



# RF TEST REPORT

**Report No.:** SET2023-02193

**Product Name:** PoC Radio

**Model No.:** iTALK-310, iTALK-300

**FCC ID:** 2A2II-ITALK310

**Applicant:** iTALKPTT Corporation

**Address:** 6905 S 1300 E #450, Cottonwood Heights, UT 84047-1817, USA

**Dates of Testing:** 02/14/2023 - 03/22/2023

**Issued by:** CCIC Southern Testing Co., Ltd.

**Lab Location:** Electronic Testing Building, No. 43 Shahe Road, Xili Street,  
Nanshan District, Shenzhen, Guangdong, China.

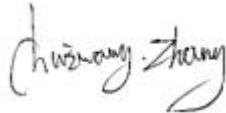
**Tel:** 86 755 26627338      **Fax:** 86 755 26627238

This test report consists of 46 pages in total. It may be duplicated completely for legal use with the approval of the applicant. It should not be reproduced except in full, without the written approval of our laboratory. The client should not use it to claim product endorsement by CCIC-SET. The test results in the report only apply to the tested sample. The test report shall be invalid without all the signatures of testing engineers, reviewer and approver. Any objections must be raised to CCIC-SET within 15 days since the date when the report is received. It will not be taken into consideration beyond this limit.



## Test Report

**Product**.....: PoC Radio  
**Brand Name**.....: iTALKPTT  
**Trade Name** .....: iTALKPTT  
**Applicant**.....: iTALKPTT Corporation  
**Applicant Address**.....: 6905 S 1300 E #450, Cottonwood Heights, UT  
84047-1817, USA  
**Manufacturer**.....: Shenzhen VTU Systems Co., Ltd.  
**Manufacturer Address**.....: 6/F, Building A, Ganghongji High-tech Intelligent  
Industrial Park, No. 1008, Songbai Road, Nanshan  
District, Shenzhen 518055, P.R. China  
**Test Standards**.....: 47 CFR Part 2/22/24/27  
**Test Result**.....: Pass

**Tested by** .....:  2023.03.23  
Chuiwang Zhang, Test Engineer

**Reviewed by**.....:  2023.03.23  
Chris You, Senior Engineer

**Approved by**.....:  2023.03.23  
Yang Fan, Manager

## Table of Contents

|                                                                          |           |
|--------------------------------------------------------------------------|-----------|
| <b>1. GENERAL INFORMATION .....</b>                                      | <b>5</b>  |
| 1.1. EUT Description .....                                               | 5         |
| 1.2. Maximum ERP/EIRP, Frequency Tolerance and Emission Designator ..... | 6         |
| 1.3. Test Standards and Results .....                                    | 7         |
| 1.4. Test Configuration of Equipment Under Test .....                    | 9         |
| 1.5. Measurement Results Explanation Example .....                       | 9         |
| 1.6. Laboratory Facilities .....                                         | 10        |
| 1.7. Test Environment Conditions .....                                   | 10        |
| <b>2. 47 CFR PART 2 REQUIREMENTS .....</b>                               | <b>11</b> |
| 2.1. Conducted Output Power and ERP/EIRP .....                           | 11        |
| 2.2. Peak-to-average power ratio (PAPR) .....                            | 15        |
| 2.3. 99% Occupied Bandwidth and 26dB Emission Bandwidth .....            | 21        |
| 2.4. Conducted Band Edge .....                                           | 27        |
| 2.5. Conducted Spurious Emission .....                                   | 31        |
| 2.6. Radiated Spurious Emission .....                                    | 35        |
| 2.7. Frequency Stability .....                                           | 41        |
| <b>3. LIST OF MEASURING EQUIPMENT .....</b>                              | <b>45</b> |
| <b>4. UNCERTAINTY OF EVALUATION .....</b>                                | <b>46</b> |



| Change History |            |                   |
|----------------|------------|-------------------|
| Issue          | Date       | Reason for change |
| 1.0            | 2023.03.23 | First edition     |
|                |            |                   |

## 1. GENERAL INFORMATION

### 1.1. EUT Description

|                                 |                                                                                                                                                           |                                                                                                     |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| Product Name                    | PoC Radio                                                                                                                                                 |                                                                                                     |
| Model No.                       | iTALK-310, iTALK-300                                                                                                                                      |                                                                                                     |
| Hardware Version                | IT330_MB_V1.0                                                                                                                                             |                                                                                                     |
| Software Version                | iTALK310_V1.0                                                                                                                                             |                                                                                                     |
| EUT supports Radios application | GSM/GPRS/EDGE/WCDMA/HSPA                                                                                                                                  |                                                                                                     |
| Frequency Range                 | GSM 850:                                                                                                                                                  | Tx: 824.2 - 848.8MHz (at intervals of 200kHz);<br>Rx: 869.2 - 893.8MHz (at intervals of 200kHz)     |
|                                 | PCS 1900:                                                                                                                                                 | Tx: 1850.2 - 1909.8MHz (at intervals of 200kHz);<br>Rx: 1930.2 - 1989.8MHz (at intervals of 200kHz) |
|                                 | WCDMA 850:                                                                                                                                                | Tx: 826.4 - 846.6MHz (at intervals of 200kHz);<br>Rx: 871.4 - 891.6MHz (at intervals of 200kHz)     |
|                                 | WCDMA 1700:                                                                                                                                               | Tx: 1712.4 - 1752.6MHz (at intervals of 200kHz);<br>Rx: 2112.4 - 2152.6MHz (at intervals of 200kHz) |
|                                 | WCDMA 1900:                                                                                                                                               | Tx: 1852.4 - 1907.6MHz (at intervals of 200kHz);<br>Rx: 1932.4 - 1987.6MHz (at intervals of 200kHz) |
| Maximum Output Power to Antenna | GSM: 850: 32.98dBm, EDGE 850: 27.33dBm<br>PCS: 1900: 30.87dBm, EDGE 1900: 26.32dBm<br>WCDMA 850: 23.38dBm<br>WCDMA 1700: 23.51dBm<br>WCDMA 1900: 23.65dBm |                                                                                                     |
| Type of Modulation              | GSM / GPRS: GMSK<br>EDGE: GMSK / 8PSK<br>WCDMA: QPSK(Uplink)<br>HSDPA: QPSK(Uplink)<br>HSUPA: QPSK(Uplink)                                                |                                                                                                     |
| Antenna Type                    | External Antenna                                                                                                                                          |                                                                                                     |
| Antenna gain                    | GSM 850/1900: 2.0dBi<br>WCDMA 850/1700/1900: 2.0dBi                                                                                                       |                                                                                                     |
| Power supply                    | Rechargeable Li-ion Polymer Battery DC3.8V/4000mAh                                                                                                        |                                                                                                     |

Note 1: Model No.: iTALK-310 and iTALK-300 are same in circuit board and specification, the same frequency range, antenna, modulation method, and RF output power. The difference is the Screen and keys, iTALK-310 with screen and keys, while iTALK-300 does not.

Note 2: Both the iTALK-310 and iTALK-300 were tested, iTALK-310 was found to have the worst test results, only the worst cases are recorded in this report.

## 1.2. Maximum ERP/EIRP, Frequency Tolerance and Emission Designator

| System    | Type of Modulation | Emission Designator | Frequency Tolerance (ppm) | Maximum ERP (W) |
|-----------|--------------------|---------------------|---------------------------|-----------------|
| GSM 850   | GMSK               | 246KGXW             | 0.0071                    | 1.919           |
| EDGE 850  | 8PSK               | 244KG7W             | 0.0069                    | 0.522           |
| WCDMA 850 | QPSK               | 4M16F9W             | 0.0067                    | 0.210           |

| System     | Type of Modulation | Emission Designator | Frequency Tolerance (ppm) | Maximum EIRP (W) |
|------------|--------------------|---------------------|---------------------------|------------------|
| PCS 1900   | GMSK               | 248KGXW             | 0.0068                    | 1.936            |
| EDGE 1900  | 8PSK               | 247KG7W             | 0.0066                    | 0.679            |
| WCDMA 1900 | QPSK               | 4M16F9W             | 0.0068                    | 0.376            |
| WCDMA 1700 | QPSK               | 4M18F9W             | 0.0072                    | 0.356            |

### 1.3. Test Standards and Results

The purpose of the report is to conduct testing according to the following FCC certification standards:

| No. | Identity                                                 | Document Title                                                                                                                             |
|-----|----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | 47 CFR Part 2                                            | Frequency Allocations and Radio Treaty Matters; General Rules and Regulations                                                              |
| 2   | 47 CFR Part 22                                           | Public Mobile Services                                                                                                                     |
| 3   | 47 CFR Part 24                                           | Personal Communications Services                                                                                                           |
| 4   | 47 CFR Part 27                                           | Miscellaneous Wireless Communications Services                                                                                             |
| 5   | KDB 971168 D01 Power Meas License Digital Systems v03r01 | Measurement Guidance For Certification of Licensed Digital Transmitters                                                                    |
| 6   | KDB 412172 D01 Determining ERP and EIRP v01r01           | Guidelines for Determining the Effective Radiated Power (ERP) and Equivalent Isotropic Radiated Power (EIRP) of an RF Transmitting Systems |
| 7   | ANSI/TIA-603-E-2016                                      | Land Mobile FM or PM Communications Equipment Measurement and Performance Standards                                                        |
| 8   | ANSI C63.26-2015                                         | American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services                                          |

Test detailed items/section required by FCC rules and results are as below:

| No. | FCC Rule                              | Description                                         | Limit                               | Result |
|-----|---------------------------------------|-----------------------------------------------------|-------------------------------------|--------|
| 1   | 2.1046                                | Conducted Output Power                              | Reporting Only                      | PASS   |
| 2   | 22.913(a)(5)                          | Effective Radiated Power (GSM850/W850)              | ERP < 7Watts                        | PASS   |
|     | 24.232 (c)                            | Equivalent Isotropic Radiated Power (GSM1900/W1900) | EIRP < 2Watts                       | PASS   |
|     | 27.50(d)(4)                           | Equivalent Isotropic Radiated Power(W1700)          | EIRP < 1Watts                       | PASS   |
| 3   | 22.913(d)<br>24.232(d)<br>27.50(d)(5) | Peak to Average Ratio                               | < 13dBm                             | PASS   |
| 4   | 2.1049                                | Occupied Bandwidth                                  | Reporting Only                      | PASS   |
| 5   | 2.1055<br>22.355                      | Frequency Stability (GSM850/W850)                   | < ±2.5ppm                           | PASS   |
|     | 24.235<br>27.54                       | Frequency Stability (PCS1900/W1700/W1900)           | Within the Authorized Band          | PASS   |
| 6   | 2.1051<br>22.917<br>24.238<br>27.53   | Conducted Spurious Emission and Conducted Band Edge | < 43+10log <sub>10</sub> (P[Watts]) | PASS   |
| 7   | 2.1053<br>22.917<br>24.238<br>27.53   | Radiated Spurious Emissions                         | < 43+10log <sub>10</sub> (P[Watts]) | PASS   |

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

## 1.4. Test Configuration of Equipment Under Test

Antenna port conducted and radiated test items listed below are performed according to KDB 971168 D01 Power Meas License Digital Systems v03r01 with maximum output power.

