# FCC RF Test Report

| | | |
|---|---|---|
| APPLICANT | : | Cellon Communications Technology Co., Ltd |
| EQUIPMENT | : | GSM850/900/1800/1900 UMTS850/1900 GPRS、EDGE、BT, WIFI mobile phone |
| BRAND NAME | : | PCD&Claro&Telcel |
| MODEL NAME | : | A3535, PCD777, CL777, TE777, PCD777EN PCD777PE, PCD777AL, PCD777CL, PCD777PO, PCD777MV, PCD777OM, PCD777MX, PCD777CA, TE777PE, AL777AL, CL777CL, CL777PO, MV777MV, TE777MX. PCD777CA, PCD777AR, PCD777BR, CL777TL |
| FCC ID | : | T38PCD3535 |
| STANDARD | : | FCC 47 CFR Part 2, 22(H), 24(E) |
| CLASSIFICATION | : | PCS Licensed Transmitter Held to Ear (PCE) |
| Tx/Rx FREQUENCY RANGE | : | GSM850 : 824.2 ~ 848.8 MHz / 869.2 ~ 893.8 MHz<br>GSM1900 : 1850.2 ~ 1909.8 MHz / 1930.2 ~ 1989.8 MHz<br>WCDMA Band V : 826.4 ~ 846.6 MHz / 871.4 ~ 891.6 MHz<br>WCDMA Band II : 1852.4 ~ 1907.6 MHz / 1932.4 ~ 1987.6 MHz |
| MAX. ERP/EIRP POWER | : | GSM850 (GPRS 8) : 0.71 W<br>GSM1900 (GPRS 8) : 1.06 W<br>WCDMA Band V (RMC 12.2Kbps) : 0.09 W<br>WCDMA Band II (RMC 12.2Kbps) : 0.13 W |
| EMISSION DESIGNATOR | : | GMSK : 254KGXW<br>QPSK : 4M16F9W |

**The product was received on Dec. 28, 2011 and completely tested on Feb. 02, 2012. We, SPORTON INTERNATIONAL (KUNSHAN) INC., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI / TIA / EIA-603-C-2004 and shown compliance with the applicable technical standards.**

**The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL (KUNSHAN) INC., the test report shall not be reproduced except in full.**

**Reviewed by:**

Jones Tsai

**Jones Tsai / Manager**

***SPORTON INTERNATIONAL (KUNSHAN) INC.***
***No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C.***

# TABLE OF CONTENTS

**REVISION HISTORY** ..... **4**

**SUMMARY OF TEST RESULT** ..... **5**

**1 GENERAL DESCRIPTION** ..... **6**

1.1 Applicant ..... 6
1.2 Manufacturer ..... 6
1.3 Feature of Equipment Under Test ..... 7
1.4 Testing Site ..... 8
1.5 Applied Standards ..... 8
1.6 Ancillary Equipment List ..... 8

**2 TEST CONFIGURATION OF EQUIPMENT UNDER TEST** ..... **9**

2.1 Test Mode ..... 9
2.2 Connection Diagram of Test System ..... 11

**3 TEST RESULT** ..... **12**

3.1 Conducted Output Power Measurement ..... 12
3.2 Effective Radiated Power and Effective Isotropic Radiated Power Measurement ..... 14
3.3 Occupied Bandwidth Measurement ..... 18
3.4 Band Edge Measurement ..... 23
3.5 Conducted Emission Measurement ..... 28
3.6 Field Strength of Spurious Radiation Measurement ..... 39
3.7 Frequency Stability Measurement ..... 49

**4 LIST OF MEASURING EQUIPMENTS** ..... **56**

**5 UNCERTAINTY OF EVALUATION** ..... **57**

**APPENDIX A. PHOTOGRAPHS OF EUT**

**APPENDIX B. SETUP PHOTOGRAPHS**

# REVISION HISTORY

| REPORT NO. | VERSION | DESCRIPTION | ISSUED DATE |
|---|---|---|---|
| FG1D2801 | Rev. 01 | Initial issue of report | Feb. 02, 2012 |
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# SUMMARY OF TEST RESULT

| Report Section | FCC Rule | Description | Limit | Result | Remark |
|---|---|---|---|---|---|
| 3.1 | §2.1046 | Conducted Output Power | N/A | PASS | - |
| 3.2 | §22.913(a)(2) | Effective Radiated Power | < 7 Watts | PASS | - |
| 3.2 | §24.232(c) | Equivalent Isotropic Radiated Power | < 2 Watts | PASS | - |
| 3.3 | §2.1049<br>§22.917(a)<br>§24.238(a) | Occupied Bandwidth | N/A | PASS | - |
| 3.4 | §2.1051<br>§22.917(a)<br>§24.238(a) | Band Edge Measurement | < $43+10\log_{10}$(P[Watts]) | PASS | - |
| 3.5 | §2.1051<br>§22.917(a)<br>§24.238(a) | Conducted Emission | < $43+10\log_{10}$(P[Watts]) | PASS | - |
| 3.6 | §2.1053<br>§22.917(a)<br>§24.238(a) | Field Strength of Spurious Radiation | < $43+10\log_{10}$(P[Watts]) | PASS | Under limit 17.27 dB at 7520 MHz |
| 3.7 | §2.1055<br>§22.355<br>§24.235 | Frequency Stability for Temperature & Voltage | < 2.5 ppm | PASS | - |

# 1 General Description

## 1.1 Applicant

**Cellon Communications Technology Co., Ltd**
11f, Skyworth C Building, Gaoxin S.Ave.1., Hi-Tech Industrial Park, Nanshan.Shenzhen

## 1.2 Manufacturer

**Cellon Communications Technology Co., Ltd**
11f, Skyworth C Building, Gaoxin S.Ave.1., Hi-Tech Industrial Park, Nanshan.Shenzhen

## 1.3 Feature of Equipment Under Test

| Product Feature & Specification | |
|---|---|
| **Equipment** | GSM850/900/1800/1900 UMTS850/1900 GPRS、EDGE、BT, WIFI mobile phone |
| **Brand Name** | PCD&Claro&Telcel |
| **Model Name** | A3535, PCD777, CL777, TE777, PCD777EN PCD777PE, PCD777AL, PCD777CL, PCD777PO, PCD777MV, PCD777OM, PCD777MX, PCD777CA, TE777PE, AL777AL, CL777CL, CL777PO, MV777MV, TE777MX. PCD777CA, PCD777AR, PCD777BR, CL777TL |
| **FCC ID** | T38PCD3535 |
| **Tx Frequency** | GSM850 : 824 MHz ~ 849 MHz<br>GSM1900 : 1850 MHz ~ 1910 MHz<br>WCDMA Band V : 824 MHz ~ 849 MHz<br>WCDMA Band II : 1850 MHz ~ 1910 MHz |
| **Rx Frequency** | GSM850 : 869 MHz ~ 894 MHz<br>GSM1900 : 1930 MHz ~ 1990 MHz<br>WCDMA Band V : 869 MHz ~ 894 MHz<br>WCDMA Band II : 1930 MHz ~ 1990 MHz |
| **Maximum Output Power to Antenna** | GSM850 : 31.88 dBm<br>GSM1900 : 30.29 dBm<br>WCDMA Band V : 23.13 dBm<br>WCDMA Band II : 21.23 dBm |
| **Maximum ERP/EIRP** | GSM850 (GPRS 8) : 0.71 W (28.54 dBm)<br>GSM1900 (GPRS 8) : 1.06 W (30.24 dBm)<br>WCDMA Band V (RMC 12.2Kbps) : 0.09 W (19.52 dBm)<br>WCDMA Band II (RMC 12.2Kbps) : 0.13 W (21.07 dBm) |
| **Antenna Type** | Fixed Internal Antenna |
| **HW Version** | P3 |
| **SW Version** | P3 |
| **Type of Modulation** | GSM / GPRS : GMSK<br>EDGE : 8PSK (Downlink Only)<br>WCDMA : QPSK |
| **Type of Emission** | GMSK : 254KGXW<br>QPSK : 4M16F9W |
| **EUT Stage** | Production Unit |

**Remark:**

1. For other wireless features of this EUT, the test report will be issued separately.
2. This test report recorded only product characteristics and test results of PCS Licensed Transmitter Held to Ear (PCE).
3. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

## 1.4 Testing Site

| | | | |
|---|---|---|---|
| **Test Site** | SPORTON INTERNATIONAL (KUNSHAN) INC. | | |
| **Test Site Location** | No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C.<br>TEL: +86-0512-5790-0158<br>FAX: +86-0512-5790-0958 | | |
| **Test Site No.** | **Sporton Site No.** | | **FCC Registration No.** |
| | TH01-KS | 03CH01-KS | 149928 |

## 1.5 Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- Preliminary Guidance for Receiving Applications for Certification of 3G Device. May 9, 2006.
- 47 CFR Part 2, 22(H), 24(E)
- ANSI / TIA / EIA-603-C-2004

**Remark:**

**1.** All test items were verified and recorded according to the standards and without any deviation during the test.

**2.** This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B (Certification), recorded in a separate test report.

## 1.6 Ancillary Equipment List

| Item | Equipment | Trade Name | Model No. | FCC ID | Data Cable | Power Cord |
|---|---|---|---|---|---|---|
| 1. | System Simulator | R&S | CMU200 | N/A | N/A | Unshielded, 1.8 m |

# 2 Test Configuration of Equipment Under Test

## 2.1 Test Mode

During all testing, EUT is in link mode with base station emulator at maximum power level. The spurious emission measurements were carried out in semi-anechoic chamber with 3-meter test range, and EUT is rotated on three test planes to find out the worst emission.

Frequency range investigated for radiated emission is as follows:

1. 30 MHz to 9000 MHz for GSM850 and WCDMA Band V.
2. 30 MHz to 19000 MHz for GSM1900 and WCDMA Band II.

| Test Modes | | |
|---|---|---|
| **Band** | **Radiated TCs** | **Conducted TCs** |
| **GSM 850** | ■ GPRS 8 Link | ■ GPRS 8 Link |
| **GSM 1900** | ■ GPRS 8 Link | ■ GPRS 8 Link |
| **WCDMA Band V** | ■ RMC 12.2Kbps Link | ■ RMC 12.2Kbps Link |
| **WCDMA Band II** | ■ RMC 12.2Kbps Link | ■ RMC 12.2Kbps Link |

**Note:**

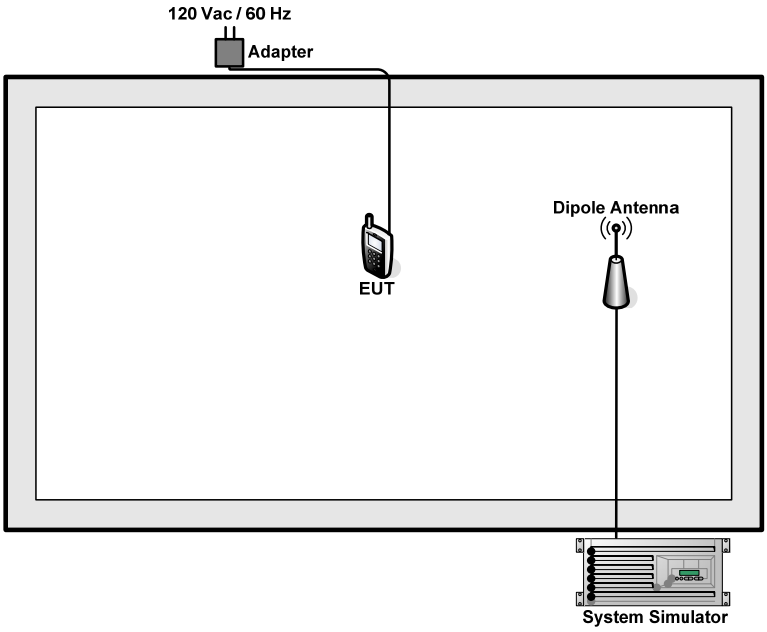
The maximum power levels are GPRS multi-slot class 8 mode for GMSK link, RMC 12.2Kbps mode for WCDMA band V and WCDMA band II, only these modes were used for all tests.

**The conducted power tables are as follows:**

| Conducted Power (*Unit: dBm) | | | | | | |
|---|---|---|---|---|---|---|
| **Band** | **GSM850** | | | **GSM1900** | | |
| **Channel** | **128** | **189** | **251** | **512** | **661** | **810** |
| **Frequency** | **824.2** | **836.4** | **848.8** | **1850.2** | **1880** | **1909.8** |
| **GSM (1 Uplink)** | 31.67 | 31.77 | **31.88** | 30.02 | 30.16 | 30.26 |
| **GPRS 8 (1 Uplink) – CS1** | 31.65 | 31.77 | **31.88** | 30.03 | 30.17 | **30.29** |
| **GPRS 10 (2 Uplink) – CS1** | 29.90 | 30.01 | 30.13 | 28.38 | 28.45 | 28.55 |
| **GPRS 11 (3 Uplink) – CS1** | 28.40 | 28.49 | 28.61 | 26.92 | 26.97 | 27.04 |
| **GPRS 12 (4 Uplink) – CS1** | 26.32 | 26.43 | 26.56 | 24.90 | 24.93 | 25.03 |

| Conducted Power (*Unit: dBm) | | | | | | |
|---|---|---|---|---|---|---|
| **Band** | **WCDMA Band V** | | | **WCDMA Band II** | | |
| **Tx Channel** | **4132** | **4182** | **4233** | **9262** | **9400** | **9538** |
| **Rx Channel** | **4357** | **4408** | **4458** | **9662** | **9800** | **9938** |
| **Frequency** | **826.4** | **836.4** | **846.6** | **1852.4** | **1880** | **1907.6** |
| **AMR** | 23.12 | 22.88 | 22.39 | 21.17 | 21.18 | 21.02 |
| **RMC 12.2K** | **23.13** | 22.90 | 22.44 | 21.18 | **21.23** | 21.03 |

## 2.2 Connection Diagram of Test System



# 3 Test Result

## 3.1 Conducted Output Power Measurement

### 3.1.1 Description of the Conducted Output Power Measurement

A base station simulator was used to establish communication with the EUT. Its parameters were set to transmit the maximum power on the EUT. The measured power in the radio frequency on the transmitter output terminals shall be reported.

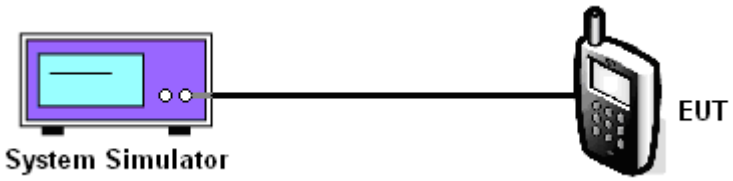
### 3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

### 3.1.3 Test Procedures

1. The transmitter output port was connected to base station.
2. Set EUT at maximum power through base station.
3. Select lowest, middle, and highest channels for each band and different modulation.

