# FCC RF Test Report

| | | |
|---|---|---|
| **APPLICANT** | : | **CT Asia** |
| **EQUIPMENT** | : | **Smart phone** |
| **BRAND NAME** | : | **BLU** |
| **MODEL NAME** | : | **ENERGY X** |
| **FCC ID** | : | **YHLBLUENERGYX** |
| **STANDARD** | : | **FCC 47 CFR Part 2, 22(H), 24(E), 27(L)** |
| **CLASSIFICATION** | : | **PCS Licensed Transmitter Held to Ear (PCE)** |

**The product was received on Jun. 18, 2015 and testing was completed on Jul. 10, 2015. We, SPORTON INTERNATIONAL (SHENZHEN) Inc., would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI / TIA / EIA-603-C-2004 and has been in 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 (SHENZHEN) INC., the test report shall not be reproduced except in full.**

**Reviewed by: Joseph Lin / Supervisor**

**Approved by: Jones Tsai / Manager**

Testing Laboratory
2353

***SPORTON INTERNATIONAL (SHENZHEN) INC.***
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# REVISION HISTORY

| REPORT NO. | VERSION | DESCRIPTION | ISSUED DATE |
|---|---|---|---|
| FG561807 | Rev. 01 | Initial issue of report | Jul. 22, 2015 |
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# SUMMARY OF TEST RESULT

| Report Section | FCC Rule | IC Rule | Description | Limit | Result | Remark |
|---|---|---|---|---|---|---|
| 3.1 | §2.1046 | RSS-132 (5.4)<br>RSS-133 (6.4)<br>RSS-139 (6.4) | Conducted Output Power | Reporting Only | PASS | - |
| 3.2 | §24.232(d) | RSS-132 (5.4)<br>RSS-133 (6.4)<br>RSS-139 (6.4) | Peak-to-Average Ratio | < 13 dB | PASS | - |
| 3.3 | §22.913(a)(2) | RSS-132(5.4)<br>SRSP-503(5.1.3) | Effective Radiated Power | < 7 Watts | PASS | - |
| | §24.232(c) | RSS-133 (6.4)<br>SRSP-510(5.1.2) | Equivalent Isotropic Radiated Power | < 2 Watts | PASS | - |
| | §27.50(d)(4) | RSS-139 (6.4)<br>SRSP-513(5.1.2) | Equivalent Isotropic Radiated Power | < 1 Watts | PASS | - |
| 3.4 | §2.1049 | RSS-GEN(6.6)<br>RSS-133(6.5)<br>RSS-139 (6.5) | Occupied Bandwidth | Reporting Only | PASS | - |
| 3.5 | §2.1051<br>§22.917(a)<br>§24.238(a)<br>§27.53(h) | RSS-132 (5.5)<br>RSS-133 (6.5)<br>RSS-139 (6.5) | Band Edge Measurement | < 43+10log10(P[Watts]) | PASS | - |
| 3.6 | §2.1051<br>§22.917(a)<br>§24.238(a)<br>§27.53(h) | RSS-132 (5.5)<br>RSS-133 (6.5)<br>RSS-139 (6.5) | Conducted Emission | < 43+10log10(P[Watts]) | PASS | - |
| 3.7 | §2.1053<br>§22.917(a)<br>§24.238(a)<br>§27.53(h) | RSS-132 (5.5)<br>RSS-133 (6.5)<br>RSS-139 (6.5) | Field Strength of Spurious Radiation | < 43+10log10(P[Watts]) | PASS | Under limit 22.43 dB at 3700.400 MHz |
| 3.8 | §2.1055<br>§22.355 | RSS-GEN(6.11)<br>RSS-132 (5.3) | Frequency Stability for Temperature & Voltage | < 2.5 ppm | PASS | - |
| | §2.1055<br>§24.235<br>§27.54 | RSS-GEN(6.11)<br>RSS-133 (6.3)<br>RSS-139 (6.3) | | Within Authorized Band | | |

# 1 General Description

## 1.1 Applicant

**CT Asia**
Unit1309-11, 13th Floor 9 Wing Hong Street Cheung Sha Wan Kowloon, Hong Kong

## 1.2 Manufacturer

**Longcheer Technology (Shanghai) Co., Ltd.**
Building 1, No.401, Caobao Rd., Xuhui District, Shanghai, P.R.China

## 1.3 Product Feature of Equipment Under Test

| Product Feature | |
|---|---|
| **Equipment** | Smart phone |
| **Brand Name** | BLU |
| **Model Name** | ENERGY X |
| **FCC ID** | YHLBLUENERGYX |
| **EUT supports Radios application** | GSM/GPRS/EGPRS/WCDMA/HSPA/HSPA+(Downlink Only)/ WLAN 2.4GHz 802.11b/g/n HT20/HT40/ Bluetooth v3.0 + EDR/Bluetooth v4.0 LE |
| **IMEI Code** | Conducted: 865843022787508/865843022785650 Radiation: 865843022787425/865843022785577 ERP&EIRP: 865843022787425/865843022785577 |
| **HW Version** | LWDM034 |
| **SW Version** | BLU_E010U_V01_GENERIC |
| **EUT Stage** | Pre-Production |

**Remark:** The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

## 1.4 Product Specification subjective to this standard

| Product Specification subjective to this standard | |
|---|---|
| **Tx Frequency** | GSM850: 824.2 MHz ~ 848.8 MHz<br>GSM1900: 1850.2 MHz ~ 1909.8MHz<br>WCDMA Band V: 826.4 MHz ~ 846.6 MHz<br>WCDMA Band IV : 1712.4 MHz ~ 1752.6 MHz<br>WCDMA Band II: 1852.4 MHz ~ 1907.6 MHz |
| **Rx Frequency** | GSM850: 869.2 MHz ~ 893.8 MHz<br>GSM1900: 1930.2 MHz ~ 1989.8 MHz<br>WCDMA Band V: 871.4 MHz ~ 891.6 MHz<br>WCDMA Band IV : 2112.4 MHz ~ 2152.6 MHz<br>WCDMA Band II: 1932.4 MHz ~ 1987.6 MHz |
| **Maximum Output Power to Antenna** | GSM850 : 32.72 dBm<br>GSM1900 : 29.78 dBm<br>WCDMA Band V : 23.05 dBm<br>WCDMA Band IV : 22.89 dBm<br>WCDMA Band II : 23.08 dBm |
| **99% Occupied Bandwidth** | GSM850: 0.259MHz<br>GSM1900: 0.254MHz<br>WCDMA Band V: 4.160MHz<br>WCDMA Band IV: 4.160MHz<br>WCDMA Band II: 4.170MHz |
| **Antenna Type** | IFA Antenna |
| **Type of Modulation** | GSM: GMSK<br>GPRS: GMSK<br>EDGE: GMSK / 8PSK<br>WCDMA: QPSK (Uplink)<br>HSDPA: QPSK (Uplink)<br>HSUPA: QPSK (Uplink)<br>HSPA+: 16QAM(Downlink Only) |

## 1.5 Modification of EUT

No modifications are made to the EUT during all test items.

## 1.6 Maximum ERP/EIRP Power, Frequency Tolerance, and Emission Designator

| FCC Rule | System | Type of Modulation | Maximum ERP/EIRP (W) | Frequency Tolerance (ppm) | Emission Designator |
|---|---|---|---|---|---|
| Part 22 | GSM850 GSM | GMSK | 0.2793 | 0.0084 ppm | 245KGXW |
| Part 22 | GSM850 EDGE class 8 | 8PSK | 0.1026 | 0.0108 ppm | 259KG7W |
| Part 22 | WCDMA Band V RMC 12.2Kbps | QPSK | 0.0254 | 0.0132 ppm | 4M16F9W |
| Part 24 | GSM1900 GSM | GMSK | 0.5984 | 0.0101 ppm | 247KGXW |
| Part 24 | GSM1900 EDGE class 8 | 8PSK | 0.1472 | 0.0037 ppm | 254KG7W |
| Part 24 | WCDMA Band II RMC 12.2Kbps | QPSK | 0.0796 | 0.0059 ppm | 4M17F9W |
| Part 27 | WCDMA Band IV RMC 12.2Kbps | QPSK | 0.0881 | 0.0081 ppm | 4M16F9W |

## 1.7 Testing Location

| | | |
|---|---|---|
| **Test Site** | SPORTON INTERNATIONAL (SHENZHEN) INC. | |
| **Test Site Location** | 1F & 2F, Building A, Morning Business Center, No. 4003 ShiGu Rd., Xili Town, Nanshan District, Shenzhen, Guangdong, P. R. China<br>TEL: +86-755-8637-9589<br>FAX: +86-755-8637-9595 | |
| **Test Site No.** | **Sporton Site No.** | |
| | TH01-SZ | |

| | | |
|---|---|---|
| **Test Site** | SPORTON INTERNATIONAL (SHENZHEN) INC. | |
| **Test Site Location** | No. 3 Building, the third floor of south, Shahe River west, Fengzeyuan warehouse, Nanshan District, Shenzhen, Guangdong, P. R. China<br>TEL: +86-755- 3320-2398 | |
| **Test Site No.** | **Sporton Site No.** | **FCC/IC Registration No.** |
| | 03CH01-SZ | 831040/4086F |

**Note:** The test site complies with ANSI C63.4 2009 requirement.

## 1.8 Applicable Standards

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

- 47 CFR Part 2, 22(H), 24(E), 27(L)
- ANSI / TIA / EIA-603-C-2004
- FCC KDB 971168 D01 Power Meas. License Digital Systems v02r02
- IC RSS-132 Issue 3
- IC RSS-133 Issue 6
- IC RSS-139 Issue 2
- IC RSS-Gen Issue 4

**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, recorded in a separate test report.

# 2 Test Configuration of Equipment Under Test

## 2.1 Test Mode

Antenna port conducted and radiated test items were performed according to KDB 971168 D01 Power Meas. License Digital Systems v02r02 with maximum output power.

Radiated measurements were performed with rotating EUT in different three orthogonal test planes to find the maximum emission.

Radiated emissions were investigated from 30 MHz to 10th harmonic.

All modes and data rates and positions were investigated.

Test modes are chosen to be reported as the worst case configuration below:

| Test Modes | | |
|---|---|---|
| **Band** | **Radiated TCs** | **Conducted TCs** |
| **GSM 850** | ■ GSM Link<br>■ EDGE class 8 Link | ■ GSM Link<br>■ EDGE class 8 Link |
| **GSM 1900** | ■ GSM Link<br>■ EDGE class 8 Link | ■ GSM Link<br>■ EDGE class 8 Link |
| **WCDMA Band V** | ■ RMC 12.2Kbps Link | ■ RMC 12.2Kbps Link |
| **WCDMA Band II** | ■ RMC 12.2Kbps Link | ■ RMC 12.2Kbps Link |
| **WCDMA Band IV** | ■ RMC 12.2Kbps Link | ■ RMC 12.2Kbps Link |

**Note:** The maximum power levels are chosen to test as the worst case configuration as follows:

GSM mode for GMSK modulation,

EDGE multi-slot class 8 mode for 8PSK modulation,

RMC 12.2Kbps mode for WCDMA band V and WCDMA band IV,

RMC 12.2Kbps mode for WCDMA band II, only these modes were used for all tests.

**Conducted Power Measurement Results:**

**SIM 1 Card:**

| Conducted Power (*Unit: dBm) | | | | | | |
|---|---|---|---|---|---|---|
| Band | GSM850 | | | GSM1900 | | |
| Channel | 128 | 189 | 251 | 512 | 661 | 810 |
| Frequency | 824.2 | 836.4 | 848.8 | 1850.2 | 1880.0 | 1909.8 |
| GSM | 32.66 | 32.69 | 32.72 | 29.78 | 29.75 | 29.73 |
| GPRS class 8 | 32.68 | 32.69 | 32.71 | 29.77 | 29.76 | 29.74 |
| GPRS class 10 | 31.91 | 31.92 | 31.95 | 29.04 | 29.04 | 29.03 |
| GPRS class 11 | 30.09 | 30.17 | 30.19 | 27.30 | 27.28 | 27.27 |
| GPRS class 12 | 28.94 | 29.05 | 29.07 | 26.21 | 26.18 | 26.17 |
| EGPRS class 8 | 26.73 | 26.65 | 26.63 | 25.74 | 25.72 | 25.61 |
| EGPRS class 10 | 25.82 | 25.73 | 25.67 | 24.71 | 24.69 | 24.45 |
| EGPRS class 11 | 23.92 | 23.78 | 23.72 | 22.62 | 22.53 | 22.25 |
| EGPRS class 12 | 22.75 | 22.68 | 22.61 | 21.45 | 21.29 | 20.84 |

| Conducted Power (*Unit: dBm) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Band | WCDMA Band V | | | WCDMA Band II | | | WCDMA Band IV | | |
| Channel | 4132 | 4182 | 4233 | 9262 | 9400 | 9538 | 1312 | 1413 | 1513 |
| Frequency | 826.4 | 836.4 | 846.6 | 1852.4 | 1880 | 1907.6 | 1712.4 | 1732.6 | 1752.6 |
| AMR 12.2Kbps | 23.04 | 22.98 | 23.00 | 22.96 | 23.02 | 23.06 | 22.84 | 22.83 | 22.86 |
| RMC 12.2Kbps | 23.05 | 22.99 | 23.02 | 22.98 | 23.04 | 23.08 | 22.85 | 22.84 | 22.89 |
| HSDPA Subtest-1 | 21.86 | 22.06 | 21.93 | 21.76 | 21.81 | 21.83 | 21.57 | 21.74 | 21.72 |
| HSDPA Subtest-2 | 21.83 | 22.05 | 21.89 | 21.73 | 21.78 | 21.79 | 21.54 | 21.69 | 21.70 |
| HSDPA Subtest-3 | 21.36 | 21.56 | 21.45 | 21.28 | 21.29 | 21.28 | 21.00 | 21.22 | 21.25 |
| HSDPA Subtest-4 | 21.33 | 21.54 | 21.44 | 21.25 | 21.24 | 21.28 | 20.98 | 21.18 | 21.19 |
| HSUPA Subtest-1 | 19.88 | 20.06 | 19.93 | 19.67 | 19.69 | 19.82 | 19.58 | 19.70 | 19.73 |
| HSUPA Subtest-2 | 19.85 | 20.05 | 19.94 | 19.61 | 19.72 | 19.83 | 19.56 | 19.68 | 19.70 |
| HSUPA Subtest-3 | 20.85 | 21.03 | 20.88 | 20.74 | 20.76 | 20.83 | 20.53 | 20.73 | 20.68 |
| HSUPA Subtest-4 | 19.28 | 19.54 | 19.41 | 19.14 | 19.13 | 19.27 | 19.05 | 19.17 | 19.19 |
| HSUPA Subtest-5 | 21.90 | 22.00 | 22.00 | 21.80 | 21.80 | 21.80 | 21.60 | 21.80 | 21.80 |

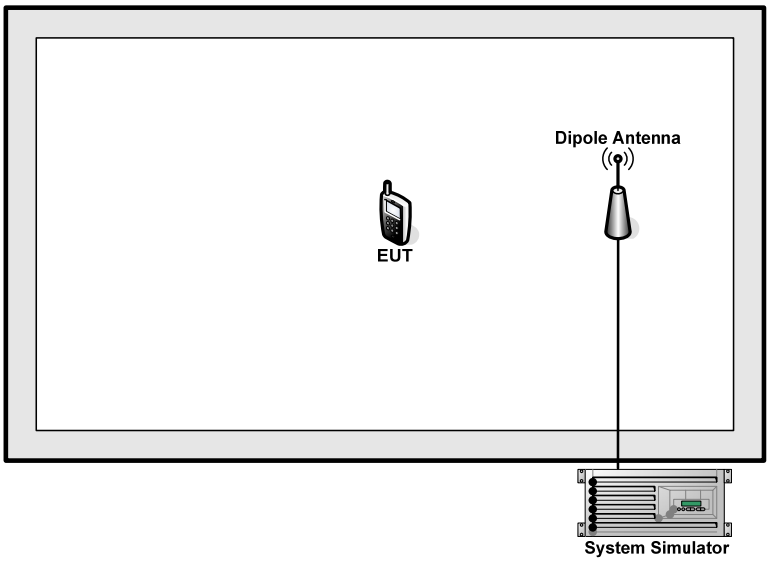
**SIM 2 Card:**

| Conducted Power (*Unit: dBm) | | | | | | |
|---|---|---|---|---|---|---|
| **Band** | **GSM850** | | | **GSM1900** | | |
| **Channel** | **128** | **189** | **251** | **512** | **661** | **810** |
| **Frequency** | **824.2** | **836.4** | **848.8** | **1850.2** | **1880.0** | **1909.8** |
| **GSM** | 32.66 | 32.68 | **32.71** | **29.76** | 29.74 | 29.72 |
| **GPRS class 8** | 32.59 | 32.61 | 32.66 | 29.72 | 29.71 | 29.70 |
| **GPRS class 10** | 31.83 | 31.87 | 31.89 | 28.98 | 28.94 | 28.97 |
| **GPRS class 11** | 30.07 | 30.08 | 30.14 | 27.25 | 27.23 | 27.22 |
| **GPRS class 12** | 28.94 | 28.97 | 29.04 | 26.15 | 26.13 | 26.12 |
| **EGPRS class 8** | 26.62 | 26.61 | 26.51 | 25.65 | 25.60 | 25.42 |
| **EGPRS class 10** | 25.65 | 25.64 | 25.56 | 24.56 | 24.59 | 24.23 |
| **EGPRS class 11** | 23.71 | 23.68 | 23.55 | 22.43 | 22.46 | 22.07 |
| **EGPRS class 12** | 22.62 | 22.57 | 22.47 | 21.28 | 21.18 | 20.73 |

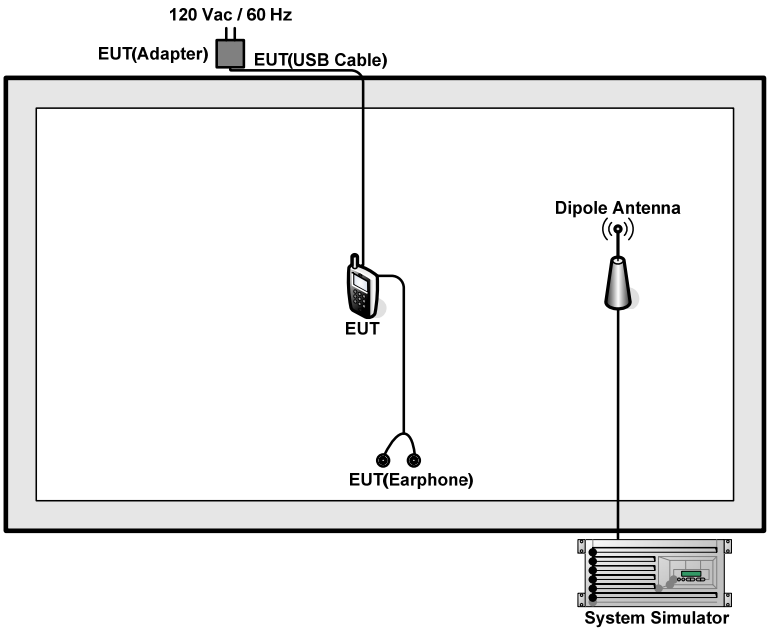
| Conducted Power (*Unit: dBm) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Band** | **WCDMA Band V** | | | **WCDMA Band II** | | | **WCDMA Band IV** | | |
| **Channel** | **4132** | **4182** | **4233** | **9262** | **9400** | **9538** | **1312** | **1413** | **1513** |
| **Frequency** | **826.4** | **836.4** | **846.6** | **1852.4** | **1880** | **1907.6** | **1712.4** | **1732.6** | **1752.6** |
| **AMR 12.2Kbps** | 23.01 | 22.96 | 23.00 | 22.95 | 23.02 | 23.01 | 22.83 | 22.76 | 22.84 |
| **RMC 12.2Kbps** | **23.03** | 22.98 | 22.97 | 22.97 | 22.93 | **23.06** | 22.84 | 22.80 | **22.88** |
| **HSDPA Subtest-1** | 21.86 | 22.04 | 21.93 | 21.62 | 21.82 | 21.78 | 21.54 | 21.67 | 21.75 |
| **HSDPA Subtest-2** | 21.82 | 22.02 | 21.90 | 21.68 | 21.77 | 21.77 | 21.50 | 21.64 | 21.75 |
| **HSDPA Subtest-3** | 21.33 | 21.58 | 21.47 | 21.24 | 21.31 | 21.27 | 21.03 | 21.17 | 21.27 |
| **HSDPA Subtest-4** | 21.33 | 21.54 | 21.42 | 21.18 | 21.27 | 21.23 | 21.03 | 21.14 | 21.26 |
| **HSUPA Subtest-1** | 19.86 | 20.05 | 19.90 | 19.65 | 19.64 | 19.77 | 19.53 | 19.68 | 19.74 |
| **HSUPA Subtest-2** | 19.83 | 20.01 | 19.90 | 19.67 | 19.67 | 19.86 | 19.46 | 19.65 | 19.74 |
| **HSUPA Subtest-3** | 20.85 | 20.99 | 20.88 | 20.67 | 20.76 | 20.80 | 20.50 | 20.74 | 20.72 |
| **HSUPA Subtest-4** | 19.28 | 19.50 | 19.40 | 19.11 | 19.08 | 19.25 | 19.01 | 19.18 | 19.18 |
| **HSUPA Subtest-5** | 21.90 | 22.00 | 22.00 | 21.70 | 21.80 | 21.80 | 21.60 | 21.70 | 21.90 |

## 2.2 Connection Diagram of Test System

**<For 22H>**




**<For 24E/27L>**



## 2.3 Support Unit used in test configuration

| Item | Equipment | Trade Name | Model No. | FCC ID | Data Cable | Power Cord |
|---|---|---|---|---|---|---|
| 1. | System Simulator | R&S | CMU 200 | N/A | N/A | Unshielded, 1.8 m |
| 2. | DC Power Supply | TOPWORD | 3303DR | N/A | N/A | Unshielded, 1.8 m |

## 2.4 Measurement Results Explanation Example

**For all conducted test items:**

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between RF conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level will be exactly the RF output level.

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.
*Offset = RF cable loss + attenuator factor.*
The following shows an offset computation example with RF cable loss 5 dB and a 10dB attenuator.

Example :
*Offset(dB) = RF cable loss(dB) + attenuator factor(dB).*
= 5 + 10 = 15 (dB)

# 3 Test Result

## 3.1 Conducted Output Power Measurement

### 3.1.1 Description of the Conducted Output Power Measurement

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

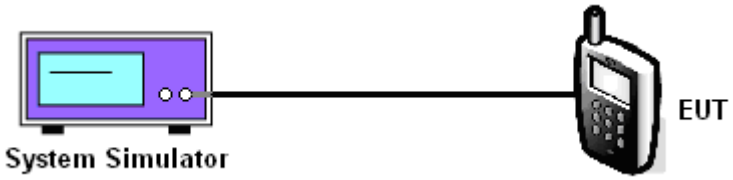
### 3.1.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

### 3.1.3 Test Procedures

1. The transmitter output port was connected to the system simulator.
2. Set EUT at maximum power through system simulator.
3. Select lowest, middle, and highest channels for each band and different modulation.
4. Measure the maximum burst average power for GSM and maximum average power for other modulation signal.

### 3.1.4 Test Setup



### 3.1.5 Test Result of Conducted Output Power

| Cellular Band | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Modes | GSM850 (GSM) | | | GSM850 (EDGE class 8) | | | WCDMA Band V (RMC 12.2Kbps) | | |
| Channel | 128 (Low) | 189 (Mid) | 251 (High) | 128 (Low) | 189 (Mid) | 251 (High) | 4132 (Low) | 4182 (Mid) | 4233 (High) |
| Frequency (MHz) | 824.2 | 836.4 | 848.8 | 824.2 | 836.4 | 848.8 | 826.4 | 836.4 | 846.6 |
| Conducted Power (dBm) | 32.66 | 32.69 | 32.72 | 26.73 | 26.65 | 26.63 | 23.05 | 22.99 | 23.02 |

| PCS Band | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Modes | GSM1900 (GSM) | | | GSM1900 (EDGE class 8) | | | WCDMA Band II (RMC 12.2Kbps) | | |
| Channel | 512 (Low) | 661 (Mid) | 810 (High) | 512 (Low) | 661 (Mid) | 810 (High) | 9262 (Low) | 9400 (Mid) | 9538 (High) |
| Frequency (MHz) | 1850.2 | 1880 | 1909.8 | 1850.2 | 1880 | 1909.8 | 1852.4 | 1880 | 1907.6 |
| Conducted Power (dBm) | 29.78 | 29.75 | 29.73 | 25.74 | 25.72 | 25.61 | 22.98 | 23.04 | 23.08 |

| AWS Band | | | |
|---|---|---|---|
| Modes | WCDMA Band IV (RMC 12.2Kbps) | | |
| Channel | 1312(Low) | 1413 (Mid) | 1513 (High) |
| Frequency (MHz) | 1712.4 | 1732.6 | 1752.6 |
| Conducted Power (dBm) | 22.85 | 22.84 | 22.89 |

**Note:** Maximum burst average power for GSM, and maximum average power for WCDMA.

## 3.2 Peak-to-Average Ratio

### 3.2.1 Description of the PAR Measurement

The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

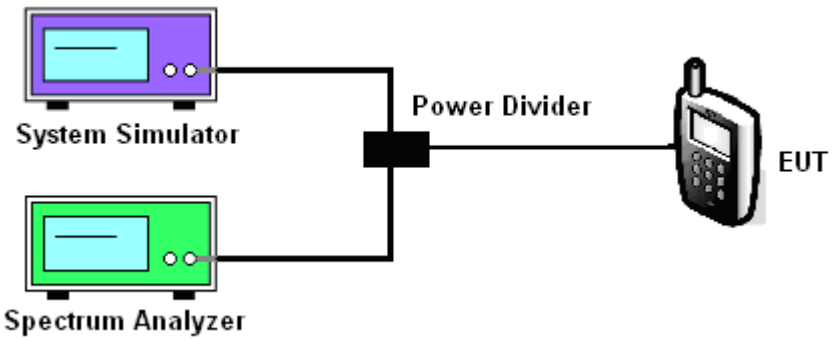
### 3.2.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

### 3.2.3 Test Procedures

1. The testing follows FCC KDB 971168 v02r02 Section 5.7.1.
2. The EUT was connected to the spectrum analyzer and system simulator via a power divider.
3. For GSM/EGPRS operating modes:
   a. Set EUT in maximum power output.
   b. Set the RBW = 1MHz, VBW = 3MHz, Peak detector on spectrum analyzer for first trace.
   c. Set the RBW = 1MHz, VBW = 3MHz, RMS detector on spectrum analyzer for second trace.
   d. The wanted burst signal is triggered by spectrum analyzer, and measured respectively the peak level and Mean level without burst-off time, after system simulator has synchronized with the spectrum analyzer.
4. For UMTS operating modes:
   a. Set the CCDF (Complementary Cumulative Distribution Function) option on the spectrum analyzer.
   b. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1 %.
5. Record the deviation as Peak to Average Ratio.