Radiated measurements are performed by rotating the EUT in three different orthogonal test planes to find the maximum emission.

Radiated emissions were investigated as following frequency range:

1. 30 MHz to 9000 MHz for GSM850 and WCDMA Band V.
2. 30 MHz to 20000 MHz for PCS1900 and WCDMA Band II.
3. 30 MHz to 18000 MHz for WCDMA Band IV.

All modes and data rates and positions were investigated.

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

| Test Modes    |                     |                     |
|---------------|---------------------|---------------------|
| Band          | Radiated TCs        | Conducted TCs       |
| GSM 850       | GSM Link, EDGE Link | GSM Link, EDGE Link |
| PCS 1900      | GSM Link, EDGE Link | GSM Link, EDGE Link |
| WCDMA Band V  | RMC 12.2kbps Link   | RMC 12.2kbps Link   |
| WCDMA Band II | RMC 12.2kbps Link   | RMC 12.2kbps Link   |
| WCDMA Band IV | RMC 12.2kbps Link   | RMC 12.2kbps Link   |

Note: The maximum power levels are chosen to test as the worst case configuration as follows:

- GSM mode for GMSK modulation,
- EDGE multi-slot class 8 mode for 8PSK modulation,
- RMC 12.2kbps mode for WCDMA band V,
- RMC 12.2kbps mode for WCDMA band II,
- RMC 12.2kbps mode for WCDMA band IV, only these modes were used for all tests.

## 1.5. Measurement Results Explanation Example

### For all conduction test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

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

Offset = RF cable loss + Power Splitter + attenuator factor..

Following shows an offset computation example with cable loss 1dB, 3dB Power Splitter, 10dB attenuator.

Example: Offset (dB) = RF cable loss(dB) + Power Splitter(dB) + attenuator factor(dB).  

$$= 1 + 3 + 10 = 14 \text{ (dB)}$$

## 1.6. Laboratory Facilities

### **FCC-Registration No.: 406086**

CCIC Southern Testing 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. Designation Number: CN1283, valid time is until April 19th, 2023.

### **ISED Registration: 11185A-1**

CCIC Southern Testing Co., Ltd. EMC Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 11185A-1 on Aug. 04, 2016, valid time is until Jun. 30th, 2023.

### **A2LA Code: 5721.01**

CCIC-SET is a third party testing organization accredited by A2LA according to ISO/IEC 17025. The accreditation certificate number is 5721.01.

## 1.7. Test Environment Conditions

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

|                             |              |
|-----------------------------|--------------|
| Temperature (°C):           | 15°C - 35°C  |
| Relative Humidity (%):      | 30% -60%     |
| Atmospheric Pressure (kPa): | 86KPa-106KPa |

## 2. 47 CFR Part 2 Requirements

### 2.1. Conducted Output Power and ERP/EIRP

#### 2.1.1. Requirement

According to FCC section 2.1046(a), for transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in FCC section 2.1033(c)(8).

The EIRP of mobile transmitters must not exceed 2 Watts for PCS1900 and W1900.

The EIRP of mobile transmitters must not exceed 1 Watts for W1700.

The ERP of mobile transmitters must not exceed 7 Watts for GSM850 and W850.

According to KDB 412172 D01 Determining ERP and EIRP v01r01.

$EIRP = P_T + G_T - L_C$ ,  $ERP = EIRP - 2.15$ , where

$P_T$  = transmitter output power in dBm;

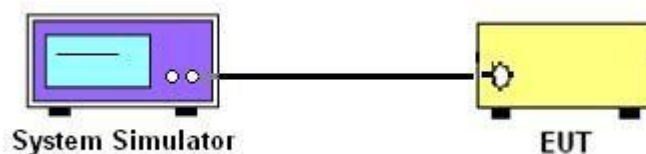
$G_T$  = gain of the transmitting antenna in dBi;

$L_C$  = signal attenuation in the connecting cable between the transmitter and antenna in dB.

#### 2.1.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

#### 2.1.3. Test Setup



#### 2.1.4. Test Procedures

1. The transmitter output port was connected to the system simulator.
2. Set EUT at maximum power through system simulator.
3. Select lowest, middle, and highest channels for each band and different modulation.
4. Measure and record the power level from the system simulator.

### 2.1.5. Test Results of Conducted Output Power and ERP/EIRP

| GSM 850  |        |                     |           |           |                       |                       |                        |
|----------|--------|---------------------|-----------|-----------|-----------------------|-----------------------|------------------------|
| EUT Mode |        | Average power (dBm) |           |           | Ant.<br>Gain<br>(dBi) | Max.<br>ERP<br>(dBm)  | ERP<br>Limit<br>(dBm)  |
|          |        | 128                 | 190       | 251       |                       |                       |                        |
|          |        | 824.2MHz            | 836.6MHz  | 848.8MHz  |                       |                       |                        |
| GSM      | Voice  | 32.98               | 32.95     | 32.94     | 2.00                  | 32.83                 | 38.45                  |
| GPRS     | Slot 1 | 32.87               | 32.82     | 32.86     |                       |                       |                        |
|          | Slot 2 | 32.19               | 32.12     | 32.14     |                       |                       |                        |
|          | Slot 3 | 29.97               | 29.94     | 29.91     |                       |                       |                        |
|          | Slot 4 | 28.97               | 28.85     | 28.89     |                       |                       |                        |
| EGPRS    | Slot 1 | 27.33               | 27.21     | 27.16     |                       | 27.18                 |                        |
|          | Slot 2 | 26.76               | 26.72     | 26.69     |                       |                       |                        |
|          | Slot 3 | 24.80               | 24.76     | 24.62     |                       |                       |                        |
|          | Slot 4 | 23.74               | 23.65     | 23.57     |                       |                       |                        |
| PCS 1900 |        |                     |           |           |                       |                       |                        |
| EUT Mode |        | Average power (dBm) |           |           | Ant.<br>Gain<br>(dBi) | Max.<br>EIRP<br>(dBm) | EIRP<br>Limit<br>(dBm) |
|          |        | 512                 | 661       | 810       |                       |                       |                        |
|          |        | 1850.2MHz           | 1880.0MHz | 1909.8MHz |                       |                       |                        |
| GSM      | Voice  | 30.68               | 30.87     | 30.80     | 2.00                  | 32.87                 | 33.00                  |
| GPRS     | Slot 1 | 30.41               | 30.31     | 30.52     |                       |                       |                        |
|          | Slot 2 | 29.54               | 29.43     | 29.38     |                       |                       |                        |
|          | Slot 3 | 27.09               | 27.05     | 27.10     |                       |                       |                        |
|          | Slot 4 | 26.03               | 25.88     | 26.00     |                       |                       |                        |
| EGPRS    | Slot 1 | 26.32               | 26.09     | 26.17     |                       | 28.32                 |                        |
|          | Slot 2 | 25.23               | 24.99     | 25.07     |                       |                       |                        |
|          | Slot 3 | 23.45               | 23.24     | 23.32     |                       |                       |                        |
|          | Slot 4 | 22.34               | 22.14     | 22.30     |                       |                       |                        |

| WCDMA 850  |           |                     |           |           |                       |                       |                        |
|------------|-----------|---------------------|-----------|-----------|-----------------------|-----------------------|------------------------|
| EUT Mode   |           | Average power (dBm) |           |           | Ant.<br>Gain<br>(dBi) | Max.<br>ERP<br>(dBm)  | ERP<br>Limit<br>(dBm)  |
|            |           | 4132                | 4183      | 4233      |                       |                       |                        |
|            |           | 826.4MHz            | 836.6MHz  | 846.6MHz  |                       |                       |                        |
| RMC        | 12.2 kbps | 23.38               | 23.15     | 23.21     | 2                     | 23.23                 | 38.45                  |
| HSDPA      | Subtest 1 | 23.36               | 23.14     | 23.20     |                       |                       |                        |
|            | Subtest 2 | 22.59               | 22.62     | 22.77     |                       |                       |                        |
|            | Subtest 3 | 22.23               | 22.21     | 22.28     |                       |                       |                        |
|            | Subtest 4 | 22.15               | 22.24     | 22.21     |                       |                       |                        |
| HSUPA      | Subtest 1 | 22.10               | 22.21     | 22.24     |                       |                       |                        |
|            | Subtest 2 | 20.47               | 20.68     | 20.73     |                       |                       |                        |
|            | Subtest 3 | 21.25               | 21.12     | 21.22     |                       |                       |                        |
|            | Subtest 4 | 21.53               | 21.66     | 21.74     |                       |                       |                        |
|            | Subtest 5 | 20.66               | 20.74     | 20.81     |                       |                       |                        |
| WCDMA 1900 |           |                     |           |           |                       |                       |                        |
| EUT Mode   |           | Average power (dBm) |           |           | Ant.<br>Gain<br>(dBi) | Max.<br>EIRP<br>(dBm) | EIRP<br>Limit<br>(dBm) |
|            |           | 9262                | 9400      | 9538      |                       |                       |                        |
|            |           | 1852.4MHz           | 1880.0MHz | 1907.6MHz |                       |                       |                        |
| RMC        | 12.2 kbps | 23.50               | 23.65     | 23.64     | 2                     | 25.65                 | 33                     |
| HSDPA      | Subtest 1 | 23.48               | 23.64     | 23.65     |                       |                       |                        |
|            | Subtest 2 | 22.55               | 22.51     | 22.35     |                       |                       |                        |
|            | Subtest 3 | 22.16               | 22.04     | 21.81     |                       |                       |                        |
|            | Subtest 4 | 21.86               | 21.96     | 21.72     |                       |                       |                        |
| HSUPA      | Subtest 1 | 21.91               | 21.91     | 21.81     |                       |                       |                        |
|            | Subtest 2 | 20.42               | 20.43     | 20.27     |                       |                       |                        |
|            | Subtest 3 | 21.07               | 20.97     | 20.81     |                       |                       |                        |
|            | Subtest 4 | 21.51               | 21.51     | 21.33     |                       |                       |                        |
|            | Subtest 5 | 20.53               | 20.45     | 20.31     |                       |                       |                        |

