

FCC RF Test Report

APPLICANT : flaik Sports North America Inc
EQUIPMENT : 2G/3G GPS Tracking Device
BRAND NAME : flaik
MODEL NAME : GEN 2 HW2004
MARKETING NAME : flaik Gen2 HW2004
FCC ID : 2AAXAG2HW2004
STANDARD : FCC 47 CFR Part 2, 22(H), 24(E), 27(L)
CLASSIFICATION : PCS Licensed Transmitter (PCB)

The product was received on Oct. 31, 2013 and testing was completed on Dec. 08, 2013. We, SPORTON INTERNATIONAL (SHENZHEN) INC., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI / TIA / EIA-603-C-2004 and shown to be compliant 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



SPORTON INTERNATIONAL (SHENZHEN) INC.

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TABLE OF CONTENTS

| | |
|---|------------|
| REVISION HISTORY..... | 3 |
| SUMMARY OF TEST RESULT | 4 |
| 1 GENERAL DESCRIPTION | 5 |
| 1.1 Applicant..... | 5 |
| 1.2 Manufacturer | 5 |
| 1.3 Feature of Equipment Under Test..... | 5 |
| 1.4 Product Specification of Equipment Under Test | 6 |
| 1.5 Modification of EUT | 7 |
| 1.6 Maximum ERP/EIRP Power, Frequency Tolerance, and Emission Designator | 7 |
| 1.7 Testing Site | 7 |
| 1.8 Applied Standards | 8 |
| 2 TEST CONFIGURATION OF EQUIPMENT UNDER TEST | 9 |
| 2.1 Test Mode..... | 9 |
| 2.2 Connection Diagram of Test System | 10 |
| 2.3 Support Unit used in test configuration and system..... | 10 |
| 2.4 Measurement Results Explanation Example | 11 |
| 3 TEST RESULT | 12 |
| 3.1 Conducted Output Power Measurement..... | 12 |
| 3.2 Peak-to-Average Ratio | 14 |
| 3.3 Effective Radiated Power and Effective Isotropic Radiated Power Measurement | 24 |
| 3.4 Occupied Bandwidth and 26dB Bandwidth Measurement..... | 30 |
| 3.5 Band Edge Measurement..... | 54 |
| 3.6 Conducted Spurious Emission Measurement..... | 69 |
| 3.7 Field Strength of Spurious Radiation Measurement | 88 |
| 3.8 Frequency Stability Measurement..... | 104 |
| 4 LIST OF MEASURING EQUIPMENTS | 110 |
| 5 UNCERTAINTY OF EVALUATION | 111 |
| APPENDIX A. SETUP PHOTOGRAPHS | |

REVISION HISTORY

| REPORT NO. | VERSION | DESCRIPTION | ISSUED DATE |
|------------|---------|-------------------------|---------------|
| FG3O3103 | Rev. 01 | Initial issue of report | Dec. 09, 2013 |
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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) RSS-133 (6.4) RSS-139 (6.4) | Conducted Output Power | N/A | PASS | - |
| 3.2 | §24.232(d) §27.50(d)(5) | RSS-132 (5.4) RSS-133(6.4) RSS-139 (6.4) | Peak-to-Average Ratio | < 13 dB | PASS | - |
| 3.3 | §22.913(a)(2) | RSS-132(5.4) SRSP-503(5.1.3) | Effective Radiated Power | < 7 Watts | PASS | - |
| 3.3 | §24.232(c) | RSS-133 (6.4) SRSP-510(5.1.2) | Equivalent Isotropic Radiated Power | < 2 Watts | PASS | - |
| 3.3 | §27.50(d)(4) | RSS-139 (6.4) SRSP-513(5.1.2) | Equivalent Isotropic Radiated Power | < 1 Watts | PASS | - |
| 3.4 | §2.1049 §22.917(a) §24.238(b) §27.53(g) | RSS-GEN(4.6.1) RSS-133(6.5) RSS-139 (6.5) | Occupied Bandwidth | N/A | PASS | - |
| 3.5 | §2.1051 §22.917(a) §24.238(a) §27.53(g) | RSS-132 (5.5) RSS-133 (6.5) RSS-139 (6.5) | Band Edge Measurement | < 43+10log10(P[Watts]) | PASS | - |
| 3.6 | §2.1051 §22.917(a) §24.238(a) §27.53(g) | RSS-132 (5.5) RSS-133 (6.5) RSS-139 (6.5) | Conducted Emission | < 43+10log10(P[Watts]) | PASS | - |
| 3.7 | §2.1053 §22.917(a) §24.238(a) §27.53(g) | RSS-132 (5.5) RSS-133 (6.5) RSS-139 (6.5) | Field Strength of Spurious Radiation | < 43+10log10(P[Watts]) | PASS | Under limit 15.17 dB at 2510.000 MHz |
| 3.7.5 | §2.1055 §22.355 §24.235 §27.54 | RSS-132 (5.3) RSS-133 (6.3) RSS-139 (6.3) | Frequency Stability for Temperature & Voltage | < 2.5 ppm | PASS | - |



1 General Description

1.1 Applicant

flaik Sports North America Inc

521 Mills St, Lafayette, CO 80026, United States

1.2 Manufacturer

flaik Sports North America Inc

521 Mills St, Lafayette, CO 80026, United States

1.3 Feature of Equipment Under Test

| Product Feature | |
|---------------------------------|----------------------------|
| Equipment | 2G/3G GPS Tracking Device |
| Brand Name | flaik |
| Model Name | GEN 2 HW2004 |
| Marketing Name | flaik Gen2 HW2004 |
| FCC ID | 2AAXAG2HW2004 |
| EUT supports Radios application | GPRS/EGPRS/WCDMA |
| HW Version | 2004r11; HE910-NAG: 1 |
| SW Version | 4.00; HE910-NAG: 12.00.313 |
| EUT Stage | Identical Prototype |

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 of Equipment Under Test

| Product Specification subjective to this standard | |
|---|--|
| Tx Frequency | GSM850: 824.2 MHz ~ 848.8 MHz GSM1900: 1850.2 MHz ~ 1909.8MHz WCDMA Band V: 826.4 MHz ~ 846.6 MHz WCDMA Band IV : 1712.4 MHz ~ 1752.6 MHz WCDMA Band II: 1852.4 MHz ~ 1907.6 MHz |
| Rx Frequency | GSM850: 869.2 MHz ~ 893.8 MHz GSM1900: 1930.2 MHz ~ 1989.8 MHz WCDMA Band V: 871.4 MHz ~ 891.6 MHz WCDMA Band IV : 2112.4 MHz ~ 2152.6 MHz WCDMA Band II : 1932.4 MHz ~ 1987.6 MHz |
| Maximum Output Power to Antenna | GSM850 : 32.77 dBm GSM1900 : 29.49 dBm WCDMA Band V : 22.83 dBm WCDMA Band IV : 22.71 dBm WCDMA Band II : 22.67 dBm |
| Antenna Type | Chip Antenna |
| Type of Modulation | GPRS: GMSK EDGE: GMSK / 8PSK WCDMA: QPSK (Uplink) |

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 GPRS class 8 | GMSK | 0.35 | 0.02 ppm | 246KGXW |
| Part 22 | GSM850 EDGE class 8 | 8PSK | 0.11 | 0.02 ppm | 250KG7W |
| Part 22 | WCDMA Band V RMC 12.2Kbps | QPSK | 0.03 | 0.01 ppm | 4M68F9W |
| Part 24 | GSM1900 GPRS class 8 | GMSK | 1.68 | 0.01 ppm | 250KGXW |
| Part 24 | GSM1900 EDGE class 8 | 8PSK | 0.59 | 0.01 ppm | 248KG7W |
| Part 24 | WCDMA Band II RMC 12.2Kbps | QPSK | 0.28 | 0.01 ppm | 4M62F9W |
| Part 27 | WCDMA Band IV RMC 12.2Kbps | QPSK | 0.19 | 0.01 ppm | 4M64F9W |

1.7 Testing Site

| | | | |
|---------------------------|--|-----------|--------------------------------|
| 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.C. TEL: +86-755- 3320-2398 | | |
| Test Site No. | Sporton Site No. | | FCC/IC Registration No. |
| | TH01-SZ | 03CH01-SZ | 831040/4086F-1 |

1.8 Applied 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 v02r01
- ♦ IC RSS-132 Issue 3
- ♦ IC RSS-133 Issue 6
- ♦ IC RSS-139 Issue 2
- ♦ IC RSS-Gen Issue 3
- ♦ NOTICE 2012-DRS0126

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

During all testing, EUT is in link mode with base station emulator at maximum power level. The spurious emission measurements were carried out in semi-anechoic chamber with 3-meter test range.

Frequency range investigated for radiated emission is as follows:

1. 30 MHz to 9000 MHz for GSM850 and WCDMA Band V.
2. 30 MHz to 18000 MHz for WCDMA Band IV.
3. 30 MHz to 19000 MHz for GSM1900 and WCDMA Band II.

| Test Modes | | |
|---------------|--|--|
| Band | Radiated TCs | Conducted TCs |
| GSM 850 | <ul style="list-style-type: none"> ■ GPRS class 8 Link ■ EDGE class 8 Link | <ul style="list-style-type: none"> ■ GPRS class 8 Link ■ EDGE class 8 Link |
| GSM 1900 | <ul style="list-style-type: none"> ■ GPRS class 8 Link ■ EDGE class 8 Link | <ul style="list-style-type: none"> ■ GPRS class 8 Link ■ EDGE class 8 Link |
| WCDMA Band V | <ul style="list-style-type: none"> ■ RMC 12.2Kbps Link | <ul style="list-style-type: none"> ■ RMC 12.2Kbps Link |
| WCDMA Band IV | <ul style="list-style-type: none"> ■ RMC 12.2Kbps Link | <ul style="list-style-type: none"> ■ RMC 12.2Kbps Link |
| WCDMA Band II | <ul style="list-style-type: none"> ■ RMC 12.2Kbps Link | <ul style="list-style-type: none"> ■ RMC 12.2Kbps Link |

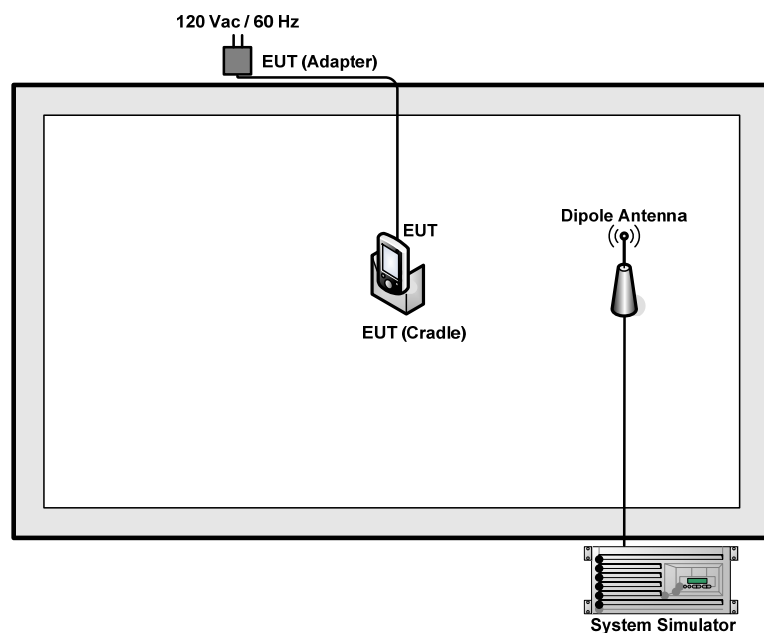
Note: The maximum power levels are GPRS multi-slot class 8 mode for GMSK link, EDGE multi-slot class 8 mode for 8PSK link, RMC 12.2Kbps mode for WCDMA band V, RMC 12.2Kbps mode for WCDMA band IV, and RMC 12.2Kbps mode for WCDMA band II, only these modes were used for all tests.

The conducted power tables are as follows:

| Conducted Power (*Unit: dBm) | | | | | | |
|------------------------------|--------|-------|-------|---------|-------|--------|
| Band | GSM850 | | | GSM1900 | | |
| Channel | 128 | 189 | 251 | 512 | 661 | 810 |
| Frequency | 824.2 | 836.4 | 848.8 | 1850.2 | 1880 | 1909.8 |
| GPRS (GMSK, 1 Tx slot) | 32.77 | 32.57 | 32.52 | 29.47 | 29.46 | 29.49 |
| EDGE (8PSK, 1 Tx slot) | 27.12 | 26.96 | 26.93 | 25.60 | 25.59 | 25.64 |

| 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 |
| RMC 12.2K | 22.83 | 22.62 | 22.39 | 22.56 | 22.64 | 22.67 | 22.71 | 22.46 | 22.33 |

2.2 Connection Diagram of Test System



2.3 Support Unit used in test configuration and system

| Item | Equipment | Trade Name | Model No. | FCC ID | Data Cable | Power Cord |
|------|------------------|------------|-----------|--------|------------|-------------------|
| 1. | System Simulator | Agilent | E5515C | N/A | N/A | Unshielded, 1.8 m |
| 2. | DC Power Supply | TOPWORD | 3303DR | N/A | N/A | N/A |

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 EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with cable loss 7 dB and 10dB attenuator.

Example :

$$\begin{aligned}\text{Offset(dB)} &= \text{RF cable loss(dB)} + \text{attenuator factor(dB)} \\ &= 7 + 10 = 17 \text{ (dB)}\end{aligned}$$

3 Test Result

3.1 Conducted Output Power Measurement

3.1.1 Description of the Conducted Output Power Measurement

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

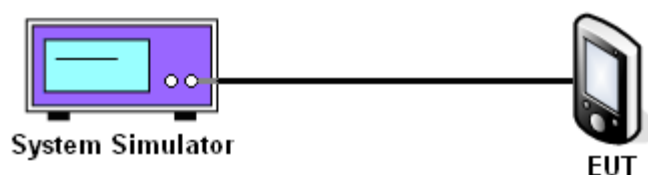
3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedures

1. The transmitter output port was connected to base station.
2. Set EUT at maximum power through base station.
3. Select lowest, middle, and highest channels for each band and different modulation.
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 (GPRS class 8) | | | 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) | 32.77 | 32.57 | 32.52 | 27.12 | 26.96 | 26.93 | 22.83 | 22.62 | 22.39 |
| Conducted Power (Watts) | 1.89 | 1.81 | 1.79 | 0.52 | 0.50 | 0.49 | 0.19 | 0.18 | 0.17 |

| PCS Band | | | | | | | | | |
|-------------------------------|------------------------|--------------|---------------|------------------------|--------------|---------------|------------------------------|---------------|----------------|
| Modes | GSM1900 (GPRS class 8) | | | 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) | 29.47 | 29.46 | 29.49 | 25.60 | 25.59 | 25.64 | 22.56 | 22.64 | 22.67 |
| Conducted Power (Watts) | 0.89 | 0.88 | 0.89 | 0.36 | 0.36 | 0.37 | 0.18 | 0.18 | 0.18 |

| 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) | 22.71 | 22.46 | 22.33 |
| Conducted Power (Watts) | 0.19 | 0.18 | 0.17 |

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.

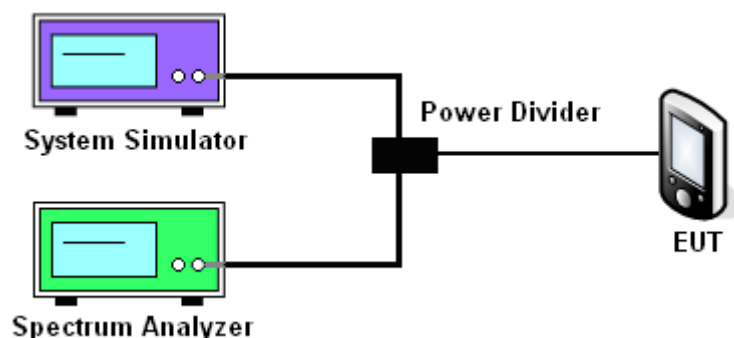
3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

1. The EUT was connected to Spectrum Analyzer and System Simulator via power divider.
2. For GSM/EGPRS operating modes:
 - a. Set EUT in maximum power output.
 - b. Set the RBW = 1MHz, VBW = 3MHz, Peak detector in spectrum analyzer for first trace.
 - c. Set the RBW = 1MHz, VBW = 3MHz, RMS detector in 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 synchronized with the spectrum analyzer.
3. For UMTS operating modes:
 - a. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
 - b. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1 %.
4. Record the deviation as Peak to Average Ratio.

3.2.4 Test Setup



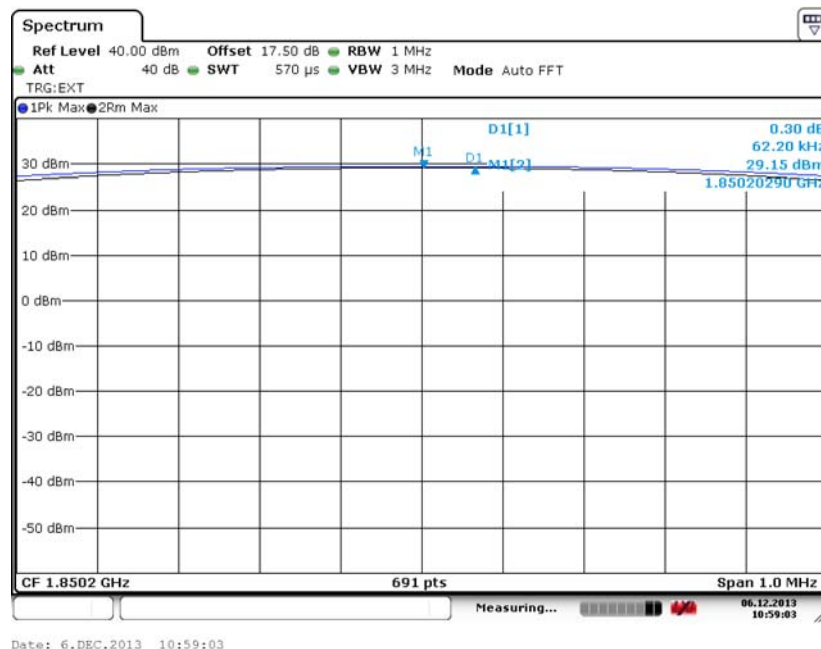
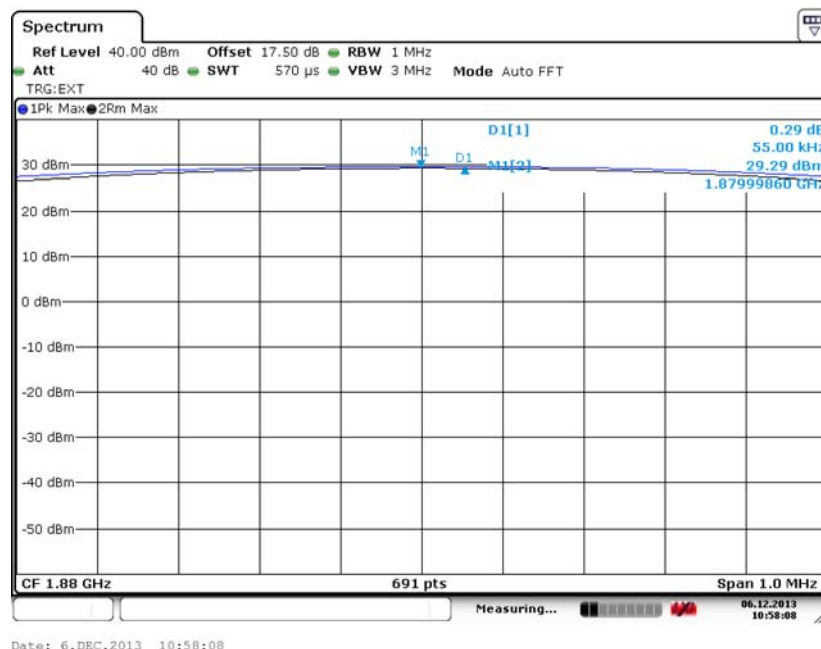
3.2.5 Test Result of Peak-to-Average Ratio

| PCS Band | | | | | | | | | |
|----------------------------|------------------------|-----------|------------|------------------------|-----------|------------|------------------------------|------------|-------------|
| Modes | GSM1900 (GPRS class 8) | | | 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 | 0.29 | 0.34 | 2.82 | 2.82 | 2.91 | 2.76 | 2.68 | 2.72 |

| 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) | 2.72 | 2.68 | 2.72 |

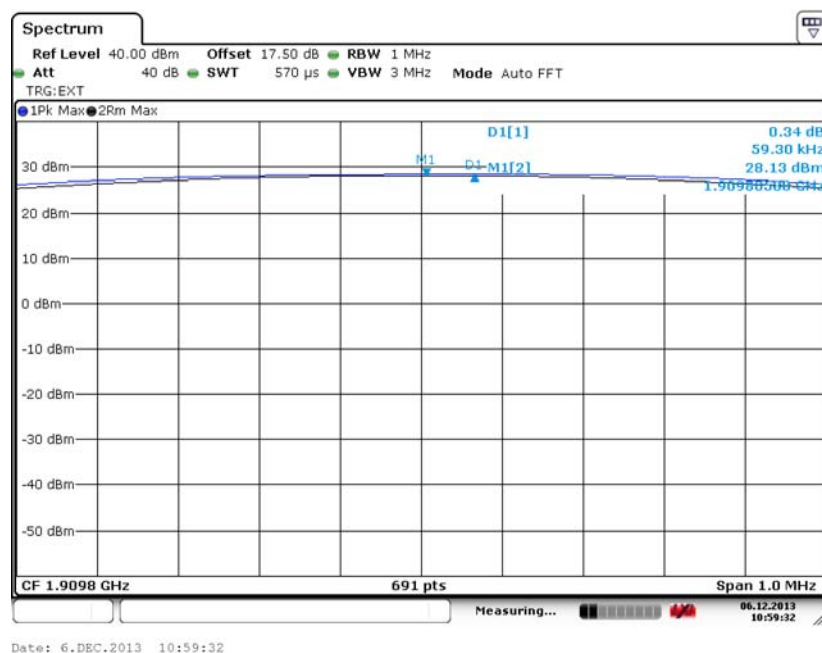
3.2.6 Test Result (Plots) of Peak-to-Average Ratio

| | | | |
|---------------|----------|--------------------|--------------------------|
| Band : | GSM 1900 | Test Mode : | GPRS class 8 Link (GMSK) |
|---------------|----------|--------------------|--------------------------|

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

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




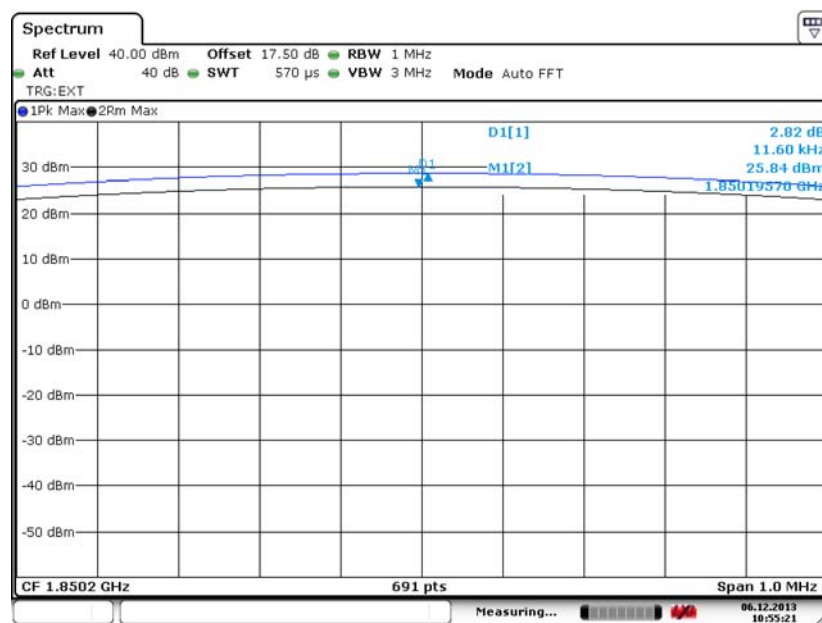
Peak-to-Average Ratio on Channel 810 (1909.8 MHz)





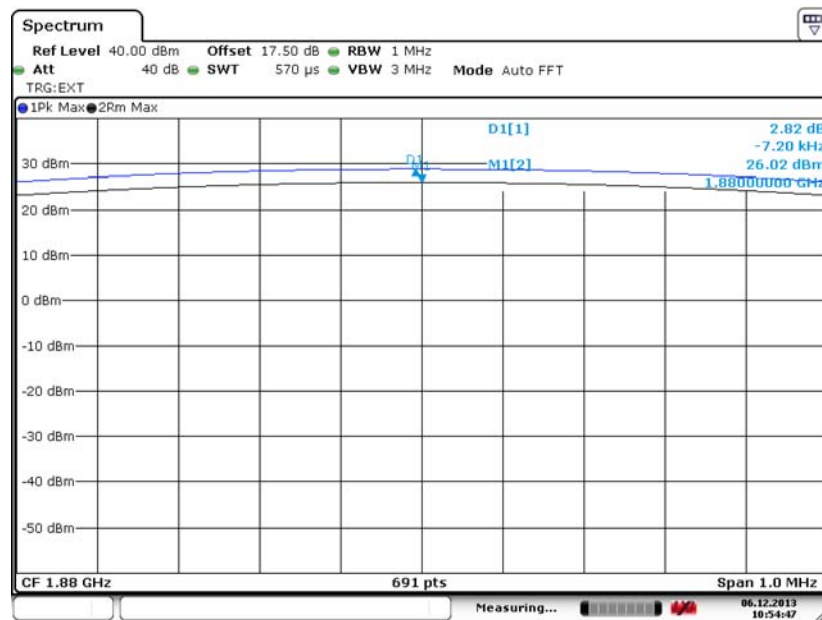
| | | | |
|--------|----------|-------------|--------------------------|
| Band : | GSM 1900 | Test Mode : | EDGE class 8 Link (8PSK) |
|--------|----------|-------------|--------------------------|

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



Date: 6.DEC.2013 10:55:21

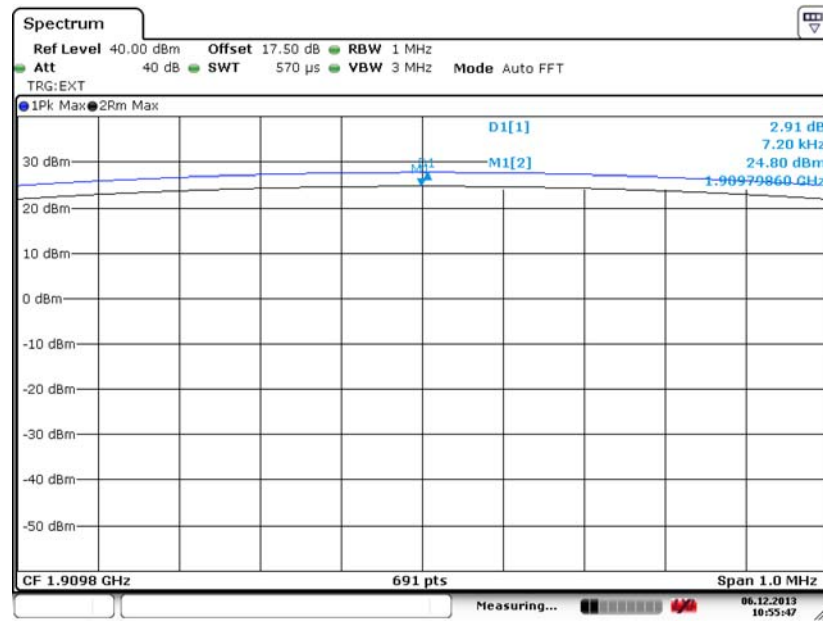
Peak-to-Average Ratio on Channel 661 (1880.0 MHz)



Date: 6.DEC.2013 10:54:47



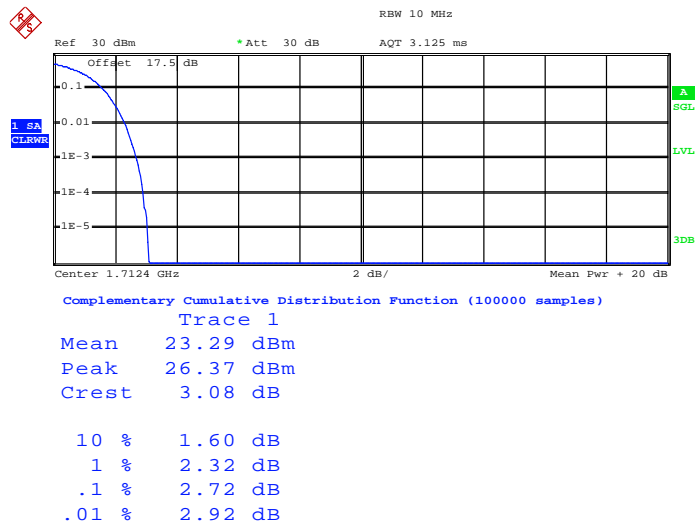
Peak-to-Average Ratio on Channel 810 (1909.8 MHz)



