



# **FCC TEST REPORT**

**FCC ID: SY4-B01015**

**On Behalf of**

**Shanghai Huace Navigation Technology Ltd.**

**Handheld GNSS Data Collector**

**Model No.: HCE600**

Prepared for : Shanghai Huace Navigation Technology Ltd.

Address : Building D, 599 Gaojing Road, Qingpu District,  
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 : A2108332-C01-R08

Date of Receipt : September 7, 2021

Date of Test : September 8, 2021- October 9, 2021

Date of Report : October 11, 2021

Version Number : V0

## Contents

Page

|          |                                                        |           |
|----------|--------------------------------------------------------|-----------|
| <b>1</b> | <b>TEST SUMMARY .....</b>                              | <b>5</b>  |
| <b>2</b> | <b>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         |
| <b>3</b> | <b>TEST INSTRUMENTS LIST .....</b>                     | <b>9</b>  |
| <b>4</b> | <b>SYSTEM TEST CONFIGURATION .....</b>                 | <b>10</b> |
| 4.1      | TEST MODE .....                                        | 10        |
| 4.2      | CONFIGURATION OF TESTED SYSTEM .....                   | 12        |
| 4.3      | CONDUCTED PEAK OUTPUT POWER .....                      | 13        |
| 4.4      | PEAK-TO-AVERAGE RATIO .....                            | 15        |
| 4.5      | OCCUPY BANDWIDTH .....                                 | 16        |
| 4.6      | MODULATION CHARACTERISTIC .....                        | 23        |
| 4.7      | OUT OF BAND EMISSION AT ANTENNA TERMINALS .....        | 23        |
| 4.8      | ERP, EIRP MEASUREMENT .....                            | 36        |
| 4.9      | FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT ..... | 47        |
| 4.10     | FREQUENCY STABILITY V.S. TEMPERATURE MEASUREMENT ..... | 54        |
| 4.11     | FREQUENCY STABILITY V.S. VOLTAGE MEASUREMENT .....     | 58        |
| <b>5</b> | <b>TEST SETUP PHOTO .....</b>                          | <b>62</b> |
| <b>6</b> | <b>EUT CONSTRUCTIONAL DETAILS .....</b>                | <b>63</b> |

## TEST REPORT DECLARATION

Applicant : Shanghai Huace Navigation Technology Ltd.  
Address : Building D, 599 Gaojing Road, Qingpu District, Shanghai, China  
Manufacturer : Shanghai Huace Navigation Technology Ltd.  
Address : Building D, 599 Gaojing Road, Qingpu District, Shanghai, China  
EUT Description : Handheld GNSS Data Collector  
(A) Model No. : HCE600  
(B) Trademark : 

Measurement Standard Used:

FCC CFR Title 47 Part 2

FCC CFR Title 47 Part22 Subpart H

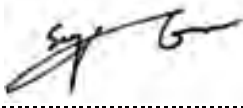
FCC CFR Title 47 Part24 Subpart E

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).....: Lucas Pang  
Project Engineer 

Approved by (name + signature).....: Simple Guan  
Project Manager 

Date of issue.....: October 11, 2021

**Revision History**

| Revision | Issue Date       | Revisions              | Revised By |
|----------|------------------|------------------------|------------|
| V0       | October 11, 2021 | Initial released Issue | Lucas Pang |

## 1 Test Summary

| Test Item                              | Section in CFR 47                                    | Result                                |
|----------------------------------------|------------------------------------------------------|---------------------------------------|
| RF Exposure (SAR)                      | Part 1.1307<br>Part 2.1093                           | Pass*<br>(Please refer to SAR Report) |
| RF Output Power                        | Part 2.1046<br>Part 22.913 (a)(2)<br>Part 24.232 (c) | Pass                                  |
| Peak-to-Average Ratio                  | Part 2.1046<br>Part 24.232 (d)                       | Pass                                  |
| Modulation Characteristics             | Part 2.1047                                          | Pass                                  |
| 99% & -26 dB Occupied Bandwidth        | Part 2.1049<br>Part 22.917<br>Part 24.238            | Pass                                  |
| Spurious Emissions at Antenna Terminal | Part 2.1051<br>Part 22.917 (a)<br>Part 24.238 (a)    | Pass                                  |
| Field Strength of Spurious Radiation   | Part 2.1053<br>Part 22.917 (a)<br>Part 24.238 (a)    | Pass                                  |
| Out of band emission, Band Edge        | Part 22.917 (a)<br>Part 24.238 (a)                   | Pass                                  |
| Frequency stability vs. temperature    | Part 2.1055(a)(1)(b)                                 | Pass                                  |
| Frequency stability vs. voltage        | Part 2.1055(d)(1)(2)                                 | Pass                                  |

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

## 2 General Information

### 2.1 General Description of EUT

|                       |                                                                                                                                                                                                                                                                                                         |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description/PMN       | : Handheld GNSS Data Collector                                                                                                                                                                                                                                                                          |
| Model Number/HVIN(s)  | : HCE600                                                                                                                                                                                                                                                                                                |
| Diff                  | : /                                                                                                                                                                                                                                                                                                     |
| Trademark             | :                                                                                                                                                                                                                      |
| Test Voltage          | : DC 3.85V from battery, DC 5V from adapter                                                                                                                                                                                                                                                             |
| Support Networks      | : GSM, 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            | : 12                                                                                                                                                                                                                                                                                                    |
| EGPRS Class           | : 12                                                                                                                                                                                                                                                                                                    |
| Modulation type       | : GPRS: GMSK<br>EGPRS: GMSK/8PSK<br>WCDMA Band II/IV/V: QPSK                                                                                                                                                                                                                                            |
| Antenna type          | : Internal antenna                                                                                                                                                                                                                                                                                      |
| Antenna gain          | : Internal Antenna, Maximum Gain is 0.2dBi for GSM 850<br>Internal Antenna, Maximum Gain is 0.8dBi for PCS1900<br>Internal Antenna, Maximum Gain is 0.2dBi for WCDMA Band V<br>Internal Antenna, Maximum Gain is 0.8dBi for WCDMA Band IV<br>Internal Antenna, Maximum Gain is 0.8dBi for WCDMA Band II |
| Software version      | : Android 10                                                                                                                                                                                                                                                                                            |
| Hardware version/FVIN | : 3.0                                                                                                                                                                                                                                                                                                   |

Remark: 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         |

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 22 subpart H and Part 24 subpart E of the FCC CFR 47 Rules.

**2.3 Test Methodology**

Both conducted and radiated testing were performed according to the procedures document on TIA/EIA 603 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 25, 2017 Certificated by IC  
Registration Number: CN0085

### 3 Test Instruments list

| Equipment                   | Manufacture   | Model No.        | Serial No.             | Last cal.  | Cal Interval |
|-----------------------------|---------------|------------------|------------------------|------------|--------------|
| 9*6*6 anechoic chamber      | CHENYU        | 9*6*6            | N/A                    | 2020.09.02 | 3Year        |
| Spectrum analyzer           | ROHDE&SCHWARZ | FSV40-N          | 102137                 | 2021.08.25 | 1Year        |
| Spectrum analyzer           | Agilent       | N9020A           | MY499100060            | 2021.08.25 | 1Year        |
| Receiver                    | ROHDE&SCHWARZ | ESR              | 1316.3003K03-102082-Wa | 2021.08.25 | 1Year        |
| Receiver                    | R&S           | ESCI             | 101165                 | 2021.08.25 | 1Year        |
| Bilog Antenna               | Schwarzbeck   | VULB 9168        | VULB9168-438           | 2020.04.12 | 2Year        |
| Horn Antenna                | SCHWARZBECK   | BBHA 9120 D      | BBHA 9120 D(1201)      | 2020.04.12 | 2Year        |
| Active Loop Antenna         | SCHWARZBECK   | FMZB 1519B       | 00059                  | 2021.08.30 | 2Year        |
| RF Cable                    | Resenberger   | Cable 1          | RE1                    | 2021.08.25 | 1Year        |
| RF Cable                    | Resenberger   | Cable 2          | RE2                    | 2021.08.25 | 1Year        |
| RF Cable                    | Resenberger   | Cable 3          | CE1                    | 2021.08.25 | 1Year        |
| Pre-amplifier               | HP            | HP8347A          | 2834A00455             | 2021.08.25 | 1Year        |
| Pre-amplifier               | Agilent       | 8449B            | 3008A02664             | 2021.08.25 | 1Year        |
| L.I.S.N.#1                  | Schwarzbeck   | NSLK8126         | 8126-466               | 2021.08.25 | 1Year        |
| L.I.S.N.#2                  | ROHDE&SCHWARZ | ENV216           | 101043                 | 2021.08.25 | 1 Year       |
| Horn Antenna                | SCHWARZBECK   | BBHA9170         | 00946                  | 2021.08.30 | 2 Year       |
| Preamplifier                | SKET          | LNPA_1840-50     | SK2018101801           | 2021.08.25 | 1 Year       |
| Power Meter                 | Agilent       | E9300A           | MY41496628             | 2021.08.25 | 1 Year       |
| Power Sensor                | DARE          | RPR3006W         | 15100041SNO91          | 2021.08.25 | 1 Year       |
| Temp. & Humid. Chamber      | Wei Huang     | WHTH-1000-40-880 | 100631                 | 2021.04.21 | 1 Year       |
| Switching Mode Power Supply | JUNKE         | JK12010S         | 20140927-6             | 2021.08.25 | 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          |

## 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>       | <ul style="list-style-type: none"> <li>■ GSM link</li> <li>■ GPRS 1 link</li> <li>■ EPRS 1 link</li> </ul>  | <ul style="list-style-type: none"> <li>■ GSM link</li> <li>■ GPRS 1 link</li> <li>■ EGPRS 1 link</li> </ul> |
| <b>PCS 1900</b>      | <ul style="list-style-type: none"> <li>■ GSM link</li> <li>■ GPRS 1 link</li> <li>■ EGPRS 1 link</li> </ul> | <ul style="list-style-type: none"> <li>■ GSM link</li> <li>■ GPRS 1 link</li> <li>■ EGPRS 1 link</li> </ul> |
| <b>WCDMA II</b>      | <ul style="list-style-type: none"> <li>■ RMC 12.2Kbps link</li> </ul>                                       | <ul style="list-style-type: none"> <li>■ RMC 12.2Kbps link</li> </ul>                                       |
| <b>WCDMA Band IV</b> | <ul style="list-style-type: none"> <li>■ RMC 12.2Kbps link</li> </ul>                                       | <ul style="list-style-type: none"> <li>■ RMC 12.2Kbps link</li> </ul>                                       |
| <b>WCDMA Band V</b>  | <ul style="list-style-type: none"> <li>■ RMC 12.2Kbps link</li> </ul>                                       | <ul style="list-style-type: none"> <li>■ RMC 12.2Kbps link</li> </ul>                                       |

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.

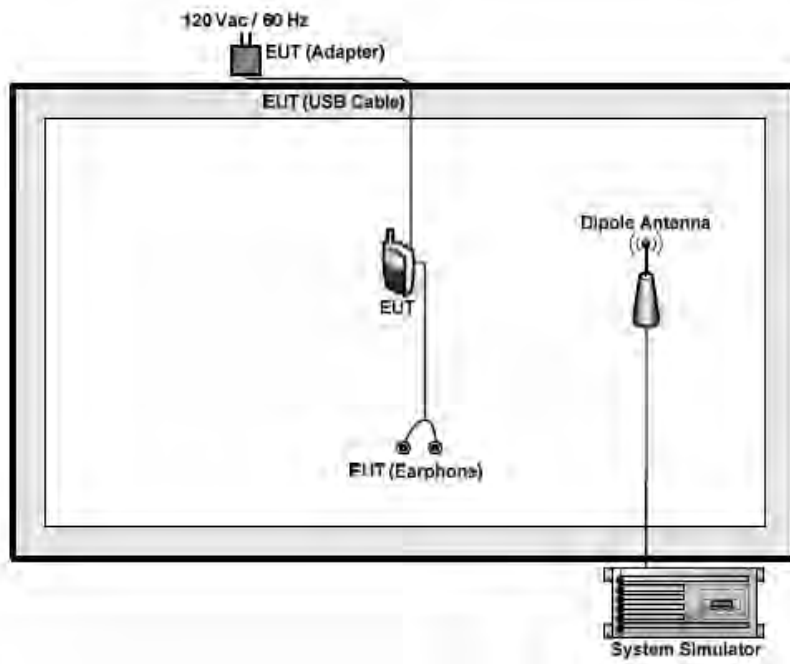
The conducted power tables are as follows:

| Conducted 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 |
| GSM (GMSK, 1 TX slot)   | 32.77  | 32.95  | 32.55  | 29.04   | 28.26   | 29.84   |
| GPRS (GMSK, 1 TX slot)  | 32.89  | 33.06  | 32.43  | 29.15   | 28.89   | 28.32   |
| GPRS (GMSK, 2 TX slot)  | 32.10  | 31.98  | 31.75  | 29.07   | 27.72   | 27.65   |
| GPRS (GMSK, 3 TX slot)  | 29.75  | 29.71  | 30.49  | 27.23   | 26.47   | 25.70   |
| GPRS (GMSK, 4 TX slot)  | 27.97  | 28.99  | 28.91  | 25.76   | 25.35   | 25.51   |
| EGPRS (8PSK, 1 TX slot) | 30.28  | 29.95  | 30.19  | 27.57   | 26.38   | 25.91   |
| EGPRS (8PSK, 2 TX slot) | 29.66  | 29.81  | 29.33  | 25.95   | 25.92   | 25.80   |
| EGPRS (8PSK, 3 TX slot) | 27.82  | 27.48  | 27.44  | 24.37   | 23.14   | 22.55   |
| EGPRS (8PSK, 4 TX slot) | 27.43  | 26.50  | 26.44  | 22.64   | 22.85   | 22.28   |

