



## FCC TEST REPORT

FCC ID: SY4-A02054

On Behalf of

Shanghai Huace Navigation Technology Ltd.

Geodetic GNSS Receiver

Model No.: i83Pro

Prepared for : Shanghai Huace Navigation Technology Ltd.  
Address : 577 Songying Road, Qingpu District, 201706 Shanghai, China

Prepared By : Shenzhen Alpha Product Testing Co., Ltd.  
Address : Building i, No.2, Lixin Road, Fuyong Street, Bao'an District, 518103, Shenzhen, Guangdong, China

Report Number : A2407108-C01-R15  
Date of Receipt : September 4, 2024  
Date of Test : September 4, 2024 – December 6, 2024  
Date of Report : December 17, 2024  
Version Number : V0  
**Test Result : Pass**

## TABLE OF CONTENTS

| <b>Description</b>                                          | <b>Page</b> |
|-------------------------------------------------------------|-------------|
| <b>1 TEST SUMMARY .....</b>                                 | <b>5</b>    |
| <b>2 GENERAL INFORMATION .....</b>                          | <b>6</b>    |
| 2.1 GENERAL DESCRIPTION OF EUT .....                        | 6           |
| 2.2 RELATED SUBMITTAL(S) / GRANT (S) .....                  | 8           |
| 2.3 TEST METHODOLOGY .....                                  | 8           |
| 2.4 TEST FACILITY .....                                     | 8           |
| 2.5 ACCESSORIES OF DEVICE (EUT) .....                       | 8           |
| 2.6 TESTED SUPPORTING SYSTEM DETAILS .....                  | 8           |
| 2.7 TEST CONDITIONS .....                                   | 8           |
| 2.8 MEASUREMENT UNCERTAINTY .....                           | 9           |
| <b>3 TEST INSTRUMENTS LIST .....</b>                        | <b>10</b>   |
| <b>4 SYSTEM TEST CONFIGURATION .....</b>                    | <b>11</b>   |
| 4.1 TEST MODE .....                                         | 11          |
| 4.2 CONFIGURATION OF TESTED SYSTEM .....                    | 11          |
| 4.3 CONDUCTED AV OUTPUT POWER .....                         | 12          |
| 4.4 PEAK-TO-AVERAGE RATIO .....                             | 14          |
| 4.5 OCCUPY BANDWIDTH .....                                  | 17          |
| 4.6 MODULATION CHARACTERISTIC .....                         | 23          |
| 4.7 OUT OF BAND EMISSION AT ANTENNA TERMINALS .....         | 23          |
| 4.8 ERP, EIRP MEASUREMENT .....                             | 34          |
| 4.9 FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT .....  | 43          |
| 4.10 FREQUENCY STABILITY V.S. TEMPERATURE MEASUREMENT ..... | 50          |
| 4.11 FREQUENCY STABILITY V.S. VOLTAGE MEASUREMENT .....     | 54          |
| <b>5 TEST SETUP PHOTO .....</b>                             | <b>57</b>   |

## TEST REPORT DECLARATION

Applicant : Shanghai Huace Navigation Technology Ltd.  
Address : 577 Songying Road, Qingpu District, 201706 Shanghai, China  
Manufacturer : Shanghai Huace Navigation Technology Ltd.  
Address : 577 Songying Road, Qingpu District, 201706 Shanghai, China  
EUT Description : Geodetic GNSS Receiver  
(A) Model No. : i83Pro  
(B) Trademark : 

Measurement Standard Used:

**FCC CFR Title 47 Part 2**  
**FCC CFR Title 47 Part 22 Subpart H**  
**FCC CFR Title 47 Part 24 Subpart E**  
**FCC CFR Title 47 Part 27**

The device described above is tested by Shenzhen Alpha Product Testing Co., Ltd. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C limits both conducted and radiated emissions. The test results are contained in this test report and Shenzhen Alpha Product Testing Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these tests.

After the test, our opinion is that EUT compliance with the requirement of the above standards.

This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Shenzhen Alpha Product Testing Co., Ltd.

Tested by (name + signature).....:

Yannis Wen  
Project Engineer

  
.....

Approved by (name + signature).....:

Jack Xu  
Project Manager

  
.....

Date of issue.....

December 17, 2024

**Revision History**

| Revision | Issue Date        | Revisions              | Revised By |
|----------|-------------------|------------------------|------------|
| V0       | December 17, 2024 | Initial released Issue | Yannis Wen |

## 1 Test Summary

| Test Item                              | Section in CFR 47                                                        | Result |
|----------------------------------------|--------------------------------------------------------------------------|--------|
| RF Output Power                        | Part 2.1046<br>Part 22.913 (a)(2)<br>Part 24.232 (c)<br>Part 27.50(d)(4) | Pass   |
| Peak-to-Average Ratio                  | Part 2.1046<br>Part 22.913(d)<br>Part 24.232 (d)<br>Part 27.50(d)(5)     | Pass   |
| Modulation Characteristics             | Part 2.1047                                                              | Pass   |
| 99% & -26 dB Occupied Bandwidth        | Part 2.1049<br>Part 22.917<br>Part 24.238<br>Part 27.53(h)               | Pass   |
| Spurious Emissions at Antenna Terminal | Part 2.1051<br>Part 22.917 (a)<br>Part 24.238 (a)<br>Part 27.53(h)       | Pass   |
| Field Strength of Spurious Radiation   | Part 2.1053<br>Part 22.917 (a)<br>Part 24.238 (a)<br>Part 27.53(h)       | Pass   |
| Out of band emission, Band Edge        | Part 22.917 (a)<br>Part 24.238 (a)<br>Part 27.53(h)                      | Pass   |
| Frequency stability vs. temperature    | Part 2.1055(a)(1)(b)                                                     | Pass   |
| Frequency stability vs. voltage        | Part 2.1055(d)(1)(2)                                                     | Pass   |

Note: 1. Pass: The EUT complies with the essential requirements in the standard.

2. The conclusion of this test report is judged by actual test data without considering measurement uncertainty.

## 2 General Information

### 2.1 General Description of EUT

|                       |                                                                                                                                                                                                                                                                       |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description/PMN       | : Geodetic GNSS Receiver                                                                                                                                                                                                                                              |
| Model No./HVIN        | : i83Pro                                                                                                                                                                                                                                                              |
| DIFF.                 | : N/A                                                                                                                                                                                                                                                                 |
| Test Voltage          | : Input 1: 5V DC=2A (supplied by external approved adapter)(Type-C port)<br>Built-in lithium battery rating:7.2V 9900mAh 71.28Wh                                                                                                                                      |
| Support Networks      | : GPRS, EGPRS, WCDMA                                                                                                                                                                                                                                                  |
| Support Bands         | : GSM850, PCS1900, WCDMA Band V, WCDMA Band IV, WCDMA Band II                                                                                                                                                                                                         |
| TX Frequency          | : GSM850: 824.20MHz-848.80MHz<br>PCS1900: 1850.20MHz-1909.80MHz<br>WCDMA Band V: 826.40MHz -846.60MHz<br>WCDMA Band II: 1852.40MHz -1907.60MHz<br>WCDMA Band IV: 1710MHz -1755MHz                                                                                     |
| GPRS Class            | : 33                                                                                                                                                                                                                                                                  |
| EGPRS Class           | : 33                                                                                                                                                                                                                                                                  |
| Modulation type       | : GPRS: GMSK<br>EGPRS: GMSK/8PSK<br>WCDMA Band II/IV/V: QPSK                                                                                                                                                                                                          |
| Antenna type          | : PCB antenna                                                                                                                                                                                                                                                         |
| Antenna gain          | : Maximum Gain is 3.27dBi for GSM 850<br>Maximum Gain is 2.52dBi for PCS1900<br>Maximum Gain is 3.27dBi for WCDMA Band V<br>Maximum Gain is 2.12dBi for WCDMA Band IV<br>Maximum Gain is 2.52dBi for WCDMA Band II<br>(Antenna information is provided by applicant.) |
| Software version      | : V1.0.0                                                                                                                                                                                                                                                              |
| Hardware version/FVIN | : V1.1.0                                                                                                                                                                                                                                                              |

Remark: 1. The worst-case simultaneous transmission configuration was evaluated with no non-compliance found. Results in this report are only for 2G and 3G function, and there is no other transmitter involved.