### 3.2.4 Test Setup



### 3.2.5 Test Result of Peak-to-Average Ratio

| Cellular Band | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Modes | GSM850 (GSM) | | | GSM850 (EDGE class 8) | | | WCDMA Band V (RMC 12.2Kbps) | | |
| Channel | 128 (Low) | 189 (Mid) | 251 (High) | 128 (Low) | 189 (Mid) | 251 (High) | 4132 (Low) | 4182 (Mid) | 4233 (High) |
| Frequency (MHz) | 824.2 | 836.4 | 848.8 | 824.2 | 836.4 | 848.8 | 826.4 | 836.4 | 846.6 |
| Peak-to-Average Ratio (dB) | 0.33 | 0.33 | 0.33 | 2.47 | 2.55 | 2.57 | 3.16 | 2.60 | 2.96 |

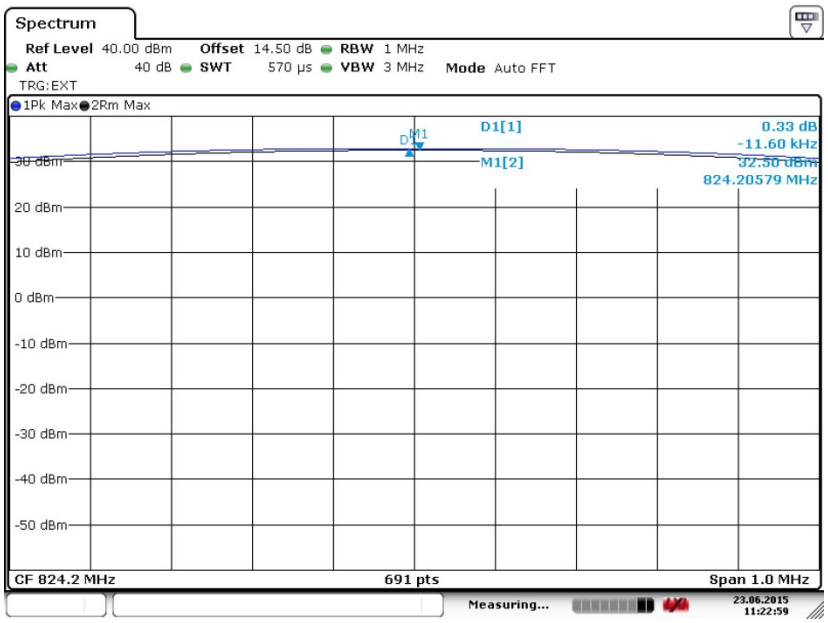
| PCS Band | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Modes | GSM1900 (GSM) | | | GSM1900 (EDGE class 8) | | | WCDMA Band II (RMC 12.2Kbps) | | |
| Channel | 512 (Low) | 661 (Mid) | 810 (High) | 512 (Low) | 661 (Mid) | 810 (High) | 9262 (Low) | 9400 (Mid) | 9538 (High) |
| Frequency (MHz) | 1850.2 | 1880 | 1909.8 | 1850.2 | 1880 | 1909.8 | 1852.4 | 1880 | 1907.6 |
| Peak-to-Average Ratio (dB) | 0.30 | 0.30 | 0.30 | 2.56 | 2.45 | 2.66 | 2.80 | 2.76 | 2.48 |

| AWS Band | | | |
|---|---|---|---|
| Modes | WCDMA Band IV (RMC 12.2Kbps) | | |
| Channel | 1312(Low) | 1413 (Mid) | 1513 (High) |
| Frequency (MHz) | 1712.4 | 1732.6 | 1752.6 |
| Peak-to-Average Ratio (dB) | 2.80 | 2.80 | 2.68 |

## 3.2.6 Test Result (Plots) of Peak-to-Average Ratio

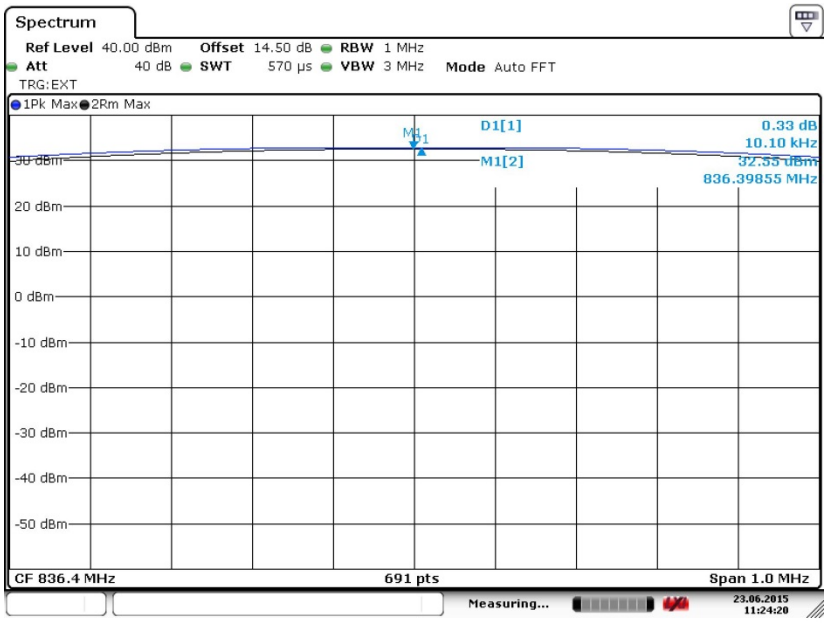
| Band : | GSM 850 | Test Mode : | GSM Link (GMSK) |
|---|---|---|---|

**Peak-to-Average Ratio on Channel 128 (824.2 MHz)**



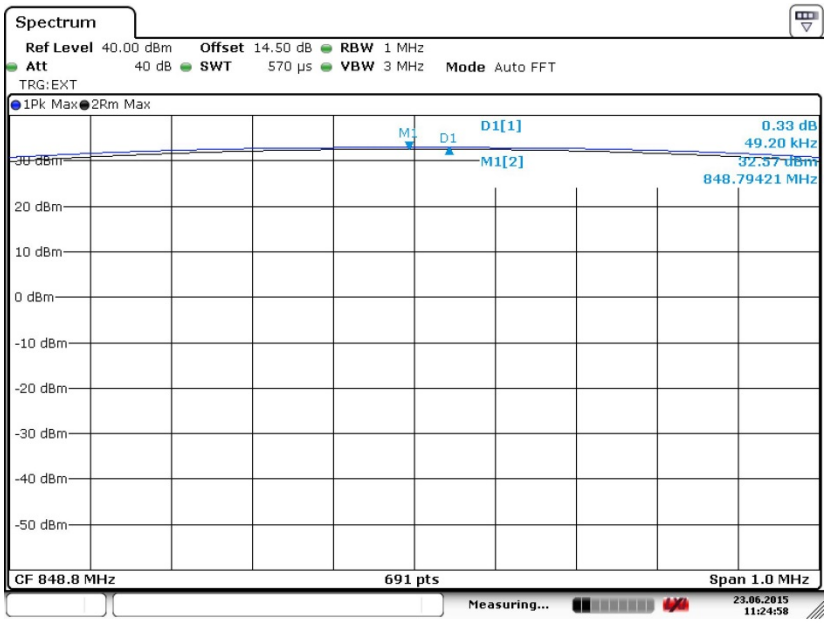

Date: 23.JUN.2015 11:22:59

**Peak-to-Average Ratio on Channel 189 (836.4 MHz)**




Date: 23.JUN.2015 11:24:20

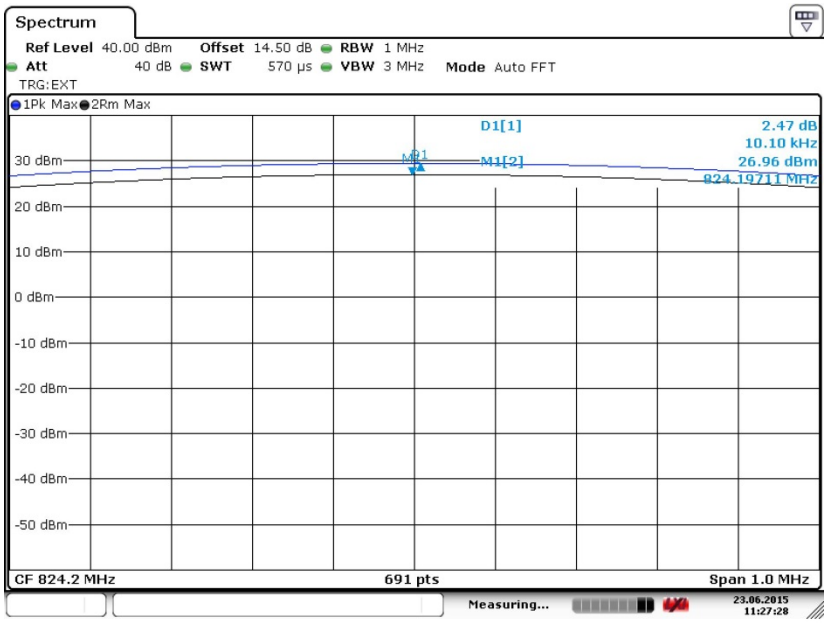
**Peak-to-Average Ratio on Channel 251 (848.8 MHz)**




Date: 23.JUN.2015 11:24:58

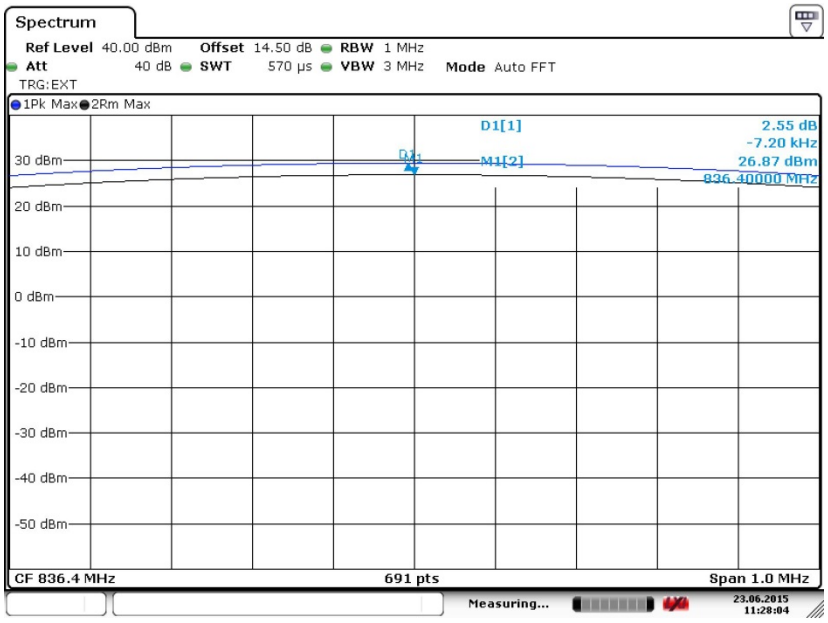
| Band : | GSM 850 | Test Mode : | EDGE class 8 Link (8PSK) |
|---|---|---|---|

**Peak-to-Average Ratio on Channel 128 (824.2 MHz)**



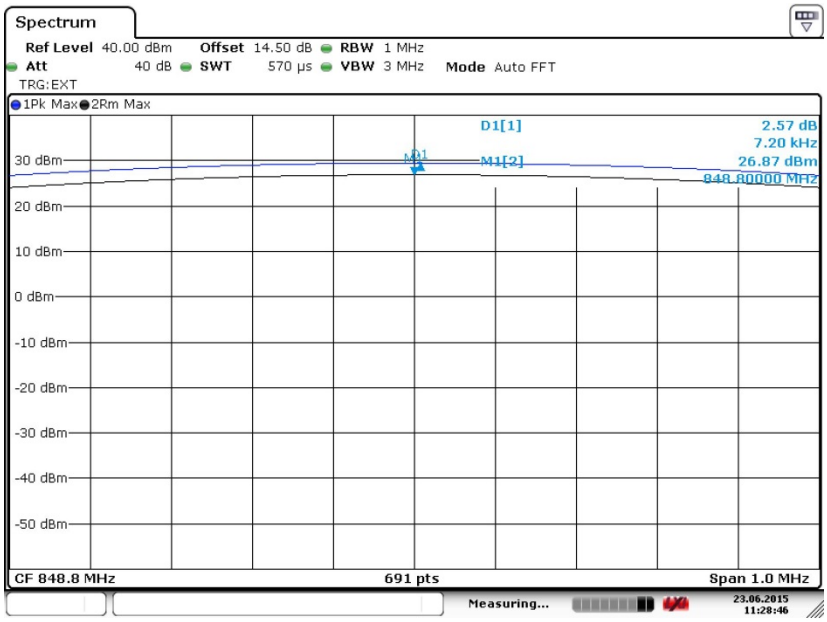

Date: 23.JUN.2015 11:27:28

**Peak-to-Average Ratio on Channel 189 (836.4 MHz)**




Date: 23.JUN.2015 11:28:04

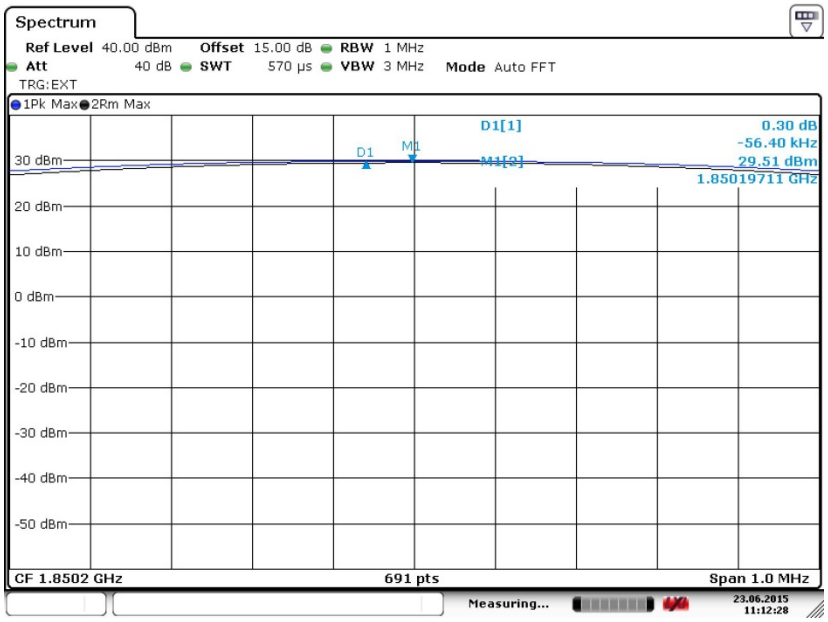
**Peak-to-Average Ratio on Channel 251 (848.8 MHz)**




Date: 23.JUN.2015 11:28:46

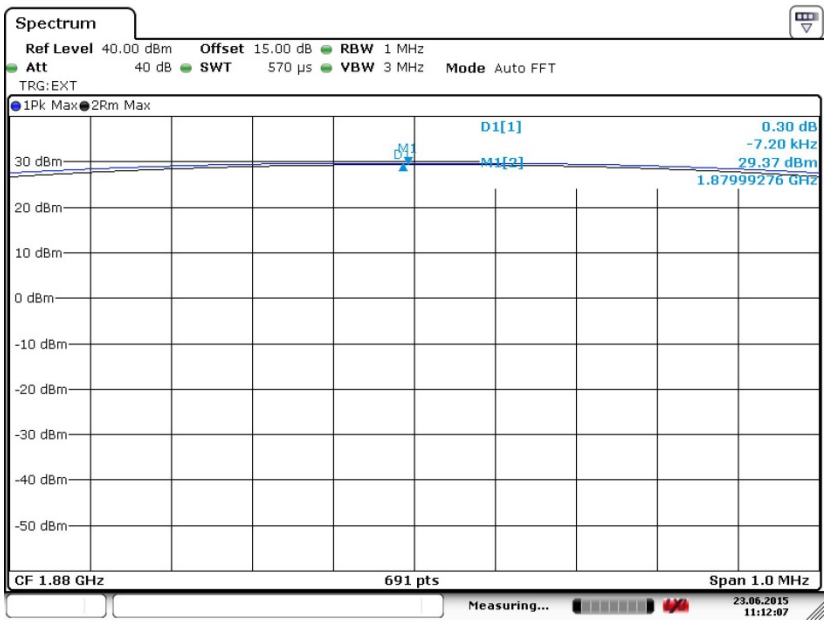
| Band : | GSM 1900 | Test Mode : | GSM Link (GMSK) |
|---|---|---|---|

**Peak-to-Average Ratio on Channel 512 (1850.2 MHz)**



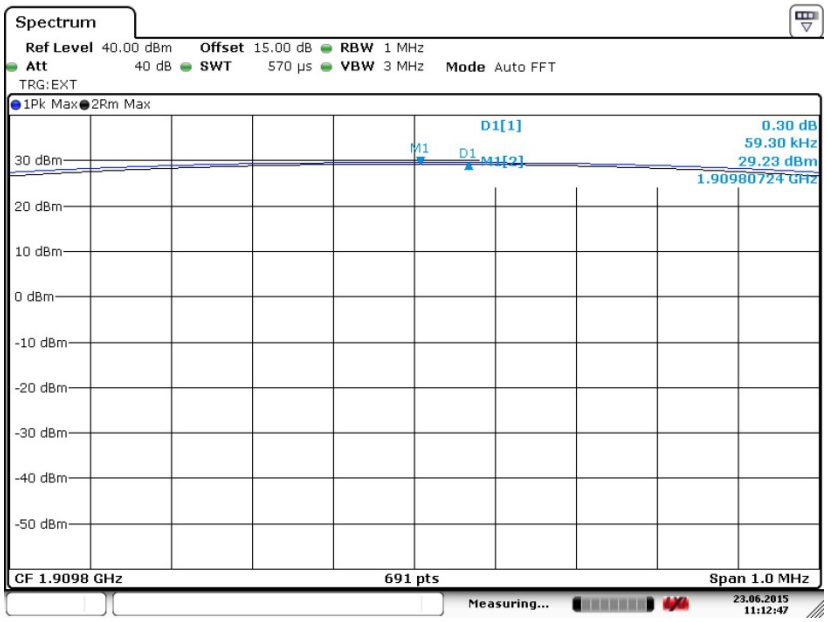

Date: 23.JUN.2015 11:12:28

**Peak-to-Average Ratio on Channel 661 (1880.0 MHz)**



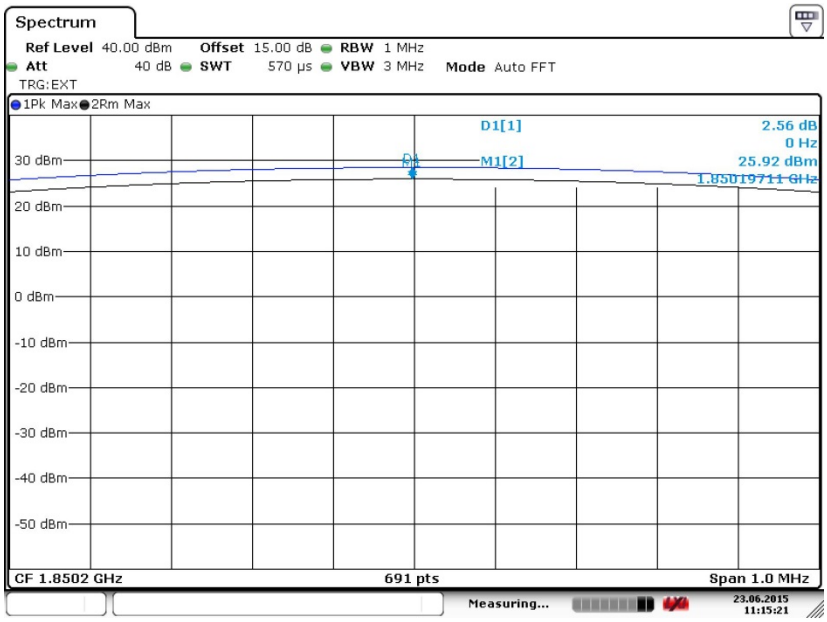

Date: 23.JUN.2015 11:12:07

**Peak-to-Average Ratio on Channel 810 (1909.8 MHz)**



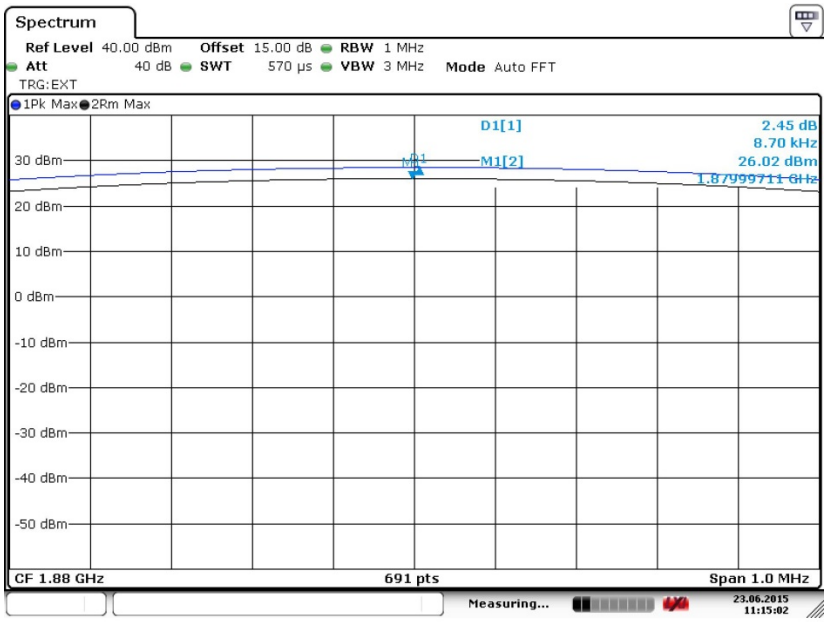
| Band : | GSM 1900 | Test Mode : | EDGE class 8 Link (8PSK) |
|---|---|---|---|

**Peak-to-Average Ratio on Channel 512 (1850.2 MHz)**



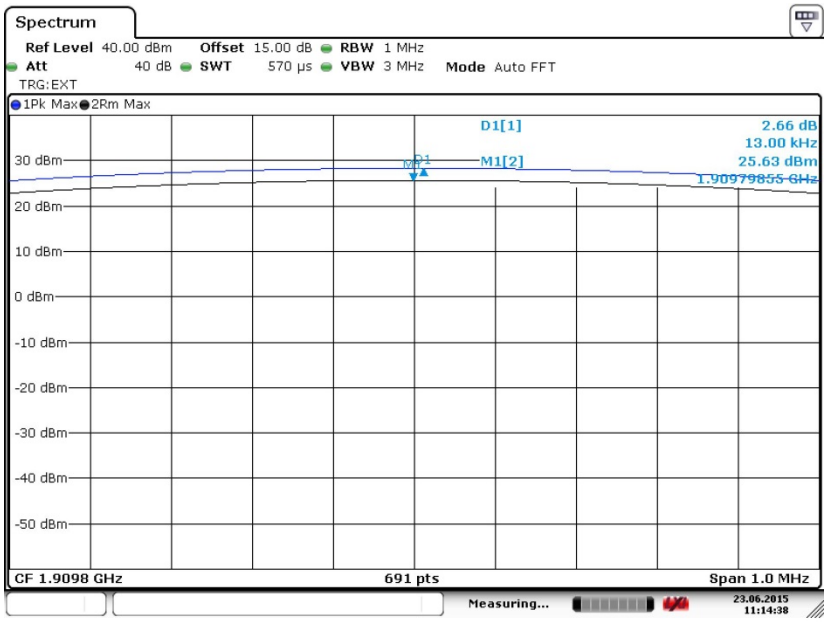

Date: 23.JUN.2015 11:15:21

**Peak-to-Average Ratio on Channel 661 (1880.0 MHz)**




Date: 23.JUN.2015 11:15:02

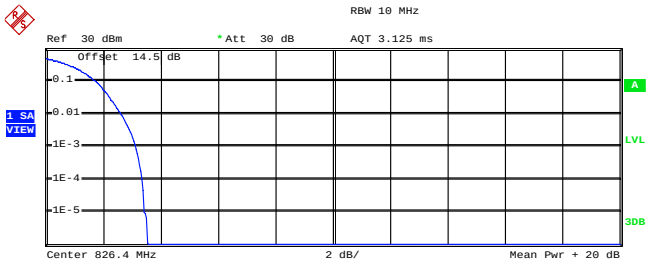
**Peak-to-Average Ratio on Channel 810 (1909.8 MHz)**




Date: 23.JUN.2015 11:14:38

| Band : | WCDMA Band V | Test Mode : | RMC 12.2Kbps Link (QPSK) |
|---|---|---|---|

**Peak-to-Average Ratio on Channel 4132 (826.4 MHz)**

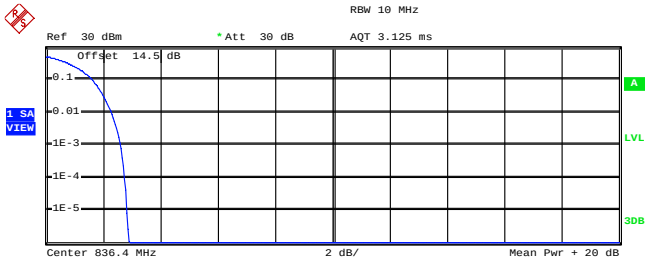



Complementary Cumulative Distribution Function (100000 samples)

| | Trace 1 |
|---|---|
| Mean | 22.95 dBm |
| Peak | 26.51 dBm |
| Crest | 3.56 dB |
| 10 % | 1.76 dB |
| 1 % | 2.64 dB |
| .1 % | 3.16 dB |
| .01 % | 3.36 dB |

Date: 20.JUN.2015 13:34:45

**Peak-to-Average Ratio on Channel 4182 (836.4 MHz)**

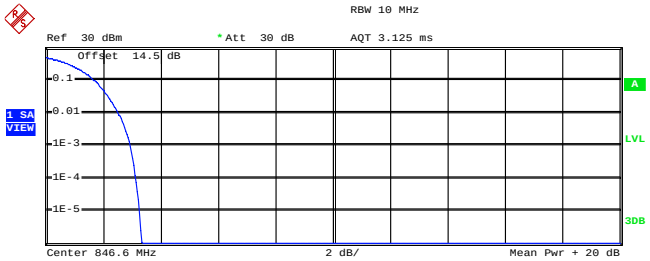



Complementary Cumulative Distribution Function (100000 samples)

| | Trace 1 |
|---|---|
| Mean | 22.84 dBm |
| Peak | 25.74 dBm |
| Crest | 2.89 dB |
| 10 % | 1.64 dB |
| 1 % | 2.28 dB |
| .1 % | 2.60 dB |
| .01 % | 2.76 dB |

Date: 20.JUN.2015 13:34:58

**Peak-to-Average Ratio on Channel 4233 (846.6 MHz)**



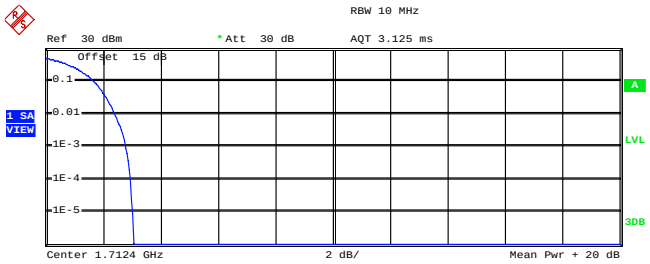

Complementary Cumulative Distribution Function (100000 samples)

| | Trace 1 |
|---|---|
| Mean | 22.90 dBm |
| Peak | 26.23 dBm |
| Crest | 3.33 dB |
| 10 % | 1.72 dB |
| 1 % | 2.52 dB |
| .1 % | 2.96 dB |
| .01 % | 3.16 dB |

Date: 20.JUN.2015 13:35:17

| Band : | WCDMA Band IV | Test Mode : | RMC 12.2Kbps Link (QPSK) |
|---|---|---|---|

**Peak-to-Average Ratio on Channel 1312 (1712.4 MHz)**

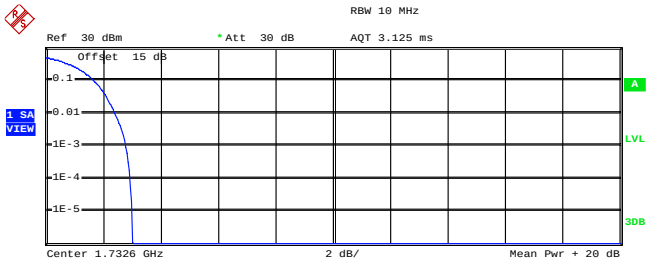



Complementary Cumulative Distribution Function (100000 samples)

| | Trace 1 |
|---|---|
| Mean | 22.53 dBm |
| Peak | 25.60 dBm |
| Crest | 3.07 dB |
| 10 % | 1.68 dB |
| 1 % | 2.40 dB |
| .1 % | 2.80 dB |
| .01 % | 2.96 dB |

Date: 20.JUN.2015 13:07:20

**Peak-to-Average Ratio on Channel 1413 (1732.6 MHz)**

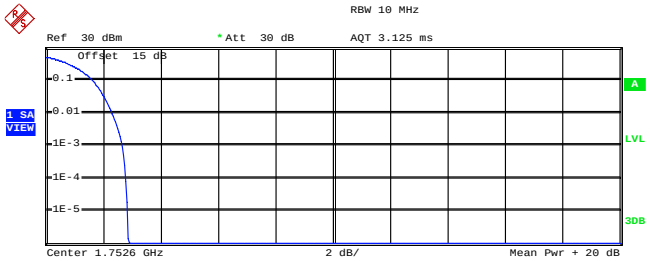



Complementary Cumulative Distribution Function (100000 samples)

| | Trace 1 |
|---|---|
| Mean | 22.23 dBm |
| Peak | 25.24 dBm |
| Crest | 3.02 dB |
| 10 % | 1.68 dB |
| 1 % | 2.40 dB |
| .1 % | 2.80 dB |
| .01 % | 2.96 dB |

Date: 20.JUN.2015 13:08:22

**Peak-to-Average Ratio on Channel 1513 (1752.6 MHz)**



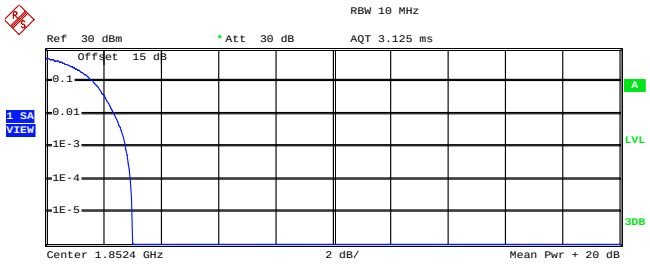

Complementary Cumulative Distribution Function (100000 samples)

| | Trace 1 |
|---|---|
| Mean | 22.65 dBm |
| Peak | 25.53 dBm |
| Crest | 2.88 dB |
| 10 % | 1.64 dB |
| 1 % | 2.32 dB |
| .1 % | 2.68 dB |
| .01 % | 2.80 dB |

Date: 20.JUN.2015 13:09:10

| Band : | WCDMA Band II | Test Mode : | RMC 12.2Kbps Link (QPSK) |
|---|---|---|---|

**Peak-to-Average Ratio on Channel 9262 (1852.4 MHz)**

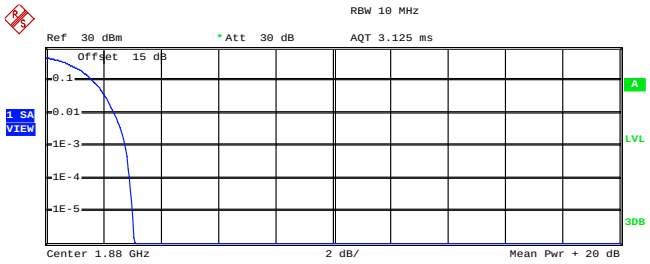



Complementary Cumulative Distribution Function (100000 samples)

| | Trace 1 |
|---|---|
| Mean | 22.59 dBm |
| Peak | 25.60 dBm |
| Crest | 3.01 dB |
| 10 % | 1.68 dB |
| 1 % | 2.40 dB |
| .1 % | 2.80 dB |
| .01 % | 2.96 dB |

Date: 20.JUN.2015 12:47:15

**Peak-to-Average Ratio on Channel 9400 (1880.0 MHz)**

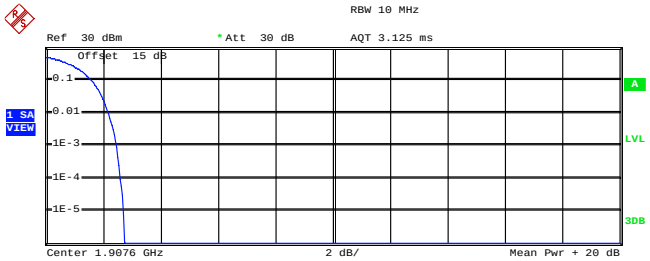



Complementary Cumulative Distribution Function (100000 samples)

| | Trace 1 |
|---|---|
| Mean | 22.79 dBm |
| Peak | 25.88 dBm |
| Crest | 3.08 dB |
| 10 % | 1.68 dB |
| 1 % | 2.40 dB |
| .1 % | 2.76 dB |
| .01 % | 2.92 dB |

Date: 20.JUN.2015 12:47:55

**Peak-to-Average Ratio on Channel 9538 (1907.6 MHz)**




Complementary Cumulative Distribution Function (100000 samples)

| | Trace 1 |
|---|---|
| Mean | 22.59 dBm |
| Peak | 25.31 dBm |
| Crest | 2.73 dB |
| 10 % | 1.60 dB |
| 1 % | 2.20 dB |
| .1 % | 2.48 dB |
| .01 % | 2.60 dB |

Date: 20.JUN.2015 12:48:25

# 3.3 Effective Radiated Power and Effective Isotropic Radiated Power Measurement

## 3.3.1 Description of the ERP/EIRP Measurement

The substitution method, in ANSI / TIA / EIA-603-C-2004, was used for ERP/EIRP measurement, and the spectrum analyzer configuration follows KDB 971168 D01 Power Meas. License Digital Systems v02r02. The ERP of mobile transmitters must not exceed 7 Watts (Cellular Band) and the EIRP of mobile transmitters are limited to 2 Watts (PCS Band) and 1 Watts (AWS Band).

