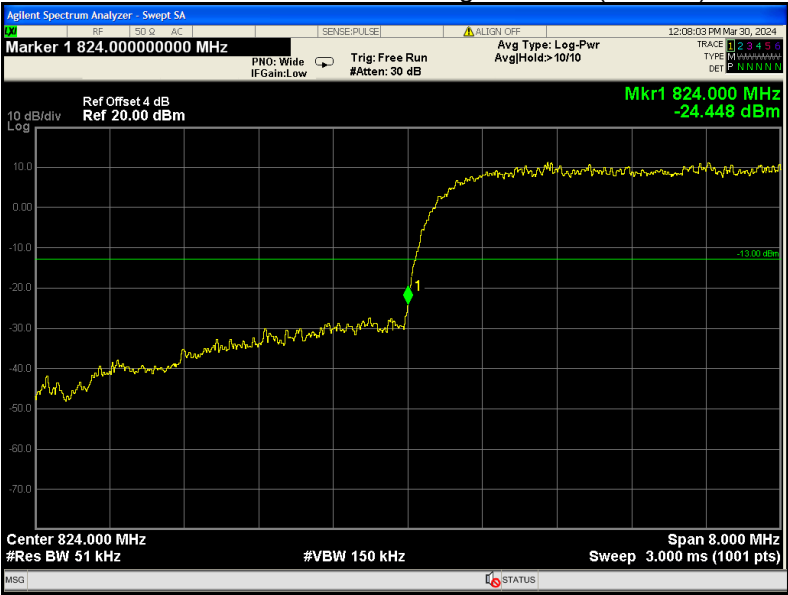
WCDMA band V band edge-left side (HSDPA)



WCDMA band V band edge-right side (HSDPA)



WCDMA band V band edge-left side (HSUPA)

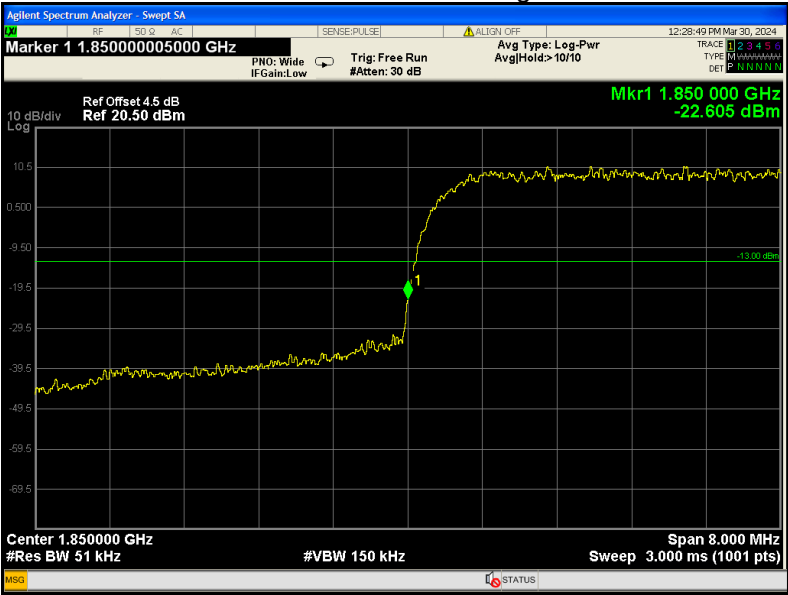


WCDMA band V band edge-right side (HSUPA)

