# FCC TEST REPORT

# (PART 22)

| | |
|---|---|
| **REPORT NO.:** | RF120621C20 R1 |
| **MODEL NO.:** | PL83200 |
| **FCC ID:** | NM8PL83200 |
| **RECEIVED:** | Jun. 21, 2012 |
| **TESTED:** | Jul. 16 ~ Sep. 18, 2012 |
| **ISSUED:** | Sep. 19, 2012 |

| | |
|---|---|
| **APPLICANT:** | HTC Corporation |
| **ADDRESS:** | 23, Xinghua Rd., Taoyuan 330, Taiwan, R.O.C. |

| | |
|---|---|
| **ISSUED BY:** | Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch |
| **LAB ADDRESS:** | No. 47, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan ( R.O.C. ) |
| **TEST LOCATION:** | No. 19, Hwa Ya 2nd Rd, Wen Hwa Tsuen, Kwei Shan Hsiang, Taoyuan Hsien 333, 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.

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# RELEASE CONTROL RECORD

| ISSUE NO. | REASON FOR CHANGE | DATE ISSUED |
|---|---|---|
| RF120621C20 | Original release | Sep. 04, 2012 |
| RF120621C20 R1 | Add wireless charger mode | Sep. 19, 2012 |

# 1 CERTIFICATION

| | |
|---|---|
| **PRODUCT:** | Smartphone |
| **MODEL:** | PL83200 |
| **BRAND:** | HTC |
| **APPLICANT:** | HTC Corporation |
| **TESTED:** | Jul. 16 ~ Sep. 18, 2012 |
| **TEST SAMPLE:** | Production Unit |
| **STANDARDS:** | **FCC PART 22, Subpart H** |

The above equipment (model: PL83200) 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** : Ivonne Wu / Senior Specialist , **DATE :** Sep. 19, 2012

**APPROVED BY** : Gary Chang / Technical Manager , **DATE :** Sep. 19, 2012

# 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>-7.57dB at 32.97MHz. |

## 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 |
|---|---|---|
| Conducted emissions | 150kHz~30MHz | 2.44 dB |
| Radiated emissions | 30MHz ~ 200MHz | 2.93 dB |
| | 200MHz ~1000MHz | 2.95 dB |
| | 1GHz ~ 18GHz | 2.26 dB |
| | 18GHz ~ 40GHz | 1.94 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

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | DATE OF CALIBRATION | DUE DATE OF CALIBRATION |
|---|---|---|---|---|
| Test Receiver Agilent | N9038A | MY51210203 | Dec. 22, 2011 | Dec. 21, 2012 |
| Spectrum Analyzer ROHDE & SCHWARZ | FSU43 | 101261 | Dec. 21, 2011 | Dec. 20, 2012 |
| BILOG Antenna SCHWARZBECK | VULB9168 | 9168-472 | Dec. 20, 2011 | Dec. 19, 2012 |
| HORN Antenna SCHWARZBECK | BBHA 9120 D | 9120D-969 | Dec. 20, 2011 | Dec. 19, 2012 |
| ORN Antenna SCHWARZBECK | BBHA 9170 | 9170-480 | Dec. 20, 2011 | Dec. 19, 2012 |
| Preamplifier EMCI | EMC 012645 | 980115 | Dec. 30, 2011 | Dec. 29, 2012 |
| Preamplifier EMCI | EMC 330H | 980112 | Dec. 30, 2011 | Dec. 29, 2012 |
| RF signal cable HUBER+SUHNNER | SUCOFLEX 104 | 309219/4 | Oct. 21, 2011 | Oct. 20, 2012 |
| RF signal cable HUBER+SUHNNER | SUCOFLEX 104 | 250130/4 | Jan. 02, 2012 | Jan. 01, 2013 |
| RF signal cable Worken | RG-213 | NA | Jan. 02, 2012 | Jan. 01, 2013 |
| Software | E3 6.120103 | NA | NA | NA |
| Antenna Tower MF | MFA-440H | NA | NA | NA |
| Turn Table MF | MFT-201SS | NA | NA | NA |
| Antenna Tower &Turn Table Controller MF | MF-7802 | NA | NA | NA |
| Mini-Circuits Power Splitter | ZN2PD-9G | NA | Mar. 23, 2012 | Mar. 22, 2013 |
| JFW 20dB attenuation | 50HF-020-SMA | NA | NA | NA |
| Communications Tester-Wireless | E5515C | MY50266653 | Sep. 28, 2011 | Sep. 27, 2012 |
| Radio Communication Analyzer | MT8820C | 6201127458 | May 25, 2012 | May 24, 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 HwaYa Chamber 9.

3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.

4. The FCC Site Registration No. is 460141.

5. The IC Site Registration No. is IC 7450F-4.

# 3 GENERAL INFORMATION

## 3.1 GENERAL DESCRIPTION OF EUT

| | | |
|---|---|---|
| **EUT** | Smartphone | |
| **MODEL NO.** | PL83200 | |
| **POWER SUPPLY** | 5.0Vdc (adapter or host equipment)<br>3.8Vdc (battery) | |
| **MODULATION TYPE** | **GSM/GPRS** | GMSK |
| | **EDGE** | 8PSK |
| | **WCDMA** | BPSK |
| | **CDMA** | QPSK, OQPSK, HPSK |
| **FREQUENCY RANGE** | **GSM/GPRS/EDGE** | 824.2MHz ~ 848.8MHz |
| | **WCDMA** | 826.4MHz ~ 846.6MHz |
| | **CDMA** | 824.7MHz ~ 848.31MHz |
| **MAX. ERP POWER** | **GSM** | 474.24mW |
| | **EDGE** | 98.63mW |
| | **WCDMA** | 58.34mW |
| | **CDMA** | 73.96mW |
| **EMISSION DESIGNATOR** | **GSM** | 250KGXW |
| | **EDGE** | 246KG7W |
| | **WCDMA** | 4M16F9W |
| | **CDMA** | 1M28F9W |
| **MULTI-SLOTS CLASS** | 12 | |
| **WCDMA RELEASE VERSION** | 6 | |
| **ANTENNA TYPE** | **GSM** | Fixed Internal antenna with -3dBi gain |
| | **EDGE** | |
| | **WCDMA** | |
| | **CDMA** | |
| **I/O PORTS** | Refer to users' manual | |
| **DATA CABLE** | Refer to NOTE as below | |
| **ACCESSORY DEVICES** | Refer to NOTE as below | |

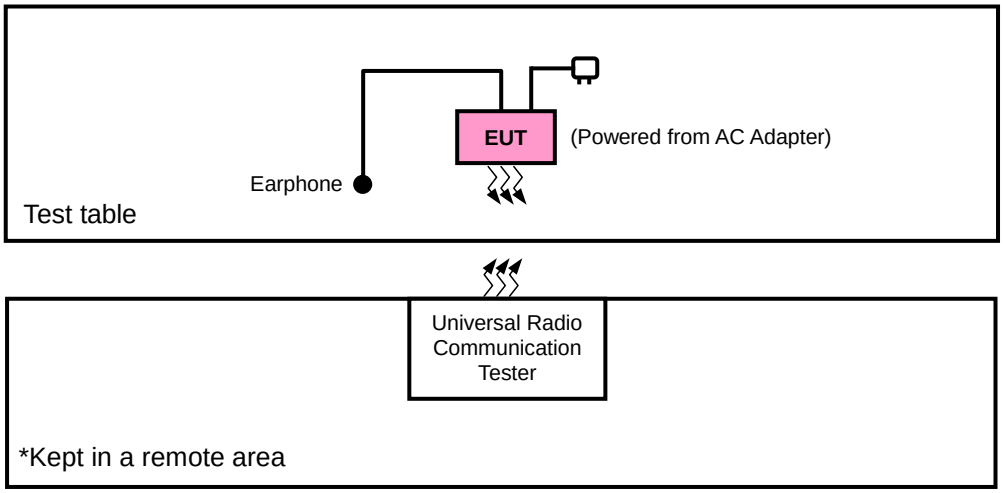
**NOTE:**

1. The EUT's accessories list refers to Ext Pho.pdf.
   * Item 2, 3, 5, 6, 7, 8 were the worst for the final test.
2. 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.

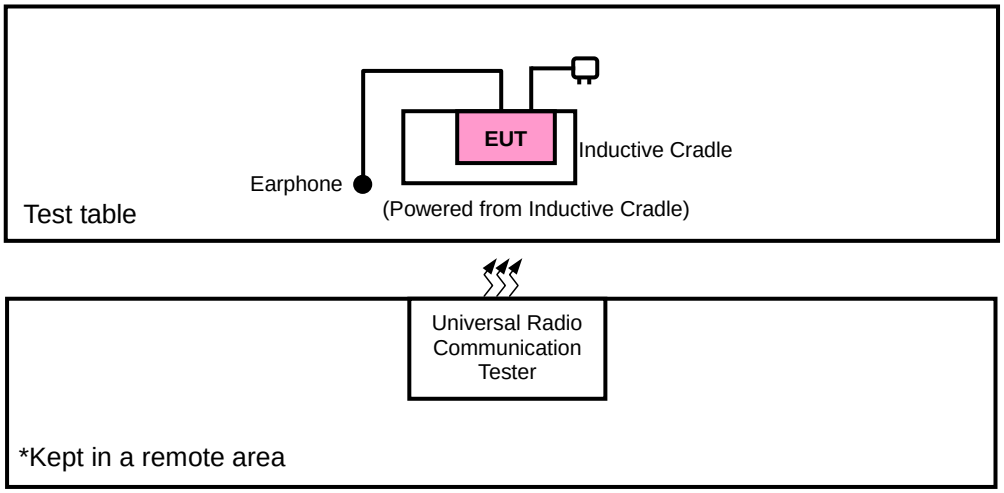
## 3.2 CONFIGURATION OF SYSTEM UNDER TEST