### 3.1.4 Test Setup



### 3.1.5 Test Result of Conducted Output Power

| Cellular Band | | | | |
|---|---|---|---|---|
| **Modes** | **Channel** | **Frequency (MHz)** | **Conducted Power (dBm)** | **Conducted Power (Watts)** |
| GSM850 (GPRS 8) | 128 (Low) | 824.2 | 31.67 | 1.47 |
| | 189 (Mid) | 836.4 | 31.77 | 1.50 |
| | 251 (High) | 848.8 | 31.88 | 1.54 |
| WCDMA Band V (RMC 12.2Kbps) | 4132 (Low) | 826.4 | 23.13 | 0.21 |
| | 4182 (Mid) | 836.4 | 22.90 | 0.19 |
| | 4233 (High) | 846.6 | 22.44 | 0.18 |

| PCS Band | | | | |
|---|---|---|---|---|
| **Modes** | **Channel** | **Frequency (MHz)** | **Conducted Power (dBm)** | **Conducted Power (Watts)** |
| GSM1900 (GPRS 8) | 512 (Low) | 1850.2 | 30.03 | 1.01 |
| | 661 (Mid) | 1880.0 | 30.17 | 1.04 |
| | 810 (High) | 1909.8 | 30.29 | 1.07 |
| WCDMA Band II (RMC 12.2Kbps) | 9262 (Low) | 1852.4 | 21.18 | 0.13 |
| | 9400 (Mid) | 1880.0 | 21.23 | 0.13 |
| | 9538 (High) | 1907.6 | 21.03 | 0.13 |

## 3.2 Effective Radiated Power and Effective Isotropic Radiated Power Measurement

### 3.2.1 Description of the ERP/EIRP Measurement

ERP/EIRP is measured by substitution method according to ANSI / TIA / EIA-603-C-2004. The ERP of mobile transmitters must not exceed 7 Watts for 824 MHz ~ 849 MHz. The EIRP of mobile transmitters are limited to 2 Watts for 1850~1910 MHz.

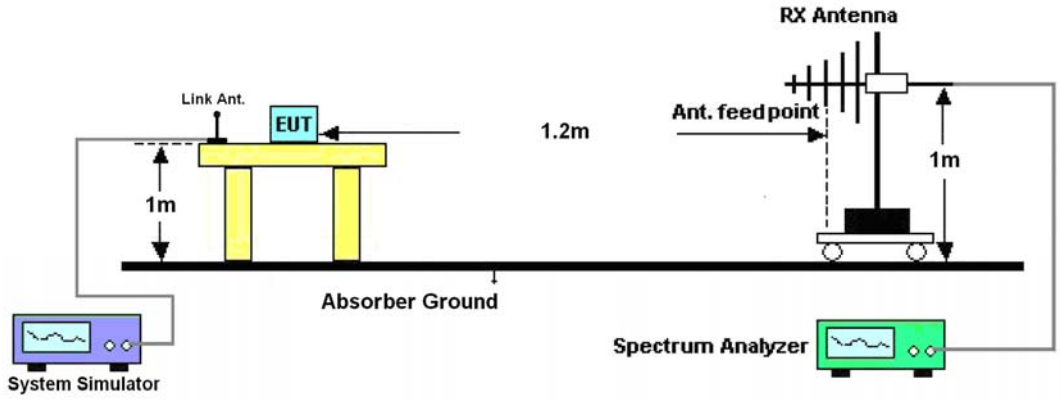
### 3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

### 3.2.3 Test Procedures

1. The EUT was placed on a turntable with 1.0 meter height in a fully anechoic chamber.
2. The EUT was set at 1.2 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiated power.
4. The height of the receiving antenna is adjusted to look for the maximum ERP/EIRP.
5. Taking the record of maximum ERP/EIRP.
6. A dipole antenna was substituted in place of the EUT and was driven by a signal generator.
7. The conducted power at the terminal of the dipole antenna is measured.
8. Repeat step 3 to step 5 to get the maximum ERP/EIRP of the substitution antenna.
9. ERP/EIRP = Ps + Et – Es + Gs = Ps + Rt – Rs + Gs
   Ps (dBm)：Input power to substitution antenna.
   Gs (dBi or dBd)：Substitution antenna Gain.
   Et = Rt + AF
   Es = Rs + AF
   AF (dB/m)：Receive antenna factor
   Rt：The highest received signal in spectrum analyzer for EUT.
   Rs：The highest received signal in spectrum analyzer for substitution antenna.

### 3.2.4 Test Setup



### 3.2.5 Test Result of ERP

| GSM850 (GPRS 8) Radiated Power ERP | | | | | | |
|---|---|---|---|---|---|---|
| Horizontal Polarization | | | | | | |
| **Frequency (MHz)** | **Rt (dBm)** | **Rs (dBm)** | **Ps (dBm)** | **Gs (dBd)** | **ERP (dBm)** | **ERP (W)** |
| 824.20 | -18.50 | -48.12 | 0.00 | -1.08 | 28.54 | 0.71 |
| 836.40 | -18.93 | -48.28 | 0.00 | -0.93 | 28.42 | 0.70 |
| 848.80 | -20.28 | -48.35 | 0.00 | -0.76 | 27.31 | 0.54 |
| Vertical Polarization | | | | | | |
| **Frequency (MHz)** | **Rt (dBm)** | **Rs (dBm)** | **Ps (dBm)** | **Gs (dBd)** | **ERP (dBm)** | **ERP (W)** |
| 824.20 | -32.40 | -47.97 | 0.00 | -1.08 | 14.49 | 0.03 |
| 836.40 | -32.79 | -48.01 | 0.00 | -0.93 | 14.29 | 0.03 |
| 848.80 | -34.55 | -48.05 | 0.00 | -0.76 | 12.74 | 0.02 |

| WCDMA Band V (RMC 12.2Kbps) Radiated Power ERP | | | | | | |
|---|---|---|---|---|---|---|
| Horizontal Polarization | | | | | | |
| **Frequency (MHz)** | **Rt (dBm)** | **Rs (dBm)** | **Ps (dBm)** | **Gs (dBd)** | **ERP (dBm)** | **ERP (W)** |
| 826.40 | -27.52 | -48.12 | 0.00 | -1.08 | 19.52 | 0.09 |
| 836.40 | -27.97 | -48.28 | 0.00 | -0.93 | 19.38 | 0.09 |
| 846.60 | -29.52 | -48.35 | 0.00 | -0.76 | 18.07 | 0.06 |
| Vertical Polarization | | | | | | |
| **Frequency (MHz)** | **Rt (dBm)** | **Rs (dBm)** | **Ps (dBm)** | **Gs (dBd)** | **ERP (dBm)** | **ERP (W)** |
| 826.40 | -41.23 | -47.97 | 0.00 | -1.08 | 5.66 | 0.00 |
| 836.40 | -41.91 | -48.01 | 0.00 | -0.93 | 5.17 | 0.00 |
| 846.60 | -43.22 | -48.05 | 0.00 | -0.76 | 4.07 | 0.00 |

### 3.2.6 Test Result of EIRP

| GSM1900 (GPRS 8) Radiated Power EIRP | | | | | | |
|---|---|---|---|---|---|---|
| Horizontal Polarization | | | | | | |
| **Frequency (MHz)** | **Rt (dBm)** | **Rs (dBm)** | **Ps (dBm)** | **Gs (dBi)** | **EIRP (dBm)** | **EIRP (W)** |
| 1850.20 | -24.37 | -51.88 | 0.00 | 1.96 | 29.47 | 0.89 |
| 1880.00 | -25.83 | -52.99 | 0.00 | 2.00 | 29.16 | 0.82 |
| 1909.80 | -26.63 | -54.28 | 0.00 | 1.98 | 29.63 | 0.92 |
| Vertical Polarization | | | | | | |
| **Frequency (MHz)** | **Rt (dBm)** | **Rs (dBm)** | **Ps (dBm)** | **Gs (dBi)** | **EIRP (dBm)** | **EIRP (W)** |
| 1850.20 | -23.85 | -52.13 | 0.00 | 1.96 | 30.24 | 1.06 |
| 1880.00 | -25.05 | -53.17 | 0.00 | 2.00 | 30.12 | 1.03 |
| 1909.80 | -26.02 | -54.13 | 0.00 | 1.98 | 30.09 | 1.02 |

| WCDMA Band II (RMC 12.2Kbps) Radiated Power EIRP | | | | | | |
|---|---|---|---|---|---|---|
| Horizontal Polarization | | | | | | |
| **Frequency (MHz)** | **Rt (dBm)** | **Rs (dBm)** | **Ps (dBm)** | **Gs (dBi)** | **EIRP (dBm)** | **EIRP (W)** |
| 1852.40 | -33.50 | -51.88 | 0.00 | 1.96 | 20.34 | 0.11 |
| 1880.00 | -34.80 | -52.99 | 0.00 | 2.00 | 20.19 | 0.10 |
| 1907.60 | -36.24 | -54.28 | 0.00 | 1.98 | 20.02 | 0.10 |
| Vertical Polarization | | | | | | |
| **Frequency (MHz)** | **Rt (dBm)** | **Rs (dBm)** | **Ps (dBm)** | **Gs (dBi)** | **EIRP (dBm)** | **EIRP (W)** |
| 1852.40 | -33.17 | -52.13 | 0.00 | 1.96 | 20.92 | 0.12 |
| 1880.00 | -34.10 | -53.17 | 0.00 | 2.00 | 21.07 | 0.13 |
| 1907.60 | -35.46 | -54.13 | 0.00 | 1.98 | 20.65 | 0.12 |

## 3.3 Occupied Bandwidth Measurement

### 3.3.1 Description of Occupied Bandwidth Measurement

The emission bandwidth is defined as the width of the signal between two points, located at the 2 sides of the carrier frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

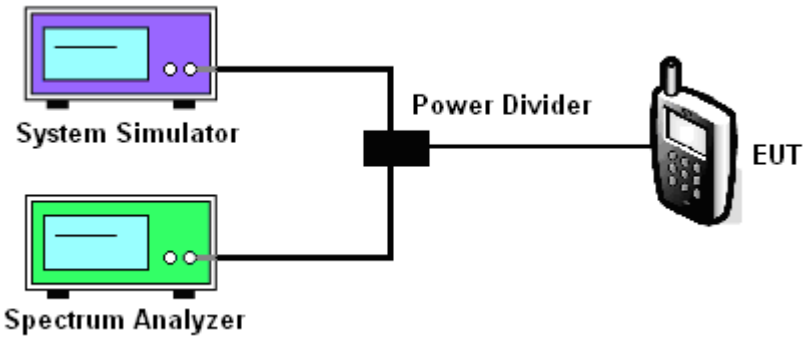
### 3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

### 3.3.3 Test Procedures

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The 99% and 26 dB occupied bandwidth (BW) of the middle channel for the highest RF powers were measured.

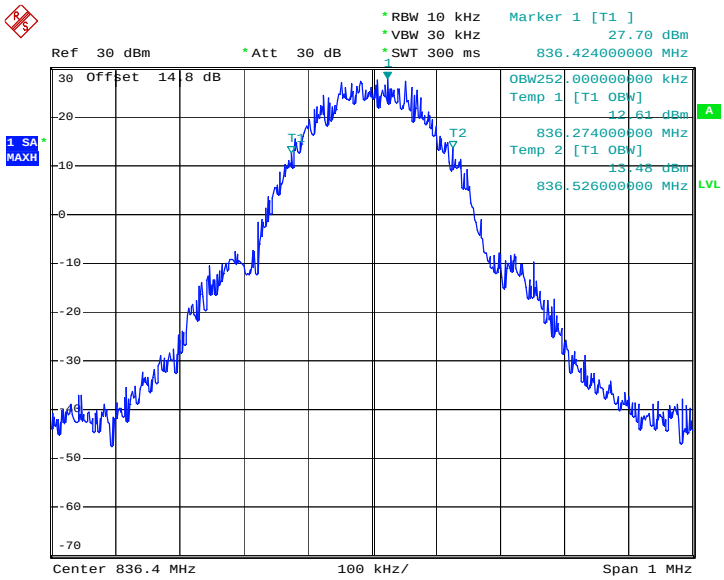
### 3.3.4 Test Setup



### 3.3.5 Test Result (Plots) of Occupied Bandwidth

| Band : | GSM 850 | Power Stage : | High |
|---|---|---|---|
| Test Mode : | GPRS 8 Link | | |

**99% Occupied Bandwidth Plot on Channel 189**

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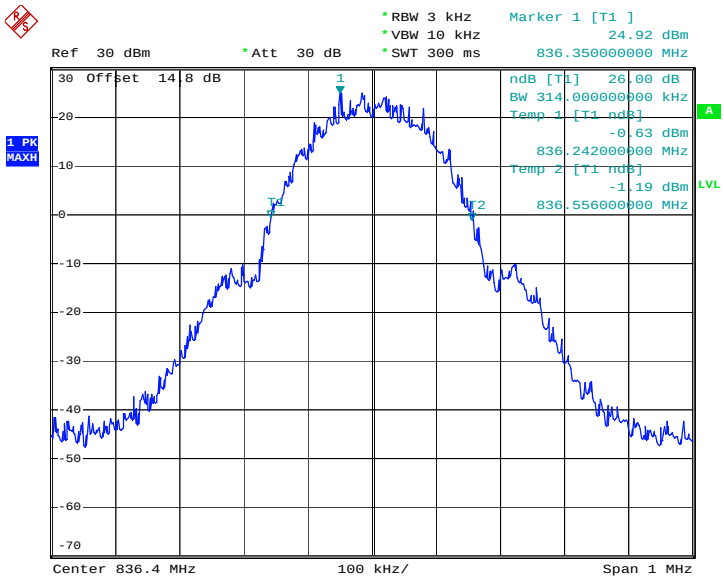
**26dB Bandwidth Plot on Channel 189**

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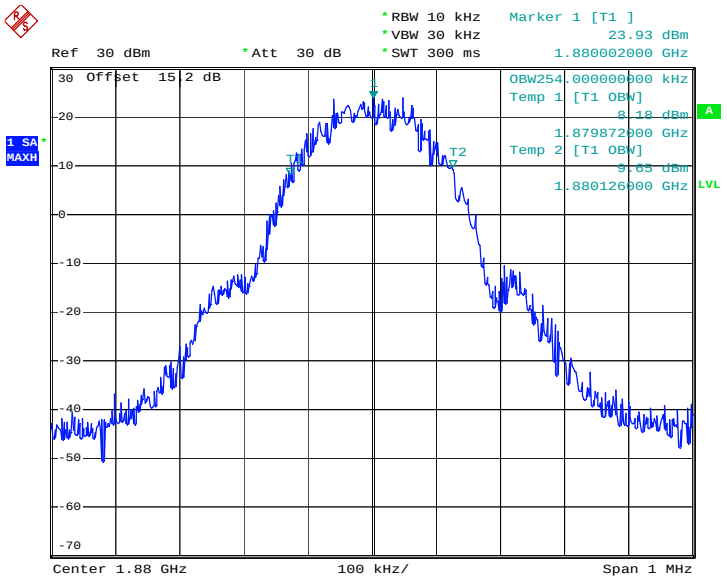
| Band : | GSM 1900 | Power Stage : | High |
|---|---|---|---|
| Test Mode : | GPRS 8 Link | | |