## 3.3.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

## 3.3.3 Test Procedures

1. The testing follows FCC KDB 971168 v02r02 Section 5.2.1. (for CDMA/WCDMA), Section 5.2.2.2 (for GSM/GPRS/EDGE) and ANSI / TIA-603-C-2004 Section 2.2.17.
2. The EUT was placed on a non-conductive rotating platform 0.8 meters high in a semi-anechoic chamber. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and a spectrum analyzer with RMS detector per section 5. of KDB 971168 D01.
3. During the measurement, the system simulator parameters were set to force the EUT transmitting at maximum output power. The maximum emission was recorded from analyzer power level (LVL) from the 360 degrees rotation of the turntable and the test antenna raised and lowered over a range from 1 to 4 meters in both horizontally and vertically polarized orientations.
4. Effective Isotropic Radiated Power (EIRP) was measured by substitution method according to TIA/EIA-603-C. The EUT was replaced by the substitution antenna at same location, and then a known power from S.G. was applied into the dipole antenna through a Tx cable, and then recorded the maximum Analyzer reading through raised and lowered the test antenna. The correction factor (in dB) = S.G. - Tx Cable loss + Substitution antenna gain - Analyzer reading. Then the EUT's EIRP was calculated with the correction factor, EIRP = LVL + Correction factor and ERP = EIRP - 2.15. Take the record of the output power at substitution antenna.

| | GSM/GPRS/EDGE | WCDMA/HSPA |
|---|---|---|
| SPAN | 500kHz | 10MHz |
| RBW | 10kHz | 100kHz |
| VBW | 30kHz | 300kHz |
| Detector | RMS | RMS |
| Trace | Average | Average |
| Average Type | Power | Power |
| Sweep Count | 100 | 100 |

### 3.3.4 Test Result of ERP

| GSM850 (GSM) Radiated Power ERP | | | | | |
|---|---|---|---|---|---|
| Channel | Frequency (MHz) | Horizontal | | Vertical | |
| | | ERP(dBm) | ERP(W) | ERP(dBm) | ERP(W) |
| Lowest | 824.2 | 20.89 | 0.1227 | 23.19 | 0.2084 |
| Middle | 836.4 | 24.10 | 0.2570 | 23.48 | 0.2228 |
| Highest | 848.8 | 23.09 | 0.2037 | 24.46 | 0.2793 |
| Limit | ERP < 7W | Result | | PASS | |

| GSM850 (EDGE class 8) Radiated Power ERP | | | | | |
|---|---|---|---|---|---|
| Channel | Frequency (MHz) | Horizontal | | Vertical | |
| | | ERP(dBm) | ERP(W) | ERP(dBm) | ERP(W) |
| Lowest | 824.2 | 8.64 | 0.0073 | 16.45 | 0.0442 |
| Middle | 836.4 | 12.66 | 0.0185 | 19.38 | 0.0867 |
| Highest | 848.8 | 15.29 | 0.0338 | 20.11 | 0.1026 |
| Limit | ERP < 7W | Result | | PASS | |

| WCDMA Band V (RMC 12.2Kbps) Radiated Power ERP | | | | | |
|---|---|---|---|---|---|
| Channel | Frequency (MHz) | Horizontal | | Vertical | |
| | | ERP(dBm) | ERP(W) | ERP(dBm) | ERP(W) |
| Lowest | 826.4 | 8.81 | 0.0076 | 11.50 | 0.0141 |
| Middle | 836.4 | 10.57 | 0.0114 | 11.76 | 0.0150 |
| Highest | 846.6 | 13.18 | 0.0208 | 14.05 | 0.0254 |
| Limit | ERP < 7W | Result | | PASS | |

### 3.3.5 Test Result of EIRP

| GSM1900 (GSM) Radiated Power EIRP | | | | | |
|---|---|---|---|---|---|
| Channel | Frequency (MHz) | Horizontal | | Vertical | |
| | | EIRP(dBm) | EIRP(W) | EIRP(dBm) | EIRP(W) |
| Lowest | 1850.2 | 26.68 | 0.4656 | 27.77 | 0.5984 |
| Middle | 1880.0 | 25.02 | 0.3177 | 26.85 | 0.4842 |
| Highest | 1909.8 | 24.14 | 0.2594 | 26.70 | 0.4677 |
| Limit | EIRP < 2W | Result | | PASS | |

| GSM1900 (EDGE class 8) Radiated Power EIRP | | | | | |
|---|---|---|---|---|---|
| Channel | Frequency (MHz) | Horizontal | | Vertical | |
| | | ERP(dBm) | ERP(W) | ERP(dBm) | ERP(W) |
| Lowest | 1850.2 | 20.06 | 0.1014 | 20.94 | 0.1242 |
| Middle | 1880.0 | 19.57 | 0.0906 | 19.43 | 0.0877 |
| Highest | 1909.8 | 19.93 | 0.0984 | 21.68 | 0.1472 |
| Limit | EIRP < 2W | Result | | PASS | |

| WCDMA Band II (RMC 12.2Kbps) Radiated Power EIRP | | | | | |
|---|---|---|---|---|---|
| Channel | Frequency (MHz) | Horizontal | | Vertical | |
| | | EIRP(dBm) | EIRP(W) | EIRP(dBm) | EIRP(W) |
| Lowest | 1852.4 | 15.99 | 0.0397 | 18.31 | 0.0678 |
| Middle | 1880.0 | 16.44 | 0.0441 | 19.01 | 0.0796 |
| Highest | 1907.6 | 16.61 | 0.0458 | 18.63 | 0.0729 |
| Limit | EIRP < 2W | Result | | PASS | |

| WCDMA Band IV(RMC 12.2Kbps) Radiated Power EIRP | | | | | |
|---|---|---|---|---|---|
| Channel | Frequency (MHz) | Horizontal | | Vertical | |
| | | EIRP(dBm) | EIRP(W) | EIRP(dBm) | EIRP(W) |
| Lowest | 1712.4 | 16.95 | 0.0495 | 17.28 | 0.0535 |
| Middle | 1732.6 | 19.45 | 0.0881 | 18.45 | 0.0700 |
| Highest | 1752.6 | 18.46 | 0.0701 | 18.09 | 0.0644 |
| Limit | EIRP < 1W | Result | | PASS | |

# 3.4 99% Occupied Bandwidth and 26dB Bandwidth Measurement

## 3.4.1 Description of 99% Occupied Bandwidth and 26dB Bandwidth Measurement

The 99% occupied bandwidth is the width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5% of the total mean transmitted power.

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.

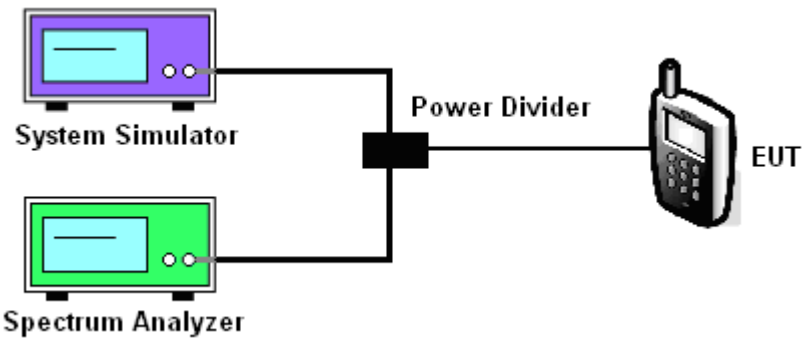
## 3.4.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

## 3.4.3 Test Procedures

1. The testing follows FCC KDB 971168 v02r02 Section 4.2.
2. The EUT was connected to the spectrum analyzer and system simulator via a power divider.
3. The RF output of the EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
4. The 99% occupied bandwidth were measured, set RBW= 1% of span, VBW= 3*RBW, peak detector, trace maximum hold.
5. The 26dB bandwidth were measured, set RBW= 1% of EBW, VBW= 3*RBW, peak detector, trace maximum hold.

## 3.4.4 Test Setup



### 3.4.5 Test Result of 99% Occupied Bandwidth and 26dB Bandwidth

| Cellular Band | | | | | | |
|---|---|---|---|---|---|---|
| **Modes** | **GSM850 (GSM)** | | | **GSM850 (EDGE class 8)** | | |
| **Channel** | **128 (Low)** | **189 (Mid)** | **251 (High)** | **128 (Low)** | **189 (Mid)** | **251 (High)** |
| **Frequency (MHz)** | **824.2** | **836.4** | **848.8** | **824.2** | **836.4** | **848.8** |
| **99% OBW (kHz)** | 243.00 | 245.00 | 245.00 | 259.00 | 255.00 | 257.00 |
| **26dB BW (kHz)** | 309.00 | 309.00 | 311.00 | 321.00 | 317.00 | 320.00 |

| PCS Band | | | | | | |
|---|---|---|---|---|---|---|
| **Modes** | **GSM1900 (GSM)** | | | **GSM1900 (EDGE class 8)** | | |
| **Channel** | **512 (Low)** | **661 (Mid)** | **810 (High)** | **512 (Low)** | **661 (Mid)** | **810 (High)** |
| **Frequency (MHz)** | **1850.2** | **1880** | **1909.8** | **1850.2** | **1880** | **1909.8** |
| **99% OBW (kHz)** | 245.00 | 245.00 | 247.00 | 250.00 | 254.00 | 254.00 |
| **26dB BW (kHz)** | 313.00 | 312.00 | 306.00 | 302.00 | 304.00 | 300.00 |

| Cellular Band | | | |
|---|---|---|---|
| Modes | WCDMA Band V (RMC 12.2Kbps) | | |
| Channel | 4132 (Low) | 4182 (Mid) | 4233 (High) |
| Frequency (MHz) | 826.4 | 836.4 | 846.6 |
| 99% OBW (MHz) | 4.16 | 4.16 | 4.14 |
| 26dB BW (MHz) | 4.68 | 4.68 | 4.67 |

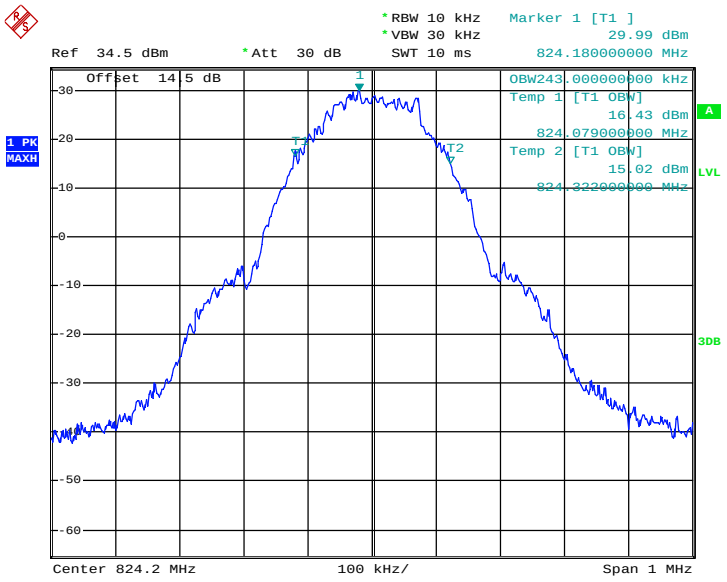
| AWS Band | | | |
|---|---|---|---|
| Modes | WCDMA Band IV (RMC 12.2Kbps) | | |
| Channel | 1312(Low) | 1413 (Mid) | 1513 (High) |
| Frequency (MHz) | 1712.4 | 1732.6 | 1752.6 |
| 99% OBW (MHz) | 4.16 | 4.16 | 4.16 |
| 26dB BW (MHz) | 4.68 | 4.70 | 4.70 |

| PCS Band | | | |
|---|---|---|---|
| Modes | WCDMA Band II (RMC 12.2Kbps) | | |
| Channel | 9262 (Low) | 9400 (Mid) | 9538 (High) |
| Frequency (MHz) | 1852.4 | 1880 | 1907.6 |
| 99% OBW (MHz) | 4.16 | 4.16 | 4.17 |
| 26dB BW (MHz) | 4.70 | 4.69 | 4.72 |

## 3.4.6 Test Result (Plots) of Occupied Bandwidth and 26dB Bandwidth

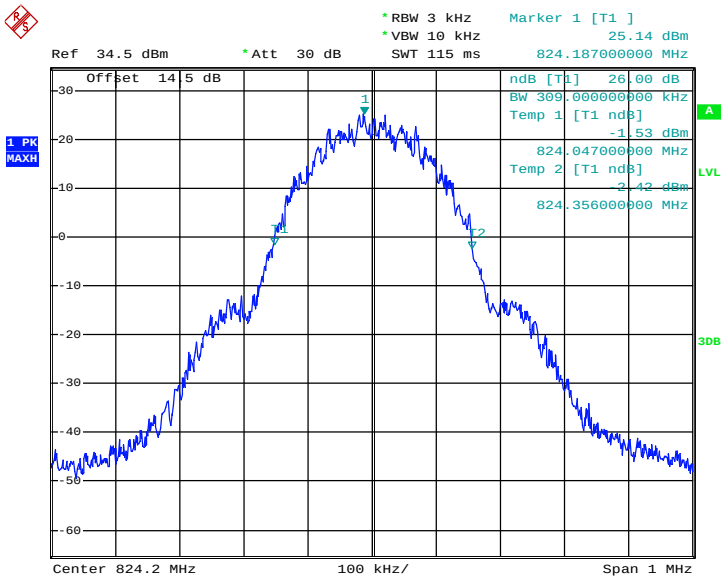
| Band : | GSM 850 | Test Mode : | GSM Link (GMSK) |
|---|---|---|---|

**99% Occupied Bandwidth Plot on Channel 128 (824.2 MHz)**



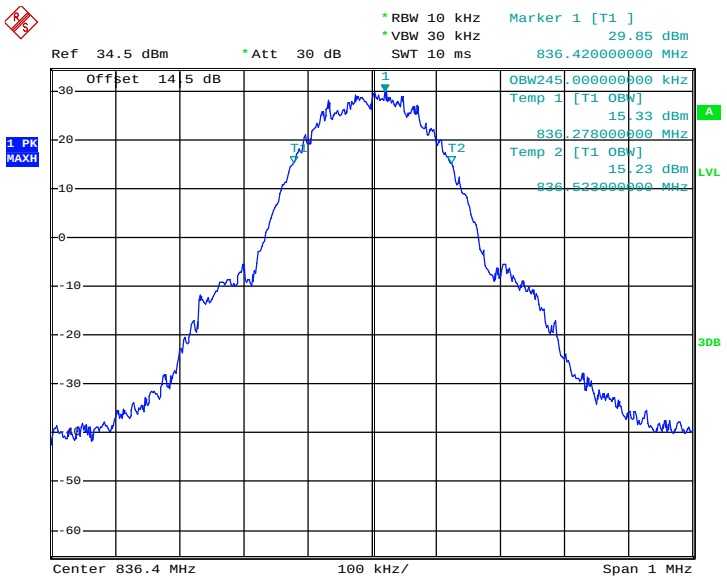

Date: 20.JUN.2015 11:48:54

**26dB Bandwidth Plot on Channel 128 (824.2 MHz)**



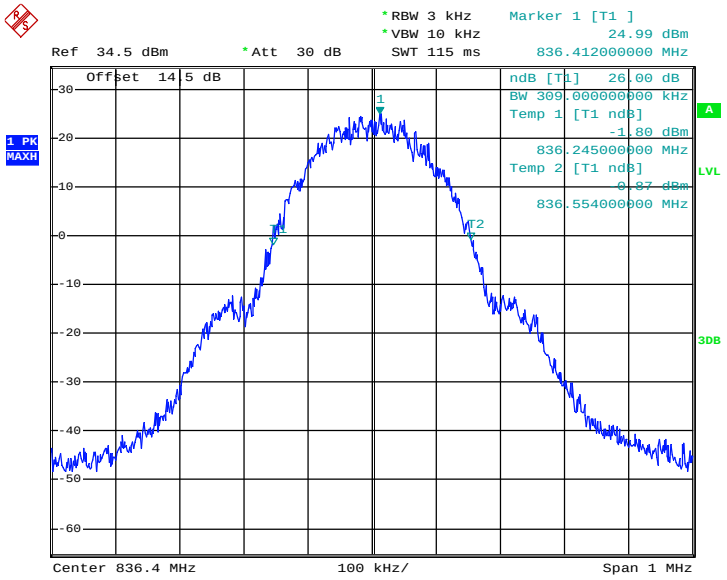

Date: 20.JUN.2015 11:46:28

## 99% Occupied Bandwidth Plot on Channel 189 (836.4 MHz)



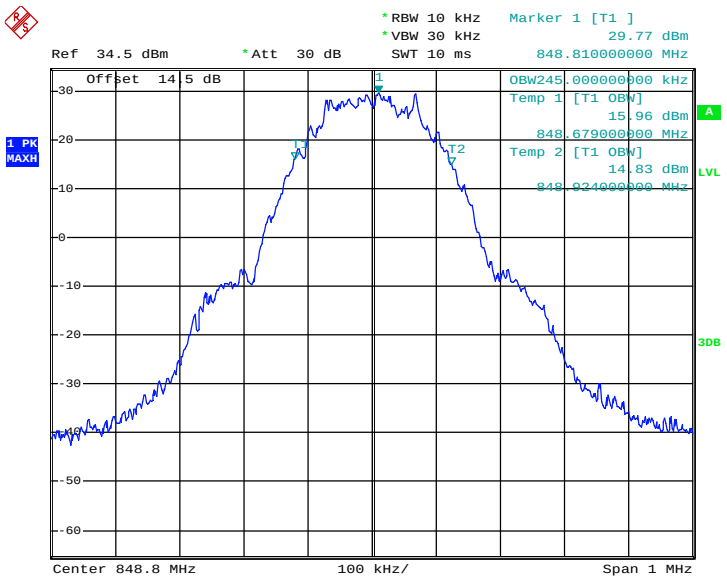

Date: 20.JUN.2015 11:49:36

## 26dB Bandwidth Plot on Channel 189 (836.4 MHz)



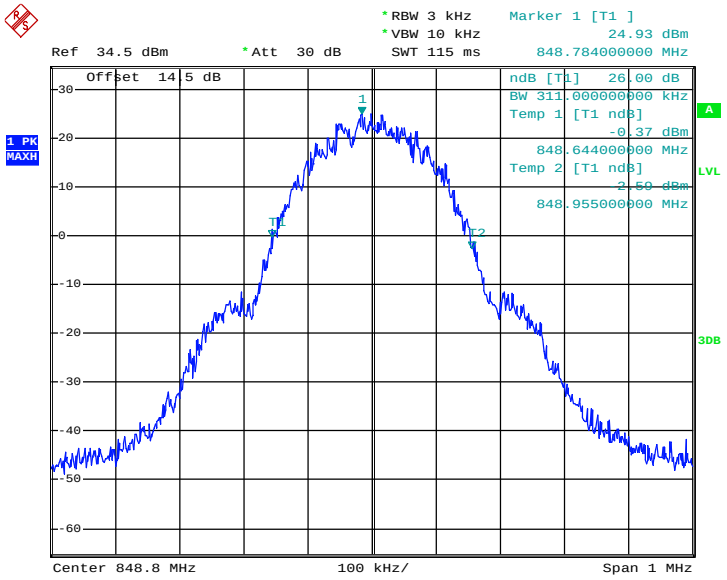

Date: 20.JUN.2015 11:47:33

## 99% Occupied Bandwidth Plot on Channel 251 (848.8 MHz)




Date: 20.JUN.2015 11:50:12

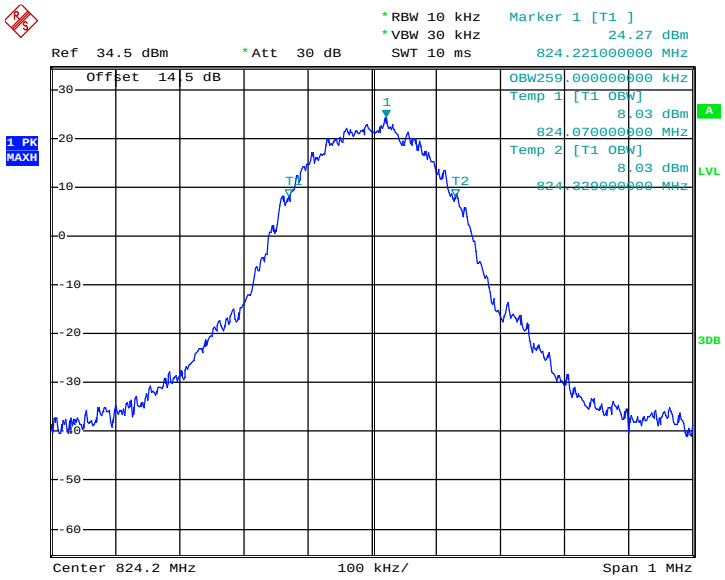
## 26dB Bandwidth Plot on Channel 251 (848.8 MHz)




Date: 20.JUN.2015 11:48:09

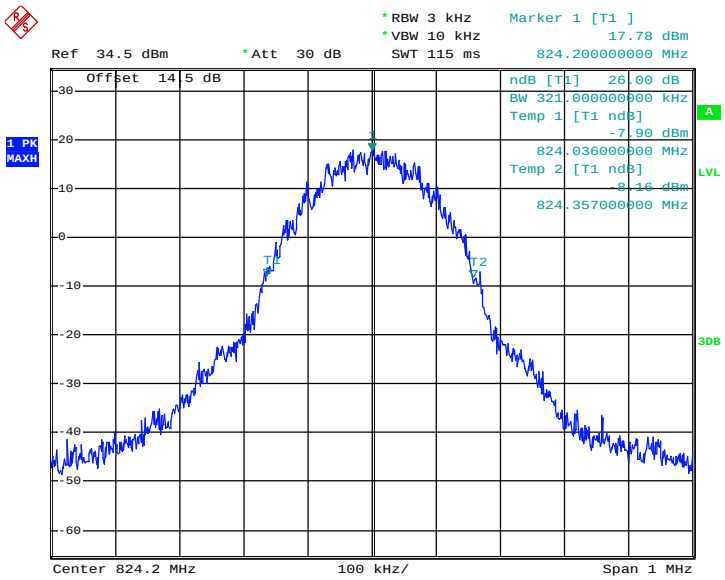
| Band : | GSM 850 | Test Mode : | EDGE class 8 Link (8PSK) |
|---|---|---|---|

**99% Occupied Bandwidth Plot on Channel 128 (824.2 MHz)**



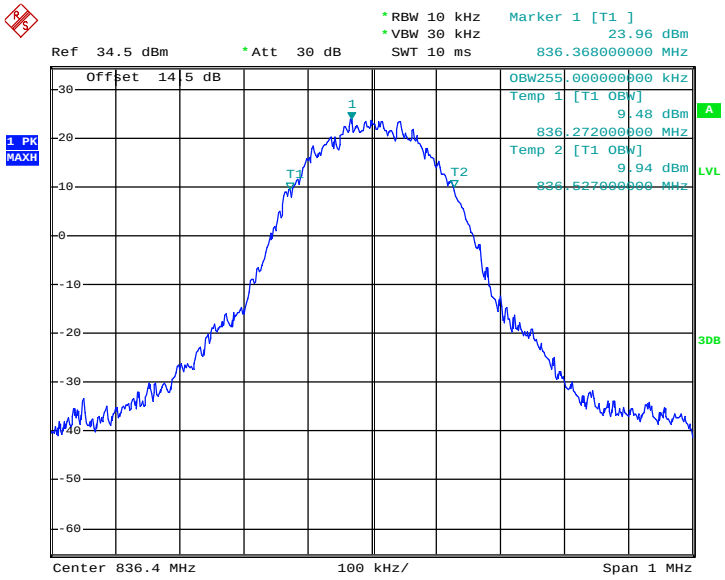

Date: 20.JUN.2015 12:04:37

**26dB Bandwidth Plot on Channel 128 (824.2 MHz)**



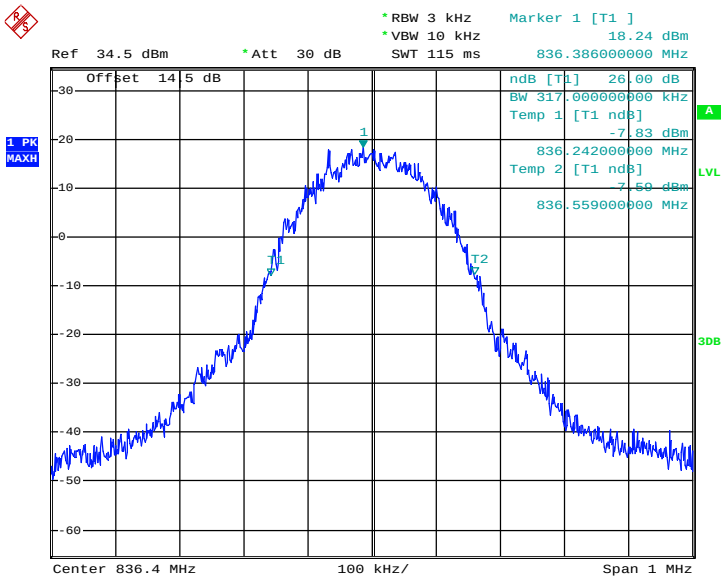

Date: 20.JUN.2015 11:59:26

## 99% Occupied Bandwidth Plot on Channel 189 (836.4 MHz)



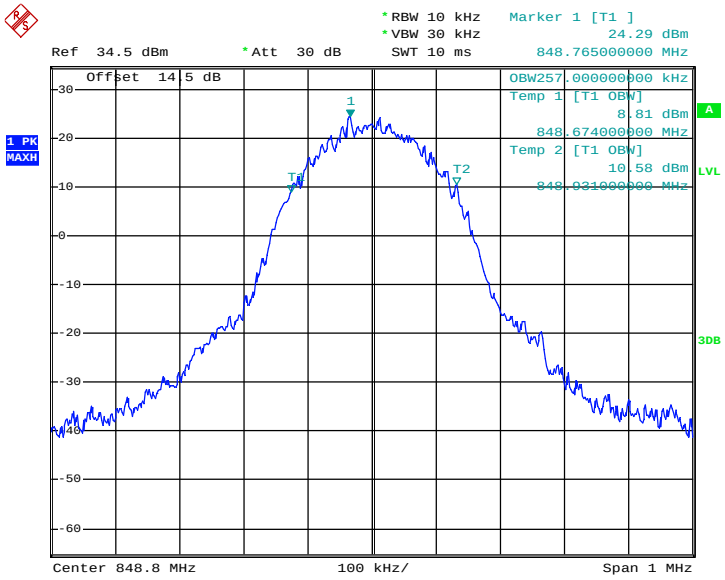

Date: 20.JUN.2015 12:05:25

## 26dB Bandwidth Plot on Channel 189 (836.4 MHz)



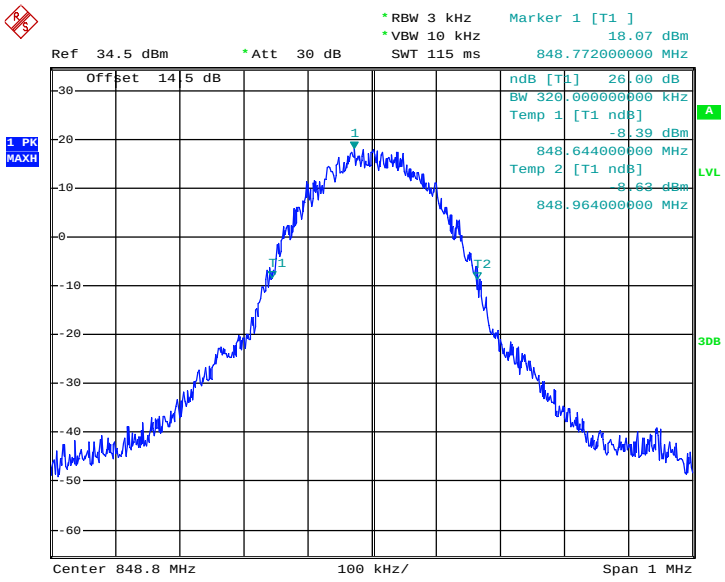

Date: 20.JUN.2015 12:01:55

## 99% Occupied Bandwidth Plot on Channel 251 (848.8 MHz)




Date: 20.JUN.2015 12:06:14

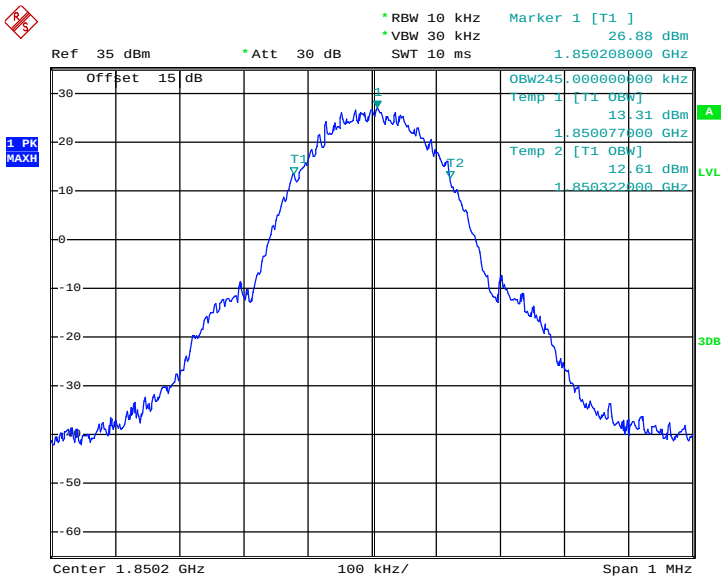
## 26dB Bandwidth Plot on Channel 251 (848.8 MHz)