**Operation Frequency List:**

| GSM 850       |                 | PCS1900 |                 | WCDMA Band V |                 | WCDMA Band II |                 |
|---------------|-----------------|---------|-----------------|--------------|-----------------|---------------|-----------------|
| Channel       | Frequency (MHz) | Channel | Frequency (MHz) | Channel      | Frequency (MHz) | Channel       | Frequency (MHz) |
| 128           | 824.20          | 512     | 1850.20         | 4132         | 826.40          | 9262          | 1852.40         |
| 129           | 824.40          | 513     | 1850.40         | 4133         | 826.60          | 9263          | 1852.60         |
| · ∴           | · ∴             | · ∴     | · ∴             | · ∴          | · ∴             | · ∴           | · ∴             |
| 189           | 836.40          | 660     | 1879.80         | 4181         | 836.20          | 9399          | 1879.80         |
| 190           | 836.60          | 661     | 1880.00         | 4182         | 836.40          | 9400          | 1880.00         |
| 191           | 836.80          | 662     | 1880.20         | 4183         | 836.60          | 9401          | 1880.20         |
| · ∴           | · ∴             | · ∴     | · ∴             | · ∴          | · ∴             | · ∴           | · ∴             |
| 250           | 848.60          | 809     | 1909.60         | 4232         | 846.40          | 9537          | 1907.40         |
| 251           | 848.80          | 810     | 1909.80         | 4233         | 846.60          | 9538          | 1907.60         |
| WCDMA Band IV |                 |         |                 |              |                 |               |                 |
| Channel       | Frequency (MHz) |         |                 |              |                 |               |                 |
| 1312          | 1712.40         |         |                 |              |                 |               |                 |
| 1313          | 1712.60         |         |                 |              |                 |               |                 |
| · ∴           | · ∴             |         |                 |              |                 |               |                 |
| 1449          | 1739.80         |         |                 |              |                 |               |                 |
| 1450          | 1740.00         |         |                 |              |                 |               |                 |
| 1451          | 1740.20         |         |                 |              |                 |               |                 |
| · ∴           | · ∴             |         |                 |              |                 |               |                 |
| 1512          | 1752.4          |         |                 |              |                 |               |                 |
| 1513          | 1752.6          |         |                 |              |                 |               |                 |

Regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

**Final test channel:**

| GSM 850       |                 | PCS1900         |                 | WCDMA Band V |                 | WCDMA Band II |                 |
|---------------|-----------------|-----------------|-----------------|--------------|-----------------|---------------|-----------------|
| Channel       | Frequency (MHz) | Channel         | Frequency (MHz) | Channel      | Frequency (MHz) | Channel       | Frequency (MHz) |
| 128           | 824.20          | 512             | 1850.20         | 4132         | 826.40          | 9262          | 1852.40         |
| 190           | 836.60          | 661             | 1880.00         | 4183         | 836.60          | 9400          | 1880.00         |
| 251           | 848.80          | 810             | 1909.80         | 4233         | 846.60          | 9538          | 1907.60         |
| WCDMA Band IV |                 |                 |                 |              |                 |               |                 |
| Channel       |                 | Frequency (MHz) |                 |              |                 |               |                 |
| 1312          |                 | 1712.4          |                 |              |                 |               |                 |
| 1450          |                 | 1740.0          |                 |              |                 |               |                 |
| 1513          |                 | 1752.6          |                 |              |                 |               |                 |

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

This submittal(s) (test report) is filing to comply with Section Part 2, Part 22 subpart H, Part 24 subpart E, Part 27 subpart C of the FCC CFR 47, KDB 971168 D01 v03r01 and ANSI C63.26.

## 2.3 Test Methodology

Both conducted and radiated testing were performed according to the procedures document on TIA/EIA 603 ANSI C63.26 and FCC CFR 47.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055 and 2.1057

## 2.4 Test Facility

Shenzhen Alpha Product Testing Co., Ltd  
Building i, No.2, Lixin Road, Fuyong Street, Bao'an District, 518103, Shenzhen, Guangdong, China

June 21, 2018 File on Federal Communication Commission  
Registration Number: 293961

July 15, 2019 Certificated by IC  
Registration Number: 12135A  
CAB identifier: CN0085

## 2.5 Accessories of Device (EUT)

Accessories : AC Adapter  
Manufacturer : Yisheng Electronics Co., LTD  
Model : EA1012AVRU-050  
Ratings : AC Input: 100-240Vac, 1.0A, 50~60Hz  
DC Output: 5.0V=2.4A 12.0W

## 2.6 Tested Supporting System Details

| No. | Description | Manufacturer | Model        | Serial Number | Certification or SDoC |
|-----|-------------|--------------|--------------|---------------|-----------------------|
| 1   | Notebook PC | Lenovo       | ThinkPad E14 | /             | /                     |

## 2.7 Test Conditions

| Items              | Required  | Actual |
|--------------------|-----------|--------|
| Temperature range: | 15-35℃    | 24℃    |
| Humidity range:    | 25-75%    | 56%    |
| Pressure range:    | 86-106kPa | 98kPa  |

## 2.8 Measurement Uncertainty

| Item                                                                      | Uncertainty               |
|---------------------------------------------------------------------------|---------------------------|
| Uncertainty for Power point Conducted Emissions Test                      | 1.63dB                    |
| Uncertainty for Radiation Emission test in 3m chamber<br>(below 30MHz)    | 3.5dB                     |
| Uncertainty for Radiation Emission test in 3m chamber<br>(30MHz to 1GHz)  | 3.74dB(Polarize: V)       |
|                                                                           | 3.76dB(Polarize: H)       |
| Uncertainty for Radiation Emission test in 3m chamber<br>(1GHz to 25GHz)  | 3.77dB(Polarize: V)       |
|                                                                           | 3.80dB(Polarize: H)       |
| Uncertainty for Radiation Emission test in 3m chamber<br>(18GHz to 40GHz) | 4.31 dB(Polarize: V)      |
|                                                                           | 4.30 dB(Polarize: H)      |
| Uncertainty for radio frequency                                           | $5.06 \times 10^{-8}$ GHz |
| Uncertainty for conducted RF Power                                        | 0.40dB                    |
| Uncertainty for temperature                                               | 0.2°C                     |
| Uncertainty for humidity                                                  | 1%                        |
| Uncertainty for DC and low frequency voltages                             | 0.06%                     |

### 3 Test Instruments list

| Equipment                    | Manufacture   | Model No.    | Firmware version | Serial No.             | Last cal.  | Cal Interval |
|------------------------------|---------------|--------------|------------------|------------------------|------------|--------------|
| 9*6*6 anechoic chamber       | CHENYU        | 9*6*6        | /                | N/A                    | 2022.05.18 | 3Year        |
| Spectrum analyzer            | ROHDE&SCHWARZ | FSV40-N      | 2.3              | 102137                 | 2024.08.08 | 1Year        |
| Spectrum analyzer            | Agilent       | N9020A       | A.14.16          | MY499100060            | 2024.08.08 | 1Year        |
| Geodetic GNSS Receiver       | ROHDE&SCHWARZ | ESR          | 2.28 SP1         | 1316.3003K03-102082-Wa | 2024.08.08 | 1Year        |
| Geodetic GNSS Receiver       | R&S           | ESCI         | 4.42 SP1         | 101165                 | 2024.08.08 | 1Year        |
| Bilog Antenna                | Schwarzbeck   | VULB 9168    | /                | VULB 9168#627          | 2023.08.28 | 2Year        |
| Horn Antenna                 | SCHWARZBECK   | BBHA 9120 D  | /                | 2106                   | 2023.08.19 | 2Year        |
| Loop Antenna                 | SCHWARZBECK   | FMZB 1519B   | /                | 00128                  | 2023.08.19 | 2Year        |
| RF Cable                     | Resenberger   | Cable 1      | /                | RE1                    | 2024.08.08 | 1Year        |
| RF Cable                     | Resenberger   | Cable 2      | /                | RE2                    | 2024.08.08 | 1Year        |
| RF Cable                     | Resenberger   | Cable 3      | /                | CE1                    | 2024.08.08 | 1Year        |
| Pre-amplifier                | HP            | HP8347A      | /                | 2834A00455             | 2024.08.08 | 1Year        |
| Pre-amplifier                | Agilent       | 8449B        | /                | 3008A02664             | 2024.08.08 | 1Year        |
| L.I.S.N.#1                   | Schwarzbeck   | NSLK8126     | /                | 8126-466               | 2024.08.08 | 1Year        |
| L.I.S.N.#2                   | ROHDE&SCHWARZ | ENV216       | /                | 101043                 | 2024.08.08 | 1Year        |
| Horn Antenna                 | SCHWARZBECK   | BBHA 9170    | /                | 00946                  | 2023.08.19 | 2Year        |
| Preamplifier                 | SKET          | LNPA_1840-50 | /                | SK2018101801           | 2024.08.08 | 1 Year       |
| Power Meter                  | Agilent       | E9300A       | /                | MY41496628             | 2024.08.08 | 1 Year       |
| Power Sensor                 | DARE          | RPR3006W     | /                | 15100041SNO91          | 2024.08.08 | 1 Year       |
| Electronic Thermo-Hygrometer | S.H.Qixiang   | HTC-1        | /                | N/A                    | 2024.08.11 | 1 Year       |
| Switching Mode Power Supply  | JUNKE         | JK12010S     | /                | 20140927-6             | 2024.08.08 | 1 Year       |
| Adjustable attenuator        | MWRFTest      | N/A          | /                | N/A                    | N/A        | N/A          |
| 10dB Attenuator              | Mini-Circuits | DC-6G        | /                | N/A                    | N/A        | N/A          |

| Software Information |               |              |           |
|----------------------|---------------|--------------|-----------|
| Test Item            | Software Name | Manufacturer | Version   |
| RE                   | EZ-EMC        | EZ           | Alpha-3A1 |
| CE                   | EZ-EMC        | EZ           | Alpha-3A1 |