### 99% Occupied Bandwidth Plot on Channel 661

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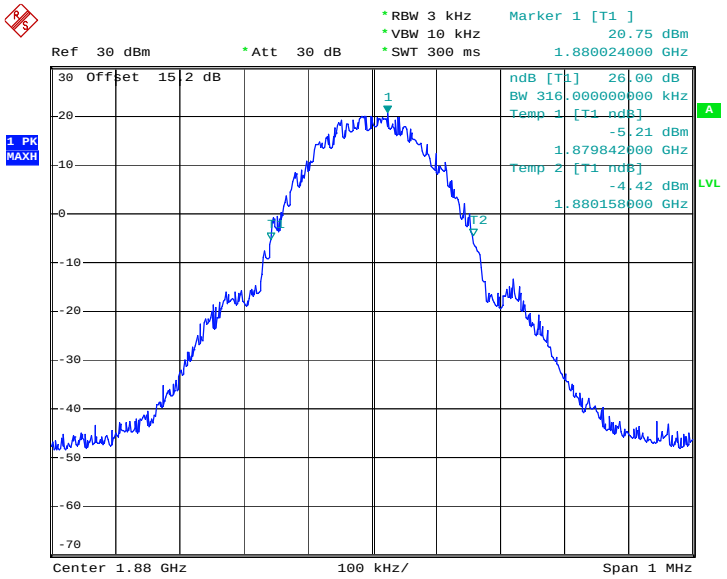
### 26dB Bandwidth Plot on Channel 661

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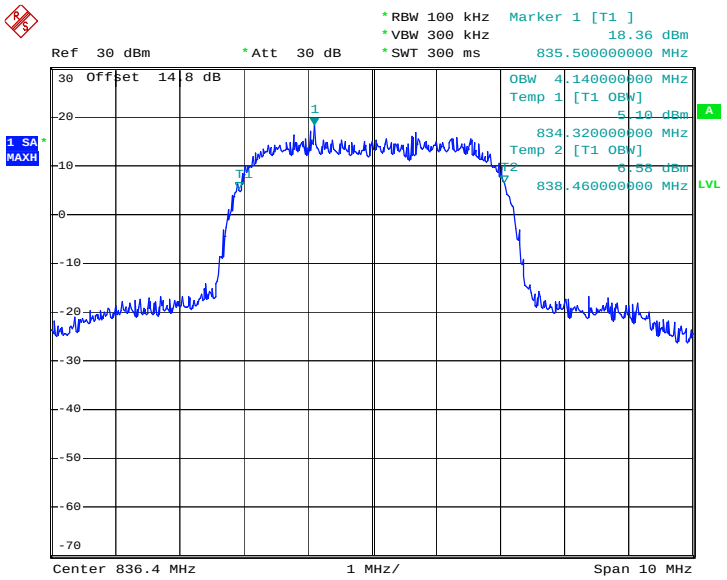
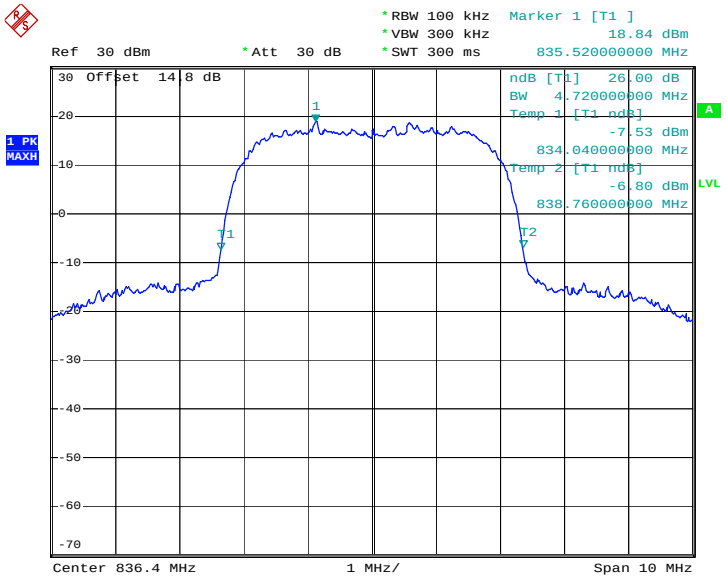
| Band : | WCDMA Band V | Power Stage : | High |
|---|---|---|---|
| Test Mode : | RMC 12.2Kbps Link | | |

### 99% Occupied Bandwidth Plot on Channel 4182




Date: 9.JAN.2012 09:56:34

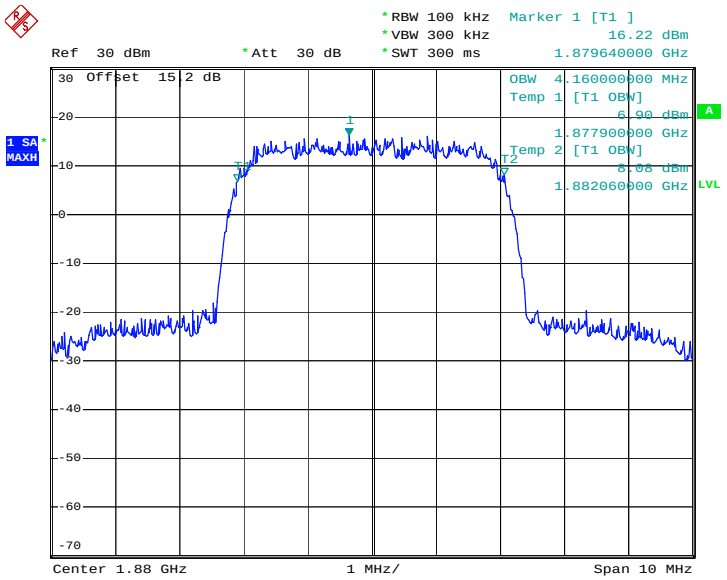
### 26dB Bandwidth Plot on Channel 4182




Date: 9.JAN.2012 09:55:15

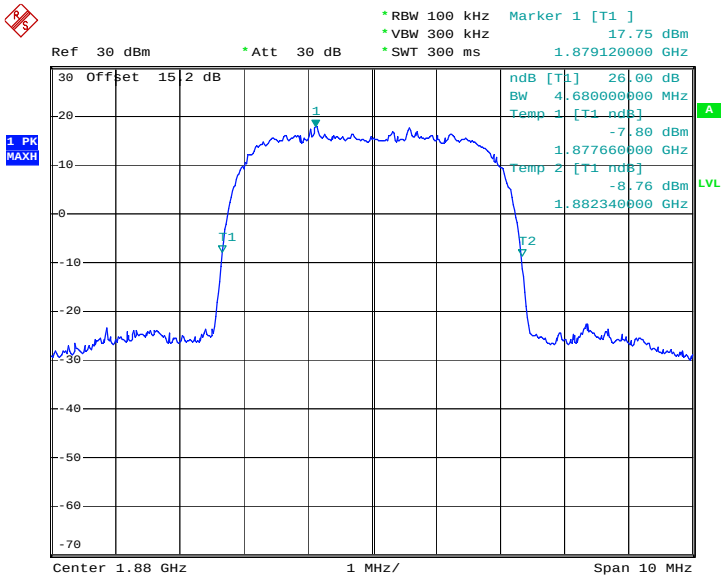
| Band : | WCDMA Band II | Power Stage : | High |
|---|---|---|---|
| Test Mode : | RMC 12.2Kbps Link | | |

### 99% Occupied Bandwidth Plot on Channel 9400




Date: 9.JAN.2012 10:22:28

### 26dB Bandwidth Plot on Channel 9400




Date: 9.JAN.2012 10:21:10

## 3.4 Band Edge Measurement

### 3.4.1 Description of Band Edge Measurement

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least 43 + 10 log (P) dB.

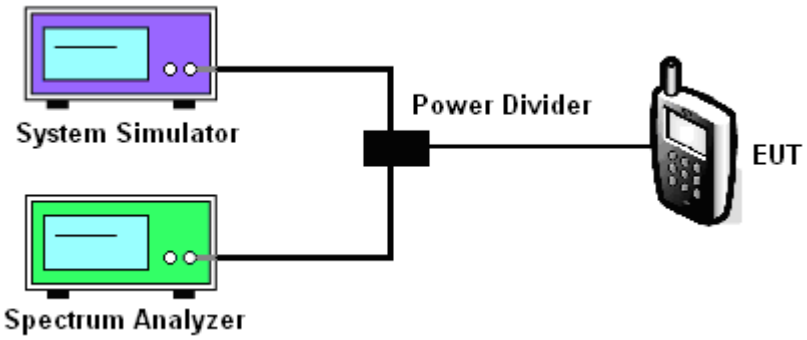
### 3.4.2 Measuring Instruments

See list of measuring instruments of this test report.

### 3.4.3 Test Procedures

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The band edges of low and high channels for the highest RF powers were measured. Setting RBW 3kHz for GSM / EDGE, Setting RBW 100kHz for WCDMA.

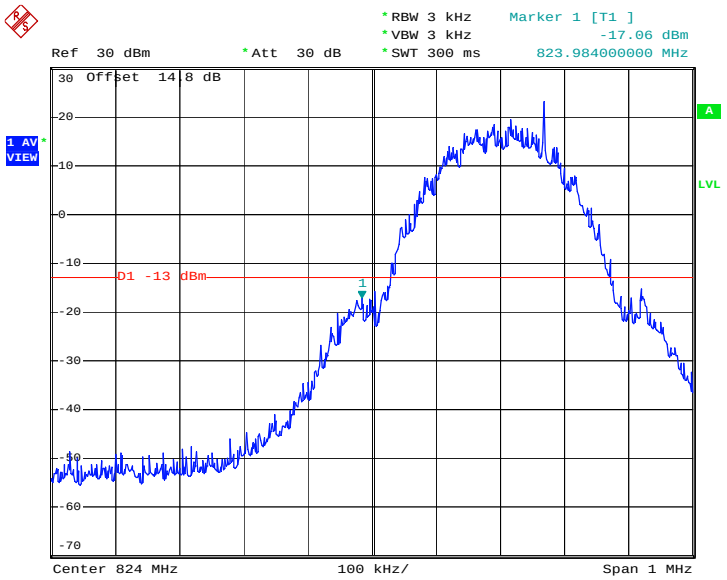
### 3.4.4 Test Setup



### 3.4.5 Test Result (Plots) of Conducted Band Edge

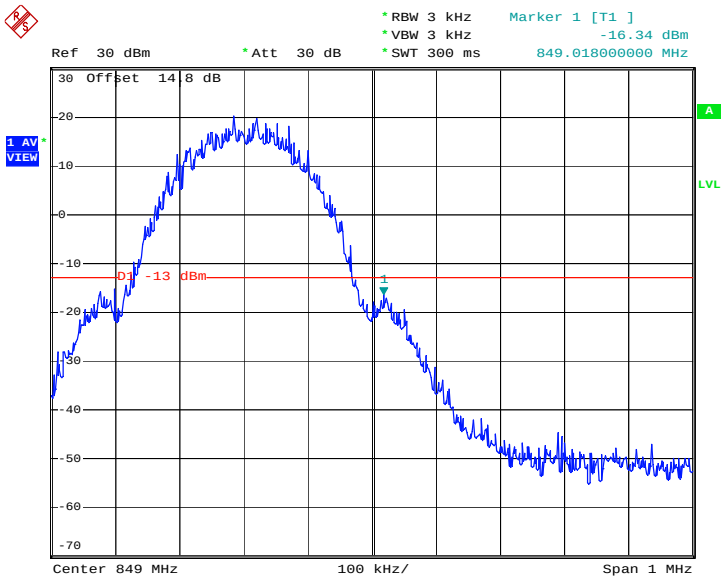
| Band : | GSM850 | Power Stage : | High |
|---|---|---|---|
| Test Mode : | GPRS 8 Link | | |

**Lower Band Edge Plot on Channel 128**




Date: 7.JAN.2012 20:29:04

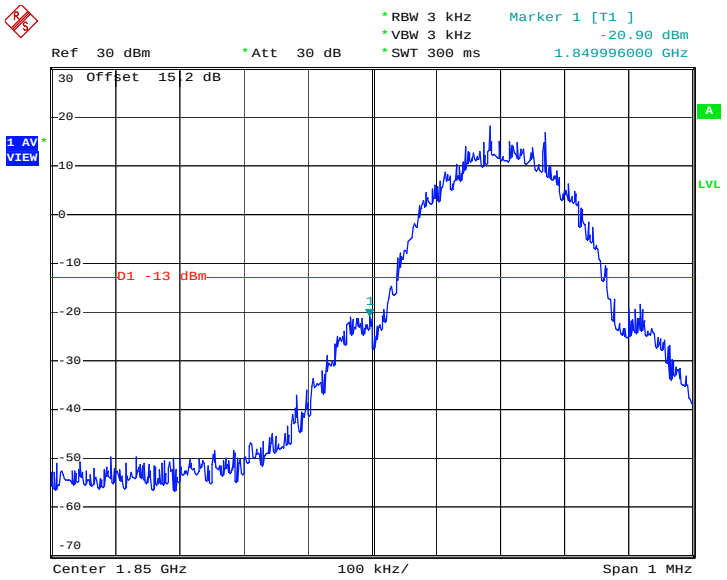
**Higher Band Edge Plot on Channel 251**




Date: 7.JAN.2012 20:29:31

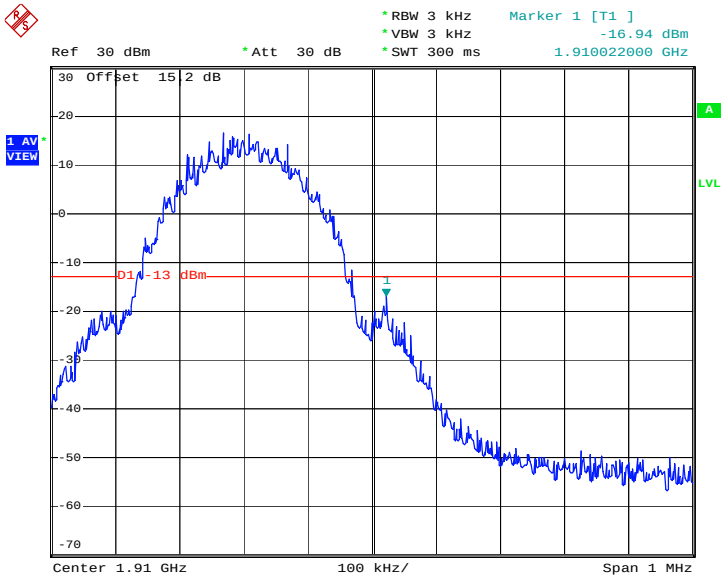
| Band : | GSM1900 | Power Stage : | High |
|---|---|---|---|
| Test Mode : | GPRS 8 Link | | |

### Lower Band Edge Plot on Channel 512




Date: 7.JAN.2012 20:57:41

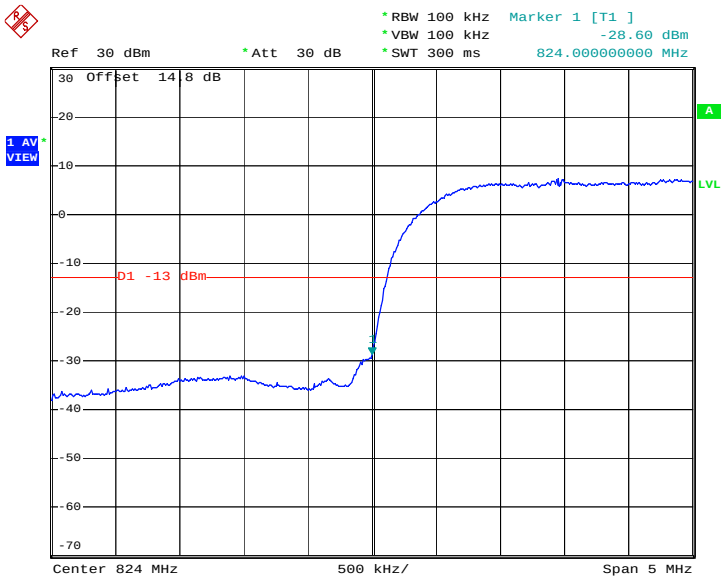
### Higher Band Edge Plot on Channel 810