Date: 20.JUN.2015 12:02:44

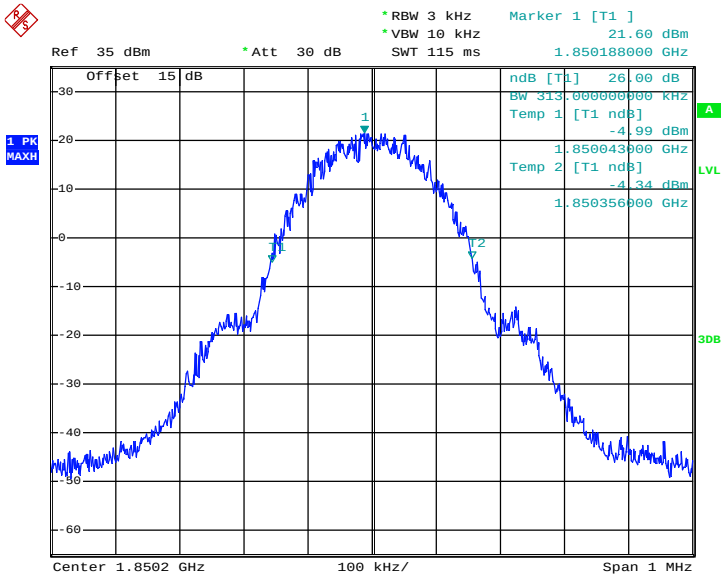
| Band : | GSM 1900 | Test Mode : | GSM Link (GMSK) |
|---|---|---|---|

### 99% Occupied Bandwidth Plot on Channel 512 (1850.2 MHz)



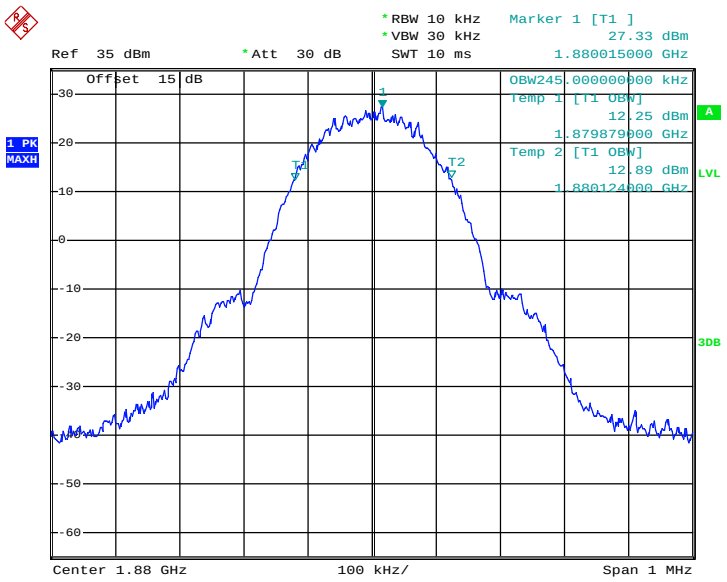

Date: 20.JUN.2015 12:26:34

### 26dB Bandwidth Plot on Channel 512 (1850.2 MHz)



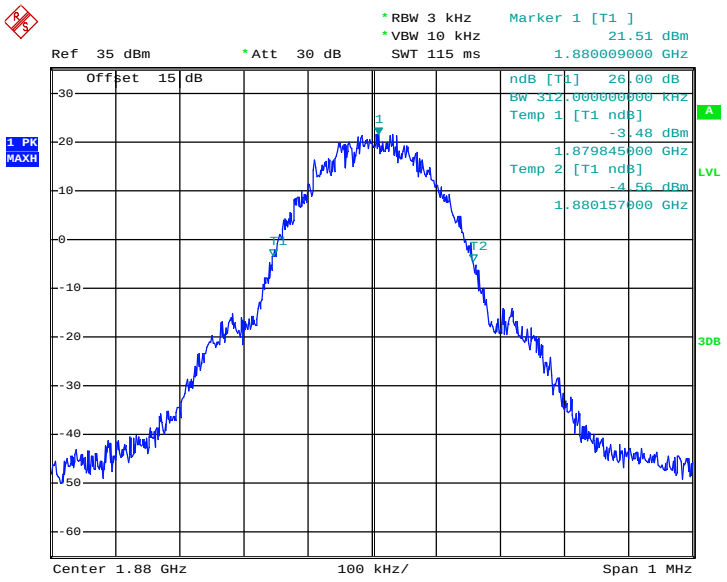

Date: 20.JUN.2015 12:23:38

## 99% Occupied Bandwidth Plot on Channel 661 (1880.0 MHz)



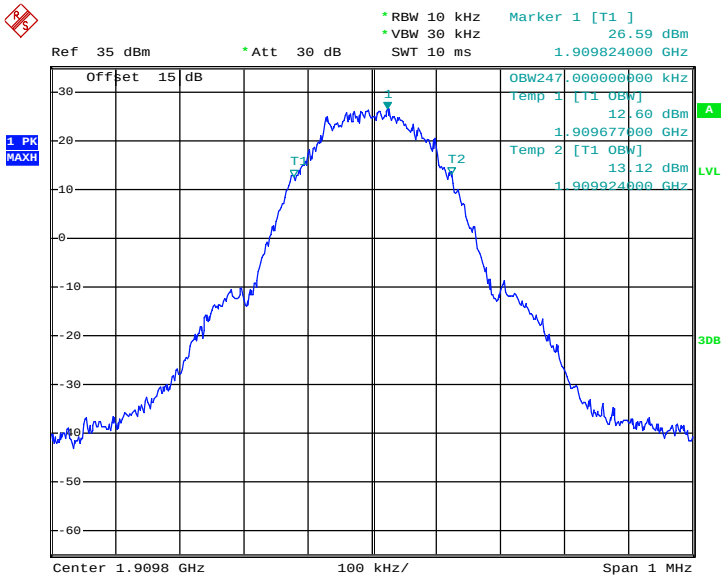

Date: 20.JUN.2015 12:28:32

## 26dB Bandwidth Plot on Channel 661 (1880.0 MHz)



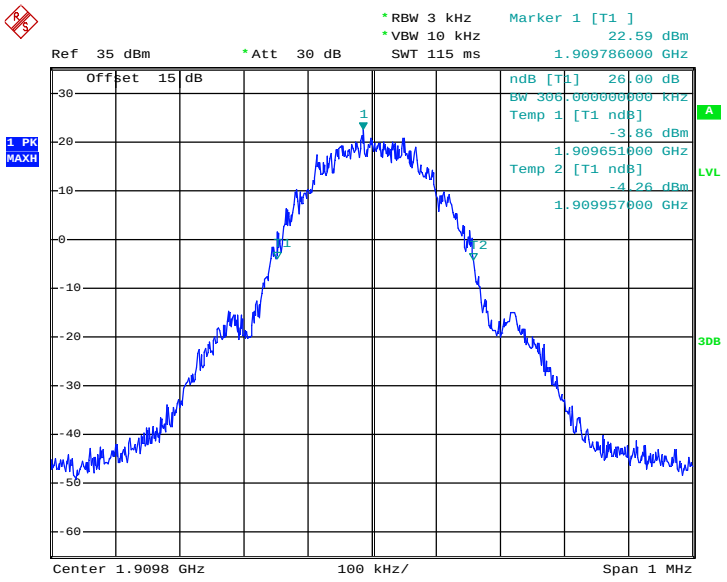

Date: 20.JUN.2015 12:24:50

## 99% Occupied Bandwidth Plot on Channel 810 (1909.8 MHz)




Date: 20.JUN.2015 12:29:51

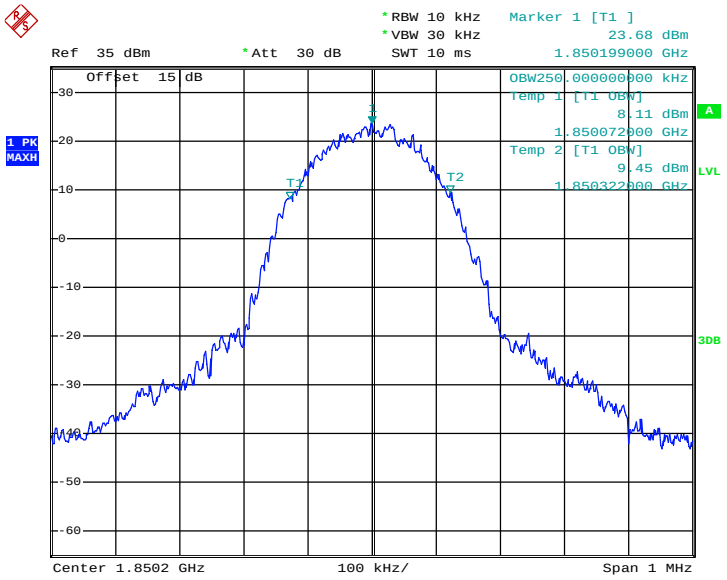
## 26dB Bandwidth Plot on Channel 810 (1909.8 MHz)




Date: 20.JUN.2015 12:25:42

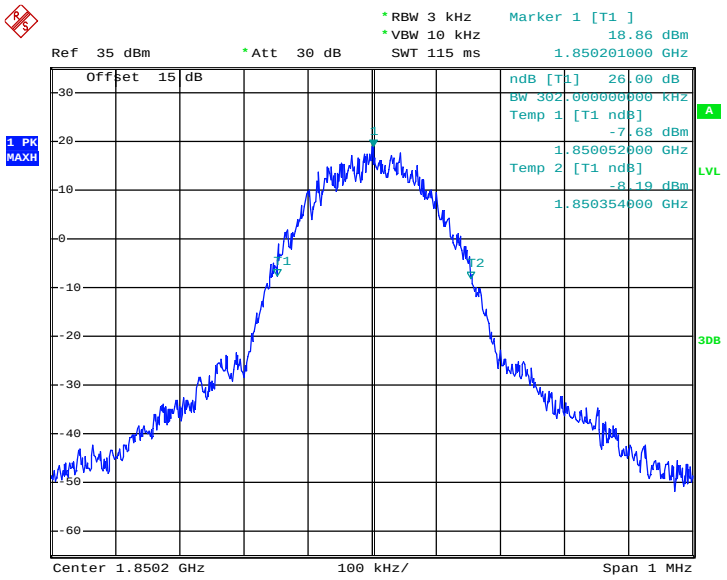
| Band : | GSM 1900 | Test Mode : | EDGE class 8 Link (8PSK) |
|---|---|---|---|

### 99% Occupied Bandwidth Plot on Channel 512 (1850.2 MHz)



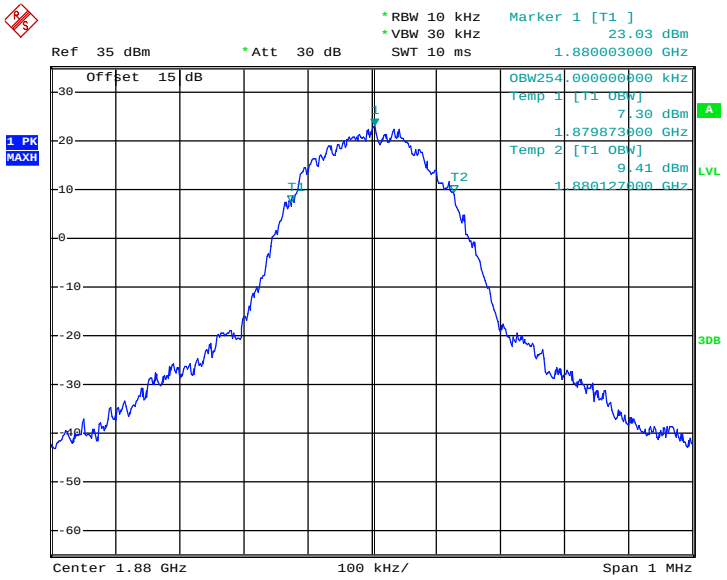

Date: 20.JUN.2015 12:12:44

### 26dB Bandwidth Plot on Channel 512 (1850.2 MHz)



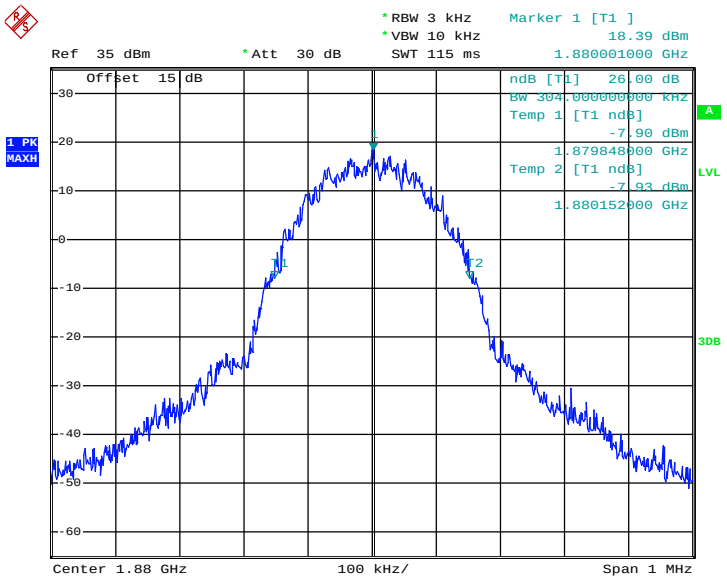

Date: 20.JUN.2015 12:10:03

## 99% Occupied Bandwidth Plot on Channel 661 (1880.0 MHz)



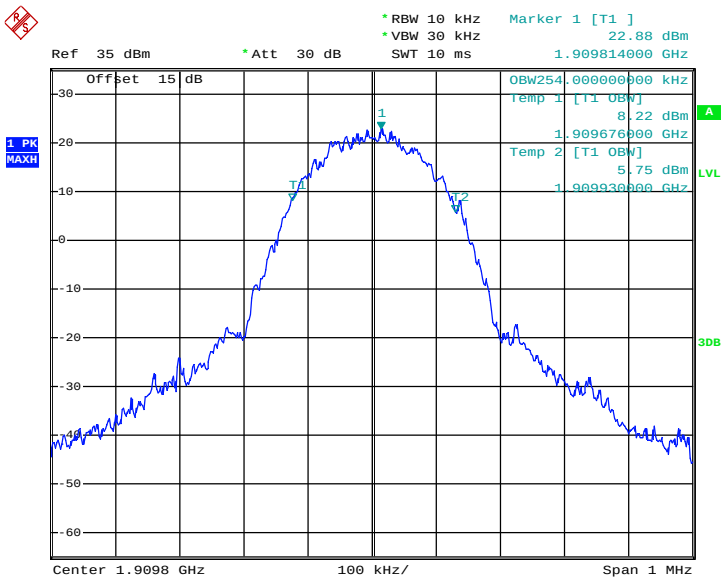

Date: 20.JUN.2015 12:13:44

## 26dB Bandwidth Plot on Channel 661 (1880.0 MHz)



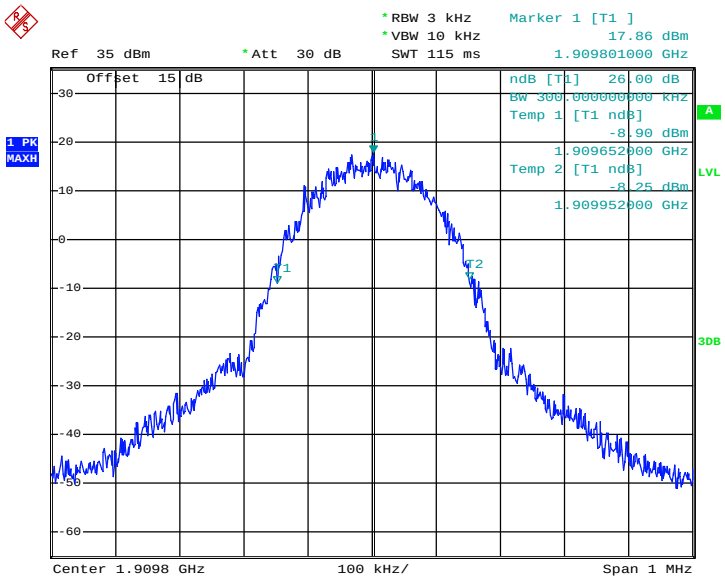

Date: 20.JUN.2015 12:10:42

## 99% Occupied Bandwidth Plot on Channel 810 (1909.8 MHz)




Date: 20.JUN.2015 12:14:24

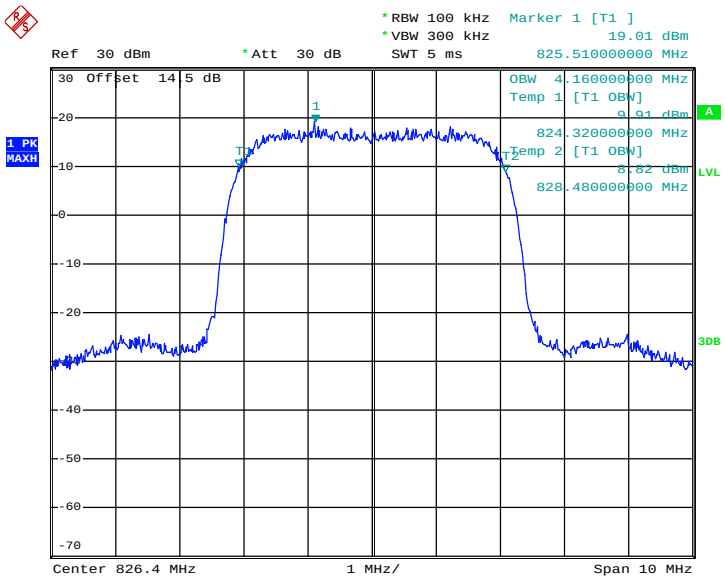
## 26dB Bandwidth Plot on Channel 810 (1909.8 MHz)




Date: 20.JUN.2015 12:11:25

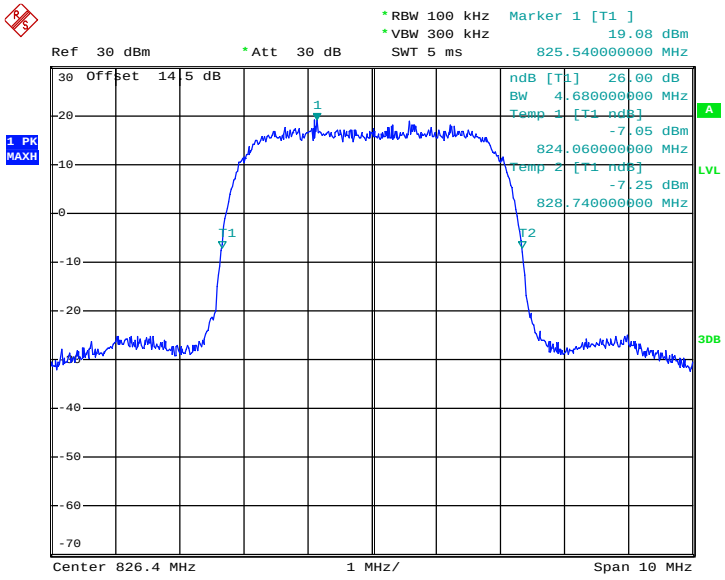
| Band : | WCDMA Band V | Test Mode : | RMC 12.2Kbps Link (QPSK) |
|---|---|---|---|

### 99% Occupied Bandwidth Plot on Channel 4132 (826.4 MHz)



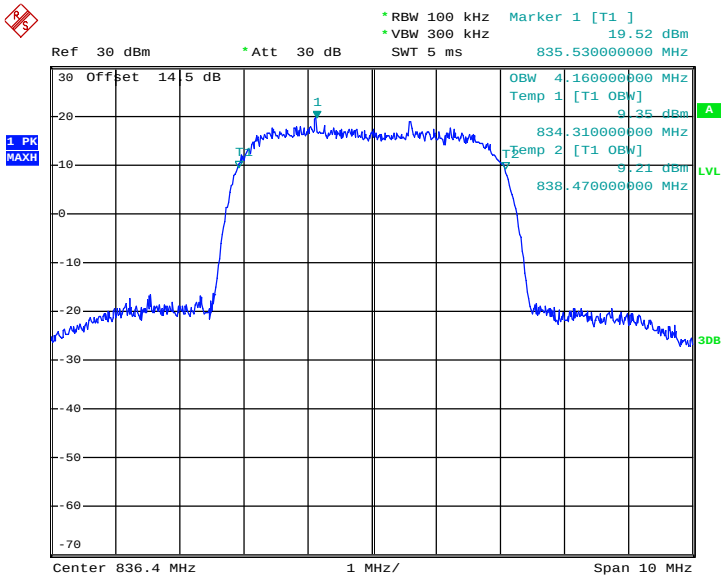

Date: 20.JUN.2015 13:32:08

### 26dB Bandwidth Plot on Channel 4132 (826.4 MHz)



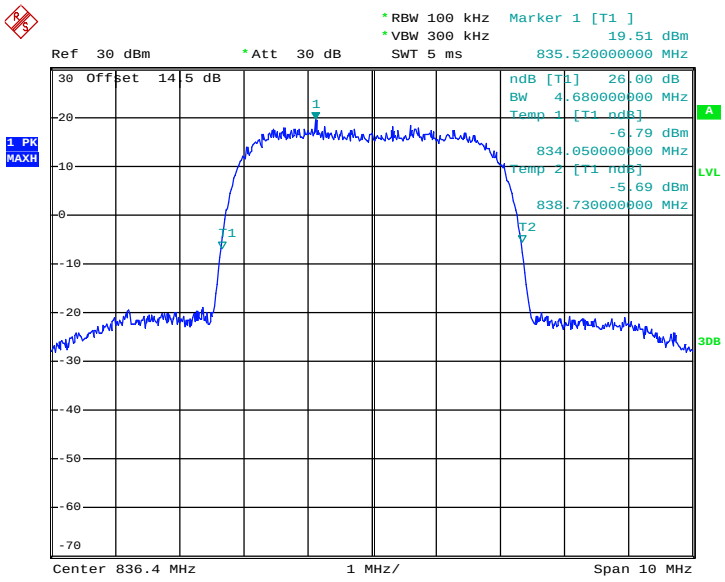

Date: 20.JUN.2015 13:29:11

## 99% Occupied Bandwidth Plot on Channel 4182 (836.4 MHz)



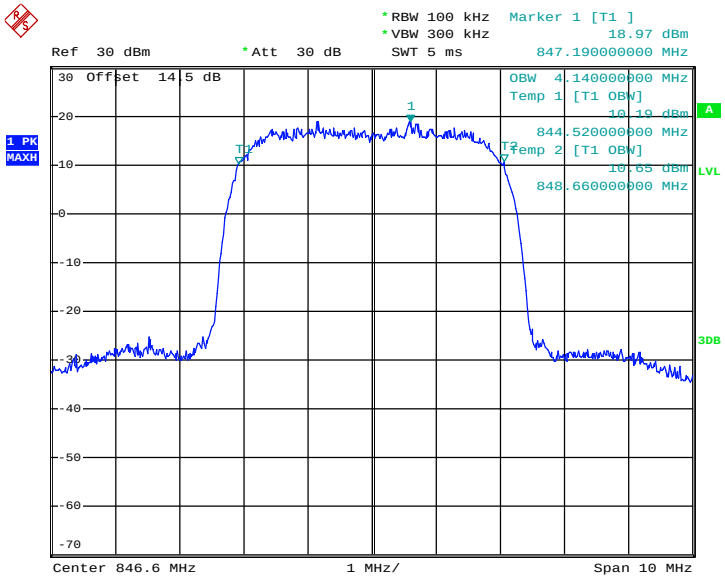

Date: 20.JUN.2015 13:33:38

## 26dB Bandwidth Plot on Channel 4182 (836.4 MHz)



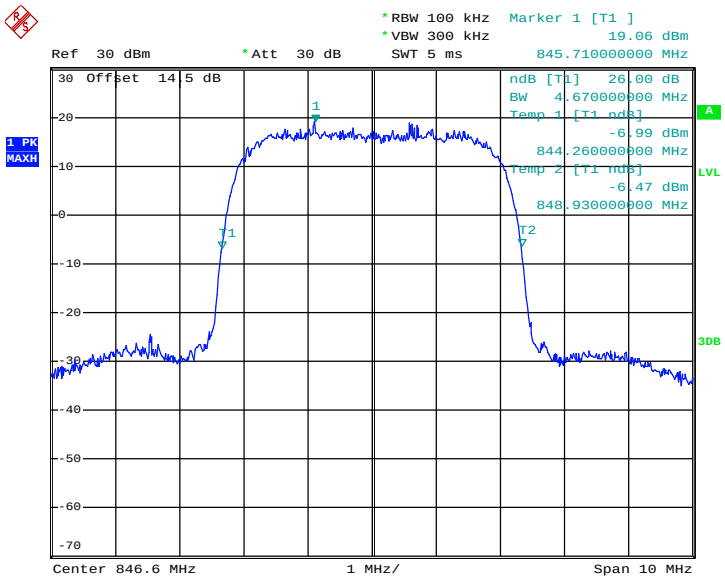

Date: 20.JUN.2015 13:30:27

## 99% Occupied Bandwidth Plot on Channel 4233 (846.6 MHz)




Date: 20.JUN.2015 13:34:17

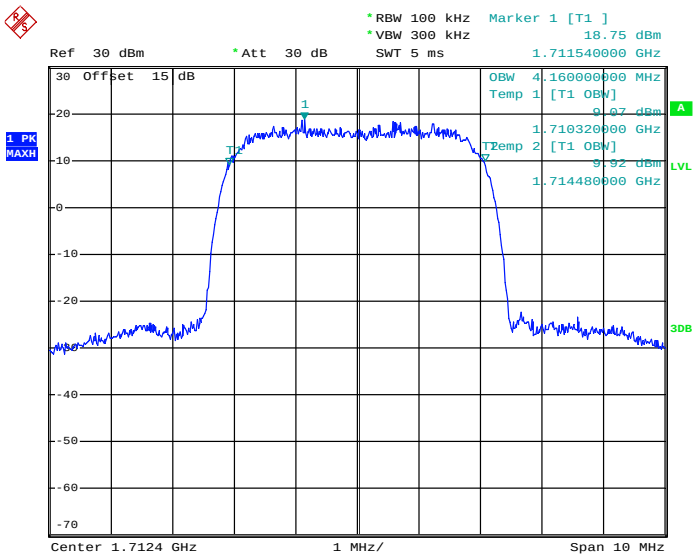
## 26dB Bandwidth Plot on Channel 4233 (846.6 MHz)




Date: 20.JUN.2015 13:31:09

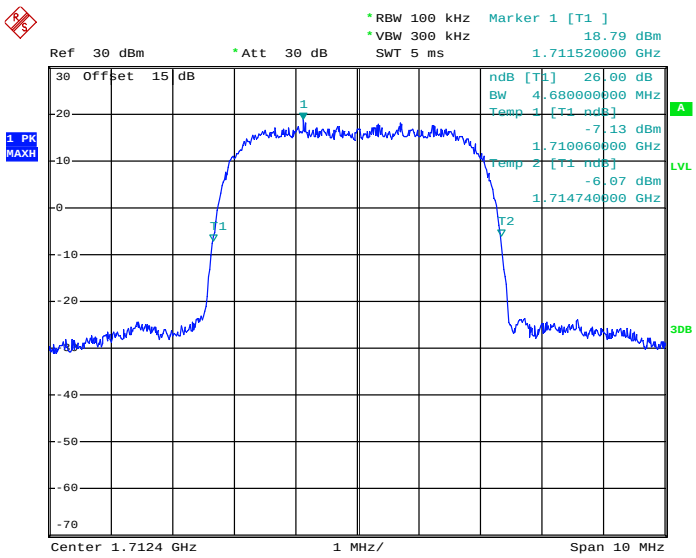
| Band : | WCDMA Band IV | Test Mode : | RMC 12.2Kbps Link (QPSK) |
|---|---|---|---|

