



A D T

# FCC TEST REPORT (Part 22)

**REPORT NO.:** RF130902E05-1

**MODEL NO.:** xAPT-103PU

**FCC ID:** MQT-XAPT103PU

**RECEIVED:** Sep. 02, 2013

**TESTED:** Sep. 11 to 25, 2013

**ISSUED:** Oct. 09, 2013

**APPLICANT:** XAC AUTOMATION CORP.

**ADDRESS:** 4F, No. 30, INDUSTRY E. RD. IX,  
SCIENCE-BASED INDUSTRIAL  
PARK,HSINCHU,TAIWAN

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

**LAB ADDRESS :** No. 81-1, Lu Liao Keng, 9th Ling, Wu Lung Tsuen,  
Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan,  
R.O.C.

**TEST LOCATION (1):** No. 81-1, Lu Liao Keng, 9th Ling, Wu Lung Tsuen,  
Chiung Lin Hsiang, Hsin Chu Hsien 307, 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.

This report should not be used by the client to claim product certification, approval, or endorsement by TAF or any government agencies.



This report is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification

## TABLE OF CONTENTS

|   |    |
|---|----|
| RELEASE CONTROL RECORD.....   | 3  |
| 1 CERTIFICATION .....   | 4  |
| 2 SUMMARY OF TEST RESULTS .....   | 5  |
| 2.1 MEASUREMENT UNCERTAINTY .....   | 5  |
| 2.2 TEST SITE AND INSTRUMENTS .....   | 6  |
| 3 GENERAL INFORMATION.....  | 8  |
| 3.1 GENERAL DESCRIPTION OF EUT.....   | 8  |
| 3.2 CONFIGURATION OF SYSTEM UNDER TEST .....  | 10 |
| 3.3 DESCRIPTION OF SUPPORT UNITS.....   | 11 |
| 3.4 TEST ITEM AND TEST CONFIGURATION .....  | 12 |
| 3.5 EUT OPERATING CONDITIONS .....  | 13 |
| 3.6 GENERAL DESCRIPTION OF APPLIED STANDARDS .....  | 13 |
| 4 TEST TYPES AND RESULTS.....   | 14 |
| 4.1 OUTPUT POWER MEASUREMENT .....  | 14 |
| 4.1.1 LIMITS OF OUTPUT POWER MEASUREMENT .....  | 14 |
| 4.1.2 TEST PROCEDURES .....   | 14 |
| 4.1.3 TEST SETUP .....  | 15 |
| 4.1.4 TEST RESULTS .....  | 16 |
| 4.2 FREQUENCY STABILITY MEASUREMENT .....   | 18 |
| 4.2.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT .....                                     | 18 |
| 4.2.2 TEST PROCEDURE .....  | 18 |
| 4.2.3 TEST SETUP .....  | 18 |
| 4.2.4 TEST RESULTS .....  | 19 |
| 4.3 OCCUPIED BANDWIDTH MEASUREMENT .....  | 20 |
| 4.3.1 TEST PROCEDURES .....   | 20 |
| 4.3.2 TEST SETUP .....  | 20 |
| 4.3.3 TEST RESULTS .....  | 21 |
| 4.4 BAND EDGE MEASUREMENT .....   | 23 |
| 4.4.1 LIMITS OF BAND EDGE MEASUREMENT .....   | 23 |
| 4.4.2 TEST SETUP .....  | 23 |
| 4.4.3 TEST PROCEDURES .....   | 23 |
| 4.4.4 TEST RESULTS .....  | 24 |
| 4.5 CONDUCTED SPURIOUS EMISSIONS.....   | 26 |
| 4.5.1 LIMITS OF CONDUCTED SPURIOUS EMISSIONS MEASUREMENT .....                            | 26 |
| 4.5.2 TEST PROCEDURE .....  | 26 |
| 4.5.3 TEST SETUP .....  | 26 |
| 4.5.4 TEST RESULTS .....  | 27 |
| 4.6 RADIATED EMISSION MEASUREMENT .....   | 30 |
| 4.6.1 LIMITS OF RADIATED EMISSION MEASUREMENT .....                                       | 30 |
| 4.6.2 TEST PROCEDURES .....   | 30 |
| 4.6.3 DEVIATION FROM TEST STANDARD .....  | 30 |
| 4.6.4 TEST SETUP .....  | 31 |
| 4.6.5 TEST RESULTS .....  | 32 |
| 5 PHOTOGRAPHS OF THE TEST CONFIGURATION.....  | 38 |
| 6 INFORMATION ON THE TESTING LABORATORIES .....   | 39 |
| 7 APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB..... | 40 |



A D T

## RELEASE CONTROL RECORD

| ISSUE NO.     | REASON FOR CHANGE | DATE ISSUED   |
|---------------|-------------------|---------------|
| RF130902E05-1 | Original release. | Oct. 09, 2013 |




A D T

## 1 CERTIFICATION

**PRODUCT:** Terminal  
**BRAND:** XAC  
**MODEL:** xAPT-103PU  
**TEST SAMPLE:** ENGINEERING SAMPLE  
**APPLICANT:** XAC AUTOMATION CORP.  
**TESTED:** Sep. 11 to 25, 2013  
**STANDARDS:** FCC PART 22, Subpart H

The above equipment (model: xAPT-103PU) 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:** Oct. 09, 2013  
( Claire Kuan, Specialist )

**APPROVED BY :**  , **DATE:** Oct. 09, 2013  
( May Chen, Manager )



A D T

## 2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

| APPLIED STANDARD: FCC Part 22 & Part 2 |                              |        |   |
|--|------------------------------|--------|---|
| STANDARD SECTION                       | TEST TYPE                    | RESULT | REMARK  |
| 2.1046<br>22.913 (a)                   | Effective radiated power     | 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<br>-16.96dB at 2509.8MHz. |

### 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 ~ 200MHz  | 5.46 dB     |
|                    | 200MHz ~1000MHz | 3.54 dB     |
|                    | 1GHz ~ 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:

| 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 horn antenna, preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
3. The test was performed in 966 Chamber No. H.
4. The FCC Site Registration No. is 797305.
5. The CANADA Site Registration No. is IC 7450H-3.
6. Tested Date: Sep. 11 to 25, 2013



A D T

**For other test items:**

| DESCRIPTION & MANUFACTURER                     | MODEL NO.                          | SERIAL NO.                            | CALIBRATED DATE | CALIBRATED UNTIL |
|--|------------------------------------|---------------------------------------|-----------------|------------------|
| Spectrum Analyzer R&S                          | FSP 40                             | 100060                                | May 03, 2013    | May 02, 2014     |
| Spectrum Analyzer Agilent                      | E4446A                             | MY48250113                            | Dec. 05, 2012   | Dec. 04, 2013    |
| AC Power Source EXTECH Electronics             | 6502                               | 1140503                               | NA              | NA               |
| Temperature & Humidity Chamber TERCHY          | MHU-225AU                          | 911033                                | Dec. 11, 2012   | Dec. 10, 2013    |
| DC Power Supply GOOD WILL INSTRUMENT CO., LTD. | GPC - 3030D                        | 7700087                               | NA              | NA               |
| ESG Vector signal generator Agilent            | E4438C                             | MY47271330<br>506 602 UNJ             | Apr. 30, 2013   | Apr. 29, 2014    |
| ESG Vector signal generator Agilent            | E4438C                             | MY45094468/<br>005 506 602<br>UK6 UNJ | Dec. 14, 2012   | Dec. 13, 2013    |
| Power meter Anritsu                            | ML2495A                            | 1014008                               | Apr. 23, 2013   | Apr. 22, 2014    |
| Power sensor Anritsu                           | MA2411B                            | 0917122                               | Apr. 23, 2013   | Apr. 22, 2014    |
| Power meter Anritsu                            | ML2495A                            | 0824006                               | May 20, 2013    | May 19, 2014     |
| Power sensor Anritsu                           | MA2411B                            | 0738172                               | May 20, 2013    | May 19, 2014     |
| Power meter Anritsu                            | ML2487B                            | 0930006                               | Nov. 14, 2012   | Nov. 13, 2013    |
| Power sensor Anritsu                           | MA2491A                            | 0845370                               | Nov. 14, 2012   | Nov. 13, 2013    |
| Software                                       | Total Power Measurement Tools V7.1 | NA                                    | NA              | NA               |
| Software                                       | ADT_RF Test Software V6.6.5.3      | NA                                    | NA              | NA               |
| Universal Radio Communication Tester           | R&S                                | CMU200                                | Oct. 23, 2012   | Oct. 22, 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



