

FCC RF Test Report

APPLICANT : ZTE CORPORATION
EQUIPMENT : MF197 HSPA USB Stick
BRAND NAME : ZTE
MODEL NAME : MF197
FCC ID : Q78-MF197
STANDARD : FCC 47 CFR Part 2, 22(H), 24(E)
CLASSIFICATION : PCS Licensed Transmitter (PCB)

The product was received on Nov. 30, 2012 and completely tested on Jan. 31, 2013. We, SPORTON INTERNATIONAL (KUNSHAN) INC., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI / TIA / EIA-603-C-2004 and shown compliance with the applicable technical standards.

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

Reviewed by:



Jones Tsai / Manager



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



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APPENDIX A. PHOTOGRAPHS OF EUT

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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) | Conducted Output Power | N/A | PASS | - |
| 3.2 | §24.232(d) | RSS-133 (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 | - |
| 3.4 | §2.1049 §22.917(a) §24.238(a) | RSS-GEN(4.6.1) RSS-133(2.3) | Occupied Bandwidth | N/A | PASS | - |
| 3.5 | §2.1051 §22.917(a) §24.238(a) | RSS-132 (5.5) RSS-133 (6.5) | Band Edge Measurement | < 43+10log ₁₀ (P[Watts]) | PASS | - |
| 3.6 | §2.1051 §22.917(a) §24.238(a) | RSS-132 (5.5) RSS-133 (6.5) | Conducted Spurious Emission | < 43+10log ₁₀ (P[Watts]) | PASS | - |
| 3.7 | §2.1053 §22.917(a) §24.238(a) | RSS-132 (5.5) RSS-133 (6.5) | Field Strength of Spurious Radiation | < 43+10log ₁₀ (P[Watts]) | PASS | Under limit 46.68 dB at 7520.000 MHz |
| 3.8 | §2.1055 §22.355 §24.235 | RSS-132 (5.3) RSS-133(6.3) | Frequency Stability for Temperature & Voltage | < 2.5 ppm | PASS | - |



1 General Description

1.1 Applicant

ZTE CORPORATION

ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China

1.2 Manufacturer

ZTE CORPORATION

ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China

1.3 Feature of Equipment Under Test

| Product Feature | |
|---------------------------------|---------------------------------|
| Equipment | MF197 HSPA USB Stick |
| Brand Name | ZTE |
| Model Name | MF197 |
| FCC ID | Q78-MF197 |
| EUT supports Radios application | GSM/GPRS/EGPRS/WCDMA/HSPA/HSPA+ |
| HW Version | dz6A |
| SW Version | BD_MF197HDV1.0.0B02 |
| 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 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 II: 1932.4 MHz ~ 1987.6 MHz |
| Maximum Output Power to Antenna | GSM850 : 31.93 dBm GSM1900 : 29.18 dBm WCDMA Band V : 21.94 dBm WCDMA Band II : 22.19 dBm |
| Antenna Type | PCB Antenna |
| Type of Modulation | GSM: GMSK GPRS: GMSK EDGE: GMSK/8PSK HSDPA: QPSK (Uplink) HSUPA: QPSK (Uplink) HSPA: QPSK (Uplink) (Rel. 6 - DL 14.4Mbps; UL 5.76Mbps) |

1.5 Maximum ERP/EIRP Power, Frequency Tolerance, and Emission Designator

| FCC Rule | System | Type of Modulation | Maximum ERP/EIRP (W) | Frequency Tolerance (% , Hz, ppm) | Emission Designator |
|----------|----------------------------|--------------------|----------------------|-----------------------------------|---------------------|
| Part 22 | GSM850 GPRS 8 | GMSK | 0.8892 | 0.06 ppm | 244KGXW |
| Part 22 | GSM850 EDGE 8 | 8PSK | 0.1791 | 0.04 ppm | 248KG7W |
| Part 22 | WCDMA Band V RMC 12.2Kbps | QPSK | 0.1343 | 0.02 ppm | 4M16F9W |
| Part 24 | GSM1900 GPRS 8 | GMSK | 1.0233 | 0.04 ppm | 248KGXW |
| Part 24 | GSM1900 EDGE 8 | 8PSK | 0.2965 | 0.03 ppm | 250KG7W |
| Part 24 | WCDMA Band II RMC 12.2Kbps | QPSK | 0.1849 | 0.02 ppm | 4M18F9W |

1.6 Testing Site

| | | | |
|---------------------------|--|-----------|--------------------------------|
| Test Site | SPORTON INTERNATIONAL (KUNSHAN) INC. | | |
| Test Site Location | No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C. TEL: +86-0512-5790-0158 FAX: +86-0512-5790-0958 | | |
| Test Site No. | Sporton Site No. | | FCC/IC Registration No. |
| | TH01-KS | 03CH01-KS | 149928/4086E-1 |

1.7 Applied Standards

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

- Preliminary Guidance for Receiving Applications for Certification of 3G Device. May 9, 2006.
- FCC 47 CFR Part 2, 22(H), 24(E)
- ANSI / TIA / EIA-603-C-2004
- FCC KDB 971168 D01 Power Meas. License Digital Systems v01
- IC RSS-132 Issue 3
- IC RSS-133 Issue 6
- 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.
3. Per the section 2.2.3 of Notice of 2012-DRS0126, " Receivers Excluded from Industry Canada Requirements", only radio communication receivers operating in stand-alone mode within the band 30-960 MHz and scanner receivers are subject to Industry Canada requirements.

2 Test Configuration of Equipment Under Test

2.1 Test Mode

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

Frequency range investigated for radiated emission is as follows:

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

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

Note:

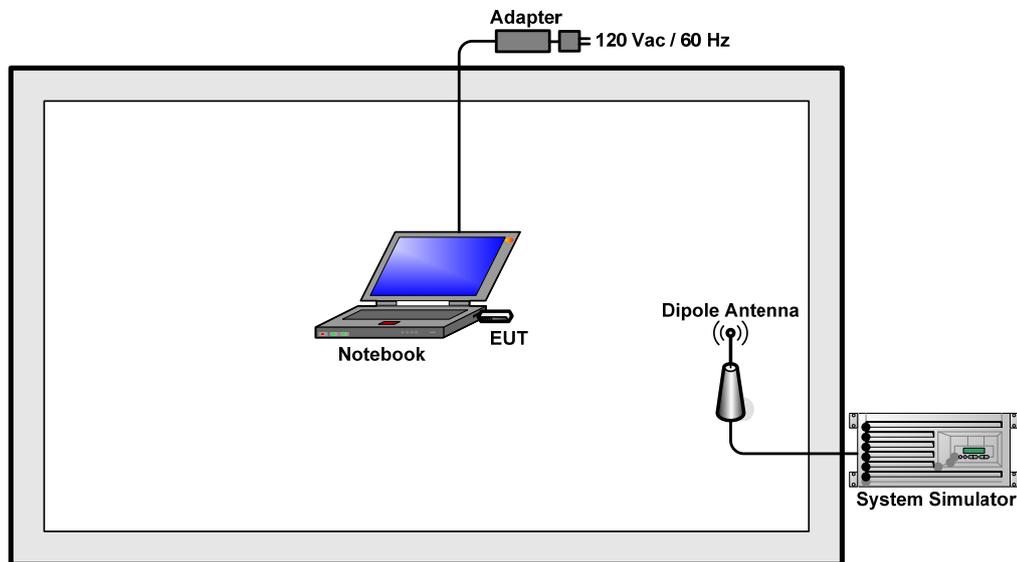
The maximum power levels are GPRS multi-slot class 8 mode for GMSK link, EDGE multi-slot class 8 mode for 8PSK link, RMC 12.2Kbps mode for WCDMA band V, and RMC 12.2Kbps mode for WCDMA band II, only these modes were used for all tests.

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 | 1880.0 | 1909.8 |
| GPRS (GMSK, 1 Tx slot) – CS1 | 31.93 | 31.62 | 31.55 | 28.84 | 28.86 | 29.18 |
| GPRS (GMSK, 2 Tx slots) – CS1 | 29.75 | 29.64 | 29.55 | 27.33 | 27.58 | 27.96 |
| EDGE (8PSK, 1 Tx slot) – MCS5 | 25.56 | 25.59 | 25.62 | 24.12 | 24.33 | 24.51 |
| EDGE (8PSK, 2 Tx slots) – MCS5 | 23.87 | 23.95 | 24.00 | 22.48 | 22.38 | 22.48 |
| EDGE (8PSK, 3 Tx slots) – MCS5 | 22.68 | 22.73 | 22.75 | 21.83 | 21.62 | 21.80 |
| EDGE (8PSK, 4 Tx slots) – MCS5 | 21.58 | 21.54 | 21.60 | 20.17 | 20.30 | 20.47 |

| Conducted Power (*Unit: dBm) | | | | | | |
|------------------------------|--------------|-------|-------|---------------|--------|--------|
| Band | WCDMA Band V | | | WCDMA Band II | | |
| Channel | 4132 | 4182 | 4233 | 9262 | 9400 | 9538 |
| Frequency | 826.4 | 836.4 | 846.6 | 1852.4 | 1880.0 | 1907.6 |
| RMC 12.2K | 21.70 | 21.94 | 21.64 | 22.06 | 22.00 | 22.19 |
| HSDPA Subtest-1 | 21.56 | 21.52 | 21.91 | 21.66 | 21.87 | 21.77 |
| HSDPA Subtest-2 | 21.76 | 21.52 | 21.85 | 21.69 | 21.89 | 21.77 |
| HSDPA Subtest-3 | 21.77 | 21.51 | 21.87 | 21.15 | 21.46 | 21.25 |
| HSDPA Subtest-4 | 21.75 | 21.61 | 21.85 | 21.20 | 21.41 | 21.24 |
| HSUPA Subtest-1 | 21.84 | 21.11 | 21.22 | 20.06 | 21.26 | 20.80 |
| HSUPA Subtest-2 | 20.12 | 20.20 | 20.59 | 20.17 | 20.30 | 20.15 |
| HSUPA Subtest-3 | 20.82 | 20.52 | 20.58 | 20.75 | 20.49 | 20.19 |
| HSUPA Subtest-4 | 20.30 | 20.26 | 20.64 | 20.07 | 20.40 | 20.15 |
| HSUPA Subtest-5 | 20.49 | 20.27 | 20.78 | 20.36 | 20.58 | 20.33 |

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 | R&S | CMU 200 | N/A | N/A | Unshielded, 1.8 m |
| 2. | DC Power Supply | GWINSTEK | GPS-3030D | N/A | N/A | Unshielded, 1.8 m |
| 3. | Notebook | DELL | VOSTRO1450 | PPD-AR5B195 | N/A | AC I/P: Unshielded, 1.8 m DC O/P: Shielded, 1.8 m |

2.4 Measurement Results Explanation Example

For conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and 10dB attenuator 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 10dB attenuator factor.

Offset = RF cable loss + attenuator factor.

Following table shows an offset computation example with cable loss 4.2 dB.

Example :

$$\begin{aligned}
 \text{Offset(dB)} &= \text{RF cable loss(dB)} + \text{attenuator factor(dB)}. \\
 &= 4.2 + 10 = 14.2 \text{ (dB)}
 \end{aligned}$$

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.

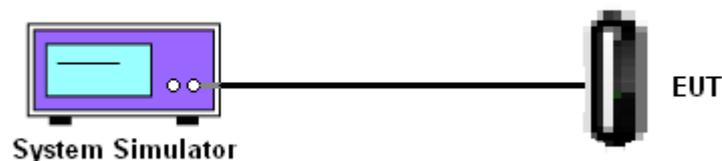
3.1.2 Measuring Instruments

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. 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. Set EUT at maximum power through base station.
4. Select lowest, middle, and highest channels for each band and different modulation.
5. 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 8) | | | GSM850 (EDGE 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) | 31.93 | 31.62 | 31.55 | 25.56 | 25.59 | 25.62 | 21.70 | 21.94 | 21.64 |
| Conducted Power (Watts) | 1.56 | 1.45 | 1.43 | 0.36 | 0.36 | 0.36 | 0.15 | 0.16 | 0.15 |

| PCS Band | | | | | | | | | |
|-------------------------|------------------|--------------|---------------|------------------|--------------|---------------|------------------------------|---------------|----------------|
| Modes | GSM1900 (GPRS 8) | | | GSM1900 (EDGE 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) | 28.84 | 28.86 | 29.18 | 24.12 | 24.33 | 24.51 | 22.06 | 22.00 | 22.19 |
| Conducted Power (Watts) | 0.77 | 0.77 | 0.83 | 0.26 | 0.27 | 0.28 | 0.16 | 0.16 | 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.

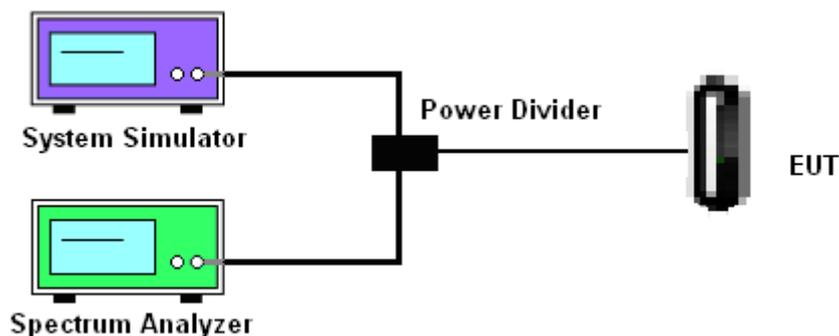
3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

1. The EUT was connected to Spectrum Analyzer and 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. For GSM/EGPRS operating modes:
 - a. Set the RBW = 1MHz, VBW = 1MHz, Peak detector in spectrum analyzer.
 - b. Set EUT in maximum power output, and triggered the burst signal.
 - c. Measured respectively the Peak level and Mean level, and the deviation was recorded as Peak to Average Ratio.
4. 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 %.

3.2.4 Test Setup



3.2.5 Test Result of Peak-to-Average Ratio

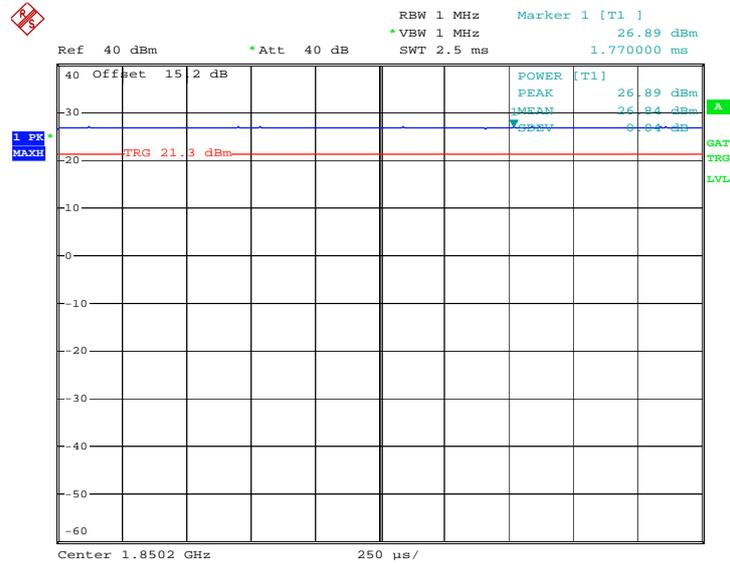
| PCS Band | | | | | | | | | |
|----------------------------|------------------|-----------|------------|------------------|-----------|------------|------------------------------|------------|-------------|
| Modes | GSM1900 (GPRS 8) | | | GSM1900 (EDGE 8) | | | WCDMA Band II (RMC 12.2Kbps) | | |
| 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) | 0.05 | 0.05 | 0.06 | 0.40 | 0.46 | 0.42 | 3.20 | 2.60 | 2.60 |



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

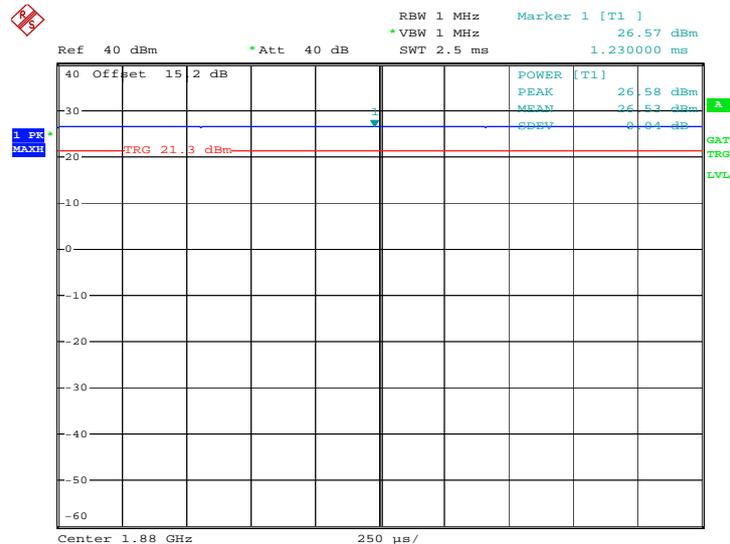
| | | | |
|--------|----------|-------------|-------------|
| Band : | GSM 1900 | Test Mode : | GPRS 8 Link |
|--------|----------|-------------|-------------|

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



Date: 3.DEC.2012 23:02:50

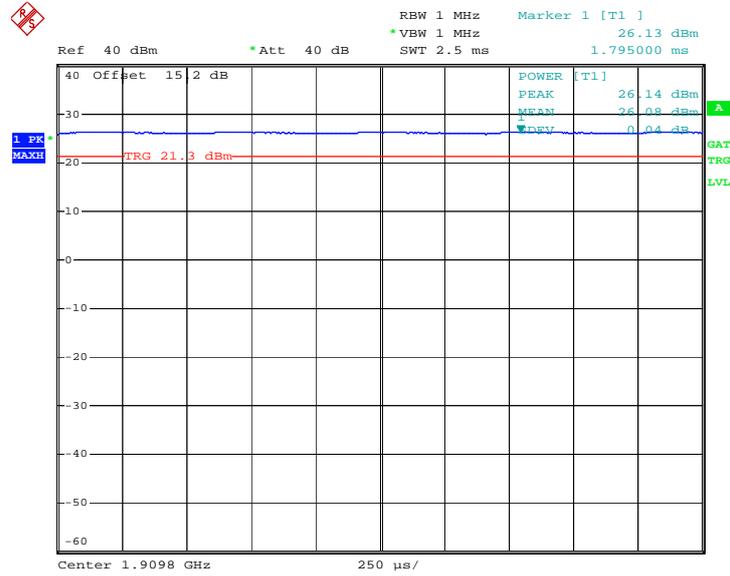
Peak-to-Average Ratio on Channel 661 (1880.0 MHz)



Date: 3.DEC.2012 23:03:14



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

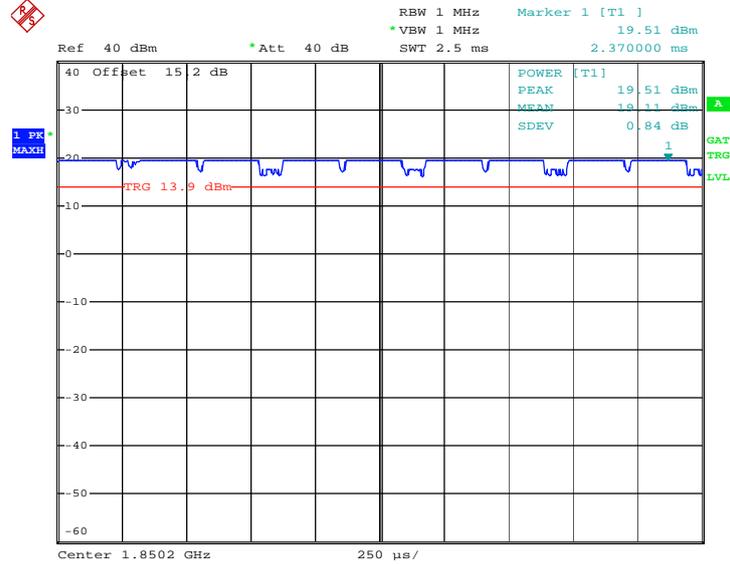


Date: 3.DEC.2012 23:03:42



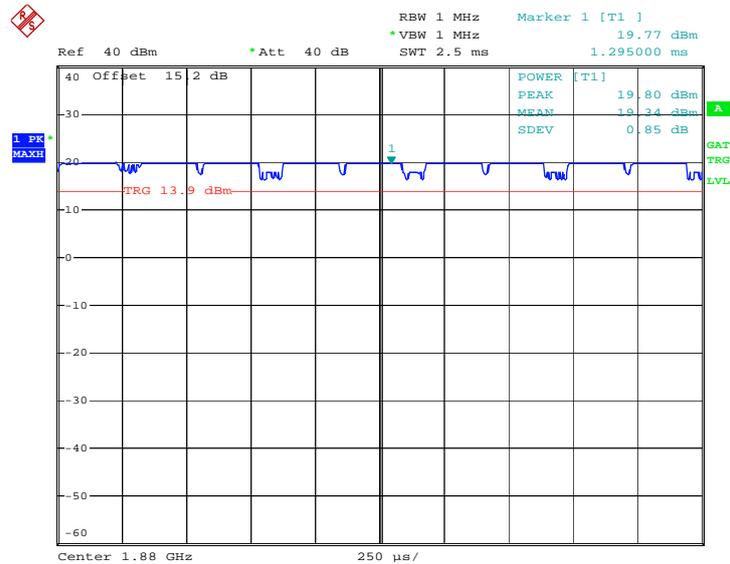
| | | | |
|--------|----------|-------------|-------------|
| Band : | GSM 1900 | Test Mode : | EDGE 8 Link |
|--------|----------|-------------|-------------|

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



Date: 3.DEC.2012 20:29:59

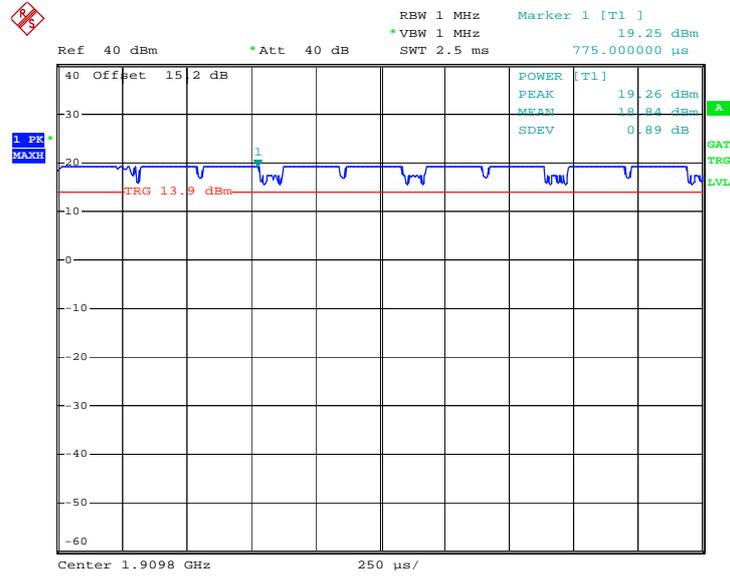
Peak-to-Average Ratio on Channel 661 (1880.0 MHz)



Date: 3.DEC.2012 20:30:35



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

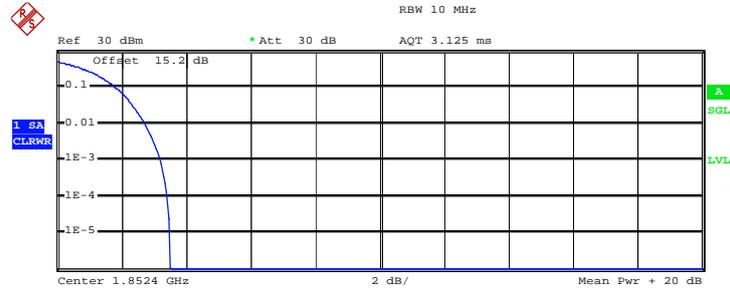


Date: 3.DEC.2012 20:30:58



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

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



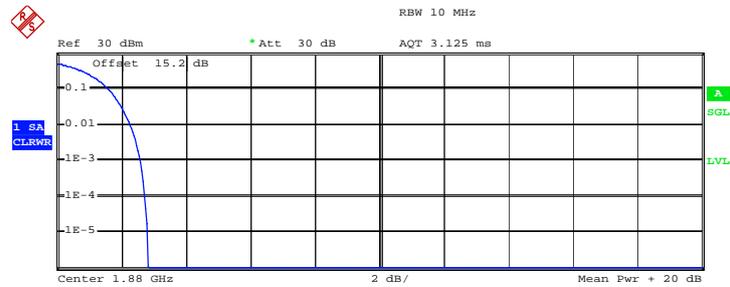
Complementary Cumulative Distribution Function (100000 samples)

Trace 1
Mean 22.05 dBm
Peak 25.56 dBm
Crest 3.51 dB

| | |
|-------|---------|
| 10 % | 1.84 dB |
| 1 % | 2.72 dB |
| .1 % | 3.20 dB |
| .01 % | 3.40 dB |

Date: 3.DEC.2012 21:36:18

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



Complementary Cumulative Distribution Function (100000 samples)

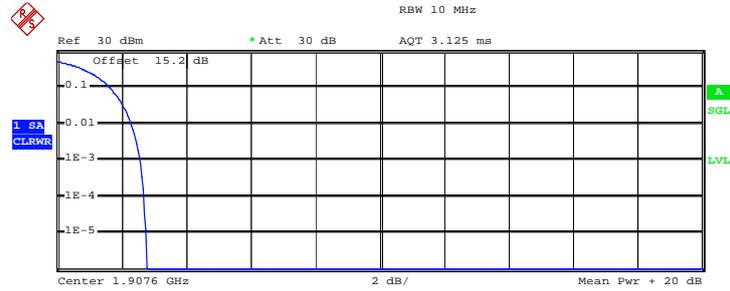
Trace 1
Mean 22.23 dBm
Peak 25.06 dBm
Crest 2.84 dB

| | |
|-------|---------|
| 10 % | 1.60 dB |
| 1 % | 2.28 dB |
| .1 % | 2.60 dB |
| .01 % | 2.72 dB |

Date: 3.DEC.2012 21:36:59



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



Complementary Cumulative Distribution Function (100000 samples)

Trace 1

| | |
|-------|-----------|
| Mean | 22.14 dBm |
| Peak | 24.92 dBm |
| Crest | 2.78 dB |
| 10 % | 1.64 dB |
| 1 % | 2.32 dB |
| .1 % | 2.60 dB |
| .01 % | 2.68 dB |

Date: 3.DEC.2012 21:37:33

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 v01. The ERP of mobile transmitters must not exceed 7 Watts and the EIRP of mobile transmitters are limited to 2 Watts.

