

# FCC TEST REPORT (PART 24)

**REPORT NO.:** RF130902E05F-2

**MODEL NO.:** xAPT-103PUW, FD410, xCE\_T103PUW

**FCC ID:** MQT-XAPT103PUWT

**RECEIVED:** Sep. 02, 2013

**TESTED:** Sep. 11 to 25, 2013 ; Aug. 10, 2016

**ISSUED:** Sep. 09, 2016

**APPLICANT:** XAC AUTOMATION CORP.

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**ISSUED BY:** Bureau Veritas Consumer Products Services (H.K.)  
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## RELEASE CONTROL RECORD

| ISSUE NO.      | REASON FOR CHANGE | DATE ISSUED   |
|----------------|-------------------|---------------|
| RF130902E05F-2 | Original release  | Sep. 09, 2016 |

## 1 CERTIFICATION

**PRODUCT :** Terminal

**BRAND NAME :** XAC, First Data

**MODEL NO. :** xAPT-103PUW, FD410, xCE\_T103PUW

**TEST ITEM:** ENGINEERING SAMPLE

**APPLICANT :** XAC AUTOMATION CORP.

**TESTED DATE :** Sep. 11 to 25, 2013 ; Aug. 10, 2016

**STANDARDS :** FCC Part 24, Subpart E

The above equipment (model: xAPT-103PUW) 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 :** Midoli Peng , **Date:** Sep. 09, 2016  
Midoli Peng / Specialist

**Approved by :** May Chen , **Date:** Sep. 09, 2016  
May Chen / Manager

## 2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

| APPLIED STANDARD: FCC Part 24 & Part 2 |                                         |        |                                                                                   |
|----------------------------------------|-----------------------------------------|--------|-----------------------------------------------------------------------------------|
| STANDARD SECTION                       | TEST TYPE                               | RESULT | REMARK                                                                            |
| 2.1046<br>24.232                       | Equivalent isotropically radiated power | PASS   | Meet the requirement of limit.                                                    |
| 2.1055<br>24.235                       | Frequency Stability                     | PASS   | Meet the requirement of limit.                                                    |
| 2.1049<br>24.238(b)                    | Occupied Bandwidth                      | PASS   | Meet the requirement of limit.                                                    |
| 24.238(b)                              | Band Edge Measurements                  | PASS   | Meet the requirement of limit.                                                    |
| 2.1051<br>24.238                       | Conducted Spurious Emissions            | PASS   | Meet the requirement of limit.                                                    |
| 2.1053<br>24.238                       | Radiated Spurious Emissions             | PASS   | Meet the requirement of limit.<br>Minimum passing margin is -10.63dB at 18800MHz. |

Note: This report is prepared for FCC class I permissive change.

### 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     | UNCERTAINTY |
|--------------------|---------------|-------------|
| Radiated emissions | 30MHz ~ 1GHz  | 5.37 dB     |
|                    | 1GHz ~ 6GHz   | 3.54 dB     |
|                    | 6GHz ~ 18GHz  | 4.08 dB     |
|                    | 18GHz ~ 40GHz | 4.11 dB     |

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

## 2.2 TEST SITE AND INSTRUMENTS

**For radiated spurious emissions (above 1GHz):**

| DESCRIPTION & MANUFACTURER              | MODEL NO.                | SERIAL NO.                          | CALIBRATED DATE | CALIBRATED UNTIL |
|-----------------------------------------|--------------------------|-------------------------------------|-----------------|------------------|
| Spectrum Analyzer<br>Agilent            | E4446A                   | MY48250253                          | Aug. 28, 2013   | Aug. 27, 2014    |
| MXE EMI Receiver<br>Agilent             | N9038A                   | MY50010156                          | Jan. 16, 2013   | Jan. 15, 2014    |
| Pre-Amplifier<br>Mini-Circuits          | ZFL-1000VH2<br>B         | AMP-ZFL-04                          | Nov. 14, 2012   | Nov. 13, 2013    |
| Pre-Amplifier<br>Agilent                | 8449B                    | 3008A01923                          | Oct. 30, 2012   | Oct. 29, 2013    |
| Pre-Amplifier<br>SPACEK LABS            | SLKKa-48-6               | 9K16                                | Nov. 14, 2012   | Nov. 13, 2013    |
| Trilog Broadband Antenna<br>SCHWARZBECK | VULB 9168                | 9168-361                            | Mar. 25, 2013   | Mar. 24, 2014    |
| Horn_Antenna<br>AISI                    | AIH.8018                 | 0000220091110                       | Nov. 27, 2012   | Nov. 26, 2013    |
| Horn_Antenna<br>SCHWARZBECK             | BBHA 9170                | 9170-424                            | Oct. 12, 2012   | Oct. 11, 2013    |
| RF Cable                                | NA                       | RF104-205<br>RF104-207<br>RF104-202 | Dec. 26, 2012   | Dec. 25, 2013    |
| RF Cable                                | NA                       | CHHCAB_001                          | Oct. 07, 2012   | Oct. 06, 2013    |
| Software                                | ADT_Radiated<br>_V8.7.05 | NA                                  | NA              | NA               |
| Antenna Tower & Turn Table<br>CT        | NA                       | NA                                  | NA              | NA               |
| Radio Communication<br>Analyzer         | Anritsu                  | MT8820C                             | May 30, 2013    | May 29, 2014     |
| Universal Radio<br>Communication Tester | R&S                      | CMU200                              | Oct. 23, 2012   | Oct. 22, 2013    |

**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. H.
3. The FCC Site Registration No. is 797305.
4. The CANADA Site Registration No. is IC 7450H-3.
5. Tested Date: Sep. 11 to 25, 2013

**For radiated spurious emissions (below 1GHz):**

| DESCRIPTION & MANUFACTURER              | MODEL NO.                | SERIAL NO.                           | CALIBRATED DATE | CALIBRATED UNTIL |
|-----------------------------------------|--------------------------|--------------------------------------|-----------------|------------------|
| Test Receiver<br>Agilent                | N9038A                   | MY51210105                           | July 06, 2016   | July 05, 2017    |
| Pre-Amplifier<br>Mini-Circuits          | ZFL-1000VH2<br>B         | AMP-ZFL-03                           | Nov. 11, 2015   | Nov. 10, 2016    |
| Trilog Broadband Antenna<br>SCHWARZBECK | VULB 9168                | 9168-360                             | Jan. 04, 2016   | Jan. 03, 2017    |
| RF Cable                                | 8D-FB                    | CHGCAB-001<br>-1<br>CHGCAB-001<br>-2 | Oct. 03, 2015   | Oct. 02, 2016    |
|                                         | RF-141                   | CHGCAB-004                           | Oct. 03, 2015   | Oct. 02, 2016    |
| Software                                | ADT_Radiated<br>_V8.7.07 | NA                                   | NA              | NA               |
| Antenna Tower & Turn Table<br>CT        | CM100                    | NA                                   | NA              | NA               |
| Boresight Antenna Fixture               | FBA-01                   | FBA-WD01                             | 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. G.
3. The FCC Site Registration No. is 966073.
3. The CANADA Site Registration No. is IC 7450H-2.
4. Tested Date: Aug. 10, 2016

**For other test items:**

| DESCRIPTION & MANUFACTURER                           | MODEL NO.                                | SERIAL NO.                            | CALIBRATED DATE | CALIBRATED UNTIL |
|------------------------------------------------------|------------------------------------------|---------------------------------------|-----------------|------------------|
| Spectrum Analyzer<br>R&S                             | FSP 40                                   | 100060                                | May 03, 2013    | May 02, 2014     |
| Spectrum Analyzer<br>Agilent                         | E4446A                                   | MY48250113                            | Dec. 05, 2012   | Dec. 04, 2013    |
| AC Power Source<br>EXTECH Electronics                | 6502                                     | 1140503                               | NA              | NA               |
| Temperature & Humidity<br>Chamber<br>TERCHY          | MHU-225AU                                | 911033                                | Dec. 11, 2012   | Dec. 10, 2013    |
| DC Power Supply<br>GOOD WILL<br>INSTRUMENT CO., LTD. | GPC - 3030D                              | 7700087                               | NA              | NA               |
| ESG Vector signal<br>generator<br>Agilent            | E4438C                                   | MY47271330<br>506 602 UNJ             | Apr. 30, 2013   | Apr. 29, 2014    |
| ESG Vector signal<br>generator<br>Agilent            | E4438C                                   | MY45094468/0<br>05 506 602<br>UK6 UNJ | Dec. 14, 2012   | Dec. 13, 2013    |
| Power meter<br>Anritsu                               | ML2495A                                  | 1014008                               | Apr. 23, 2013   | Apr. 22, 2014    |
| Power sensor<br>Anritsu                              | MA2411B                                  | 0917122                               | Apr. 23, 2013   | Apr. 22, 2014    |
| Power meter<br>Anritsu                               | ML2495A                                  | 0824006                               | May 20, 2013    | May 19, 2014     |
| Power sensor<br>Anritsu                              | MA2411B                                  | 0738172                               | May 20, 2013    | May 19, 2014     |
| Power meter<br>Anritsu                               | ML2487B                                  | 0930006                               | Nov. 14, 2012   | Nov. 13, 2013    |
| Power sensor<br>Anritsu                              | MA2491A                                  | 0845370                               | Nov. 14, 2012   | Nov. 13, 2013    |
| Software                                             | Total Power<br>Measurement<br>Tools V7.1 | NA                                    | NA              | NA               |
| Software                                             | ADT_RF Test<br>Software<br>V6.6.5.3      | NA                                    | NA              | NA               |
| Universal Radio<br>Communication Tester              | R&S                                      | CMU200                                | Oct. 23, 2012   | Oct. 22, 2013    |
| Digital Multimeter<br>FLUKE                          | 87III                                    | 73680266                              | Nov. 27, 2012   | Nov. 06, 2013    |

- NOTE:**
1. The test was performed in Oven room A.
  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. 24, 2013

### 3 GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

|                              |                                                   |                       |
|------------------------------|---------------------------------------------------|-----------------------|
| <b>EUT</b>                   | Terminal                                          |                       |
| <b>MODEL NO.</b>             | xAPT-103PUW, FD410, xCE_T103PUW                   |                       |
| <b>POWER SUPPLY</b>          | DC 7.4V from Battery<br>DC 12V from power adapter |                       |
| <b>HW VERSION</b>            | B2 (Rev.3)                                        |                       |
| <b>SW VERSION</b>            | Revision 01.009                                   |                       |
| <b>MODULATION TYPE</b>       | <b>GPRS</b>                                       | GMSK                  |
|                              | <b>EDGE</b>                                       | 8PSK                  |
|                              | <b>WCDMA, HSDPA, HSUPA</b>                        | BPSK                  |
| <b>FREQUENCY RANGE</b>       | <b>GPRS, EDGE</b>                                 | 1850.2MHz ~ 1909.8MHz |
|                              | <b>WCDMA, HSDPA, HSUPA</b>                        | 1852.4MHz ~ 1907.6MHz |
| <b>MAX. EIRP POWER</b>       | <b>GPRS</b>                                       | 1548.8mW              |
|                              | <b>EDGE</b>                                       | 707.9mW               |
|                              | <b>WCDMA</b>                                      | 354.8mW               |
| <b>EMISSION DESIGNATOR</b>   | <b>GPRS</b>                                       | 246KGXW               |
|                              | <b>EDGE</b>                                       | 248KG7W               |
|                              | <b>WCDMA</b>                                      | 4M08F9W               |
|                              | <b>HSDPA</b>                                      | 4M08F9W               |
|                              | <b>HSUPA</b>                                      | 4M08F9W               |
| <b>MULTI-SLOTS CLASS</b>     | 12                                                |                       |
| <b>WCDMA RELEASE VERSION</b> | R7                                                |                       |
| <b>ANTENNA TYPE</b>          | Refer to NOTE                                     |                       |
| <b>I/O PORTS</b>             | Refer to users' manual                            |                       |
| <b>DATA CABLE</b>            | NA                                                |                       |
| <b>ACCESSORY DEVICES</b>     | Adapter (Optional) x 1                            |                       |