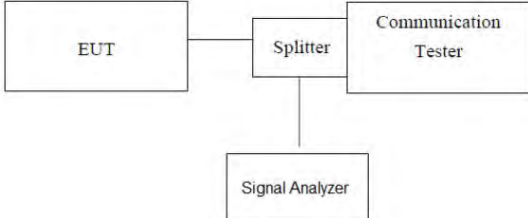
| Conducted Power (dBm) |               |        |        |              |       |       |
|-----------------------|---------------|--------|--------|--------------|-------|-------|
| Band                  | WCDMA Band II |        |        | WCDMA Band V |       |       |
| Channel               | 9262          | 9400   | 9538   | 4132         | 4183  | 4233  |
| Frequency             | 1852.4        | 1880.0 | 1907.6 | 826.4        | 836.6 | 846.6 |
| RMC 12.2Kbps          | 19.94         | 20.23  | 19.74  | 22.75        | 22.28 | 22.85 |
| HSDPA Subtest-1       | 19.93         | 20.37  | 20.38  | 21.45        | 21.62 | 22.00 |
| HSDPA Subtest-2       | 19.96         | 20.46  | 20.06  | 21.64        | 21.16 | 21.90 |
| HSDPA Subtest-3       | 20.19         | 19.79  | 19.57  | 21.70        | 21.84 | 21.66 |
| HSDPA Subtest-4       | 19.79         | 20.19  | 19.98  | 22.19        | 21.97 | 21.66 |
| HSUPA Subtest-1       | 20.32         | 19.89  | 19.48  | 21.66        | 21.58 | 21.74 |
| HSUPA Subtest-2       | 20.16         | 20.41  | 19.67  | 22.22        | 21.09 | 21.57 |
| HSUPA Subtest-3       | 20.34         | 19.89  | 19.56  | 22.03        | 21.48 | 21.64 |
| HSUPA Subtest-4       | 20.40         | 19.88  | 19.70  | 22.11        | 21.33 | 21.55 |
| HSUPA Subtest-5       | 20.26         | 20.65  | 19.86  | 21.80        | 21.42 | 21.36 |
| AMR                   | 20.05         | 20.19  | 19.61  | 22.02        | 21.52 | 22.08 |

| Conducted Power (dBm) |               |        |        |
|-----------------------|---------------|--------|--------|
| Band                  | WCDMA Band IV |        |        |
| Channel               | 1312          | 1450   | 1513   |
| Frequency             | 1712.4        | 1740.0 | 1752.6 |
| RMC 12.2Kbps          | 23.04         | 22.56  | 22.76  |
| HSDPA Subtest-1       | 21.89         | 20.92  | 21.12  |
| HSDPA Subtest-2       | 21.67         | 20.76  | 20.96  |
| HSDPA Subtest-3       | 22.74         | 22.45  | 22.65  |
| HSDPA Subtest-4       | 22.08         | 21.70  | 21.90  |
| HSUPA Subtest-1       | 21.62         | 20.50  | 20.70  |
| HSUPA Subtest-2       | 22.20         | 21.19  | 21.39  |
| HSUPA Subtest-3       | 22.60         | 21.61  | 21.81  |
| HSUPA Subtest-4       | 22.33         | 21.49  | 21.69  |
| HSUPA Subtest-5       | 22.28         | 21.96  | 22.16  |
| AMR                   | 21.91         | 21.57  | 21.77  |

## 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<br>PCS1900, WCDMA Band II: 2W<br>WCDMA Band IV: 1W                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 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> </ol> |
| Test Instruments: | Refer to section 5.0 for details                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Test mode:        | Refer to section 6.1 for details                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Test results:     | Pass                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

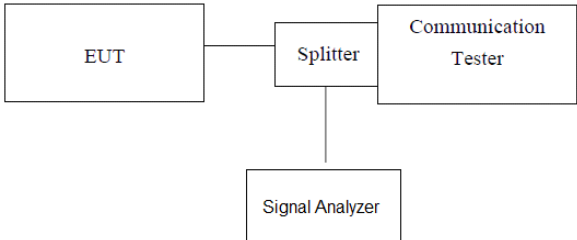
## Measurement Data

| 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      |
| GSM (GMSK, 1 TX slot)       | 32.17  | 31.28  | <b>32.66</b> | 29.99   | 29.83        | <b>30.28</b> |
| GPRS (GMSK, 1 TX slot)      | 31.46  | 30.47  | <b>32.60</b> | 28.59   | 27.95        | <b>29.61</b> |
| GPRS (GMSK, 2 TX slot)      | 30.55  | 30.72  | 30.24        | 26.81   | 27.85        | 28.63        |
| GPRS (GMSK, 3 TX slot)      | 28.50  | 30.75  | 28.69        | 26.66   | 26.89        | 28.32        |
| GPRS (GMSK, 4 TX slot)      | 28.55  | 30.17  | 28.27        | 23.45   | 24.41        | 25.12        |
| EGPRS (8PSK, 1 TX slot)     | 27.04  | 26.17  | <b>27.54</b> | 27.06   | <b>27.11</b> | 27.01        |
| EGPRS (8PSK, 2 TX slot)     | 24.19  | 23.45  | 23.94        | 24.93   | 23.64        | 23.69        |
| EGPRS (8PSK, 3 TX slot)     | 23.67  | 26.11  | 22.93        | 24.00   | 23.49        | 23.22        |
| EGPRS (8PSK, 4 TX slot)     | 23.26  | 23.25  | 23.54        | 23.28   | 22.74        | 23.49        |

| 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              | 23.09         | <b>23.20</b> | 23.17  | 22.91        | <b>24.91</b> | 22.07 |
| HSDPA Subtest-1           | 22.63         | 22.76        | 22.68  | 20.67        | 21.22        | 21.08 |
| HSDPA Subtest-2           | 22.33         | 22.45        | 22.40  | 21.96        | 22.74        | 22.22 |
| HSDPA Subtest-3           | 22.27         | 22.40        | 22.34  | 21.03        | 22.85        | 22.22 |
| HSDPA Subtest-4           | 22.21         | 22.38        | 22.33  | 21.78        | 21.59        | 20.94 |
| HSUPA Subtest-1           | 21.97         | 22.10        | 22.00  | 21.08        | 21.45        | 22.34 |
| HSUPA Subtest-2           | 21.87         | 22.00        | 21.92  | 20.78        | 24.34        | 22.35 |
| HSUPA Subtest-3           | 21.82         | 21.63        | 21.60  | 22.29        | 23.39        | 22.45 |
| HSUPA Subtest-4           | 21.43         | 21.57        | 21.48  | 23.26        | 22.74        | 21.52 |
| HSUPA Subtest-5           | 21.34         | 21.41        | 21.39  | 22.19        | 21.73        | 22.96 |

| Burst Average Power (dBm) |               |              |        |
|---------------------------|---------------|--------------|--------|
| Band                      | WCDMA Band IV |              |        |
| Channel                   | 1312          | 1450         | 1513   |
| Frequency                 | 1712.4        | 1740.0       | 1752.6 |
| RMC 12.2Kbps              | 23.45         | <b>23.56</b> | 23.53  |
| HSDPA Subtest-1           | 22.99         | 23.12        | 23.04  |
| HSDPA Subtest-2           | 22.69         | 22.81        | 22.76  |
| HSDPA Subtest-3           | 22.63         | 22.76        | 22.70  |
| HSDPA Subtest-4           | 22.57         | 22.74        | 22.69  |
| HSUPA Subtest-1           | 22.33         | 22.46        | 22.36  |
| HSUPA Subtest-2           | 22.23         | 22.36        | 22.28  |
| HSUPA Subtest-3           | 22.18         | 21.99        | 21.96  |
| HSUPA Subtest-4           | 21.79         | 21.93        | 21.84  |
| HSUPA Subtest-5           | 21.70         | 21.77        | 21.75  |

#### 4.4 Peak-to-Average Ratio

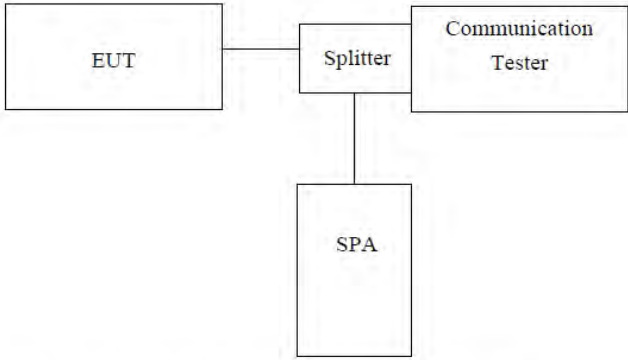
|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Requirement: | FCC part24.232(d)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 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 5.0 for details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Test mode:        | Refer to section 6.1 for details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Test results:     | Pass                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

#### Measurement data

| Test mode       | Peak to Average Ratio<br>(dB) |            |          | Limit<br>(dB) | Result |
|-----------------|-------------------------------|------------|----------|---------------|--------|
|                 | Low Ch.                       | Middle Ch. | High Ch. |               |        |
| GSM/TM1/GSM850  | 9.85                          | 9.37       | 9.14     | 13            | PASS   |
| GSM/TM1/GSM1900 | 9.26                          | 9.76       | 9.09     | 13            | PASS   |

| Test mode     | Peak to Average Ratio<br>( dB ) |            |          | Limit<br>( dB ) | Result |
|---------------|---------------------------------|------------|----------|-----------------|--------|
|               | Low Ch.                         | Middle Ch. | High Ch. |                 |        |
| WCDMA Band II | 3.04                            | 3.06       | 3.00     | 13              | PASS   |
| WCDMA Band IV | 2.99                            | 3.06       | 3.01     |                 |        |
| WCDMA Band V  | 2.91                            | 2.78       | 2.80     |                 |        |

#### 4.5 Occupy Bandwidth

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Requirement: | FCC part22.913(a) and FCC part24.232(b)                                                                                                                                                                                                                                                                                                                                                                                  |
| Test Method:      | FCC part2.1049                                                                                                                                                                                                                                                                                                                                                                                                           |
| 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 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 display line was placed on the screen (or 99% bandwidth), the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace.</li> </ol> |
| Test Instruments: | Refer to section 5.0 for details                                                                                                                                                                                                                                                                                                                                                                                         |
| Test mode:        | Refer to section 6.1 for details                                                                                                                                                                                                                                                                                                                                                                                         |
| Test results:     | Pass                                                                                                                                                                                                                                                                                                                                                                                                                     |

## Measurement Data

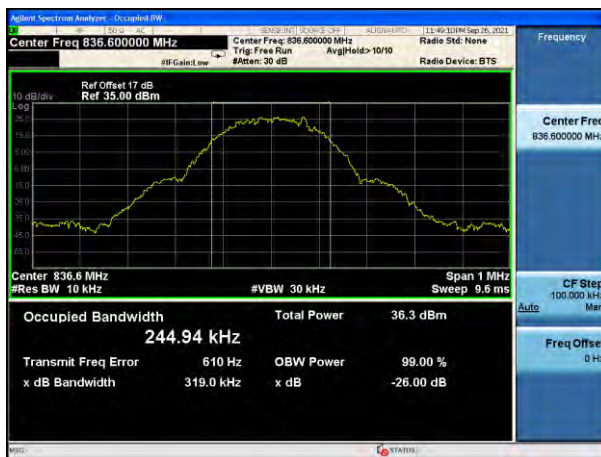
| EUT Mode                             | Channel | Frequency (MHz) | 99% Occupy bandwidth (KHz) | -26dB bandwidth (KHz) |
|--------------------------------------|---------|-----------------|----------------------------|-----------------------|
| GSM 850<br>(GSM link)                | 128     | 824.20          | 246.88                     | 316.6                 |
|                                      | 190     | 836.60          | 244.94                     | 319.0                 |
|                                      | 251     | 848.80          | 248.44                     | 322.1                 |
| GSM 850<br>(GPRS 1 link)             | 128     | 824.20          | 236.09                     | 321.4                 |
|                                      | 190     | 836.60          | 238.52                     | 325.3                 |
|                                      | 251     | 848.80          | 237.42                     | 322.3                 |
| GSM 850<br>(EGPRS 1 link)            | 128     | 824.20          | 244.07                     | 316.9                 |
|                                      | 190     | 836.60          | 240.11                     | 319.2                 |
|                                      | 251     | 848.80          | 236.48                     | 312.7                 |
| PCS 1900<br>(GSM link)               | 512     | 1850.20         | 248.37                     | 318.2                 |
|                                      | 661     | 1880.00         | 245.61                     | 317.1                 |
|                                      | 810     | 1909.80         | 243.34                     | 316.6                 |
| PCS 1900<br>(GPRS 1 link)            | 512     | 1850.20         | 237.99                     | 313.3                 |
|                                      | 661     | 1880.00         | 237.38                     | 326.6                 |
|                                      | 810     | 1909.80         | 237.20                     | 319.5                 |
| PCS 1900<br>(EGPRS 1 link)           | 512     | 1850.20         | 238.35                     | 318.0                 |
|                                      | 661     | 1880.00         | 246.53                     | 320.3                 |
|                                      | 810     | 1909.80         | 241.32                     | 307.8                 |
| WCDMA Band V<br>(RMC 12.2Kbps link)  | 4132    | 826.40          | 4169.6                     | 4712.0                |
|                                      | 4183    | 836.60          | 4171.4                     | 4723.0                |
|                                      | 4233    | 846.60          | 4176.5                     | 4727.0                |
| WCDMA Band II<br>(RMC 12.2Kbps link) | 9262    | 1852.4          | 4173.5                     | 4721.0                |
|                                      | 9400    | 1880.0          | 4178.1                     | 4746.0                |
|                                      | 9538    | 1907.6          | 4161.2                     | 4710.0                |
| WCDMA Band IV<br>(RMC 12.2Kbps link) | 1312    | 1712.4          | 4170.6                     | 4709.0                |
|                                      | 1450    | 1740.0          | 4189.2                     | 4723.0                |
|                                      | 1513    | 1752.6          | 4166.5                     | 4704.0                |

Test plot as follows:

GSM 850 (GSM link)



Lowest channel



Middle channel



Highest channel

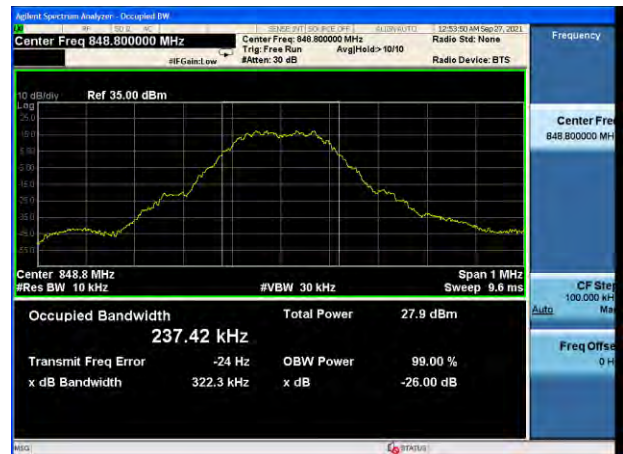
GSM 850 (GPRS 1 link)