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 a turntable with 1.5 meter height in a fully anechoic chamber.
2. The EUT was set at 3 meter from the receiving antenna, which was mounted on the antenna tower.
3. GSM operating modes: Set RBW= 1MHz, VBW= 3MHz, RMS detector over burst;
UMTS operating modes: Set RBW= 100 KHz, VBW= 300 KHz, RMS detector over frame, and use channel power option with bandwidth=5MHz, per section 4.0 of KDB 971168 D01.
4. The table was rotated 360 degrees to determine the position of the highest radiated power.
5. The height of the receiving antenna is adjusted to look for the maximum ERP/EIRP.
6. Taking the record of maximum ERP/EIRP.
7. A dipole antenna was substituted in place of the EUT and was driven by a signal generator.
8. The conducted power at the terminal of the dipole antenna is measured.
9. Repeat step 3 to step 5 to get the maximum ERP/EIRP of the substitution antenna.
10. $ERP/EIRP = P_s + E_t - E_s + G_s = P_s + R_t - R_s + G_s$

P_s (dBm) : Input power to substitution antenna.

G_s (dBi or dBd) : Substitution antenna Gain.

$E_t = R_t + AF$

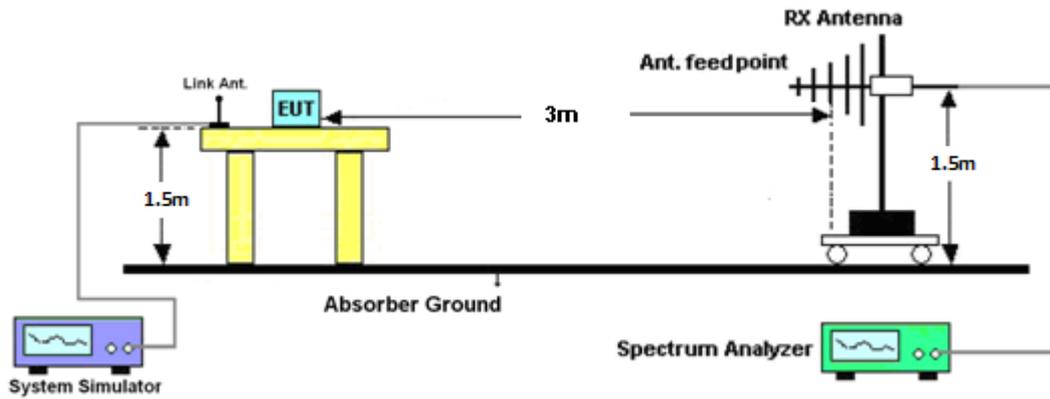
$E_s = R_s + AF$

AF (dB/m) : Receive antenna factor

R_t : The highest received signal in spectrum analyzer for EUT.

R_s : The highest received signal in spectrum analyzer for substitution antenna.

3.3.4 Test Setup



3.3.5 Test Result of ERP

| GSM850 (GPRS 8) Radiated Power ERP | | | | | | |
|------------------------------------|----------|----------|----------|----------|-----------|---------|
| Horizontal Polarization | | | | | | |
| Frequency (MHz) | Rt (dBm) | Rs (dBm) | Ps (dBm) | Gs (dBd) | ERP (dBm) | ERP (W) |
| 824.20 | -19.88 | -48.12 | 0.00 | -1.08 | 27.16 | 0.5200 |
| 836.40 | -18.47 | -48.28 | 0.00 | -0.93 | 28.88 | 0.7727 |
| 848.80 | -18.10 | -48.35 | 0.00 | -0.76 | 29.49 | 0.8892 |
| Vertical Polarization | | | | | | |
| Frequency (MHz) | Rt (dBm) | Rs (dBm) | Ps (dBm) | Gs (dBd) | ERP (dBm) | ERP (W) |
| 824.20 | -19.66 | -47.97 | 0.00 | -1.08 | 27.23 | 0.5284 |
| 836.40 | -18.55 | -48.01 | 0.00 | -0.93 | 28.53 | 0.7129 |
| 848.80 | -18.22 | -48.05 | 0.00 | -0.76 | 29.07 | 0.8072 |

| GSM850 (EDGE 8) Radiated Power ERP | | | | | | |
|------------------------------------|----------|----------|----------|----------|-----------|---------|
| Horizontal Polarization | | | | | | |
| Frequency (MHz) | Rt (dBm) | Rs (dBm) | Ps (dBm) | Gs (dBd) | ERP (dBm) | ERP (W) |
| 824.20 | -27.06 | -48.12 | 0.00 | -1.08 | 19.98 | 0.0995 |
| 836.40 | -26.06 | -48.28 | 0.00 | -0.93 | 21.29 | 0.1346 |
| 848.80 | -25.06 | -48.35 | 0.00 | -0.76 | 22.53 | 0.1791 |
| Vertical Polarization | | | | | | |
| Frequency (MHz) | Rt (dBm) | Rs (dBm) | Ps (dBm) | Gs (dBd) | ERP (dBm) | ERP (W) |
| 824.20 | -27.12 | -47.97 | 0.00 | -1.08 | 19.77 | 0.0948 |
| 836.40 | -26.37 | -48.01 | 0.00 | -0.93 | 20.71 | 0.1178 |
| 848.80 | -25.69 | -48.05 | 0.00 | -0.76 | 21.60 | 0.1445 |



| WCDMA Band V (RMC 12.2Kbps) Radiated Power ERP | | | | | | |
|--|----------|----------|----------|----------|-----------|---------|
| Horizontal Polarization | | | | | | |
| Frequency (MHz) | Rt (dBm) | Rs (dBm) | Ps (dBm) | Gs (dBd) | ERP (dBm) | ERP (W) |
| 826.40 | -25.76 | -48.12 | 0.00 | -1.08 | 21.28 | 0.1343 |
| 836.40 | -28.28 | -48.28 | 0.00 | -0.93 | 19.07 | 0.0807 |
| 846.60 | -27.07 | -48.35 | 0.00 | -0.76 | 20.52 | 0.1127 |
| Vertical Polarization | | | | | | |
| Frequency (MHz) | Rt (dBm) | Rs (dBm) | Ps (dBm) | Gs (dBd) | ERP (dBm) | ERP (W) |
| 826.40 | -25.87 | -47.97 | 0.00 | -1.08 | 21.02 | 0.1265 |
| 836.40 | -28.76 | -48.01 | 0.00 | -0.93 | 18.32 | 0.0679 |
| 846.60 | -27.53 | -48.05 | 0.00 | -0.76 | 19.76 | 0.0946 |



3.3.6 Test Result of EIRP

| GSM1900 (GPRS 8) Radiated Power EIRP | | | | | | |
|--------------------------------------|----------|----------|----------|----------|------------|----------|
| Horizontal Polarization | | | | | | |
| Frequency (MHz) | Rt (dBm) | Rs (dBm) | Ps (dBm) | Gs (dBi) | EIRP (dBm) | EIRP (W) |
| 1850.20 | -25.32 | -51.88 | 0.00 | 1.96 | 28.52 | 0.7112 |
| 1880.00 | -25.55 | -52.99 | 0.00 | 2.00 | 29.44 | 0.8790 |
| 1909.80 | -26.16 | -54.28 | 0.00 | 1.98 | 30.10 | 1.0233 |
| Vertical Polarization | | | | | | |
| Frequency (MHz) | Rt (dBm) | Rs (dBm) | Ps (dBm) | Gs (dBi) | EIRP (dBm) | EIRP (W) |
| 1850.20 | -26.80 | -52.13 | 0.00 | 1.96 | 27.29 | 0.5358 |
| 1880.00 | -26.55 | -53.17 | 0.00 | 2.00 | 28.62 | 0.7278 |
| 1909.80 | -26.30 | -54.13 | 0.00 | 1.98 | 29.81 | 0.9572 |

| GSM1900 (EDGE 8) Radiated Power EIRP | | | | | | |
|--------------------------------------|----------|----------|----------|----------|------------|----------|
| Horizontal Polarization | | | | | | |
| Frequency (MHz) | Rt (dBm) | Rs (dBm) | Ps (dBm) | Gs (dBi) | EIRP (dBm) | EIRP (W) |
| 1850.20 | -31.38 | -51.88 | 0.00 | 1.96 | 22.46 | 0.1762 |
| 1880.00 | -31.27 | -52.99 | 0.00 | 2.00 | 23.72 | 0.2355 |
| 1909.80 | -31.54 | -54.28 | 0.00 | 1.98 | 24.72 | 0.2965 |
| Vertical Polarization | | | | | | |
| Frequency (MHz) | Rt (dBm) | Rs (dBm) | Ps (dBm) | Gs (dBi) | EIRP (dBm) | EIRP (W) |
| 1850.20 | -33.16 | -52.13 | 0.00 | 1.96 | 20.93 | 0.1239 |
| 1880.00 | -32.38 | -53.17 | 0.00 | 2.00 | 22.79 | 0.1901 |
| 1909.80 | -31.52 | -54.13 | 0.00 | 1.98 | 24.59 | 0.2877 |



| WCDMA Band II (RMC 12.2Kbps) Radiated Power EIRP | | | | | | |
|--|----------|----------|----------|----------|------------|----------|
| Horizontal Polarization | | | | | | |
| Frequency (MHz) | Rt (dBm) | Rs (dBm) | Ps (dBm) | Gs (dBi) | EIRP (dBm) | EIRP (W) |
| 1852.40 | -31.17 | -51.88 | 0.00 | 1.96 | 22.67 | 0.1849 |
| 1880.00 | -33.79 | -52.99 | 0.00 | 2.00 | 21.20 | 0.1318 |
| 1907.60 | -35.02 | -54.28 | 0.00 | 1.98 | 21.24 | 0.1330 |
| Vertical Polarization | | | | | | |
| Frequency (MHz) | Rt (dBm) | Rs (dBm) | Ps (dBm) | Gs (dBi) | EIRP (dBm) | EIRP (W) |
| 1852.40 | -32.63 | -52.13 | 0.00 | 1.96 | 21.46 | 0.1400 |
| 1880.00 | -34.95 | -53.17 | 0.00 | 2.00 | 20.22 | 0.1052 |
| 1907.60 | -35.11 | -54.13 | 0.00 | 1.98 | 21.00 | 0.1259 |

3.4 99% Occupied Bandwidth and 26dB Bandwidth Measurement

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

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

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

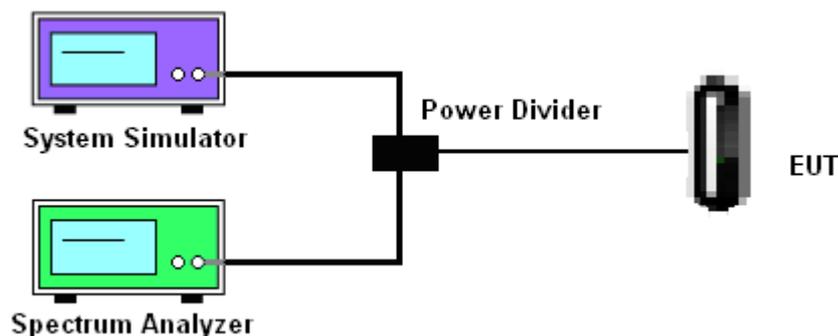
3.4.2 Measuring Instruments

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 and 26 dB bandwidth of the middle channel for the highest RF powers were measured.

3.4.4 Test Setup





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

| Cellular Band | | | | | | |
|-----------------|-----------------|--------------|---------------|-----------------|--------------|---------------|
| Modes | GSM850 (GPRS 8) | | | GSM850 (EDGE 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) | 244.00 | 242.00 | 242.00 | 242.00 | 248.00 | 242.00 |
| 26dB BW (KHz) | 302.00 | 302.00 | 302.00 | 298.00 | 310.00 | 294.00 |

| PCS Band | | | | | | |
|-----------------|------------------|--------------|---------------|------------------|--------------|---------------|
| Modes | GSM1900 (GPRS 8) | | | GSM1900 (EDGE 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) | 238.00 | 248.00 | 238.00 | 244.00 | 248.00 | 250.00 |
| 26dB BW (KHz) | 302.00 | 302.00 | 304.00 | 314.00 | 308.00 | 306.00 |

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

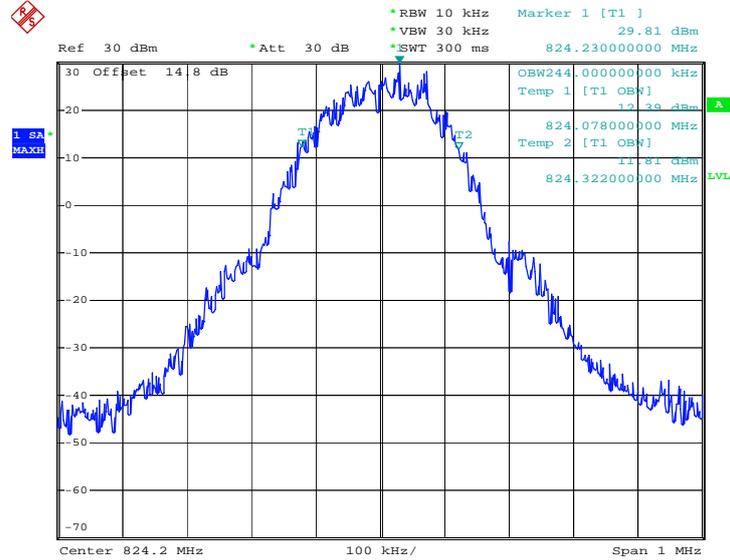
| PCS Band | | | |
|-----------------|------------------------------|------------|-------------|
| Modes | WCDMA Band II (RMC 12.2Kbps) | | |
| Channel | 9262 (Low) | 9400 (Mid) | 9538 (High) |
| Frequency (MHz) | 1852.4 | 1880 | 1907.6 |
| 99% OBW (MHz) | 4.16 | 4.18 | 4.18 |
| 26dB BW (MHz) | 4.68 | 4.68 | 4.70 |



3.4.6 Test Result (Plots) of 99% Occupied Bandwidth and 26dB Bandwidth

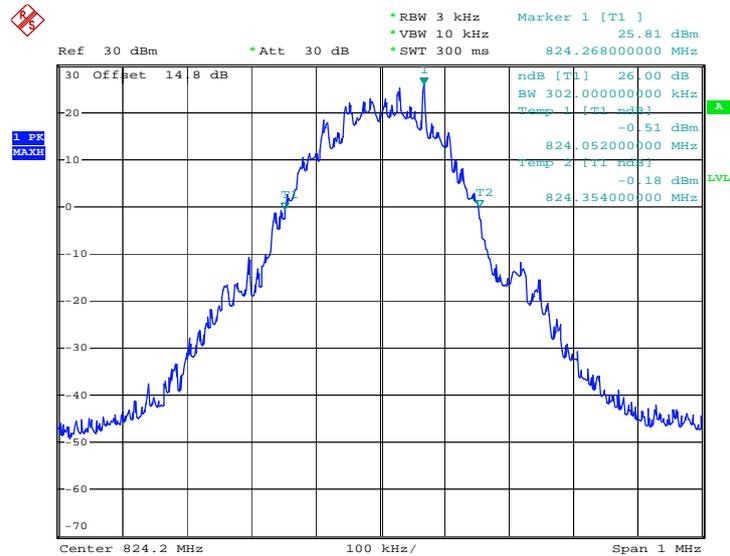
| | | | |
|--------|---------|-------------|-------------|
| Band : | GSM 850 | Test Mode : | GPRS 8 Link |
|--------|---------|-------------|-------------|

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



Date: 3.DEC.2012 22:19:19

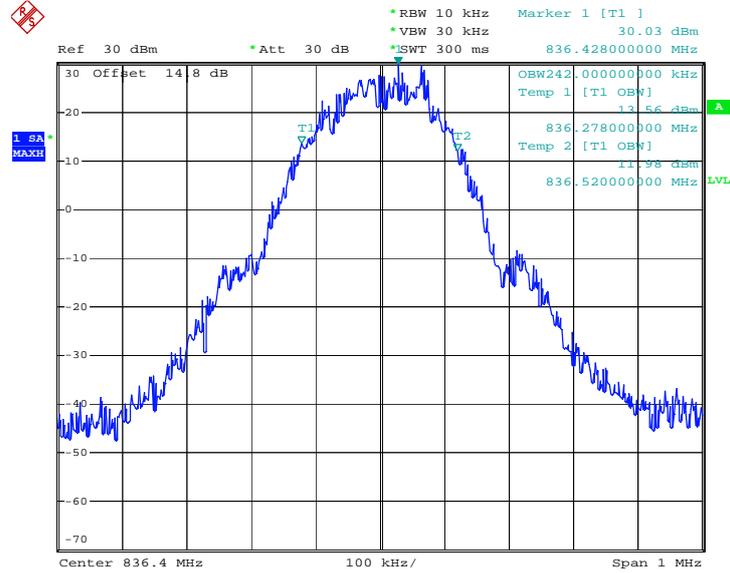
26dB Bandwidth Plot on Channel 128 (824.2 MHz)



Date: 3.DEC.2012 22:18:00

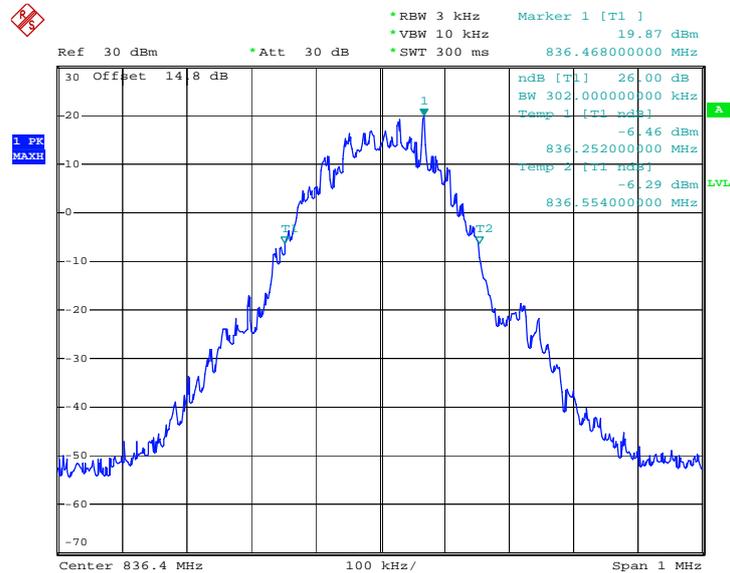


99% Occupied Bandwidth Plot on Channel 189 (836.4 MHz)



Date: 3.DEC.2012 22:19:45

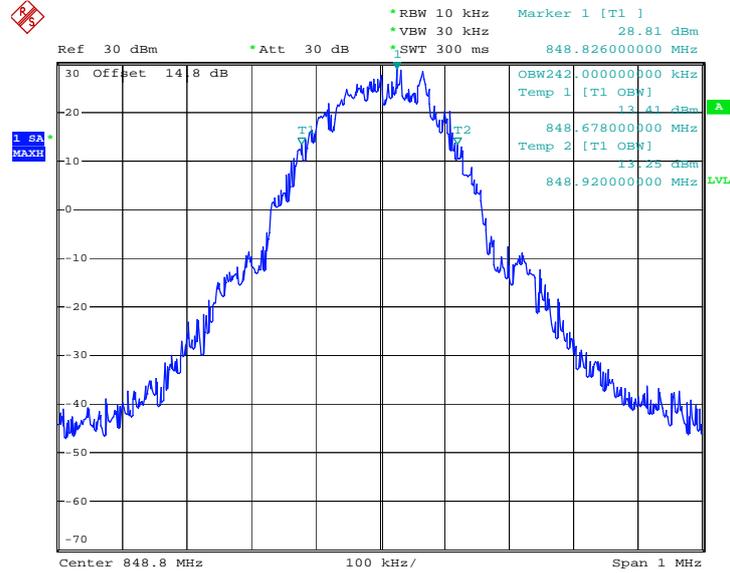
26dB Bandwidth Plot on Channel 189 (836.4 MHz)



Date: 3.DEC.2012 22:44:10

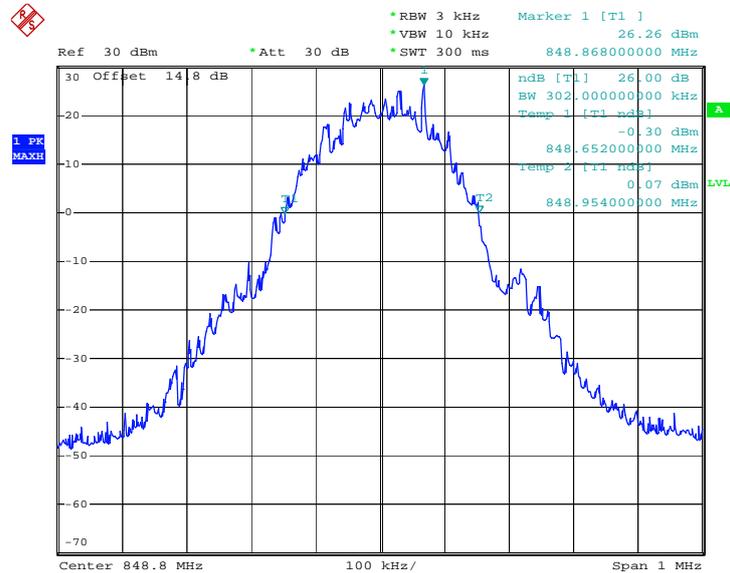


99% Occupied Bandwidth Plot on Channel 251 (848.8 MHz)



