

# FCC TEST REPORT (PART 24)

- REPORT NO.:
   RF120405C02-3

   MODEL NO.:
   PL01130

   FCC ID:
   NM8PL01130

   RECEIVED:
   Apr. 05, 2012

   TESTED:
   Apr. 17, 2012

   ISSUED:
   Apr. 24, 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.

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## **RELEASE CONTROL RECORD**

| ISSUE NO.     | REASON FOR CHANGE | DATE ISSUED   |
|---------------|-------------------|---------------|
| RF120405C02-3 | Original release  | Apr. 24, 2012 |



## **1 CERTIFICATION**

PRODUCT:Smart PhoneMODEL:PL01130BRAND:HTCAPPLICANT:HTC CorporationTESTED:Apr. 17, 2012TEST SAMPLE:Production UnitSTANDARDS:FCC Part 24, Subpart E

The above equipment (model: PL01130) 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 : Apr. 24, 2012 Pettie Chen / Specialist

APPROVED BY

, DATE : Apr. 24, 2012 Gary Chang / Technical Manager



## 2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

|                     | APPLIED STANDARD: FCC Part 24 & Part 2  |        |  |  |  |  |  |
|---------------------|---|--------|--|--|--|--|--|
| STANDARD<br>SECTION | TEST TYPE                               | RESULT | REMARK   |  |  |  |  |
| 2.1046<br>24.232    | Equivalent isotropically radiated power | PASS   | Meet the requirement of limit.   |  |  |  |  |
| 2.1055<br>24.235    | Frequency Stability                     | PASS   | Meet the requirement of limit.   |  |  |  |  |
| 2.1049<br>24.238(b) | Occupied Bandwidth                      | PASS   | Meet the requirement of limit.   |  |  |  |  |
| 24.238(b)           | Band Edge Measurements                  | PASS   | Meet the requirement of limit.   |  |  |  |  |
| 2.1051<br>24.238    | Conducted Spurious Emissions            | PASS   | Meet the requirement of limit.   |  |  |  |  |
| 2.1053<br>24.238    | Radiated Spurious Emissions             |        | Meet the requirement of limit.<br>Minimum passing margin is<br>-19.30dB at 33.78MHz. |  |  |  |  |

## 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     |
|                                  | 30MHz ~ 200MHz  | 2.93 dB     |
| Dedicted emissions               | 200MHz ~1000MHz | 2.95 dB     |
| Radiated emissions               | 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 &<br>MANUFACTURER                 | MODEL NO.      | SERIAL NO. | DATE OF<br>CALIBRATION | DUE DATE OF<br>CALIBRATION |
|---|----------------|------------|------------------------|----------------------------|
| Test Receiver<br>Agilent                      | N9038A         | MY51210203 | Dec. 22, 2011          | Dec. 21, 2012              |
| Spectrum Analyzer<br>ROHDE & SCHWARZ          | FSU43          | 101261     | Dec. 21, 2011          | Dec. 20, 2012              |
| BILOG Antenna<br>SCHWARZBECK                  | VULB9168       | 9168-472   | Dec. 20, 2011          | Dec. 19, 2012              |
| HORN Antenna<br>SCHWARZBECK                   | BBHA 9120 D    | 9120D-969  | Dec. 20, 2011          | Dec. 19, 2012              |
| HORN Antenna<br>SCHWARZBECK                   | BBHA 9170      | 9170-480   | Dec. 20, 2011          | Dec. 19, 2012              |
| Preamplifier<br>EMCI                          | EMC 012645     | 980115     | Dec. 30, 2011          | Dec. 29, 2012              |
| Preamplifier<br>EMCI                          | EMC 330H       | 980112     | Dec. 30, 2011          | Dec. 29, 2012              |
| RF signal cable<br>HUBER+SUHNNER              | SUCOFLEX 104   | 309219/4   | Oct. 21, 2011          | Oct. 20, 2012              |
| RF signal cable<br>HUBER+SUHNNER              | SUCOFLEX 104   | 250130/4   | Jan. 02, 2012          | Jan. 01, 2013              |
| RF signal cable<br>Worken                     | RG-213         | NA         | Jan. 02, 2012          | Jan. 01, 2013              |
| Software                                      | E3<br>6.120103 | NA         | NA                     | NA                         |
| Antenna Tower<br>MF                           | MFA-440H       | NA         | NA                     | NA                         |
| Turn Table<br>MF                              | MFT-201SS      | NA         | NA                     | NA                         |
| Antenna Tower &Turn Table<br>Controller<br>MF | MF-7802        | NA         | NA                     | NA                         |
| Mini-Circuits Power Splitter                  | ZN2PD-9G       | NA         | May 25, 2011           | May 24, 2012               |
| JFW 20dB attenuation                          | 50HF-020-SMA   | NA         | NA                     | NA                         |

**NOTE:** 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

- 2. The test was performed in 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                   | Smart Phone                                   |
|-----------------------|---|
| MODEL NO.             | PL01130                                       |
| POWER SUPPLY          | 5.0Vdc (adapter or host equipment)            |
| POWER SUPPLY          | 3.7Vdc (battery)                              |
|                       | GSM, GPRS: GMSK                               |
| MODULATION TYPE       | EDGE: 8PSK                                    |
|                       | WCDMA : BPSK                                  |
| FREQUENCY RANGE       | <b>GSM, GPRS, EDGE:</b> 1850.2MHz ~ 1909.8MHz |
| FREQUENCI RANGE       | WCDMA: 1852.4MHz ~ 1907.6MHz                  |
|                       | GSM: 0.67Watts                                |
| MAX. ERP POWER        | EDGE: 0.32Watts                               |
|                       | WCDMA: 0.16Watts                              |
| MULTI-SLOTS CLASS     | 12  |
| WCDMA RELEASE VERSION | 5   |
| ANTENNA TYPE          | Fixed Internalantenna with 0dBi gain          |
| I/O PORTS             | Refer to users' manual                        |
| DATA CABLE N/A        |   |
| ACCESSORY DEVICES     | N/A   |