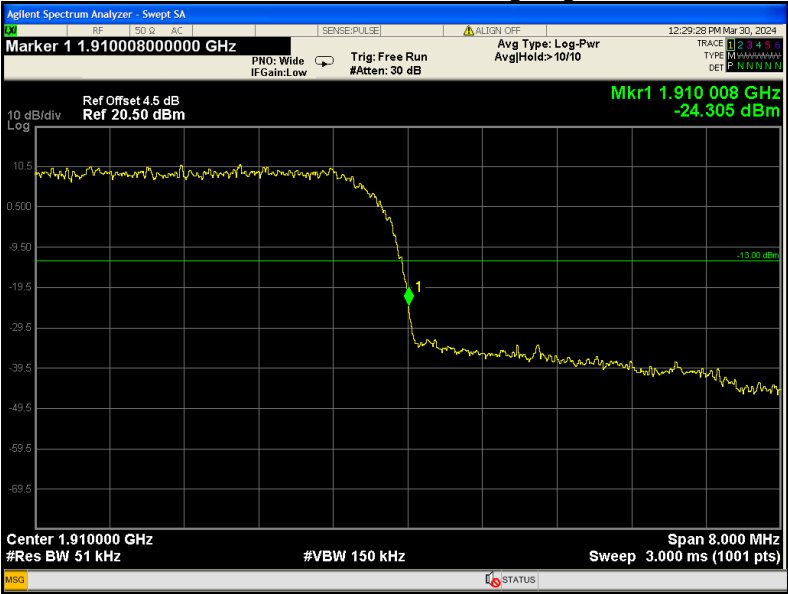


Cellular Band (Part 24E)