Date: 3.DEC.2012 22:20:11

26dB Bandwidth Plot on Channel 251 (848.8 MHz)

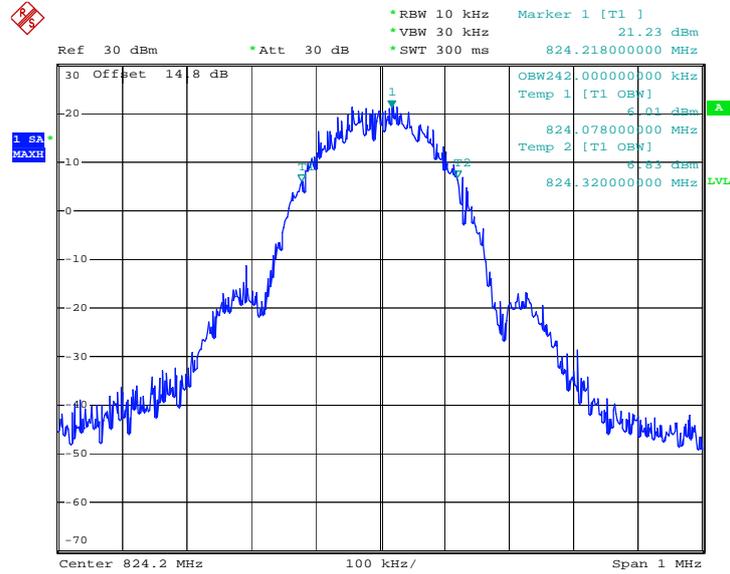


Date: 3.DEC.2012 22:18:53



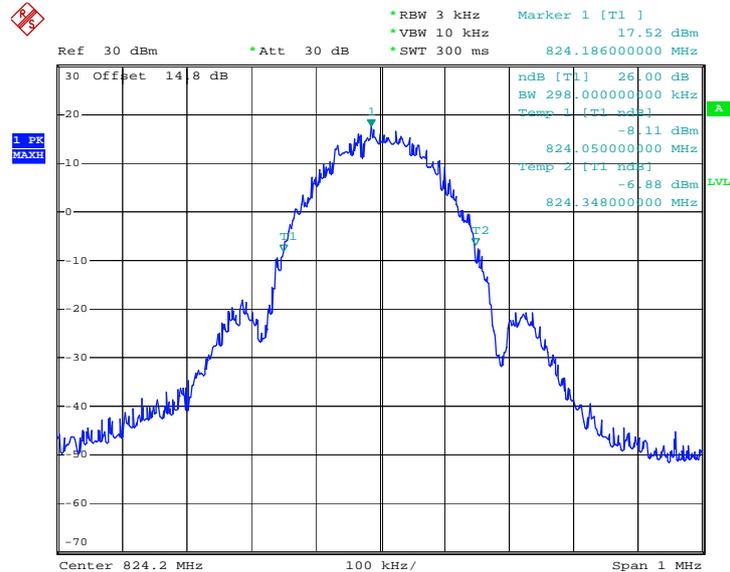
| | | | |
|--------|---------|-------------|-------------|
| Band : | GSM 850 | Test Mode : | EDGE 8 Link |
|--------|---------|-------------|-------------|

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



Date: 3.DEC.2012 19:24:19

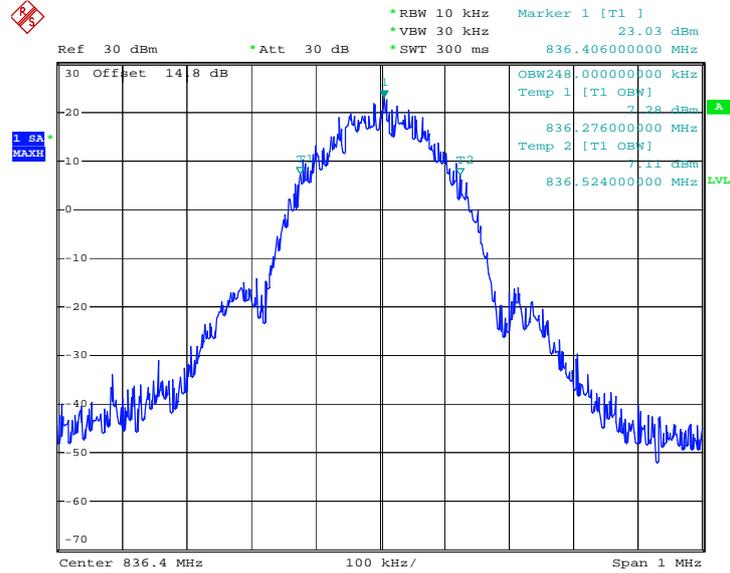
26dB Bandwidth Plot on Channel 128 (824.2 MHz)



Date: 3.DEC.2012 19:01:36

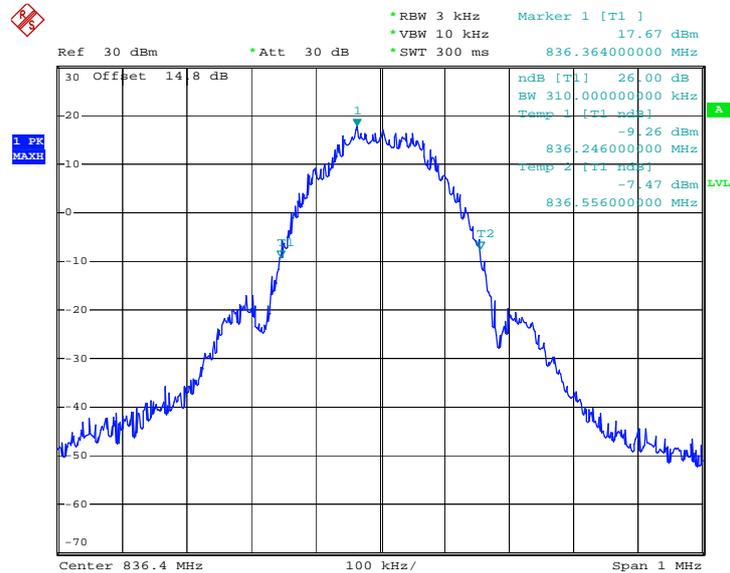


99% Occupied Bandwidth Plot on Channel 189 (836.4 MHz)



Date: 3.DEC.2012 19:03:20

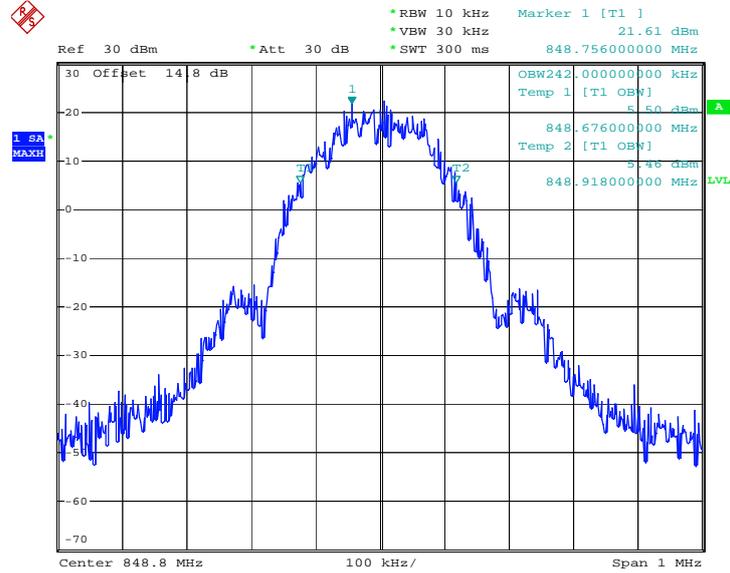
26dB Bandwidth Plot on Channel 189 (836.4 MHz)



Date: 3.DEC.2012 19:02:02

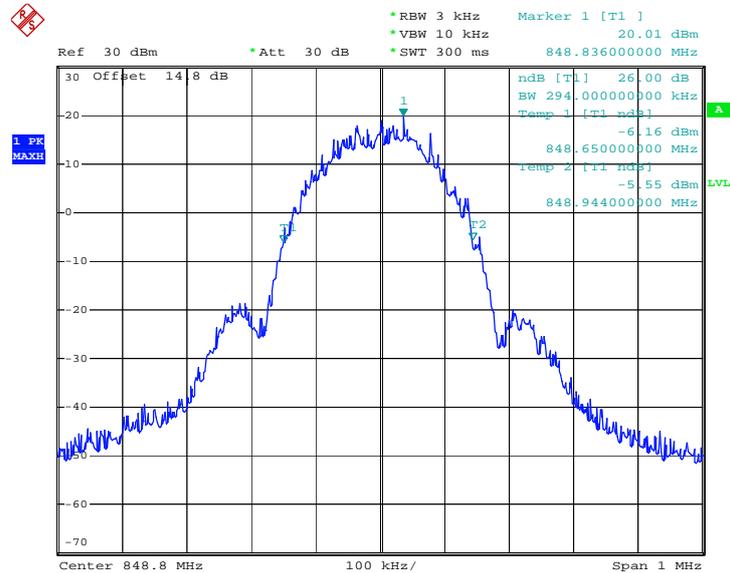


99% Occupied Bandwidth Plot on Channel 251 (848.8 MHz)



Date: 3.DEC.2012 19:25:00

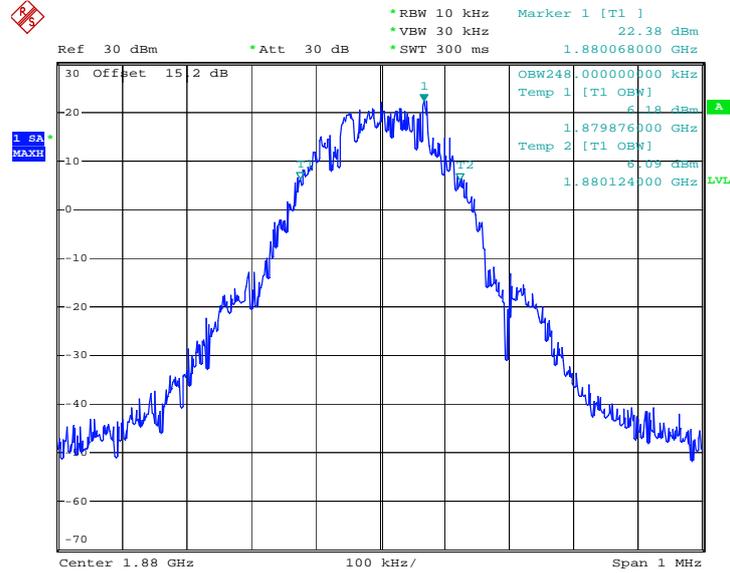
26dB Bandwidth Plot on Channel 251 (848.8 MHz)



Date: 3.DEC.2012 19:02:28

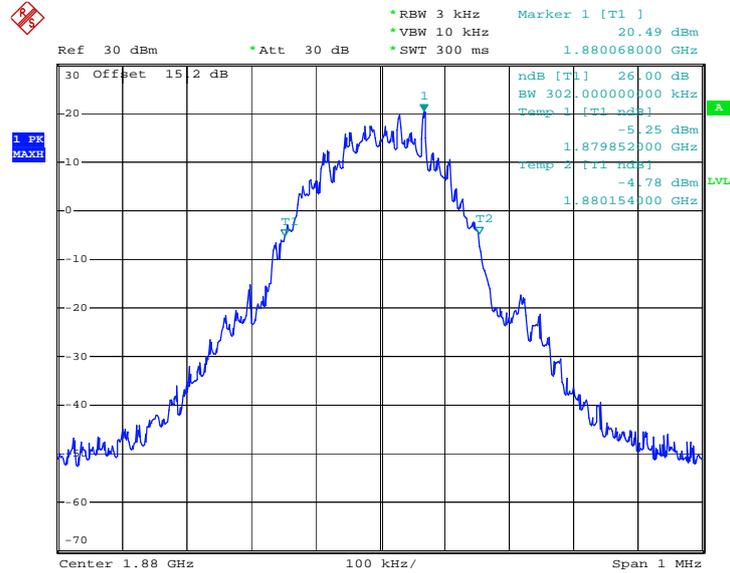


99% Occupied Bandwidth Plot on Channel 661 (1880.0 MHz)



Date: 3.DEC.2012 22:57:21

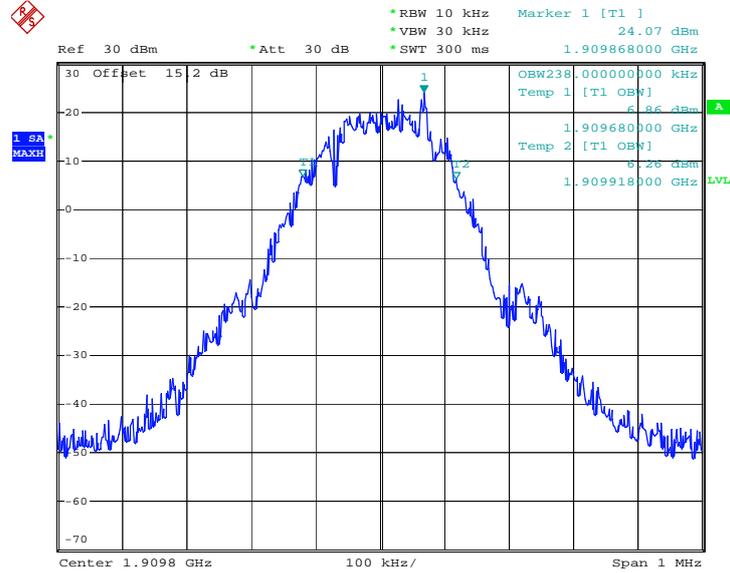
26dB Bandwidth Plot on Channel 661 (1880.0 MHz)



Date: 3.DEC.2012 22:56:04

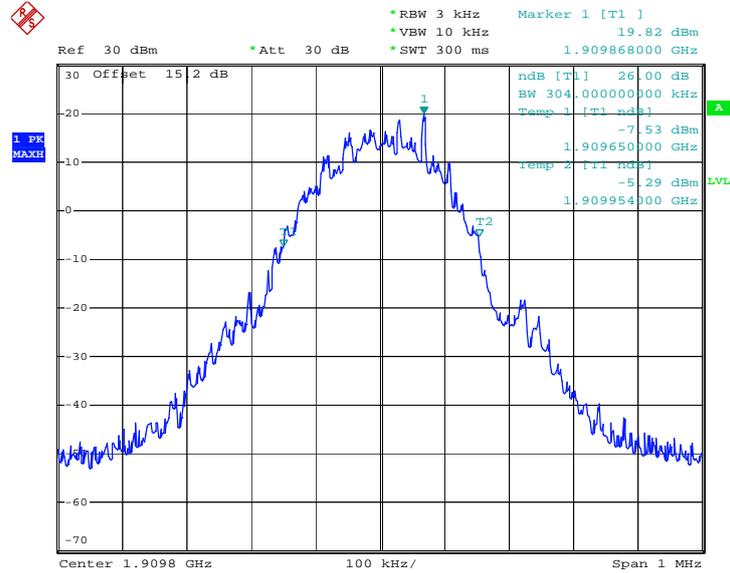


99% Occupied Bandwidth Plot on Channel 810 (1909.8 MHz)



Date: 3.DEC.2012 22:57:47

26dB Bandwidth Plot on Channel 810 (1909.8 MHz)

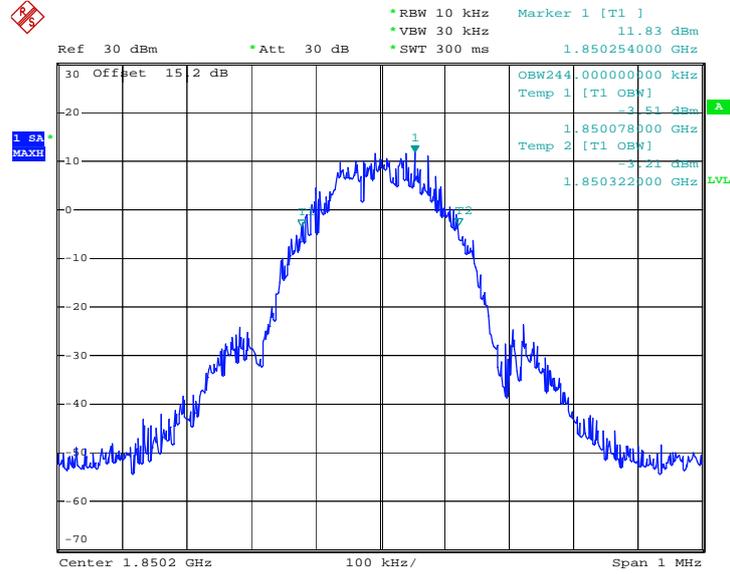


Date: 3.DEC.2012 22:56:29



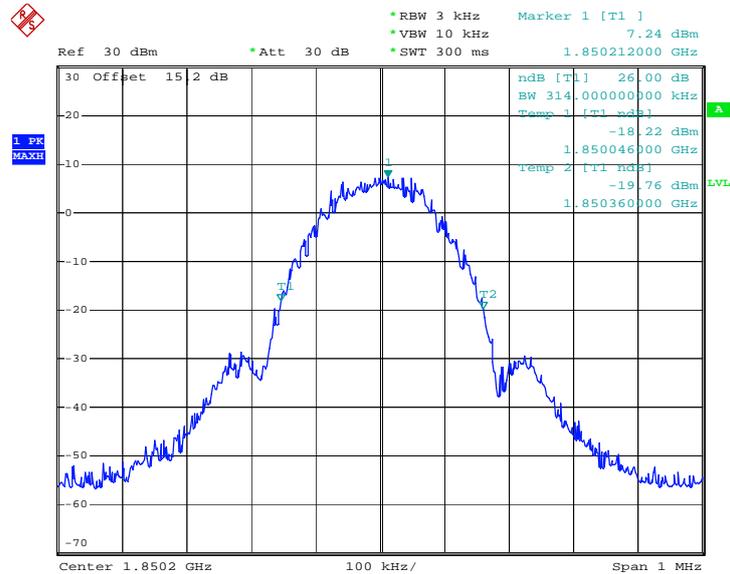
| | | | |
|--------|----------|-------------|-------------|
| Band : | GSM 1900 | Test Mode : | EDGE 8 Link |
|--------|----------|-------------|-------------|

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



Date: 3.DEC.2012 19:47:08

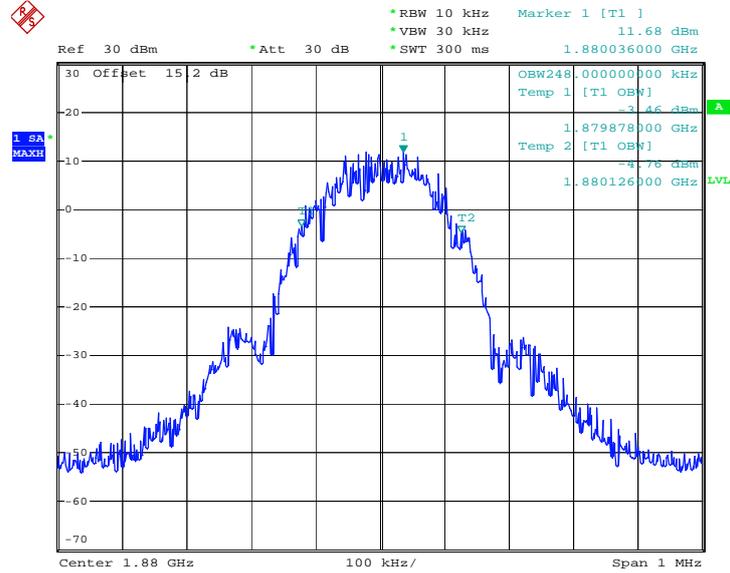
26dB Bandwidth Plot on Channel 512 (1850.2 MHz)



Date: 3.DEC.2012 19:45:50

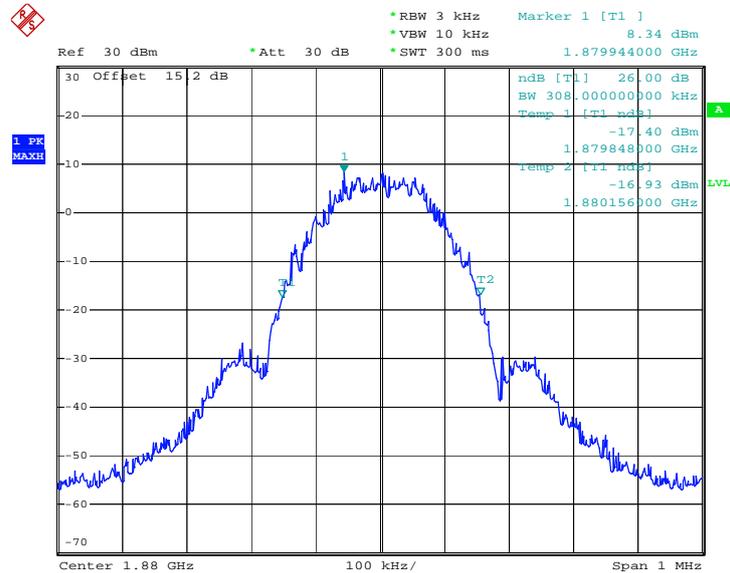


99% Occupied Bandwidth Plot on Channel 661 (1880.0 MHz)



Date: 3.DEC.2012 19:47:34

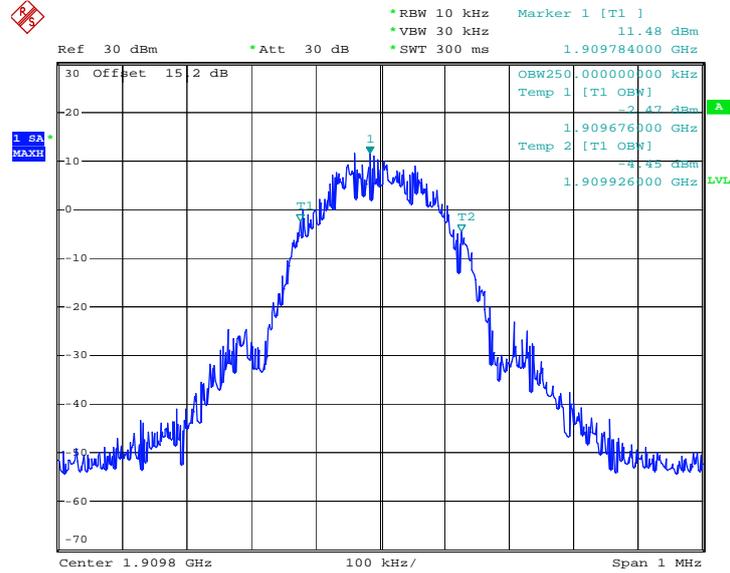
26dB Bandwidth Plot on Channel 661 (1880.0 MHz)