#### NOTE:

1. The EUT's accessories list refers to EUT photo.pdf.

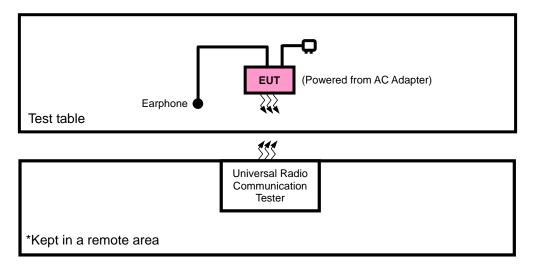
\*Item 1, 6, 8, 10 were the worst for the final test.

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



#### FOR E.I.R.P. TEST

| Test table             | EUT (Powered from battery)                 |
|------------------------|--|
|                        | <u>\$\$\$</u>                              |
|                        | Universal Radio<br>Communication<br>Tester |
| *Kept in a remote area |  |



## 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    | 104484     | NA     |

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

NOTE:

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

2. Item 1 acted as a communication partners to transfer data.



## 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 Y-axis for radiated emission. Following channel(s) was (were) selected for the final test as listed below:

#### **GSM MODE**

| EUT<br>CONFIGURE<br>MODE | TEST ITEM            | AVAILABLE CHANNEL | TESTED CHANNEL | MODE      |
|--------------------------|----------------------|-------------------|----------------|-----------|
| -                        | EIRP                 | 512 to 810        | 512, 661, 810  | GSM, EDGE |
| -                        | FREQUENCY STABILITY  | 512 to 810        | 661            | GSM, EDGE |
| -                        | OCCUPIED BANDWIDTH   | 512 to 810        | 512, 661, 810  | GSM, EDGE |
| -                        | BAND EDGE            | 512 to 810        | 512, 810       | GSM, EDGE |
| -                        | CONDCUDETED EMISSION | 512 to 810        | 661            | GSM, EDGE |
| -                        | RADIATED EMISSION    | 512 to 810        | 661            | GSM, EDGE |

#### WCDMA MODE

| EUT<br>CONFIGURE<br>MODE | TEST ITEM            | AVAILABLE CHANNEL | TESTED CHANNEL   | MODE  |
|--------------------------|----------------------|-------------------|------------------|-------|
| -                        | EIRP                 | 9262 to 9538      | 9262, 9400, 9538 | WCDMA |
| -                        | FREQUENCY STABILITY  | 9262 to 9538      | 9400             | WCDMA |
| -                        | OCCUPIED BANDWIDTH   | 9262 to 9538      | 9262, 9400, 9538 | WCDMA |
| -                        | BAND EDGE            | 9262 to 9538      | 9262, 9538       | WCDMA |
| -                        | CONDCUDETED EMISSION | 9262 to 9538      | 9400             | WCDMA |
| -                        | RADIATED EMISSION    | 9262 to 9538      | 9400             | WCDMA |

#### **TEST CONDITION:**

| TEST ITEM            | ENVIRONMENTAL CONDITIONS | INPUT POWER  | TESTED BY    |
|----------------------|--------------------------|--------------|--------------|
| ERP                  | 25deg. C, 65%RH          | 3.7Vdc       | Phoenix Chen |
| FREQUENCY STABILITY  | 25deg. C, 65%RH          | 3.7Vdc       | Phoenix Chen |
| OCCUPIED BANDWIDTH   | 25deg. C, 65%RH          | 3.7Vdc       | Phoenix Chen |
| BAND EDGE            | 25deg. C, 65%RH          | 3.7Vdc       | Phoenix Chen |
| CONDCUDETED EMISSION | 25deg. C, 65%RH          | 3.7Vdc       | 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 24 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 and portable stations are limited to 2 watts EIRP

#### 4.1.2 TEST PROCEDURES

#### EIRP MEASUREMENT:

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

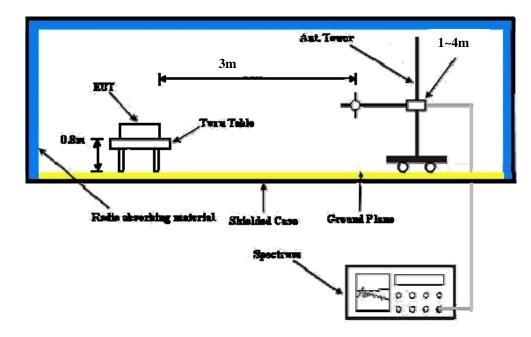
#### CONDUCTED POWER MEASUREMENT:

The EUT was set up for the maximum power with GSM, 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.