### FOR RADIATION EMISSION TEST

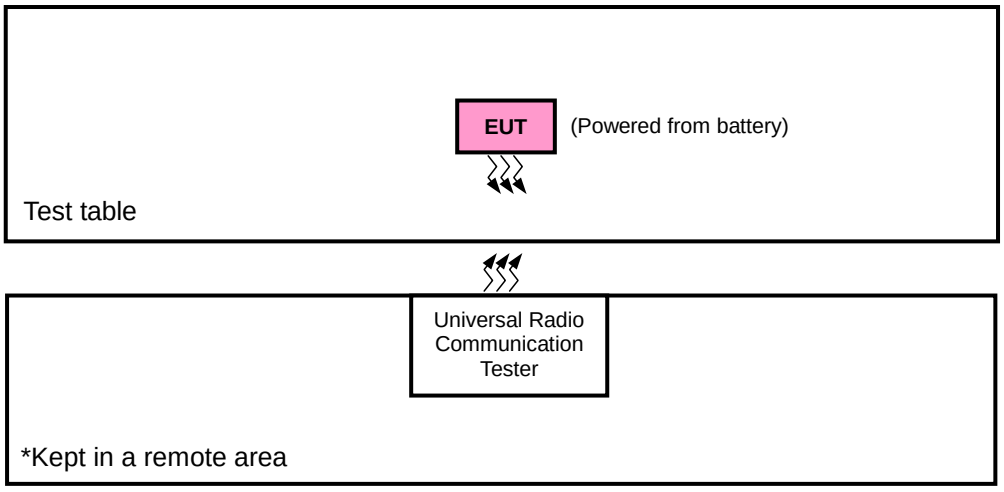
#### Tset Mode A




#### Tset Mode B



**FOR E.R.P. 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.

| NO. | PRODUCT | BRAND | MODEL NO. | SERIAL NO. | FCC ID |
|---|---|---|---|---|---|
| 1 | Earphone | Merry | HS S250 | NA | NA |
| 2 | Inductive Cradle | Energizer | IC2B | NA | NA |

| NO. | SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS |
|---|---|
| 1 | NA |
| 2 | NA |

**NOTE:**

1. All power cords of the above support units are non shielded (1.8m).
2. Items 1-2 were provided by client.

## 3.4 TEST ITEM AND TEST CONFIGURATION

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports The worst case was found when positioned on Y-plane for ERP and X-axis for radiated emission. Following channel(s) was (were) selected for the final test as listed below:

| EUT CONFIGURE MODE | DESCRIPTION |
|---|---|
| A | Normal Link |
| B | Wireless Charge |

### GSM MODE

| EUT CONFIGURE MODE | TEST ITEM | AVAILABLE CHANNEL | TESTED CHANNEL | MODE |
|---|---|---|---|---|
| A | ERP | 128 to 251 | 128, 189, 251 | GSM, EDGE |
| A | FREQUENCY STABILITY | 128 to 251 | 189 | GSM, EDGE |
| A | OCCUPIED BANDWIDTH | 128 to 251 | 128, 189, 251 | GSM, EDGE |
| A | BAND EDGE | 128 to 251 | 128, 251 | GSM, EDGE |
| A | CONDCUDETED EMISSION | 128 to 251 | 189 | GSM |
| A | RADIATED EMISSION | 128 to 251 | 189 | GSM, EDGE |
| B | RADIATED EMISSION | 128 to 251 | 189 | GSM |

### WCDMA MODE

| EUT CONFIGURE MODE | TEST ITEM | AVAILABLE CHANNEL | TESTED CHANNEL | MODE |
|---|---|---|---|---|
| A | ERP | 4132 to 4233 | 4132, 4182, 4233 | WCDMA |
| A | FREQUENCY STABILITY | 4132 to 4233 | 4182 | WCDMA |
| A | OCCUPIED BANDWIDTH | 4132 to 4233 | 4132, 4182, 4233 | WCDMA |
| A | BAND EDGE | 4132 to 4233 | 4132, 4233 | WCDMA |
| A | CONDCUDETED EMISSION | 4132 to 4233 | 4182 | WCDMA |
| A | RADIATED EMISSION | 4132 to 4233 | 4182 | WCDMA |

## CDMA MODE

| EUT CONFIGURE MODE | TEST ITEM | AVAILABLE CHANNEL | TESTED CHANNEL | MODE |
|---|---|---|---|---|
| A | ERP | 1013 to 777 | 1013, 384, 777 | 1xRTT |
| A | FREQUENCY STABILITY | 1013 to 777 | 384 | 1xRTT |
| A | OCCUPIED BANDWIDTH | 1013 to 777 | 1013, 384, 777 | 1xRTT |
| A | BAND EDGE | 1013 to 777 | 1013, 777 | 1xRTT |
| A | CONDCUDETED EMISSION | 1013 to 777 | 384 | 1xRTT |
| A | RADIATED EMISSION | 1013 to 777 | 384 | 1xRTT |

## TEST CONDITION:

| TEST ITEM | ENVIRONMENTAL CONDITIONS | INPUT POWER | TESTED BY |
|---|---|---|---|
| ERP | 26deg. C, 58%RH | 3.8Vdc | Phoenix Chen |
| FREQUENCY STABILITY | 26deg. C, 58%RH | 3.8Vdc | Phoenix Chen |
| OCCUPIED BANDWIDTH | 26deg. C, 58%RH | 3.8Vdc | Phoenix Chen |
| BAND EDGE | 26deg. C, 58%RH | 3.8Vdc | Phoenix Chen |
| CONDCUDETED EMISSION | 26deg. C, 58%RH | 3.8Vdc | Phoenix Chen |
| RADIATED EMISSION | 25deg. C, 65%RH | 120Vac, 60Hz | Kay Wu |

## 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.

# 4 TEST TYPES AND RESULTS

## 4.1 OUTPUT POWER MEASUREMENT

### 4.1.1 LIMITS OF OUTPUT POWER MEASUREMENT

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

### 4.1.2 TEST PROCEDURES

**EIRP / ERP MEASUREMENT:**

a. All measurements were done at low, middle and high operational frequency range. RBW and VBW is 1MHz for GSM, GPRS & EDGE, 5MHz for WCDMA and CDMA mode.

b. Substitution method is used for E.I.R.P 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

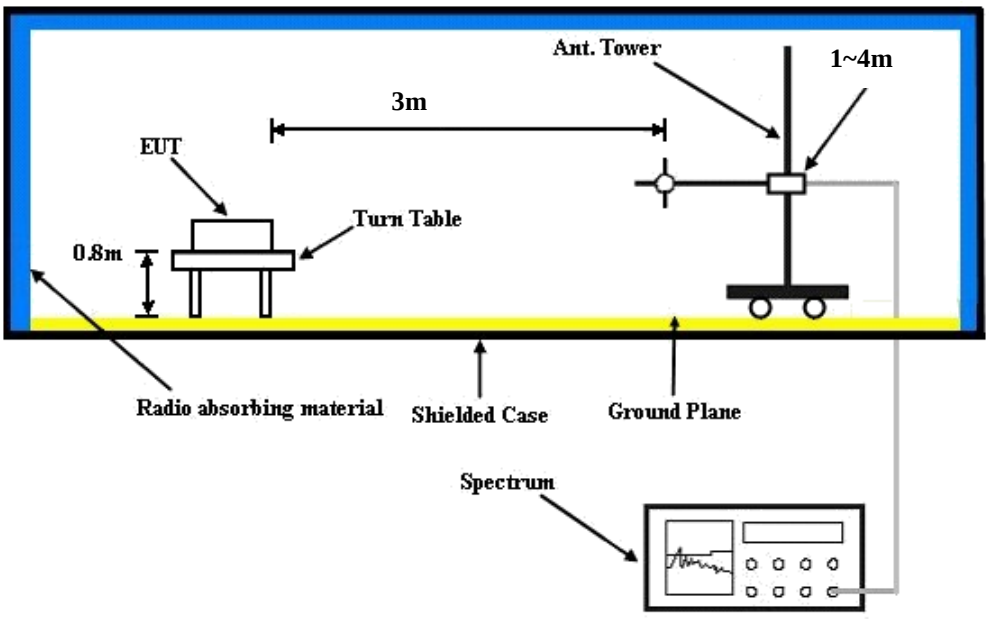
d. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.P.R power - 2.15dBi.

**CONDUCTED POWER MEASUREMENT:**

The EUT was set up for the maximum power with GSM, GPRS, EDGE, WCDMA & CDMA 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.

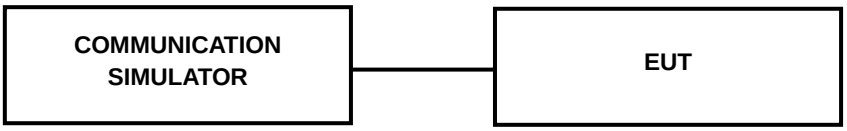
## 4.1.3 TEST SETUP

**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 | 189 | 251 |
| Frequency (MHz) | 824.2 | 836.4 | 848.8 |
| GSM (1 Uplink) | **33.68** | 33.11 | 33.20 |
| GPRS 8 (GMSK, 1 slot) | 33.63 | 33.06 | 33.15 |
| GPRS 10 (GMSK, 2 slot) | 32.34 | 31.77 | 31.86 |
| GPRS 11 (GMSK, 3 Uplink) | 31.16 | 30.59 | 30.68 |
| GPRS 12 (GMSK, 4 Uplink) | 29.17 | 28.60 | 28.69 |
| EDGE 8 (GMSK, 1 Uplink) | 33.52 | 32.95 | 33.04 |
| EDGE 10 (GMSK, 2 Uplink) | 32.32 | 31.75 | 31.84 |
| EDGE 11 (GMSK, 3 Uplink) | 31.12 | 30.55 | 30.64 |
| EDGE 12 (GMSK, 4 Uplink) | 29.12 | 28.55 | 28.64 |
| EDGE 8 (8PSK, 1 Uplink) | 26.23 | 25.66 | 25.75 |
| EDGE 10 (8PSK, 2 Uplink) | 25.94 | 25.37 | 25.46 |
| EDGE 11 (8PSK, 3 Uplink) | 25.73 | 25.16 | 25.25 |
| EDGE 12 (8PSK, 4 Uplink) | 24.06 | 23.49 | 23.58 |

| Band | WCDMA V | | |
|---|---|---|---|
| Channel | 4132 | 4182 | 4233 |
| Frequency (MHz) | 826.4 | 836.4 | 846.6 |
| RMC 12.2K | **24.10** | 23.81 | 23.87 |
| HSDPA Subtest-1 | 22.60 | 22.31 | 22.37 |
| HSDPA Subtest-2 | 22.55 | 22.26 | 22.32 |
| HSDPA Subtest-3 | 22.63 | 22.34 | 22.40 |
| HSDPA Subtest-4 | 22.54 | 22.25 | 22.31 |
| HSUPA Subtest-1 | 22.40 | 22.11 | 22.17 |
| HSUPA Subtest-2 | 21.01 | 20.72 | 20.78 |
| HSUPA Subtest-3 | 21.66 | 21.37 | 21.43 |
| HSUPA Subtest-4 | 22.18 | 21.89 | 21.95 |
| HSUPA Subtest-5 | 23.11 | 22.82 | 22.88 |

| Band | CDMA | | |
|---|---|---|---|
| Channel | 1013 | 384 | 777 |
| Frequency (MHz) | 824.70 | 836.52 | 848.31 |
| RC1+SO55 | 24.29 | 24.35 | 24.32 |
| RC3+SO55 | 24.38 | **24.47** | 24.44 |
| RC3+SO32(+ F-SCH) | 24.34 | 24.43 | 24.40 |
| RC3+SO32(+SCH) | 24.33 | 24.42 | 24.39 |
| RTAP 153.6 | 24.23 | 24.32 | 24.29 |
| RETAP 4096 | 24.22 | 24.31 | 24.28 |