**99% Occupied Bandwidth Plot on Channel 1312 (1712.4 MHz)**



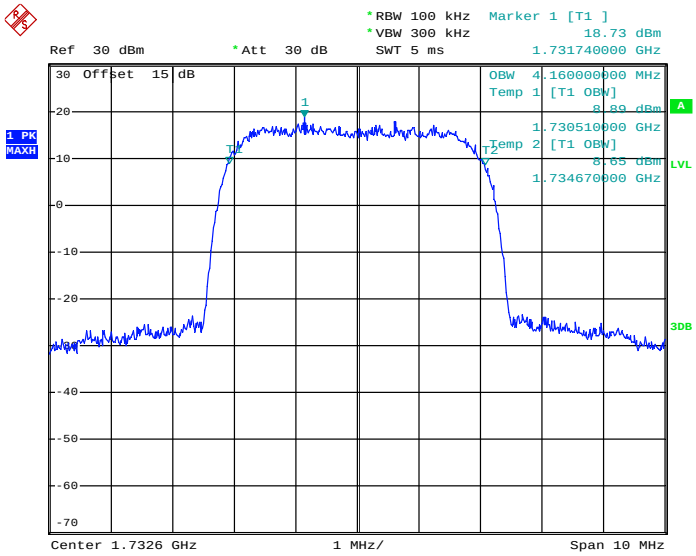

Date: 20.JUN.2015 13:02:34

**26dB Bandwidth Plot on Channel 1312 (1712.4 MHz)**



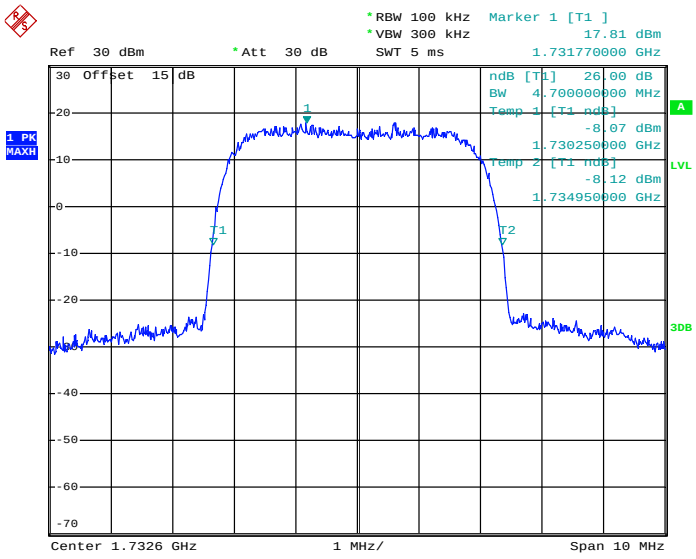

Date: 20.JUN.2015 12:59:54

## 99% Occupied Bandwidth Plot on Channel 1413 (1732.6 MHz)



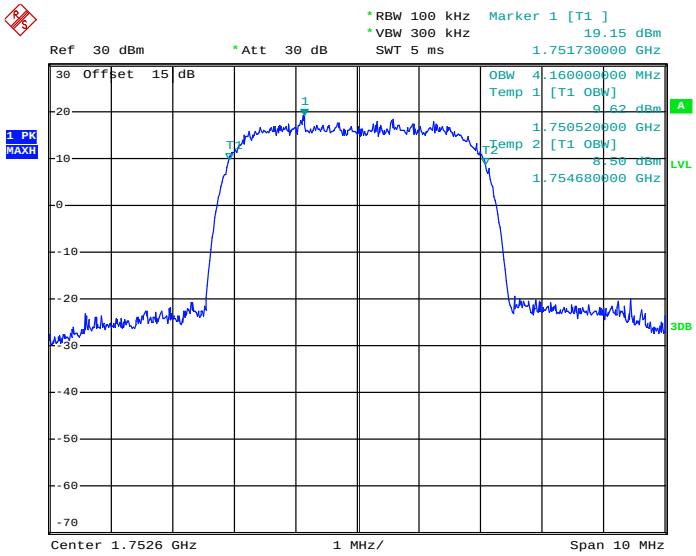

Date: 20.JUN.2015 13:03:20

## 26dB Bandwidth Plot on Channel 1413 (1732.6 MHz)



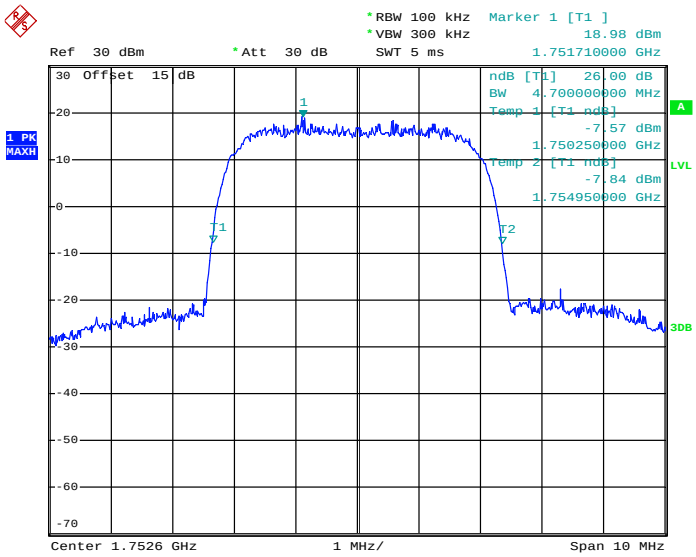

Date: 20.JUN.2015 13:00:40

## 99% Occupied Bandwidth Plot on Channel 1513 (1752.6 MHz)




Date: 20.JUN.2015 13:04:12

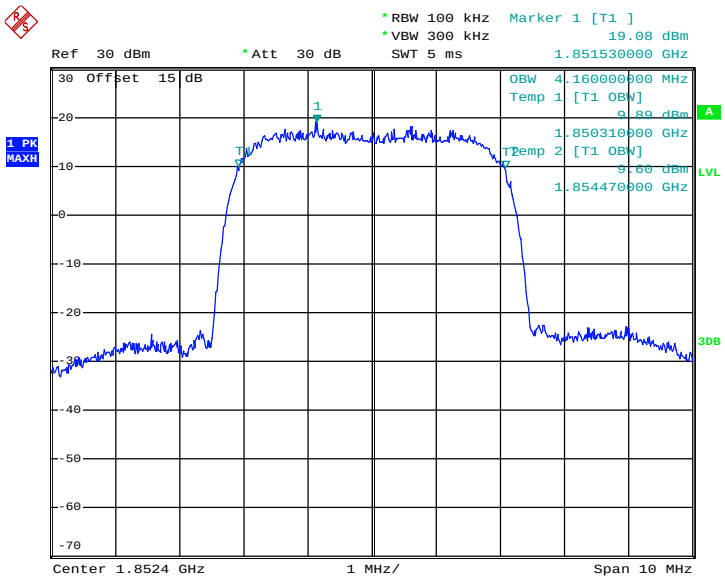
## 26dB Bandwidth Plot on Channel 1513 (1752.6 MHz)




Date: 20.JUN.2015 13:01:22

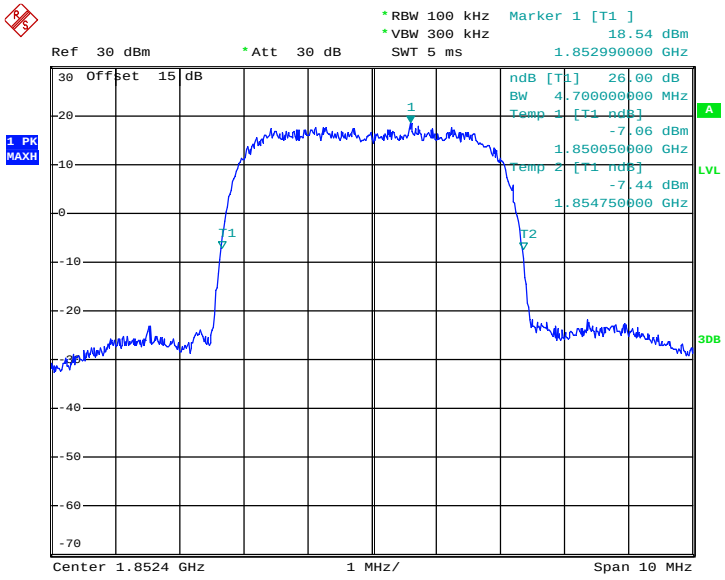
| Band : | WCDMA Band II | Test Mode : | RMC 12.2Kbps Link (QPSK) |
|---|---|---|---|

### 99% Occupied Bandwidth Plot on Channel 9262 (1852.4 MHz)



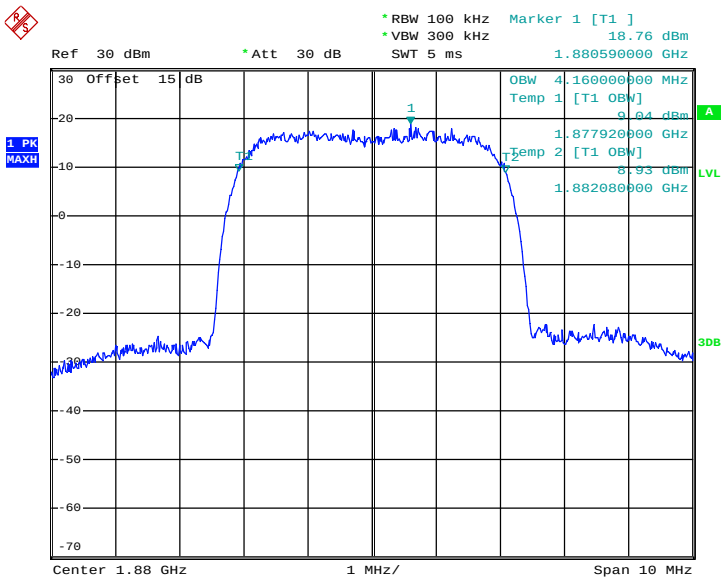

Date: 20.JUN.2015 12:41:19

### 26dB Bandwidth Plot on Channel 9262 (1852.4 MHz)



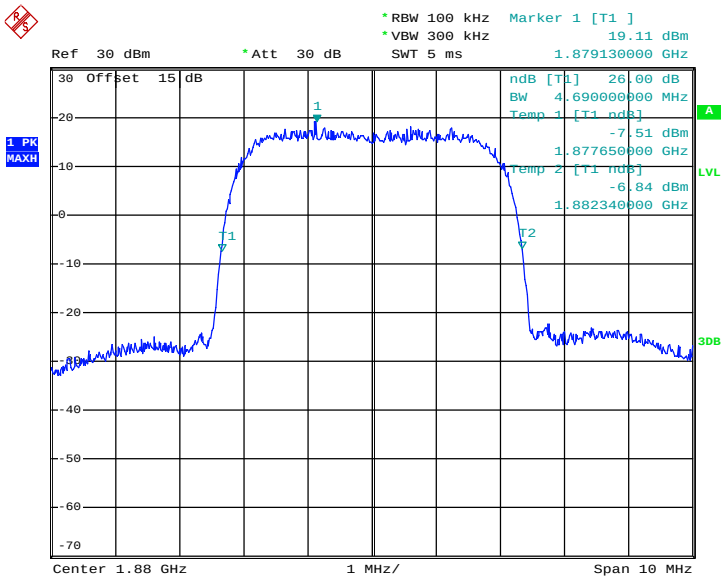

Date: 20.JUN.2015 12:34:41

## 99% Occupied Bandwidth Plot on Channel 9400 (1880.0 MHz)



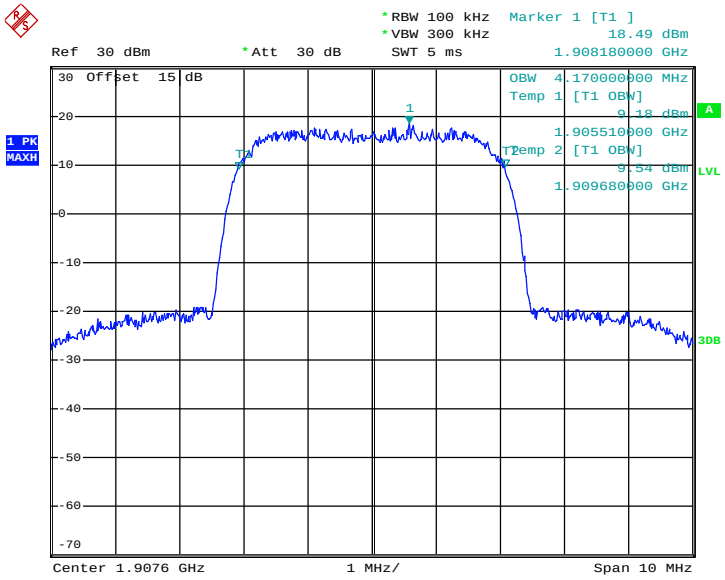

Date: 20.JUN.2015 12:42:34

## 26dB Bandwidth Plot on Channel 9400 (1880.0 MHz)



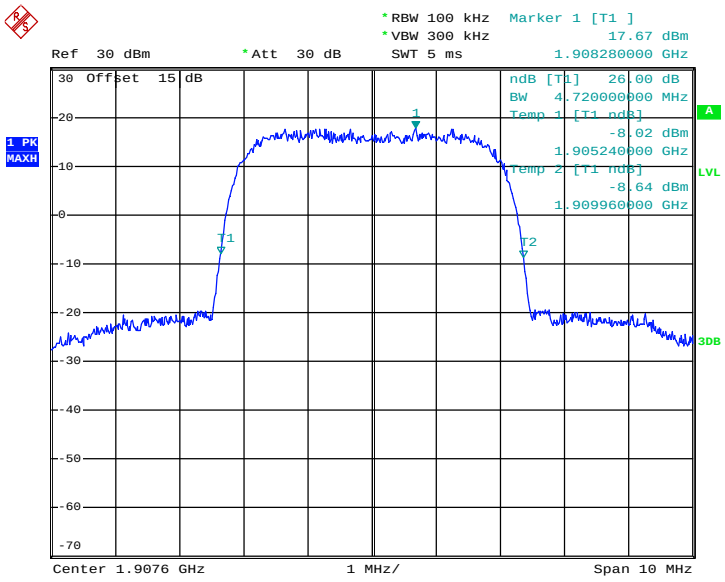

Date: 20.JUN.2015 12:36:07

## 99% Occupied Bandwidth Plot on Channel 9538 (1907.6 MHz)




Date: 20.JUN.2015 12:43:21

## 26dB Bandwidth Plot on Channel 9538 (1907.6 MHz)




Date: 20.JUN.2015 12:37:03

# 3.5 Band Edge Measurement

## 3.5.1 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.

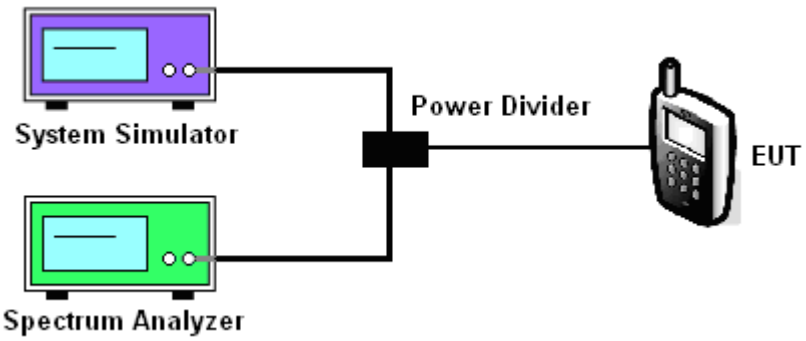
## 3.5.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

## 3.5.3 Test Procedures

1. The testing follows FCC KDB 971168 v02r02 Section 6.0.
2. The EUT was connected to the spectrum analyzer and system simulator via a power divider.
3. The RF output of EUT was connected to the spectrum analyzer by an RF cable and attenuator. The path loss was compensated to the results for each measurement.
4. The band edges of low and high channels for the highest RF powers were measured.
5. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
6. The limit line is derived from 43 + 10log(P) dB below the transmitter power P(Watts)
   = P(W) - [43 + 10log(P) ] (dB)
   = [30 + 10log(P)] (dBm) - [43 + 10log(P) ] (dB)
   = -13dBm.

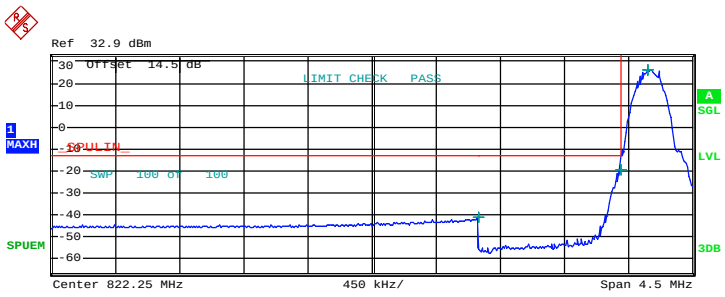
## 3.5.4 Test Setup



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

| Band : | GSM850 | Test Mode : | GSM Link (GMSK) |
|---|---|---|---|

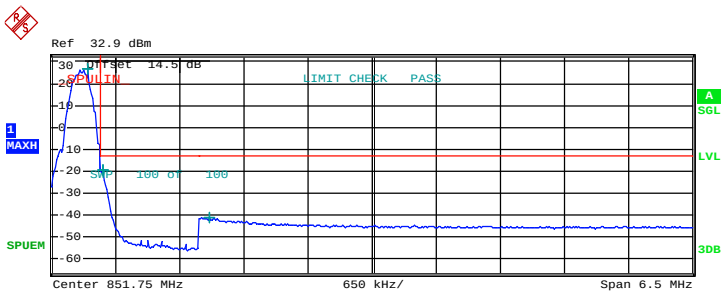
**Lower Band Edge Plot on Channel 128 (824.2 MHz)**




| Start [Hz] | Stop [Hz] | RBW [Hz] | Freq [Hz] | PwrAbs [dBm] | ΔLimit [dB] |
|---|---|---|---|---|---|
| 820.000 M | 823.000 M | 100.00 k | 823.000000 M | -41.09 | -28.09 |
| 823.000 M | 824.000 M | 3.00 k | 823.996000 M | -19.25 | -6.25 |
| 824.000 M | 824.500 M | 10.00 k | 824.187500 M | 26.18 | -8.82 |

Date: 23.JUN.2015 12:53:23

**Higher Band Edge Plot on Channel 251 (848.8 MHz)**

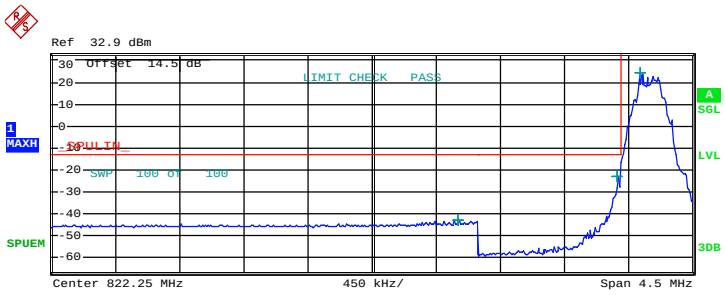



| Start [Hz] | Stop [Hz] | RBW [Hz] | Freq [Hz] | PwrAbs [dBm] | ΔLimit [dB] |
|---|---|---|---|---|---|
| 848.500 M | 849.000 M | 10.00 k | 848.869000 M | 26.61 | -8.39 |
| 849.000 M | 850.000 M | 3.00 k | 849.016000 M | -19.52 | -6.52 |
| 850.000 M | 855.000 M | 100.00 k | 850.095000 M | -41.12 | -28.12 |

Date: 23.JUN.2015 12:56:41

| Band : | GSM850 | Test Mode : | EDGE class 8 Link (8PSK) |
|---|---|---|---|

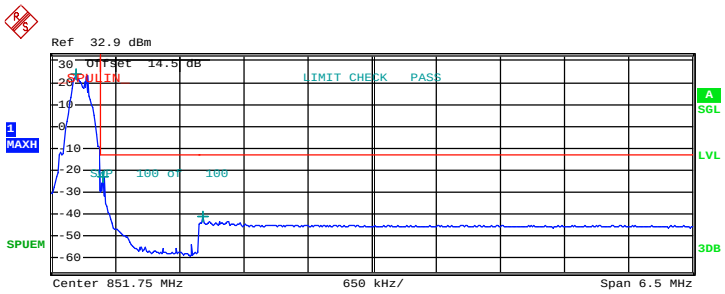
## Lower Band Edge Plot on Channel 128 (824.2 MHz)




| Start [Hz] | Stop [Hz] | RBW [Hz] | Freq [Hz] | PwrAbs [dBm] | ΔLimit [dB] |
|---|---|---|---|---|---|
| 820.000 M | 823.000 M | 100.00 k | 822.856000 M | -42.82 | -29.82 |
| 823.000 M | 824.000 M | 3.00 k | 823.972000 M | -23.21 | -10.21 |
| 824.000 M | 824.500 M | 10.00 k | 824.133500 M | 24.66 | -10.34 |

Date: 23.JUN.2015 15:44:18

## Higher Band Edge Plot on Channel 251 (848.8 MHz)

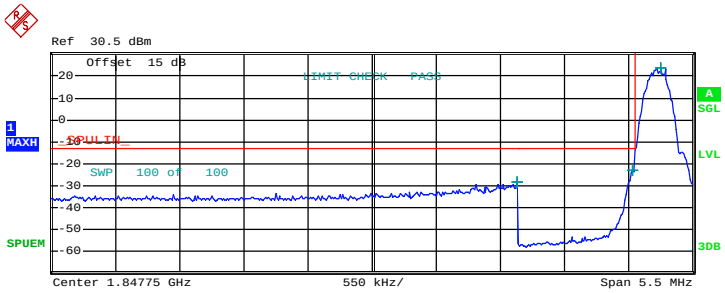



| Start [Hz] | Stop [Hz] | RBW [Hz] | Freq [Hz] | PwrAbs [dBm] | ΔLimit [dB] |
|---|---|---|---|---|---|
| 848.500 M | 849.000 M | 10.00 k | 848.745000 M | 23.96 | -11.04 |
| 849.000 M | 850.000 M | 3.00 k | 849.024000 M | -23.23 | -10.23 |
| 850.000 M | 855.000 M | 100.00 k | 850.035000 M | -41.24 | -28.24 |

Date: 23.JUN.2015 15:48:33

| Band : | GSM1900 | Test Mode : | GSM Link (GMSK) |
|---|---|---|---|

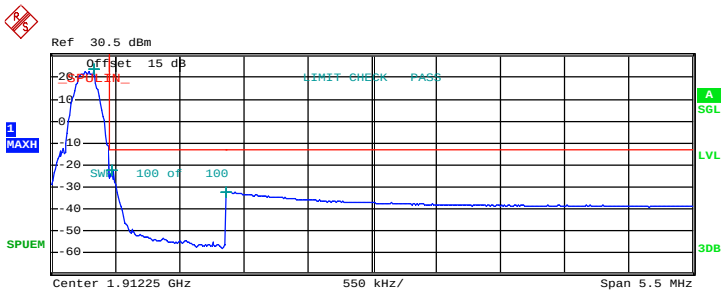
**Lower Band Edge Plot on Channel 512 (1850.2 MHz)**




| Start [Hz] | Stop [Hz] | RBW [Hz] | Freq [Hz] | PwrAbs [dBm] | ΔLimit [dB] |
|---|---|---|---|---|---|
| 1.845 G | 1.849 G | 1.00 M | 1.848992 G | -28.45 | -15.45 |
| 1.849 G | 1.850 G | 3.00 k | 1.849980 G | -23.15 | -10.15 |
| 1.850 G | 1.851 G | 10.00 k | 1.850227 G | 23.68 | -11.32 |

Date: 23.JUN.2015 13:08:36

**Higher Band Edge Plot on Channel 810 (1909.8 MHz)**

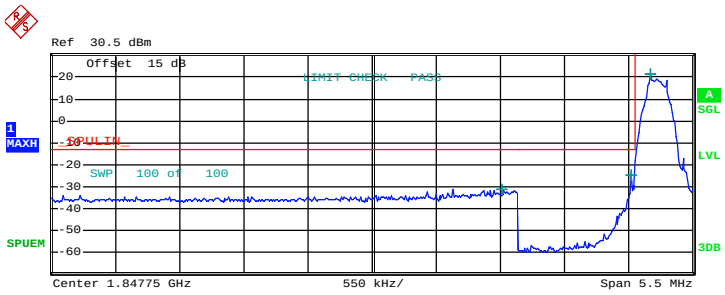



| Start [Hz] | Stop [Hz] | RBW [Hz] | Freq [Hz] | PwrAbs [dBm] | ΔLimit [dB] |
|---|---|---|---|---|---|
| 1.910 G | 1.910 G | 10.00 k | 1.909866 G | 23.49 | -11.51 |
| 1.910 G | 1.911 G | 3.00 k | 1.910020 G | -22.49 | -9.49 |
| 1.911 G | 1.915 G | 1.00 M | 1.911000 G | -32.35 | -19.35 |

Date: 23.JUN.2015 13:06:35

| Band : | GSM1900 | Test Mode : | EDGE class 8 Link (8PSK) |
|---|---|---|---|

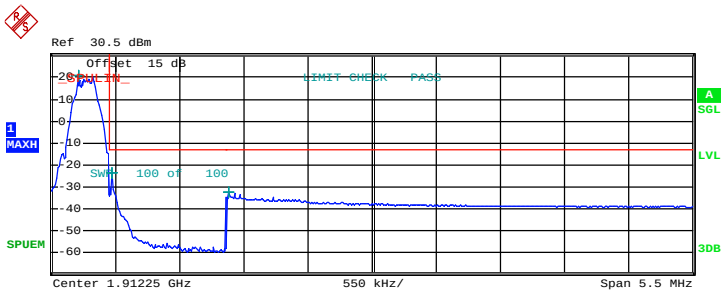
## Lower Band Edge Plot on Channel 512 (1850.2 MHz)




| Start [Hz] | Stop [Hz] | RBW [Hz] | Freq [Hz] | PwrAbs [dBm] | ΔLimit [dB] |
|---|---|---|---|---|---|
| 1.845 G | 1.849 G | 1.00 M | 1.848864 G | -31.02 | -18.02 |
| 1.849 G | 1.850 G | 3.00 k | 1.849968 G | -24.96 | -11.96 |
| 1.850 G | 1.851 G | 10.00 k | 1.850142 G | 21.61 | -13.39 |

Date: 23.JUN.2015 15:54:16

## Higher Band Edge Plot on Channel 810 (1909.8 MHz)

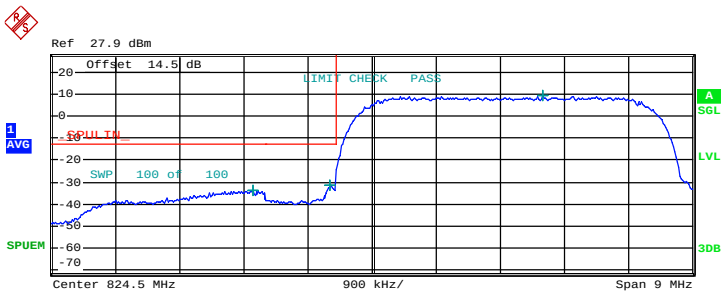



| Start [Hz] | Stop [Hz] | RBW [Hz] | Freq [Hz] | PwrAbs [dBm] | ΔLimit [dB] |
|---|---|---|---|---|---|
| 1.910 G | 1.910 G | 10.00 k | 1.909732 G | 20.81 | -14.19 |
| 1.910 G | 1.911 G | 3.00 k | 1.910012 G | -23.67 | -10.67 |
| 1.911 G | 1.915 G | 1.00 M | 1.911016 G | -32.55 | -19.55 |

Date: 23.JUN.2015 15:57:32

| Band : | WCDMA Band V | Test Mode : | RMC 12.2Kbps Link (QPSK) |
|---|---|---|---|

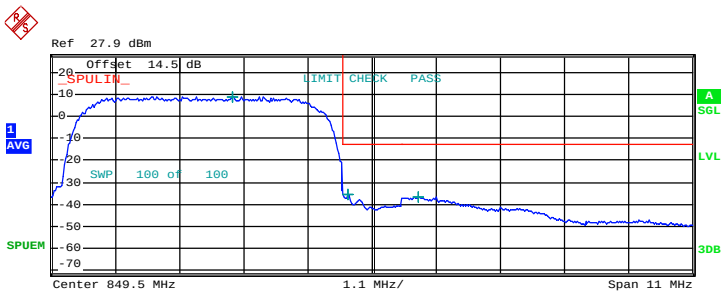
**Lower Band Edge Plot on Channel 4132 (826.4 MHz)**




| Start [Hz] | Stop [Hz] | RBW [Hz] | Freq [Hz] | PwrAbs [dBm] | ΔLimit [dB] |
|---|---|---|---|---|---|
| 820.000 M | 823.000 M | 100.00 k | 822.823000 M | -33.99 | -20.99 |
| 823.000 M | 824.000 M | 50.00 k | 823.912000 M | -31.44 | -18.44 |
| 824.000 M | 829.000 M | 100.00 k | 826.890000 M | 9.30 | -25.70 |

Date: 23.JUN.2015 15:14:26

**Higher Band Edge Plot on Channel 4233 (846.6 MHz)**

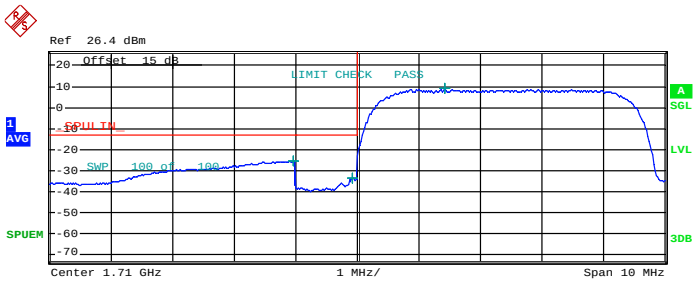



| Start [Hz] | Stop [Hz] | RBW [Hz] | Freq [Hz] | PwrAbs [dBm] | ΔLimit [dB] |
|---|---|---|---|---|---|
| 844.000 M | 849.000 M | 100.00 k | 847.100000 M | 9.14 | -25.86 |
| 849.000 M | 850.000 M | 50.00 k | 849.084000 M | -35.60 | -22.60 |
| 850.000 M | 855.000 M | 100.00 k | 850.300000 M | -36.89 | -23.89 |