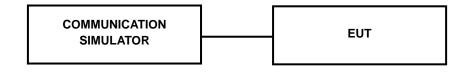
#### 4.1.3 TEST SETUP

#### EIRP 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                   | GSM1900 |        |        |  |  |  |  |  |
|------------------------|---------|--------|--------|--|--|--|--|--|
| Channel                | 512     | 661    | 810    |  |  |  |  |  |
| Frequency (MHz)        | 1850.2  | 1880.0 | 1909.8 |  |  |  |  |  |
| GSM (GMSK, 1 slot)     | 30.21   | 30.33  | 30.29  |  |  |  |  |  |
| GPRS 8 (GMSK, 1 slot)  | 30.19   | 30.27  | 30.26  |  |  |  |  |  |
| GPRS 10 (GMSK, 2 slot) | 29.67   | 29.79  | 29.76  |  |  |  |  |  |
| EDGE 8 (GMSK, 1 slot)  | 30.18   | 30.29  | 30.25  |  |  |  |  |  |
| EDGE 10 (GMSK, 2 slot) | 29.63   | 29.76  | 29.70  |  |  |  |  |  |
| EDGE 8 (8PSK, 1 slot)  | 26.76   | 26.87  | 26.84  |  |  |  |  |  |
| EDGE 10 (8PSK, 2 slot) | 25.75   | 25.86  | 25.82  |  |  |  |  |  |

| Band            | WCDMA II |        |        |  |  |  |  |  |  |
|-----------------|----------|--------|--------|--|--|--|--|--|--|
| Channel         | 9262     | 9400   | 9538   |  |  |  |  |  |  |
| Frequency (MHz) | 1852.4   | 1880.0 | 1907.6 |  |  |  |  |  |  |
| RMC 12.2K       | 23.78    | 23.66  | 23.81  |  |  |  |  |  |  |
| HSDPA Subtest-1 | 23.77    | 23.64  | 23.80  |  |  |  |  |  |  |
| HSDPA Subtest-2 | 23.55    | 23.52  | 23.74  |  |  |  |  |  |  |
| HSDPA Subtest-3 | 21.69    | 21.59  | 21.75  |  |  |  |  |  |  |
| HSDPA Subtest-4 | 21.67    | 21.54  | 21.69  |  |  |  |  |  |  |



#### EIRP POWER (dBm)

#### **GSM 1900**

| Plane | Channel | Frequency<br>(MHz) | LVL<br>(dBm) | Correction<br>Factor(dB) | EIRP(dBm)  | EIRP(W) | Polarization<br>(H/V) |
|-------|---------|--------------------|--------------|--------------------------|------------|---------|-----------------------|
|       | 512     | 1850.2             | -17.38       | 38.19                    | 20.81      | 0.12    | Н                     |
|       | 661     | 1880.0             | -17.78       | 38.70                    | 20.92      | 0.12    | Н                     |
| Y     | 810     | 1909.8             | -17.60       | 39.35                    | 21.75      | 0.15    | Н                     |
| Y     | 512     | 1850.2             | -10.28       | 38.48                    | 28.20      | 0.66    | V                     |
|       | 661     | 1880.0             | -10.31       | 38.59                    | 28.28 0.67 |         | V                     |
|       | 810     | 1909.8             | -10.65       | 38.87                    | 28.22      | 0.66    | V                     |

#### EDGE 1900

| Plane | Channel Frequency LVL Correction<br>(MHz) (dBm) Factor(dB) |        | EIRP(dBm) | EIRP(dBm) EIRP(W) |                  |      |   |
|-------|--|--------|-----------|-------------------|------------------|------|---|
|       | 512  | 1850.2 | -20.63    | 38.19             | 17.56            | 0.06 | Н |
|       | 661  | 1880.0 | -21.13    | 38.70             | 17.57            | 0.06 | н |
| Y     | 810  | 1909.8 | -20.86    | 39.35             | 18.49            | 0.07 | н |
| Y     | 512  | 1850.2 | -13.50    | 38.48             | 24.98            | 0.31 | V |
|       | 661  | 1880.0 | -13.56    | 38.59             | 38.59 25.03 0.32 |      | V |
|       | 810  | 1909.8 | -14.09    | 38.87             | 24.78            | 0.30 | V |

#### WCDMA 1900

| Plane | Channel | Frequency<br>(MHz) | LVL<br>(dBm) | Correction<br>Factor(dB) | EIRP(dBm) EIRP(W) |            | Polarization<br>(H/V) |
|-------|---------|--------------------|--------------|--------------------------|-------------------|------------|-----------------------|
|       | 9262    | 1852.4             | -21.72       | 38.19                    | 16.47             | 0.04       | Н                     |
|       | 9400    | 1880.0             | -21.95       | 38.70                    | 16.75             | 0.05       | Н                     |
| Y     | 9538    | 1907.6             | -22.25       | 39.35                    | 17.10             | 0.05       | Н                     |
| Y     | 9262    | 1852.4             | -16.84       | 38.48                    | 21.64             | 0.15       | V                     |
|       | 9400    | 1880.0             | -16.47       | 38.59                    | 22.12             | 22.12 0.16 |                       |
|       | 9538    | 1907.6             | -16.73       | 38.87                    | 22.14             | 0.16       | V                     |



## 4.2 FREQUENCY STABILITY MEASUREMENT

#### 4.2.1 LIMITS OF FREQUENCY STABILIITY MEASUREMENT

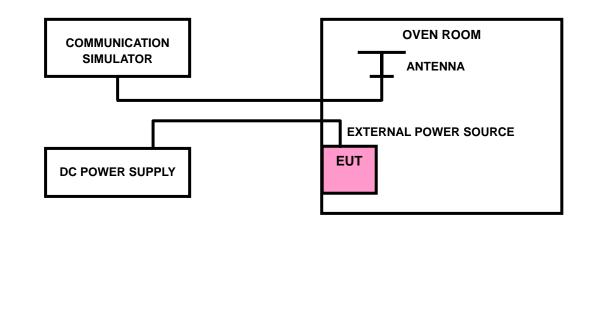
The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

#### 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  $\pm 0.5^{\circ}$ 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

|                 | FRE   |      |       |             |
|-----------------|-------|------|-------|-------------|
| VOLTAGE (Volts) | GSM   | EDGE | WCDMA | LIMIT (ppm) |
| 3.7             | -0.02 | 0.01 | -0.01 | 2.5         |
| 3.6             | -0.01 | 0.01 | -0.01 | 2.5         |
| 4.2             | -0.01 | 0.01 | -0.01 | 2.5         |