Lowest channel



Middle channel



Highest channel

## GSM 850 (EGPRS 1 link)



Lowest channel

## PCS 1900 (GSM link)



Lowest channel



Middle channel



Middle channel



Highest channel



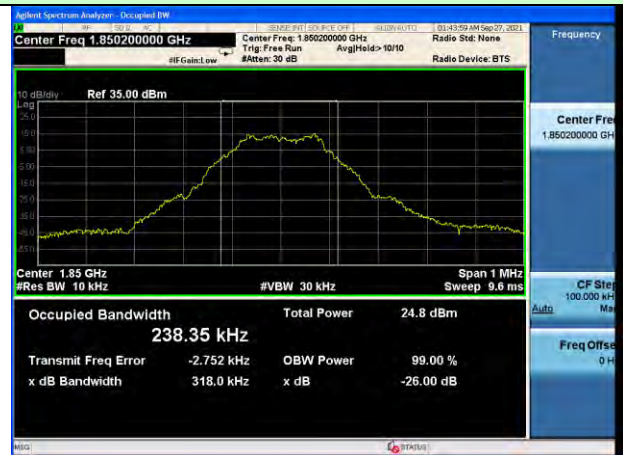
Highest channel

## PCS 1900 (GPRS 1 link)



Lowest channel

## PCS 1900 (EGPRS 1 link)



Lowest channel



Middle channel



Middle channel



Highest channel



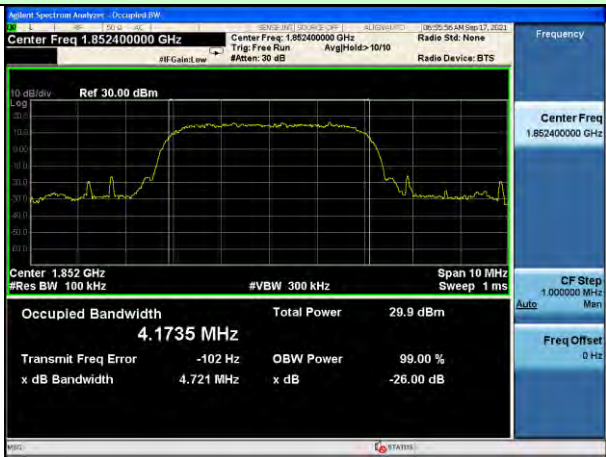
Highest channel

WCDMA Band V (RMC 12.2Kbps link)



Lowest channel

WCDMA Band II (RMC 12.2Kbps link)



Lowest channel



Middle channel



Middle channel



Highest channel



Highest channel

WCDMA Band IV (RMC 12.2Kbps link)



Lowest channel



Middle channel

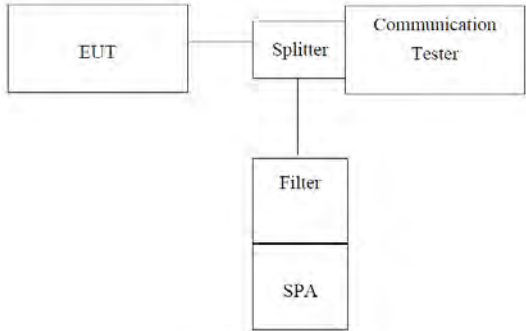


Highest channel

#### 4.6 MODULATION CHARACTERISTIC

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

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

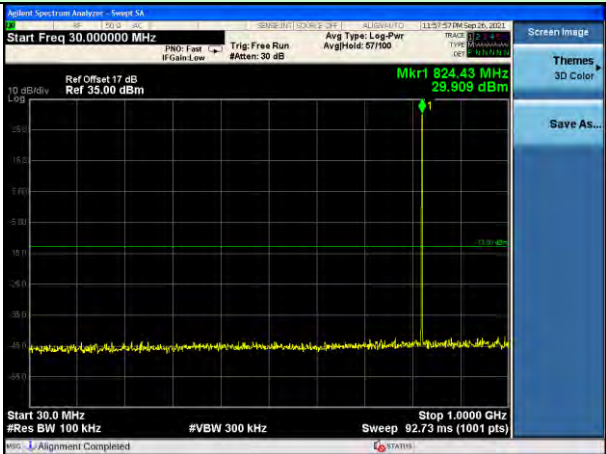
|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Requirement: | FCC part22.917(a) and FCC part24.238(a)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 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 5.0 for details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Test mode:        | Refer to section 6.1 for details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Test results:     | Pass                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

Test plot as follows:

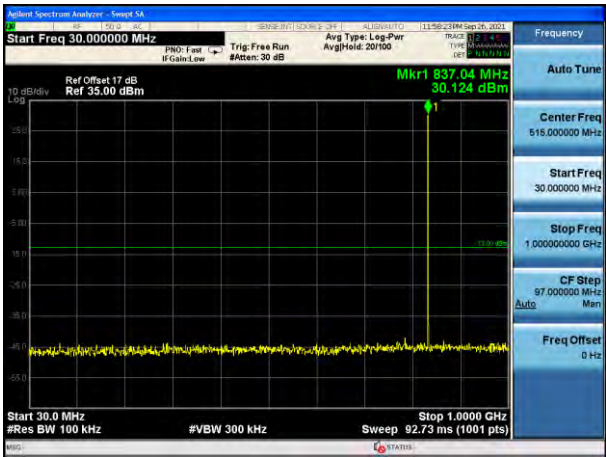
Note: During the conducted spurious emission test, a band filter was used. The information of the filter is reported at section 6.0 (refer to item 24, 25).

Test Mode: Traffic mode

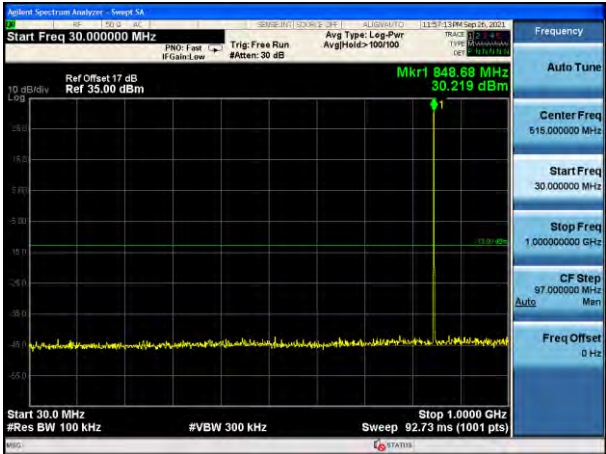
GSM 850 (GSM link)



Lowest channel



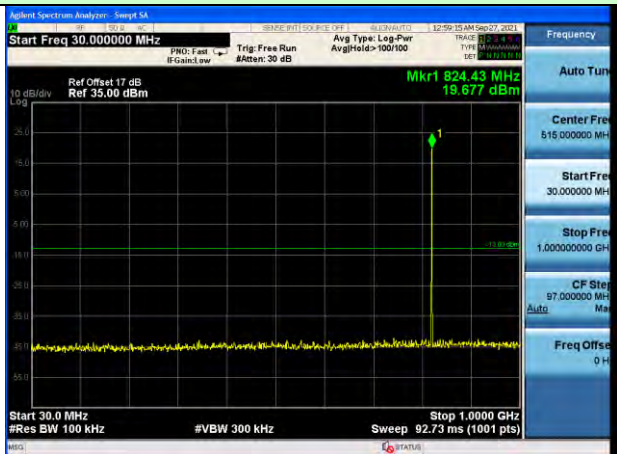
Middle channel



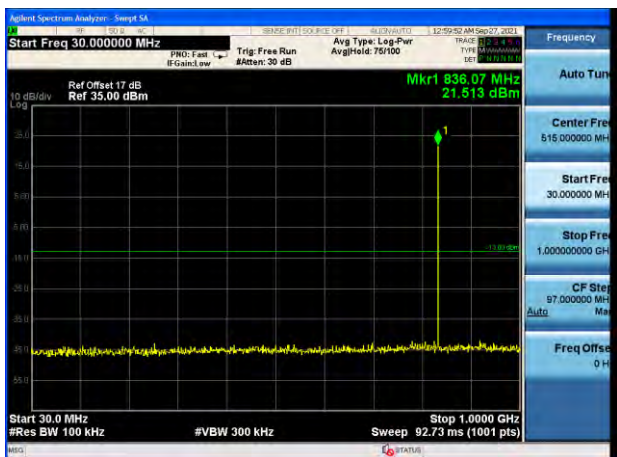
Highest channel

Test Mode: Traffic mode

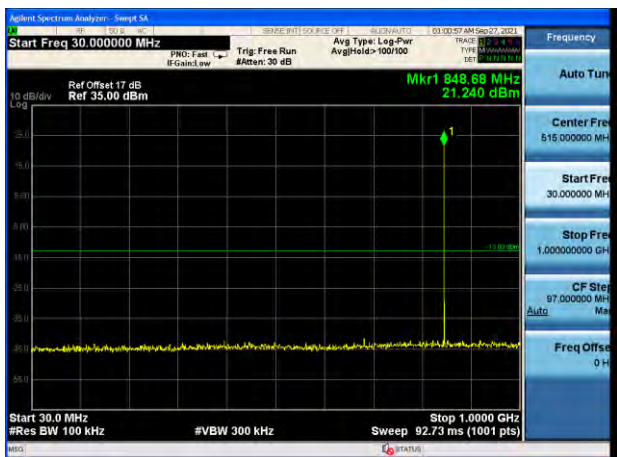
GSM 850 (GPRS 1 link)



Lowest channel



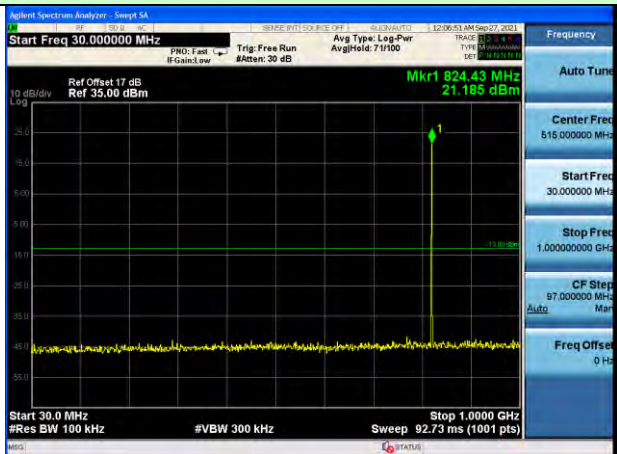
Middle channel



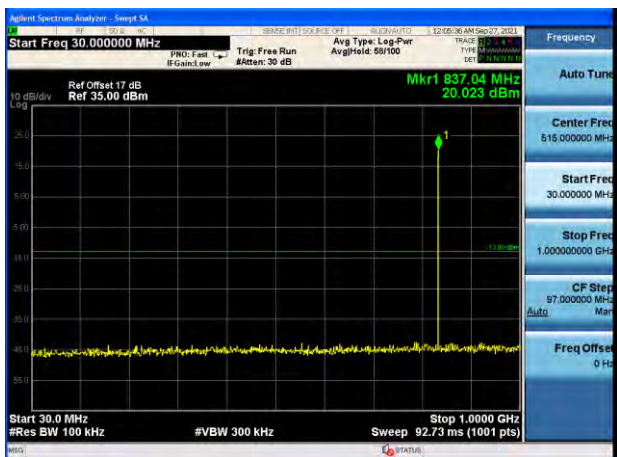
Highest channel

Test Mode: Traffic mode

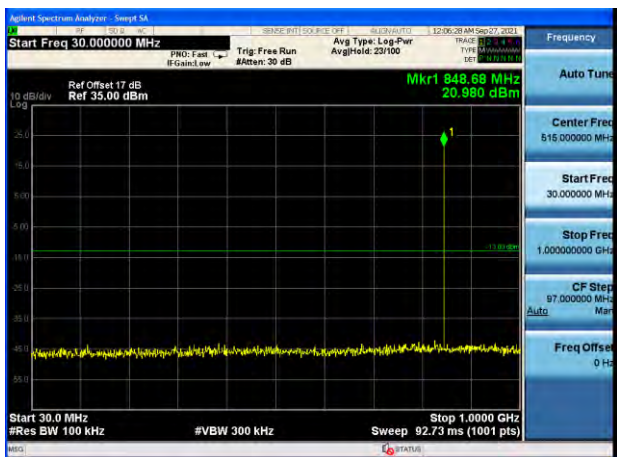
GSM 850 (EGPRS 1 link)



Lowest channel



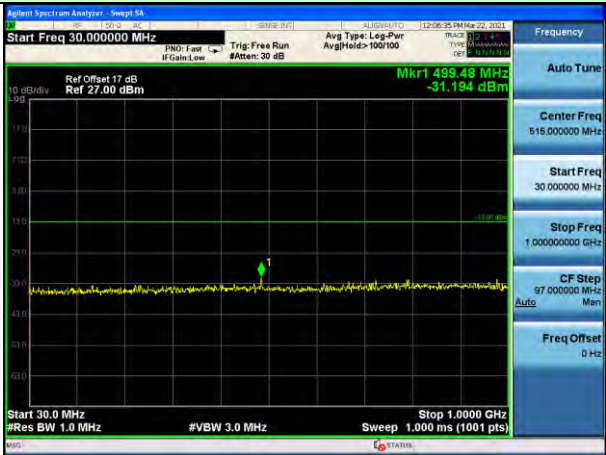
Middle channel



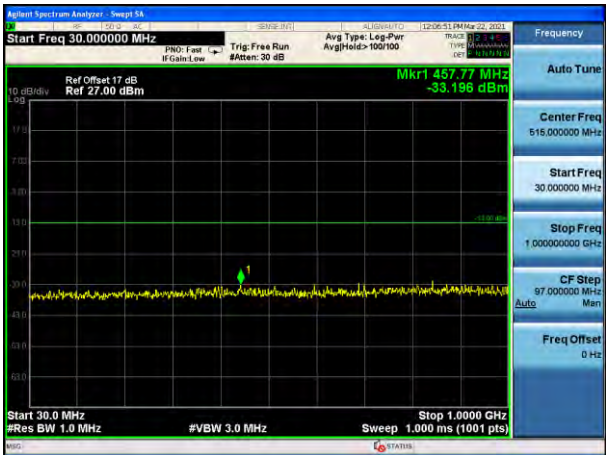
Highest channel

Test Mode: Traffic mode

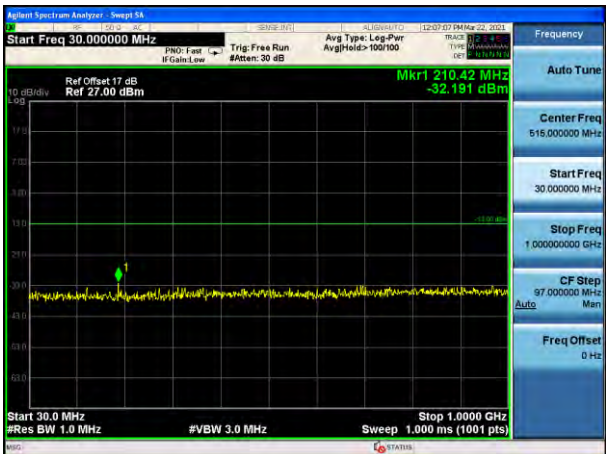
PCS1900 (GSM link)