| WCDMA 1700 |           |                     |           |           |                       |                       |                        |
|------------|-----------|---------------------|-----------|-----------|-----------------------|-----------------------|------------------------|
| EUT Mode   |           | Average power (dBm) |           |           | Ant.<br>Gain<br>(dBi) | Max.<br>EIRP<br>(dBm) | EIRP<br>Limit<br>(dBm) |
|            |           | 1312                | 1413      | 1513      |                       |                       |                        |
|            |           | 1712.4MHz           | 1732.6MHz | 1752.6MHz |                       |                       |                        |
| RMC        | 12.2 kbps | 23.51               | 23.30     | 23.46     | 2                     | 25.51                 | 30.00                  |
| HSDPA      | Subtest 1 | 23.50               | 23.28     | 23.43     |                       |                       |                        |
|            | Subtest 2 | 22.10               | 22.22     | 22.17     |                       |                       |                        |
|            | Subtest 3 | 21.65               | 21.77     | 21.71     |                       |                       |                        |
|            | Subtest 4 | 21.57               | 21.71     | 21.62     |                       |                       |                        |
| HSUPA      | Subtest 1 | 21.51               | 21.64     | 21.61     |                       |                       |                        |
|            | Subtest 2 | 20.10               | 20.22     | 20.17     |                       |                       |                        |
|            | Subtest 3 | 20.55               | 20.71     | 20.64     |                       |                       |                        |
|            | Subtest 4 | 21.04               | 21.23     | 21.13     |                       |                       |                        |
|            | Subtest 5 | 20.11               | 20.22     | 20.15     |                       |                       |                        |

## 2.2. Peak-to-average power ratio (PAPR)

### 2.2.1. Requirement

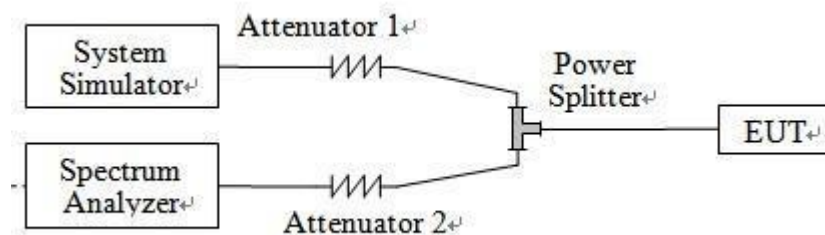
Power Complementary Cumulative Distribution Function (CCDF) curves provide a means for characterizing the power peaks of a digitally modulated signal on a statistical basis. A CCDF curve depicts the probability of the peak signal amplitude exceeding the average power level. Most contemporary measurement instrumentation include the capability to produce CCDF curves for an input signal provided that the instrument's resolution bandwidth can be set wide enough to accommodate the entire input signal bandwidth.

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

### 2.2.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

### 2.2.3. Test Description



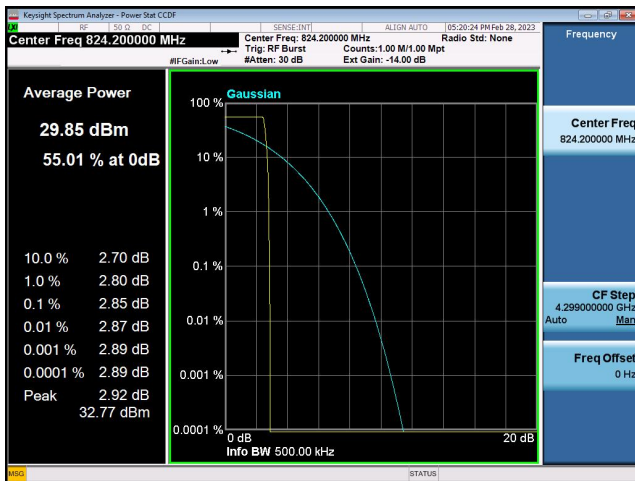
### 2.2.4. Test Procedures

1. The testing follows the of KDB 971168 D01 v03r01 Section 5.7.2 and ANSI C63.26-2015 Section 5.2.3.4.
2. The EUT was connected to spectrum analyzer and system simulator via a power divider, Path loss compensation is then performed on the spectrum analyzer and the system simulator respectively.
3. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
4. Set resolution/measurement bandwidth  $\geq$  OBW or specified reference bandwidth.
5. Set the number of counts to a value that stabilizes the measured CCDF curve.
6. Set the EUT working in highest power level, measured and recorded the 0.1% as PAPR level.
7. Repeat step 3~6 at other frequency and modulations.

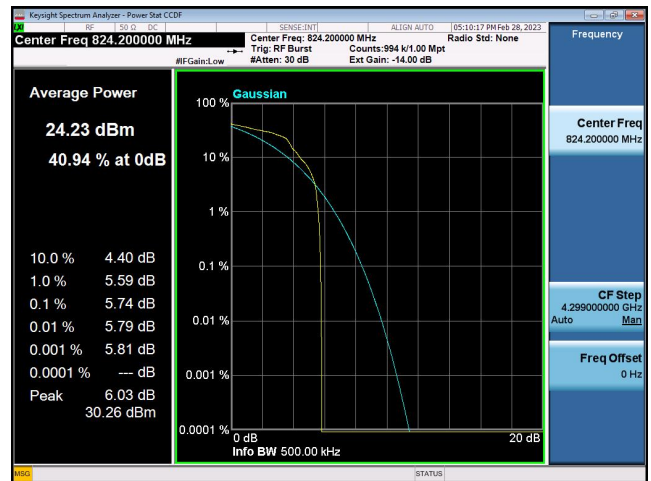
### 2.2.5. Test Results of Peak-to-average power ratio (PAPR)

| Band       | Channel | Frequency<br>(MHz) | Peak to Average ratio | Limit<br>dB | Verdict |
|------------|---------|--------------------|-----------------------|-------------|---------|
|            |         |                    | dB                    |             |         |
| GSM 850    | 128     | 824.2              | 2.85                  | 13          | PASS    |
|            | 190     | 836.6              | 2.85                  |             | PASS    |
|            | 251     | 848.8              | 2.85                  |             | PASS    |
| EDGE 850   | 128     | 824.2              | 5.74                  | 13          | PASS    |
|            | 190     | 836.6              | 5.76                  |             | PASS    |
|            | 251     | 848.8              | 5.75                  |             | PASS    |
| PCS 1900   | 512     | 1850.2             | 2.82                  | 13          | PASS    |
|            | 661     | 1880.0             | 2.82                  |             | PASS    |
|            | 810     | 1909.8             | 2.83                  |             | PASS    |
| EDGE 1900  | 512     | 1850.2             | 5.73                  | 13          | PASS    |
|            | 661     | 1880.0             | 5.82                  |             | PASS    |
|            | 810     | 1909.8             | 5.83                  |             | PASS    |
| WCDMA 850  | 4132    | 826.4              | 2.98                  | 13          | PASS    |
|            | 4183    | 836.6              | 2.96                  |             | PASS    |
|            | 4233    | 846.6              | 2.86                  |             | PASS    |
| WCDMA 1900 | 9262    | 1852.4             | 3.03                  | 13          | PASS    |
|            | 9400    | 1880.0             | 3.04                  |             | PASS    |
|            | 9538    | 1907.6             | 2.89                  |             | PASS    |
| WCDMA 1700 | 1312    | 1712.4             | 2.83                  | 13          | PASS    |
|            | 1413    | 1732.6             | 2.86                  |             | PASS    |
|            | 1513    | 1752.6             | 2.73                  |             | PASS    |