Date: 6.DEC.2013 10:55:47

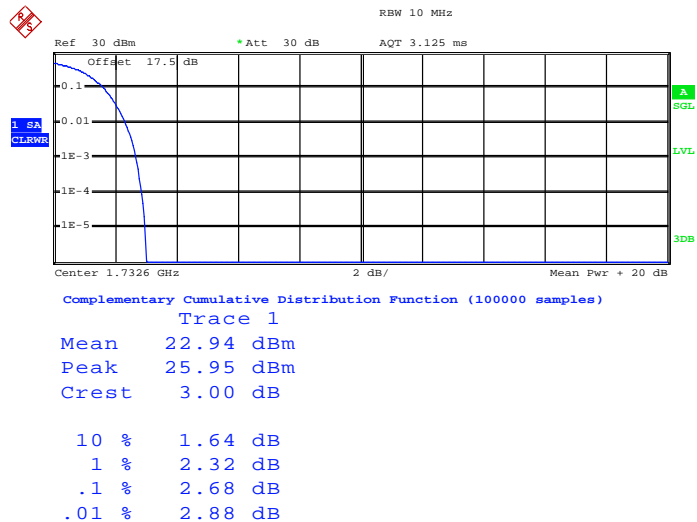
| | | | |
|---------------|---------------|--------------------|--------------------------|
| Band : | WCDMA Band IV | Test Mode : | RMC 12.2Kbps Link (QPSK) |
|---------------|---------------|--------------------|--------------------------|

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



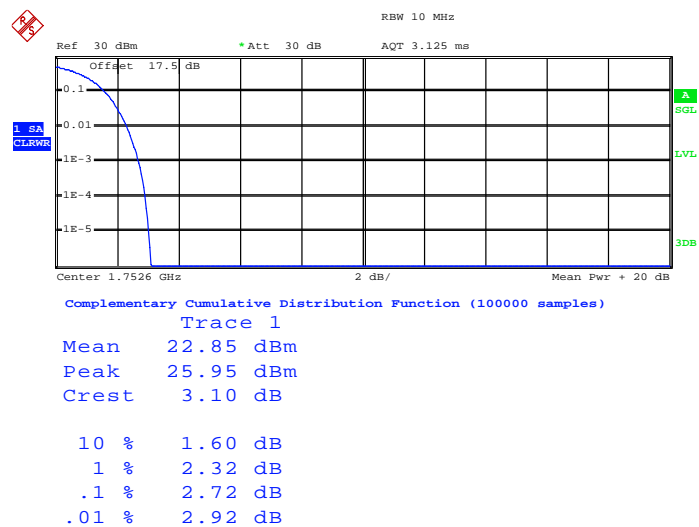
Date: 8.DEC.2013 11:16:55

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



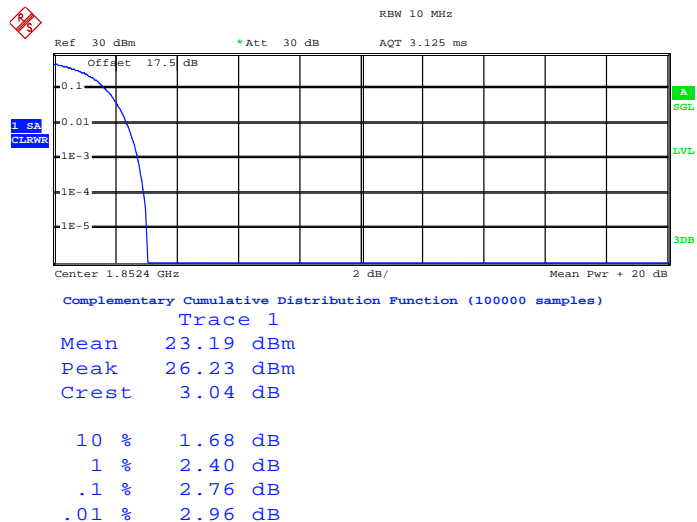
Date: 8.DEC.2013 11:18:44

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

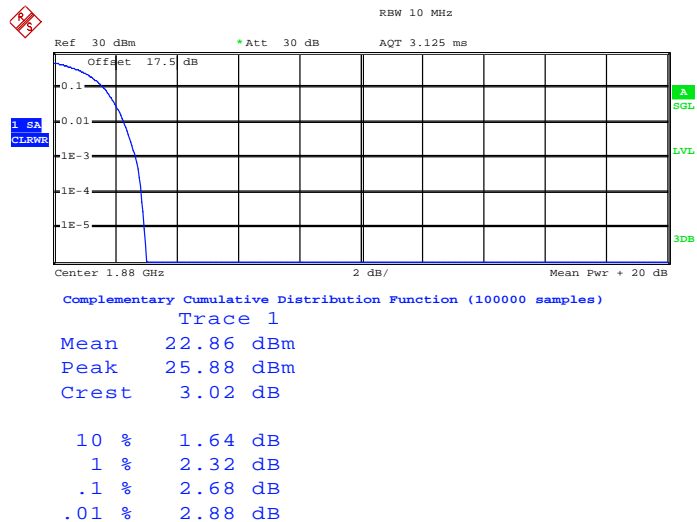


Date: 8.DEC.2013 11:17:31

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

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


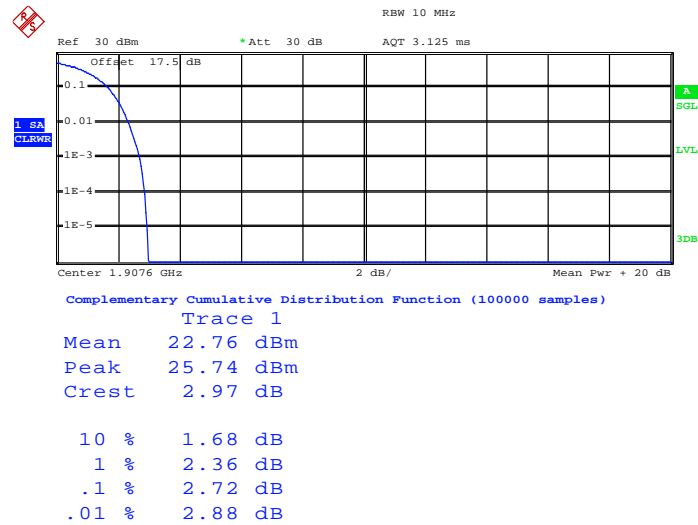
Date: 8.DEC.2013 11:20:49

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


Date: 8.DEC.2013 11:20:13



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



Date: 8.DEC.2013 11:21:21

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 v02r01. 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).

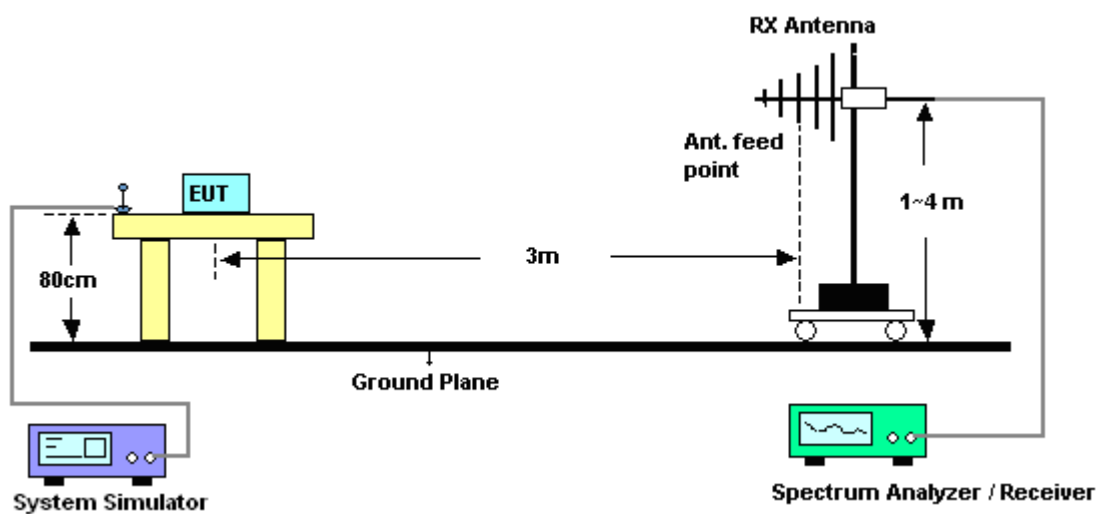
3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

3.3.3 Test Procedures

1. The EUT was placed on an non-conductive rotating platform with 0.8 meter height in a semi-anechoic chamber. The radiated emission at the fundamental frequencies were measured at 3 m with a test antenna and a spectrum analyzer with RBW= 1MHz, VBW= 3MHz for GSM for RMS, and the RBW= 300kHz, VBW= 1MHz for WCDMA, and RMS detector with channel power measurement option =5MHz settings per section 4.0 of KDB 971168 D01.
2. During the measurement, the EUT was enforced in maximum power and linked with a base station. The highest 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.
3. Effective Isotropic Radiated Power (EIRP) was measured by substitution method according to TIA/EIA-603-C. The EUT was replaced by dipole antenna (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, $EIRP = LVL + \text{Correction factor}$ and $ERP = EIRP - 2.15$.

3.3.4 Test Setup



3.3.5 Test Result of ERP

| GSM850 (GPRS class 8) Radiated Power ERP | | | | |
|---|----------------------|-----------------------------------|----------------------|--------------------|
| Horizontal Polarization | | | | |
| Frequency (MHz) | LVL (dBm) | Correction Factor (dB) | ERP (dBm) | ERP (W) |
| 824.2 | -2.66 | 28.798 | 23.99 | 0.25 |
| 836.4 | -1.79 | 28.577 | 24.64 | 0.29 |
| 848.8 | -0.44 | 28.064 | 25.47 | 0.35 |
| Vertical Polarization | | | | |
| Frequency (MHz) | LVL (dBm) | Correction Factor (dB) | ERP (dBm) | ERP (W) |
| 824.2 | -11.33 | 32.596 | 19.12 | 0.08 |
| 836.4 | -11.59 | 31.952 | 18.21 | 0.07 |
| 848.8 | -12.19 | 31.561 | 17.22 | 0.05 |

* ERP = LVL (dBm) + Correction Factor (dB) – 2.15

| GSM850 (EDGE class 8) Radiated Power ERP | | | | |
|---|----------------------|-----------------------------------|----------------------|--------------------|
| Horizontal Polarization | | | | |
| Frequency (MHz) | LVL (dBm) | Correction Factor (dB) | ERP (dBm) | ERP (W) |
| 824.2 | -7.15 | 28.798 | 19.50 | 0.09 |
| 836.4 | -6.06 | 28.577 | 20.37 | 0.11 |
| 848.8 | -5.45 | 28.064 | 20.46 | 0.11 |
| Vertical Polarization | | | | |
| Frequency (MHz) | LVL (dBm) | Correction Factor (dB) | ERP (dBm) | ERP (W) |
| 824.2 | -15.87 | 32.596 | 14.58 | 0.03 |
| 836.4 | -15.61 | 31.952 | 14.19 | 0.03 |
| 848.8 | -15.92 | 31.561 | 13.49 | 0.02 |

* ERP = LVL (dBm) + Correction Factor (dB) – 2.15

| WCDMA Band V (RMC 12.2Kbps) Radiated Power ERP | | | | |
|--|--------------|---------------------------|--------------|------------|
| Horizontal Polarization | | | | |
| Frequency (MHz) | LVL (dBm) | Correction Factor (dB) | ERP (dBm) | ERP (W) |
| 826.4 | -13.03 | 28.945 | 13.77 | 0.02 |
| 836.4 | -11.63 | 28.577 | 14.80 | 0.03 |
| 846.6 | -12.09 | 28.051 | 13.81 | 0.02 |
| Vertical Polarization | | | | |
| Frequency (MHz) | LVL (dBm) | Correction Factor (dB) | ERP (dBm) | ERP (W) |
| 826.4 | -21.31 | 32.594 | 9.13 | 0.01 |
| 836.4 | -20.76 | 31.952 | 9.04 | 0.01 |
| 846.6 | -20.23 | 31.684 | 9.30 | 0.01 |

* ERP = LVL (dBm) + Correction Factor (dB) – 2.15

3.3.6 Test Result of EIRP

| GSM1900 (GPRS class 8) Radiated Power EIRP | | | | |
|---|----------------------|-----------------------------------|-----------------------|---------------------|
| Horizontal Polarization | | | | |
| Frequency (MHz) | LVL (dBm) | Correction Factor (dB) | EIRP (dBm) | EIRP (W) |
| 1850.2 | -11.85 | 42.33 | 30.48 | 1.12 |
| 1880.0 | -11.01 | 43.26 | 32.25 | 1.68 |
| 1909.8 | -12.15 | 43.11 | 30.96 | 1.25 |
| Vertical Polarization | | | | |
| Frequency (MHz) | LVL (dBm) | Correction Factor (dB) | EIRP (dBm) | EIRP (W) |
| 1850.2 | -16.79 | 44.96 | 28.17 | 0.66 |
| 1880.0 | -17.44 | 45.13 | 27.69 | 0.59 |
| 1909.8 | -17.28 | 45.47 | 28.19 | 0.66 |

* EIRP = LVL (dBm) + Correction Factor (dB)

| GSM1900 (EDGE class 8) Radiated Power EIRP | | | | |
|---|----------------------|-----------------------------------|-----------------------|---------------------|
| Horizontal Polarization | | | | |
| Frequency (MHz) | LVL (dBm) | Correction Factor (dB) | EIRP (dBm) | EIRP (W) |
| 1850.2 | -16.53 | 42.33 | 25.80 | 0.38 |
| 1880.0 | -15.55 | 43.26 | 27.71 | 0.59 |
| 1909.8 | -15.93 | 43.11 | 27.18 | 0.52 |
| Vertical Polarization | | | | |
| Frequency (MHz) | LVL (dBm) | Correction Factor (dB) | EIRP (dBm) | EIRP (W) |
| 1850.2 | -19.98 | 44.96 | 24.98 | 0.31 |
| 1880.0 | -20.13 | 45.13 | 25.00 | 0.32 |
| 1909.8 | -20.13 | 45.47 | 25.34 | 0.34 |

* EIRP = LVL (dBm) + Correction Factor (dB)

| WCDMA Band IV (RMC 12.2Kbps) Radiated Power EIRP | | | | |
|---|----------------------|-----------------------------------|-----------------------|---------------------|
| Horizontal Polarization | | | | |
| Frequency (MHz) | LVL (dBm) | Correction Factor (dB) | EIRP (dBm) | EIRP (W) |
| 1712.4 | -17.31 | 38.58 | 21.27 | 0.13 |
| 1732.6 | -16.72 | 39.50 | 22.78 | 0.19 |
| 1752.6 | -16.89 | 38.64 | 21.75 | 0.15 |
| Vertical Polarization | | | | |
| Frequency (MHz) | LVL (dBm) | Correction Factor (dB) | EIRP (dBm) | EIRP (W) |
| 1712.4 | -25.59 | 40.90 | 15.31 | 0.03 |
| 1732.6 | -25.76 | 40.63 | 14.87 | 0.03 |
| 1752.6 | -24.78 | 41.48 | 16.70 | 0.05 |

* EIRP = LVL (dBm) + Correction Factor (dB)

| WCDMA Band II (RMC 12.2Kbps) Radiated Power EIRP | | | | |
|---|----------------------|-----------------------------------|-----------------------|---------------------|
| Horizontal Polarization | | | | |
| Frequency (MHz) | LVL (dBm) | Correction Factor (dB) | EIRP (dBm) | EIRP (W) |
| 1852.4 | -18.94 | 42.39 | 23.45 | 0.22 |
| 1880.0 | -18.81 | 43.26 | 24.45 | 0.28 |
| 1907.6 | -19.29 | 43.05 | 23.76 | 0.24 |
| Vertical Polarization | | | | |
| Frequency (MHz) | LVL (dBm) | Correction Factor (dB) | EIRP (dBm) | EIRP (W) |
| 1852.4 | -24.58 | 44.90 | 20.32 | 0.11 |
| 1880.0 | -25.41 | 45.13 | 19.72 | 0.09 |
| 1907.6 | -25.74 | 45.47 | 19.73 | 0.09 |

* EIRP = LVL (dBm) + Correction Factor (dB)

3.4 Occupied Bandwidth and 26dB Bandwidth Measurement

3.4.1 Description of Occupied Bandwidth and 26dB Bandwidth Measurement

The 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.

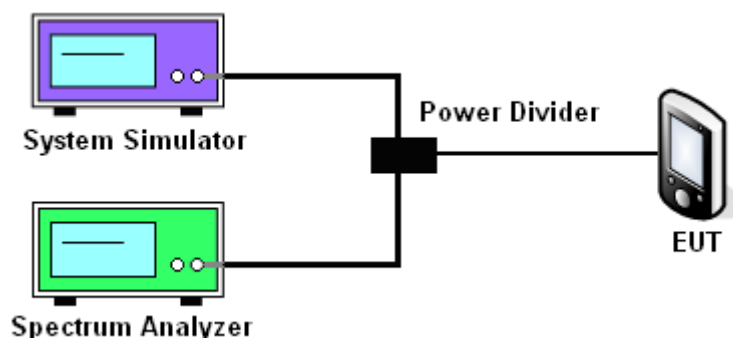
3.4.2 Measuring Instruments

See list of measuring instruments of this test report.

3.4.3 Test Procedures

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. The 99% occupied bandwidth were measured, set RBW= 1% of span, VBW= 3*RBW, sample detector, trace maximum hold.
4. 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 Occupied Bandwidth and 26dB Bandwidth

| Cellular Band | | | | | | |
|-----------------|-----------------------|--------------|---------------|-----------------------|--------------|---------------|
| Modes | GSM850 (GPRS class 8) | | | 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) | 242.00 | 246.00 | 246.00 | 248.00 | 250.00 | 248.00 |
| 26dB BW (kHz) | 314.00 | 310.00 | 314.00 | 314.00 | 314.00 | 314.00 |

| PCS Band | | | | | | |
|-----------------|------------------------|--------------|---------------|------------------------|--------------|---------------|
| Modes | GSM1900 (GPRS class 8) | | | 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) | 250.00 | 242.00 | 244.00 | 246.00 | 248.00 | 246.00 |
| 26dB BW (kHz) | 312.00 | 312.00 | 320.00 | 316.00 | 312.00 | 316.00 |

| 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) | 4.66 | 4.68 | 4.66 |
| 26dB BW (MHz) | 4.68 | 4.68 | 4.66 |

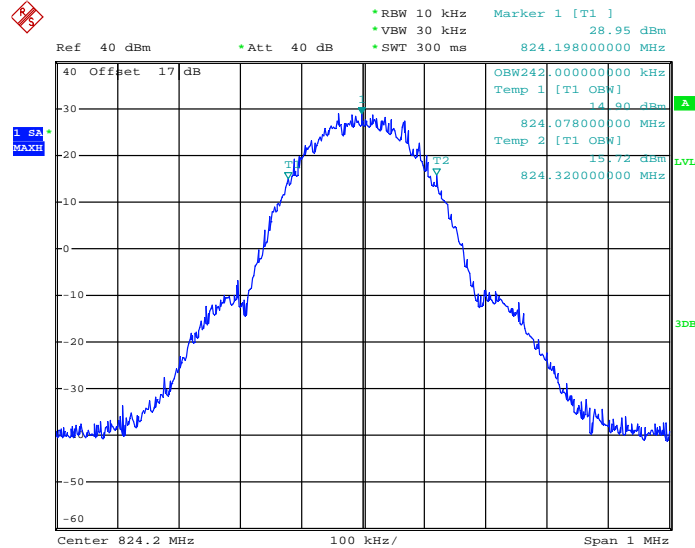
| AWS Band | | | |
|-----------------|------------------------------|------------|-------------|
| Modes | WCDMA Band IV (RMC 12.2Kbps) | | |
| Channel | 1312(Low) | 1413 (Mid) | 1513 (High) |
| Frequency (MHz) | 1712.4 | 1732.6 | 1752.6 |
| 99% OBW (MHz) | 4.64 | 4.64 | 4.62 |
| 26dB BW (MHz) | 4.66 | 4.64 | 4.66 |

| 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) | 4.62 | 4.62 | 4.62 |
| 26dB BW (MHz) | 4.64 | 4.66 | 4.64 |

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

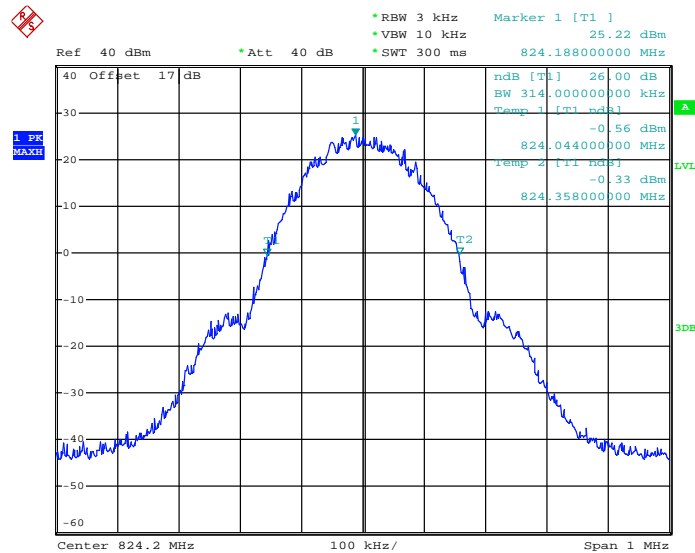
| | | | |
|---------------|---------|--------------------|--------------------------|
| Band : | GSM 850 | Test Mode : | GPRS class 8 Link (GMSK) |
|---------------|---------|--------------------|--------------------------|

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



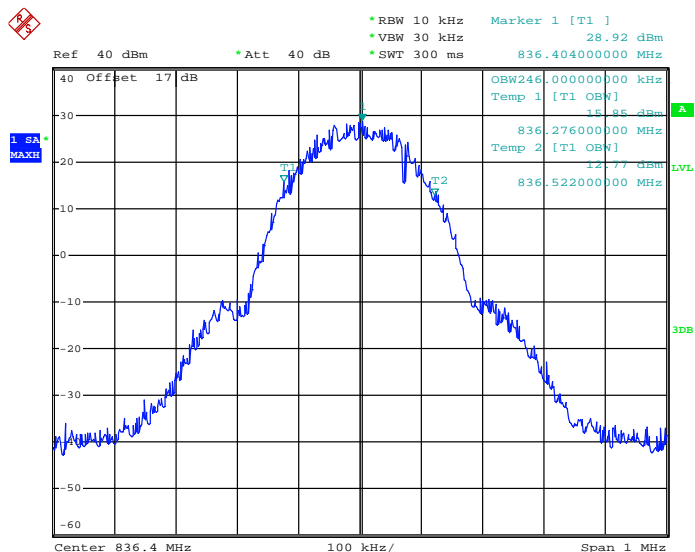
Date: 7.DEC.2013 14:46:53

26dB Bandwidth Plot on Channel 128 (824.2 MHz)



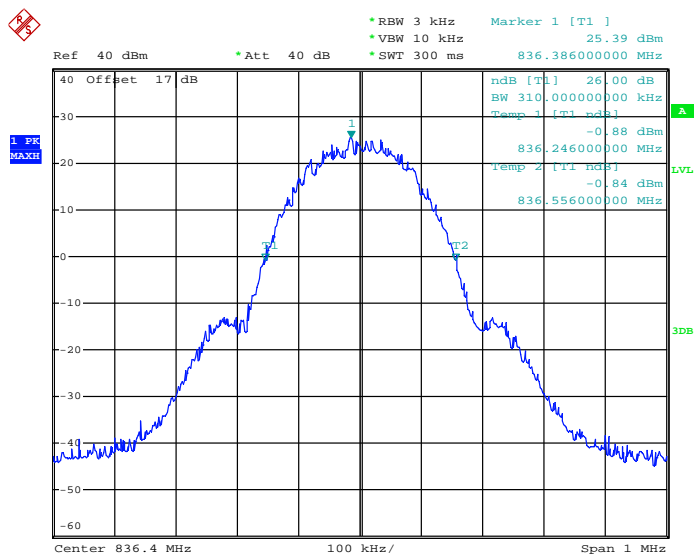
Date: 7.DEC.2013 14:36:40

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



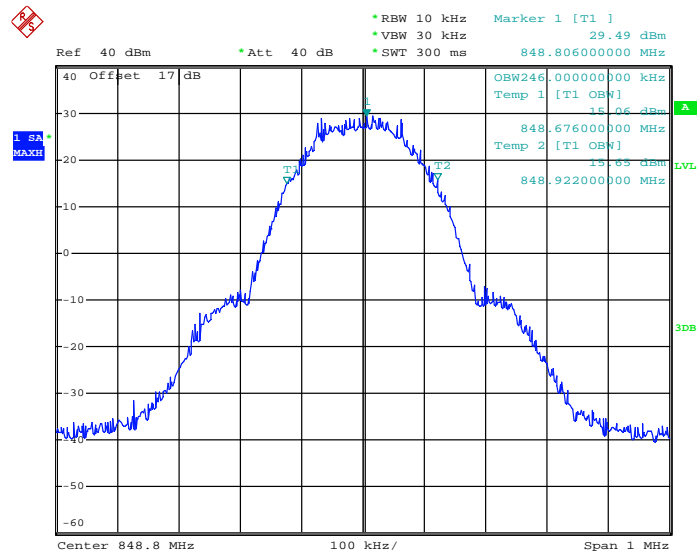
Date: 7.DEC.2013 14:44:06

26dB Bandwidth Plot on Channel 189 (836.4 MHz)



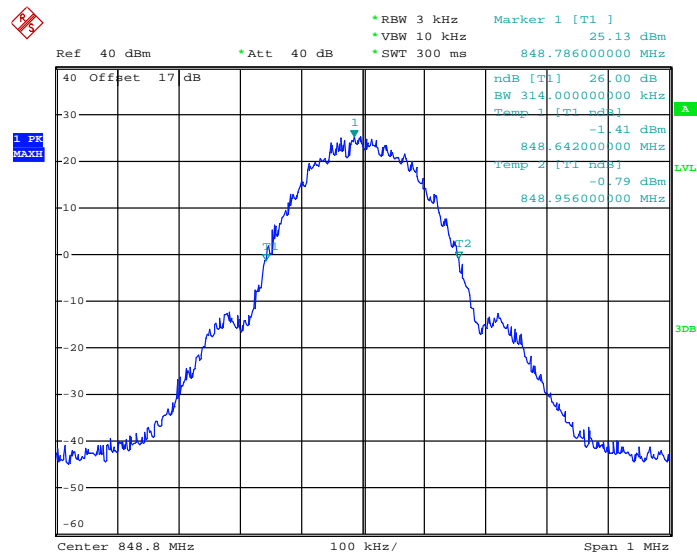
Date: 7.DEC.2013 14:34:36

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



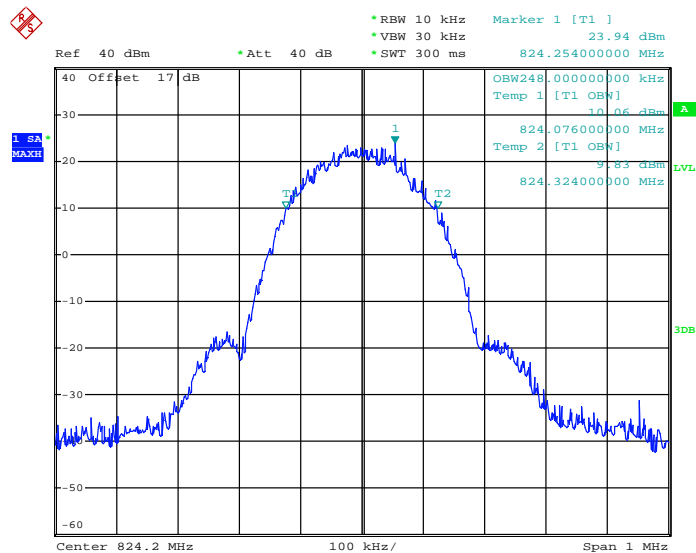
Date: 7.DEC.2013 14:42:47

26dB Bandwidth Plot on Channel 251 (848.8 MHz)

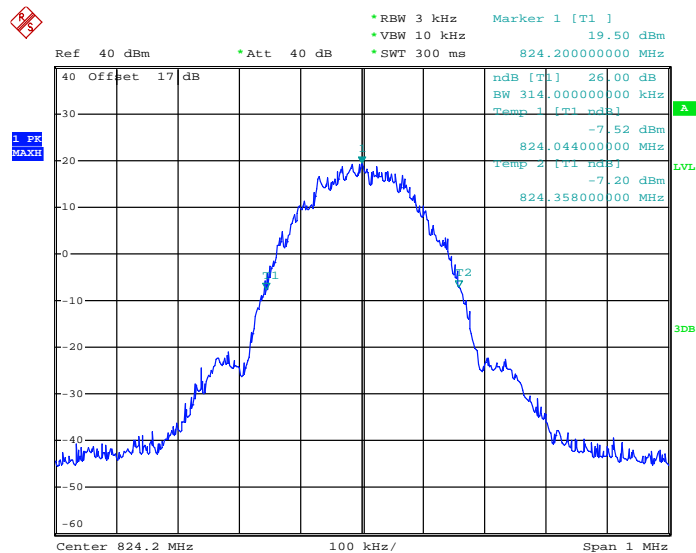


Date: 7.DEC.2013 14:38:30

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

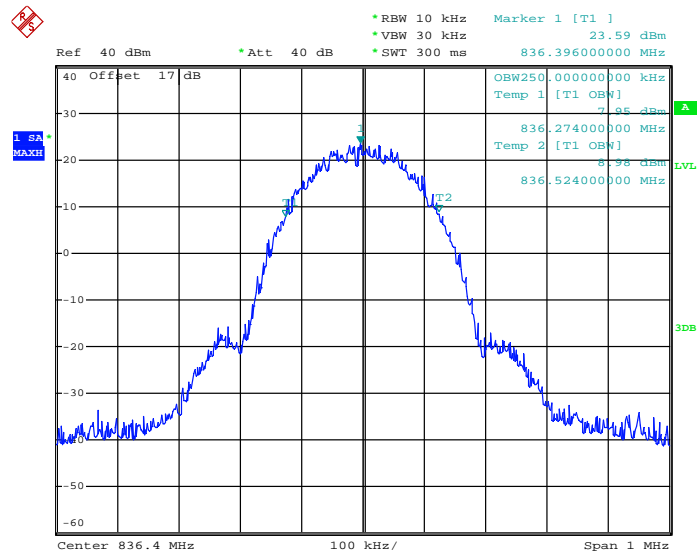
99% Occupied Bandwidth Plot on Channel 128 (824.2 MHz)


