

## FCC Test Report (PART 22)

**Report No.:** RF160818E07-3

**FCC ID:** G95TCA301

**Test Model:** TCA301TCH1

**Series Model:** TCA301TCH2, TCA301ROG1, TCA301COX2, TCA301BHN2,  
TCA301CMP2, TCA301TWC2

**Received Date:** Aug. 18, 2016

**Test Date:** Sep. 04 to 13, 2016

**Issued Date:** Dec. 15, 2016

**Applicant:** Technicolor Connected Home USA LLC

**Address:** 5030 Sugarloaf Parkway, Building 6, Lawrenceville, GA 30044

**Issued By:** Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch  
Hsin Chu Laboratory

**Lab Address:** E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,  
Taiwan R.O.C.

**Test Location (1):** E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,  
Taiwan R.O.C.

**Test Location (2):** No. 49, Ln. 206, Wende Rd., Shangshan Tsuen, Chiung Lin Hsiang, Hsin  
Chu Hsien 307, Taiwan R.O.C.



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### Release Control Record

| Issue No.     | Description       | Date Issued   |
|---------------|-------------------|---------------|
| RF160818E07-3 | Original release. | Dec. 15, 2016 |

## 1 Certificate of Conformity

**Product:** Integrated Device

**Brand:** Technicolor

**Test Model:** TCA301TCH1

**Series Model:** TCA301TCH2, TCA301ROG1, TCA301COX2, TCA301BHN2, TCA301CMP2,  
TCA301TWC2

**Sample Status:** ENGINEERING SAMPLE

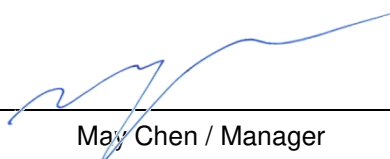
**Applicant:** Technicolor Connected Home USA LLC

**Test Date:** Sep. 04 to 13, 2016

**Standards:** FCC Part 22

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

**Prepared by :**  , **Date:** Dec. 15, 2016  
Claire Kuan / Specialist

**Approved by :**  , **Date:** Dec. 15, 2016  
May Chen / Manager

## 2 Summary of Test Results

| Applied Standard: FCC Part 22 & Part 2 |                              |        |                                                                                    |
|----------------------------------------|------------------------------|--------|------------------------------------------------------------------------------------|
| FCC Clause                             | Test Item                    | Result | Remarks                                                                            |
| 2.1046<br>22.913 (a)                   | Effective radiated power     | PASS   | Meet the requirement of limit.                                                     |
| ---                                    | Peak to Average Ratio        | PASS   | Meet the requirement of limit.                                                     |
| 2.1055<br>22.355                       | Frequency Stability          | PASS   | Meet the requirement of limit.                                                     |
| 2.1049                                 | Occupied Bandwidth           | PASS   | Meet the requirement of limit.                                                     |
| 22.917                                 | Band Edge Measurements       | PASS   | Meet the requirement of limit.                                                     |
| 2.1051<br>22.917                       | Conducted Spurious Emissions | PASS   | Meet the requirement of limit.                                                     |
| 2.1053<br>22.917                       | Radiated Spurious Emissions  | PASS   | Meet the requirement of limit.<br>Minimum passing margin is -15.26dB at 2509.5MHz. |

### 2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

| Measurement                    | Frequency                 | Expended Uncertainty (k=2) (±) |
|--------------------------------|---------------------------|--------------------------------|
| Radiated Emissions up to 1 GHz | 30MHz ~ 1GHz – Chamber 3  | 5.31 dB                        |
|                                | 30MHz ~ 1GHz – Chamber 4  | 5.19 dB                        |
| Radiated Emissions above 1 GHz | 1GHz ~ 6GHz – Chamber 3   | 3.40 dB                        |
|                                | 6GHz ~ 18GHz – Chamber 3  | 3.73 dB                        |
|                                | 18GHz ~ 40GHz – Chamber 3 | 4.11 dB                        |

## 2.2 Test Site and Instruments

### For WCDMA & LTE Radiated Spurious Emissions below 1GHz test:

| DESCRIPTION & MANUFACTURER              | MODEL NO.                | SERIAL NO.                    | CALIBRATED DATE | CALIBRATED UNTIL |
|-----------------------------------------|--------------------------|-------------------------------|-----------------|------------------|
| Test Receiver<br>Keysight               | N9038A                   | MY54450088                    | July 20, 2016   | July 19, 2017    |
| Pre-Amplifier<br>Mini-Circuits          | ZFL-1000VH2<br>B         | AMP-ZFL-01                    | Nov. 11, 2015   | Nov. 10, 2016    |
| Trilog Broadband Antenna<br>SCHWARZBECK | VULB 9168                | 9168-406                      | Jan. 04, 2016   | Jan. 03, 2017    |
| RF Cable                                | 8D                       | 966-4-1<br>966-4-2<br>966-4-3 | Apr. 02, 2016   | Apr. 01, 2017    |
| Software                                | ADT_Radiated<br>_V8.7.08 | NA                            | NA              | NA               |
| Antenna Tower & Turn Table<br>Max-Full  | MF-7802                  | MF780208410                   | NA              | NA               |

#### Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in 966 Chamber No. 4.
3. The FCC Site Registration No. is 292998
4. The CANADA Site Registration No. is 20331-2
5. Loop antenna was used for all emissions below 30 MHz
6. Tested Date: Sep. 10 to 13, 2016

**For EIRP Power & other Radiated Spurious Emissions test:**

| DESCRIPTION & MANUFACTURER              | MODEL NO.                                                               | SERIAL NO.                    | CALIBRATED DATE | CALIBRATED UNTIL |
|-----------------------------------------|-------------------------------------------------------------------------|-------------------------------|-----------------|------------------|
| Test Receiver<br>Agilent                | N9038A                                                                  | MY50010156                    | Aug. 18, 2016   | Aug. 17, 2017    |
| Pre-Amplifier<br>Mini-Circuits          | ZFL-1000VH2<br>B                                                        | AMP-ZFL-05                    | May 07, 2016    | May 06, 2017     |
| Trilog Broadband Antenna<br>SCHWARZBECK | VULB 9168                                                               | 9168-156                      | Jan. 04, 2016   | Jan. 03, 2017    |
| RF Cable                                | 8D                                                                      | 966-3-1<br>966-3-2<br>966-3-3 | Apr. 02, 2016   | Apr. 01, 2017    |
| Horn_Antenna<br>SCHWARZBECK             | BBHA9120-D                                                              | 9120D-406                     | Jan. 20, 2016   | Jan. 19, 2017    |
| Pre-Amplifier<br>Agilent                | 8449B                                                                   | 3008A02465                    | Apr. 05, 2016   | Apr. 04, 2017    |
| RF Cable                                | EMC104-SM-<br>SM-2000<br>EMC104-SM-<br>SM-5000<br>EMC104-SM-<br>SM-5000 | 150317<br>150321<br>150322    | Mar. 30, 2016   | Mar. 29, 2017    |
| Spectrum Analyzer<br>Keysight           | N9030A                                                                  | MY54490520                    | July 29, 2016   | July 28, 2017    |
| Pre-Amplifier<br>EMCI                   | EMC184045                                                               | 980143                        | Jan. 15, 2016   | Jan. 14, 2017    |
| Horn_Antenna<br>SCHWARZBECK             | BBHA 9170                                                               | BBHA9170608                   | Jan. 08, 2016   | Jan. 07, 2017    |
| RF Cable                                | SUCOFLEX<br>102                                                         | 36432/2<br>36441/2            | Jan. 16, 2016   | Jan. 15, 2017    |
| Software                                | ADT_Radiated<br>_V8.7.08                                                | NA                            | NA              | NA               |
| Antenna Tower & Turn Table<br>Max-Full  | MF-7802                                                                 | MF780208406                   | NA              | NA               |
| Boresight Antenna Fixture               | FBA-01                                                                  | FBA-SIP01                     | NA              | NA               |

**Note:**

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in 966 Chamber No. 3.
3. The FCC Site Registration No. is 147459
4. The CANADA Site Registration No. is 20331-1
5. Tested Date: Sep. 10 to 12, 2016

**For other test items:**

| DESCRIPTION & MANUFACTURER                     | MODEL NO.                     | SERIAL NO.                           | CALIBRATED DATE | CALIBRATED UNTIL |
|------------------------------------------------|-------------------------------|--------------------------------------|-----------------|------------------|
| Spectrum Analyzer R&S                          | FSP40                         | 100036                               | Jan. 27, 2016   | Jan. 26, 2017    |
| Spectrum Analyzer Keysight                     | N9030A                        | MY54490570                           | July 06, 2016   | July 05, 2017    |
| AC Power Source Exttech Electronics            | 6502                          | 1140503                              | NA              | NA               |
| Temperature & Humidity Chamber TERCHY          | MHU-225AU                     | 911033                               | Dec. 03, 2015   | Dec. 02, 2016    |
| DC Power Supply GOOD WILL INSTRUMENT CO., LTD. | GPC - 3030D                   | 7700087                              | NA              | NA               |
| ESG Vector signal generator Agilent            | E4438C                        | Y45094468/00<br>5 506 602 UK6<br>UNJ | Dec. 01, 2015   | Nov. 30, 2016    |
| Power meter Anritsu                            | ML2495A                       | 0824006                              | May 26, 2016    | May 25, 2017     |
| Power sensor Anritsu                           | MA2411B                       | 0738172                              | May 26, 2016    | May 25, 2017     |
| Software                                       | ADT_RF Test Software V6.6.5.4 | NA                                   | NA              | NA               |
| Digital Multimeter FLUKE                       | 87III                         | 73680266                             | Nov. 10, 2015   | Nov. 09, 2016    |

- NOTE:**
1. The test was performed in Oven room 1.
  2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
  3. Tested Date: Sep. 04, 2016

### 3 General Information

#### 3.1 General Description of EUT

|                     |                                                                        |                           |                                 |
|---------------------|------------------------------------------------------------------------|---------------------------|---------------------------------|
| Product             | Integrated Device                                                      |                           |                                 |
| Brand               | Technicolor                                                            |                           |                                 |
| Test Model          | TCA301TCH1                                                             |                           |                                 |
| Series Model        | TCA301TCH2, TCA301ROG1, TCA301COX2, TCA301BHN2, TCA301CMP2, TCA301TWC2 |                           |                                 |
| Status of EUT       | ENGINEERING SAMPLE                                                     |                           |                                 |
| Power Supply Rating | 12Vdc from power adapter or<br>4Vdc from battery                       |                           |                                 |
| Modulation Type     | GPRS                                                                   |                           | GMSK                            |
|                     | EDGE                                                                   |                           | 8PSK                            |
|                     | WCDMA, HSDPA, HSUPA                                                    |                           | BPSK                            |
|                     | LTE                                                                    |                           | QPSK, 16QAM                     |
| Operating Frequency | GPRS, EDGE                                                             |                           | 824.2MHz ~848.8MHz              |
|                     | WCDMA, HSDPA, HSUPA                                                    |                           | 826.4MHz ~846.6MHz              |
|                     | LTE                                                                    | Channel Bandwidth: 1.4MHz | 824.7MHz ~848.3MHz              |
|                     |                                                                        | Channel Bandwidth: 3MHz   | 825.5MHz ~847.5MHz              |
|                     |                                                                        | Channel Bandwidth: 5MHz   | 826.5MHz ~846.5MHz              |
|                     |                                                                        | Channel Bandwidth: 10MHz  | 829MHz ~844MHz                  |
| Max. ERP Power      | GPRS                                                                   |                           | 2275.10mW                       |
|                     | EDGE                                                                   |                           | 2172.70mW                       |
|                     | WCDMA                                                                  |                           | 205.12mW                        |
|                     | LTE                                                                    | Channel Bandwidth: 1.4MHz | 236.05mW                        |
|                     |                                                                        | Channel Bandwidth: 3MHz   | 228.56mW                        |
|                     |                                                                        | Channel Bandwidth: 5MHz   | 223.36mW                        |
|                     |                                                                        | Channel Bandwidth: 10MHz  | 215.28mW                        |
| Emission Designator | GPRS                                                                   |                           | 240KGXW                         |
|                     | EDGE                                                                   |                           | 240KG7W                         |
|                     | WCDMA                                                                  |                           | 4M18F9W                         |
|                     | LTE                                                                    | Channel Bandwidth: 1.4MHz | QPSK: 1M08G7D<br>16QAM: 1M09D7W |
|                     |                                                                        | Channel Bandwidth: 3MHz   | QPSK: 2M68G7D<br>16QAM: 2M68D7W |
|                     |                                                                        | Channel Bandwidth: 5MHz   | QPSK: 4M49G7D<br>16QAM: 4M49D7W |
|                     |                                                                        | Channel Bandwidth: 10MHz  | QPSK: 8M98G7D<br>16QAM: 8M94D7W |
| Antenna Type        | Please see Note                                                        |                           |                                 |
| Antenna Connector   | Please see Note                                                        |                           |                                 |
| Accessory Device    | Adapter x1<br>Battery x1                                               |                           |                                 |
| HW Version          | FGR                                                                    |                           |                                 |
| SW Version          | i-control v.1.4.0                                                      |                           |                                 |

Note:

1. All models are listed as below.

| Brand       | Model      | Difference     |
|-------------|------------|----------------|
| Technicolor | TCA301TCH1 | For marketing. |
|             | TCA301TCH2 |                |
|             | TCA301ROG1 |                |
|             | TCA301COX2 |                |
|             | TCA301BHN2 |                |
|             | TCA301CMP2 |                |
|             | TCA301TWC2 |                |

From the above models, model: **TCA301TCH1** was selected as representative model for the test and its data was recorded in this report.

2. There are WLAN, Bluetooth, Zigbee, Zigbee Thread and WWAN technology used for the EUT.

3. Simultaneously transmission condition.

| Condition | Technology    |           |        |               |                 |
|-----------|---------------|-----------|--------|---------------|-----------------|
| 1         | WLAN (2.4GHz) | Bluetooth | Zigbee | Zigbee Thread | WWAN (2G/3G/4G) |
| 2         | WLAN (5GHz)   | Bluetooth | Zigbee | Zigbee Thread | WWAN (2G/3G/4G) |

Note: The emission of the simultaneous operation has been evaluated and no non-compliance was found.

4. The EUT power needs to be supplied from one power adapter or battery, the information is as below table:

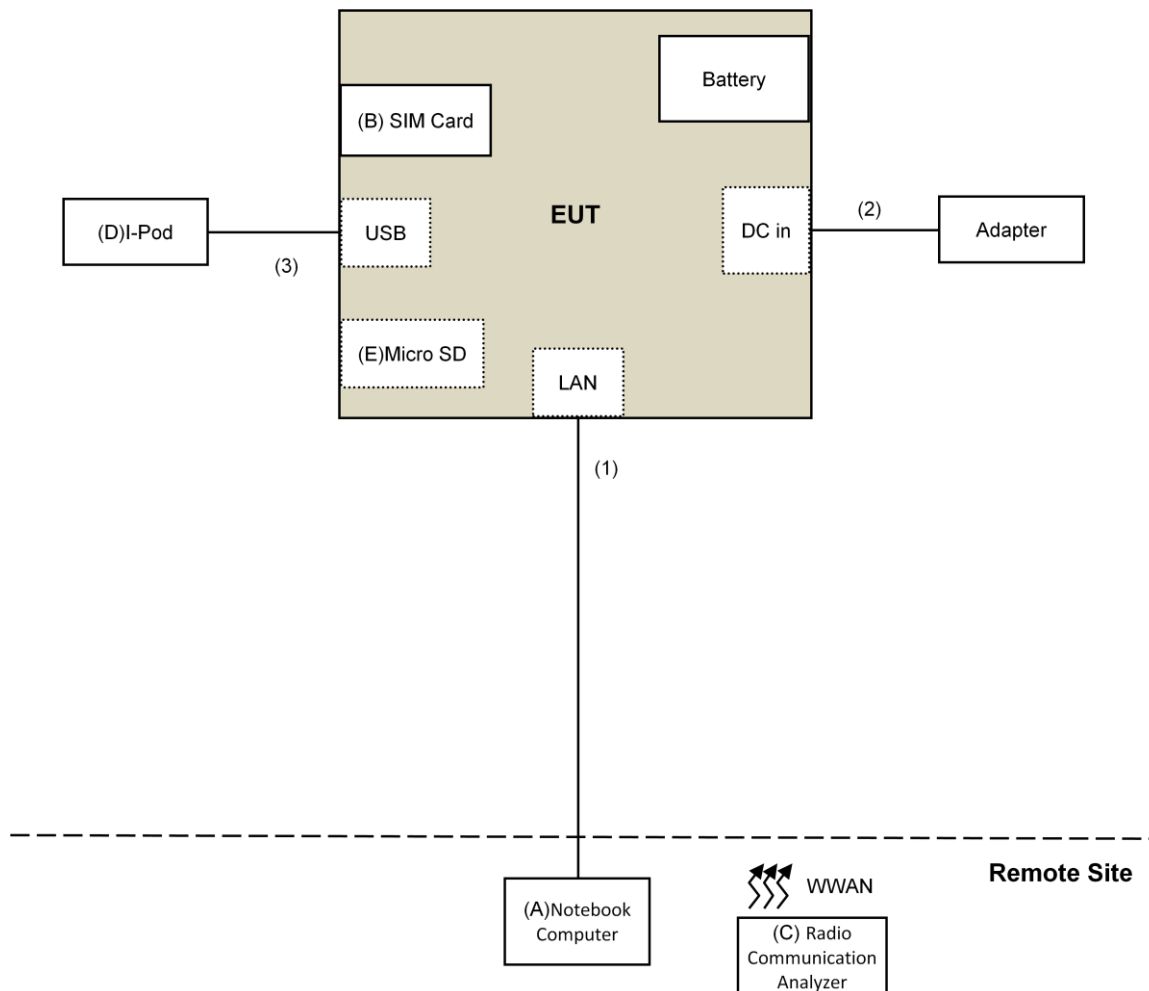
| Adapter |            |                                                                                           |
|---------|------------|-------------------------------------------------------------------------------------------|
| Brand   | Model      | Spec.                                                                                     |
| AcBel   | WAF007     | Input: 100-120Vac, 50/60Hz, 0.7A<br>Output: 12V, 1.5A<br>DC output cable (Unshielded, 3m) |
| Battery |            |                                                                                           |
| Brand   | Model      | Spec.                                                                                     |
| GETAC   | U46P332.00 | 4V 3540mAh 14.16Wh.                                                                       |

5. The antennas provided to the EUT, please refer to the following table:

| WLAN & BT Antenna Spec. |                     |                                |                       |              |                   |
|-------------------------|---------------------|--------------------------------|-----------------------|--------------|-------------------|
| Antenna No.             | Transmitter Circuit | Gain(dBi) Including cable loss | Frequency range (MHz) | Antenna Type | Antenna Connector |
| WiFi 1 & BT             | Chain (0)           | 2.29                           | 2400~2500             | FPCB         | i-pex(MHF)        |
|                         |                     | 3.36                           | 5150~5250             |              |                   |
|                         |                     | 3.66                           | 5250~5350             |              |                   |
|                         |                     | 3.77                           | 5470~5725             |              |                   |
|                         |                     | 3.36                           | 5725~5850             |              |                   |
| WiFi 2                  | Chain (1)           | 2.34                           | 2400~2500             | PCB          | i-pex(MHF)        |
|                         |                     | 3.62                           | 5150~5250             |              |                   |
|                         |                     | 3.55                           | 5250~5350             |              |                   |
|                         |                     | 2.86                           | 5470~5725             |              |                   |
|                         |                     | 2.99                           | 5725~5850             |              |                   |
| Zigbee Antenna Spec.    |                     |                                |                       |              |                   |
| Antenna No.             |                     | Gain(dBi) Including cable loss | Frequency range (MHz) | Antenna Type | Antenna Connector |
| Zigbee-A                |                     | 2.33                           | 2400~2500             | PCB          | i-pex(MHF)        |
| Zigbee- Thread          |                     | 2.5                            | 2400~2500             | PCB          | i-pex(MHF)        |
| WWAN Antenna Spec.      |                     |                                |                       |              |                   |
| Antenna No.             |                     | Gain(dBi) Including cable loss | Frequency range (MHz) | Antenna Type | Antenna Connector |
| WWAN 1                  |                     | 1.62                           | 704~894               | PCB          | i-pex(MHF)        |
|                         |                     | 2.36                           | 1710~2170             |              |                   |
| WWAN 2                  |                     | 0.63                           | 704~894               | FPCB         | i-pex(MHF)        |
|                         |                     | 1.66                           | 1710~2170             |              |                   |

6. The above EUT information was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

### 3.2 Configuration of System under Test



### 3.2.1 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

| ID | Product                            | Brand   | Model No.              | Serial No.   | FCC ID | Remarks         |
|----|------------------------------------|---------|------------------------|--------------|--------|-----------------|
| A. | Notebook Computer                  | HP      | Pavilion<br>14-ab023TU | 5CD5340WXZ   | NA     | Provided by Lab |
| B. | SIM Card                           | NA      | NA                     | NA           | NA     | Provided by Lab |
| C. | Radio<br>Communication<br>Analyzer | Anritsu | MT8820C                | 6201127458   | NA     | Provided by Lab |
| D. | i-Pod                              | Apple   | MD778TA/A              | CC4JMFLOF4T1 | NA     | Provided by Lab |
| E. | Micro SD                           | NA      | NA                     | NA           | NA     | Provided by Lab |

Note:

1. All power cords of the above support units are non-shielded (1.8m).

| ID | Descriptions | Qty. | Length (m) | Shielding<br>(Yes/No) | Cores (Qty.) | Remarks            |
|----|--------------|------|------------|-----------------------|--------------|--------------------|
| 1. | RJ45 Cable   | 1    | 10         | No                    | 0            | Provided by Lab    |
| 2. | DC Cable     | 1    | 3          | No                    | 0            | Supplied by client |
| 3. | USB Calbe    | 1    | 0.1        | Yes                   | 0            | Provided by Lab    |

### 3.3 Test Mode Applicability and Tested Channel Detail

The EUT had been pre-tested on the positioned of each 2 axis. The worst case was found when positioned on **Y-plane**.