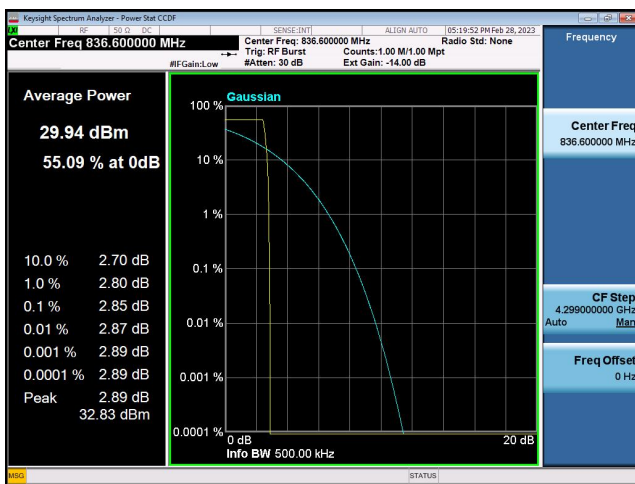
### GSM 850-128



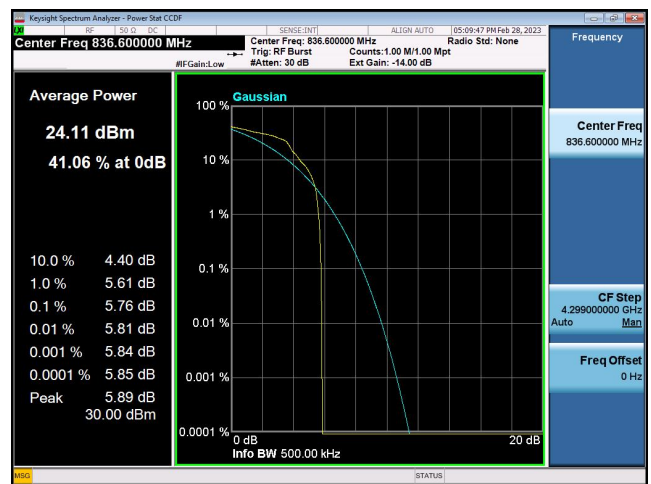
### EDGE 850-128



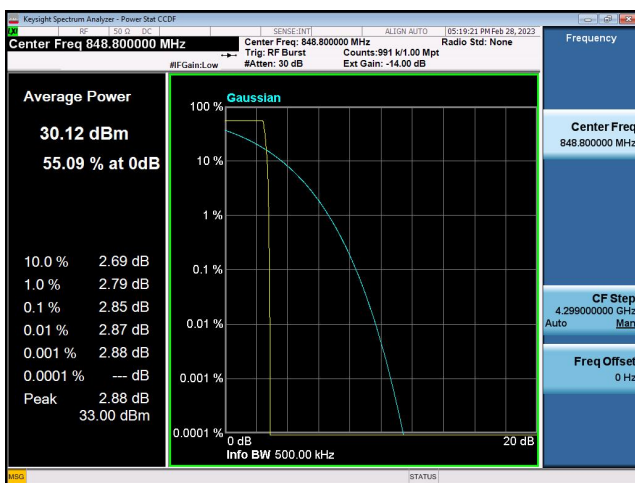
### GSM 850-190



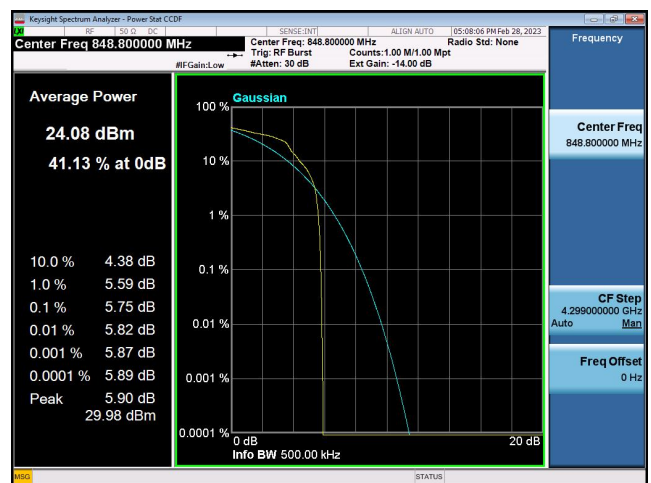
### EDGE 850-190



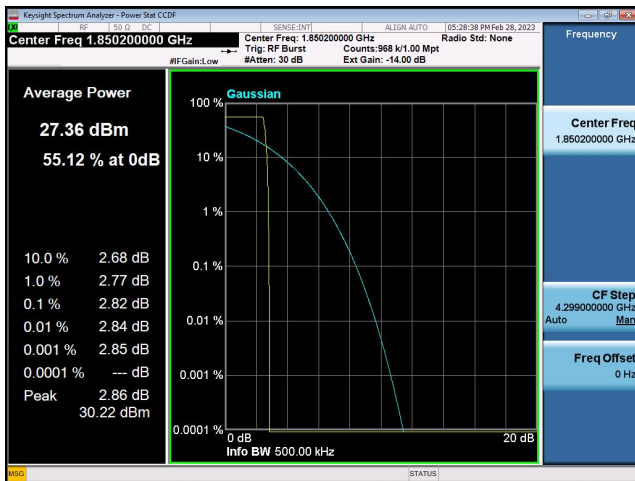
### GSM 850-251



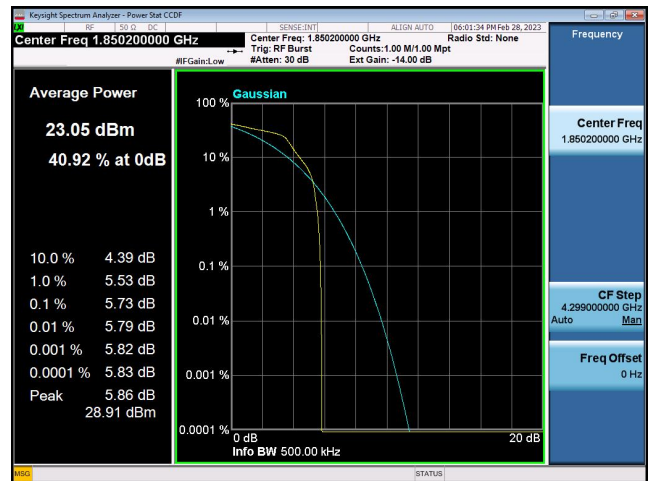
### EDGE 850-251



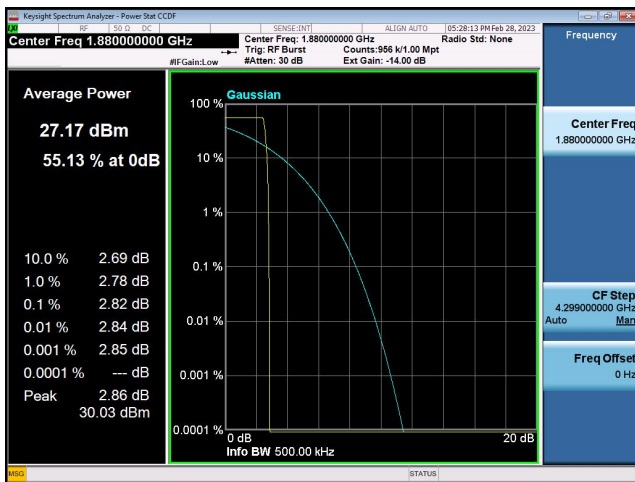
### PCS 1900-512



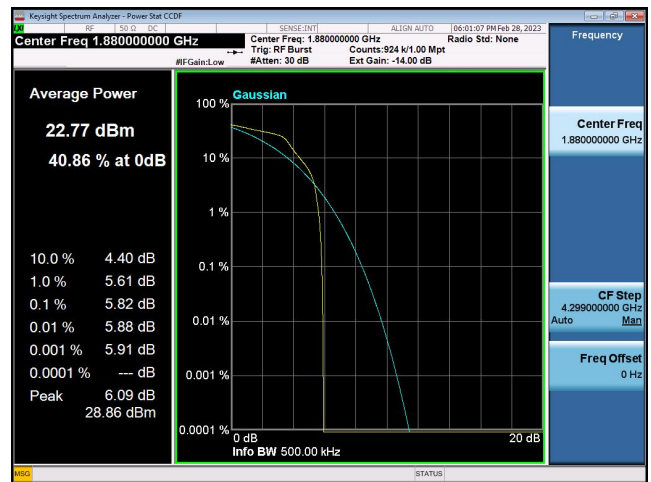
### EDGE 1900-512



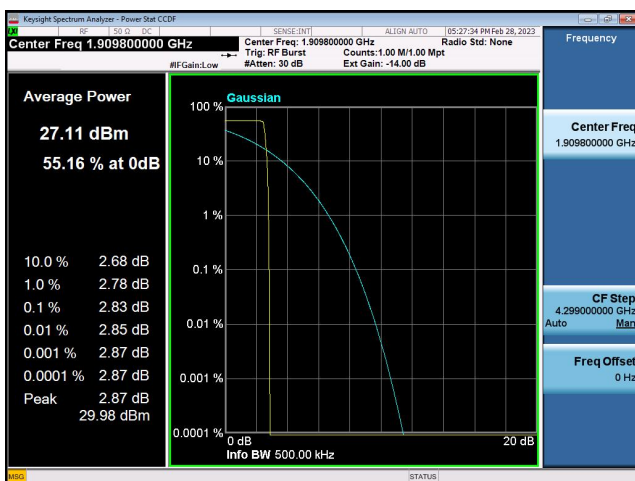
### PCS 1900-661



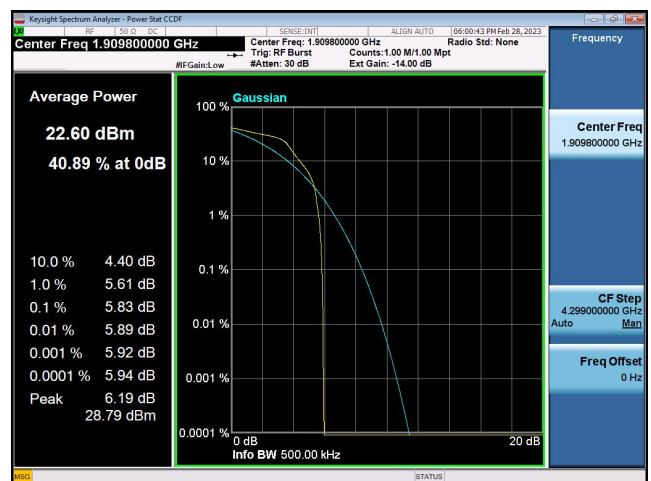
### EDGE 1900-661



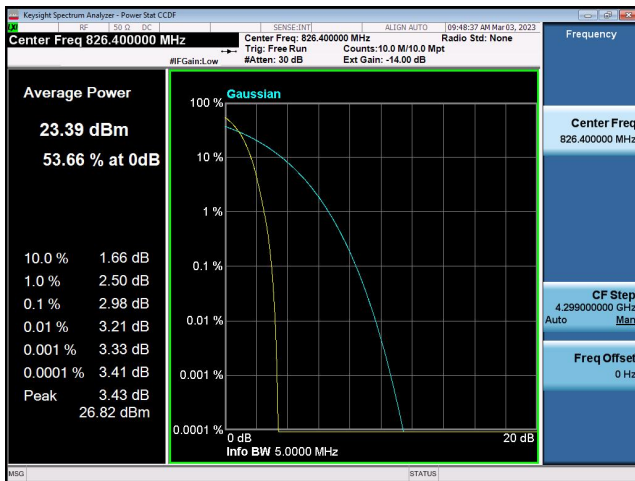
### PCS 1900-810



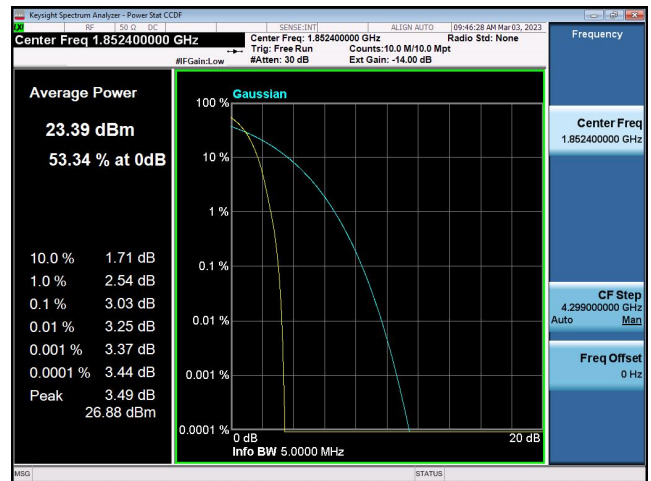