A D T

### 3 GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

|                              |   |                     |
|------------------------------|---|---------------------|
| <b>EUT</b>                   | Terminal  |                     |
| <b>MODEL NO.</b>             | xAPT-103PU  |                     |
| <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>                                 | 824.2MHz ~ 848.8MHz |
|                              | <b>WCDMA</b>                                      | 826.4MHz ~ 846.6MHz |
| <b>MAX. ERP POWER</b>        | <b>GPRS</b>                                       | 1584.9mW            |
|                              | <b>EDGE</b>                                       | 891.3mW             |
|                              | <b>WCDMA</b>                                      | 214.8mW             |
| <b>EMISSION DESIGNATOR</b>   | <b>GPRS</b>                                       | 246KG7W             |
|                              | <b>EDGE</b>                                       | 246KG7W             |
|                              | <b>WCDMA</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>     | NA  |                     |





**NOTE:**

- 1. The EUT is a RFID, GSM and WCDMA device.
- 2. The antennas provided to the EUT, please refer to the following table:

| <b>GPRS, EDGE, WCDMA, HSDPA and HSUPA Antenna Spec.</b> |                                       |               |                   |           |                       |
|---|---------------------------------------|---------------|-------------------|-----------|-----------------------|
| Brand   | Model No.                             | Antenna Type  | Antenna Connector | Gain(dBi) | Frequency range (MHz) |
| Ethertronics Inc.                                       | T-000084-01                           | FPCB          | NA                | 0.14      | 850                   |
|   |                                       |               |                   | 2.57      | 1900                  |
| <b>RFID Antenna Spec.</b>                               |                                       |               |                   |           |                       |
| Brand   | Model No.                             | Antenna Type  | Antenna Connector | Gain(dBi) | Frequency range (MHz) |
| XAC   | PCB ENIG ANT BOARD (W/KEY) 8006(ROHS) | PCB (2 Layer) | NA                | 13        | 13.56                 |

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

| Item    | Brand   | Model No.  | Spec.  |
|---------|---------|------------|--|
| Battery | Foxlink | FD400      | DC 7.4V, 2300mAh (17.02Wh)   |
| Adapter | 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 |

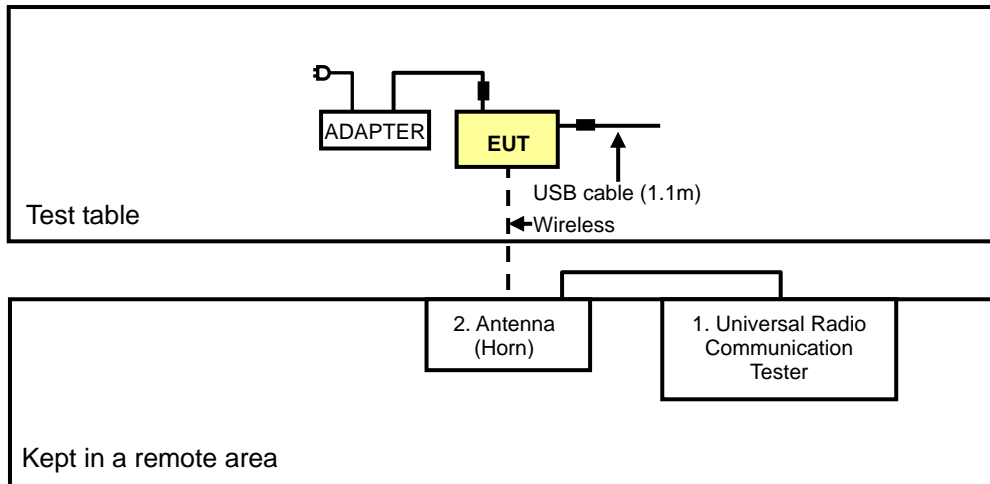
- 4. The EUT is pre-tested under following test modes :

| 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.

- 5. The EUT inside has one 2G/3G module which FCC ID: QIPEHS5-US.
- 6. RFID, GSM and WCDMA technology cannot transmit at same time.
- 7. 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





A D T

### 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.

| NO. | PRODUCT                                    | BRAND        | MODEL NO. | SERIAL NO. | FCC ID |
|-----|--|--------------|-----------|------------|--------|
| 1   | Universal Radio<br>Communication<br>Tester | R&S          | CMU200    | 121040     | NA     |
| 2   | Antenna (Horn)                             | ETS.LINDGREN | 3115      | SN00028262 | NA     |

| NO. | SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS |
|-----|---|
| 1   | SMA cable (0.6m)                                    |
| 2   | NA  |

**NOTE:**

1. All power cords of the above support units are non-shielded (1.8m).
2. Items 1-2 act as communication partners to transfer data.



### 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       |
|---------------------|-------------------|----------------|------------|
| ERP                 | 128 to 251        | 128, 190, 251  | GPRS, EDGE |
| FREQUENCY STABILITY | 128 to 251        | 190            | GPRS, EDGE |
| OCCUPIED BANDWIDTH  | 128 to 251        | 128, 190, 251  | GPRS, EDGE |
| BAND EDGE           | 128 to 251        | 128, 251       | GPRS, EDGE |
| CONDCUDED EMISSION  | 128 to 251        | 190            | GPRS, EDGE |
| RADIATED EMISSION   | 128 to 251        | 190            | GPRS, EDGE |

#### WCDMA MODE

| TEST ITEM           | AVAILABLE CHANNEL | TESTED CHANNEL   | MODE                |
|---------------------|-------------------|------------------|---------------------|
| ERP                 | 4132 to 4233      | 4132, 4183, 4233 | WCDMA               |
| FREQUENCY STABILITY | 4132 to 4233      | 4183             | WCDMA               |
| OCCUPIED BANDWIDTH  | 4132 to 4233      | 4132, 4183, 4233 | WCDMA, HSDPA, HSUPA |
| BAND EDGE           | 4132 to 4233      | 4132, 4233       | WCDMA, HSDPA, HSUPA |
| CONDCUDED EMISSION  | 4132 to 4233      | 4183             | WCDMA               |
| RADIATED EMISSION   | 4132 to 4233      | 4183             | WCDMA               |

#### TEST CONDITION:

#### GPRS/WCDMA

| TEST ITEM                         | ENVIRONMENTAL CONDITIONS | INPUT POWER  | TESTED BY  |
|-----------------------------------|--------------------------|--------------|------------|
| ERP                               | 25deg. C, 63%RH          | 7.4Vdc       | James Chan |
| FREQUENCY STABILITY               | 25deg. C, 63%RH          | 7.4Vdc       | James Chan |
| OCCUPIED BANDWIDTH                | 25deg. C, 63%RH          | 7.4Vdc       | James Chan |
| BAND EDGE                         | 25deg. C, 63%RH          | 7.4Vdc       | James Chan |
| CONDCUDED EMISSION                | 25deg. C, 63%RH          | 7.4Vdc       | James Chan |
| RADIATED EMISSION<br>(Below 1GHz) | 25deg. C, 63%RH          | 120Vac, 60Hz | Andy Ho    |
| RADIATED EMISSION<br>(Above 1GHz) | 25deg. C, 63%RH          | 120Vac, 60Hz | Tim Ho     |