Date: 23.JUN.2015 15:17:47

| Band : | WCDMA Band IV | Test Mode : | RMC 12.2Kbps Link (QPSK) |
|---|---|---|---|

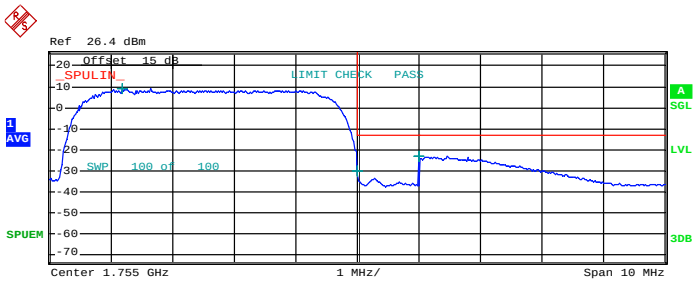
**Lower Band Edge Plot on Channel 1312 (1712.4 MHz)**




| Start [Hz] | Stop [Hz] | RBW [Hz] | Freq [Hz] | PwrAbs [dBm] | ΔLimit [dB] |
|---|---|---|---|---|---|
| 1.705 G | 1.709 G | 1.00 M | 1.708964 G | -25.51 | -12.51 |
| 1.709 G | 1.710 G | 50.00 k | 1.709928 G | -33.32 | -20.32 |
| 1.710 G | 1.715 G | 100.00 k | 1.711425 G | 9.10 | -25.90 |

Date: 23.JUN.2015 15:30:53

**Higher Band Edge Plot on Channel 1513 (1752.6 MHz)**

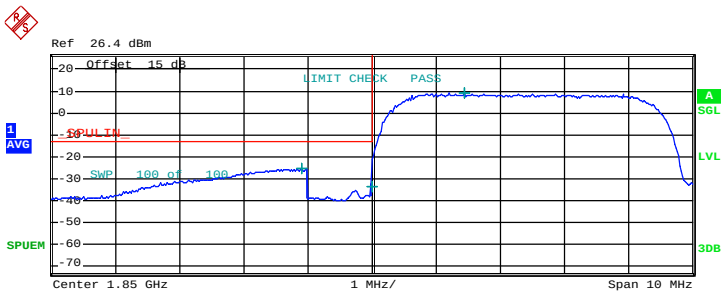



| Start [Hz] | Stop [Hz] | RBW [Hz] | Freq [Hz] | PwrAbs [dBm] | ΔLimit [dB] |
|---|---|---|---|---|---|
| 1.750 G | 1.755 G | 100.00 k | 1.751170 G | 9.03 | -25.97 |
| 1.755 G | 1.756 G | 50.00 k | 1.755004 G | -30.28 | -17.28 |
| 1.756 G | 1.760 G | 1.00 M | 1.756004 G | -23.29 | -10.29 |

Date: 23.JUN.2015 15:33:46

| Band : | WCDMA Band II | Test Mode : | RMC 12.2Kbps Link (QPSK) |
|---|---|---|---|

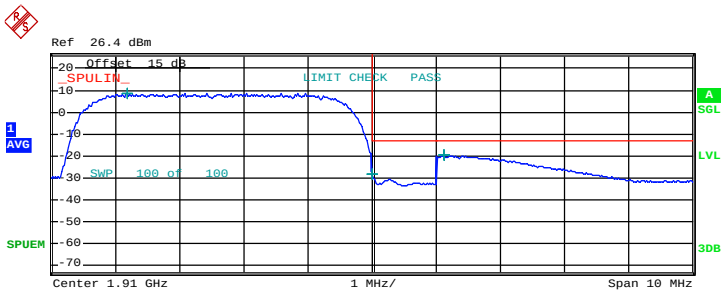
**Lower Band Edge Plot on Channel 9262 (1852.4 MHz)**




| Start [Hz] | Stop [Hz] | RBW [Hz] | Freq [Hz] | PwrAbs [dBm] | ΔLimit [dB] |
|---|---|---|---|---|---|
| 1.845 G | 1.849 G | 1.00 M | 1.848892 G | -25.62 | -12.62 |
| 1.849 G | 1.850 G | 50.00 k | 1.849996 G | -33.25 | -20.25 |
| 1.850 G | 1.855 G | 100.00 k | 1.851440 G | 9.35 | -25.65 |

Date: 23.JUN.2015 15:23:54

**Higher Band Edge Plot on Channel 9538 (1907.6 MHz)**




| Start [Hz] | Stop [Hz] | RBW [Hz] | Freq [Hz] | PwrAbs [dBm] | ΔLimit [dB] |
|---|---|---|---|---|---|
| 1.905 G | 1.910 G | 100.00 k | 1.906175 G | 8.67 | -26.33 |
| 1.910 G | 1.911 G | 50.00 k | 1.910004 G | -28.15 | -15.15 |
| 1.911 G | 1.915 G | 1.00 M | 1.911124 G | -19.72 | -6.72 |

Date: 23.JUN.2015 15:27:46

# 3.6 Conducted Spurious Emission Measurement

## 3.6.1 Description of Conducted Spurious 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.

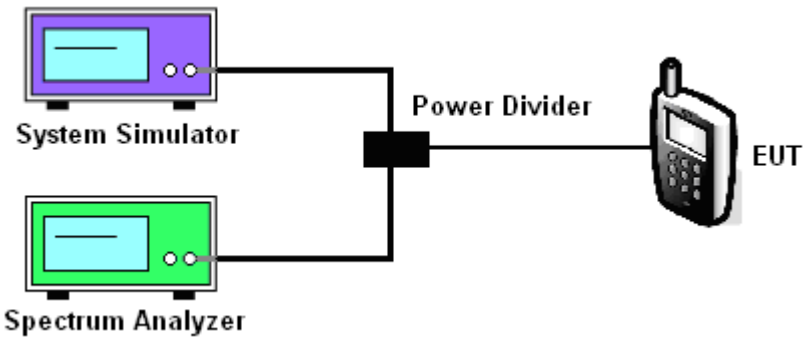
## 3.6.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

## 3.6.3 Test Procedures

1. The testing follows FCC KDB 971168 v02r02 Section 6.0.
2. The EUT was connected to the spectrum analyzer and system simulator via a power divider.
3. The RF output of EUT was connected to the spectrum analyzer by an RF cable and attenuator. The path loss was compensated to the results for each measurement.
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.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
7. The limit line is derived from 43 + 10log(P) dB below the transmitter power P(Watts)
   = P(W) - [43 + 10log(P)] (dB)
   = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)
   = -13dBm.

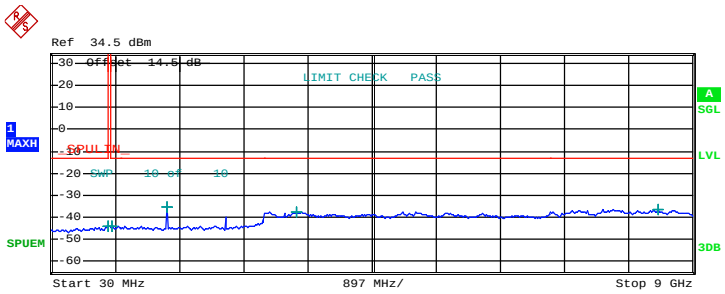
## 3.6.4 Test Setup



## 3.6.5 Test Result (Plots) of Conducted Spurious Emission

| Band : | GSM850 | Channel : | CH128 |
|---|---|---|---|
| Test Mode : | GSM Link (GMSK) | Frequency : | 824.2 MHz |

**Conducted Spurious Emission Plot between 30MHz ~ 9GHz**

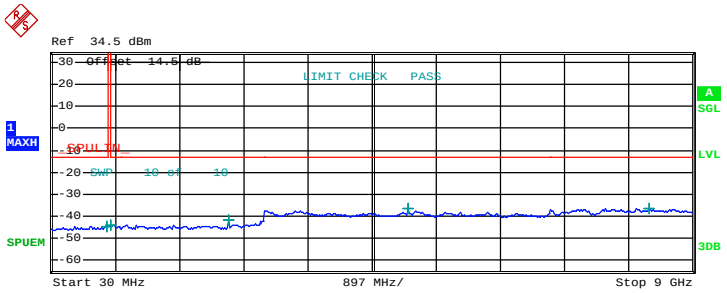



| Start [Hz] | Stop [Hz] | RBW [Hz] | Freq [Hz] | PwrAbs [dBm] | ΔLimit [dB] |
|---|---|---|---|---|---|
| 30.000 M | 820.000 M | 1.00 M | 811.310000 M | -44.32 | -31.32 |
| 855.000 M | 1.000 G | 1.00 M | 867.143751 M | -44.05 | -31.05 |
| 1.000 G | 3.000 G | 1.00 M | 1.648500 G | -35.67 | -22.67 |
| 3.000 G | 7.000 G | 1.00 M | 3.451000 G | -37.85 | -24.85 |
| 7.000 G | 9.000 G | 1.00 M | 8.523000 G | -36.51 | -23.51 |

Date: 20.JUN.2015 11:53:09

| Band : | GSM850 | Channel : | CH189 |
|---|---|---|---|
| Test Mode : | GSM Link (GMSK) | Frequency : | 836.4 MHz |

**Conducted Spurious Emission Plot between 30MHz ~ 9GHz**

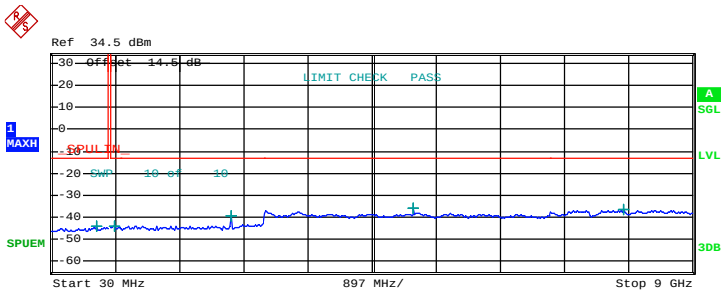



| Start [Hz] | Stop [Hz] | RBW [Hz] | Freq [Hz] | PwrAbs [dBm] | ΔLimit [dB] |
|---|---|---|---|---|---|
| 30.000 M | 820.000 M | 1.00 M | 804.792500 M | -44.73 | -31.73 |
| 855.000 M | 1.000 G | 1.00 M | 863.591251 M | -44.22 | -31.22 |
| 1.000 G | 3.000 G | 1.00 M | 2.509500 G | -41.84 | -28.84 |
| 3.000 G | 7.000 G | 1.00 M | 5.018000 G | -36.77 | -23.77 |
| 7.000 G | 9.000 G | 1.00 M | 8.394000 G | -36.46 | -23.46 |

Date: 20.JUN.2015 11:53:48

| Band : | GSM850 | Channel : | CH 251 |
|---|---|---|---|
| Test Mode : | GSM Link (GMSK) | Frequency : | 848.8 MHz |

**Conducted Spurious Emission Plot between 30MHz ~ 9GHz**

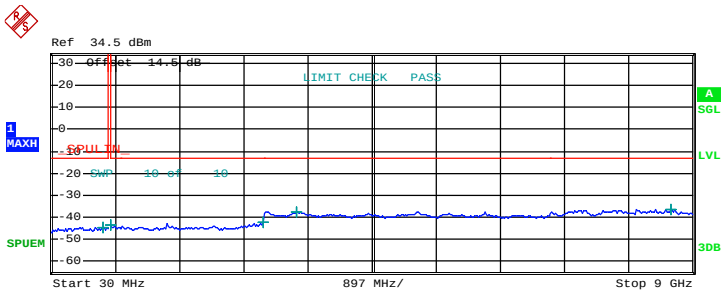



| Start [Hz] | Stop [Hz] | RBW [Hz] | Freq [Hz] | PwrAbs [dBm] | ΔLimit [dB] |
|---|---|---|---|---|---|
| 30.000 M | 820.000 M | 1.00 M | 653.705000 M | -44.21 | -31.21 |
| 855.000 M | 1.000 G | 1.00 M | 909.157504 M | -44.26 | -31.26 |
| 1.000 G | 3.000 G | 1.00 M | 2.546500 G | -39.30 | -26.30 |
| 3.000 G | 7.000 G | 1.00 M | 5.093000 G | -35.93 | -22.93 |
| 7.000 G | 9.000 G | 1.00 M | 8.035500 G | -36.80 | -23.80 |

Date: 20.JUN.2015 11:54:31

| Band : | GSM850 | Channel : | CH128 |
|---|---|---|---|
| Test Mode : | EDGE class 8 Link (8PSK) | Frequency : | 824.2 MHz |

**Conducted Spurious Emission Plot between 30MHz ~ 9GHz**

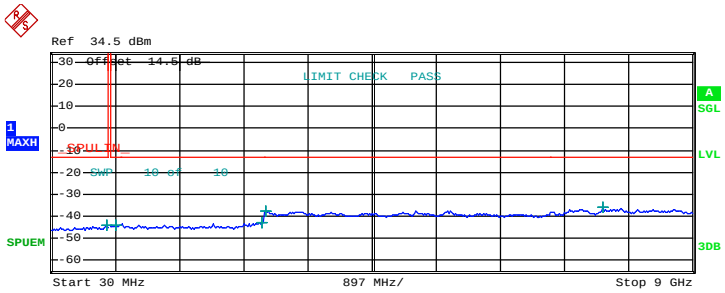



| Start [Hz] | Stop [Hz] | RBW [Hz] | Freq [Hz] | PwrAbs [dBm] | ΔLimit [dB] |
|---|---|---|---|---|---|
| 30.000 M | 820.000 M | 1.00 M | 749.492500 M | -44.58 | -31.58 |
| 855.000 M | 1.000 G | 1.00 M | 862.685001 M | -43.86 | -30.86 |
| 1.000 G | 3.000 G | 1.00 M | 2.991500 G | -42.22 | -29.22 |
| 3.000 G | 7.000 G | 1.00 M | 3.454000 G | -37.64 | -24.64 |
| 7.000 G | 9.000 G | 1.00 M | 8.688500 G | -36.53 | -23.53 |

Date: 20.JUN.2015 11:56:46

| Band : | GSM850 | Channel : | CH189 |
|---|---|---|---|
| Test Mode : | EDGE class 8 Link (8PSK) | Frequency : | 836.4 MHz |

**Conducted Spurious Emission Plot between 30MHz ~ 9GHz**

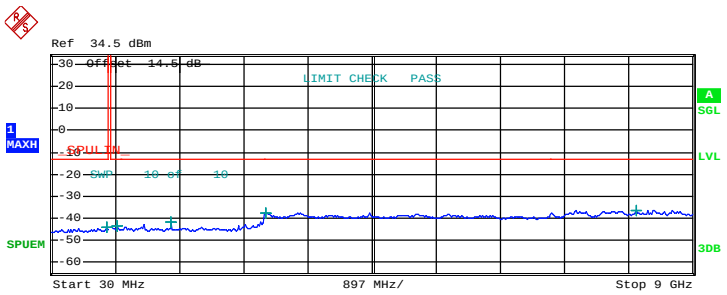



| Start [Hz] | Stop [Hz] | RBW [Hz] | Freq [Hz] | PwrAbs [dBm] | ΔLimit [dB] |
|---|---|---|---|---|---|
| 30.000 M | 820.000 M | 1.00 M | 807.360000 M | -44.13 | -31.13 |
| 855.000 M | 1.000 G | 1.00 M | 919.162504 M | -44.23 | -31.23 |
| 1.000 G | 3.000 G | 1.00 M | 2.979500 G | -42.71 | -29.71 |
| 3.000 G | 7.000 G | 1.00 M | 3.026000 G | -37.53 | -24.53 |
| 7.000 G | 9.000 G | 1.00 M | 7.746500 G | -35.89 | -22.89 |

Date: 20.JUN.2015 11:57:22

| Band : | GSM850 | Channel : | CH251 |
|---|---|---|---|
| Test Mode : | EDGE class 8 Link (8PSK) | Frequency : | 848.8 MHz |

**Conducted Spurious Emission Plot between 30MHz ~ 9GHz**

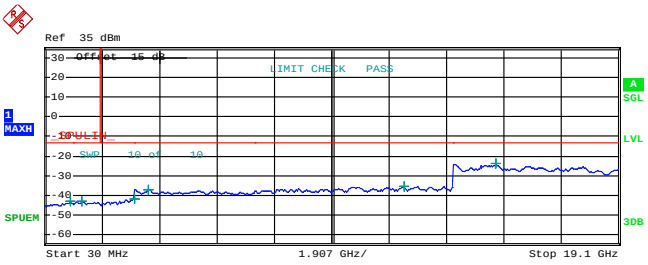



| Start [Hz] | Stop [Hz] | RBW [Hz] | Freq [Hz] | PwrAbs [dBm] | ΔLimit [dB] |
|---|---|---|---|---|---|
| 30.000 M | 820.000 M | 1.00 M | 801.435000 M | -44.39 | -31.39 |
| 855.000 M | 1.000 G | 1.00 M | 940.296256 M | -43.57 | -30.57 |
| 1.000 G | 3.000 G | 1.00 M | 1.697500 G | -41.95 | -28.95 |
| 3.000 G | 7.000 G | 1.00 M | 3.034000 G | -37.57 | -24.57 |
| 7.000 G | 9.000 G | 1.00 M | 8.215000 G | -36.37 | -23.37 |

Date: 20.JUN.2015 11:57:59

| Band : | GSM1900 | Channel : | CH512 |
|---|---|---|---|
| Test Mode : | GSM Link (GMSK) | Frequency : | 1850.2 MHz |

**Conducted Spurious Emission Plot between 30MHz ~ 19.1GHz**

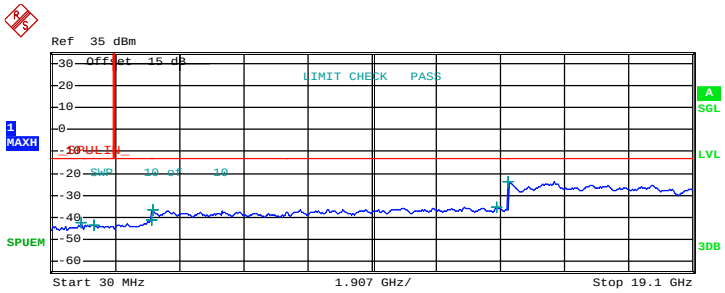



| Start [Hz] | Stop [Hz] | RBW [Hz] | Freq [Hz] | PwrAbs [dBm] | ΔLimit [dB] |
|---|---|---|---|---|---|
| 30.000 M | 1.000 G | 1.00 M | 850.377500 M | -42.98 | -29.98 |
| 1.000 G | 1.845 G | 1.00 M | 1.251599 G | -43.06 | -30.06 |
| 1.915 G | 3.000 G | 1.00 M | 2.995660 G | -41.94 | -28.94 |
| 3.000 G | 7.000 G | 1.00 M | 3.447000 G | -37.31 | -24.31 |
| 7.000 G | 13.600 G | 1.00 M | 11.975575 G | -35.56 | -22.56 |
| 13.600 G | 19.100 G | 1.00 M | 15.001813 G | -24.01 | -11.01 |

Date: 20.JUN.2015 12:20:02

| Band : | GSM1900 | Channel : | CH661 |
|---|---|---|---|
| Test Mode : | GSM Link (GMSK) | Frequency : | 1880.0 MHz |

**Conducted Spurious Emission Plot between 30MHz ~ 19.1GHz**

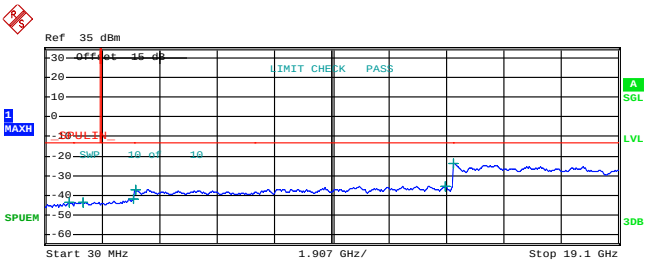



| Start [Hz] | Stop [Hz] | RBW [Hz] | Freq [Hz] | PwrAbs [dBm] | ΔLimit [dB] |
|---|---|---|---|---|---|
| 30.000 M | 1.000 G | 1.00 M | 895.240000 M | -42.54 | -29.54 |
| 1.000 G | 1.845 G | 1.00 M | 1.296806 G | -43.57 | -30.57 |
| 1.915 G | 3.000 G | 1.00 M | 2.996202 G | -41.55 | -28.55 |
| 3.000 G | 7.000 G | 1.00 M | 3.031000 G | -36.69 | -23.69 |
| 7.000 G | 13.600 G | 1.00 M | 13.269175 G | -35.27 | -22.27 |
| 13.600 G | 19.100 G | 1.00 M | 13.617875 G | -23.49 | -10.49 |

Date: 20.JUN.2015 12:21:01

| Band : | GSM1900 | Channel : | CH810 |
|---|---|---|---|
| Test Mode : | GSM Link (GMSK) | Frequency : | 1909.8 MHz |

**Conducted Spurious Emission Plot between 30MHz ~ 19.1GHz**

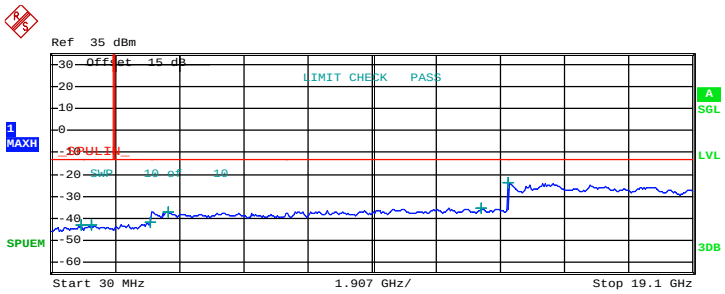



| Start [Hz] | Stop [Hz] | RBW [Hz] | Freq [Hz] | PwrAbs [dBm] | ΔLimit [dB] |
|---|---|---|---|---|---|
| 30.000 M | 1.000 G | 1.00 M | 845.042500 M | -43.79 | -30.79 |
| 1.000 G | 1.845 G | 1.00 M | 1.286666 G | -43.42 | -30.42 |
| 1.915 G | 3.000 G | 1.00 M | 2.980741 G | -41.95 | -28.95 |
| 3.000 G | 7.000 G | 1.00 M | 3.030000 G | -37.25 | -24.25 |
| 7.000 G | 13.600 G | 1.00 M | 13.350025 G | -35.18 | -22.18 |
| 13.600 G | 19.100 G | 1.00 M | 13.624750 G | -23.89 | -10.89 |

Date: 20.JUN.2015 12:21:40

| Band : | GSM1900 | Channel : | CH512 |
|---|---|---|---|
| Test Mode : | EDGE class 8 Link (8PSK) | Frequency : | 1850.2 MHz |

**Conducted Spurious Emission Plot between 30MHz ~ 19.1GHz**

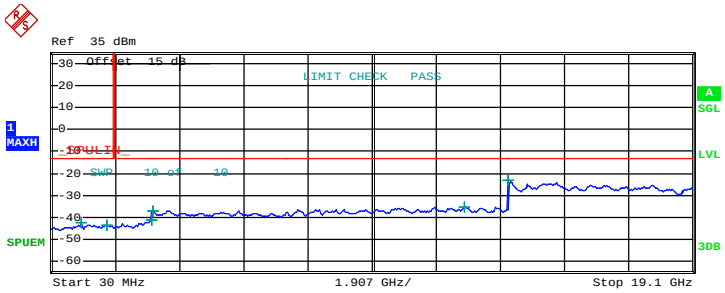



| Start [Hz] | Stop [Hz] | RBW [Hz] | Freq [Hz] | PwrAbs [dBm] | ΔLimit [dB] |
|---|---|---|---|---|---|
| 30.000 M | 1.000 G | 1.00 M | 893.300000 M | -43.30 | -30.30 |
| 1.000 G | 1.845 G | 1.00 M | 1.207448 G | -42.79 | -29.79 |
| 1.915 G | 3.000 G | 1.00 M | 2.982911 G | -41.88 | -28.88 |
| 3.000 G | 7.000 G | 1.00 M | 3.502000 G | -37.03 | -24.03 |
| 7.000 G | 13.600 G | 1.00 M | 12.808000 G | -35.62 | -22.62 |
| 13.600 G | 19.100 G | 1.00 M | 13.614437 G | -23.72 | -10.72 |

Date: 20.JUN.2015 12:15:54

| Band : | GSM1900 | Channel : | CH661 |
|---|---|---|---|
| Test Mode : | EDGE class 8 Link (8PSK) | Frequency : | 1880.0 MHz |

**Conducted Spurious Emission Plot between 30MHz ~ 19.1GHz**

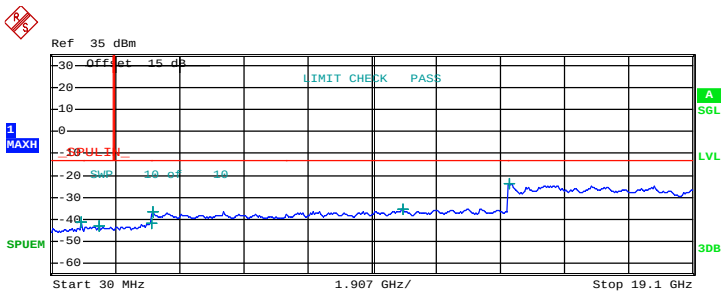



| Start [Hz] | Stop [Hz] | RBW [Hz] | Freq [Hz] | PwrAbs [dBm] | ΔLimit [dB] |
|---|---|---|---|---|---|
| 30.000 M | 1.000 G | 1.00 M | 895.240000 M | -42.56 | -29.56 |
| 1.000 G | 1.845 G | 1.00 M | 1.688252 G | -43.47 | -30.47 |
| 1.915 G | 3.000 G | 1.00 M | 2.993219 G | -41.52 | -28.52 |
| 3.000 G | 7.000 G | 1.00 M | 3.043000 G | -37.11 | -24.11 |
| 7.000 G | 13.600 G | 1.00 M | 12.327025 G | -35.42 | -22.42 |
| 13.600 G | 19.100 G | 1.00 M | 13.604125 G | -23.12 | -10.12 |

Date: 20.JUN.2015 12:16:49

| Band : | GSM1900 | Channel : | CH810 |
|---|---|---|---|
| Test Mode : | EDGE class 8 Link (8PSK) | Frequency : | 1909.8 MHz |

**Conducted Spurious Emission Plot between 30MHz ~ 19.1GHz**

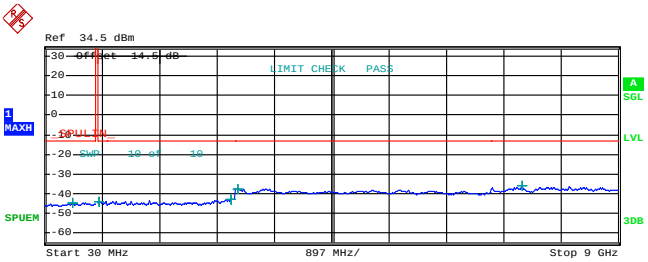



| Start [Hz] | Stop [Hz] | RBW [Hz] | Freq [Hz] | PwrAbs [dBm] | ΔLimit [dB] |
|---|---|---|---|---|---|
| 30.000 M | 1.000 G | 1.00 M | 894.997500 M | -41.53 | -28.53 |
| 1.000 G | 1.845 G | 1.00 M | 1.426936 G | -43.20 | -30.20 |
| 1.915 G | 3.000 G | 1.00 M | 2.994575 G | -41.89 | -28.89 |
| 3.000 G | 7.000 G | 1.00 M | 3.035000 G | -36.58 | -23.58 |
| 7.000 G | 13.600 G | 1.00 M | 10.474900 G | -35.47 | -22.47 |
| 13.600 G | 19.100 G | 1.00 M | 13.650187 G | -23.76 | -10.76 |

Date: 20.JUN.2015 12:17:30

| Band : | WCDMA Band V | Channel : | CH4132 |
|---|---|---|---|
| Test Mode : | RMC 12.2Kbps Link (QPSK) | Frequency : | 826.4 MHz |

**Conducted Spurious Emission Plot between 30MHz ~ 9GHz**

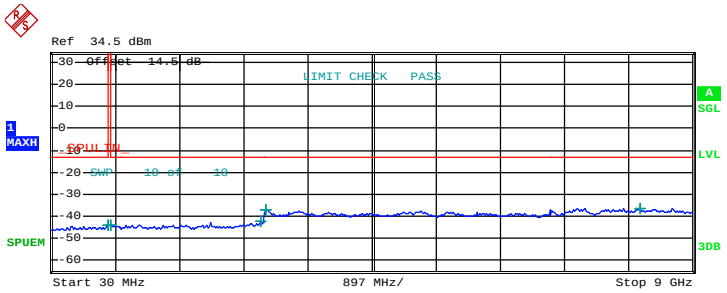



| Start [Hz] | Stop [Hz] | RBW [Hz] | Freq [Hz] | PwrAbs [dBm] | ΔLimit [dB] |
|---|---|---|---|---|---|
| 30.000 M | 820.000 M | 1.00 M | 464.895000 M | -44.82 | -31.82 |
| 855.000 M | 1.000 G | 1.00 M | 874.321251 M | -43.99 | -30.99 |
| 1.000 G | 3.000 G | 1.00 M | 2.929500 G | -42.82 | -29.82 |
| 3.000 G | 7.000 G | 1.00 M | 3.042000 G | -37.45 | -24.45 |
| 7.000 G | 9.000 G | 1.00 M | 7.498000 G | -36.23 | -23.23 |

Date: 20.JUN.2015 13:36:26

| Band : | WCDMA Band V | Channel : | CH4182 |
|---|---|---|---|
| Test Mode : | RMC 12.2Kbps Link (QPSK) | Frequency : | 836.4 MHz |