#### NOTE:

1. The EUT could be supplied with DC 7.4V battery or power adapter as the following table:

|                                       |            |                                                                                                                                            |
|---------------------------------------|------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| Battery                               |            |                                                                                                                                            |
| Brand                                 | Model No.  | Spec.                                                                                                                                      |
| Foxlink                               | FD400      | DC 7.4V, 2300mAh (17.02Wh)                                                                                                                 |
| Adapter (only for test, not for sale) |            |                                                                                                                                            |
| Brand                                 | Model No.  | Spec.                                                                                                                                      |
| DELTA                                 | ADP-36JH B | AC I/P: 100-240V, 50-60Hz, 1.0A<br>AC input cable: Unshielded, 1.85m<br>DC O/P: 12V, 3A<br>DC output cable: Unshielded, 1.8m with one core |

2. All models are listed as below table:

| Brand      | Model       | Difference                |
|------------|-------------|---------------------------|
| XAC        | xAPT-103PUW | For marketing requirement |
| XAC        | xCE_T103PUW |                           |
| First Data | FD410       |                           |

From the above models, model: xAPT-103PUW was selected as representative model for the test and its data was recorded in this report.

3. The EUT is a WLAN, RFID, GSM and WCDMA device.

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

4. The antennas provided to the ESI, please refer to the following table.

| GPRS, EDGE, WCDMA, HSDPA and HSUPA Antenna Spec. |                                       |              |                   |           |                       |
|--------------------------------------------------|---------------------------------------|--------------|-------------------|-----------|-----------------------|
| Brand                                            | Model No.                             | Antenna Type | Antenna Connector | Gain(dBi) | Frequency range (MHz) |
| Ethertronics Inc.                                | T-000084-01                           | FPCB         | IPEX              | 0.14      | 850                   |
|                                                  |                                       |              |                   | 2.57      | 1900                  |
| WLAN Antenna Spec.                               |                                       |              |                   |           |                       |
| Brand                                            | Model No.                             | Antenna Type | Antenna Connector | Gain(dBi) | Frequency range (MHz) |
| ACX                                              | AT3216-T2R4PAA                        | Chip         | NA                | 1.5       | 2400-2500             |
| RFID Antenna Spec.                               |                                       |              |                   |           |                       |
| Brand                                            | Model No.                             | Antenna Type | Antenna Connector | Gain(dBi) | Frequency range (MHz) |
| XAC                                              | PCB ENIG ANT BOARD (W/KEY) 8006(RQHS) | Loop         | NA                | 13        | 13.56                 |

5. WLAN, RFID, GSM and WCDMA technology cannot transmit at same time.

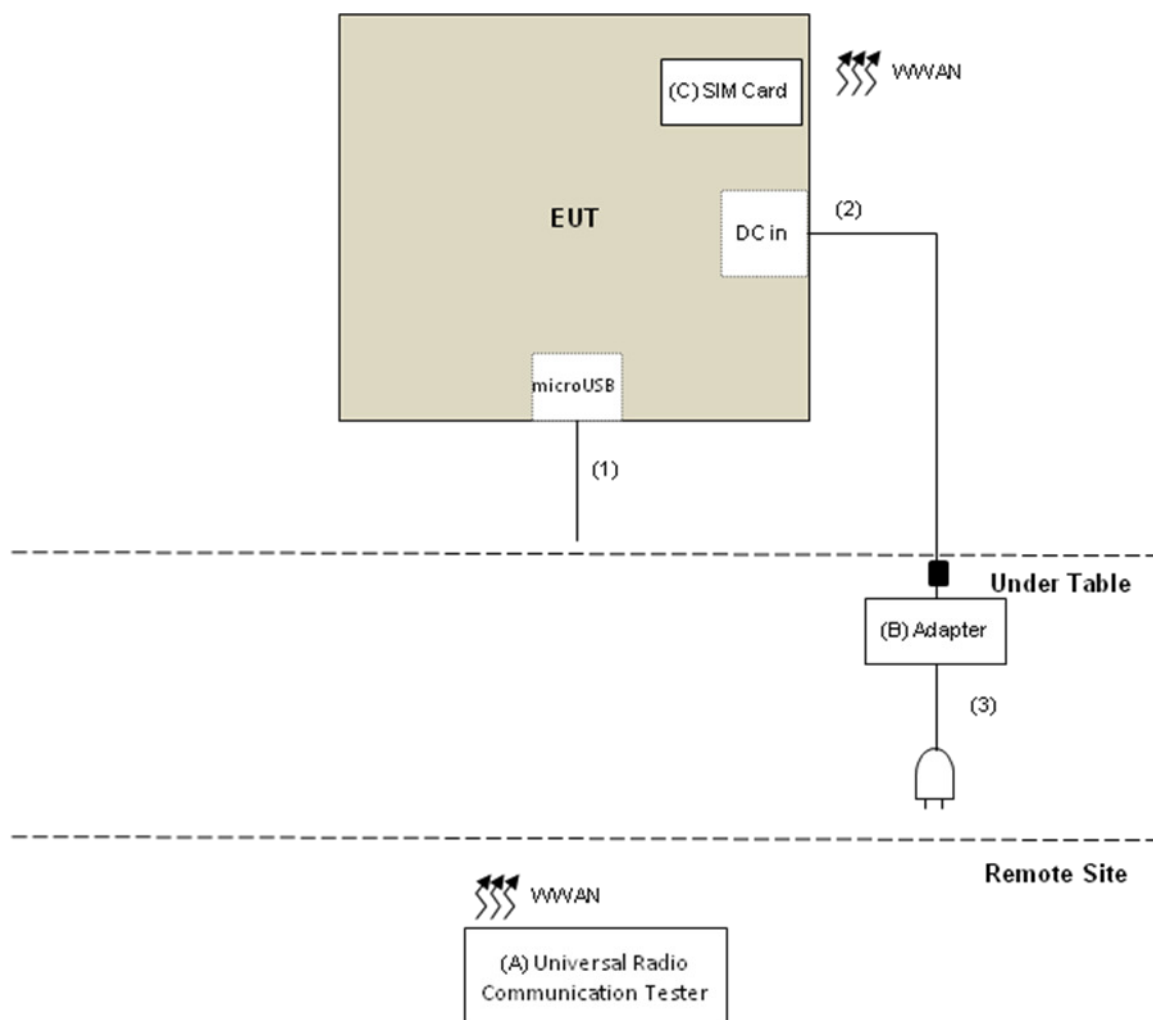
6. The EUT is pre-tested under following test modes :

| Pre-test Mode | Description         |
|---------------|---------------------|
| Mode A        | Battery mode        |
| <b>Mode B</b> | <b>Adapter mode</b> |

For the above modes, the worse radiated emissions test was found in **Mode B**. Therefore only the test data of the modes were recorded in this report.

7. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

### 3.2 CONFIGURATION OF SYSTEM UNDER TEST



### 3.3 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. | Universal Radio Communication Tester | R&S   | CMU200     | 121040     | NA     | Provided by Lab    |
| B. | Adapter                              | DELTA | ADP-36JH B | NA         | NA     | Supplied by Client |
| C. | SIM Card                             | R&S   | CRT-Z3     | 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 (Yes/No) | Cores (Qty.) | Remarks            |
|----|----------------|------|------------|--------------------|--------------|--------------------|
| 1. | microUSB Cable | 1    | 1          | No                 | 0            | Provided by Lab    |
| 2. | DC Cable       | 1    | 1.8        | No                 | 1            | Supplied by client |
| 3. | AC Cable       | 1    | 1.85       | No                 | 0            | Supplied by client |

Note: The core(s) is(are) originally attached to the cable(s).

### 3.4 TEST ITEM AND TEST CONFIGURATION

Following channel(s) was (were) selected for the final test as listed below:

#### GPRS MODE

| TEST ITEM             | AVAILABLE CHANNEL | TESTED CHANNEL | MODE       |
|-----------------------|-------------------|----------------|------------|
| EIRP                  | 512 to 810        | 512, 661, 810  | GPRS, EDGE |
| FREQUENCY STABILITY   | 512 to 810        | 661            | GPRS, EDGE |
| OCCUPIED BANDWIDTH    | 512 to 810        | 512, 661, 810  | GPRS, EDGE |
| PEAK TO AVERAGE RATIO | 512 to 810        | 512, 661, 810  | GPRS, EDGE |
| BAND EDGE             | 512 to 810        | 512, 810       | GPRS, EDGE |
| CONDCUDED EMISSION    | 512 to 810        | 661            | GPRS, EDGE |
| RADIATED EMISSION     | 512 to 810        | 661            | GPRS, EDGE |

#### WCDMA MODE

| TEST ITEM             | AVAILABLE CHANNEL | TESTED CHANNEL   | MODE                |
|-----------------------|-------------------|------------------|---------------------|
| EIRP                  | 9262 to 9538      | 9262, 9400, 9538 | WCDMA               |
| FREQUENCY STABILITY   | 9262 to 9538      | 9400             | WCDMA               |
| OCCUPIED BANDWIDTH    | 9262 to 9538      | 9262, 9400, 9538 | WCDMA, HSDPA, HSUPA |
| PEAK TO AVERAGE RATIO | 9262 to 9538      | 9262, 9400, 9538 | WCDMA               |
| BAND EDGE             | 9262 to 9538      | 9262, 9538       | WCDMA, HSDPA, HSUPA |
| CONDCUDED EMISSION    | 9262 to 9538      | 9400             | WCDMA               |
| RADIATED EMISSION     | 9262 to 9538      | 9400             | WCDMA               |

#### TEST CONDITION:

| TEST ITEM                         | ENVIRONMENTAL CONDITIONS | INPUT POWER  | TESTED BY |
|-----------------------------------|--------------------------|--------------|-----------|
| EIRP                              | 25deg. C, 63%RH          | 7.4Vdc       | Rex Huang |
| FREQUENCY STABILITY               | 25deg. C, 63%RH          | 7.4Vdc       | Rex Huang |
| OCCUPIED BANDWIDTH                | 25deg. C, 63%RH          | 7.4Vdc       | Rex Huang |
| PEAK TO AVERAGE RATIO             | 25deg. C, 63%RH          | 7.4Vdc       | Rex Huang |
| BAND EDGE                         | 25deg. C, 63%RH          | 7.4Vdc       | Rex Huang |
| CONDCUDED EMISSION                | 25deg. C, 63%RH          | 7.4Vdc       | Rex Huang |
| RADIATED EMISSION<br>(Below 1GHz) | 25deg. C, 63%RH          | 120Vac, 60Hz | Weiwei Lo |
| RADIATED EMISSION<br>(Above 1GHz) | 25deg. C, 63%RH          | 120Vac, 60Hz | Rex Huang |

### **3.5 EUT OPERATING CONDITIONS**

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

### **3.6 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 24**

**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 and portable stations are limited to 2 watts EIRP

#### 4.1.2 TEST PROCEDURES

##### CONDUCTED POWER MEASUREMENT:

The EUT was set up for the maximum power with GPRS & WCDMA 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.