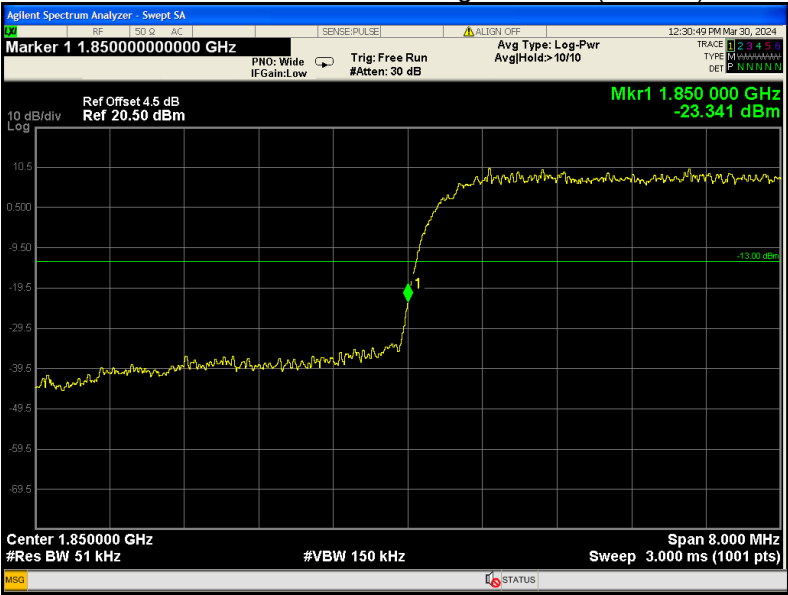
WCDMA band II band edge-left side



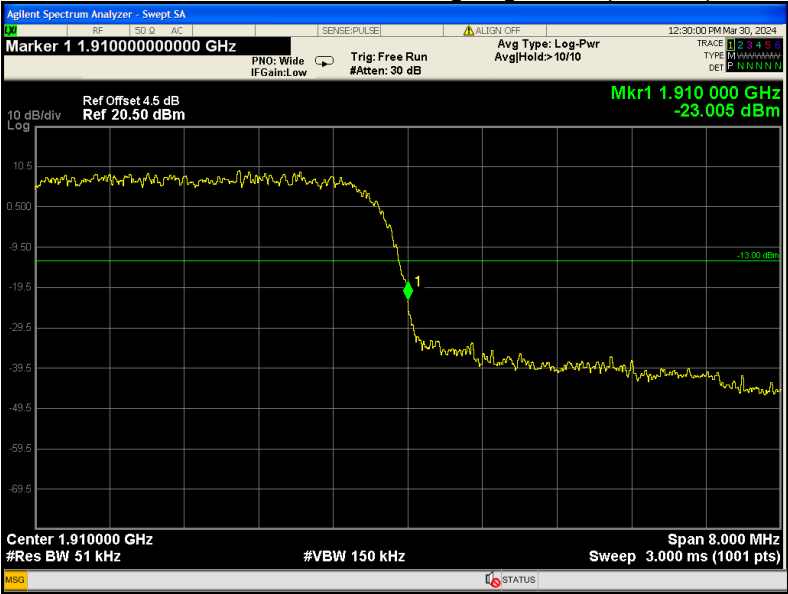
WCDMA band II band edge-right side



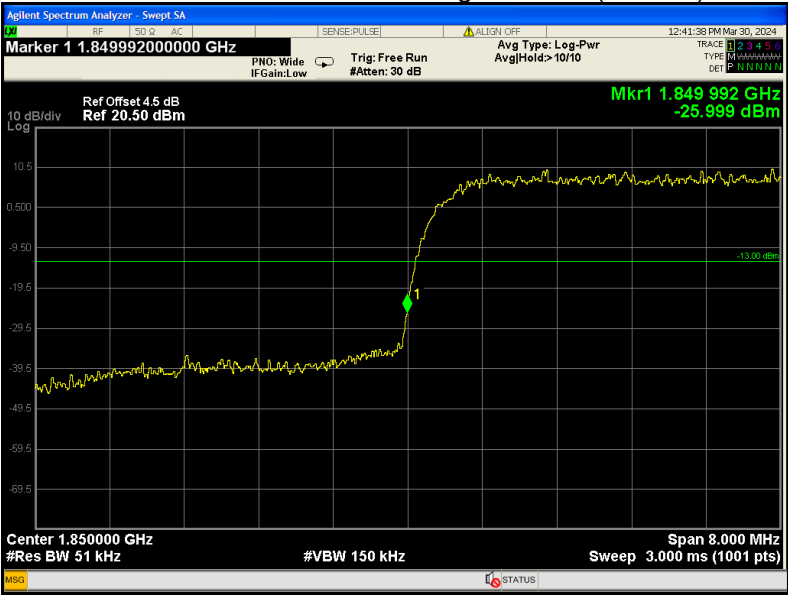
WCDMA band II band edge-left side (HSDPA)



WCDMA band II band edge-right side (HSDPA)



WCDMA band II band edge-left side (HSUPA)



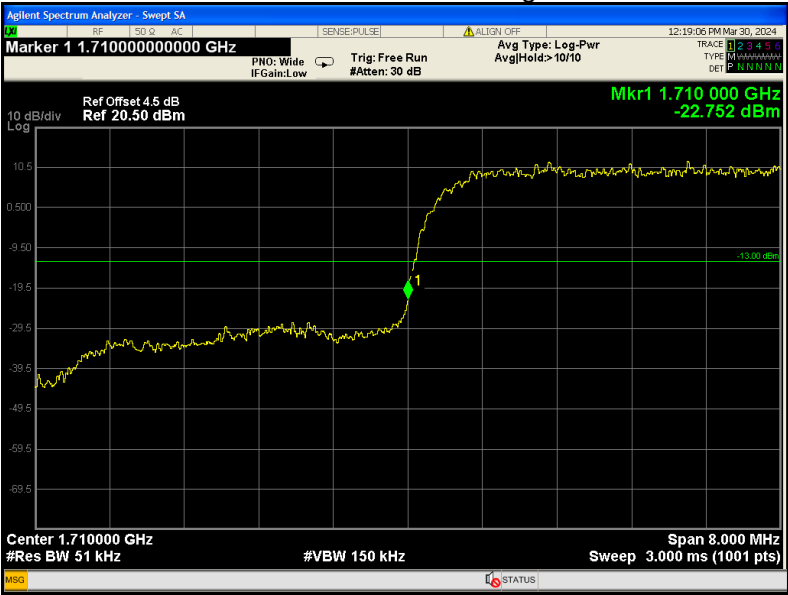
WCDMA band II band edge-right side (HSUPA)