**NOTE:** The applicant defined the normal working voltage of the battery is from 3.6Vdc to 4.2Vdc.

#### FREQUENCY ERROR vs. TEMPERATURE.

| TEMP. (℃) | FRE   |       |       |             |
|-----------|-------|-------|-------|-------------|
|           | GSM   | EDGE  | WCDMA | LIMIT (ppm) |
| -10       | -0.01 | 0.01  | -0.02 | 2.5         |
| 0         | -0.01 | -0.01 | -0.01 | 2.5         |
| 10        | -0.01 | 0.01  | -0.02 | 2.5         |
| 20        | -0.01 | 0.01  | -0.01 | 2.5         |
| 30        | -0.01 | 0.01  | -0.01 | 2.5         |
| 40        | -0.01 | 0.01  | -0.01 | 2.5         |
| 50        | -0.01 | 0.01  | -0.01 | 2.5         |
| 55        | -0.01 | 0.01  | -0.01 | 2.5         |

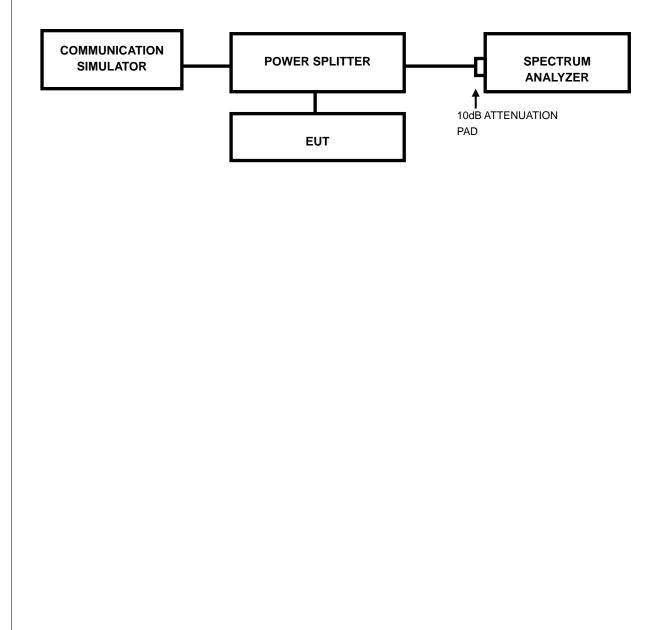


## 4.3 OCCUPIED BANDWIDTH MEASUREMENT

#### 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.

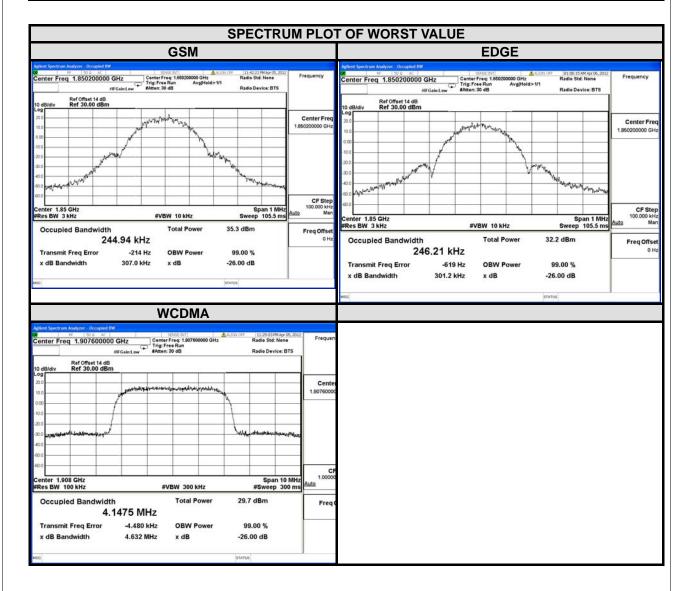
#### 4.3.2 TEST SETUP





## 4.3.3 TEST RESULTS

| CHANNEL | FREQUENCY<br>(MHz) | 99% OCCUPIED<br>BANDWIDTH (kHz)<br>GSM EDGE |        | CHANNEL | FREQUENCY<br>(MHz) | 99% OCCUPIED<br>BANDWIDTH (MHz)<br>WCDMA |
|---------|--------------------|---|--------|---------|--------------------|--|
| 512     | 1850.2             | 244.94                                      | 246.21 | 9262    | 1852.4             | 4.15                                     |
| 661     | 1880.0             | 244.94                                      | 240.99 | 9400    | 1880.0             | 4.14                                     |
| 810     | 1909.8             | 242.87                                      | 243.97 | 9538    | 1907.6             | 4.15                                     |