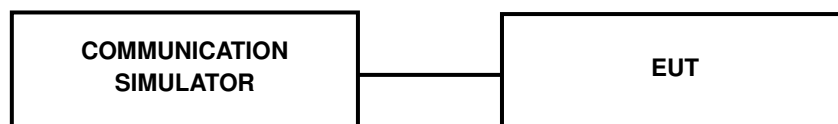
##### EIRP MEASUREMENT:

- a. All measurements were done at low, middle and high operational frequency range. RBW and VBW is 1MHz for GPRS & EDGE, 5MHz for WCDMA.
- 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 horn 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.  $EIRP = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn}.$

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

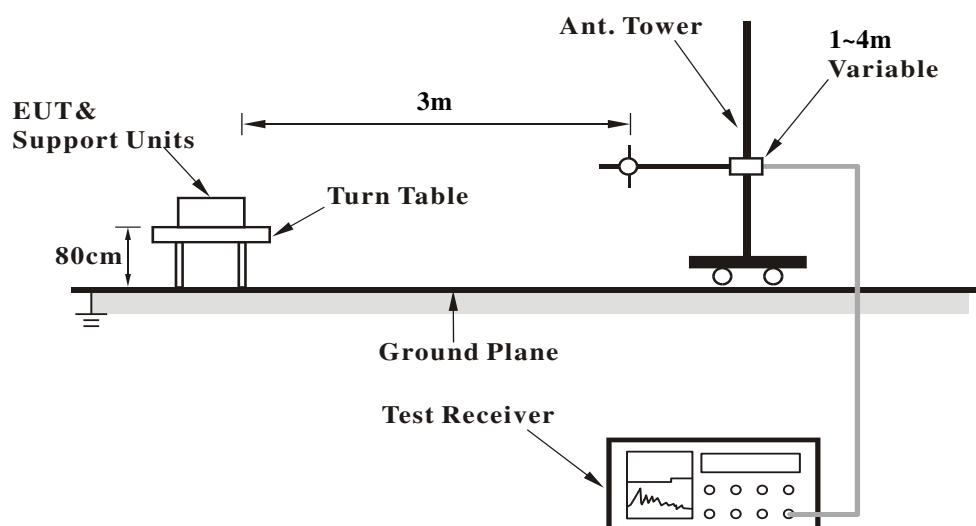
### 4.1.3 TEST SETUP

#### CONDUCTED POWER MEASUREMENT:



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

#### EIRP MEASUREMENT:



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

#### 4.1.4 TEST RESULTS

##### CONDUCTED OUTPUT POWER (dBm)

| Band               | GPRS1900 |        |        |
|--------------------|----------|--------|--------|
| Channel            | 512      | 661    | 810    |
| Frequency (MHz)    | 1850.2   | 1880.0 | 1909.8 |
| GPRS 8 (1 Uplink)  | 29.0     | 28.9   | 28.8   |
| GPRS 10 (2 Uplink) | 26.1     | 26.0   | 25.9   |
| GPRS 11 (3 Uplink) | 24.3     | 24.2   | 24.1   |
| GPRS 12 (4 Uplink) | 23.0     | 22.9   | 22.8   |
| EDGE 8 (1 Uplink)  | 25.2     | 24.8   | 24.6   |
| EDGE 10 (2 Uplink) | 22.8     | 22.5   | 22.2   |
| EDGE 11 (3 Uplink) | 20.5     | 20.3   | 20.0   |
| EDGE 12 (4 Uplink) | 19.0     | 19.1   | 19.1   |

| Band            | WCDMA II |        |        |
|-----------------|----------|--------|--------|
| Channel         | 9262     | 9400   | 9538   |
| Frequency (MHz) | 1852.4   | 1880.0 | 1907.6 |
| RMC 12.2K       | 23.9     | 22.9   | 22.7   |
| HSDPA Subtest-1 | 23.5     | 22.8   | 22.6   |
| HSDPA Subtest-2 | 23.6     | 22.7   | 22.7   |
| HSDPA Subtest-3 | 23.5     | 22.6   | 22.7   |
| HSDPA Subtest-4 | 23.6     | 22.6   | 22.6   |
| HSUPA Subtest-1 | 23.5     | 22.2   | 22.6   |
| HSUPA Subtest-2 | 23.4     | 22.1   | 22.5   |
| HSUPA Subtest-3 | 23.6     | 22.2   | 22.6   |
| HSUPA Subtest-4 | 23.6     | 22.3   | 22.6   |
| HSUPA Subtest-5 | 23.4     | 22.1   | 22.5   |

## EIRP POWER (dBm)

### GPRS

| Plane | Channel | Frequency (MHz) | Antenna Polarization | LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW) |
|-------|---------|-----------------|----------------------|-----------|-----------------------|-----------|----------|
| X     | 512     | 1850.2          | H                    | 25.1      | 6.6                   | 31.7      | 1479.1   |
|       | 661     | 1880.0          | H                    | 25.1      | 6.7                   | 31.8      | 1513.6   |
|       | 810     | 1909.8          | H                    | 25.2      | 6.7                   | 31.9      | 1548.8   |

### EDGE

| Plane | Channel | Frequency (MHz) | Antenna Polarization | LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW) |
|-------|---------|-----------------|----------------------|-----------|-----------------------|-----------|----------|
| X     | 512     | 1850.2          | H                    | 21.5      | 6.6                   | 28.1      | 645.7    |
|       | 661     | 1880.0          | H                    | 21.5      | 6.7                   | 28.2      | 660.7    |
|       | 810     | 1909.8          | H                    | 21.8      | 6.7                   | 28.5      | 707.9    |

### WCDMA

| Plane | Channel | Frequency (MHz) | Antenna Polarization | LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW) |
|-------|---------|-----------------|----------------------|-----------|-----------------------|-----------|----------|
| X     | 9262    | 1852.4          | H                    | 17.9      | 6.6                   | 24.5      | 281.8    |
|       | 9400    | 1880.0          | H                    | 18.8      | 6.7                   | 25.5      | 354.8    |
|       | 9538    | 1907.6          | H                    | 18.7      | 6.7                   | 25.4      | 346.7    |

## 4.2 FREQUENCY STABILITY MEASUREMENT

### 4.2.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

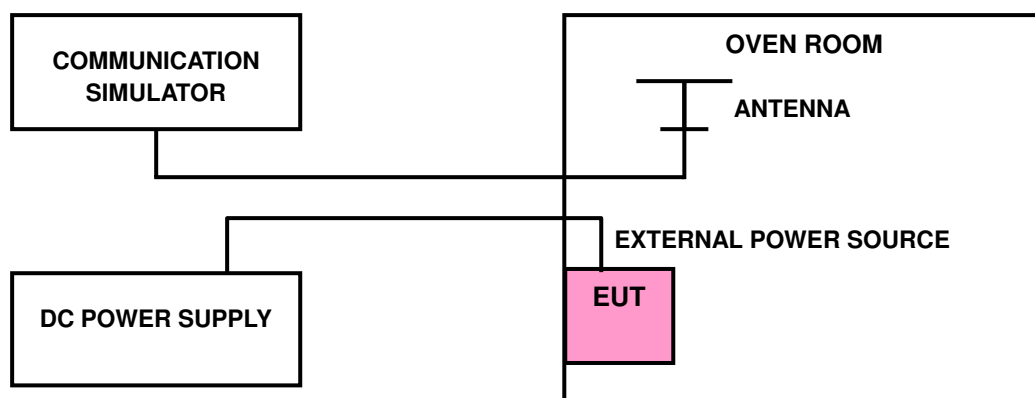
The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

### 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 DC input power. The test voltage range is from 6.29Vdc to 8.51Vdc 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  $\pm 0.5^{\circ}\text{C}$  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<br>(Volts) | FREQUENCY ERROR (ppm) |       |       | LIMIT<br>(ppm) |
|--------------------|-----------------------|-------|-------|----------------|
|                    | GPRS                  | EDGE  | WCDMA |                |
| 6.29               | 0.006                 | 0.007 | 0.008 | 2.5            |
| 8.51               | 0.007                 | 0.009 | 0.007 | 2.5            |

**NOTE:** The applicant defined the normal working voltage of the battery is from 6.29Vdc to 8.51Vdc.

### FREQUENCY ERROR vs. TEMPERATURE

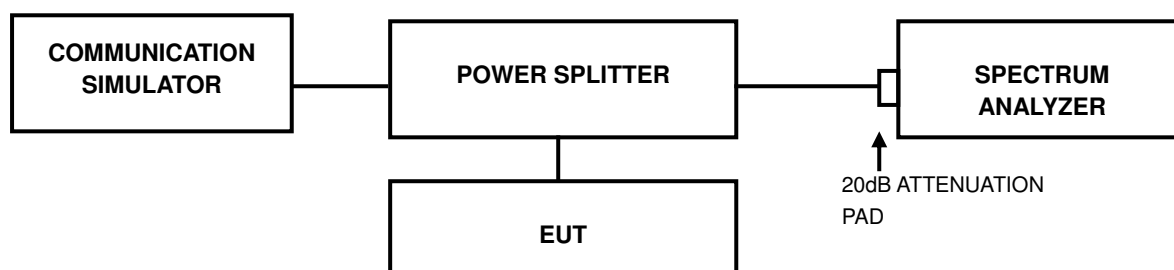
| TEMP. (°C) | FREQUENCY ERROR (ppm) |       |       | LIMIT<br>(ppm) |
|------------|-----------------------|-------|-------|----------------|
|            | GPRS                  | EDGE  | WCDMA |                |
| 50         | 0.012                 | 0.014 | 0.012 | 2.5            |
| 40         | 0.011                 | 0.013 | 0.010 | 2.5            |
| 30         | 0.009                 | 0.012 | 0.010 | 2.5            |
| 20         | 0.007                 | 0.011 | 0.009 | 2.5            |
| 10         | 0.008                 | 0.010 | 0.010 | 2.5            |
| 0          | 0.011                 | 0.011 | 0.010 | 2.5            |
| -10        | 0.013                 | 0.013 | 0.012 | 2.5            |
| -20        | 0.014                 | 0.015 | 0.013 | 2.5            |
| -30        | 0.017                 | 0.016 | 0.015 | 2.5            |

## 4.3 OCCUPIED BANDWIDTH MEASUREMENT

### 4.3.1 TEST PROCEDURES

The EUT makes a call to the communication simulator. 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.