Date: 7.JAN.2012 20:58:07

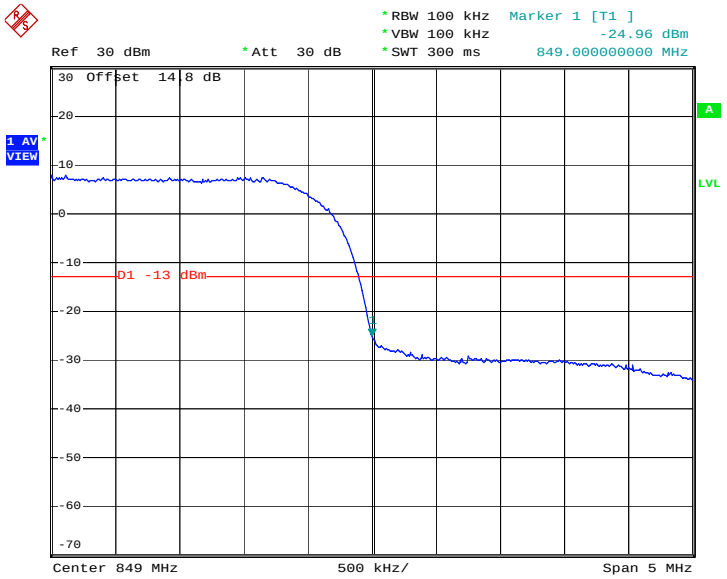
| Band : | WCDMA Band V | Power Stage : | High |
|---|---|---|---|
| Test Mode : | RMC 12.2Kbps Link | | |

### Lower Band Edge Plot on Channel 4132




Date: 9.JAN.2012 09:58:28

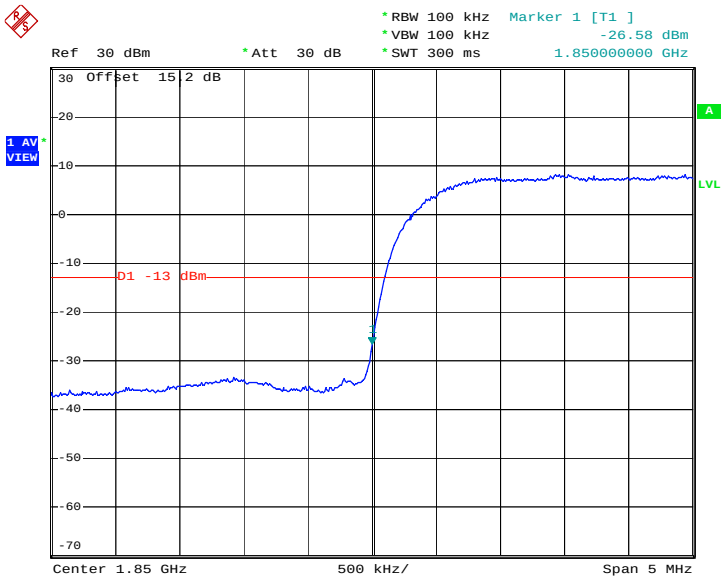
### Higher Band Edge Plot on Channel 4233




Date: 9.JAN.2012 09:58:55

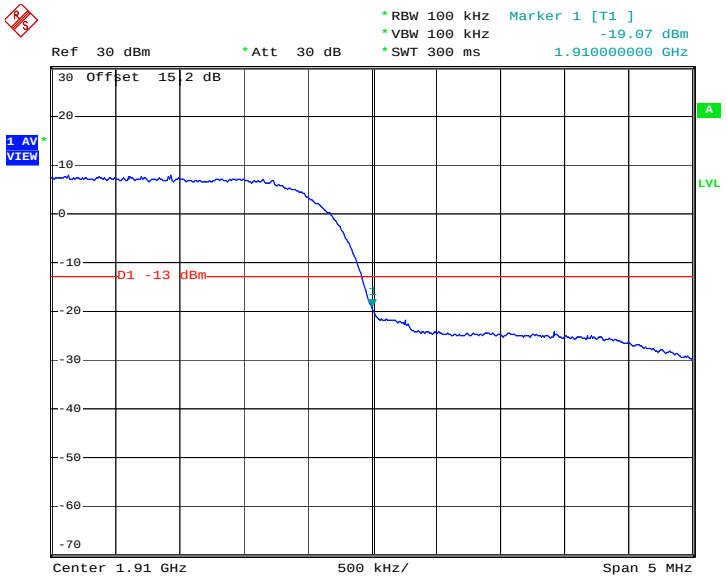
| Band : | WCDMA Band II | Power Stage : | High |
|---|---|---|---|
| Test Mode : | RMC 12.2Kbps Link | | |

### Lower Band Edge Plot on Channel 9262




Date: 9.JAN.2012 10:24:21

### Higher Band Edge Plot on Channel 9538




Date: 9.JAN.2012 10:24:47

## 3.5 Conducted Emission Measurement

### 3.5.1 Description of Conducted Emission Measurement

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least 43 + 10 log (P) dB.

It is measured by means of a calibrated spectrum analyzer and scanned from 30 MHz up to a frequency including its $10^{th}$ harmonic.

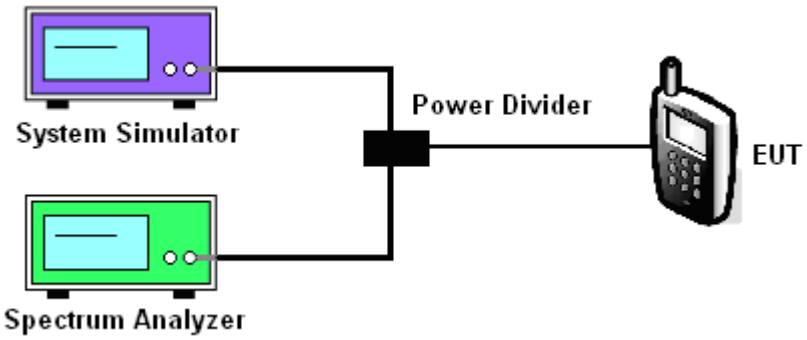
### 3.5.2 Measuring Instruments

See list of measuring instruments of this test report.

### 3.5.3 Test Procedures

3. The EUT was connected to spectrum analyzer and base station via power divider.
4. The middle channel for the highest RF power within the transmitting frequency was measured.
5. The conducted spurious emission for the whole frequency range was taken.

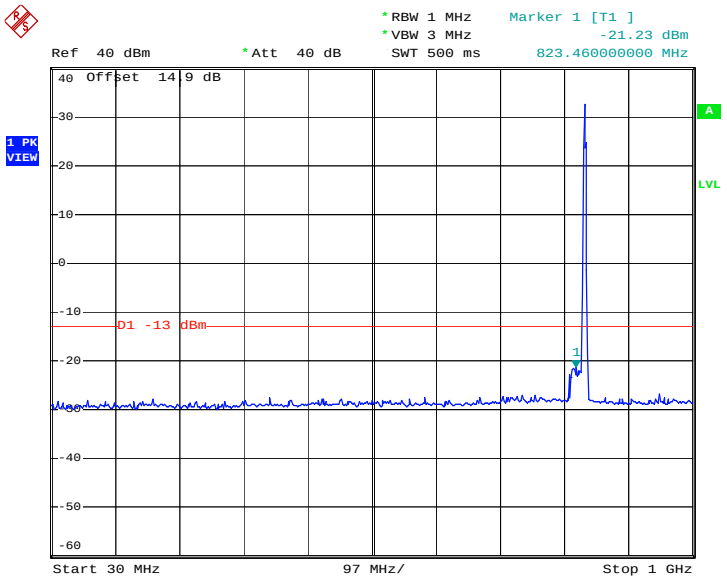
### 3.5.4 Test Setup



### 3.5.5 Test Result (Plots) of Conducted Emission

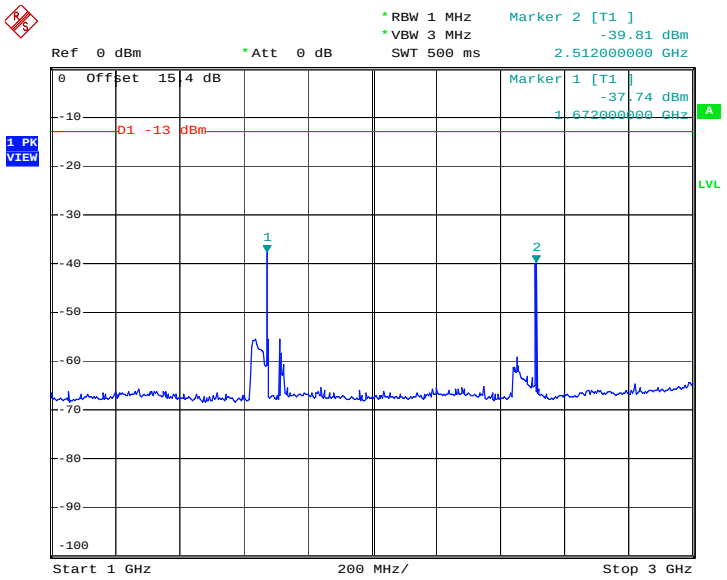
| Band : | GSM850 | Channel : | CH189 |
|---|---|---|---|
| Test Mode : | GPRS 8 Link | | |

**Conducted Emission Plot between 30MHz ~ 1GHz**



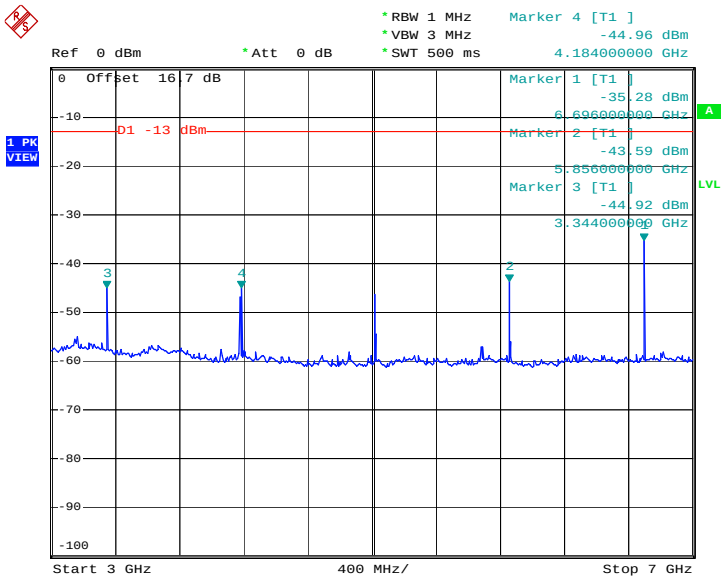

Date: 9.JAN.2012 11:34:25

**Conducted Emission Plot between 1GHz ~ 3GHz**



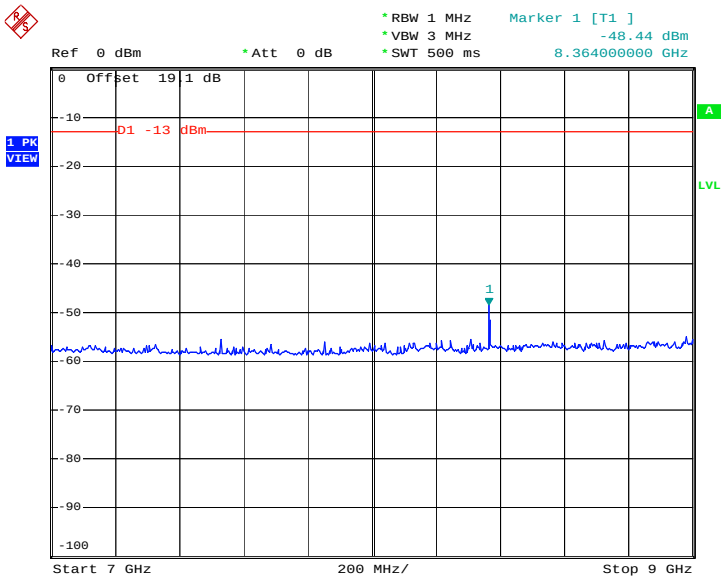

Date: 9.JAN.2012 11:38:26

## Conducted Emission Plot between 3GHz ~ 7GHz




Date: 9.JAN.2012 11:40:03

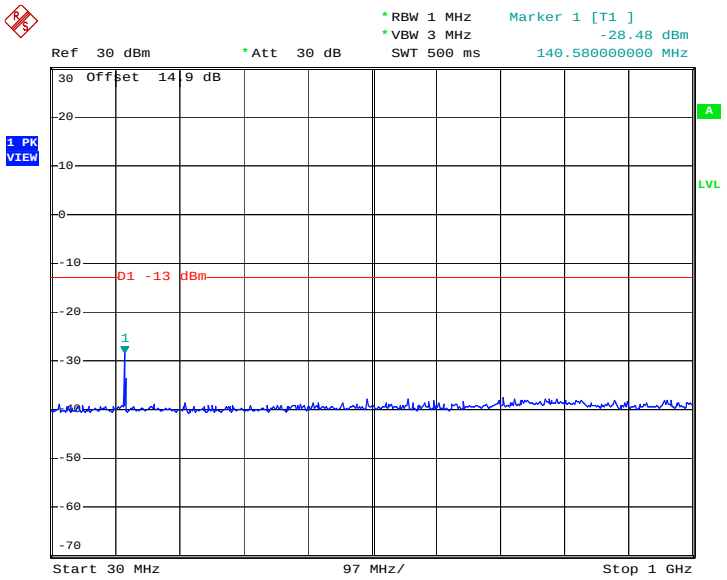
## Conducted Emission Plot between 7GHz ~ 9GHz




Date: 9.JAN.2012 11:42:23

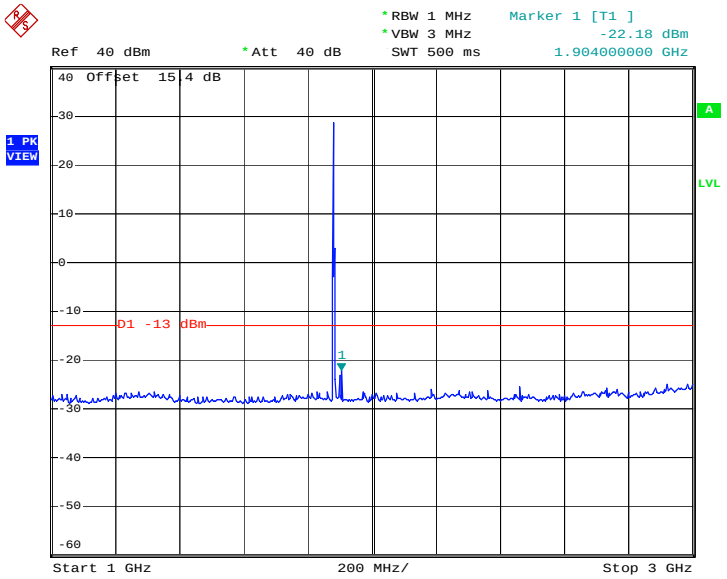
| Band : | GSM1900 | Channel : | CH661 |
|---|---|---|---|
| Test Mode : | GPRS 8 Link | | |