A D T

### **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 22**

**ANSI/TIA/EIA-603-C 2004**

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



A D T

## 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

##### **CONDUCTED POWER MEASUREMENT:**

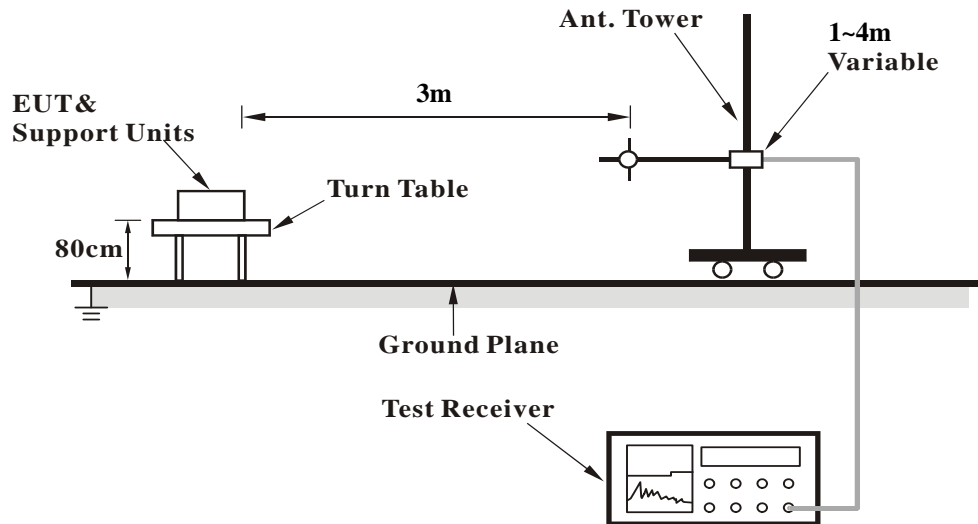
The EUT was set up for the maximum power with GPRS, EDGE & WCDMA link data modulation and link up with simulator. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

##### **EIRP / ERP MEASUREMENT:**

- a. All measurements were done at low, middle and high operational frequency range. RBW and VBW is 1MHz for GPRS & EDGE and 5MHz for WCDMA mode.
- 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.  $EIRP = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn}$ . ERP power can be calculated form E.I.R.P power by subtracting the gain of dipole,  $ERP \text{ power} = EIRP \text{ power} - 2.15\text{dBi}$ .

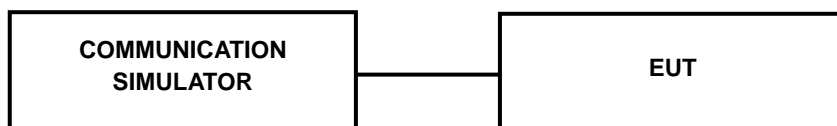
### 4.1.3 TEST SETUP

#### EIRP / ERP MEASUREMENT:



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

#### CONDUCTED POWER 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            | GPRS850 |       |       |
|-----------------|---------|-------|-------|
| Channel         | 128     | 190   | 251   |
| Frequency (MHz) | 824.2   | 836.6 | 848.8 |
| GPRS 8          | 32.5    | 32.5  | 32.6  |
| GPRS 10         | 29.8    | 29.9  | 29.9  |
| GPRS 11         | 28.0    | 28.0  | 27.9  |
| GPRS 12         | 26.9    | 26.8  | 26.8  |
| EDGE 8 (MCS9)   | 30.1    | 30.0  | 30.9  |
| EDGE 10 (MCS9)  | 27.0    | 26.9  | 26.9  |
| EDGE 11 (MCS9)  | 25.1    | 25.0  | 25.0  |
| EDGE 12 (MCS9)  | 24.1    | 23.9  | 23.8  |

| Band            | WCDMA V |       |       |
|-----------------|---------|-------|-------|
| Channel         | 4132    | 4183  | 4233  |
| Frequency (MHz) | 826.4   | 836.6 | 846.6 |
| RMC             | 23.8    | 23.9  | 23.7  |
| HSDPA Subtest-1 | 23.4    | 23.5  | 23.3  |
| HSDPA Subtest-2 | 23.4    | 23.3  | 23.3  |
| HSDPA Subtest-3 | 23.5    | 23.5  | 23.4  |
| HSDPA Subtest-4 | 23.3    | 23.4  | 23.4  |
| HSUPA Subtest-1 | 23.5    | 23.7  | 23.5  |
| HSUPA Subtest-2 | 23.4    | 23.6  | 23.4  |
| HSUPA Subtest-3 | 23.4    | 23.6  | 23.5  |
| HSUPA Subtest-4 | 23.3    | 23.7  | 23.5  |
| HSUPA Subtest-5 | 23.4    | 23.6  | 23.4  |





A D T

## ERP POWER (dBm)

### GPRS

| Plane | Channel | Frequency (MHz) | LVL (dBm) | Correction Factor(dB) | ERP(dBm) | ERP(mW) |
|-------|---------|-----------------|-----------|-----------------------|----------|---------|
| X     | 128     | 824.2           | 27.5      | 1.3                   | 28.8     | 758.6   |
|       | 190     | 836.6           | 29.2      | 1.2                   | 30.4     | 1096.5  |
|       | 251     | 848.8           | 31.0      | 1.0                   | 32.0     | 1584.9  |

### EDGE

| Plane | Channel | Frequency (MHz) | LVL (dBm) | Correction Factor(dB) | ERP(dBm) | ERP(mW) |
|-------|---------|-----------------|-----------|-----------------------|----------|---------|
| X     | 128     | 824.2           | 25.3      | 1.3                   | 26.6     | 457.1   |
|       | 190     | 836.6           | 26.9      | 1.2                   | 28.1     | 645.7   |
|       | 251     | 848.8           | 28.5      | 1.0                   | 29.5     | 891.3   |

### WCDMA

| Plane | Channel | Frequency (MHz) | LVL (dBm) | Correction Factor(dB) | ERP(dBm) | ERP(mW) |
|-------|---------|-----------------|-----------|-----------------------|----------|---------|
| X     | 4132    | 826.4           | 20.1      | 1.3                   | 21.4     | 136.8   |
|       | 4183    | 836.6           | 20.8      | 1.2                   | 22.0     | 157.8   |
|       | 4233    | 846.6           | 22.3      | 1.0                   | 23.3     | 214.8   |

## 4.2 FREQUENCY STABILITY MEASUREMENT

### 4.2.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

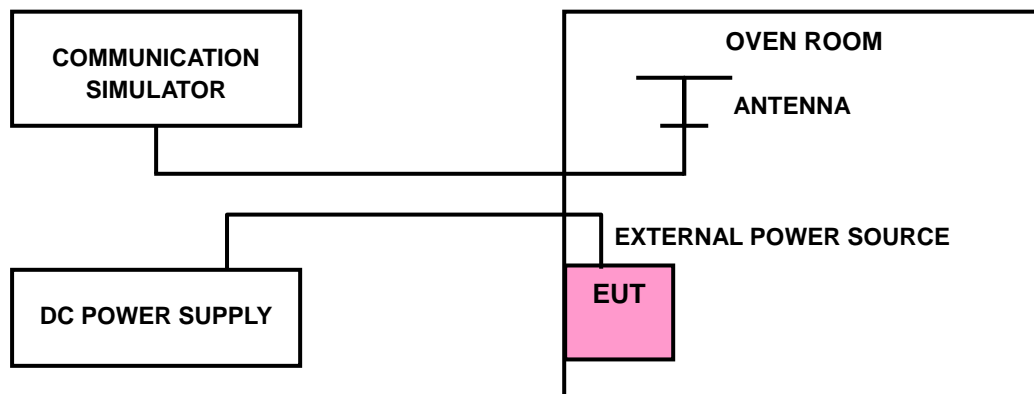
1.5 ppm is for base and fixed station. 2.5 ppm is for mobile station.