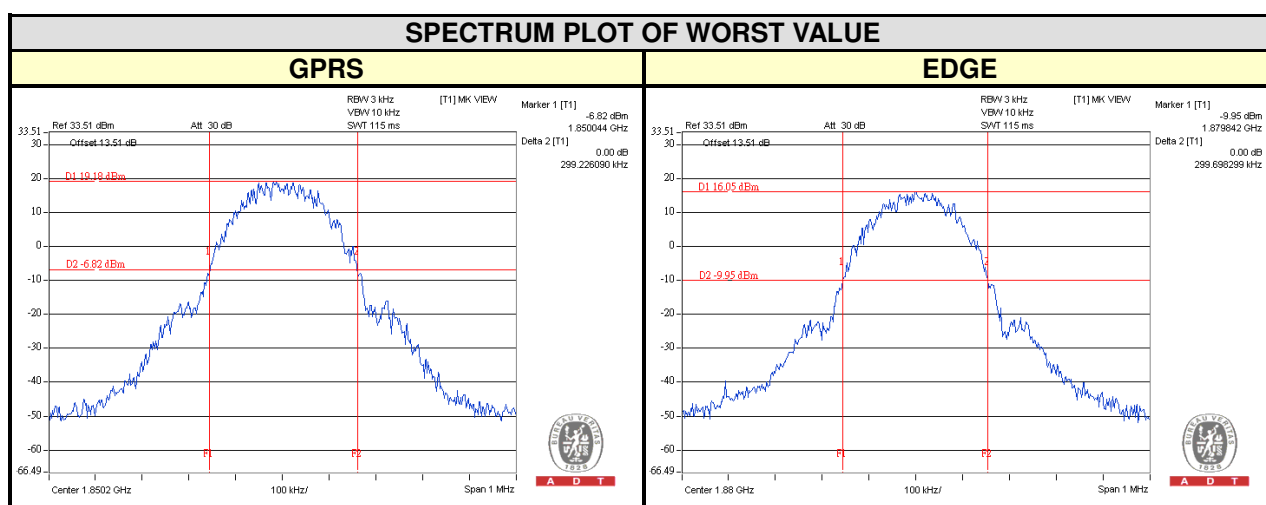
### 4.3.2 TEST SETUP



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

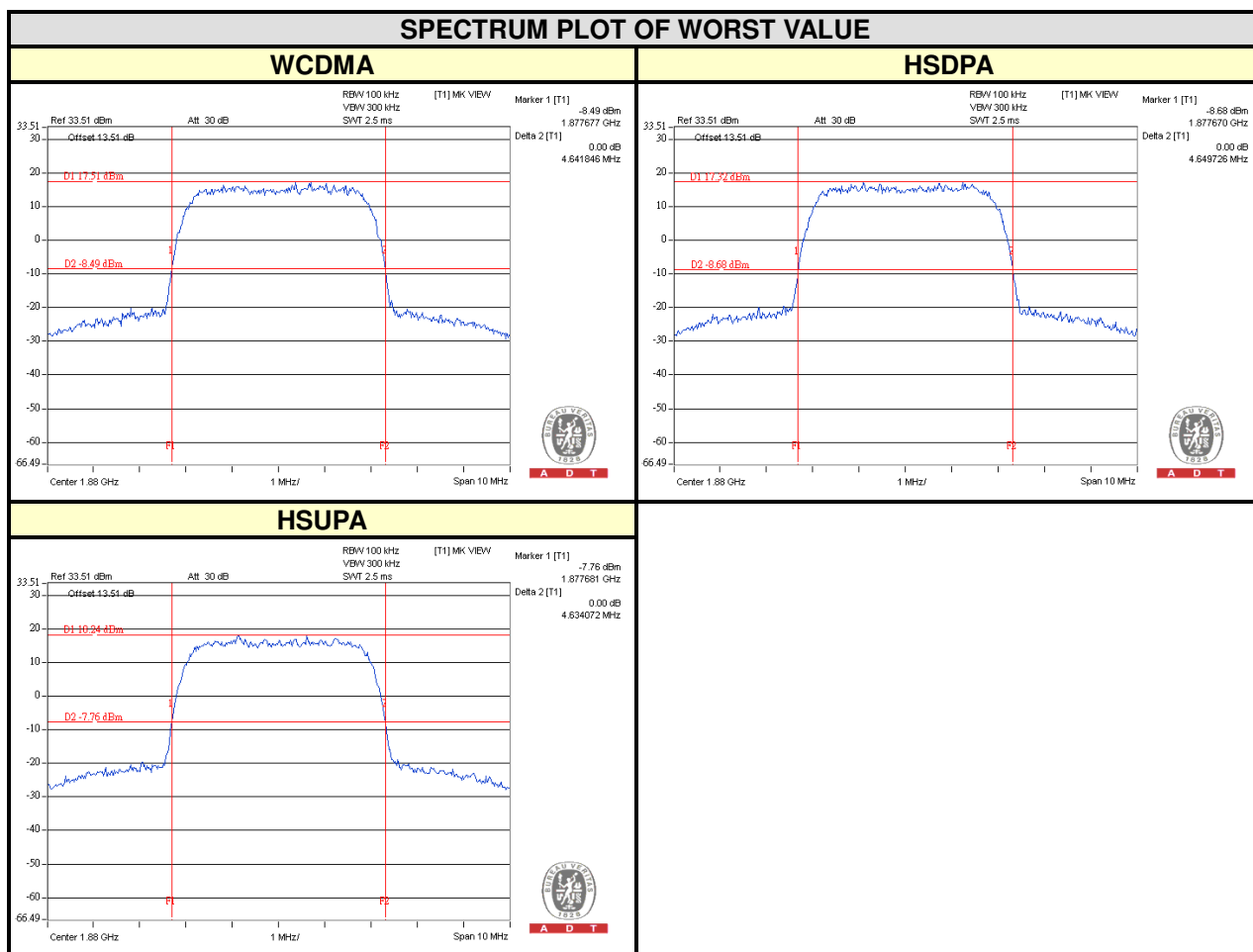
#### GPRS/EDGE

| CHANNEL | FREQUENCY<br>(MHz) | -26dB BANDWIDTH (kHz) |         |
|---------|--------------------|-----------------------|---------|
|         |                    | GPRS                  | EDGE    |
| 512     | 1850.2             | 299.226               | 293.401 |
| 661     | 1880.0             | 299.012               | 299.698 |
| 810     | 1909.8             | 299.146               | 299.331 |



## WCDMA/HSDPA/HSUPA

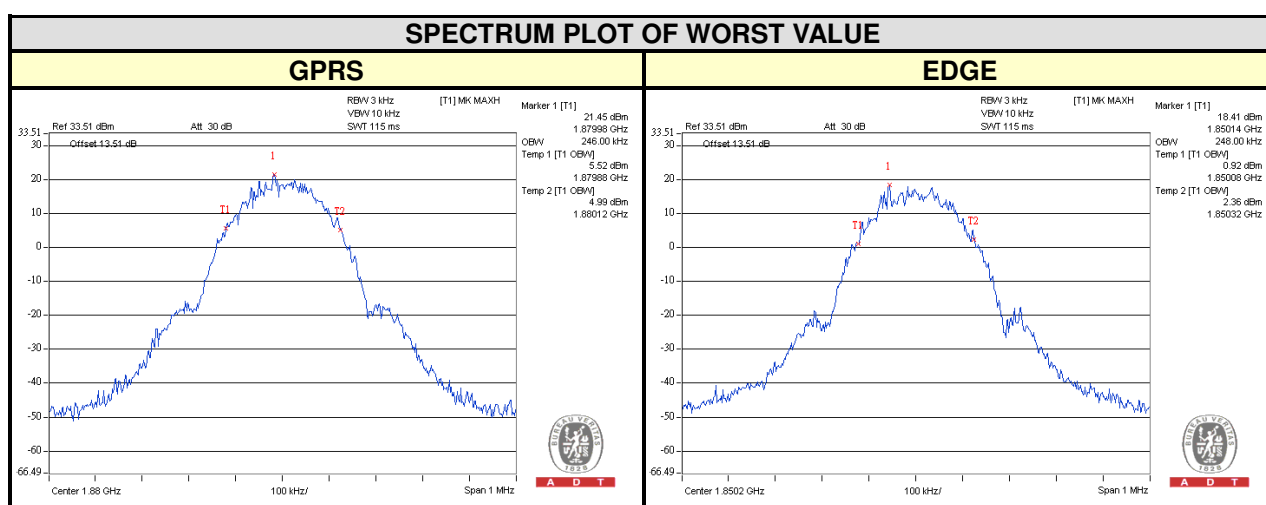
| CHANNEL | FREQUENCY<br>(MHz) | -26dB BANDWIDTH (MHz) |       |       |
|---------|--------------------|-----------------------|-------|-------|
|         |                    | WCDMA                 | HSDPA | HSUPA |
| 9262    | 1852.4             | 4.641                 | 4.622 | 4.620 |
| 9400    | 1880.0             | 4.642                 | 4.650 | 4.634 |
| 9538    | 1907.6             | 4.616                 | 4.608 | 4.603 |