## Conducted Emission Plot between 30MHz ~ 1GHz



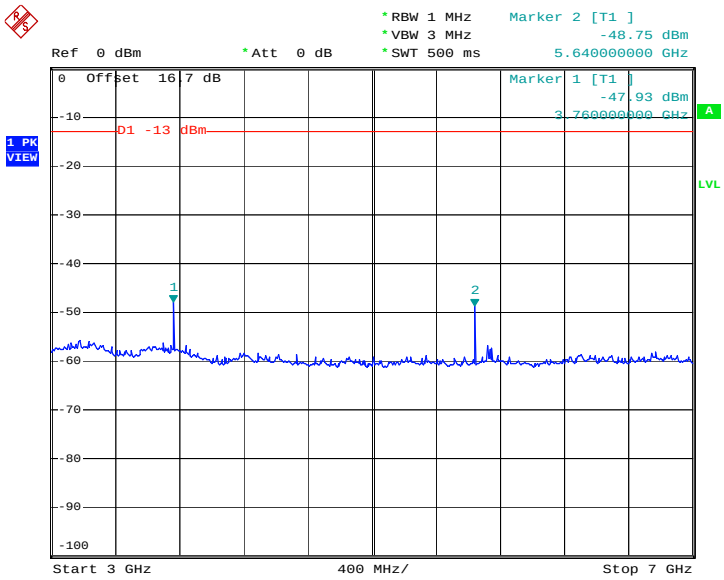

Date: 9.JAN.2012 11:29:38

## Conducted Emission Plot between 1GHz ~ 3GHz



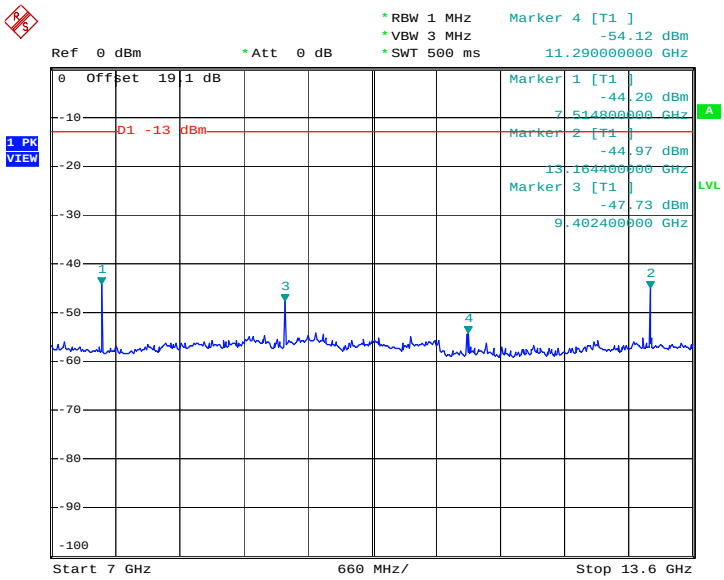

Date: 9.JAN.2012 11:28:29

## Conducted Emission Plot between 3GHz ~ 7GHz



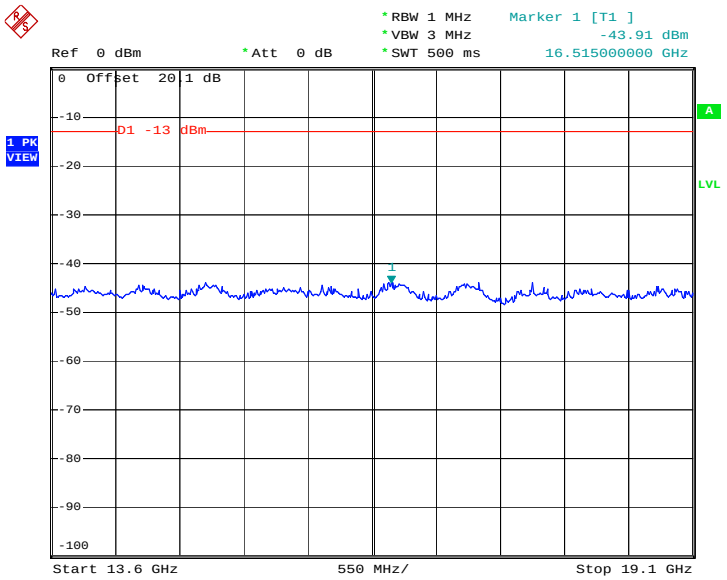

Date: 9.JAN.2012 11:23:34

## Conducted Emission Plot between 7GHz ~ 13.6G




Date: 9.JAN.2012 11:22:20

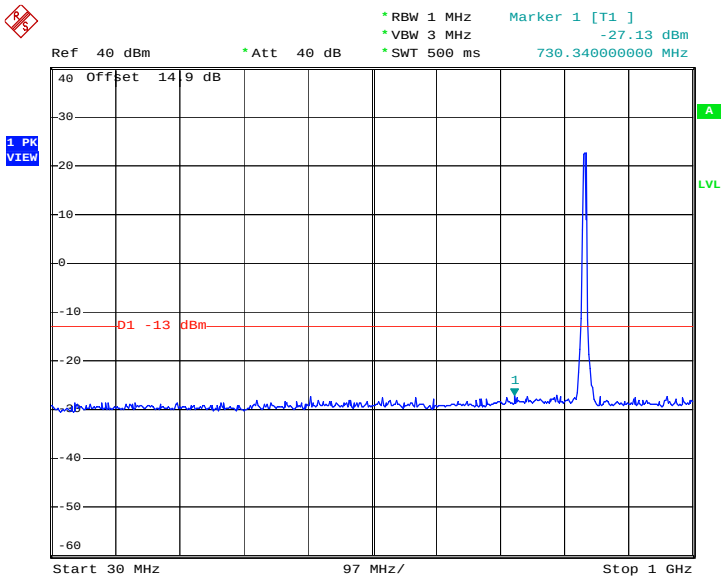
## Conducted Emission Plot between 13.6GHz ~ 19.1GHz




Date: 9.JAN.2012 11:20:36

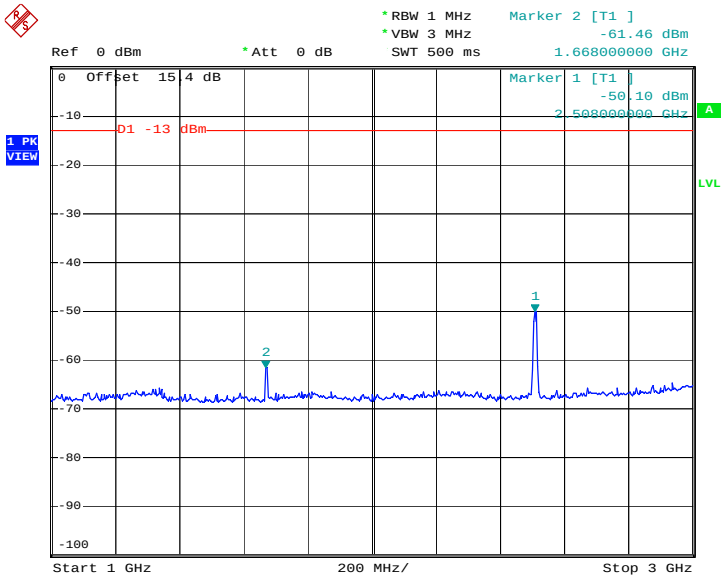
| Band : | WCDMA Band V | Channel : | CH4182 |
|---|---|---|---|
| Test Mode : | RMC 12.2Kbps Link | | |

## Conducted Emission Plot between 30MHz ~ 1GHz



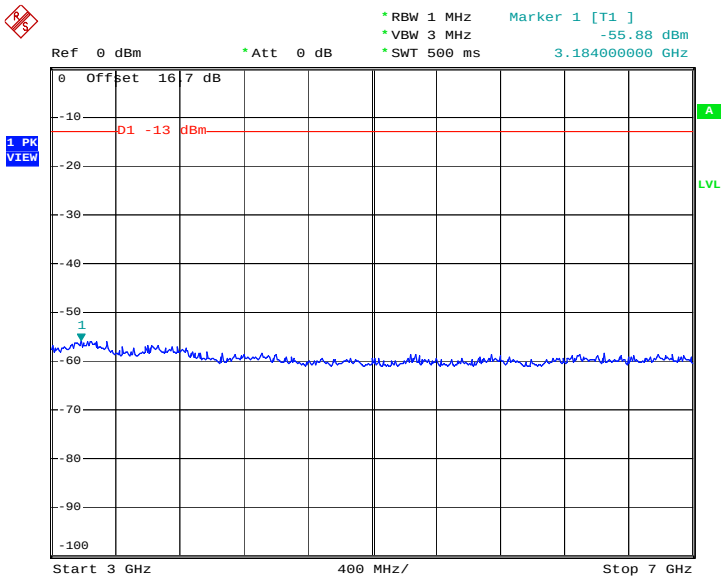

Date: 9.JAN.2012 10:43:18

## Conducted Emission Plot between 1GHz ~ 3GHz



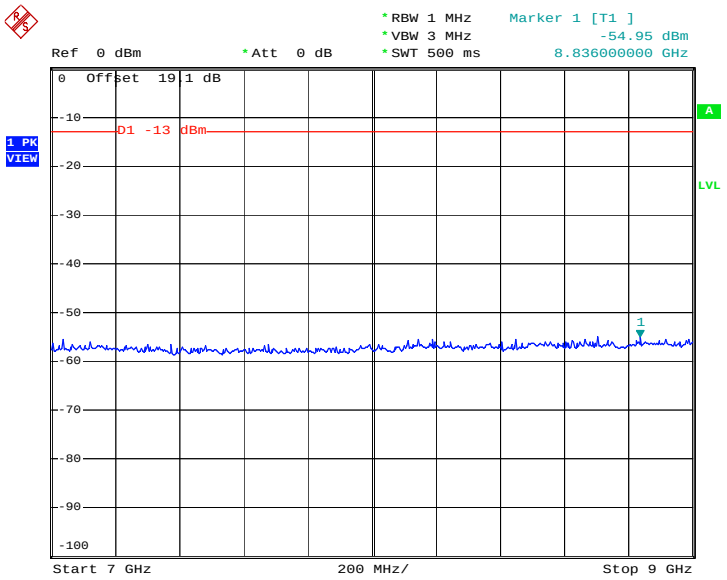

Date: 9.JAN.2012 10:45:17

## Conducted Emission Plot between 3GHz ~ 7GHz




Date: 9.JAN.2012 10:47:43

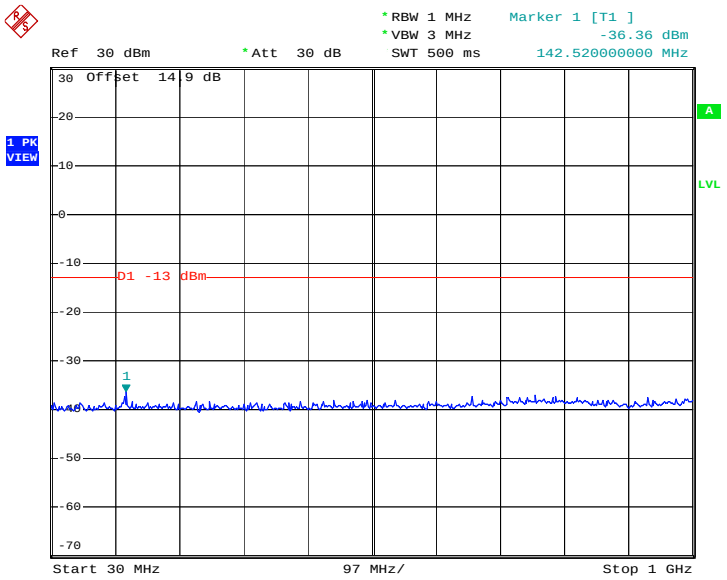
## Conducted Emission Plot between 7GHz ~ 9GHz




Date: 9.JAN.2012 10:48:39

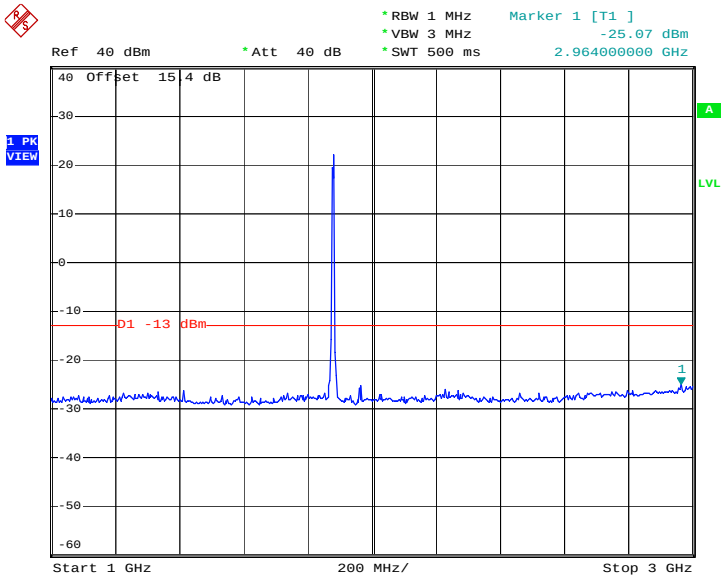
| Band : | WCDMA Band II | Channel : | CH9400 |
|---|---|---|---|
| Test Mode : | RMC 12.2Kbps Link | | |