## 4 System test configuration

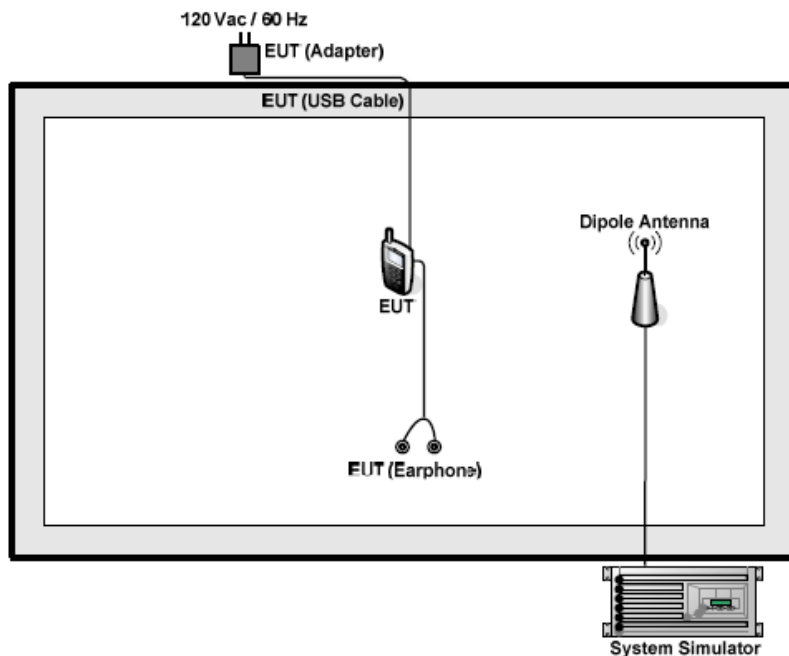
### 4.1 Test mode

During all testing, EUT is in link mode with base station emulator at maximum power level. The spurious emission measurements were carried out in semi-anechoic chamber with 3-meter test range, and EUT is rotated on three test planes to find out the worst emission.

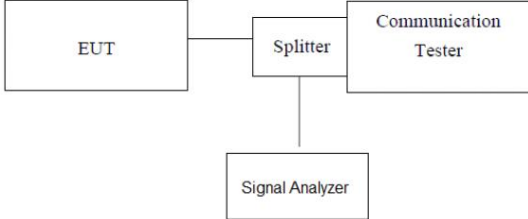
| Test modes           |                                                                                                                                          |                                                                                                                                          |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| Band                 | Radiated                                                                                                                                 | Conducted                                                                                                                                |
| <b>GSM 850</b>       | <input type="checkbox"/> GSM link<br><input checked="" type="checkbox"/> GPRS 1 link<br><input checked="" type="checkbox"/> EPRS 1 link  | <input type="checkbox"/> GSM link<br><input checked="" type="checkbox"/> GPRS 1 link<br><input checked="" type="checkbox"/> EGPRS 1 link |
| <b>PCS 1900</b>      | <input type="checkbox"/> GSM link<br><input checked="" type="checkbox"/> GPRS 1 link<br><input checked="" type="checkbox"/> EGPRS 1 link | <input type="checkbox"/> GSM link<br><input checked="" type="checkbox"/> GPRS 1 link<br><input checked="" type="checkbox"/> EGPRS 1 link |
| <b>WCDMA II</b>      | <input checked="" type="checkbox"/> RMC 12.2Kbps link                                                                                    | <input checked="" type="checkbox"/> RMC 12.2Kbps link                                                                                    |
| <b>WCDMA Band IV</b> | <input checked="" type="checkbox"/> RMC 12.2Kbps link                                                                                    | <input checked="" type="checkbox"/> RMC 12.2Kbps link                                                                                    |
| <b>WCDMA Band V</b>  | <input checked="" type="checkbox"/> RMC 12.2Kbps link                                                                                    | <input checked="" type="checkbox"/> RMC 12.2Kbps link                                                                                    |

Note: The maximum power levels are GSM mode for GMSK link, GPRS multi-slot class 8 mode for GMSK link, EGPRS multi-slot class 8 mode for 8PSK link, RMC12.2Kbps mode for WCDMA Band V/II. only these modes were used for all tests.

### 4.2 Configuration of Tested System



### 4.3 Conducted AV Output Power

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Requirement: | FCC part22.913(a) and FCC part24.232(b), FCC part 27.50 (d)(4)                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Test Method:      | FCC part2.1046                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Limit:            | GSM850, WCDMA Band V: 7W(38.45dbm)<br>PCS1900, WCDMA Band II: 2W(33.01dbm)<br>WCDMA Band IV: 1W(30.00dbm)                                                                                                                                                                                                                                                                                                                                                                                            |
| Test setup:       |  <pre> graph LR     EUT[EUT] --- Splitter[Splitter]     Splitter --- CT[Communication Tester]     Splitter --- SA[Signal Analyzer] </pre> <p><i>Note: Measurement setup for testing on Antenna connector</i></p>                                                                                                                                                                                                   |
| Test Procedure:   | <ol style="list-style-type: none"> <li>1. The transmitter output port was connected to base station.</li> <li>2. The RF output of EUT was connected to the Signal Analyzer by RF cable and attenuator, the path loss was compensated to the results for each measurement.</li> <li>3. Set EUT at maximum power through base station.</li> <li>4. Select lowest, middle, and highest channels for each band and different modulation.</li> <li>5. Measure the maximum burst average power.</li> </ol> |
| Test Instruments: | Refer to section 3 for details                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Test mode:        | Refer to section 4.1 for details                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Test results:     | Pass                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

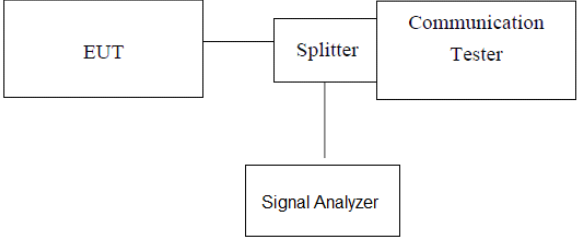
## Measurement Data

| Conducted Burst Power (dBm) |              |        |        |         |         |              |
|-----------------------------|--------------|--------|--------|---------|---------|--------------|
| Band                        | GSM850       |        |        | PCS1900 |         |              |
| Channel                     | 128          | 190    | 251    | 512     | 661     | 810          |
| Frequency                   | 824.20       | 836.60 | 848.80 | 1850.20 | 1880.00 | 1909.80      |
| GPRS (GMSK, 1 TX slot)      | <b>32.77</b> | 32.51  | 32.07  | 31.83   | 32.73   | <b>32.85</b> |
| GPRS (GMSK, 2 TX slot)      | 31.46        | 30.62  | 32.24  | 30.47   | 30.78   | 30.68        |
| GPRS (GMSK, 3 TX slot)      | 30.15        | 30.90  | 31.07  | 30.61   | 29.63   | 30.78        |
| GPRS (GMSK, 4 TX slot)      | 30.27        | 28.71  | 29.05  | 28.43   | 29.96   | 29.87        |
| EGPRS (8PSK, 1 TX slot)     | 31.82        | 32.69  | 32.41  | 31.71   | 32.81   | 32.26        |
| EGPRS (8PSK, 2 TX slot)     | 31.11        | 30.61  | 30.53  | 30.37   | 30.50   | 31.15        |
| EGPRS (8PSK, 3 TX slot)     | 31.22        | 30.12  | 30.28  | 29.41   | 30.27   | 29.74        |
| EGPRS (8PSK, 4 TX slot)     | 28.61        | 30.27  | 28.94  | 28.48   | 28.95   | 30.14        |

| Burst Average Power (dBm) |               |        |        |              |       |              |
|---------------------------|---------------|--------|--------|--------------|-------|--------------|
| Band                      | WCDMA Band II |        |        | WCDMA Band V |       |              |
| Channel                   | 9262          | 9400   | 9538   | 4132         | 4183  | 4233         |
| Frequency                 | 1852.4        | 1880.0 | 1907.6 | 826.4        | 836.6 | 846.6        |
| RMC 12.2Kbps              | <b>24.54</b>  | 23.77  | 24.20  | 24.06        | 23.51 | <b>24.74</b> |
| HSDPA Subtest-1           | 23.96         | 23.55  | 24.18  | 24.08        | 23.37 | 23.88        |
| HSDPA Subtest-2           | 23.67         | 23.30  | 22.65  | 23.28        | 23.50 | 22.29        |
| HSDPA Subtest-3           | 22.43         | 22.12  | 21.76  | 22.11        | 23.24 | 23.60        |
| HSDPA Subtest-4           | 21.35         | 22.21  | 22.85  | 22.22        | 21.77 | 22.07        |
| HSUPA Subtest-1           | 23.84         | 24.46  | 24.16  | 23.67        | 24.36 | 23.64        |
| HSUPA Subtest-2           | 23.95         | 24.19  | 24.13  | 23.52        | 23.48 | 23.24        |
| HSUPA Subtest-3           | 23.04         | 23.47  | 22.45  | 23.00        | 22.47 | 22.34        |
| HSUPA Subtest-4           | 23.38         | 23.34  | 21.98  | 22.15        | 22.55 | 22.82        |
| HSUPA Subtest-5           | 21.77         | 21.55  | 21.40  | 22.65        | 21.88 | 21.93        |

| Burst Average Power (dBm) |               |              |        |
|---------------------------|---------------|--------------|--------|
| Band                      | WCDMA Band IV |              |        |
| Channel                   | 1312          | 1450         | 1513   |
| Frequency                 | 1712.4        | 1740.0       | 1752.6 |
| RMC 12.2Kbps              | 22.99         | <b>24.02</b> | 23.21  |
| HSDPA Subtest-1           | 22.12         | 22.72        | 21.83  |
| HSDPA Subtest-2           | 22.62         | 21.46        | 22.95  |
| HSDPA Subtest-3           | 20.89         | 22.40        | 21.90  |
| HSDPA Subtest-4           | 21.28         | 21.71        | 21.02  |
| HSUPA Subtest-1           | 23.02         | 23.87        | 22.97  |
| HSUPA Subtest-2           | 22.33         | 22.65        | 22.33  |
| HSUPA Subtest-3           | 21.87         | 22.36        | 21.66  |
| HSUPA Subtest-4           | 22.16         | 22.26        | 22.40  |
| HSUPA Subtest-5           | 21.18         | 20.28        | 21.59  |