#### 4.3.4 Test Result (Occupied Bandwidth)

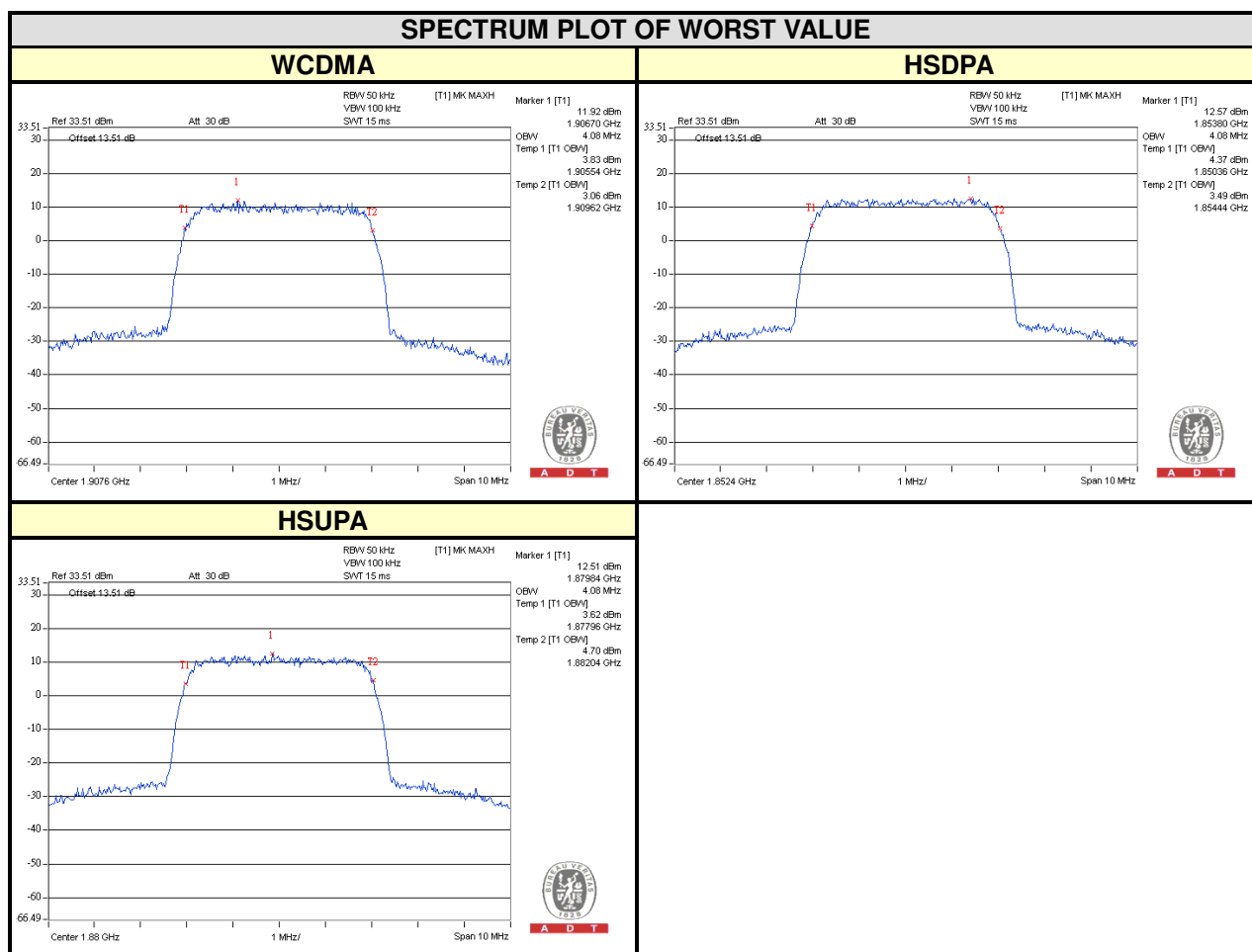
##### GPRS/EDGE

| CHANNEL | FREQUENCY (MHz) | 99% OCCUPIED BANDWIDTH (kHz) |      |
|---------|-----------------|------------------------------|------|
|         |                 | GPRS                         | EDGE |
| 512     | 1850.2          | 242                          | 248  |
| 661     | 1880.0          | 246                          | 246  |
| 810     | 1909.8          | 242                          | 244  |



## WCDMA/HSDPA/HSUPA

| CHANNEL | FREQUENCY<br>(MHz) | 99% OCCUPIED<br>BANDWIDTH (MHz) |       |       |
|---------|--------------------|---------------------------------|-------|-------|
|         |                    | WCDMA                           | HSDPA | HSUPA |
| 9262    | 1852.4             | 4.06                            | 4.08  | 4.06  |
| 9400    | 1880.0             | 4.06                            | 4.06  | 4.08  |
| 9538    | 1907.6             | 4.08                            | 4.04  | 4.06  |

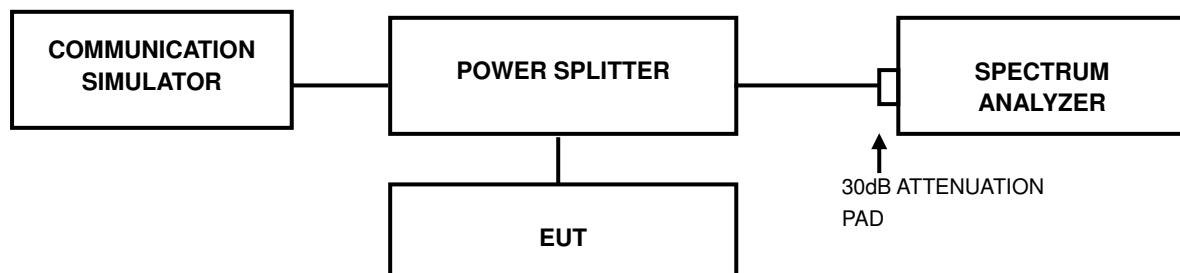


## 4.4 PEAK TO AVERAGE RATIO

### 4.4.1 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

### 4.4.2 TEST SETUP

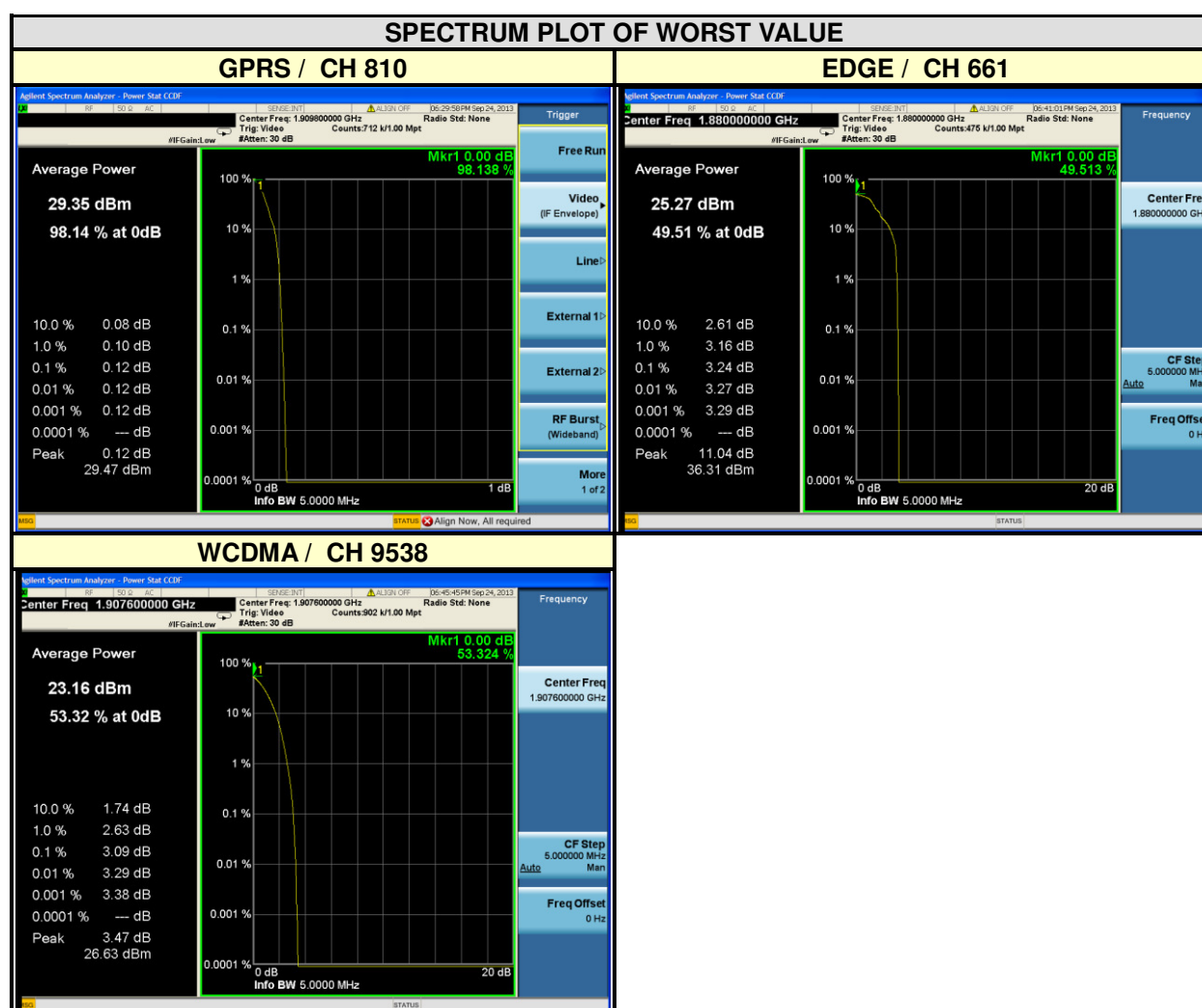


### 4.4.3 TEST PROCEDURES

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%.

#### 4.4.4 TEST RESULTS

| GPRS    |                 |                            | EDGE    |                            |                            |
|---------|-----------------|----------------------------|---------|----------------------------|----------------------------|
| CHANNEL | FREQUENCY (MHz) | PEAK TO AVERAGE RATIO (dB) | CHANNEL | FREQUENCY (MHz)            | PEAK TO AVERAGE RATIO (dB) |
| 512     | 1850.2          | 0.1                        | 512     | 1850.2                     | 2.98                       |
| 661     | 1880.0          | 0.1                        | 661     | 1880.0                     | 3.24                       |
| 810     | 1909.8          | 0.12                       | 810     | 1909.8                     | 3.23                       |
| WCDMA   |                 |                            |         |                            |                            |
| CHANNEL |                 | FREQUENCY (MHz)            |         | PEAK TO AVERAGE RATIO (dB) |                            |
| 9262    |                 | 1852.4                     |         | 2.98                       |                            |
| 9400    |                 | 1880.0                     |         | 3.03                       |                            |
| 9538    |                 | 1907.6                     |         | 3.09                       |                            |