Lowest channel



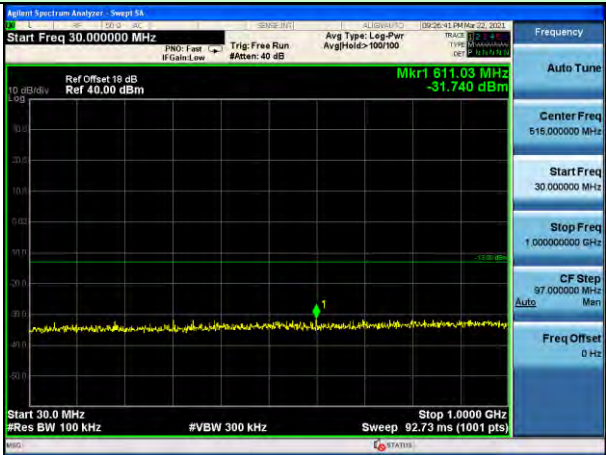
Middle channel



Highest channel

Test Mode: Traffic mode

PCS1900 (GPRS 1 link)



Lowest channel



Middle channel



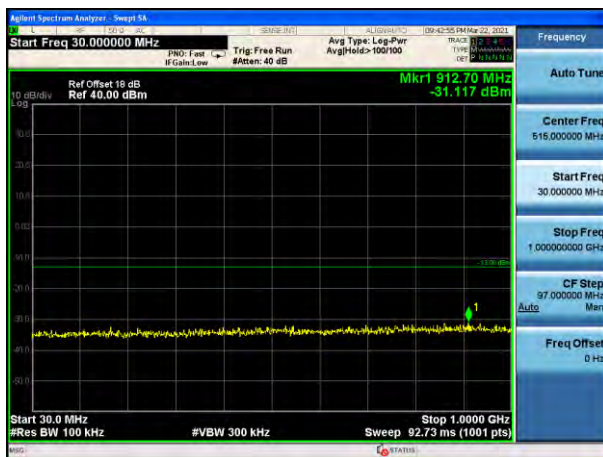
Highest channel

## Test Mode: Traffic mode

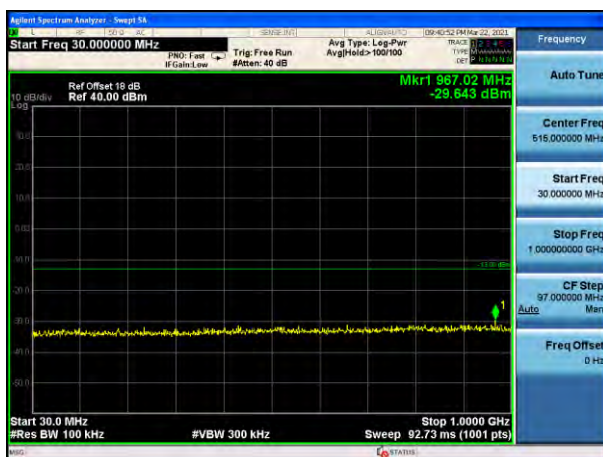
## PCS1900 (EGPRS 1 link)



Lowest channel



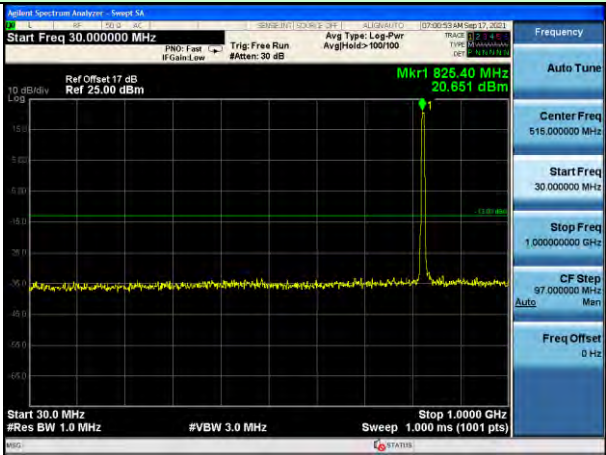
Middle channel



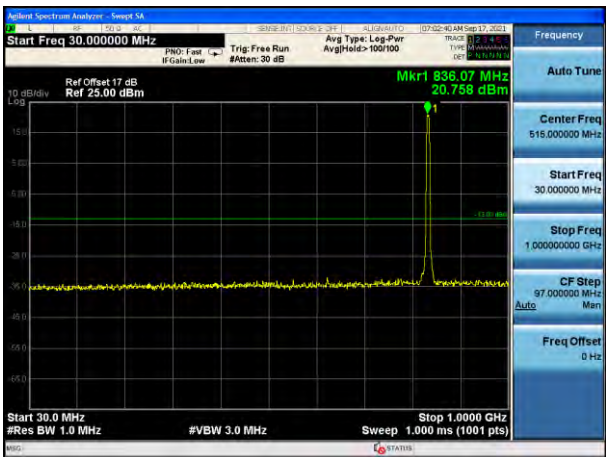
Highest channel

Test Mode: Traffic mode

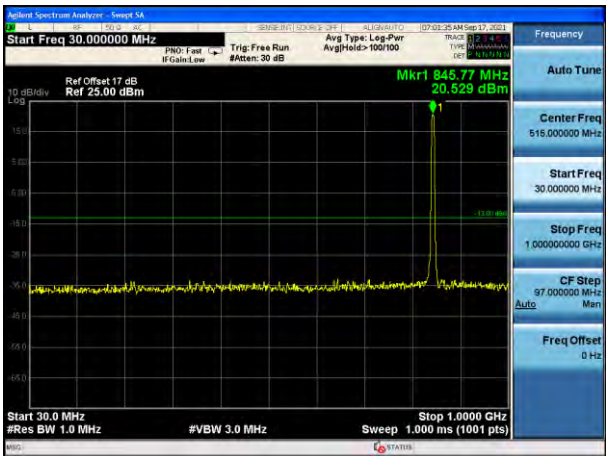
WCDMA Band V (RMC 12.2Kbps link)



Lowest channel



Middle channel



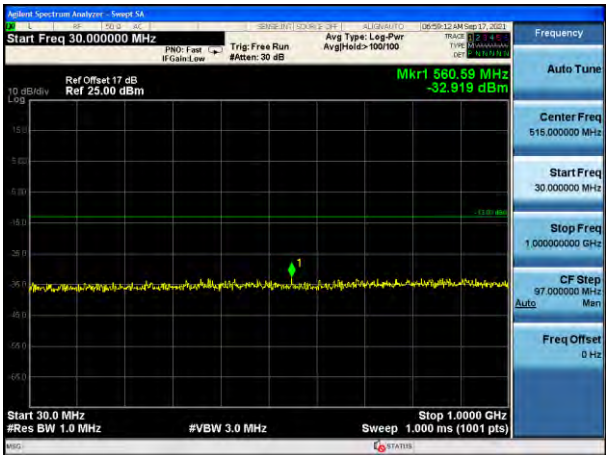
Highest channel

Test Mode: Traffic mode

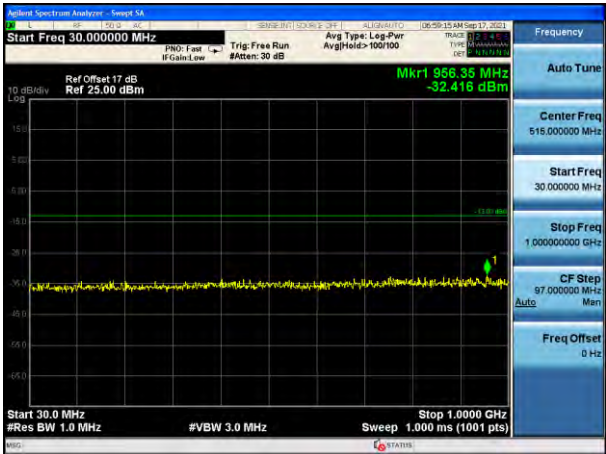
WCDMA Band II (RMC 12.2Kbps link)



Lowest channel



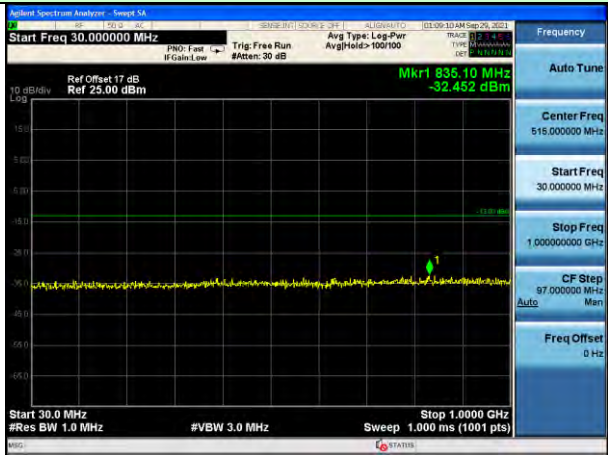
Middle channel



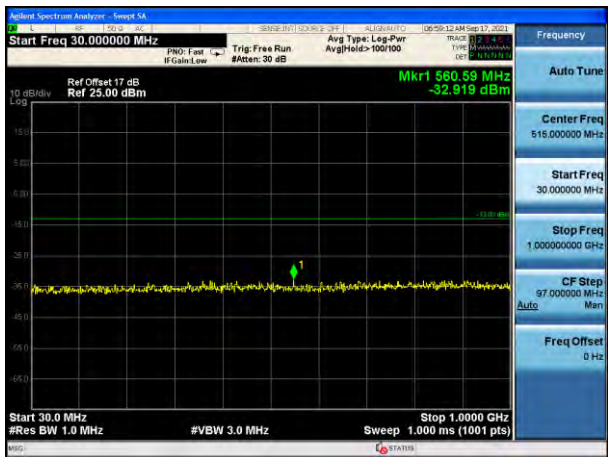
Highest channel

Test Mode: Traffic mode

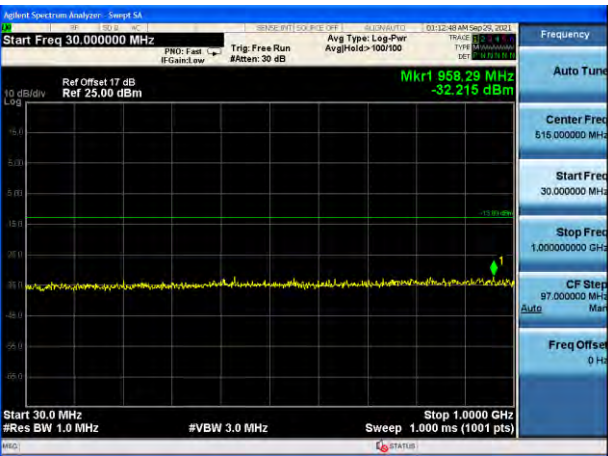
WCDMA Band IV (RMC 12.2Kbps link)



Lowest channel



Middle channel



Highest channel

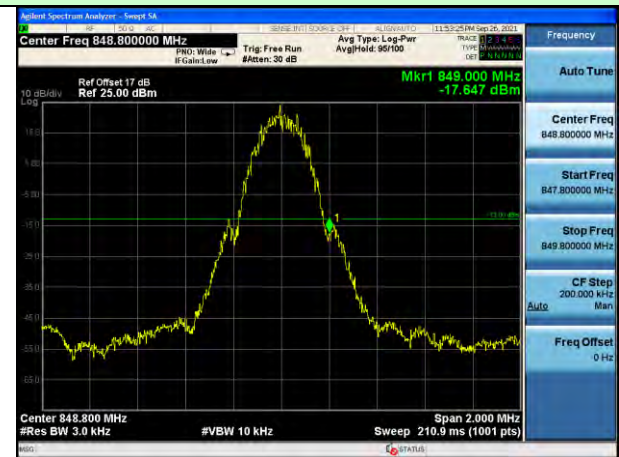
Band Edge:

Test Mode: Traffic mode

GSM850 (GSM link)



Lowest channel



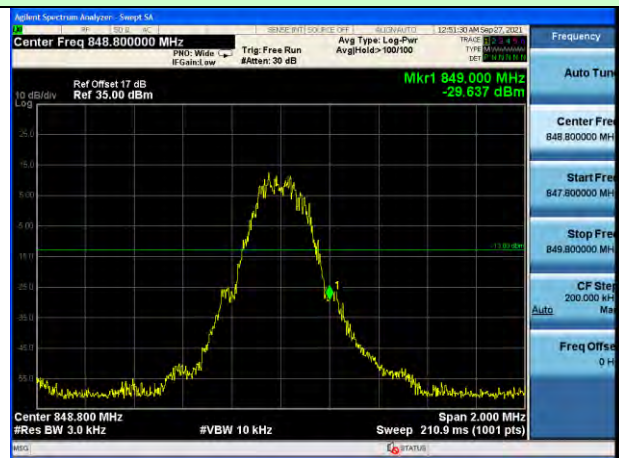
Highest channel

Test Mode: Traffic mode

GSM850 (GPRS 1 link)



Lowest channel



Highest channel

Test Mode: Traffic mode

GSM850 (EGPRS 1 link)