Date: 3.DEC.2012 19:46:16

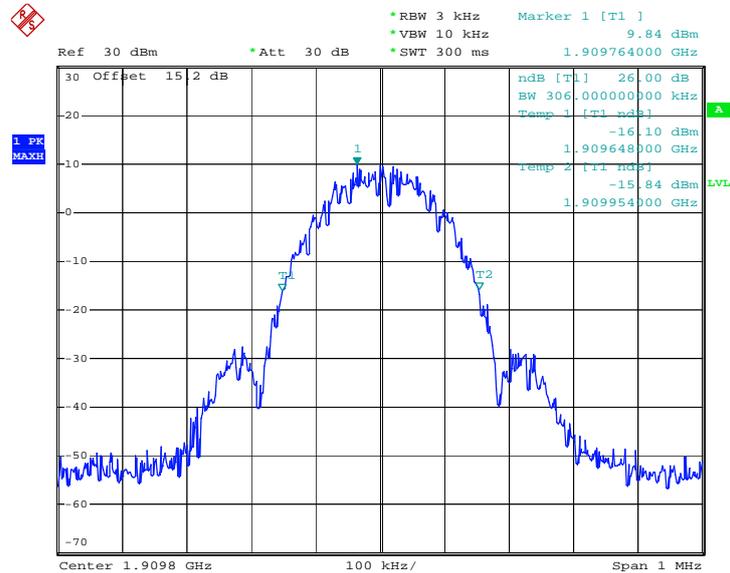


99% Occupied Bandwidth Plot on Channel 810 (1909.8 MHz)



Date: 3.DEC.2012 20:22:19

26dB Bandwidth Plot on Channel 810 (1909.8 MHz)

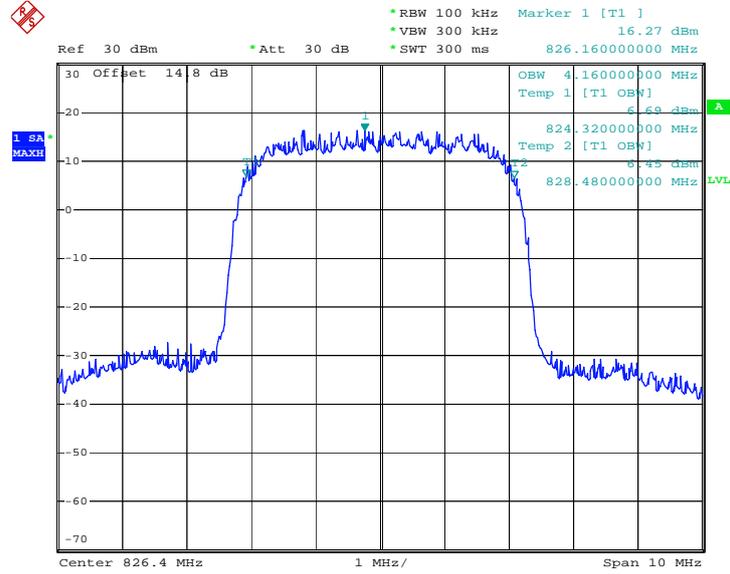


Date: 31.JAN.2013 02:02:53



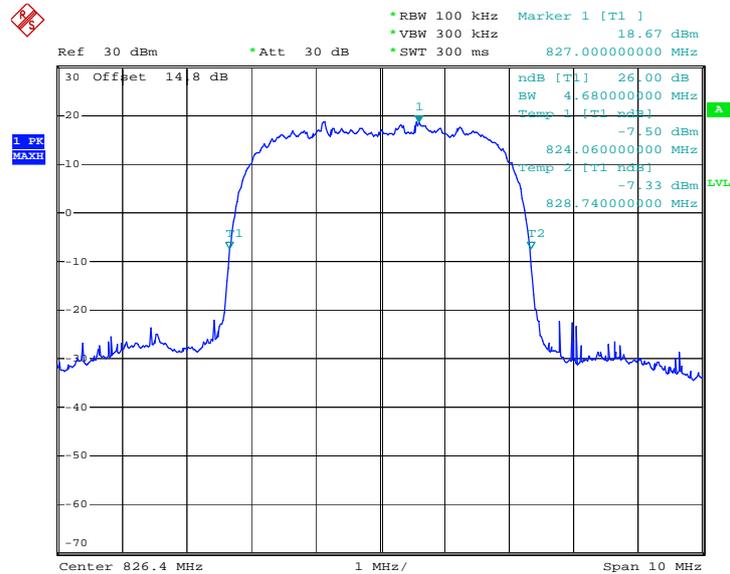
| | | | |
|--------|--------------|-------------|-------------------|
| Band : | WCDMA Band V | Test Mode : | RMC 12.2Kbps Link |
|--------|--------------|-------------|-------------------|

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



Date: 3.DEC.2012 21:17:18

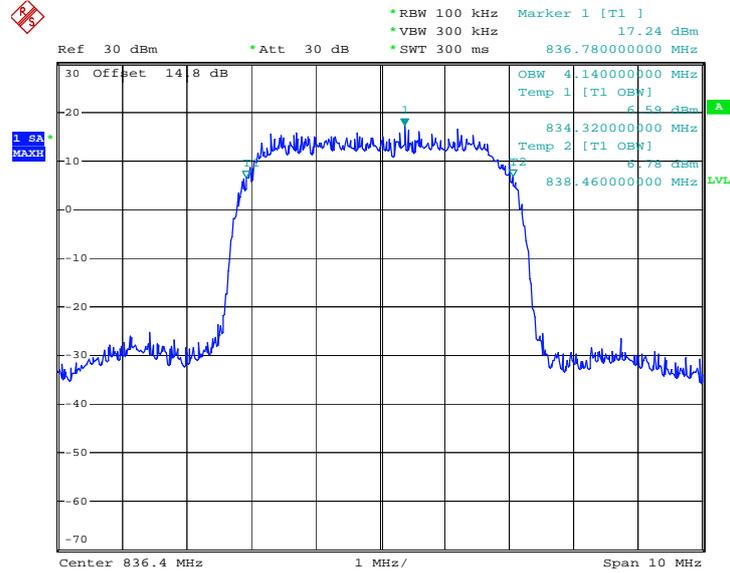
26dB Bandwidth Plot on Channel 4132 (826.4 MHz)



Date: 3.DEC.2012 21:16:00

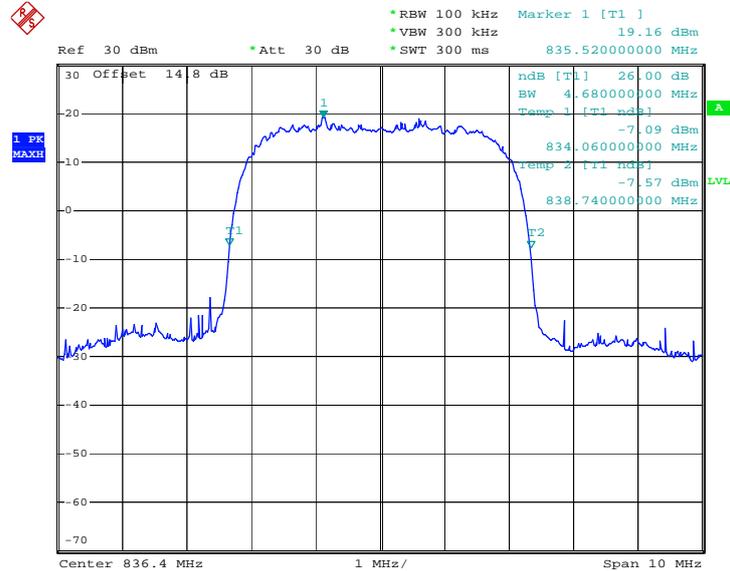


99% Occupied Bandwidth Plot on Channel 4182 (836.4 MHz)



Date: 3.DEC.2012 21:10:45

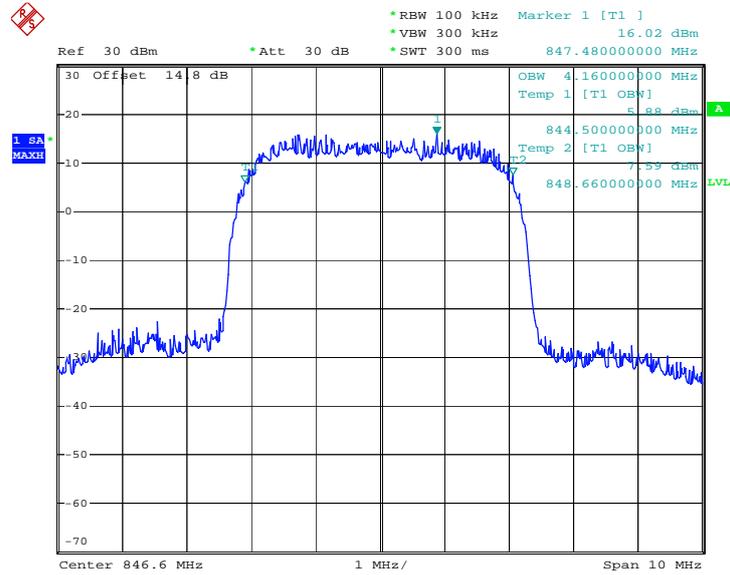
26dB Bandwidth Plot on Channel 4182 (836.4 MHz)



Date: 3.DEC.2012 21:16:26

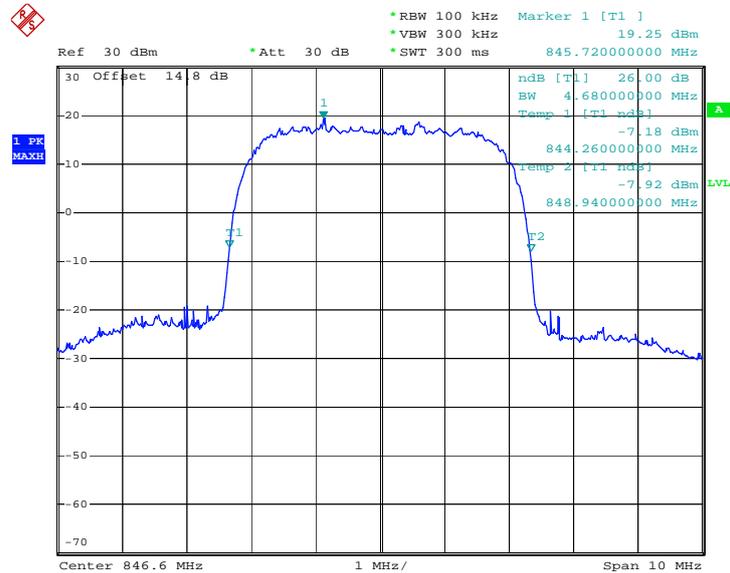


99% Occupied Bandwidth Plot on Channel 4233 (846.6 MHz)



Date: 3.DEC.2012 21:11:10

26dB Bandwidth Plot on Channel 4233 (846.6 MHz)

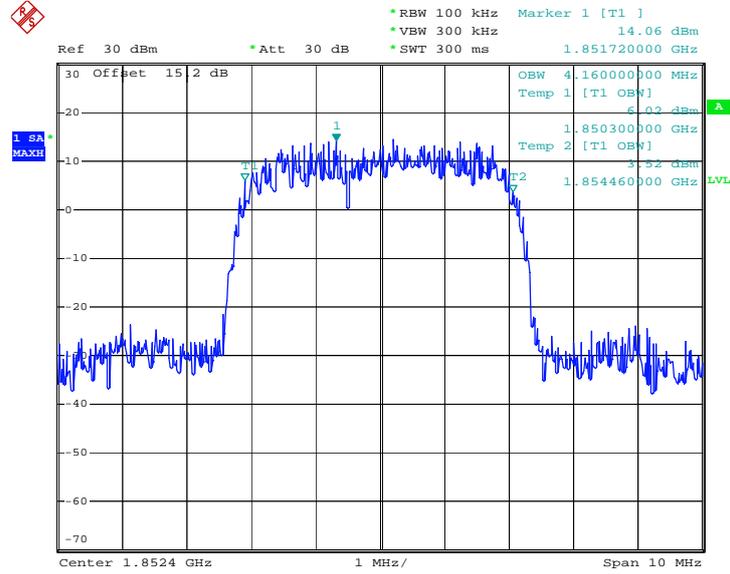


Date: 3.DEC.2012 21:16:52



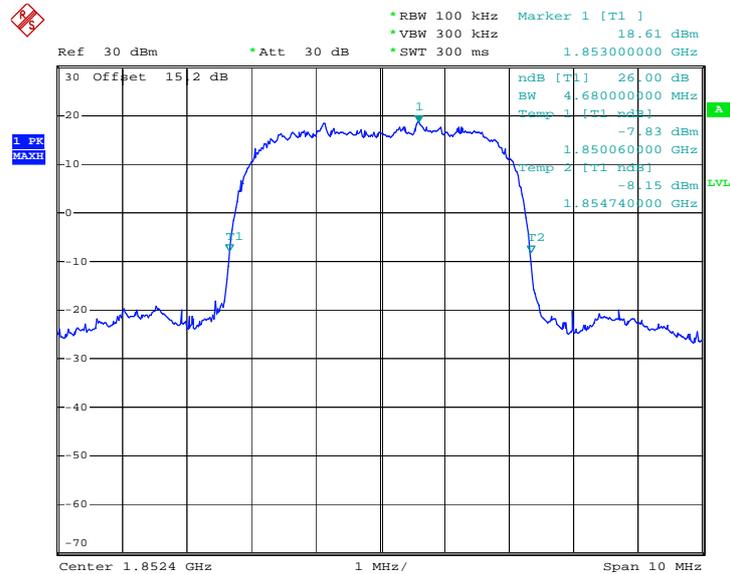
| | | | |
|--------|---------------|-------------|-------------------|
| Band : | WCDMA Band II | Test Mode : | RMC 12.2Kbps Link |
|--------|---------------|-------------|-------------------|

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



Date: 3.DEC.2012 21:47:00

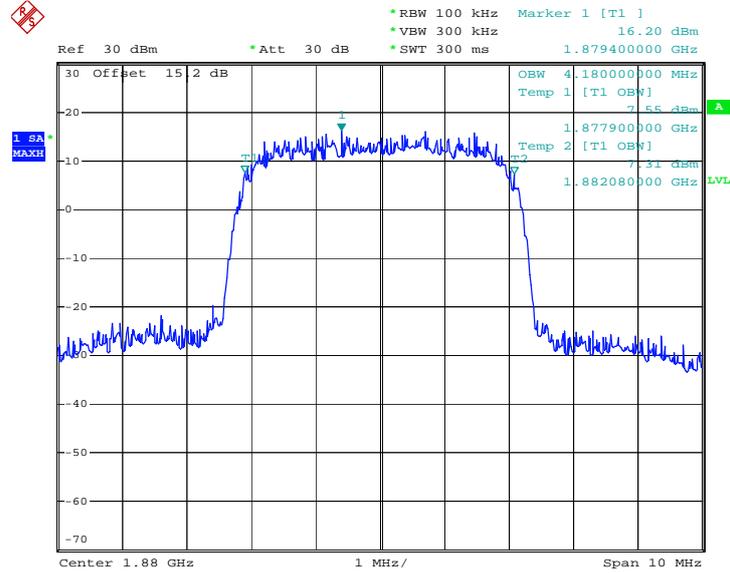
26dB Bandwidth Plot on Channel 9262 (1852.4 MHz)



Date: 3.DEC.2012 21:25:57

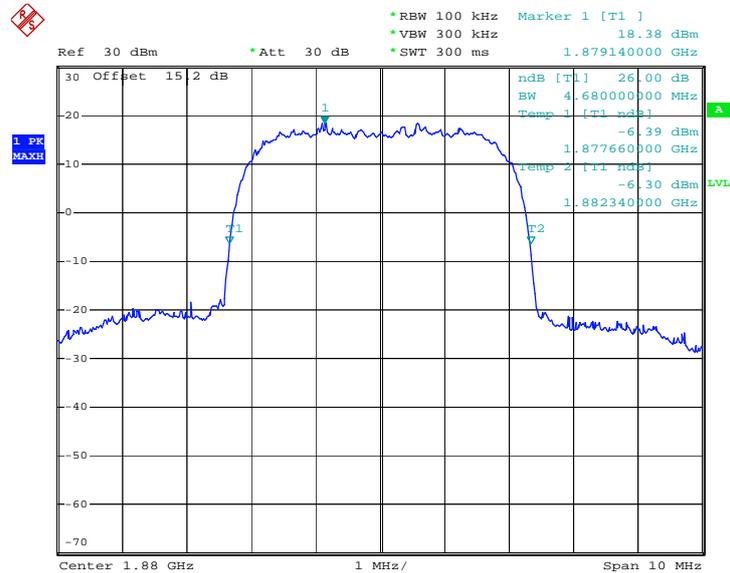


99% Occupied Bandwidth Plot on Channel 9400 (1880.0 MHz)



Date: 3.DEC.2012 21:47:27

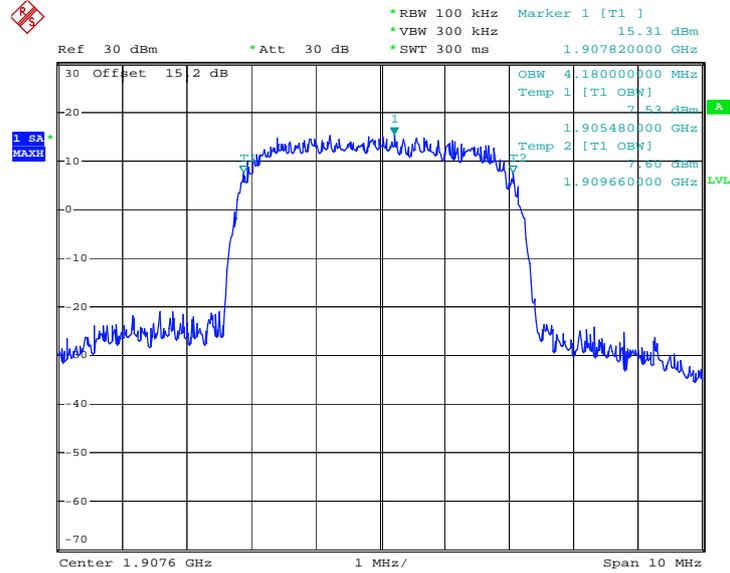
26dB Bandwidth Plot on Channel 9400 (1880.0 MHz)



Date: 3.DEC.2012 21:26:24

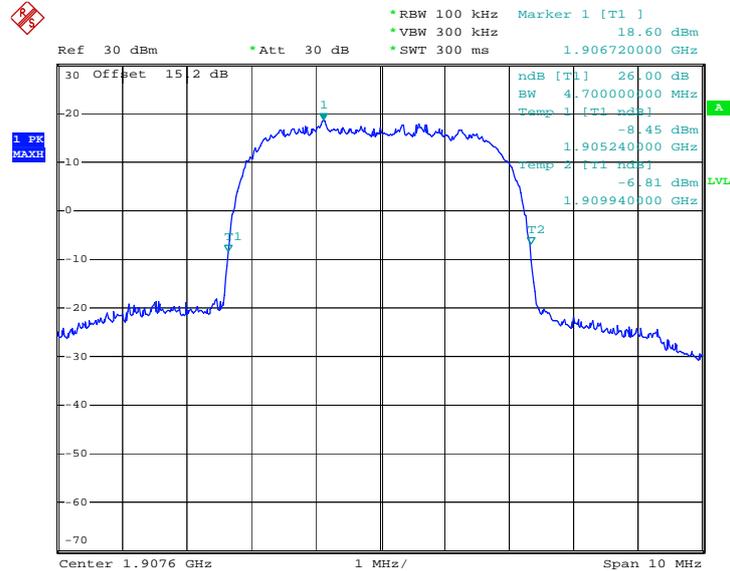


99% Occupied Bandwidth Plot on Channel 9538 (1907.6 MHz)



Date: 3.DEC.2012 21:47:54

26dB Bandwidth Plot on Channel 9538 (1907.6 MHz)



Date: 3.DEC.2012 21:26:50

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.

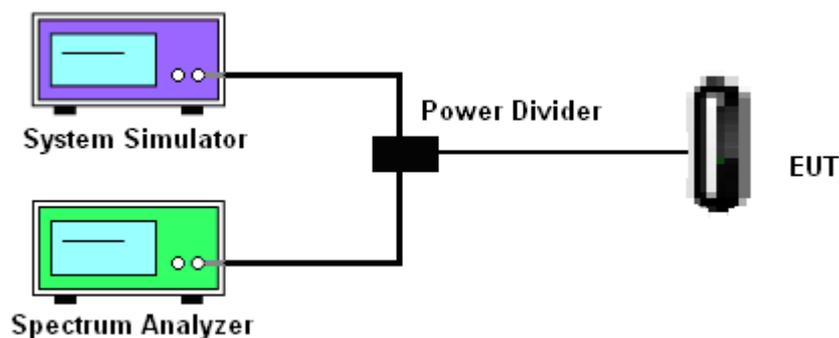
3.5.2 Measuring Instruments

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.
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)
 $= P(W) - [43 + 10\log(P)] \text{ (dB)}$
 $= [30 + 10\log(P)] \text{ (dBm)} - [43 + 10\log(P)] \text{ (dB)}$
 $= -13\text{dBm}.$

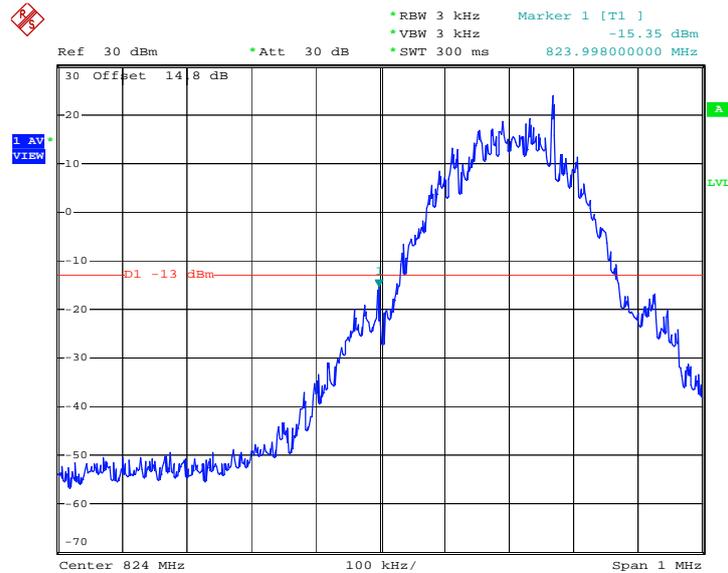
3.5.4 Test Setup



3.5.5 Test Result (Plots) of Conducted Band Edge

| | | | |
|---------------------|-----------|--------------------------|-------------|
| Band : | GSM850 | Test Mode : | GPRS 8 Link |
| Correction Factor : | 0.03dB | Maximum 26dB Bandwidth : | 0.302MHz |
| Band Edge : | -15.32dBm | Measurement Value : | -15.35dBm |

Lower Band Edge Plot on Channel 128 (824.2 MHz)



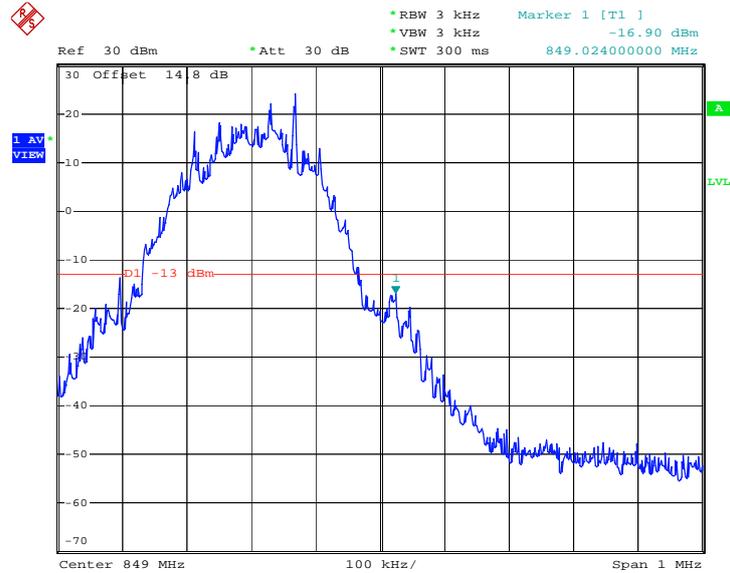
Date: 3.DEC.2012 22:49:48

1. Correction Factor(dB)= $10\log(1\% \text{ Emission BW/RBW})$
 2. Band Edge= Measurement Value + Correction Factor(dB)
- For example, $-15.35\text{dBm} + 0.03\text{dB} = -15.32\text{dBm}$



| | | | |
|---------------------|-----------|--------------------------|-------------|
| Band : | GSM850 | Test Mode : | GPRS 8 Link |
| Correction Factor : | 0.03dB | Maximum 26dB Bandwidth : | 0.302MHz |
| Band Edge : | -16.87dBm | Measurement Value : | -16.90dBm |