### EDGE 1900-810



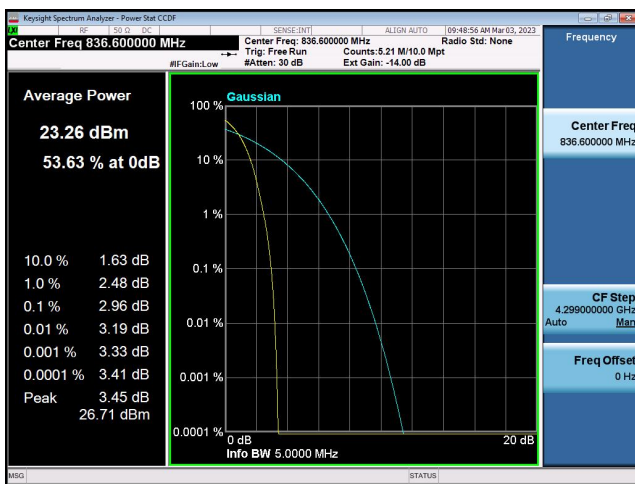
### WCDMA 850-4132



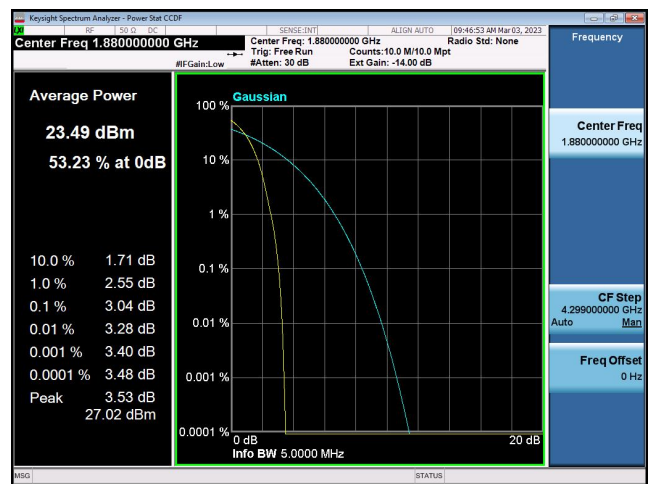
### WCDMA 1900



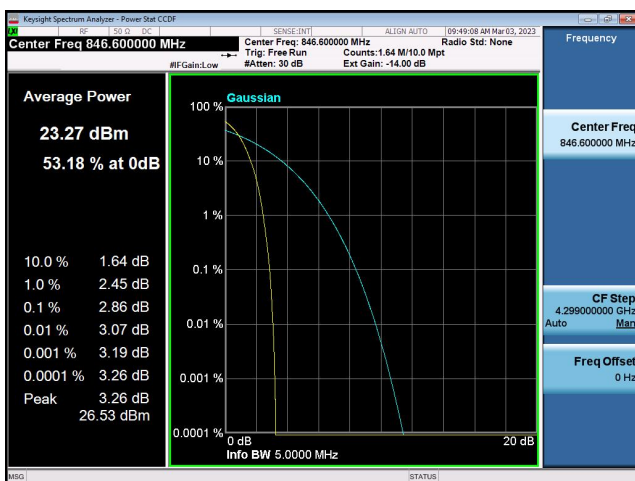
### WCDMA 850-4183



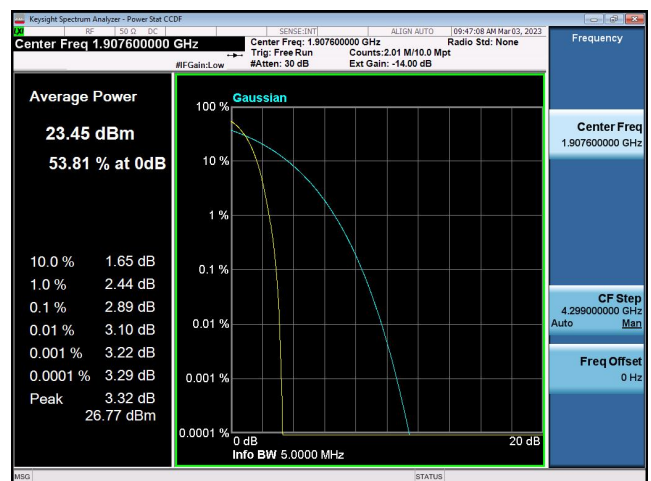
### WCDMA 1900-9400



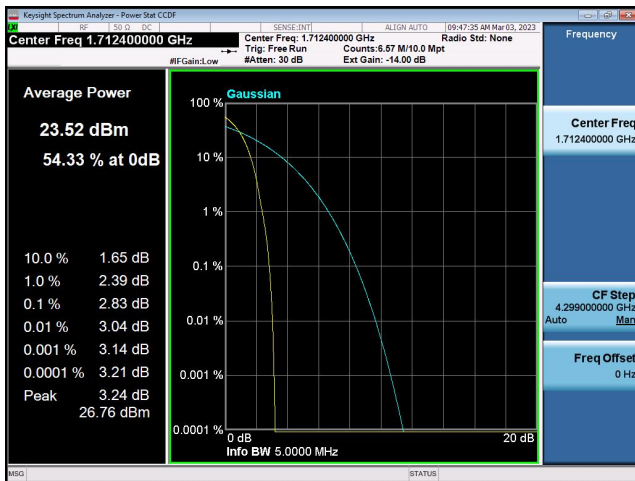
### WCDMA 850-4233



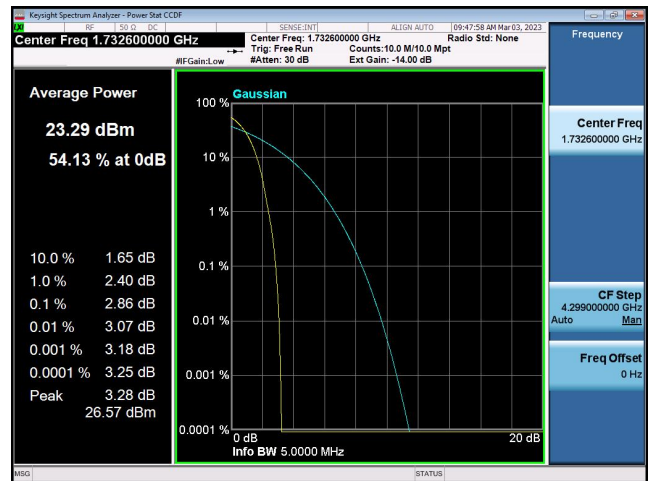
### WCDMA 1900-9538



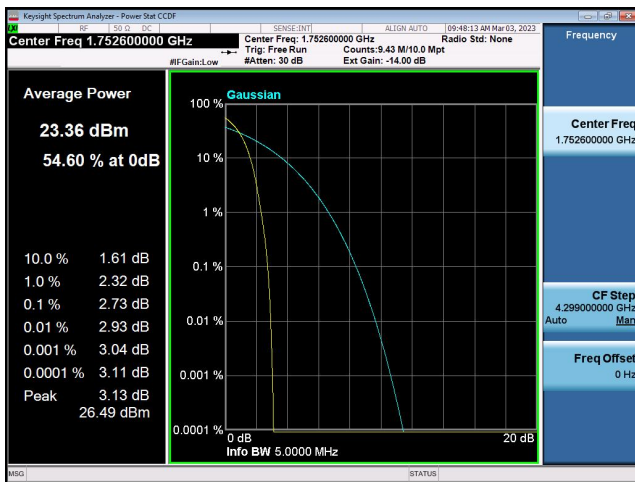
### WCDMA 1700-1312



### WCDMA 1700-1413



### WCDMA 1700-1513



## 2.3. 99% Occupied Bandwidth and 26dB Emission Bandwidth

### 2.3.1. Requirement

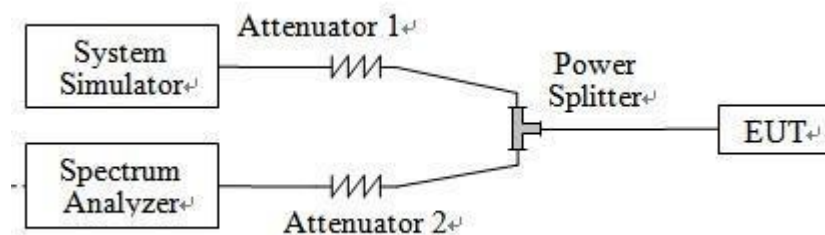
The Occupied Bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5% of the total mean power of the given emission.