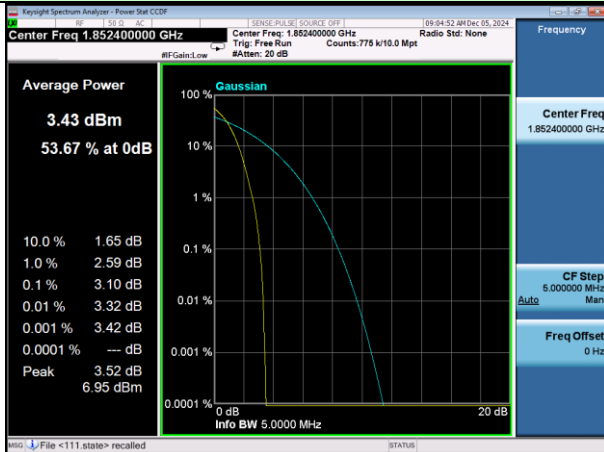
#### 4.4 Peak-to-Average Ratio

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Requirement: | Part 22.913(d), FCC part24.232(d), FCC part27.50(d)(5)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Test Method:      | FCC part2.1046                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Limit:            | 13db                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Test setup:       |  <p><i>Note: Measurement setup for testing on Antenna connector</i></p>                                                                                                                                                                                                                                                                                                                                                                                                        |
| Test Procedure:   | <ol style="list-style-type: none"> <li>1. The transmitter output port was connected to base station.</li> <li>2. The RF output of EUT was connected to the Signal Analyzer by RF cable and attenuator, the path loss was compensated to the results for each measurement.</li> <li>3. Set EUT at maximum power through base station.</li> <li>4. Select lowest, middle, and highest channels for each band and different modulation.</li> <li>5. Measure the maximum burst average power.</li> <li>6. Record the maximum peak-to-average ratio value.</li> </ol> |
| Test Instruments: | Refer to section 3 for details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Test mode:        | Refer to section 4.1 for details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Test results:     | Pass                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

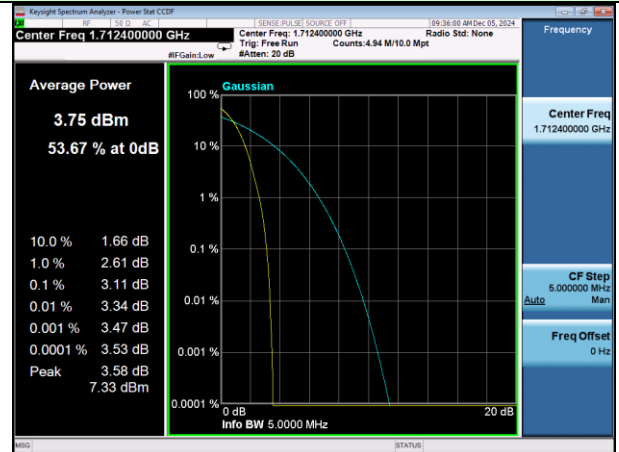
#### Measurement data

| Test mode     | Peak to Average Ratio<br>(dB) |               |             | Limit<br>(dB) | Result |
|---------------|-------------------------------|---------------|-------------|---------------|--------|
|               | Low Ch.                       | Middle<br>Ch. | High<br>Ch. |               |        |
| WCDMA Band II | 3.10                          | 3.15          | 3.15        | 13            | PASS   |
| WCDMA Band IV | 3.11                          | 3.13          | 3.16        | 13            | PASS   |
| WCDMA Band V  | 3.17                          | 3.17          | 3.13        | 13            | PASS   |

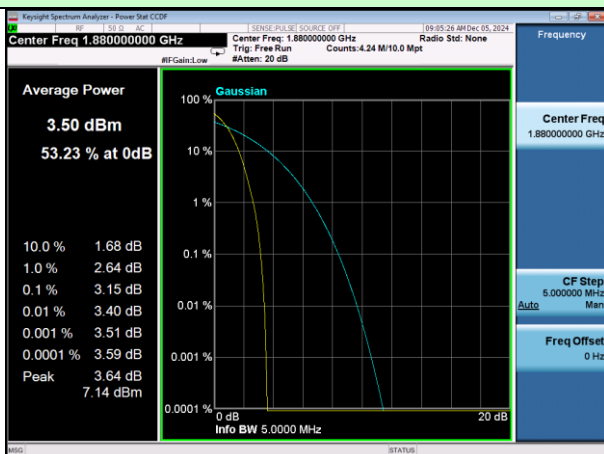
### Test Mode: WCDMA Band II Low Ch.



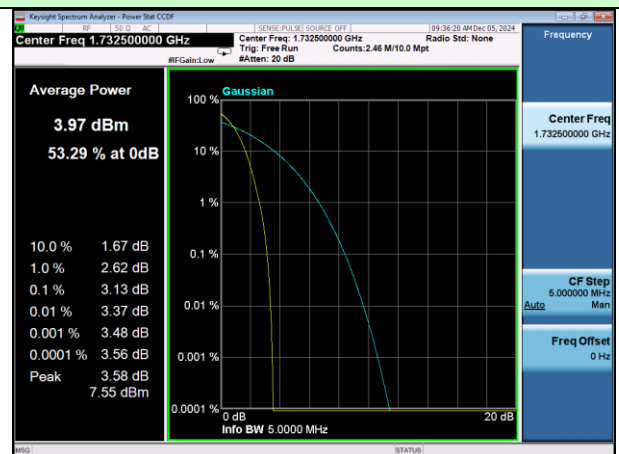
### Test Mode: WCDMA Band IV Low Ch.



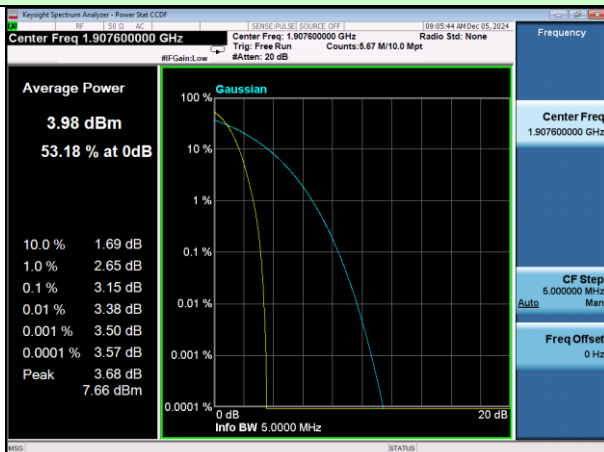
### Middle Ch.



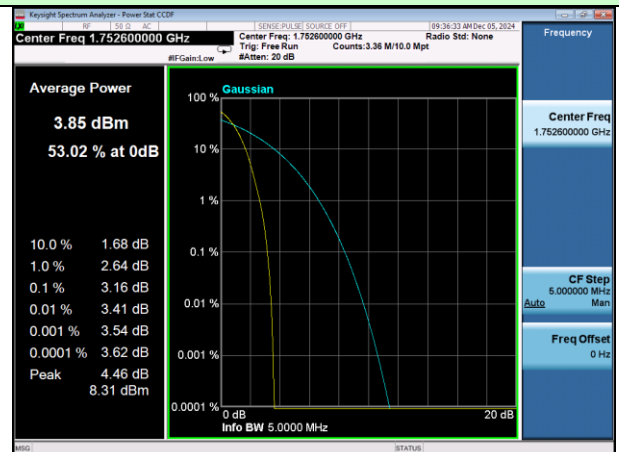
### Middle Ch.

