# FCC Test Report (PART 22)

**Report No.:** RF160421D16-1

**FCC ID:** RFHIKARPC07AA9

**Test Model:** IKARPC-07A-A9

**Received Date:** Apr. 21, 2016

**Test Date:** May 26 ~ 30, 2016

**Issued Date:** Jun. 14, 2016

**Applicant:** IEI Integration Corp.

**Address:** No.29, Zhongxing Rd., Xizhi Dist., New Taipei City 221,Taiwan, R.O.C.

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

**Lab Address:** No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan (R.O.C.)

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## Release Control Record

| Issue No. | Description | Date Issued |
|---|---|---|
| RF160421D16-1 | Original release. | Jun. 14, 2016 |

## 1 Certificate of Conformity

**Product:** Panel PC

**Brand:** iEi

**Test Model:** IKARPC-07A-A9

**Sample Status:** Engineering sample

**Applicant:** IEI Integration Corp.

**Test Date:** May 26 ~ 30, 2016

**Standards:** FCC Part 22, Subpart H

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

**Prepared by :** Annie Chang , **Date:** Jun. 14, 2016

Annie Chang / Senior Specialist

**Approved by :** Rex. Lai , **Date:** Jun. 14, 2016

Rex Lai / Assistant Manager

## 2 Summary of Test Results

| Applied Standard: FCC Part 22 & Part 2 | | | |
|---|---|---|---|
| FCC Clause | Test Item | Result | Remarks |
| 2.1046<br>22.913 (a) | Effective radiated power | PASS | Meet the requirement of limit. |
| --- | Peak To Average Ratio | PASS | Meet the requirement of limit. |
| 2.1055<br>22.355 | Frequency Stability | PASS | Meet the requirement of limit. |
| 2.1049 | Occupied Bandwidth | PASS | Meet the requirement of limit. |
| 22.917 | Band Edge Measurements | PASS | Meet the requirement of limit. |
| 2.1051<br>22.917 | Conducted Spurious Emissions | PASS | Meet the requirement of limit. |
| 2.1053<br>22.917 | Radiated Spurious Emissions | PASS | Meet the requirement of limit.<br>Minimum passing margin is<br>-37.24dB at 1694.80MHz. |

### 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 | Expended Uncertainty (k=2) (±) |
|---|---|
| Radiated Emissions up to 1 GHz | 4.00 dB |
| Radiated Emissions above 1 GHz | 3.36 dB |

## 2.2 Test Site And Instruments

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | CALIBRATED DATE | CALIBRATED UNTIL |
|---|---|---|---|---|
| HP Preamplifier | 8447D | 2432A03504 | Feb. 26, 2016 | Feb. 25, 2017 |
| HP Preamplifier | 8449B | 3008A01201 | Feb. 26, 2016 | Feb. 25, 2017 |
| MITEQ Preamplifier | AMF-6F-260400-33-8P | 892164 | Mar. 01, 2016 | Feb. 28, 2017 |
| Agilent TEST RECEIVER | N9038A | MY51210129 | Feb. 02, 2016 | Feb. 01, 2017 |
| Schwarzbeck Antenna | VULB 9168 | 139 | Jan. 04, 2016 | Jan. 03, 2017 |
| Schwarzbeck Antenna | VHBA 9123 | 480 | May 29, 2015 | May 28, 2017 |
| Schwarzbeck Horn Antenna | BBHA-9170 | 212 | Jan. 08, 2016 | Jan. 07, 2017 |
| Schwarzbeck Horn Antenna | BBHA 9120-D1 | D130 | Jan. 21, 2016 | Jan. 20, 2017 |
| ADT. Turn Table | TT100 | 0306 | NA | NA |
| ADT. Tower | AT100 | 0306 | NA | NA |
| Software | Radiated_V7.6.15.9.4 | NA | NA | NA |
| SUHNER RF cable With 4dB PAD | SF104 | CABLE-CH6 | Aug. 15, 2015 | Aug. 14, 2016 |
| SUHNER RF cable With 3dB PAD | SF102 | Cable-CH8-3.6m | Aug. 15, 2015 | Aug. 14, 2016 |
| KEYSIGHT Spectrum Analyzer | N9030A | MY54490260 | Jul. 14, 2015 | Jul. 13, 2016 |
| Loop Antenna EMCI | LPA600 | 270 | Aug. 20, 2015 | Aug. 19, 2017 |
| EMCO Horn Antenna | 3115 | 00028257 | Jan. 19, 2016 | Jan. 18, 2017 |
| Highpass filter Wainwright Instruments | WHK 3.1/18G-10SS | SN 8 | NA | NA |
| ROHDE & SCHWARZ Spectrum Analyzer | FSV40 | 101042 | Sep. 23, 2015 | Sep. 22, 2016 |
| Anritsu Power Sensor | MA2411B | 0738404 | Apr. 28, 2016 | Apr. 27, 2017 |
| Anritsu Power Meter | ML2495A | 0842014 | Apr. 28, 2016 | Apr. 27, 2017 |
| Temperature & Humidity Chamber | MHU-225AU | 920409 | May 25, 2016 | May 24, 2017 |

**NOTE:**
1. The calibration interval of the above test instruments is 12/24 months. And the calibrations are traceable to NML/ROC and NIST/USA.
2. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
3. The test was performed in Chamber No. 6.
4. The Industry Canada Reference No. IC 7450E-6.
5. The FCC Site Registration No. is 447212.

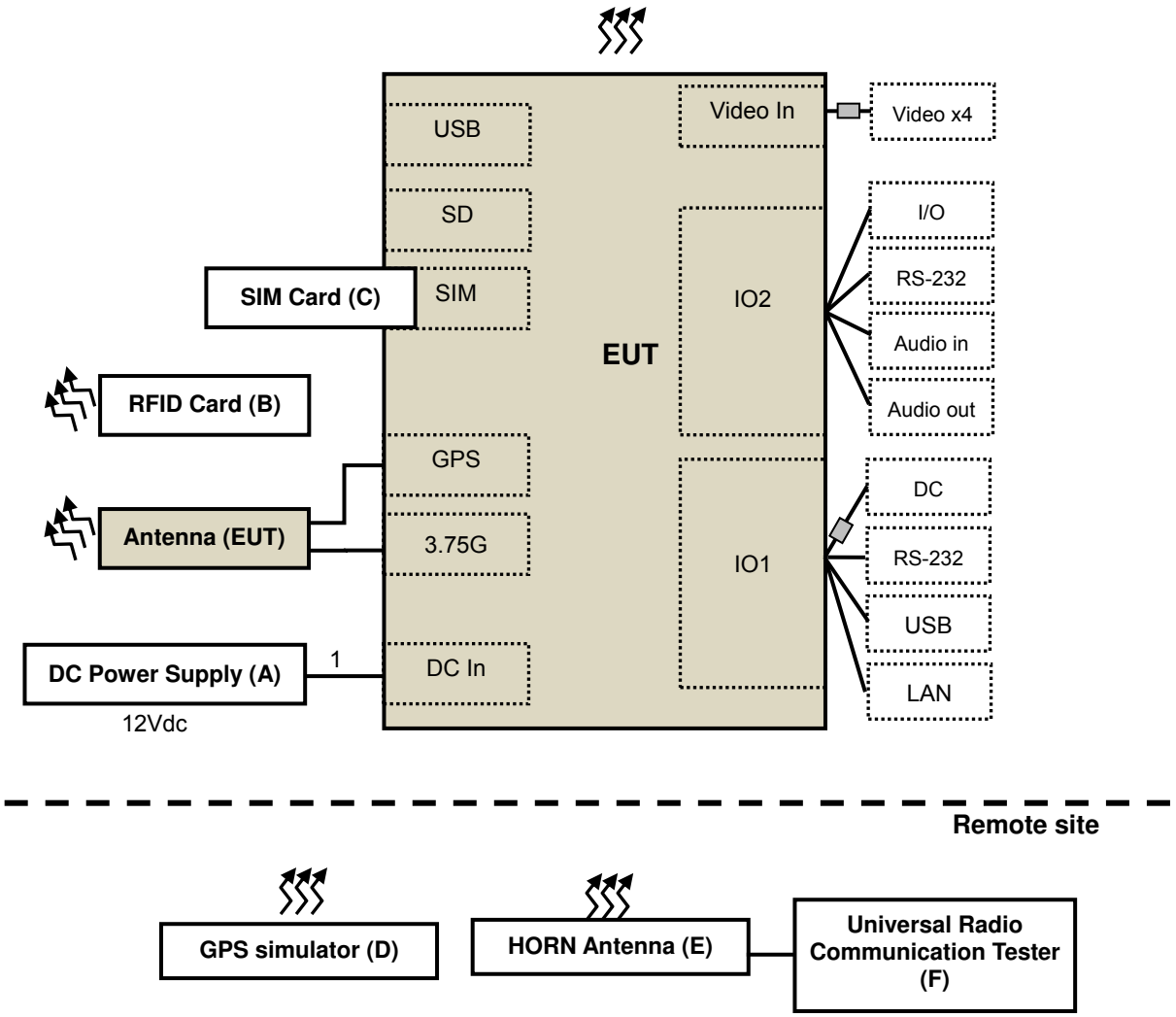
# 3 General Information

## 3.1 General Description of EUT

| | |
|---|---|
| Product | Panel PC |
| Brand | iEi |
| Test Model | IKARPC-07A-A9 |
| Status of EUT | Engineering sample |
| Power Supply Rating | 12/24Vdc |
| Modulation Type | EGPRS, GPRS |
| | WCDMA, HSDPA, HSUPA |
| Operating Frequency | GPRS: 824.2MHz ~ 848.8MHz<br>WCDMA: 826.4MHz ~ 846.6MHz |
| Max. ERP Power | GPRS: 737.90mW (28.68dBm)<br>WCDMA: 141.25mW (21.50dBm) |
| Emission Designator | GPRS: 248KG7W<br>WCDMA: 4M10F9W |
| Antenna Type | External combo antenna with -1dBi gain |
| Antenna Connector | SMA |
| Accessory Device | N/A |
| Data Cable Supplied | I/O connector 1 cable (20-pin)<br>I/O connector 2 cable (24-pin)<br>Video In connector cable (8-pin) |
| SW version | A0-R1.1-B00-1510291641 |
| HW version | V1.03 |

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

## 3.2 Configuration of System Under Test



### 3.2.1 Description Of Support Units

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

| ID | Product | Brand | Model No. | Serial No. | FCC ID | Remarks |
|---|---|---|---|---|---|---|
| A. | DC Power Supply | Topward | 6303D | N/A | N/A | Provided by Lab |
| B. | RFID Card | N/A | N/A | N/A | N/A | Supplied by client |
| C. | SIM Card | N/A | N/A | N/A | N/A | Provided by Lab |
| D. | GPS simulator | PENDULUM | GSG-5 | 200447 | N/A | Provided by Lab |
| E. | HORN Antenna | ETS | 3117 | 00034127 | N/A | Provided by Lab |
| F. | Radio Communication Analyzer | Anritsu | MT8820C | 6201300640 | N/A | Provided by Lab |

Note:
1. All power cords of the above support units are non-shielded (1.8m).
2. Items D~F acted as communication partners to transfer data.

| ID | Descriptions | Qty. | Length (m) | Shielding (Yes/No) | Cores (Qty.) | Remarks |
|---|---|---|---|---|---|---|
| 1. | DC power cord | 1 | 1.8 | N | 0 | Provided by Lab |

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

### 3.3 Test Mode Applicability and Tested Channel Detail

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

**GPRS MODE**

| EUT Configure Mode | Test Item | Available Channel | Tested Channel | Mode |
|---|---|---|---|---|
| - | ERP | 128 to 251 | 128, 190, 251 | GPRS |
| - | Frequency Stability | 128 to 251 | 128 | GPRS |
| - | Occupied Bandwidth | 128 to 251 | 128, 190, 251 | GPRS, EGPRS |
| - | Band Edge | 128 to 251 | 128, 251 | GPRS, EGPRS |
| - | Peak To Average Ratio | 128 to 251 | 128, 190, 251 | GPRS, EGPRS |
| - | Condcudeted Emission | 128 to 251 | 128, 190, 251 | GPRS, EGPRS |
| - | Radiated Emission Below 1GHz | 128 to 251 | 128, 190, 251 | GPRS |
| - | Radiated Emission Above 1GHz | 128 to 251 | 128, 190, 251 | GPRS |

**WCDMA Band V MODE**

| EUT Configure Mode | Test Item | Available Channel | Tested Channel | Mode |
|---|---|---|---|---|
| - | ERP | 4132 to 4233 | 4132, 4183, 4233 | WCDMA |
| - | Frequency Stability | 4132 to 4233 | 4132 | WCDMA |
| - | Occupied Bandwidth | 4132 to 4233 | 4132, 4183, 4233 | WCDMA, HSDPA, HSUPA |
| - | Band Edge | 4132 to 4233 | 4132, 4233 | WCDMA, HSDPA, HSUPA |
| - | Peak To Average Ratio | 4132 to 4233 | 4132, 4183, 4233 | WCDMA, HSDPA, HSUPA |
| - | Condcudeted Emission | 4132 to 4233 | 4132, 4183, 4233 | WCDMA, HSDPA, HSUPA |
| - | Radiated Emission Below 1GHz | 4132 to 4233 | 4132, 4183, 4233 | WCDMA |
| - | Radiated Emission Above 1GHz | 4132 to 4233 | 4132, 4183, 4233 | WCDMA |

**Test Condition:**

| Test Item | Environmental Conditions | Input Power | Tested By |
|---|---|---|---|
| ERP | 27deg. C, 63%RH | 12Vdc | Aaron You |
| Frequency Stability | 25deg. C, 60%RH | 12Vdc | Aaron You |
| Occupied Bandwidth | 25deg. C, 60%RH | 12Vdc | Aaron You |
| Band Edge | 25deg. C, 60%RH | 12Vdc | Aaron You |
| Peak To Average Ratio | 25deg. C, 60%RH | 12Vdc | Aaron You |
| Condcudeted Emission | 25deg. C, 60%RH | 12Vdc | Aaron You |
| Radiated Emission | 26deg. C, 67%RH | 12Vdc | Aaron You |

### 3.4 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.

### 3.5 General Description of Applied Standards

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

**FCC 47 CFR Part 2**

**FCC 47 CFR Part 22**

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

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

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

# 4 Test Types and Results

## 4.1 Output Power Measurement

### 4.1.1 Limits of Output Power Measurement

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

### 4.1.2 Test Procedures

**EIRP / ERP Measurement:**

a. All measurements were done at low, middle and high operational frequency range. RBW and VBW is 1MHz for GPRS 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

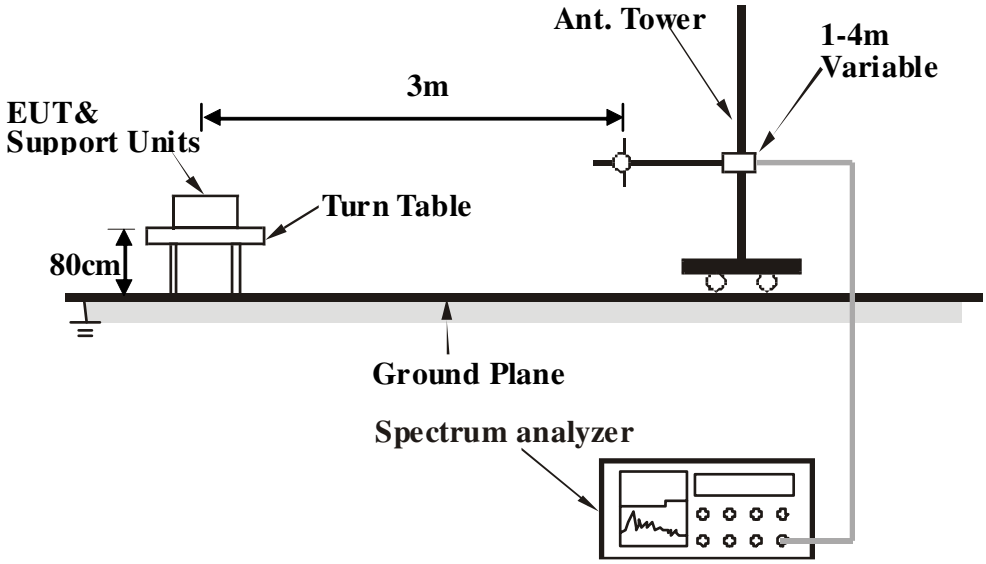
d. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.P.R power - 2.15dBi.