## Conducted Emission Plot between 30MHz ~ 1GHz



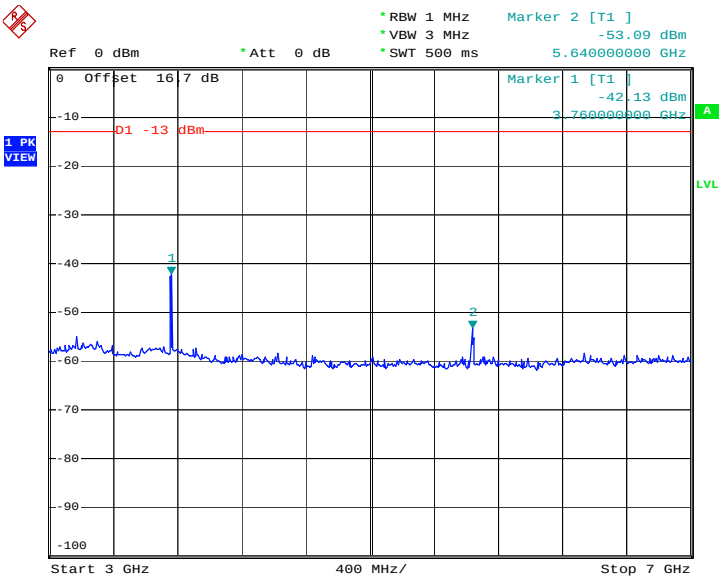

Date: 9.JAN.2012 11:08:14

## Conducted Emission Plot between 1GHz ~ 3GHz



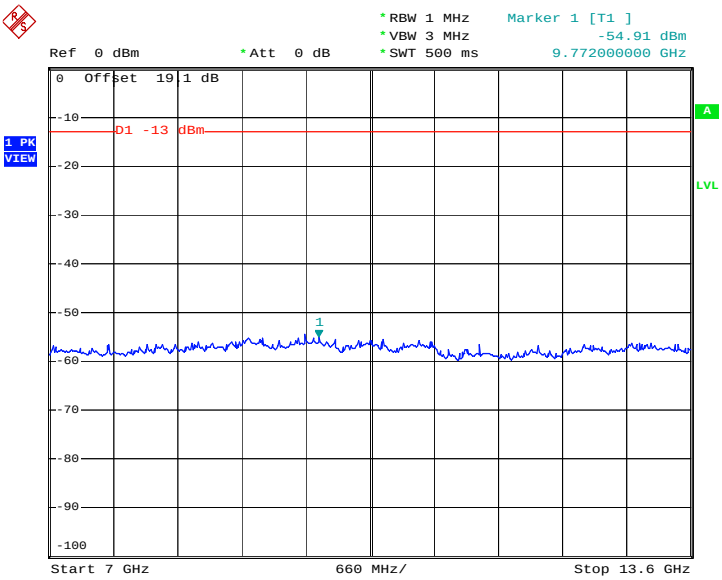

Date: 2.FEB.2012 17:19:32

## Conducted Emission Plot between 3GHz ~ 7GHz



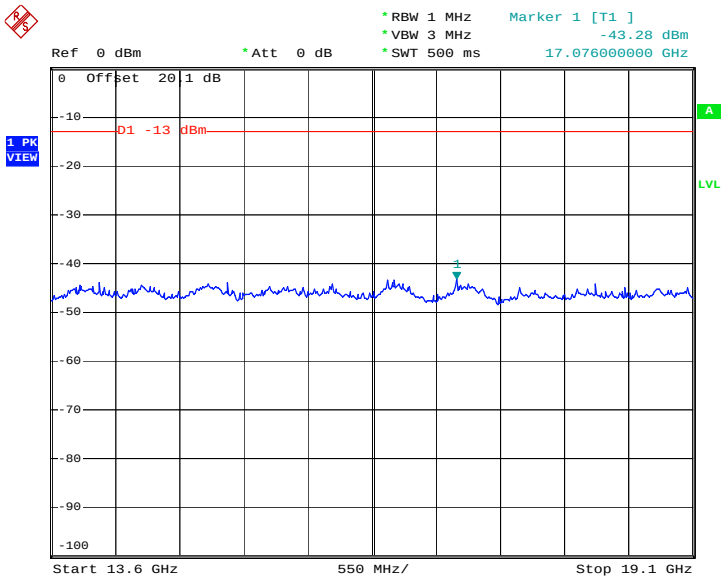

Date: 9.JAN.2012 11:14:53

## Conducted Emission Plot between 7GHz ~ 13.6GHz




Date: 9.JAN.2012 11:15:40

## Conducted Emission Plot between 13.6GHz ~ 19.1GHz




Date: 9.JAN.2012 11:16:36

## 3.6 Field Strength of Spurious Radiation Measurement

### 3.6.1 Description of Field Strength of Spurious Radiated Measurement

The radiated spurious emission was measured by substitution method according to ANSI / TIA / EIA-603-C-2004. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least 43 + 10 log (P) dB. The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

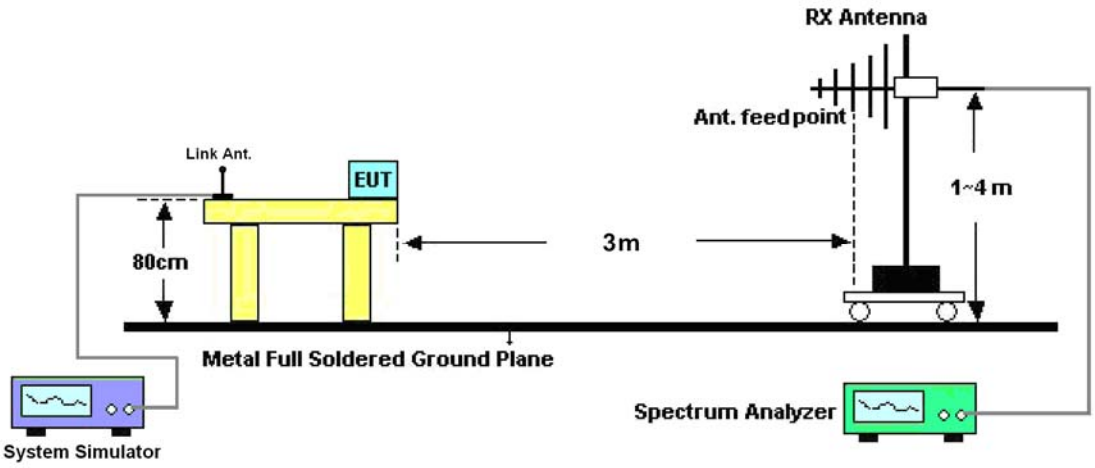
### 3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

### 3.6.3 Test Procedures

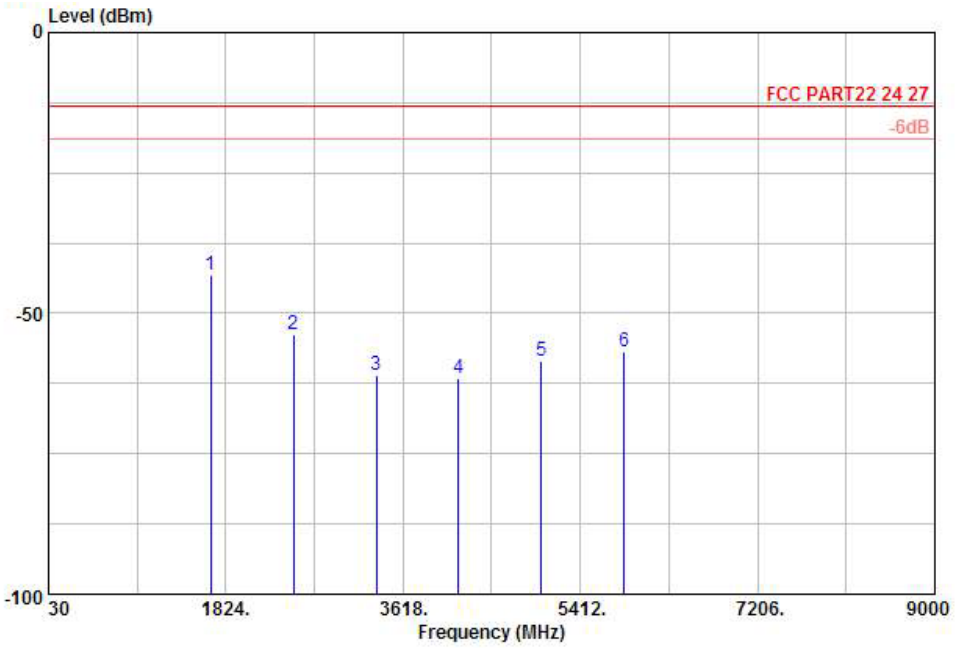
1. The EUT was placed on a rotatable wooden table with 0.8 meter about ground.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations.
5. Taking the record of maximum spurious emission.
6. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
7. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
8. Taking the record of output power at antenna port.
9. Repeat step 7 to step 8 for another polarization.
10. EIRP (dBm) = S.G. Power – Tx Cable Loss + Tx Antenna Gain
11. ERP (dBm) = EIRP - 2.15

### 3.6.4 Test Setup



### 3.6.5 Test Result of Field Strength of Spurious Radiated

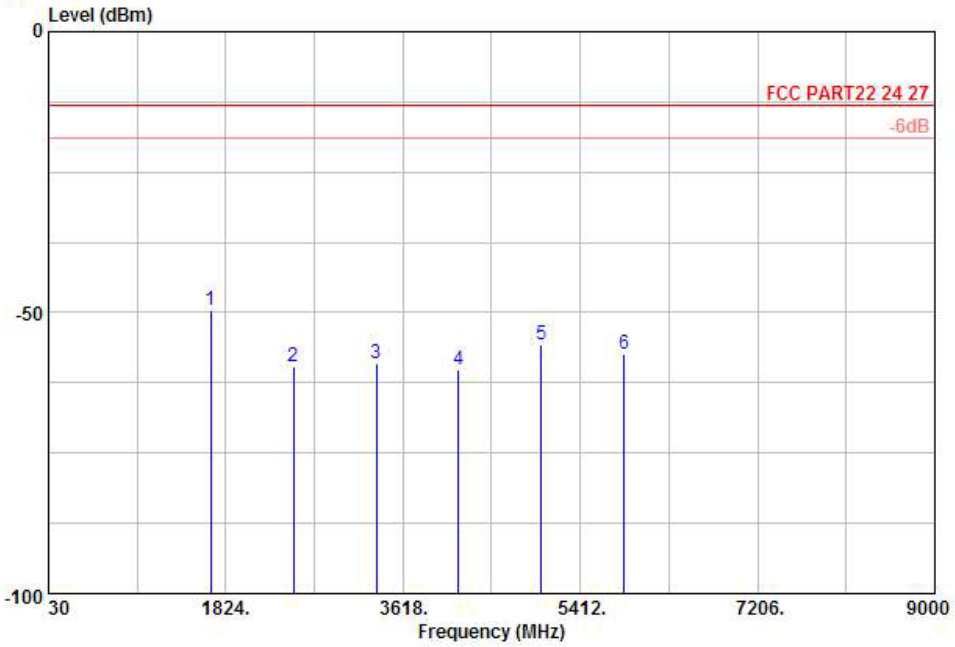
| | | | |
|---|---|---|---|
| **Band :** | GSM850 | **Temperature :** | 20~21°C |
| **Test Mode :** | GPRS 8 Link | **Relative Humidity :** | 40~41% |
| **Test Engineer :** | Jack Li | **Polarization :** | Horizontal |
| **Remark :** | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |




Site : 03CH01-KS
Condition: FCC PART22 24 27 HF EIRP FACTOR-09020 HORIZONTAL
Project : (FG) 1D2801

| Frequency ( MHz ) | ERP ( dBm ) | Limit ( dBm ) | Over Limit ( dB ) | SPA Reading (dBm) | S.G. Power ( dBm ) | TX Cable loss ( dB ) | TX Antenna Gain (dBi) | Polarization (H/V) | Result |
|---|---|---|---|---|---|---|---|---|---|
| 1672 | -43.10 | -13 | -30.10 | -42.99 | -43.75 | 0.57 | 3.37 | H | Pass |
| 2510 | -53.63 | -13 | -40.63 | -55.88 | -55.86 | 0.78 | 5.16 | H | Pass |
| 3345 | -61.14 | -13 | -48.14 | -63.08 | -64.78 | 0.87 | 6.66 | H | Pass |
| 4182 | -61.69 | -13 | -48.69 | -64.43 | -66.28 | 0.97 | 7.71 | H | Pass |
| 5018 | -58.61 | -13 | -45.61 | -64.81 | -64.28 | 1.09 | 8.91 | H | Pass |
| 5854 | -56.87 | -13 | -43.87 | -65.58 | -63.31 | 1.22 | 9.81 | H | Pass |

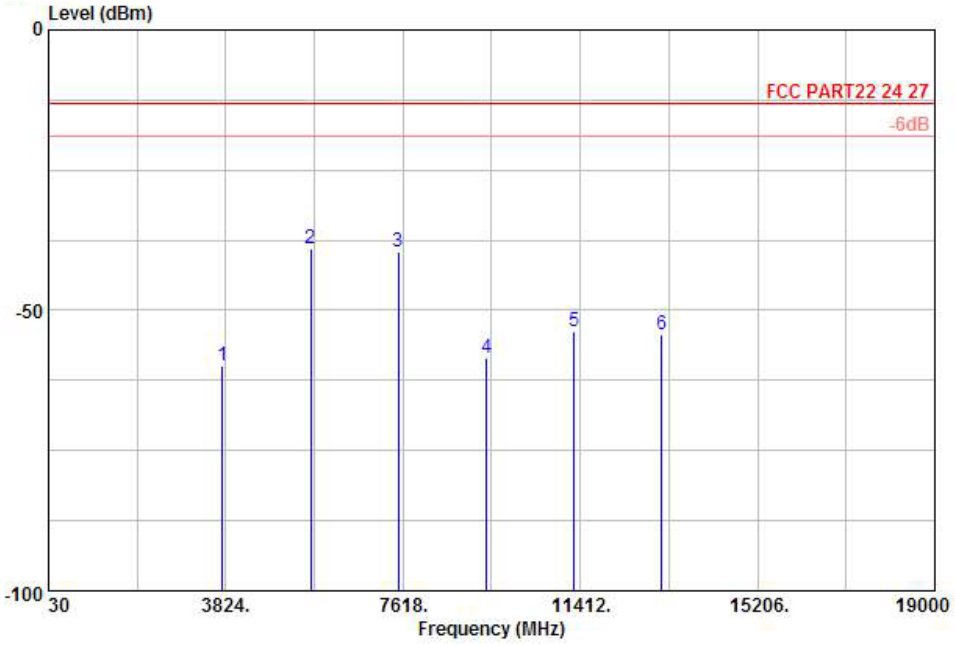
| | | | |
|---|---|---|---|
| **Band :** | GSM850 | **Temperature :** | 20~21°C |
| **Test Mode :** | GPRS 8 Link | **Relative Humidity :** | 40~41% |
| **Test Engineer :** | Jack Li | **Polarization :** | Vertical |
| **Remark :** | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |




Site : 03CH01-KS
Condition: FCC PART22 24 27 HF EIRP FACTOR-09020 VERTICAL
Project : (FG) 1D2801

| Frequency ( MHz ) | ERP ( dBm ) | Limit ( dBm ) | Over Limit ( dB ) | SPA Reading (dBm) | S.G. Power ( dBm ) | TX Cable loss ( dB ) | TX Antenna Gain (dBi) | Polarization (H/V) | Result |
|---|---|---|---|---|---|---|---|---|---|
| 1672 | -49.57 | -13 | -36.57 | -51.77 | -50.22 | 0.57 | 3.37 | V | Pass |
| 2510 | -59.73 | -13 | -46.73 | -62.84 | -61.96 | 0.78 | 5.16 | V | Pass |
| 3345 | -59.16 | -13 | -46.16 | -61.14 | -62.80 | 0.87 | 6.66 | V | Pass |
| 4182 | -60.15 | -13 | -47.15 | -63.99 | -64.74 | 0.97 | 7.71 | V | Pass |
| 5018 | -55.67 | -13 | -42.67 | -60.61 | -61.34 | 1.09 | 8.91 | V | Pass |
| 5854 | -57.36 | -13 | -44.36 | -65.35 | -63.80 | 1.22 | 9.81 | V | Pass |