## ERP POWER (dBm)

### GSM

| Plane | Channel | Frequency (MHz) | LVL (dBm) | Correction Factor(dB) | ERP(dBm) | ERP(mW) | Polarization (H/V) |
|---|---|---|---|---|---|---|---|
| Y | 128 | 824.2 | -3.76 | 32.62 | 26.71 | 468.81 | H |
| | 189 | 836.4 | -3.61 | 32.52 | 26.76 | 474.24 | H |
| | 251 | 848.8 | -3.86 | 32.65 | 26.64 | 461.32 | H |
| | 128 | 824.2 | -10.37 | 32.76 | 20.24 | 105.68 | V |
| | 189 | 836.4 | -9.90 | 32.39 | 20.34 | 108.14 | V |
| | 251 | 848.8 | -10.12 | 32.54 | 20.27 | 106.41 | V |

### EDGE

| Plane | Channel | Frequency (MHz) | LVL (dBm) | Correction Factor(dB) | ERP(dBm) | ERP(mW) | Polarization (H/V) |
|---|---|---|---|---|---|---|---|
| Y | 128 | 824.2 | -10.86 | 32.62 | 19.61 | 91.41 | H |
| | 189 | 836.4 | -10.43 | 32.52 | 19.94 | 98.63 | H |
| | 251 | 848.8 | -11.41 | 32.65 | 19.09 | 81.10 | H |
| | 128 | 824.2 | -17.54 | 32.76 | 13.07 | 20.28 | V |
| | 189 | 836.4 | -16.92 | 32.39 | 13.32 | 21.48 | V |
| | 251 | 848.8 | -16.86 | 32.54 | 13.53 | 22.54 | V |

### WCDMA

| Plane | Channel | Frequency (MHz) | LVL (dBm) | Correction Factor(dB) | ERP(dBm) | ERP(mW) | Polarization (H/V) |
|---|---|---|---|---|---|---|---|
| Y | 4132 | 826.4 | -13.25 | 32.62 | 17.22 | 52.72 | H |
| | 4182 | 836.4 | -12.71 | 32.52 | 17.66 | 58.34 | H |
| | 4233 | 846.6 | -13.38 | 32.65 | 17.12 | 51.52 | H |
| | 4132 | 826.4 | -19.08 | 32.76 | 11.53 | 14.22 | V |
| | 4182 | 836.4 | -19.11 | 32.39 | 11.13 | 12.97 | V |
| | 4233 | 846.6 | -18.85 | 32.54 | 11.54 | 14.26 | V |

## CDMA

| Plane | Channel | Frequency (MHz) | LVL (dBm) | Correction Factor(dB) | ERP(dBm) | ERP(mW) | Polarization (H/V) |
|---|---|---|---|---|---|---|---|
| Y | 1013 | 824.7 | -12.07 | 32.62 | 18.40 | 69.18 | H |
| | 384 | 836.52 | -11.68 | 32.52 | 18.69 | 73.96 | H |
| | 777 | 848.31 | -12.50 | 32.65 | 18.00 | 63.10 | H |
| | 1013 | 824.7 | -19.62 | 32.76 | 10.99 | 12.56 | V |
| | 384 | 836.52 | -18.89 | 32.39 | 11.35 | 13.65 | V |
| | 777 | 848.31 | -19.59 | 32.54 | 10.80 | 12.02 | V |

## 4.2 FREQUENCY STABILITY MEASUREMENT

### 4.2.1 LIMITS OF FREQUENCY STABILIITY MEASUREMENT

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

### 4.2.2 TEST PROCEDURE

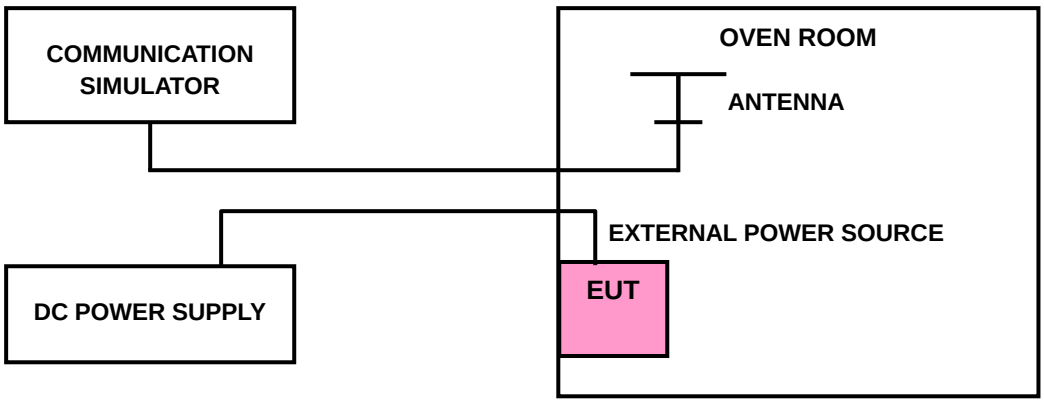
a. Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.

b. EUT is connected the external power supply to control the DC input power. The test voltage range is from minimum to maximum working voltage. Each step shall be record the frequency error rate.

c. The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the ±0.5℃ during the measurement testing. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.

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

### 4.2.3 TEST SETUP



## 4.2.4 TEST RESULTS

**FREQUENCY ERROR VS. VOLTAGE**

| VOLTAGE (Volts) | FREQUENCY ERROR (ppm) | | | | LIMIT (ppm) |
|---|---|---|---|---|---|
| | GPRS | EDGE | WCDMA | CDMA | |
| 3.8 | 0.006 | 0.035 | 0.002 | -0.01 | 2.5 |
| 3.6 | 0.004 | 0.029 | 0.002 | -0.01 | 2.5 |
| 4.35 | 0.006 | 0.029 | 0.002 | -0.01 | 2.5 |

**NOTE:** The applicant defined the normal working voltage of the battery is from 3.6Vdc to 4.35Vdc.

**FREQUENCY ERROR vs. TEMPERATURE.**

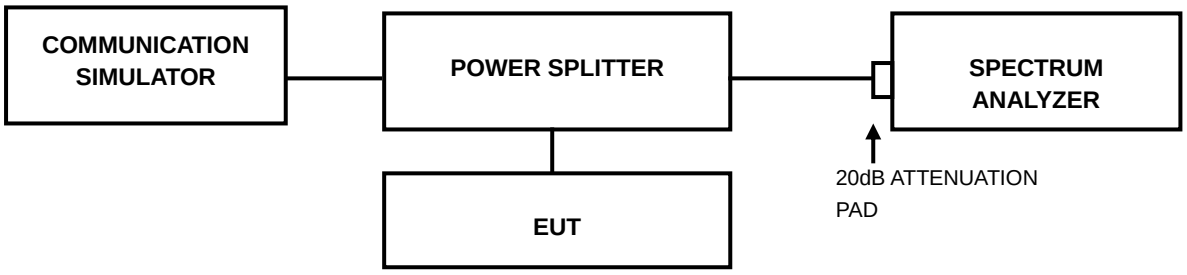
| TEMP. (℃) | FREQUENCY ERROR (ppm) | | | | LIMIT (ppm) |
|---|---|---|---|---|---|
| | GPRS | EDGE | WCDMA | CDMA | |
| -30 | 0.006 | 0.026 | 0.003 | -0.009 | 2.5 |
| -20 | 0.005 | 0.024 | 0.002 | -0.008 | 2.5 |
| -10 | 0.006 | 0.026 | 0.002 | -0.009 | 2.5 |
| 0 | -0.005 | 0.034 | 0.002 | -0.010 | 2.5 |
| 10 | -0.005 | 0.035 | 0.002 | -0.008 | 2.5 |
| 20 | 0.004 | 0.035 | -0.003 | -0.008 | 2.5 |
| 30 | 0.005 | 0.034 | 0.002 | -0.008 | 2.5 |
| 40 | 0.005 | 0.027 | 0.002 | -0.009 | 2.5 |
| 50 | -0.005 | 0.031 | 0.002 | -0.009 | 2.5 |
| 60 | 0.006 | 0.032 | 0.003 | -0.009 | 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



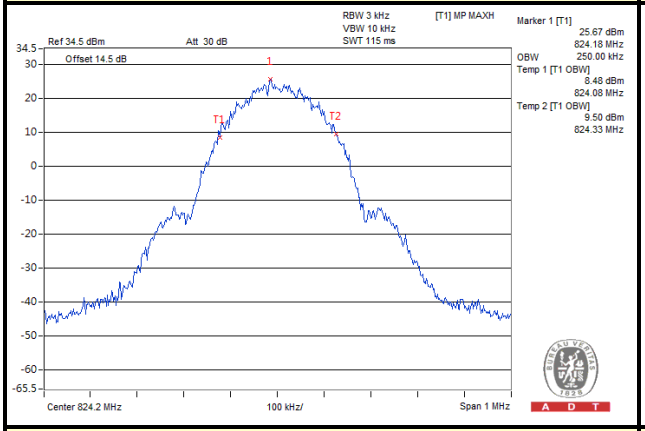
## 4.3.3 TEST RESULTS

| CHANNEL | FREQUENCY (MHz) | 99% OCCUPIED BANDWIDTH (kHz) | | CHANNEL | FREQUENCY (MHz) | 99% OCCUPIED BANDWIDTH (MHz) |
|---|---|---|---|---|---|---|
| | | GPRS | EDGE | | | WCDMA |
| 128 | 824.2 | 250.00 | 246.00 | 4132 | 826.4 | 4.15 |
| 189 | 836.4 | 248.00 | 240.00 | 4182 | 836.4 | 4.16 |
| 251 | 848.8 | 246.00 | 246.00 | 4233 | 846.6 | 4.15 |

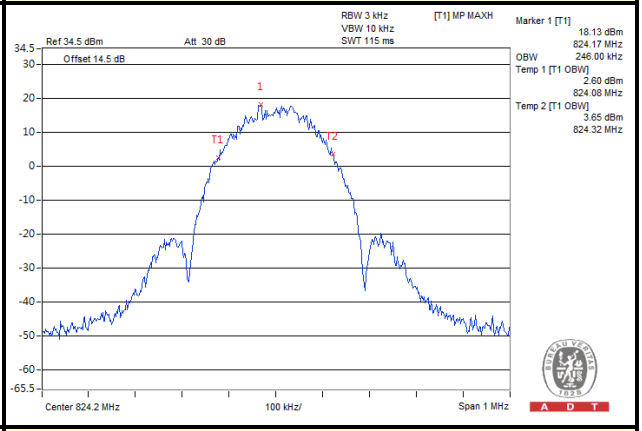
| CHANNEL | FREQUENCY (MHz) | 99% OCCUPIED BANDWIDTH (MHz) |
|---|---|---|
| | | CDMA |
| 1013 | 824.70 | 1.275 |
| 384 | 836.52 | 1.276 |
| 777 | 848.31 | 1.271 |