#### GSM850 MODE

| Test Item                       | Available Channel | Tested Channel | Mode       |
|---------------------------------|-------------------|----------------|------------|
| ERP                             | 128 to 251        | 128, 189, 251  | GPRS, EDGE |
| Frequency Stability             | 128 to 251        | 189            | GPRS       |
| Occupied Bandwidth              | 128 to 251        | 128, 189, 251  | GPRS, EDGE |
| Peak to Average Ratio           | 128 to 251        | 128, 189, 251  | GPRS, EDGE |
| Band Edge                       | 128 to 251        | 128, 251       | GPRS, EDGE |
| Conducted Emission              | 128 to 251        | 189            | GPRS, EDGE |
| Radiated Emission<br>Below 1GHz | 128 to 251        | 189            | GPRS, EDGE |
| Radiated Emission<br>Above 1GHz | 128 to 251        | 189            | GPRS, EDGE |

#### WCDMA V MODE

| Test Item                       | Available Channel | Tested Channel   | Mode  |
|---------------------------------|-------------------|------------------|-------|
| ERP                             | 4132 to 4233      | 4132, 4182, 4233 | WCDMA |
| Frequency Stability             | 4132 to 4233      | 4182             | WCDMA |
| Occupied Bandwidth              | 4132 to 4233      | 4132, 4182, 4233 | WCDMA |
| Peak to Average Ratio           | 4132 to 4233      | 4132, 4182, 4233 | WCDMA |
| Band Edge                       | 4132 to 4233      | 4132, 4233       | WCDMA |
| Conducted Emission              | 4132 to 4233      | 4182             | WCDMA |
| Radiated Emission<br>Below 1GHz | 4132 to 4233      | 4182             | WCDMA |
| Radiated Emission<br>Above 1GHz | 4132 to 4233      | 4182             | WCDMA |

## LTE Band 5

| TEST ITEM             | AVAILABLE CHANNEL | TESTED CHANNEL      | CHANNEL BANDWIDTH | MODULATION | MODE                |
|-----------------------|-------------------|---------------------|-------------------|------------|---------------------|
| ERP                   | 20407 to 20643    | 20407, 20525, 20643 | 1.4M              | QPSK/16QAM | 1RB / 0RB offset    |
|                       | 20415 to 20635    | 20415, 20525, 20635 | 3M                | QPSK/16QAM | 1RB / 0RB offset    |
|                       | 20425 to 20625    | 20425, 20525, 20625 | 5MHz              | QPSK/16QAM | 1RB / 0RB offset    |
|                       | 20450 to 20600    | 20450, 20525, 20600 | 10MHz             | QPSK/16QAM | 1RB / 0RB offset    |
| Frequency Stability   | 20407 to 20643    | 20525               | 1.4M              | QPSK       | 1RB / 0RB offset    |
|                       | 20415 to 20635    | 20525               | 3M                | QPSK       | 1RB / 0RB offset    |
|                       | 20425 to 20625    | 20525               | 5MHz              | QPSK       | 1RB / 0RB offset    |
|                       | 20450 to 20600    | 20525               | 10MHz             | QPSK       | 1RB / 0RB offset    |
| Occupied Bandwidth    | 20407 to 20643    | 20407, 20525, 20643 | 1.4M              | QPSK/16QAM | 6 RB / 0 RB offset  |
|                       | 20415 to 20635    | 20415, 20525, 20635 | 3M                | QPSK/16QAM | 15 RB / 0 RB offset |
|                       | 20425 to 20625    | 20425, 20525, 20625 | 5MHz              | QPSK/16QAM | 25 RB / 0 RB offset |
|                       | 20450 to 20600    | 20450, 20525, 20600 | 10MHz             | QPSK/16QAM | 50 RB / 0 RB offset |
| Peak to Average Ratio | 20407 to 20643    | 20525               | 1.4M              | QPSK       | 1RB / 0RB offset    |
|                       | 20415 to 20635    | 20525               | 3M                | QPSK       | 1RB / 0RB offset    |
|                       | 20425 to 20625    | 20525               | 5MHz              | QPSK       | 1RB / 0RB offset    |
|                       | 20450 to 20600    | 20525               | 10MHz             | QPSK       | 1RB / 0RB offset    |
| Band Edge             | 20407 to 20643    | 20407, 20643        | 1.4M              | QPSK       | 1 RB / 0 RB offset  |
|                       |                   |                     |                   |            | 6 RB / 0 RB offset  |
|                       | 20415 to 20635    | 20415, 20635        | 3M                | QPSK       | 1 RB / 0 RB offset  |
|                       |                   |                     |                   |            | 15 RB / 0 RB offset |
|                       | 20425 to 20625    | 20425, 20625        | 5MHz              | QPSK       | 1 RB / 0 RB offset  |
|                       |                   |                     |                   |            | 25 RB / 0 RB offset |
| Conducuted Emission   | 20407 to 20643    | 20525               | 1.4M              | QPSK       | 1RB / 0RB offset    |
|                       | 20415 to 20635    | 20525               | 3M                | QPSK       | 1RB / 0RB offset    |
|                       | 20425 to 20625    | 20525               | 5MHz              | QPSK       | 1RB / 0RB offset    |
|                       | 20450 to 20600    | 20525               | 10MHz             | QPSK       | 1RB / 0RB offset    |
| Radiated Emission     | 20407 to 20643    | 20525               | 1.4M              | QPSK       | 1RB / 0RB offset    |
|                       | 20415 to 20635    | 20525               | 3M                | QPSK       | 1RB / 0RB offset    |
|                       | 20425 to 20625    | 20525               | 5MHz              | QPSK       | 1RB / 0RB offset    |
|                       | 20450 to 20600    | 20525               | 10MHz             | QPSK       | 1RB / 0RB offset    |

**Test Condition:**

| Test Item                       | Environmental Conditions | Input Power  | Tested By  |
|---------------------------------|--------------------------|--------------|------------|
| ERP                             | 25deg. C, 63%RH          | 120Vac, 60Hz | Gary Cheng |
| Frequency Stability             | 25deg. C, 63%RH          | 120Vac, 60Hz | Gary Cheng |
| Occupied Bandwidth              | 25deg. C, 63%RH          | 120Vac, 60Hz | Gary Cheng |
| Band Edge                       | 25deg. C, 63%RH          | 120Vac, 60Hz | Gary Cheng |
| Peak to Average Ratio           | 25deg. C, 63%RH          | 120Vac, 60Hz | Gary Cheng |
| Conducuted Emission             | 25deg. C, 63%RH          | 120Vac, 60Hz | Gary Cheng |
| Radiated Emission<br>Below 1GHz | 25deg. C, 63%RH          | 120Vac, 60Hz | Andy Ho    |
| Radiated Emission<br>Above 1GHz | 25deg. C, 63%RH          | 120Vac, 60Hz | Andy Ho    |

**3.4 EUT Operating Conditions**

The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency

### **3.5 General Description of Applied Standards**

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

**FCC 47 CFR Part 2**

**FCC 47 CFR Part 22**

**KDB 971168 D01 Power Meas License Digital Systems v02r02**

**ANSI/TIA/EIA-603-D 2010**

**NOTE:** All test items have been performed and recorded as per the above standards.

## **4 Test Types and Results**

### **4.1 Output Power Measurement**

#### **4.1.1 Limits of Output Power Measurement**

Mobile / Portable station are limited to 7 watts e.r.p.

#### **4.1.2 Test Procedures**

##### **EIRP / ERP Measurement:**

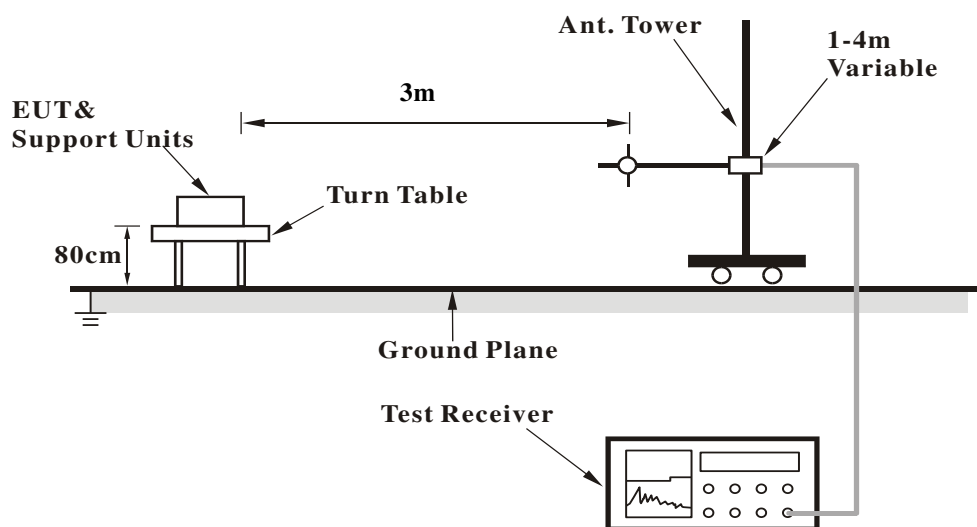
- a. All measurements were done at low, middle and high operational frequency range. Set the RBW  $\geq$  OBW and VBW  $\geq$  3xRBW.
- b. Substitution method is used for EIRP measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
- c. The substitution antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to "Read Value" of step b. Record the power level of S.G
- d.  $EIRP = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution antenna}$ .
- e. ERP power can be calculated form EIRP power by subtracting the gain of dipole,  $ERP \text{ power} = EIRP \text{ power} - 2.15\text{dBi}$ .

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

The EUT was set up for the maximum power with GPRS, EDGE, WCDMA & LTE link data modulation and link up with simulator. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

Note: The worst case vertical or horizontal polarization have been investigated and reported in this report.

#### 4.1.3 Test Setup ERP/EIRP MEASUREMENT:



For the actual test configuration, please refer to the attached file (Test Setup Photo).

#### CONDUCTED POWER MEASUREMENT:



#### 4.1.4 Test Results

##### CONDUCTED OUTPUT POWER (dBm)

| Band            | GSM850 |       |       |
|-----------------|--------|-------|-------|
| Channel         | 128    | 189   | 251   |
| Frequency (MHz) | 824.2  | 836.4 | 848.8 |
| GPRS 8          | 30.90  | 31.10 | 30.70 |
| GPRS 10         | 32.10  | 31.90 | 31.70 |
| GPRS 11         | 31.80  | 31.90 | 30.30 |
| GPRS 12         | 31.70  | 31.80 | 30.50 |
| EDGE 8 (MCS9)   | 30.80  | 31.10 | 31.50 |
| EDGE 10 (MCS9)  | 30.30  | 30.60 | 31.30 |
| EDGE 11 (MCS9)  | 31.60  | 31.50 | 31.10 |
| EDGE 12 (MCS9)  | 31.53  | 31.44 | 31.40 |

| Band            | WCDMA V |       |       |
|-----------------|---------|-------|-------|
| Channel         | 4132    | 4182  | 4233  |
| Frequency (MHz) | 826.4   | 836.4 | 846.6 |
| RMC             | 23.60   | 23.52 | 23.10 |
| HSDPA Subtest-1 | 23.30   | 23.40 | 23.30 |
| HSDPA Subtest-2 | 23.30   | 23.60 | 23.10 |
| HSDPA Subtest-3 | 23.20   | 23.30 | 23.40 |
| HSDPA Subtest-4 | 23.90   | 23.44 | 23.60 |
| HSUPA Subtest-1 | 23.10   | 23.50 | 23.30 |
| HSUPA Subtest-2 | 23.60   | 23.80 | 23.30 |
| HSUPA Subtest-3 | 23.90   | 23.62 | 23.60 |
| HSUPA Subtest-4 | 23.62   | 23.74 | 23.55 |
| HSUPA Subtest-5 | 23.60   | 23.56 | 23.42 |

| LTE Band 5 |            |       |           |    |           |     |        |          |
|------------|------------|-------|-----------|----|-----------|-----|--------|----------|
| BW         | Modulation | CH    | Frequency | RB | RB Offset | MPR | Target | Measured |
|            |            |       | (MHz)     |    |           |     | Power  | Power    |
| 1.4 MHz    | QPSK       | 20407 | 824.7     | 1  | 0         | 0   | 24     | 23.16    |
|            |            | 20525 | 836.5     | 1  | 0         | 0   | 24     | 23.25    |
|            |            | 20643 | 848.3     | 1  | 0         | 0   | 24     | 23.25    |
|            |            | 20407 | 824.7     | 1  | 2         | 0   | 24     | 23.26    |
|            |            | 20525 | 836.5     | 1  | 2         | 0   | 24     | 23.23    |
|            |            | 20643 | 848.3     | 1  | 2         | 0   | 24     | 23.18    |
|            |            | 20407 | 824.7     | 1  | 5         | 0   | 24     | 23.18    |
|            |            | 20525 | 836.5     | 1  | 5         | 0   | 24     | 23.19    |
|            |            | 20643 | 848.3     | 1  | 5         | 0   | 24     | 22.86    |
|            |            | 20407 | 824.7     | 3  | 0         | 0   | 24     | 23.22    |
|            |            | 20525 | 836.5     | 3  | 0         | 0   | 24     | 23.33    |
|            |            | 20643 | 848.3     | 3  | 0         | 0   | 24     | 22.85    |
|            |            | 20407 | 824.7     | 3  | 1         | 0   | 24     | 23.19    |
|            |            | 20525 | 836.5     | 3  | 1         | 0   | 24     | 23.38    |
|            |            | 20643 | 848.3     | 3  | 1         | 0   | 24     | 22.87    |
|            |            | 20407 | 824.7     | 3  | 3         | 0   | 24     | 23.07    |
|            |            | 20525 | 836.5     | 3  | 3         | 0   | 24     | 23.32    |
|            |            | 20643 | 848.3     | 3  | 3         | 0   | 24     | 22.85    |
|            |            | 20407 | 824.7     | 6  | 0         | 1   | 24     | 22.15    |
|            |            | 20525 | 836.5     | 6  | 0         | 1   | 24     | 22.37    |
|            |            | 20643 | 848.3     | 6  | 0         | 1   | 24     | 21.94    |

| LTE Band 5 |            |       |           |    |           |     |        |          |
|------------|------------|-------|-----------|----|-----------|-----|--------|----------|
| BW         | Modulation | CH    | Frequency | RB | RB Offset | MPR | Target | Measured |
|            |            |       | (MHz)     |    |           |     | Power  | Power    |
| 1.4 MHz    | 16QAM      | 20407 | 824.7     | 1  | 0         | 1   | 24     | 22.15    |
|            |            | 20525 | 836.5     | 1  | 0         | 1   | 24     | 22.12    |
|            |            | 20643 | 848.3     | 1  | 0         | 1   | 24     | 21.87    |
|            |            | 20407 | 824.7     | 1  | 2         | 1   | 24     | 22.40    |
|            |            | 20525 | 836.5     | 1  | 2         | 1   | 24     | 22.50    |
|            |            | 20643 | 848.3     | 1  | 2         | 1   | 24     | 22.21    |
|            |            | 20407 | 824.7     | 1  | 5         | 1   | 24     | 22.03    |
|            |            | 20525 | 836.5     | 1  | 5         | 1   | 24     | 22.57    |
|            |            | 20643 | 848.3     | 1  | 5         | 1   | 24     | 22.17    |
|            |            | 20407 | 824.7     | 3  | 0         | 1   | 24     | 22.33    |
|            |            | 20525 | 836.5     | 3  | 0         | 1   | 24     | 22.39    |
|            |            | 20643 | 848.3     | 3  | 0         | 1   | 24     | 21.90    |
|            |            | 20407 | 824.7     | 3  | 1         | 1   | 24     | 22.11    |
|            |            | 20525 | 836.5     | 3  | 1         | 1   | 24     | 22.29    |
|            |            | 20643 | 848.3     | 3  | 1         | 1   | 24     | 22.14    |
|            |            | 20407 | 824.7     | 3  | 3         | 1   | 24     | 22.30    |
|            |            | 20525 | 836.5     | 3  | 3         | 1   | 24     | 22.35    |
|            |            | 20643 | 848.3     | 3  | 3         | 1   | 24     | 21.85    |
|            |            | 20407 | 824.7     | 6  | 0         | 2   | 24     | 21.32    |
|            |            | 20525 | 836.5     | 6  | 0         | 2   | 24     | 21.30    |
|            |            | 20643 | 848.3     | 6  | 0         | 2   | 24     | 20.99    |

| LTE Band 5 |            |       |           |    |           |     |        |          |
|------------|------------|-------|-----------|----|-----------|-----|--------|----------|
| BW         | Modulation | CH    | Frequency | RB | RB Offset | MPR | Target | Measured |
|            |            |       | (MHz)     |    |           |     | Power  | Power    |
| 3 MHz      | QPSK       | 20415 | 825.5     | 1  | 0         | 0   | 24     | 23.20    |
|            |            | 20525 | 836.5     | 1  | 0         | 0   | 24     | 23.15    |
|            |            | 20635 | 847.5     | 1  | 0         | 0   | 24     | 22.97    |
|            |            | 20415 | 825.5     | 1  | 7         | 0   | 24     | 23.09    |
|            |            | 20525 | 836.5     | 1  | 7         | 0   | 24     | 23.28    |
|            |            | 20635 | 847.5     | 1  | 7         | 0   | 24     | 22.93    |
|            |            | 20415 | 825.5     | 1  | 14        | 0   | 24     | 22.96    |
|            |            | 20525 | 836.5     | 1  | 14        | 0   | 24     | 23.21    |
|            |            | 20635 | 847.5     | 1  | 14        | 0   | 24     | 22.89    |
|            |            | 20415 | 825.5     | 8  | 0         | 1   | 24     | 22.23    |
|            |            | 20525 | 836.5     | 8  | 0         | 1   | 24     | 22.22    |
|            |            | 20635 | 847.5     | 8  | 0         | 1   | 24     | 22.05    |
|            |            | 20415 | 825.5     | 8  | 3         | 1   | 24     | 22.13    |
|            |            | 20525 | 836.5     | 8  | 3         | 1   | 24     | 22.34    |
|            |            | 20635 | 847.5     | 8  | 3         | 1   | 24     | 22.00    |
|            |            | 20415 | 825.5     | 8  | 7         | 1   | 24     | 22.14    |
|            |            | 20525 | 836.5     | 8  | 7         | 1   | 24     | 22.33    |
|            |            | 20635 | 847.5     | 8  | 7         | 1   | 24     | 22.03    |
|            |            | 20415 | 825.5     | 15 | 0         | 1   | 24     | 22.12    |
|            |            | 20525 | 836.5     | 15 | 0         | 1   | 24     | 22.24    |
|            |            | 20635 | 847.5     | 15 | 0         | 1   | 24     | 22.04    |

| LTE Band 5 |            |       |           |    |           |     |        |          |
|------------|------------|-------|-----------|----|-----------|-----|--------|----------|
| BW         | Modulation | CH    | Frequency | RB | RB Offset | MPR | Target | Measured |
|            |            |       | (MHz)     |    |           |     | Power  | Power    |
| 3 MHz      | 16QAM      | 20415 | 825.5     | 1  | 0         | 1   | 24     | 22.31    |
|            |            | 20525 | 836.5     | 1  | 0         | 1   | 24     | 22.16    |
|            |            | 20635 | 847.5     | 1  | 0         | 1   | 24     | 21.59    |
|            |            | 20415 | 825.5     | 1  | 7         | 1   | 24     | 22.40    |
|            |            | 20525 | 836.5     | 1  | 7         | 1   | 24     | 22.29    |
|            |            | 20635 | 847.5     | 1  | 7         | 1   | 24     | 22.19    |
|            |            | 20415 | 825.5     | 1  | 14        | 1   | 24     | 21.56    |
|            |            | 20525 | 836.5     | 1  | 14        | 1   | 24     | 22.09    |
|            |            | 20635 | 847.5     | 1  | 14        | 1   | 24     | 21.85    |
|            |            | 20415 | 825.5     | 8  | 0         | 2   | 24     | 21.13    |
|            |            | 20525 | 836.5     | 8  | 0         | 2   | 24     | 21.03    |
|            |            | 20635 | 847.5     | 8  | 0         | 2   | 24     | 20.94    |
|            |            | 20415 | 825.5     | 8  | 3         | 2   | 24     | 21.20    |
|            |            | 20525 | 836.5     | 8  | 3         | 2   | 24     | 21.28    |
|            |            | 20635 | 847.5     | 8  | 3         | 2   | 24     | 21.07    |
|            |            | 20415 | 825.5     | 8  | 7         | 2   | 24     | 21.06    |
|            |            | 20525 | 836.5     | 8  | 7         | 2   | 24     | 21.22    |
|            |            | 20635 | 847.5     | 8  | 7         | 2   | 24     | 20.91    |
|            |            | 20415 | 825.5     | 15 | 0         | 2   | 24     | 21.06    |
|            |            | 20525 | 836.5     | 15 | 0         | 2   | 24     | 21.17    |
|            |            | 20635 | 847.5     | 15 | 0         | 2   | 24     | 20.94    |