Higher Band Edge Plot on Channel 251 (848.8 MHz)



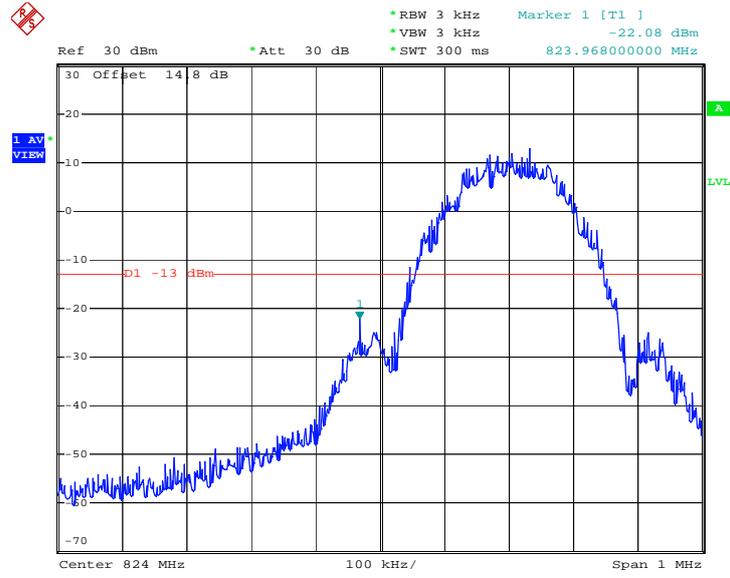
Date: 3.DEC.2012 22:50:14

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



| | | | |
|---------------------|-----------|--------------------------|-------------|
| Band : | GSM850 | Test Mode : | EDGE 8 Link |
| Correction Factor : | 0.14dB | Maximum 26dB Bandwidth : | 0.310MHz |
| Band Edge : | -21.94dBm | Measurement Value : | -22.08dBm |

Lower Band Edge Plot on Channel 128 (824.2 MHz)



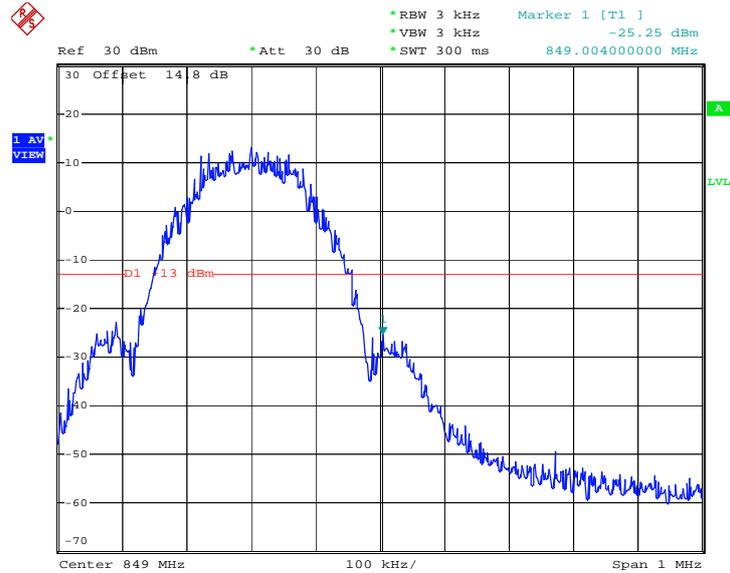
Date: 3.DEC.2012 19:05:10

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



| | | | |
|---------------------|-----------|--------------------------|-------------|
| Band : | GSM850 | Test Mode : | EDGE 8 Link |
| Correction Factor : | 0.14dB | Maximum 26dB Bandwidth : | 0.310MHz |
| Band Edge : | -25.11dBm | Measurement Value : | -25.25dBm |

Higher Band Edge Plot on Channel 251 (848.8 MHz)



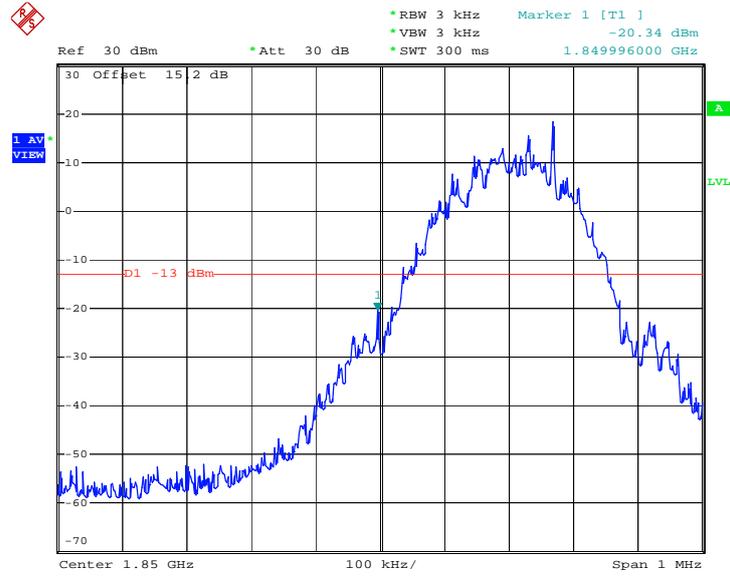
Date: 3.DEC.2012 19:05:36

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



| | | | |
|---------------------|-----------|--------------------------|-------------|
| Band : | GSM1900 | Test Mode : | GPRS 8 Link |
| Correction Factor : | 0.06dB | Maximum 26dB Bandwidth : | 0.304MHz |
| Band Edge : | -20.28dBm | Measurement Value : | -20.34dBm |

Lower Band Edge Plot on Channel 512 (1850.2 MHz)



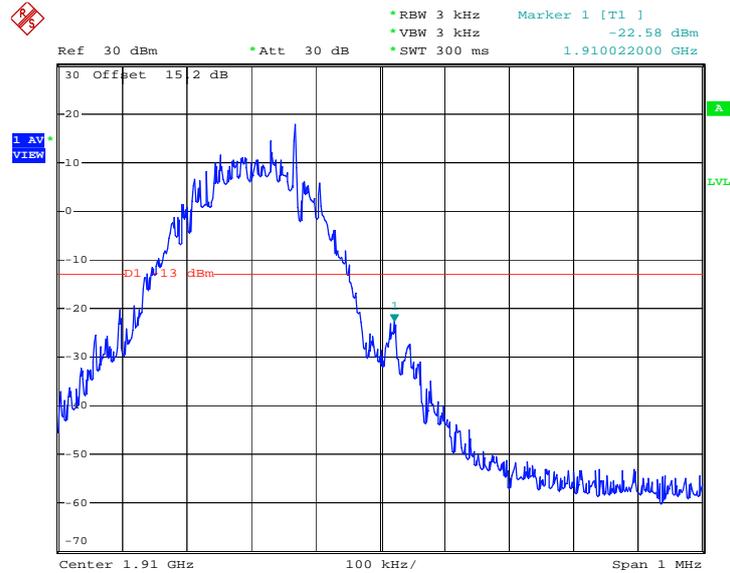
Date: 3.DEC.2012 22:59:11

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



| | | | |
|---------------------|-----------|--------------------------|-------------|
| Band : | GSM1900 | Test Mode : | GPRS 8 Link |
| Correction Factor : | 0.06dB | Maximum 26dB Bandwidth : | 0.304MHz |
| Band Edge : | -22.52dBm | Measurement Value : | -22.58dBm |

Higher Band Edge Plot on Channel 810 (1909.8 MHz)



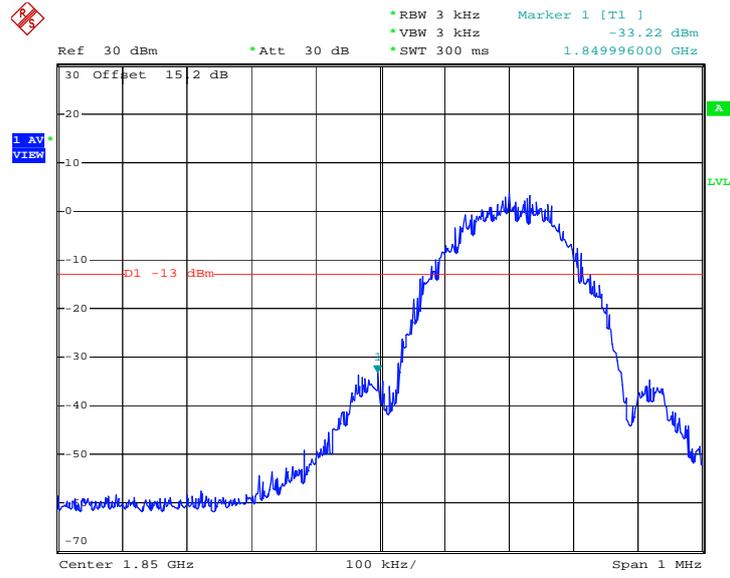
Date: 3.DEC.2012 22:59:37

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



| | | | |
|---------------------|-----------|--------------------------|-------------|
| Band : | GSM1900 | Test Mode : | EDGE 8 Link |
| Correction Factor : | 0.20dB | Maximum 26dB Bandwidth : | 0.314MHz |
| Band Edge : | -33.02dBm | Measurement Value : | -33.22dBm |

Lower Band Edge Plot on Channel 512 (1850.2 MHz)



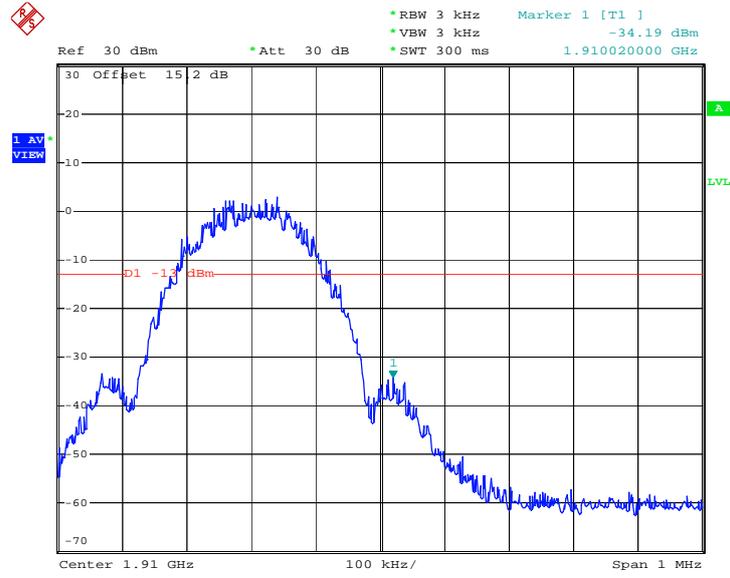
Date: 3.DEC.2012 19:49:24

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



| | | | |
|---------------------|-----------|--------------------------|-------------|
| Band : | GSM1900 | Test Mode : | EDGE 8 Link |
| Correction Factor : | 0.20dB | Maximum 26dB Bandwidth : | 0.314MHz |
| Band Edge : | -33.99dBm | Measurement Value : | -34.19dBm |

Higher Band Edge Plot on Channel 810 (1909.8 MHz)



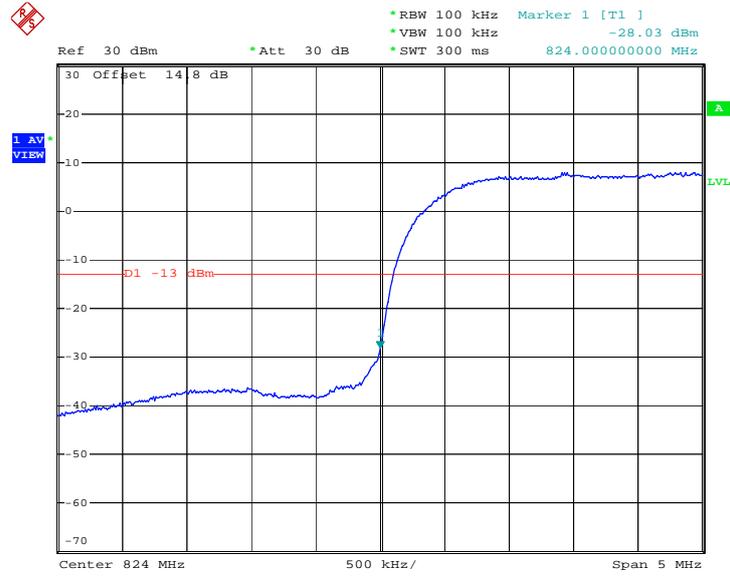
Date: 3.DEC.2012 19:49:50

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



| | | | |
|---------------------|--------------|--------------------------|-------------------|
| Band : | WCDMA Band V | Test Mode : | RMC 12.2Kbps Link |
| Correction Factor : | -3.30dB | Maximum 26dB Bandwidth : | 4.680MHz |
| Band Edge : | -31.33dBm | Measurement Value : | -28.03dBm |

Lower Band Edge Plot on Channel 4132 (826.4 MHz)



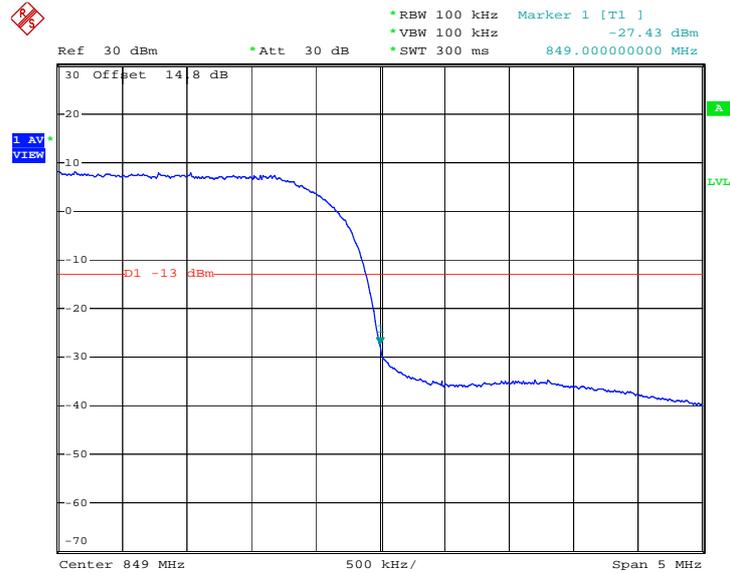
Date: 3.DEC.2012 21:19:38

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



| | | | |
|---------------------|--------------|--------------------------|-------------------|
| Band : | WCDMA Band V | Test Mode : | RMC 12.2Kbps Link |
| Correction Factor : | -3.30dB | Maximum 26dB Bandwidth : | 4.680MHz |
| Band Edge : | -30.73dBm | Measurement Value : | -27.43dBm |

Higher Band Edge Plot on Channel 4233 (846.6 MHz)



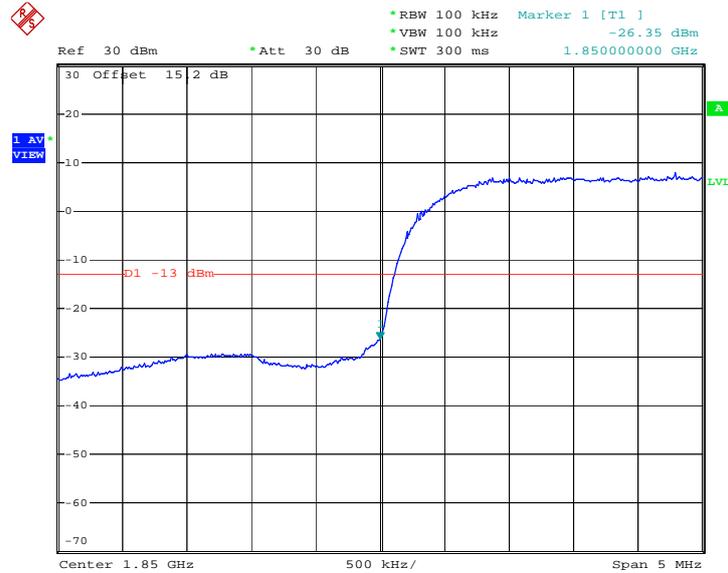
Date: 3.DEC.2012 21:20:05

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



| | | | |
|---------------------|---------------|--------------------------|-------------------|
| Band : | WCDMA Band II | Test Mode : | RMC 12.2Kbps Link |
| Correction Factor : | -3.28dB | Maximum 26dB Bandwidth : | 4.700MHz |
| Band Edge : | -29.63dBm | Measurement Value : | -26.35dBm |

Lower Band Edge Plot on Channel 9262 (1852.4 MHz)



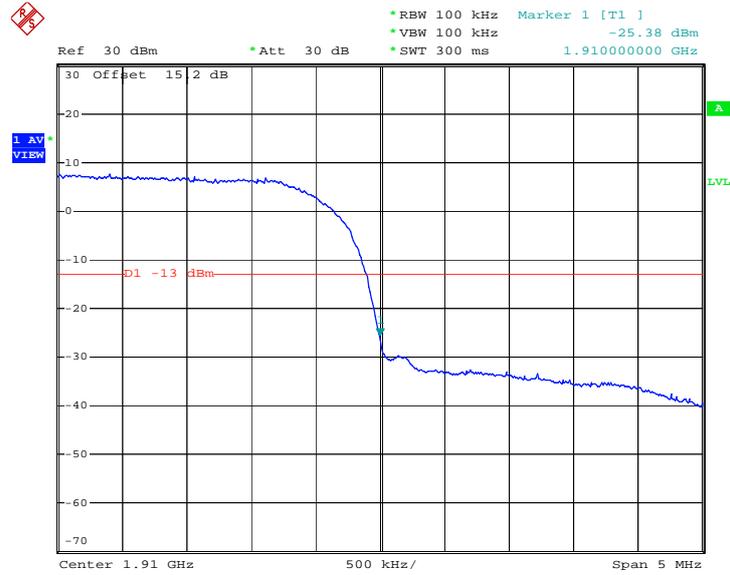
Date: 3.DEC.2012 21:56:03

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 |
| Correction Factor : | -3.28dB | Maximum 26dB Bandwidth : | 4.700MHz |
| Band Edge : | -28.66dBm | Measurement Value : | -25.38dBm |

Higher Band Edge Plot on Channel 9538 (1907.6 MHz)



Date: 3.DEC.2012 21:30:17

1. Correction Factor(dB)= 10log(1% 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.

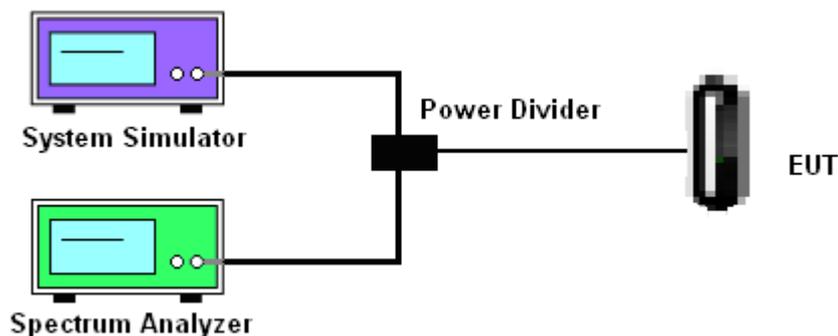
3.6.2 Measuring Instruments

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)
 - = $P(W) - [43 + 10\log(P)]$ (dB)
 - = $[30 + 10\log(P)]$ (dBm) - $[43 + 10\log(P)]$ (dB)
 - = -13dBm.

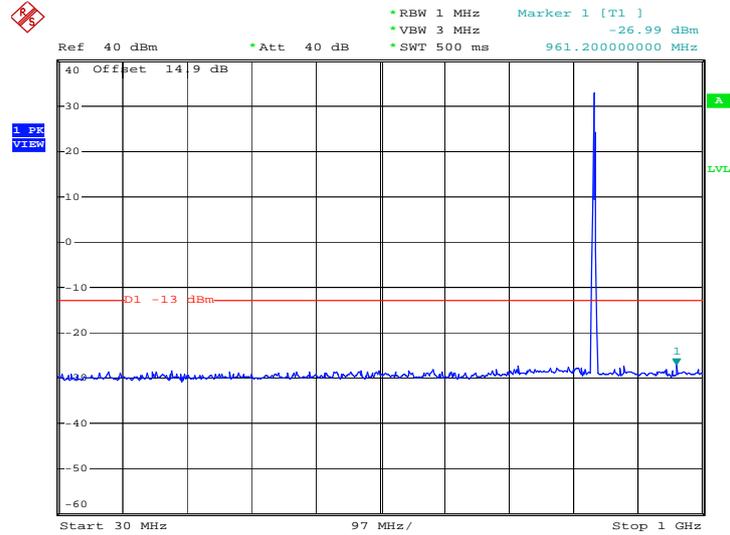
3.6.4 Test Setup



3.6.5 Test Result (Plots) of Conducted Spurious Emission

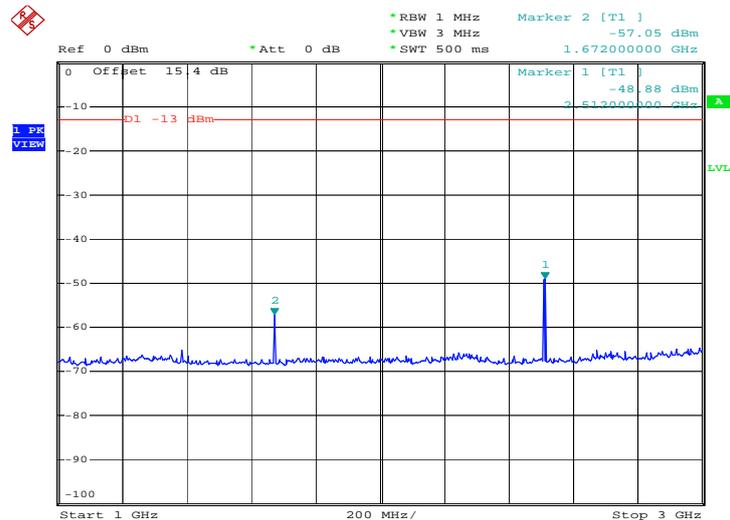
| | | | |
|-------------|-------------|-------------|-----------|
| Band : | GSM850 | Channel : | CH189 |
| Test Mode : | GPRS 8 Link | Frequency : | 836.4 MHz |

Conducted Spurious Emission Plot between 30MHz ~ 1GHz



Date: 3.DEC.2012 22:30:14

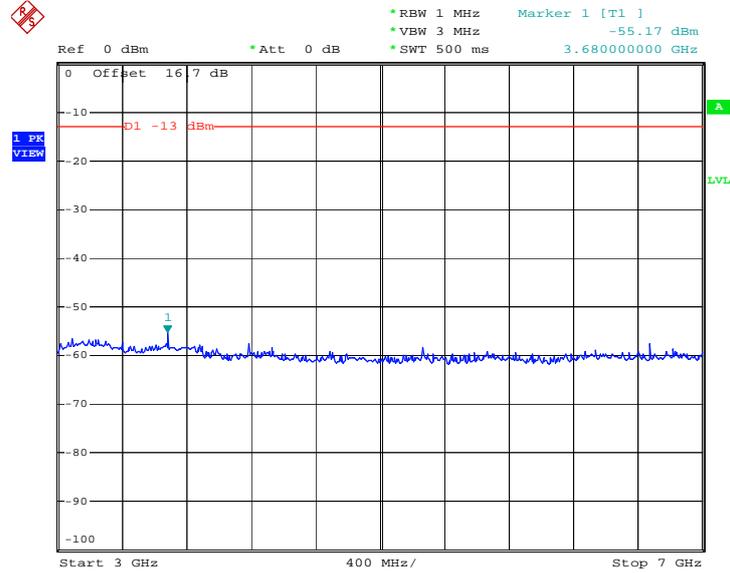
Conducted Spurious Emission Plot between 1GHz ~ 3GHz