The 26 dB emission bandwidth is defined as the frequency range between two points, one above and one below the carrier frequency, at which the spectral density of the emission is attenuated 26 dB below the maximum in-band spectral density of the modulated signal Spectral density (power per unit bandwidth) is to be measured with a detector of resolution bandwidth equal to approximately 1.0% of the emission bandwidth.

### 2.3.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

### 2.3.3. Test Setup



### 2.3.4. Test Procedures

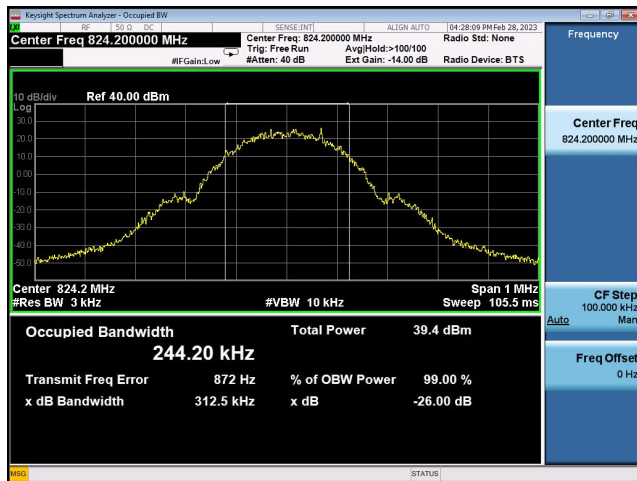
1. The testing follows the of KDB 971168 D01 v03r01 Section 4 and ANSI C63.26-2015 Section 5.4.
2. The EUT was connected to spectrum analyzer and system simulator via a power divider, Path loss compensation is then performed on the spectrum analyzer and the system simulator respectively.
3. The spectrum analyzer center frequency is set to the nominal EUT channel center frequency.
4. Set span to be approximately 1.5 to 5 times the OBW.
5. The nominal RBW shall be in the range of 1% to 5% of the anticipated OBW.
6. Set  $VBW \geq 3 \times RBW$ .
7. Set Detection mode = peak.
8. Set Trace mode = max hold.
9. Allow trace to stabilize.
10. Repeat step 3~9 at other frequency and modulations.

### 2.3.5. Test Result of 99% Occupied Bandwidth and 26dB Emission Bandwidth

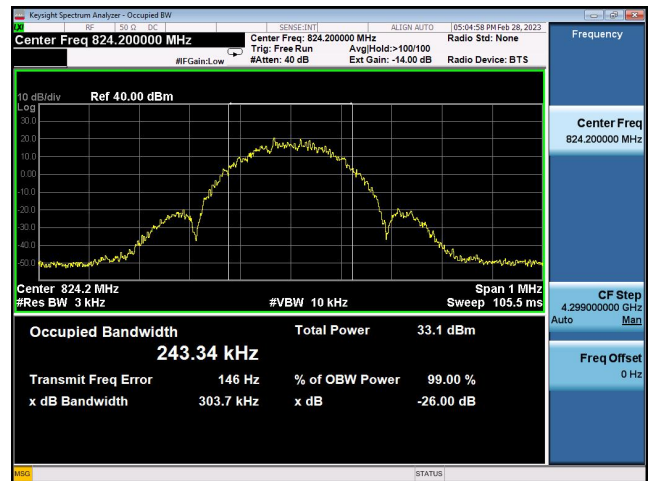
| Band      | Channel | Frequency (MHz) | 26dB EBW (kHz) | 99% OBW (kHz) | Verdict |
|-----------|---------|-----------------|----------------|---------------|---------|
| GSM 850   | 128     | 824.2           | 312.5          | 244.20        | PASS    |
|           | 190     | 836.6           | 313.3          | 245.54        | PASS    |
|           | 251     | 848.8           | 315.0          | 245.65        | PASS    |
| EDGE 850  | 128     | 824.2           | 303.7          | 243.34        | PASS    |
|           | 190     | 836.6           | 309.6          | 242.14        | PASS    |
|           | 251     | 848.8           | 306.8          | 243.56        | PASS    |
| PCS 1900  | 512     | 1850.2          | 307.7          | 244.17        | PASS    |
|           | 661     | 1880.0          | 311.3          | 243.75        | PASS    |
|           | 810     | 1909.8          | 318.9          | 247.00        | PASS    |
| EDGE 1900 | 512     | 1850.2          | 307.6          | 247.17        | PASS    |
|           | 661     | 1880.0          | 305.2          | 246.18        | PASS    |
|           | 810     | 1909.8          | 315.7          | 242.44        | PASS    |

| Band       | Channel | Frequency (MHz) | 26dB EBW (MHz) | 99% OBW (MHz) | Verdict |
|------------|---------|-----------------|----------------|---------------|---------|
| WCDMA 850  | 4132    | 826.4           | 4.710          | 4.1616        | PASS    |
|            | 4183    | 836.6           | 4.707          | 4.1380        | PASS    |
|            | 4233    | 846.6           | 4.710          | 4.1394        | PASS    |
| WCDMA 1700 | 1312    | 1712.4          | 4.739          | 4.1645        | PASS    |
|            | 1412    | 1732.4          | 4.730          | 4.1593        | PASS    |
|            | 1513    | 1752.6          | 4.754          | 4.1769        | PASS    |
| WCDMA 1900 | 9262    | 1852.4          | 4.715          | 4.1546        | PASS    |
|            | 9400    | 1880.0          | 4.714          | 4.1527        | PASS    |
|            | 9538    | 1907.6          | 4.714          | 4.1577        | PASS    |