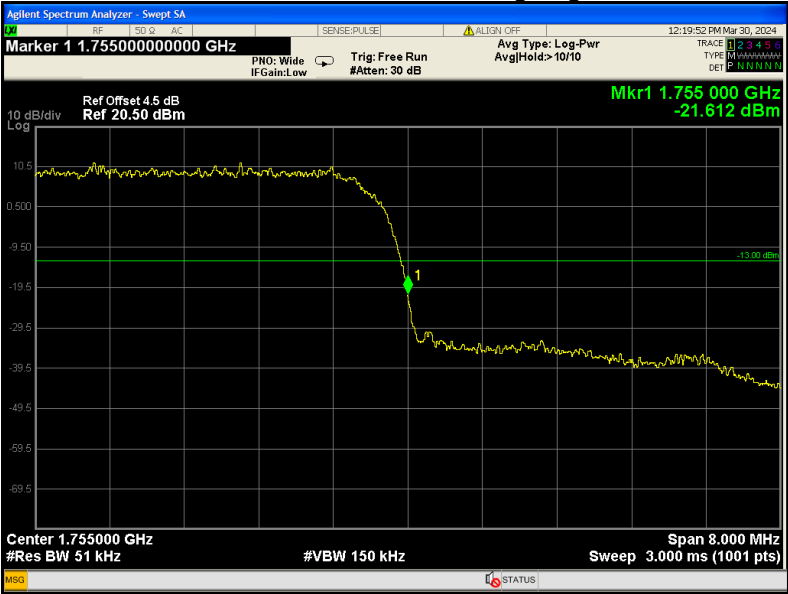


Part 27L

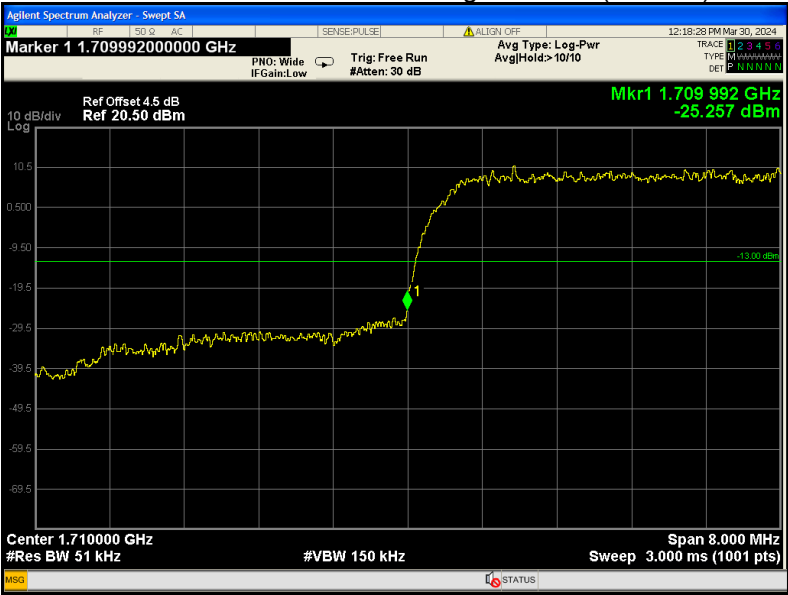
WCDMA band IV band edge-left side



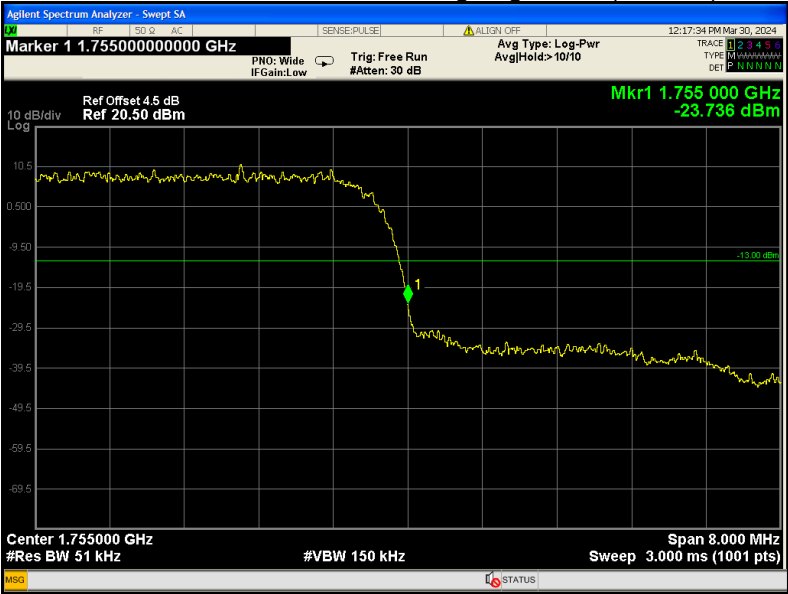
WCDMA band IV band edge-right side