Date: 3.DEC.2012 22:32:14

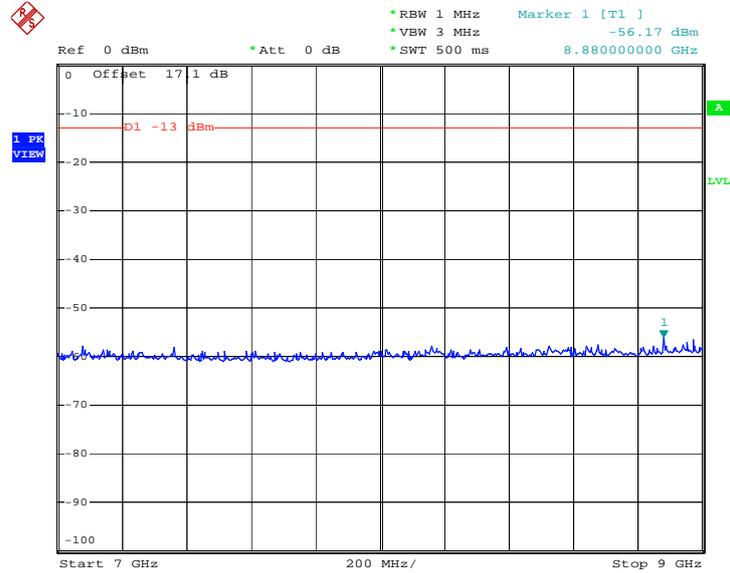


Conducted Spurious Emission Plot between 3GHz ~ 7GHz



Date: 3.DEC.2012 22:32:49

Conducted Spurious Emission Plot between 7GHz ~ 9GHz

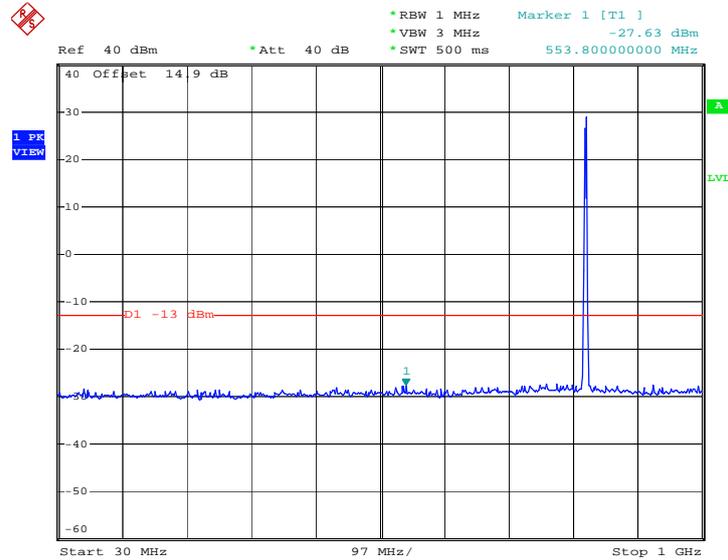


Date: 3.DEC.2012 22:33:19



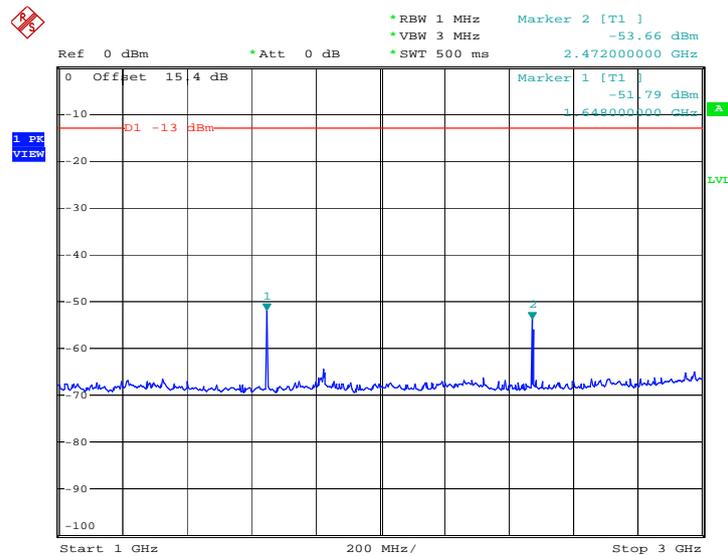
| | | | |
|-------------|-------------|-------------|-----------|
| Band : | GSM850 | Channel : | CH189 |
| Test Mode : | EDGE 8 Link | Frequency : | 836.4 MHz |

Conducted Spurious Emission Plot between 30MHz ~ 1GHz



Date: 3.DEC.2012 19:38:03

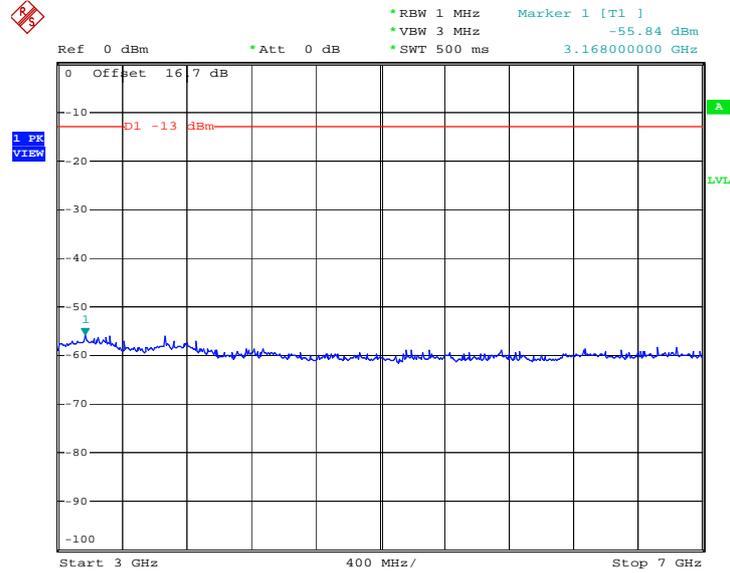
Conducted Spurious Emission Plot between 1GHz ~ 3GHz



Date: 3.DEC.2012 19:39:15

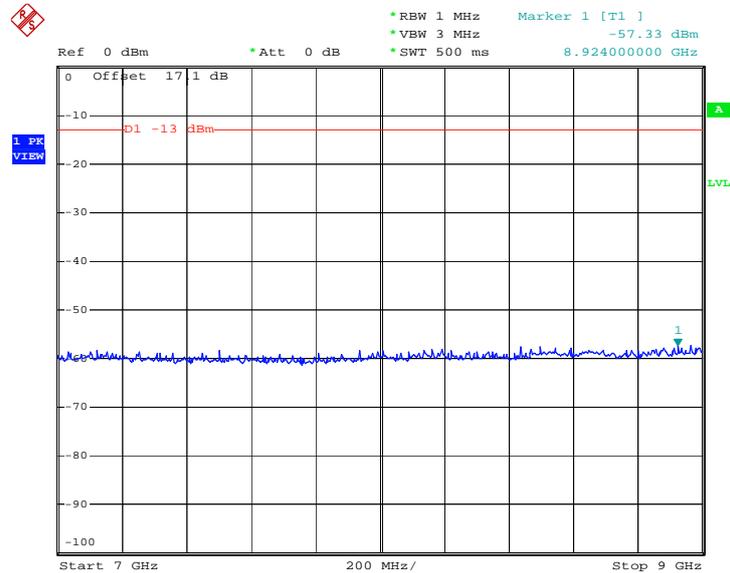


Conducted Spurious Emission Plot between 3GHz ~ 7GHz



Date: 3.DEC.2012 19:40:02

Conducted Spurious Emission Plot between 7GHz ~ 9GHz

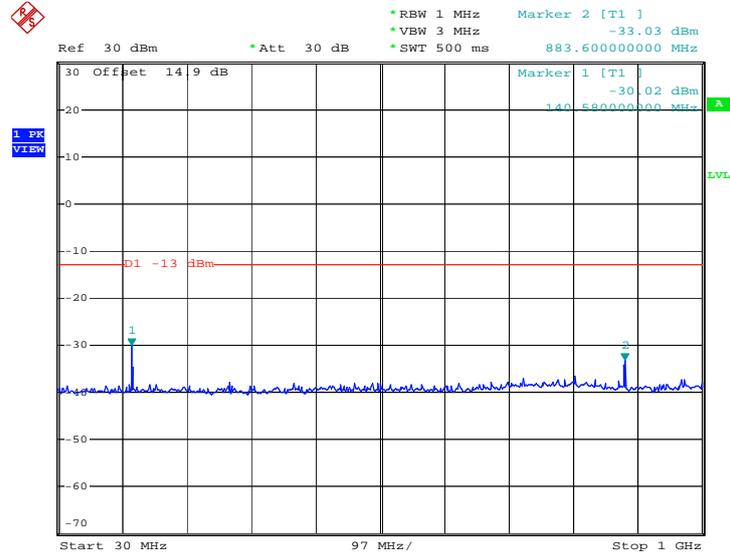


Date: 3.DEC.2012 19:40:35



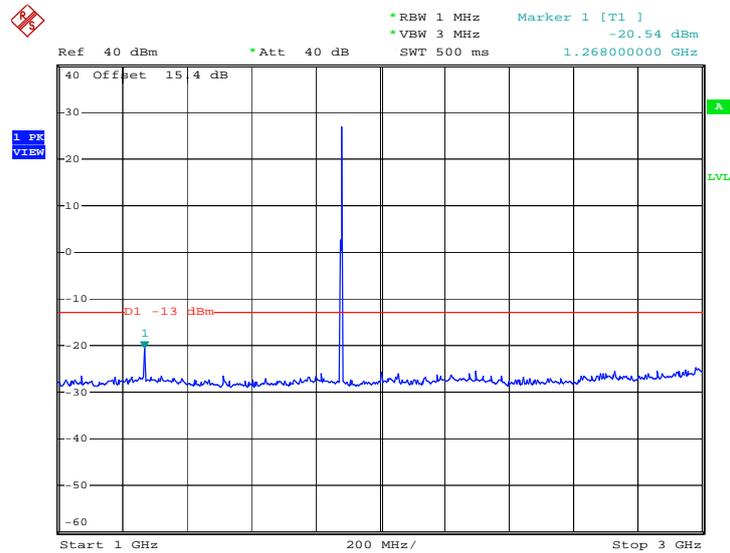
| | | | |
|-------------|-------------|-------------|------------|
| Band : | GSM1900 | Channel : | CH661 |
| Test Mode : | GPRS 8 Link | Frequency : | 1880.0 MHz |

Conducted Spurious Emission Plot between 30MHz ~ 1GHz



Date: 3.DEC.2012 23:13:33

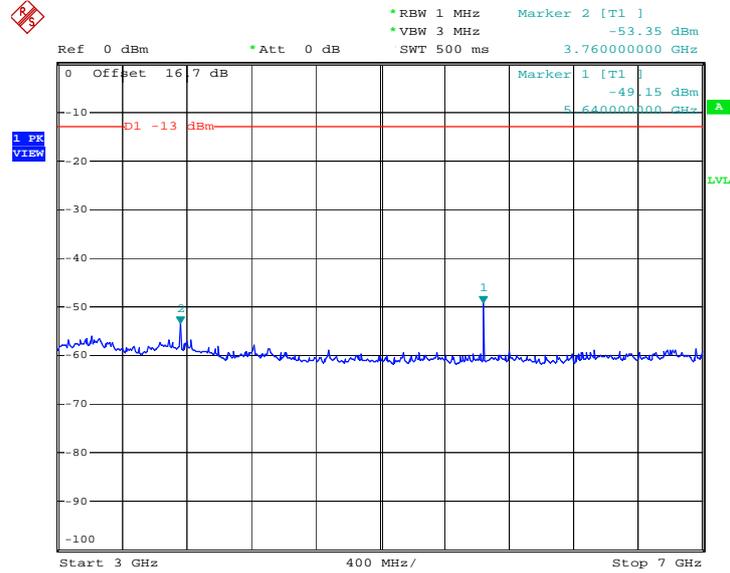
Conducted Spurious Emission Plot between 1GHz ~ 3GHz



Date: 3.DEC.2012 23:06:00

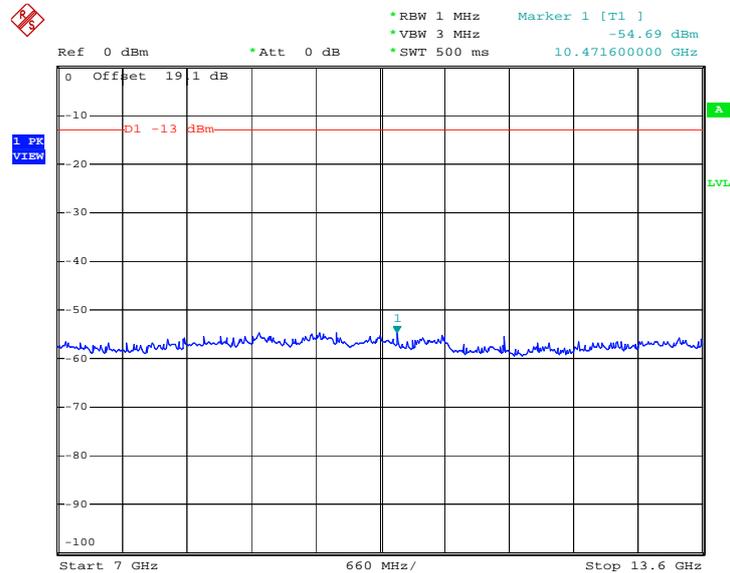


Conducted Spurious Emission Plot between 3GHz ~ 7GHz



Date: 3.DEC.2012 23:14:19

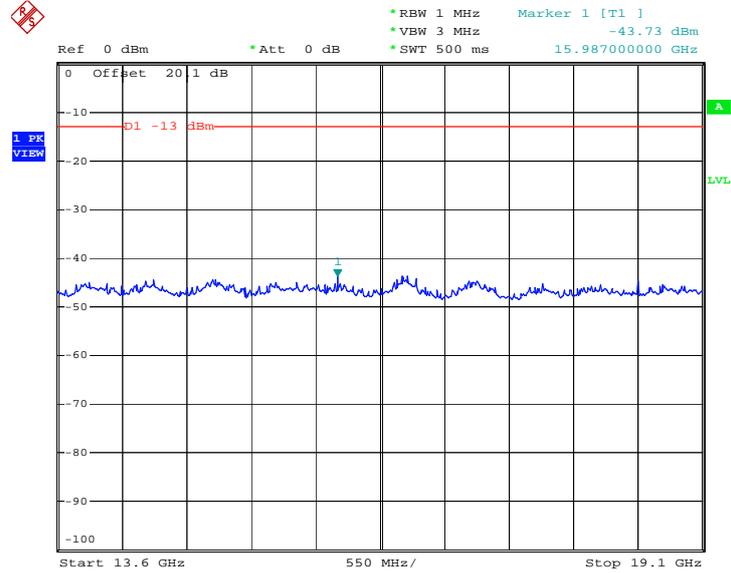
Conducted Emission Plot between 7GHz ~ 13.6GHz



Date: 3.DEC.2012 23:07:55



Conducted Spurious Emission Plot between 13.6GHz ~ 19.1GHz

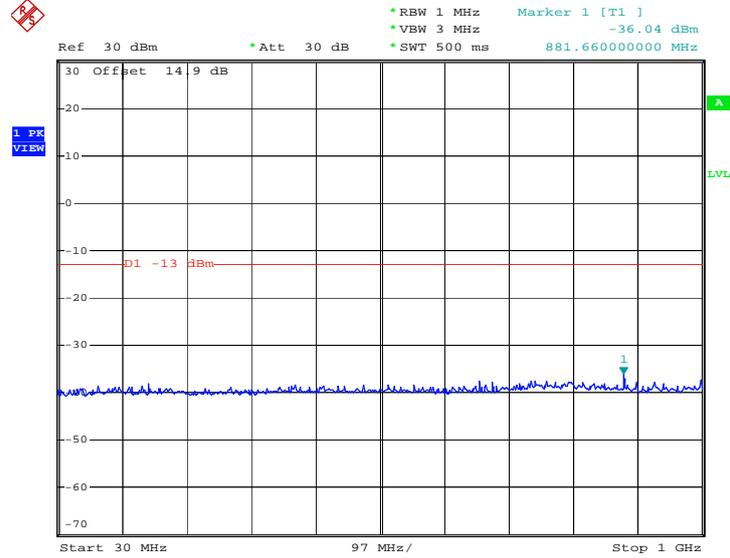


Date: 3.DEC.2012 23:08:47



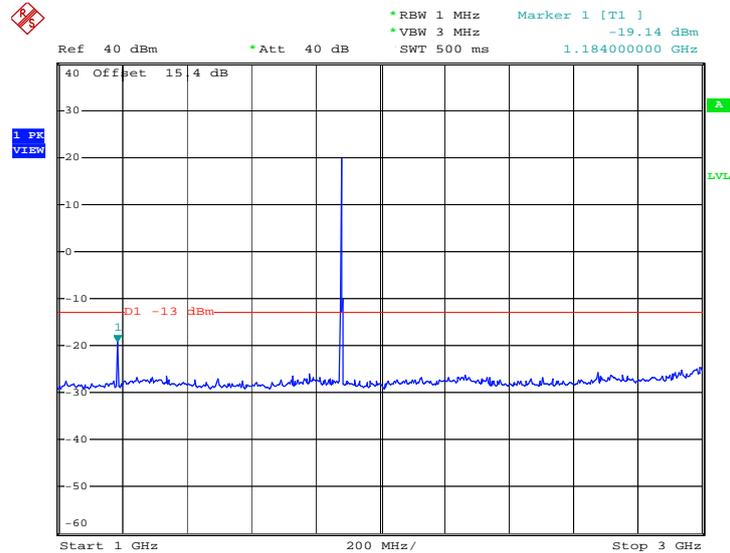
| | | | |
|-------------|-------------|-------------|------------|
| Band : | GSM1900 | Channel : | CH661 |
| Test Mode : | EDGE 8 Link | Frequency : | 1880.0 MHz |

Conducted Spurious Emission Plot between 30MHz ~ 1GHz



Date: 3.DEC.2012 20:34:16

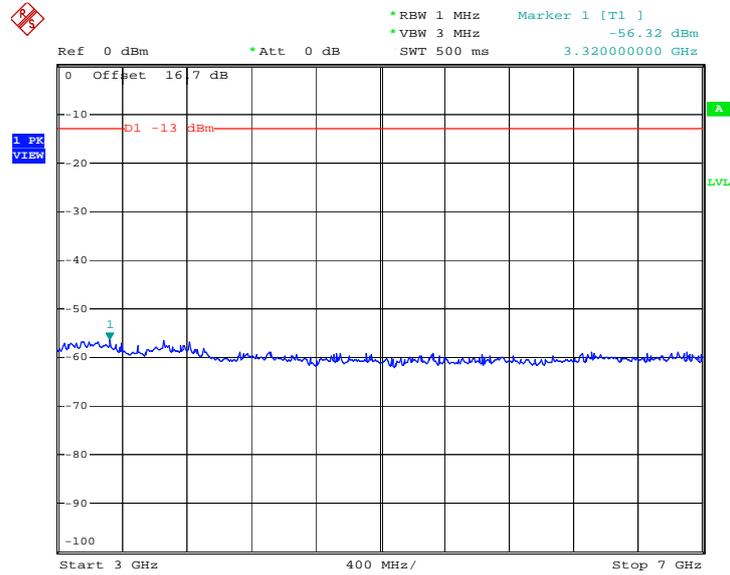
Conducted Spurious Emission Plot between 1GHz ~ 3GHz



Date: 3.DEC.2012 20:35:09

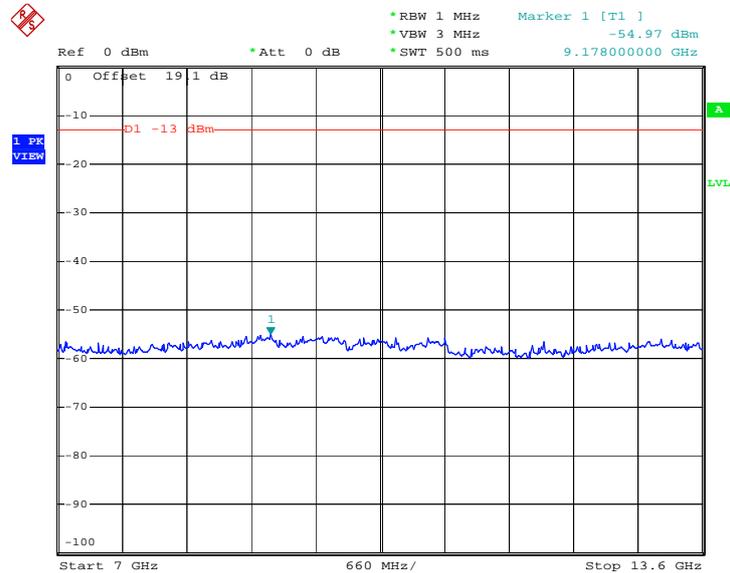


Conducted Spurious Emission Plot between 3GHz ~ 7GHz



Date: 3.DEC.2012 20:35:48

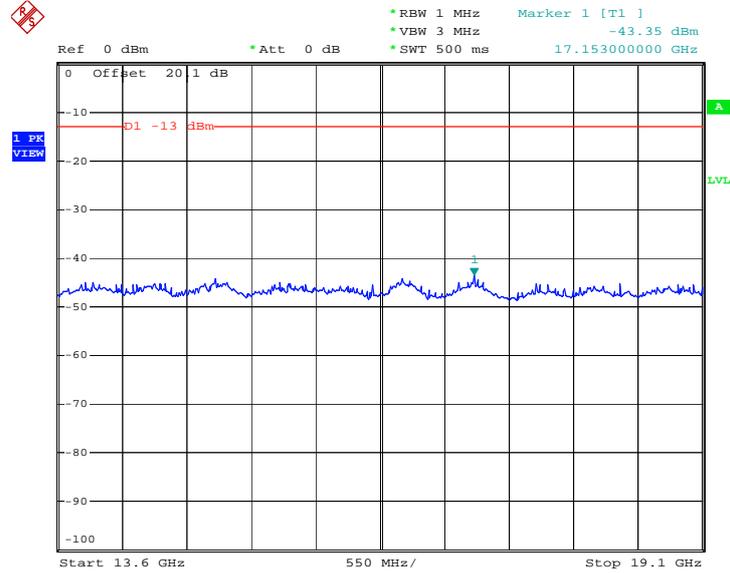
Conducted Spurious Emission Plot between 7GHz ~ 13.6GHz