**SPECTRUM PLOT OF WORST VALUE**

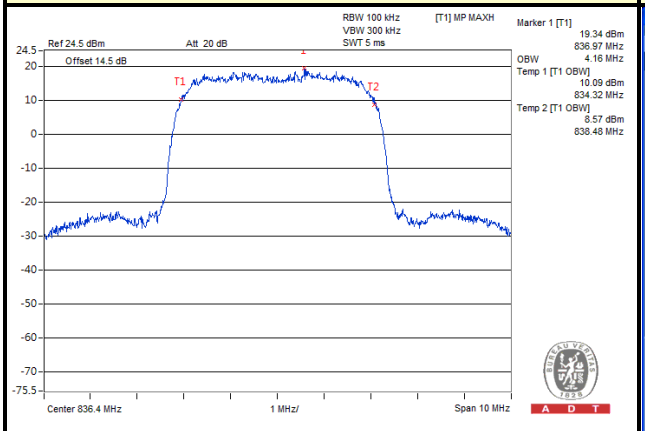
**GSM**



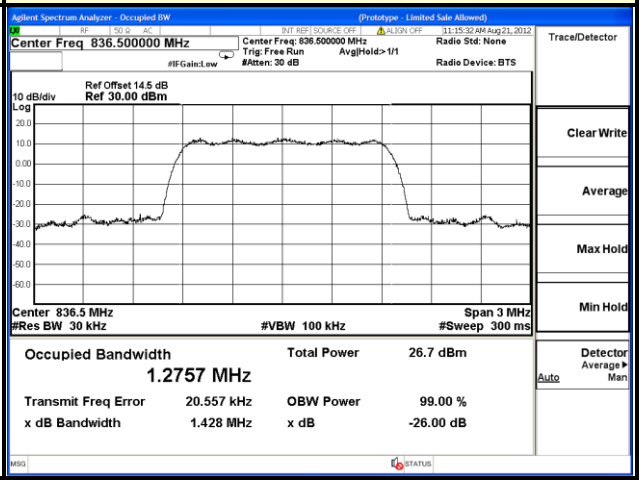

**EDGE**




**WCDMA**




**CDMA**

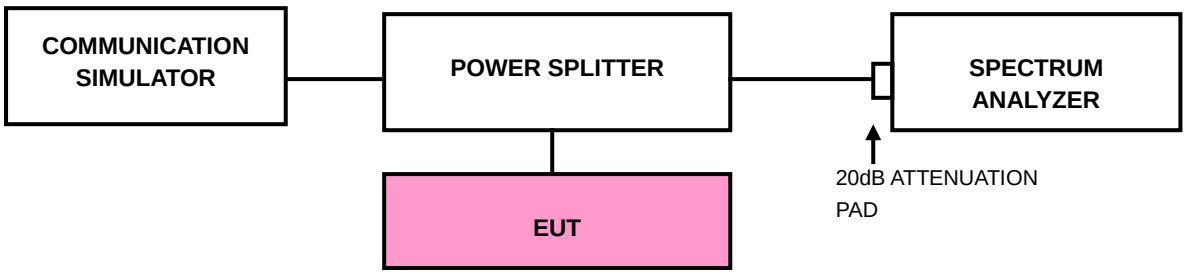


## 4.4 BAND EDGE MEASUREMENT

### 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

a. All measurements were done at low and high operational frequency range.

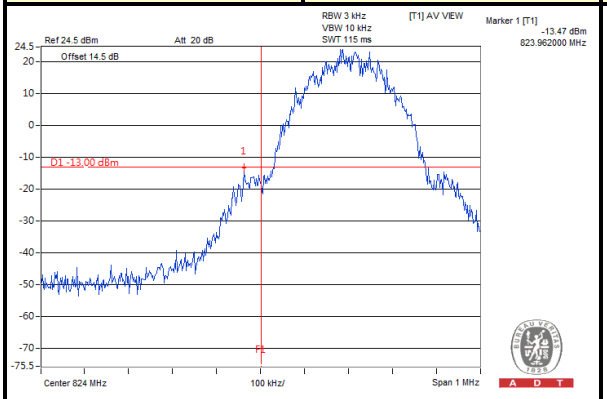
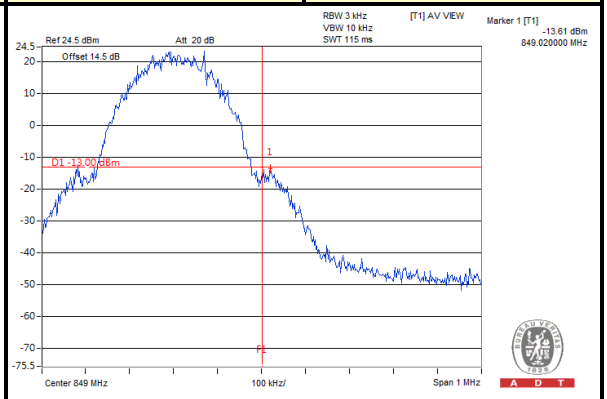
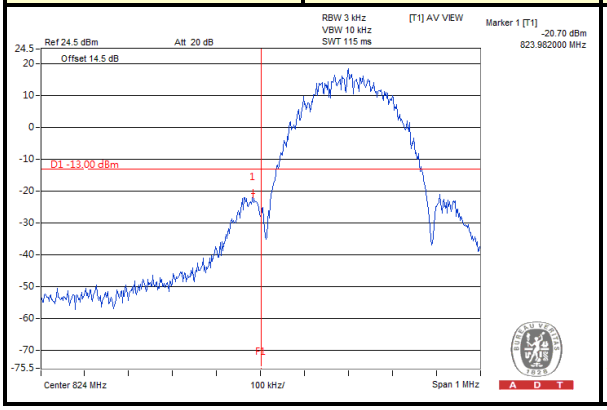
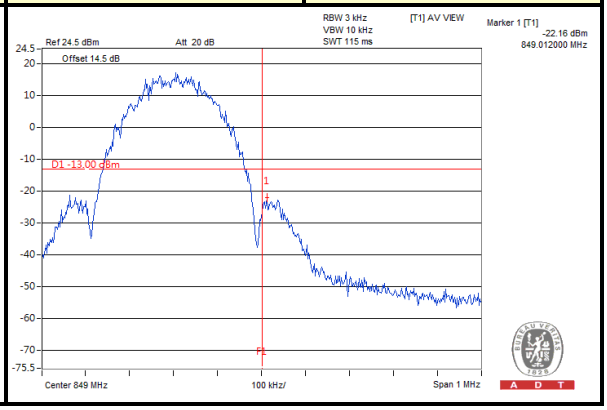
b. The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 3kHz and VB of the spectrum is 10kHz (GSM/GPRS/ EDGE).

c. The center frequency of spectrum is the band edge frequency and span is 5MHz. RB of the spectrum is 100kHz and VB of the spectrum is 300kHz (WCDMA).

d. The center frequency of spectrum is the band edge frequency and span is 2MHz. RB of the spectrum is 13kHz and VB of the spectrum is 51kHz (WCDMA).

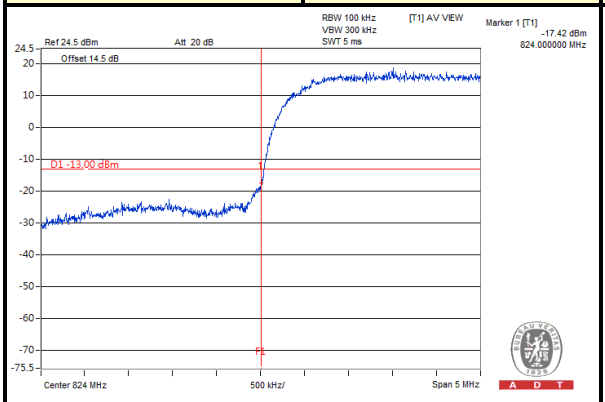
e. Record the max trace plot into the test report.

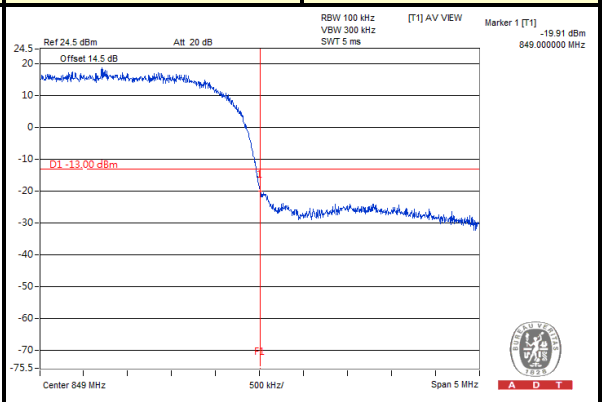
## 4.4.4 TEST RESULTS

| GSM | | | |
|---|---|---|---|
| CHANNEL | 128 | CHANNEL | 251 |
|  | |  | |
| **EDGE** | | | |
| CHANNEL | 128 | CHANNEL | 251 |
|  | |  | |

## WCDMA

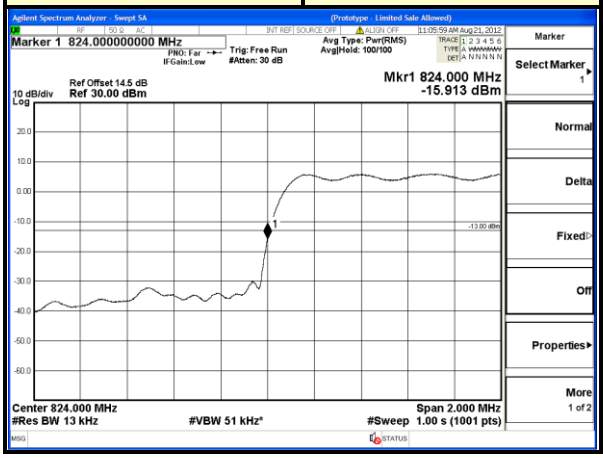
| CHANNEL | 4132 | CHANNEL | 4233 |
|---|---|---|---|