**Conducted Power Measurement:**

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

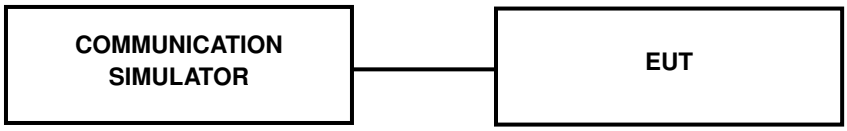
4.1.3 Test Setup

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 | GSM850 | | |
|---|---|---|---|
| Channel | 128 | 190 | 251 |
| Frequency (MHz) | 824.2 | 836.6 | 848.8 |
| GPRS 8 | 31.96 | 31.86 | 31.9 |
| EGPRS 8 (MCS1) | 31.92 | 31.83 | 31.87 |
| EGPRS 8 (MCS9) | 31.91 | 31.84 | 31.89 |

| Band | WCDMA Band V | | |
|---|---|---|---|
| Channel | 4132 | 4183 | 4233 |
| Frequency (MHz) | 826.4 | 836.6 | 846.6 |
| RMC 12.2K | 22.89 | 22.7 | 22.89 |
| HSDPA Subtest-1 | 22.74 | 22.58 | 22.86 |
| HSDPA Subtest-2 | 22.73 | 22.63 | 22.85 |
| HSDPA Subtest-3 | 22.73 | 22.58 | 22.82 |
| HSDPA Subtest-4 | 22.73 | 22.61 | 22.82 |
| HSUPA Subtest-1 | 22.76 | 22.61 | 22.82 |
| HSUPA Subtest-2 | 22.72 | 22.62 | 22.83 |
| HSUPA Subtest-3 | 22.75 | 22.62 | 22.81 |
| HSUPA Subtest-4 | 22.73 | 22.57 | 22.83 |
| HSUPA Subtest-5 | 22.7 | 22.61 | 22.78 |

## ERP Power (dBm)

For GPRS Mode:

| MODE | TX channel 128 | | | | | | |
|---|---|---|---|---|---|---|---|
| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 824.20 | 20.56 | 0.78 | 27.10 | 27.88 | 38.45 | -10.57 |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 824.20 | 16.75 | -2.95 | 27.10 | 24.15 | 38.45 | -14.30 |

| MODE | TX channel 190 | | | | | | |
|---|---|---|---|---|---|---|---|
| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 836.6 | 20.77 | 0.87 | 27.20 | 28.07 | 38.45 | -10.38 |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 836.60 | 16.44 | -3.10 | 27.20 | 24.10 | 38.45 | -14.35 |

| MODE | TX channel 251 | | | | | | |
|---|---|---|---|---|---|---|---|
| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| **1** | **848.40** | **21.40** | **1.35** | **27.33** | **28.68** | **38.45** | **-9.77** |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 848.40 | 16.80 | -2.62 | 27.33 | 24.71 | 38.45 | -13.74 |

NOTE: ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

For WCDMA Mode:

| MODE | TX channel 4132 | | | | | | |
|---|---|---|---|---|---|---|---|
| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| **1** | **826.40** | **14.18** | **-5.62** | **27.12** | **21.50** | **38.45** | **-16.95** |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 826.40 | 11.01 | -8.67 | 27.12 | 18.45 | 38.45 | -20.00 |

| MODE | TX channel 4183 | | | | | | |
|---|---|---|---|---|---|---|---|
| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 836.60 | 13.82 | -6.08 | 27.20 | 21.12 | 38.45 | -17.33 |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 836.60 | 10.90 | -8.64 | 27.20 | 18.56 | 38.45 | -19.89 |

| MODE | TX channel 4233 | | | | | | |
|---|---|---|---|---|---|---|---|
| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 846.60 | 14.20 | -5.81 | 27.30 | 21.49 | 38.45 | -16.96 |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 846.60 | 11.44 | -7.99 | 27.30 | 19.31 | 38.45 | -19.14 |

NOTE: ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

## 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

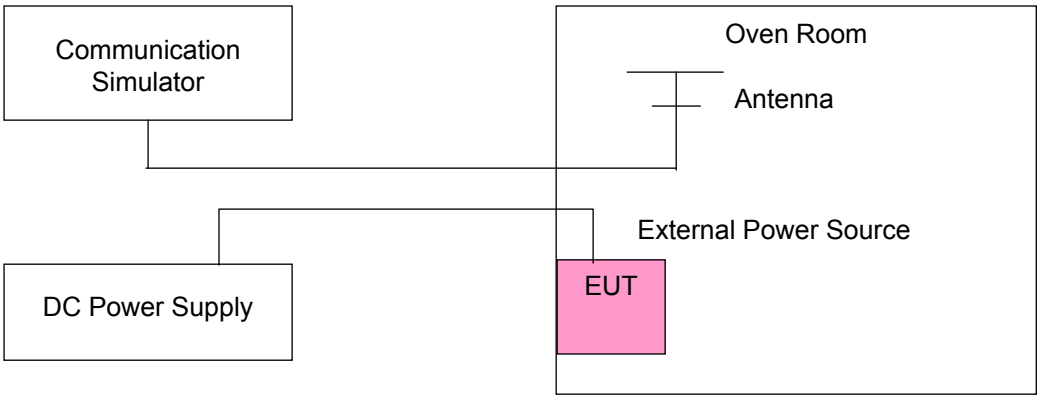
a. Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.

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 | WCDMA | |
| 13.2 | 0.0157728707 | 0.0169409487 | 2.5 |
| 12.0 | 0.0133462752 | 0.0157308809 | 2.5 |
| 10.8 | 0.0145595729 | 0.0181510165 | 2.5 |

**NOTE:** The applicant defined the normal working voltage of the battery is from 10.8Vdc to 13.2Vdc.

Frequency Error vs. Temperature.

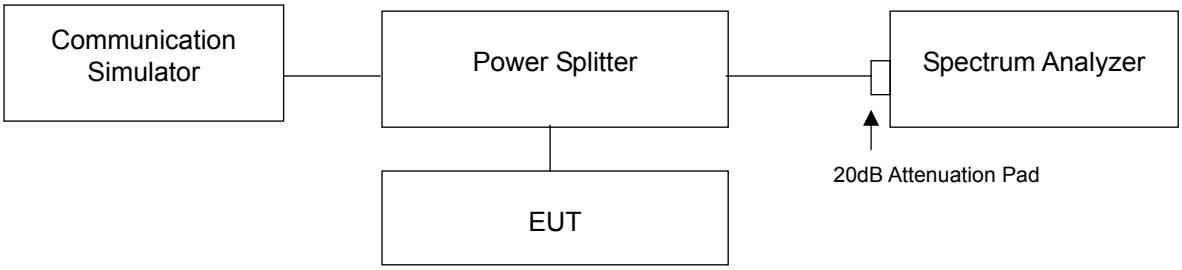
| TEMP. (℃) | Frequency Error (ppm) | | Limit (ppm) |
|---|---|---|---|
| | GPRS | WCDMA | |
| 60 | 0.0133462752 | 0.0145208132 | 2.5 |
| 50 | 0.0121329774 | 0.0133107454 | 2.5 |
| 40 | 0.0109196797 | 0.0121006776 | 2.5 |
| 30 | 0.0133462752 | 0.0169409487 | 2.5 |
| 20 | 0.0109196797 | 0.0121006776 | 2.5 |
| 10 | 0.0097063819 | 0.0133107454 | 2.5 |
| 0 | 0.0097063819 | 0.0121006776 | 2.5 |
| -10 | 0.0109196797 | 0.0145208132 | 2.5 |
| -20 | 0.0121329774 | 0.0145208132 | 2.5 |

## 4.3 Occupied Bandwidth Measurement

### 4.3.1 Test Procedure

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

### 4.3.2 Test Setup

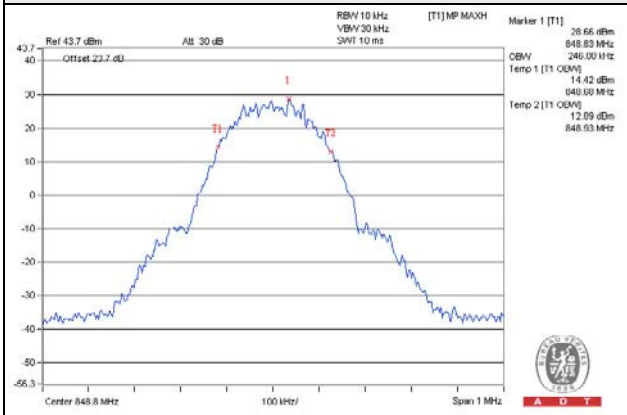


### 4.3.3 Test Result

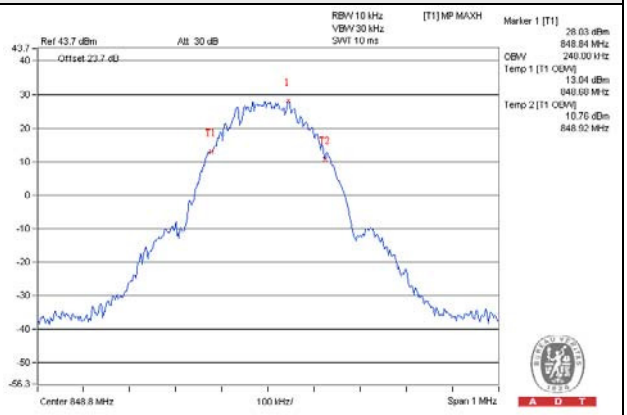
| Channel | Frequency (MHz) | 99% Occupied Bandwidth (kHz) | | Channel | FREQ. (MHz) | 99% Occupied Bandwidth (MHz) | | |
|---|---|---|---|---|---|---|---|---|
| | | GPRS | EGPRS | | | WCDMA | HSDPA | HSUPA |
| 128 | 824.2 | 244 | 242 | 4132 | 826.4 | 4.10 | 4.08 | 4.08 |
| 190 | 836.6 | 242 | 244 | 4183 | 836.6 | 4.08 | 4.08 | 4.08 |
| 251 | 848.8 | 246 | 248 | 4233 | 846.6 | 4.06 | 4.08 | 4.08 |