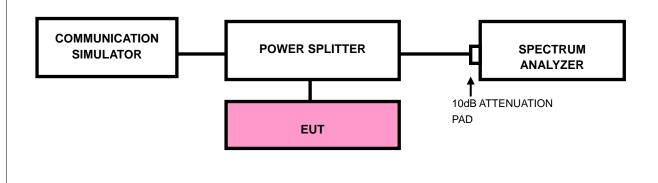


## 4.4 BAND EDGE MEASUREMENT

#### 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

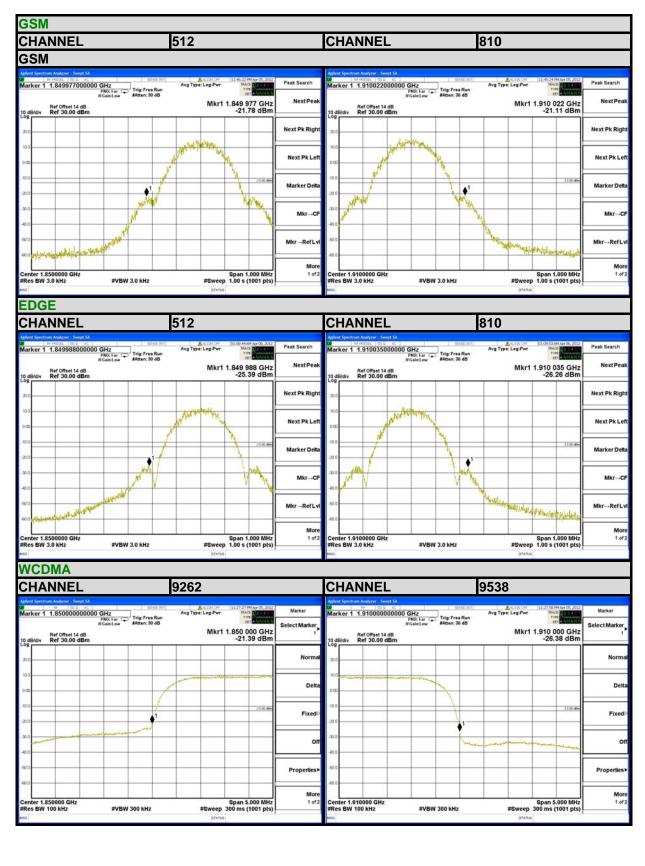


#### 4.4.3 TEST PROCEDURES

- 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 1.5 MHz. RB of the spectrum is 3kHz and VB of the spectrum is 3kHz (GSM / EDGE).
- c. The center frequency of spectrum is the band edge frequency and span is 10MHz. RB of the spectrum is 100kHz and VB of the spectrum is 300kHz (WCDMA).
- d. Record the max trace plot into the test report.



## 4.4.4 TEST RESULTS





## 4.5 CONDUCTED SPURIOUS EMISSIONS

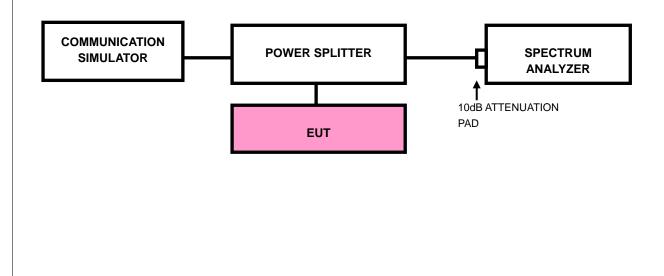
#### 4.5.1 LIMITS OF CONDUCTED SPURIOUS EMISSIONS MEASUREMENT

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.
- Measuring frequency range is from 9 kHz to 19.1GHz. 10dB attenuation pad is connected with spectrum. RBW=1MHz and VBW=3MHz is used for conducted emission measurement.