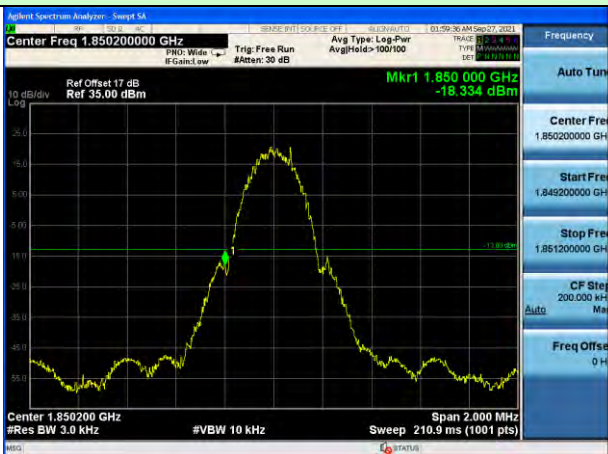
Lowest channel



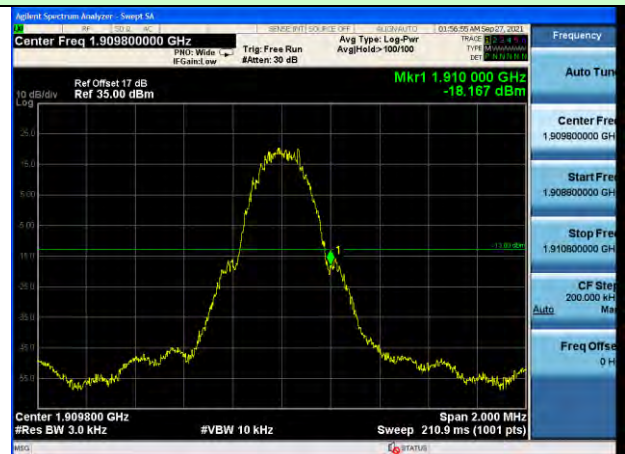
Highest channel

## Test Mode: Traffic mode

## PCS1900 (GSM link)



Lowest channel



Highest channel

## Test Mode: Traffic mode

## PCS1900 (GPRS 1 link)



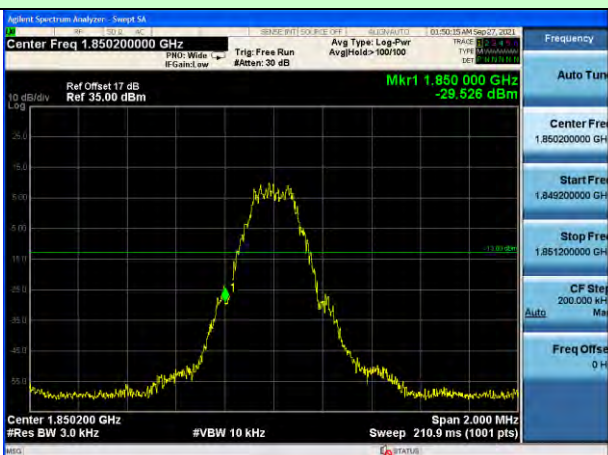
Lowest channel



Highest channel

## Test Mode: Traffic mode

## PCS1900 (EGPRS 1 link)



Lowest channel



Highest channel

## Test Mode: Traffic mode

## WCDMA Band V (RMC 12.2Kbps link)



Lowest channel



Highest channel

## Test Mode: Traffic mode

## WCDMA Band II (RMC 12.2Kbps link)



Lowest channel



Highest channel

## Test Mode: Traffic mode

## WCDMA Band IV (RMC 12.2Kbps link)

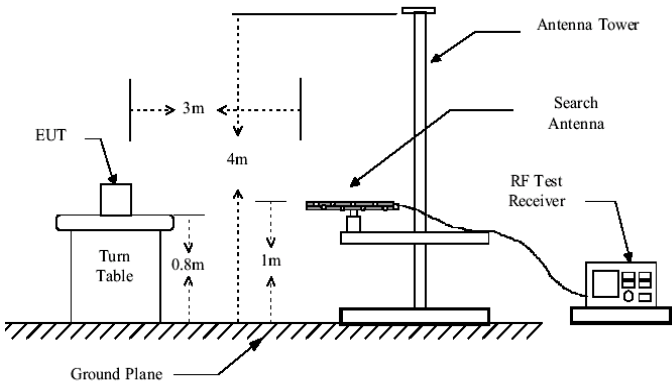
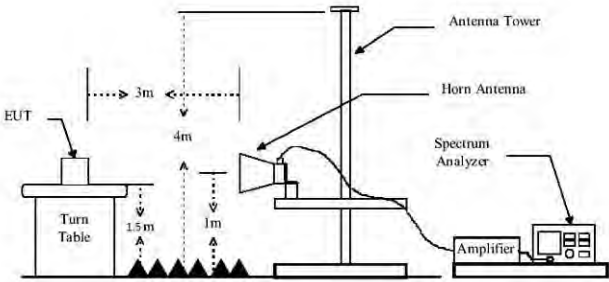
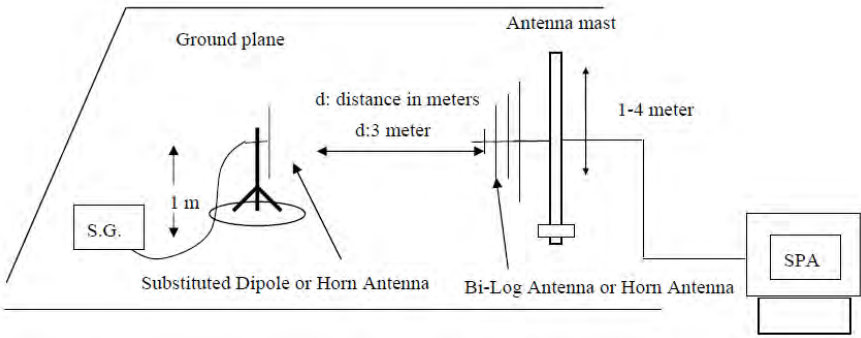


Lowest channel



Highest channel

4.8 ERP, EIRP Measurement

|                   |                                                                                                                                                                                                                                                                                                                              |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Requirement: | FCC part22.913(a) and FCC part24.232(b)                                                                                                                                                                                                                                                                                      |
| Test Method:      | FCC part2.1046                                                                                                                                                                                                                                                                                                               |
| Limit:            | GSM850, WCDMA Band V: 7W<br>PCS1900, WCDMA Band II: 2W<br>WCDMA Band IV: 1W                                                                                                                                                                                                                                                  |
| Test setup:       | <p>Below 1GHz</p>  <p>Above 1GHz</p>  <p>Substituted method:</p>  |

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Procedure:   | <ol style="list-style-type: none"><li>1. The EUT was placed on an non-conductive turntable using a non-conductive support. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer.</li><li>2. During the measurement, the EUT was communication with the station. The highest emission was recorded with the rotation of the turntable and the lowering of the test antenna from 4m to 1m. The reading was recorded and the field strength (E in dBuV/m) was calculated.</li><li>3. ERP in frequency band 824.2 –848.80.8MHz were measured using a substitution method. The EUT was replaced by dipole antenna connected, the S.G. output was recorded and ERP was calculated asfollows:<br/><math display="block">\text{ERP} = \text{S.G. output (dBm)} + \text{Antenna Gain (dBd)} - \text{Cable Loss (dB)}</math></li><li>4. EIRP in frequency band 1850.2 –1909.8MHz were measured using a substitution method. The EUT was replaced by or horn antenna connected, the S.G. output was recorded and EIRP was calculated as follows:<br/><math display="block">\text{EIRP} = \text{S.G. output (dBm)} + \text{Antenna Gain (dBi)} - \text{Cable Loss (dB)}</math></li></ol> |
| Test Instruments: | Refer to section 5.0 for details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Test mode:        | Refer to section 6.1 for details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Test results:     | Pass                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

## Measurement Data

| EUT mode             | Channel | EUT Pol. | Antenna Pol. | ERP(dBm)     | Limit (dBm) | Result |
|----------------------|---------|----------|--------------|--------------|-------------|--------|
| GSM850<br>(GSM link) | Lowest  | H        | V            | 26.26        | 38.45       | Pass   |
|                      |         |          | H            | <b>30.20</b> |             |        |
|                      |         | E1       | V            | 25.11        |             |        |
|                      |         |          | H            | 28.62        |             |        |
|                      |         | E2       | V            | 26.45        |             |        |
|                      |         |          | H            | 29.47        |             |        |
|                      | Middle  | H        | V            | 25.55        | 38.45       | Pass   |
|                      |         |          | H            | 29.73        |             |        |
|                      |         | E1       | V            | 25.60        |             |        |
|                      |         |          | H            | 29.46        |             |        |
|                      |         | E2       | V            | 25.28        |             |        |
|                      |         |          | H            | 28.89        |             |        |
|                      | Highest | H        | V            | 25.82        | 38.45       | Pass   |
|                      |         |          | H            | 29.32        |             |        |
|                      |         | E1       | V            | 26.32        |             |        |
|                      |         |          | H            | 30.03        |             |        |
|                      |         | E2       | V            | 26.43        |             |        |
|                      |         |          | H            | 25.73        |             |        |

| EUT mode                | Channel | EUT Pol. | Antenna Pol. | ERP(dBm)     | Limit (dBm) | Result |
|-------------------------|---------|----------|--------------|--------------|-------------|--------|
| GSM850<br>(GPRS 1 link) | Lowest  | H        | V            | 26.65        | 38.45       | Pass   |
|                         |         |          | H            | 30.86        |             |        |
|                         |         | E1       | V            | 26.51        |             |        |
|                         |         |          | H            | 29.42        |             |        |
|                         |         | E2       | V            | 26.59        |             |        |
|                         |         |          | H            | 30.88        |             |        |
|                         | Middle  | H        | V            | 26.30        | 38.45       | Pass   |
|                         |         |          | H            | <b>31.12</b> |             |        |
|                         |         | E1       | V            | 26.29        |             |        |
|                         |         |          | H            | 30.39        |             |        |
|                         |         | E2       | V            | 26.08        |             |        |
|                         |         |          | H            | 30.12        |             |        |
|                         | Highest | H        | V            | 26.74        | 38.45       | Pass   |
|                         |         |          | H            | 30.22        |             |        |
|                         |         | E1       | V            | 27.58        |             |        |
|                         |         |          | H            | 30.54        |             |        |
|                         |         | E2       | V            | 26.30        |             |        |
|                         |         |          | H            | 30.36        |             |        |

| EUT mode                 | Channel | EUT Pol. | Antenna Pol. | ERP(dBm) | Limit (dBm) | Result |
|--------------------------|---------|----------|--------------|----------|-------------|--------|
| GSM850<br>(EGPRS 1 link) | Lowest  | H        | V            | 27.17    | 38.45       | Pass   |
|                          |         |          | H            | 30.87    |             |        |
|                          |         | E1       | V            | 27.67    |             |        |
|                          |         |          | H            | 30.49    |             |        |
|                          |         | E2       | V            | 26.09    |             |        |
|                          |         |          | H            | 28.47    |             |        |
|                          | Middle  | H        | V            | 26.12    | 38.45       | Pass   |
|                          |         |          | H            | 29.99    |             |        |
|                          |         | E1       | V            | 25.62    |             |        |
|                          |         |          | H            | 29.90    |             |        |
|                          |         | E2       | V            | 25.53    |             |        |
|                          |         |          | H            | 28.36    |             |        |
|                          | Highest | H        | V            | 27.56    | 38.45       | Pass   |
|                          |         |          | H            | 30.10    |             |        |
|                          |         | E1       | V            | 27.18    |             |        |
|                          |         |          | H            | 29.18    |             |        |
|                          |         | E2       | V            | 25.02    |             |        |
|                          |         |          | H            | 29.10    |             |        |

| EUT mode              | Channel | EUT Pol. | Antenna Pol. | EIRP (dBm)   | Limit (dBm) | Result |
|-----------------------|---------|----------|--------------|--------------|-------------|--------|
| PCS1900<br>(GSM link) | Lowest  | H        | V            | 23.53        | 33.01       | Pass   |
|                       |         |          | H            | 27.14        |             |        |
|                       |         | E1       | V            | 24.12        |             |        |
|                       |         |          | H            | 27.56        |             |        |
|                       |         | E2       | V            | 22.44        |             |        |
|                       |         |          | H            | 26.35        |             |        |
|                       | Middle  | H        | V            | 24.12        | 33.01       | Pass   |
|                       |         |          | H            | 27.12        |             |        |
|                       |         | E1       | V            | 24.15        |             |        |
|                       |         |          | H            | 26.60        |             |        |
|                       |         | E2       | V            | 22.73        |             |        |
|                       |         |          | H            | 26.43        |             |        |
|                       | Highest | H        | V            | 24.76        | 33.01       | Pass   |
|                       |         |          | H            | 26.97        |             |        |
|                       |         | E1       | V            | 23.76        |             |        |
|                       |         |          | H            | 26.35        |             |        |
|                       |         | E2       | V            | 23.45        |             |        |
|                       |         |          | H            | <b>27.80</b> |             |        |

| EUT mode                 | Channel | EUT Pol. | Antenna Pol. | EIRP (dBm)   | Limit (dBm) | Result |
|--------------------------|---------|----------|--------------|--------------|-------------|--------|
| PCS1900<br>(GPRS 1 link) | Lowest  | H        | V            | 21.28        | 33.01       | Pass   |
|                          |         |          | H            | 23.61        |             |        |
|                          |         | E1       | V            | 20.10        |             |        |
|                          |         |          | H            | 23.47        |             |        |
|                          |         | E2       | V            | 22.56        |             |        |
|                          |         |          | H            | 26.36        |             |        |
|                          | Middle  | H        | V            | 22.43        | 33.01       | Pass   |
|                          |         |          | H            | 26.55        |             |        |
|                          |         | E1       | V            | 21.54        |             |        |
|                          |         |          | H            | 24.37        |             |        |
|                          |         | E2       | V            | 21.29        |             |        |
|                          |         |          | H            | 23.48        |             |        |
|                          | Highest | H        | V            | 24.08        | 33.01       | Pass   |
|                          |         |          | H            | <b>27.40</b> |             |        |
|                          |         | E1       | V            | 23.89        |             |        |
|                          |         |          | H            | 27.31        |             |        |
|                          |         | E2       | V            | 22.55        |             |        |
|                          |         |          | H            | 25.28        |             |        |