| LTE Band 5 |            |       |           |    |           |     |        |          |
|------------|------------|-------|-----------|----|-----------|-----|--------|----------|
| BW         | Modulation | CH    | Frequency | RB | RB Offset | MPR | Target | Measured |
|            |            |       | (MHz)     |    |           |     | Power  | Power    |
| 5 MHz      | QPSK       | 20425 | 826.5     | 1  | 0         | 0   | 24     | 23.44    |
|            |            | 20525 | 836.5     | 1  | 0         | 0   | 24     | 23.77    |
|            |            | 20625 | 846.5     | 1  | 0         | 0   | 24     | 23.66    |
|            |            | 20425 | 826.5     | 1  | 12        | 0   | 24     | 23.46    |
|            |            | 20525 | 836.5     | 1  | 12        | 0   | 24     | 23.69    |
|            |            | 20625 | 846.5     | 1  | 12        | 0   | 24     | 23.43    |
|            |            | 20425 | 826.5     | 1  | 24        | 0   | 24     | 23.62    |
|            |            | 20525 | 836.5     | 1  | 24        | 0   | 24     | 23.46    |
|            |            | 20625 | 846.5     | 1  | 24        | 0   | 24     | 23.52    |
|            |            | 20425 | 826.5     | 12 | 0         | 1   | 24     | 22.53    |
|            |            | 20525 | 836.5     | 12 | 0         | 1   | 24     | 22.62    |
|            |            | 20625 | 846.5     | 12 | 0         | 1   | 24     | 22.43    |
|            |            | 20425 | 826.5     | 12 | 6         | 1   | 24     | 22.62    |
|            |            | 20525 | 836.5     | 12 | 6         | 1   | 24     | 22.54    |
|            |            | 20625 | 846.5     | 12 | 6         | 1   | 24     | 22.52    |
|            |            | 20425 | 826.5     | 12 | 13        | 1   | 24     | 22.43    |
|            |            | 20525 | 836.5     | 12 | 13        | 1   | 24     | 22.82    |
|            |            | 20625 | 846.5     | 12 | 13        | 1   | 24     | 22.77    |
|            |            | 20425 | 826.5     | 25 | 0         | 1   | 24     | 22.53    |
|            |            | 20525 | 836.5     | 25 | 0         | 1   | 24     | 22.67    |
|            |            | 20625 | 846.5     | 25 | 0         | 1   | 24     | 22.46    |

| LTE Band 5 |            |       |           |    |           |     |        |          |
|------------|------------|-------|-----------|----|-----------|-----|--------|----------|
| BW         | Modulation | CH    | Frequency | RB | RB Offset | MPR | Target | Measured |
|            |            |       | (MHz)     |    |           |     | Power  | Power    |
| 5 MHz      | 16QAM      | 20425 | 826.5     | 1  | 0         | 1   | 24     | 22.43    |
|            |            | 20525 | 836.5     | 1  | 0         | 1   | 24     | 22.92    |
|            |            | 20625 | 846.5     | 1  | 0         | 1   | 24     | 22.91    |
|            |            | 20425 | 826.5     | 1  | 12        | 1   | 24     | 22.20    |
|            |            | 20525 | 836.5     | 1  | 12        | 1   | 24     | 23.12    |
|            |            | 20625 | 846.5     | 1  | 12        | 1   | 24     | 22.20    |
|            |            | 20425 | 826.5     | 1  | 24        | 1   | 24     | 22.43    |
|            |            | 20525 | 836.5     | 1  | 24        | 1   | 24     | 22.62    |
|            |            | 20625 | 846.5     | 1  | 24        | 1   | 24     | 22.69    |
|            |            | 20425 | 826.5     | 12 | 0         | 2   | 24     | 21.46    |
|            |            | 20525 | 836.5     | 12 | 0         | 2   | 24     | 21.92    |
|            |            | 20625 | 846.5     | 12 | 0         | 2   | 24     | 21.69    |
|            |            | 20425 | 826.5     | 12 | 6         | 2   | 24     | 21.54    |
|            |            | 20525 | 836.5     | 12 | 6         | 2   | 24     | 21.86    |
|            |            | 20625 | 846.5     | 12 | 6         | 2   | 24     | 21.57    |
|            |            | 20425 | 826.5     | 12 | 13        | 2   | 24     | 21.62    |
|            |            | 20525 | 836.5     | 12 | 13        | 2   | 24     | 21.79    |
|            |            | 20625 | 846.5     | 12 | 13        | 2   | 24     | 21.91    |
|            |            | 20425 | 826.5     | 25 | 0         | 2   | 24     | 21.62    |
|            |            | 20525 | 836.5     | 25 | 0         | 2   | 24     | 21.62    |
|            |            | 20625 | 846.5     | 25 | 0         | 2   | 24     | 21.62    |

| LTE Band 5 |            |       |           |    |           |     |        |          |
|------------|------------|-------|-----------|----|-----------|-----|--------|----------|
| BW         | Modulation | CH    | Frequency | RB | RB Offset | MPR | Target | Measured |
|            |            |       | (MHz)     |    |           |     | Power  | Power    |
| 10 MHz     | QPSK       | 20450 | 829       | 1  | 0         | 0   | 24     | 23.6     |
|            |            | 20525 | 836.5     | 1  | 0         | 0   | 24     | 24.12    |
|            |            | 20600 | 844       | 1  | 0         | 0   | 24     | 23.44    |
|            |            | 20450 | 829       | 1  | 24        | 0   | 24     | 23.4     |
|            |            | 20525 | 836.5     | 1  | 24        | 0   | 24     | 24.4     |
|            |            | 20600 | 844       | 1  | 24        | 0   | 24     | 23.52    |
|            |            | 20450 | 829       | 1  | 49        | 0   | 24     | 23.7     |
|            |            | 20525 | 836.5     | 1  | 49        | 0   | 24     | 23.5     |
|            |            | 20600 | 844       | 1  | 49        | 0   | 24     | 23.16    |
|            |            | 20450 | 829       | 25 | 0         | 1   | 24     | 22.5     |
|            |            | 20525 | 836.5     | 25 | 0         | 1   | 24     | 23.1     |
|            |            | 20600 | 844       | 25 | 0         | 1   | 24     | 22.30    |
|            |            | 20450 | 829       | 25 | 12        | 1   | 24     | 22.8     |
|            |            | 20525 | 836.5     | 25 | 12        | 1   | 24     | 23       |
|            |            | 20600 | 844       | 25 | 12        | 1   | 24     | 22.54    |
|            |            | 20450 | 829       | 25 | 25        | 1   | 24     | 23.3     |
|            |            | 20525 | 836.5     | 25 | 25        | 1   | 24     | 23.3     |
|            |            | 20600 | 844       | 25 | 25        | 1   | 24     | 22.72    |
|            |            | 20450 | 829       | 50 | 0         | 1   | 24     | 22.5     |
|            |            | 20525 | 836.5     | 50 | 0         | 1   | 24     | 23.32    |
|            |            | 20600 | 844       | 50 | 0         | 1   | 24     | 22.54    |

| LTE Band 5 |            |       |           |    |           |     |        |          |
|------------|------------|-------|-----------|----|-----------|-----|--------|----------|
| BW         | Modulation | CH    | Frequency | RB | RB Offset | MPR | Target | Measured |
|            |            |       | (MHz)     |    |           |     | Power  | Power    |
| 10 MHz     | 16QAM      | 20450 | 829       | 1  | 0         | 1   | 24     | 23.4     |
|            |            | 20525 | 836.5     | 1  | 0         | 1   | 24     | 23.1     |
|            |            | 20600 | 844       | 1  | 0         | 1   | 24     | 22.33    |
|            |            | 20450 | 829       | 1  | 24        | 1   | 24     | 22.8     |
|            |            | 20525 | 836.5     | 1  | 24        | 1   | 24     | 23.44    |
|            |            | 20600 | 844       | 1  | 24        | 1   | 24     | 22.44    |
|            |            | 20450 | 829       | 1  | 49        | 1   | 24     | 22.7     |
|            |            | 20525 | 836.5     | 1  | 49        | 1   | 24     | 22.9     |
|            |            | 20600 | 844       | 1  | 49        | 1   | 24     | 22.39    |
|            |            | 20450 | 829       | 25 | 0         | 2   | 24     | 21.85    |
|            |            | 20525 | 836.5     | 25 | 0         | 2   | 24     | 21.74    |
|            |            | 20600 | 844       | 25 | 0         | 2   | 24     | 21.60    |
|            |            | 20450 | 829       | 25 | 12        | 2   | 24     | 21.88    |
|            |            | 20525 | 836.5     | 25 | 12        | 2   | 24     | 21.53    |
|            |            | 20600 | 844       | 25 | 12        | 2   | 24     | 21.22    |
|            |            | 20450 | 829       | 25 | 25        | 2   | 24     | 22.22    |
|            |            | 20525 | 836.5     | 25 | 25        | 2   | 24     | 22.46    |
|            |            | 20600 | 844       | 25 | 25        | 2   | 24     | 21.53    |
|            |            | 20450 | 829       | 50 | 0         | 2   | 24     | 21.45    |
|            |            | 20525 | 836.5     | 50 | 0         | 2   | 24     | 21.77    |
|            |            | 20600 | 844       | 50 | 0         | 2   | 24     | 21.42    |

## ERP POWER (dBm)

### GPRS

| Channel | Frequency (MHz) | Antenna Polarization | LVL (dBm) | Correction Factor(dB) | ERP(dBm) | ERP(mW) |
|---------|-----------------|----------------------|-----------|-----------------------|----------|---------|
| 128     | 824.2           | H                    | 32.27     | 1.30                  | 33.57    | 2275.10 |
| 189     | 836.4           | H                    | 31.45     | 1.17                  | 32.62    | 1828.10 |
| 251     | 848.8           | H                    | 31.58     | 1.04                  | 32.62    | 1828.10 |

### EDGE

| Channel | Frequency (MHz) | Antenna Polarization | LVL (dBm) | Correction Factor(dB) | ERP(dBm) | ERP(mW) |
|---------|-----------------|----------------------|-----------|-----------------------|----------|---------|
| 128     | 824.2           | H                    | 31.87     | 1.30                  | 33.17    | 2074.91 |
| 189     | 836.4           | H                    | 32.20     | 1.17                  | 33.37    | 2172.70 |
| 251     | 848.8           | H                    | 31.98     | 1.04                  | 33.02    | 2004.47 |

### WCDMA

| Channel | Frequency (MHz) | Antenna Polarization | LVL (dBm) | Correction Factor(dB) | ERP(dBm) | ERP(mW) |
|---------|-----------------|----------------------|-----------|-----------------------|----------|---------|
| 4132    | 826.4           | H                    | 21.68     | 1.27                  | 22.95    | 197.24  |
| 4182    | 836.4           | H                    | 21.95     | 1.17                  | 23.12    | 205.12  |
| 4233    | 846.6           | H                    | 21.54     | 1.07                  | 22.61    | 182.39  |

## QPSK

### LTE Band 5 (1.4MHz)

| Channel | Frequency (MHz) | Antenna Polarization | LVL (dBm) | Correction Factor(dB) | ERP(dBm) | ERP(mW) |
|---------|-----------------|----------------------|-----------|-----------------------|----------|---------|
| 20407   | 824.7           | H                    | 23.16     | 2.72                  | 25.88    | 387.26  |
| 20525   | 836.5           | H                    | 22.29     | 2.78                  | 25.07    | 321.37  |
| 20643   | 848.3           | H                    | 22.87     | 2.83                  | 25.70    | 371.54  |

### LTE Band 5 (3MHz)

| Channel | Frequency (MHz) | Antenna Polarization | LVL (dBm) | Correction Factor(dB) | ERP(dBm) | ERP(mW) |
|---------|-----------------|----------------------|-----------|-----------------------|----------|---------|
| 20415   | 825.5           | H                    | 23.02     | 2.72                  | 25.74    | 374.97  |
| 20525   | 836.5           | H                    | 22.29     | 2.78                  | 25.07    | 321.37  |
| 20635   | 847.5           | H                    | 22.79     | 2.83                  | 25.62    | 364.75  |

### LTE Band 5 (5MHz)

| Channel | Frequency (MHz) | Antenna Polarization | LVL (dBm) | Correction Factor(dB) | ERP(dBm) | ERP(mW) |
|---------|-----------------|----------------------|-----------|-----------------------|----------|---------|
| 20425   | 826.5           | H                    | 22.91     | 2.73                  | 25.64    | 366.44  |
| 20525   | 836.5           | H                    | 22.58     | 2.78                  | 25.36    | 343.56  |
| 20625   | 846.5           | H                    | 22.67     | 2.82                  | 25.49    | 354.00  |

### LTE Band 5 (10MHz)

| Channel | Frequency (MHz) | Antenna Polarization | LVL (dBm) | Correction Factor(dB) | ERP(dBm) | ERP(mW) |
|---------|-----------------|----------------------|-----------|-----------------------|----------|---------|
| 20450   | 829             | H                    | 22.74     | 2.74                  | 25.48    | 353.18  |
| 20525   | 836.5           | H                    | 22.41     | 2.78                  | 25.19    | 330.37  |
| 2600    | 844             | H                    | 22.63     | 2.81                  | 25.44    | 349.95  |

**REMARKS:** 1. EIRP Output Power (dBm) = SPA Reading (dBm) + Correction Factor (dB).  
 2. ERP power = EIPR power - 2.15dBi.  
 3. Correction factor (dB) = Free Space Loss + Antenna Factor + Cable Loss.

## 16QAM

### LTE Band 5 (1.4MHz)

| Channel | Frequency (MHz) | Antenna Polarization | LVL (dBm) | Correction Factor(dB) | ERP(dBm) | ERP(mW) |
|---------|-----------------|----------------------|-----------|-----------------------|----------|---------|
| 20407   | 824.7           | H                    | 22.20     | 2.72                  | 24.92    | 310.46  |
| 20525   | 836.5           | H                    | 21.34     | 2.78                  | 24.12    | 258.23  |
| 20643   | 848.3           | H                    | 22.01     | 2.83                  | 24.84    | 304.79  |

### LTE Band 5 (3MHz)

| Channel | Frequency (MHz) | Antenna Polarization | LVL (dBm) | Correction Factor(dB) | ERP(dBm) | ERP(mW) |
|---------|-----------------|----------------------|-----------|-----------------------|----------|---------|
| 20415   | 825.5           | H                    | 22.12     | 2.72                  | 24.84    | 304.79  |
| 20525   | 836.5           | H                    | 21.39     | 2.78                  | 24.17    | 261.22  |
| 20635   | 847.5           | H                    | 21.90     | 2.83                  | 24.73    | 297.17  |

### LTE Band 5 (5MHz)

| Channel | Frequency (MHz) | Antenna Polarization | LVL (dBm) | Correction Factor(dB) | ERP(dBm) | ERP(mW) |
|---------|-----------------|----------------------|-----------|-----------------------|----------|---------|
| 20425   | 826.5           | H                    | 22.05     | 2.73                  | 24.78    | 300.61  |
| 20525   | 836.5           | H                    | 21.65     | 2.78                  | 24.43    | 277.33  |
| 20625   | 846.5           | H                    | 21.72     | 2.82                  | 24.54    | 284.45  |

### LTE Band 5 (10MHz)

| Channel | Frequency (MHz) | Antenna Polarization | LVL (dBm) | Correction Factor(dB) | ERP(dBm) | ERP(mW) |
|---------|-----------------|----------------------|-----------|-----------------------|----------|---------|
| 20450   | 829             | H                    | 21.80     | 2.74                  | 24.54    | 284.45  |
| 20525   | 836.5           | H                    | 21.46     | 2.78                  | 24.24    | 265.46  |
| 2600    | 844             | H                    | 21.70     | 2.81                  | 24.51    | 282.49  |

**REMARKS:** 1. EIRP Output Power (dBm) = SPA Reading (dBm) + Correction Factor (dB).  
2. ERP power = EIPR power - 2.15dBi.  
3. Correction factor (dB) = Free Space Loss + Antenna Factor + Cable Loss.

## 4.2 Frequency Stability Measurement

### 4.2.1 Limits of Frequency Stability Measurement

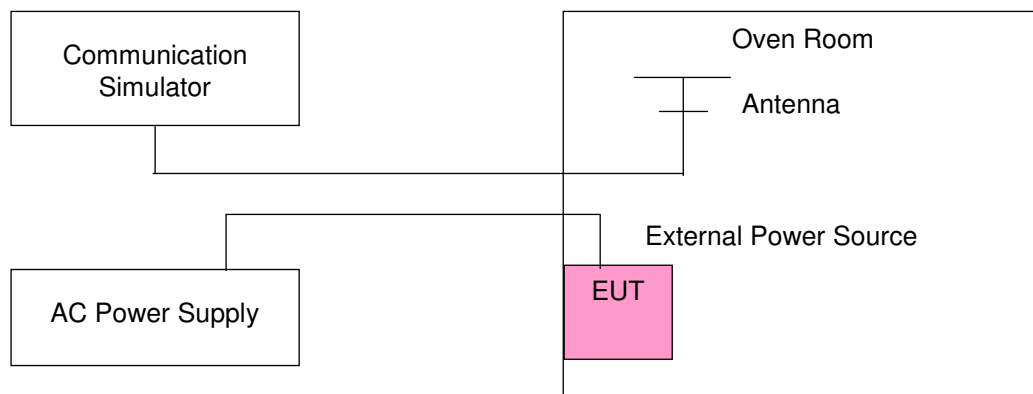
1.5 ppm is for base and fixed station. 2.5 ppm is for mobile station.

### 4.2.2 Test Procedure

- Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.
- EUT is connected the external power supply to control the AC input power. The test voltage range is from minimum to maximum working voltage. Each step shall be record the frequency error rate.
- The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the  $\pm 0.5$  °C during the measurement testing. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.

**NOTE:** The frequency error was recorded frequency error from the communication simulator.

### 4.2.3 Test Setup



#### 4.2.4 Test Results

##### Frequency Error vs. Voltage

| Voltage (Volts) | Frequency Error (ppm) |       | Limit (ppm) |
|-----------------|-----------------------|-------|-------------|
|                 | GPRS                  | WCDMA |             |
| 102             | 0.012                 | 0.011 | 2.5         |
| 138             | 0.011                 | 0.010 | 2.5         |

##### Frequency Error vs. Temperature.

| TEMP. (°C) | Frequency Error (ppm) |       | Limit (ppm) |
|------------|-----------------------|-------|-------------|
|            | GPRS                  | WCDMA |             |
| 75         | 0.041                 | 0.027 | 2.5         |
| 70         | 0.037                 | 0.025 | 2.5         |
| 60         | 0.037                 | 0.020 | 2.5         |
| 50         | 0.031                 | 0.018 | 2.5         |
| 40         | 0.026                 | 0.011 | 2.5         |
| 30         | 0.025                 | 0.011 | 2.5         |
| 20         | 0.024                 | 0.010 | 2.5         |
| 10         | 0.026                 | 0.011 | 2.5         |
| 0          | 0.027                 | 0.016 | 2.5         |
| -10        | 0.027                 | 0.016 | 2.5         |
| -20        | 0.035                 | 0.017 | 2.5         |
| -30        | 0.033                 | 0.019 | 2.5         |

| Voltage (Volts) | Frequency Error (ppm) |       |       |       | Limit (ppm) |
|-----------------|-----------------------|-------|-------|-------|-------------|
|                 | LTE                   |       |       |       |             |
|                 | 1.4MHz                | 3MHz  | 5MHz  | 10MHz |             |
| 102             | 0.032                 | 0.039 | 0.041 | 0.042 | 2.5         |
| 138             | 0.038                 | 0.032 | 0.045 | 0.027 | 2.5         |

Frequency Error vs. Temperature.