Date: 7.DEC.2013 17:50:22

26dB Bandwidth Plot on Channel 128 (824.2 MHz)


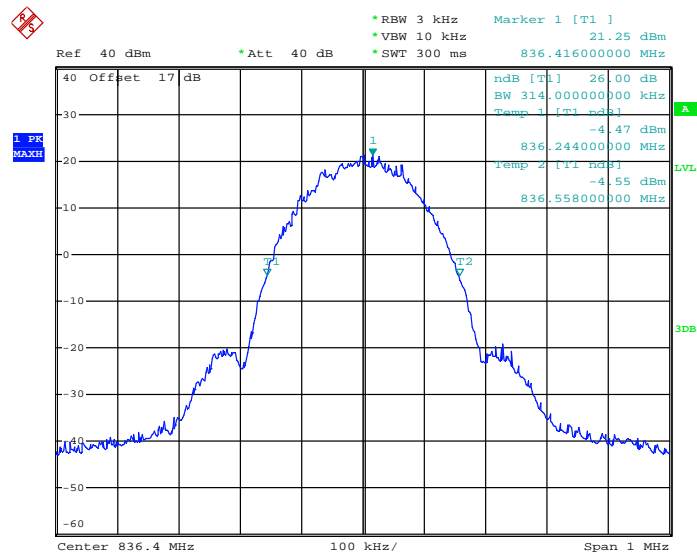
Date: 7.DEC.2013 17:28:46

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

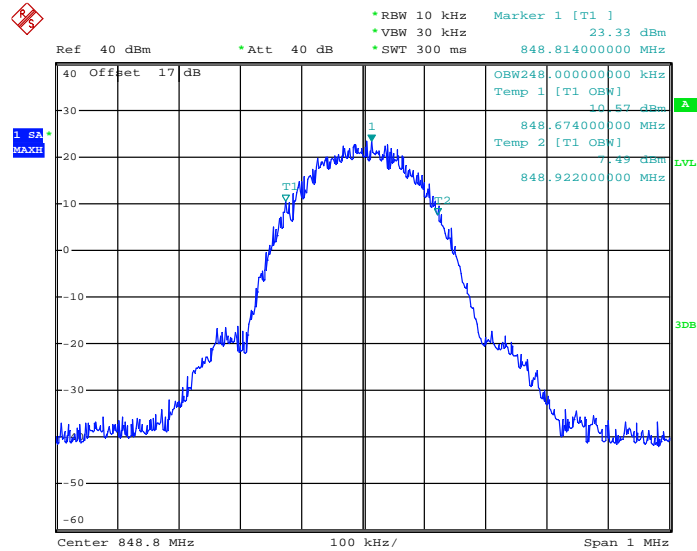


Date: 7.DEC.2013 17:47:12

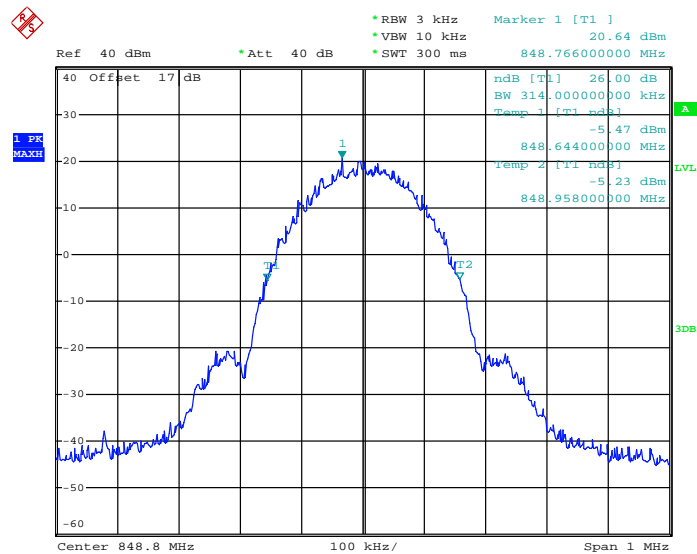
26dB Bandwidth Plot on Channel 189 (836.4 MHz)



Date: 7.DEC.2013 17:27:29

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


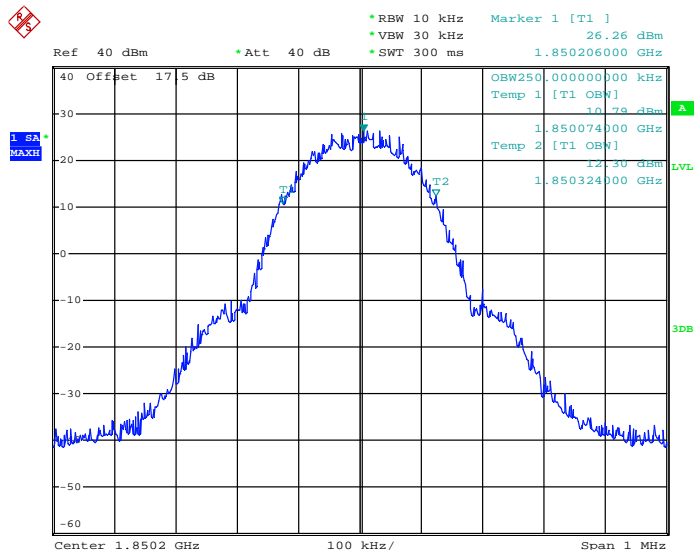
Date: 7.DEC.2013 17:44:38

26dB Bandwidth Plot on Channel 251 (848.8 MHz)


Date: 7.DEC.2013 17:31:20

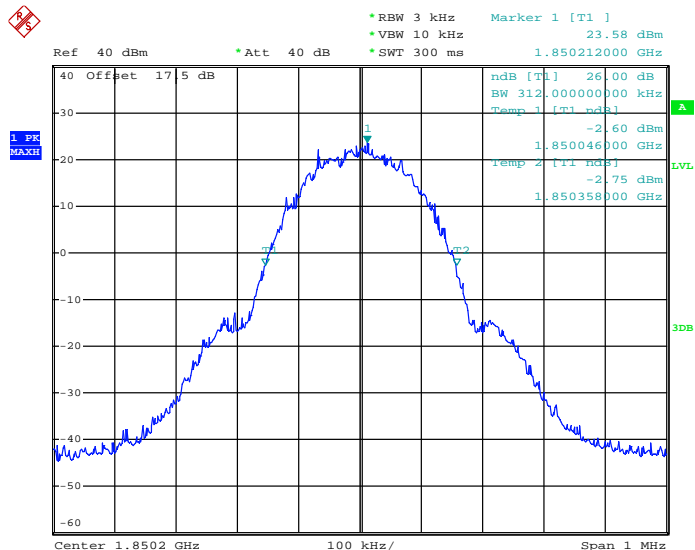
| | | | |
|--------|----------|-------------|--------------------------|
| Band : | GSM 1900 | Test Mode : | GPRS class 8 Link (GMSK) |
|--------|----------|-------------|--------------------------|

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



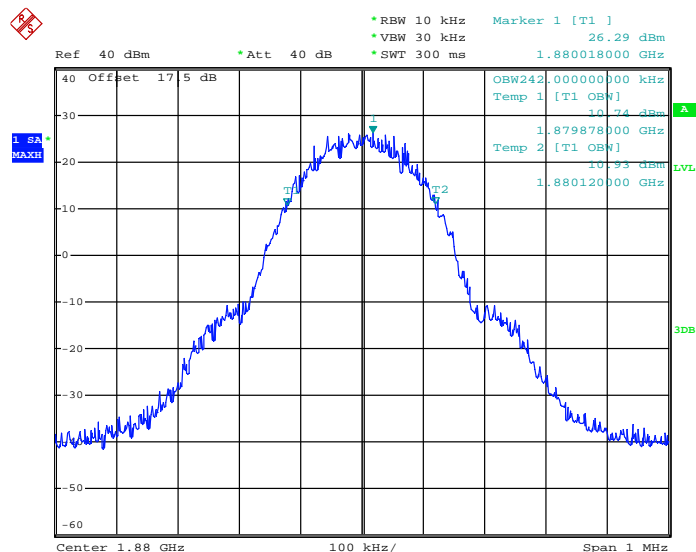
Date: 7.DEC.2013 15:35:16

26dB Bandwidth Plot on Channel 512 (1850.2 MHz)



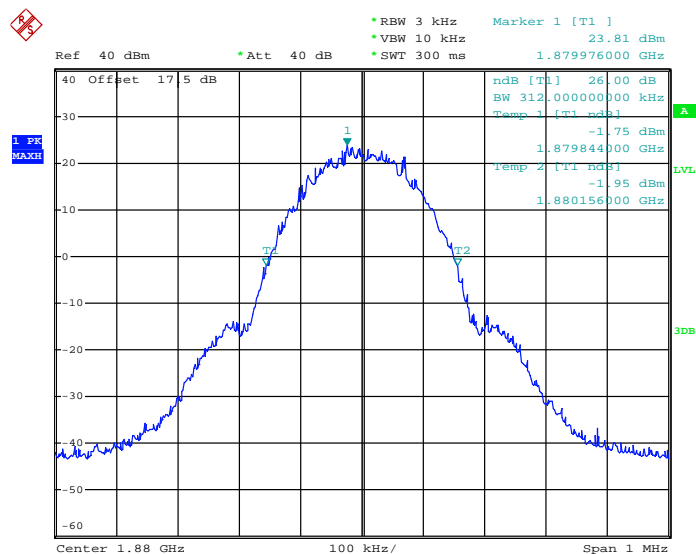
Date: 7.DEC.2013 15:23:42

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



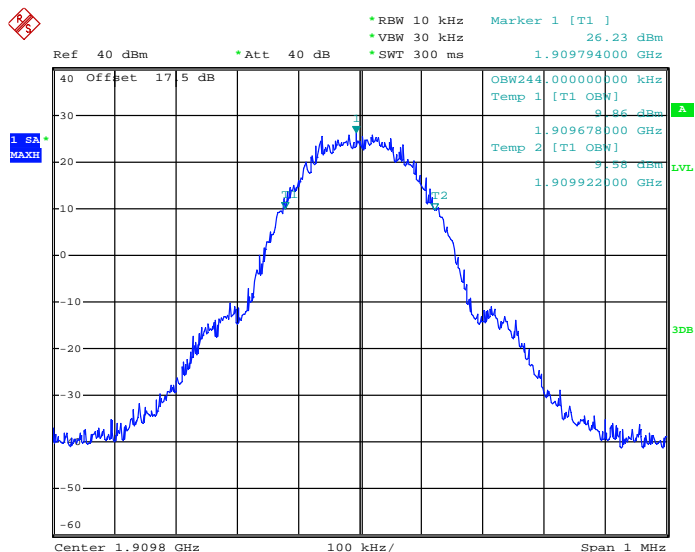
Date: 7.DEC.2013 15:32:45

26dB Bandwidth Plot on Channel 661 (1880.0 MHz)



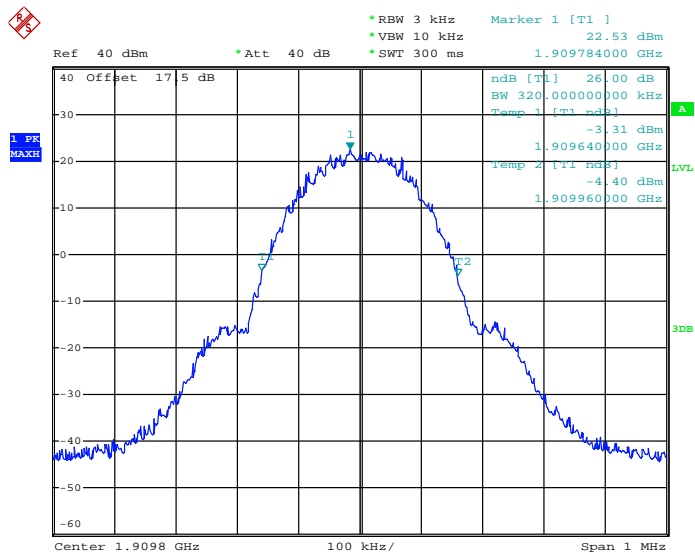
Date: 7.DEC.2013 15:20:15

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



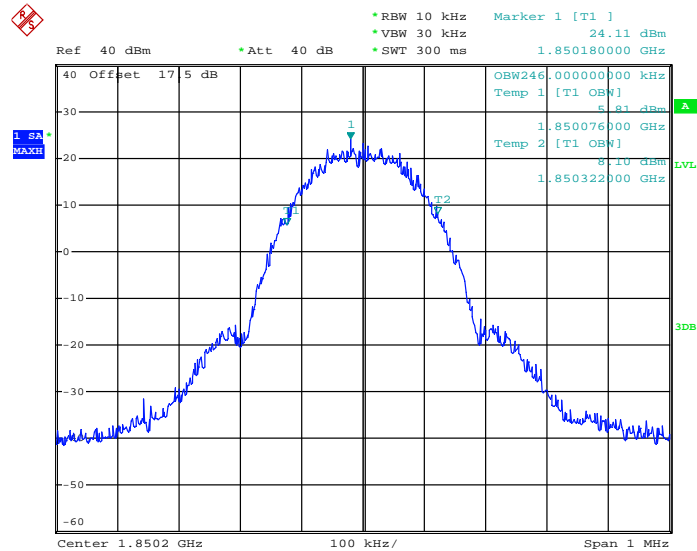
Date: 7.DEC.2013 15:30:50

26dB Bandwidth Plot on Channel 810 (1909.8 MHz)

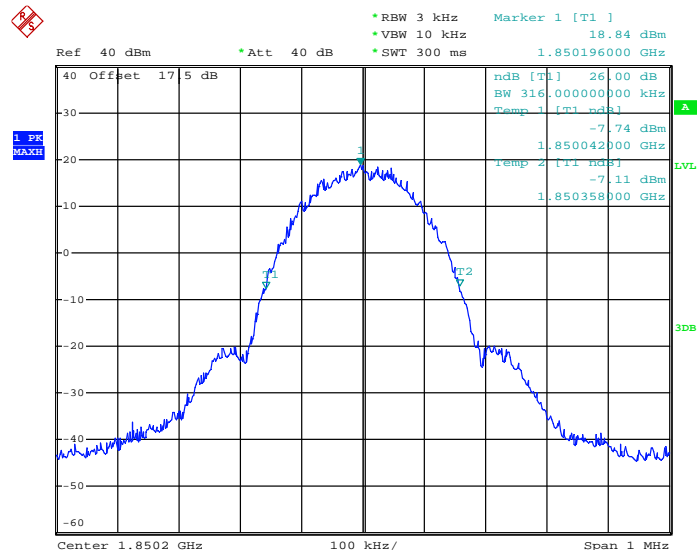


Date: 7.DEC.2013 15:27:50

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

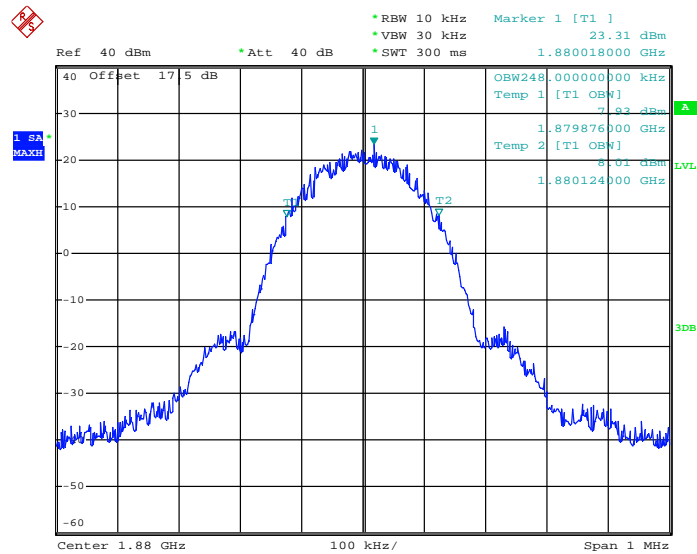
99% Occupied Bandwidth Plot on Channel 512 (1850.2 MHz)


Date: 7.DEC.2013 16:39:23

26dB Bandwidth Plot on Channel 512 (1850.2 MHz)


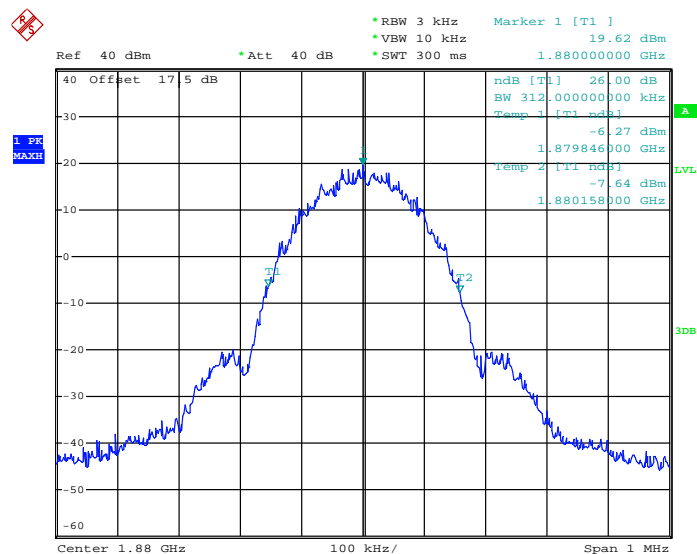
Date: 7.DEC.2013 16:26:06

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



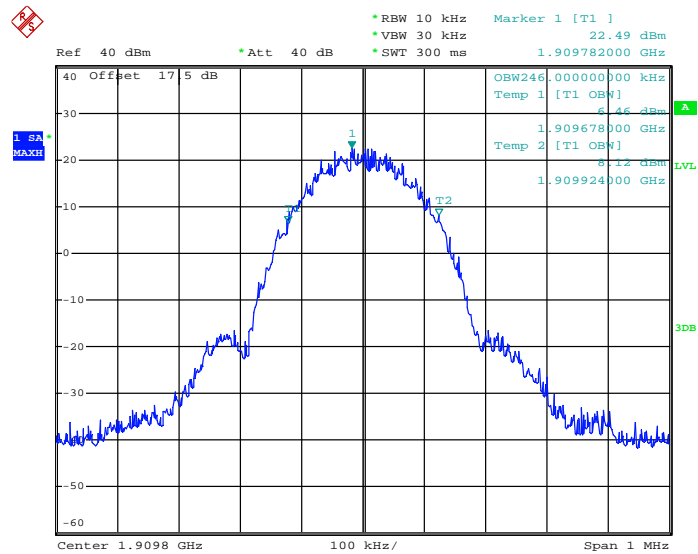
Date: 7.DEC.2013 16:35:54

26dB Bandwidth Plot on Channel 661 (1880.0 MHz)



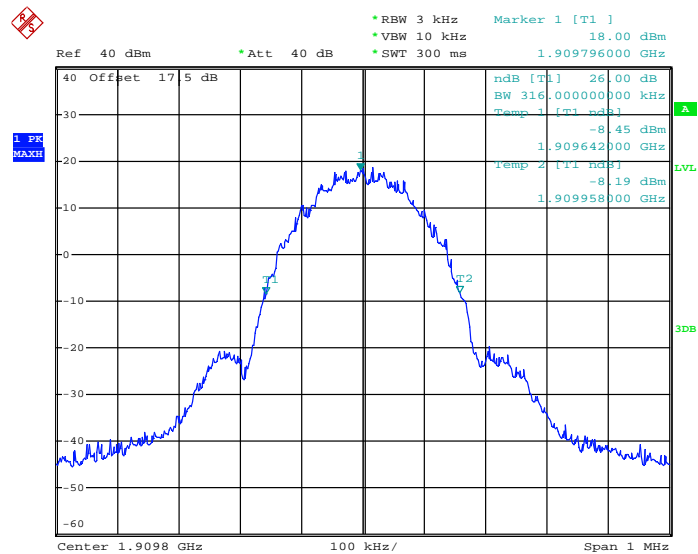
Date: 7.DEC.2013 16:27:53

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



Date: 7.DEC.2013 16:33:12

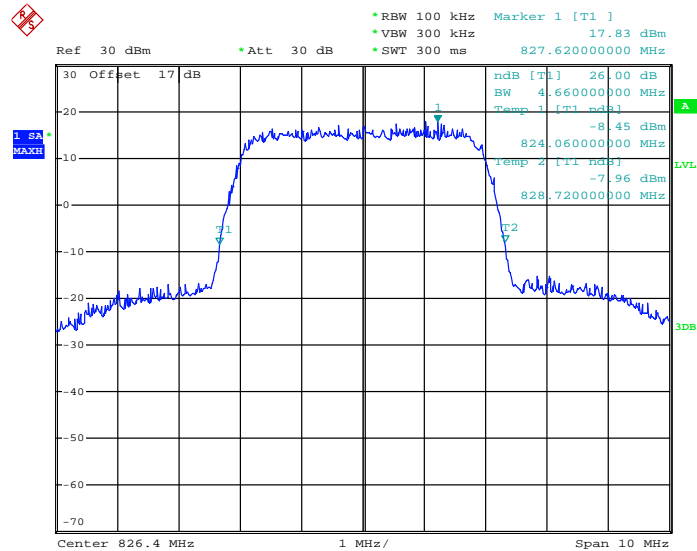
26dB Bandwidth Plot on Channel 810 (1909.8 MHz)



Date: 7.DEC.2013 16:30:17

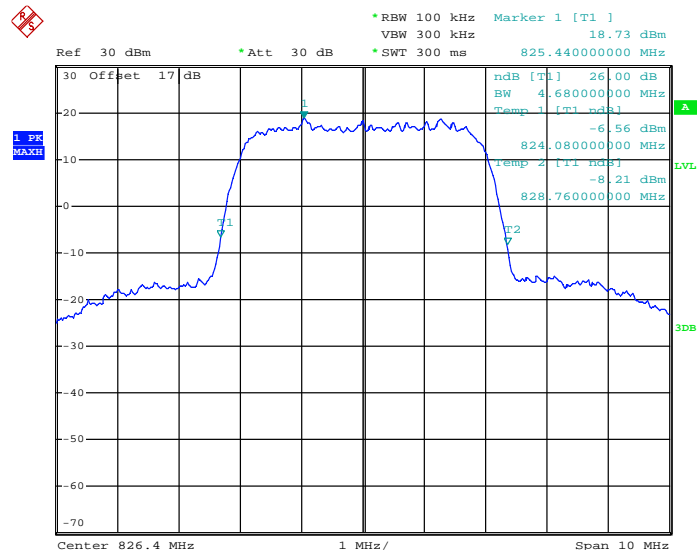
| | | | |
|--------|--------------|-------------|--------------------------|
| Band : | WCDMA Band V | Test Mode : | RMC 12.2Kbps Link (QPSK) |
|--------|--------------|-------------|--------------------------|

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



Date: 8.DEC.2013 10:40:29

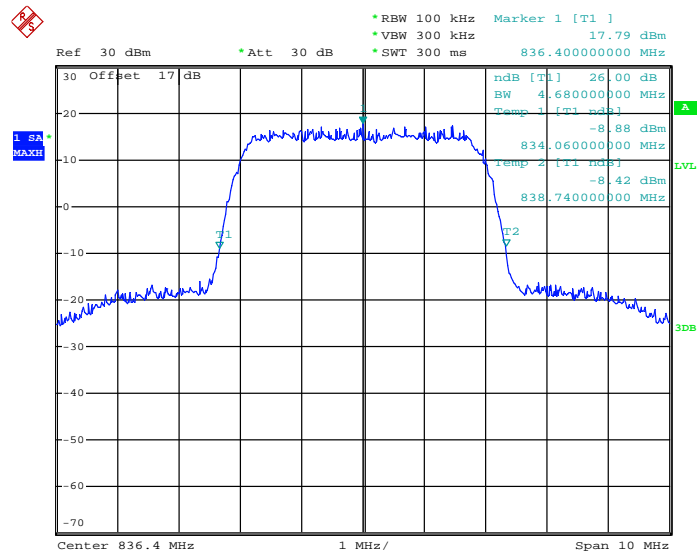
26dB Bandwidth Plot on Channel 4132 (826.4 MHz)



Date: 8.DEC.2013 10:09:38

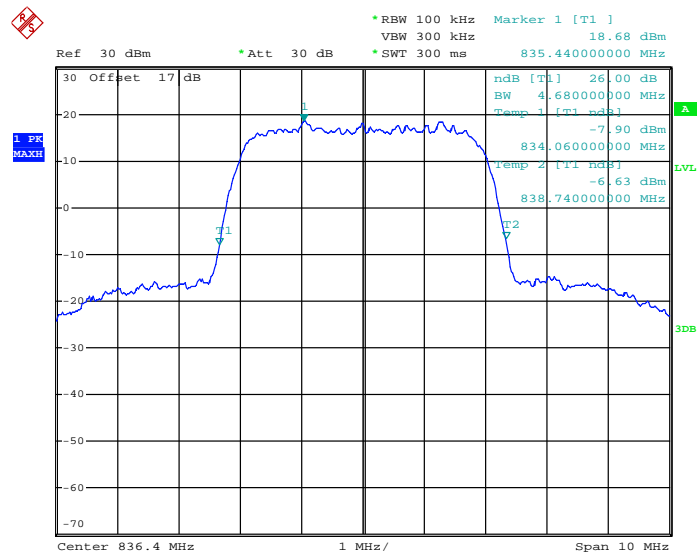


99% Occupied Bandwidth Plot on Channel 4182 (836.4 MHz)



Date: 8.DEC.2013 10:38:13

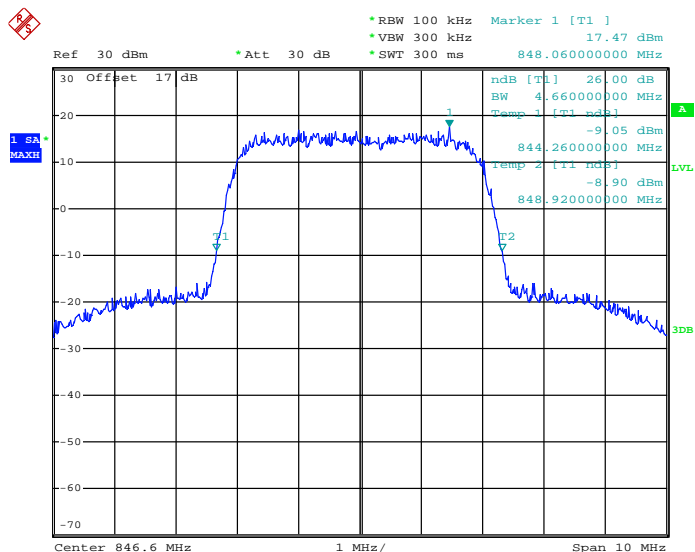
26dB Bandwidth Plot on Channel 4182 (836.4 MHz)



Date: 8.DEC.2013 10:08:29

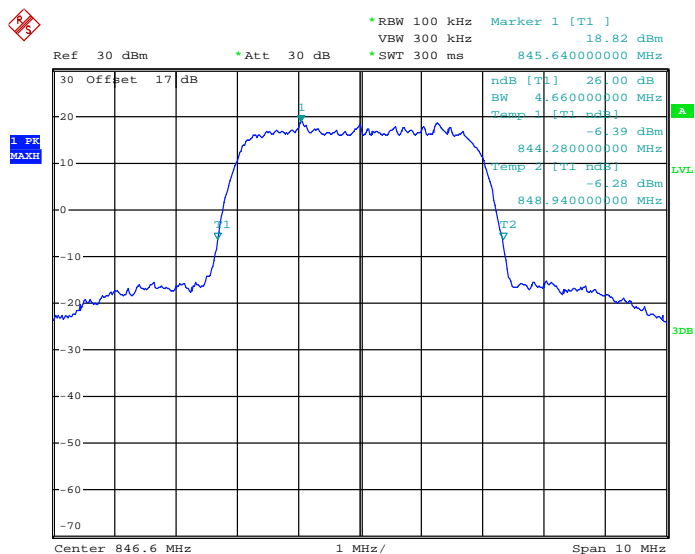


99% Occupied Bandwidth Plot on Channel 4233 (846.6 MHz)



Date: 8.DEC.2013 10:42:20

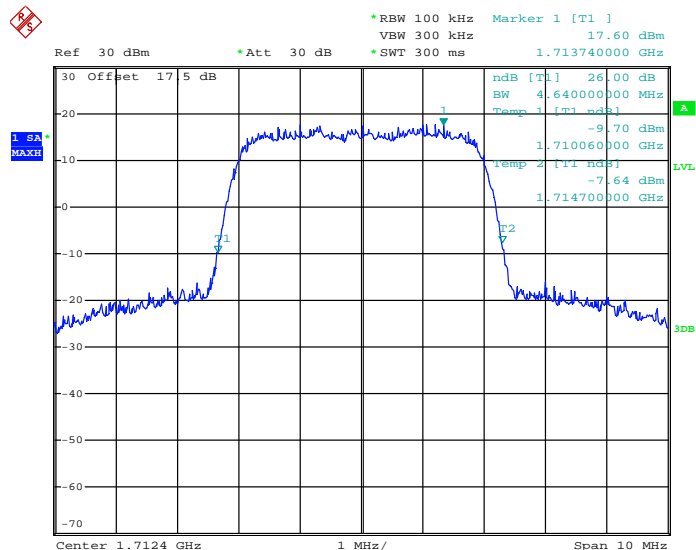
26dB Bandwidth Plot on Channel 4233 (846.6 MHz)