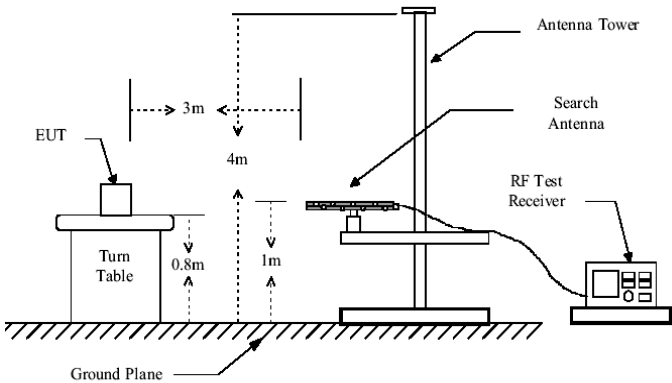
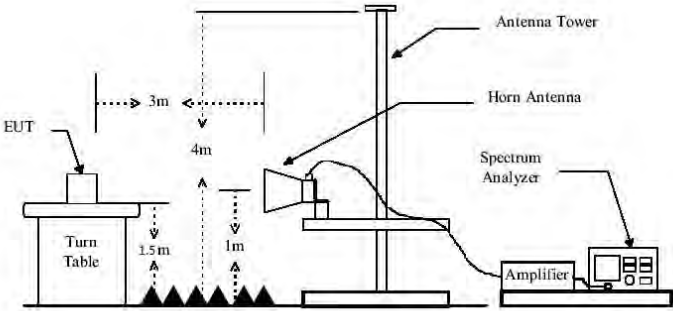
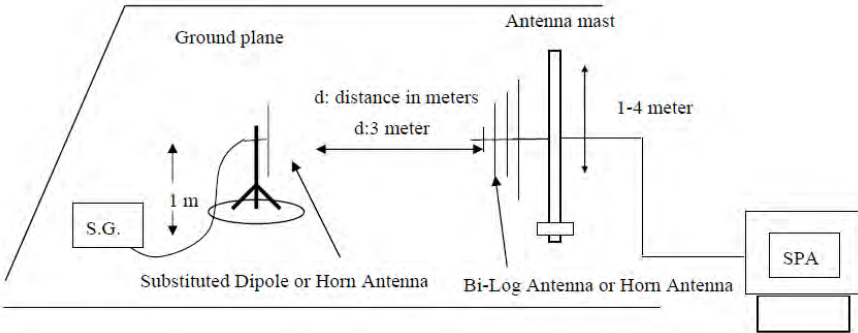
| EUT mode                  | Channel | EUT Pol. | Antenna Pol. | EIRP (dBm)   | Limit (dBm) | Result |
|---------------------------|---------|----------|--------------|--------------|-------------|--------|
| PCS1900<br>(EGPRS 1 link) | Lowest  | H        | V            | 22.85        | 33.01       | Pass   |
|                           |         |          | H            | <b>26.78</b> |             |        |
|                           |         | E1       | V            | 22.94        |             |        |
|                           |         |          | H            | 25.90        |             |        |
|                           |         | E2       | V            | 22.62        |             |        |
|                           |         |          | H            | 26.73        |             |        |
|                           | Middle  | H        | V            | 22.50        | 33.01       | Pass   |
|                           |         |          | H            | 26.40        |             |        |
|                           |         | E1       | V            | 23.24        |             |        |
|                           |         |          | H            | 26.54        |             |        |
|                           |         | E2       | V            | 22.29        |             |        |
|                           |         |          | H            | 25.72        |             |        |
|                           | Highest | H        | V            | 24.34        | 33.01       | Pass   |
|                           |         |          | H            | 26.47        |             |        |
|                           |         | E1       | V            | 24.61        |             |        |
|                           |         |          | H            | 25.61        |             |        |
|                           |         | E2       | V            | 23.61        |             |        |
|                           |         |          | H            | 26.56        |             |        |

| EUT mode        | Channel | EUT Pol. | Antenna Pol. | ERP(dBm)     | Limit (dBm) | Result |
|-----------------|---------|----------|--------------|--------------|-------------|--------|
| WCDMA<br>Band V | Lowest  | H        | V            | 23.27        | 38.45       | Pass   |
|                 |         |          | H            | 26.18        |             |        |
|                 |         | E1       | V            | 22.66        |             |        |
|                 |         |          | H            | 25.80        |             |        |
|                 |         | E2       | V            | 22.94        |             |        |
|                 |         |          | H            | 26.33        |             |        |
|                 | Middle  | H        | V            | 22.69        | 38.45       | Pass   |
|                 |         |          | H            | <b>26.53</b> |             |        |
|                 |         | E1       | V            | 22.73        |             |        |
|                 |         |          | H            | 25.08        |             |        |
|                 |         | E2       | V            | 21.11        |             |        |
|                 |         |          | H            | 24.90        |             |        |
|                 | Highest | H        | V            | 23.48        | 38.45       | Pass   |
|                 |         |          | H            | 26.40        |             |        |
|                 |         | E1       | V            | 23.42        |             |        |
|                 |         |          | H            | 25.95        |             |        |
|                 |         | E2       | V            | 24.37        |             |        |
|                 |         |          | H            | 26.12        |             |        |

| EUT mode         | Channel | EUT Pol. | Antenna Pol. | EIRP(dBm)    | Limit (dBm) | Result |
|------------------|---------|----------|--------------|--------------|-------------|--------|
| WCDMA<br>Band II | Lowest  | H        | V            | 22.76        | 33.01       | Pass   |
|                  |         |          | H            | 24.97        |             |        |
|                  |         | E1       | V            | 22.35        |             |        |
|                  |         |          | H            | 25.08        |             |        |
|                  |         | E2       | V            | 22.55        |             |        |
|                  |         |          | H            | 25.56        |             |        |
|                  | Middle  | H        | V            | 21.79        | 33.01       | Pass   |
|                  |         |          | H            | 26.14        |             |        |
|                  |         | E1       | V            | 23.05        |             |        |
|                  |         |          | H            | 24.98        |             |        |
|                  |         | E2       | V            | 21.90        |             |        |
|                  |         |          | H            | 25.19        |             |        |
|                  | Highest | H        | V            | 23.37        | 33.01       | Pass   |
|                  |         |          | H            | 26.69        |             |        |
|                  |         | E1       | V            | 24.62        |             |        |
|                  |         |          | H            | 25.85        |             |        |
|                  |         | E2       | V            | 24.41        |             |        |
|                  |         |          | H            | <b>26.96</b> |             |        |

| EUT mode         | Channel | EUT Pol. | Antenna Pol. | EIRP(dBm)    | Limit (dBm) | Result |
|------------------|---------|----------|--------------|--------------|-------------|--------|
| WCDMA<br>Band IV | Lowest  | H        | V            | 23.12        | 33.01       | Pass   |
|                  |         |          | H            | <b>26.86</b> |             |        |
|                  |         | E1       | V            | 21.99        |             |        |
|                  |         |          | H            | 25.64        |             |        |
|                  |         | E2       | V            | 22.95        |             |        |
|                  |         |          | H            | 25.93        |             |        |
|                  | Middle  | H        | V            | 22.39        | 33.01       | Pass   |
|                  |         |          | H            | 26.57        |             |        |
|                  |         | E1       | V            | 22.18        |             |        |
|                  |         |          | H            | 25.12        |             |        |
|                  |         | E2       | V            | 21.26        |             |        |
|                  |         |          | H            | 24.66        |             |        |
|                  | Highest | H        | V            | 23.37        | 33.01       | Pass   |
|                  |         |          | H            | 26.37        |             |        |
|                  |         | E1       | V            | 24.20        |             |        |
|                  |         |          | H            | 26.52        |             |        |
|                  |         | E2       | V            | 23.87        |             |        |
|                  |         |          | H            | 26.09        |             |        |

4.9 Field strength of spurious radiation measurement

|                   |                                                                                                                                                                                                                                                                                                                                                                          |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Requirement: | FCC part22.917(a) and FCC part24.238(a)                                                                                                                                                                                                                                                                                                                                  |
| Test Method:      | FCC part2.1053                                                                                                                                                                                                                                                                                                                                                           |
| Limit:            | -13dBm                                                                                                                                                                                                                                                                                                                                                                   |
| Test setup:       | <div>Below 1GHz</div> <div></div> <div>Above 1GHz</div> <div></div> <div>Substituted method:</div> <div></div> |

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Procedure:   | <ol style="list-style-type: none"><li>1. The EUT was placed on an non-conductive turntable using a non-conductive support. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer.</li><li>2. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.</li><li>3. The frequency range up to tenth harmonic was investigated for each of three fundamental frequency (low, middle and high channels). Once spurious emission was identified, the power of the emission was determined using the substitution method.</li><li>4. The spurious emissions attenuation was calculated as the difference between radiated power at the fundamental frequency and the spurious emissions frequency.<br/><math display="block">\text{ERP / EIRP} = \text{S.G. output (dBm)} + \text{Antenna Gain(dB/dBi)} - \text{Cable Loss (dB)}</math></li></ol> |
| Test Instruments: | Refer to section 5.0 for details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Test mode:        | Refer to section 6.1 for details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Test results:     | Pass                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

## Measurement Data

| Test mode:      | GSM850            |             | Test channel: | Lowest  |
|-----------------|-------------------|-------------|---------------|---------|
| Frequency (MHz) | Spurious Emission |             | Limit (dBm)   | Result  |
|                 | Polarization      | Level (dBm) |               |         |
| 1648.40         | Vertical          | -37.24      | -13.00        | Pass    |
| 2472.60         | V                 | -39.73      |               |         |
| 3296.80         | V                 | -37.56      |               |         |
| 4121.00         | V                 | -43.14      |               |         |
| 4945.20         | V                 | ---         |               |         |
| 1648.40         | Horizontal        | -39.12      | -13.00        | Pass    |
| 2472.60         | H                 | -42.59      |               |         |
| 3296.80         | H                 | -44.61      |               |         |
| 4121.00         | H                 | -45.71      |               |         |
| 4945.20         | H                 | ---         |               |         |
| Test mode:      | GSM850            |             | Test channel: | Middle  |
| Frequency (MHz) | Spurious Emission |             | Limit (dBm)   | Result  |
|                 | Polarization      | Level (dBm) |               |         |
| 1673.20         | Vertical          | -36.78      | -13.00        | Pass    |
| 2509.80         | V                 | -39.18      |               |         |
| 3346.40         | V                 | -37.72      |               |         |
| 4183.00         | V                 | -43.33      |               |         |
| 5019.60         | V                 | ---         |               |         |
| 1673.20         | Horizontal        | -39.23      | -13.00        | Pass    |
| 2509.80         | H                 | -43.07      |               |         |
| 3346.40         | H                 | -44.39      |               |         |
| 4183.00         | H                 | -46.10      |               |         |
| 5019.60         | H                 | ---         |               |         |
| Test mode:      | GSM850            |             | Test channel: | Highest |
| Frequency (MHz) | Spurious Emission |             | Limit (dBm)   | Result  |
|                 | Polarization      | Level (dBm) |               |         |
| 1697.60         | Vertical          | -37.19      | -13.00        | Pass    |
| 2546.40         | V                 | -39.79      |               |         |
| 3395.20         | V                 | -38.17      |               |         |
| 4244.00         | V                 | -43.29      |               |         |
| 5092.80         | V                 | ---         |               |         |
| 1697.60         | Horizontal        | -39.57      | -13.00        | Pass    |
| 2546.40         | H                 | -42.89      |               |         |
| 3395.20         | H                 | -44.41      |               |         |
| 4244.00         | H                 | -45.59      |               |         |
| 5092.80         | H                 | ---         |               |         |

Remark :

1. The emission behaviour belongs to narrowband spurious emission.
2. Remark"---" means that the emission level is too low to be measured
3. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

| Test mode:      | PCS1900           |             | Test channel: | Lowest  |
|-----------------|-------------------|-------------|---------------|---------|
| Frequency (MHz) | Spurious Emission |             | Limit (dBm)   | Result  |
|                 | Polarization      | Level (dBm) |               |         |
| 3700.40         | Vertical          | -36.99      | -13.00        | Pass    |
| 5550.60         | V                 | -39.62      |               |         |
| 7400.80         | V                 | -38.33      |               |         |
| 9251.00         | V                 | -43.23      |               |         |
| 11101.20        | V                 | ---         |               |         |
| 3700.40         | Horizontal        | -39.45      | -13.00        | Pass    |
| 5550.60         | H                 | -42.24      |               |         |
| 7400.80         | H                 | -44.98      |               |         |
| 9251.00         | H                 | -45.71      |               |         |
| 11101.20        | H                 | ---         |               |         |
| Test mode:      | PCS1900           |             | Test channel: | Middle  |
| Frequency (MHz) | Spurious Emission |             | Limit (dBm)   | Result  |
|                 | Polarization      | Level (dBm) |               |         |
| 3760.00         | Vertical          | -36.61      | -13.00        | Pass    |
| 5640.00         | V                 | -39.74      |               |         |
| 7520.00         | V                 | -38.37      |               |         |
| 9400.00         | V                 | -43.32      |               |         |
| 11280.00        | V                 | ---         |               |         |
| 3760.00         | Horizontal        | -38.60      | -13.00        | Pass    |
| 5640.00         | H                 | -43.04      |               |         |
| 7520.00         | H                 | -44.82      |               |         |
| 9400.00         | H                 | -45.68      |               |         |
| 11280.00        | H                 | ---         |               |         |
| Test mode:      | PCS1900           |             | Test channel: | Highest |
| Frequency (MHz) | Spurious Emission |             | Limit (dBm)   | Result  |
|                 | Polarization      | Level (dBm) |               |         |
| 3819.60         | Vertical          | -36.61      | -13.00        | Pass    |
| 5729.40         | V                 | -39.56      |               |         |
| 7639.20         | V                 | -37.69      |               |         |
| 9549.00         | V                 | -43.41      |               |         |
| 11458.80        | V                 | ---         |               |         |
| 3819.60         | Horizontal        | -39.09      | -13.00        | Pass    |
| 5729.40         | H                 | -42.23      |               |         |
| 7639.20         | H                 | -44.74      |               |         |
| 9549.00         | H                 | -46.35      |               |         |
| 11458.80        | H                 | ---         |               |         |

Remark:

1. The emission behaviour belongs to narrowband spurious emission.
2. Remark"---" means that the emission level is too low to be measured
3. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

| Test mode:      | WCDMA Band V      |             | Test channel: | Lowest  |
|-----------------|-------------------|-------------|---------------|---------|
| Frequency (MHz) | Spurious Emission |             | Limit (dBm)   | Result  |
|                 | Polarization      | Level (dBm) |               |         |
| 1652.80         | Vertical          | -37.16      | -13.00        | Pass    |
| 2479.20         | V                 | -39.56      |               |         |
| 3305.60         | V                 | -38.32      |               |         |
| 4132.00         | V                 | -43.35      |               |         |
| 4958.40         | V                 | ---         |               |         |
| 1652.80         | Horizontal        | -38.94      | -13.00        | Pass    |
| 2479.20         | H                 | -42.49      |               |         |
| 3305.60         | H                 | -44.90      |               |         |
| 4132.00         | H                 | -45.95      |               |         |
| 4958.40         | H                 | ---         |               |         |
| Test mode:      | WCDMA Band V      |             | Test channel: | Middle  |
| Frequency (MHz) | Spurious Emission |             | Limit (dBm)   | Result  |
|                 | Polarization      | Level (dBm) |               |         |
| 1672.80         | Vertical          | -36.88      | -13.00        | Pass    |
| 2509.20         | V                 | -39.70      |               |         |
| 3345.60         | V                 | -38.42      |               |         |
| 4182.00         | V                 | -43.40      |               |         |
| 5018.40         | V                 | ---         |               |         |
| 1672.80         | Horizontal        | -39.24      | -13.00        | Pass    |
| 2509.20         | H                 | -42.32      |               |         |
| 3345.60         | H                 | -44.69      |               |         |
| 4182.00         | H                 | -45.65      |               |         |
| 5018.40         | H                 | ---         |               |         |
| Test mode:      | WCDMA Band V      |             | Test channel: | Highest |
| Frequency (MHz) | Spurious Emission |             | Limit (dBm)   | Result  |
|                 | Polarization      | Level (dBm) |               |         |
| 1693.20         | Vertical          | -37.00      | -13.00        | Pass    |
| 2539.80         | V                 | -39.88      |               |         |
| 3386.40         | V                 | -38.03      |               |         |
| 4233.00         | V                 | -43.26      |               |         |
| 5079.60         | V                 | ---         |               |         |
| 1693.20         | Horizontal        | -39.14      | -13.00        | Pass    |
| 2539.80         | H                 | -42.89      |               |         |
| 3386.40         | H                 | -44.85      |               |         |
| 4233.00         | H                 | -46.00      |               |         |
| 5079.60         | H                 | ---         |               |         |

Remark :

1. The emission behaviour belongs to narrowband spurious emission.
2. Remark"---" means that the emission level is too low to be measured
3. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

| Test mode:      | WCDMA Band II     |             | Test channel: | Lowest  |
|-----------------|-------------------|-------------|---------------|---------|
| Frequency (MHz) | Spurious Emission |             | Limit (dBm)   | Result  |
|                 | Polarization      | Level (dBm) |               |         |
| 3704.80         | Vertical          | -36.63      | -13.00        | Pass    |
| 5557.20         | V                 | -39.08      |               |         |
| 7409.60         | V                 | -37.95      |               |         |
| 9262.00         | V                 | -43.17      |               |         |
| 11114.40        | V                 | ---         |               |         |
| 3704.80         | Horizontal        | -38.62      | -13.00        | Pass    |
| 5557.20         | H                 | -42.44      |               |         |
| 7409.60         | H                 | -45.18      |               |         |
| 9262.00         | H                 | -46.15      |               |         |
| 11114.40        | H                 | ---         |               |         |
| Test mode:      | WCDMA Band II     |             | Test channel: | Middle  |
| Frequency (MHz) | Spurious Emission |             | Limit (dBm)   | Result  |
|                 | Polarization      | Level (dBm) |               |         |
| 3760.00         | Vertical          | -37.13      | -13.00        | Pass    |
| 5640.00         | V                 | -39.21      |               |         |
| 7520.00         | V                 | -37.71      |               |         |
| 9400.00         | V                 | -42.91      |               |         |
| 11280.00        | V                 | ---         |               |         |
| 3760.00         | Horizontal        | -39.36      | -13.00        | Pass    |
| 5640.00         | H                 | -42.15      |               |         |
| 7520.00         | H                 | -45.13      |               |         |
| 9400.00         | H                 | -45.65      |               |         |
| 11280.00        | H                 | ---         |               |         |
| Test mode:      | WCDMA Band II     |             | Test channel: | Highest |
| Frequency (MHz) | Spurious Emission |             | Limit (dBm)   | Result  |
|                 | Polarization      | Level (dBm) |               |         |
| 3815.20         | Vertical          | -37.20      | -13.00        | Pass    |
| 5722.80         | V                 | -39.13      |               |         |
| 7630.40         | V                 | -37.63      |               |         |
| 9538.00         | V                 | -43.64      |               |         |
| 11445.60        | V                 | ---         |               |         |
| 3815.20         | Horizontal        | -39.46      | -13.00        | Pass    |
| 5722.80         | H                 | -42.88      |               |         |
| 7630.40         | H                 | -44.83      |               |         |
| 9538.00         | H                 | -46.20      |               |         |
| 11445.60        | H                 | ---         |               |         |

Remark:

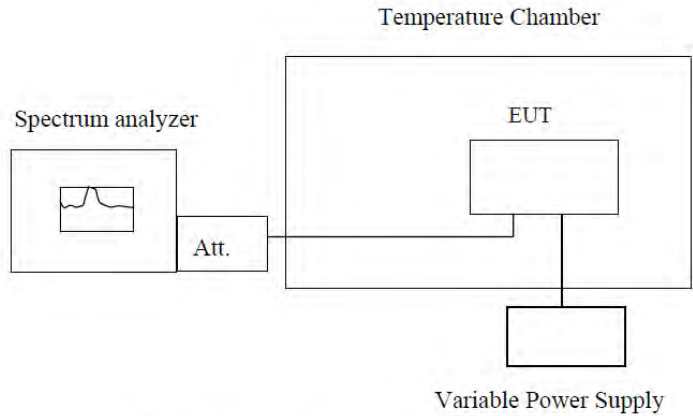
1. The emission behaviour belongs to narrowband spurious emission.
2. Remark"---" means that the emission level is too low to be measured
3. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

| Test mode:      | WCDMA Band IV     |             | Test channel: | Lowest  |
|-----------------|-------------------|-------------|---------------|---------|
| Frequency (MHz) | Spurious Emission |             | Limit (dBm)   | Result  |
|                 | Polarization      | Level (dBm) |               |         |
| 3424.8          | Vertical          | -37.23      | -13.00        | Pass    |
| 5137.2          | V                 | -39.52      |               |         |
| 10274.4         | V                 | -38.40      |               |         |
| 15411.6         | V                 | -43.53      |               |         |
| 30823.2         | V                 | ---         |               |         |
| 3424.8          | Horizontal        | -39.39      | -13.00        | Pass    |
| 5137.2          | H                 | -42.66      |               |         |
| 10274.4         | H                 | -44.65      |               |         |
| 15411.6         | H                 | -46.44      |               |         |
| 30823.2         | H                 | ---         |               |         |
| Test mode:      | WCDMA Band IV     |             | Test channel: | Middle  |
| Frequency (MHz) | Spurious Emission |             | Limit (dBm)   | Result  |
|                 | Polarization      | Level (dBm) |               |         |
| 3480            | Vertical          | -37.23      | -13.00        | Pass    |
| 5220            | V                 | -39.52      |               |         |
| 10440           | V                 | -38.40      |               |         |
| 15660           | V                 | -43.53      |               |         |
| 31320           | V                 | ---         |               |         |
| 3480            | Horizontal        | -39.39      | -13.00        | Pass    |
| 5220            | H                 | -42.66      |               |         |
| 10440           | H                 | -44.65      |               |         |
| 15660           | H                 | -46.44      |               |         |
| 31320           | H                 | ---         |               |         |
| Test mode:      | WCDMA Band IV     |             | Test channel: | Highest |
| Frequency (MHz) | Spurious Emission |             | Limit (dBm)   | Result  |
|                 | Polarization      | Level (dBm) |               |         |
| 3505.2          | Vertical          | -36.85      | -13.00        | Pass    |
| 5257.8          | V                 | -39.25      |               |         |
| 10515.6         | V                 | -38.45      |               |         |
| 15773.4         | V                 | -43.38      |               |         |
| 31546.8         | V                 | ---         |               |         |
| 3505.2          | Horizontal        | -39.30      | -13.00        | Pass    |
| 5257.8          | H                 | -42.81      |               |         |
| 10515.6         | H                 | -44.45      |               |         |
| 15773.4         | H                 | -46.04      |               |         |
| 31546.8         | H                 | ---         |               |         |

Remark:

1. The emission behaviour belongs to narrowband spurious emission.
2. Remark"---" means that the emission level is too low to be measured
3. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

#### 4.10 Frequency stability V.S. Temperature measurement

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Requirement: | FCC Part2.1055(a)(1)(b)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Test Method:      | FCC Part2.1055(a)(1)(b)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Limit:            | 2.5ppm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Test setup:       |  <p><b>Note :</b> Measurement setup for testing on Antenna connector</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Test procedure:   | <ol style="list-style-type: none"> <li>1. The equipment under test was connected to an external DC power supply and input rated voltage.</li> <li>2. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators.</li> <li>3. The EUT was placed inside the temperature chamber.</li> <li>4. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 25°C operating frequency as reference frequency.</li> <li>5. Turn EUT off and set the chamber temperature to –20°C . After the temperature stabilized for approximately 30 minutes recorded the frequency.</li> <li>6. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached.</li> </ol> |
| Test Instruments: | Refer to section 5.0 for details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Test mode:        | Refer to section 6.1 for details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Test results:     | Pass                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

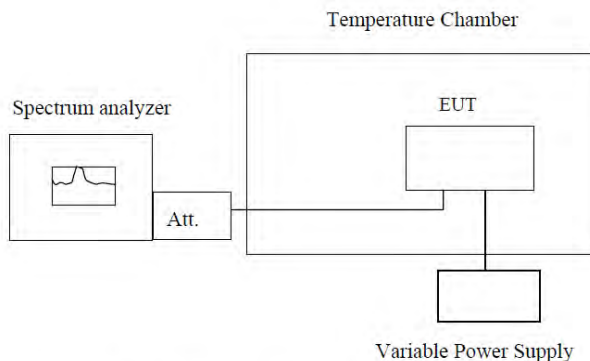
Measurement Data

| Reference Frequency: GSM850 (GSM link) Middle channel=190 channel=836.6MHz     |                  |                 |        |             |        |
|--------------------------------------------------------------------------------|------------------|-----------------|--------|-------------|--------|
| Power supplied (Vdc)                                                           | Temperature (℃ ) | Frequency error |        | Limit (ppm) | Result |
|                                                                                |                  | Hz              | ppm    |             |        |
| 3.85                                                                           | -30              | 59              | 0.0702 | 2.5         | Pass   |
|                                                                                | -20              | 23              | 0.0275 |             |        |
|                                                                                | -10              | 67              | 0.0798 |             |        |
|                                                                                | 0                | 30              | 0.0357 |             |        |
|                                                                                | 10               | 33              | 0.0393 |             |        |
|                                                                                | 20               | 21              | 0.0247 |             |        |
|                                                                                | 30               | 31              | 0.0371 |             |        |
|                                                                                | 40               | 35              | 0.0416 |             |        |
|                                                                                | 50               | 35              | 0.0418 |             |        |
| Reference Frequency: GSM850 (GPRS 1 link) Middle channel=190 channel=836.6MHz  |                  |                 |        |             |        |
| Power supplied (Vdc)                                                           | Temperature (℃ ) | Frequency error |        | Limit (ppm) | Result |
|                                                                                |                  | Hz              | ppm    |             |        |
| 3.85                                                                           | -30              | 54              | 0.0650 | 2.5         | Pass   |
|                                                                                | -20              | 23              | 0.0275 |             |        |
|                                                                                | -10              | 69              | 0.0822 |             |        |
|                                                                                | 0                | 32              | 0.0380 |             |        |
|                                                                                | 10               | 28              | 0.0340 |             |        |
|                                                                                | 20               | 23              | 0.0275 |             |        |
|                                                                                | 30               | 32              | 0.0382 |             |        |
|                                                                                | 40               | 33              | 0.0396 |             |        |
|                                                                                | 50               | 32              | 0.0382 |             |        |
| Reference Frequency: GSM850 (EGPRS 1 link) Middle channel=190 channel=836.6MHz |                  |                 |        |             |        |
| Power supplied (Vdc)                                                           | Temperature (℃)  | Frequency error |        | Limit (ppm) | Result |
|                                                                                |                  | Hz              | ppm    |             |        |
| 3.85                                                                           | -30              | 53              | 0.0638 | 2.5         | Pass   |
|                                                                                | -20              | 23              | 0.0275 |             |        |
|                                                                                | -10              | 66              | 0.0790 |             |        |
|                                                                                | 0                | 34              | 0.0401 |             |        |
|                                                                                | 10               | 30              | 0.0360 |             |        |
|                                                                                | 20               | 21              | 0.0249 |             |        |
|                                                                                | 30               | 32              | 0.0388 |             |        |
|                                                                                | 40               | 34              | 0.0406 |             |        |
|                                                                                | 50               | 35              | 0.0414 |             |        |

| Reference Frequency: PCS1900 (GSM link) Middle channel=661 channel=1880MHz     |                  |                 |        |     |        |
|--------------------------------------------------------------------------------|------------------|-----------------|--------|-----|--------|
| Power supplied (Vdc)                                                           | Temperature (℃ ) | Frequency error |        |     | Result |
|                                                                                |                  | Hz              | ppm    |     |        |
| 3.85                                                                           | -30              | 54              | 0.0286 | 2.5 | Pass   |
|                                                                                | -20              | 23              | 0.0122 |     |        |
|                                                                                | -10              | 66              | 0.0350 |     |        |
|                                                                                | 0                | 29              | 0.0155 |     |        |
|                                                                                | 10               | 32              | 0.0170 |     |        |
|                                                                                | 20               | 22              | 0.0115 |     |        |
|                                                                                | 30               | 34              | 0.0180 |     |        |
|                                                                                | 40               | 33              | 0.0175 |     |        |
|                                                                                | 50               | 31              | 0.0166 |     |        |
| Reference Frequency: PCS1900 (GPRS 1 link) Middle channel=661 channel=1880MHz  |                  |                 |        |     |        |
| Power supplied (Vdc)                                                           | Temperature (℃ ) | Frequency error |        |     | Result |
|                                                                                |                  | Hz              | ppm    |     |        |
| 3.85                                                                           | -30              | 59              | 0.0312 | 2.5 | Pass   |
|                                                                                | -20              | 23              | 0.0122 |     |        |
|                                                                                | -10              | 67              | 0.0355 |     |        |
|                                                                                | 0                | 31              | 0.0166 |     |        |
|                                                                                | 10               | 31              | 0.0163 |     |        |
|                                                                                | 20               | 23              | 0.0122 |     |        |
|                                                                                | 30               | 29              | 0.0152 |     |        |
|                                                                                | 40               | 30              | 0.0161 |     |        |
|                                                                                | 50               | 33              | 0.0177 |     |        |
| Reference Frequency: PCS1900 (EGPRS 1 link) Middle channel=661 channel=1880MHz |                  |                 |        |     |        |
| Power supplied (Vdc)                                                           | Temperature (℃)  | Frequency error |        |     | Result |
|                                                                                |                  | Hz              | ppm    |     |        |
| 3.85                                                                           | -30              | 58              | 0.0310 | 2.5 | Pass   |
|                                                                                | -20              | 23              | 0.0122 |     |        |
|                                                                                | -10              | 65              | 0.0348 |     |        |
|                                                                                | 0                | 33              | 0.0174 |     |        |
|                                                                                | 10               | 27              | 0.0145 |     |        |
|                                                                                | 20               | 24              | 0.0127 |     |        |
|                                                                                | 30               | 34              | 0.0179 |     |        |
|                                                                                | 40               | 30              | 0.0158 |     |        |
|                                                                                | 50               | 33              | 0.0173 |     |        |