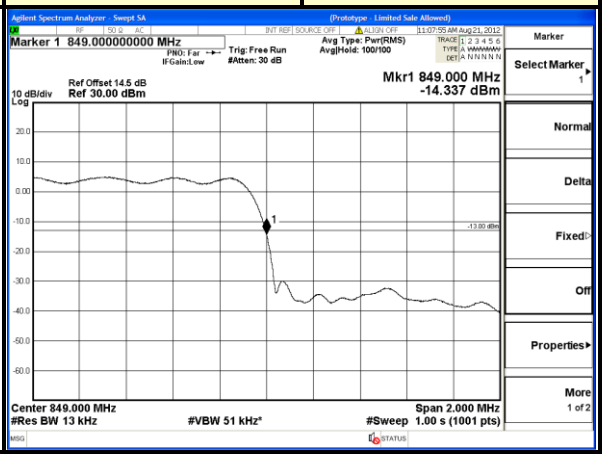



## CDMA

| CHANNEL | 1013 | CHANNEL | 777 |
|---|---|---|---|



## 4.5 CONDUCTED SPURIOUS EMISSIONS

### 4.5.1 LIMITS OF CONDUCTED SPURIOUS EMISSIONS MEASUREMENT

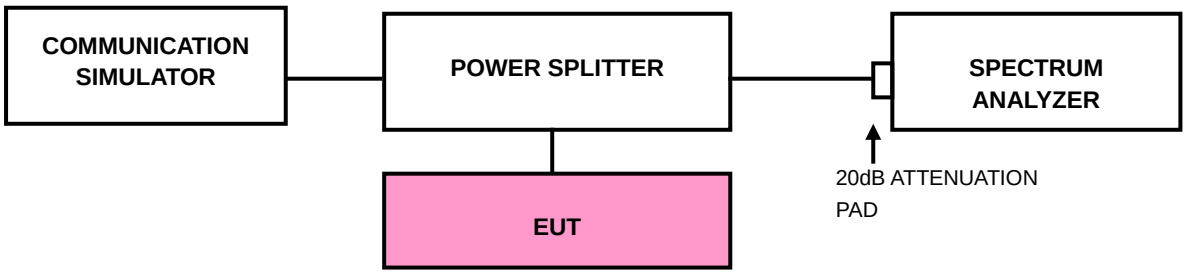
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. The emission limit equal to –13dBm.

### 4.5.2 TEST PROCEDURE

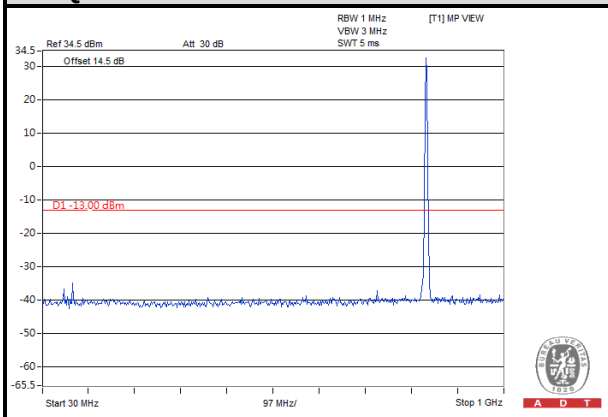
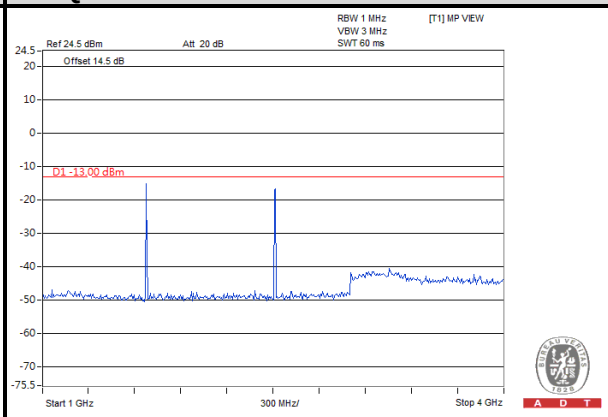
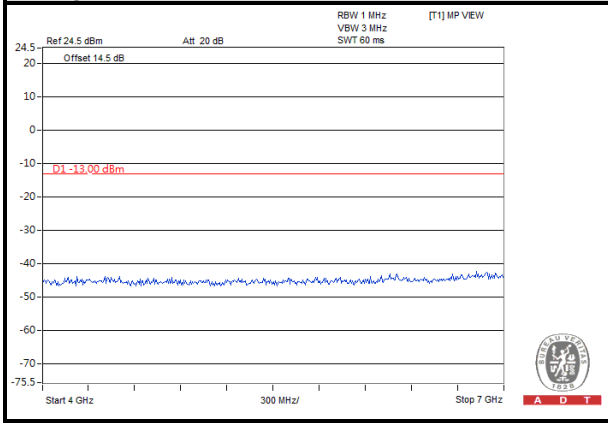
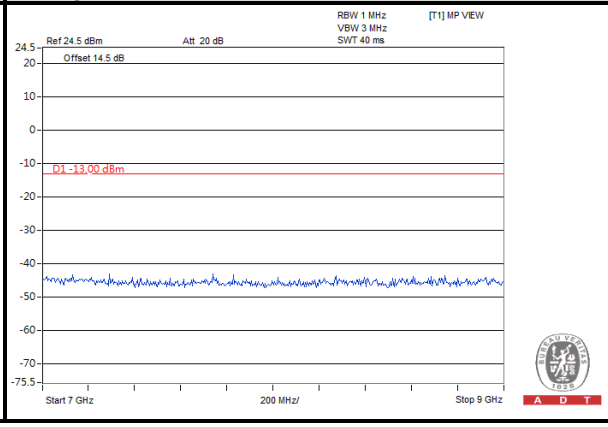
a. The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range.

b. Measuring frequency range is from 30 MHz to 9GHz. 10dB attenuation pad is connected with spectrum. RBW=1MHz and VBW=3MHz is used for conducted emission measurement.

### 4.5.3 TEST SETUP



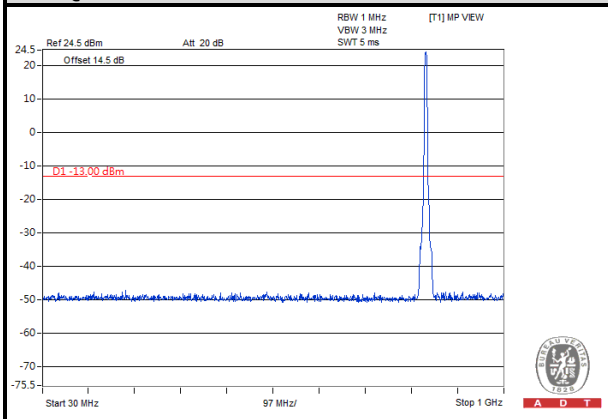
## 4.5.4 TEST RESULTS

| GSM | |
|---|---|
| CHANNEL 189 | |
| FREQUENCY RANGE : 30MHz~1GHz | FREQUENCY RANGE : 1GHz~4GHz |
|  |  |
| FREQUENCY RANGE : 4GHz~7GHz | FREQUENCY RANGE : 7GHz~9GHz |
|  |  |

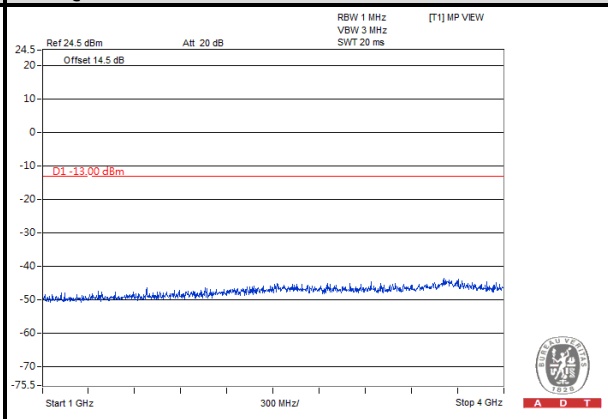
## WCDMA

## CHANNEL 4182

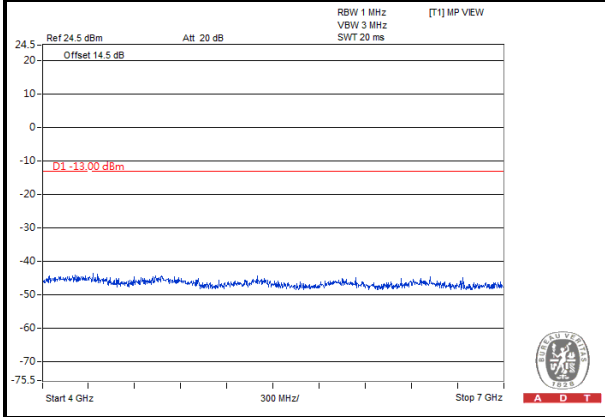
### FREQUENCY RANGE : 30MHz~1GHz



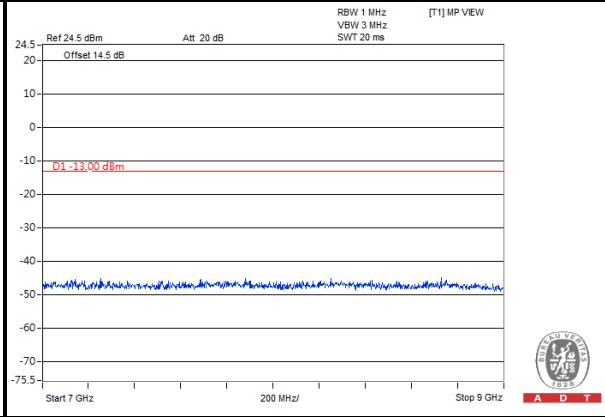

### FREQUENCY RANGE : 1GHz~4GHz




### FREQUENCY RANGE : 4GHz~7GHz



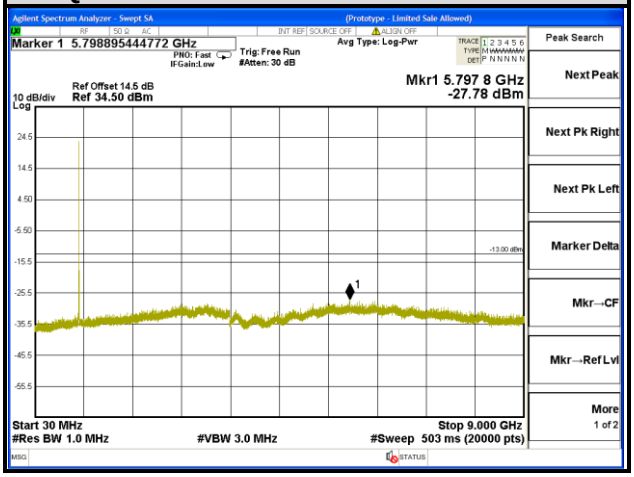

### FREQUENCY RANGE : 7GHz~9GHz




## CDMA

## CHANNEL 384

### FREQUENCY RANGE : 30MHz~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 –13dBm.

### 4.6.2 TEST PROCEDURES

a. Substitution method is used for E.I.R.P 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. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.