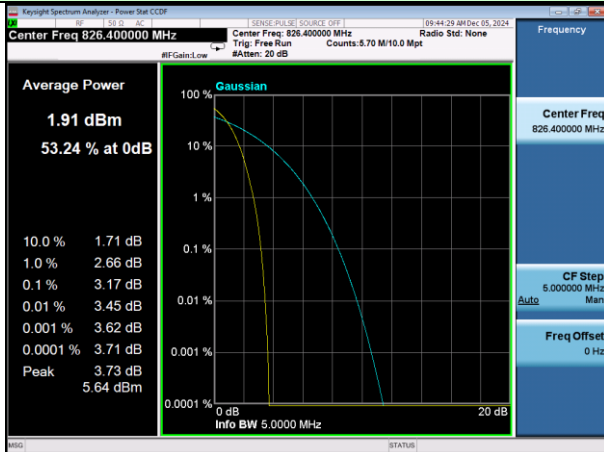
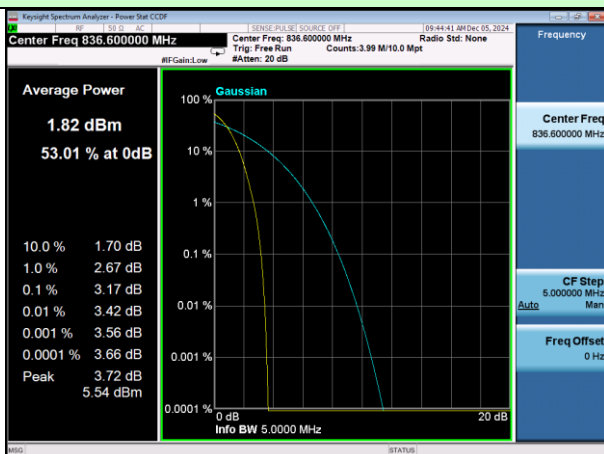
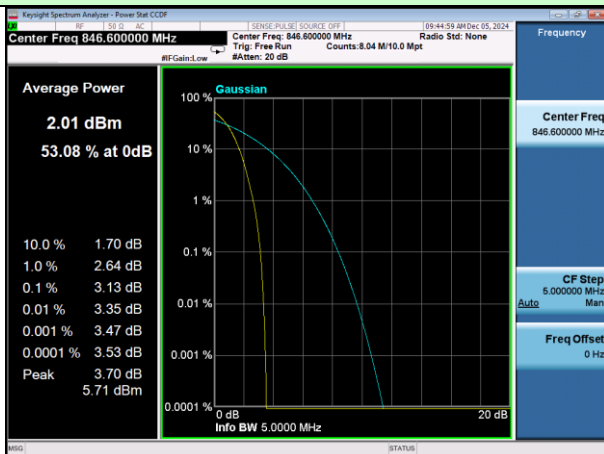


### High Ch.

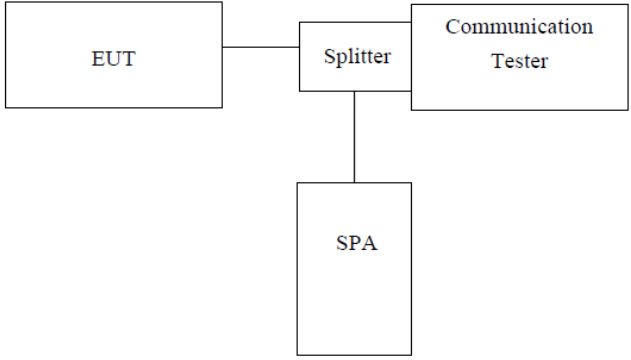


### High Ch.



**Test Mode: WCDMA Band V  
Low Ch.****Middle Ch.****High Ch.**

#### 4.5 Occupy Bandwidth

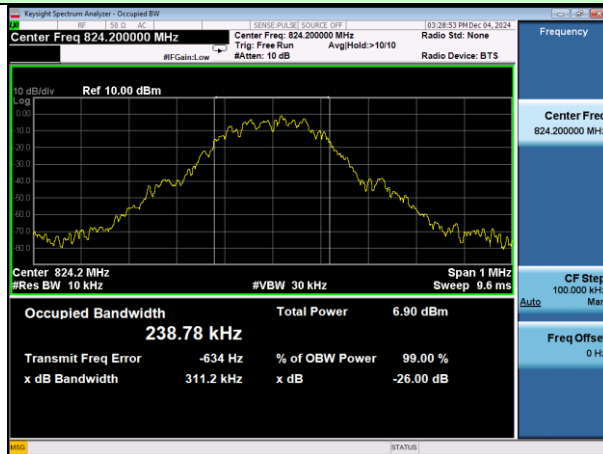
|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Requirement: | FCC part22.913(a) and FCC part24.232(b), FCC part27.53(h)                                                                                                                                                                                                                                                                                                                                                                                              |
| Test Method:      | FCC part2.1049                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Test setup:       |  <pre> graph LR     EUT[EUT] --- Splitter[Splitter]     Splitter --- CT[Communication Tester]     Splitter --- SPA[SPA] </pre> <p><i>Note: Measurement setup for testing on Antenna connector</i></p>                                                                                                                                                                |
| Test Procedure:   | <ol style="list-style-type: none"> <li>1. The EUT's output RF connector was connected with a short cable to the spectrum analyzer</li> <li>2. RBW was set to about 1% of emission BW, VBW= 3 times RBW.</li> <li>3. -26dBc Geodetic GNSS Receiver line was placed on the screen (or 99% bandwidth), the occupied bandwidth is the delta frequency between the two points where the Geodetic GNSS Receiver line intersects the signal trace.</li> </ol> |
| Test Instruments: | Refer to section 3 for details                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Test mode:        | Refer to section 4.1 for details                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Test results:     | Pass                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

## Measurement Data

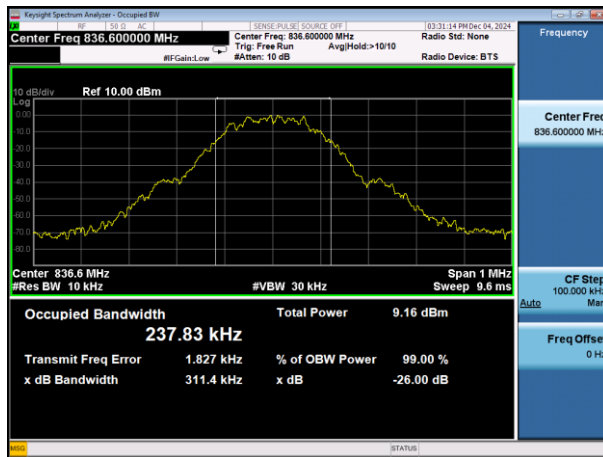
| EUT Mode                             | Channel | Frequency (MHz) | 99% Occupy bandwidth (KHz) | -26dB bandwidth (KHz) |
|--------------------------------------|---------|-----------------|----------------------------|-----------------------|
| GSM 850<br>(GPRS 1 link)             | 128     | 824.20          | 243.51                     | 313.6                 |
|                                      | 190     | 836.60          | 240.42                     | 314.4                 |
|                                      | 251     | 848.80          | 239.57                     | 316.3                 |
| GSM 850<br>(EGPRS 1 link)            | 128     | 824.20          | 238.78                     | 311.2                 |
|                                      | 190     | 836.60          | 237.83                     | 311.4                 |
|                                      | 251     | 848.80          | 243.45                     | 316.4                 |
| PCS 1900<br>(GPRS 1 link)            | 512     | 1850.20         | 235.07                     | 295                   |
|                                      | 661     | 1880.00         | 242.72                     | 316.8                 |
|                                      | 810     | 1909.80         | 236.76                     | 310.8                 |
| PCS 1900<br>(EGPRS 1 link)           | 512     | 1850.20         | 239.83                     | 310.6                 |
|                                      | 661     | 1880.00         | 236.66                     | 307.9                 |
|                                      | 810     | 1909.80         | 238.43                     | 305.9                 |
| WCDMA Band V<br>(RMC 12.2Kbps link)  | 4132    | 826.40          | 4135                       | 4721                  |
|                                      | 4183    | 836.60          | 4131.3                     | 4718                  |
|                                      | 4233    | 846.60          | 4128.9                     | 4698                  |
| WCDMA Band II<br>(RMC 12.2Kbps link) | 9262    | 1852.4          | 4129.9                     | 4706                  |
|                                      | 9400    | 1880.0          | 4133.5                     | 4739                  |
|                                      | 9538    | 1907.6          | 4143.4                     | 4719                  |
| WCDMA Band IV<br>(RMC 12.2Kbps link) | 1312    | 1712.4          | 4128.6                     | 4703                  |
|                                      | 1450    | 1740.0          | 4148.8                     | 4734                  |
|                                      | 1513    | 1752.6          | 4148.5                     | 4706                  |

Test plot as follows:

### GSM 850 (EGPRS 1 link)



Lowest channel



Middle channel

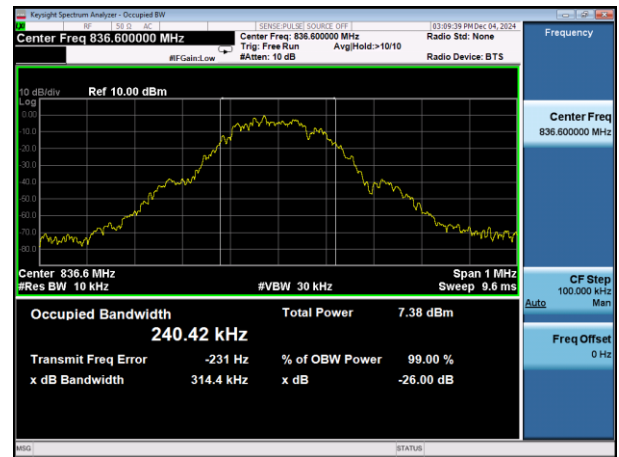


Highest channel

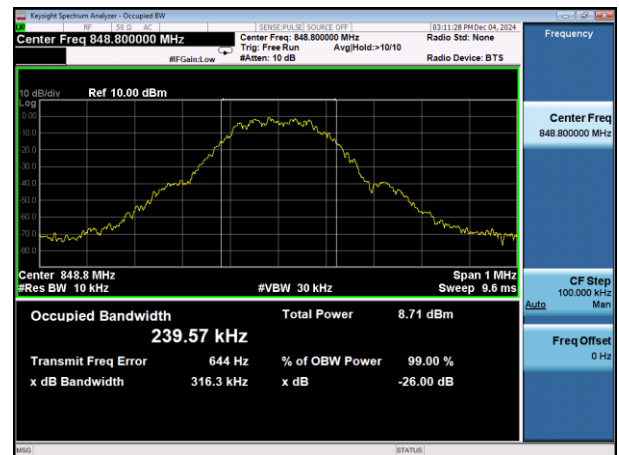
### GSM 850 (GPRS 1 link)



Lowest channel



Middle channel

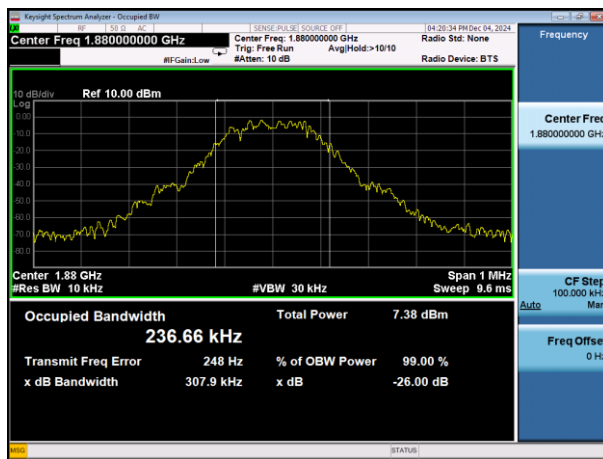


Highest channel

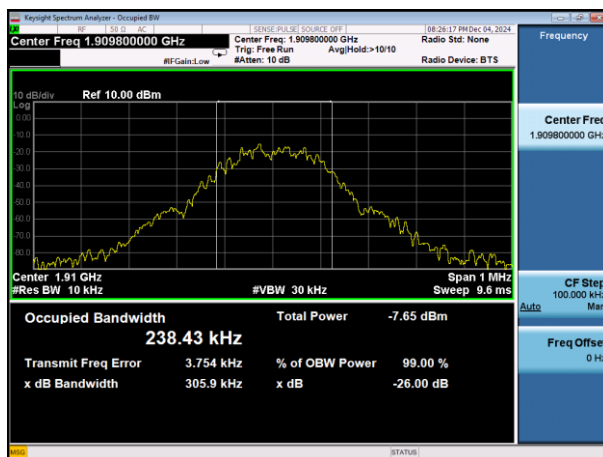
## PCS 1900 (EGPRS 1 link)



Lowest channel



Middle channel

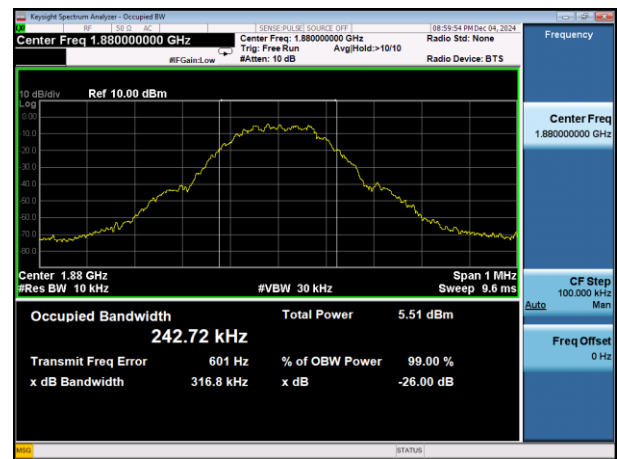


Highest channel

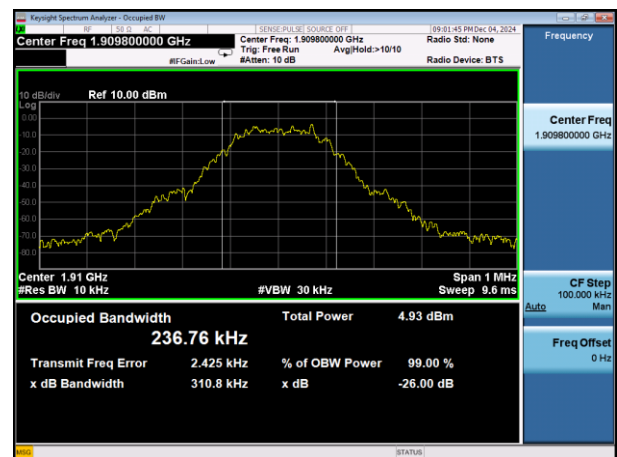
## PCS 1900 (GPRS 1 link)



Lowest channel



Middle channel



Highest channel

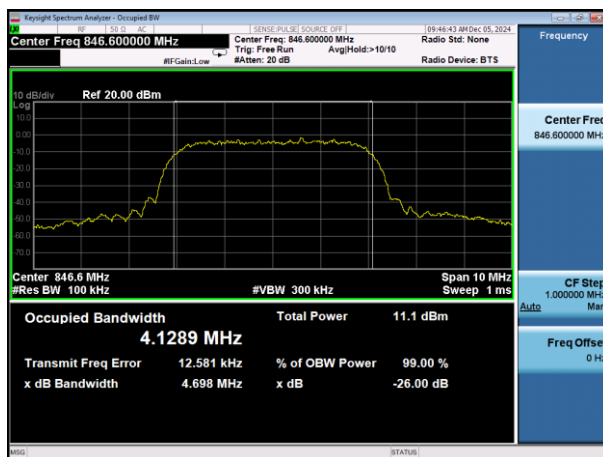
## WCDMA Band V (RMC 12.2Kbps link)



Lowest channel

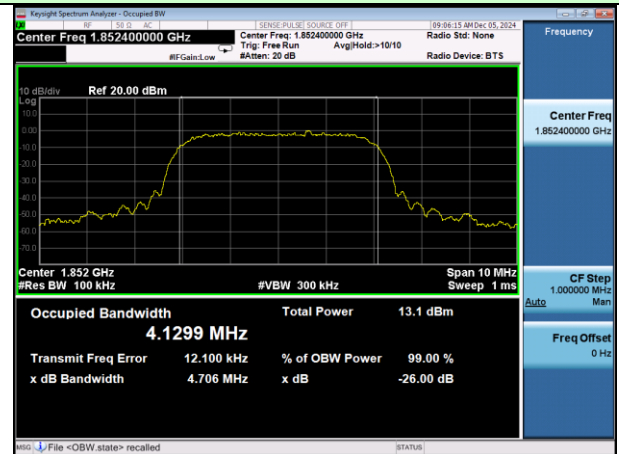


Middle channel

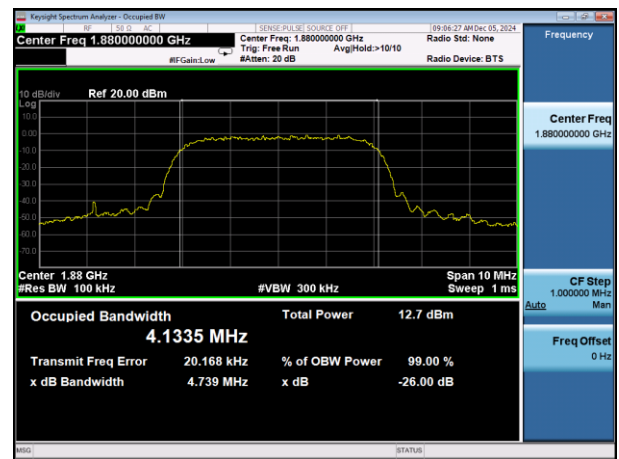


Highest channel

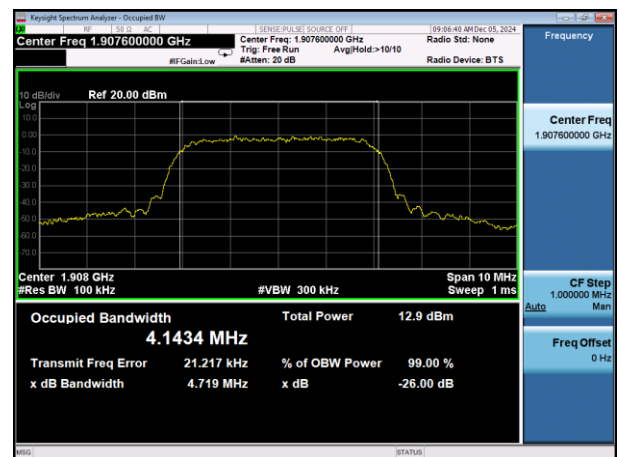
## WCDMA Band II (RMC 12.2Kbps link)