#### 4.5.3 TEST SETUP

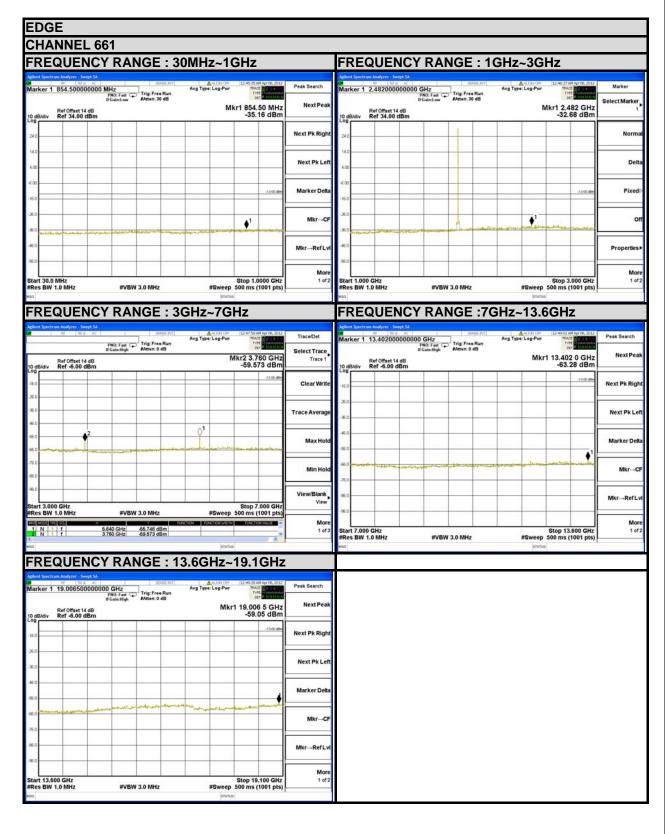




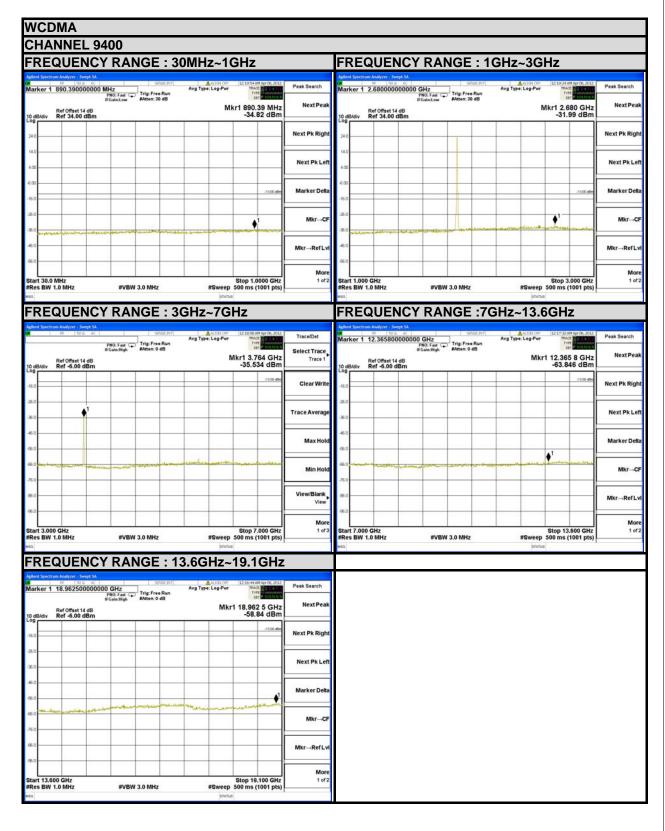
## 4.5.4 TEST RESULTS

| R   | EQUENC  | Y RAN  | IGE : 3                          | BOMHz  | ~1GHz  |                               |                          | FREG                 | UEN  | CY R/                                     | ANGE                 | E : 10          | €Hz~        | 3GH      | lz                   |   |                        |
|---|---|--|----------------------------------|--|--|-------------------------------|--------------------------|----------------------|--|---|----------------------|-----------------|-------------|----------|----------------------|---|------------------------|
| arke  | er 1 994.18000000   | DO MHz<br>PNO: Fast<br>IFGaint.ow  | Trig: Free Run<br>SAtten: 30 dB  | Avg Type: Lo   | Pg-Pwr TRAC<br>Tvi<br>Di   | ET P NNNN N                   | Peak Search<br>Next Peak | Marker 1 2           | 2.566000000  | 54<br>0000 GHz<br>PNO: Fast<br>IFGaint.or | Trig: Fr<br>#Atten:  | ee Run<br>30 dB | Avg Type: L |          | TRACE<br>TVPE<br>DET | lpr 06, 2012                            | Marker<br>Select Marke |
|   | Ref Offset 14 dB<br>fiv Ref 34.00 dBm   | <u> </u>   |                                  |  | Mkr1 994.<br>-34.  | 18 MHz<br>47 dBm              |                          | 10 dB/div            | Ref Offset 14 dB   | 3<br>m                                    | _                    |                 |             | MK       | -32.84               | dBm                                     |                        |
| 4.0   |   |  |                                  |  | _  |                               | Next Pk Right            | 24.0                 | -  |   | ++-                  |                 |             |          |                      |   | Norn                   |
| 00  |   |  |                                  |  |  |                               | Next Pk Left             | 4.00                 |  |   |                      |                 |             |          |                      |   | De                     |
| 0   |   |  |                                  |  |  | -13.00 dbn                    | Marker Delta             | -6 00                |  |   |                      |                 |             | -        |                      | -13.00 dbin                             | Fixe                   |
| 0-  |   |  |                                  |  |  | 1                             | Mkr→CF                   | -26.0                |  |   |                      |                 |             | •        |                      | _                                       | <u>_</u>               |
| 0   | ميان هاي هاي من محمد على <mark>م</mark> رينا مي المراجع | and and a start of the start of | and Friday Bee                   | and the second second second   | an y service a design of the service |                               | Mkr→RefLvi               | -36.0                | and a second | CC. Mind Salar                            | action of the second |                 |             |          |                      |   | Propertie              |
| art 3   | 30.0 MHz  |  |                                  |  | Stop 1.0   | D000 GHz                      | More<br>1 of 2           | -55.0<br>Start 1.000 | GH7  |   |                      |                 |             |          | Stop 3.0             | 00 GHz                                  | Mo                     |
|   | BW 1.0 MHz  | #VBW 3   | 3.0 MHz                          | #S   | weep 500 ms (  | (1001 pts)                    |                          | #Res BW 1.           |  | #\  | BW 3.0 MH            | z               | #1          | Sweep 5  | 00 ms (10            | 01 pts)                                 |                        |
| R   | EQUENC  | Y RAN  | IGE : 3                          | BGHz~ <sup>™</sup>   | 7GHz   |                               |                          | FREG                 | UEN  | CY R/                                     | ANGE                 | E :7G           | Hz~1        | 3.6      | GHz                  |   |                        |
| nt S  | AF 100 Ac   |  | 1648.941                         | Avg Type: Lo   | 1210-34 A  | M Apr 06, 2012                | Peak Search              | Aglent Spectrum      | Analyzer Sweet<br>3.48120000   | 55<br>10                                  |                      | (EV.E. 711)     | Avg Type: L | JON OFF  | 12:11:07 AM A        | lpr 06, 2012                            | Peak Search            |
| _   | Ref Offset 14 dB  | FNO: Fast 😱<br>IFGain:High   | Trig: Free Run<br>#Atten: 0 dB   | Ang type. L  | Mkr2 3.7   | PE CONSIGNATION OF PERSON NOT | NextPeak                 |                      | Ref Offset 14 dE   | PNO: Fas<br>IFGain:Hig                    | Trig: Fr<br>#Atten:  | ee Run<br>0 dB  | Nug type.   |          | 13.481<br>-63.751    | 2 GHz                                   | NextPe                 |
| BIG   | div Ref -6.00 dBm   |  |                                  |  | -36.   | -13.00 alber                  | Next Pk Right            | 10 dB/div            | Ref -6.00 dBr  | m   |                      |                 | _           |          | -03.73               | -13.00 dBn                              | Next Pk Ri             |