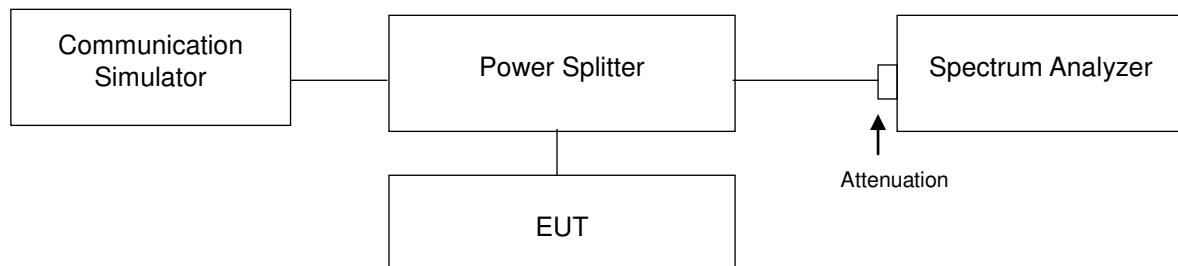
| TEMP. (°C) | Frequency Error (ppm) |       |       |       | Limit (ppm) |
|------------|-----------------------|-------|-------|-------|-------------|
|            | LTE                   |       |       |       |             |
|            | 1.4MHz                | 3MHz  | 5MHz  | 10MHz |             |
| 75         | 0.033                 | 0.041 | 0.039 | 0.042 | 2.5         |
| 70         | 0.038                 | 0.032 | 0.044 | 0.027 | 2.5         |
| 60         | 0.033                 | 0.039 | 0.039 | 0.041 | 2.5         |
| 50         | 0.037                 | 0.033 | 0.045 | 0.027 | 2.5         |
| 40         | 0.032                 | 0.039 | 0.039 | 0.043 | 2.5         |
| 30         | 0.037                 | 0.032 | 0.045 | 0.027 | 2.5         |
| 20         | 0.032                 | 0.039 | 0.039 | 0.042 | 2.5         |
| 10         | 0.037                 | 0.033 | 0.047 | 0.027 | 2.5         |
| 0          | 0.032                 | 0.039 | 0.041 | 0.041 | 2.5         |
| -10        | 0.038                 | 0.032 | 0.047 | 0.029 | 2.5         |
| -20        | 0.032                 | 0.039 | 0.042 | 0.041 | 2.5         |
| -30        | 0.037                 | 0.032 | 0.047 | 0.026 | 2.5         |

### 4.3 Occupied Bandwidth Measurement

#### 4.3.1 Test Procedure

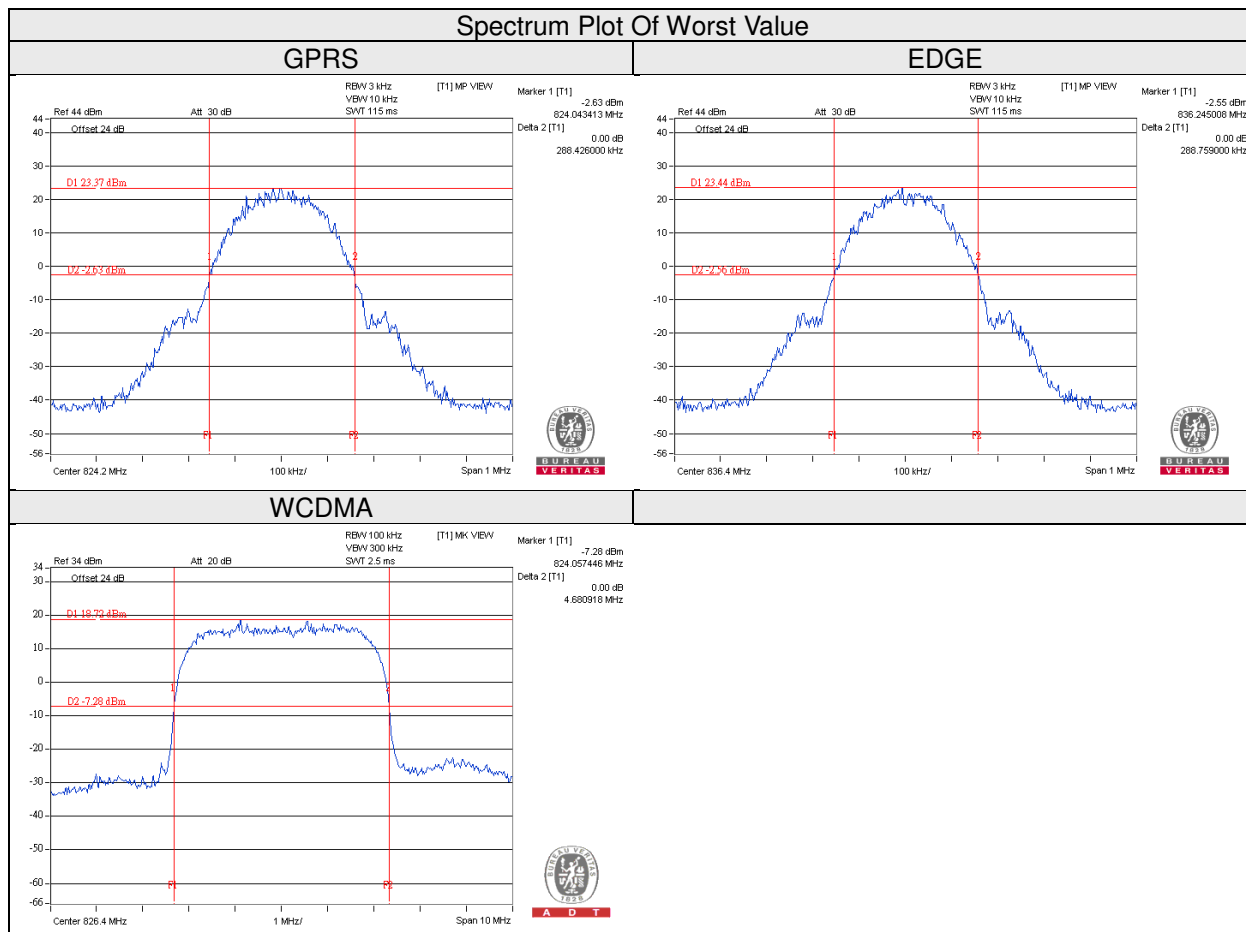
All measurements were done at low, middle and high operational frequency range. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.

#### 4.3.2 Test Setup

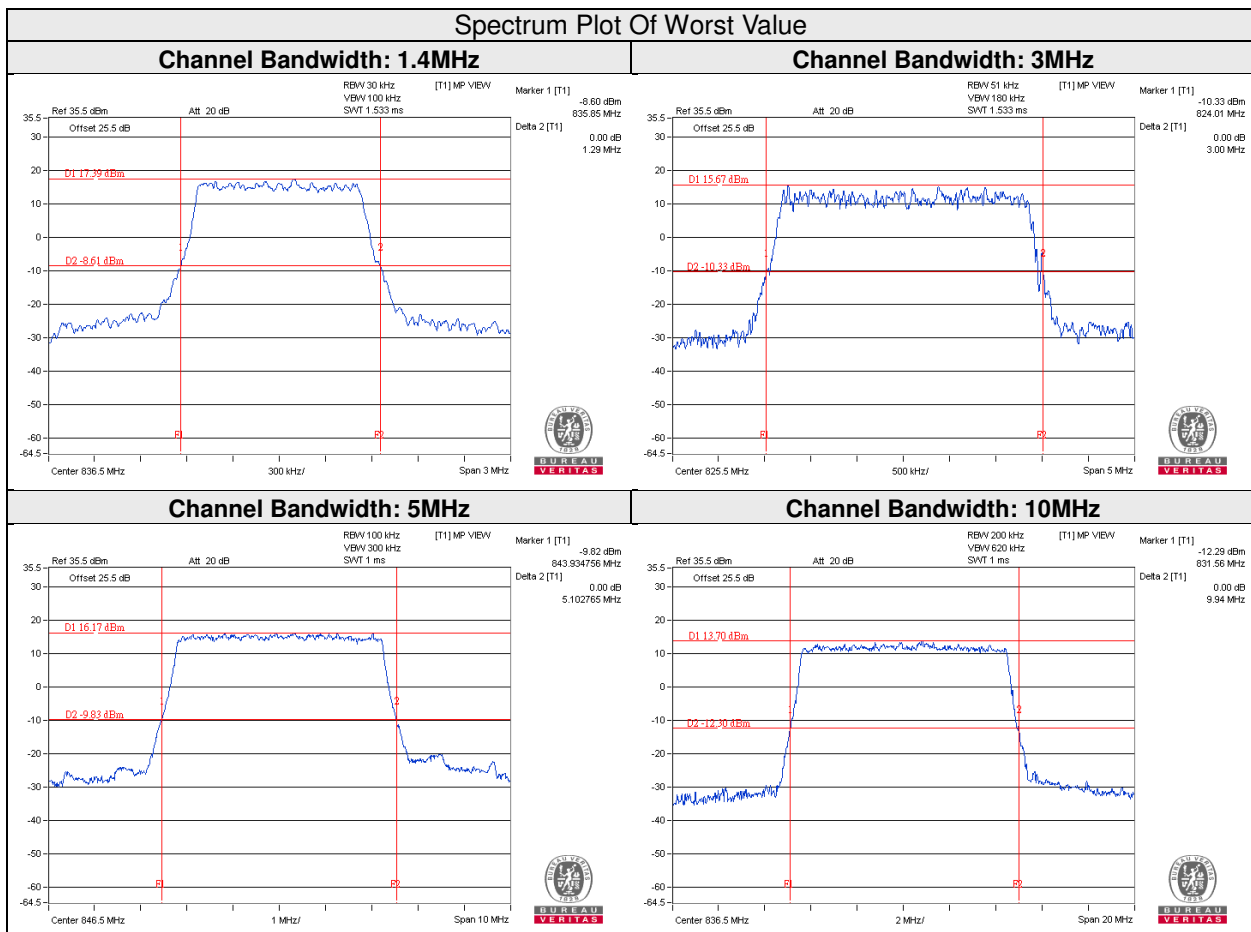


#### 4.3.3 Test Result (-26dB Bandwidth)

| Channel | Frequency (MHz) | -26dB Bandwidth (kHz) |      | Channel | FREQ. (MHz) | -26dB Bandwidth (MHz) |
|---------|-----------------|-----------------------|------|---------|-------------|-----------------------|
|         |                 | GPRS                  | EDGE |         |             | WCDMA                 |
| 128     | 824.2           | 288                   | 287  | 4132    | 826.4       | 4.68                  |
| 189     | 836.4           | 288                   | 288  | 4182    | 836.4       | 4.67                  |
| 251     | 848.8           | 287                   | 288  | 4233    | 846.6       | 4.66                  |

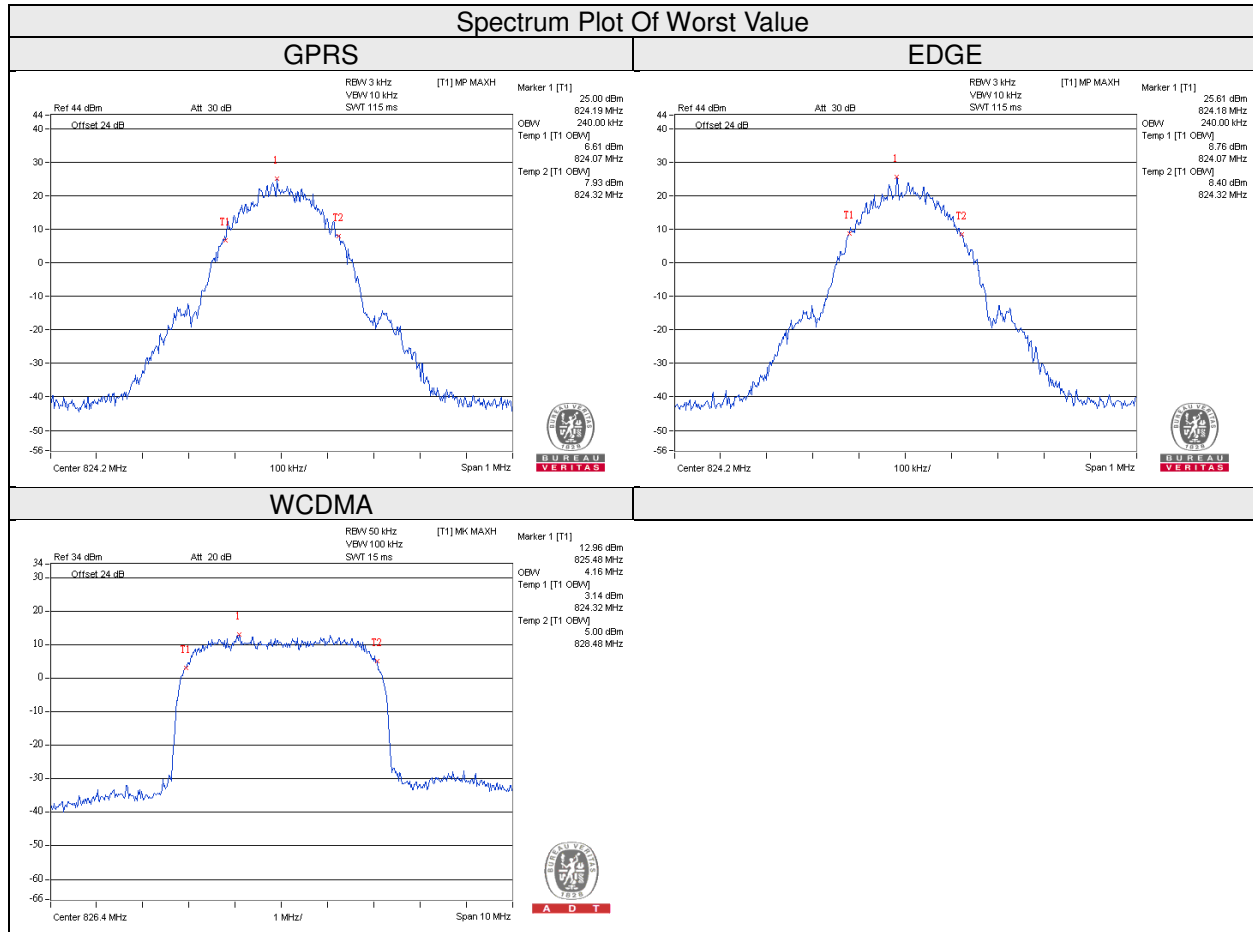


| LTE                       |                 |                       |       |                          |             |                       |       |
|---------------------------|-----------------|-----------------------|-------|--------------------------|-------------|-----------------------|-------|
| Channel Bandwidth: 1.4MHz |                 |                       |       | Channel Bandwidth: 3MHz  |             |                       |       |
| Channel                   | Frequency (MHz) | -26dB Bandwidth (MHz) |       | Channel                  | FREQ. (MHz) | -26dB Bandwidth (MHz) |       |
|                           |                 | QPSK                  | 16QAM |                          |             | QPSK                  | 16QAM |
| 20407                     | 824.7           | 1.25                  | 1.3   | 20415                    | 825.5       | 3                     | 3     |
| 20525                     | 836.5           | 1.27                  | 1.29  | 20525                    | 836.5       | 2.91                  | 2.98  |
| 20643                     | 848.3           | 1.28                  | 1.27  | 20635                    | 847.5       | 2.92                  | 2.93  |
| Channel Bandwidth: 5MHz   |                 |                       |       | Channel Bandwidth: 10MHz |             |                       |       |
| Channel                   | Frequency (MHz) | -26dB Bandwidth (MHz) |       | Channel                  | FREQ. (MHz) | -26dB Bandwidth (MHz) |       |
|                           |                 | QPSK                  | 16QAM |                          |             | QPSK                  | 16QAM |
| 20425                     | 826.5           | 4.95                  | 4.95  | 20450                    | 829         | 9.61                  | 9.86  |
| 20525                     | 836.5           | 4.95                  | 5     | 20525                    | 836.5       | 9.63                  | 9.94  |
| 20625                     | 846.5           | 5.1                   | 4.98  | 20600                    | 844         | 9.66                  | 9.81  |

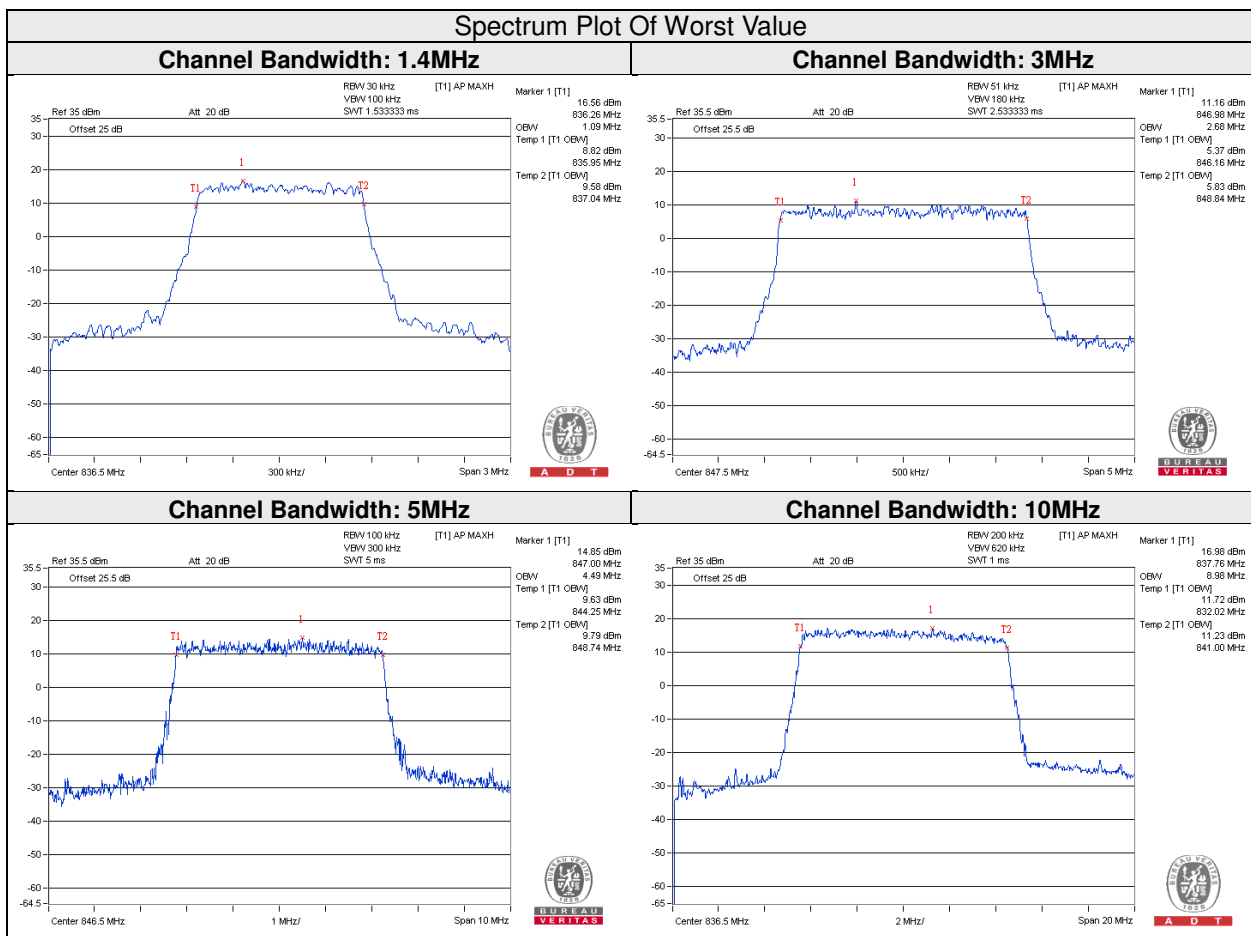


#### 4.3.4 Test Result (Occupied Bandwidth)

| Channel | Frequency (MHz) | 99% Occupied Bandwidth (kHz) |      | Channel | FREQ. (MHz) | 99% Occupied Bandwidth (MHz) |
|---------|-----------------|------------------------------|------|---------|-------------|------------------------------|
|         |                 | GPRS                         | EDGE |         |             | WCDMA                        |
| 128     | 824.2           | 240                          | 240  | 4132    | 826.4       | 4.16                         |
| 189     | 836.4           | 240                          | 240  | 4182    | 836.4       | 4.16                         |
| 251     | 848.8           | 240                          | 240  | 4233    | 846.6       | 4.18                         |



| LTE                       |                 |                              |       |                          |             |                              |       |
|---------------------------|-----------------|------------------------------|-------|--------------------------|-------------|------------------------------|-------|
| Channel Bandwidth: 1.4MHz |                 |                              |       | Channel Bandwidth: 3MHz  |             |                              |       |
| Channel                   | Frequency (MHz) | 99% Occupied Bandwidth (MHz) |       | Channel                  | FREQ. (MHz) | 99% Occupied Bandwidth (MHz) |       |
|                           |                 | QPSK                         | 16QAM |                          |             | QPSK                         | 16QAM |
| 20407                     | 824.7           | 1.08                         | 1.08  | 20415                    | 825.5       | 2.68                         | 2.67  |
| 20525                     | 836.5           | 1.08                         | 1.09  | 20525                    | 836.5       | 2.67                         | 2.67  |
| 20643                     | 848.3           | 1.08                         | 1.08  | 20635                    | 847.5       | 2.68                         | 2.68  |
| Channel Bandwidth: 5MHz   |                 |                              |       | Channel Bandwidth: 10MHz |             |                              |       |
| Channel                   | Frequency (MHz) | 99% Occupied Bandwidth (MHz) |       | Channel                  | FREQ. (MHz) | 99% Occupied Bandwidth (MHz) |       |
|                           |                 | QPSK                         | 16QAM |                          |             | QPSK                         | 16QAM |
| 20425                     | 826.5           | 4.48                         | 4.48  | 20450                    | 829         | 8.94                         | 8.94  |
| 20525                     | 836.5           | 4.49                         | 4.49  | 20525                    | 836.5       | 8.98                         | 8.92  |
| 20625                     | 846.5           | 4.49                         | 4.49  | 20600                    | 844         | 8.92                         | 8.92  |