### 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 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               | 0.016                 | 0.018 | 0.006 | 2.5            |
| 8.51               | 0.017                 | 0.019 | 0.005 | 2.5            |

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

##### FREQUENCY ERROR VS. TEMPERATURE.

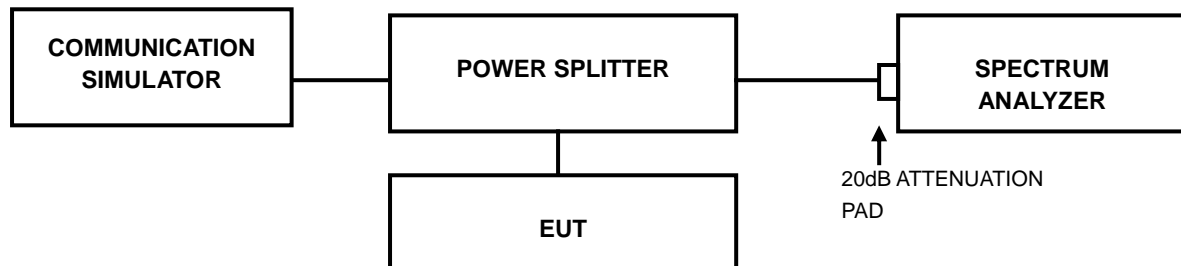
| TEMP. (°C) | FREQUENCY ERROR (ppm) |       |       | LIMIT<br>(ppm) |
|------------|-----------------------|-------|-------|----------------|
|            | GPRS                  | EDGE  | WCDMA |                |
| 50         | 0.032                 | 0.035 | 0.016 | 2.5            |
| 40         | 0.027                 | 0.033 | 0.014 | 2.5            |
| 30         | 0.023                 | 0.031 | 0.011 | 2.5            |
| 20         | 0.020                 | 0.027 | 0.010 | 2.5            |
| 10         | 0.022                 | 0.024 | 0.008 | 2.5            |
| 0          | 0.026                 | 0.025 | 0.011 | 2.5            |
| -10        | 0.033                 | 0.031 | 0.013 | 2.5            |
| -20        | 0.032                 | 0.032 | 0.016 | 2.5            |
| -30        | 0.035                 | 0.033 | 0.019 | 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



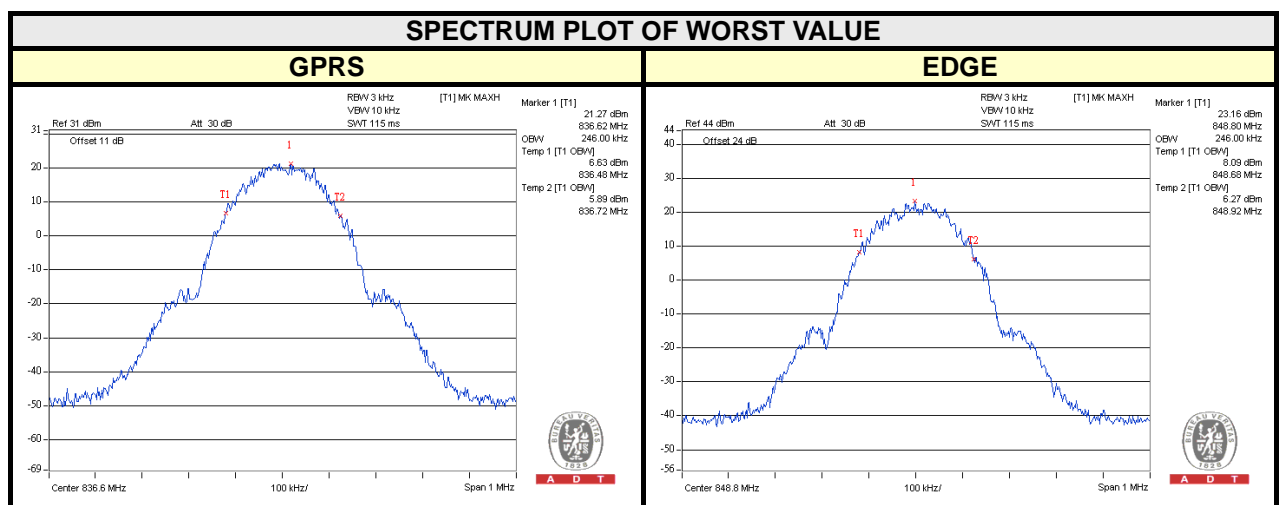


A D T

### 4.3.3 TEST RESULTS

#### GPRS / EDGE

| CHANNEL | FREQUENCY (MHz) | 99% OCCUPIED BANDWIDTH (kHz) |      |
|---------|-----------------|------------------------------|------|
|         |                 | GPRS                         | EDGE |
| 128     | 824.2           | 240                          | 244  |
| 190     | 836.6           | 246                          | 242  |
| 251     | 848.8           | 242                          | 246  |



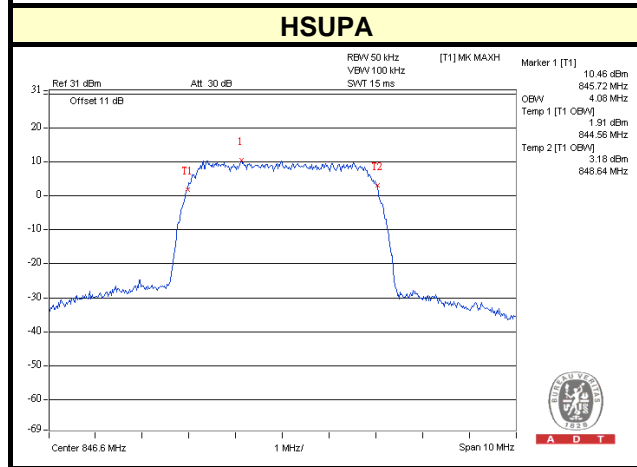
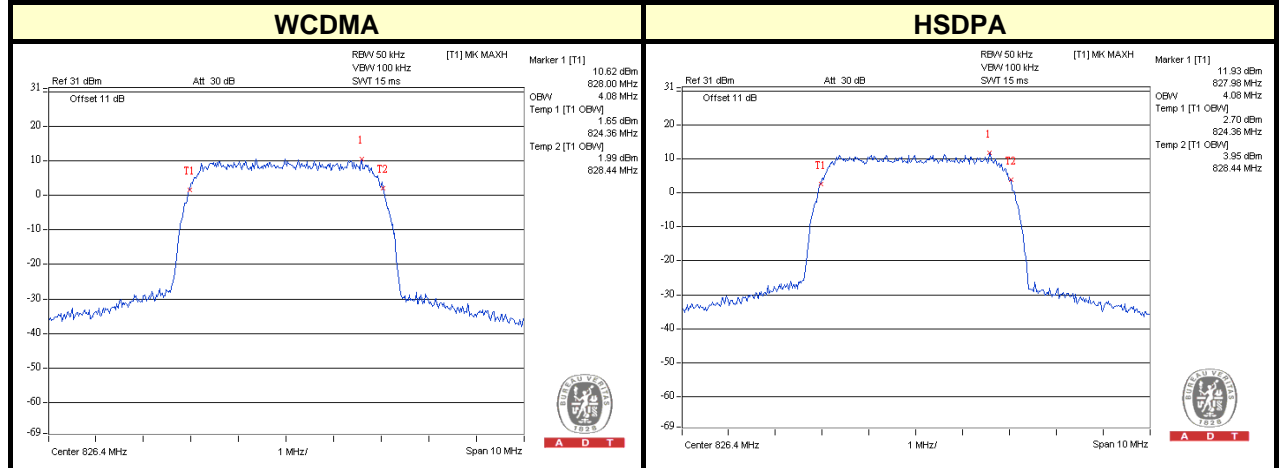


A D T

WCDMA / HSDPA / HSUPA

| CHANNEL | FREQUENCY (MHz) | 99% OCCUPIED BANDWIDTH (MHz) |       |       |
|---------|-----------------|------------------------------|-------|-------|
|         |                 | WCDMA                        | HSDPA | HSUPA |
| 4132    | 826.4           | 4.08                         | 4.08  | 4.06  |
| 4183    | 836.6           | 4.07                         | 4.06  | 4.06  |
| 4233    | 846.6           | 4.06                         | 4.06  | 4.08  |