Date: 8.DEC.2013 10:10:39

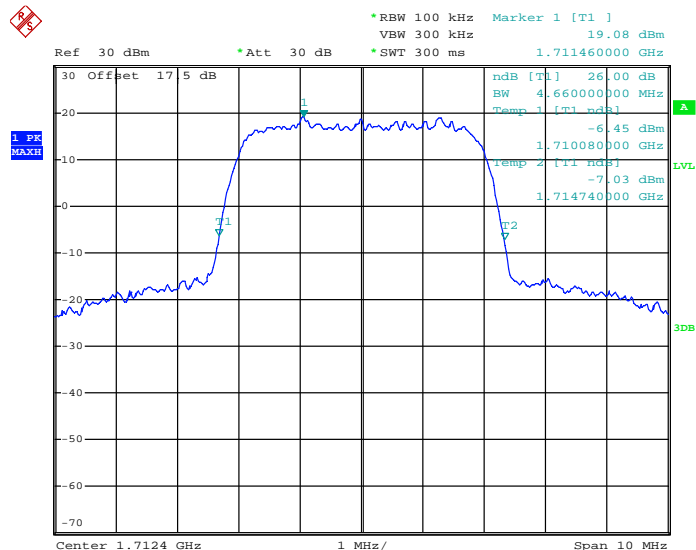
| | | | |
|--------|---------------|-------------|--------------------------|
| Band : | WCDMA Band IV | Test Mode : | RMC 12.2Kbps Link (QPSK) |
|--------|---------------|-------------|--------------------------|

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



Date: 8.DEC.2013 10:23:01

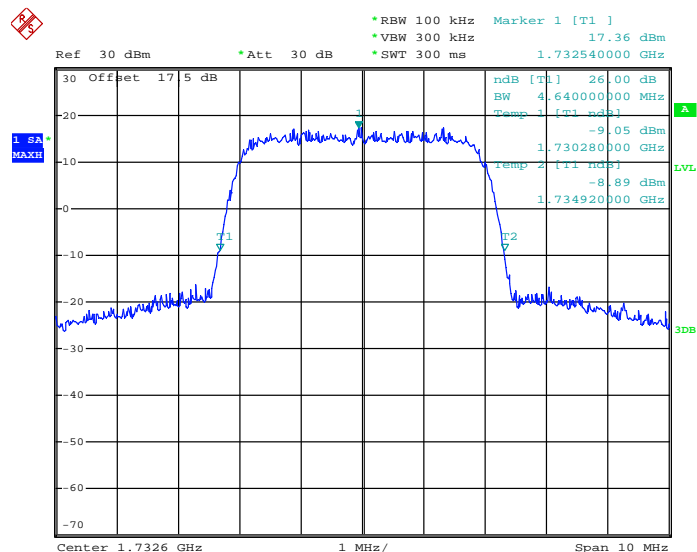
26dB Bandwidth Plot on Channel 1312 (1712.4 MHz)



Date: 8.DEC.2013 10:20:41

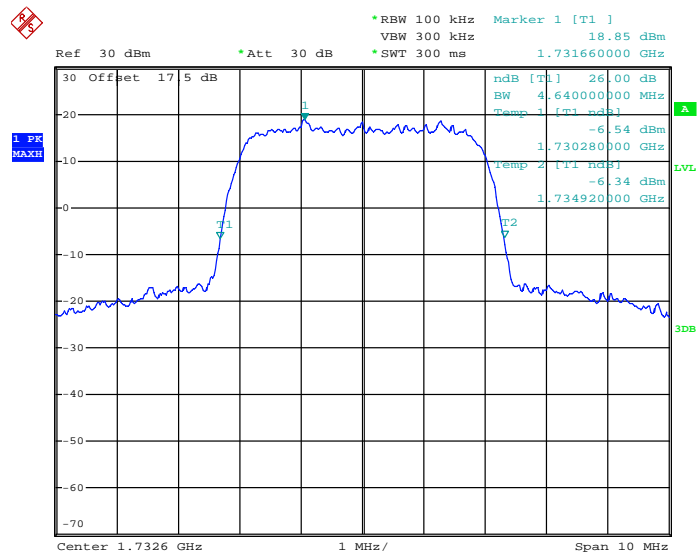


99% Occupied Bandwidth Plot on Channel 1413 (1732.6 MHz)

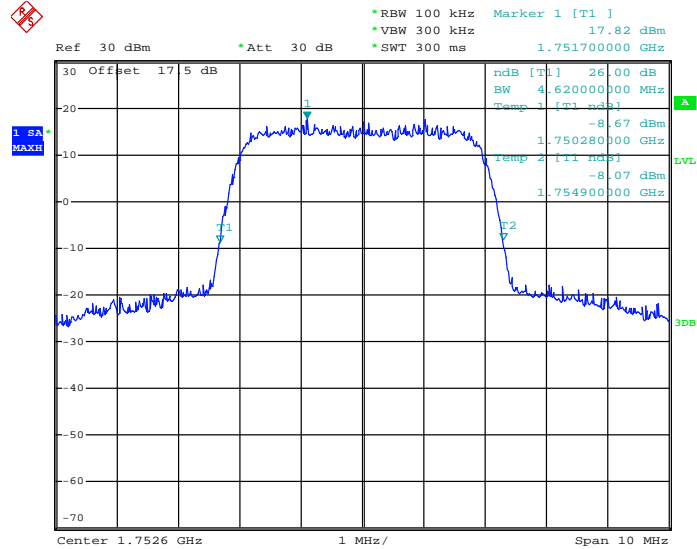


Date: 8.DEC.2013 10:25:02

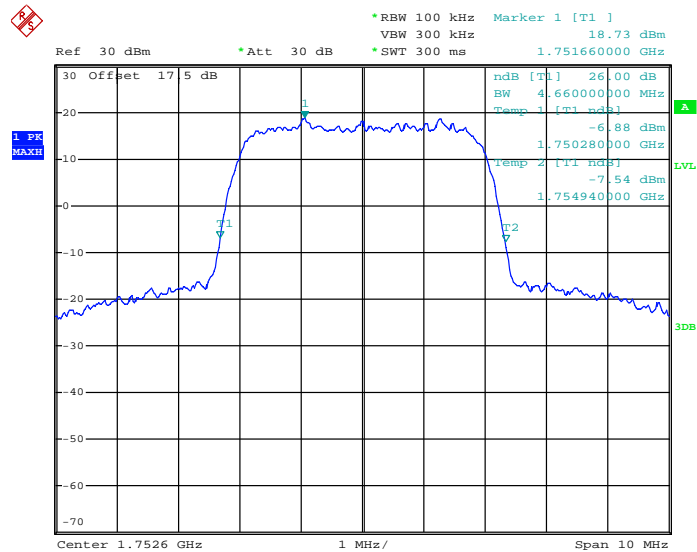
26dB Bandwidth Plot on Channel 1413 (1732.6 MHz)



Date: 8.DEC.2013 10:19:27

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


Date: 8.DEC.2013 10:27:15

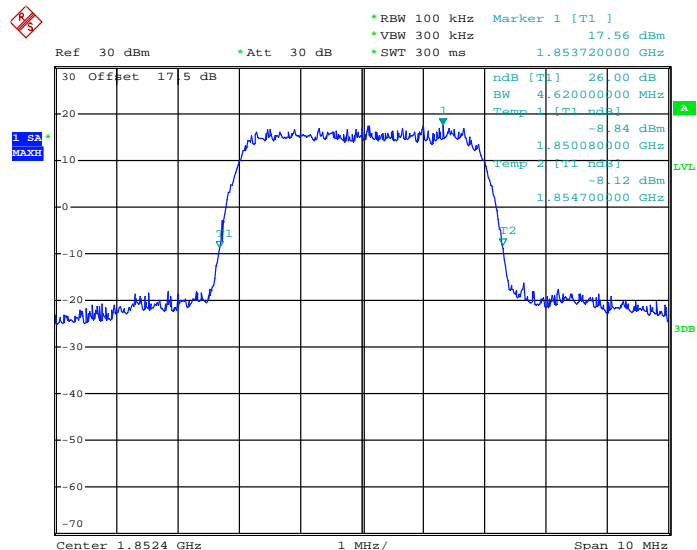
26dB Bandwidth Plot on Channel 1513 (1752.6 MHz)


Date: 8.DEC.2013 10:18:25



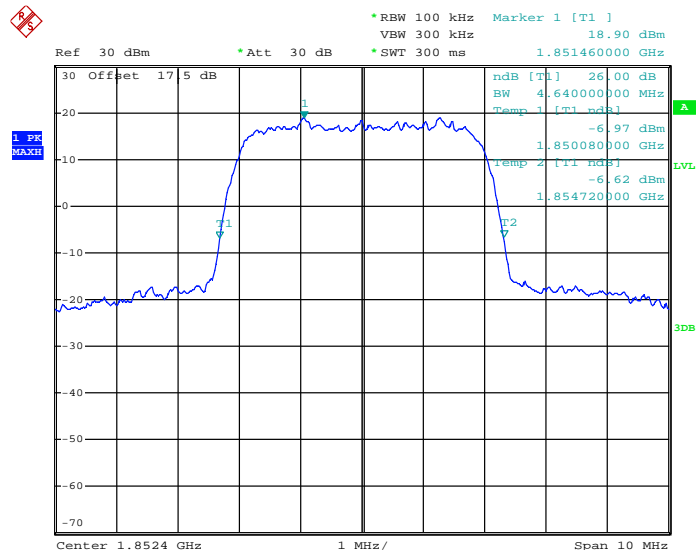
| | | | |
|--------|---------------|-------------|--------------------------|
| Band : | WCDMA Band II | Test Mode : | RMC 12.2Kbps Link (QPSK) |
|--------|---------------|-------------|--------------------------|

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

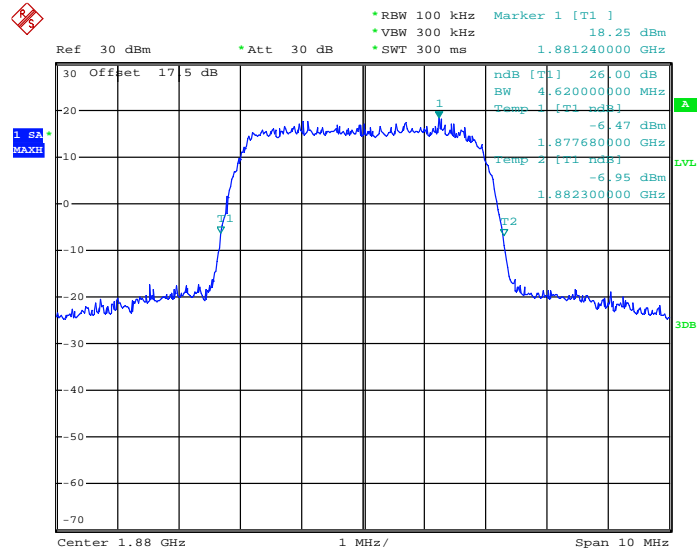


Date: 8.DEC.2013 10:33:29

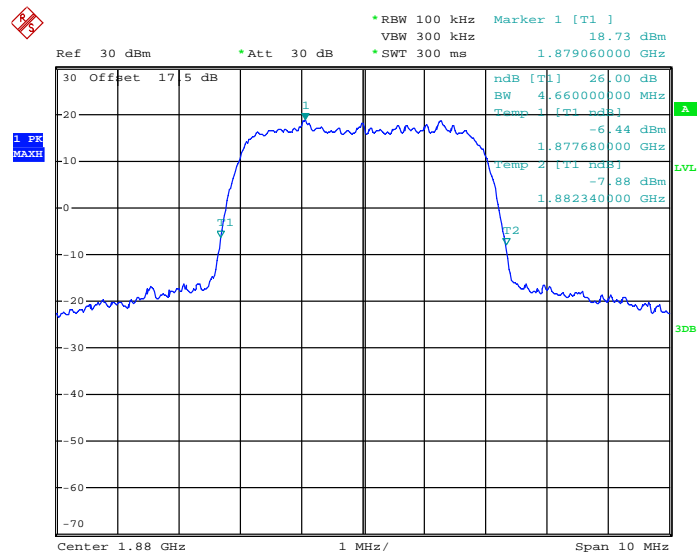
26dB Bandwidth Plot on Channel 9262 (1852.4 MHz)



Date: 8.DEC.2013 10:13:33

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


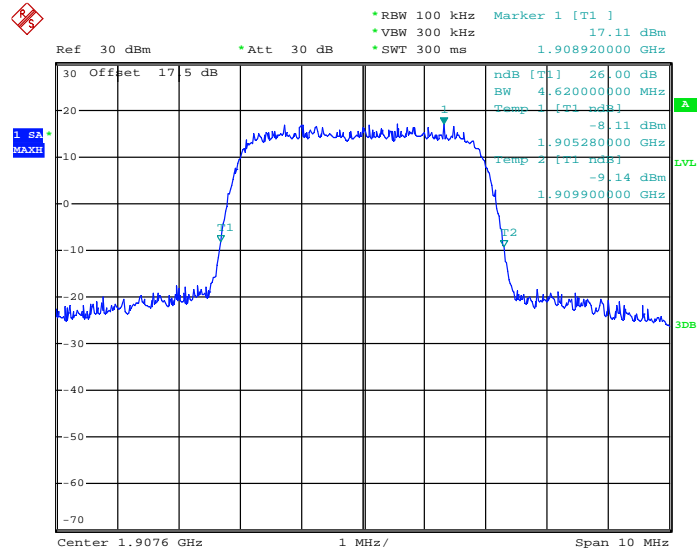
Date: 8.DEC.2013 10:31:16

26dB Bandwidth Plot on Channel 9400 (1880.0 MHz)


Date: 8.DEC.2013 10:12:18

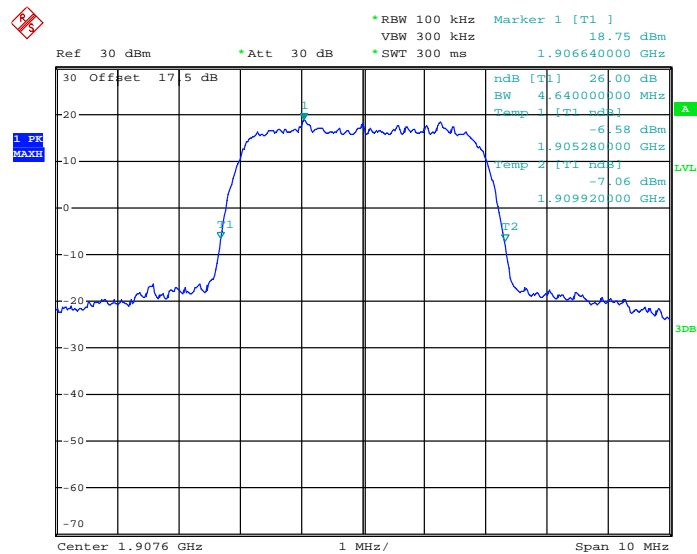


99% Occupied Bandwidth Plot on Channel 9538 (1907.6 MHz)



Date: 8.DEC.2013 10:35:09

26dB Bandwidth Plot on Channel 9538 (1907.6 MHz)



Date: 8.DEC.2013 10:14:25

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

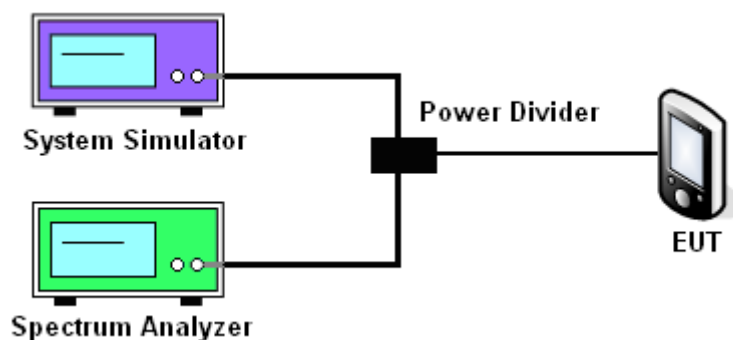
See list of measuring instruments of this test report.

3.5.3 Test Procedures

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. The band edges of low and high channels for the highest RF powers were measured. Setting RBW as roughly BW/100.
4. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
5. The limit line is derived from $43 + 10\log(P)$ dB below the transmitter power P(Watts)
 $= P(W) - [43 + 10\log(P)] \text{ (dB)}$
 $= [30 + 10\log(P)] \text{ (dBm)} - [43 + 10\log(P)] \text{ (dB)}$
 $= -13\text{dBm}.$

3.5.4 Test Setup

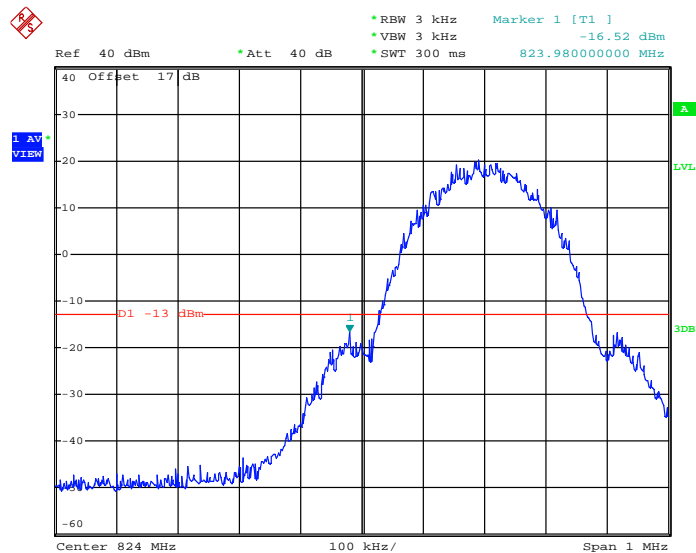
<Conducted Band Edge >



3.5.5 Test Result (Plots) of Conducted Band Edge

| | | | |
|----------------------------|-----------|---------------------------------|--------------------------|
| Band : | GSM850 | Test Mode : | GPRS class 8 Link (GMSK) |
| Correction Factor : | 0.20dB | Maximum 26dB Bandwidth : | 0.314MHz |
| Band Edge : | -16.32dBm | Measurement Value : | -16.52dBm |

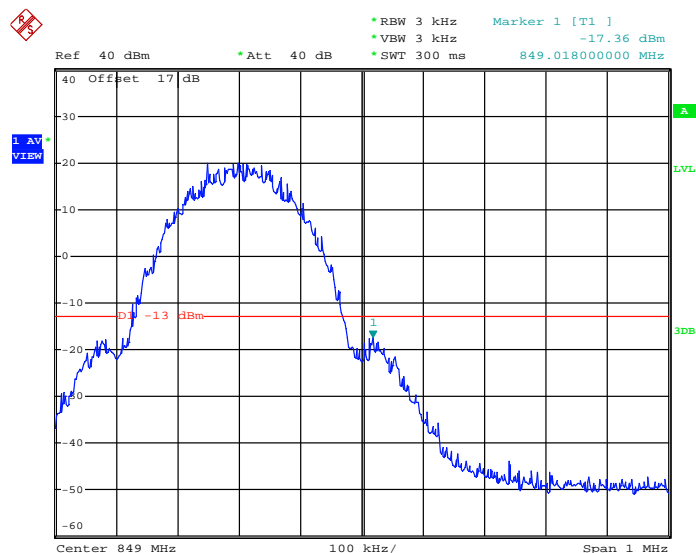
Lower Band Edge Plot on Channel 128 (824.2 MHz)



Date: 7.DEC.2013 14:49:45

1. Correction Factor(dB)= $10\log(1\% \text{ Emission BW/RBW})$
2. Band Edge= Measurement Value + Correction Factor(dB)
For example, -16.52 dBm + 0.20 dB = -16.32 dBm

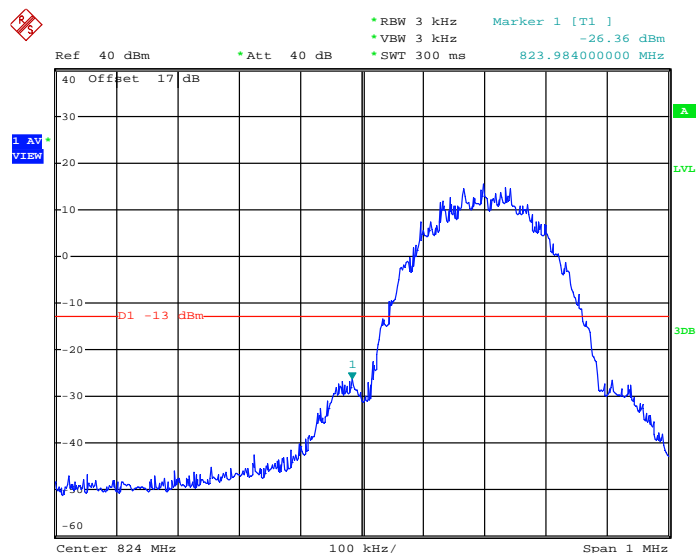
| | | | |
|----------------------------|-----------|---------------------------------|--------------------------|
| Band : | GSM850 | Test Mode : | GPRS class 8 Link (GMSK) |
| Correction Factor : | 0.20dB | Maximum 26dB Bandwidth : | 0.314MHz |
| Band Edge : | -17.16dBm | Measurement Value : | -17.36dBm |

Higher Band Edge Plot on Channel 251 (848.8 MHz)


Date: 7.DEC.2013 14:51:25

1. Correction Factor(dB)= $10\log(1\% \text{ Emission BW/RBW})$
2. Band Edge= Measurement Value + Correction Factor(dB)

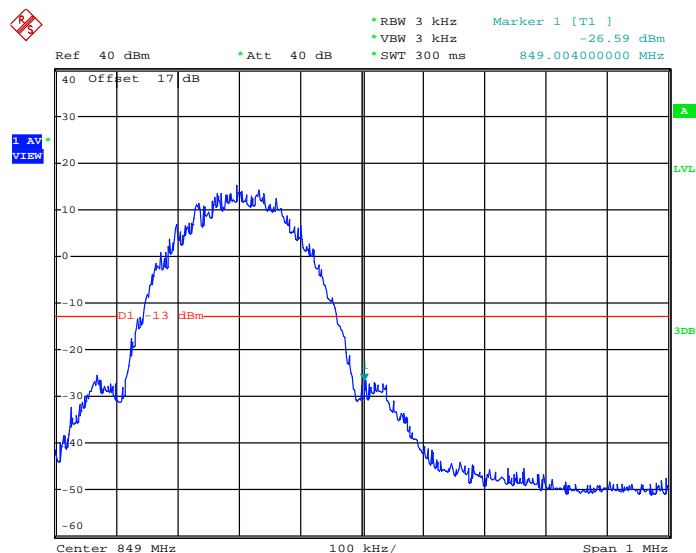
| | | | |
|----------------------------|-----------|---------------------------------|--------------------------|
| Band : | GSM850 | Test Mode : | EDGE class 8 Link (8PSK) |
| Correction Factor : | 0.20dB | Maximum 26dB Bandwidth : | 0.314MHz |
| Band Edge : | -26.16dBm | Measurement Value : | -26.36dBm |

Lower Band Edge Plot on Channel 128 (824.2 MHz)


Date: 7.DEC.2013 17:56:12

1. Correction Factor(dB)= $10\log(1\% \text{ Emission BW/RBW})$
2. Band Edge= Measurement Value + Correction Factor(dB)

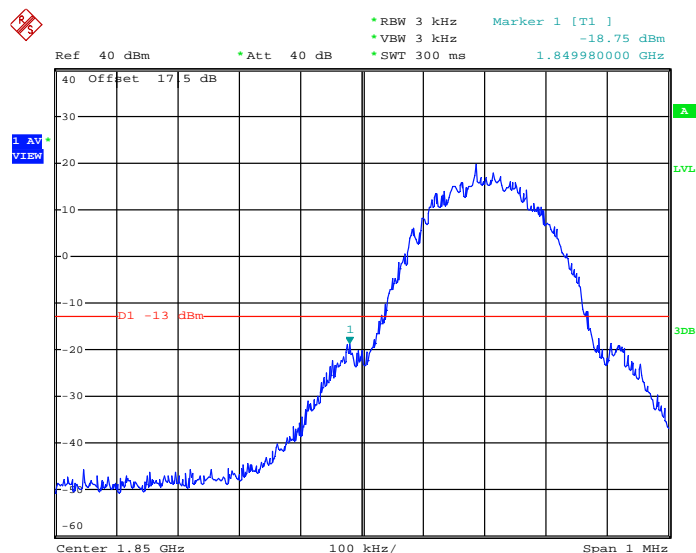
| | | | |
|----------------------------|-----------|---------------------------------|--------------------------|
| Band : | GSM850 | Test Mode : | EDGE class 8 Link (8PSK) |
| Correction Factor : | 0.20dB | Maximum 26dB Bandwidth : | 0.314MHz |
| Band Edge : | -26.39dBm | Measurement Value : | -26.59dBm |

Higher Band Edge Plot on Channel 251 (848.8 MHz)


Date: 7.DEC.2013 17:58:36

1. Correction Factor(dB)= $10\log(1\% \text{ Emission BW/RBW})$
2. Band Edge= Measurement Value + Correction Factor(dB)

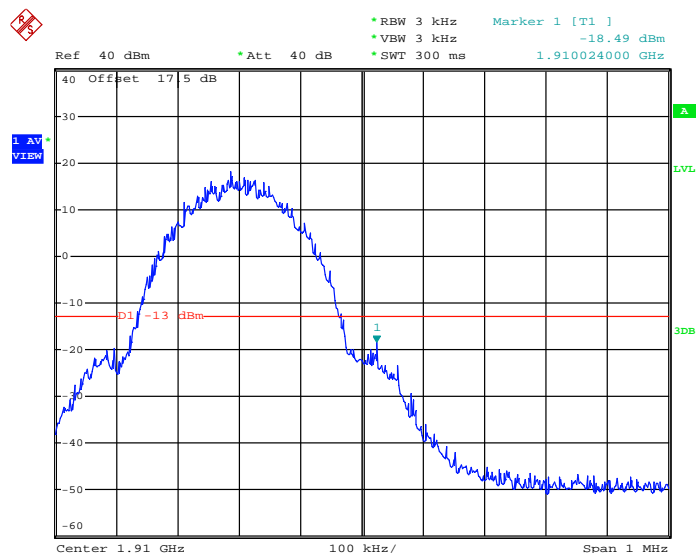
| | | | |
|----------------------------|-----------|---------------------------------|--------------------------|
| Band : | GSM1900 | Test Mode : | GPRS class 8 Link (GMSK) |
| Correction Factor : | 0.28dB | Maximum 26dB Bandwidth : | 0.320MHz |
| Band Edge : | -18.47dBm | Measurement Value : | -18.75dBm |

Lower Band Edge Plot on Channel 512 (1850.2 MHz)


Date: 7.DEC.2013 15:40:04

1. Correction Factor(dB)= $10\log(1\% \text{ Emission BW/RBW})$
2. Band Edge= Measurement Value + Correction Factor(dB)

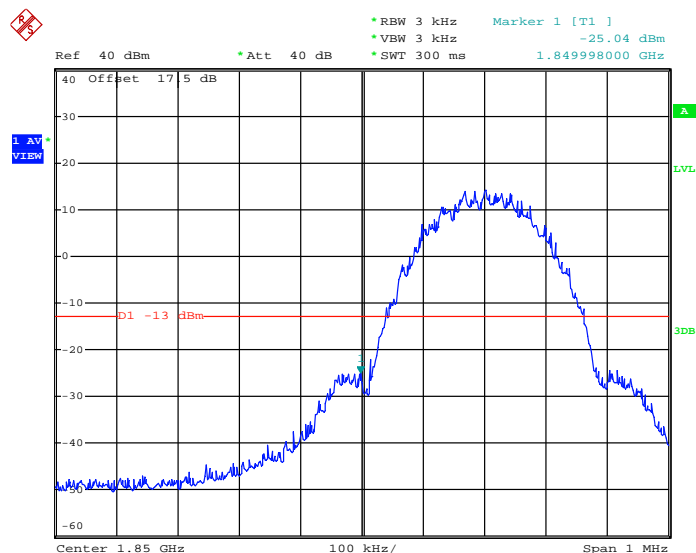
| | | | |
|----------------------------|-----------|---------------------------------|--------------------------|
| Band : | GSM1900 | Test Mode : | GPRS class 8 Link (GMSK) |
| Correction Factor : | 0.28dB | Maximum 26dB Bandwidth : | 0.320MHz |
| Band Edge : | -18.21dBm | Measurement Value : | -18.49dBm |

Higher Band Edge Plot on Channel 810 (1909.8 MHz)


Date: 7.DEC.2013 15:42:07

1. Correction Factor(dB)= $10\log(1\% \text{ Emission BW/RBW})$
2. Band Edge= Measurement Value + Correction Factor(dB)

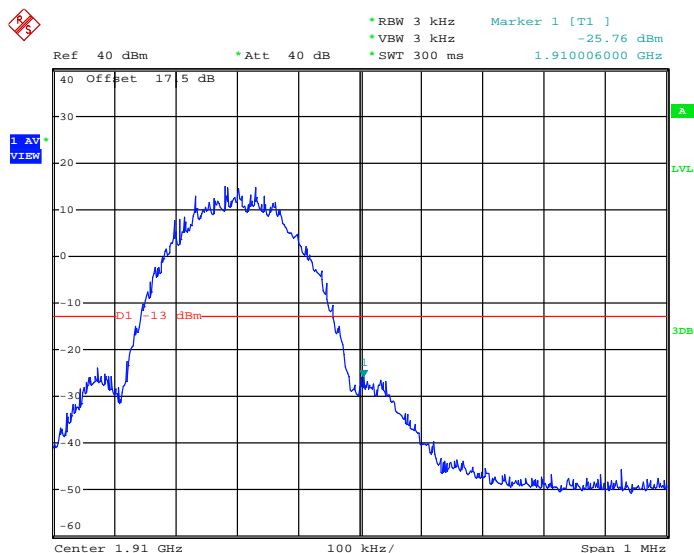
| | | | |
|----------------------------|-----------|---------------------------------|--------------------------|
| Band : | GSM1900 | Test Mode : | EDGE class 8 Link (8PSK) |
| Correction Factor : | 0.23dB | Maximum 26dB Bandwidth : | 0.316MHz |
| Band Edge : | -24.81dBm | Measurement Value : | -25.04dBm |