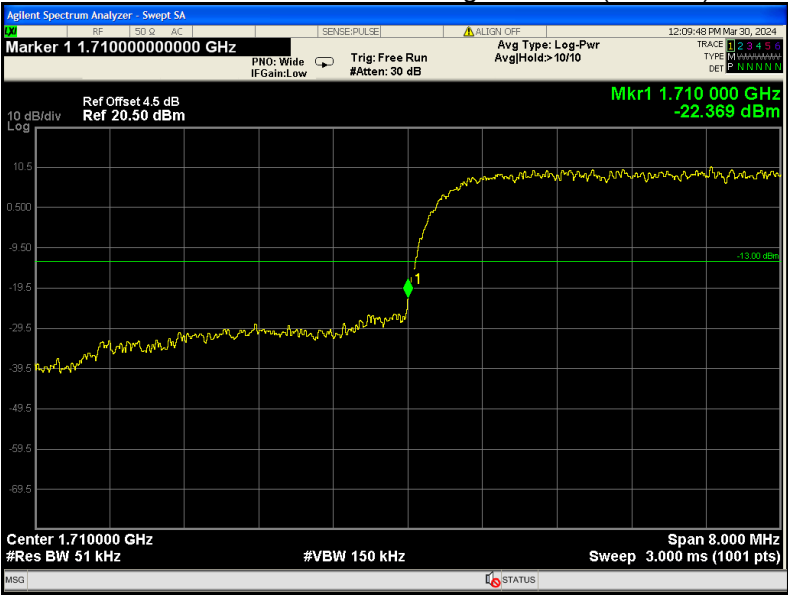
WCDMA band IV band edge-left side (HSDPA)



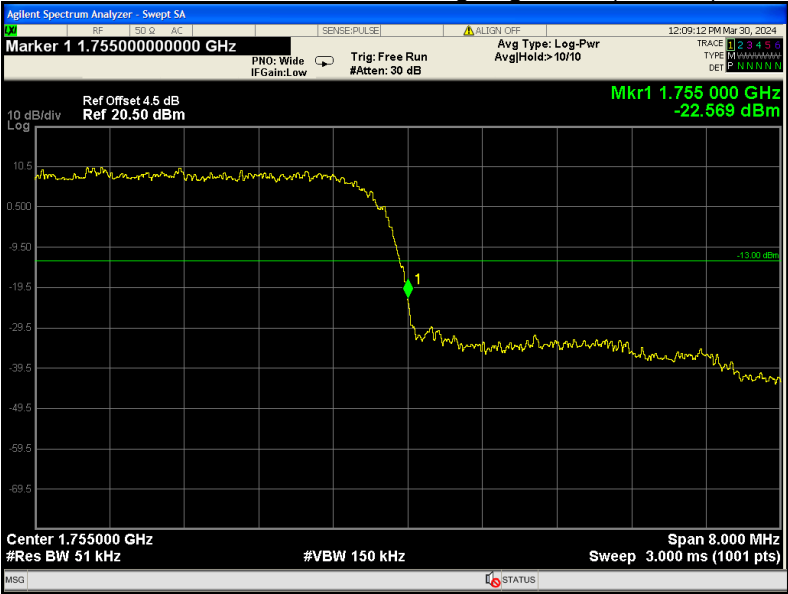
WCDMA band IV band edge-right side (HSDPA)