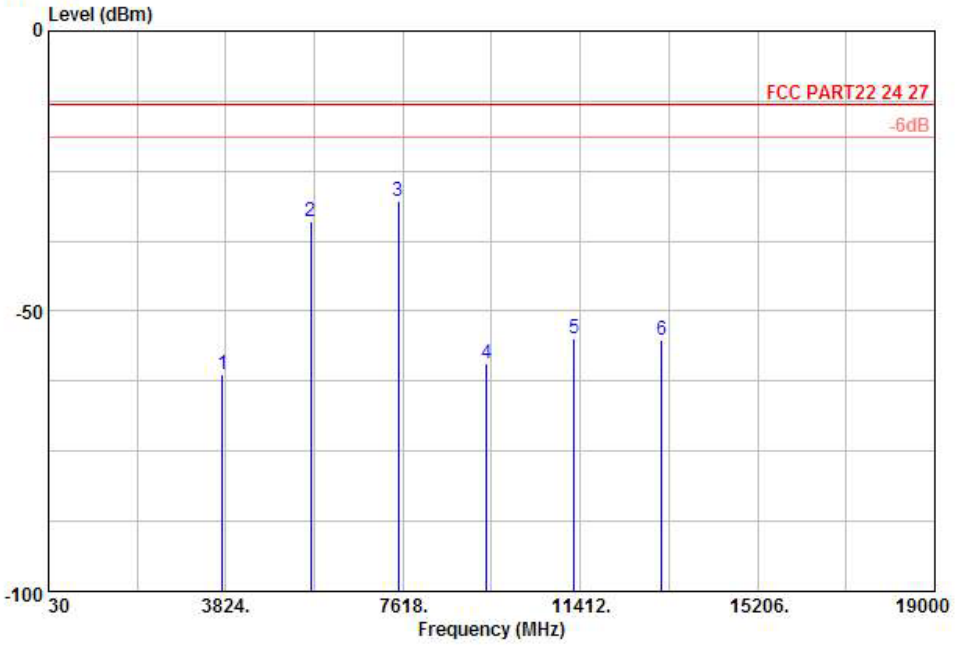
| | | | |
|---|---|---|---|
| **Band :** | GSM1900 | **Temperature :** | 20~21°C |
| **Test Mode :** | GPRS 8 Link | **Relative Humidity :** | 40~41% |
| **Test Engineer :** | Jack Li | **Polarization :** | Horizontal |
| **Remark :** | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |




Site : 03CH01-KS
Condition: FCC PART22 24 27 HF EIRP FACTOR-09020 HORIZONTAL
Project : (FG) 1D2801

| Frequency ( MHz ) | EIRP ( dBm ) | Limit ( dBm ) | Over Limit ( dB ) | SPA Reading (dBm) | S.G. Power ( dBm ) | TX Cable loss ( dB ) | TX Antenna Gain (dBi) | Polarization (H/V) | Result |
|---|---|---|---|---|---|---|---|---|---|
| 3760 | -59.91 | -13 | -46.91 | -60.88 | -66.29 | 0.78 | 7.16 | H | Pass |
| 5640 | -38.87 | -13 | -25.87 | -50.47 | -47.41 | 1.04 | 9.58 | H | Pass |
| 7520 | -39.48 | -13 | -26.48 | -53.06 | -49.59 | 1.35 | 11.46 | H | Pass |
| 9400 | -58.42 | -13 | -45.42 | -61.68 | -69.48 | 1.75 | 12.81 | H | Pass |
| 11280 | -53.84 | -13 | -40.84 | -65.33 | -64.93 | 2 | 13.09 | H | Pass |
| 13160 | -54.40 | -13 | -41.40 | -65.70 | -66.11 | 2.04 | 13.75 | H | Pass |

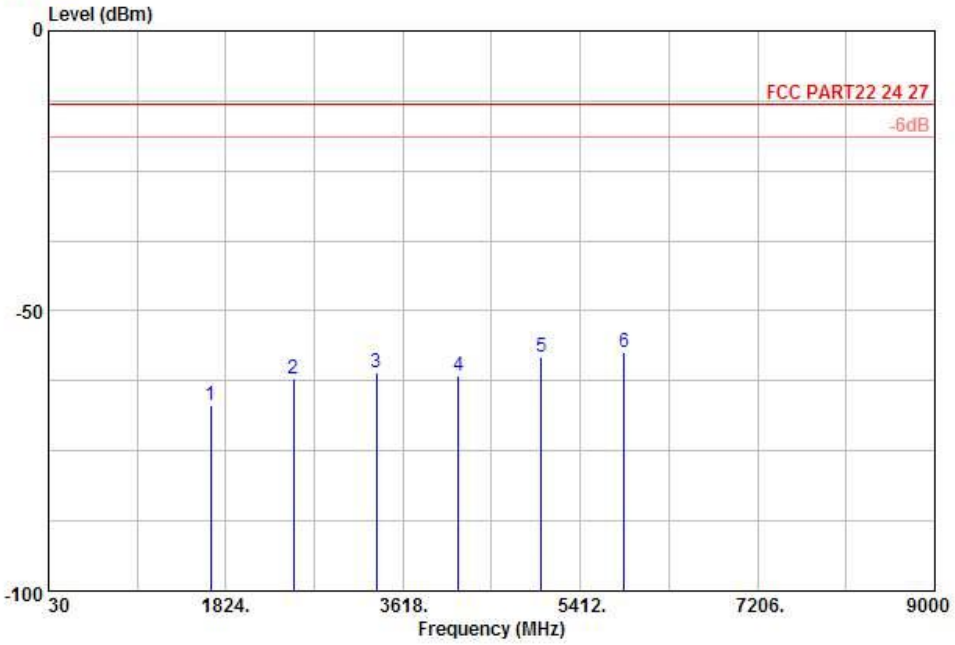
| | | | |
|---|---|---|---|
| **Band :** | GSM1900 | **Temperature :** | 20~21°C |
| **Test Mode :** | GPRS 8 Link | **Relative Humidity :** | 40~41% |
| **Test Engineer :** | Jack Li | **Polarization :** | Vertical |
| **Remark :** | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |




Site : 03CH01-KS
Condition: FCC PART22 24 27 HF EIRP FACTOR-09020 VERTICAL
Project : (FG) 1D2801

| Frequency ( MHz ) | EIRP ( dBm ) | Limit ( dBm ) | Over Limit ( dB ) | SPA Reading (dBm) | S.G. Power ( dBm ) | TX Cable loss ( dB ) | TX Antenna Gain (dBi) | Polarization (H/V) | Result |
|---|---|---|---|---|---|---|---|---|---|
| 3760 | -61.35 | -13 | -48.35 | -62.72 | -67.73 | 0.78 | 7.16 | V | Pass |
| 5640 | -33.96 | -13 | -20.96 | -47.51 | -42.50 | 1.04 | 9.58 | V | Pass |
| 7520 | -30.27 | -13 | -17.27 | -47.7 | -40.38 | 1.35 | 11.46 | V | Pass |
| 9400 | -59.22 | -13 | -46.22 | -60.44 | -70.28 | 1.75 | 12.81 | V | Pass |
| 11280 | -54.99 | -13 | -41.99 | -66.23 | -66.08 | 2 | 13.09 | V | Pass |
| 13160 | -55.27 | -13 | -42.27 | -66.46 | -66.98 | 2.04 | 13.75 | V | Pass |

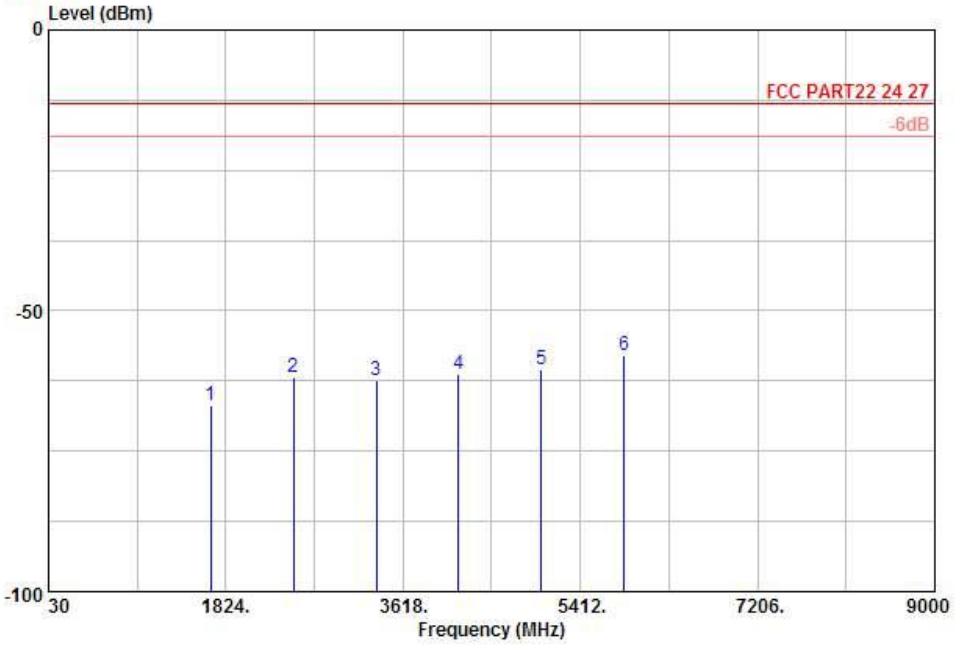
| | | | |
|---|---|---|---|
| **Band :** | WCDMA Band V | **Temperature :** | 20~21°C |
| **Test Mode :** | RMC 12.2Kbps Link | **Relative Humidity :** | 40~41% |
| **Test Engineer :** | Jack Li | **Polarization :** | Horizontal |
| **Remark :** | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |




Site : 03CH01-KS
Condition: FCC PART22 24 27 HF EIRP FACTOR-09020 HORIZONTAL
Project : (FG) 1D2801

| Frequency ( MHz ) | ERP ( dBm ) | Limit ( dBm ) | Over Limit ( dB ) | SPA Reading (dBm) | S.G. Power ( dBm ) | TX Cable loss ( dB ) | TX Antenna Gain (dBi) | Polarization (H/V) | Result |
|---|---|---|---|---|---|---|---|---|---|
| 1672 | -66.76 | -13 | -53.76 | -62.54 | -67.41 | 0.57 | 3.37 | H | Pass |
| 2510 | -62.19 | -13 | -49.19 | -64.44 | -64.42 | 0.78 | 5.16 | H | Pass |
| 3345 | -61.14 | -13 | -48.14 | -63.08 | -64.78 | 0.87 | 6.66 | H | Pass |
| 4182 | -61.44 | -13 | -48.44 | -64.18 | -66.03 | 0.97 | 7.71 | H | Pass |
| 5018 | -58.28 | -13 | -45.28 | -64.48 | -63.95 | 1.09 | 8.91 | H | Pass |
| 5854 | -57.37 | -13 | -44.37 | -66.08 | -63.81 | 1.22 | 9.81 | H | Pass |

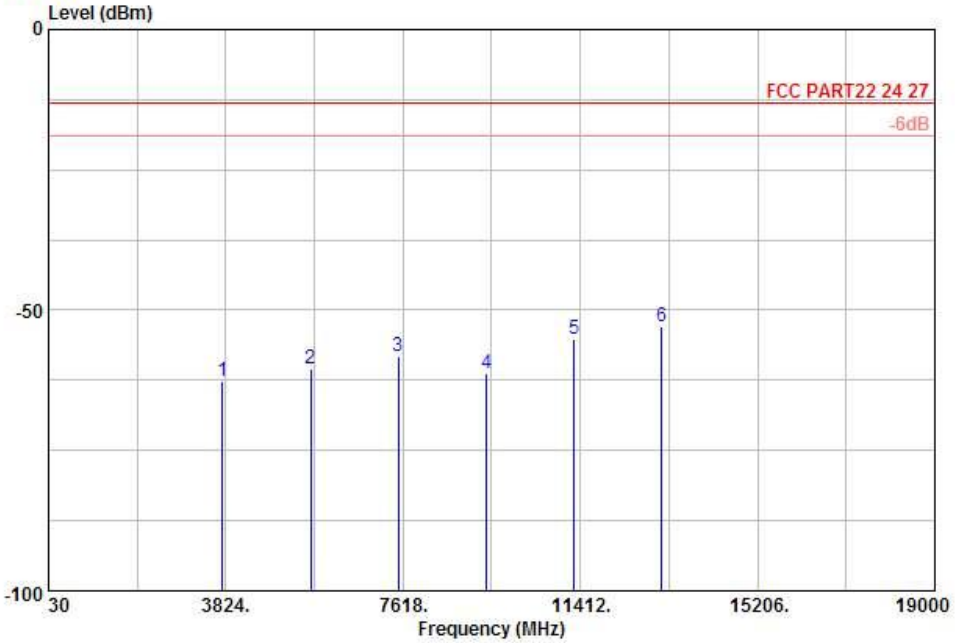
| | | | |
|---|---|---|---|
| **Band :** | WCDMA Band V | **Temperature :** | 20~21°C |
| **Test Mode :** | RMC 12.2Kbps Link | **Relative Humidity :** | 40~41% |
| **Test Engineer :** | Jack Li | **Polarization :** | Vertical |
| **Remark :** | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |




Site : 03CH01-KS
Condition: FCC PART22 24 27 HF EIRP FACTOR-09020 VERTICAL
Project : (FG) 1D2801

| Frequency ( MHz ) | ERP ( dBm ) | Limit ( dBm ) | Over Limit ( dB ) | SPA Reading (dBm) | S.G. Power ( dBm ) | TX Cable loss ( dB ) | TX Antenna Gain (dBi) | Polarization (H/V) | Result |
|---|---|---|---|---|---|---|---|---|---|
| 1672 | -66.89 | -13 | -53.89 | -62.54 | -67.54 | 0.57 | 3.37 | V | Pass |
| 2510 | -61.70 | -13 | -48.70 | -64.81 | -63.93 | 0.78 | 5.16 | V | Pass |
| 3345 | -62.33 | -13 | -49.33 | -64.31 | -65.97 | 0.87 | 6.66 | V | Pass |
| 4182 | -61.39 | -13 | -48.39 | -65.23 | -65.98 | 0.97 | 7.71 | V | Pass |
| 5018 | -60.45 | -13 | -47.45 | -65.39 | -66.12 | 1.09 | 8.91 | V | Pass |
| 5854 | -58.04 | -13 | -45.04 | -66.03 | -64.48 | 1.22 | 9.81 | V | Pass |

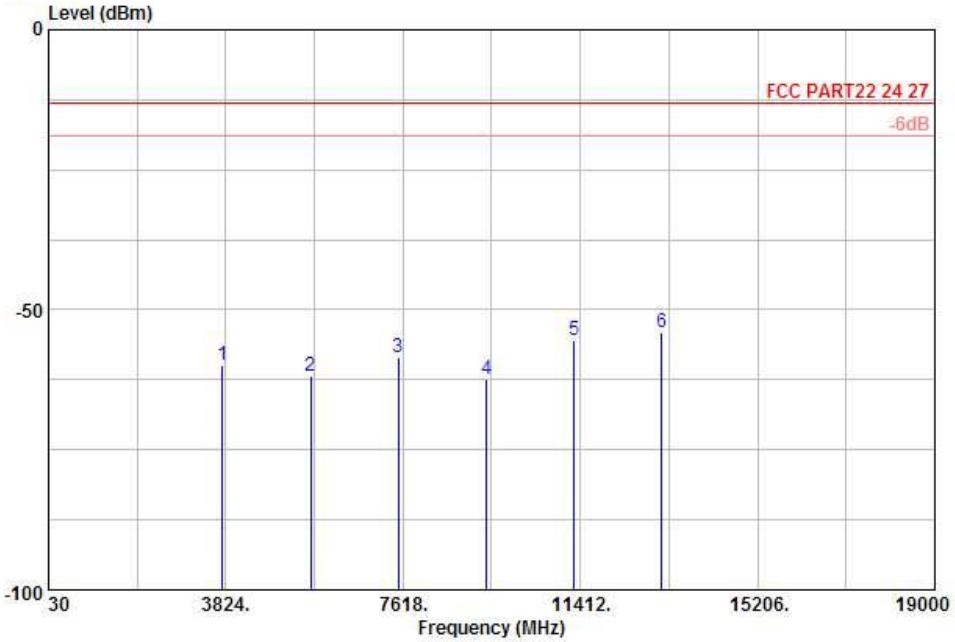
| | | | |
|---|---|---|---|
| **Band :** | WCDMA Band II | **Temperature :** | 20~21°C |
| **Test Mode :** | RMC 12.2Kbps Link | **Relative Humidity :** | 40~41% |
| **Test Engineer :** | Jack Li | **Polarization :** | Horizontal |
| **Remark :** | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |




Site : 03CH01-KS
Condition: FCC PART22 24 27 HF EIRP FACTOR-09020 HORIZONTAL
Project : (FG) 1D2801

| Frequency ( MHz ) | EIRP ( dBm ) | Limit ( dBm ) | Over Limit ( dB ) | SPA Reading (dBm) | S.G. Power ( dBm ) | TX Cable loss ( dB ) | TX Antenna Gain (dBi) | Polarization (H/V) | Result |
|---|---|---|---|---|---|---|---|---|---|
| 3760 | -62.74 | -13 | -49.74 | -63.71 | -69.12 | 0.78 | 7.16 | H | Pass |
| 5640 | -60.31 | -13 | -47.31 | -64.49 | -68.85 | 1.04 | 9.58 | H | Pass |
| 7520 | -58.16 | -13 | -45.16 | -63.29 | -68.27 | 1.35 | 11.46 | H | Pass |
| 9400 | -61.40 | -13 | -48.40 | -64.66 | -72.46 | 1.75 | 12.81 | H | Pass |
| 11280 | -55.07 | -13 | -42.07 | -66.56 | -66.16 | 2 | 13.09 | H | Pass |
| 13160 | -52.95 | -13 | -39.95 | -64.25 | -64.66 | 2.04 | 13.75 | H | Pass |

| | | | |
|---|---|---|---|
| **Band :** | WCDMA Band II | **Temperature :** | 20~21°C |
| **Test Mode :** | RMC 12.2Kbps Link | **Relative Humidity :** | 40~41% |
| **Test Engineer :** | Jack Li | **Polarization :** | Vertical |
| **Remark :** | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |




Site : 03CH01-KS
Condition: FCC PART22 24 27 HF EIRP FACTOR-09020 VERTICAL
Project : (FG) 1D2801

| Frequency ( MHz ) | EIRP ( dBm ) | Limit ( dBm ) | Over Limit ( dB ) | SPA Reading (dBm) | S.G. Power ( dBm ) | TX Cable loss ( dB ) | TX Antenna Gain (dBi) | Polarization (H/V) | Result |
|---|---|---|---|---|---|---|---|---|---|
| 3760 | -59.86 | -13 | -46.86 | -61.23 | -66.24 | 0.78 | 7.16 | V | Pass |
| 5640 | -61.75 | -13 | -48.75 | -64.97 | -70.29 | 1.04 | 9.58 | V | Pass |
| 7520 | -58.60 | -13 | -45.60 | -63.09 | -68.71 | 1.35 | 11.46 | V | Pass |
| 9400 | -62.49 | -13 | -49.49 | -63.71 | -73.55 | 1.75 | 12.81 | V | Pass |
| 11280 | -55.41 | -13 | -42.41 | -66.65 | -66.50 | 2 | 13.09 | V | Pass |
| 13160 | -54.17 | -13 | -41.17 | -65.36 | -65.88 | 2.04 | 13.75 | V | Pass |

## 3.7 Frequency Stability Measurement

### 3.7.1 Description of Frequency Stability Measurement

The frequency stability shall be measured by variation of ambient temperature and variation of primary supply voltage to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within ±0.00025% (±2.5ppm) of the center frequency.

### 3.7.2 Measuring Instruments

See list of measuring instruments of this test report.

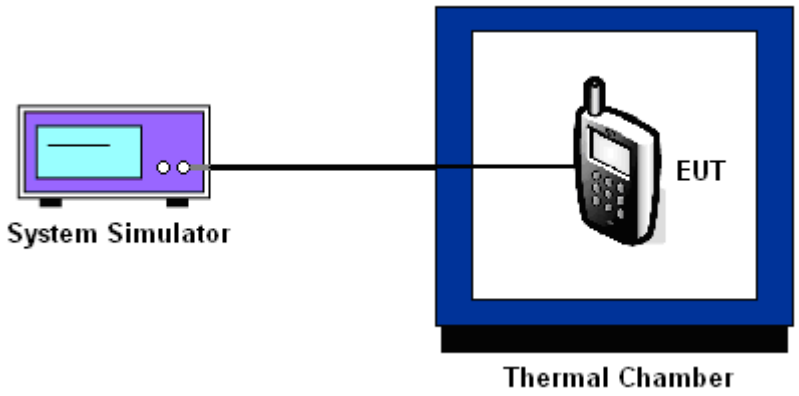
### 3.7.3 Test Procedures for Temperature Variation

1. The EUT was set up in the thermal chamber and connected with the base station.
2. With power OFF, the temperature was decreased to -30°C and the EUT was stabilized for three hours. Power was applied and the maximum change in frequency was recorded within one minute.
3. With power OFF, the temperature was raised in 10°C step up to 50°C. The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.
4. If the EUT cannot be turned on at -30°C, the testing lowest temperature will be raised in 10°C step until the EUT can be turned on.

### 3.7.4 Test Procedures for Voltage Variation

1. The EUT was placed in a temperature chamber at 25±5° C and connected with the base station.
2. The power supply voltage to the EUT was varied from BEP to 115% of the nominal value measured at the input to the EUT.
3. The variation in frequency was measured for the worst case.

### 3.7.5 Test Setup



### 3.7.6 Test Result of Temperature Variation

| Band : | GSM 850 | Channel : | 189 |
|---|---|---|---|
| Limit (ppm) : | 2.5 | | |

| Temperature (°C) | GPRS 8 | | Result |
|---|---|---|---|
| | Freq. Dev. (Hz) | Deviation (ppm) | |
| -30 | NA | NA | PASS |
| -20 | NA | NA | |
| -15 | -9 | -0.01 | |
| -10 | -8 | -0.01 | |
| 0 | -11 | -0.01 | |
| 10 | -9 | -0.01 | |
| 20 | -10 | -0.01 | |
| 30 | -11 | -0.01 | |
| 40 | -10 | -0.01 | |
| 50 | -12 | -0.01 | |
| 55 | -11 | -0.01 | |

**Note:** The manufacturer declared that the EUT could work properly between temperatures -15°C~55°C.

| Band : | GSM 1900 | Channel : | 661 |
|---|---|---|---|
| Limit (ppm) : | 2.5 | | |

| Temperature (°C) | GPRS 8 | | Result |
|---|---|---|---|
| | Freq. Dev. (Hz) | Deviation (ppm) | |
| -30 | NA | NA | PASS |
| -20 | NA | NA | |
| -15 | -20 | -0.01 | |
| -10 | -21 | -0.01 | |
| 0 | -19 | -0.01 | |
| 10 | -18 | -0.01 | |
| 20 | -20 | -0.01 | |
| 30 | -21 | -0.01 | |
| 40 | -22 | -0.01 | |
| 50 | -21 | -0.01 | |
| 55 | -23 | -0.01 | |

**Note:** The manufacturer declared that the EUT could work properly between temperatures -15°C~55°C.

| Band : | WCDMA Band V | Channel : | 4182 |
|---|---|---|---|
| Limit (ppm) : | 2.5 | | |

| Temperature (°C) | RMC 12.2Kbps | | Result |
|---|---|---|---|
| | Freq. Dev. (Hz) | Deviation (ppm) | |
| -30 | NA | NA | PASS |
| -20 | NA | NA | |
| -15 | 7 | 0.01 | |
| -10 | 6 | 0.01 | |
| 0 | 8 | 0.01 | |
| 10 | 5 | 0.01 | |
| 20 | 7 | 0.01 | |
| 30 | -8 | -0.01 | |
| 40 | -9 | -0.01 | |
| 50 | -7 | -0.01 | |
| 55 | 9 | 0.01 | |

**Note:** The manufacturer declared that the EUT could work properly between temperatures -15°C~55°C.

| Band : | WCDMA Band II | Channel : | 9400 |
|---|---|---|---|
| Limit (ppm) : | 2.5 | | |

| Temperature (°C) | RMC 12.2Kbps | | Result |
|---|---|---|---|
| | Freq. Dev. (Hz) | Deviation (ppm) | |
| -30 | NA | NA | PASS |
| -20 | NA | NA | |
| -15 | 12 | 0.01 | |
| -10 | -11 | -0.01 | |
| 0 | 10 | 0.01 | |
| 10 | 12 | 0.01 | |
| 20 | 12 | 0.01 | |
| 30 | 10 | 0.01 | |
| 40 | -11 | -0.01 | |
| 50 | -13 | -0.01 | |
| 55 | 12 | 0.01 | |

**Note:** The manufacturer declared that the EUT could work properly between temperatures -15°C~55°C.

### 3.7.7 Test Result of Voltage Variation

| Band & Channel | Mode | Voltage (Volt) | Freq. Dev. (Hz) | Deviation (ppm) | Limit (ppm) | Result |
|---|---|---|---|---|---|---|
| GSM 850 CH189 | GPRS 8 | 3.7 | -12 | -0.01 | 2.5 | PASS |
| | | BEP | -13 | -0.02 | | |
| | | 4.2 | -9 | -0.01 | | |
| GSM 1900 CH661 | GPRS 8 | 3.7 | -16 | -0.01 | | |
| | | BEP | -18 | -0.01 | | |
| | | 4.2 | -22 | -0.01 | | |
| WCDMA Band V CH4182 | RMC 12.2Kbps | 3.7 | 7 | 0.01 | | |
| | | BEP | -8 | -0.01 | | |
| | | 4.2 | 6 | 0.01 | | |
| WCDMA Band II CH9400 | RMC 12.2Kbps | 3.7 | 10 | 0.01 | | |
| | | BEP | 12 | 0.01 | | |
| | | 4.2 | 11 | 0.01 | | |

**Note:**

1. Normal Voltage = 3.7V.
2. Battery End Point (BEP) = 3.4 V.

# 4 List of Measuring Equipments

| Instrument | Manufacturer | Model No. | Serial No. | Characteristics | Calibration Date | Test Date | Due Date | Remark |
|---|---|---|---|---|---|---|---|---|
| Spectrum Analyzer | R&S | FSP40 | 100319 | 9kHz~40GHz | Dec. 30, 2011 | Feb. 02, 2012 | Dec. 29, 2012 | Conducted (TH01-KS) |
| System Simulator | R&S | CMU200 | 837587/066 | 2G Full-Band | Dec. 30, 2011 | Feb. 02, 2012 | Dec. 29, 2012 | Conducted (TH01-KS) |
| DC Power Supply | TOPWARD | GPS-3030D | E1884515 | N/A | Aug. 23, 2011 | Feb. 02, 2012 | Aug. 22, 2012 | Conducted (TH01-KS) |
| Thermal Chamber | Ten Billion | TTC-B3S | TBN-96050 | N/A | Dec. 30, 2011 | Feb. 02, 2012 | Dec. 29, 2012 | Conducted (TH01-KS) |
| EMI Test Receiver | R&S | ESCI | 100534 | 9kHz~3GHz | Nov. 09, 2011 | Jan. 31, 2012 | Nov. 08, 2012 | Radiation (03CH01-KS) |
| Spectrum Analyzer | R&S | FSP40 | 100319 | 9kHz~40GHz | Dec. 30, 2011 | Jan. 31, 2012 | Dec. 29, 2012 | Radiation (03CH01-KS) |
| Bilog Antenna | SCHAFFNER | CBL6112D | 23182 | 25MHz~2GHz | Dec. 08, 2011 | Jan. 31, 2012 | Dec. 07, 2012 | Radiation (03CH01-KS) |
| Loop Antenna | R&S | HFH2-Z2 | 860004/00 | 9 kHz~30 MHz | Jul. 28, 2011 | Jan. 31, 2012 | Jul. 27, 2012 | Radiation (03CH01-KS) |
| Double Ridge Horn Antenna | EMCO | 3117 | 00075959 | 1GHz~18GHz | Jan. 06, 2012 | Jan. 31, 2012 | Jan. 05, 2013 | Radiation (03CH01-KS) |
| Amplifier | Wireless | FPA-6592G | 060007 | 30MHz~2GHz | Dec. 30, 2011 | Jan. 31, 2012 | Dec. 29, 2012 | Radiation (03CH01-KS) |
| Active Horn Antenna | com-power | AHA-118 | 701023 | 1GHz~18GHz | Nov. 07, 2011 | Jan. 31, 2012 | Nov. 06, 2012 | Radiation (03CH01-KS) |
| SHE-EHF Horn | Schwarzbeck | BBHA9170 | BBHA170249 | 15GHz~40GHz | Oct. 11, 2011 | Jan. 31, 2012 | Oct. 10, 2012 | Radiation (03CH01-KS) |
| System Simulator | R&S | CMU200 | 837587/066 | 2G Full-Band | Dec. 30, 2011 | Jan. 31, 2012 | Dec. 29, 2012 | - |

# 5 Uncertainty of Evaluation

**Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)**

| Contribution | Uncertainty of $X_i$ | | $u(X_i)$ |
|---|---|---|---|
| | dB | Probability Distribution | |
| Receiver Reading | 0.41 | Normal (k=2) | 0.21 |
| Antenna Factor Calibration | 0.83 | Normal (k=2) | 0.42 |
| Cable Loss Calibration | 0.25 | Normal (k=2) | 0.13 |
| Pre-Amplifier Gain Calibration | 0.27 | Normal (k=2) | 0.14 |
| RCV/SPA Specification | 2.50 | Rectangular | 0.72 |
| Antenna Factor Interpolation for Frequency | 1.00 | Rectangular | 0.29 |
| Site Imperfection | 1.43 | Rectangular | 0.83 |
| Mismatch | +0.39 / -0.41 | U-Shape | 0.28 |
| **Combined Standard Uncertainty Uc(y)** | **1.27** | | |
| **Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))** | **2.54** | | |

**Uncertainty of Radiated Emission Measurement (1 GHz ~ 40 GHz)**

| Contribution | Uncertainty of $X_i$ | | $u(X_i)$ | $C_i$ | $C_i * u(X_i)$ |
|---|---|---|---|---|---|
| | dB | Probability Distribution | | | |
| Receiver Reading | ±0.10 | Normal (k=2) | 0.10 | 1 | 0.10 |
| Antenna Factor Calibration | ±1.70 | Normal (k=2) | 0.85 | 1 | 0.85 |
| Cable Loss Calibration | ±0.50 | Normal (k=2) | 0.25 | 1 | 0.25 |
| Receiver Correction | ±2.00 | Rectangular | 1.15 | 1 | 1.15 |
| Antenna Factor Directional | ±1.50 | Rectangular | 0.87 | 1 | 0.87 |
| Site Imperfection | ±2.80 | Triangular | 1.14 | 1 | 1.14 |
| Mismatch<br>Receiver VSWR Γ1 = 0.197<br>Antenna VSWR Γ2 = 0.194<br>Uncertainty = 20Log(1-Γ1*Γ2) | +0.34 / -0.35 | U-Shape | 0.244 | 1 | 0.244 |
| **Combined Standard Uncertainty Uc(y)** | **2.36** | | | | |
| **Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))** | **4.72** | | | | |

# Appendix A. Photographs of EUT

Please refer to Sporton report number EP1D2801 as below.