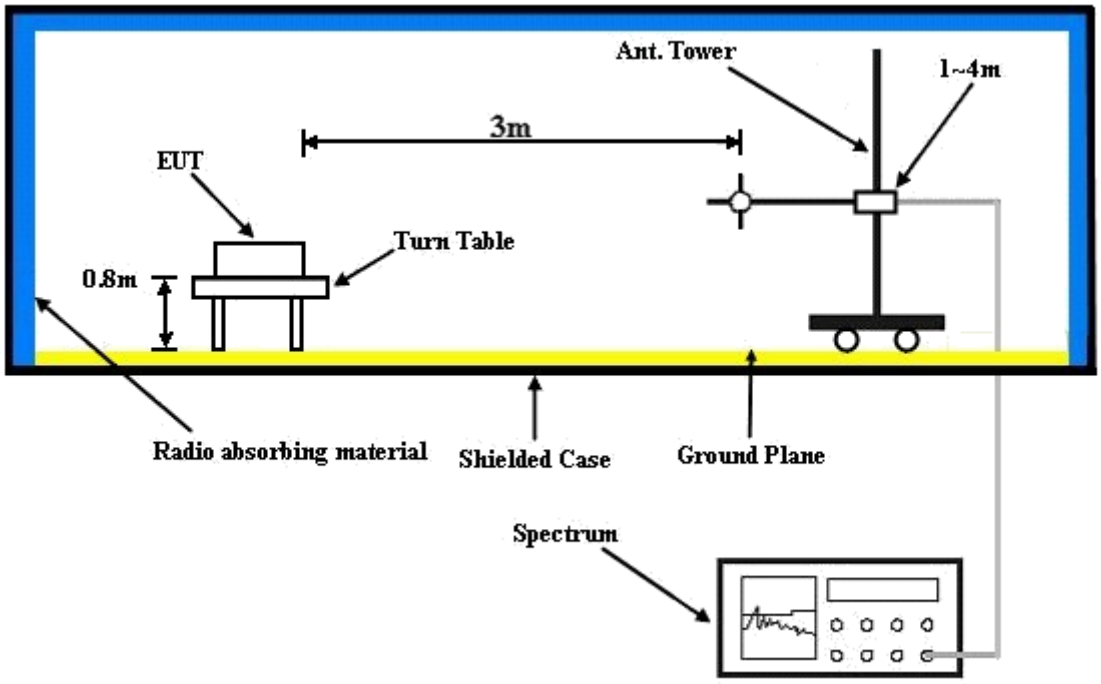
d. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.P.R power - 2.15dBi.

**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



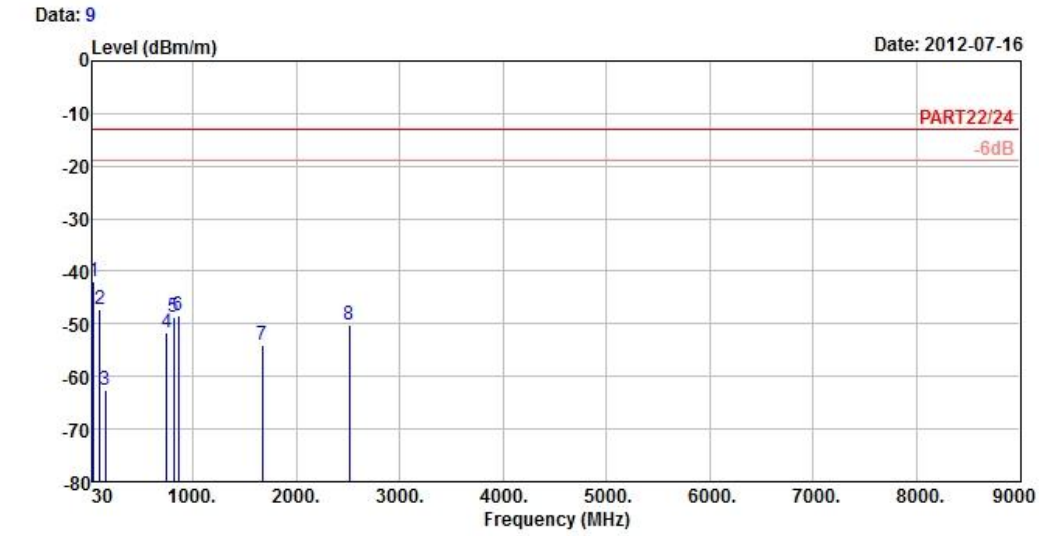

For the actual test configuration, please refer to the attached file (Test Setup Photo).

## 4.6.5 TEST RESULTS

**TEST MODE A**

**GSM:**

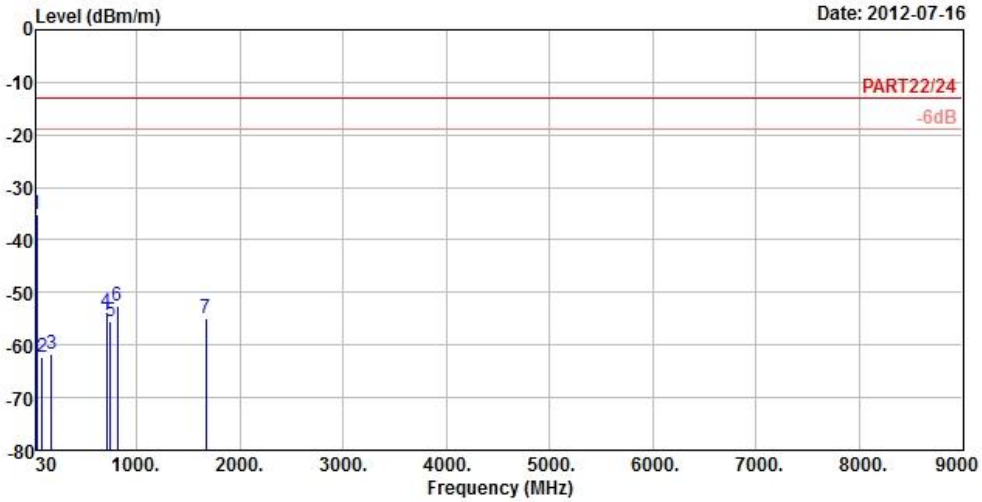
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch




Site : 966 Chamber 5
Condition : PART22/24 3m EIRP_RSE_1G~19G_3 HORIZONTAL
Brand/Model: PL83200
Remark : GSM850 Link
Tested by : Kay Wu
Temprature : 25℃
Humidity : 65%
Plane : X

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBm/m | dBm | dBm/m | dB | dB/m | |
| 1 pp | 38.91 | -41.83 | -40.09 | -13.00 | -28.83 | -1.74 | Peak |
| 2 | 100.20 | -47.18 | -36.78 | -13.00 | -34.18 | -10.40 | Peak |
| 3 | 155.55 | -62.60 | -56.16 | -13.00 | -49.60 | -6.44 | Peak |
| 4 | 748.70 | -51.72 | -53.50 | -13.00 | -38.72 | 1.78 | Peak |
| 5 | 813.10 | -48.80 | -51.00 | -13.00 | -35.80 | 2.20 | Peak |
| 6 | 859.30 | -48.33 | -50.80 | -13.00 | -35.33 | 2.47 | Peak |
| 7 | 1672.80 | -53.99 | -41.17 | -13.00 | -40.99 | -12.82 | Peak |
| 8 | 2509.20 | -50.14 | -40.97 | -13.00 | -37.14 | -9.17 | Peak |

Data: 10




Site : 966 Chamber 5
Condition : PART22/24 3m EIRP_RSE_1G~19G_3 VERTICAL
Brand/Model: PL83200
Remark : GSM850 Link
Tested by : Kay Wu
Temprature : 25℃
Humidity : 65%
Plane : X

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBm/m | dBm | dBm/m | dB | dB/m | |
| 1 pp | 30.27 | -35.15 | -36.22 | -13.00 | -22.15 | 1.07 | Peak |
| 2 | 83.19 | -62.39 | -52.03 | -13.00 | -49.39 | -10.36 | Peak |
| 3 | 173.37 | -61.72 | -54.95 | -13.00 | -48.72 | -6.77 | Peak |
| 4 | 710.20 | -53.71 | -55.23 | -13.00 | -40.71 | 1.52 | Peak |
| 5 | 748.70 | -55.38 | -57.16 | -13.00 | -42.38 | 1.78 | Peak |
| 6 | 813.80 | -52.50 | -54.71 | -13.00 | -39.50 | 2.21 | Peak |
| 7 | 1672.80 | -54.85 | -42.03 | -13.00 | -41.85 | -12.82 | Peak |

**EDGE:**

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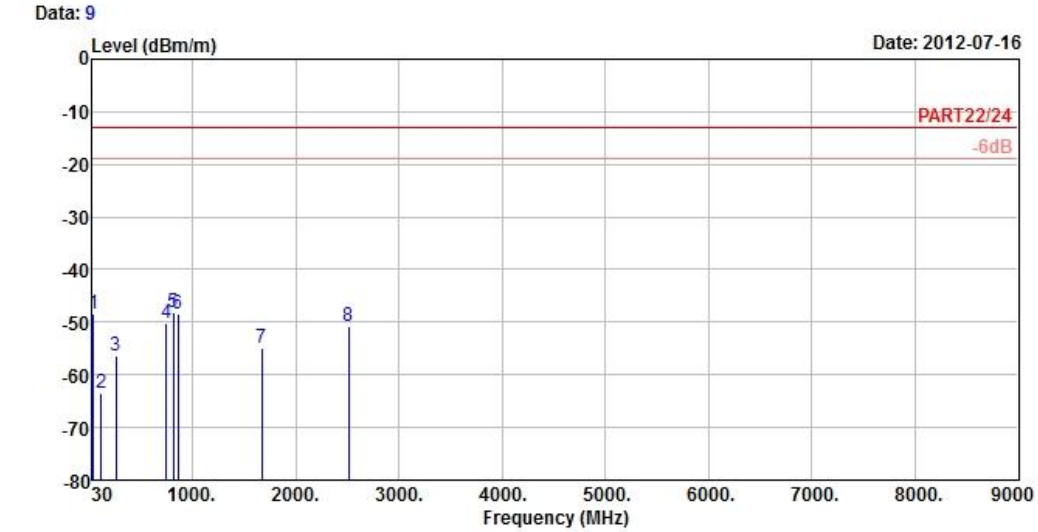
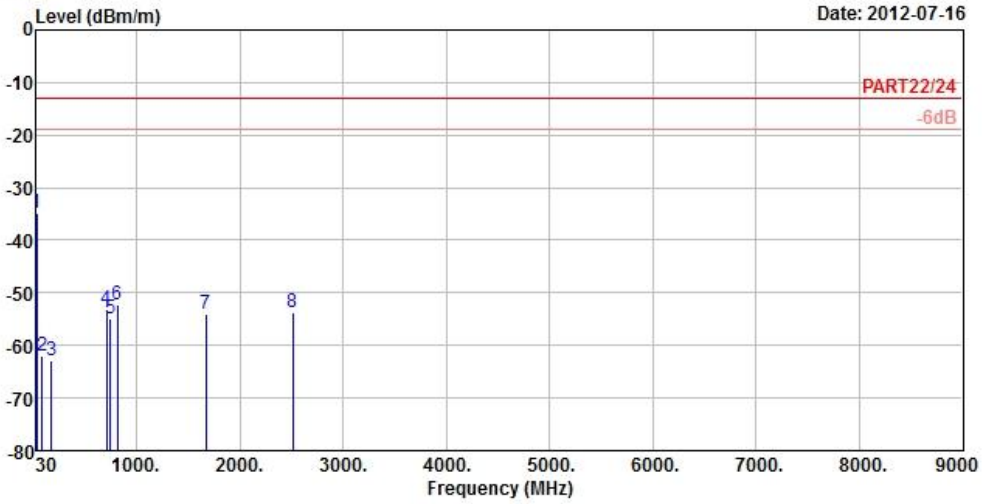