SPECTRUM PLOT OF WORST VALUE

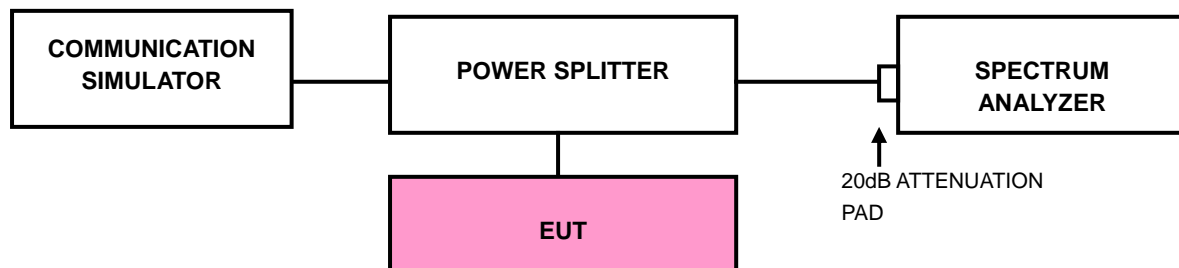


## 4.4 BAND EDGE MEASUREMENT

### 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



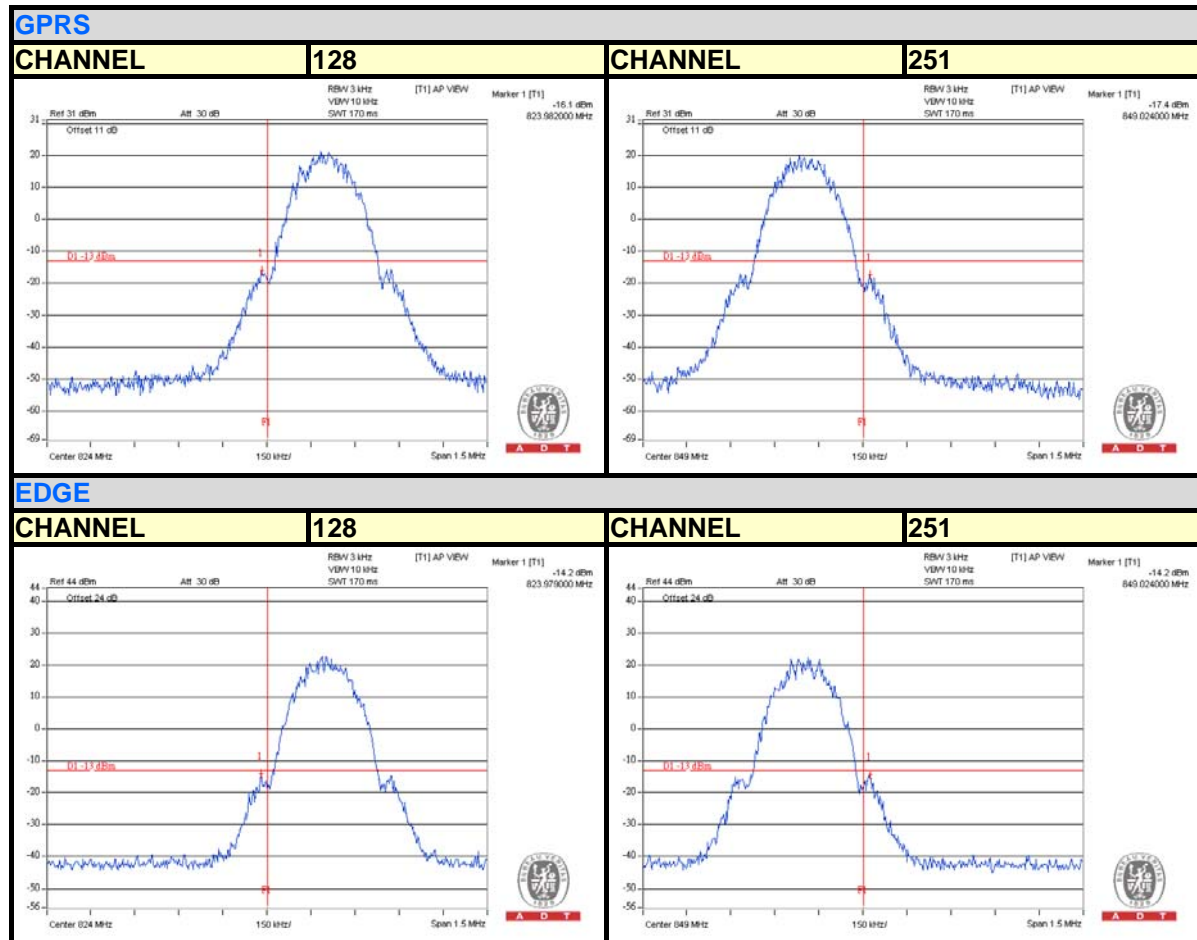
### 4.4.3 TEST PROCEDURES

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



A D T

### 4.4.4 TEST RESULTS

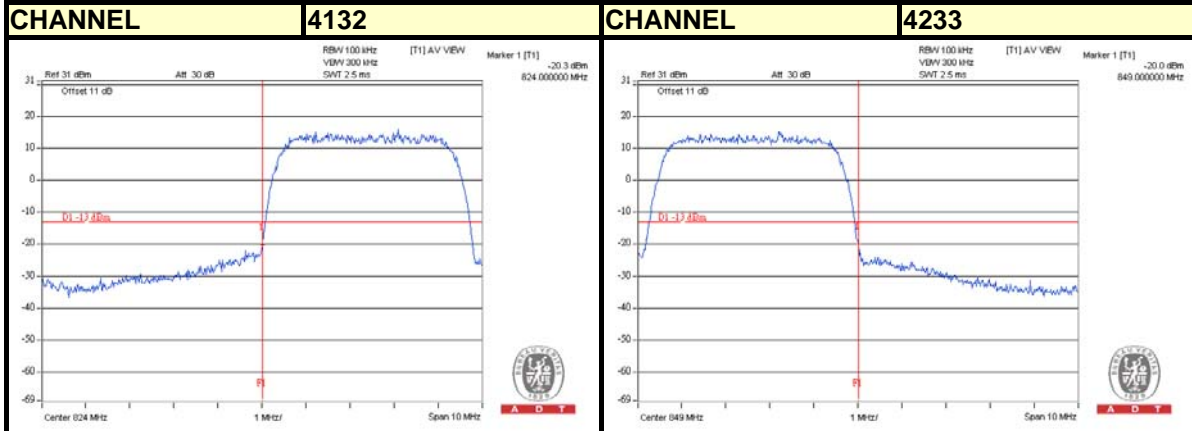




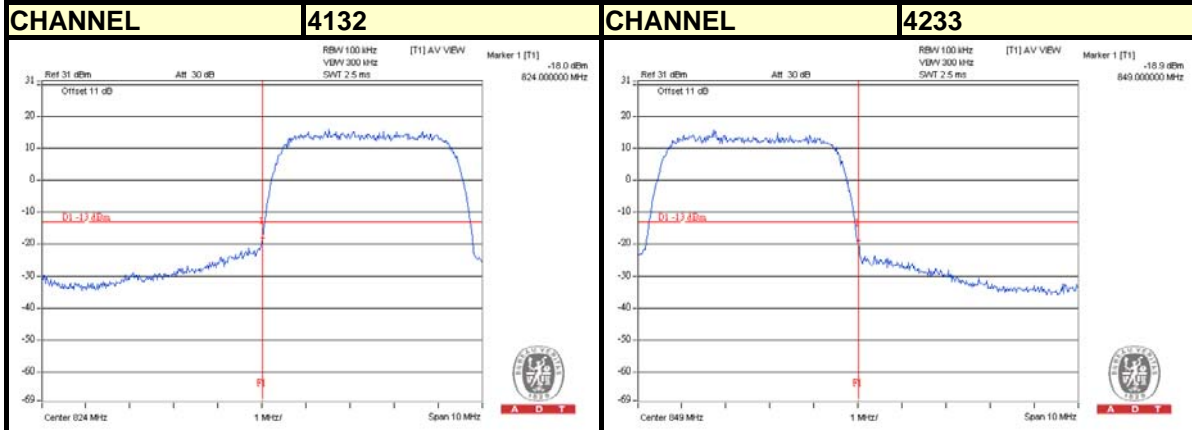


A D T

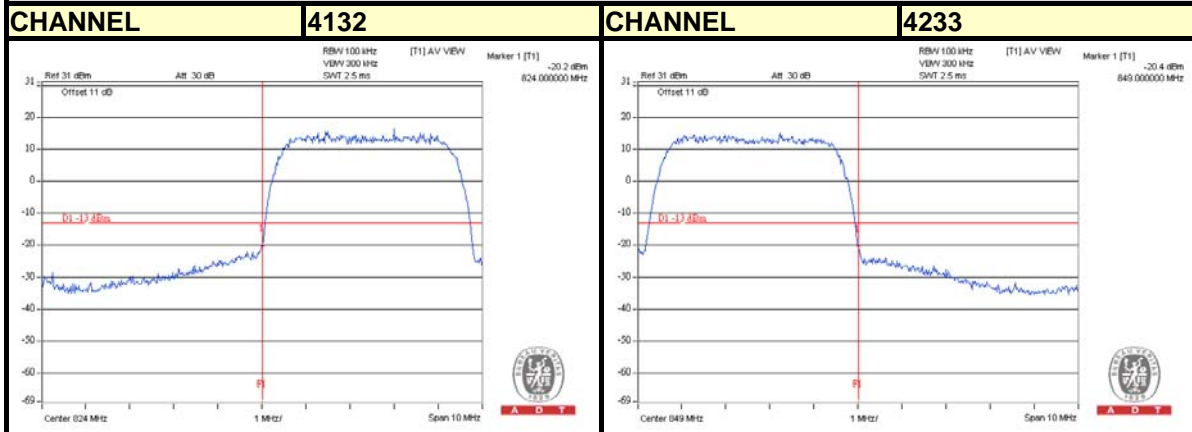
### WCDMA



### HSDPA



### HSUPA



## 4.5 CONDUCTED SPURIOUS EMISSIONS

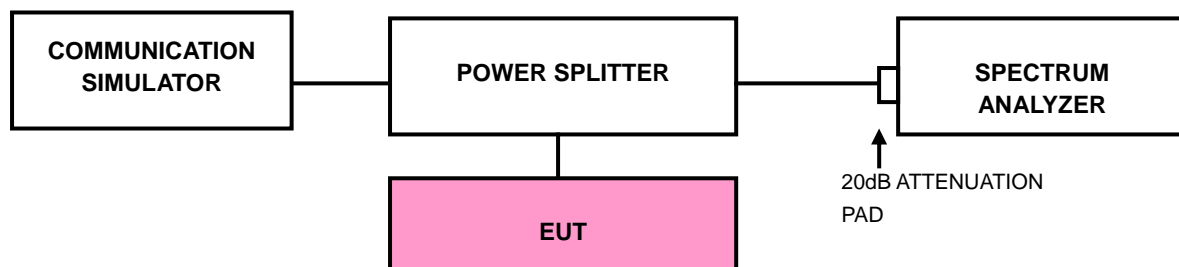
### 4.5.1 LIMITS OF CONDUCTED SPURIOUS EMISSIONS MEASUREMENT

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  $-13\text{dBm}$ .

### 4.5.2 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 9GHz. 20dB attenuation pad is connected with spectrum. RBW=1MHz and VBW=3MHz is used for conducted emission measurement.

### 4.5.3 TEST SETUP





A D T

#### 4.5.4 TEST RESULTS



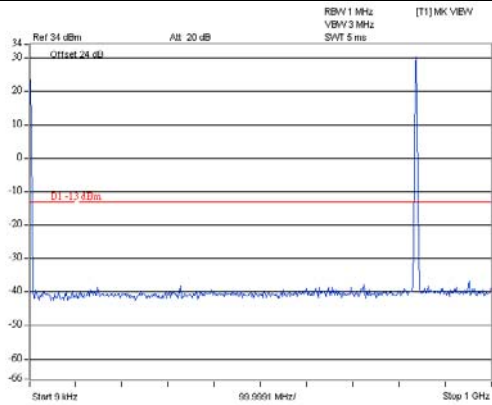


A D T

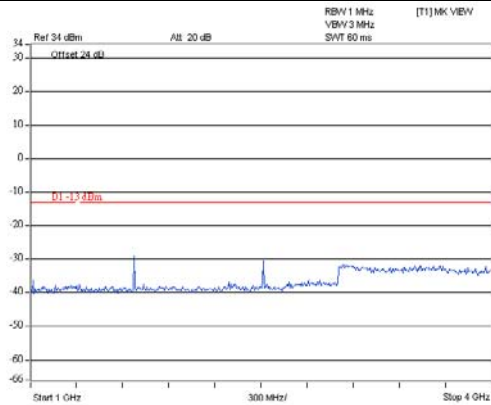