Spectrum Plot Of Worst Value

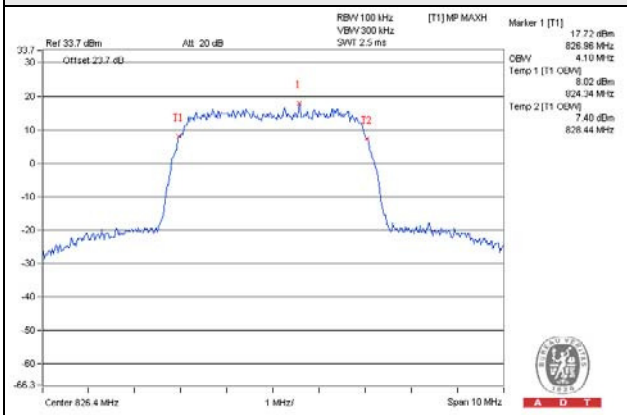
GPRS



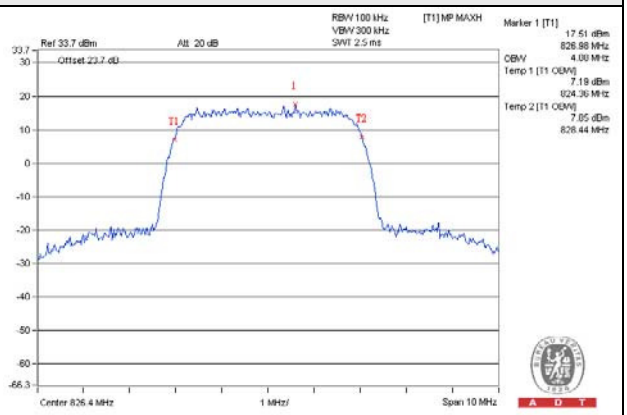

EGPRS



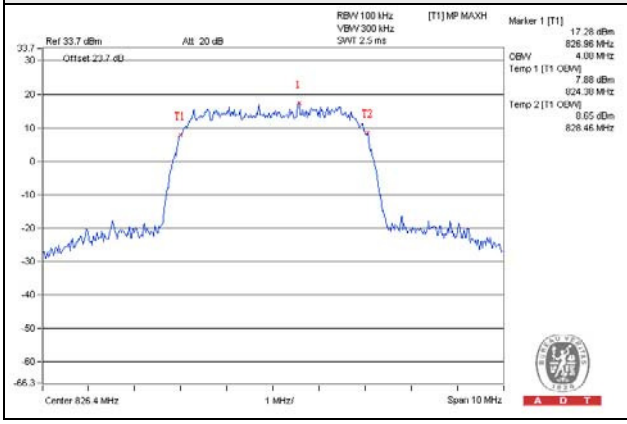

WCDMA




HSDPA




HSUPA

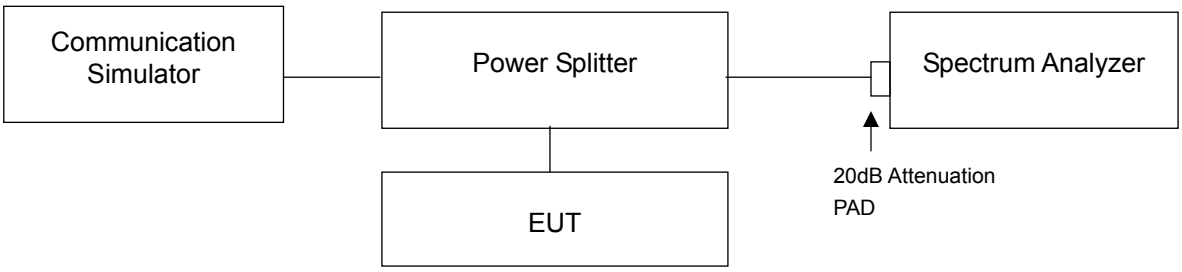


## 4.4 Band Edge Measurement

### 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

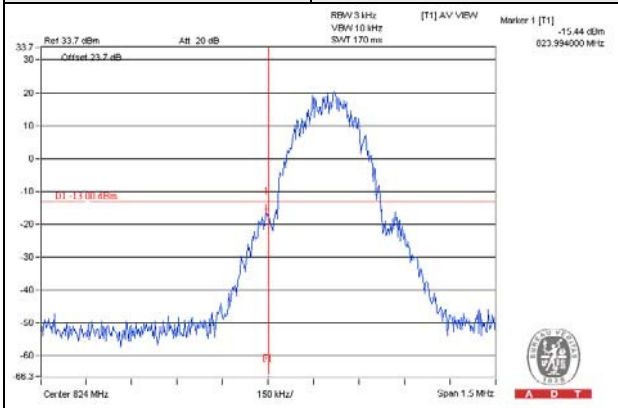
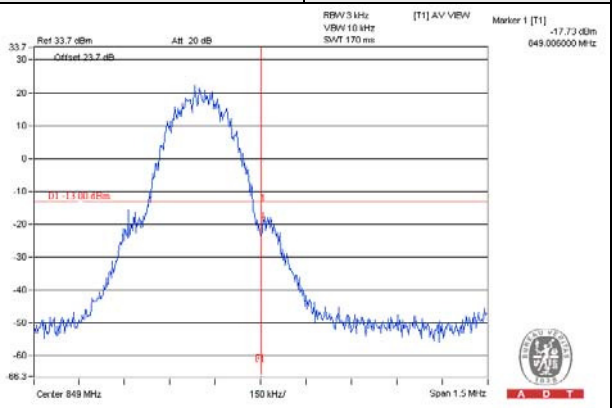
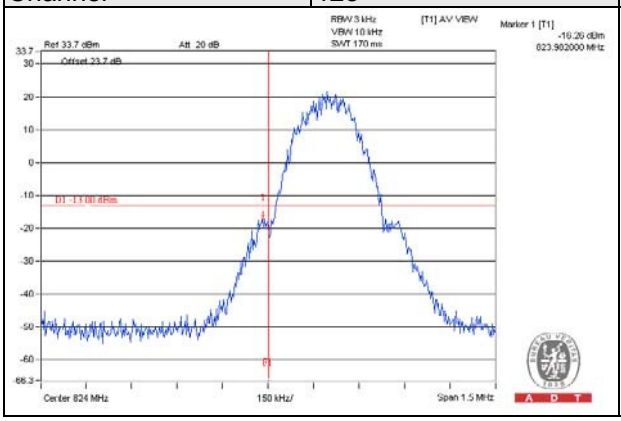
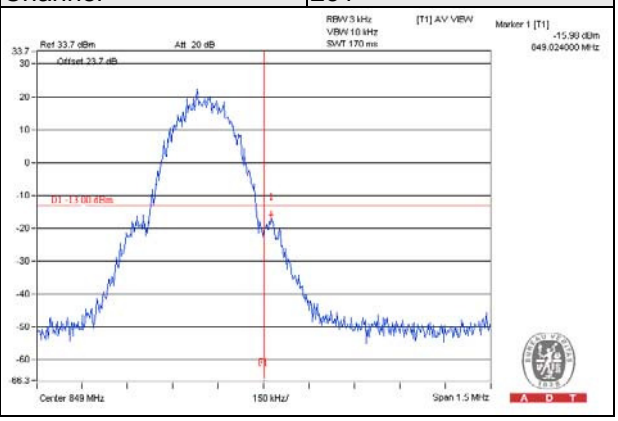
a. All measurements were done at low and high operational frequency range.

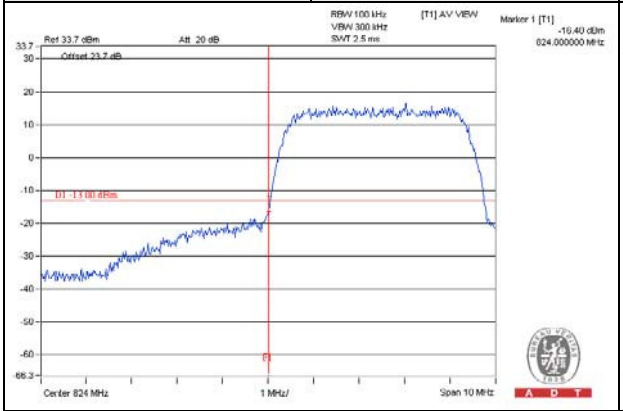
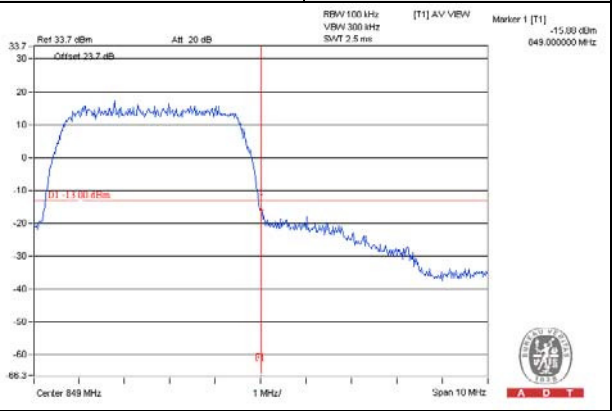
b. The center frequency of spectrum is the band edge frequency and span is 1.5MHz. RB of the spectrum is 3kHz and VB of the spectrum is 10kHz (GPRS/ EGPRS).

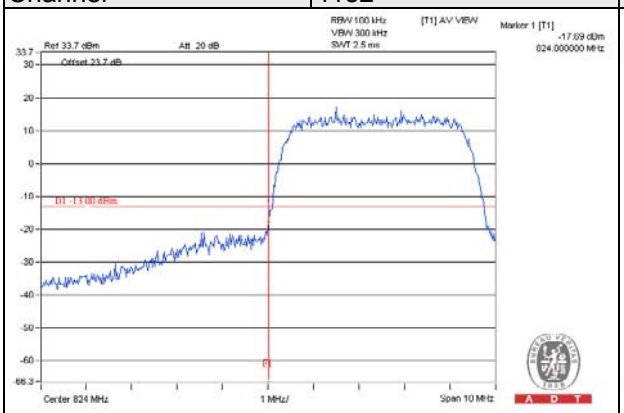
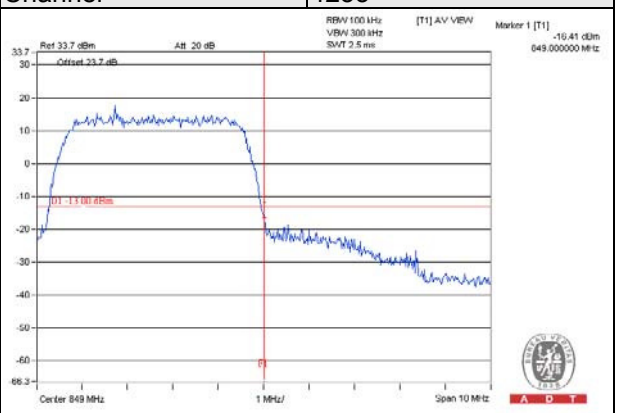
c. The center frequency of spectrum is the band edge frequency and span is 10MHz. RB of the spectrum is 100kHz and VB of the spectrum is 300kHz (WCDMA/HSDPA/HSUPA).

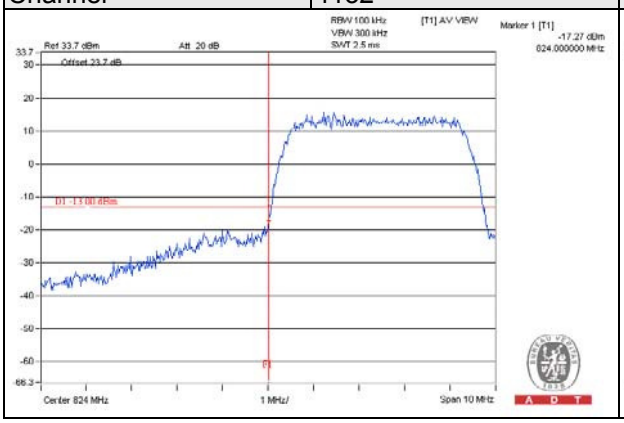
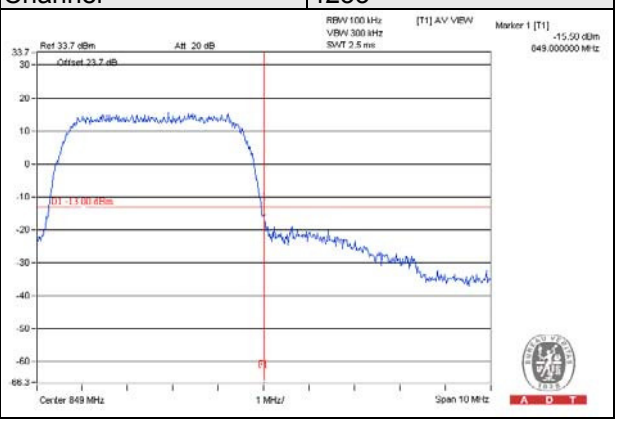
d. Record the max trace plot into the test report.

### 4.4.4 Test Results

| GPRS | | | |
|---|---|---|---|
| Channel | 128 | Channel | 251 |
|  | |  | |
| EGPRS | | | |
| Channel | 128 | Channel | 251 |
|  | |  | |

| WCDMA | | | |
|---|---|---|---|
| Channel | 4132 | Channel | 4233 |
|  | |  | |

| HSDPA | | | |
|---|---|---|---|
| Channel | 4132 | Channel | 4233 |
|  | |  | |

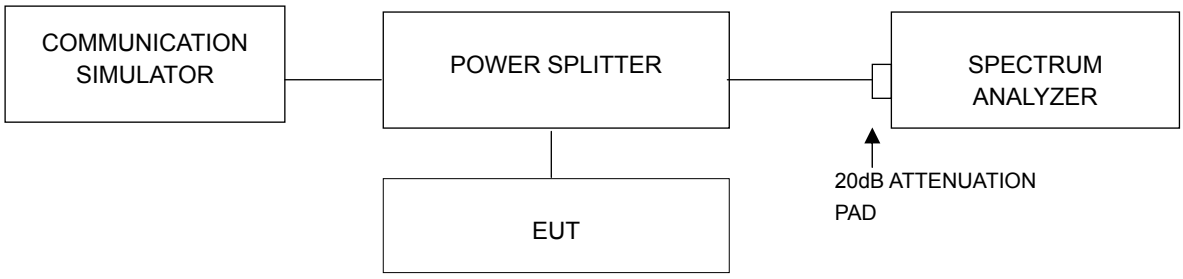
| HSUPA | | | |
|---|---|---|---|
| Channel | 4132 | Channel | 4233 |
|  | |  | |

## 4.5 Peak To Average Ratio

### 4.5.1 Limits of Peak To Average Ratio Measurement

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

### 4.5.2 Test Setup




### 4.5.3 Test Procedures

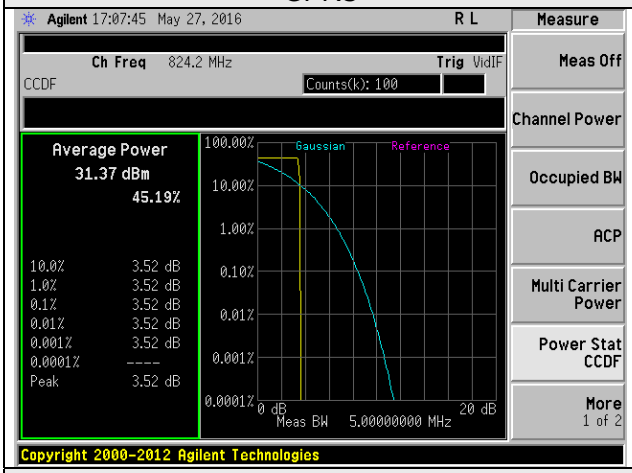
1. Set resolution/measurement bandwidth ≥ signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Record the maximum PAPR level associated with a probability of 0.1%.

### 4.5.4 Test Results

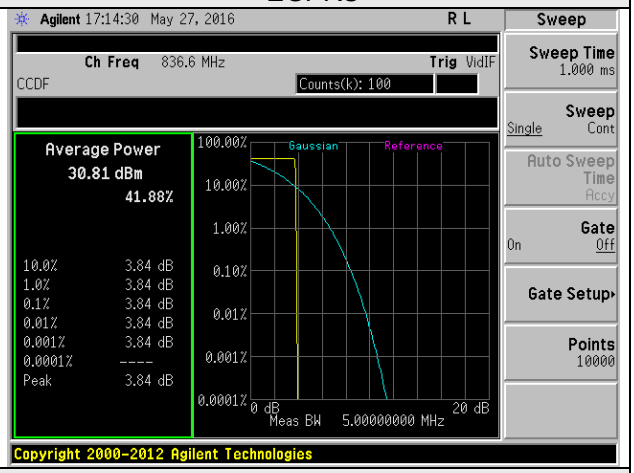
| Channel | Frequency (MHz) | Peak To Average Ratio (dB) | | Channel | Freq. (MHz) | Peak To Average Ratio (dB) | | |
|---|---|---|---|---|---|---|---|---|
| | | GPRS | EGPRS | | | WCDMA | HSDPA | HSUPA |
| 128 | 824.2 | 3.52 | 3.79 | 4132 | 826.4 | 2.83 | 2.81 | 2.83 |
| 190 | 836.6 | 2.64 | 3.84 | 4183 | 836.6 | 2.82 | 2.83 | 2.80 |
| 251 | 848.8 | 3.10 | 3.61 | 4233 | 846.6 | 2.84 | 2.83 | 2.84 |