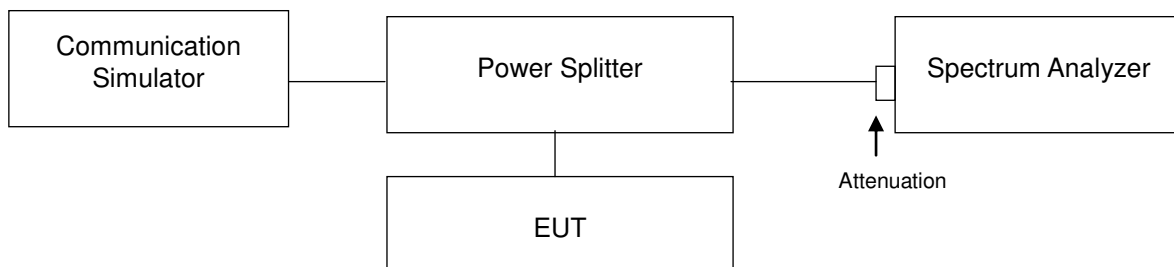


## 4.4 Band Edge Measurement

### 4.4.1 Limits of Band Edge Measurement

Power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

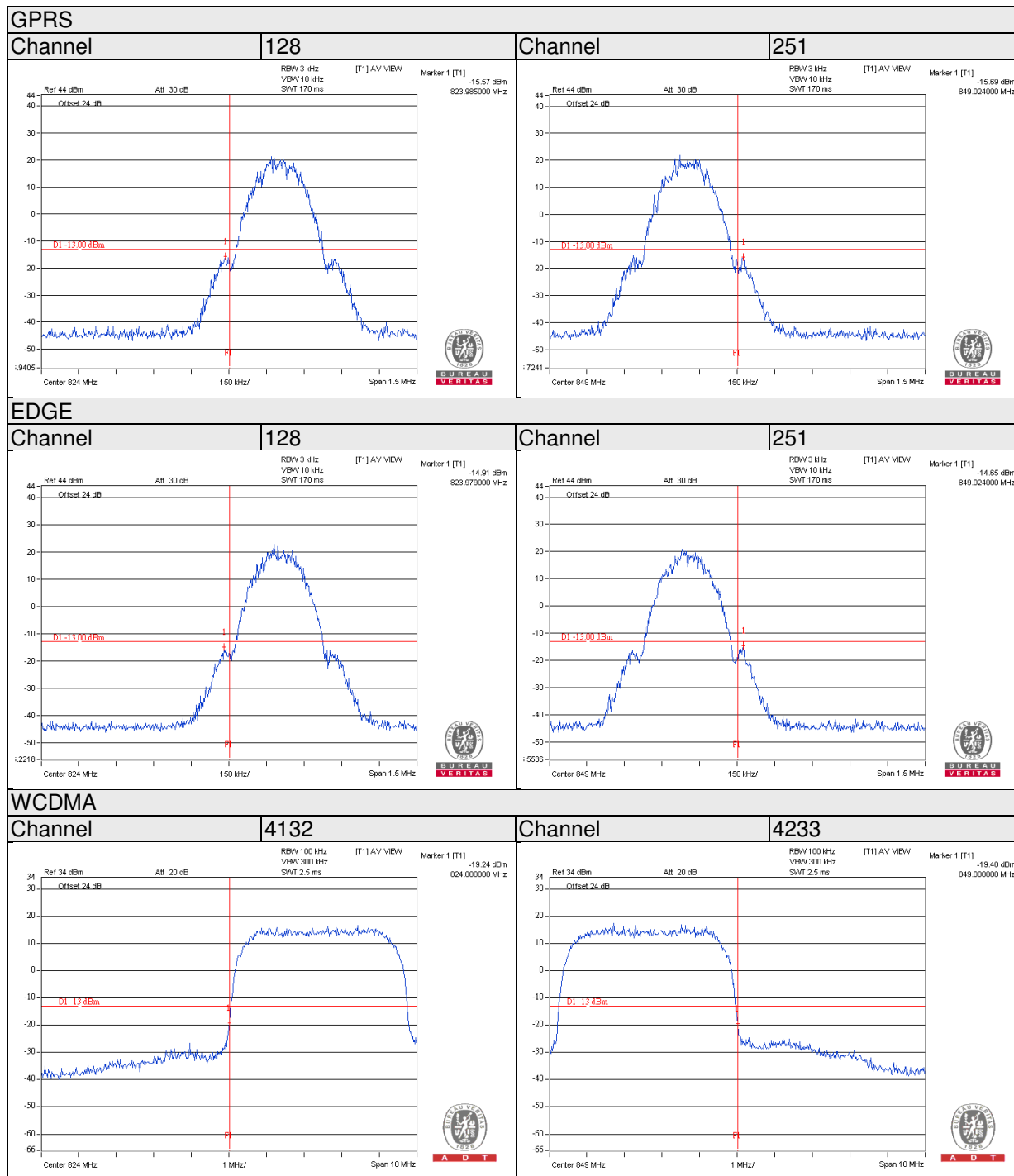
### 4.4.2 Test Setup



### 4.4.3 Test Procedures

- All measurements were done at low and high operational frequency range.
- The center frequency of spectrum is the band edge frequency and s RB of the spectrum is  $>1\%$  EMISSION BANDWIDTH and VB of the spectrum is  $\geq 3 \times RB$ .
- Record the max trace plot into the test report.

#### 4.4.4 Test Results



LTE

1.4MHz

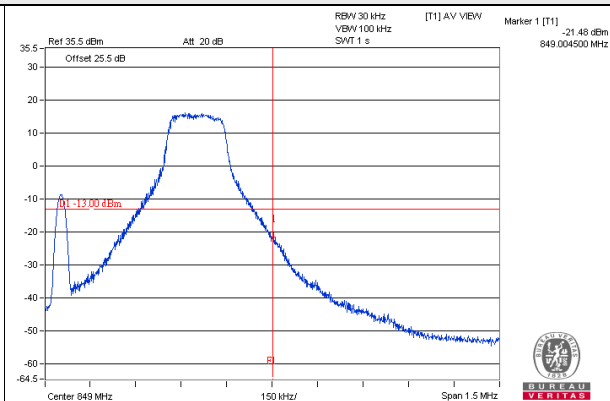
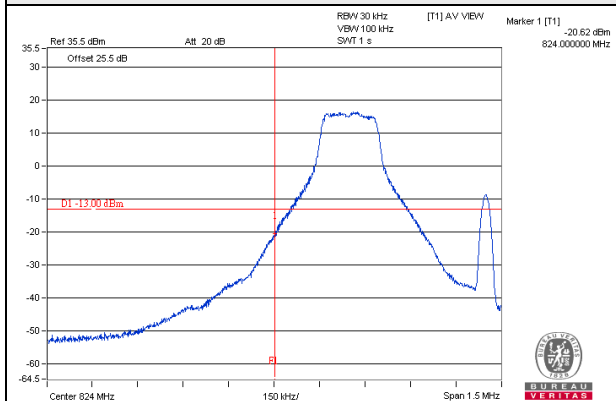
Channel

20407

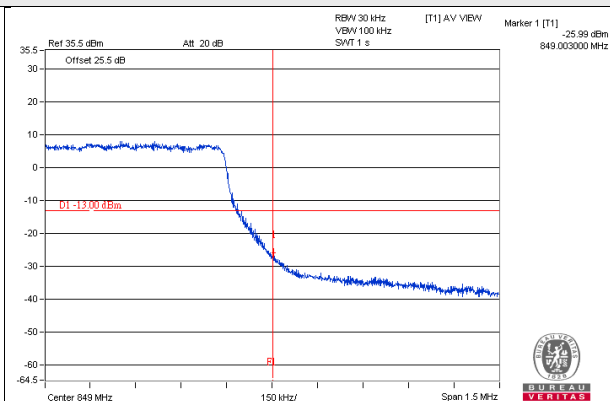
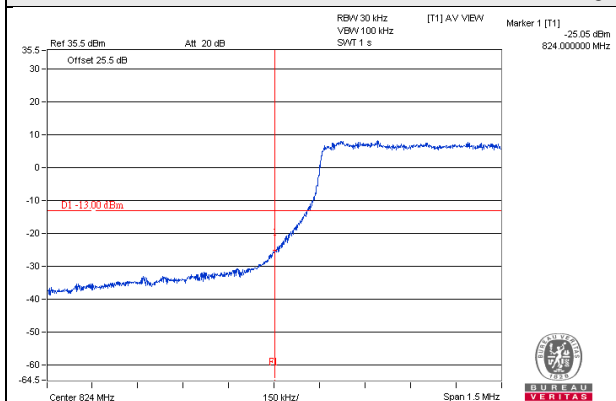
Channel

20643

1 RB



6 RB



3MHz

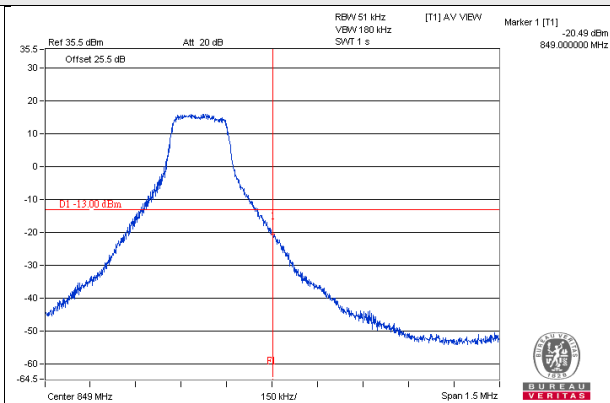
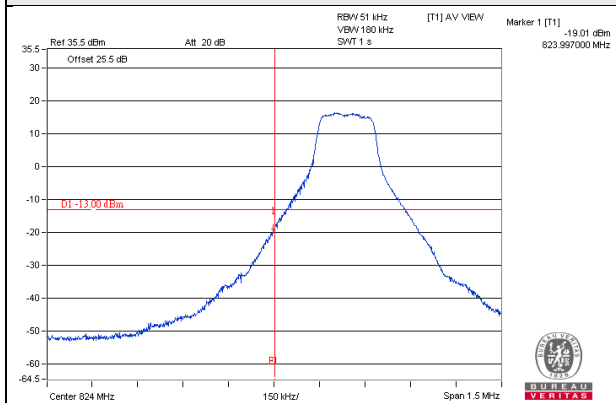
Channel

20415

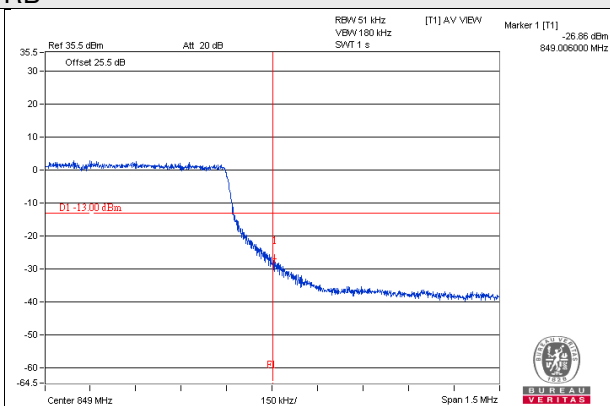
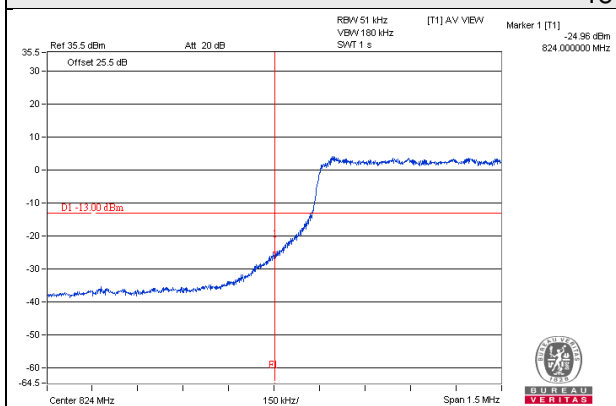
Channel

20635

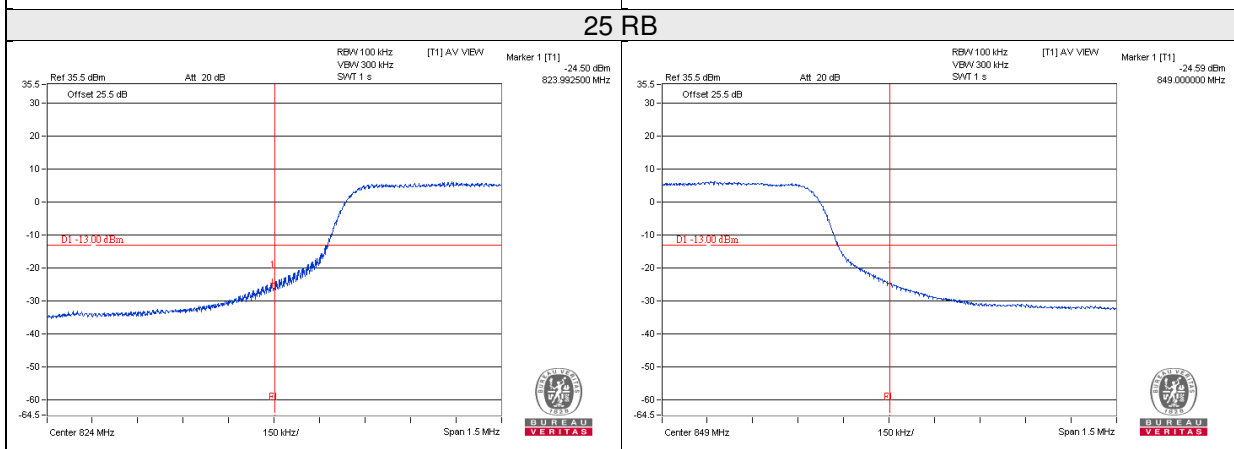
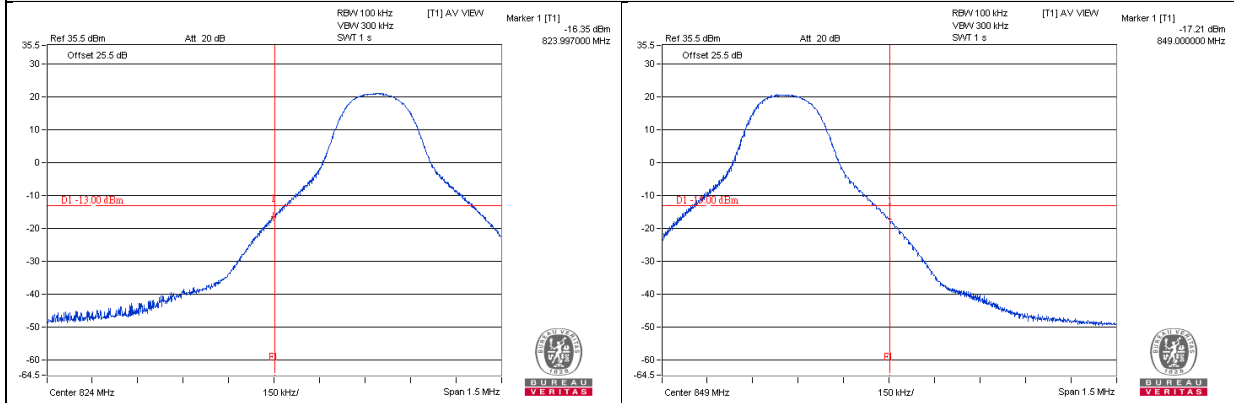
1 RB



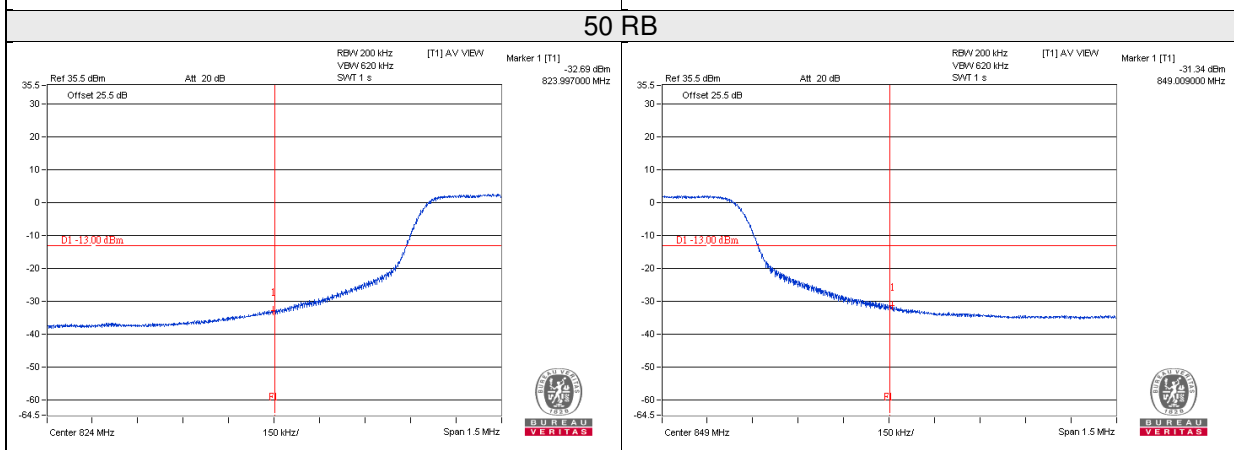
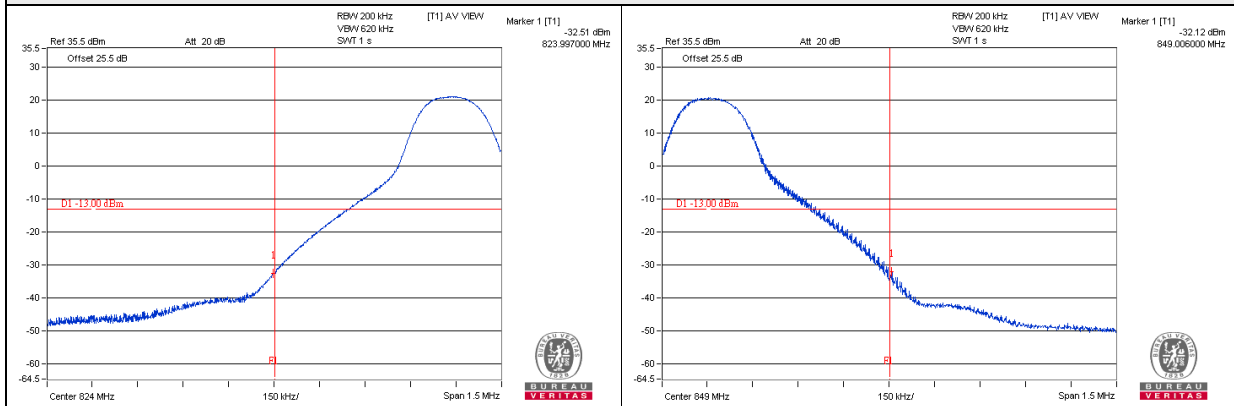
15 RB



|         |       |         |       |
|---------|-------|---------|-------|
| 5MHz    |       |         |       |
| Channel | 20425 | Channel | 20625 |
| 1 RB    |       |         |       |



|         |       |         |       |
|---------|-------|---------|-------|
| 10MHz   |       |         |       |
| Channel | 20450 | Channel | 20600 |
| 1 RB    |       |         |       |