Lowest channel



Middle channel

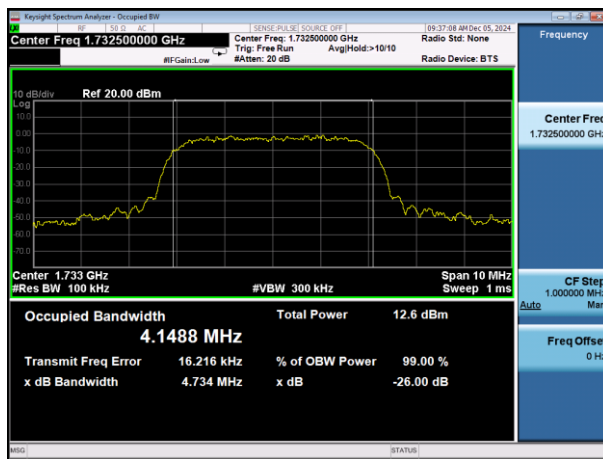


Highest channel

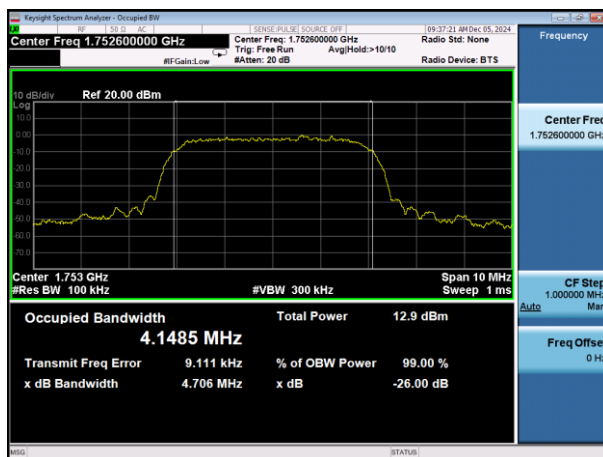
## WCDMA Band IV (RMC 12.2Kbps link)



Lowest channel



Middle channel

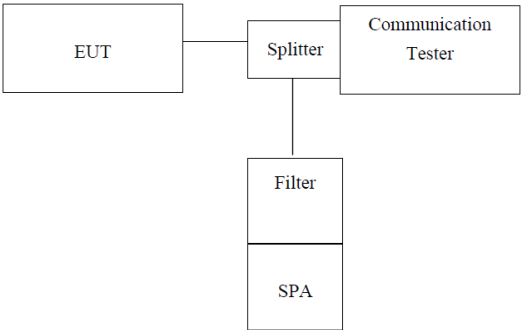


Highest channel

#### 4.6 MODULATION CHARACTERISTIC

According to FCC § 2.1047(d), Part 22H & 24E & 27C, there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

#### 4.7 Out of band emission at antenna terminals

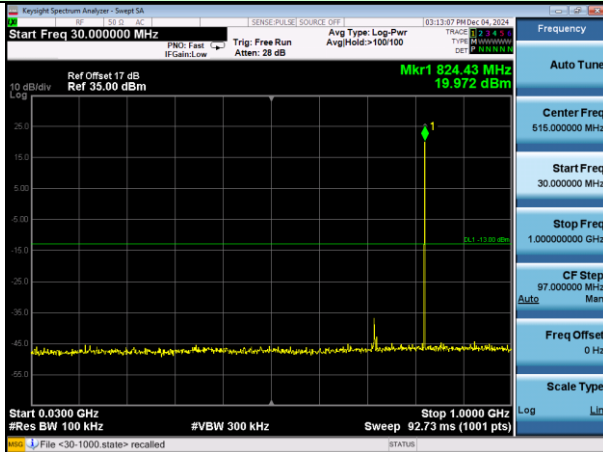
|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Requirement: | FCC part22.917(a) and FCC part24.238(a), FCC part27.53(h)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Test Method:      | FCC part2.1051                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Limit:            | -13dBm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Test setup:       |  <p><i>Note: Measurement setup for testing on Antenna connector</i></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Test Procedure:   | <ol style="list-style-type: none"> <li>1 The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation.</li> <li>2 The resolution bandwidth of the spectrum analyzer was set at 1MHz, sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic.</li> <li>3 For the out of band: Set the RBW, VBW = 1MHz, Start=30MHz, Stop= 10th harmonic.</li> <li>4 Band Edge Requirements: In the 1 MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to measure the out of band Emissions.</li> </ol> |
| Test Instruments: | Refer to section 3 for details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Test mode:        | Refer to section 4.1 for details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Test results:     | Pass                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

Test plot as follows:

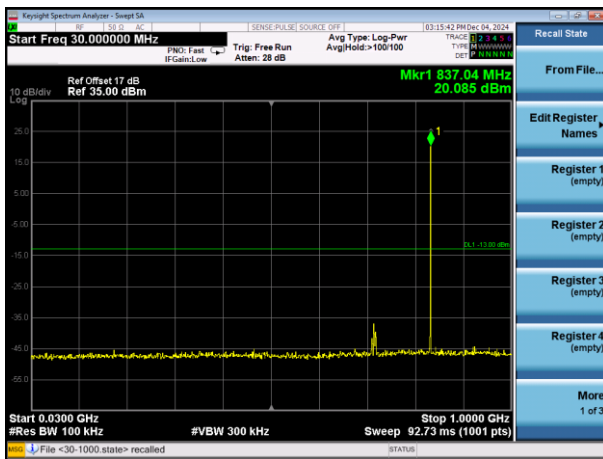
Note: During the conducted spurious emission test, a band filter was used. The information of the filter is reported at section 6.0 (refer to item 24, 25).

## Test Mode: Traffic mode

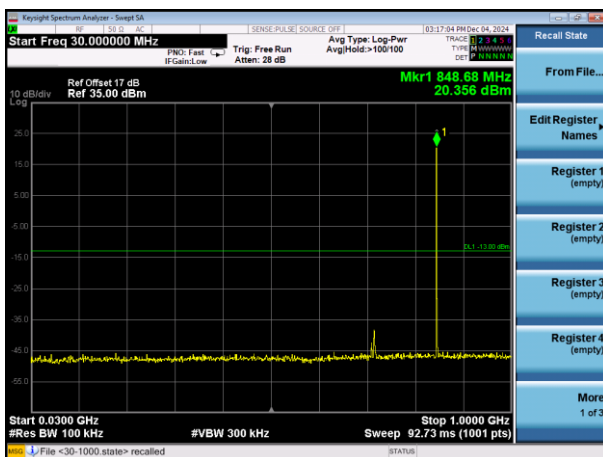
## GSM 850 (GPRS 1 link)



## Lowest channel



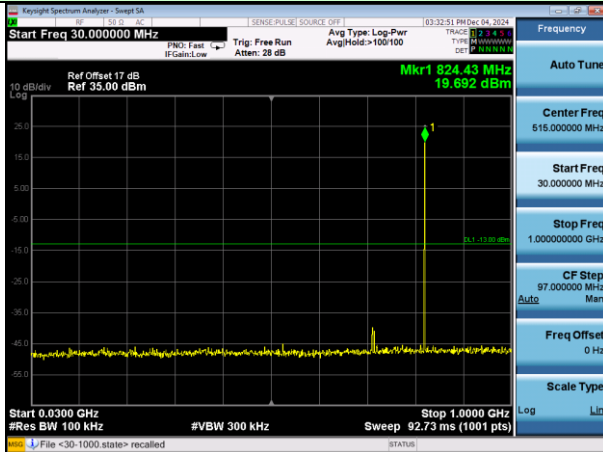
## Middle channel



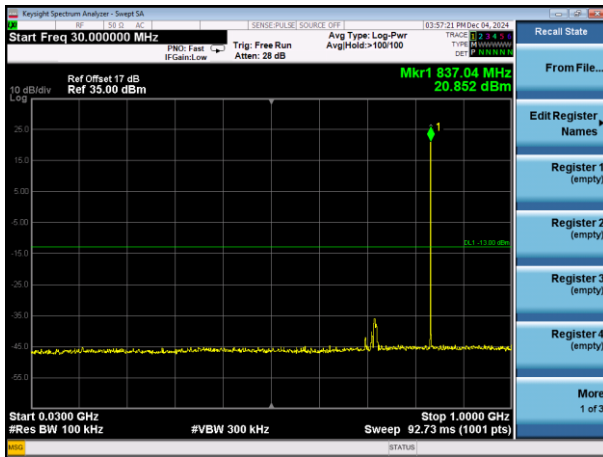
## Highest channel

## Test Mode: Traffic mode

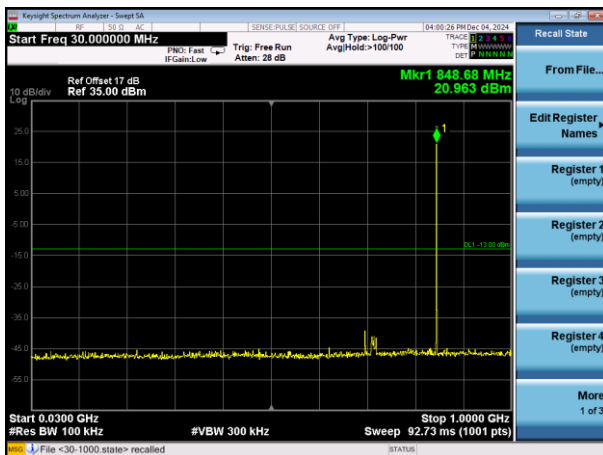
## GSM 850 (EGPRS 1 link)