Spectrum Plot Of Worst Value

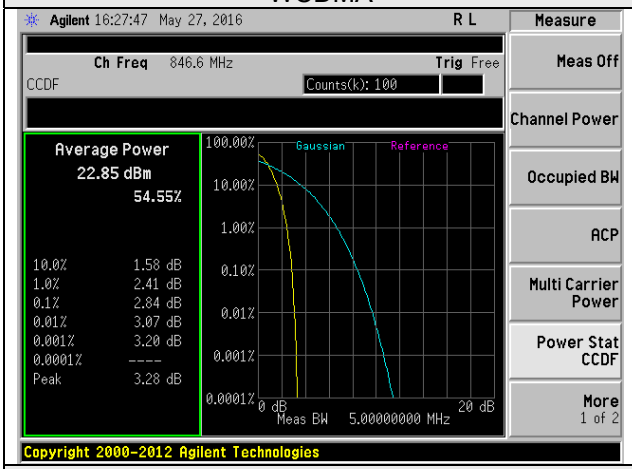
GPRS



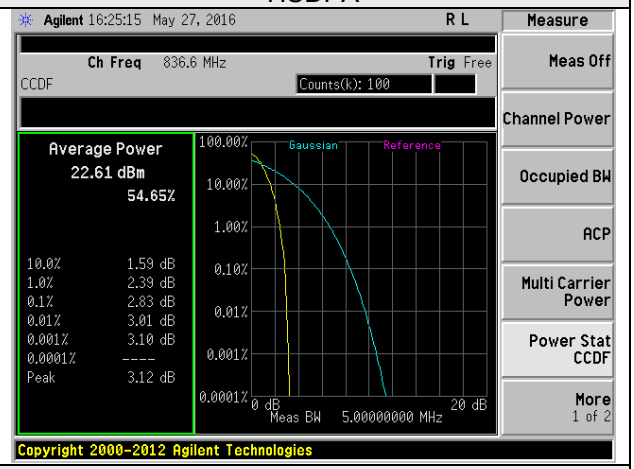

EGPRS



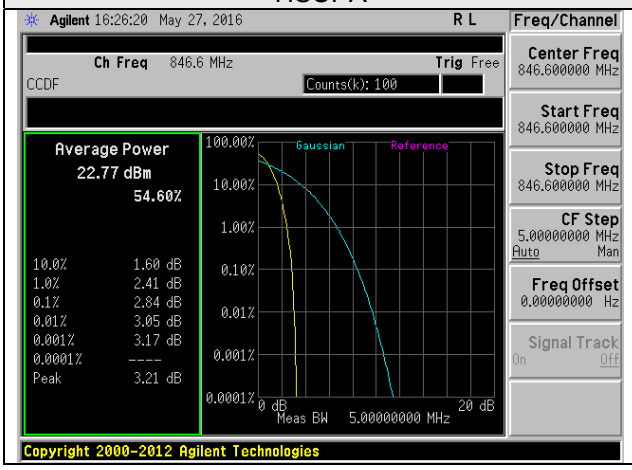

WCDMA




HSDPA




HSUPA

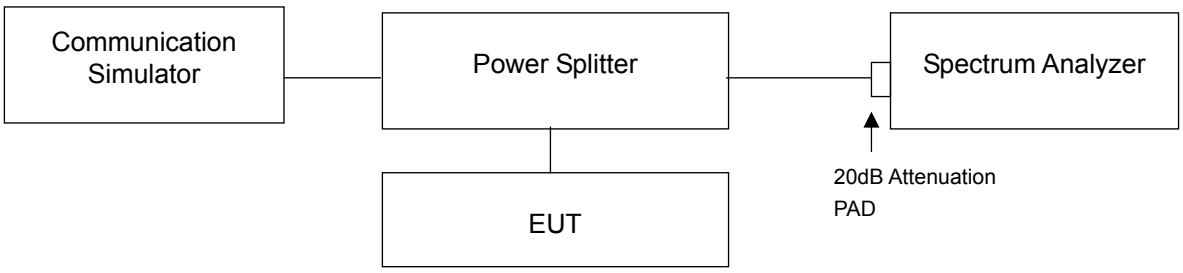


## 4.6 Conducted Spurious Emissions

### 4.6.1 Limits of Conducted Spurious Emissions Measurement

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

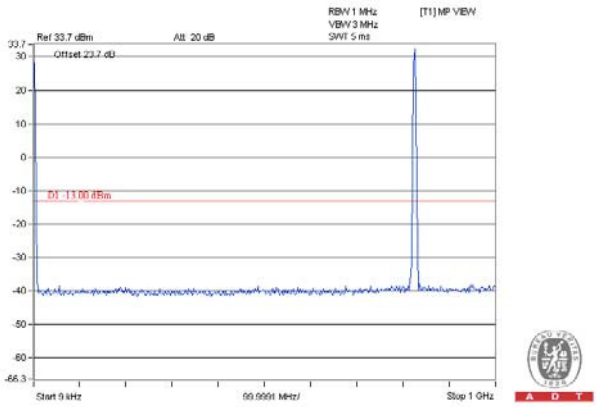
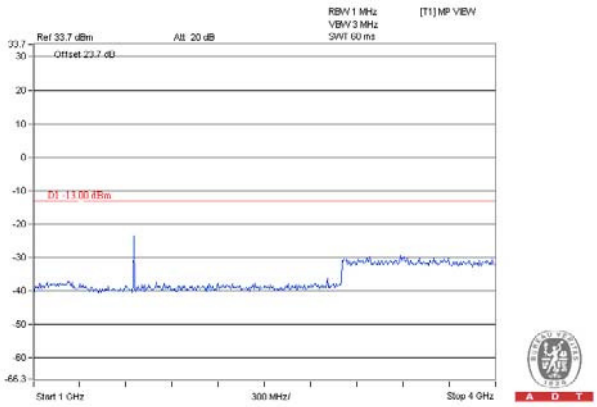
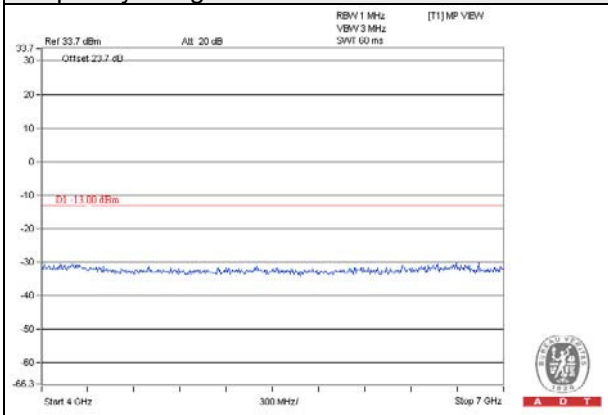
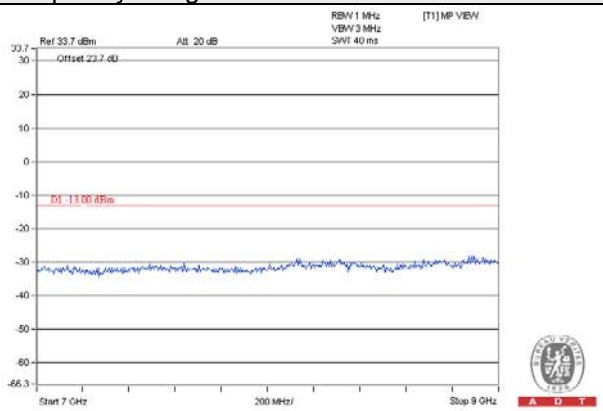
### 4.6.2 Test Setup

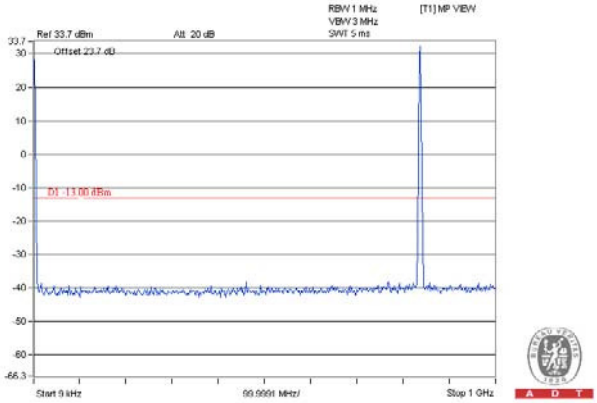
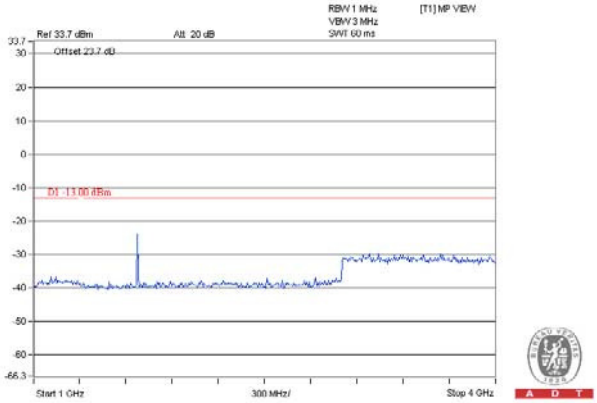
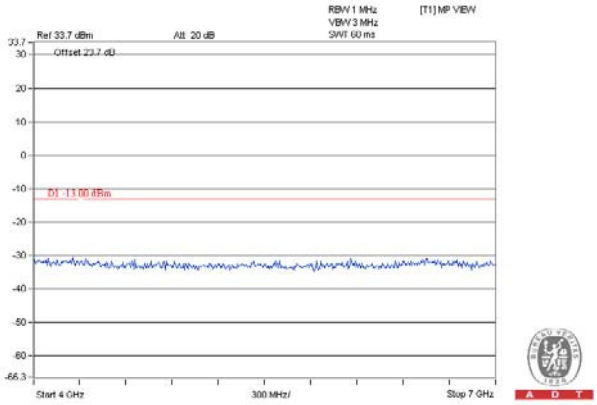
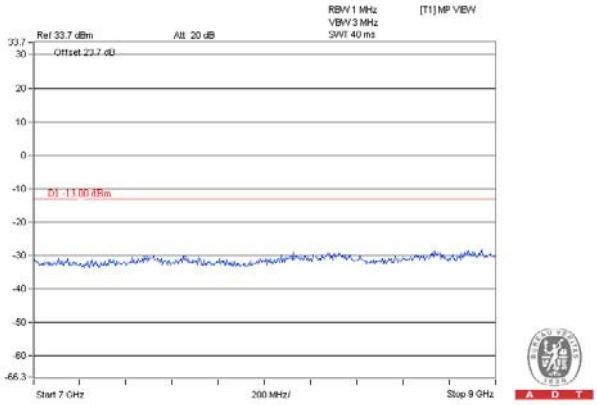


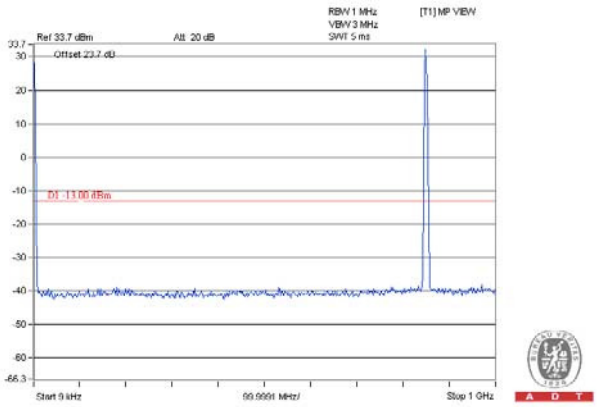
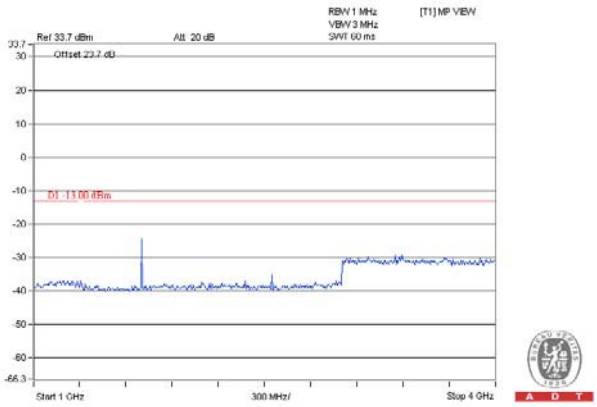
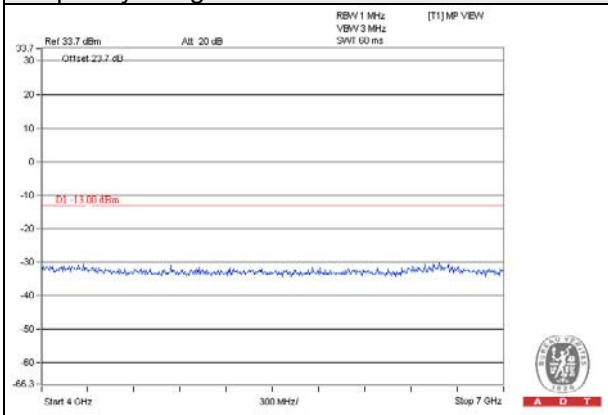
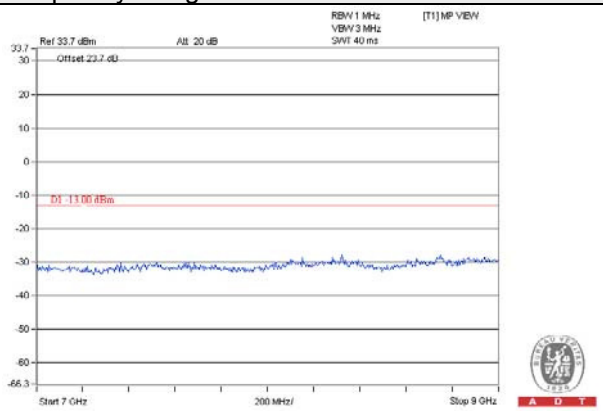

### 4.6.3 Test Procedure

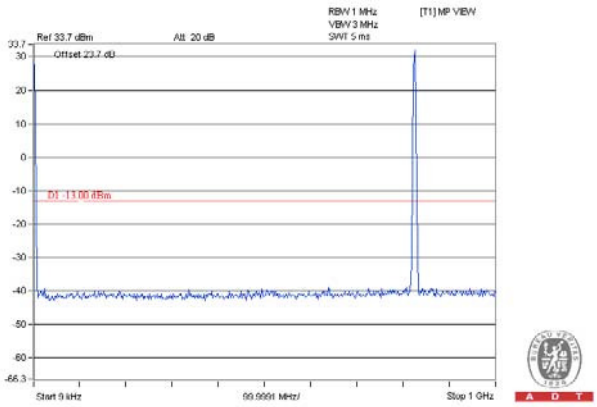
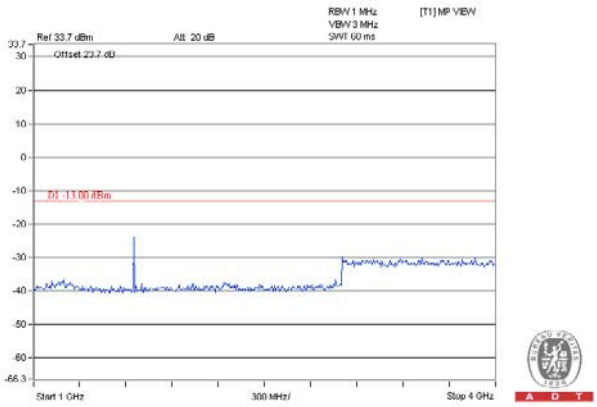
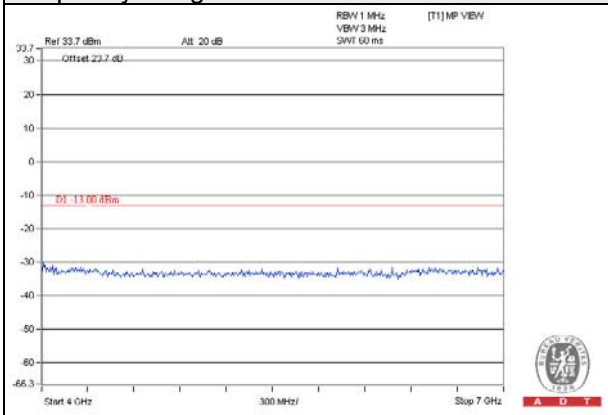
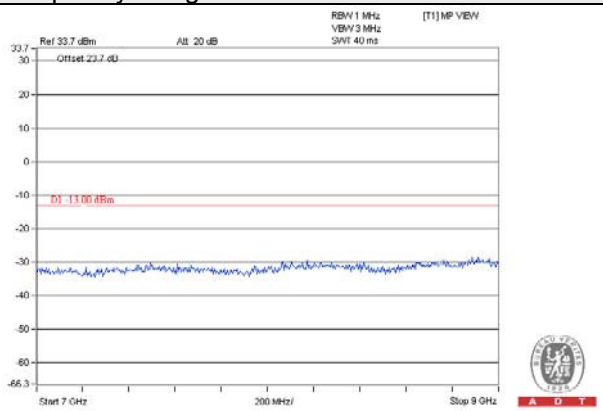
a. The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range.
b. Measuring frequency range is from 9 kHz to 9GHz. 20dB attenuation pad is connected with spectrum. RBW=1MHz and VBW=3MHz is used for conducted emission measurement.