**Conducted Spurious Emission Plot between 30MHz ~ 9GHz**

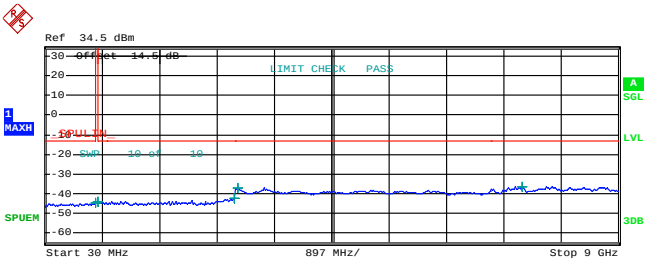



| Start [Hz] | Stop [Hz] | RBW [Hz] | Freq [Hz] | PwrAbs [dBm] | ΔLimit [dB] |
|---|---|---|---|---|---|
| 30.000 M | 820.000 M | 1.00 M | 816.050000 M | -44.25 | -31.25 |
| 855.000 M | 1.000 G | 1.00 M | 859.930000 M | -44.23 | -31.23 |
| 1.000 G | 3.000 G | 1.00 M | 2.951500 G | -42.32 | -29.32 |
| 3.000 G | 7.000 G | 1.00 M | 3.034000 G | -37.24 | -24.24 |
| 7.000 G | 9.000 G | 1.00 M | 8.258500 G | -36.43 | -23.43 |

Date: 20.JUN.2015 13:37:07

| Band : | WCDMA Band V | Channel : | CH4233 |
|---|---|---|---|
| Test Mode : | RMC 12.2Kbps Link (QPSK) | Frequency : | 846.6 MHz |

**Conducted Spurious Emission Plot between 30MHz ~ 9GHz**

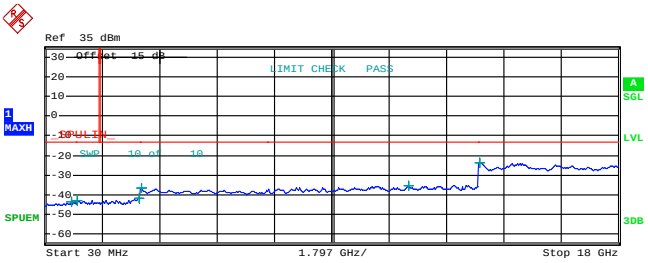



| Start [Hz] | Stop [Hz] | RBW [Hz] | Freq [Hz] | PwrAbs [dBm] | ΔLimit [dB] |
|---|---|---|---|---|---|
| 30.000 M | 820.000 M | 1.00 M | 819.210000 M | -44.76 | -31.76 |
| 855.000 M | 1.000 G | 1.00 M | 859.748750 M | -44.38 | -31.38 |
| 1.000 G | 3.000 G | 1.00 M | 2.986500 G | -42.62 | -29.62 |
| 3.000 G | 7.000 G | 1.00 M | 3.048000 G | -37.27 | -24.27 |
| 7.000 G | 9.000 G | 1.00 M | 7.501000 G | -36.49 | -23.49 |

Date: 20.JUN.2015 13:37:42

| Band : | WCDMA Band IV | Channel : | CH1312 |
|---|---|---|---|
| Test Mode : | RMC 12.2Kbps Link (QPSK) | Frequency : | 1712.4 MHz |

**Conducted Spurious Emission Plot between 30MHz ~ 18GHz**

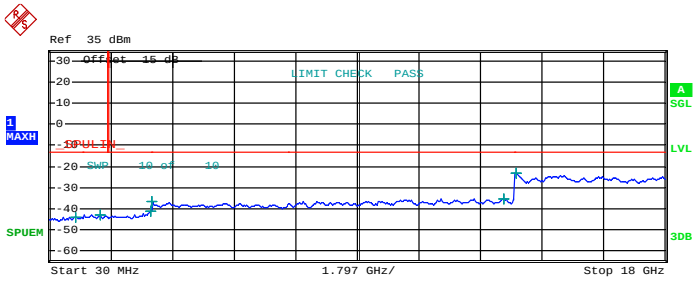



| Start [Hz] | Stop [Hz] | RBW [Hz] | Freq [Hz] | PwrAbs [dBm] | ΔLimit [dB] |
|---|---|---|---|---|---|
| 30.000 M | 1.000 G | 1.00 M | 851.347500 M | -43.40 | -30.40 |
| 1.000 G | 1.705 G | 1.00 M | 1.035603 G | -42.97 | -29.97 |
| 1.760 G | 3.000 G | 1.00 M | 2.970550 G | -41.94 | -28.94 |
| 3.000 G | 7.000 G | 1.00 M | 3.034000 G | -36.88 | -23.88 |
| 7.000 G | 13.600 G | 1.00 M | 11.408800 G | -35.39 | -22.39 |
| 13.600 G | 18.000 G | 1.00 M | 13.656100 G | -23.83 | -10.83 |

Date: 20.JUN.2015 12:54:37

| Band : | WCDMA Band IV | Channel : | CH1413 |
|---|---|---|---|
| Test Mode : | RMC 12.2Kbps Link (QPSK) | Frequency : | 1732.6 MHz |

**Conducted Spurious Emission Plot between 30MHz ~ 18GHz**

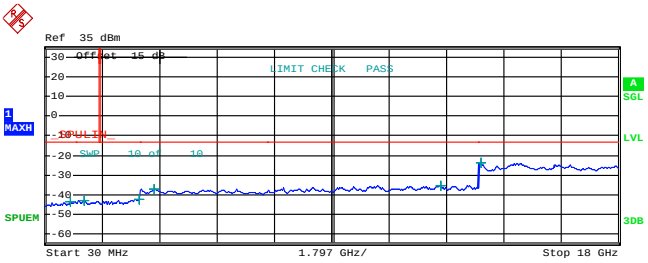



| Start [Hz] | Stop [Hz] | RBW [Hz] | Freq [Hz] | PwrAbs [dBm] | ΔLimit [dB] |
|---|---|---|---|---|---|
| 30.000 M | 1.000 G | 1.00 M | 776.657500 M | -44.06 | -31.06 |
| 1.000 G | 1.705 G | 1.00 M | 1.510596 G | -42.81 | -29.81 |
| 1.760 G | 3.000 G | 1.00 M | 2.974270 G | -41.31 | -28.31 |
| 3.000 G | 7.000 G | 1.00 M | 3.019000 G | -36.57 | -23.57 |
| 7.000 G | 13.600 G | 1.00 M | 13.284025 G | -35.30 | -22.30 |
| 13.600 G | 18.000 G | 1.00 M | 13.666000 G | -23.15 | -10.15 |

Date: 20.JUN.2015 12:55:29

| Band : | WCDMA Band IV | Channel : | CH1513 |
|---|---|---|---|
| Test Mode : | RMC 12.2Kbps Link (QPSK) | Frequency : | 1752.6 MHz |

**Conducted Spurious Emission Plot between 30MHz ~ 18GHz**

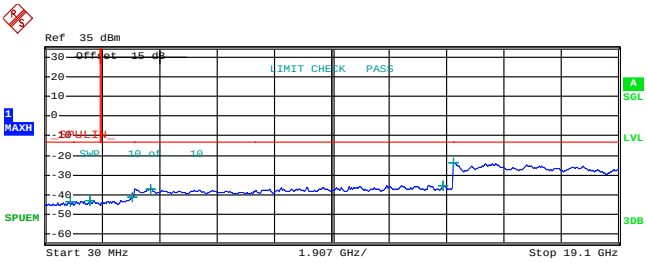



| Start [Hz] | Stop [Hz] | RBW [Hz] | Freq [Hz] | PwrAbs [dBm] | ΔLimit [dB] |
|---|---|---|---|---|---|
| 30.000 M | 1.000 G | 1.00 M | 830.735000 M | -43.76 | -30.76 |
| 1.000 G | 1.705 G | 1.00 M | 1.240934 G | -43.12 | -30.12 |
| 1.760 G | 3.000 G | 1.00 M | 2.986360 G | -42.28 | -29.28 |
| 3.000 G | 7.000 G | 1.00 M | 3.433000 G | -36.95 | -23.95 |
| 7.000 G | 13.600 G | 1.00 M | 12.432625 G | -35.31 | -22.31 |
| 13.600 G | 18.000 G | 1.00 M | 13.696250 G | -23.65 | -10.65 |

Date: 20.JUN.2015 12:56:10

| Band : | WCDMA Band II | Channel : | CH9262 |
|---|---|---|---|
| Test Mode : | RMC 12.2Kbps Link (QPSK) | Frequency : | 1852.4MHz |

**Conducted Spurious Emission Plot between 30MHz ~ 19.1GHz**

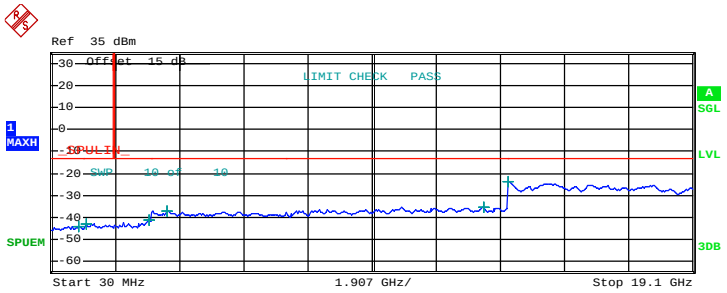



| Start [Hz] | Stop [Hz] | RBW [Hz] | Freq [Hz] | PwrAbs [dBm] | ΔLimit [dB] |
|---|---|---|---|---|---|
| 30.000 M | 1.000 G | 1.00 M | 871.475000 M | -43.95 | -30.95 |
| 1.000 G | 1.845 G | 1.00 M | 1.513549 G | -43.25 | -30.25 |
| 1.915 G | 3.000 G | 1.00 M | 2.915641 G | -41.14 | -28.14 |
| 3.000 G | 7.000 G | 1.00 M | 3.528000 G | -37.15 | -24.15 |
| 7.000 G | 13.600 G | 1.00 M | 13.272475 G | -35.20 | -22.20 |
| 13.600 G | 19.100 G | 1.00 M | 13.604813 G | -23.67 | -10.67 |

Date: 20.JUN.2015 12:50:42

| Band : | WCDMA Band II | Channel : | CH9400 |
|---|---|---|---|
| Test Mode : | RMC 12.2Kbps Link (QPSK) | Frequency : | 1880.0 MHz |

**Conducted Spurious Emission Plot between 30MHz ~ 19.1GHz**

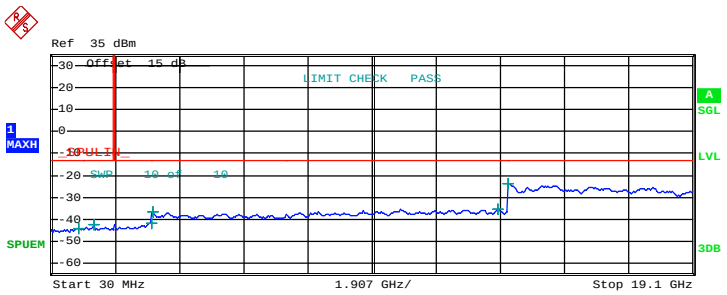



| Start [Hz] | Stop [Hz] | RBW [Hz] | Freq [Hz] | PwrAbs [dBm] | ΔLimit [dB] |
|---|---|---|---|---|---|
| 30.000 M | 1.000 G | 1.00 M | 816.912500 M | -44.03 | -31.03 |
| 1.000 G | 1.845 G | 1.00 M | 1.052601 G | -42.89 | -29.89 |
| 1.915 G | 3.000 G | 1.00 M | 2.923236 G | -41.51 | -28.51 |
| 3.000 G | 7.000 G | 1.00 M | 3.464000 G | -37.13 | -24.13 |
| 7.000 G | 13.600 G | 1.00 M | 12.888025 G | -35.36 | -22.36 |
| 13.600 G | 19.100 G | 1.00 M | 13.619250 G | -23.95 | -10.95 |

Date: 20.JUN.2015 12:52:51

| Band : | WCDMA Band II | Channel : | CH9538 |
|---|---|---|---|
| Test Mode : | RMC 12.2Kbps Link (QPSK) | Frequency : | 1907.6 MHz |

**Conducted Spurious Emission Plot between 30MHz ~ 19.1GHz**




| Start [Hz] | Stop [Hz] | RBW [Hz] | Freq [Hz] | PwrAbs [dBm] | ΔLimit [dB] |
|---|---|---|---|---|---|
| 30.000 M | 1.000 G | 1.00 M | 821.277500 M | -44.11 | -31.11 |
| 1.000 G | 1.845 G | 1.00 M | 1.305679 G | -42.58 | -29.58 |
| 1.915 G | 3.000 G | 1.00 M | 2.996745 G | -41.73 | -28.73 |
| 3.000 G | 7.000 G | 1.00 M | 3.040000 G | -36.88 | -23.88 |
| 7.000 G | 13.600 G | 1.00 M | 13.294750 G | -35.23 | -22.23 |
| 13.600 G | 19.100 G | 1.00 M | 13.600687 G | -23.75 | -10.75 |

Date: 20.JUN.2015 12:53:31

# 3.7 Field Strength of Spurious Radiation Measurement

## 3.7.1 Description of Field Strength of Spurious Radiated Measurement

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.

## 3.7.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

## 3.7.3 Test Procedures

1. The testing follows FCC KDB 971168 v02r02 Section 5.8 and ANSI / TIA-603-C-2004 Section 2.2.12.
2. The EUT was placed on a rotatable wooden table 0.8 meters above the ground.
3. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
4. The table was rotated 360 degrees to determine the position of the highest spurious emission.
5. The height of the receiving antenna is varied between one meter and four meters to search for the maximum spurious emission for both horizontal and vertical polarizations.
6. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking record of maximum spurious emission.
7. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
8. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
9. Taking the record of output power at antenna port.
10. Repeat step 7 to step 8 for another polarization.
11. EIRP (dBm) = S.G. Power – Tx Cable Loss + Tx Antenna Gain
12. ERP (dBm) = EIRP - 2.15
13. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
14. The limit line is derived from 43 + 10log(P) dB below the transmitter power P(Watts)

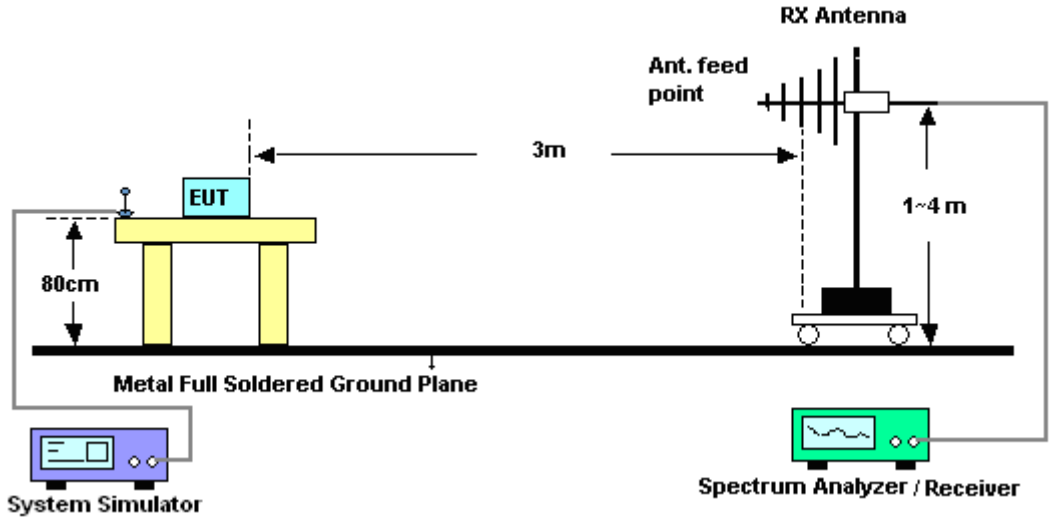
    = P(W) - [43 + 10log(P)] (dB)

    = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)

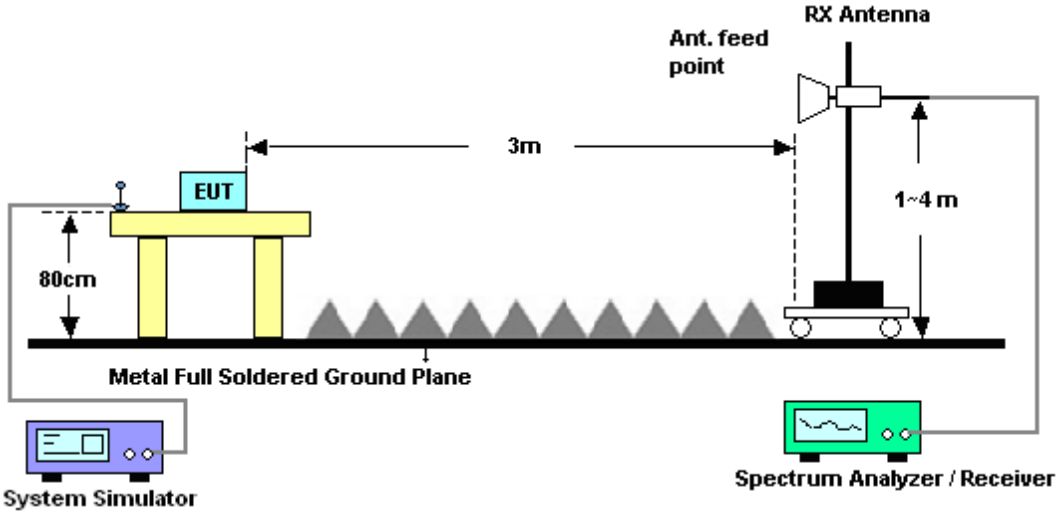
    = -13dBm.

### 3.7.4 Test Setup

**For radiated emissions from 30MHz to 1GHz**




**For radiated emissions above 1GHz**



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

| Band : | GSM850 for CH128 | Temperature : | 23~25°C |
|---|---|---|---|
| Test Mode : | GSM Link (GMSK) | Relative Humidity : | 48~52% |
| Test Engineer : | Jeff Yao | Polarization : | Horizontal |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |

| 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 |
|---|---|---|---|---|---|---|---|---|---|
| 1648.4 | -43.79 | -13 | -30.79 | -47.13 | -50.48 | 0.56 | 9.40 | H | Pass |
| 2472.6 | -44.31 | -13 | -31.31 | -49.98 | -52.01 | 0.75 | 10.60 | H | Pass |
| 3296.8 | -43.45 | -13 | -30.45 | -54.04 | -53.05 | 0.85 | 12.60 | H | Pass |
| 4121 | -49.74 | -13 | -36.74 | -60.56 | -59.30 | 0.89 | 12.60 | H | Pass |

| Band : | GSM850 for CH128 | Temperature : | 23~25°C |
|---|---|---|---|
| Test Mode : | GSM Link (GMSK) | Relative Humidity : | 48~52% |
| Test Engineer : | Jeff Yao | Polarization : | Vertical |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |

| 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 |
|---|---|---|---|---|---|---|---|---|---|
| 1648.4 | -40.51 | -13 | -27.51 | -46.03 | -47.20 | 0.56 | 9.40 | V | Pass |
| 2472.6 | -44.06 | -13 | -31.06 | -51.18 | -51.76 | 0.75 | 10.60 | V | Pass |
| 3296.8 | -44.20 | -13 | -31.20 | -53.18 | -53.80 | 0.85 | 12.60 | V | Pass |
| 4121 | -52.40 | -13 | -39.40 | -62.69 | -61.96 | 0.89 | 12.60 | V | Pass |

| Band : | GSM850 for CH189 | Temperature : | 23~25°C |
|---|---|---|---|
| Test Mode : | GSM Link (GMSK) | Relative Humidity : | 48~52% |
| Test Engineer : | Jeff Yao | Polarization : | Horizontal |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |

| 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 | -39.98 | -13 | -26.98 | -43.59 | -46.67 | 0.56 | 9.40 | H | Pass |
| 2510 | -43.01 | -13 | -30.01 | -48.82 | -50.71 | 0.75 | 10.60 | H | Pass |
| 3346 | -48.29 | -13 | -35.29 | -57.59 | -57.89 | 0.85 | 12.60 | H | Pass |
| 4182 | -50.81 | -13 | -37.81 | -61.63 | -60.37 | 0.89 | 12.60 | H | Pass |

| Band : | GSM850 for CH189 | Temperature : | 23~25°C |
|---|---|---|---|
| Test Mode : | GSM Link (GMSK) | Relative Humidity : | 48~52% |
| Test Engineer : | Jeff Yao | Polarization : | Vertical |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |

| 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 | -38.27 | -13 | -25.27 | -43.95 | -44.96 | 0.56 | 9.40 | V | Pass |
| 2510 | -39.39 | -13 | -26.39 | -47.43 | -47.09 | 0.75 | 10.60 | V | Pass |
| 3346 | -44.52 | -13 | -31.52 | -53.44 | -54.12 | 0.85 | 12.60 | V | Pass |
| 4182 | -51.88 | -13 | -38.88 | -62.17 | -61.44 | 0.89 | 12.60 | V | Pass |

| Band : | GSM850 for CH251 | Temperature : | 23~25°C |
|---|---|---|---|
| Test Mode : | GSM Link (GMSK) | Relative Humidity : | 48~52% |
| Test Engineer : | Jeff Yao | Polarization : | Horizontal |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |

| 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 |
|---|---|---|---|---|---|---|---|---|---|
| 1697.6 | -50.10 | -13 | -37.10 | -52.42 | -56.79 | 0.56 | 9.40 | H | Pass |
| 2546.4 | -49.79 | -13 | -36.79 | -54.56 | -57.49 | 0.75 | 10.60 | H | Pass |
| 3395.2 | -52.39 | -13 | -39.39 | -61.69 | -61.99 | 0.85 | 12.60 | H | Pass |
| 4240 | -51.92 | -13 | -38.92 | -62.74 | -61.48 | 0.89 | 12.60 | H | Pass |

| Band : | GSM850 for CH251 | Temperature : | 23~25°C |
|---|---|---|---|
| Test Mode : | GSM Link (GMSK) | Relative Humidity : | 48~52% |
| Test Engineer : | Jeff Yao | Polarization : | Vertical |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |

| 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 |
|---|---|---|---|---|---|---|---|---|---|
| 1697.6 | -41.49 | -13 | -28.49 | -46.93 | -48.18 | 0.56 | 9.40 | V | Pass |
| 2546.4 | -44.66 | -13 | -31.66 | -51.79 | -52.36 | 0.75 | 10.60 | V | Pass |
| 3395.2 | -52.36 | -13 | -39.36 | -59.22 | -61.96 | 0.85 | 12.60 | V | Pass |
| 4240 | -47.71 | -13 | -34.71 | -58.00 | -57.27 | 0.89 | 12.60 | V | Pass |

| Band : | GSM850 for CH128 | Temperature : | 23~25°C |
|---|---|---|---|
| Test Mode : | EDGE class 8 Link (8PSK) | Relative Humidity : | 48~52% |
| Test Engineer : | Jeff Yao | Polarization : | Horizontal |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |

| 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 |
|---|---|---|---|---|---|---|---|---|---|
| 1648.4 | -48.90 | -13 | -35.90 | -51.62 | -55.59 | 0.56 | 9.40 | H | Pass |
| 2472.6 | -57.64 | -13 | -44.64 | -61.54 | -65.34 | 0.75 | 10.60 | H | Pass |
| 3296.8 | -51.14 | -13 | -38.14 | -60.44 | -60.74 | 0.85 | 12.60 | H | Pass |

| Band : | GSM850 for CH128 | Temperature : | 23~25°C |
|---|---|---|---|
| Test Mode : | EDGE class 8 Link (8PSK) | Relative Humidity : | 48~52% |
| Test Engineer : | Jeff Yao | Polarization : | Vertical |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |

| 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 |
|---|---|---|---|---|---|---|---|---|---|
| 1648.4 | -47.13 | -13 | -34.13 | -51.73 | -53.82 | 0.56 | 9.40 | V | Pass |
| 2472.6 | -57.65 | -13 | -44.65 | -62.03 | -65.35 | 0.75 | 10.60 | V | Pass |
| 3296.8 | -51.73 | -13 | -38.73 | -58.59 | -61.33 | 0.85 | 12.60 | V | Pass |

| Band : | GSM850 for CH189 | Temperature : | 23~25°C |
|---|---|---|---|
| Test Mode : | EDGE class 8 Link (8PSK) | Relative Humidity : | 48~52% |
| Test Engineer : | Jeff Yao | Polarization : | Horizontal |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |

| 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 | -53.20 | -13 | -40.20 | -54.69 | -59.89 | 0.56 | 9.40 | H | Pass |
| 2510 | -54.53 | -13 | -41.53 | -58.43 | -62.23 | 0.75 | 10.60 | H | Pass |
| 3346 | -55.41 | -13 | -42.41 | -64.71 | -65.01 | 0.85 | 12.60 | H | Pass |

| Band : | GSM850 for CH189 | Temperature : | 23~25°C |
|---|---|---|---|
| Test Mode : | EDGE class 8 Link (8PSK) | Relative Humidity : | 48~52% |
| Test Engineer : | Jeff Yao | Polarization : | Vertical |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |

| 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 | -50.17 | -13 | -37.17 | -54.13 | -56.86 | 0.56 | 9.40 | V | Pass |
| 2510 | -51.65 | -13 | -38.65 | -56.58 | -59.35 | 0.75 | 10.60 | V | Pass |
| 3346 | -55.73 | -13 | -42.73 | -62.59 | -65.33 | 0.85 | 12.60 | V | Pass |

| Band : | GSM850 for CH251 | Temperature : | 23~25°C |
|---|---|---|---|
| Test Mode : | EDGE class 8 Link (8PSK) | Relative Humidity : | 48~52% |
| Test Engineer : | Jeff Yao | Polarization : | Horizontal |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |

| 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 |
|---|---|---|---|---|---|---|---|---|---|
| 1697.6 | -49.11 | -13 | -36.11 | -51.78 | -55.80 | 0.56 | 9.40 | H | Pass |
| 2546.4 | -56.87 | -13 | -43.87 | -60.77 | -64.57 | 0.75 | 10.60 | H | Pass |
| 3395.2 | -56.15 | -13 | -43.15 | -65.45 | -65.75 | 0.85 | 12.60 | H | Pass |

| Band : | GSM850 for CH251 | Temperature : | 23~25°C |
|---|---|---|---|
| Test Mode : | EDGE class 8 Link (8PSK) | Relative Humidity : | 48~52% |
| Test Engineer : | Jeff Yao | Polarization : | Vertical |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |

| 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 |
|---|---|---|---|---|---|---|---|---|---|
| 1697.6 | -47.59 | -13 | -34.59 | -51.98 | -54.28 | 0.56 | 9.40 | V | Pass |
| 2546.4 | -56.44 | -13 | -43.44 | -60.82 | -64.14 | 0.75 | 10.60 | V | Pass |
| 3395.2 | -58.02 | -13 | -45.02 | -64.88 | -67.62 | 0.85 | 12.60 | V | Pass |

| Band : | GSM1900 for CH512 | Temperature : | 23~25°C |
|---|---|---|---|
| Test Mode : | GSM Link (GMSK) | Relative Humidity : | 48~52% |
| Test Engineer : | Jeff Yao | Polarization : | Horizontal |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |

| 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 |
|---|---|---|---|---|---|---|---|---|---|
| 3700.4 | -39.38 | -13 | -26.38 | -55.84 | -46.12 | 1.28 | 8.02 | H | Pass |
| 5550.6 | -52.45 | -13 | -39.45 | -70.44 | -60.87 | 1.58 | 10.00 | H | Pass |
| 7400.8 | -53.77 | -13 | -40.77 | -75.71 | -64.09 | 1.78 | 12.10 | H | Pass |

| Band : | GSM1900 for CH512 | Temperature : | 23~25°C |
|---|---|---|---|
| Test Mode : | GSM Link (GMSK) | Relative Humidity : | 48~52% |
| Test Engineer : | Jeff Yao | Polarization : | Vertical |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |

| 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 |
|---|---|---|---|---|---|---|---|---|---|
| 3700.4 | -35.43 | -13 | -22.43 | -53.19 | -42.17 | 1.28 | 8.02 | V | Pass |
| 5550.6 | -49.20 | -13 | -36.20 | -66.28 | -57.62 | 1.58 | 10 | V | Pass |
| 7400.8 | -53.08 | -13 | -40.08 | -75.33 | -63.40 | 1.78 | 12.1 | V | Pass |

| Band : | GSM1900 for CH661 | Temperature : | 23~25°C |
|---|---|---|---|
| Test Mode : | GSM Link (GMSK) | Relative Humidity : | 48~52% |
| Test Engineer : | Jeff Yao | Polarization : | Horizontal |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |

| 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 | -54.21 | -13 | -41.21 | -66.36 | -60.95 | 1.28 | 8.02 | H | Pass |
| 5640 | -51.30 | -13 | -38.30 | -69.29 | -59.72 | 1.58 | 10.00 | H | Pass |
| 7520 | -53.30 | -13 | -40.30 | -75.24 | -63.62 | 1.78 | 12.10 | H | Pass |

| Band : | GSM1900 for CH661 | Temperature : | 23~25°C |
|---|---|---|---|
| Test Mode : | GSM Link (GMSK) | Relative Humidity : | 48~52% |
| Test Engineer : | Jeff Yao | Polarization : | Vertical |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |

| 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 | -51.17 | -13 | -38.17 | -66.2 | -57.91 | 1.28 | 8.02 | V | Pass |
| 5640 | -53.19 | -13 | -40.19 | -70.27 | -61.61 | 1.58 | 10 | V | Pass |
| 7520 | -52.65 | -13 | -39.65 | -74.9 | -62.97 | 1.78 | 12.1 | V | Pass |

| Band : | GSM1900 for CH810 | Temperature : | 23~25°C |
|---|---|---|---|
| Test Mode : | GSM Link (GMSK) | Relative Humidity : | 48~52% |
| Test Engineer : | Jeff Yao | Polarization : | Horizontal |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |

| 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 |
|---|---|---|---|---|---|---|---|---|---|
| 3819.6 | -47.20 | -13 | -34.20 | -61.62 | -53.94 | 1.28 | 8.02 | H | Pass |
| 5729.4 | -51.67 | -13 | -38.67 | -69.66 | -60.09 | 1.58 | 10.00 | H | Pass |
| 7639.2 | -53.74 | -13 | -40.74 | -75.68 | -64.06 | 1.78 | 12.10 | H | Pass |

| Band : | GSM1900 for CH810 | Temperature : | 23~25°C |
|---|---|---|---|
| Test Mode : | GSM Link (GMSK) | Relative Humidity : | 48~52% |
| Test Engineer : | Jeff Yao | Polarization : | Vertical |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |

| 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 |
|---|---|---|---|---|---|---|---|---|---|
| 3819.6 | -47.12 | -13 | -34.12 | -62.15 | -53.86 | 1.28 | 8.02 | V | Pass |
| 5729.4 | -50.71 | -13 | -37.71 | -67.79 | -59.13 | 1.58 | 10 | V | Pass |
| 7639.2 | -53.70 | -13 | -40.70 | -75.95 | -64.02 | 1.78 | 12.1 | V | Pass |

| Band : | GSM1900 for CH512 | Temperature : | 23~25°C |
|---|---|---|---|
| Test Mode : | EDGE class 8 Link (8PSK) | Relative Humidity : | 48~52% |
| Test Engineer : | Jeff Yao | Polarization : | Horizontal |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |

| 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 |
|---|---|---|---|---|---|---|---|---|---|
| 3700.4 | -60.17 | -13 | -47.17 | -72.32 | -66.91 | 1.28 | 8.02 | H | Pass |
| 5550.6 | -55.94 | -13 | -42.94 | -73.93 | -64.36 | 1.58 | 10.00 | H | Pass |
| 7400.8 | -53.81 | -13 | -40.81 | -75.75 | -64.13 | 1.78 | 12.10 | H | Pass |

| Band : | GSM1900 for CH512 | Temperature : | 23~25°C |
|---|---|---|---|
| Test Mode : | EDGE class 8 Link (8PSK) | Relative Humidity : | 48~52% |
| Test Engineer : | Jeff Yao | Polarization : | Vertical |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |

| 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 |
|---|---|---|---|---|---|---|---|---|---|
| 3700.4 | -54.63 | -13 | -41.63 | -69.66 | -61.37 | 1.28 | 8.02 | V | Pass |
| 5550.6 | -54.98 | -13 | -41.98 | -72.06 | -63.40 | 1.58 | 10 | V | Pass |
| 7400.8 | -51.86 | -13 | -38.86 | -74.11 | -62.18 | 1.78 | 12.1 | V | Pass |

| Band : | GSM1900 for CH661 | Temperature : | 23~25°C |
|---|---|---|---|
| Test Mode : | EDGE class 8 Link (8PSK) | Relative Humidity : | 48~52% |
| Test Engineer : | Jeff Yao | Polarization : | Horizontal |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |

| 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 | -60.43 | -13 | -47.43 | -72.58 | -67.17 | 1.28 | 8.02 | H | Pass |
| 5640 | -54.77 | -13 | -41.77 | -72.76 | -63.19 | 1.58 | 10.00 | H | Pass |
| 7520 | -53.06 | -13 | -40.06 | -75.00 | -63.38 | 1.78 | 12.10 | H | Pass |

| Band : | GSM1900 for CH661 | Temperature : | 23~25°C |
|---|---|---|---|
| Test Mode : | EDGE class 8 Link (8PSK) | Relative Humidity : | 48~52% |
| Test Engineer : | Jeff Yao | Polarization : | Vertical |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |

| 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 | -58.03 | -13 | -45.03 | -73.06 | -64.77 | 1.28 | 8.02 | V | Pass |
| 5640 | -52.67 | -13 | -39.67 | -69.75 | -61.09 | 1.58 | 10 | V | Pass |
| 7520 | -53.24 | -13 | -40.24 | -75.49 | -63.56 | 1.78 | 12.1 | V | Pass |

| Band : | GSM1900 for CH810 | Temperature : | 23~25°C |
|---|---|---|---|
| Test Mode : | EDGE class 8 Link (8PSK) | Relative Humidity : | 48~52% |
| Test Engineer : | Jeff Yao | Polarization : | Horizontal |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |

| 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 |
|---|---|---|---|---|---|---|---|---|---|
| 3819.6 | -59.77 | -13 | -46.77 | -71.92 | -66.51 | 1.28 | 8.02 | H | Pass |
| 5729.4 | -55.27 | -13 | -42.27 | -73.26 | -63.69 | 1.58 | 10.00 | H | Pass |
| 7639.2 | -52.81 | -13 | -39.81 | -74.75 | -63.13 | 1.78 | 12.10 | H | Pass |

| Band : | GSM1900 for CH810 | Temperature : | 23~25°C |
|---|---|---|---|
| Test Mode : | EDGE class 8 Link (8PSK) | Relative Humidity : | 48~52% |
| Test Engineer : | Jeff Yao | Polarization : | Vertical |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |

| 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 |
|---|---|---|---|---|---|---|---|---|---|
| 3819.6 | -55.94 | -13 | -42.94 | -70.97 | -62.68 | 1.28 | 8.02 | V | Pass |
| 5729.4 | -56.45 | -13 | -43.45 | -73.53 | -64.87 | 1.58 | 10 | V | Pass |
| 7639.2 | -53.35 | -13 | -40.35 | -75.6 | -63.67 | 1.78 | 12.1 | V | Pass |

| Band : | WCDMA Band V for CH4132 | Temperature : | 23~25°C |
|---|---|---|---|
| Test Mode : | RMC 12.2Kbps Link (QPSK) | Relative Humidity : | 48~52% |
| Test Engineer : | Jeff Yao | Polarization : | Horizontal |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |

| 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 |
|---|---|---|---|---|---|---|---|---|---|
| 1652.8 | -59.07 | -13 | -46.07 | -60.68 | -65.76 | 0.56 | 9.40 | H | Pass |
| 2479.2 | -60.17 | -13 | -47.17 | -64.07 | -67.87 | 0.75 | 10.60 | H | Pass |
| 3305.6 | -55.82 | -13 | -42.82 | -65.12 | -65.42 | 0.85 | 12.60 | H | Pass |

| Band : | WCDMA Band V for CH4132 | Temperature : | 23~25°C |
|---|---|---|---|
| Test Mode : | RMC 12.2Kbps Link (QPSK) | Relative Humidity : | 48~52% |
| Test Engineer : | Jeff Yao | Polarization : | Vertical |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |

| 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 |
|---|---|---|---|---|---|---|---|---|---|
| 1652.8 | -58.90 | -13 | -45.90 | -61.35 | -65.59 | 0.56 | 9.40 | V | Pass |
| 2479.2 | -59.68 | -13 | -46.68 | -64.06 | -67.38 | 0.75 | 10.60 | V | Pass |
| 3305.6 | -57.87 | -13 | -44.87 | -64.73 | -67.47 | 0.85 | 12.60 | V | Pass |

| Band : | WCDMA Band V for CH4182 | Temperature : | 23~25°C |
|---|---|---|---|
| Test Mode : | RMC 12.2Kbps Link (QPSK) | Relative Humidity : | 48~52% |
| Test Engineer : | Jeff Yao | Polarization : | Horizontal |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |

| 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 | -60.00 | -13 | -47.00 | -61.61 | -66.69 | 0.56 | 9.40 | H | Pass |
| 2510 | -59.63 | -13 | -46.63 | -63.53 | -67.33 | 0.75 | 10.60 | H | Pass |
| 3346 | -56.74 | -13 | -43.74 | -66.04 | -66.34 | 0.85 | 12.60 | H | Pass |

| Band : | WCDMA Band V for CH4182 | Temperature : | 23~25°C |
|---|---|---|---|
| Test Mode : | RMC 12.2Kbps Link (QPSK) | Relative Humidity : | 48~52% |
| Test Engineer : | Jeff Yao | Polarization : | Vertical |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |

| 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 | -58.18 | -13 | -45.18 | -60.63 | -64.87 | 0.56 | 9.40 | V | Pass |
| 2510 | -60.22 | -13 | -47.22 | -64.60 | -67.92 | 0.75 | 10.60 | V | Pass |
| 3346 | -58.97 | -13 | -45.97 | -65.83 | -68.57 | 0.85 | 12.60 | V | Pass |

| Band : | WCDMA Band V for CH4233 | Temperature : | 23~25°C |
|---|---|---|---|
| Test Mode : | RMC 12.2Kbps Link (QPSK) | Relative Humidity : | 48~52% |
| Test Engineer : | Jeff Yao | Polarization : | Horizontal |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |

| 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 |
|---|---|---|---|---|---|---|---|---|---|
| 1693.2 | -54.49 | -13 | -41.49 | -56.10 | -61.18 | 0.56 | 9.40 | H | Pass |
| 2539.8 | -59.97 | -13 | -46.97 | -63.87 | -67.67 | 0.75 | 10.60 | H | Pass |
| 3386.4 | -55.49 | -13 | -42.49 | -64.79 | -65.09 | 0.85 | 12.60 | H | Pass |

| Band : | WCDMA Band V for CH4233 | Temperature : | 23~25°C |
|---|---|---|---|
| Test Mode : | RMC 12.2Kbps Link (QPSK) | Relative Humidity : | 48~52% |
| Test Engineer : | Jeff Yao | Polarization : | Vertical |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |

| 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 |
|---|---|---|---|---|---|---|---|---|---|
| 1693.2 | -51.90 | -13 | -38.90 | -55.20 | -58.59 | 0.56 | 9.40 | V | Pass |
| 2539.8 | -59.37 | -13 | -46.37 | -63.75 | -67.07 | 0.75 | 10.60 | V | Pass |
| 3386.4 | -58.47 | -13 | -45.47 | -65.33 | -68.07 | 0.85 | 12.60 | V | Pass |

| Band : | WCDMA Band IV for CH1312 | Temperature : | 23~25°C |
|---|---|---|---|
| Test Mode : | RMC 12.2Kbps Link (QPSK) | Relative Humidity : | 48~52% |
| Test Engineer : | Jeff Yao | Polarization : | Horizontal |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |

| 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 |
|---|---|---|---|---|---|---|---|---|---|
| 3424.80 | -60.26 | -13 | -47.26 | -71.34 | -38.20 | 1.15 | 7.54 | H | Pass |
| 5137.20 | -54.56 | -13 | -41.56 | -73.52 | -68.60 | 1.51 | 9.80 | H | Pass |
| 6849.60 | -51.13 | -13 | -38.13 | -74.75 | -67.90 | 1.75 | 11.51 | H | Pass |

| Band : | WCDMA Band IV for CH1312 | Temperature : | 23~25°C |
|---|---|---|---|
| Test Mode : | RMC 12.2Kbps Link (QPSK) | Relative Humidity : | 48~52% |
| Test Engineer : | Jeff Yao | Polarization : | Vertical |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |

| 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 |
|---|---|---|---|---|---|---|---|---|---|
| 3424.80 | -58.69 | -13 | -45.69 | -71.55 | -43.20 | 1.15 | 7.54 | V | Pass |
| 5137.20 | -53.71 | -13 | -40.71 | -73.11 | -70.30 | 1.51 | 9.80 | V | Pass |
| 6849.60 | -51.41 | -13 | -38.41 | -74.74 | -64.60 | 1.75 | 11.51 | V | Pass |

| Band : | WCDMA Band IV for CH1413 | Temperature : | 23~25°C |
|---|---|---|---|
| Test Mode : | RMC 12.2Kbps Link (QPSK) | Relative Humidity : | 48~52% |
| Test Engineer : | Jeff Yao | Polarization : | Horizontal |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |

| 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 |
|---|---|---|---|---|---|---|---|---|---|
| 3465.00 | -60.23 | -13 | -47.23 | -71.31 | -38.20 | 1.15 | 7.54 | H | Pass |
| 5197.50 | -53.65 | -13 | -40.65 | -72.61 | -68.60 | 1.51 | 9.80 | H | Pass |
| 6930.00 | -51.04 | -13 | -38.04 | -74.66 | -67.90 | 1.75 | 11.51 | H | Pass |

| Band : | WCDMA Band IV for CH1413 | Temperature : | 23~25°C |
|---|---|---|---|
| Test Mode : | RMC 12.2Kbps Link (QPSK) | Relative Humidity : | 48~52% |
| Test Engineer : | Jeff Yao | Polarization : | Vertical |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |

| 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 |
|---|---|---|---|---|---|---|---|---|---|
| 3465.00 | -58.47 | -13 | -45.47 | -71.33 | -43.20 | 1.15 | 7.54 | V | Pass |
| 5197.50 | -53.55 | -13 | -40.55 | -72.95 | -70.30 | 1.51 | 9.80 | V | Pass |
| 6930.00 | -50.17 | -13 | -37.17 | -73.5 | -64.60 | 1.75 | 11.51 | V | Pass |

| Band : | WCDMA Band IV for CH1513 | Temperature : | 23~25°C |
|---|---|---|---|
| Test Mode : | RMC 12.2Kbps Link (QPSK) | Relative Humidity : | 48~52% |
| Test Engineer : | Jeff Yao | Polarization : | Horizontal |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |

| 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 |
|---|---|---|---|---|---|---|---|---|---|
| 3505.20 | -60.17 | -13 | -47.17 | -71.25 | -38.20 | 1.15 | 7.54 | H | Pass |
| 5257.80 | -54.54 | -13 | -41.54 | -73.50 | -68.60 | 1.51 | 9.80 | H | Pass |
| 7010.40 | -51.66 | -13 | -38.66 | -75.28 | -67.90 | 1.75 | 11.51 | H | Pass |

| Band : | WCDMA Band IV for CH1513 | Temperature : | 23~25°C |
|---|---|---|---|
| Test Mode : | RMC 12.2Kbps Link (QPSK) | Relative Humidity : | 48~52% |
| Test Engineer : | Jeff Yao | Polarization : | Vertical |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |

| 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 |
|---|---|---|---|---|---|---|---|---|---|
| 3505.20 | -58.89 | -13 | -45.89 | -71.75 | -43.20 | 1.15 | 7.54 | V | Pass |
| 5257.80 | -53.91 | -13 | -40.91 | -73.31 | -70.30 | 1.51 | 9.80 | V | Pass |
| 7010.40 | -51.83 | -13 | -38.83 | -75.16 | -64.60 | 1.75 | 11.51 | V | Pass |

| Band : | WCDMA Band II for CH9296 | Temperature : | 23~25°C |
|---|---|---|---|
| Test Mode : | RMC 12.2Kbps Link (QPSK) | Relative Humidity : | 48~52% |
| Test Engineer : | Jeff Yao | Polarization : | Horizontal |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |

| 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 |
|---|---|---|---|---|---|---|---|---|---|
| 3700.4 | -59.79 | -13 | -46.79 | -71.94 | -66.53 | 1.28 | 8.02 | H | Pass |
| 5550.6 | -55.46 | -13 | -42.46 | -73.45 | -63.88 | 1.58 | 10.00 | H | Pass |
| 7400.8 | -53.53 | -13 | -40.53 | -75.47 | -63.85 | 1.78 | 12.10 | H | Pass |

| Band : | WCDMA Band II for CH9296 | Temperature : | 23~25°C |
|---|---|---|---|
| Test Mode : | RMC 12.2Kbps Link (QPSK) | Relative Humidity : | 48~52% |
| Test Engineer : | Jeff Yao | Polarization : | Vertical |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |

| 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 |
|---|---|---|---|---|---|---|---|---|---|
| 3700.4 | -57.84 | -13 | -44.84 | -72.87 | -64.58 | 1.28 | 8.02 | V | Pass |
| 5550.6 | -56.57 | -13 | -43.57 | -73.65 | -64.99 | 1.58 | 10 | V | Pass |
| 7400.8 | -53.20 | -13 | -40.20 | -75.45 | -63.52 | 1.78 | 12.1 | V | Pass |

| Band : | WCDMA Band II for CH9400 | Temperature : | 23~25°C |
|---|---|---|---|
| Test Mode : | RMC 12.2Kbps Link (QPSK) | Relative Humidity : | 48~52% |
| Test Engineer : | Jeff Yao | Polarization : | Horizontal |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |

| 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 | -60.47 | -13 | -47.47 | -72.62 | -67.21 | 1.28 | 8.02 | H | Pass |
| 5640 | -54.80 | -13 | -41.80 | -72.79 | -63.22 | 1.58 | 10.00 | H | Pass |
| 7520 | -53.69 | -13 | -40.69 | -75.63 | -64.01 | 1.78 | 12.10 | H | Pass |

| Band : | WCDMA Band II for CH9400 | Temperature : | 23~25°C |
|---|---|---|---|
| Test Mode : | RMC 12.2Kbps Link (QPSK) | Relative Humidity : | 48~52% |
| Test Engineer : | Jeff Yao | Polarization : | Vertical |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |

| 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 | -57.09 | -13 | -44.09 | -72.12 | -63.83 | 1.28 | 8.02 | V | Pass |
| 5640 | -56.53 | -13 | -43.53 | -73.61 | -64.95 | 1.58 | 10 | V | Pass |
| 7520 | -53.27 | -13 | -40.27 | -75.52 | -63.59 | 1.78 | 12.1 | V | Pass |

| Band : | WCDMA Band II for CH9538 | Temperature : | 23~25°C |
|---|---|---|---|
| Test Mode : | RMC 12.2Kbps Link (QPSK) | Relative Humidity : | 48~52% |
| Test Engineer : | Jeff Yao | Polarization : | Horizontal |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |

| 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 |
|---|---|---|---|---|---|---|---|---|---|
| 3819.6 | -61.04 | -13 | -48.04 | -73.19 | -67.78 | 1.28 | 8.02 | H | Pass |
| 5729.4 | -55.56 | -13 | -42.56 | -73.55 | -63.98 | 1.58 | 10.00 | H | Pass |
| 7639.2 | -53.84 | -13 | -40.84 | -75.78 | -64.16 | 1.78 | 12.10 | H | Pass |

| Band : | WCDMA Band II for CH9538 | Temperature : | 23~25°C |
|---|---|---|---|
| Test Mode : | RMC 12.2Kbps Link (QPSK) | Relative Humidity : | 48~52% |
| Test Engineer : | Jeff Yao | Polarization : | Vertical |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |

| 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 |
|---|---|---|---|---|---|---|---|---|---|
| 3819.6 | -58.03 | -13 | -45.03 | -73.06 | -64.77 | 1.28 | 8.02 | V | Pass |
| 5729.4 | -56.39 | -13 | -43.39 | -73.47 | -64.81 | 1.58 | 10 | V | Pass |
| 7639.2 | -52.88 | -13 | -39.88 | -75.13 | -63.20 | 1.78 | 12.1 | V | Pass |

# 3.8 Frequency Stability Measurement

## 3.8.1 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.

## 3.8.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

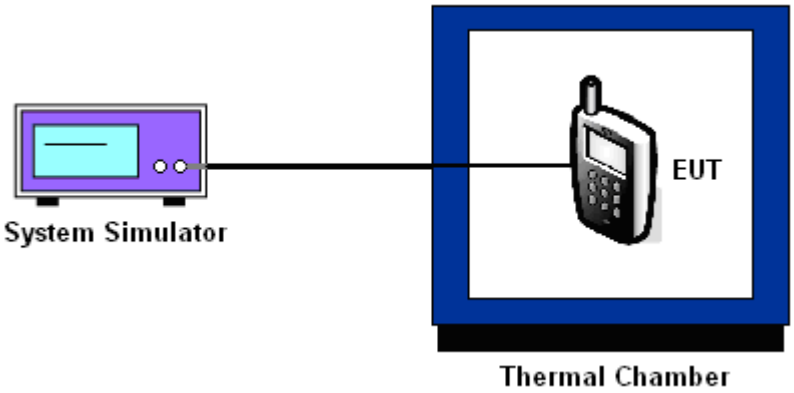
## 3.8.3 Test Procedures for Temperature Variation

1. The testing follows FCC KDB 971168 v02r02 Section 9.0.
2. The EUT was set up in the thermal chamber and connected with the system simulator.
3. With power OFF, the temperature was decreased to -30°C and the EUT was stabilized before testing. Power was applied and the maximum change in frequency was recorded within one minute.
4. With power OFF, the temperature was raised in 10°C steps 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.

## 3.8.4 Test Procedures for Voltage Variation

1. The testing follows FCC KDB 971168 v02r02 Section 9.0.
2. The EUT was placed in a temperature chamber at 25±5° C and connected with the system simulator.
3. The power supply voltage to the EUT was varied from BEP to 115% of the nominal value measured at the input to the EUT.
4. The variation in frequency was measured for the worst case.

### 3.8.5 Test Setup



### 3.8.6 Test Result of Temperature Variation

| Band : | GSM 850 | Channel : | 189 |
|---|---|---|---|
| Limit (ppm) : | 2.5 | Frequency : | 836.4 MHz |

| Temperature (°C) | GSM | EDGE class 8 | Result |
|---|---|---|---|
| | Deviation (ppm) | Deviation (ppm) | |
| 50 | 0.0060 | 0.0072 | PASS |
| 40 | 0.0036 | 0.0048 | |
| 30 | 0.0024 | 0.0024 | |
| 20(Ref.) | 0.0000 | 0.0000 | |
| 10 | 0.0012 | 0.0036 | |
| 0 | 0.0024 | 0.0024 | |
| -10 | 0.0048 | 0.0048 | |
| -20 | 0.0072 | 0.0072 | |
| -30 | 0.0084 | 0.0108 | |

| Band : | GSM 1900 | Channel : | 661 |
|---|---|---|---|
| Limit (ppm) : | within authorized band | Frequency : | 1880.0 MHz |

| Temperature (°C) | GSM | EDGE class 8 | Result |
|---|---|---|---|
| | Deviation (ppm) | Deviation (ppm) | |
| 50 | 0.0059 | 0.0032 | PASS |
| 40 | 0.0032 | 0.0021 | |
| 30 | 0.0016 | 0.0005 | |
| 20(Ref.) | 0.0000 | 0.0000 | |
| 10 | 0.0027 | 0.0011 | |
| 0 | 0.0048 | 0.0016 | |
| -10 | 0.0037 | 0.0011 | |
| -20 | 0.0085 | 0.0027 | |
| -30 | 0.0101 | 0.0037 | |

Note: The frequency fundamental emissions stay within the authorized frequency block based on the frequency deviation measured is small.

| Band : | WCDMA Band V | Channel : | 4182 |
|---|---|---|---|
| Limit (ppm) : | 2.5 | Frequency : | 836.4 MHz |

| Temperature (°C) | RMC 12.2Kbps | Result |
|---|---|---|
| | Deviation (ppm) | |
| 50 | 0.0084 | PASS |
| 40 | 0.0036 | |
| 30 | 0.0024 | |
| 20(Ref.) | 0.0000 | |
| 10 | 0.0024 | |
| 0 | 0.0012 | |
| -10 | 0.0060 | |
| -20 | 0.0096 | |
| -30 | 0.0132 | |

| Band : | WCDMA Band IV | Channel : | 1413 |
|---|---|---|---|
| Limit (ppm) : | within authorized band | Frequency : | 1732.6 MHz |

| Temperature (°C) | RMC 12.2Kbps | Result |
|---|---|---|
| | Deviation (ppm) | |
| 50 | 0.0052 | PASS |
| 40 | 0.0046 | |
| 30 | 0.0017 | |
| 20(Ref.) | 0.0000 | |
| 10 | 0.0006 | |
| 0 | 0.0035 | |
| -10 | 0.0029 | |
| -20 | 0.0058 | |
| -30 | 0.0081 | |

Note: The frequency fundamental emissions stay within the authorized frequency block based on the frequency deviation measured is small.

| Band : | WCDMA Band II | Channel : | 9400 |
|---|---|---|---|
| Limit (ppm) : | within authorized band | Frequency : | 1880.0 MHz |

| Temperature (°C) | RMC 12.2Kbps | Result |
|---|---|---|
| | Deviation (ppm) | |
| 50 | 0.0037 | PASS |
| 40 | 0.0021 | |
| 30 | 0.0005 | |
| 20(Ref.) | 0.0000 | |
| 10 | 0.0005 | |
| 0 | 0.0016 | |
| -10 | 0.0011 | |
| -20 | 0.0037 | |
| -30 | 0.0059 | |

Note: The frequency fundamental emissions stay within the authorized frequency block based on the frequency deviation measured is small.

### 3.8.7 Test Result of Voltage Variation

| Band & Channel | Mode | Voltage (Volt) | Deviation (ppm) | Limit (ppm) | Result |
|---|---|---|---|---|---|
| GSM 850 CH189 | GSM | 4.35 | 0.0012 | 2.5 | PASS |
| | | 3.80 | 0.0000 | | |
| | | BEP | 0.0012 | | |
| | EDGE class 8 | 4.35 | 0.0012 | | |
| | | 3.80 | 0.0000 | | |
| | | BEP | 0.0024 | | |
| GSM 1900 CH661 | GSM | 4.35 | 0.0016 | (Note 3.) | |
| | | 3.80 | 0.0000 | | |
| | | BEP | 0.0011 | | |
| | EDGE class 8 | 4.35 | 0.0005 | | |
| | | 3.80 | 0.0000 | | |
| | | BEP | 0.0005 | | |
| WCDMA Band V CH4182 | RMC 12.2Kbps | 4.35 | 0.0024 | 2.5 | |
| | | 3.80 | 0.0000 | | |
| | | BEP | 0.0024 | | |
| WCDMA Band IV CH1413 | RMC 12.2Kbps | 4.35 | 0.0012 | (Note 3.) | |
| | | 3.80 | 0.0000 | | |
| | | BEP | 0.0023 | | |
| WCDMA Band II CH9400 | RMC 12.2Kbps | 4.35 | 0.0005 | (Note 3.) | |
| | | 3.80 | 0.0000 | | |
| | | BEP | 0.0011 | | |

**Note:**

1. Normal Voltage = 3.80V.
2. Battery End Point (BEP) = 3.45 V.
3. The frequency fundamental emissions stay within the authorized frequency block based on the frequency deviation measured is small.

# 4 List of Measuring Equipment

| Instrument | Manufacturer | Model No. | Serial No. | Characteristics | Calibration Date | Test Date | Due Date | Remark |
|---|---|---|---|---|---|---|---|---|
| Spectrum Analyzer | R&S | FSV40 | 101078 | 9kHz~40GHz | May 05, 2015 | Jun. 20, 2015~ Jun. 23, 2015 | May 04, 2016 | Conducted (TH01-SZ) |
| Spectrum Analyzer | R&S | FSP30 | 101400 | 9kHz~30GHz | Jan. 28, 2015 | Jun. 20, 2015~ Jun. 23, 2015 | Jan. 27, 2016 | Conducted (TH01-SZ) |
| Thermal Chamber | Ten Billion | LP-150U | H2014081803 | -40~+150°C | Sep. 16, 2014 | Jun. 20, 2015~ Jun. 23, 2015 | Sep. 15, 2015 | Conducted (TH01-SZ) |
| EMI Test Receiver&SA | Agilent Technologies | N9038A | MY52260185 | 20Hz~26.5GHz | May 26, 2015 | Jun. 25, 2015~ Jul. 10, 2015 | May 25, 2016 | Radiation (03CH01-SZ) |
| Spectrum Analyzer | R&S | FSV40 | 101041 | 10kHz~40GHz;Max 30dBm | Sep. 25, 2014 | Jun. 25, 2015~ Jul. 10, 2015 | Sep. 24, 2015 | Radiation (03CH01-SZ) |
| Bilog Antenna | TeseQ | CBL6112D | 23188 | 30MHz~2GHz | Nov. 07, 2014 | Jun. 25, 2015~ Jul. 10, 2015 | Nov. 06, 2015 | Radiation (03CH01-SZ) |
| Double Ridge Horn Antenna | SCHWARZBECK | BBHA 9120D | 9120D-1285 | 1GHz~18GHz | Jan. 20, 2015 | Jun. 25, 2015~ Jul. 10, 2015 | Jan. 19, 2016 | Radiation (03CH01-SZ) |
| SHF-EHF Horn | com-power | AH-840 | 101071 | 18GHz~40GHz | Sep. 04, 2014 | Jun. 25, 2015~ Jul. 10, 2015 | Sep. 03, 2015 | Radiation (03CH01-SZ) |
| Amplifier | ADVANTEST | BB525C | E9007003 | 9kHz~3000MHz / 30 dB | Jan. 28, 2015 | Jun. 25, 2015~ Jul. 10, 2015 | Jan. 27, 2016 | Radiation (03CH01-SZ) |
| Amplifier | Yiai | AV3860B | 04030 | 2GHz~26.5GHz | May 05, 2015 | Jun. 25, 2015~ Jul. 10, 2015 | May 04, 2016 | Radiation (03CH01-SZ) |
| Amplifier | Agilent Technologies | 83017A | MY39501302 | 500MHz~26.5GHz | Jan. 28, 2015 | Jun. 25, 2015~ Jul. 10, 2015 | Jan. 27, 2016 | Radiation (03CH01-SZ) |
| AC Power Source | Chroma | 61601 | 616010001985 | N/A | NCR | Jun. 25, 2015~ Jul. 10, 2015 | NCR | Radiation (03CH01-SZ) |
| Turn Table | EM | EM1000 | N/A | 0~360 degree | NCR | Jun. 25, 2015~ Jul. 10, 2015 | NCR | Radiation (03CH01-SZ) |
| Antenna Mast | EM | EM1000 | N/A | 1 m~4 m | NCR | Jun. 25, 2015~ Jul. 10, 2015 | NCR | Radiation (03CH01-SZ) |

# 5 Uncertainty of Evaluation

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

| | |
|---|---|
| **Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))** | **3.9dB** |