| Reference Frequency: WCDMA Band V Middle channel=4183 channel=836.6MHz   |                  |                 |        |             |        |
|--------------------------------------------------------------------------|------------------|-----------------|--------|-------------|--------|
| Power supplied (Vdc)                                                     | Temperature (°C) | Frequency error |        | Limit (ppm) | Result |
|                                                                          |                  | Hz              | ppm    |             |        |
| 3.85                                                                     | -30              | 57              | 0.0675 | 2.5         | Pass   |
|                                                                          | -20              | 23              | 0.0275 |             |        |
|                                                                          | -10              | 66              | 0.0791 |             |        |
|                                                                          | 0                | 35              | 0.0417 |             |        |
|                                                                          | 10               | 28              | 0.0340 |             |        |
|                                                                          | 20               | 24              | 0.0283 |             |        |
|                                                                          | 30               | 34              | 0.0401 |             |        |
|                                                                          | 40               | 29              | 0.0351 |             |        |
|                                                                          | 50               | 32              | 0.0382 |             |        |
| Reference Frequency: WCDMA Band II Middle channel=9400 channel=1880.0MHz |                  |                 |        |             |        |
| Power supplied (Vdc)                                                     | Temperature (°C) | Frequency error |        | Limit (ppm) | Result |
|                                                                          |                  | Hz              | ppm    |             |        |
| 3.85                                                                     | -30              | 57              | 0.0303 | 2.5         | Pass   |
|                                                                          | -20              | 23              | 0.0122 |             |        |
|                                                                          | -10              | 65              | 0.0348 |             |        |
|                                                                          | 0                | 31              | 0.0165 |             |        |
|                                                                          | 10               | 28              | 0.0150 |             |        |
|                                                                          | 20               | 24              | 0.0126 |             |        |
|                                                                          | 30               | 33              | 0.0174 |             |        |
|                                                                          | 40               | 33              | 0.0176 |             |        |
|                                                                          | 50               | 36              | 0.0189 |             |        |
| Reference Frequency: WCDMA Band IV Middle channel=1450 channel=1740.0MHz |                  |                 |        |             |        |
| Power supplied (Vdc)                                                     | Temperature (°C) | Frequency error |        | Limit (ppm) | Result |
|                                                                          |                  | Hz              | ppm    |             |        |
| 3.85                                                                     | -30              | 58              | 0.0335 | 2.5         | Pass   |
|                                                                          | -20              | 23              | 0.0132 |             |        |
|                                                                          | -10              | 68              | 0.0388 |             |        |
|                                                                          | 0                | 30              | 0.0173 |             |        |
|                                                                          | 10               | 31              | 0.0177 |             |        |
|                                                                          | 20               | 24              | 0.0141 |             |        |
|                                                                          | 30               | 32              | 0.0184 |             |        |
|                                                                          | 40               | 32              | 0.0183 |             |        |
|                                                                          | 50               | 32              | 0.0183 |             |        |

#### 4.11 Frequency stability V.S. Voltage measurement

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Requirement: | FCC Part2.1055(d)(1)(2)                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Test Method:      | FCC Part2.1055(d)(1)(2)                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Limit:            | 2.5ppm                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Test setup:       |  <p><b>Note :</b> Measurement setup for testing on Antenna connector</p>                                                                                                                                                                                                                                                                                        |
| Test procedure:   | <ol style="list-style-type: none"> <li>1. Set chamber temperature to 25°C . Use a variable DC power source to power the EUT and set the voltage to rated voltage.</li> <li>2. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency.</li> <li>3. Reduce the input voltage to specified extreme voltage variation (+/- 15%) and endpoint, record the maximum frequency change.</li> </ol> |
| Test Instruments: | Refer to section 5.0 for details                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Test mode:        | Refer to section 6.1 for details                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Test results:     | Pass                                                                                                                                                                                                                                                                                                                                                                                                                                              |

## Measurement Data

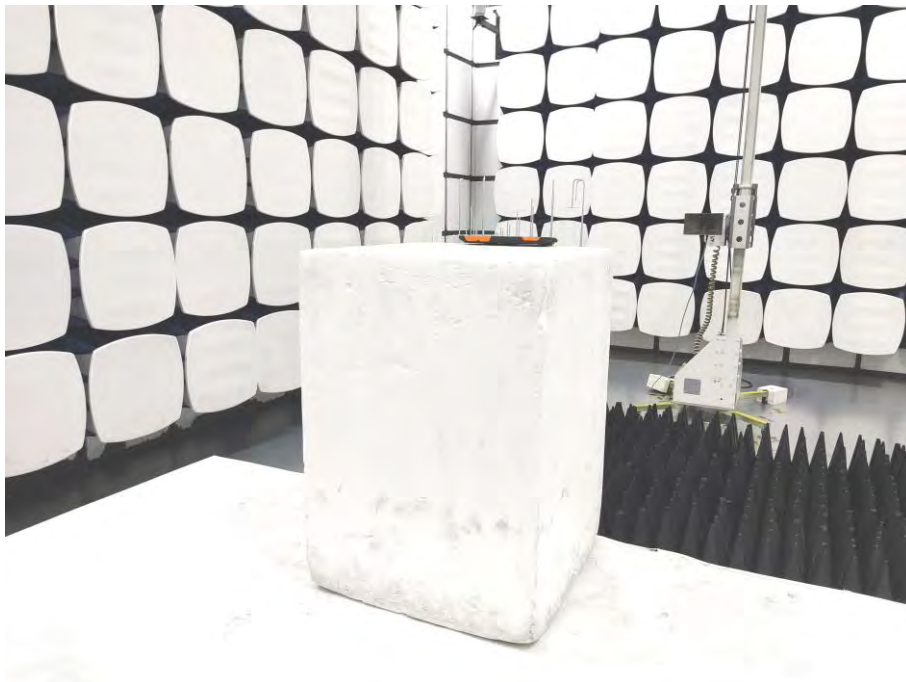
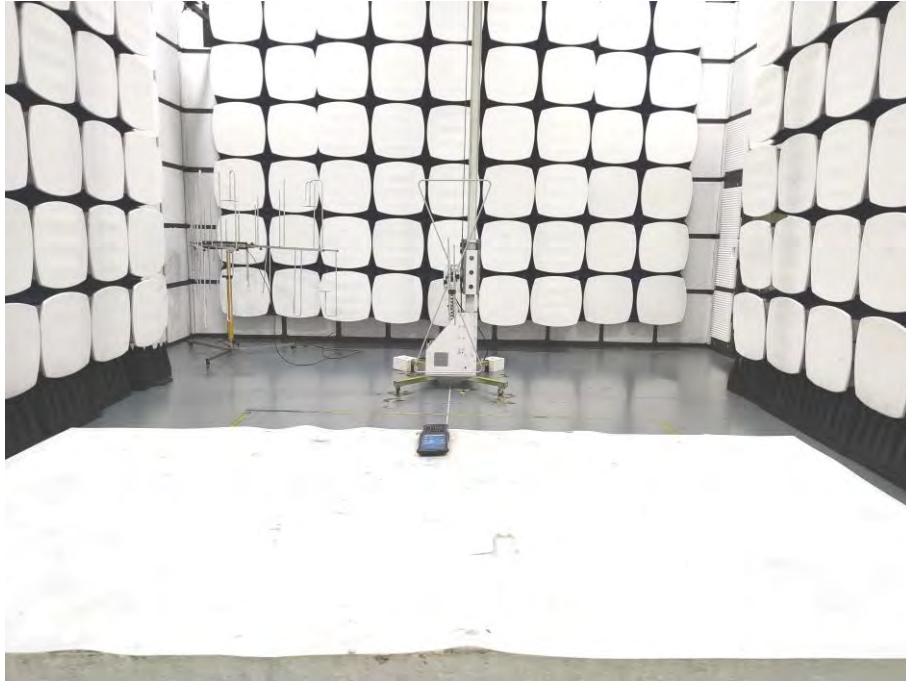
| Reference Frequency: GSM850 (GSM link) Middle channel=190 channel=836.6MHz     |                      |                 |        |             |        |
|--------------------------------------------------------------------------------|----------------------|-----------------|--------|-------------|--------|
| Temperature (℃ )                                                               | Power supplied (Vdc) | Frequency error |        | Limit (ppm) | Result |
|                                                                                |                      | Hz              | ppm    |             |        |
| 25                                                                             | 4.40                 | 58              | 0.0688 | 2.5         | Pass   |
|                                                                                | 3.85                 | 23              | 0.0275 |             |        |
|                                                                                | 3.30                 | 65              | 0.0781 |             |        |
| Reference Frequency: GSM850 (GPRS 1 link) Middle channel=190 channel=836.6MHz  |                      |                 |        |             |        |
| Temperature (℃ )                                                               | Power supplied (Vdc) | Frequency error |        | Limit (ppm) | Result |
|                                                                                |                      | Hz              | ppm    |             |        |
| 25                                                                             | 4.40                 | 30              | 0.0364 | 2.5         | Pass   |
|                                                                                | 3.85                 | 22              | 0.0265 |             |        |
|                                                                                | 3.30                 | 31              | 0.0373 |             |        |
| Reference Frequency: GSM850 (EGPRS 1 link) Middle channel=190 channel=836.6MHz |                      |                 |        |             |        |
| Temperature (℃)                                                                | Power supplied (Vdc) | Frequency error |        | Limit (ppm) | Result |
|                                                                                |                      | Hz              | ppm    |             |        |
| 25                                                                             | 4.40                 | 33              | 0.0399 | 2.5         | Pass   |
|                                                                                | 3.85                 | 20              | 0.0236 |             |        |
|                                                                                | 3.30                 | 20              | 0.0236 |             |        |

| Reference Frequency: PCS1900 (GSM link) Middle channel=661 channel=1880MHz     |                      |                 |        |             |        |
|--------------------------------------------------------------------------------|----------------------|-----------------|--------|-------------|--------|
| Temperature (℃ )                                                               | Power supplied (Vdc) | Frequency error |        | Limit (ppm) | Result |
|                                                                                |                      | Hz              | ppm    |             |        |
| 25                                                                             | 4.40                 | 36              | 0.0190 | 2.5         | Pass   |
|                                                                                | 3.85                 | 21              | 0.0110 |             |        |
|                                                                                | 3.30                 | 17              | 0.0093 |             |        |
| Reference Frequency: PCS1900 (GPRS 1 link) Middle channel=661 channel=1880MHz  |                      |                 |        |             |        |
| Temperature (℃ )                                                               | Power supplied (Vdc) | Frequency error |        | Limit (ppm) | Result |
|                                                                                |                      | Hz              | ppm    |             |        |
| 25                                                                             | 4.40                 | 65              | 0.0346 | 2.5         | Pass   |
|                                                                                | 3.85                 | 33              | 0.0174 |             |        |
|                                                                                | 3.30                 | 29              | 0.0156 |             |        |
| Reference Frequency: PCS1900 (EGPRS 1 link) Middle channel=661 channel=1880MHz |                      |                 |        |             |        |
| Temperature (℃ )                                                               | Power supplied (Vdc) | Frequency error |        | Limit (ppm) | Result |
|                                                                                |                      | Hz              | ppm    |             |        |
| 25                                                                             | 4.40                 | 23              | 0.0121 | 2.5         | Pass   |
|                                                                                | 3.85                 | 33              | 0.0177 |             |        |
|                                                                                | 3.30                 | 31              | 0.0166 |             |        |

| Reference Frequency: WCDMA Band V Middle channel=4183 channel=836.6MHz   |                      |                 |        |             |        |
|--------------------------------------------------------------------------|----------------------|-----------------|--------|-------------|--------|
| Temperature (°C)                                                         | Power supplied (Vdc) | Frequency error |        | Limit (ppm) | Result |
|                                                                          |                      | Hz              | ppm    |             |        |
| 25                                                                       | 4.40                 | 29              | 0.0341 | 2.5         | Pass   |
|                                                                          | 3.85                 | 34              | 0.0404 |             |        |
|                                                                          | 3.30                 | 32              | 0.0387 |             |        |
| Reference Frequency: WCDMA Band II Middle channel=940 channel=1880.0MHz  |                      |                 |        |             |        |
| Temperature (°C)                                                         | Power supplied (Vdc) | Frequency error |        | Limit (ppm) | Result |
|                                                                          |                      | Hz              | ppm    |             |        |
| 25                                                                       | 4.40                 | 23              | 0.0122 | 2.5         | Pass   |
|                                                                          | 3.85                 | 66              | 0.0352 |             |        |
|                                                                          | 3.30                 | 33              | 0.0173 |             |        |
| Reference Frequency: WCDMA Band IV Middle channel=1450 channel=1740.0MHz |                      |                 |        |             |        |
| Temperature (°C)                                                         | Power supplied (Vdc) | Frequency error |        | Limit (ppm) | Result |
|                                                                          |                      | Hz              | ppm    |             |        |
| 25                                                                       | 4.40                 | 34              | 0.0194 | 2.5         | Pass   |
|                                                                          | 3.85                 | 31              | 0.0177 |             |        |
|                                                                          | 3.30                 | 21              | 0.0122 |             |        |

## 5 Test Setup Photo

### Radiated Emission



## **6 EUT Constructional Details**

Please refer to report A2108332-C01-R02.

-----End-----