Lower Band Edge Plot on Channel 512 (1850.2 MHz)


Date: 7.DEC.2013 16:22:39

1. Correction Factor(dB)= $10\log(1\% \text{ Emission BW/RBW})$
2. Band Edge= Measurement Value + Correction Factor(dB)

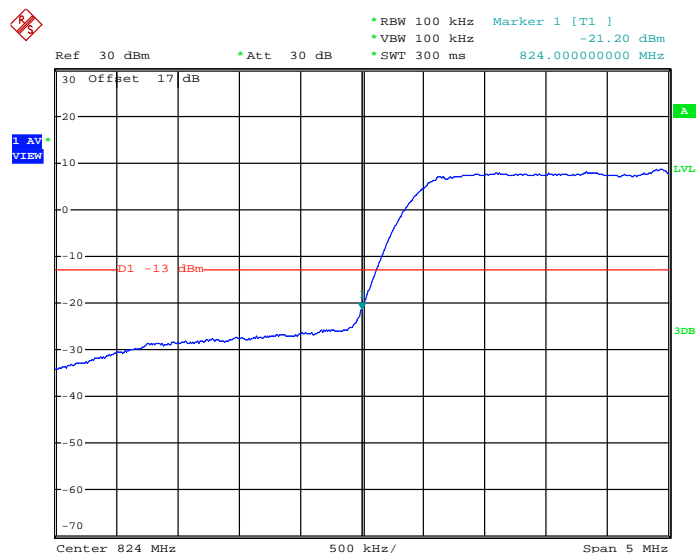
| | | | |
|----------------------------|-----------|---------------------------------|--------------------------|
| Band : | GSM1900 | Test Mode : | EDGE class 8 Link (8PSK) |
| Correction Factor : | 0.23dB | Maximum 26dB Bandwidth : | 0.316MHz |
| Band Edge : | -25.53dBm | Measurement Value : | -25.76dBm |

Higher Band Edge Plot on Channel 810 (1909.8 MHz)


Date: 7.DEC.2013 16:17:36

1. Correction Factor(dB)= $10\log(1\% \text{ Emission BW/RBW})$
2. Band Edge= Measurement Value + Correction Factor(dB)

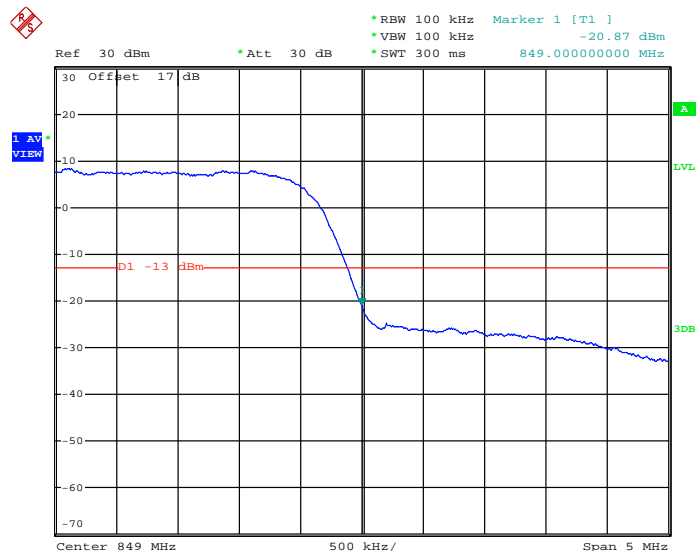
| | | | |
|----------------------------|--------------|---------------------------------|--------------------------|
| Band : | WCDMA Band V | Test Mode : | RMC 12.2Kbps Link (QPSK) |
| Correction Factor : | -3.30dB | Maximum 26dB Bandwidth : | 4.680MHz |
| Band Edge : | -24.50dBm | Measurement Value : | -21.20dBm |

Lower Band Edge Plot on Channel 4132 (826.4 MHz)


Date: 8.DEC.2013 11:07:01

1. Correction Factor(dB)= $10\log(1\% \text{ Emission BW/RBW})$
2. Band Edge= Measurement Value + Correction Factor(dB)

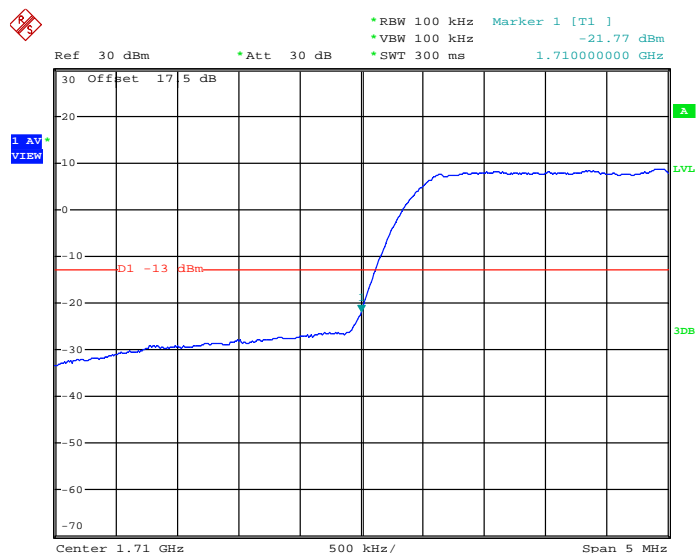
| | | | |
|----------------------------|--------------|---------------------------------|--------------------------|
| Band : | WCDMA Band V | Test Mode : | RMC 12.2Kbps Link (QPSK) |
| Correction Factor : | -3.30dB | Maximum 26dB Bandwidth : | 4.680MHz |
| Band Edge : | -24.17dBm | Measurement Value : | -20.87dBm |

Higher Band Edge Plot on Channel 4233 (846.6 MHz)


Date: 8.DEC.2013 11:05:11

1. Correction Factor(dB)= $10\log(1\% \text{ Emission BW/RBW})$
2. Band Edge= Measurement Value + Correction Factor(dB)

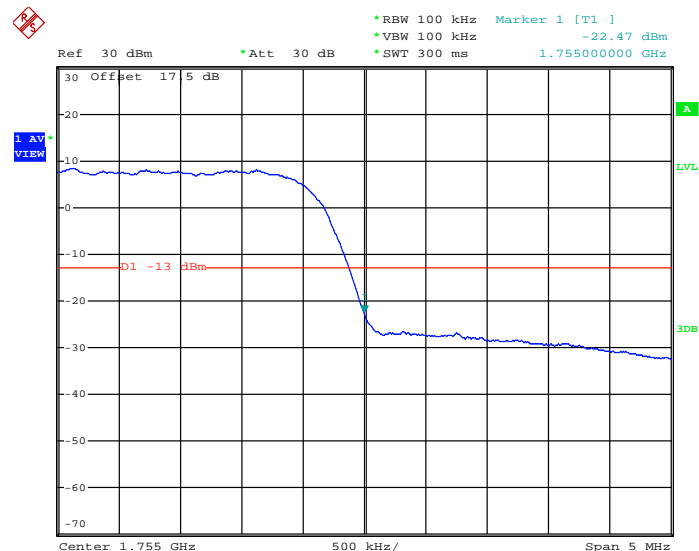
| | | | |
|----------------------------|---------------|---------------------------------|--------------------------|
| Band : | WCDMA Band IV | Test Mode : | RMC 12.2Kbps Link (QPSK) |
| Correction Factor : | -3.32dB | Maximum 26dB Bandwidth : | 4.660MHz |
| Band Edge : | -25.09dBm | Measurement Value : | -21.77dBm |

Lower Band Edge Plot on Channel 1312 (1712.4 MHz)


Date: 8.DEC.2013 11:14:15

1. Correction Factor(dB)= $10\log(1\% \text{ Emission BW/RBW})$
2. Band Edge= Measurement Value + Correction Factor(dB)

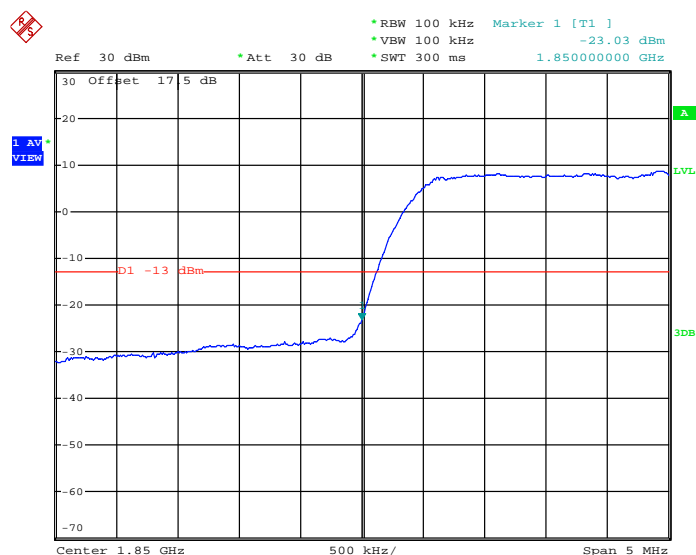
| | | | |
|----------------------------|---------------|---------------------------------|--------------------------|
| Band : | WCDMA Band IV | Test Mode : | RMC 12.2Kbps Link (QPSK) |
| Correction Factor : | -3.32dB | Maximum 26dB Bandwidth : | 4.660MHz |
| Band Edge : | -25.79dBm | Measurement Value : | -22.47dBm |

Higher Band Edge Plot on Channel 1513 (1752.6 MHz)


Date: 8.DEC.2013 11:12:33

1. Correction Factor(dB)= $10\log(1\% \text{ Emission BW/RBW})$
2. Band Edge= Measurement Value + Correction Factor(dB)

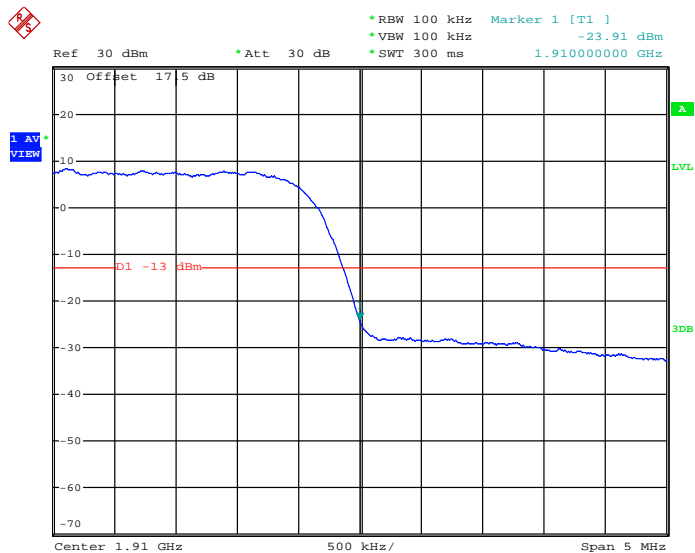
| | | | |
|----------------------------|---------------|---------------------------------|--------------------------|
| Band : | WCDMA Band II | Test Mode : | RMC 12.2Kbps Link (QPSK) |
| Correction Factor : | -3.32dB | Maximum 26dB Bandwidth : | 4.660MHz |
| Band Edge : | -26.35dBm | Measurement Value : | -23.03dBm |

Lower Band Edge Plot on Channel 9262 (1852.4 MHz)


Date: 8.DEC.2013 11:08:33

1. Correction Factor(dB)= $10\log(1\% \text{ Emission BW/RBW})$
2. Band Edge= Measurement Value + Correction Factor(dB)

| | | | |
|----------------------------|---------------|---------------------------------|--------------------------|
| Band : | WCDMA Band II | Test Mode : | RMC 12.2Kbps Link (QPSK) |
| Correction Factor : | -3.32dB | Maximum 26dB Bandwidth : | 4.660MHz |
| Band Edge : | -27.23dBm | Measurement Value : | -23.91dBm |

Higher Band Edge Plot on Channel 9538 (1907.6 MHz)


Date: 8.DEC.2013 11:09:54

1. Correction Factor(dB)= $10\log(1\% \text{ Emission BW/RBW})$
2. Band Edge= Measurement Value + Correction Factor(dB)

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 10th harmonic.

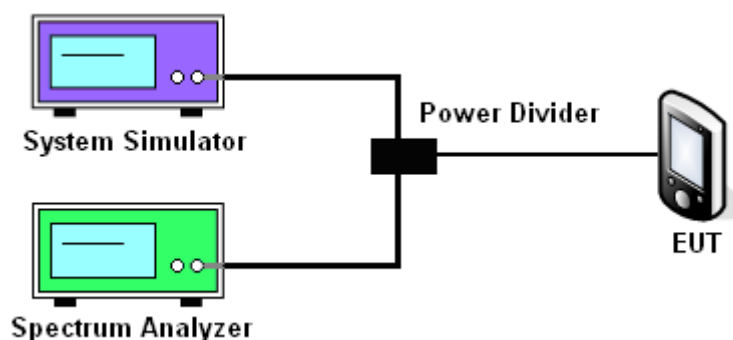
3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

3.6.3 Test Procedures

1. The EUT was connected to spectrum analyzer and base station via power divider.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. The middle channel for the highest RF power within the transmitting frequency was measured.
4. The conducted spurious emission for the whole frequency range was taken.
5. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
6. The limit line is derived from $43 + 10\log(P)$ dB below the transmitter power P(Watts)
 $= P(W) - [43 + 10\log(P)] \text{ (dB)}$
 $= [30 + 10\log(P)] \text{ (dBm)} - [43 + 10\log(P)] \text{ (dB)}$
 $= -13\text{dBm}.$

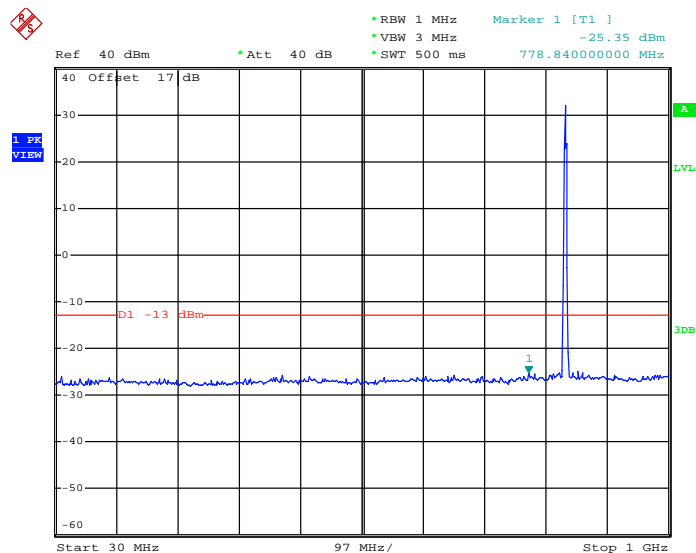
3.6.4 Test Setup



3.6.5 Test Result (Plots) of Conducted Emission

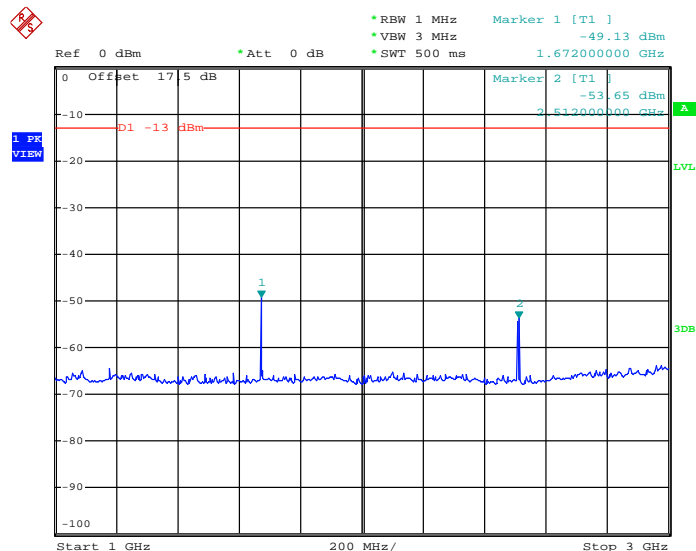
| | | | |
|--------------------|--------------------------|--------------------|-----------|
| Band : | GSM850 | Channel : | CH189 |
| Test Mode : | GPRS class 8 Link (GMSK) | Frequency : | 836.4 MHz |

Conducted Spurious Emission Plot between 30MHz ~ 1GHz



Date: 7.DEC.2013 14:57:54

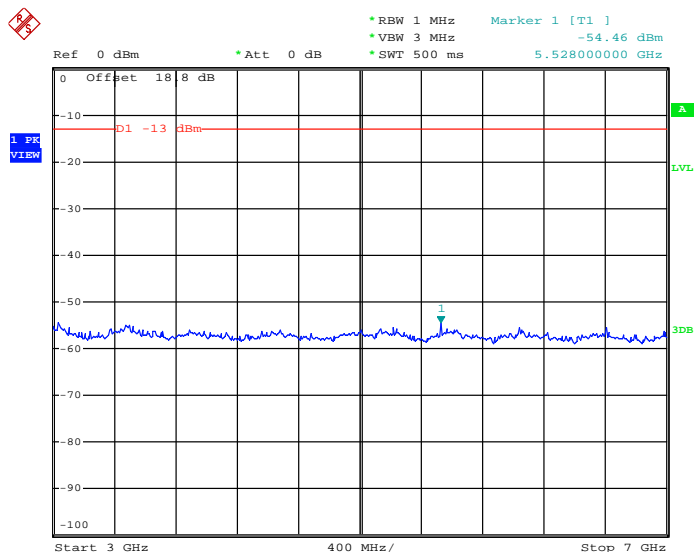
Conducted Spurious Emission Plot between 1GHz ~ 3GHz



Date: 7.DEC.2013 15:02:54

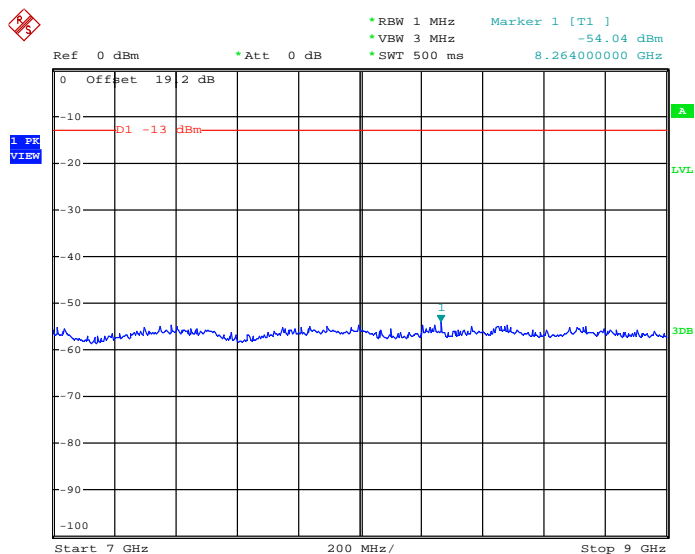


Conducted Spurious Emission Plot between 3GHz ~ 7GHz



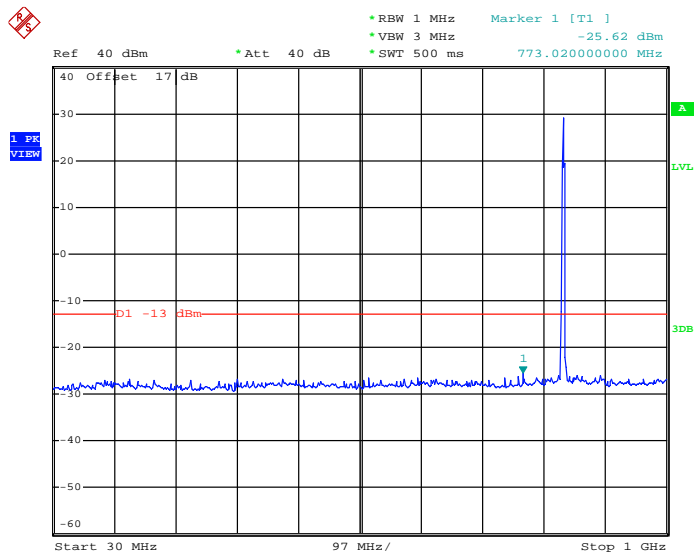
Date: 7.DEC.2013 15:03:52

Conducted Spurious Emission Plot between 7GHz ~ 9GHz

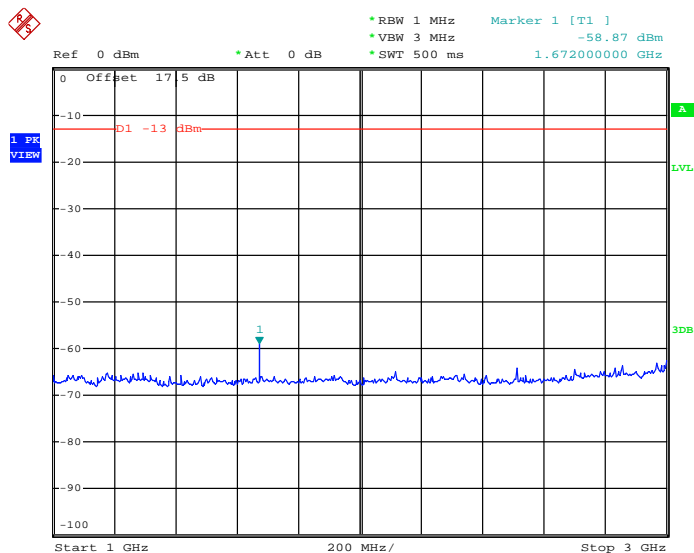


Date: 7.DEC.2013 15:04:22

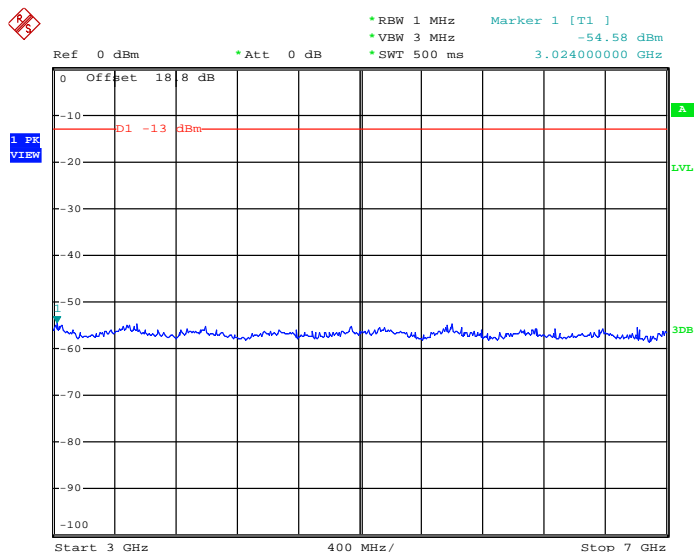
| | | | |
|--------------------|--------------------------|--------------------|-----------|
| Band : | GSM850 | Channel : | CH189 |
| Test Mode : | EDGE class 8 Link (8PSK) | Frequency : | 836.4 MHz |

Conducted Spurious Emission Plot between 30MHz ~ 1GHz


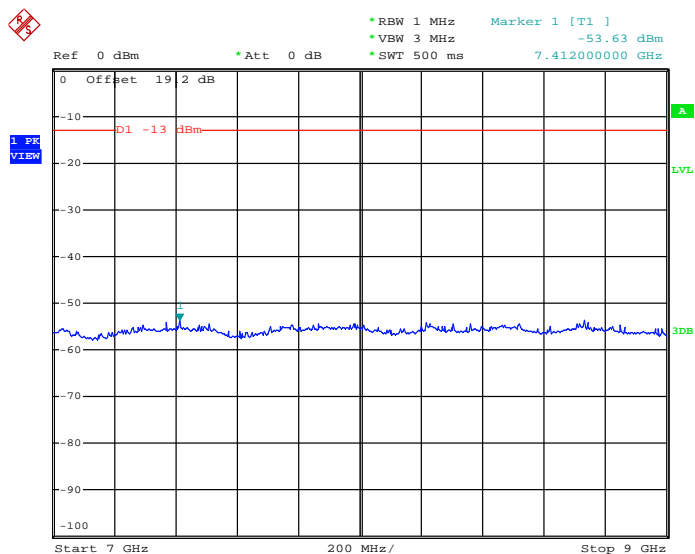
Date: 7.DEC.2013 17:02:58

Conducted Spurious Emission Plot between 1GHz ~ 3GHz


Date: 7.DEC.2013 16:57:02

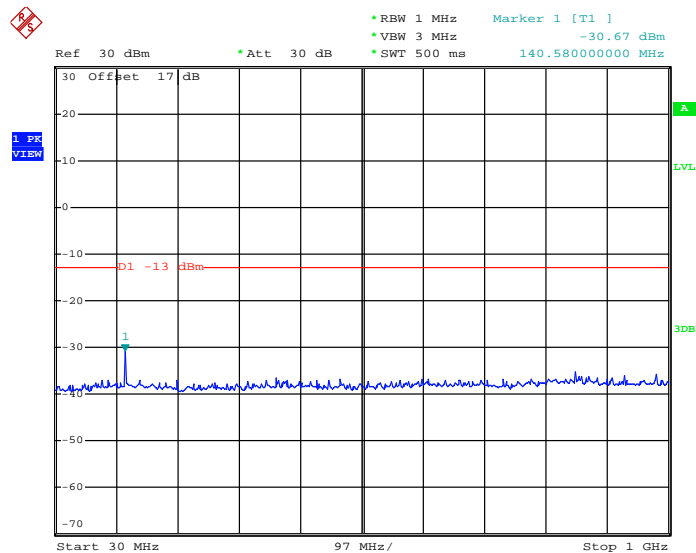
Conducted Spurious Emission Plot between 3GHz ~ 7GHz


Date: 7.DEC.2013 16:58:49

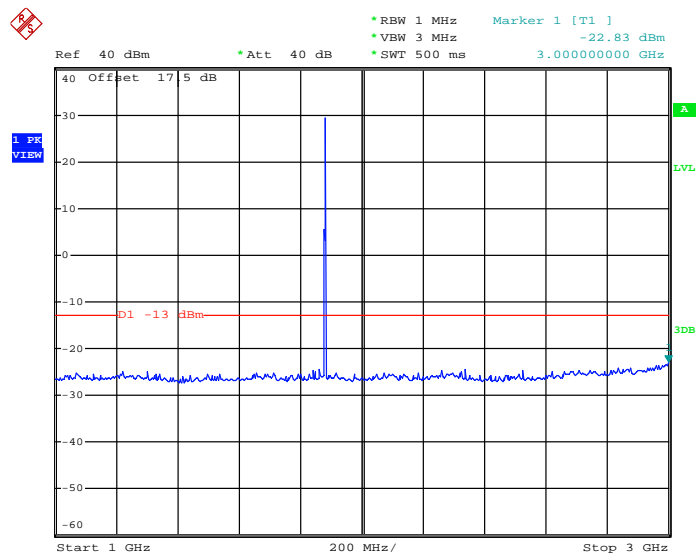
Conducted Spurious Emission Plot between 7GHz ~ 9GHz