## Lowest channel



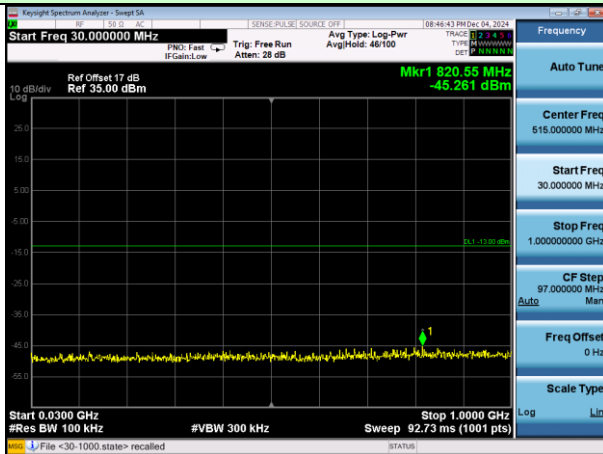
## Middle channel



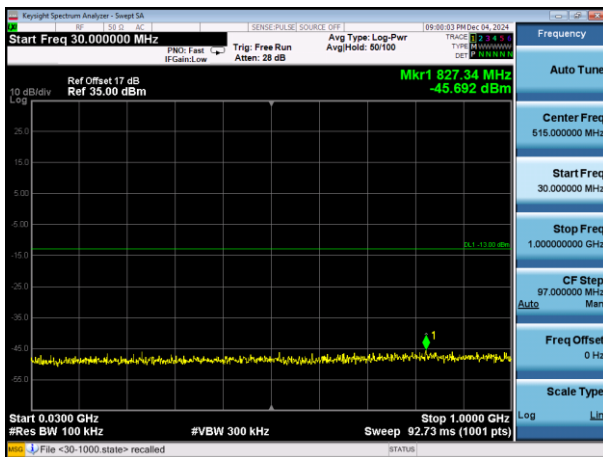
## Highest channel

## Test Mode: Traffic mode

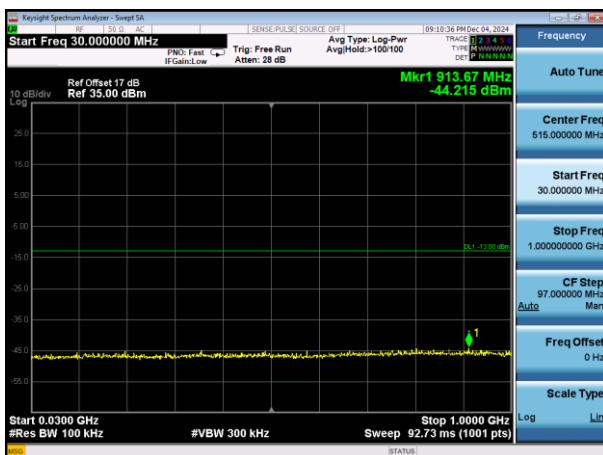
## PCS1900 (GPRS 1 link)



Lowest channel



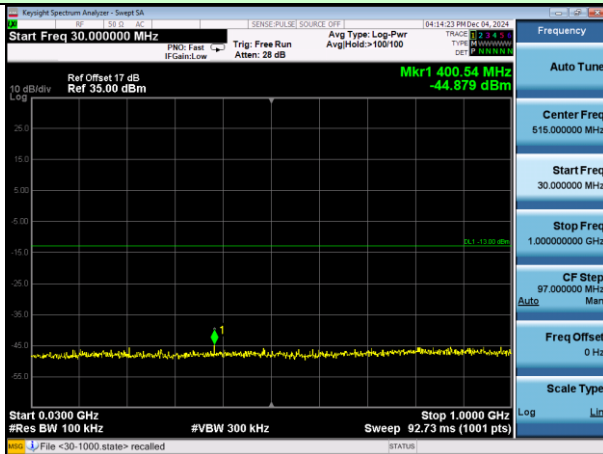
Middle channel



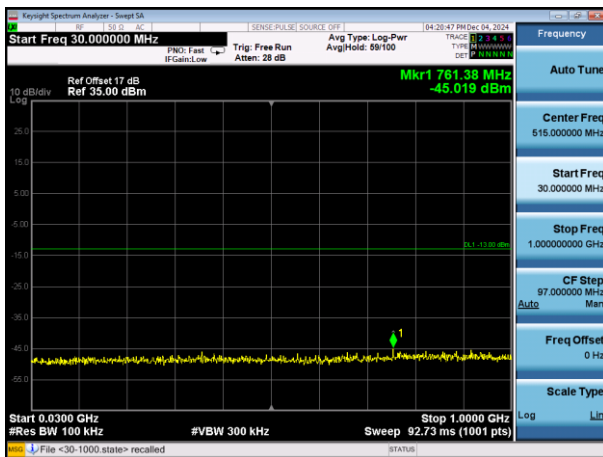
Highest channel

## Test Mode: Traffic mode

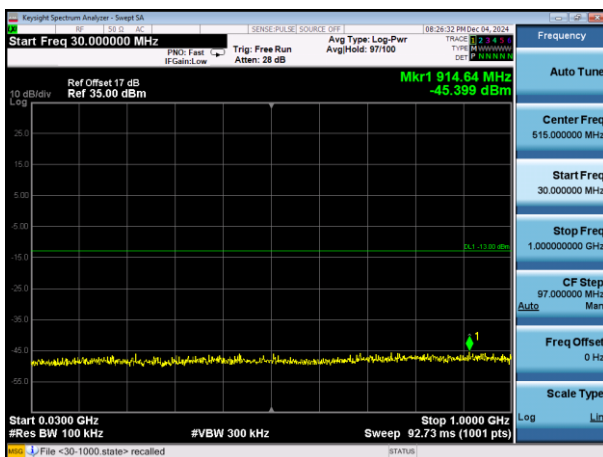
## PCS1900 (EGPRS 1 link)



## Lowest channel



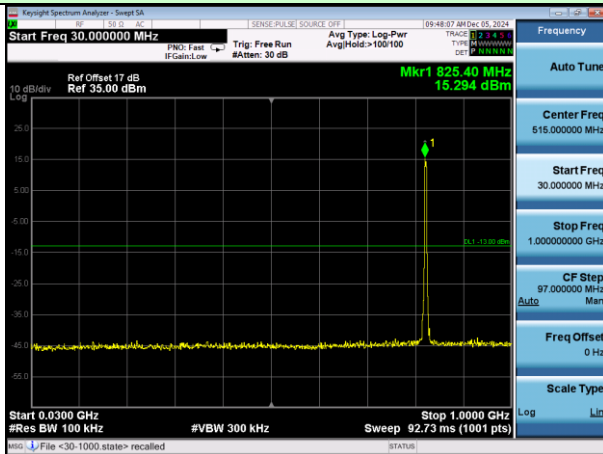
## Middle channel



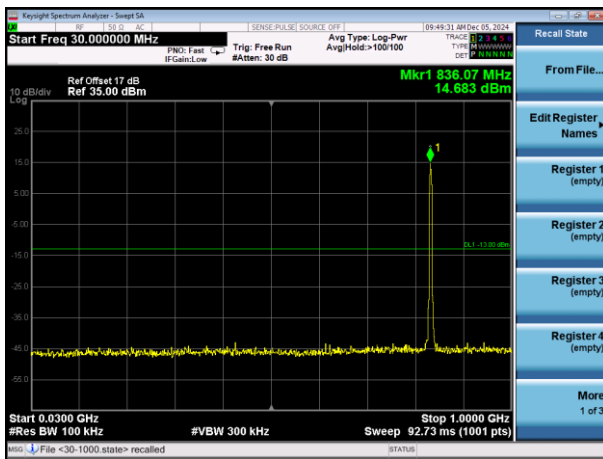
## Highest channel

## Test Mode: Traffic mode

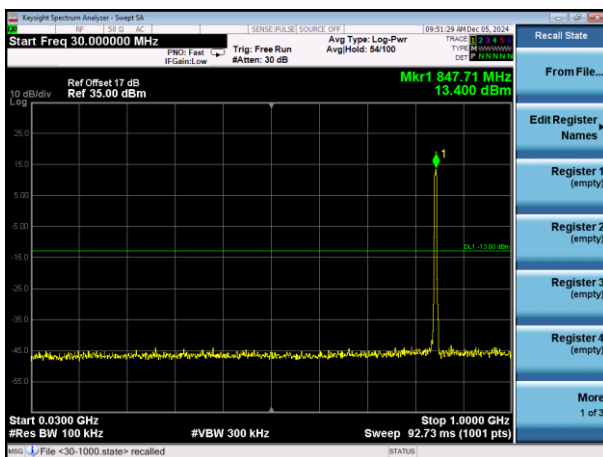
## WCDMA Band V (RMC 12.2Kbps link)



## Lowest channel



## Middle channel



## Highest channel