**EDGE**

**CHANNEL 190**

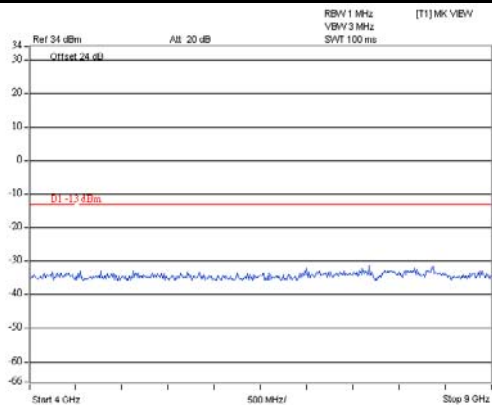
**FREQUENCY RANGE : 9kHz~1GHz**



**FREQUENCY RANGE : 1GHz~4GHz**



**FREQUENCY RANGE : 4GHz~9GHz**



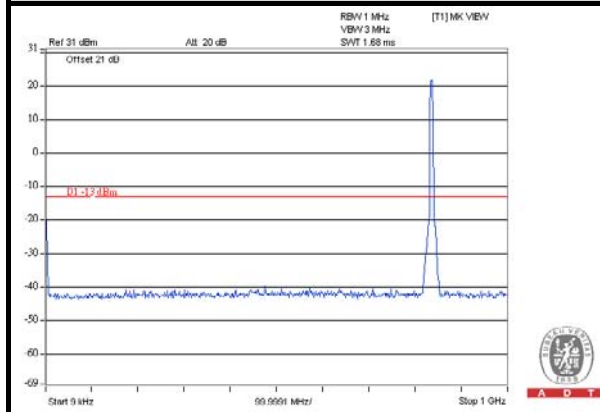


A D T

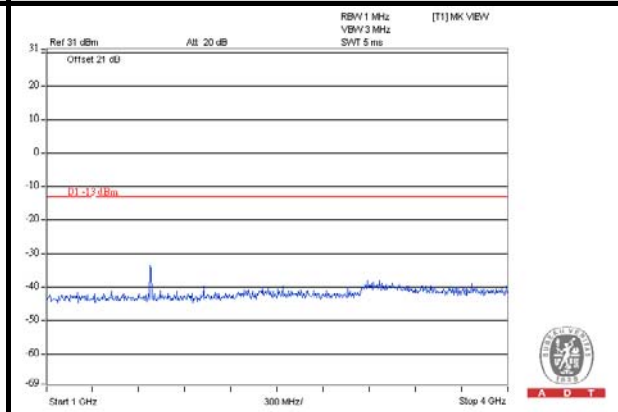
### WCDMA

### CHANNEL 4183

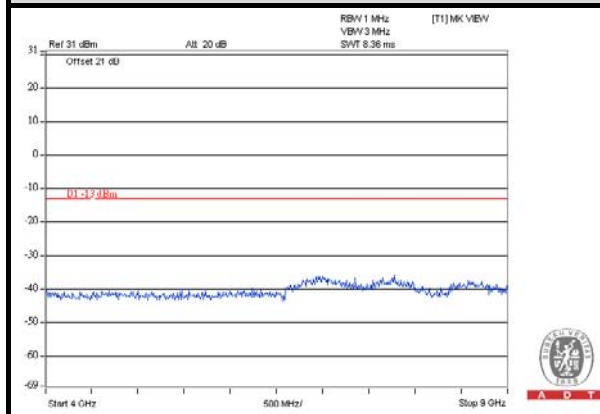
#### FREQUENCY RANGE : 9kHz~1GHz



#### FREQUENCY RANGE : 1GHz~4GHz



#### FREQUENCY RANGE : 4GHz~9GHz



## 4.6 RADIATED EMISSION MEASUREMENT

### 4.6.1 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  $-13\text{dBm}$ .

### 4.6.2 TEST PROCEDURES

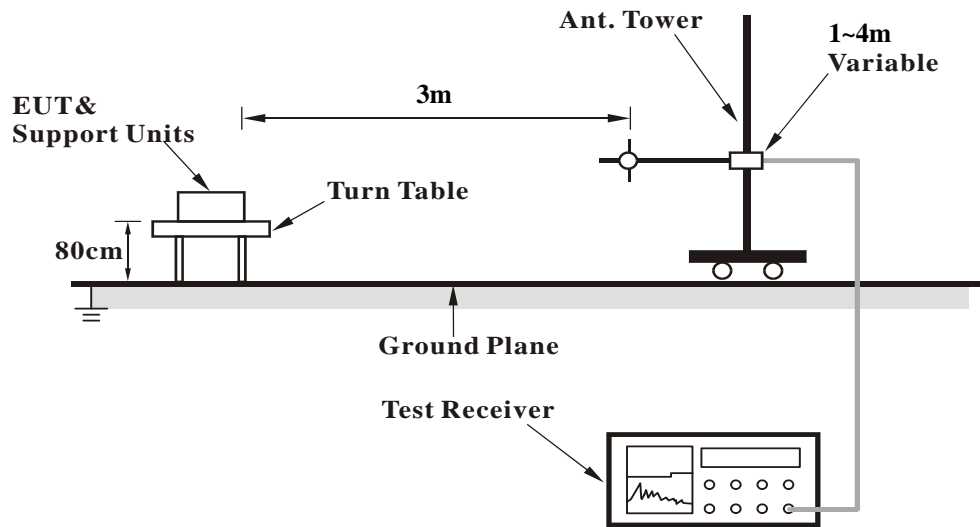
- a. Substitution method is used for EIRP measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 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.  $\text{EIRP} = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn}$ .
- d. ERP power can be calculated form EIRP power by subtracting the gain of dipole,  
 $\text{ERP power} = \text{EIRP power} - 2.15\text{dBi}$ .