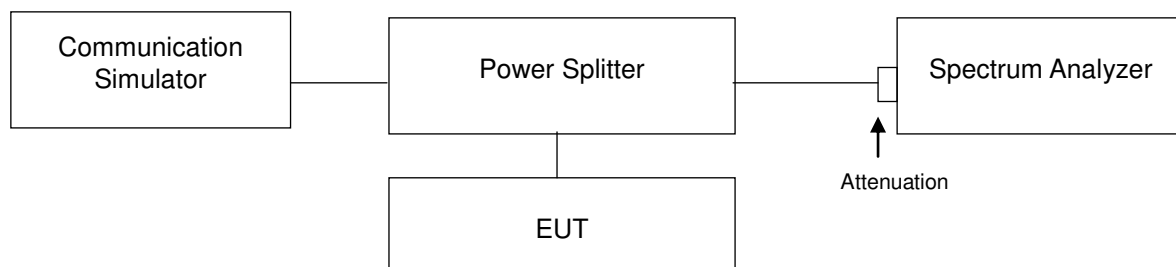


## 4.5 Peak to Average Ratio

### 4.5.1 Limits of Peak to Average Ratio Measurement

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

### 4.5.2 Test Setup

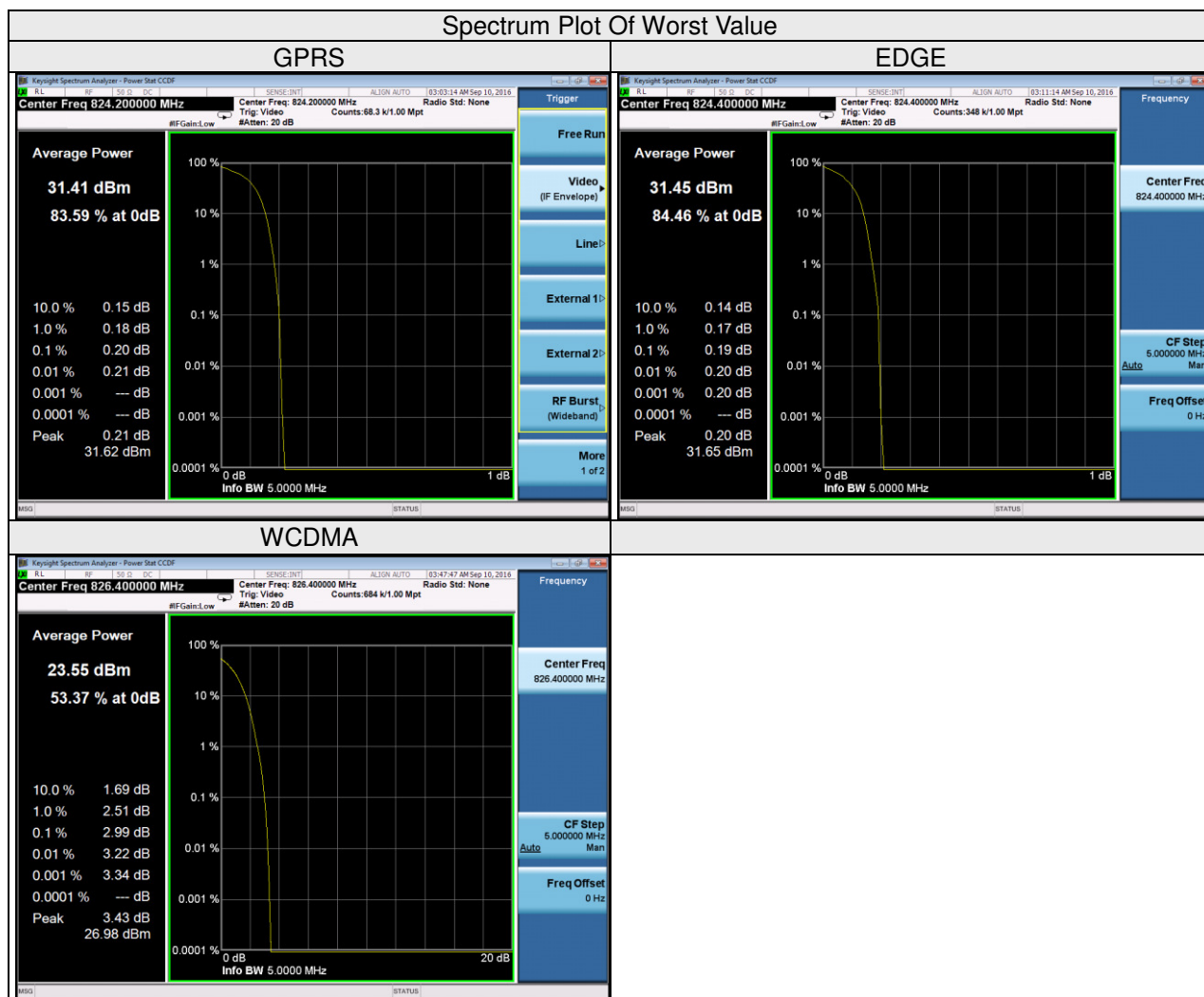


### 4.5.3 Test Procedures

1. Set resolution/measurement bandwidth  $\geq$  signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Record the maximum PAPR level associated with a probability of 0.1%.

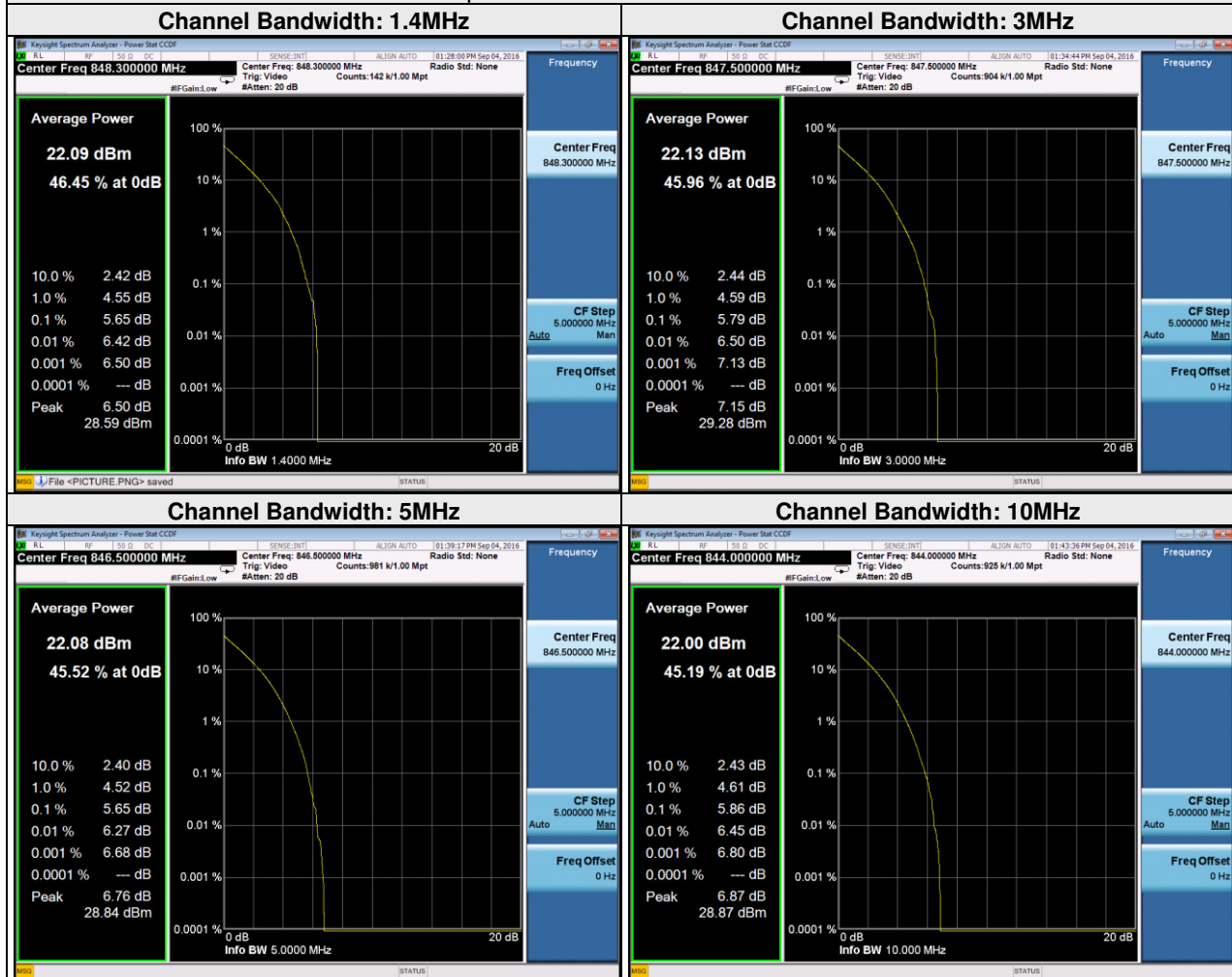
#### 4.5.4 Test Results

| Channel | Frequency (MHz) | Peak to Average Ratio (dB) |      | Channel | Freq. (MHz) | Peak to Average Ratio (dB) |
|---------|-----------------|----------------------------|------|---------|-------------|----------------------------|
|         |                 | GPRS                       | EDGE |         |             | WCDMA                      |
| 128     | 824.2           | 0.2                        | 0.19 | 4132    | 826.4       | 2.99                       |
| 189     | 836.4           | 0.19                       | 0.19 | 4182    | 836.4       | 2.77                       |
| 251     | 848.8           | 0.2                        | 0.19 | 4233    | 846.6       | 2.97                       |



| Channel Bandwidth: 1.4MHz |                 |                            | Channel Bandwidth: 3MHz  |             |                            |
|---------------------------|-----------------|----------------------------|--------------------------|-------------|----------------------------|
| Channel                   | Frequency (MHz) | Peak to Average Ratio (dB) | Channel                  | Freq. (MHz) | Peak to Average Ratio (dB) |
|                           |                 | LTE 1.4MHz                 |                          |             | LTE 3MHz                   |
| 20407                     | 824.7           | 5.56                       | 20415                    | 825.5       | 5.72                       |
| 20525                     | 836.5           | 5.5                        | 20525                    | 836.5       | 5.68                       |
| 20643                     | 848.3           | 5.65                       | 20635                    | 847.5       | 5.79                       |
| Channel Bandwidth: 5MHz   |                 |                            | Channel Bandwidth: 10MHz |             |                            |
| Channel                   | Frequency (MHz) | Peak to Average Ratio (dB) | Channel                  | Freq. (MHz) | Peak to Average Ratio (dB) |
|                           |                 | LTE 5MHz                   |                          |             | LTE 10MHz                  |
| 20425                     | 826.5           | 5.56                       | 20450                    | 829         | 5.77                       |
| 20525                     | 836.5           | 5.61                       | 20525                    | 836.5       | 5.71                       |
| 20625                     | 846.5           | 5.65                       | 20600                    | 844         | 5.86                       |

### Spectrum Plot Of Worst Value

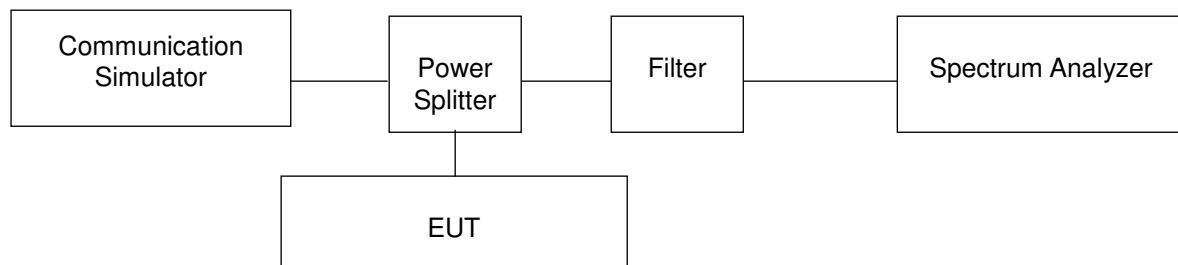


## 4.6 Conducted Spurious Emissions

### 4.6.1 Limits of Conducted Spurious Emissions Measurement

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB. The emission limit equal to  $-13\text{dBm}$ .

### 4.6.2 Test Setup



### 4.6.3 Test Procedure

- All measurements were done at low, middle and high operational frequency range.
- Measuring frequency range is from 9 kHz to 10GHz. RBW:100 kHz if the measuring frequency range is at or below 1 GHz and 1 MHz if the measuring frequency range is above 1 GHz .VBW=3\*RBW is used for measurement.

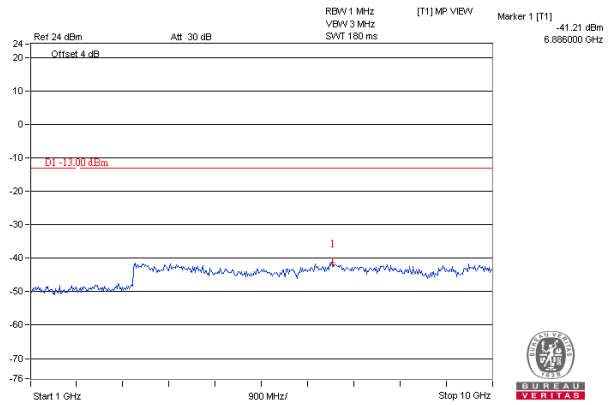
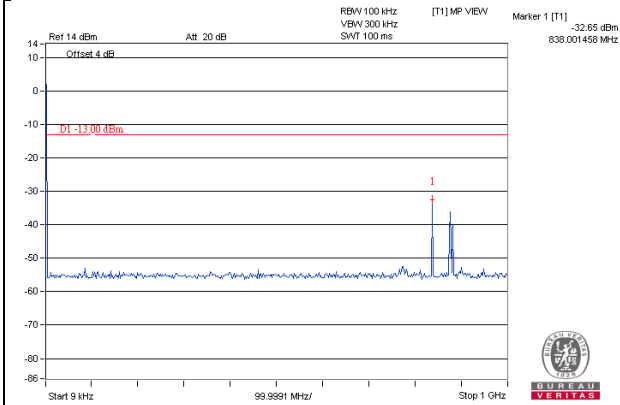
#### 4.6.4 Test Results

##### GPRS

##### Channel 189

Frequency Range : 9kHz~1GHz

Frequency Range : 1GHz~10GHz

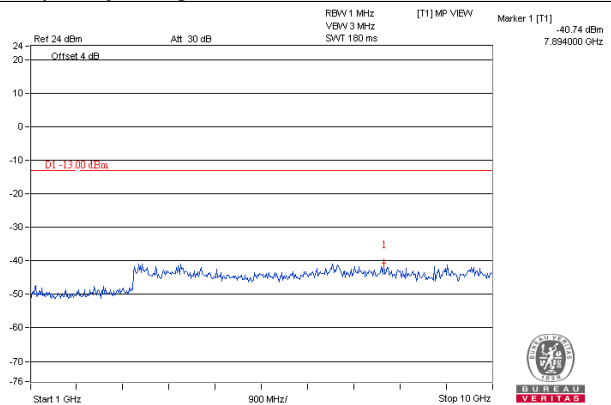
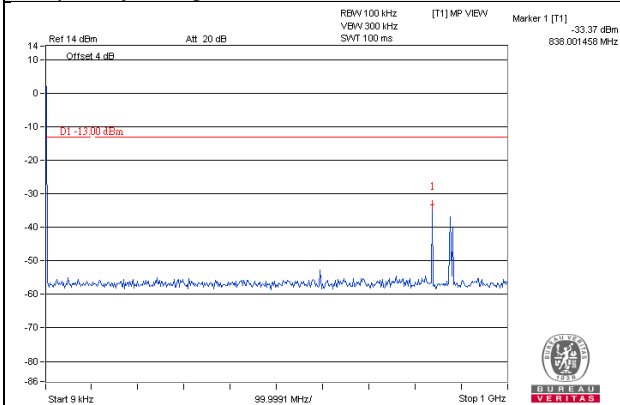


##### EDGE

##### Channel 189

Frequency Range : 9kHz~1GHz

Frequency Range : 1GHz~10GHz

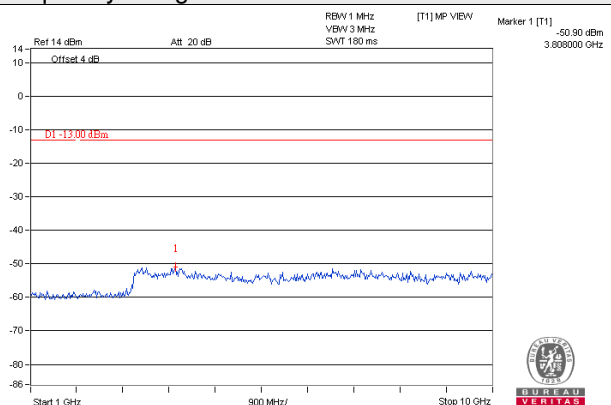
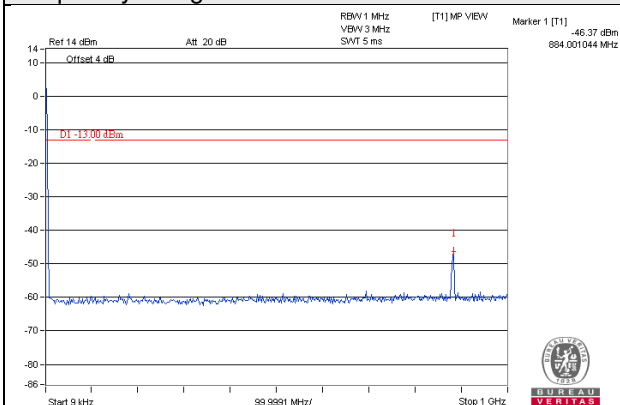


##### WCDMA

##### Channel 4182

Frequency Range : 9kHz~1GHz

Frequency Range : 1GHz~10GHz

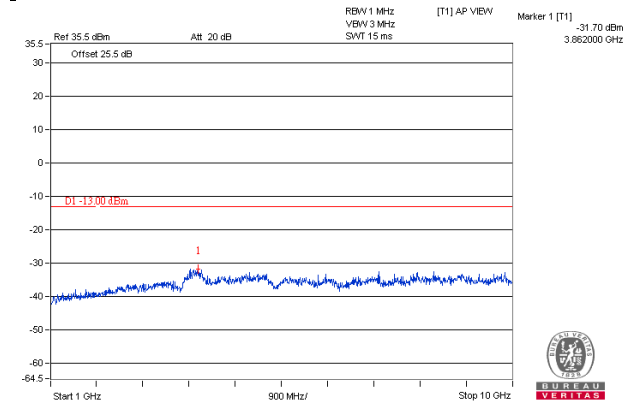
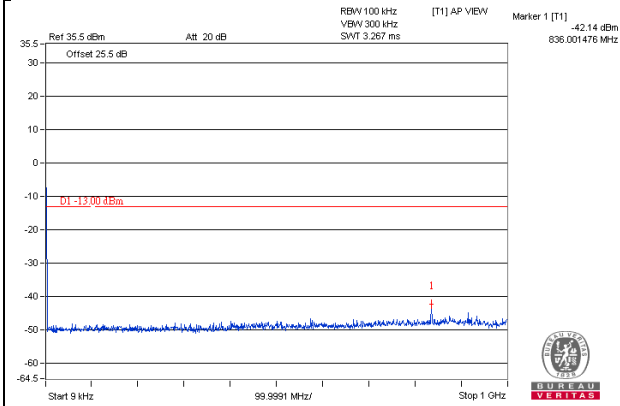


### LTE 1.4MHz

Channel 20525

Frequency Range : 9kHz~1GHz

Frequency Range : 1GHz~10GHz

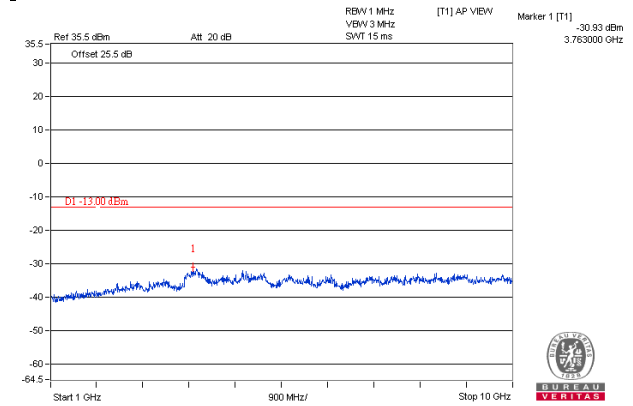
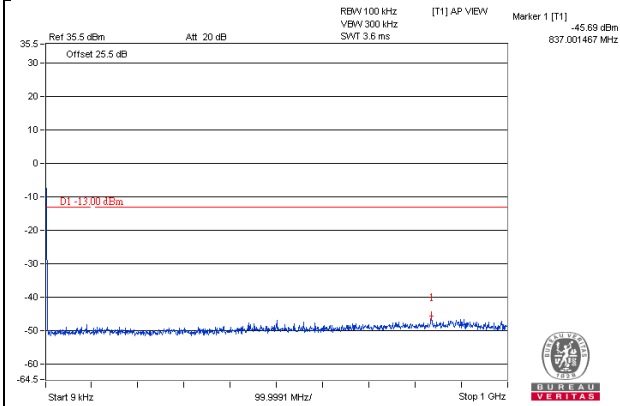