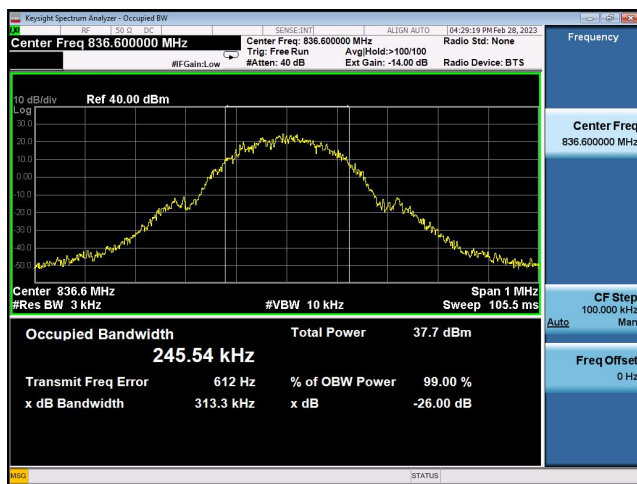
### GSM 850-128



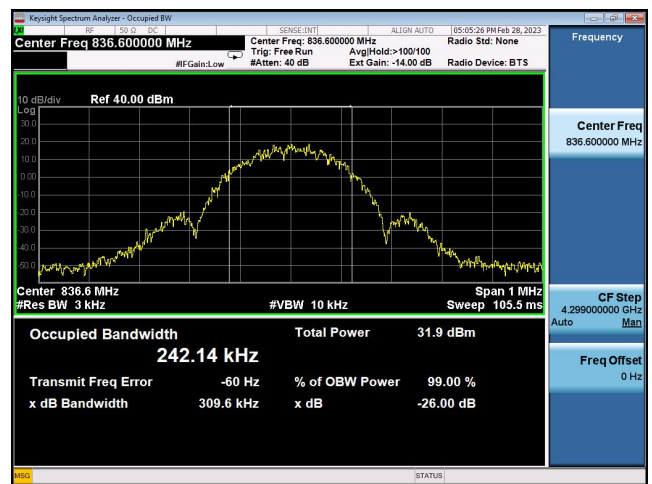
### EDGE 850-128



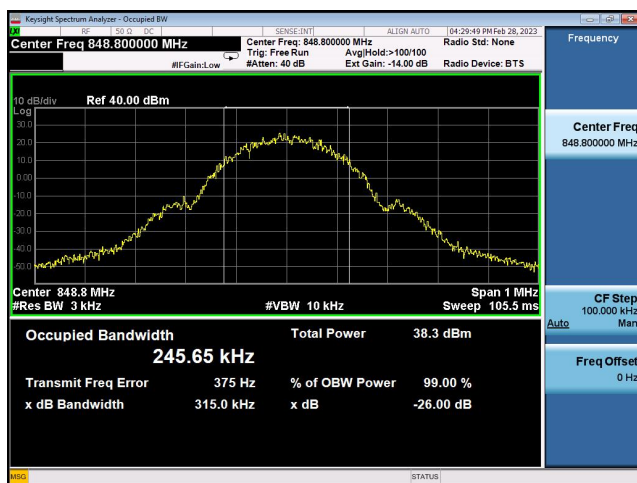
### GSM 850-190



### EDGE 850-190



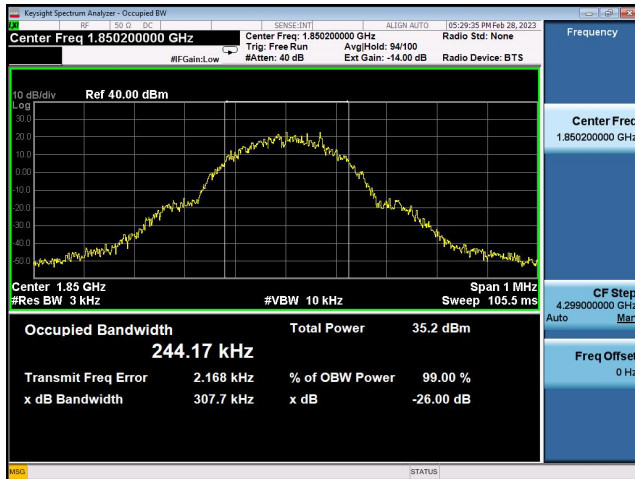
### GSM 850-251



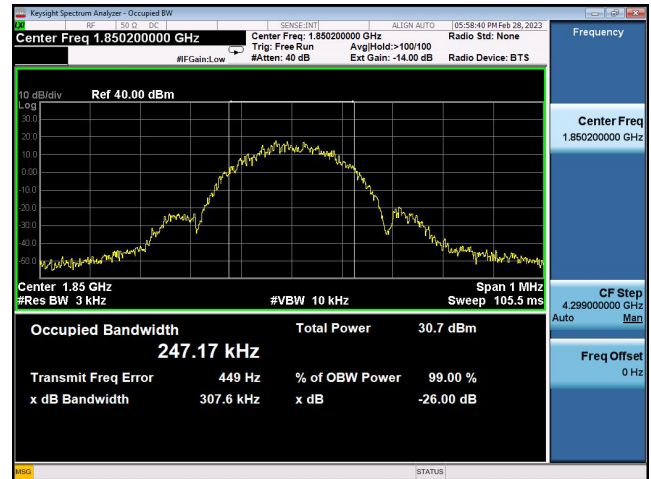
### EDGE 850-251



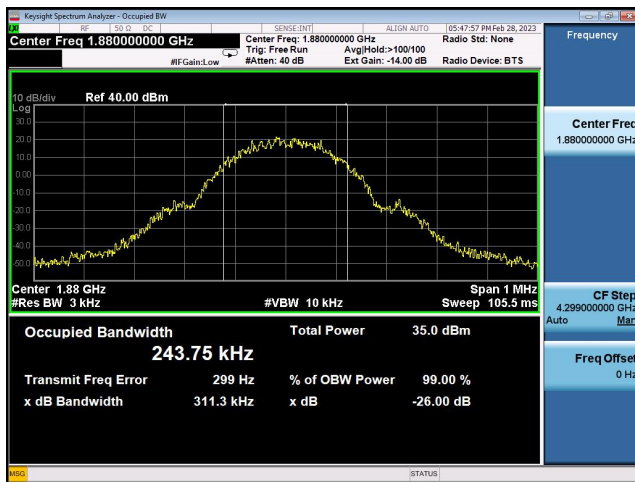
### PCS 1900-512



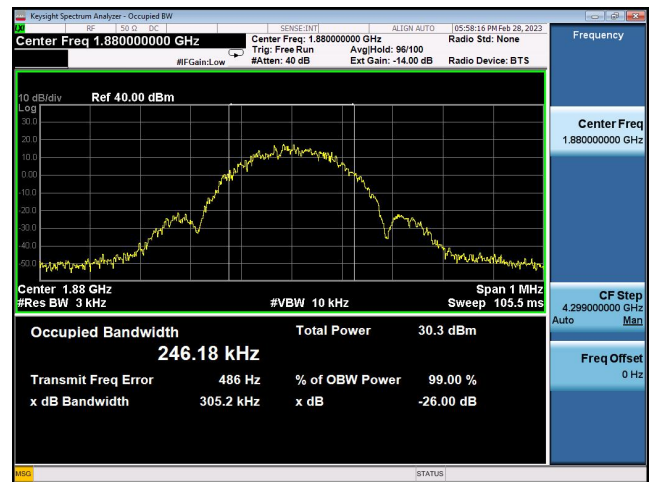
### EDGE 1900-512



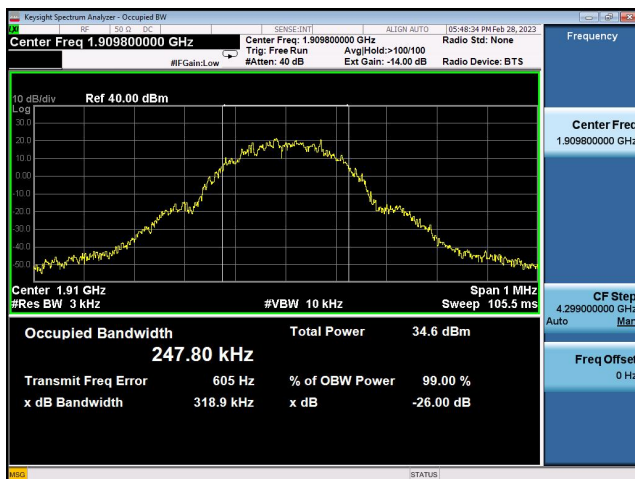
### PCS 1900-661



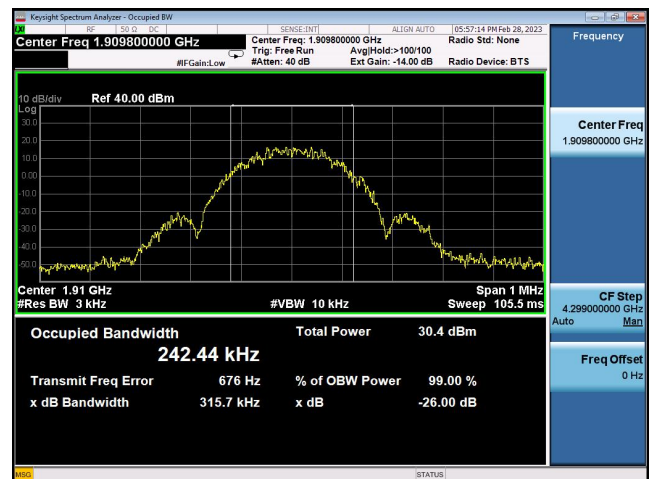
### EDGE 1900-661



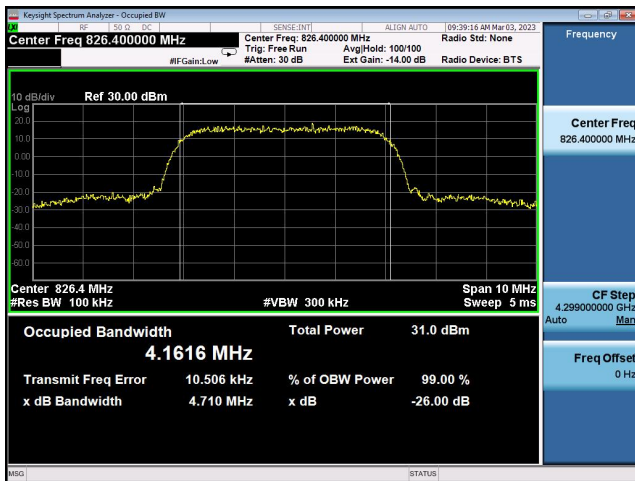
### PCS 1900-810



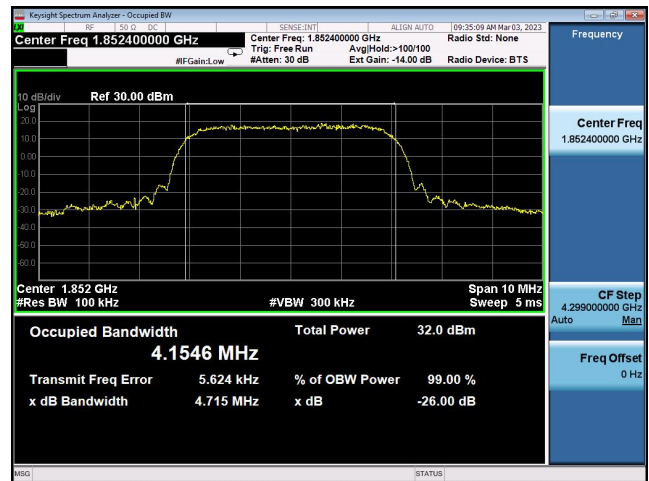
### EDGE 1900-810



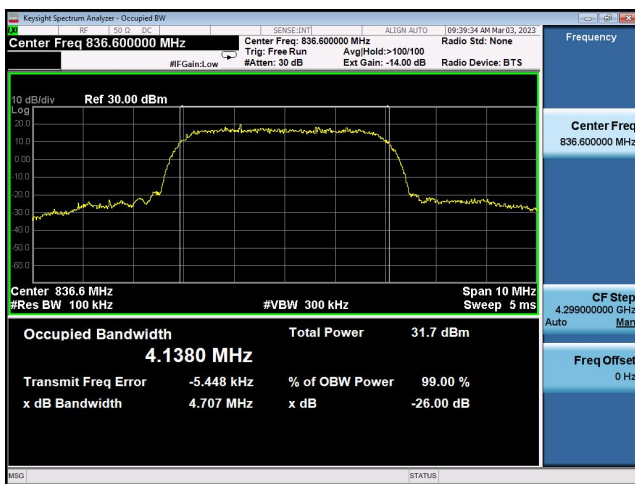
### WCDMA 850-4132



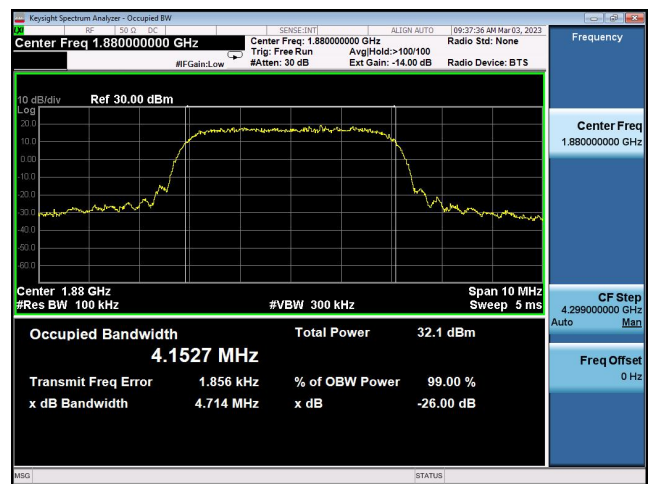
### WCDMA 1900-9262



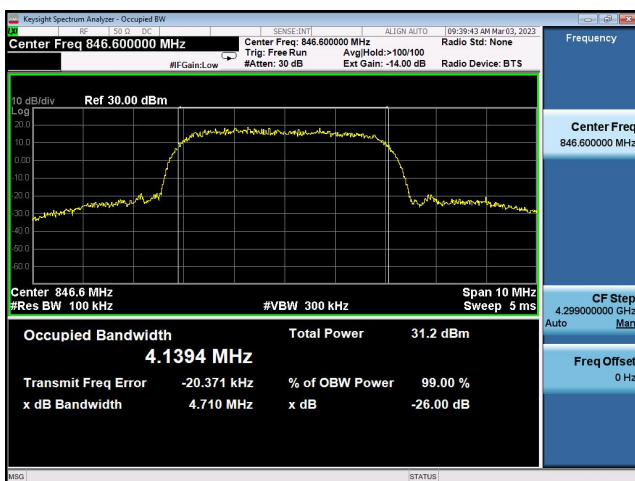
### WCDMA 850-4183



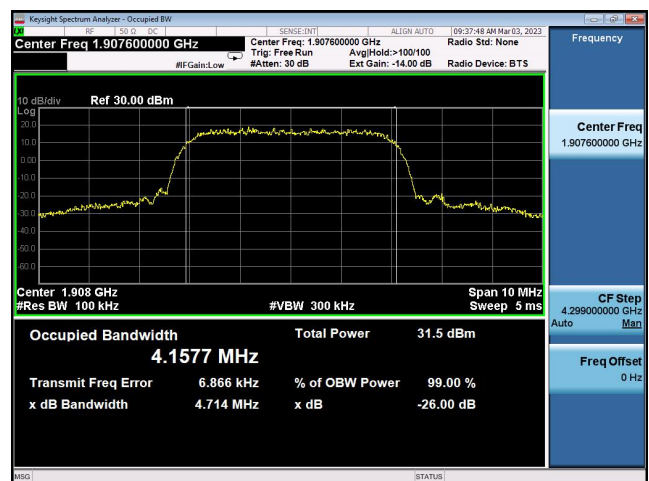
### WCDMA 1900-9400



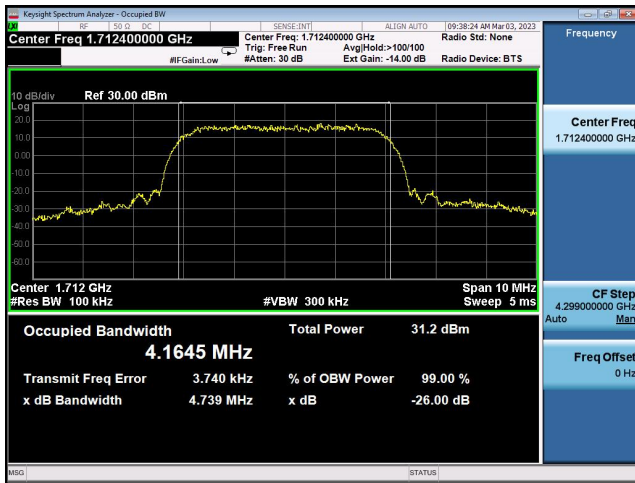
### WCDMA 850-4233



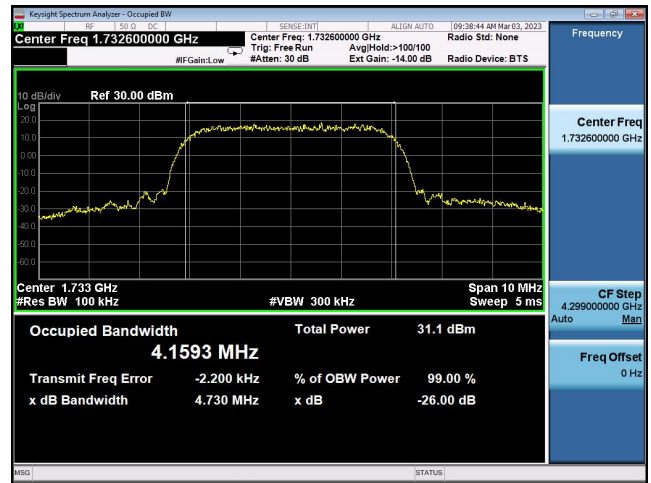
### WCDMA 1900-9538



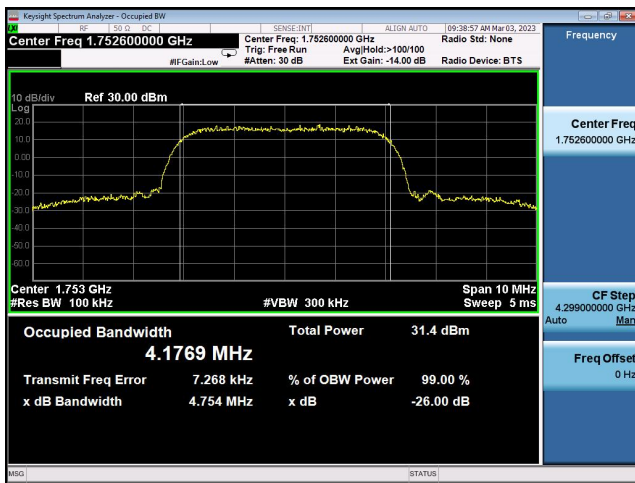
### WCDMA 1700-1312



### WCDMA 1700-1413



### WCDMA 1700-1513



## 2.4. Conducted Band Edge

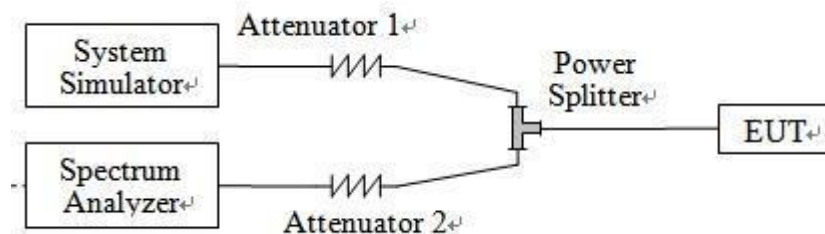
### 2.4.1. Requirement

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least  $43 + 10 \log (P)$  dB.