| 0   |   |  |                                  |  | _  |                               | Next Pk Left             | -26.0                |  |   |                      |                 |             |          |                      |   | Next Pk L              |
| 0   | ¢2  |  |                                  | \\$ <sup>1</sup>   | _  |                               | Marker Delta             | -46.0                |  |   | _                    |                 |             |          | _                    | _                                       | Marker De              |
| 0   | and the second second second  |  | and any international states are | a <mark>, the standard size of</mark>  | سمريد ومعقطتك فللغط  |                               | Mkr→CF                   | -56.0                | -  | up who who                                | -                    | فدرسهمه         |             | -        |                      | میں | Mkr→                   |
| 0   |   |  |                                  |  |  |                               | Mkr→RefLvi               | -76.0                |  |   |                      |                 |             |          |                      |   | Mkr→Refi               |
| art 3   | 3.000 GHz<br>BW 1.0 MHz   | #VBW 3   | 3.0 MHz                          | #5   | Stop 7<br>weep 500 ms (  | .000 GHz<br>1001 pts)         | MKI KEI EVI              | -96.0                | -  |   | -                    |                 | -           | _        | _                    |   | MKI-+Kell              |
|   |   | 5.640 GHz<br>3.760 GHz   | -54.50 dBm<br>-58.54 dBm         | FUNCTION   | ON WIGH FUNCTION   | IN VALUE                      | More<br>1 of 2           | Start 7.000          | GHz  |   |                      |                 |             | 5        | Stop 13.6            | 00 GHz                                  | M(                     |
|   |   |  |                                  |  | STATUS   | 2                             |                          | #Res BW 1.           | 0 MHz  | #\  | BW 3.0 MH            | z               | #1          | Sweep 50 | 00 ms (10            | 01 pts)                                 |                        |
| R   | EQUENC  | Y RAN  | IGE : 1                          | 3.6GH  | lz~19.1  | GHz                           | 1                        |                      |  |   |                      |                 |             |          |                      |   |                        |
| nts<br>arke   | er 1 18.781000000   | 000 GHz  | 100.8.001                        | Avg Type: Lo   | 121.017 12:11:52 /<br>bg-Pwr TRAC  | - Hereiter                    | Peak Search              |                      |  |   |                      |                 |             |          |                      |   |                        |
|   | Ref Offset 14 dB  | PNO: Fast<br>IFGain:High   | #Atten: 0 dB                     |  | Mkr1 18.78   | 1 0 GHz                       | Next Peak                |                      |  |   |                      |                 |             |          |                      |   |                        |
|   | siv Ref -6.00 dBm   |  |                                  |  | -58.   | 33 dBm                        | Next Pk Right            |                      |  |   |                      |                 |             |          |                      |   |                        |
| BId   |   |  |                                  |  |  |                               | Next Pk Left             |                      |  |   |                      |                 |             |          |                      |   |                        |
| 0   |   |  |                                  |  |  |                               |                          |                      |  |   |                      |                 |             |          |                      |   |                        |
| 0   |   |  |                                  |  |  | <b>●</b> <sup>1</sup>         | Marker Delta             |                      |  |   |                      |                 |             |          |                      |   |                        |
| 0   | and and a start of the  | 100 mary 100 mary 100 m  | ingen to have                    | whiteman   | - and the second day   | - second                      |                          |                      |  |   |                      |                 |             |          |                      |   |                        |
| 0   | and the state of the                 | and and product of the second second   | نامه کاری او کاروند.<br>او       | hand a start of the start of th |  |                               | Mkr→CF                   |                      |  |   |                      |                 |             |          |                      |   |                        |
| dB/d<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0 |   |  |                                  |  |  |                               | Mkr→CF<br>Mkr→RefLvl     |                      |  |   |                      |                 |             |          |                      |   |                        |