### LTE 3MHz

Channel 20525

Frequency Range : 9kHz~1GHz

Frequency Range : 1GHz~10GHz

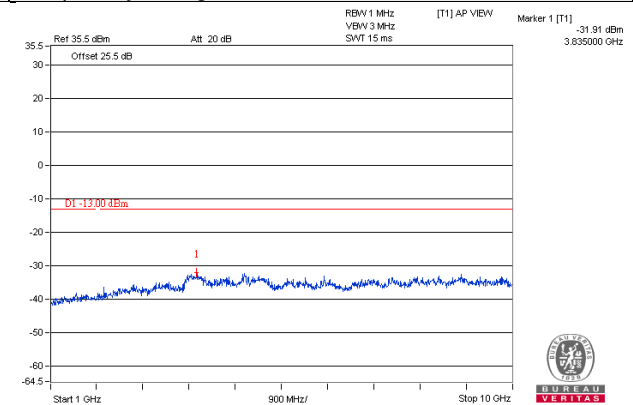
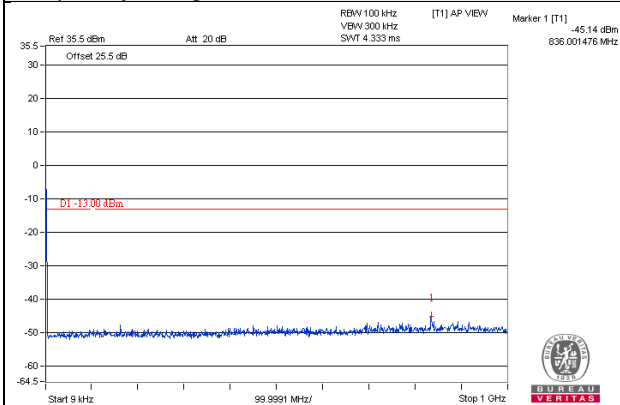


### LTE 5MHz

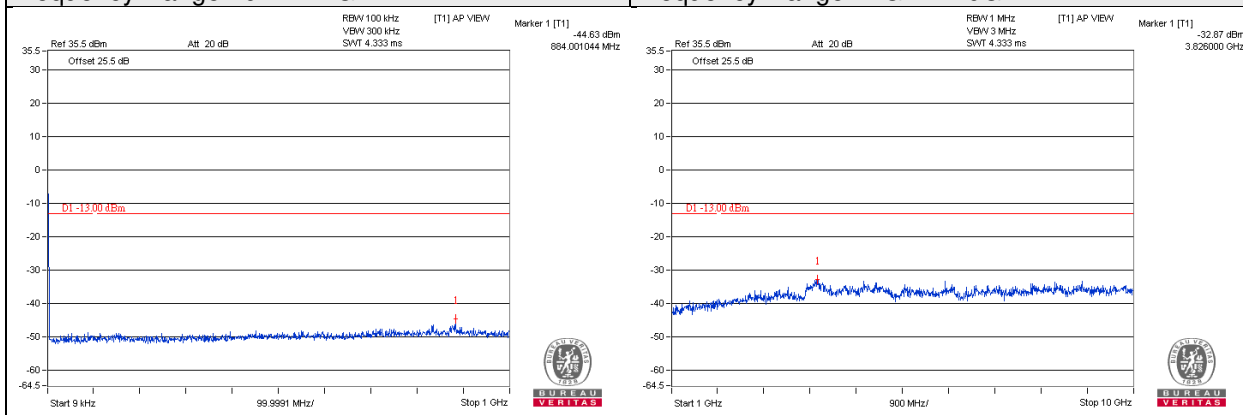
Channel 20525

Frequency Range : 9kHz~1GHz

Frequency Range : 1GHz~10GHz



|                                    |                                     |
|------------------------------------|-------------------------------------|
| <b>LTE 10MHz</b>                   |                                     |
| <b>Channel 20525</b>               |                                     |
| <b>Frequency Range : 9kHz~1GHz</b> | <b>Frequency Range : 1GHz~10GHz</b> |



## 4.7 Radiated Emission Measurement

### 4.7.1 Limits of Radiated Emission Measurement

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB. The emission limit equal to  $-13\text{dBm}$ .

### 4.7.2 Test Procedure

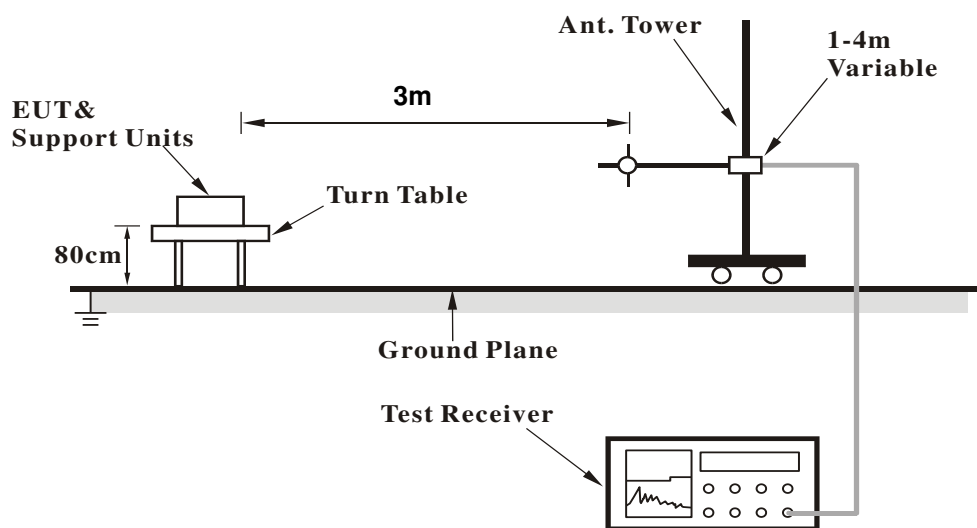
- a. The power was measured with Spectrum Analyzer. All measurements were done at 3 channels (low, middle and high channel of operational frequency range.)
- b. Substitution method is used for EIRP measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
- c. The substitution antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to "Read Value " of step b. Record the power level of S.G
- d.  $\text{EIRP} = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution antenna}$ .

**NOTE:** The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 100kHz/300kHz.

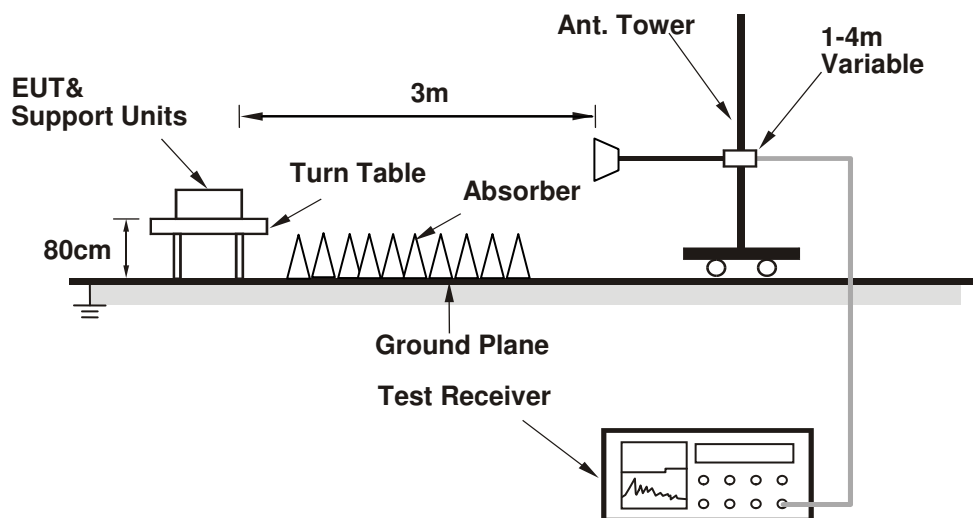
### 4.7.3 Deviation from Test Standard

No deviation.

#### 4.7.4 Test Setup For Below 1GHz



#### For Above 1GHz:



For the actual test configuration, please refer to the attached file (Test Setup Photo).

#### 4.7.5 Test Results

BELOW 1GHz

**GPRS:**

|      |                |                 |                |
|------|----------------|-----------------|----------------|
| Mode | TX channel 189 | Frequency Range | Below 1000 MHz |
|------|----------------|-----------------|----------------|

| Antenna Polarity & Test Distance: Horizontal at 3 M |             |               |                       |                        |                      |             |             |
|-----------------------------------------------------|-------------|---------------|-----------------------|------------------------|----------------------|-------------|-------------|
| No.                                                 | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | Emission Value (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 30.03       | 31.60         | -39.67                | -14.89                 | -54.56               | -25         | -29.56      |
| 2                                                   | 135         | 35.50         | -59.87                | -1.46                  | -61.34               | -25         | -36.34      |
| 3                                                   | 208.04      | 32.10         | -63.37                | 4.24                   | -59.13               | -25         | -34.13      |
| 4                                                   | 479.98      | 29.30         | -66.46                | 3.04                   | -63.42               | -25         | -38.42      |
| 5                                                   | 600.17      | 29.10         | -65.52                | 1.79                   | -63.73               | -25         | -38.73      |
| 6                                                   | 995.39      | 33.50         | -62.53                | 0.59                   | -61.94               | -25         | -36.94      |
| Antenna Polarity & Test Distance: Vertical at 3 M   |             |               |                       |                        |                      |             |             |
| No.                                                 | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | Emission Value (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 34.32       | 36.90         | -35.92                | -13.85                 | -49.77               | -25         | -24.77      |
| 2                                                   | 81.2        | 30.60         | -63.30                | -1.71                  | -65.01               | -25         | -40.01      |
| 3                                                   | 135         | 30.50         | -64.87                | -1.46                  | -66.34               | -25         | -41.34      |
| 4                                                   | 189         | 32.60         | -61.96                | 3.16                   | -58.80               | -25         | -33.80      |
| 5                                                   | 208.31      | 32.50         | -62.96                | 4.23                   | -58.73               | -25         | -33.73      |
| 6                                                   | 928.65      | 29.10         | -69.31                | 0.41                   | -68.91               | -25         | -43.91      |

Remarks:

1. Emission Value (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

# EDGE:

|      |                |                 |                |
|------|----------------|-----------------|----------------|
| Mode | TX channel 189 | Frequency Range | Below 1000 MHz |
|------|----------------|-----------------|----------------|

| Antenna Polarity & Test Distance: Horizontal at 3 M |             |               |                       |                        |                      |             |             |
|-----------------------------------------------------|-------------|---------------|-----------------------|------------------------|----------------------|-------------|-------------|
| No.                                                 | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | Emission Value (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 30.02       | 29.40         | -41.87                | -14.89                 | -56.76               | -25         | -31.76      |
| 2                                                   | 135         | 35.30         | -60.07                | -1.46                  | -61.54               | -25         | -36.54      |
| 3                                                   | 208.04      | 29.90         | -65.57                | 4.24                   | -61.33               | -25         | -36.33      |
| 4                                                   | 479.98      | 27.40         | -68.36                | 3.04                   | -65.32               | -25         | -40.32      |
| 5                                                   | 600.17      | 28.10         | -66.52                | 1.79                   | -64.73               | -25         | -39.73      |
| 6                                                   | 995.39      | 31.40         | -64.63                | 0.59                   | -64.04               | -25         | -39.04      |
| Antenna Polarity & Test Distance: Vertical at 3 M   |             |               |                       |                        |                      |             |             |
| No.                                                 | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | Emission Value (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 34.33       | 36.80         | -36.03                | -13.84                 | -49.87               | -25         | -24.87      |
| 2                                                   | 81.02       | 30.30         | -63.64                | -1.72                  | -65.36               | -25         | -40.36      |
| 3                                                   | 135         | 29.90         | -65.47                | -1.46                  | -66.94               | -25         | -41.94      |
| 4                                                   | 189.01      | 31.30         | -63.26                | 3.16                   | -60.10               | -25         | -35.10      |
| 5                                                   | 208.31      | 32.60         | -62.86                | 4.23                   | -58.63               | -25         | -33.63      |
| 6                                                   | 928.66      | 28.90         | -69.51                | 0.41                   | -69.10               | -25         | -44.10      |

## Remarks:

1. Emission Value (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

# WCDMA:

|      |                 |                 |                |
|------|-----------------|-----------------|----------------|
| Mode | TX channel 4182 | Frequency Range | Below 1000 MHz |
|------|-----------------|-----------------|----------------|

| Antenna Polarity & Test Distance: Horizontal at 3 M |             |               |                       |                        |                      |             |             |
|-----------------------------------------------------|-------------|---------------|-----------------------|------------------------|----------------------|-------------|-------------|
| No.                                                 | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | Emission Value (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 30.02       | 30.60         | -40.67                | -14.89                 | -55.56               | -25         | -30.56      |
| 2                                                   | 135         | 36.30         | -59.07                | -1.46                  | -60.54               | -25         | -35.54      |
| 3                                                   | 208.05      | 30.00         | -65.47                | 4.24                   | -61.23               | -25         | -36.23      |
| 4                                                   | 479.95      | 34.30         | -61.46                | 3.04                   | -58.42               | -25         | -33.42      |
| 5                                                   | 600.14      | 32.30         | -62.32                | 1.79                   | -60.53               | -25         | -35.53      |
| 6                                                   | 995.38      | 39.60         | -56.43                | 0.59                   | -55.84               | -25         | -30.84      |
| Antenna Polarity & Test Distance: Vertical at 3 M   |             |               |                       |                        |                      |             |             |
| No.                                                 | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | Emission Value (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 34.3        | 36.40         | -36.42                | -13.85                 | -50.27               | -25         | -25.27      |
| 2                                                   | 81          | 31.60         | -62.34                | -1.72                  | -64.06               | -25         | -39.06      |
| 3                                                   | 135         | 31.20         | -64.17                | -1.46                  | -65.64               | -25         | -40.64      |
| 4                                                   | 189         | 29.70         | -64.86                | 3.16                   | -61.70               | -25         | -36.70      |
| 5                                                   | 208.31      | 31.10         | -64.36                | 4.23                   | -60.13               | -25         | -35.13      |
| 6                                                   | 928.66      | 32.30         | -66.59                | 0.23                   | -66.36               | -25         | -41.36      |

## Remarks:

1. Emission Value (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

**LTE:**  
**1.4 MHz**

|      |                  |                 |                |
|------|------------------|-----------------|----------------|
| Mode | TX channel 20525 | Frequency Range | Below 1000 MHz |
|------|------------------|-----------------|----------------|

| Antenna Polarity & Test Distance: Horizontal at 3 M |             |               |                       |                        |                      |             |             |
|-----------------------------------------------------|-------------|---------------|-----------------------|------------------------|----------------------|-------------|-------------|
| No.                                                 | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | Emission Value (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 30.02       | 33.20         | -38.07                | -14.89                 | -52.96               | -25         | -27.96      |
| 2                                                   | 135         | 37.30         | -58.07                | -1.46                  | -59.54               | -25         | -34.54      |
| 3                                                   | 208.06      | 33.50         | -61.97                | 4.24                   | -57.73               | -25         | -32.73      |
| 4                                                   | 479.9       | 32.10         | -63.66                | 3.04                   | -60.62               | -25         | -35.62      |
| 5                                                   | 600.15      | 33.40         | -61.22                | 1.79                   | -59.43               | -25         | -34.43      |
| 6                                                   | 995.39      | 37.50         | -59.13                | 0.57                   | -58.56               | -25         | -33.56      |
| Antenna Polarity & Test Distance: Vertical at 3 M   |             |               |                       |                        |                      |             |             |
| No.                                                 | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | Emission Value (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 34.3        | 36.40         | -36.42                | -13.85                 | -50.27               | -25         | -25.27      |
| 2                                                   | 81.2        | 32.20         | -61.70                | -1.71                  | -63.41               | -25         | -38.41      |
| 3                                                   | 135         | 32.30         | -63.07                | -1.46                  | -64.54               | -25         | -39.54      |
| 4                                                   | 189         | 31.40         | -63.16                | 3.16                   | -60.00               | -25         | -35.00      |
| 5                                                   | 208.35      | 33.50         | -61.96                | 4.23                   | -57.73               | -25         | -32.73      |
| 6                                                   | 928.65      | 31.20         | -67.69                | 0.23                   | -67.46               | -25         | -42.46      |

**Remarks:**

1. Emission Value (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

### 3 MHz

|      |                  |                 |                |
|------|------------------|-----------------|----------------|
| Mode | TX channel 20525 | Frequency Range | Below 1000 MHz |
|------|------------------|-----------------|----------------|

| Antenna Polarity & Test Distance: Horizontal at 3 M |             |               |                       |                        |                      |             |             |
|-----------------------------------------------------|-------------|---------------|-----------------------|------------------------|----------------------|-------------|-------------|
| No.                                                 | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | Emission Value (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 30.01       | 34.10         | -37.16                | -14.90                 | -52.06               | -25         | -27.06      |
| 2                                                   | 135         | 36.20         | -59.17                | -1.46                  | -60.64               | -25         | -35.64      |
| 3                                                   | 208.06      | 35.10         | -60.37                | 4.24                   | -56.13               | -25         | -31.13      |
| 4                                                   | 479.9       | 30.40         | -65.36                | 3.04                   | -62.32               | -25         | -37.32      |
| 5                                                   | 600.15      | 35.10         | -59.52                | 1.79                   | -57.73               | -25         | -32.73      |
| 6                                                   | 995.39      | 36.40         | -60.23                | 0.57                   | -59.66               | -25         | -34.66      |
| Antenna Polarity & Test Distance: Vertical at 3 M   |             |               |                       |                        |                      |             |             |
| No.                                                 | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | Emission Value (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 34.2        | 36.20         | -36.62                | -13.85                 | -50.47               | -25         | -25.47      |
| 2                                                   | 81.2        | 33.10         | -60.80                | -1.71                  | -62.51               | -25         | -37.51      |
| 3                                                   | 135         | 32.40         | -62.97                | -1.46                  | -64.44               | -25         | -39.44      |
| 4                                                   | 189         | 32.30         | -62.26                | 3.16                   | -59.10               | -25         | -34.10      |
| 5                                                   | 208.4       | 33.10         | -62.36                | 4.23                   | -58.13               | -25         | -33.13      |
| 6                                                   | 928.5       | 33.60         | -65.30                | 0.23                   | -65.07               | -25         | -40.07      |

#### Remarks:

1. Emission Value (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

## 5 MHz

|      |                  |                 |                |
|------|------------------|-----------------|----------------|
| Mode | TX channel 20525 | Frequency Range | Below 1000 MHz |
|------|------------------|-----------------|----------------|

| Antenna Polarity & Test Distance: Horizontal at 3 M |             |               |                       |                        |                      |             |             |
|-----------------------------------------------------|-------------|---------------|-----------------------|------------------------|----------------------|-------------|-------------|
| No.                                                 | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | Emission Value (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 30.01       | 34.20         | -37.06                | -14.90                 | -51.96               | -25         | -26.96      |
| 2                                                   | 135         | 36.90         | -58.47                | -1.46                  | -59.94               | -25         | -34.94      |
| 3                                                   | 208         | 36.40         | -59.07                | 4.24                   | -54.83               | -25         | -29.83      |
| 4                                                   | 480.1       | 36.20         | -59.56                | 3.04                   | -56.52               | -25         | -31.52      |
| 5                                                   | 600.2       | 30.40         | -64.22                | 1.79                   | -62.43               | -25         | -37.43      |
| 6                                                   | 995.42      | 42.10         | -53.93                | 0.59                   | -53.34               | -25         | -28.34      |
| Antenna Polarity & Test Distance: Vertical at 3 M   |             |               |                       |                        |                      |             |             |
| No.                                                 | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | Emission Value (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 34.3        | 35.80         | -37.02                | -13.85                 | -50.87               | -25         | -25.87      |
| 2                                                   | 81.2        | 33.60         | -60.30                | -1.71                  | -62.01               | -25         | -37.01      |
| 3                                                   | 135         | 36.20         | -59.17                | -1.46                  | -60.64               | -25         | -35.64      |
| 4                                                   | 189         | 32.10         | -62.46                | 3.16                   | -59.30               | -25         | -34.30      |
| 5                                                   | 208.4       | 36.40         | -59.06                | 4.23                   | -54.83               | -25         | -29.83      |
| 6                                                   | 928.5       | 35.80         | -63.10                | 0.23                   | -62.87               | -25         | -37.87      |

### Remarks:

1. Emission Value (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

## 10 MHz

|      |                  |                 |                |
|------|------------------|-----------------|----------------|
| Mode | TX channel 20525 | Frequency Range | Below 1000 MHz |
|------|------------------|-----------------|----------------|

| Antenna Polarity & Test Distance: Horizontal at 3 M |             |               |                       |                        |                      |             |             |
|-----------------------------------------------------|-------------|---------------|-----------------------|------------------------|----------------------|-------------|-------------|
| No.                                                 | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | Emission Value (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 30.01       | 35.30         | -35.96                | -14.90                 | -50.86               | -25         | -25.86      |
| 2                                                   | 135         | 36.40         | -58.97                | -1.46                  | -60.44               | -25         | -35.44      |
| 3                                                   | 208         | 35.20         | -60.27                | 4.24                   | -56.03               | -25         | -31.03      |
| 4                                                   | 480.1       | 36.10         | -59.66                | 3.04                   | -56.62               | -25         | -31.62      |
| 5                                                   | 600.2       | 33.40         | -61.22                | 1.79                   | -59.43               | -25         | -34.43      |
| 6                                                   | 995.42      | 42.30         | -53.73                | 0.59                   | -53.14               | -25         | -28.14      |
| Antenna Polarity & Test Distance: Vertical at 3 M   |             |               |                       |                        |                      |             |             |
| No.                                                 | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | Emission Value (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 34.3        | 35.60         | -37.22                | -13.85                 | -51.07               | -25         | -26.07      |
| 2                                                   | 81.2        | 34.60         | -59.30                | -1.71                  | -61.01               | -25         | -36.01      |
| 3                                                   | 135         | 35.70         | -59.67                | -1.46                  | -61.14               | -25         | -36.14      |
| 4                                                   | 189         | 33.90         | -60.66                | 3.16                   | -57.50               | -25         | -32.50      |
| 5                                                   | 208.4       | 35.80         | -59.66                | 4.23                   | -55.43               | -25         | -30.43      |
| 6                                                   | 928.5       | 36.20         | -62.70                | 0.23                   | -62.47               | -25         | -37.47      |