WCDMA band IV band edge-left side (HSUPA)



WCDMA band IV band edge-right side (HSUPA)



## 13 Frequency Stability

|                   |                                                |
|-------------------|------------------------------------------------|
| Test Requirement: | FCC Part 2.1055, 22.355, 24.235, 27.5(h),27.54 |
| Test Method:      | TIA/EIA-603-E:2016<br>ANSI C63.26:2015         |
| Test Mode:        | TX transmitting                                |

### 13.1 EUT Operation

Operating Environment :

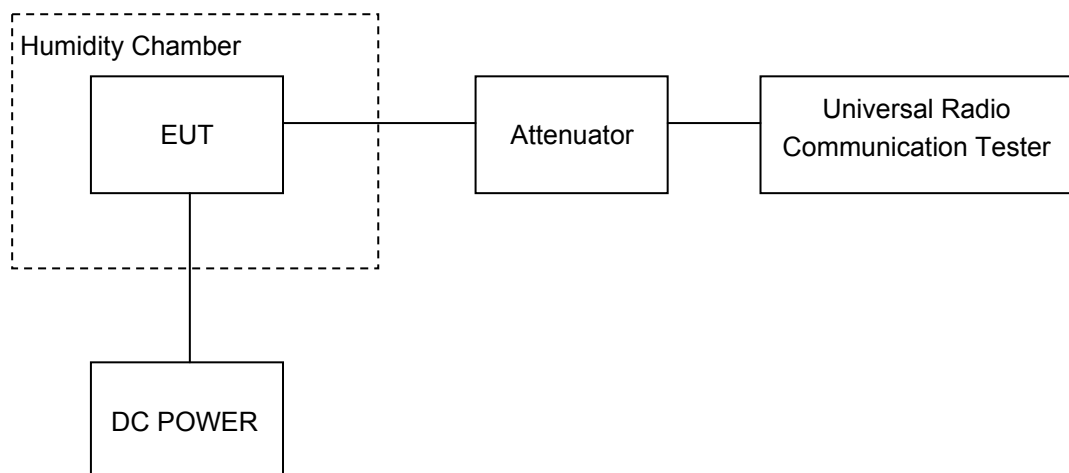
|                       |           |
|-----------------------|-----------|
| Temperature:          | 24.6 °C   |
| Humidity:             | 55.1 % RH |
| Atmospheric Pressure: | 101.2kPa  |

### 13.2 Test Procedure

Frequency Stability vs. Temperature: The equipment under test was connected to an external DC power supply and the RF output was connected to communication test set via feed-through attenuators. The EUT was placed inside the temperature chamber. The DC leads and RF output cable exited the chamber through an opening made for the purpose.

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the communication test set.

Frequency Stability vs. Voltage: For hand carried, battery powered equipment; reduce primary supply voltage to the battery operating end point which shall be specified by the manufacturer.



### 13.3 Test Result

Cellular Band (Part 22H)

| WCDMA Band V Test Frequency:836.6MHz |                       |                         |                          |                |
|--------------------------------------|-----------------------|-------------------------|--------------------------|----------------|
| Temperature<br>(°C)                  | Power Supply<br>(VDC) | Frequency Error<br>(Hz) | Frequency Error<br>(ppm) | Limit<br>(ppm) |
| 50                                   | 3.7                   | -5                      | -0.0060                  | 2.5            |
| 40                                   |                       | 10                      | 0.0120                   | 2.5            |
| 30                                   |                       | 2                       | 0.0024                   | 2.5            |
| 20                                   |                       | 3                       | 0.0036                   | 2.5            |
| 10                                   |                       | 7                       | 0.0084                   | 2.5            |
| 0                                    |                       | -6                      | -0.0072                  | 2.5            |
| -10                                  |                       | 4                       | 0.0048                   | 2.5            |
| -20                                  |                       | -5                      | -0.0060                  | 2.5            |
| -30                                  |                       | -5                      | -0.0060                  | 2.5            |
| 20                                   | 3.3                   | 9                       | 0.0108                   | 2.5            |
| 20                                   | 4.2                   | 9                       | 0.0108                   | 2.5            |