## 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.

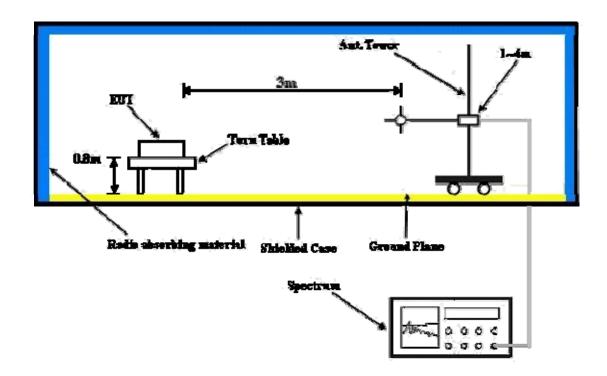
**NOTE:** The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.

#### 4.6.3 DEVIATION FROM TEST STANDARD

No deviation



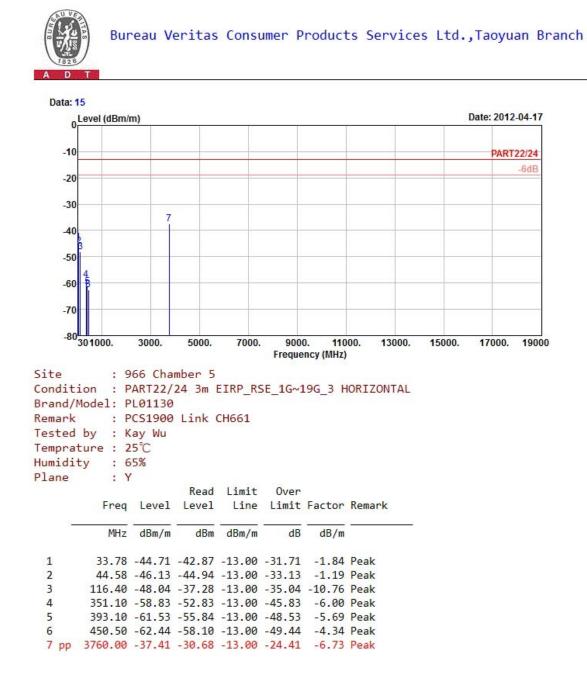
#### 4.6.4 TEST SETUP



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



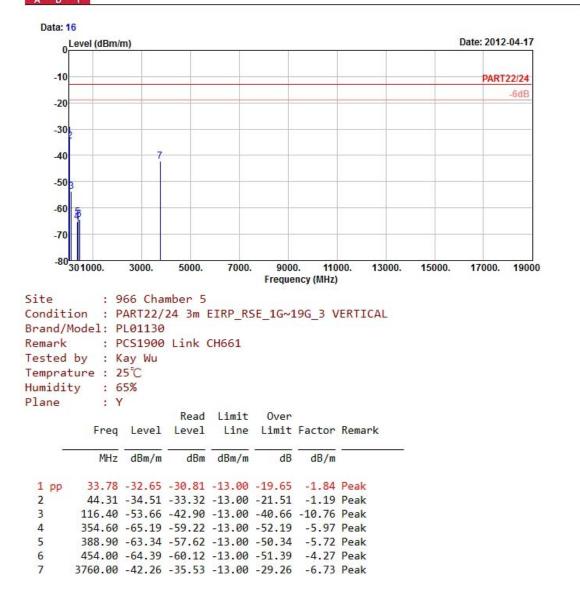
#### 4.6.5 TEST RESULTS





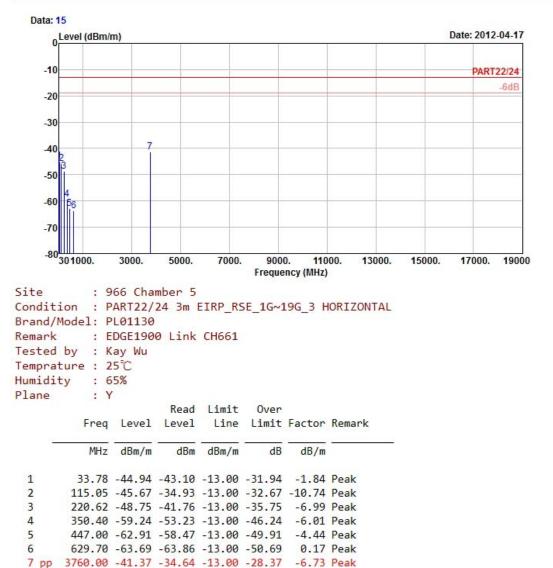


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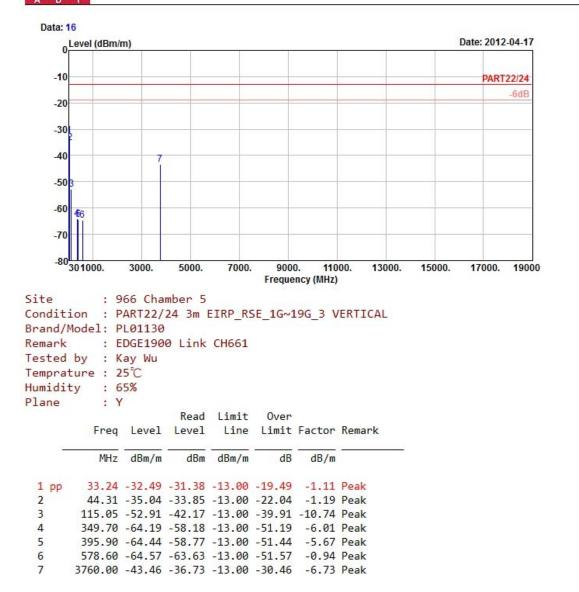






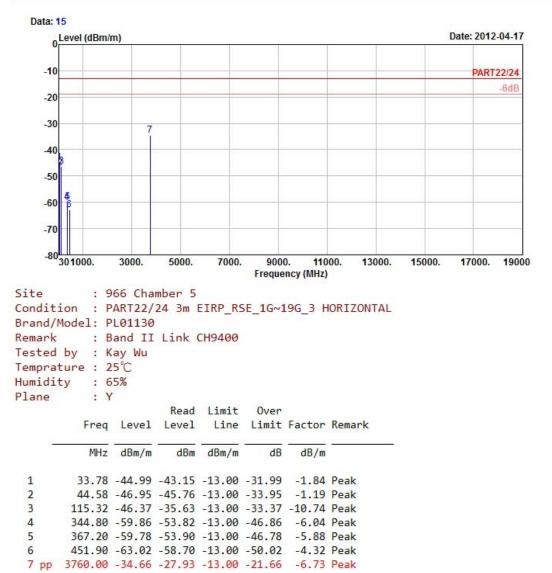


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch



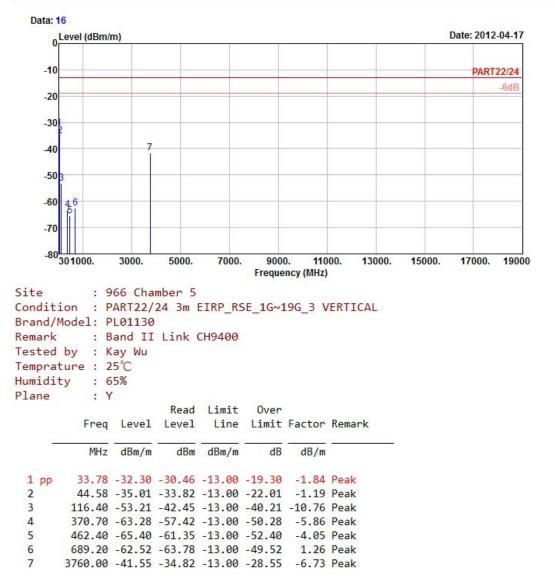














## 5 PHOTOGRAPHS OF THE TEST CONFIGURATION

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.

Copies of accreditation and authorization certificates of our laboratories obtained from approval agencies can be downloaded from our web site: <u>www.adt.com.tw/index.5.phtml</u>. 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 are made to the EUT by the lab during the test.

---END----