### 2.4.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

### 2.4.3. Test Setup

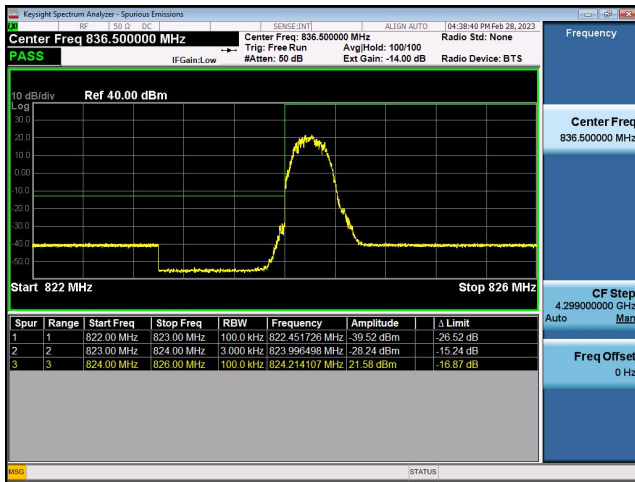


### 2.4.4. Test Procedures

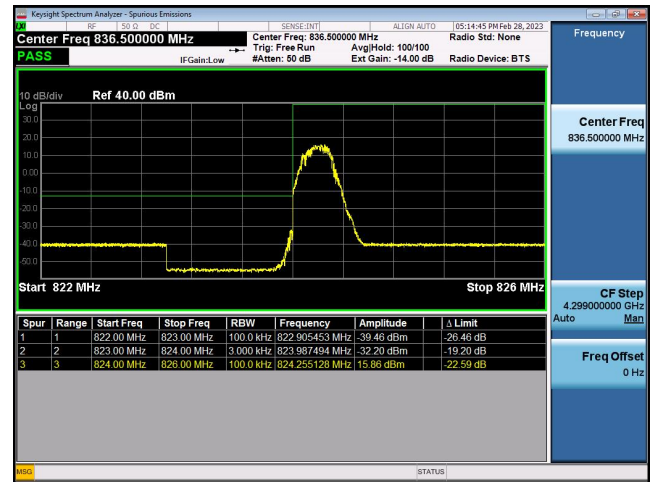
1. The testing follows the of KDB 971168 D01 v03r01 Section 6 and ANSI C63.26-2015 Section 5.7.
2. The EUT was connected to spectrum analyzer and system simulator via a power divider, Path loss compensation is then performed on the spectrum analyzer and the system simulator respectively.
3. Span was set large enough so as to capture all out of band emissions near the Channel Edge.
4. Use  $RBW \geq 1\%$  EBW in the 1 megahertz bands immediately outside and adjacent to the licensee's authorized frequency channel, and use  $RBW = 1$  MHz outside 1 MHz of the authorized frequency channel.
5. Set  $VBW \geq 3 \times RBW$
6. Set Detector = power averaging (rms).
7. Set the number of points in sweep  $\geq 2 \times \text{span} / RBW$ .
8. Set sweep trigger to "free run."
9. Set the Sweep time  $> (\text{number of points in sweep}) \times (\text{transmitter period})$  (i.e., the transmit on-time + the off-time).
10. Perform a trace average of at least 100 traces.
11. Repeat step 3~10 at other frequency and modulations.

### 2.4.5. Test Result of Conducted Band Edge

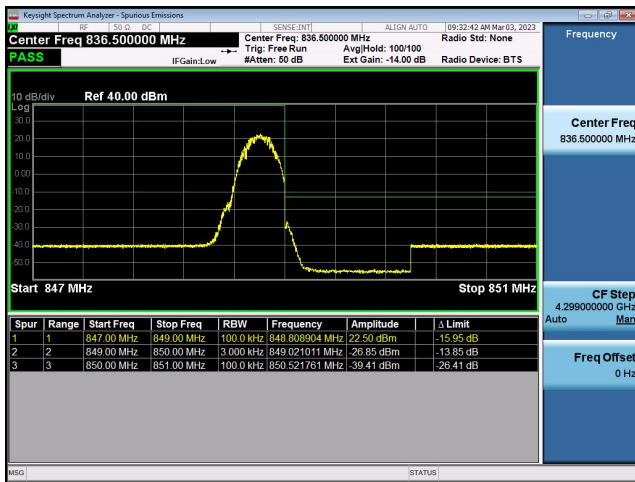
#### GSM 850-128



#### EDGE 850-128



#### GSM 850-251



#### EDGE 850-251