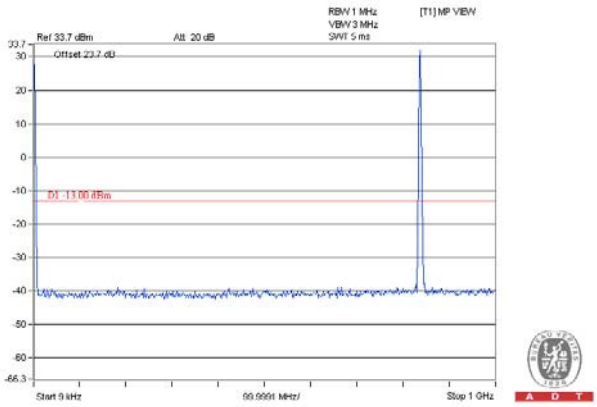
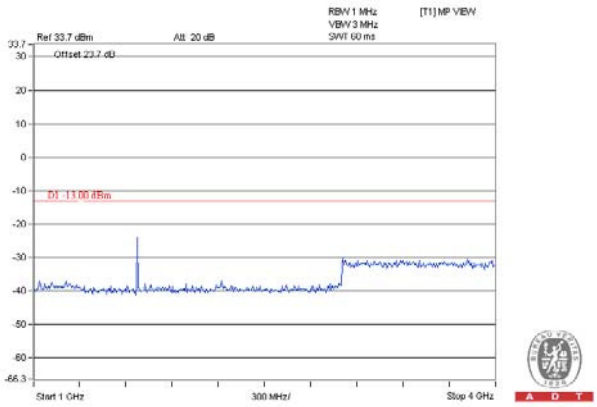
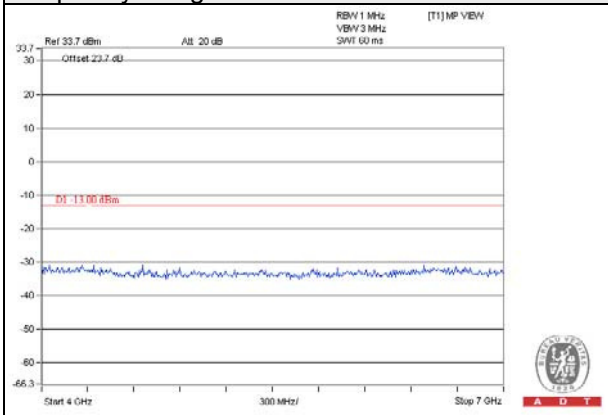
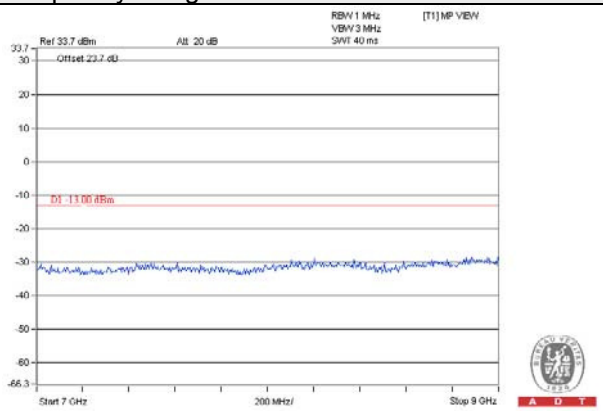
### 4.6.4 Test Results

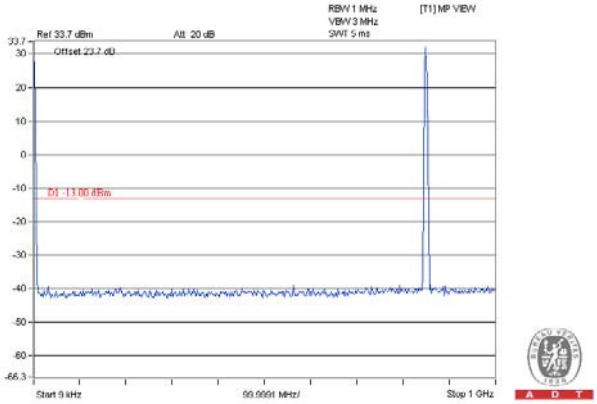
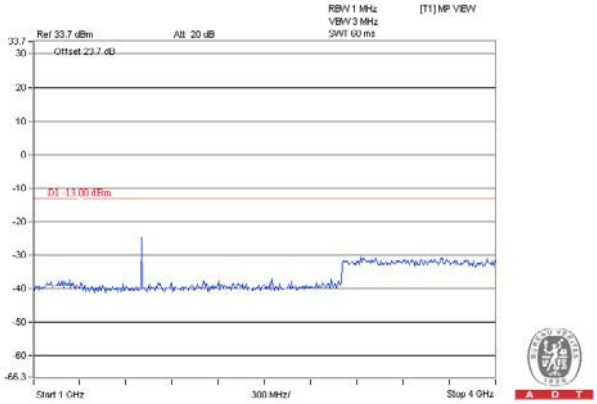
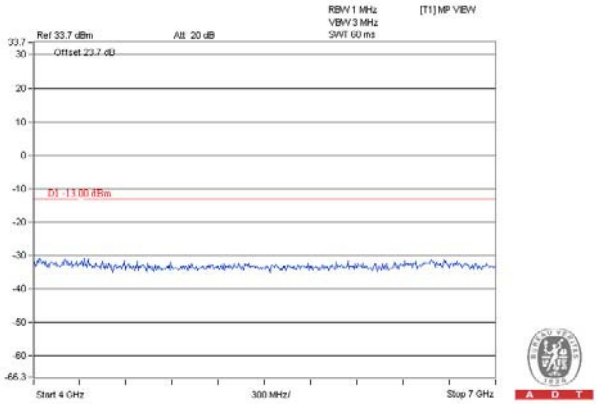
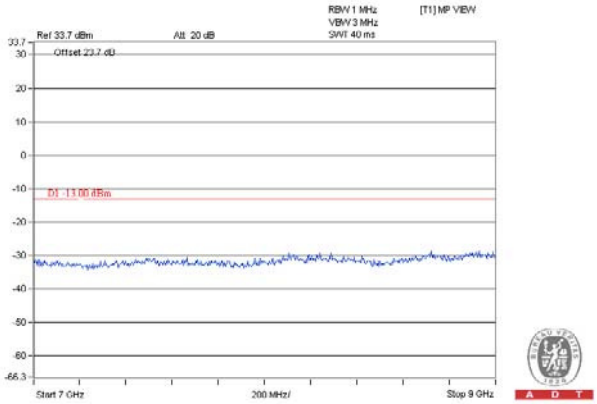
| GPRS | |
|---|---|
| Channel 128 | |
| Frequency Range : 9kHz~1GHz | Frequency Range : 1GHz~4GHz |
|  |  |
| Frequency Range : 4GHz~7GHz | Frequency Range : 7GHz~9GHz |
|  |  |

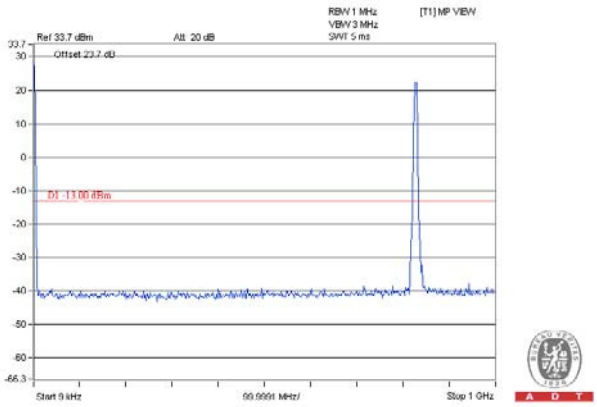
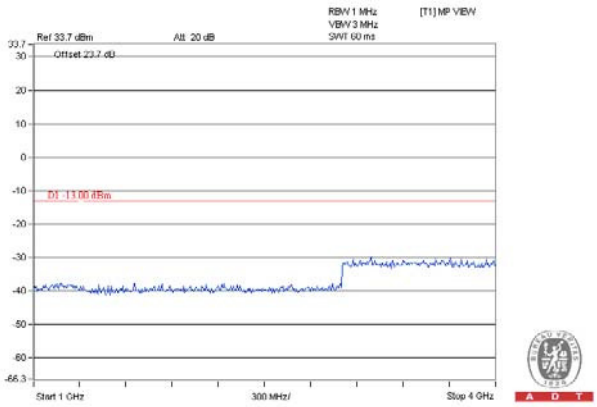
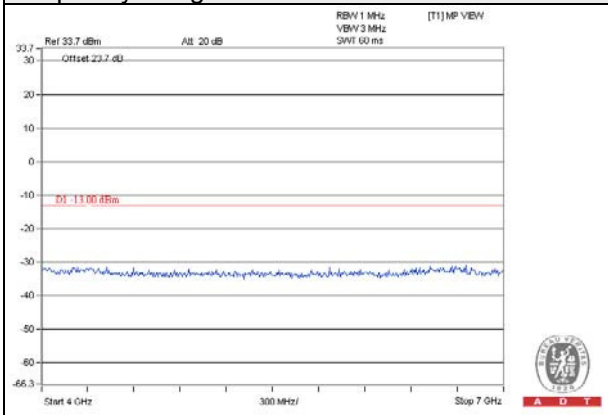
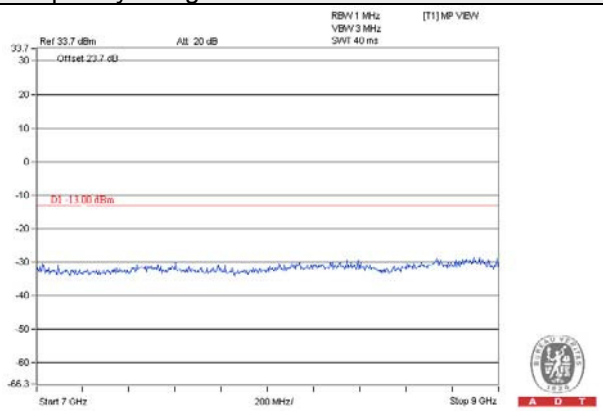
| GPRS | |
|---|---|
| Channel 190 | |
| Frequency Range : 9kHz~1GHz | Frequency Range : 1GHz~4GHz |
|  |  |
| Frequency Range : 4GHz~7GHz | Frequency Range : 7GHz~9GHz |
|  |  |

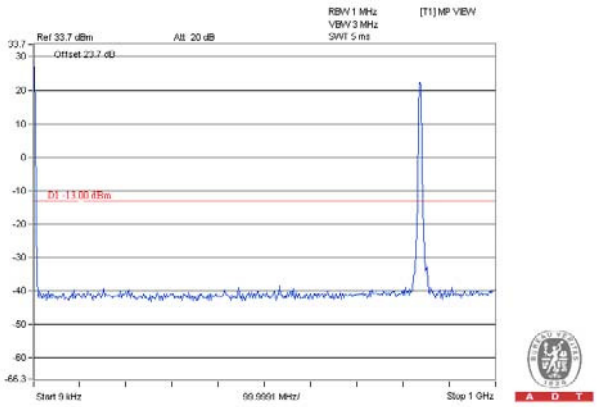
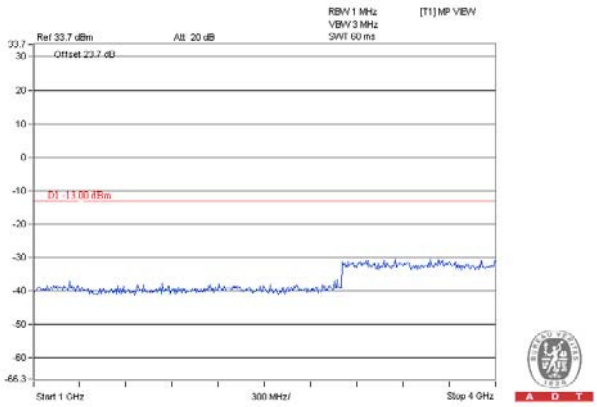
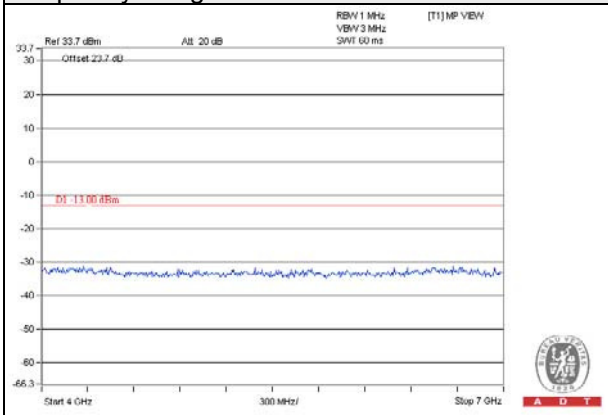
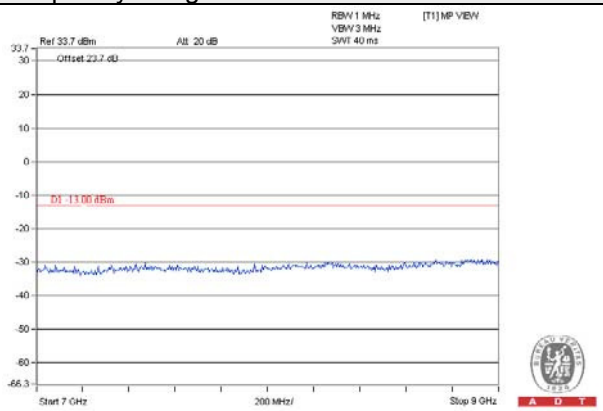
| GPRS | |
|---|---|
| Channel 251 | |
| Frequency Range : 9kHz~1GHz | Frequency Range : 1GHz~4GHz |
|  |  |
| Frequency Range : 4GHz~7GHz | Frequency Range : 7GHz~9GHz |
|  |  |

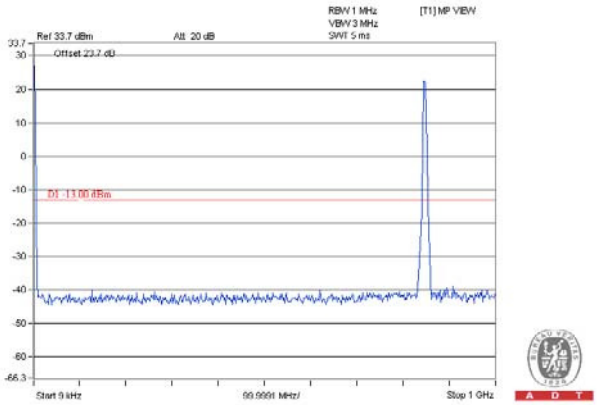
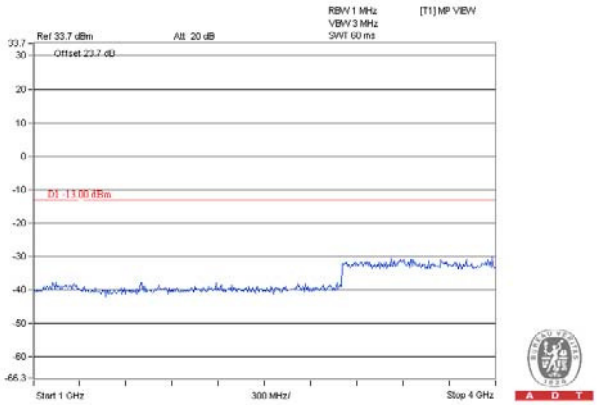
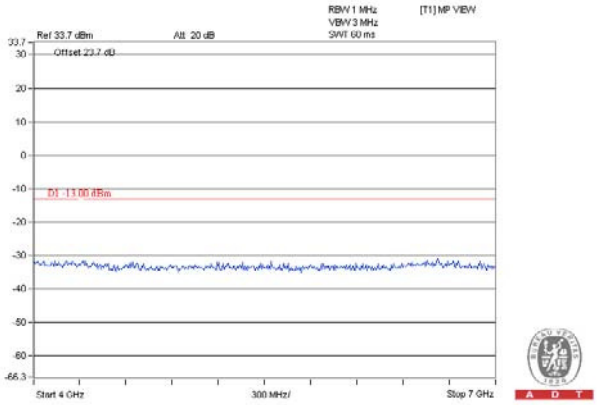
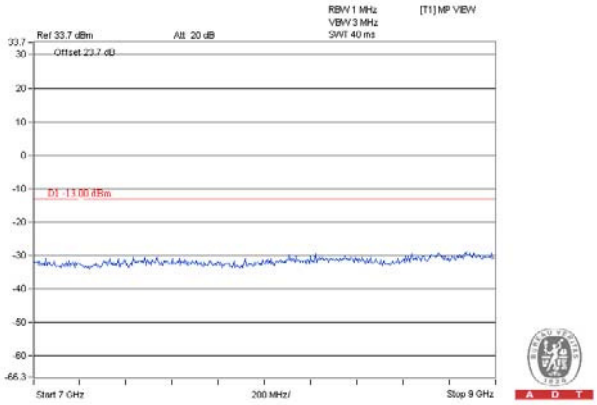
| EGPRS | |
|---|---|
| Channel 128 | |
| Frequency Range : 9kHz~1GHz | Frequency Range : 1GHz~4GHz |
|  |  |
| Frequency Range : 4GHz~7GHz | Frequency Range : 7GHz~9GHz |
|  |  |