Date: 7.DEC.2013 17:00:25

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

Conducted Spurious Emission Plot between 30MHz ~ 1GHz


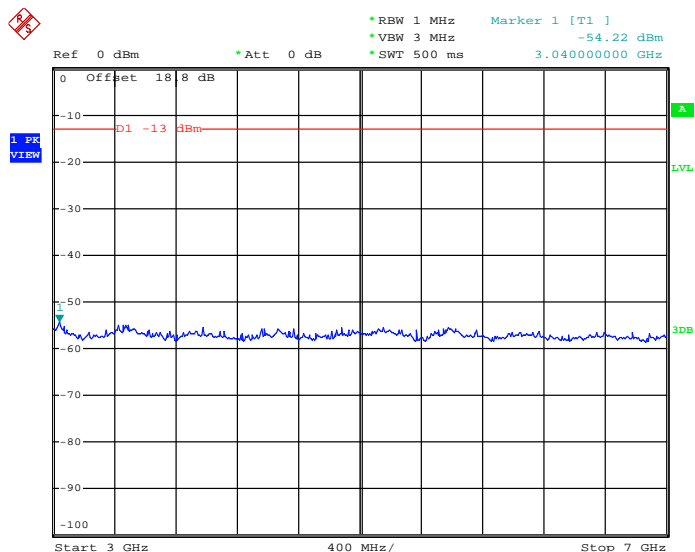
Date: 7.DEC.2013 15:13:51

Conducted Spurious Emission Plot between 1GHz ~ 3GHz


Date: 7.DEC.2013 15:14:51

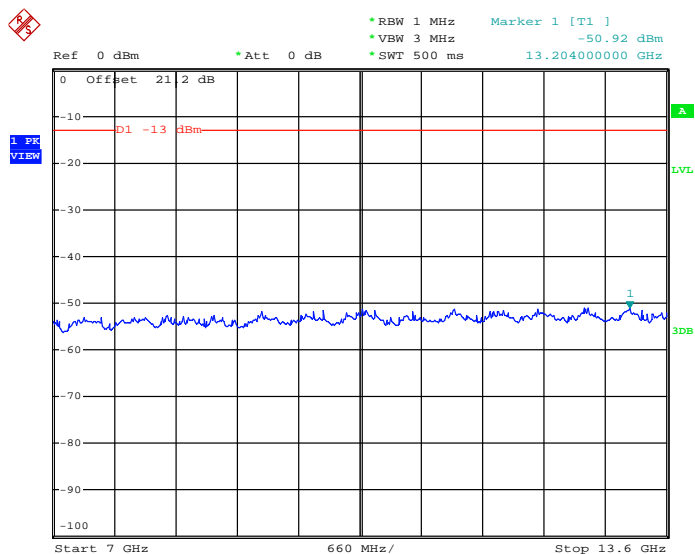


Conducted Spurious Emission Plot between 3GHz ~ 7GHz

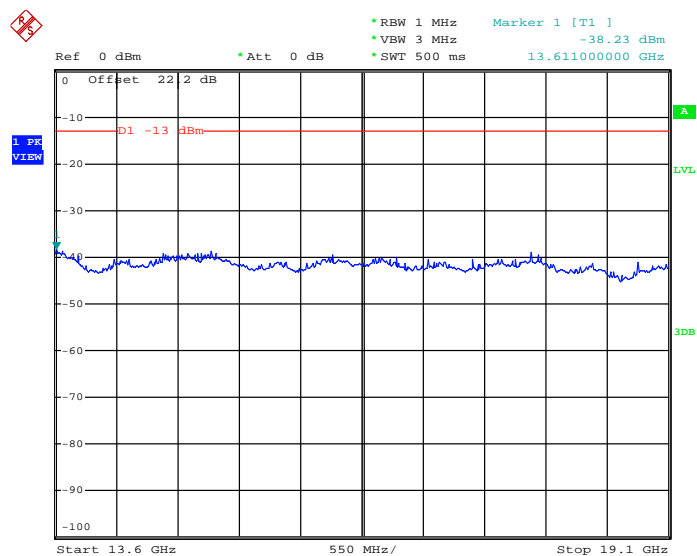


Date: 7.DEC.2013 15:09:57

Conducted Spurious Emission Plot between 7GHz ~ 13.6G

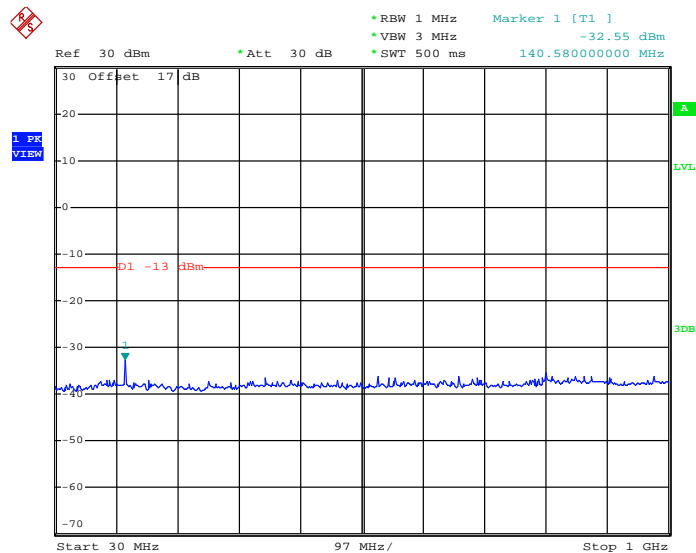


Date: 7.DEC.2013 15:10:47

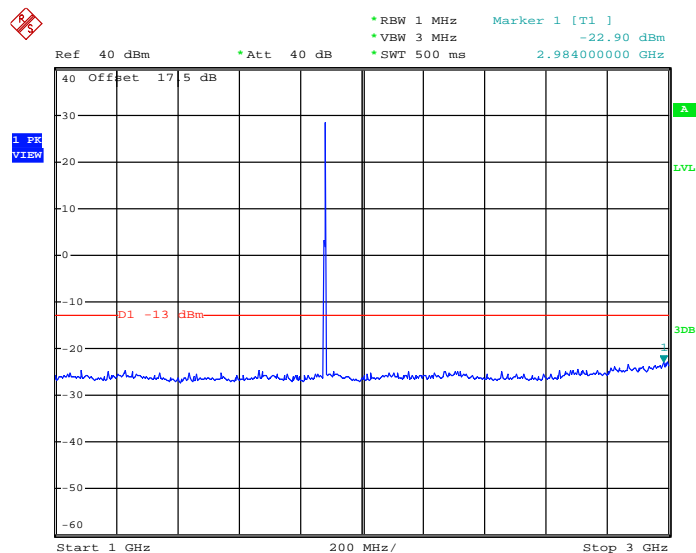
Conducted Spurious Emission Plot between 13.6GHz ~ 19.1GHz


Date: 7.DEC.2013 15:12:10

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

Conducted Spurious Emission Plot between 30MHz ~ 1GHz


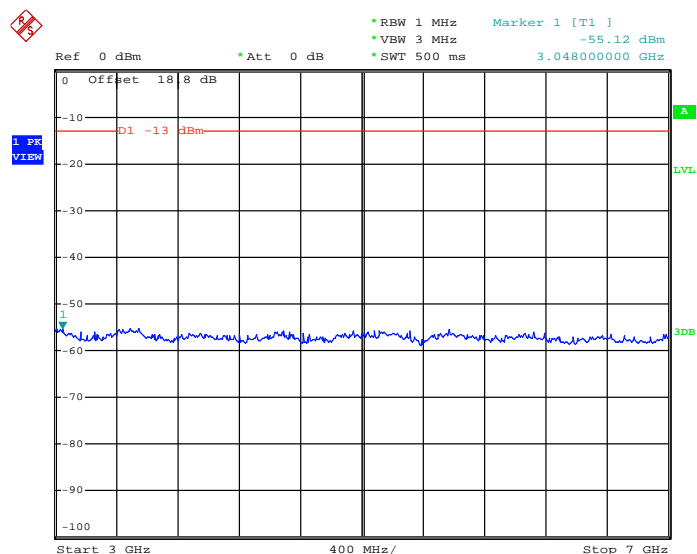
Date: 7.DEC.2013 16:44:47

Conducted Spurious Emission Plot between 1GHz ~ 3GHz


Date: 7.DEC.2013 16:45:54

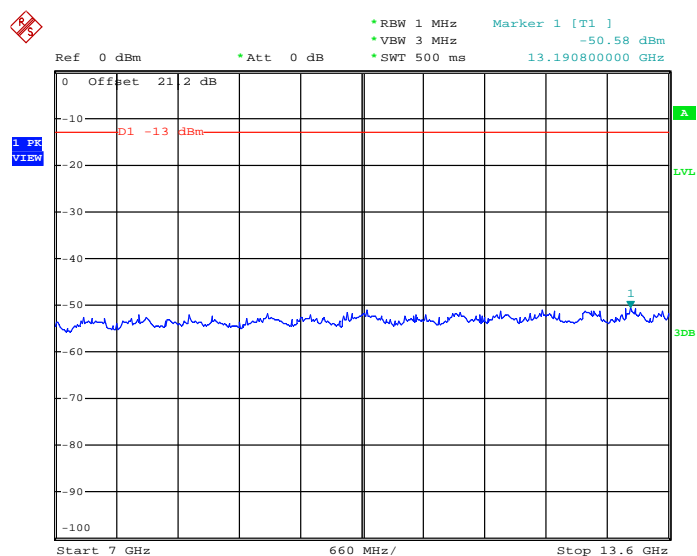


Conducted Spurious Emission Plot between 3GHz ~ 7GHz

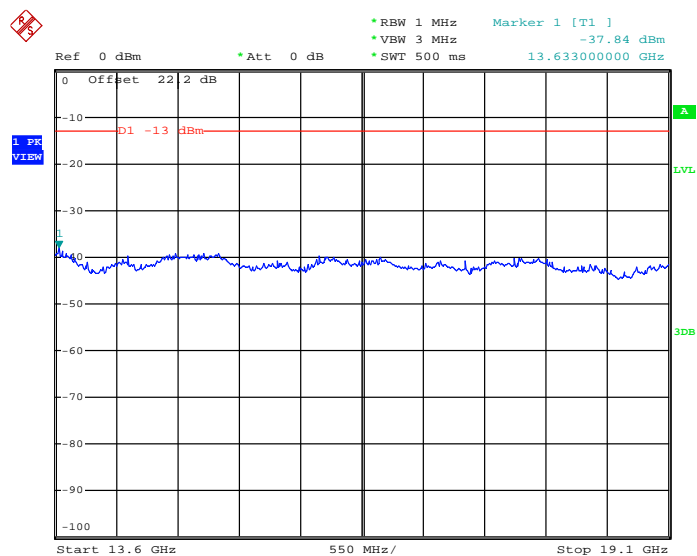


Date: 7.DEC.2013 16:47:55

Conducted Spurious Emission Plot between 7GHz ~ 13.6GHz

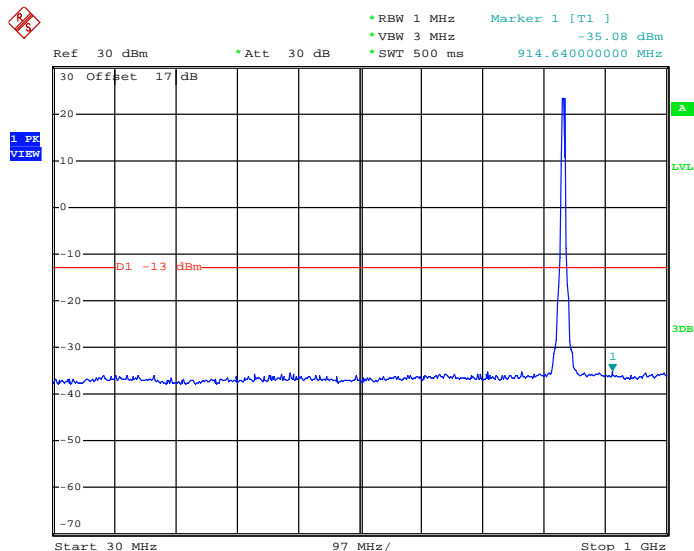


Date: 7.DEC.2013 16:49:28

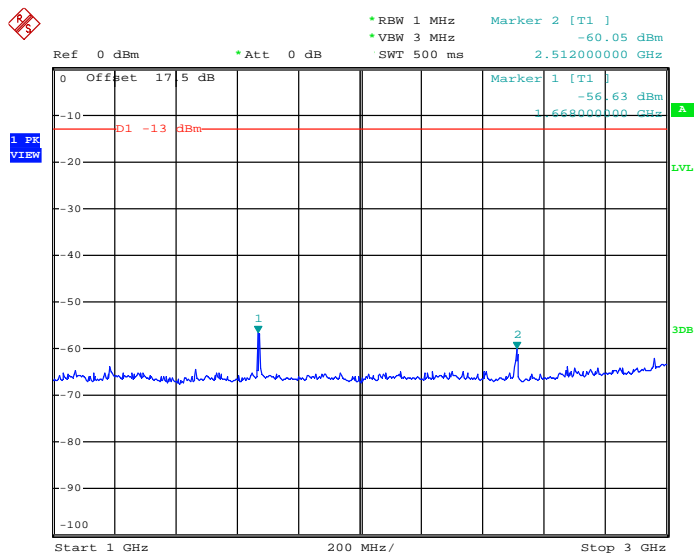
Conducted Spurious Emission Plot between 13.6GHz ~ 19.1GHz


Date: 7.DEC.2013 16:51:23

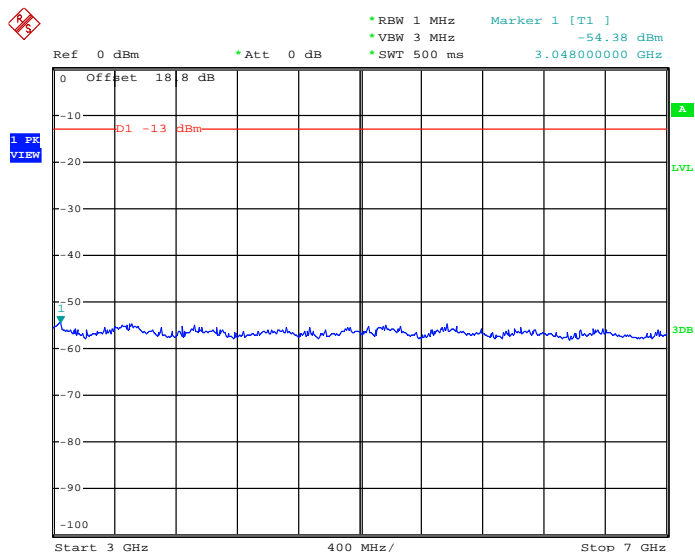
| | | | |
|--------------------|--------------------------|--------------------|-----------|
| Band : | WCDMA Band V | Channel : | CH4182 |
| Test Mode : | RMC 12.2Kbps Link (QPSK) | Frequency : | 836.4 MHz |

Conducted Spurious Emission Plot between 30MHz ~ 1GHz


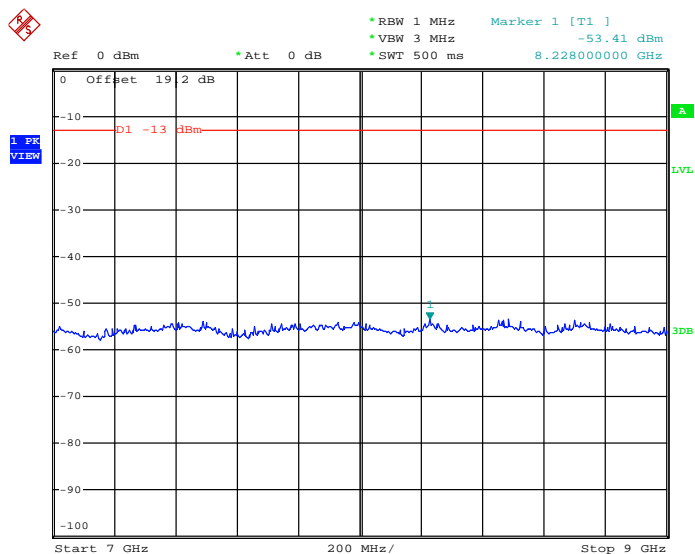
Date: 8.DEC.2013 11:35:48

Conducted Spurious Emission Plot between 1GHz ~ 3GHz


Date: 8.DEC.2013 11:39:59

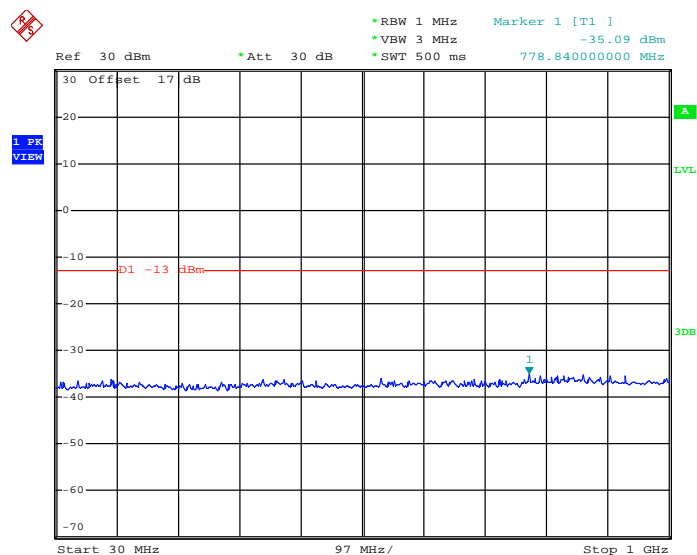
Conducted Spurious Emission Plot between 3GHz ~ 7GHz


Date: 8.DEC.2013 11:40:49

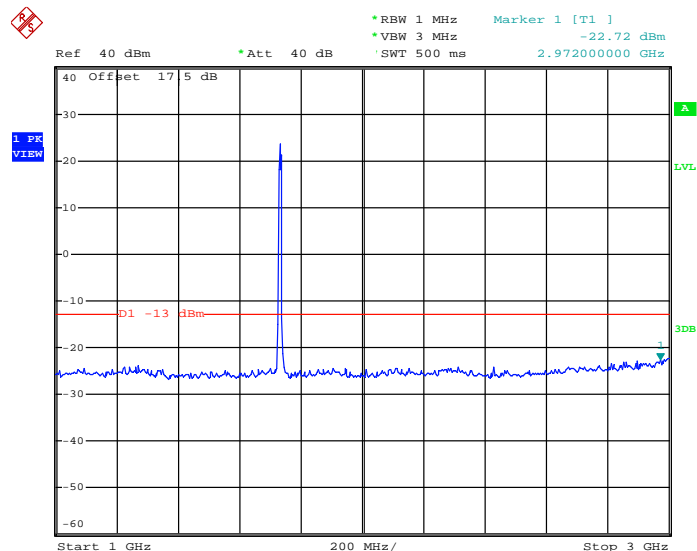
Conducted Spurious Emission Plot between 7GHz ~ 9GHz


Date: 8.DEC.2013 11:41:28

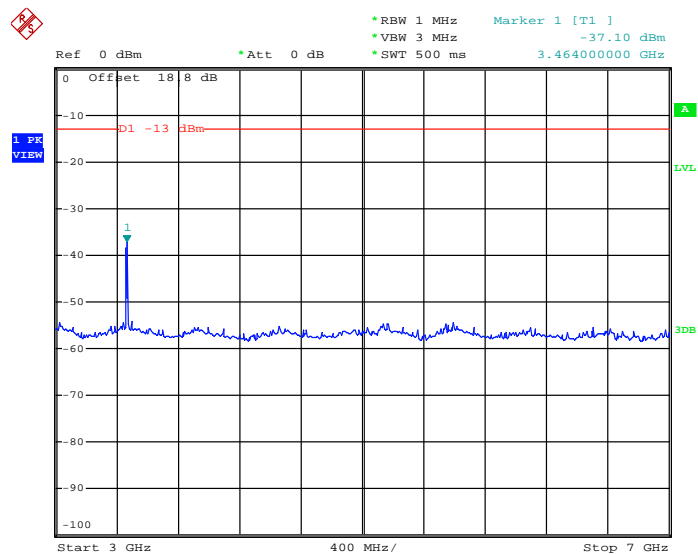
| | | | |
|--------------------|-----------------------------|--------------------|------------|
| Band : | WCDMA Band IV | Channel : | CH1413 |
| Test Mode : | RMC 12.2Kbps Link (QPSK) | Frequency : | 1732.6 MHz |

Conducted Spurious Emission Plot between 30MHz ~ 1GHz


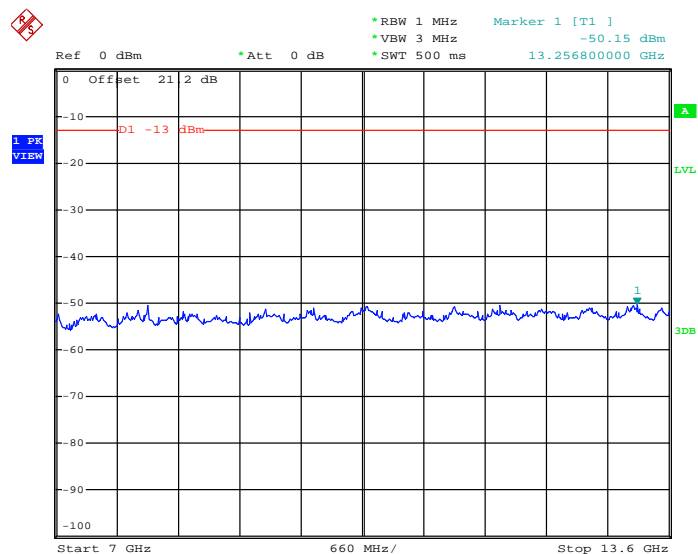
Date: 8.DEC.2013 11:46:49

Conducted Spurious Emission Plot between 1GHz ~ 3GHz


Date: 8.DEC.2013 11:56:54

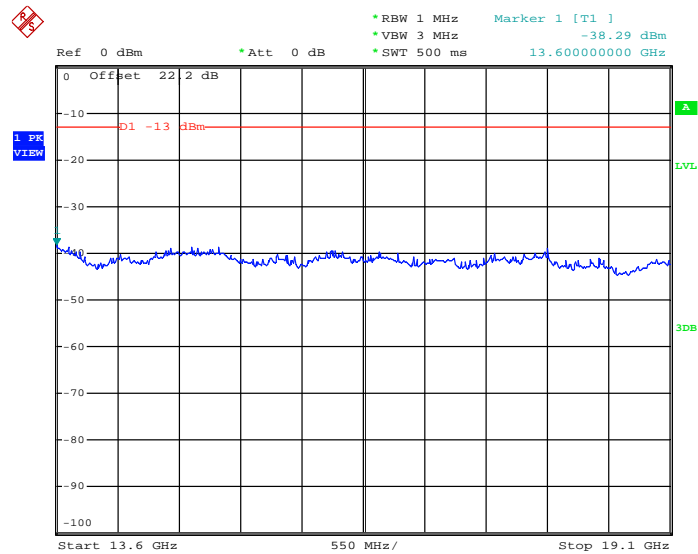
Conducted Spurious Emission Plot between 3GHz ~ 7GHz


Date: 8.DEC.2013 12:00:18

Conducted Spurious Emission Plot between 7GHz ~ 13.6GHz


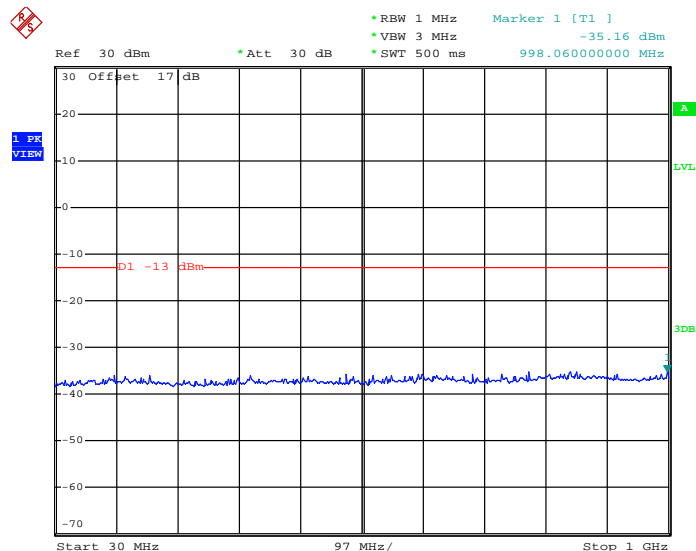
Date: 8.DEC.2013 12:01:21

Conducted Spurious Emission Plot between 13.6GHz ~ 19.1GHz

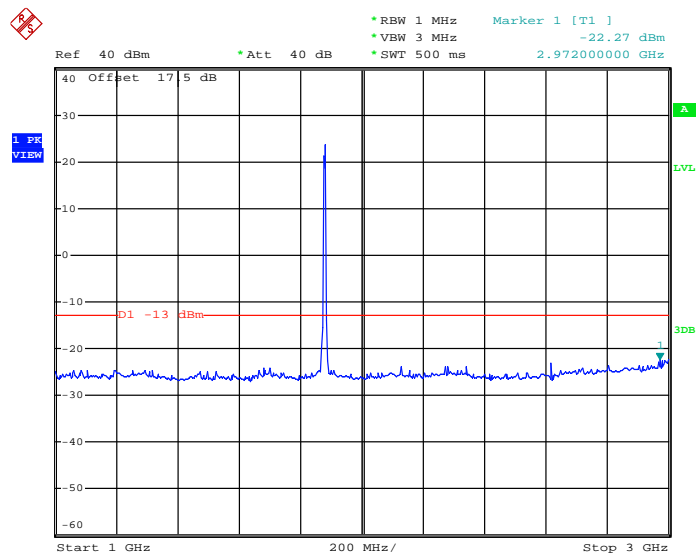


Date: 8.DEC.2013 12:03:36

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

Conducted Spurious Emission Plot between 30MHz ~ 1GHz


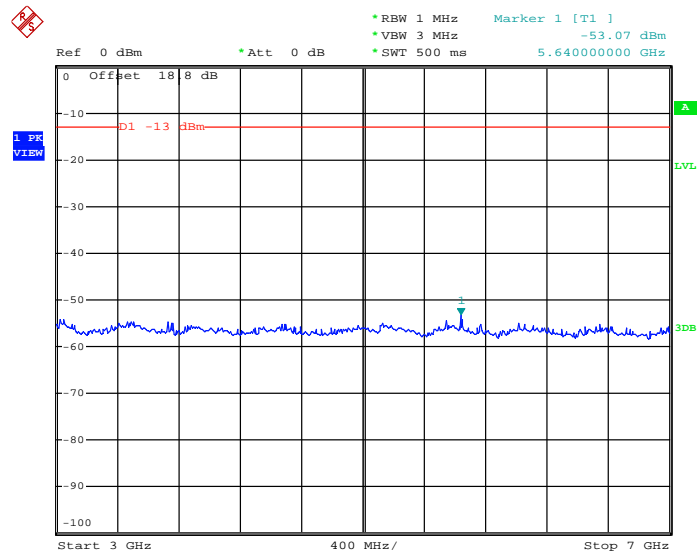
Date: 8.DEC.2013 11:44:47

Conducted Spurious Emission Plot between 1GHz ~ 3GHz


Date: 8.DEC.2013 11:58:29

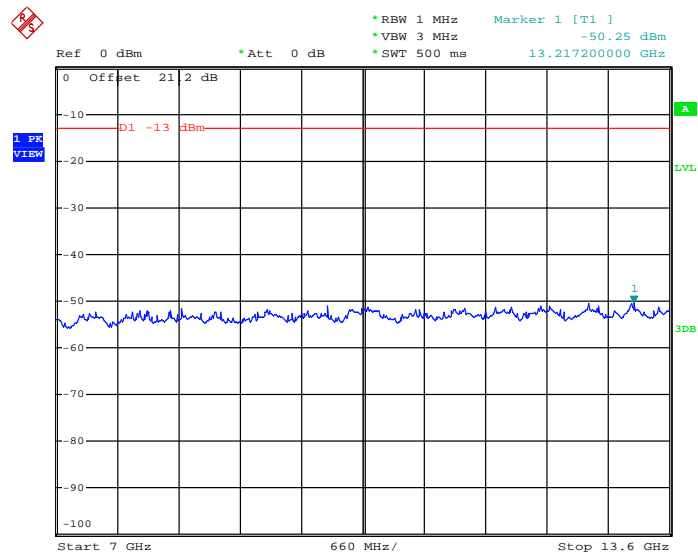


Conducted Spurious Emission Plot between 3GHz ~ 7GHz



Date: 8.DEC.2013 11:59:39

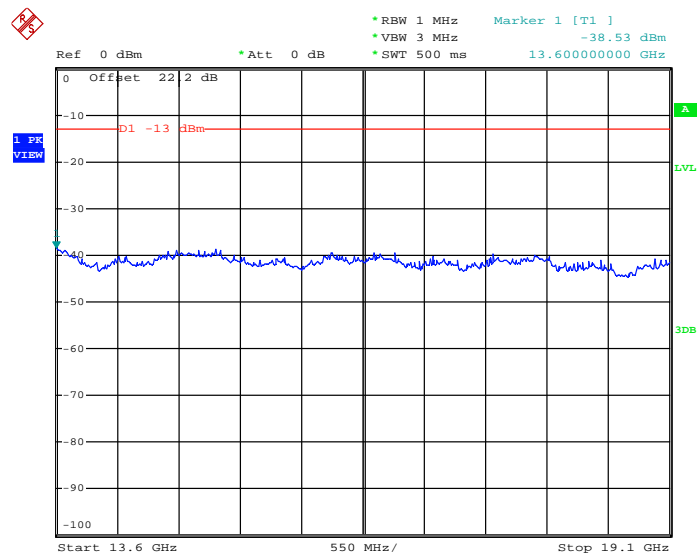
Conducted Spurious Emission Plot between 7GHz ~ 13.6GHz



Date: 8.DEC.2013 12:01:56



Conducted Spurious Emission Plot between 13.6GHz ~ 19.1GHz



Date: 8.DEC.2013 12:02:46

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

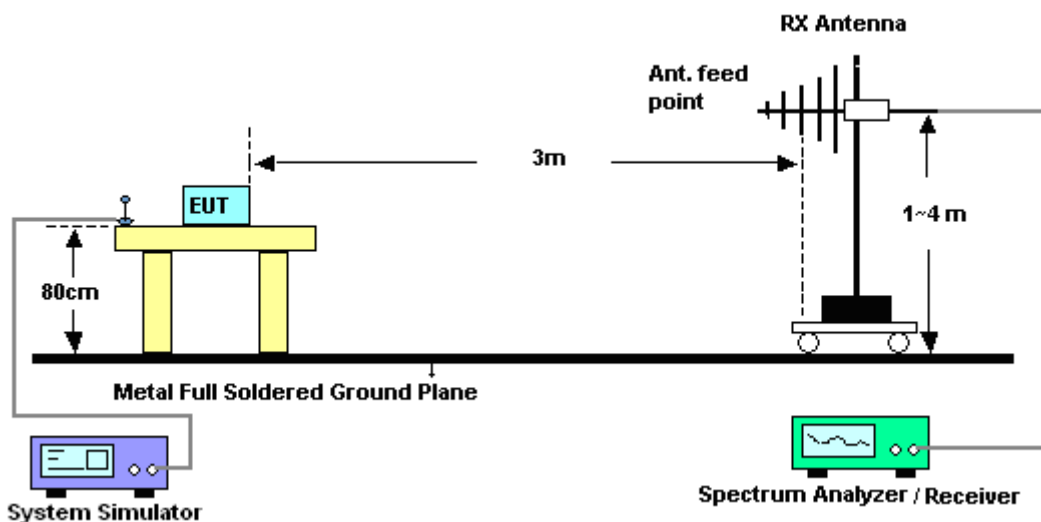
See list of measuring instruments of this test report.