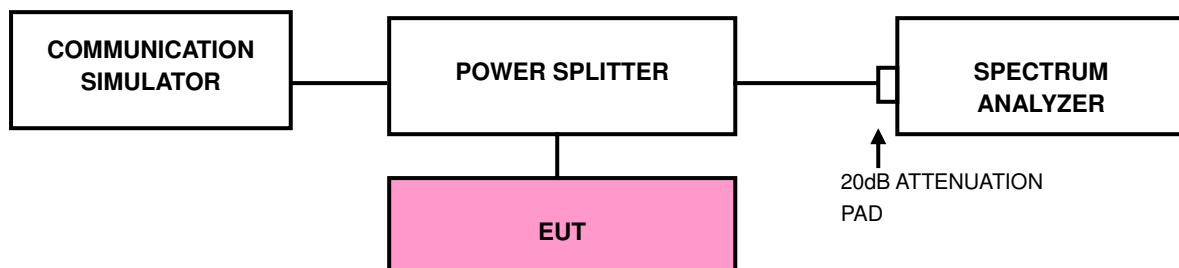


## 4.5 BAND EDGE MEASUREMENT

### 4.5.1 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.

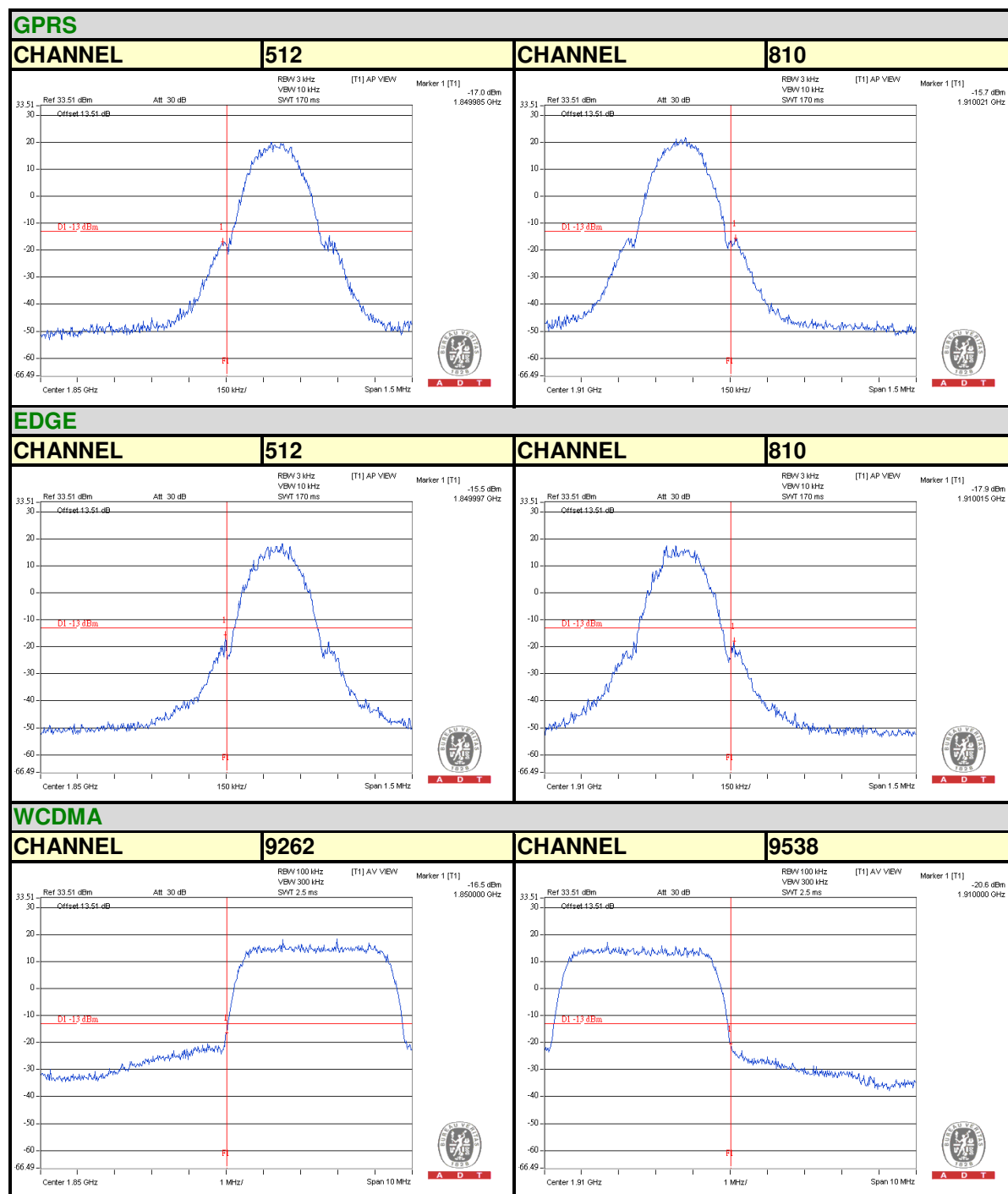
### 4.5.2 TEST SETUP



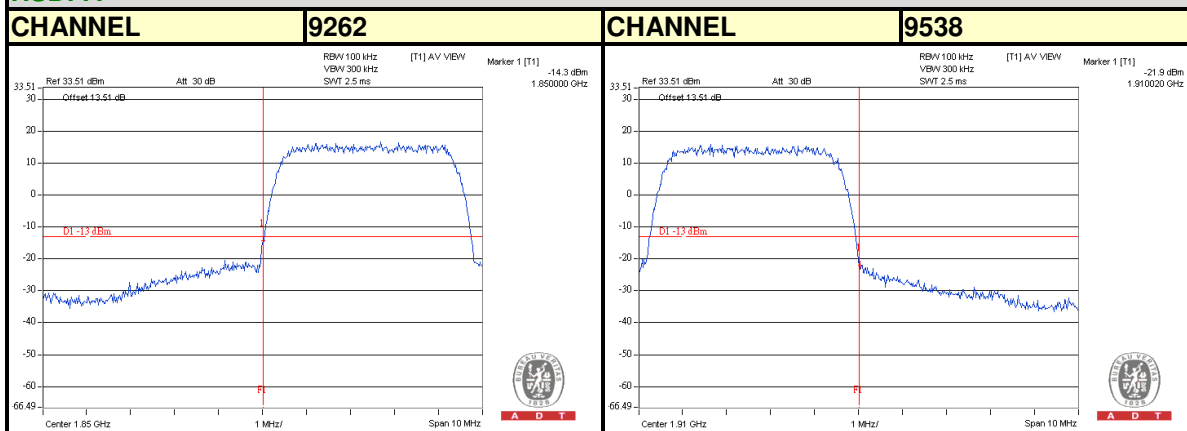
### 4.5.3 TEST PROCEDURES

- 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  $>1\%$  OCCUPIED BANDWIDTH and VB of the spectrum is  $\geq 3 \times \text{RB}$ .
- Record the max trace plot into the test report.

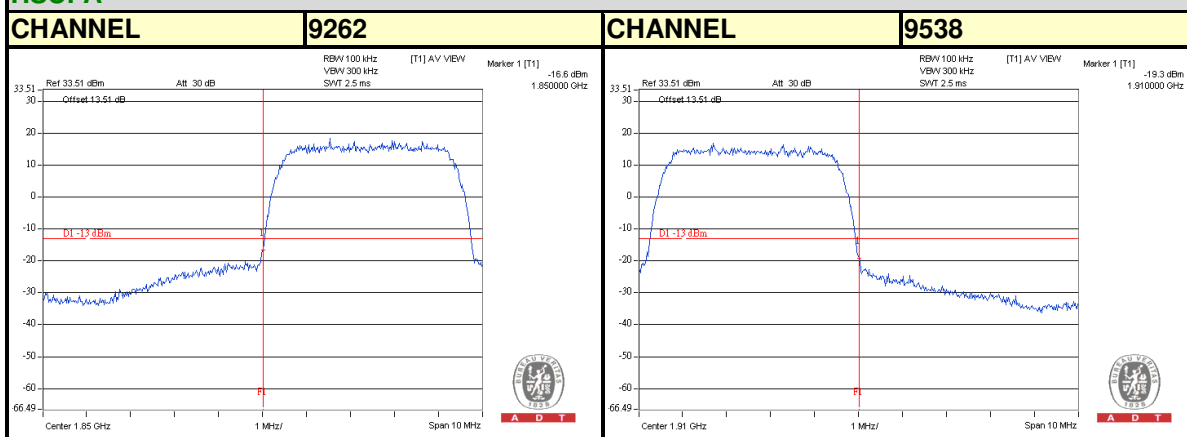
## 4.5.4 TEST RESULTS



## HSDPA



## HSUPA



## 4.6 CONDUCTED SPURIOUS EMISSIONS

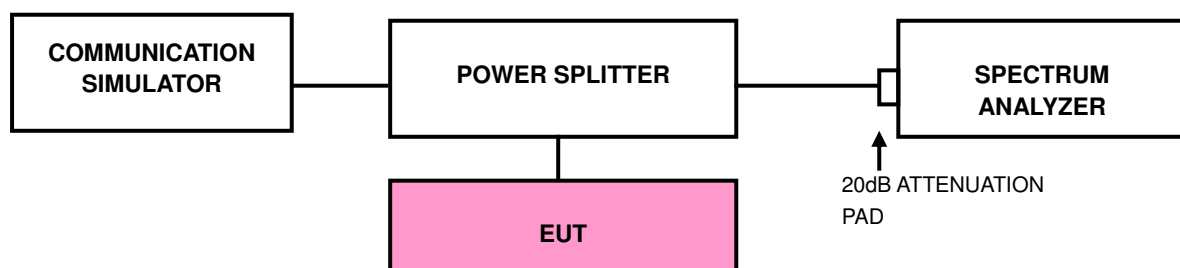
### 4.6.1 LIMITS OF CONDUCTED SPURIOUS EMISSIONS MEASUREMENT

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  $-13\text{dBm}$ .

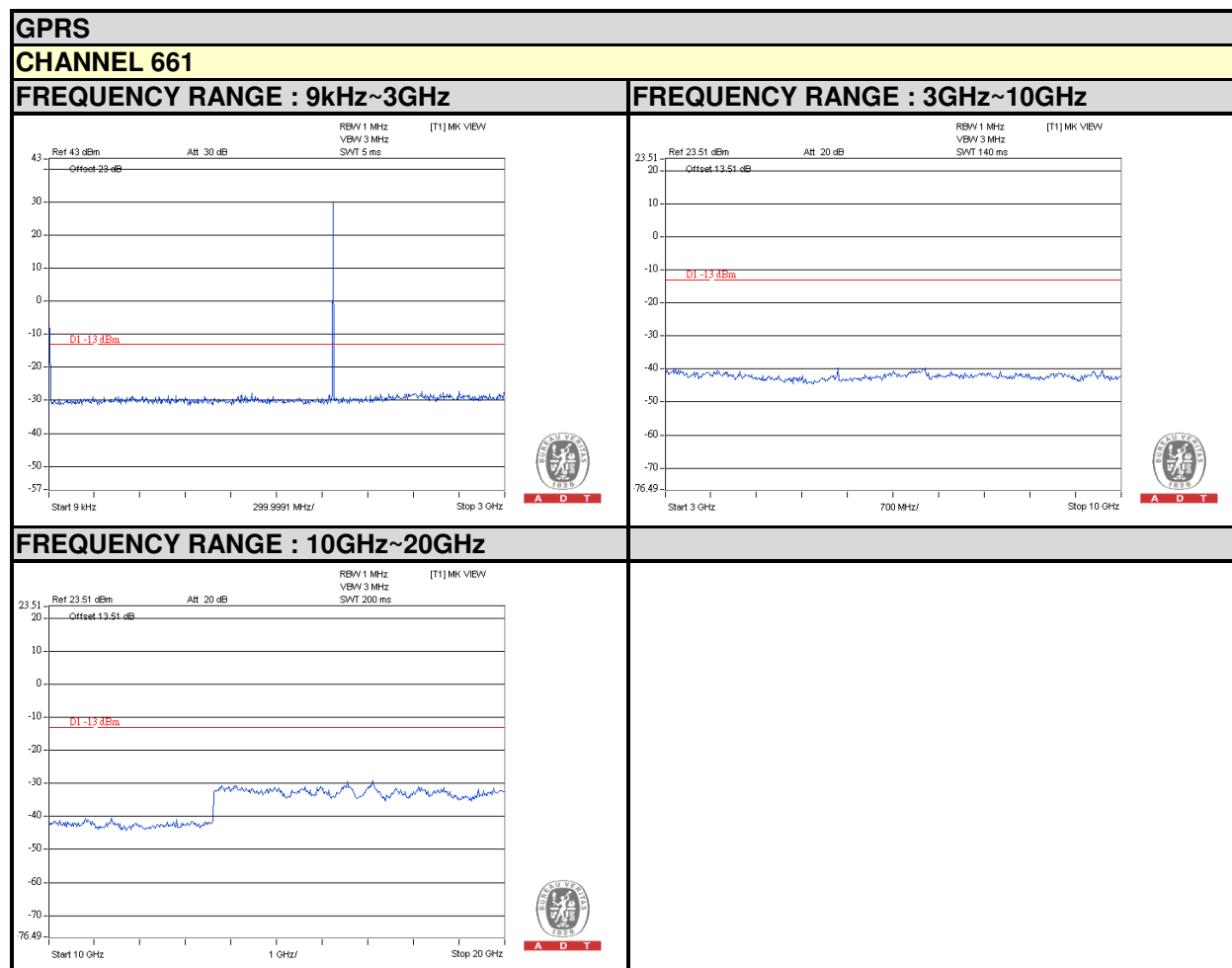
### 4.6.2 TEST PROCEDURE

- The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range.
- Measuring frequency range is from 9kHz to 20GHz. 20dB attenuation pad is connected with spectrum. RBW=1MHz and VBW=3MHz is used for conducted emission measurement.