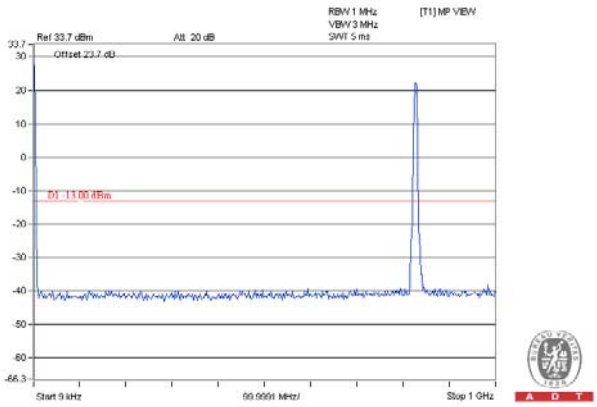
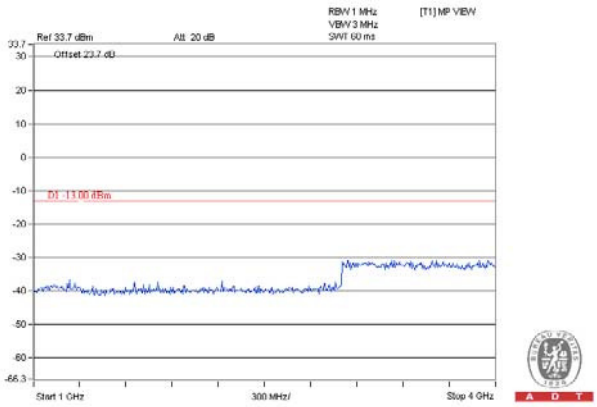
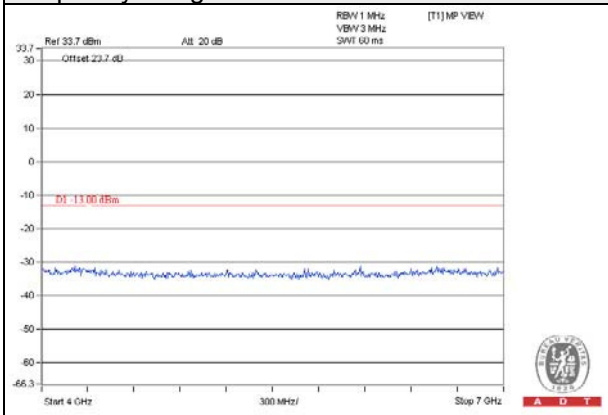
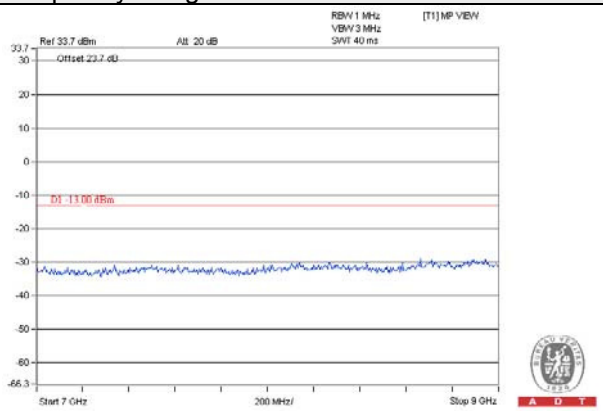
| EGPRS | |
|---|---|
| Channel 190 | |
| Frequency Range : 9kHz~1GHz | Frequency Range : 1GHz~4GHz |
|  |  |
| Frequency Range : 4GHz~7GHz | Frequency Range : 7GHz~9GHz |
|  |  |

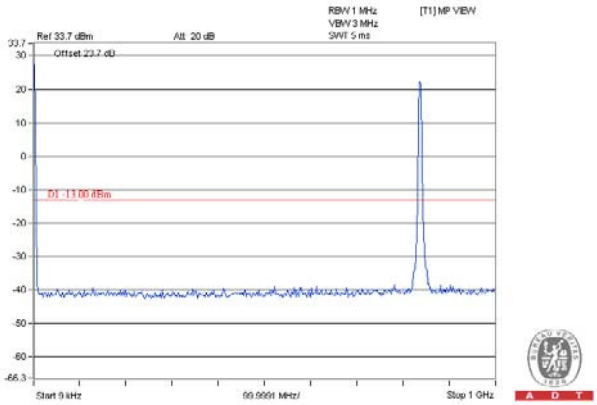
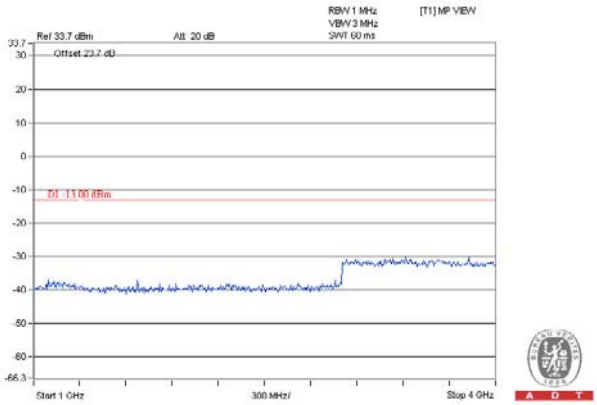
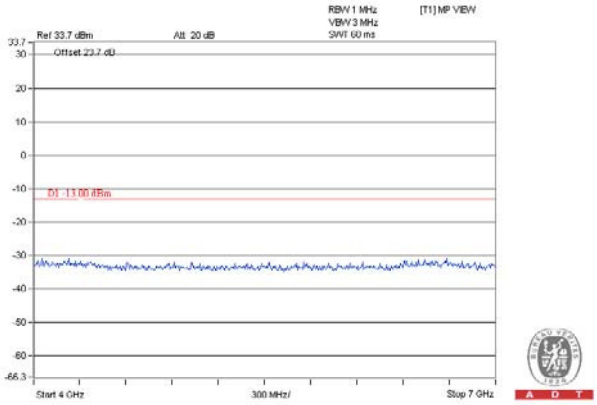
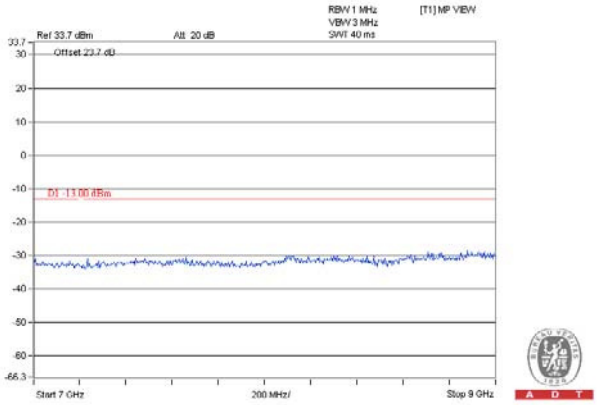
| EGPRS | |
|---|---|
| Channel 251 | |
| Frequency Range : 9kHz~1GHz | Frequency Range : 1GHz~4GHz |
|   |   |
| Frequency Range : 4GHz~7GHz | Frequency Range : 7GHz~9GHz |
|   |   |

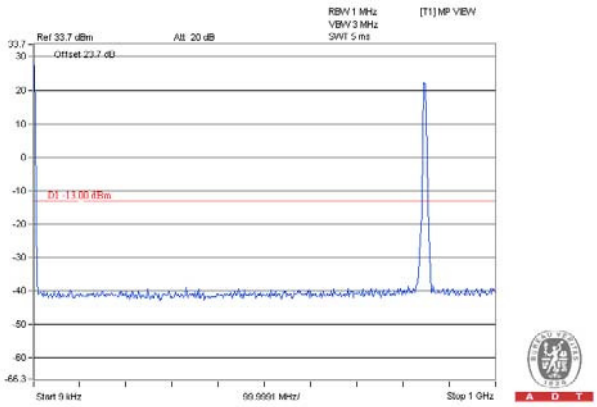
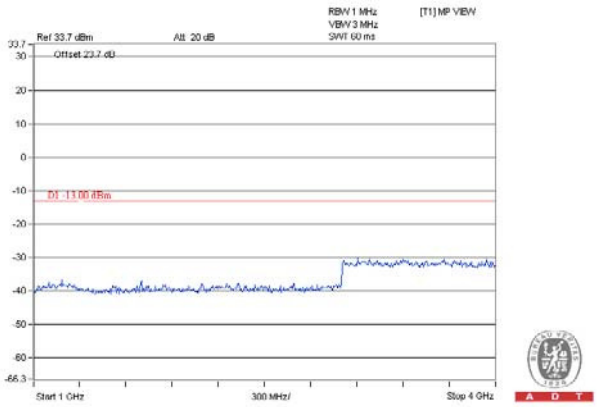
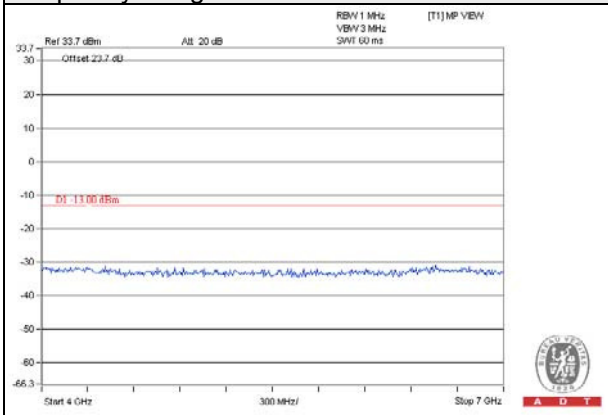
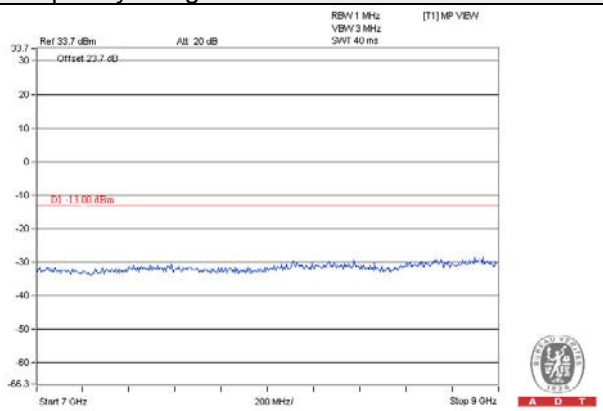
| WCDMA | |
|---|---|
| Channel 4132 | |
| Frequency Range : 9kHz~1Hz | Frequency Range : 1GHz~4GHz |
|  |  |
| Frequency Range : 4GHz~7GHz | Frequency Range : 7GHz~9GHz |
|  |  |

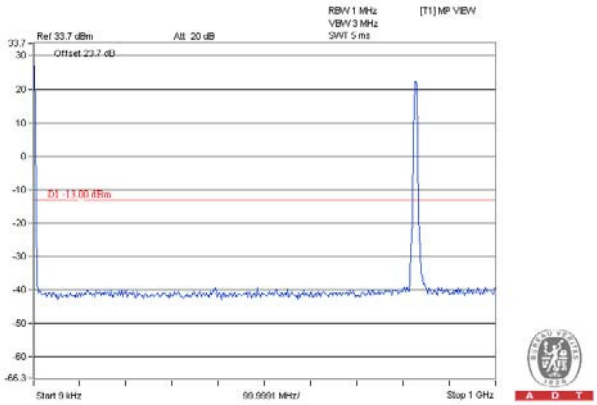
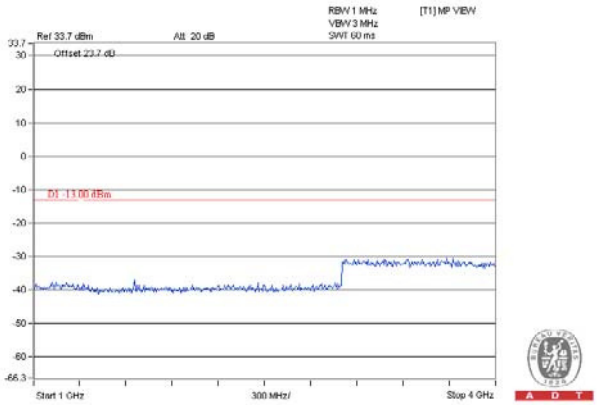
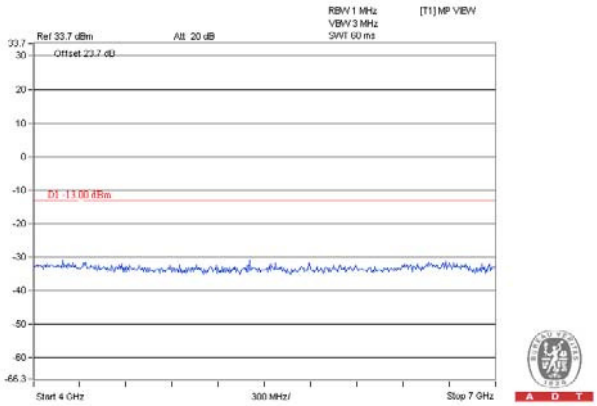
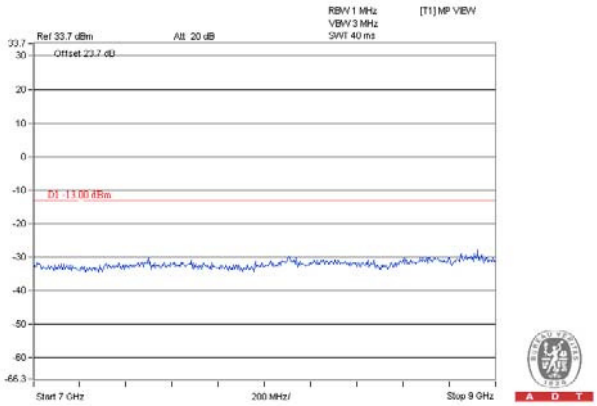
| WCDMA | |
|---|---|
| Channel 4183 | |
| Frequency Range : 9kHz~1GHz | Frequency Range : 1GHz~4GHz |
|  |  |
| Frequency Range : 4GHz~7GHz | Frequency Range : 7GHz~9GHz |
|  |  |