Date: 3.DEC.2012 20:36:22



Conducted Spurious Emission Plot between 13.6GHz ~ 19.1GHz

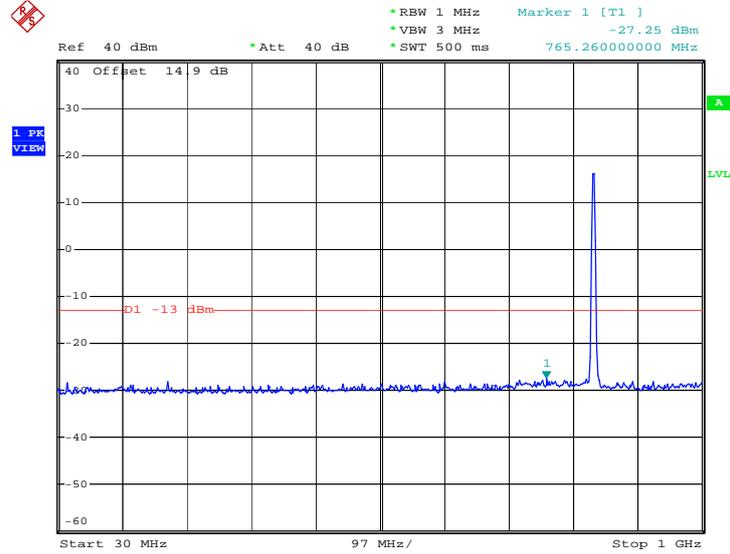


Date: 3.DEC.2012 20:37:06



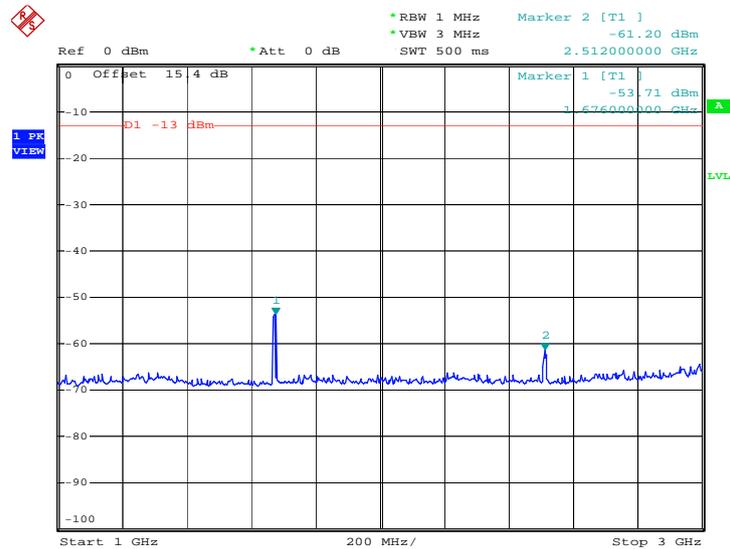
| | | | |
|-------------|-------------------|-------------|-----------|
| Band : | WCDMA Band V | Channel : | CH4182 |
| Test Mode : | RMC 12.2Kbps Link | Frequency : | 836.4 MHz |

Conducted Spurious Emission Plot between 30MHz ~ 1GHz



Date: 3.DEC.2012 21:03:22

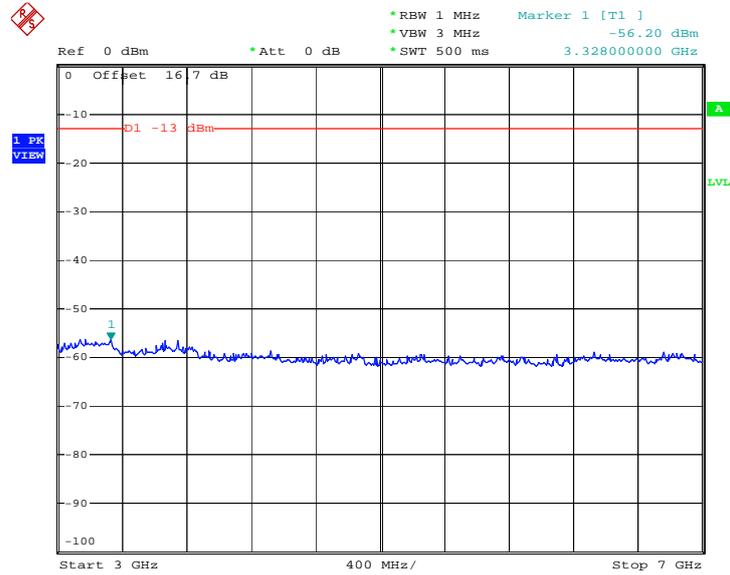
Conducted Spurious Emission Plot between 1GHz ~ 3GHz



Date: 3.DEC.2012 21:05:03

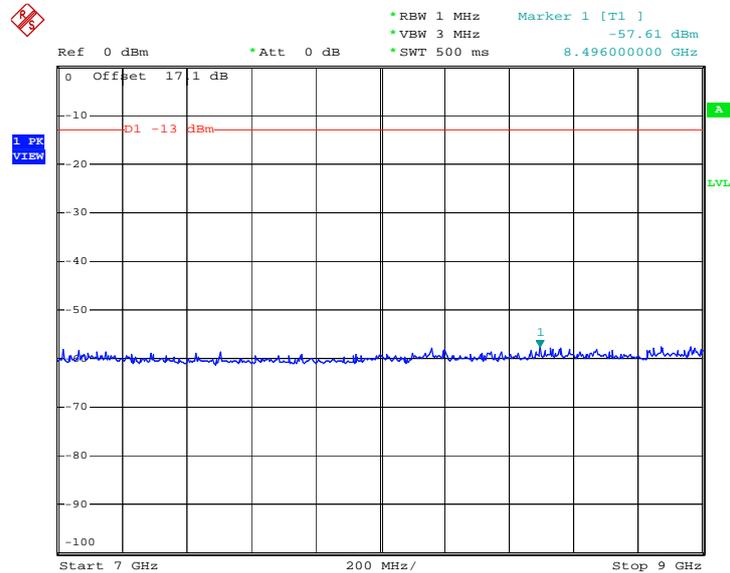


Conducted Spurious Emission Plot between 3GHz ~ 7GHz



Date: 3.DEC.2012 21:05:39

Conducted Spurious Emission Plot between 7GHz ~ 9GHz

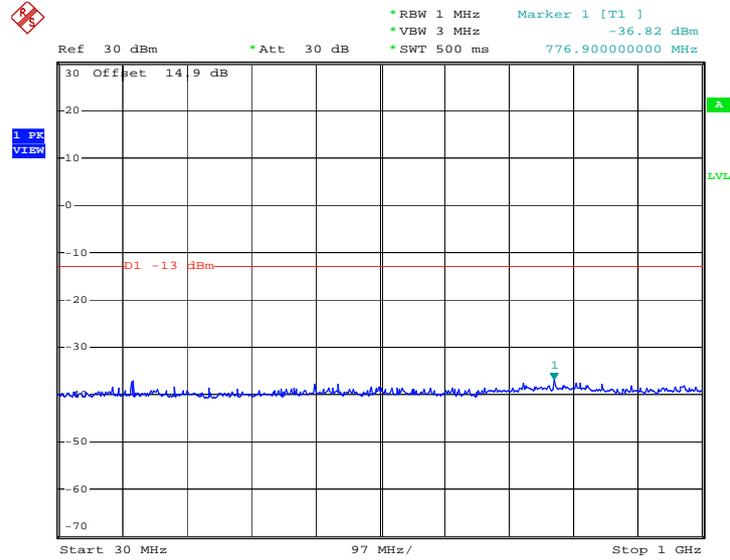


Date: 3.DEC.2012 21:06:08



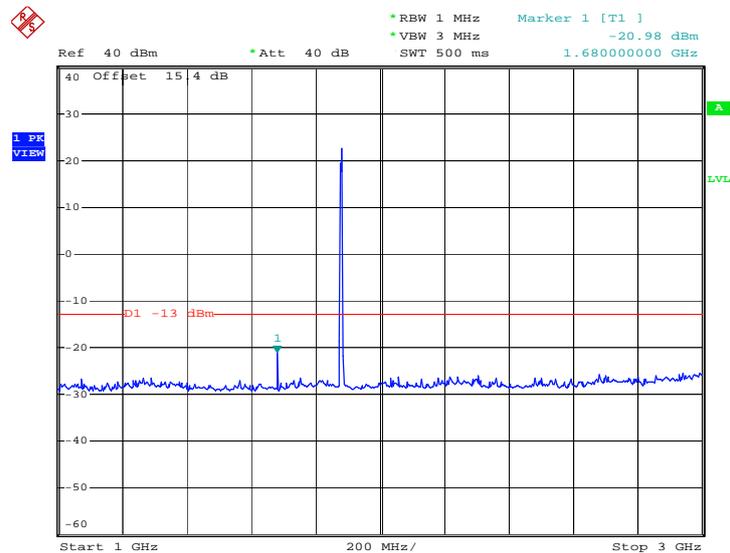
| | | | |
|-------------|-------------------|-------------|------------|
| Band : | WCDMA Band II | Channel : | CH9400 |
| Test Mode : | RMC 12.2Kbps Link | Frequency : | 1880.0 MHz |

Conducted Spurious Emission Plot between 30MHz ~ 1GHz



Date: 3.DEC.2012 21:38:39

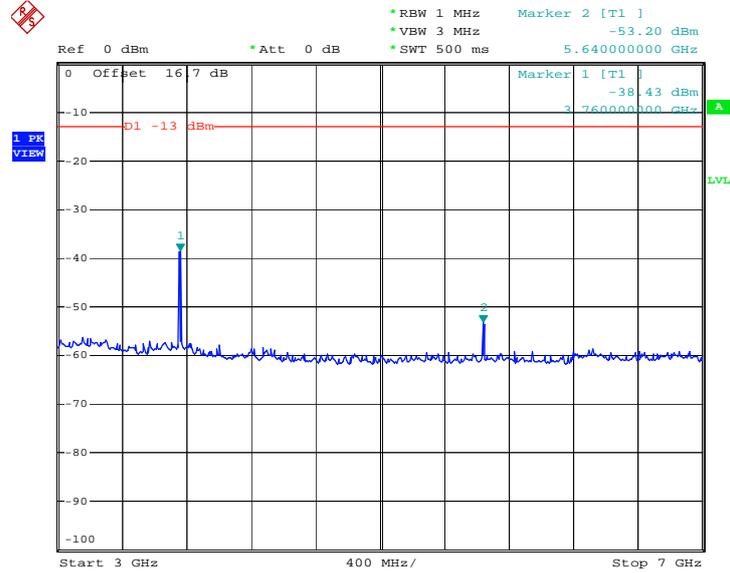
Conducted Spurious Emission Plot between 1GHz ~ 3GHz



Date: 3.DEC.2012 21:39:32

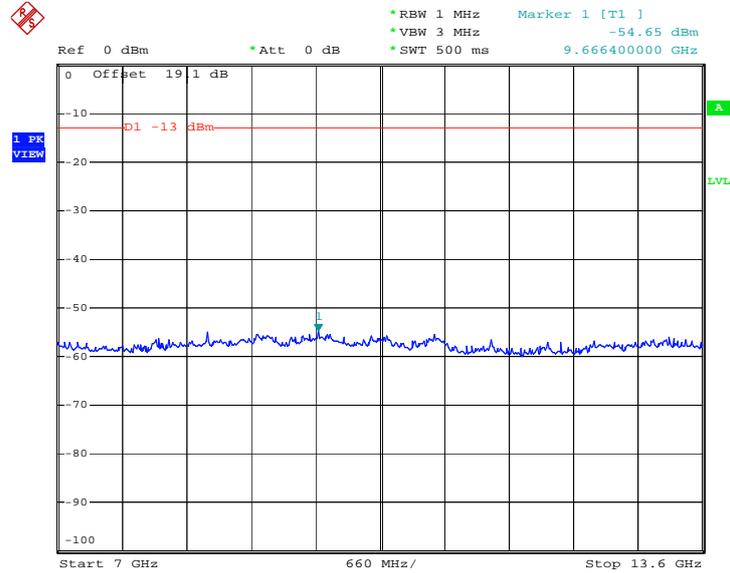


Conducted Spurious Emission Plot between 3GHz ~ 7GHz



Date: 3.DEC.2012 22:10:28

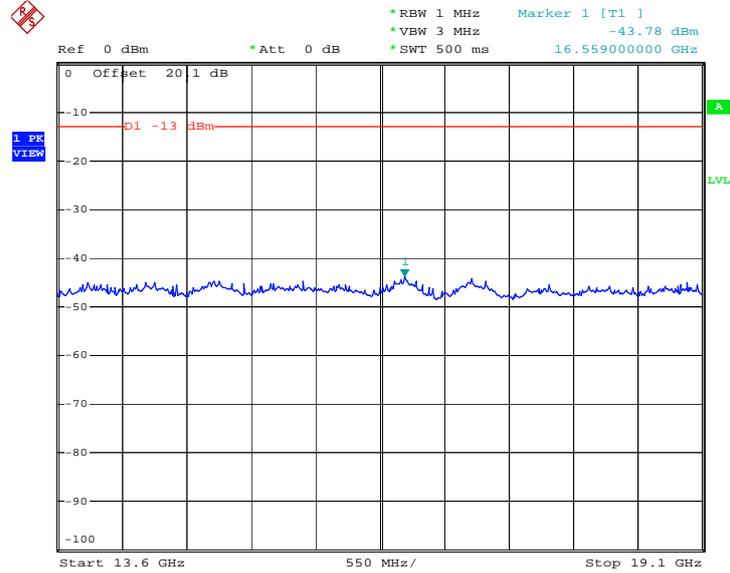
Conducted Spurious Emission Plot between 7GHz ~ 13.6GHz



Date: 3.DEC.2012 21:41:01



Conducted Spurious Emission Plot between 13.6GHz ~ 19.1GHz



Date: 3.DEC.2012 21:41:41

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

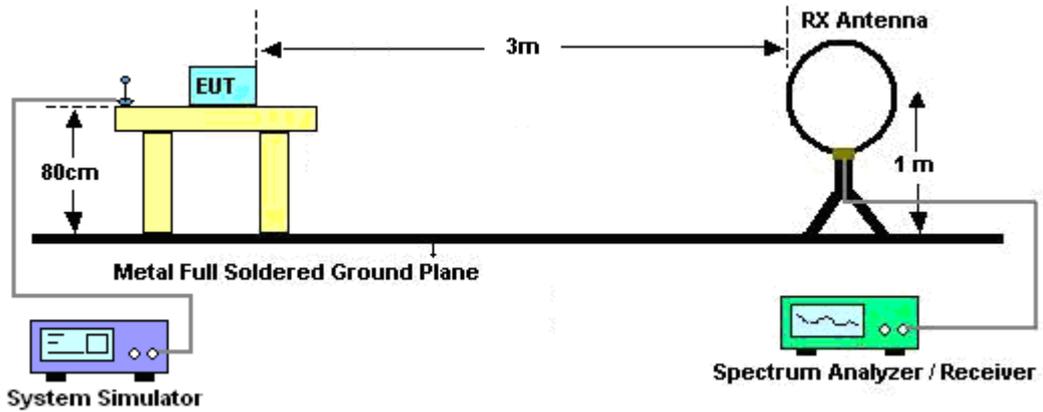
See list of measuring instruments of this test report.

3.7.3 Test Procedures

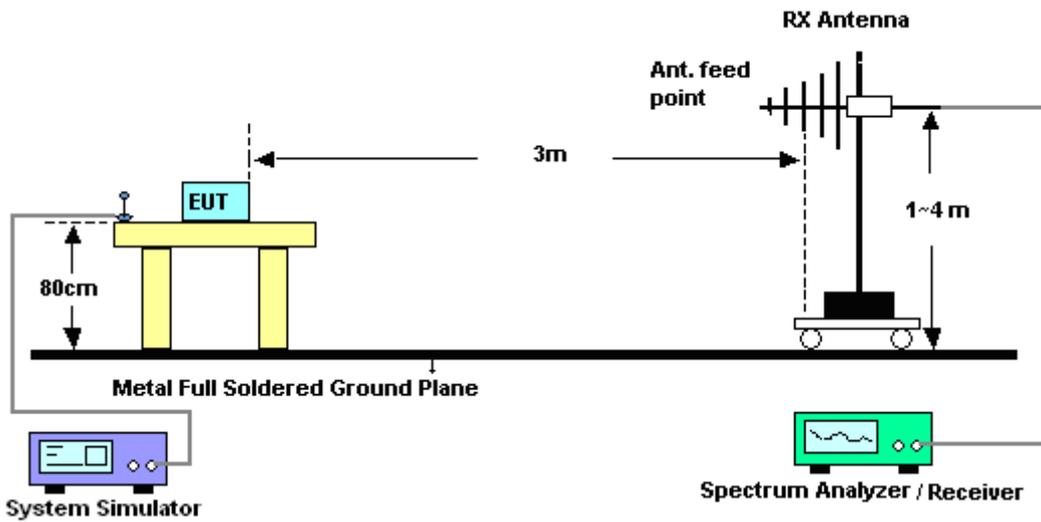
1. The EUT was placed on a rotatable wooden table with 0.8 meter above ground.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving 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. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
11. The limit line is derived from $43 + 10\log(P)$ dB below the transmitter power P(Watts)
= $P(W) - [43 + 10\log(P)]$ (dB)
= $[30 + 10\log(P)]$ (dBm) - $[43 + 10\log(P)]$ (dB)
= -13dBm.
12. $EIRP$ (dBm) = S.G. Power – Tx Cable Loss + Tx Antenna Gain
13. ERP (dBm) = $EIRP - 2.15$

3.7.4 Test Setup

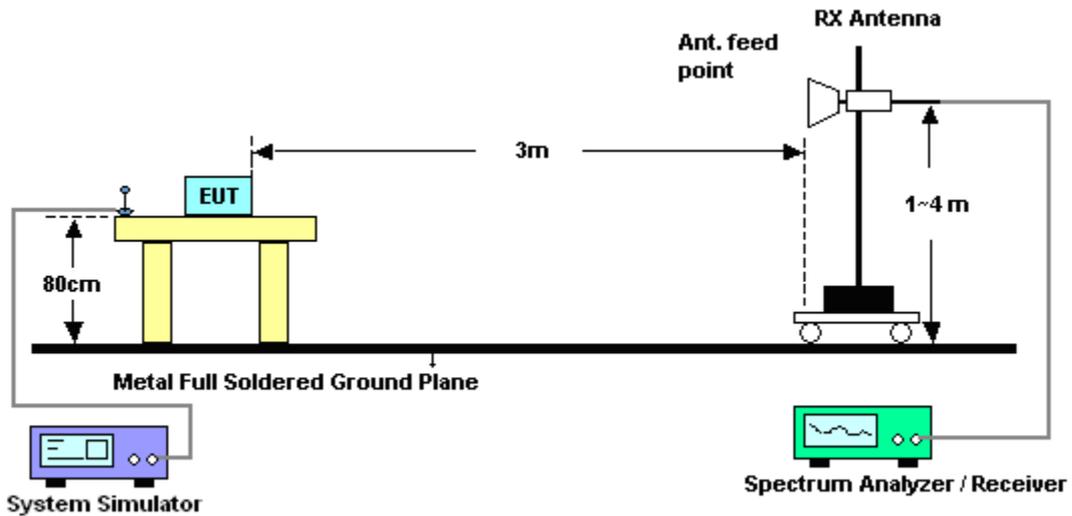
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



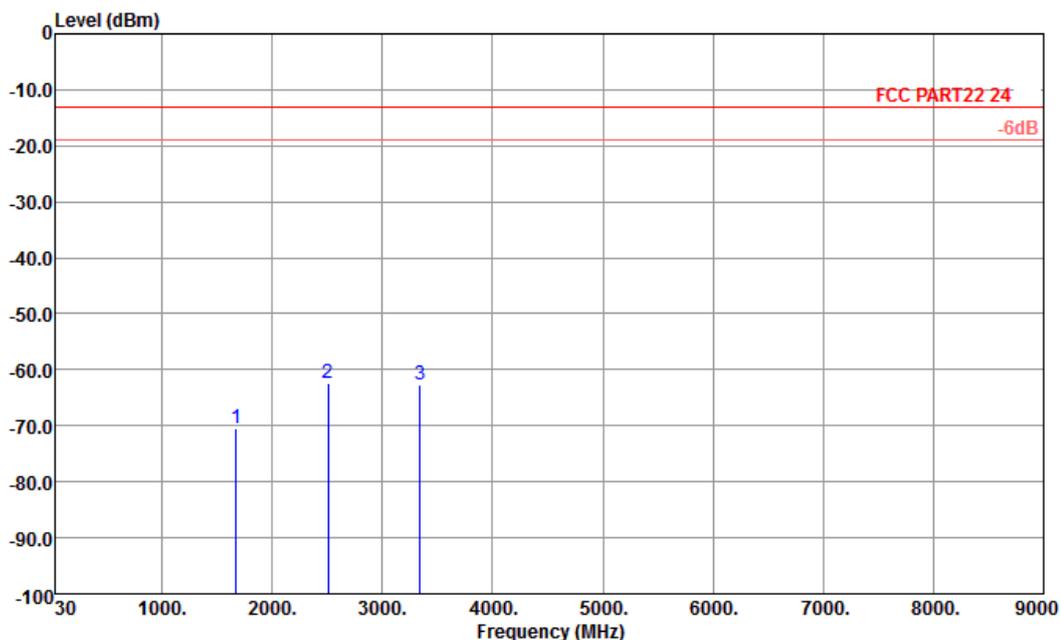
3.7.5 Test Results of Radiated Emissions (9 KHz ~ 30 MHz)

The low frequency, which started from 9 KHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.