### 4.6.3 TEST SETUP



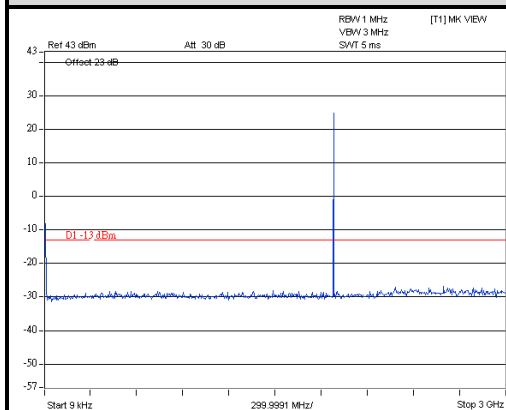
## 4.6.4 TEST RESULTS



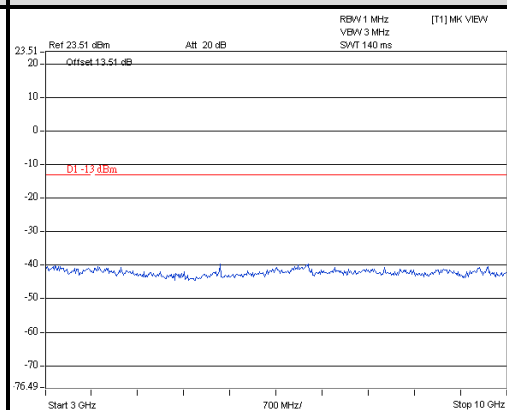
## EDGE

### CHANNEL 661

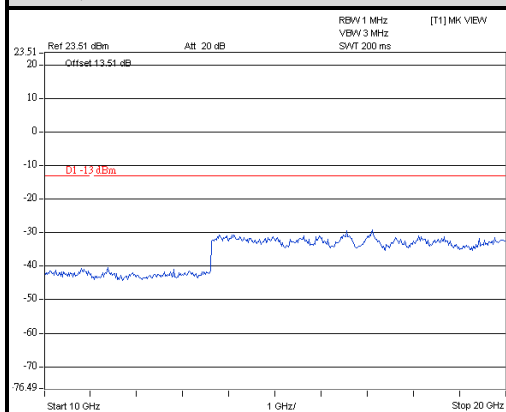
#### FREQUENCY RANGE : 9kHz~3GHz



#### FREQUENCY RANGE : 3GHz~10GHz



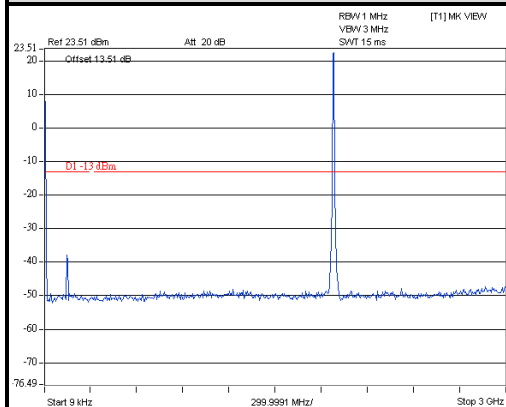
#### FREQUENCY RANGE : 10GHz~20GHz



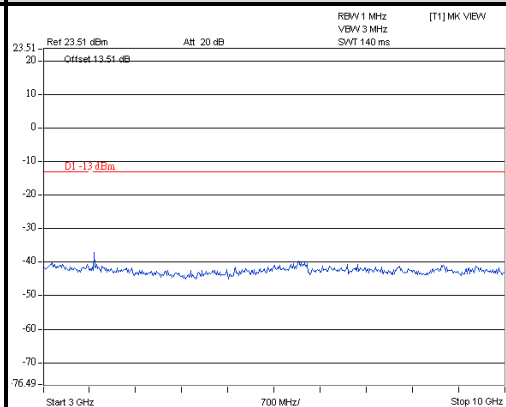
# WCDMA

## CHANNEL 9400

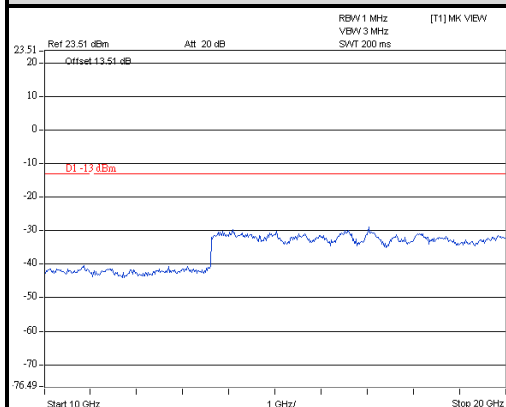
### FREQUENCY RANGE : 9kHz~3GHz



### FREQUENCY RANGE : 3GHz~10GHz



### FREQUENCY RANGE : 10GHz~20GHz



## 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 PROCEDURES

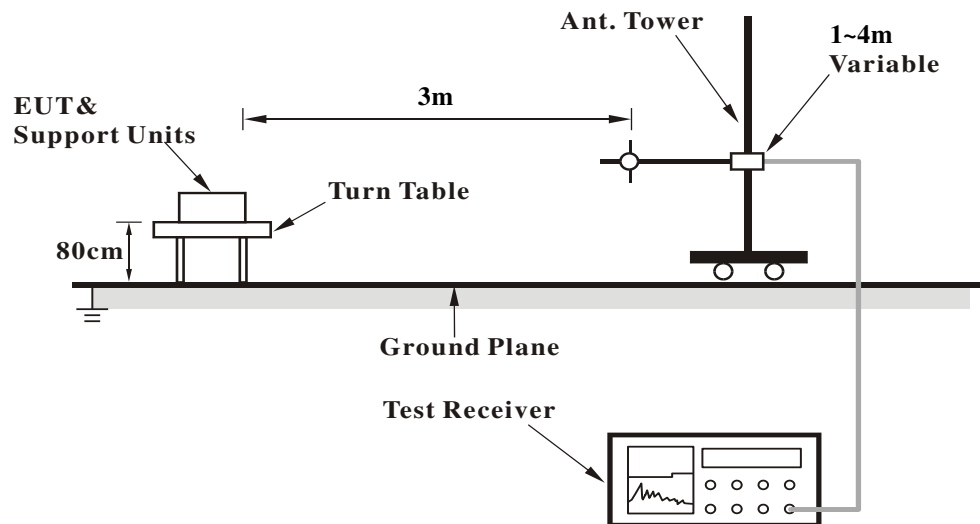
- a. Substitution method is used for EIRP measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
- b. The substitution horn 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 a. Record the power level of S.G
- c.  $\text{EIRP} = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn}$ .

**NOTE:** The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.

### 4.7.3 DEVIATION FROM TEST STANDARD

No deviation

#### 4.7.4 TEST SETUP



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 661 | FREQUENCY RANGE | Below 1000MHz |
|------|----------------|-----------------|---------------|

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |               |             |                       |                        |            |             |
|-----------------------------------------------------|-------------|---------------|-------------|-----------------------|------------------------|------------|-------------|
| No.                                                 | Freq. (MHz) | Reading (dBm) | Limit (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Margin (dB) |
| 1                                                   | 144         | 25.60         | -13         | -67.19                | -1.19                  | -68.38     | -55.38      |
| 2                                                   | 288.02      | 30.70         | -13         | -64.58                | 3.74                   | -60.84     | -47.84      |
| 3                                                   | 300.02      | 31.80         | -13         | -63.98                | 3.71                   | -60.27     | -47.27      |
| 4                                                   | 312.03      | 27.70         | -13         | -68.58                | 3.68                   | -64.90     | -51.90      |
| 5                                                   | 336.01      | 27.20         | -13         | -70.67                | 3.67                   | -67.00     | -54.00      |
| 6                                                   | 949.61      | 37.50         | -13         | -60.68                | 0.34                   | -60.35     | -47.35      |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |             |               |             |                       |                        |            |             |
| No.                                                 | Freq. (MHz) | Reading (dBm) | Limit (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Margin (dB) |
| 1                                                   | 40.02       | 28.90         | -13         | -45.99                | -12.45                 | -58.44     | -45.44      |
| 2                                                   | 144         | 25.80         | -13         | -66.99                | -1.19                  | -68.18     | -55.18      |
| 3                                                   | 266.68      | 26.40         | -13         | -68.38                | 3.93                   | -64.45     | -51.45      |
| 4                                                   | 288.02      | 30.10         | -13         | -65.18                | 3.74                   | -61.44     | -48.44      |
| 5                                                   | 300.02      | 31.00         | -13         | -64.78                | 3.71                   | -61.07     | -48.07      |
| 6                                                   | 493.51      | 27.50         | -13         | -68.10                | 2.94                   | -65.16     | -52.16      |

### REMARKS:

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

**EDGE:**

|             |                |                        |               |
|-------------|----------------|------------------------|---------------|
| <b>MODE</b> | TX channel 661 | <b>FREQUENCY RANGE</b> | Below 1000MHz |
|-------------|----------------|------------------------|---------------|

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |               |             |                       |                        |            |             |
|-----------------------------------------------------|-------------|---------------|-------------|-----------------------|------------------------|------------|-------------|
| No.                                                 | Freq. (MHz) | Reading (dBm) | Limit (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Margin (dB) |
| 1                                                   | 144         | 26.30         | -13         | -66.49                | -1.19                  | -67.68     | -54.68      |
| 2                                                   | 288.02      | 31.00         | -13         | -64.28                | 3.74                   | -60.54     | -47.54      |
| 3                                                   | 300         | 32.00         | -13         | -63.78                | 3.71                   | -60.07     | -47.07      |
| 4                                                   | 312         | 28.00         | -13         | -68.28                | 3.68                   | -64.60     | -51.60      |
| 5                                                   | 497.44      | 27.70         | -13         | -67.85                | 2.91                   | -64.94     | -51.94      |
| 6                                                   | 949.56      | 37.20         | -13         | -60.98                | 0.34                   | -60.65     | -47.65      |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |             |               |             |                       |                        |            |             |
| No.                                                 | Freq. (MHz) | Reading (dBm) | Limit (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Margin (dB) |
| 1                                                   | 39.89       | 29.00         | -13         | -45.84                | -12.49                 | -58.33     | -45.33      |
| 2                                                   | 144         | 24.70         | -13         | -68.09                | -1.19                  | -69.28     | -56.28      |
| 3                                                   | 288.02      | 29.40         | -13         | -65.88                | 3.74                   | -62.14     | -49.14      |
| 4                                                   | 300.02      | 32.20         | -13         | -63.58                | 3.71                   | -59.87     | -46.87      |
| 5                                                   | 312         | 26.60         | -13         | -69.68                | 3.68                   | -66.00     | -53.00      |
| 6                                                   | 498.44      | 31.00         | -13         | -64.54                | 2.90                   | -61.64     | -48.64      |