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

### 4.6.3 DEVIATION FROM TEST STANDARD

No deviation

#### 4.6.4 TEST SETUP



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

#### 4.6.5 TEST RESULTS

**Below 1GHz**  
**GPRS:**

|             |                |                        |               |
|-------------|----------------|------------------------|---------------|
| <b>MODE</b> | TX channel 190 | <b>FREQUENCY RANGE</b> | Below 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) | ERP (dBm) | Margin (dB) |
| 1  | 58.8        | 34.68         | -13         | -47.01                | -7.87                  | -54.88    | -41.88      |
| 2  | 64.32       | 29.54         | -13         | -55.17                | -6.33                  | -61.50    | -48.50      |
| 3  | 143.95      | 40.30         | -13         | -52.51                | -1.19                  | -53.70    | -40.70      |
| 4  | 237.1       | 42.70         | -13         | -52.67                | 3.85                   | -48.81    | -35.81      |
| 5  | 281.45      | 42.63         | -13         | -52.59                | 3.83                   | -48.76    | -35.76      |
| 6  | 296.3       | 40.20         | -13         | -55.43                | 3.72                   | -51.71    | -38.71      |
| <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) | ERP (dBm) | Margin (dB) |
| 1  | 40.7        | 35.40         | -13         | -39.73                | -12.29                 | -52.02    | -39.02      |
| 2  | 228.05      | 39.10         | -13         | -56.30                | 3.97                   | -52.32    | -39.32      |
| 3  | 237         | 41.10         | -13         | -54.27                | 3.85                   | -50.41    | -37.41      |
| 4  | 406.8       | 36.30         | -13         | -61.60                | 3.26                   | -58.34    | -45.34      |
| 5  | 798.4       | 41.50         | -13         | -57.35                | 1.57                   | -55.78    | -42.78      |
| 6  | 1000        | 42.20         | -13         | -54.27                | 0.59                   | -53.68    | -40.68      |

**REMARKS:**

1. ERP(dBm) = S.G Power Value (dBm) + Correction Factor (dB).
2. Correction Factor = gain of substitution antenna + cable loss





A D T

**EDGE:**

|             |                |                        |               |
|-------------|----------------|------------------------|---------------|
| <b>MODE</b> | TX channel 190 | <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) | ERP (dBm) | Margin (dB) |
|-----|-------------|---------------|-------------|-----------------------|------------------------|-----------|-------------|
| 1   | 58.8        | 34.57         | -13         | -47.12                | -7.87                  | -54.99    | -41.99      |
| 2   | 64.32       | 29.67         | -13         | -55.04                | -6.33                  | -61.37    | -48.37      |
| 3   | 143.95      | 40.76         | -13         | -52.05                | -1.19                  | -53.24    | -40.24      |
| 4   | 237.1       | 42.56         | -13         | -52.81                | 3.85                   | -48.95    | -35.95      |
| 5   | 281.45      | 42.44         | -13         | -52.78                | 3.83                   | -48.95    | -35.95      |
| 6   | 296.3       | 40.25         | -13         | -55.38                | 3.72                   | -51.66    | -38.66      |

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

| No. | Freq. (MHz) | Reading (dBm) | Limit (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Margin (dB) |
|-----|-------------|---------------|-------------|-----------------------|------------------------|-----------|-------------|
| 1   | 40.7        | 35.65         | -13         | -39.48                | -12.29                 | -51.77    | -38.77      |
| 2   | 228.05      | 39.11         | -13         | -56.29                | 3.97                   | -52.31    | -39.31      |
| 3   | 237         | 41.34         | -13         | -54.03                | 3.85                   | -50.17    | -37.17      |
| 4   | 406.8       | 36.45         | -13         | -61.45                | 3.26                   | -58.19    | -45.19      |
| 5   | 798.4       | 41.65         | -13         | -57.20                | 1.57                   | -55.63    | -42.63      |
| 6   | 1000        | 42.56         | -13         | -53.91                | 0.59                   | -53.32    | -40.32      |

**REMARKS:**

1.  $ERP(dBm) = S.G\ Power\ Value\ (dBm) + Correction\ Factor\ (dB)$ .
2. Correction Factor = gain of substitution antenna + cable loss



A D T

**WCDMA:**

|             |                 |                        |               |
|-------------|-----------------|------------------------|---------------|
| <b>MODE</b> | TX channel 4183 | <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) | ERP (dBm) | Margin (dB) |
|-----|-------------|---------------|-------------|-----------------------|------------------------|-----------|-------------|
| 1   | 42.3        | 34.50         | -13         | -41.21                | -11.90                 | -53.11    | -40.11      |
| 2   | 46.16       | 35.28         | -13         | -41.83                | -10.96                 | -52.79    | -39.79      |
| 3   | 162.92      | 35.20         | -13         | -53.82                | -0.28                  | -54.10    | -41.10      |
| 4   | 222.2       | 39.59         | -13         | -55.83                | 4.05                   | -51.78    | -38.78      |
| 5   | 251.85      | 40.30         | -13         | -54.59                | 3.91                   | -50.68    | -37.68      |
| 6   | 333.27      | 39.40         | -13         | -57.77                | 3.63                   | -54.13    | -41.13      |

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

| No. | Freq. (MHz) | Reading (dBm) | Limit (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Margin (dB) |
|-----|-------------|---------------|-------------|-----------------------|------------------------|-----------|-------------|
| 1   | 35.75       | 34.61         | -13         | -38.73                | -13.50                 | -52.23    | -39.23      |
| 2   | 48.5        | 33.00         | -13         | -44.96                | -10.38                 | -55.34    | -42.34      |
| 3   | 202.45      | 36.90         | -13         | -58.58                | 4.31                   | -54.27    | -41.27      |
| 4   | 217.3       | 38.80         | -13         | -56.63                | 4.11                   | -52.52    | -39.52      |
| 5   | 251.85      | 40.00         | -13         | -54.89                | 3.91                   | -50.98    | -37.98      |
| 6   | 261.7       | 39.41         | -13         | -55.22                | 3.96                   | -51.25    | -38.25      |

**REMARKS:**

1. ERP(dBm) = S.G Power Value (dBm) + Correction Factor (dB).
2. Correction Factor = gain of substitution antenna + cable loss



**Above 1GHz**  
**GPRS:**

|             |                |                        |               |
|-------------|----------------|------------------------|---------------|
| <b>MODE</b> | TX channel 190 | <b>FREQUENCY RANGE</b> | 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) | ERP (dBm) | Margin (dB) |
|-----|-------------|---------------|-------------|-----------------------|------------------------|-----------|-------------|
| 1   | 1673.2      | 63.47         | -13         | -39.16                | 6.31                   | -32.85    | -19.85      |
| 2   | 2509.8      | 61.29         | -13         | -37.23                | 6.66                   | -30.57    | -17.57      |
| 3   | 3346.4      | 62.41         | -13         | -40.60                | 7.63                   | -32.97    | -19.97      |
| 4   | 4183        | 46.8          | -13         | -58.04                | 7.44                   | -50.60    | -37.60      |
| 5   | 5019.6      | 49.7          | -13         | -54.56                | 7.01                   | -47.55    | -34.55      |
| 6   | 5856.2      | 51.36         | -13         | -53.02                | 6.87                   | -46.15    | -33.15      |
| 7   | 6692.8      | 56.11         | -13         | -47.21                | 5.56                   | -41.65    | -28.65      |
| 8   | 7529.4      | 56.53         | -13         | -46.09                | 4.52                   | -41.57    | -28.57      |
| 9   | 8366        | 55.88         | -13         | -46.74                | 4.18                   | -42.56    | -29.56      |