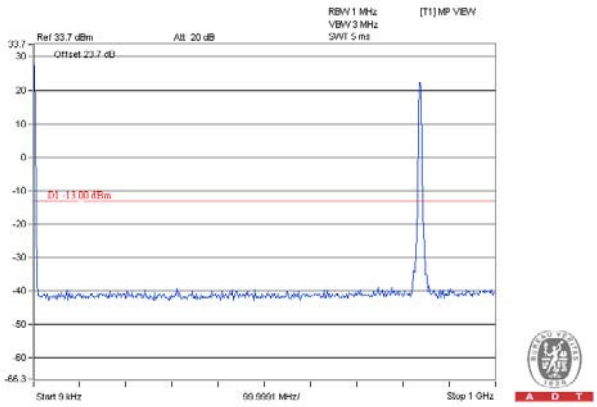
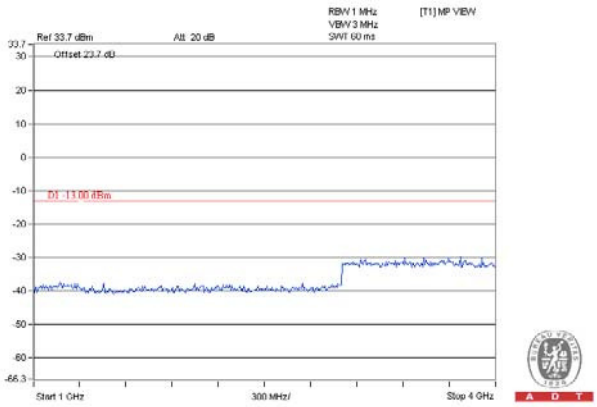
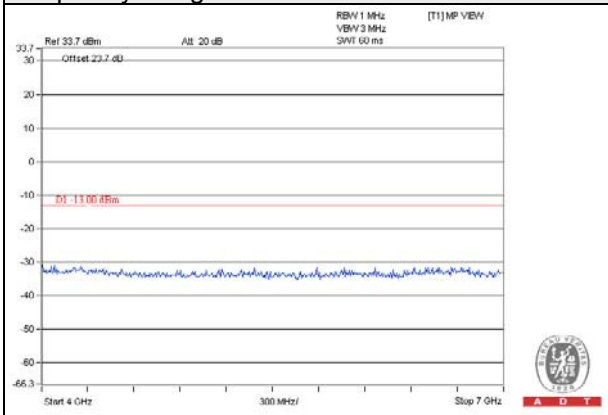
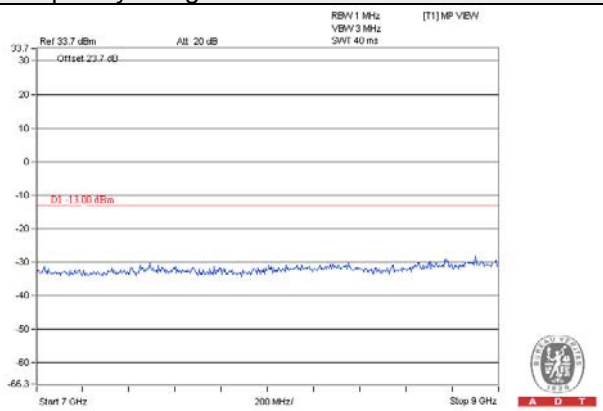
| WCDMA | |
|---|---|
| Channel 4233 | |
| Frequency Range : 9kHz~1GHz | Frequency Range : 1GHz~4GHz |
|  |  |
| Frequency Range : 4GHz~7GHz | Frequency Range : 7GHz~9GHz |
|  |  |

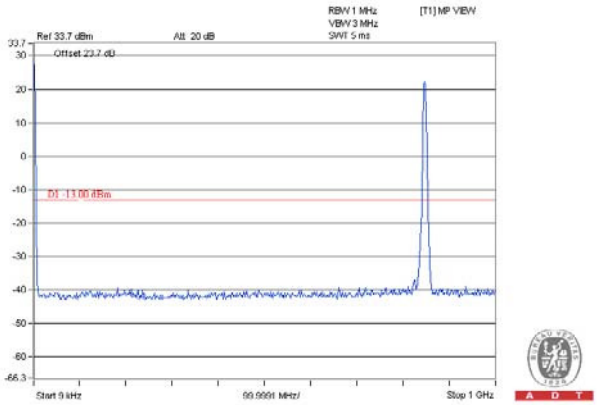
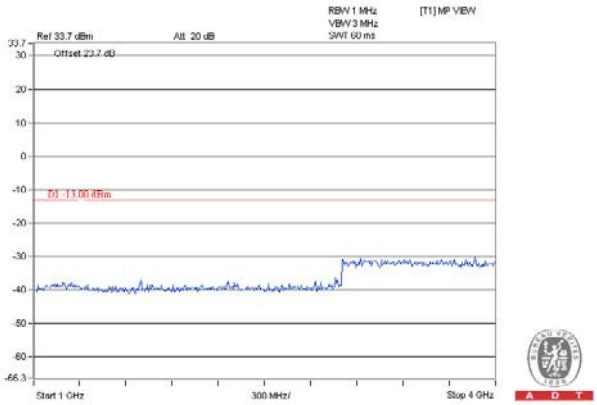
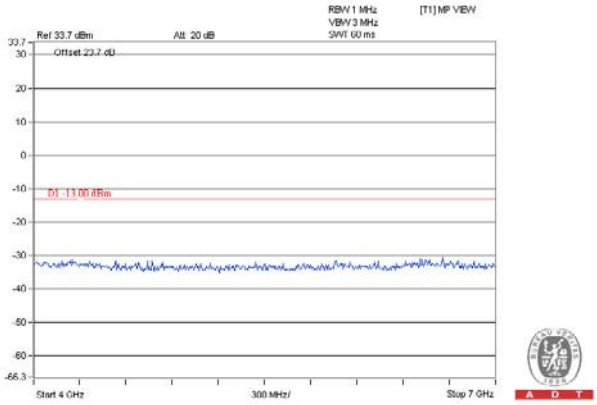
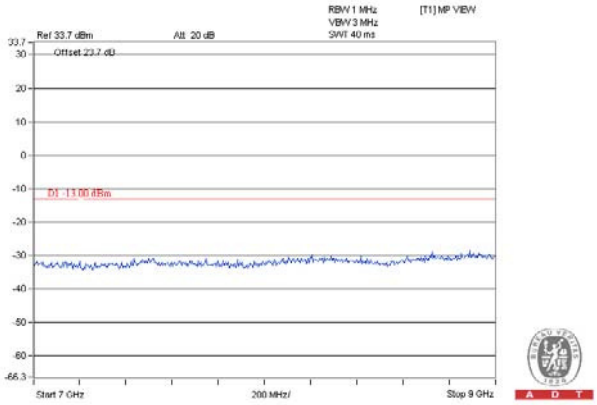
| HSDPA | |
|---|---|
| Channel 4132 | |
| Frequency Range : 9kHz~1GHz | Frequency Range : 1GHz~4GHz |
|  |  |
| Frequency Range : 4GHz~7GHz | Frequency Range : 7GHz~9GHz |
|  |  |

| HSDPA | |
|---|---|
| Channel 4183 | |
| Frequency Range : 9kHz~1GHz | Frequency Range : 1GHz~4GHz |
|  |  |
| Frequency Range : 4GHz~7GHz | Frequency Range : 7GHz~9GHz |
|  |  |

| HSDPA | |
|---|---|
| Channel 4233 | |
| Frequency Range : 9kHz~1GHz | Frequency Range : 1GHz~4GHz |
|  |  |
| Frequency Range : 4GHz~7GHz | Frequency Range : 7GHz~9GHz |
|  |  |

| HSUPA | |
|---|---|
| Channel 4132 | |
| Frequency Range : 9kHz~1GHz | Frequency Range : 1GHz~4GHz |
|  |  |
| Frequency Range : 4GHz~7GHz | Frequency Range : 7GHz~9GHz |
|  |  |

| HSUPA | |
|---|---|
| Channel 4183 | |
| Frequency Range : 9kHz~1GHz | Frequency Range : 1GHz~4GHz |
|  |  |
| Frequency Range : 4GHz~7GHz | Frequency Range : 7GHz~9GHz |
|  |  |

| HSUPA | |
|---|---|
| Channel 4233 | |
| Frequency Range : 9kHz~1GHz | Frequency Range : 1GHz~4GHz |
|  |  |
| Frequency Range : 4GHz~7GHz | Frequency Range : 7GHz~9GHz |
|  |  |

## 4.7 Radiated Emission Measurement

### 4.7.1 Limits of Radiated Emission Measurement

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

### 4.7.2 Test Procedure

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.

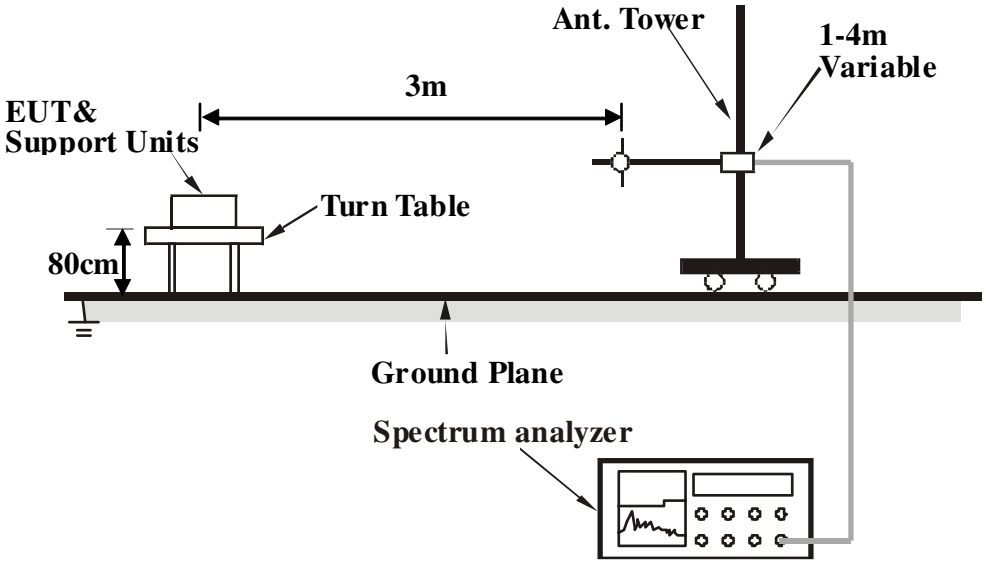
d. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.P.R power - 2.15dBi.

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

### 4.7.3 Deviation from Test Standard

No deviation.

4.7.4 Test Setup




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

4.7.5 Test Results

BELOW 1GHz

**GPRS:**

| Mode | TX channel 128 | Frequency Range | Below 1000 MHz |
|---|---|---|---|

| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
|---|---|---|---|---|---|---|---|
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 124.94 | -71.97 | -87.50 | 13.07 | -74.43 | -13.00 | -61.43 |
| 2 | 249.95 | -65.54 | -83.28 | 14.22 | -69.06 | -13.00 | -56.06 |
| 3 | 374.96 | -68.11 | -86.47 | 18.20 | -68.27 | -13.00 | -55.27 |
| 4 | 455.95 | -75.25 | -94.83 | 20.52 | -74.31 | -13.00 | -61.31 |
| 5 | 715.18 | -75.01 | -94.16 | 25.16 | -69.00 | -13.00 | -56.00 |
| 6 | 874.99 | -73.89 | -93.52 | 27.67 | -65.85 | -13.00 | -52.85 |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 124.94 | -74.46 | -89.44 | 13.07 | -76.37 | -13.00 | -63.37 |
| 2 | 339.43 | -73.32 | -90.96 | 17.14 | -73.82 | -13.00 | -60.82 |
| 3 | 374.96 | -70.71 | -88.81 | 18.20 | -70.61 | -13.00 | -57.61 |
| 4 | 503.97 | -72.72 | -92.54 | 21.38 | -71.16 | -13.00 | -58.16 |
| 5 | 678.81 | -74.05 | -94.08 | 24.76 | -69.32 | -13.00 | -56.32 |
| 6 | 874.99 | -73.50 | -93.32 | 27.67 | -65.65 | -13.00 | -52.65 |

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

| Mode | TX channel 190 | Frequency Range | Below 1000 MHz |
|---|---|---|---|

| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
|---|---|---|---|---|---|---|---|
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 31.82 | -69.77 | -83.38 | 12.89 | -70.49 | -13.00 | -57.49 |
| 2 | 149.07 | -74.95 | -89.58 | 15.05 | -74.53 | -13.00 | -61.53 |
| 3 | 249.95 | -65.65 | -83.39 | 14.22 | -69.17 | -13.00 | -56.17 |
| 4 | 374.96 | -66.09 | -84.45 | 18.20 | -66.25 | -13.00 | -53.25 |
| 5 | 503.97 | -70.36 | -89.65 | 21.38 | -68.27 | -13.00 | -55.27 |
| 6 | 1000.00 | -77.18 | -96.29 | 29.05 | -67.24 | -13.00 | -54.24 |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 31.58 | -73.08 | -84.55 | 12.90 | -71.65 | -13.00 | -58.65 |
| 2 | 124.94 | -75.20 | -90.18 | 13.07 | -77.11 | -13.00 | -64.11 |
| 3 | 290.93 | -73.51 | -91.07 | 15.88 | -75.19 | -13.00 | -62.19 |
| 4 | 374.96 | -70.84 | -88.94 | 18.20 | -70.74 | -13.00 | -57.74 |
| 5 | 678.81 | -74.80 | -94.83 | 24.76 | -70.07 | -13.00 | -57.07 |
| 6 | 911.97 | -76.38 | -96.67 | 28.27 | -68.40 | -13.00 | -55.40 |

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

| Mode | TX channel 251 | Frequency Range | Below 1000 MHz |
|---|---|---|---|

| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
|---|---|---|---|---|---|---|---|
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 32.06 | -74.19 | -87.74 | 12.88 | -74.86 | -13.00 | -61.86 |
| 2 | 124.94 | -73.10 | -88.63 | 13.07 | -75.56 | -13.00 | -62.56 |
| 3 | 249.95 | -65.18 | -82.92 | 14.22 | -68.70 | -13.00 | -55.70 |
| 4 | 374.96 | -66.08 | -84.44 | 18.20 | -66.24 | -13.00 | -53.24 |
| 5 | 503.97 | -70.01 | -89.30 | 21.38 | -67.92 | -13.00 | -54.92 |
| 6 | 874.99 | -73.85 | -93.48 | 27.67 | -65.81 | -13.00 | -52.81 |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 31.82 | -71.19 | -82.68 | 12.89 | -69.79 | -13.00 | -56.79 |
| 2 | 249.95 | -73.65 | -89.68 | 14.22 | -75.46 | -13.00 | -62.46 |
| 3 | 374.96 | -70.51 | -88.61 | 18.20 | -70.41 | -13.00 | -57.41 |
| 4 | 503.97 | -72.49 | -92.31 | 21.38 | -70.93 | -13.00 | -57.93 |
| 5 | 746.95 | -68.67 | -89.71 | 26.20 | -63.51 | -13.00 | -50.51 |
| 6 | 895.12 | -69.27 | -89.34 | 27.84 | -61.50 | -13.00 | -48.50 |