**REMARKS:**

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

# WCDMA:

|             |                 |                        |               |
|-------------|-----------------|------------------------|---------------|
| <b>MODE</b> | TX channel 9400 | <b>FREQUENCY RANGE</b> | Below 1000MHz |
|-------------|-----------------|------------------------|---------------|

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |               |             |                       |                        |            |             |
|-----------------------------------------------------|-------------|---------------|-------------|-----------------------|------------------------|------------|-------------|
| No.                                                 | Freq. (MHz) | Reading (dBm) | Limit (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Margin (dB) |
| 1                                                   | 143.97      | 25.90         | -13         | -66.90                | -1.19                  | -68.09     | -55.09      |
| 2                                                   | 288         | 30.80         | -13         | -64.48                | 3.74                   | -60.74     | -47.74      |
| 3                                                   | 300         | 32.20         | -13         | -63.58                | 3.71                   | -59.87     | -46.87      |
| 4                                                   | 400.03      | 26.00         | -13         | -71.84                | 3.33                   | -68.51     | -55.51      |
| 5                                                   | 607.42      | 30.80         | -13         | -63.88                | 1.78                   | -62.09     | -49.09      |
| 6                                                   | 949.61      | 36.80         | -13         | -61.38                | 0.34                   | -61.05     | -48.05      |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |             |               |             |                       |                        |            |             |
| No.                                                 | Freq. (MHz) | Reading (dBm) | Limit (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Margin (dB) |
| 1                                                   | 40.09       | 28.80         | -13         | -46.11                | -12.44                 | -58.55     | -45.55      |
| 2                                                   | 144         | 24.80         | -13         | -67.99                | -1.19                  | -69.18     | -56.18      |
| 3                                                   | 300         | 31.80         | -13         | -63.98                | 3.71                   | -60.27     | -47.27      |
| 4                                                   | 494.58      | 27.90         | -13         | -67.68                | 2.93                   | -64.75     | -51.75      |
| 5                                                   | 607.42      | 29.70         | -13         | -64.98                | 1.78                   | -63.19     | -50.19      |
| 6                                                   | 949.58      | 35.00         | -13         | -63.18                | 0.34                   | -62.85     | -49.85      |

## REMARKS:

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

**Above 1GHz**

**GPRS:**

|             |                |                        |               |
|-------------|----------------|------------------------|---------------|
| <b>MODE</b> | TX channel 661 | <b>FREQUENCY RANGE</b> | Above 1000MHz |
|-------------|----------------|------------------------|---------------|

| <b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b> |             |               |             |                       |                        |            |             |
|----------------------------------------------------------------|-------------|---------------|-------------|-----------------------|------------------------|------------|-------------|
| No.                                                            | Freq. (MHz) | Reading (dBm) | Limit (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Margin (dB) |
| 1                                                              | 3760        | 47.00         | -13         | -57.15                | 7.68                   | -49.47     | -36.47      |
| 2                                                              | 5640        | 54.70         | -13         | -50.04                | 7.02                   | -43.02     | -30.02      |
| 3                                                              | 7520        | 56.20         | -13         | -46.42                | 4.53                   | -41.89     | -28.89      |
| 4                                                              | 9400        | 56.3          | -13         | -45.57                | 4.21                   | -41.37     | -28.37      |
| 5                                                              | 11280       | 58            | -13         | -43.49                | 3.48                   | -40.01     | -27.01      |
| 6                                                              | 13160       | 62.4          | -13         | -38.21                | 4.06                   | -34.14     | -21.14      |
| 7                                                              | 15040       | 63.3          | -13         | -34.05                | 3.70                   | -30.35     | -17.35      |
| 8                                                              | 16920       | 66.9          | -13         | -30.45                | 3.70                   | -26.75     | -13.75      |
| 9                                                              | 18800       | 69.7          | -13         | -27.65                | 3.70                   | -23.95     | -10.95      |
| <b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>   |             |               |             |                       |                        |            |             |
| No.                                                            | Freq. (MHz) | Reading (dBm) | Limit (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Margin (dB) |
| 1                                                              | 3760        | 48.3          | -13         | -55.85                | 7.68                   | -48.17     | -35.17      |
| 2                                                              | 5640        | 52.3          | -13         | -52.44                | 7.02                   | -45.42     | -32.42      |
| 3                                                              | 7520        | 56.7          | -13         | -45.92                | 4.53                   | -41.39     | -28.39      |
| 4                                                              | 9400        | 56.4          | -13         | -45.47                | 4.21                   | -41.27     | -28.27      |
| 5                                                              | 11280       | 58.5          | -13         | -42.99                | 3.48                   | -39.51     | -26.51      |
| 6                                                              | 13160       | 62            | -13         | -38.61                | 4.06                   | -34.54     | -21.54      |
| 7                                                              | 15040       | 63.2          | -13         | -34.15                | 3.70                   | -30.45     | -17.45      |
| 8                                                              | 16920       | 67.1          | -13         | -30.25                | 3.70                   | -26.55     | -13.55      |
| 9                                                              | 18800       | 69.3          | -13         | -28.05                | 3.70                   | -24.35     | -11.35      |

**REMARKS:**

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

# EDGE:

|      |                |                 |               |
|------|----------------|-----------------|---------------|
| MODE | TX channel 661 | FREQUENCY RANGE | Above 1000MHz |
|------|----------------|-----------------|---------------|

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |               |             |                       |                        |            |             |
|-----------------------------------------------------|-------------|---------------|-------------|-----------------------|------------------------|------------|-------------|
| No.                                                 | Freq. (MHz) | Reading (dBm) | Limit (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Margin (dB) |
| 1                                                   | 3760        | 46.57         | -13         | -57.58                | 7.68                   | -49.90     | -36.90      |
| 2                                                   | 5640        | 55.36         | -13         | -49.38                | 7.02                   | -42.36     | -29.36      |
| 3                                                   | 7520        | 57.11         | -13         | -45.51                | 4.53                   | -40.98     | -27.98      |
| 4                                                   | 9400        | 55.37         | -13         | -46.50                | 4.21                   | -42.30     | -29.30      |
| 5                                                   | 11280       | 57.39         | -13         | -44.10                | 3.48                   | -40.62     | -27.62      |
| 6                                                   | 13160       | 63.37         | -13         | -37.24                | 4.06                   | -33.17     | -20.17      |
| 7                                                   | 15040       | 64.22         | -13         | -33.13                | 3.70                   | -29.43     | -16.43      |
| 8                                                   | 16920       | 66.4          | -13         | -30.95                | 3.70                   | -27.25     | -14.25      |
| 9                                                   | 18800       | 69.71         | -13         | -27.64                | 3.70                   | -23.94     | -10.94      |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |             |               |             |                       |                        |            |             |
| No.                                                 | Freq. (MHz) | Reading (dBm) | Limit (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Margin (dB) |
| 1                                                   | 3760        | 47.46         | -13         | -56.69                | 7.68                   | -49.01     | -36.01      |
| 2                                                   | 5640        | 52.87         | -13         | -51.87                | 7.02                   | -44.85     | -31.85      |
| 3                                                   | 7520        | 56.39         | -13         | -46.23                | 4.53                   | -41.70     | -28.70      |
| 4                                                   | 9400        | 56.07         | -13         | -45.80                | 4.21                   | -41.60     | -28.60      |
| 5                                                   | 11280       | 59.28         | -13         | -42.21                | 3.48                   | -38.73     | -25.73      |
| 6                                                   | 13160       | 62.3          | -13         | -38.31                | 4.06                   | -34.24     | -21.24      |
| 7                                                   | 15040       | 63.68         | -13         | -33.67                | 3.70                   | -29.97     | -16.97      |
| 8                                                   | 16920       | 66.78         | -13         | -30.57                | 3.70                   | -26.87     | -13.87      |
| 9                                                   | 18800       | 70.02         | -13         | -27.33                | 3.70                   | -23.63     | -10.63      |

## REMARKS:

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

# WCDMA:

|      |                 |                 |               |
|------|-----------------|-----------------|---------------|
| MODE | TX channel 9400 | FREQUENCY RANGE | Above 1000MHz |
|------|-----------------|-----------------|---------------|

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |               |             |                       |                        |            |             |
|-----------------------------------------------------|-------------|---------------|-------------|-----------------------|------------------------|------------|-------------|
| No.                                                 | Freq. (MHz) | Reading (dBm) | Limit (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Margin (dB) |
| 1                                                   | 3760        | 54.20         | -13         | -49.95                | 7.68                   | -42.27     | -29.27      |
| 2                                                   | 5640        | 50.10         | -13         | -54.64                | 7.02                   | -47.62     | -34.62      |
| 3                                                   | 7520        | 54.90         | -13         | -47.72                | 4.53                   | -43.19     | -30.19      |
| 4                                                   | 9400        | 55.7          | -13         | -46.17                | 4.21                   | -41.97     | -28.97      |
| 5                                                   | 11280       | 57.6          | -13         | -43.89                | 3.48                   | -40.41     | -27.41      |
| 6                                                   | 13160       | 60.6          | -13         | -40.01                | 4.06                   | -35.94     | -22.94      |
| 7                                                   | 15040       | 61.4          | -13         | -35.95                | 3.70                   | -32.25     | -19.25      |
| 8                                                   | 16920       | 66            | -13         | -31.35                | 3.70                   | -27.65     | -14.65      |
| 9                                                   | 18800       | 68.9          | -13         | -28.45                | 3.70                   | -24.75     | -11.75      |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |             |               |             |                       |                        |            |             |
| No.                                                 | Freq. (MHz) | Reading (dBm) | Limit (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Margin (dB) |
| 1                                                   | 3760        | 52.1          | -13         | -52.05                | 7.68                   | -44.37     | -31.37      |
| 2                                                   | 5640        | 50.7          | -13         | -54.04                | 7.02                   | -47.02     | -34.02      |
| 3                                                   | 7520        | 55.4          | -13         | -47.22                | 4.53                   | -42.69     | -29.69      |
| 4                                                   | 9400        | 54.8          | -13         | -47.07                | 4.21                   | -42.87     | -29.87      |
| 5                                                   | 11280       | 57.4          | -13         | -44.09                | 3.48                   | -40.61     | -27.61      |
| 6                                                   | 13160       | 60.8          | -13         | -39.81                | 4.06                   | -35.74     | -22.74      |
| 7                                                   | 15040       | 62.2          | -13         | -35.15                | 3.70                   | -31.45     | -18.45      |
| 8                                                   | 16920       | 65.9          | -13         | -31.45                | 3.70                   | -27.75     | -14.75      |
| 9                                                   | 18800       | 68.3          | -13         | -29.05                | 3.70                   | -25.35     | -12.35      |

## REMARKS:

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

## 5 PHOTOGRAPHS OF THE TEST CONFIGURATION

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

## 6 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:

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

## **7 APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB**

No any modifications were made to the EUT by the lab during the test.

**---END---**