Site : 966 Chamber 5
Condition : PART22/24 3m EIRP_RSE_1G~19G_3 HORIZONTAL
Brand/Model: PL83200
Remark : EDGE850 Link
Tested by : Kay Wu
Temprature : 25℃
Humidity : 65%
Plane : X

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBm/m | dBm | dBm/m | dB | dB/m | |
| 1 | 38.91 | -48.29 | -46.55 | -13.00 | -35.29 | -1.74 | Peak |
| 2 | 114.51 | -63.52 | -52.81 | -13.00 | -50.52 | -10.71 | Peak |
| 3 | 257.34 | -56.40 | -50.62 | -13.00 | -43.40 | -5.78 | Peak |
| 4 | 748.70 | -50.04 | -51.82 | -13.00 | -37.04 | 1.78 | Peak |
| 5 pp | 813.10 | -48.21 | -50.41 | -13.00 | -35.21 | 2.20 | Peak |
| 6 | 860.00 | -48.55 | -51.02 | -13.00 | -35.55 | 2.47 | Peak |
| 7 | 1672.80 | -55.05 | -42.23 | -13.00 | -42.05 | -12.82 | Peak |
| 8 | 2509.20 | -50.63 | -41.46 | -13.00 | -37.63 | -9.17 | Peak |

Data: 10




Site : 966 Chamber 5
Condition : PART22/24 3m EIRP_RSE_1G~19G_3 VERTICAL
Brand/Model: PL83200
Remark : EDGE850 Link
Tested by : Kay Wu
Temprature : 25℃
Humidity : 65%
Plane : X

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBm/m | dBm | dBm/m | dB | dB/m | |
| 1 pp | 31.35 | -34.84 | -35.18 | -13.00 | -21.84 | 0.34 | Peak |
| 2 | 83.73 | -61.98 | -51.62 | -13.00 | -48.98 | -10.36 | Peak |
| 3 | 174.72 | -62.83 | -56.04 | -13.00 | -49.83 | -6.79 | Peak |
| 4 | 710.20 | -53.01 | -54.53 | -13.00 | -40.01 | 1.52 | Peak |
| 5 | 748.70 | -54.85 | -56.63 | -13.00 | -41.85 | 1.78 | Peak |
| 6 | 813.80 | -52.32 | -54.53 | -13.00 | -39.32 | 2.21 | Peak |
| 7 | 1672.80 | -54.03 | -41.21 | -13.00 | -41.03 | -12.82 | Peak |
| 8 | 2509.20 | -53.62 | -44.45 | -13.00 | -40.62 | -9.17 | Peak |

**WCDMA:**

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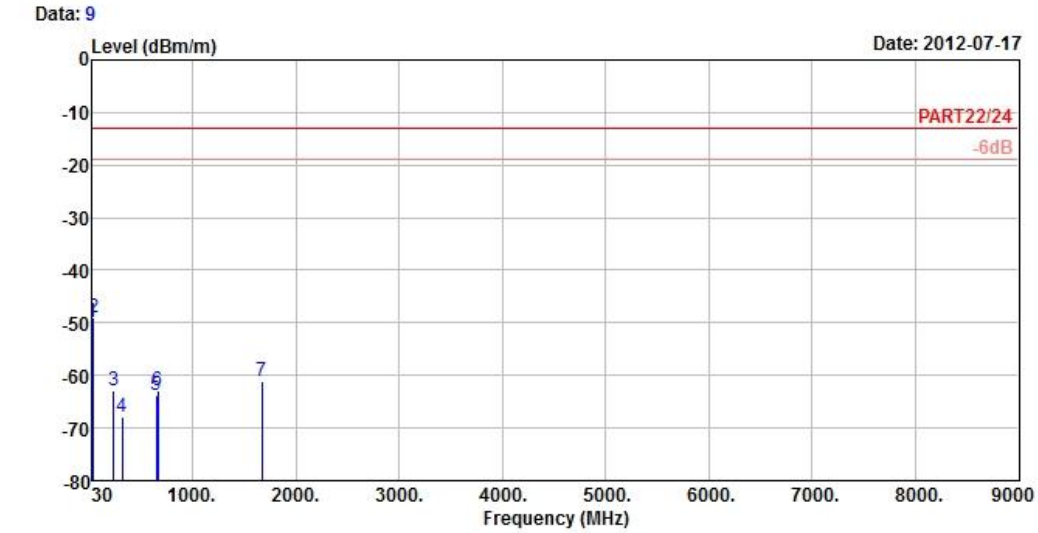
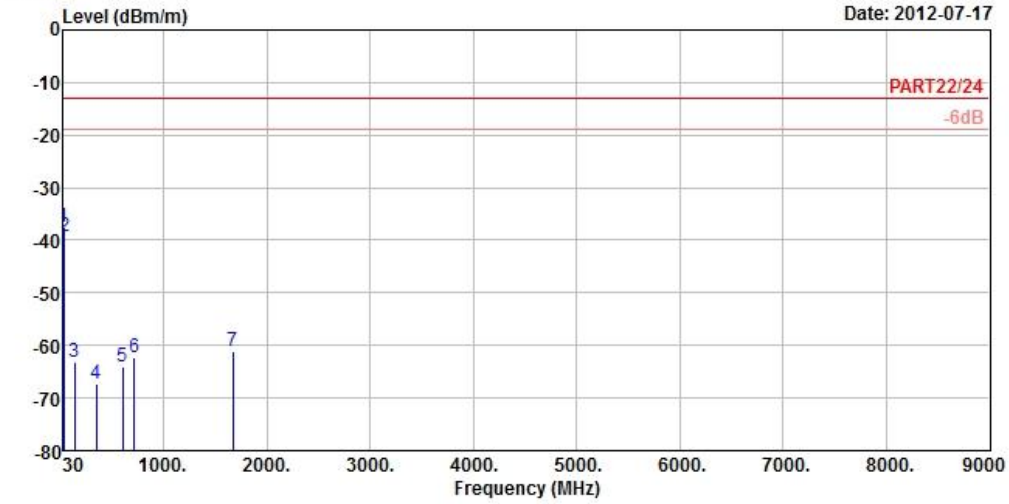



Site : 966 Chamber 5
Condition : PART22/24 3m EIRP_RSE_1G~19G_3 HORIZONTAL
Brand/Model: PL83200
Remark : BAND V Link
Tested by : Kay Wu
Temprature : 25℃
Humidity : 65%
Plane : X

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBm/m | dBm | dBm/m | dB | dB/m | |
| 1 | 30.00 | -49.79 | -50.86 | -13.00 | -36.79 | 1.07 | Peak |
| 2 pp | 38.91 | -48.88 | -47.14 | -13.00 | -35.88 | -1.74 | Peak |
| 3 | 238.17 | -62.78 | -56.58 | -13.00 | -49.78 | -6.20 | Peak |
| 4 | 316.10 | -67.96 | -61.70 | -13.00 | -54.96 | -6.26 | Peak |
| 5 | 646.50 | -63.90 | -64.39 | -13.00 | -50.90 | 0.49 | Peak |
| 6 | 663.30 | -62.83 | -63.62 | -13.00 | -49.83 | 0.79 | Peak |
| 7 | 1672.80 | -60.97 | -48.15 | -13.00 | -47.97 | -12.82 | Peak |

Data: 10

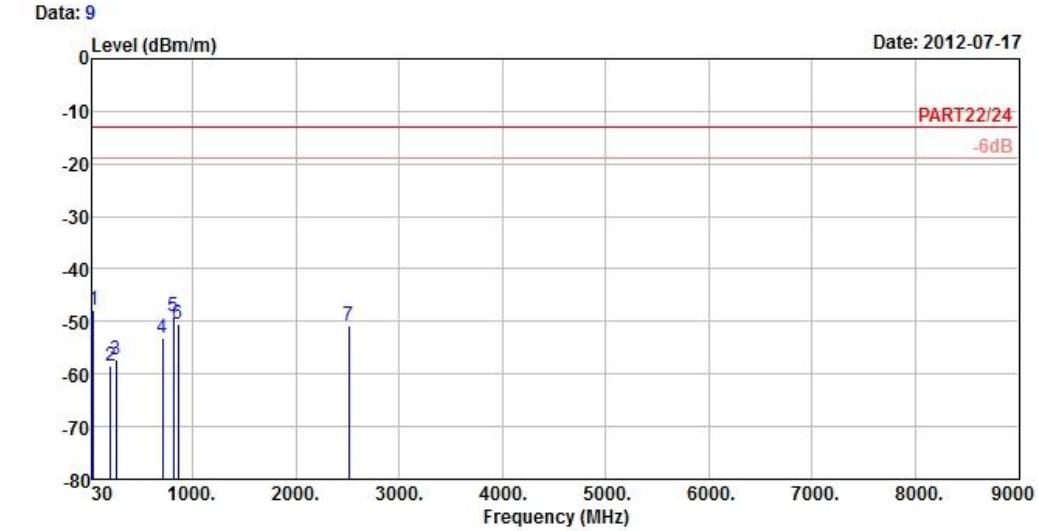



Site : 966 Chamber 5
Condition : PART22/24 3m EIRP_RSE_1G~19G_3 VERTICAL
Brand/Model: PL83200
Remark : BAND V Link
Tested by : Kay Wu
Temprature : 25℃
Humidity : 65%
Plane : X