| WCDMA Band V Test Frequency:836.6MHz(HSDPA) |                    |                      |                       |             |
|---------------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                            | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                          | 3.7                | 7                    | 0.0084                | 2.5         |
| 40                                          |                    | 1                    | 0.0012                | 2.5         |
| 30                                          |                    | -2                   | -0.0024               | 2.5         |
| 20                                          |                    | 5                    | 0.0060                | 2.5         |
| 10                                          |                    | -2                   | -0.0024               | 2.5         |
| 0                                           |                    | 10                   | 0.0120                | 2.5         |
| -10                                         |                    | 7                    | 0.0084                | 2.5         |
| -20                                         |                    | -2                   | -0.0024               | 2.5         |
| -30                                         |                    | 12                   | 0.0143                | 2.5         |
| 20                                          | 3.3                | 0                    | 0.0000                | 2.5         |
| 20                                          | 4.2                | 14                   | 0.0167                | 2.5         |

| WCDMA Band V Test Frequency:836.6MHz(HSUPA) |                    |                      |                       |             |
|---------------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                            | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                          | 3.7                | 3                    | 0.0036                | 2.5         |
| 40                                          |                    | 11                   | 0.0131                | 2.5         |
| 30                                          |                    | 1                    | 0.0012                | 2.5         |
| 20                                          |                    | 4                    | 0.0048                | 2.5         |
| 10                                          |                    | 3                    | 0.0036                | 2.5         |
| 0                                           |                    | 11                   | 0.0131                | 2.5         |
| -10                                         |                    | -3                   | -0.0036               | 2.5         |
| -20                                         |                    | -2                   | -0.0024               | 2.5         |
| -30                                         |                    | 8                    | 0.0096                | 2.5         |
| 20                                          | 3.3                | -1                   | -0.0012               | 2.5         |
| 20                                          | 4.2                | 5                    | 0.0060                | 2.5         |

## PCS Band (Part 24E)

| WCDMA Band II Test Frequency:1880.0MHz |                    |                      |                       |             |
|----------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                       | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                     | 3.7                | 7                    | 0.0037                | 2.5         |
| 40                                     |                    | 13                   | 0.0069                | 2.5         |
| 30                                     |                    | 13                   | 0.0069                | 2.5         |
| 20                                     |                    | 6                    | 0.0032                | 2.5         |
| 10                                     |                    | 12                   | 0.0064                | 2.5         |
| 0                                      |                    | 1                    | 0.0005                | 2.5         |
| -10                                    |                    | 11                   | 0.0059                | 2.5         |
| -20                                    |                    | 3                    | 0.0016                | 2.5         |
| -30                                    |                    | 9                    | 0.0048                | 2.5         |
| 20                                     | 3.3                | 11                   | 0.0059                | 2.5         |
| 20                                     | 4.2                | -2                   | -0.0011               | 2.5         |

| WCDMA Band II Test Frequency:1880.0MHz(HSDPA) |                    |                      |                       |             |
|-----------------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                              | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                            | 3.7                | 1                    | 0.0005                | 2.5         |
| 40                                            |                    | 7                    | 0.0037                | 2.5         |
| 30                                            |                    | 13                   | 0.0069                | 2.5         |
| 20                                            |                    | 4                    | 0.0021                | 2.5         |
| 10                                            |                    | 2                    | 0.0011                | 2.5         |
| 0                                             |                    | 4                    | 0.0021                | 2.5         |
| -10                                           |                    | -2                   | -0.0011               | 2.5         |
| -20                                           |                    | 0                    | 0.0000                | 2.5         |
| -30                                           |                    | 7                    | 0.0037                | 2.5         |
| 20                                            | 3.3                | 9                    | 0.0048                | 2.5         |
| 20                                            | 4.2                | 11                   | 0.0059                | 2.5         |