3.7.3 Test Procedures

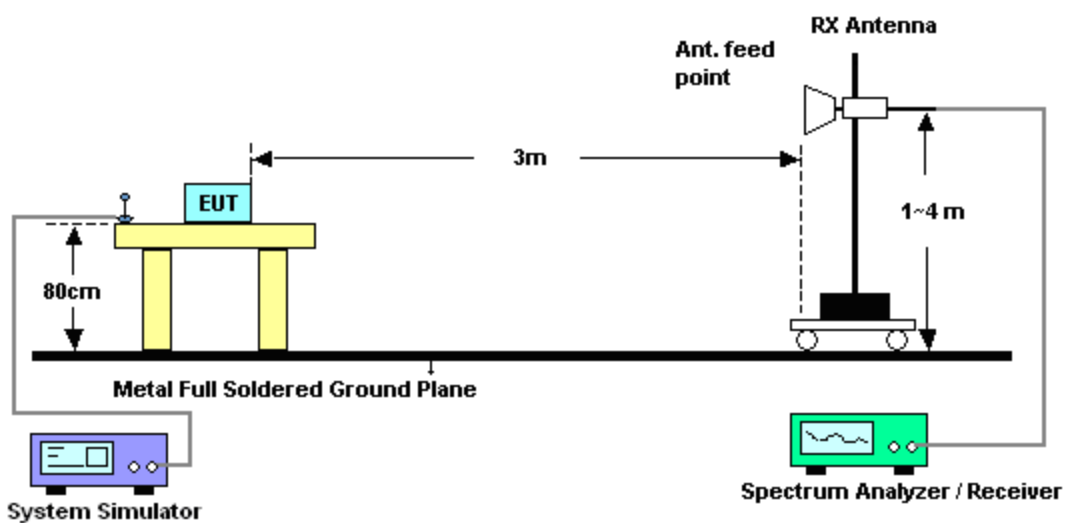
1. The EUT was placed on a rotatable wooden table with 0.8 meter above ground.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations.
5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
6. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
7. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
8. Taking the record of output power at antenna port.
9. Repeat step 7 to step 8 for another polarization.
10. $EIRP \text{ (dBm)} = S.G. \text{ Power} - Tx \text{ Cable Loss} + Tx \text{ Antenna Gain}$
11. $ERP \text{ (dBm)} = EIRP - 2.15$
12. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
13. The limit line is derived from $43 + 10\log(P)$ dB below the transmitter power P(Watts)
 $= P(W) - [43 + 10\log(P)] \text{ (dB)}$
 $= [30 + 10\log(P)] \text{ (dBm)} - [43 + 10\log(P)] \text{ (dB)}$
 $= -13\text{dBm}.$

3.7.4 Test Setup

For radiated emissions from 30MHz to 1GHz

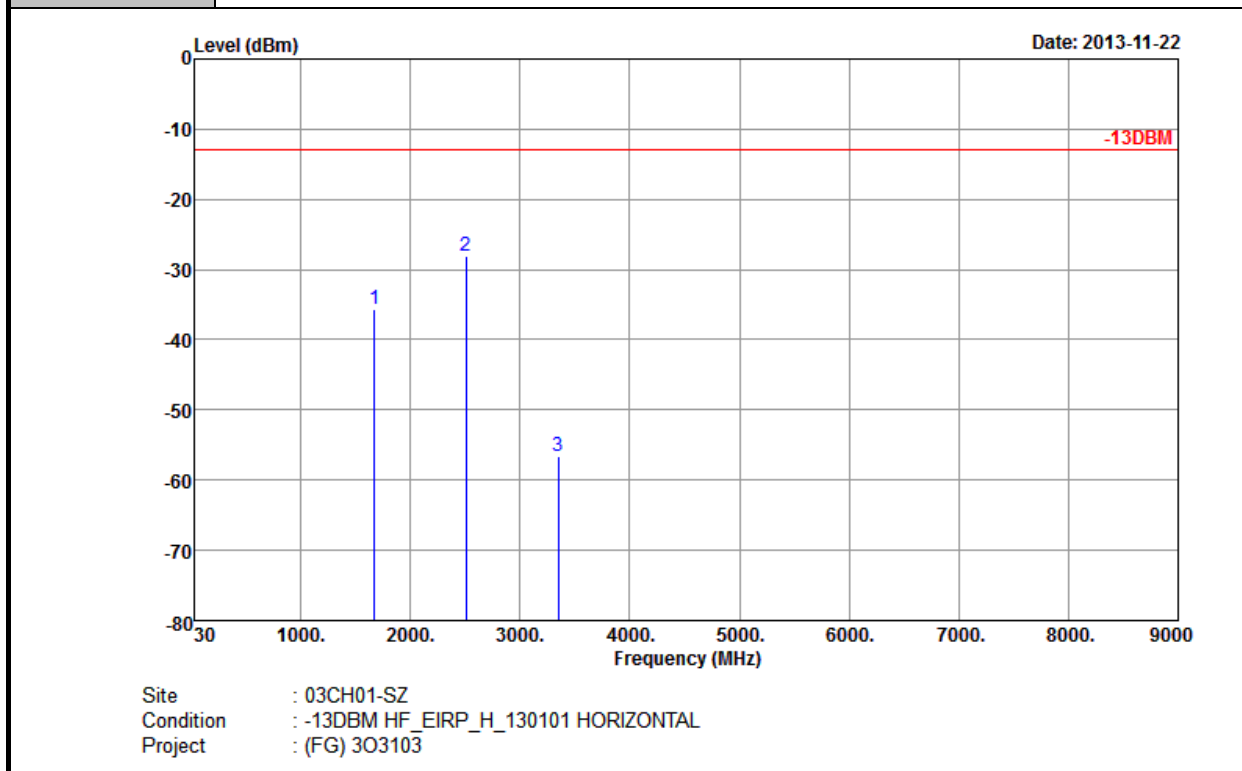


For radiated emissions above 1GHz



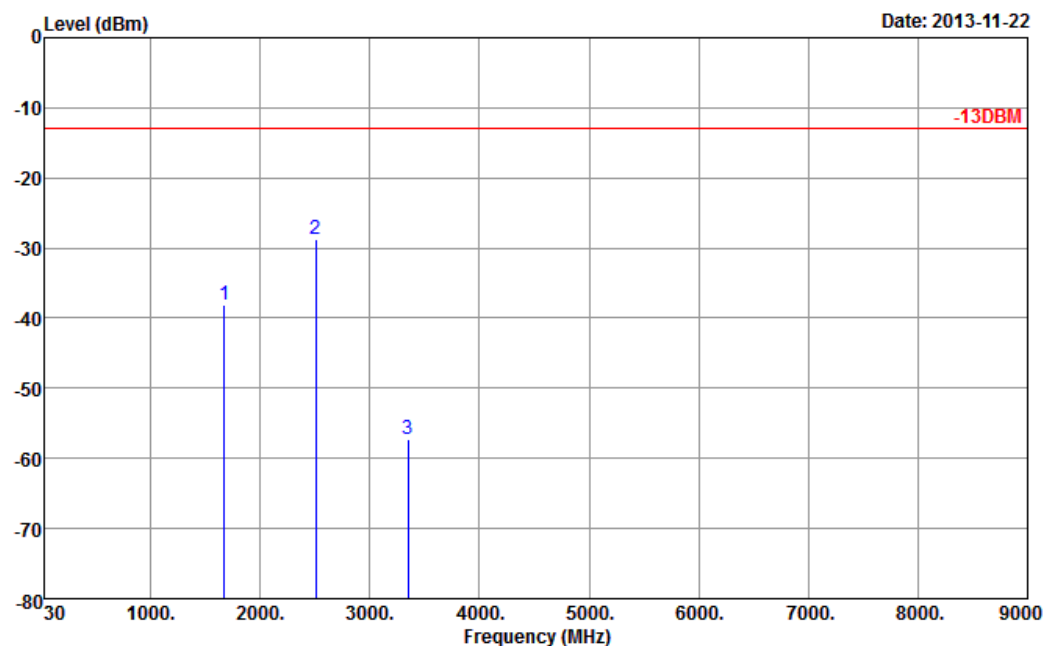
3.7.5 Test Result of Field Strength of Spurious Radiated

| | | | |
|------------------------|--|----------------------------|------------|
| Band : | GSM850 | Temperature : | 24~25°C |
| Test Mode : | GPRS class 8 Link (GMSK) | Relative Humidity : | 48~49% |
| Test Engineer : | Leo Liao | 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 | -35.56 | -13 | -22.56 | -52.41 | -38.53 | 0.88 | 6.00 | H | Pass |
| 2510 | -28.17 | -13 | -15.17 | -53.61 | -30.78 | 1.08 | 5.84 | H | Pass |
| 3346 | -56.58 | -13 | -43.58 | -67.18 | -60.95 | 1.14 | 7.66 | H | Pass |

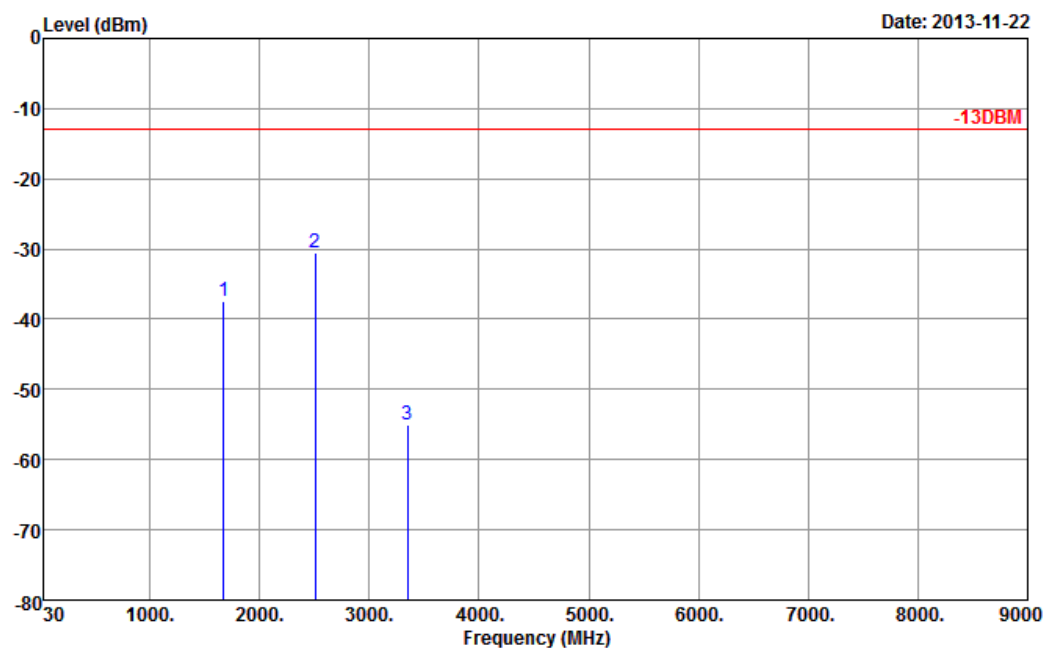
| | | | |
|------------------------|--|----------------------------|----------|
| Band : | GSM850 | Temperature : | 24~25°C |
| Test Mode : | GPRS class 8 Link (GMSK) | Relative Humidity : | 48~49% |
| Test Engineer : | Leo Liao | Polarization : | Vertical |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |



Site : 03CH01-SZ
 Condition : -13DBM HF_EIRP_V_130101 VERTICAL
 Project : (FG) 303103

| 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 | -38.18 | -13 | -25.18 | -52.01 | -41.15 | 0.88 | 6.00 | V | Pass |
| 2510 | -28.76 | -13 | -15.76 | -51.76 | -31.37 | 1.08 | 5.84 | V | Pass |
| 3346 | -57.30 | -13 | -44.30 | -69.13 | -61.67 | 1.14 | 7.66 | V | Pass |

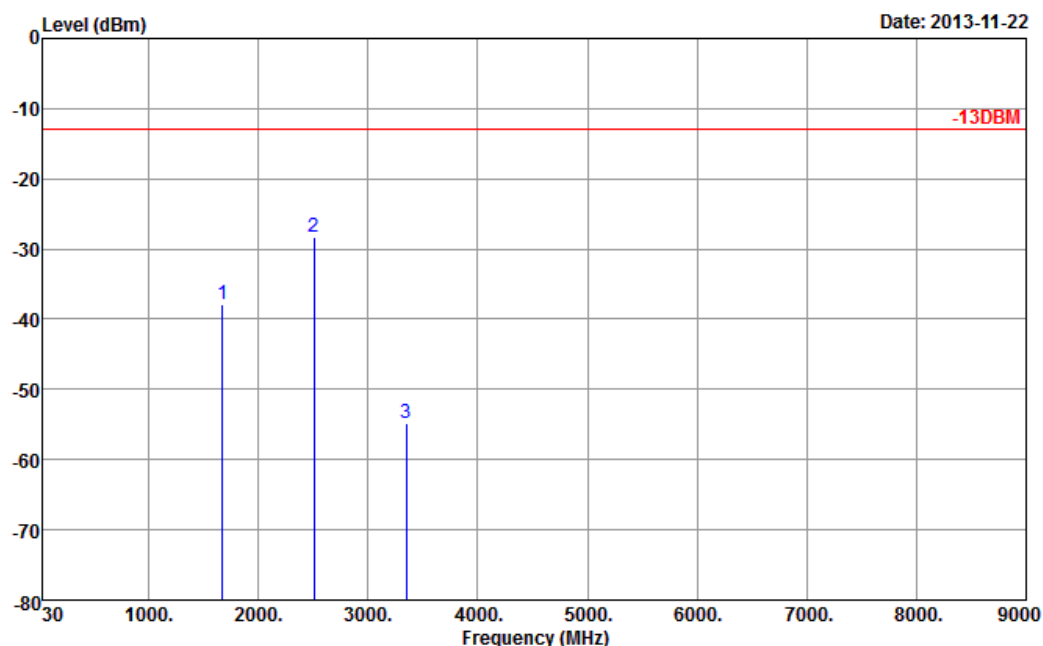
| | | | |
|------------------------|--|----------------------------|------------|
| Band : | GSM850 | Temperature : | 24~25°C |
| Test Mode : | EDGE class 8 Link (8PSK) | Relative Humidity : | 48~49% |
| Test Engineer : | Leo Liao | Polarization : | Horizontal |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |



Site : 03CH01-SZ
 Condition : -13DBM HF_EIRP_H_130101 HORIZONTAL
 Project : (FG) 303103

| 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 | -37.37 | -13 | -24.37 | -54.19 | -40.34 | 0.88 | 6.00 | H | Pass |
| 2510 | -30.48 | -13 | -17.48 | -55.79 | -33.09 | 1.08 | 5.84 | H | Pass |
| 3346 | -55.06 | -13 | -42.06 | -65.66 | -59.43 | 1.14 | 7.66 | H | Pass |

| | | | |
|------------------------|--|----------------------------|----------|
| Band : | GSM850 | Temperature : | 24~25°C |
| Test Mode : | EDGE class 8 Link (8PSK) | Relative Humidity : | 48~49% |
| Test Engineer : | Leo Liao | Polarization : | Vertical |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |

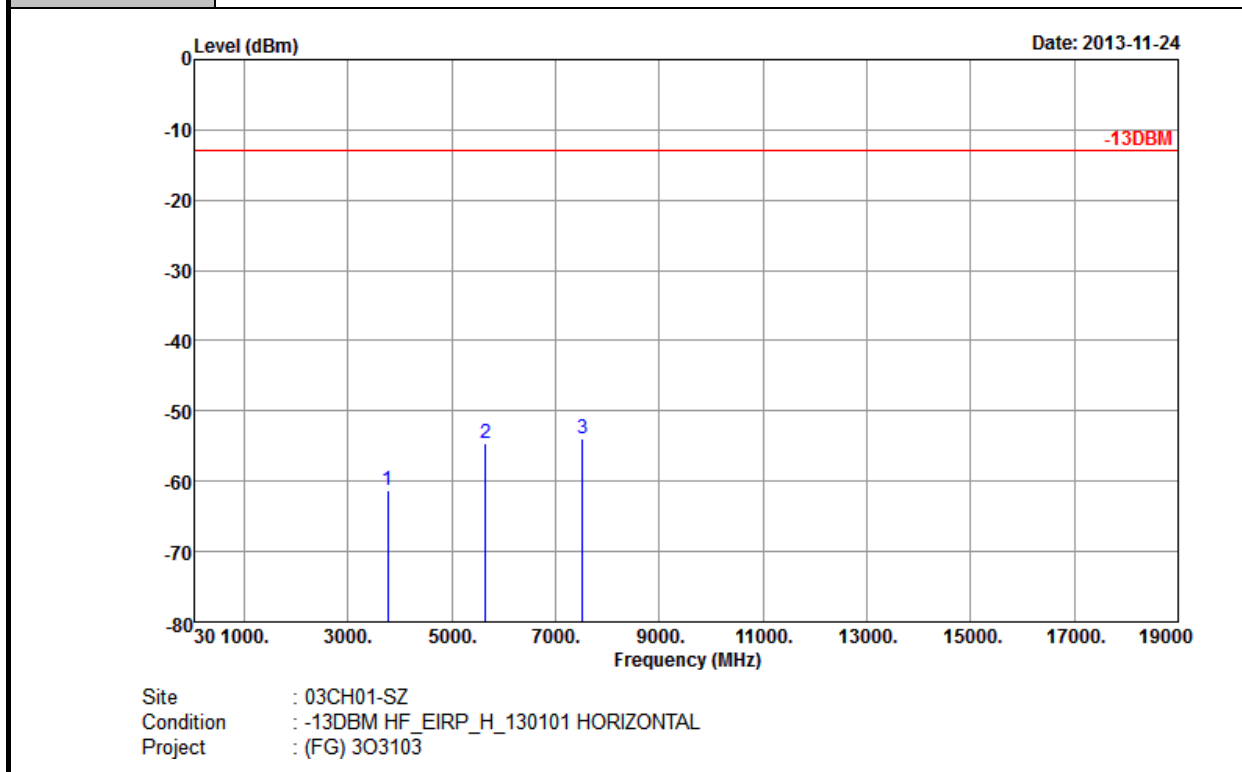


Site : 03CH01-SZ
 Condition : -13DBM HF_EIRP_V_130101 VERTICAL
 Project : (FG) 303103

| 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 | -37.91 | -13 | -24.91 | -51.80 | -40.88 | 0.88 | 6.00 | V | Pass |
| 2510 | -28.40 | -13 | -15.40 | -51.43 | -31.01 | 1.08 | 5.84 | V | Pass |
| 3346 | -54.93 | -13 | -41.93 | -66.76 | -59.30 | 1.14 | 7.66 | V | Pass |



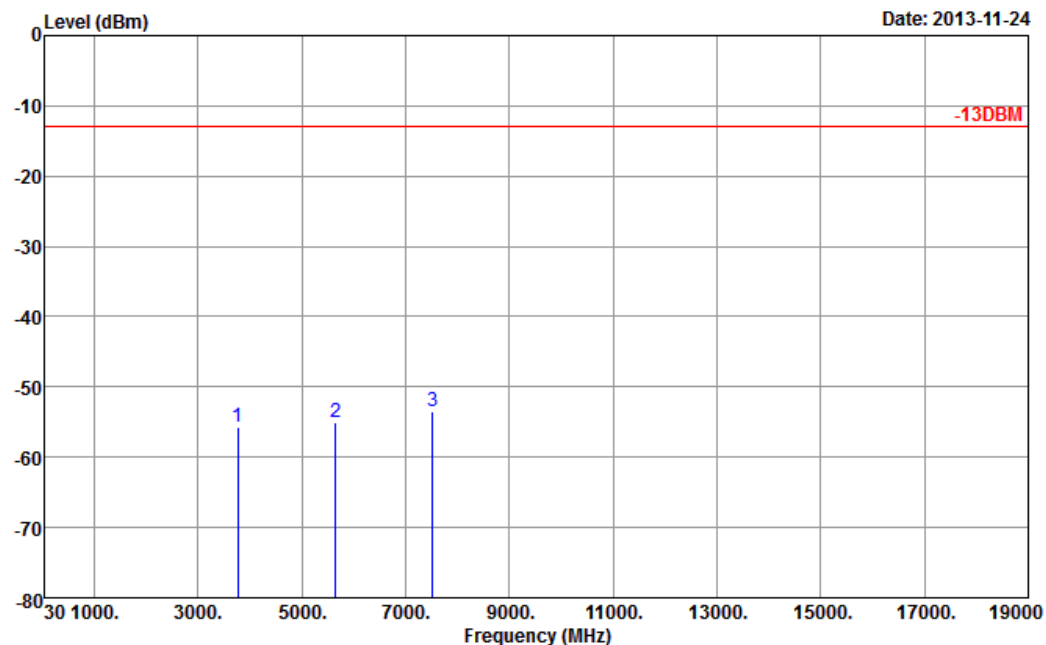
| | | | |
|------------------------|--|----------------------------|------------|
| Band : | GSM1900 | Temperature : | 24~25°C |
| Test Mode : | GPRS class 8 Link (GMSK) | Relative Humidity : | 48~49% |
| Test Engineer : | Leo Liao | Polarization : | Horizontal |
| Remark : | Spurious emissions within 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 | -61.17 | -13 | -48.17 | -73.32 | -67.91 | 1.28 | 8.02 | H | Pass |
| 5640 | -54.57 | -13 | -41.57 | -72.56 | -62.99 | 1.58 | 10.00 | H | Pass |
| 7520 | -53.86 | -13 | -40.86 | -75.80 | -64.18 | 1.78 | 12.10 | H | Pass |



| | | | |
|-----------------|--|---------------------|----------|
| Band : | GSM1900 | Temperature : | 24~25°C |
| Test Mode : | GPRS class 8 Link (GMSK) | Relative Humidity : | 48~49% |
| Test Engineer : | Leo Liao | Polarization : | Vertical |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |

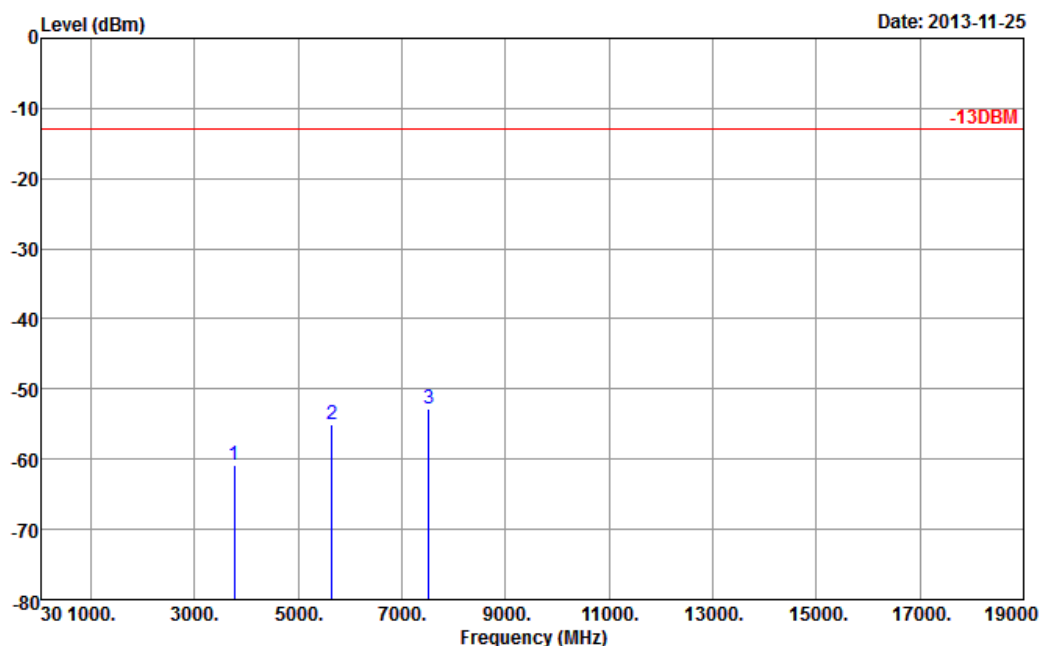


Site : 03CH01-SZ
Condition : -13DBM HF_EIRP_V_130101 VERTICAL
Project : (FG) 303103

| 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 | -55.65 | -13 | -42.65 | -70.68 | -62.39 | 1.28 | 8.02 | V | Pass |
| 5640 | -55.06 | -13 | -42.06 | -72.14 | -63.48 | 1.58 | 10 | V | Pass |
| 7520 | -53.54 | -13 | -40.54 | -75.79 | -63.86 | 1.78 | 12.1 | V | Pass |



| | | | |
|------------------------|--|----------------------------|------------|
| Band : | GSM1900 | Temperature : | 24~25°C |
| Test Mode : | EDGE class 8 Link (8PSK) | Relative Humidity : | 48~49% |
| Test Engineer : | Leo Liao | Polarization : | Horizontal |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |

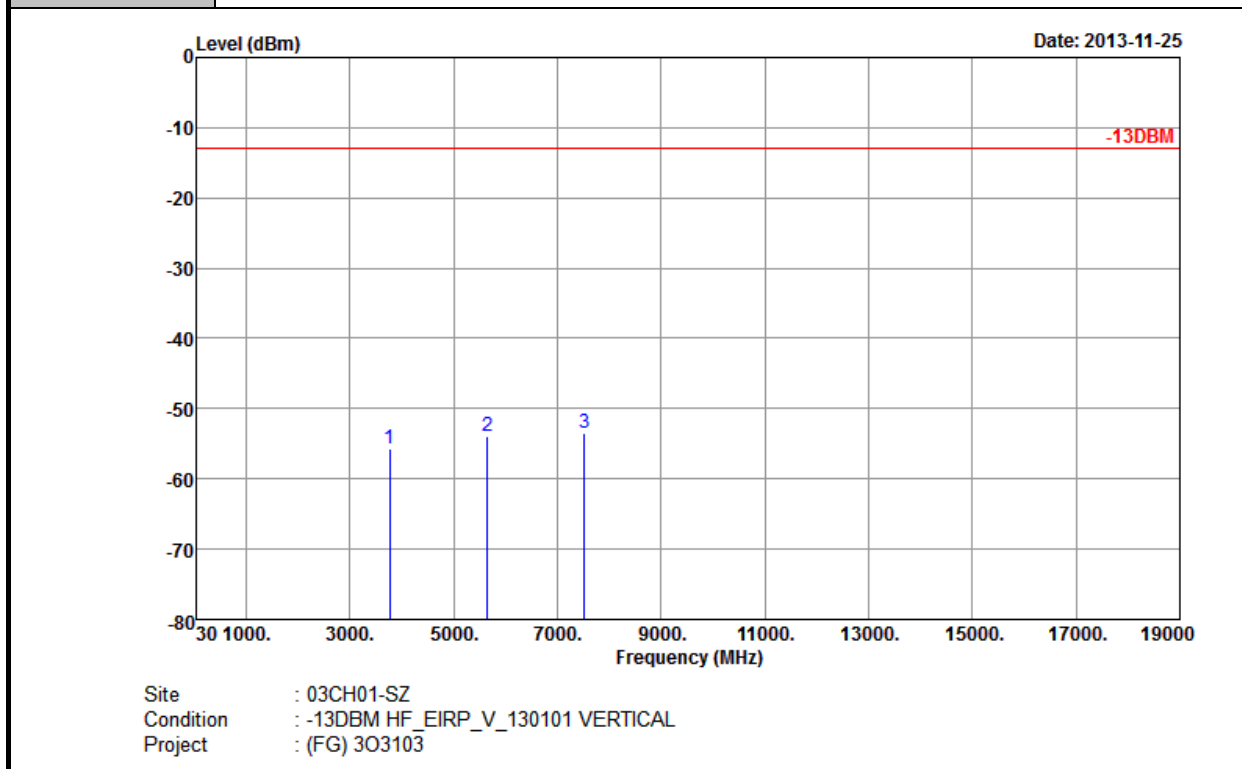


Site : 03CH01-SZ
Condition : -13DBM HF_EIRP_H_130101 HORIZONTAL
Project : (FG) 303103

| 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 | -60.74 | -13 | -47.74 | -72.89 | -67.48 | 1.28 | 8.02 | H | Pass |
| 5640 | -55.12 | -13 | -42.12 | -73.11 | -63.54 | 1.58 | 10.00 | H | Pass |
| 7520 | -52.84 | -13 | -39.84 | -74.78 | -63.16 | 1.78 | 12.10 | H | Pass |