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBm/m | dBm | dBm/m | dB | dB/m | |
| 1 pp | 30.81 | -37.59 | -37.93 | -13.00 | -24.59 | 0.34 | Peak |
| 2 | 38.91 | -39.25 | -37.51 | -13.00 | -26.25 | -1.74 | Peak |
| 3 | 140.97 | -63.13 | -57.40 | -13.00 | -50.13 | -5.73 | Peak |
| 4 | 350.40 | -67.27 | -61.26 | -13.00 | -54.27 | -6.01 | Peak |
| 5 | 601.70 | -64.00 | -63.67 | -13.00 | -51.00 | -0.33 | Peak |
| 6 | 719.30 | -62.20 | -63.78 | -13.00 | -49.20 | 1.58 | Peak |
| 7 | 1672.80 | -61.21 | -48.39 | -13.00 | -48.21 | -12.82 | Peak |

## CDMA

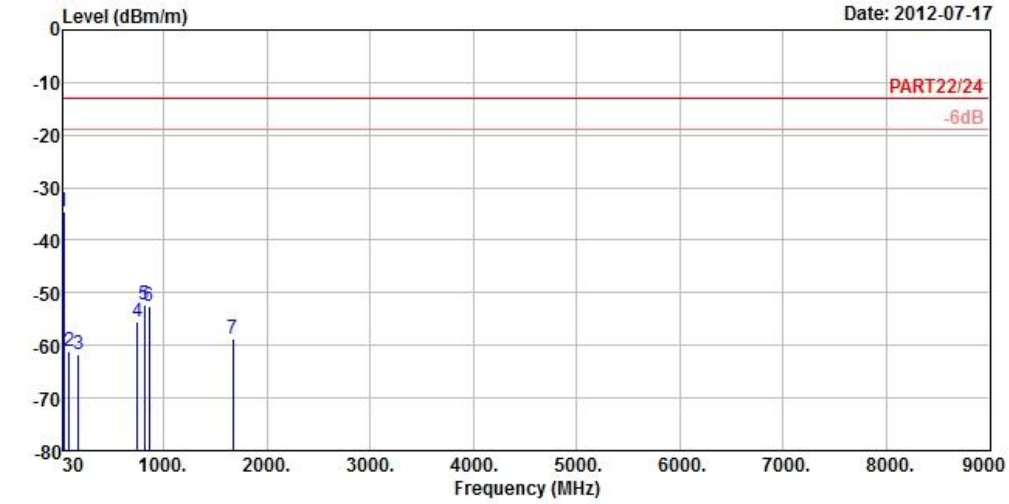
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch




Site : 966 Chamber 5
Condition : PART22/24 3m EIRP_RSE_1G~19G_3 HORIZONTAL
Brand/Model: PL83200
Remark : 1XRTT850 Link
Tested by : Kay Wu
Temprature : 25℃
Humidity : 65%
Plane : X

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBm/m | dBm | dBm/m | dB | dB/m | |
| 1 pp | 39.45 | -47.73 | -46.20 | -13.00 | -34.73 | -1.53 | Peak |
| 2 | 204.96 | -58.58 | -50.85 | -13.00 | -45.58 | -7.73 | Peak |
| 3 | 258.69 | -57.28 | -51.48 | -13.00 | -44.28 | -5.80 | Peak |
| 4 | 710.20 | -53.01 | -54.53 | -13.00 | -40.01 | 1.52 | Peak |
| 5 | 813.10 | -49.10 | -51.30 | -13.00 | -36.10 | 2.20 | Peak |
| 6 | 859.30 | -50.55 | -53.02 | -13.00 | -37.55 | 2.47 | Peak |
| 7 | 2509.20 | -50.83 | -41.66 | -13.00 | -37.83 | -9.17 | Peak |

Data: 10



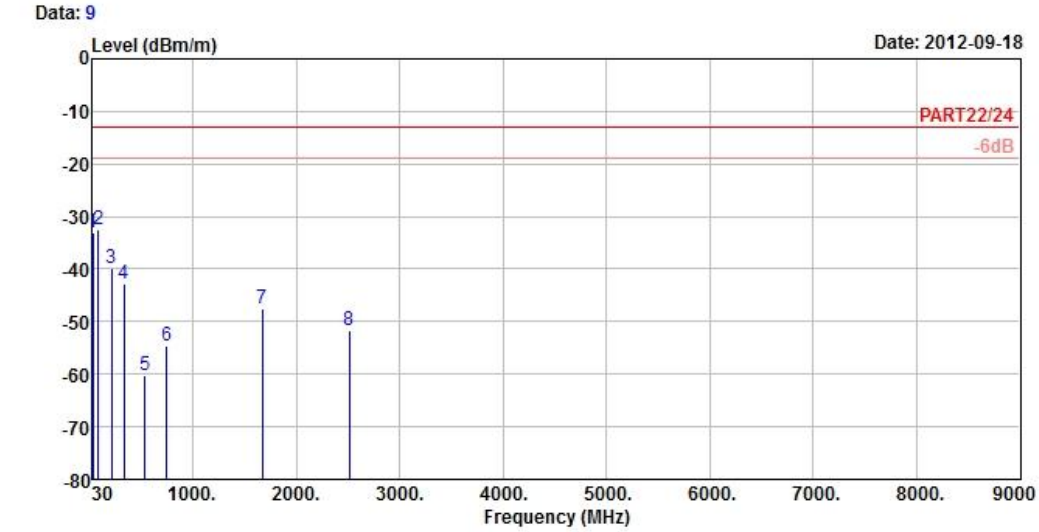

Site : 966 Chamber 5
Condition : PART22/24 3m EIRP_RSE_1G~19G_3 VERTICAL
Brand/Model: PL83200
Remark : 1XRTT850 Link
Tested by : Kay Wu
Temprature : 25℃
Humidity : 65%
Plane : X

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBm/m | dBm | dBm/m | dB | dB/m | |
| 1 pp | 31.62 | -34.67 | -34.28 | -13.00 | -21.67 | -0.39 | Peak |
| 2 | 82.92 | -61.22 | -50.86 | -13.00 | -48.22 | -10.36 | Peak |
| 3 | 173.37 | -61.78 | -55.01 | -13.00 | -48.78 | -6.77 | Peak |
| 4 | 748.70 | -55.64 | -57.42 | -13.00 | -42.64 | 1.78 | Peak |
| 5 | 812.40 | -52.22 | -54.42 | -13.00 | -39.22 | 2.20 | Peak |
| 6 | 859.30 | -52.55 | -55.02 | -13.00 | -39.55 | 2.47 | Peak |
| 7 | 1672.80 | -58.85 | -46.03 | -13.00 | -45.85 | -12.82 | Peak |

## TEST MODE B

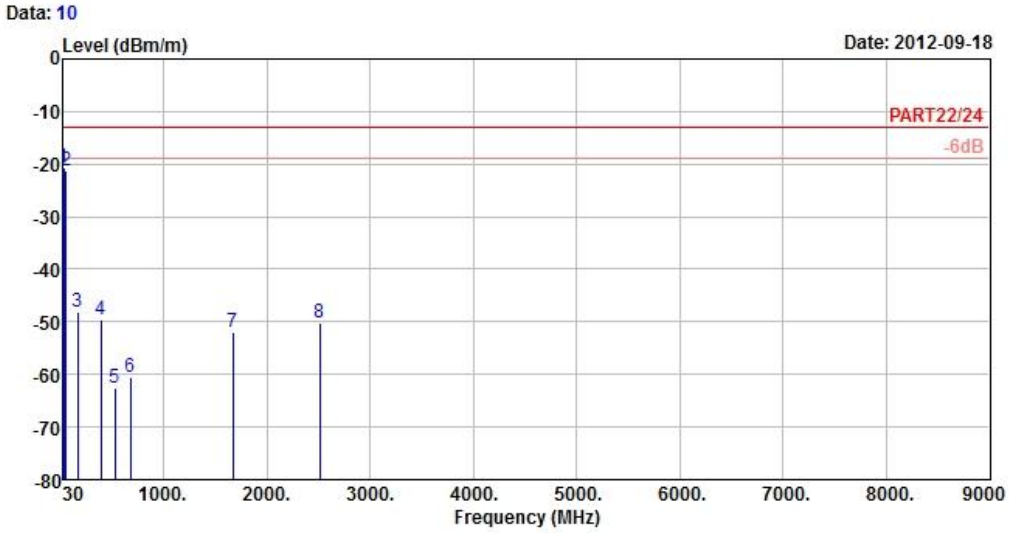
### GSM:

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch




Site : 966 Chamber 5
Condition : PART22/24 3m EIRP_RSE_1G~19G_3 HORIZONTAL
Brand/Model: PL83200
Remark : GSM850 Link
Tested by : Kay Wu
Temprature : 25℃
Humidity : 65%
Plane : GSM850(無線充電)

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBm/m | dBm | dBm/m | dB | dB/m | |
| 1 | 33.24 | -33.15 | -32.04 | -13.00 | -20.15 | -1.11 | Peak |
| 2 pp | 84.81 | -32.42 | -21.99 | -13.00 | -19.42 | -10.43 | Peak |
| 3 | 216.03 | -39.72 | -32.51 | -13.00 | -26.72 | -7.21 | Peak |
| 4 | 335.70 | -42.67 | -36.56 | -13.00 | -29.67 | -6.11 | Peak |
| 5 | 537.30 | -60.17 | -58.09 | -13.00 | -47.17 | -2.08 | Peak |
| 6 | 748.70 | -54.64 | -56.42 | -13.00 | -41.64 | 1.78 | Peak |
| 7 | 1672.80 | -47.40 | -34.58 | -13.00 | -34.40 | -12.82 | Peak |
| 8 | 2509.20 | -51.79 | -42.62 | -13.00 | -38.79 | -9.17 | Peak |




Site : 966 Chamber 5
Condition : PART22/24 3m EIRP_RSE_1G~19G_3 VERTICAL
Brand/Model: PL83200
Remark : GSM850 Link
Tested by : Kay Wu
Temprature : 25℃
Humidity : 65%
Plane : GSM850(無線充電)

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBm/m | dBm | dBm/m | dB | dB/m | |
| 1 pp | 32.97 | -20.57 | -19.46 | -13.00 | -7.57 | -1.11 | Peak |
| 2 | 57.27 | -21.39 | -15.74 | -13.00 | -8.39 | -5.65 | Peak |
| 3 | 165.81 | -48.07 | -41.45 | -13.00 | -35.07 | -6.62 | Peak |
| 4 | 391.70 | -49.63 | -43.93 | -13.00 | -36.63 | -5.70 | Peak |
| 5 | 525.40 | -62.66 | -60.26 | -13.00 | -49.66 | -2.40 | Peak |
| 6 | 680.10 | -60.58 | -61.66 | -13.00 | -47.58 | 1.08 | Peak |
| 7 | 1672.80 | -52.08 | -39.26 | -13.00 | -39.08 | -12.82 | Peak |
| 8 | 2509.20 | -50.16 | -40.99 | -13.00 | -37.16 | -9.17 | Peak |

# 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
**Web Site**: www.adt.com.tw


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---**