### Remarks:

1. Emission Value (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

ABOVE 1GHz

GPRS:

|      |                |                 |               |
|------|----------------|-----------------|---------------|
| Mode | TX channel 189 | Frequency Range | Above 1000MHz |
|------|----------------|-----------------|---------------|

| Antenna Polarity & Test Distance: Horizontal at 3 M |             |               |                       |                        |                      |             |             |
|-----------------------------------------------------|-------------|---------------|-----------------------|------------------------|----------------------|-------------|-------------|
| No.                                                 | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | Emission Value (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 1672.8      | 48.00         | -54.63                | 6.31                   | -48.32               | -13         | -35.32      |
| 2                                                   | 2509.2      | 54.70         | -43.82                | 6.66                   | -37.16               | -13         | -24.16      |
| 3                                                   | 3345.6      | 39.23         | -63.78                | 7.63                   | -56.15               | -13         | -43.15      |
| 4                                                   | 4182        | 45.38         | -59.46                | 7.44                   | -52.02               | -13         | -39.02      |
| 5                                                   | 5018.4      | 42.09         | -62.17                | 7.01                   | -55.16               | -13         | -42.16      |
| 6                                                   | 5854.8      | 42.22         | -62.16                | 6.87                   | -55.29               | -13         | -42.29      |
| 7                                                   | 6691.2      | 45.1          | -58.22                | 5.56                   | -52.66               | -13         | -39.66      |
| 8                                                   | 7527.6      | 46.12         | -56.50                | 4.52                   | -51.98               | -13         | -38.98      |
| 9                                                   | 8364        | 48.67         | -53.95                | 4.18                   | -49.77               | -13         | -36.77      |
| Antenna Polarity & Test Distance: Vertical at 3 M   |             |               |                       |                        |                      |             |             |
| No.                                                 | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | Emission Value (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 1672.8      | 49.6          | -53.03                | 6.31                   | -46.72               | -13         | -33.72      |
| 2                                                   | 2509.2      | 50.3          | -48.22                | 6.66                   | -41.56               | -13         | -28.56      |
| 3                                                   | 3345.6      | 39.5          | -63.51                | 7.63                   | -55.88               | -13         | -42.88      |
| 4                                                   | 4182        | 42.9          | -61.94                | 7.44                   | -54.50               | -13         | -41.50      |
| 5                                                   | 5018.4      | 43.1          | -61.16                | 7.01                   | -54.15               | -13         | -41.15      |
| 6                                                   | 5854.8      | 44.5          | -59.88                | 6.87                   | -53.01               | -13         | -40.01      |
| 7                                                   | 6691.2      | 46.3          | -57.02                | 5.56                   | -51.46               | -13         | -38.46      |
| 8                                                   | 7527.6      | 48            | -54.62                | 4.52                   | -50.10               | -13         | -37.10      |
| 9                                                   | 8364        | 46.79         | -55.83                | 4.18                   | -51.65               | -13         | -38.65      |

Remarks:

1. Emission Value (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

# EDGE:

|      |                |                 |               |
|------|----------------|-----------------|---------------|
| Mode | TX channel 189 | Frequency Range | Above 1000MHz |
|------|----------------|-----------------|---------------|

| Antenna Polarity & Test Distance: Horizontal at 3 M |             |               |                       |                        |                      |             |             |
|-----------------------------------------------------|-------------|---------------|-----------------------|------------------------|----------------------|-------------|-------------|
| No.                                                 | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | Emission Value (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 1672.8      | 48.87         | -53.76                | 6.31                   | -47.45               | -13         | -34.45      |
| 2                                                   | 2509.2      | 55.49         | -43.03                | 6.66                   | -36.37               | -13         | -23.37      |
| 3                                                   | 3345.6      | 38.68         | -64.33                | 7.63                   | -56.70               | -13         | -43.70      |
| 4                                                   | 4182        | 44.79         | -60.05                | 7.44                   | -52.61               | -13         | -39.61      |
| 5                                                   | 5018.4      | 41.4          | -62.86                | 7.01                   | -55.85               | -13         | -42.85      |
| 6                                                   | 5854.8      | 42.9          | -61.48                | 6.87                   | -54.61               | -13         | -41.61      |
| 7                                                   | 6691.2      | 44.83         | -58.49                | 5.56                   | -52.93               | -13         | -39.93      |
| 8                                                   | 7527.6      | 46.7          | -55.92                | 4.52                   | -51.40               | -13         | -38.40      |
| 9                                                   | 8364        | 48.8          | -53.82                | 4.18                   | -49.64               | -13         | -36.64      |
| Antenna Polarity & Test Distance: Vertical at 3 M   |             |               |                       |                        |                      |             |             |
| No.                                                 | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | Emission Value (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 1672.8      | 50.17         | -52.46                | 6.31                   | -46.15               | -13         | -33.15      |
| 2                                                   | 2509.2      | 50.58         | -47.94                | 6.66                   | -41.28               | -13         | -28.28      |
| 3                                                   | 3345.6      | 38.98         | -64.03                | 7.63                   | -56.40               | -13         | -43.40      |
| 4                                                   | 4182        | 42.82         | -62.02                | 7.44                   | -54.58               | -13         | -41.58      |
| 5                                                   | 5018.4      | 42.1          | -62.16                | 7.01                   | -55.15               | -13         | -42.15      |
| 6                                                   | 5854.8      | 45.31         | -59.07                | 6.87                   | -52.20               | -13         | -39.20      |
| 7                                                   | 6691.2      | 45.59         | -57.73                | 5.56                   | -52.17               | -13         | -39.17      |
| 8                                                   | 7527.6      | 48.37         | -54.25                | 4.52                   | -49.73               | -13         | -36.73      |
| 9                                                   | 8364        | 47.19         | -55.43                | 4.18                   | -51.25               | -13         | -38.25      |

## Remarks:

1. Emission Value (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

**WCDMA:**

|      |                 |                 |               |
|------|-----------------|-----------------|---------------|
| Mode | TX channel 4182 | Frequency Range | Above 1000MHz |
|------|-----------------|-----------------|---------------|

| Antenna Polarity & Test Distance: Horizontal at 3 M |             |               |                       |                        |                      |             |             |
|-----------------------------------------------------|-------------|---------------|-----------------------|------------------------|----------------------|-------------|-------------|
| No.                                                 | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | Emission Value (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 1672.8      | 48.74         | -53.89                | 6.31                   | -47.58               | -13         | -34.58      |
| 2                                                   | 2509.2      | 55.06         | -43.46                | 6.66                   | -36.80               | -13         | -23.80      |
| 3                                                   | 3345.6      | 40.06         | -62.95                | 7.63                   | -55.32               | -13         | -42.32      |
| 4                                                   | 4182        | 45.06         | -59.78                | 7.44                   | -52.34               | -13         | -39.34      |
| 5                                                   | 5018.4      | 41.86         | -62.40                | 7.01                   | -55.39               | -13         | -42.39      |
| 6                                                   | 5854.8      | 42.26         | -62.12                | 6.87                   | -55.25               | -13         | -42.25      |
| 7                                                   | 6691.2      | 44.54         | -58.78                | 5.56                   | -53.22               | -13         | -40.22      |
| 8                                                   | 7527.6      | 46.14         | -56.48                | 4.52                   | -51.96               | -13         | -38.96      |
| 9                                                   | 8364        | 48.44         | -54.18                | 4.18                   | -50.00               | -13         | -37.00      |
| Antenna Polarity & Test Distance: Vertical at 3 M   |             |               |                       |                        |                      |             |             |
| No.                                                 | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | Emission Value (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 1672.8      | 49.03         | -53.60                | 6.31                   | -47.29               | -13         | -34.29      |
| 2                                                   | 2509.2      | 50.32         | -48.20                | 6.66                   | -41.54               | -13         | -28.54      |
| 3                                                   | 3345.6      | 39.37         | -63.64                | 7.63                   | -56.01               | -13         | -43.01      |
| 4                                                   | 4182        | 42.34         | -62.50                | 7.44                   | -55.06               | -13         | -42.06      |
| 5                                                   | 5018.4      | 43.15         | -61.11                | 7.01                   | -54.10               | -13         | -41.10      |
| 6                                                   | 5854.8      | 43.71         | -60.67                | 6.87                   | -53.80               | -13         | -40.80      |
| 7                                                   | 6691.2      | 46.83         | -56.49                | 5.56                   | -50.93               | -13         | -37.93      |
| 8                                                   | 7527.6      | 48.68         | -53.94                | 4.52                   | -49.42               | -13         | -36.42      |
| 9                                                   | 8364        | 46.34         | -56.28                | 4.18                   | -52.10               | -13         | -39.10      |

**Remarks:**

1. Emission Value (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

**LTE:**  
**1.4MHz**

|      |                  |                 |               |
|------|------------------|-----------------|---------------|
| Mode | TX channel 20525 | Frequency Range | Above 1000MHz |
|------|------------------|-----------------|---------------|

| Antenna Polarity & Test Distance: Horizontal at 3 M |               |               |                       |                        |                      |             |               |
|-----------------------------------------------------|---------------|---------------|-----------------------|------------------------|----------------------|-------------|---------------|
| No.                                                 | Freq. (MHz)   | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | Emission Value (dBm) | Limit (dBm) | Margin (dB)   |
| 1                                                   | 1673          | 60.80         | -41.83                | 6.31                   | -35.52               | -13         | -22.52        |
| 2                                                   | <b>2509.5</b> | <b>63.60</b>  | <b>-34.92</b>         | <b>6.66</b>            | <b>-28.26</b>        | <b>-13</b>  | <b>-15.26</b> |
| 3                                                   | 3346          | 39.07         | -63.94                | 7.63                   | -56.31               | -13         | -43.31        |
| 4                                                   | 4182.5        | 38.67         | -66.17                | 7.44                   | -58.73               | -13         | -45.73        |
| 5                                                   | 5019          | 40.86         | -63.40                | 7.01                   | -56.39               | -13         | -43.39        |
| 6                                                   | 5855.5        | 40.85         | -63.53                | 6.87                   | -56.66               | -13         | -43.66        |
| 7                                                   | 6692          | 44.41         | -58.92                | 5.56                   | -53.36               | -13         | -40.36        |
| 8                                                   | 7528.5        | 46.28         | -56.34                | 4.52                   | -51.82               | -13         | -38.82        |
| 9                                                   | 8365          | 44.56         | -58.06                | 4.18                   | -53.88               | -13         | -40.88        |
| Antenna Polarity & Test Distance: Vertical at 3 M   |               |               |                       |                        |                      |             |               |
| No.                                                 | Freq. (MHz)   | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | Emission Value (dBm) | Limit (dBm) | Margin (dB)   |
| 1                                                   | 1673          | 55.2          | -47.43                | 6.31                   | -41.12               | -13         | -28.12        |
| 2                                                   | 2509.5        | 58            | -40.52                | 6.66                   | -33.86               | -13         | -20.86        |
| 3                                                   | 3346          | 38.6          | -64.41                | 7.63                   | -56.78               | -13         | -43.78        |
| 4                                                   | 4182.5        | 40.6          | -64.24                | 7.44                   | -56.80               | -13         | -43.80        |
| 5                                                   | 5019          | 39.16         | -65.10                | 7.01                   | -58.09               | -13         | -45.09        |
| 6                                                   | 5855.5        | 41.01         | -63.37                | 6.87                   | -56.50               | -13         | -43.50        |
| 7                                                   | 6692          | 43.92         | -59.41                | 5.56                   | -53.85               | -13         | -40.85        |
| 8                                                   | 7528.5        | 43.61         | -59.01                | 4.52                   | -54.49               | -13         | -41.49        |
| 9                                                   | 8365          | 46.25         | -56.37                | 4.18                   | -52.19               | -13         | -39.19        |

Remarks:

1. Emission Value (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

### 3MHz

|      |                  |                 |               |
|------|------------------|-----------------|---------------|
| Mode | TX channel 20525 | Frequency Range | Above 1000MHz |
|------|------------------|-----------------|---------------|

| Antenna Polarity & Test Distance: Horizontal at 3 M |             |               |                       |                        |                      |             |             |
|-----------------------------------------------------|-------------|---------------|-----------------------|------------------------|----------------------|-------------|-------------|
| No.                                                 | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | Emission Value (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 1673        | 58.30         | -44.33                | 6.31                   | -38.02               | -13         | -25.02      |
| 2                                                   | 2509.5      | 62.10         | -36.42                | 6.66                   | -29.76               | -13         | -16.76      |
| 3                                                   | 3346        | 39.39         | -63.62                | 7.63                   | -55.99               | -13         | -42.99      |
| 4                                                   | 4182.5      | 39.43         | -65.41                | 7.44                   | -57.97               | -13         | -44.97      |
| 5                                                   | 5019        | 41.36         | -62.90                | 7.01                   | -55.89               | -13         | -42.89      |
| 6                                                   | 5855.5      | 41.06         | -63.32                | 6.87                   | -56.45               | -13         | -43.45      |
| 7                                                   | 6692        | 43.83         | -59.50                | 5.56                   | -53.94               | -13         | -40.94      |
| 8                                                   | 7528.5      | 46.47         | -56.15                | 4.52                   | -51.63               | -13         | -38.63      |
| 9                                                   | 8365        | 44.14         | -58.48                | 4.18                   | -54.30               | -13         | -41.30      |
| Antenna Polarity & Test Distance: Vertical at 3 M   |             |               |                       |                        |                      |             |             |
| No.                                                 | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | Emission Value (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 1673        | 54.7          | -47.93                | 6.31                   | -41.62               | -13         | -28.62      |
| 2                                                   | 2509.5      | 57.2          | -41.32                | 6.66                   | -34.66               | -13         | -21.66      |
| 3                                                   | 3346        | 38.92         | -64.09                | 7.63                   | -56.46               | -13         | -43.46      |
| 4                                                   | 4182.5      | 40.85         | -63.99                | 7.44                   | -56.55               | -13         | -43.55      |
| 5                                                   | 5019        | 38.83         | -65.43                | 7.01                   | -58.42               | -13         | -45.42      |
| 6                                                   | 5855.5      | 40.27         | -64.11                | 6.87                   | -57.24               | -13         | -44.24      |
| 7                                                   | 6692        | 43.26         | -60.07                | 5.56                   | -54.51               | -13         | -41.51      |
| 8                                                   | 7528.5      | 44.18         | -58.44                | 4.52                   | -53.92               | -13         | -40.92      |
| 9                                                   | 8365        | 46.32         | -56.30                | 4.18                   | -52.12               | -13         | -39.12      |

#### Remarks:

1. Emission Value (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

# 5MHz

|      |                  |                 |               |
|------|------------------|-----------------|---------------|
| Mode | TX channel 20525 | Frequency Range | Above 1000MHz |
|------|------------------|-----------------|---------------|

| Antenna Polarity & Test Distance: Horizontal at 3 M |             |               |                       |                        |                      |             |             |
|-----------------------------------------------------|-------------|---------------|-----------------------|------------------------|----------------------|-------------|-------------|
| No.                                                 | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | Emission Value (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 1673        | 57.20         | -45.43                | 6.31                   | -39.12               | -13         | -26.12      |
| 2                                                   | 2509.5      | 60.40         | -38.12                | 6.66                   | -31.46               | -13         | -18.46      |
| 3                                                   | 3346        | 39.71         | -63.30                | 7.63                   | -55.67               | -13         | -42.67      |
| 4                                                   | 4182.5      | 38.52         | -66.32                | 7.44                   | -58.88               | -13         | -45.88      |
| 5                                                   | 5019        | 41.54         | -62.72                | 7.01                   | -55.71               | -13         | -42.71      |
| 6                                                   | 5855.5      | 41.13         | -63.25                | 6.87                   | -56.38               | -13         | -43.38      |
| 7                                                   | 6692        | 43.67         | -59.66                | 5.56                   | -54.10               | -13         | -41.10      |
| 8                                                   | 7528.5      | 46.07         | -56.55                | 4.52                   | -52.03               | -13         | -39.03      |
| 9                                                   | 8365        | 44.85         | -57.77                | 4.18                   | -53.59               | -13         | -40.59      |
| Antenna Polarity & Test Distance: Vertical at 3 M   |             |               |                       |                        |                      |             |             |
| No.                                                 | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | Emission Value (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 1673        | 53.6          | -49.03                | 6.31                   | -42.72               | -13         | -29.72      |
| 2                                                   | 2509.5      | 56.1          | -42.42                | 6.66                   | -35.76               | -13         | -22.76      |
| 3                                                   | 3346        | 38.93         | -64.08                | 7.63                   | -56.45               | -13         | -43.45      |
| 4                                                   | 4182.5      | 40.61         | -64.23                | 7.44                   | -56.79               | -13         | -43.79      |
| 5                                                   | 5019        | 38.93         | -65.33                | 7.01                   | -58.32               | -13         | -45.32      |
| 6                                                   | 5855.5      | 39.74         | -64.64                | 6.87                   | -57.77               | -13         | -44.77      |
| 7                                                   | 6692        | 43.45         | -59.88                | 5.56                   | -54.32               | -13         | -41.32      |
| 8                                                   | 7528.5      | 44.85         | -57.77                | 4.52                   | -53.25               | -13         | -40.25      |
| 9                                                   | 8365        | 45.35         | -57.27                | 4.18                   | -53.09               | -13         | -40.09      |

## Remarks:

1. Emission Value (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

# 10MHz

|      |                  |                 |               |
|------|------------------|-----------------|---------------|
| Mode | TX channel 20525 | Frequency Range | Above 1000MHz |
|------|------------------|-----------------|---------------|

| Antenna Polarity & Test Distance: Horizontal at 3 M |             |               |                       |                        |                      |             |             |
|-----------------------------------------------------|-------------|---------------|-----------------------|------------------------|----------------------|-------------|-------------|
| No.                                                 | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | Emission Value (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 1673        | 56.93         | -45.70                | 6.31                   | -39.39               | -13         | -26.39      |
| 2                                                   | 2509.5      | 61.02         | -37.50                | 6.66                   | -30.84               | -13         | -17.84      |
| 3                                                   | 3346        | 40.49         | -62.52                | 7.63                   | -54.89               | -13         | -41.89      |
| 4                                                   | 4182.5      | 39.14         | -65.70                | 7.44                   | -58.26               | -13         | -45.26      |
| 5                                                   | 5019        | 41.99         | -62.27                | 7.01                   | -55.26               | -13         | -42.26      |
| 6                                                   | 5855.5      | 42.12         | -62.26                | 6.87                   | -55.39               | -13         | -42.39      |
| 7                                                   | 6692        | 44.32         | -59.01                | 5.56                   | -53.45               | -13         | -40.45      |
| 8                                                   | 7528.5      | 46.91         | -55.71                | 4.52                   | -51.19               | -13         | -38.19      |
| 9                                                   | 8365        | 44.81         | -57.81                | 4.18                   | -53.63               | -13         | -40.63      |
| Antenna Polarity & Test Distance: Vertical at 3 M   |             |               |                       |                        |                      |             |             |
| No.                                                 | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | Emission Value (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 1673        | 52.68         | -49.95                | 6.31                   | -43.64               | -13         | -30.64      |
| 2                                                   | 2509.5      | 55.48         | -43.04                | 6.66                   | -36.38               | -13         | -23.38      |
| 3                                                   | 3346        | 38.45         | -64.56                | 7.63                   | -56.93               | -13         | -43.93      |
| 4                                                   | 4182.5      | 41.28         | -63.56                | 7.44                   | -56.12               | -13         | -43.12      |
| 5                                                   | 5019        | 39.47         | -64.79                | 7.01                   | -57.78               | -13         | -44.78      |
| 6                                                   | 5855.5      | 39.37         | -65.01                | 6.87                   | -58.14               | -13         | -45.14      |
| 7                                                   | 6692        | 43.22         | -60.11                | 5.56                   | -54.55               | -13         | -41.55      |
| 8                                                   | 7528.5      | 44.31         | -58.31                | 4.52                   | -53.79               | -13         | -40.79      |
| 9                                                   | 8365        | 45.92         | -56.70                | 4.18                   | -52.52               | -13         | -39.52      |

## Remarks:

1. Emission Value (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

## 5 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo).

## Appendix – Information on the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

### **Linko EMC/RF Lab**

Tel: 886-2-26052180

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### **Hsin Chu EMC/RF/Telecom Lab**

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### **Hwa Ya EMC/RF/Safety Lab**

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**Web Site:** [www.bureauveritas-adt.com](http://www.bureauveritas-adt.com)

The address and road map of all our labs can be found in our web site also.

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