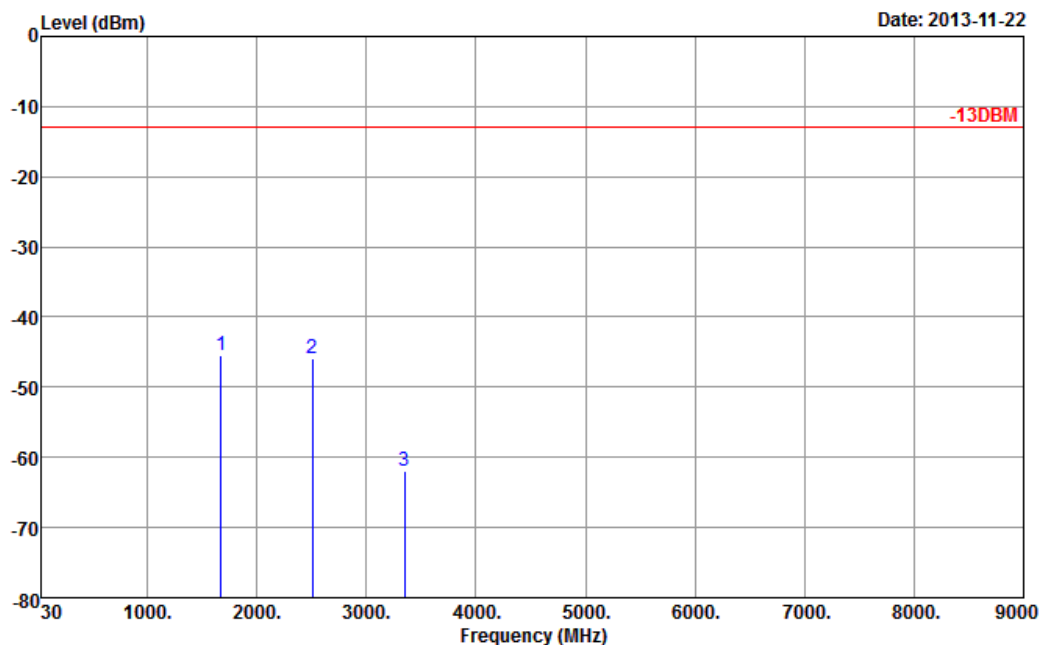
| | | | |
|------------------------|--|----------------------------|----------|
| Band : | GSM1900 | Temperature : | 24~25°C |
| Test Mode : | EDGE class 8 Link (8PSK) | Relative Humidity : | 48~49% |
| Test Engineer : | Leo Liao | Polarization : | Vertical |
| Remark : | Spurious emissions within 30-1000MHz 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 | -55.80 | -13 | -42.80 | -70.83 | -62.54 | 1.28 | 8.02 | V | Pass |
| 5640 | -53.95 | -13 | -40.95 | -71.03 | -62.37 | 1.58 | 10 | V | Pass |
| 7520 | -53.47 | -13 | -40.47 | -75.72 | -63.79 | 1.78 | 12.1 | V | Pass |



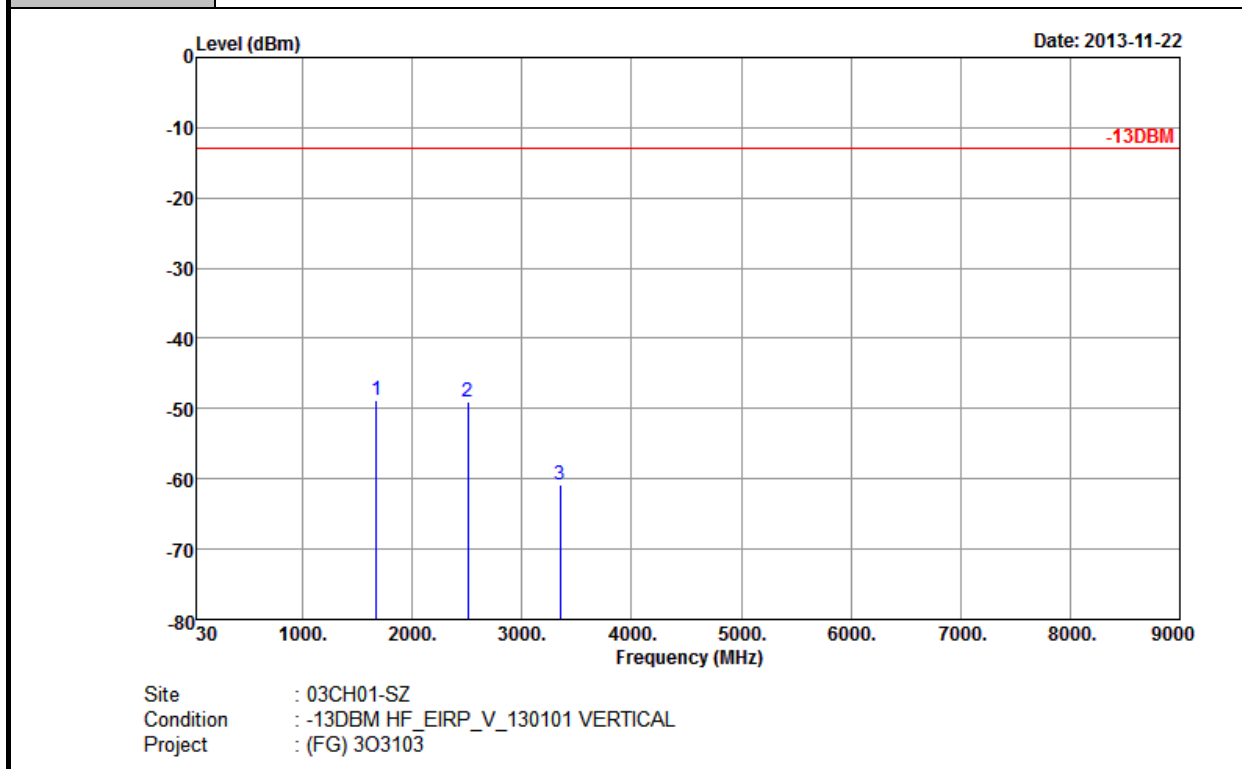
| | | | |
|-----------------|--|---------------------|------------|
| Band : | WCDMA Band V | Temperature : | 24~25°C |
| Test Mode : | RMC 12.2Kbps Link (QPSK) | Relative Humidity : | 48~49% |
| Test Engineer : | Leo Liao | Polarization : | Horizontal |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |



Site : 03CH01-SZ
Condition : -13DBM HF_EIRP_H_130101 HORIZONTAL
Project : (FG) 303103

| 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 | -45.50 | -13 | -32.50 | -61.32 | -48.47 | 0.88 | 6.00 | H | Pass |
| 2510 | -45.80 | -13 | -32.80 | -68.65 | -48.41 | 1.08 | 5.84 | H | Pass |
| 3346 | -61.98 | -13 | -48.98 | -72.58 | -66.35 | 1.14 | 7.66 | H | Pass |

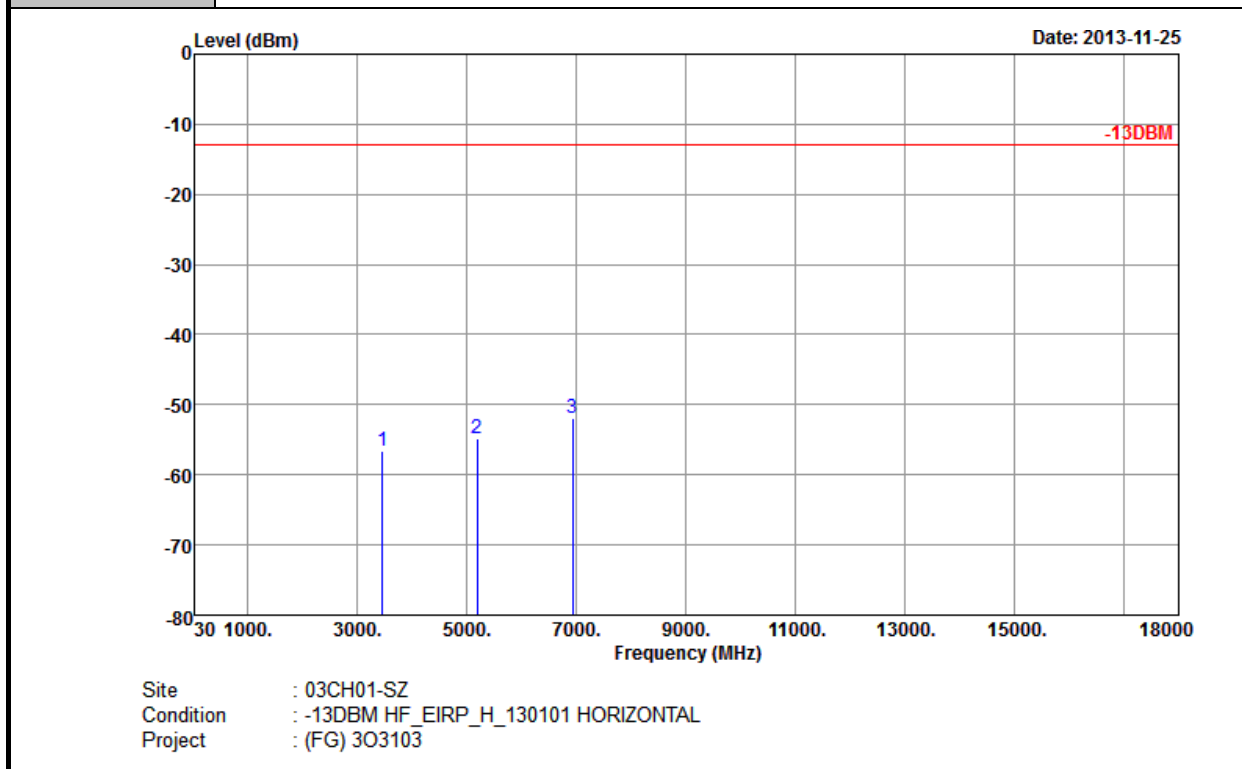
| | | | |
|------------------------|--|----------------------------|----------|
| Band : | WCDMA Band V | Temperature : | 24~25°C |
| Test Mode : | RMC 12.2Kbps Link (QPSK) | Relative Humidity : | 48~49% |
| Test Engineer : | Leo Liao | Polarization : | Vertical |
| Remark : | Spurious emissions within 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 | -48.82 | -13 | -35.82 | -61.72 | -51.79 | 0.88 | 6.00 | V | Pass |
| 2510 | -48.94 | -13 | -35.94 | -69.23 | -51.55 | 1.08 | 5.84 | V | Pass |
| 3346 | -60.75 | -13 | -47.75 | -72.58 | -65.12 | 1.14 | 7.66 | V | Pass |



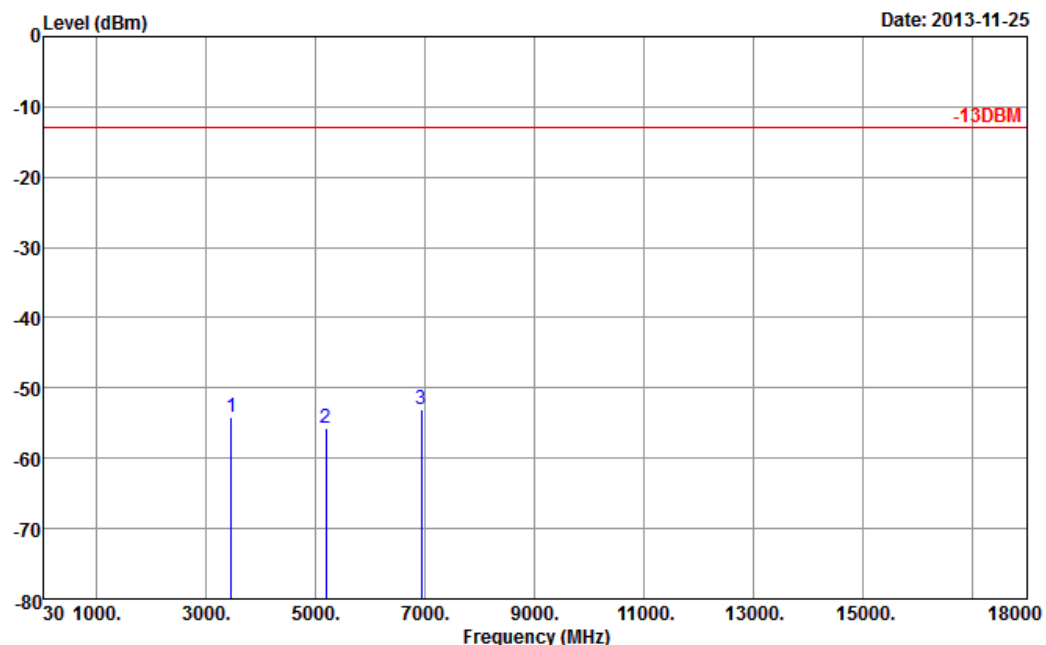
| | | | |
|------------------------|--|----------------------------|------------|
| Band : | WCDMA Band IV | Temperature : | 24~25°C |
| Test Mode : | RMC 12.2Kbps Link (QPSK) | Relative Humidity : | 48~49% |
| Test Engineer : | Leo Liao | Polarization : | Horizontal |
| Remark : | Spurious emissions 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 | -56.62 | -13 | -43.62 | -69.03 | -63.52 | 1.4 | 8.30 | H | Pass |
| 5197.5 | -54.88 | -13 | -41.88 | -73.32 | -63.53 | 1.65 | 10.30 | H | Pass |
| 6930 | -51.96 | -13 | -38.96 | -74.20 | -62.51 | 1.85 | 12.40 | H | Pass |



| | | | |
|------------------------|--|----------------------------|----------|
| Band : | WCDMA Band IV | Temperature : | 24~25°C |
| Test Mode : | RMC 12.2Kbps Link (QPSK) | Relative Humidity : | 48~49% |
| Test Engineer : | Leo Liao | Polarization : | Vertical |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |

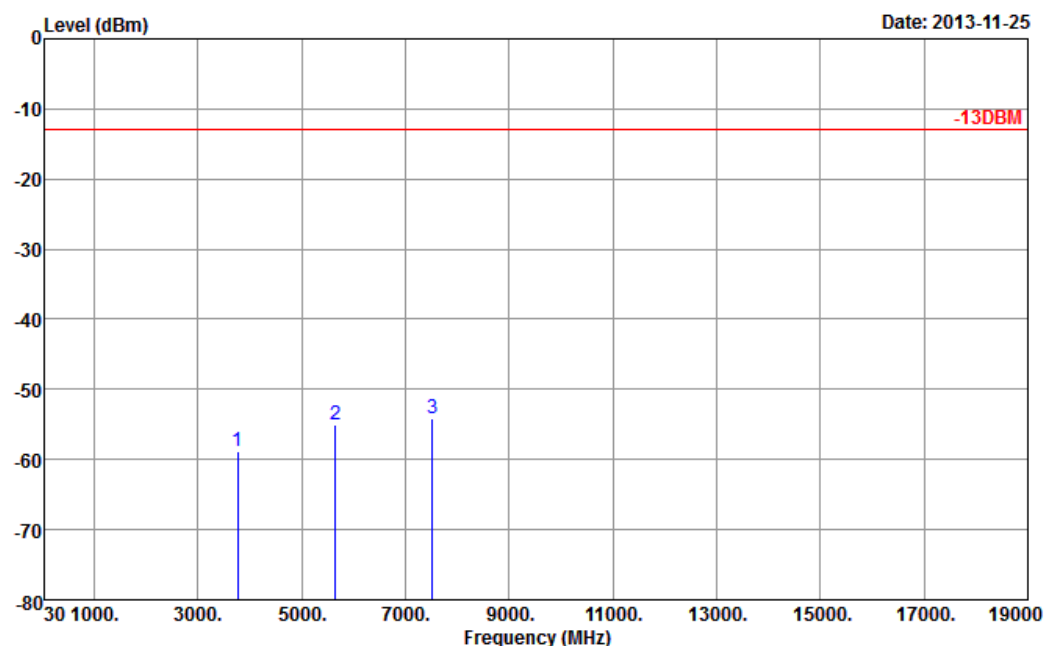


Site : 03CH01-SZ
Condition : -13DBM HF_EIRP_V_130101 VERTICAL
Project : (FG) 303103

| 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 | -54.12 | -13 | -41.12 | -69.41 | -61.02 | 1.4 | 8.3 | V | Pass |
| 5197.5 | -55.68 | -13 | -42.68 | -73.21 | -64.33 | 1.65 | 10.3 | V | Pass |
| 6930 | -52.96 | -13 | -39.96 | -75.51 | -63.51 | 1.85 | 12.4 | V | Pass |



| | | | |
|------------------------|--|----------------------------|------------|
| Band : | WCDMA Band II | Temperature : | 24~25°C |
| Test Mode : | RMC 12.2Kbps Link (QPSK) | Relative Humidity : | 48~49% |
| Test Engineer : | Leo Liao | Polarization : | Horizontal |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |

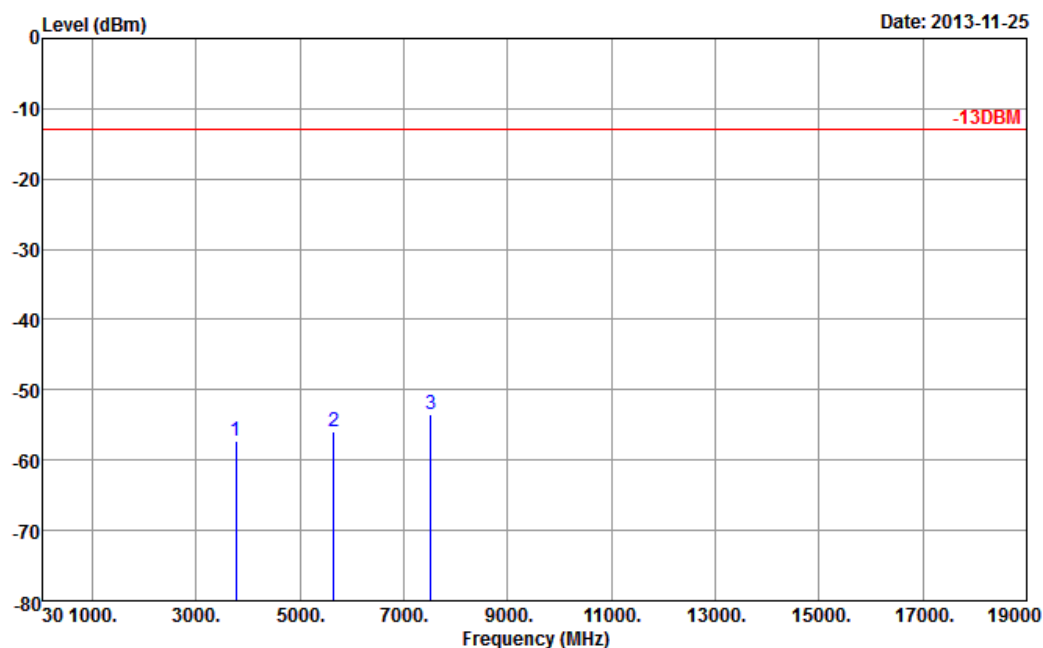


Site : 03CH01-SZ
Condition : -13DBM HF_EIRP_H_130101 HORIZONTAL
Project : (FG) 303103

| 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 | -58.74 | -13 | -45.74 | -70.89 | -65.48 | 1.28 | 8.02 | H | Pass |
| 5640 | -55.12 | -13 | -42.12 | -73.11 | -63.54 | 1.58 | 10.00 | H | Pass |
| 7520 | -54.11 | -13 | -41.11 | -76.05 | -64.43 | 1.78 | 12.10 | H | Pass |



| | | | |
|------------------------|--|----------------------------|----------|
| Band : | WCDMA Band II | Temperature : | 24~25°C |
| Test Mode : | RMC 12.2Kbps Link (QPSK) | Relative Humidity : | 48~49% |
| Test Engineer : | Leo Liao | Polarization : | Vertical |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |



Site : 03CH01-SZ
Condition : -13DBM HF_EIRP_V_130101 VERTICAL
Project : (FG) 303103

| 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 | -57.31 | -13 | -44.31 | -72.34 | -64.05 | 1.28 | 8.02 | V | Pass |
| 5640 | -56.03 | -13 | -43.03 | -73.11 | -64.45 | 1.58 | 10 | V | Pass |
| 7520 | -53.40 | -13 | -40.40 | -75.65 | -63.72 | 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 $\pm 0.00025\%$ ($\pm 2.5\text{ppm}$) of the center frequency.

3.8.2 Measuring Instruments

See list of measuring instruments of this test report.

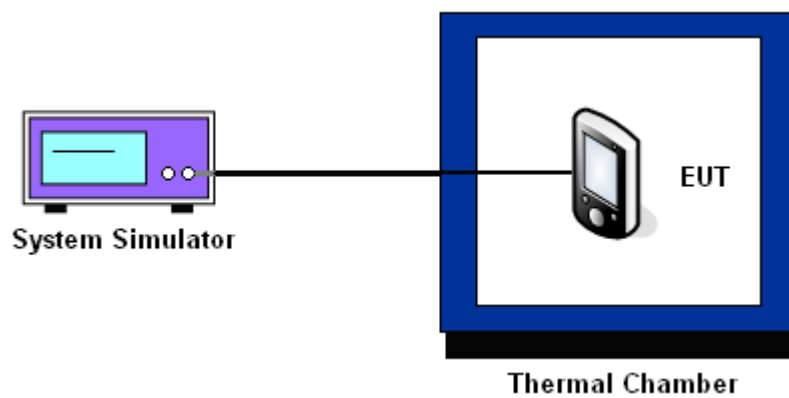
3.8.3 Test Procedures for Temperature Variation

1. The EUT was set up in the thermal chamber and connected with the base station.
2. With power OFF, the temperature was decreased to -30°C and the EUT was stabilized before testing. Power was applied and the maximum change in frequency was recorded within one minute.
3. With power OFF, the temperature was raised in 10°C step up to 50°C . The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.

3.8.4 Test Procedures for Voltage Variation

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

3.8.5 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) | GPRS class 8 | | EDGE class 8 | | Result |
|------------------|-----------------|-----------------|-----------------|-----------------|--------|
| | Freq. Dev. (Hz) | Deviation (ppm) | Freq. Dev. (Hz) | Deviation (ppm) | |
| -30 | 11 | +0.01 | 13 | +0.02 | PASS |
| -20 | 12 | +0.01 | 12 | +0.01 | |
| -10 | 10 | +0.01 | 14 | +0.02 | |
| 0 | 12 | +0.01 | 12 | +0.01 | |
| 10 | 13 | +0.02 | 11 | +0.01 | |
| 20 | 14 | +0.02 | 12 | +0.01 | |
| 30 | 12 | +0.01 | 12 | +0.01 | |
| 40 | 11 | +0.01 | 13 | +0.02 | |
| 50 | 10 | +0.01 | 14 | +0.02 | |

| | | | |
|----------------------|----------|--------------------|------------|
| Band : | GSM 1900 | Channel : | 661 |
| Limit (ppm) : | 2.5 | Frequency : | 1880.0 MHz |

| Temperature (°C) | GPRS class 8 | | EDGE class 8 | | Result |
|------------------|-----------------|-----------------|-----------------|-----------------|--------|
| | Freq. Dev. (Hz) | Deviation (ppm) | Freq. Dev. (Hz) | Deviation (ppm) | |
| -30 | -15 | -0.01 | -17 | -0.01 | PASS |
| -20 | -18 | -0.01 | -19 | -0.01 | |
| -10 | -16 | -0.01 | -18 | -0.01 | |
| 0 | -18 | -0.01 | -19 | -0.01 | |
| 10 | -17 | -0.01 | -17 | -0.01 | |
| 20 | -20 | -0.01 | -20 | -0.01 | |
| 30 | -18 | -0.01 | -18 | -0.01 | |
| 40 | -17 | -0.01 | -19 | -0.01 | |
| 50 | -16 | -0.01 | -18 | -0.01 | |

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

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

| | | | |
|----------------------|---------------|--------------------|------------|
| Band : | WCDMA Band IV | Channel : | 1413 |
| Limit (ppm) : | 2.5 | Frequency : | 1732.6 MHz |

| Temperature (°C) | RMC 12.2Kbps | | Result |
|------------------|-----------------|-----------------|--------|
| | Freq. Dev. (Hz) | Deviation (ppm) | |
| -30 | -10 | -0.01 | PASS |
| -20 | -9 | -0.01 | |
| -10 | -9 | -0.01 | |
| 0 | -10 | -0.01 | |
| 10 | -11 | -0.01 | |
| 20 | -9 | -0.01 | |
| 30 | -10 | -0.01 | |
| 40 | -11 | -0.01 | |
| 50 | -11 | -0.01 | |

| | | | |
|----------------------|---------------|--------------------|-----------|
| Band : | WCDMA Band II | Channel : | 9400 |
| Limit (ppm) : | 2.5 | Frequency : | 836.4 MHz |

| Temperature (°C) | RMC 12.2Kbps | | Result |
|------------------|-----------------|-----------------|--------|
| | Freq. Dev. (Hz) | Deviation (ppm) | |
| -30 | -15 | -0.01 | PASS |
| -20 | -13 | -0.01 | |
| -10 | -14 | -0.01 | |
| 0 | -12 | -0.01 | |
| 10 | -15 | -0.01 | |
| 20 | -13 | -0.01 | |
| 30 | -14 | -0.01 | |
| 40 | -14 | -0.01 | |
| 50 | -16 | -0.01 | |

3.8.7 Test Result of Voltage Variation

| Band & Channel | Mode | Voltage (Volt) | Freq. Dev. (Hz) | Deviation (ppm) | Limit (ppm) | Result |
|-------------------------|-----------------|----------------|-----------------|-----------------|-------------|--------|
| GSM 850 CH189 | GPRS class 8 | 3.7 | 14 | +0.02 | 2.5 | PASS |
| | | BEP | 13 | +0.02 | | |
| | | 4.2 | 13 | +0.02 | | |
| | EDGE class 8 | 3.7 | 12 | +0.01 | | |
| | | BEP | 12 | +0.01 | | |
| | | 4.2 | 13 | +0.02 | | |
| GSM 1900 CH661 | GPRS class 8 | 3.7 | -20 | -0.01 | | |
| | | BEP | -19 | -0.01 | | |
| | | 4.2 | -18 | -0.01 | | |
| | EDGE class 8 | 3.7 | -18 | -0.01 | | |
| | | BEP | -17 | -0.01 | | |
| | | 4.2 | -20 | -0.01 | | |
| WCDMA Band V CH4182 | RMC 12.2Kbps | 3.7 | -6 | -0.01 | | |
| | | BEP | -5 | -0.01 | | |
| | | 4.2 | -6 | -0.01 | | |
| WCDMA Band IV CH1413 | RMC 12.2Kbps | 3.7 | -10 | -0.01 | | |
| | | BEP | -9 | -0.01 | | |
| | | 4.2 | -10 | -0.01 | | |
| WCDMA Band II CH9400 | RMC 12.2Kbps | 3.7 | -13 | -0.01 | | |
| | | BEP | -11 | -0.01 | | |
| | | 4.2 | -14 | -0.01 | | |

Note:

1. Normal Voltage = 3.7V.
2. Battery End Point (BEP) = 3.3 V.

4 List of Measuring Equipments

| Instrument | Manufacturer | Model No. | Serial No. | Characteristics | Calibration Date | Test Date | Due Date | Remark |
|---------------------------|----------------------|-----------|-------------|---------------------|------------------|---------------------------------|---------------|-----------------------|
| Spectrum Analyzer | R&S | FSV30 | 100845 | 9kHz~30GHz | Nov. 05, 2013 | Dec. 06, 2013~ Dec. 08, 2013 | Nov. 04, 2014 | Conducted (TH01-SZ) |
| Spectrum Analyzer | R&S | FSP30 | 101400 | 9kHz~30GHz | Mar. 28, 2013 | Dec. 06, 2013~ Dec. 08, 2013 | Mar. 27, 2014 | Conducted (TH01-SZ) |
| Power Meter | Anritsu | ML2495A | 1218010 | N/A | Mar. 28, 2013 | Dec. 06, 2013~ Dec. 08, 2013 | Mar. 27, 2014 | Conducted (TH01-SZ) |
| Power Sensor | Anritsu | MA2411B | 1207253 | N/A | Mar. 28, 2013 | Dec. 06, 2013~ Dec. 08, 2013 | Mar. 27, 2014 | Conducted (TH01-SZ) |
| Thermal Chamber | Hongzhan | LP-150U | HD20120425 | N/A | Mar. 28, 2013 | Dec. 06, 2013~ Dec. 08, 2013 | Mar. 27, 2014 | Conducted (TH01-SZ) |
| Spectrum Analyzer | Agilent Technologies | N9038A | MY52260185 | 20Hz~26.5GHz | Apr. 04, 2013 | Nov. 22, 2013~ Nov. 25, 2013 | Apr. 03, 2014 | Radiation (03CH01-SZ) |
| Double Ridge Horn Antenna | ETS Lindgren | 3117 | 00119436 | 1GHz~18GHz | Oct. 26, 2013 | Nov. 22, 2013~ Nov. 25, 2013 | Oct. 25, 2014 | Radiation (03CH01-SZ) |
| Bilog Antenna | SCHAFFNER | CBL6112B | 2614 | 30MHz~2GHz | Dec. 26, 2012 | Nov. 22, 2013~ Nov. 25, 2013 | Dec. 25, 2013 | Radiation (03CH01-SZ) |
| Amplifier | ADVANTEST | BB525C | E9007003 | 9kHz~3GHz Gain 30dB | Mar. 28, 2013 | Nov. 22, 2013~ Nov. 25, 2013 | Mar. 27, 2014 | Radiation (03CH01-SZ) |
| Amplifier | Yiai | AV3860B | 04030 | 2GHz~26.5GHz | Mar. 28, 2013 | Nov. 22, 2013~ Nov. 25, 2013 | Mar. 27, 2014 | Radiation (03CH01-SZ) |
| SHF-EHF-Horn | Schwarzbeck | BBHA9170 | BBHA9170249 | 14GHz~40GHz | Nov. 22, 2013 | Nov. 22, 2013~ Nov. 25, 2013 | Nov. 21, 2014 | Radiation (03CH01-SZ) |
| Loop Antenna | R&S | HFH2-Z2 | 100321 | 9kHz~30MHz | Oct. 21, 2013 | Nov. 22, 2013~ Nov. 25, 2013 | Oct. 20, 2014 | Radiation (03CH01-SZ) |
| Turn Table | EM Electronics | EM 1000 | N/A | 0 ~ 360 degree | N/A | Nov. 22, 2013~ Nov. 25, 2013 | N/A | Radiation (03CH01-SZ) |
| Antenna Mast | EM Electronics | EM 1000 | N/A | 1 m ~ 4 m | N/A | Nov. 22, 2013~ Nov. 25, 2013 | N/A | 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% ($U = 2U_c(y)$) | 3.90 |
|---|------|