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

| No. | Freq. (MHz) | Reading (dBm) | Limit (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Margin (dB) |
|-----|-------------|---------------|-------------|-----------------------|------------------------|-----------|-------------|
| 1   | 1673.2      | 63.11         | -13         | -39.52                | 6.31                   | -33.21    | -20.21      |
| 2   | 2509.8      | 59.82         | -13         | -38.70                | 6.66                   | -32.04    | -19.04      |
| 3   | 3346.4      | 62.21         | -13         | -40.80                | 7.63                   | -33.17    | -20.17      |
| 4   | 4183        | 47.4          | -13         | -57.44                | 7.44                   | -50.00    | -37.00      |
| 5   | 5019.6      | 50.08         | -13         | -54.18                | 7.01                   | -47.17    | -34.17      |
| 6   | 5856.2      | 53.76         | -13         | -50.62                | 6.87                   | -43.75    | -30.75      |
| 7   | 6692.8      | 55.08         | -13         | -48.24                | 5.56                   | -42.68    | -29.68      |
| 8   | 7529.4      | 57.77         | -13         | -44.85                | 4.52                   | -40.33    | -27.33      |
| 9   | 8366        | 55.93         | -13         | -46.69                | 4.18                   | -42.51    | -29.51      |

**REMARKS:**

1.  $ERP(dBm) = S.G \text{ Power Value (dBm)} + \text{Correction Factor (dB)}$ .
2. Correction Factor = gain of substitution antenna + cable loss



A D T

**EDGE:**

|             |                |                        |               |
|-------------|----------------|------------------------|---------------|
| <b>MODE</b> | TX channel 190 | <b>FREQUENCY RANGE</b> | 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) | ERP (dBm) | Margin (dB) |
|-----|-------------|---------------|-------------|-----------------------|------------------------|-----------|-------------|
| 1   | 1673.2      | 64.33         | -13         | -38.30                | 6.31                   | -31.99    | -18.99      |
| 2   | 2509.8      | 61.90         | -13         | -36.62                | 6.66                   | -29.96    | -16.96      |
| 3   | 3346.4      | 61.40         | -13         | -41.61                | 7.63                   | -33.98    | -20.98      |
| 4   | 4183        | 45.47         | -13         | -59.37                | 7.44                   | -51.93    | -38.93      |
| 5   | 5019.6      | 50.51         | -13         | -53.75                | 7.01                   | -46.74    | -33.74      |
| 6   | 5856.2      | 50.99         | -13         | -53.39                | 6.87                   | -46.52    | -33.52      |
| 7   | 6692.8      | 53.76         | -13         | -49.56                | 5.56                   | -44.00    | -31.00      |
| 8   | 7529.4      | 56.07         | -13         | -46.55                | 4.52                   | -42.03    | -29.03      |
| 9   | 8366        | 56.59         | -13         | -46.03                | 4.18                   | -41.85    | -28.85      |

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

| No. | Freq. (MHz) | Reading (dBm) | Limit (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Margin (dB) |
|-----|-------------|---------------|-------------|-----------------------|------------------------|-----------|-------------|
| 1   | 1673.2      | 64.21         | -13         | -38.42                | 6.31                   | -32.11    | -19.11      |
| 2   | 2509.8      | 60.68         | -13         | -37.84                | 6.66                   | -31.18    | -18.18      |
| 3   | 3346.4      | 61.71         | -13         | -41.30                | 7.63                   | -33.67    | -20.67      |
| 4   | 4183        | 46.9          | -13         | -57.94                | 7.44                   | -50.50    | -37.50      |
| 5   | 5019.6      | 48.51         | -13         | -55.75                | 7.01                   | -48.74    | -35.74      |
| 6   | 5856.2      | 53.06         | -13         | -51.32                | 6.87                   | -44.45    | -31.45      |
| 7   | 6692.8      | 56.29         | -13         | -47.03                | 5.56                   | -41.47    | -28.47      |
| 8   | 7529.4      | 59.16         | -13         | -43.46                | 4.52                   | -38.94    | -25.94      |
| 9   | 8366        | 55.53         | -13         | -47.09                | 4.18                   | -42.91    | -29.91      |

**REMARKS:**

1.  $ERP(dBm) = S.G \text{ Power Value (dBm)} + \text{Correction Factor (dB)}$ .
2. Correction Factor = gain of substitution antenna + cable loss



A D T

**WCDMA:**

|             |                 |                        |               |
|-------------|-----------------|------------------------|---------------|
| <b>MODE</b> | TX channel 4183 | <b>FREQUENCY RANGE</b> | 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) | ERP (dBm) | Margin (dB) |
|-----|-------------|---------------|-------------|-----------------------|------------------------|-----------|-------------|
| 1   | 1673.2      | 64.34         | -13         | -38.29                | 6.31                   | -31.98    | -18.98      |
| 2   | 2509.8      | 61.15         | -13         | -37.37                | 6.66                   | -30.71    | -17.71      |
| 3   | 3346.4      | 62.49         | -13         | -40.52                | 7.63                   | -32.89    | -19.89      |
| 4   | 4183        | 46.55         | -13         | -58.29                | 7.44                   | -50.85    | -37.85      |
| 5   | 5019.6      | 50.34         | -13         | -53.92                | 7.01                   | -46.91    | -33.91      |
| 6   | 5856.2      | 51.09         | -13         | -53.29                | 6.87                   | -46.42    | -33.42      |
| 7   | 6692.8      | 55.87         | -13         | -47.45                | 5.56                   | -41.89    | -28.89      |
| 8   | 7529.4      | 56.41         | -13         | -46.21                | 4.52                   | -41.69    | -28.69      |
| 9   | 8366        | 55.47         | -13         | -47.15                | 4.18                   | -42.97    | -29.97      |

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

| No. | Freq. (MHz) | Reading (dBm) | Limit (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Margin (dB) |
|-----|-------------|---------------|-------------|-----------------------|------------------------|-----------|-------------|
| 1   | 1673.2      | 62.2          | -13         | -40.43                | 6.31                   | -34.12    | -21.12      |
| 2   | 2509.8      | 60.17         | -13         | -38.35                | 6.66                   | -31.69    | -18.69      |
| 3   | 3346.4      | 62.9          | -13         | -40.11                | 7.63                   | -32.48    | -19.48      |
| 4   | 4183        | 48.29         | -13         | -56.55                | 7.44                   | -49.11    | -36.11      |
| 5   | 5019.6      | 50.52         | -13         | -53.74                | 7.01                   | -46.73    | -33.73      |
| 6   | 5856.2      | 54.6          | -13         | -49.78                | 6.87                   | -42.91    | -29.91      |
| 7   | 6692.8      | 54.66         | -13         | -48.66                | 5.56                   | -43.10    | -30.10      |
| 8   | 7529.4      | 57.5          | -13         | -45.12                | 4.52                   | -40.60    | -27.60      |
| 9   | 8366        | 55.92         | -13         | -46.70                | 4.18                   | -42.52    | -29.52      |

**REMARKS:**

1.  $ERP(dBm) = S.G \text{ Power Value (dBm)} + \text{Correction Factor (dB)}$ .
2.  $\text{Correction Factor} = \text{gain of substitution antenna} + \text{cable loss}$



A D T

## 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:

**Linko EMC/RF Lab:**

Tel: 886-2-26052180

Fax: 886-2-26051924

**Hsin Chu EMC/RF Lab:**

Tel: 886-3-5935343

Fax: 886-3-5935342

**Hwa Ya EMC/RF/Safety/Telecom Lab:**

Tel: 886-3-3183232

Fax: 886-3-3270892

**Email:** [service.adt@tw.bureauveritas.com](mailto:service.adt@tw.bureauveritas.com)

**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.



A D T

## **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---