| WCDMA Band II Test Frequency:1880.0MHz(HSUPA) |                    |                      |                       |             |
|-----------------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                              | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                            | 3.7                | 3                    | 0.0016                | 2.5         |
| 40                                            |                    | 9                    | 0.0048                | 2.5         |
| 30                                            |                    | 16                   | 0.0085                | 2.5         |
| 20                                            |                    | 7                    | 0.0037                | 2.5         |
| 10                                            |                    | 8                    | 0.0043                | 2.5         |
| 0                                             |                    | 4                    | 0.0021                | 2.5         |
| -10                                           |                    | 11                   | 0.0059                | 2.5         |
| -20                                           |                    | 7                    | 0.0037                | 2.5         |
| -30                                           |                    | 4                    | 0.0021                | 2.5         |
| 20                                            | 3.3                | 1                    | 0.0005                | 2.5         |
| 20                                            | 4.2                | 3                    | 0.0016                | 2.5         |



## Part 27L

| WCDMA Band IV Test Frequency:1732.6MHz |                    |                      |                       |             |
|----------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                       | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                     | 3.7                | 10                   | 0.0058                | 2.5         |
| 40                                     |                    | 8                    | 0.0046                | 2.5         |
| 30                                     |                    | 1                    | 0.0006                | 2.5         |
| 20                                     |                    | 6                    | 0.0035                | 2.5         |
| 10                                     |                    | 0                    | 0.0000                | 2.5         |
| 0                                      |                    | 7                    | 0.0040                | 2.5         |
| -10                                    |                    | 13                   | 0.0075                | 2.5         |
| -20                                    |                    | 5                    | 0.0029                | 2.5         |
| -30                                    |                    | 3                    | 0.0017                | 2.5         |
| 20                                     | 3.3                | 13                   | 0.0075                | 2.5         |
| 20                                     | 4.2                | 6                    | 0.0035                | 2.5         |

| WCDMA Band IV Test Frequency:1732.6MHz (HSDPA) |                    |                      |                       |             |
|------------------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                               | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                             | 3.7                | 4                    | 0.0023                | 2.5         |
| 40                                             |                    | 12                   | 0.0069                | 2.5         |
| 30                                             |                    | 0                    | 0.0000                | 2.5         |
| 20                                             |                    | 7                    | 0.0040                | 2.5         |
| 10                                             |                    | 1                    | 0.0006                | 2.5         |
| 0                                              |                    | 12                   | 0.0069                | 2.5         |
| -10                                            |                    | 3                    | 0.0017                | 2.5         |
| -20                                            |                    | 8                    | 0.0046                | 2.5         |
| -30                                            |                    | 4                    | 0.0023                | 2.5         |
| 20                                             | 3.3                | 16                   | 0.0092                | 2.5         |
| 20                                             | 4.2                | 12                   | 0.0069                | 2.5         |

| WCDMA Band IV Test Frequency:1732.6MHz (HSUPA) |                    |                      |                       |             |
|------------------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                               | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                             | 3.7                | 7                    | 0.0040                | 2.5         |
| 40                                             |                    | -3                   | -0.0017               | 2.5         |
| 30                                             |                    | 12                   | 0.0069                | 2.5         |
| 20                                             |                    | 5                    | 0.0029                | 2.5         |
| 10                                             |                    | 2                    | 0.0012                | 2.5         |
| 0                                              |                    | 6                    | 0.0035                | 2.5         |
| -10                                            |                    | 2                    | 0.0012                | 2.5         |
| -20                                            |                    | 6                    | 0.0035                | 2.5         |
| -30                                            |                    | 2                    | 0.0012                | 2.5         |
| 20                                             | 3.3                | 5                    | 0.0029                | 2.5         |
| 20                                             | 4.2                | 1                    | 0.0006                | 2.5         |

## **14 RF Exposure**

Remark: refer to MPE test report: WTD24D01019176W005.

## **15 Photographs of test setup and EUT.**

Note: Please refer to appendix: Appendix- MF3-Photos.

===== End of Report =====