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

**WCDMA:**

| Mode | TX channel 4132 | Frequency Range | Below 1000 MHz |
|---|---|---|---|

| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
|---|---|---|---|---|---|---|---|
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 150.76 | -74.08 | -88.52 | 15.04 | -73.48 | -13.00 | -60.48 |
| 2 | 216.00 | -65.41 | -82.08 | 12.20 | -69.88 | -13.00 | -56.88 |
| 3 | 249.95 | -63.65 | -81.39 | 14.22 | -67.17 | -13.00 | -54.17 |
| 4 | 374.96 | -67.54 | -85.90 | 18.20 | -67.70 | -13.00 | -54.70 |
| 5 | 407.94 | -68.53 | -87.00 | 18.92 | -68.08 | -13.00 | -55.08 |
| 6 | 503.97 | -70.92 | -90.21 | 21.38 | -68.83 | -13.00 | -55.83 |
| 7 | 696.03 | -79.25 | -98.30 | 24.97 | -73.33 | -13.00 | -60.33 |
| 8 | 935.98 | -79.22 | -98.60 | 28.54 | -70.06 | -13.00 | -57.06 |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 30.73 | -74.53 | -85.95 | 12.96 | -72.99 | -13.00 | -59.99 |
| 2 | 150.28 | -75.89 | -90.02 | 15.05 | -74.97 | -13.00 | -61.97 |
| 3 | 249.95 | -65.09 | -81.12 | 14.22 | -66.90 | -13.00 | -53.90 |
| 4 | 374.96 | -71.00 | -89.10 | 18.20 | -70.90 | -13.00 | -57.90 |
| 5 | 503.97 | -68.05 | -87.87 | 21.38 | -66.49 | -13.00 | -53.49 |
| 6 | 678.81 | -73.67 | -93.70 | 24.76 | -68.94 | -13.00 | -55.94 |
| 7 | 874.99 | -75.74 | -95.56 | 27.67 | -67.89 | -13.00 | -54.89 |

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

| Mode | TX channel 4183 | Frequency Range | Below 1000 MHz |
|---|---|---|---|

| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
|---|---|---|---|---|---|---|---|
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 147.73 | -72.80 | -87.74 | 15.05 | -72.69 | -13.00 | -59.69 |
| 2 | 216.00 | -63.65 | -80.32 | 12.20 | -68.12 | -13.00 | -55.12 |
| 3 | 249.95 | -64.05 | -81.79 | 14.22 | -67.57 | -13.00 | -54.57 |
| 4 | 374.96 | -67.52 | -85.88 | 18.20 | -67.68 | -13.00 | -54.68 |
| 5 | 503.97 | -65.54 | -84.83 | 21.38 | -63.45 | -13.00 | -50.45 |
| 6 | 551.98 | -68.65 | -88.70 | 22.26 | -66.44 | -13.00 | -53.44 |
| 7 | 1000.00 | -78.22 | -97.33 | 29.05 | -68.28 | -13.00 | -55.28 |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 30.61 | -75.94 | -87.36 | 12.97 | -74.39 | -13.00 | -61.39 |
| 2 | 149.19 | -76.02 | -90.33 | 15.06 | -75.27 | -13.00 | -62.27 |
| 3 | 249.95 | -64.98 | -81.01 | 14.22 | -66.79 | -13.00 | -53.79 |
| 4 | 407.94 | -74.28 | -92.75 | 18.92 | -73.83 | -13.00 | -60.83 |
| 5 | 551.98 | -71.94 | -91.37 | 22.26 | -69.11 | -13.00 | -56.11 |
| 6 | 678.81 | -72.62 | -92.65 | 24.76 | -67.89 | -13.00 | -54.89 |
| 7 | 1000.00 | -79.84 | -99.54 | 29.05 | -70.49 | -13.00 | -57.49 |

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

| Mode | TX channel 4233 | Frequency Range | Below 1000 MHz |
|---|---|---|---|

| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
|---|---|---|---|---|---|---|---|
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 30.12 | -72.66 | -86.72 | 13.00 | -73.72 | -13.00 | -60.72 |
| 2 | 149.31 | -73.40 | -87.98 | 15.06 | -72.92 | -13.00 | -59.92 |
| 3 | 249.95 | -63.90 | -81.64 | 14.22 | -67.42 | -13.00 | -54.42 |
| 4 | 374.96 | -67.56 | -85.92 | 18.20 | -67.72 | -13.00 | -54.72 |
| 5 | 503.97 | -66.40 | -85.69 | 21.38 | -64.31 | -13.00 | -51.31 |
| 6 | 551.98 | -68.61 | -88.66 | 22.26 | -66.40 | -13.00 | -53.40 |
| 7 | 1000.00 | -77.80 | -96.91 | 29.05 | -67.86 | -13.00 | -54.86 |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 30.00 | -71.00 | -82.38 | 13.01 | -69.37 | -13.00 | -56.37 |
| 2 | 249.95 | -64.78 | -80.81 | 14.22 | -66.59 | -13.00 | -53.59 |
| 3 | 290.93 | -68.35 | -85.91 | 15.88 | -70.03 | -13.00 | -57.03 |
| 4 | 374.96 | -70.64 | -88.74 | 18.20 | -70.54 | -13.00 | -57.54 |
| 5 | 503.97 | -68.06 | -87.88 | 21.38 | -66.50 | -13.00 | -53.50 |
| 6 | 729.13 | -68.69 | -89.09 | 25.58 | -63.51 | -13.00 | -50.51 |
| 7 | 1000.00 | -79.19 | -98.89 | 29.05 | -69.84 | -13.00 | -56.84 |

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

ABOVE 1GHz

**GPRS:**

| Mode | TX channel 128 | Frequency Range | Above 1000MHz |
|---|---|---|---|

| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
|---|---|---|---|---|---|---|---|
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 1648.44 | -59.76 | -73.39 | 12.06 | -61.33 | -13.00 | -48.33 |
| 2 | 2474.31 | -64.08 | -74.28 | 13.92 | -60.36 | -13.00 | -47.36 |
| 3 | 3296.65 | -64.92 | -77.26 | 16.89 | -60.37 | -13.00 | -47.37 |
| 4 | 4119.18 | -66.23 | -79.90 | 19.44 | -60.46 | -13.00 | -47.46 |
| 5 | 4946.57 | -66.48 | -80.12 | 21.01 | -59.11 | -13.00 | -46.11 |
| 6 | 5766.92 | -68.60 | -81.75 | 22.73 | -59.02 | -13.00 | -46.02 |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 1648.35 | -60.92 | -74.39 | 12.06 | -62.33 | -13.00 | -49.33 |
| 2 | 2474.24 | -65.62 | -76.05 | 13.92 | -62.13 | -13.00 | -49.13 |
| 3 | 3296.97 | -65.30 | -77.76 | 16.89 | -60.87 | -13.00 | -47.87 |
| 4 | 4122.95 | -67.30 | -80.97 | 19.44 | -61.53 | -13.00 | -48.53 |
| 5 | 4947.08 | -68.93 | -82.20 | 21.01 | -61.19 | -13.00 | -48.19 |
| 6 | 5767.61 | -69.77 | -83.08 | 22.73 | -60.35 | -13.00 | -47.35 |

Remarks:

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

| Mode | TX channel 190 | Frequency Range | Above 1000MHz |
|---|---|---|---|

| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
|---|---|---|---|---|---|---|---|
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 1673.30 | -58.18 | -71.52 | 12.05 | -59.47 | -13.00 | -46.47 |
| 2 | 2509.74 | -64.61 | -74.89 | 14.11 | -60.78 | -13.00 | -47.78 |
| 3 | 3345.35 | -64.93 | -77.37 | 17.09 | -60.28 | -13.00 | -47.28 |
| 4 | 4183.98 | -65.84 | -80.06 | 19.52 | -60.54 | -13.00 | -47.54 |
| 5 | 5019.34 | -66.40 | -80.18 | 21.03 | -59.15 | -13.00 | -46.15 |
| 6 | 5858.11 | -69.50 | -82.54 | 22.80 | -59.74 | -13.00 | -46.74 |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 1673.23 | -61.22 | -74.19 | 12.05 | -62.14 | -13.00 | -49.14 |
| 2 | 2509.24 | -65.28 | -75.77 | 14.11 | -61.66 | -13.00 | -48.66 |
| 3 | 3347.28 | -65.88 | -78.49 | 17.10 | -61.39 | -13.00 | -48.39 |
| 4 | 4184.26 | -66.83 | -80.94 | 19.52 | -61.42 | -13.00 | -48.42 |
| 5 | 5020.78 | -67.69 | -81.17 | 21.04 | -60.13 | -13.00 | -47.13 |
| 6 | 5855.61 | -70.08 | -83.26 | 22.80 | -60.46 | -13.00 | -47.46 |

Remarks:

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

| Mode | TX channel 251 | Frequency Range | Above 1000MHz |
|---|---|---|---|

| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
|---|---|---|---|---|---|---|---|
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 1697.68 | -56.87 | -69.95 | 12.05 | -57.90 | -13.00 | -44.90 |
| 2 | 2544.56 | -64.55 | -74.90 | 14.21 | -60.69 | -13.00 | -47.69 |
| 3 | 3397.61 | -65.06 | -77.62 | 17.31 | -60.31 | -13.00 | -47.31 |
| 4 | 4241.93 | -66.13 | -80.87 | 20.01 | -60.86 | -13.00 | -47.86 |
| 5 | 5093.44 | -67.20 | -80.89 | 21.22 | -59.67 | -13.00 | -46.67 |
| 6 | 5942.60 | -68.79 | -81.74 | 22.88 | -58.86 | -13.00 | -45.86 |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 1697.63 | -60.45 | -72.95 | 12.05 | -60.90 | -13.00 | -47.90 |
| 2 | 2545.56 | -65.41 | -75.88 | 14.21 | -61.67 | -13.00 | -48.67 |
| 3 | 3394.12 | -66.25 | -78.99 | 17.29 | -61.70 | -13.00 | -48.70 |
| 4 | 4243.48 | -67.36 | -81.91 | 20.02 | -61.89 | -13.00 | -48.89 |
| 5 | 5094.56 | -69.03 | -82.49 | 21.22 | -61.27 | -13.00 | -48.27 |
| 6 | 5941.12 | -69.65 | -82.72 | 22.88 | -59.84 | -13.00 | -46.84 |

Remarks:

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

**WCDMA:**

| Mode | TX channel 4132 | Frequency Range | Above 1000MHz |
|---|---|---|---|

| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
|---|---|---|---|---|---|---|---|
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 1654.30 | -52.35 | -65.91 | 12.06 | -53.85 | -13.00 | -40.85 |
| 2 | 2478.47 | -66.02 | -76.22 | 13.94 | -62.28 | -13.00 | -49.28 |
| 3 | 3306.75 | -65.92 | -78.29 | 16.93 | -61.36 | -13.00 | -48.36 |
| 4 | 4133.56 | -68.27 | -82.05 | 19.45 | -62.60 | -13.00 | -49.60 |
| 5 | 4958.44 | -68.80 | -82.47 | 21.00 | -61.47 | -13.00 | -48.47 |
| 6 | 5786.73 | -68.97 | -82.11 | 22.76 | -59.35 | -13.00 | -46.35 |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 1654.19 | -55.25 | -68.60 | 12.06 | -56.54 | -13.00 | -43.54 |
| 2 | 2479.12 | -68.48 | -78.93 | 13.96 | -64.97 | -13.00 | -51.97 |
| 3 | 3307.96 | -67.88 | -80.38 | 16.93 | -63.45 | -13.00 | -50.45 |
| 4 | 4129.54 | -70.35 | -84.06 | 19.45 | -64.61 | -13.00 | -51.61 |
| 5 | 4959.08 | -71.24 | -84.55 | 21.00 | -63.55 | -13.00 | -50.55 |
| 6 | 5786.28 | -72.58 | -85.88 | 22.76 | -63.12 | -13.00 | -50.12 |

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

| Mode | TX channel 4183 | Frequency Range | Above 1000MHz |
|---|---|---|---|

| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
|---|---|---|---|---|---|---|---|
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 1674.55 | -51.57 | -64.90 | 12.05 | -52.85 | -13.00 | -39.85 |
| 2 | 2510.56 | -65.35 | -75.63 | 14.11 | -61.52 | -13.00 | -48.52 |
| 3 | 3345.79 | -63.71 | -76.15 | 17.09 | -59.06 | -13.00 | -46.06 |
| 4 | 4184.10 | -65.47 | -79.69 | 19.52 | -60.17 | -13.00 | -47.17 |
| 5 | 5021.35 | -67.06 | -80.84 | 21.04 | -59.80 | -13.00 | -46.80 |
| 6 | 5858.35 | -69.53 | -82.57 | 22.80 | -59.77 | -13.00 | -46.77 |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 1674.55 | -54.30 | -67.25 | 12.05 | -55.20 | -13.00 | -42.20 |
| 2 | 2510.75 | -67.36 | -77.86 | 14.13 | -63.73 | -13.00 | -50.73 |
| 3 | 3345.06 | -67.79 | -80.40 | 17.09 | -63.31 | -13.00 | -50.31 |
| 4 | 4181.67 | -67.71 | -81.80 | 19.52 | -62.28 | -13.00 | -49.28 |
| 5 | 5018.45 | -70.39 | -83.86 | 21.03 | -62.83 | -13.00 | -49.83 |
| 6 | 5856.30 | -70.64 | -83.82 | 22.80 | -61.02 | -13.00 | -48.02 |

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

| Mode | TX channel 4233 | Frequency Range | Above 1000MHz |
|---|---|---|---|

| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
|---|---|---|---|---|---|---|---|
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| **1** | **1694.80** | **-49.18** | **-62.28** | **12.04** | **-50.24** | **-13.00** | **-37.24** |
| 2 | 2537.97 | -65.42 | -75.76 | 14.19 | -61.57 | -13.00 | -48.57 |
| 3 | 3386.57 | -65.44 | -77.97 | 17.26 | -60.71 | -13.00 | -47.71 |
| 4 | 4231.32 | -65.77 | -80.41 | 19.89 | -60.52 | -13.00 | -47.52 |
| 5 | 5081.08 | -67.45 | -81.16 | 21.19 | -59.97 | -13.00 | -46.97 |
| 6 | 5927.44 | -68.31 | -81.27 | 22.86 | -58.41 | -13.00 | -45.41 |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 1694.81 | -51.37 | -63.91 | 12.04 | -51.87 | -13.00 | -38.87 |
| 2 | 2537.42 | -68.74 | -79.22 | 14.19 | -65.03 | -13.00 | -52.03 |
| 3 | 3384.72 | -66.56 | -79.27 | 17.25 | -62.02 | -13.00 | -49.02 |
| 4 | 4230.91 | -68.44 | -82.89 | 19.88 | -63.01 | -13.00 | -50.01 |
| 5 | 5078.23 | -69.27 | -82.74 | 21.18 | -61.56 | -13.00 | -48.56 |
| 6 | 5927.13 | -71.46 | -84.54 | 22.86 | -61.68 | -13.00 | -48.68 |

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

## 5 Pictures of Test Arrangements

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

## Appendix – Information on the Testing Laboratories

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

If you have any comments, please feel free to contact us at the following: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The address and road map of all our labs can be found in our web site also.

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