3.7.6 Test Result of Field Strength of Spurious Radiated

| | | | |
|------------------------|--|----------------------------|------------|
| Band : | GSM850 | Temperature : | 21~22°C |
| Test Mode : | GPRS 8 Link | Relative Humidity : | 42~43% |
| Test Engineer : | Allen Cheng | Polarization : | Horizontal |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |

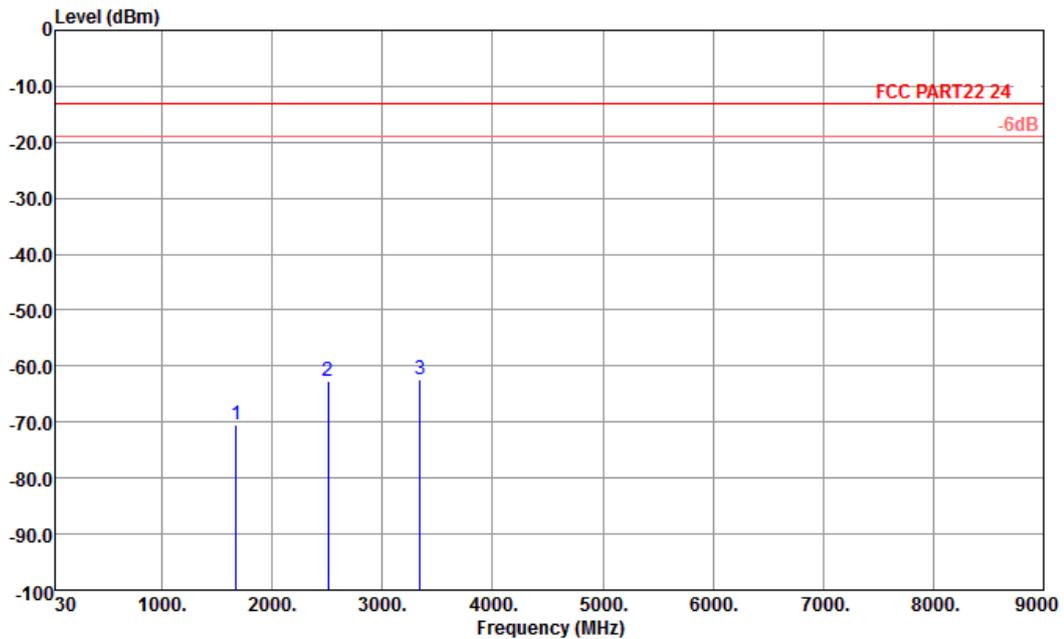


Site : 03CH01-KS
 Condition : FCC PART22 24 HF EIRP FACTOR-09020 HORIZONTAL
 Project : (FG) 2N3001

| 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 | -70.58 | -13 | -57.58 | -66.36 | -71.23 | 0.57 | 3.37 | H | Pass |
| 2509 | -62.52 | -13 | -49.52 | -64.77 | -64.75 | 0.78 | 5.16 | H | Pass |
| 3345 | -62.76 | -13 | -49.76 | -64.70 | -66.40 | 0.87 | 6.66 | H | Pass |



| | | | |
|------------------------|--|----------------------------|----------|
| Band : | GSM850 | Temperature : | 21~22°C |
| Test Mode : | GPRS 8 Link | Relative Humidity : | 42~43% |
| Test Engineer : | Allen Cheng | Polarization : | Vertical |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |

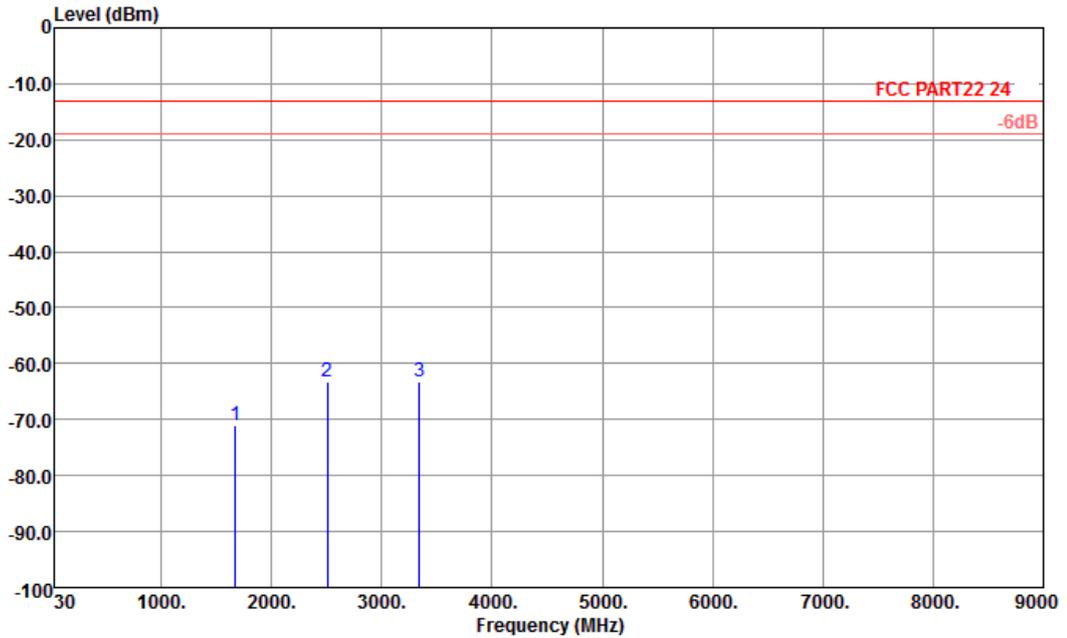


Site : 03CH01-KS
 Condition : FCC PART22 24 HF EIRP FACTOR-09020 VERTICAL
 Project : (FG) 2N3001

| 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 | -70.53 | -13 | -57.53 | -66.18 | -71.18 | 0.57 | 3.37 | V | Pass |
| 2509 | -62.63 | -13 | -49.63 | -65.74 | -64.86 | 0.78 | 5.16 | V | Pass |
| 3345 | -62.28 | -13 | -49.28 | -64.26 | -65.92 | 0.87 | 6.66 | V | Pass |



| | | | |
|------------------------|--|----------------------------|------------|
| Band : | GSM850 | Temperature : | 21~22°C |
| Test Mode : | EDGE 8 Link | Relative Humidity : | 42~43% |
| Test Engineer : | Allen Cheng | Polarization : | Horizontal |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |

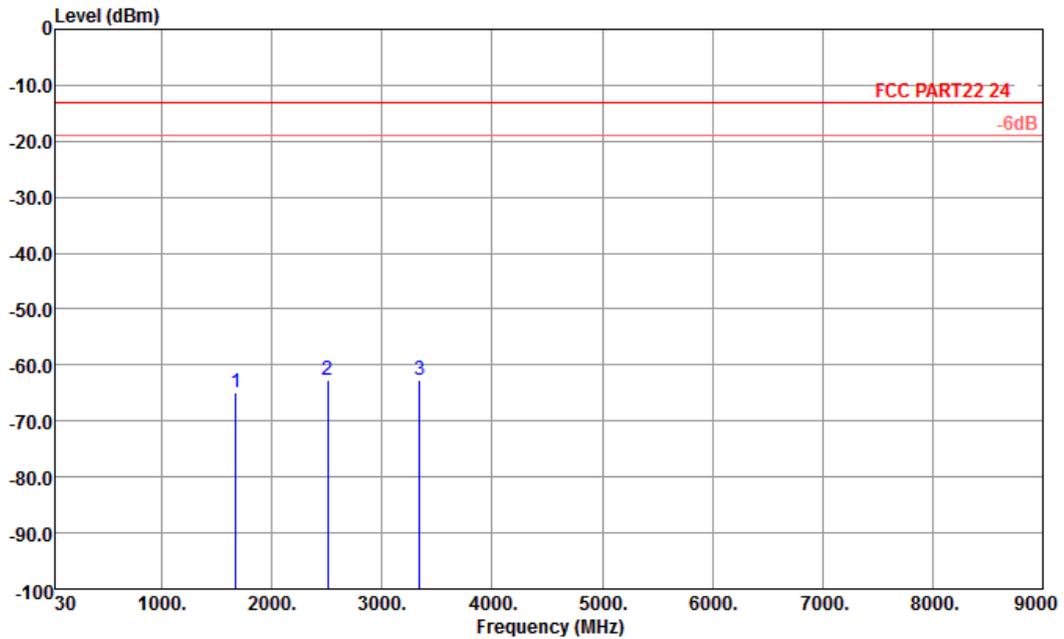


Site : 03CH01-KS
 Condition : FCC PART22 24 HF EIRP FACTOR-09020 HORIZONTAL
 Project : (FG) 2N3001

| 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 | -70.98 | -13 | -57.98 | -66.76 | -71.63 | 0.57 | 3.37 | H | Pass |
| 2509 | -63.23 | -13 | -50.23 | -65.48 | -65.46 | 0.78 | 5.16 | H | Pass |
| 3345 | -63.11 | -13 | -50.11 | -65.05 | -66.75 | 0.87 | 6.66 | H | Pass |



| | | | |
|------------------------|--|----------------------------|----------|
| Band : | GSM850 | Temperature : | 21~22°C |
| Test Mode : | EDGE 8 Link | Relative Humidity : | 42~43% |
| Test Engineer : | Allen Cheng | Polarization : | Vertical |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |

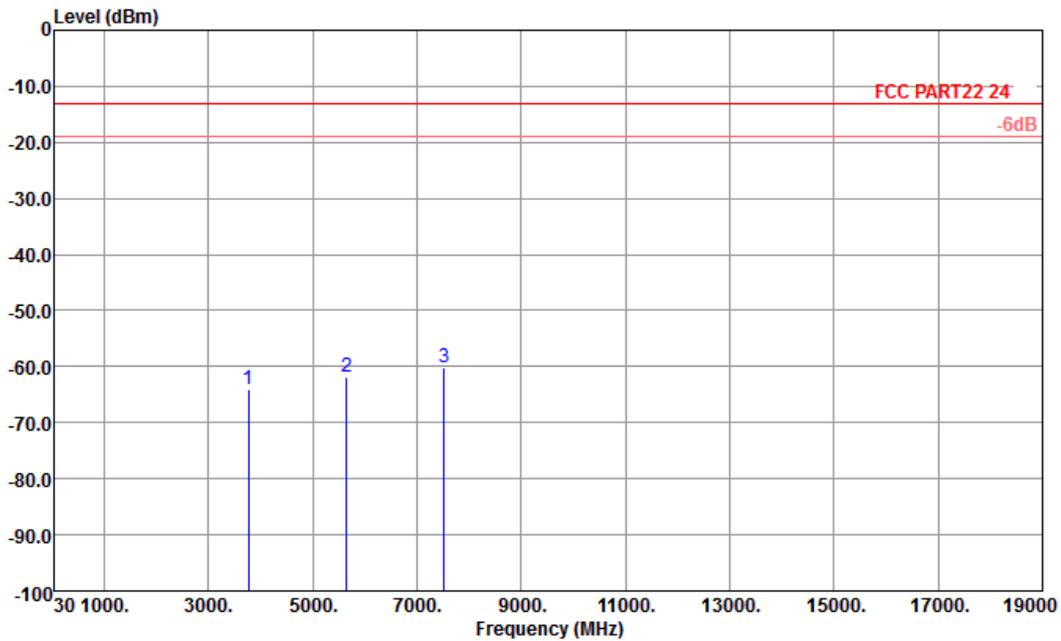


Site : 03CH01-KS
 Condition : FCC PART22 24 HF EIRP FACTOR-09020 VERTICAL
 Project : (FG) 2N3001

| 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 |
|-------------------|-------------|---------------|-------------------|---------------------|--------------------|----------------------|-------------------------|----------------------|--------|
| 1670 | -64.87 | -13 | -51.87 | -60.52 | -65.52 | 0.57 | 3.37 | V | Pass |
| 2509 | -62.76 | -13 | -49.76 | -65.87 | -64.99 | 0.78 | 5.16 | V | Pass |
| 3345 | -62.57 | -13 | -49.57 | -64.55 | -66.21 | 0.87 | 6.66 | V | Pass |



| | | | |
|------------------------|--|----------------------------|------------|
| Band : | GSM1900 | Temperature : | 21~22°C |
| Test Mode : | GPRS 8 Link | Relative Humidity : | 42~43% |
| Test Engineer : | Allen Cheng | Polarization : | Horizontal |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |

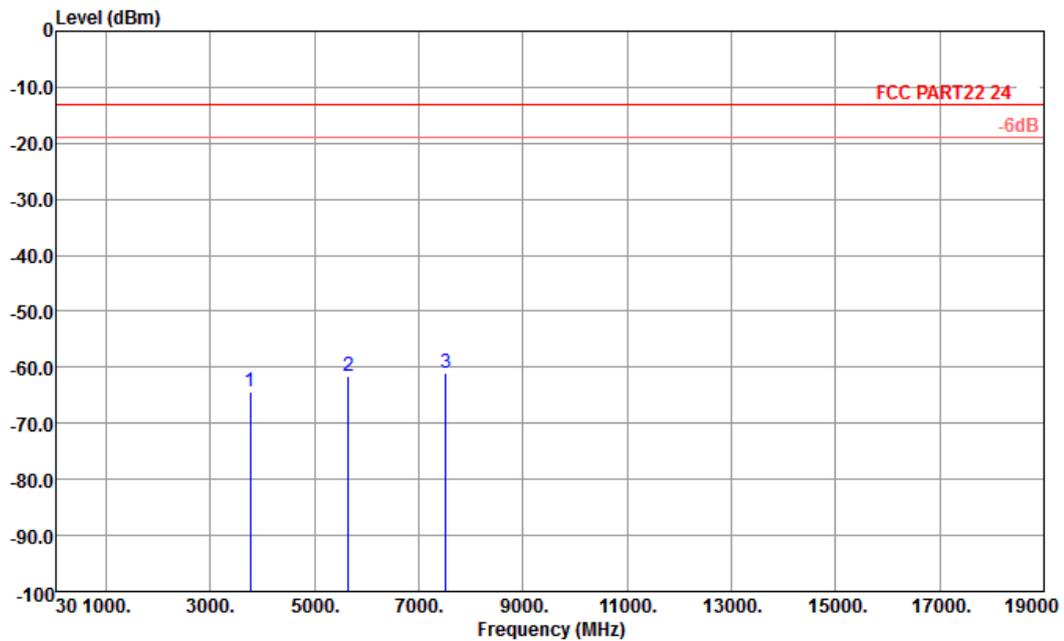


Site : 03CH01-KS
 Condition : FCC PART22 24 HF EIRP FACTOR-09020 HORIZONTAL
 Project : (FG) 2N3001

| 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 | -64.20 | -13 | -51.20 | -65.17 | -70.58 | 0.78 | 7.16 | H | Pass |
| 5640 | -61.71 | -13 | -48.71 | -65.89 | -70.25 | 1.04 | 9.58 | H | Pass |
| 7520 | -60.06 | -13 | -47.06 | -65.19 | -70.17 | 1.35 | 11.46 | H | Pass |



| | | | |
|------------------------|--|----------------------------|----------|
| Band : | GSM1900 | Temperature : | 21~22°C |
| Test Mode : | GPRS 8 Link | Relative Humidity : | 42~43% |
| Test Engineer : | Allen Cheng | Polarization : | Vertical |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |

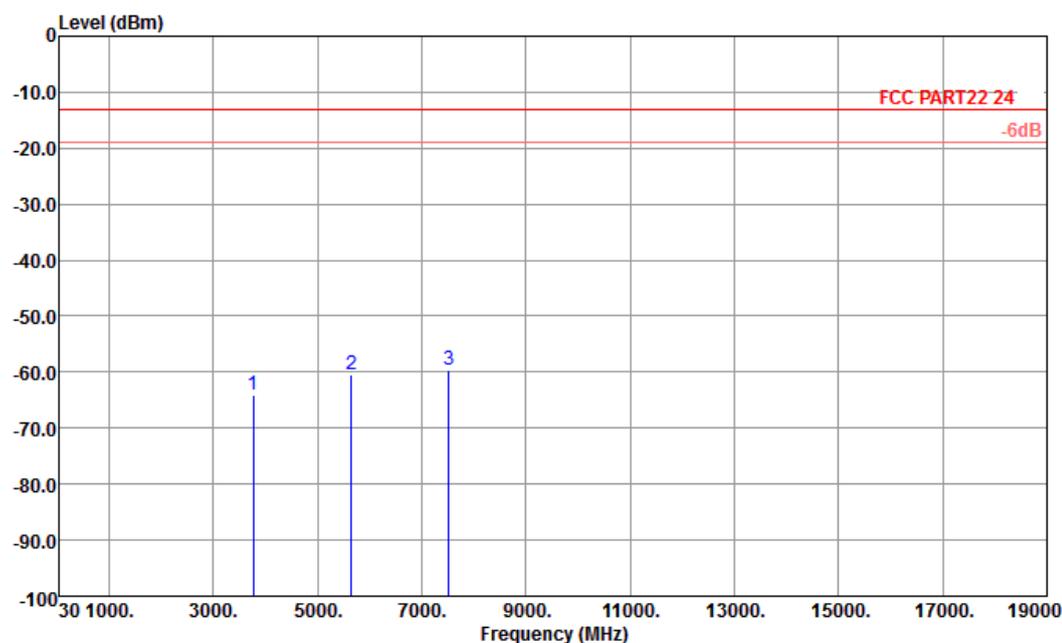


Site : 03CH01-KS
 Condition : FCC PART22 24 HF EIRP FACTOR-09020 VERTICAL
 Project : (FG) 2N3001

| 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 | -64.43 | -13 | -51.43 | -65.8 | -70.81 | 0.78 | 7.16 | V | Pass |
| 5640 | -61.43 | -13 | -48.43 | -64.65 | -69.97 | 1.04 | 9.58 | V | Pass |
| 7520 | -61.13 | -13 | -48.13 | -65.62 | -71.24 | 1.35 | 11.46 | V | Pass |



| | | | |
|------------------------|--|----------------------------|------------|
| Band : | GSM1900 | Temperature : | 21~22°C |
| Test Mode : | EDGE 8 Link | Relative Humidity : | 42~43% |
| Test Engineer : | Allen Cheng | Polarization : | Horizontal |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |

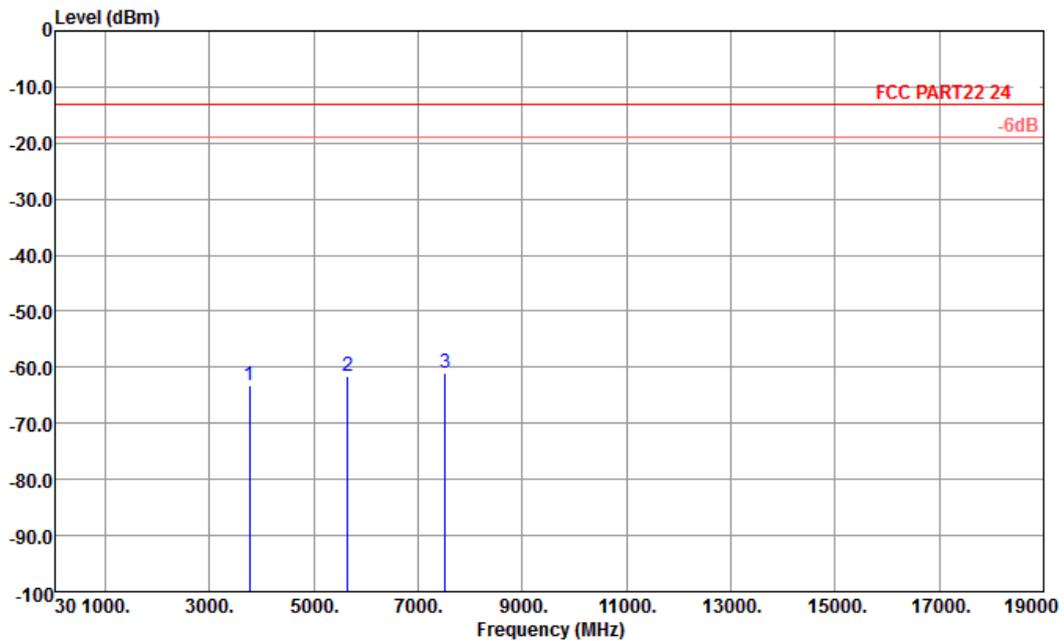


Site : 03CH01-KS
 Condition : FCC PART22 24 HF EIRP FACTOR-09020 HORIZONTAL
 Project : (FG) 2N3001

| 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 | -64.10 | -13 | -51.10 | -65.07 | -70.48 | 0.78 | 7.16 | H | Pass |
| 5640 | -60.48 | -13 | -47.48 | -64.66 | -69.02 | 1.04 | 9.58 | H | Pass |
| 7520 | -59.68 | -13 | -46.68 | -64.81 | -69.79 | 1.35 | 11.46 | H | Pass |



| | | | |
|------------------------|--|----------------------------|----------|
| Band : | GSM1900 | Temperature : | 21~22°C |
| Test Mode : | EDGE 8 Link | Relative Humidity : | 42~43% |
| Test Engineer : | Allen Cheng | Polarization : | Vertical |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |

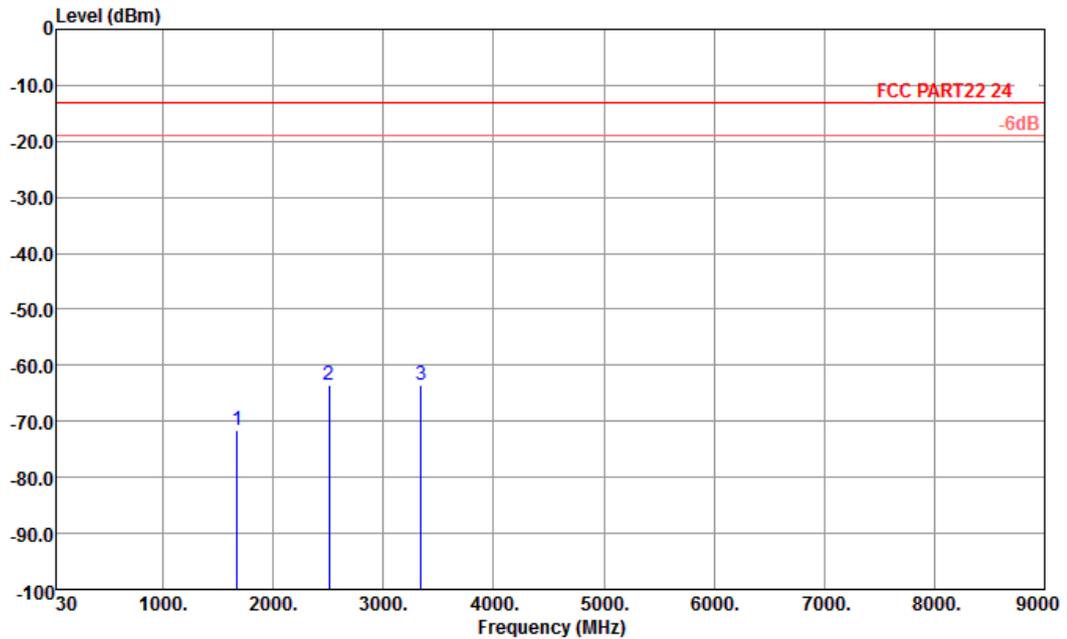


Site : 03CH01-KS
 Condition : FCC PART22 24 HF EIRP FACTOR-09020 VERTICAL
 Project : (FG) 2N3001

| 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 | -63.31 | -13 | -50.31 | -64.68 | -69.69 | 0.78 | 7.16 | V | Pass |
| 5640 | -61.59 | -13 | -48.59 | -64.81 | -70.13 | 1.04 | 9.58 | V | Pass |
| 7520 | -61.10 | -13 | -48.10 | -65.59 | -71.21 | 1.35 | 11.46 | V | Pass |



| | | | |
|------------------------|--|----------------------------|------------|
| Band : | WCDMA Band V | Temperature : | 21~22°C |
| Test Mode : | RMC 12.2Kbps Link | Relative Humidity : | 42~43% |
| Test Engineer : | Allen Cheng | Polarization : | Horizontal |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |

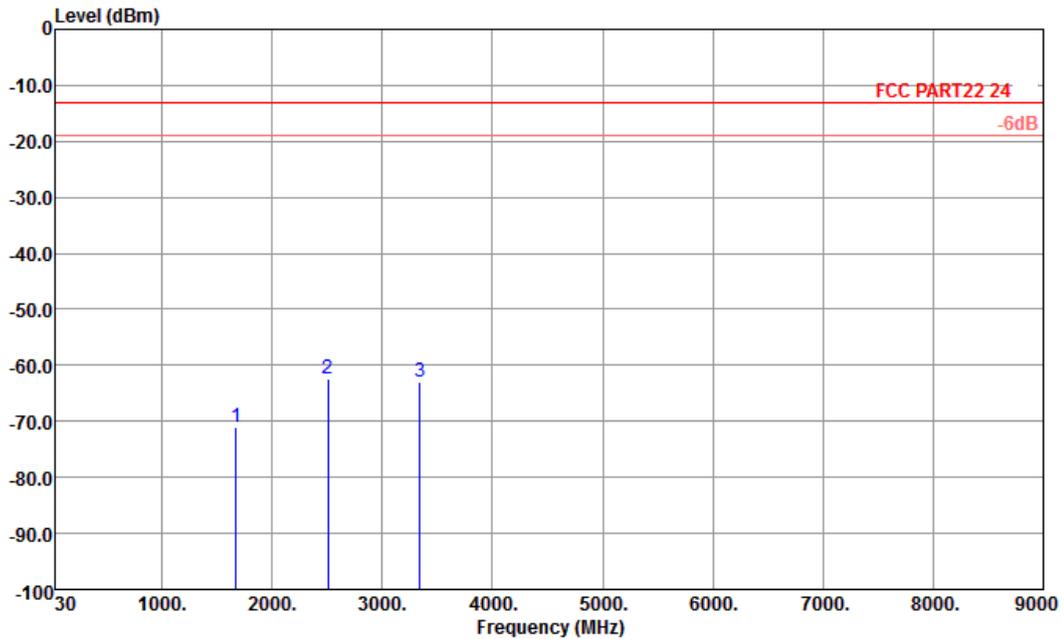


Site : 03CH01-KS
 Condition : FCC PART22 24 HF EIRP FACTOR-09020 HORIZONTAL
 Project : (FG) 2N3001

| 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 | -71.67 | -13 | -58.67 | -67.45 | -72.32 | 0.57 | 3.37 | H | Pass |
| 2509 | -63.40 | -13 | -50.40 | -65.65 | -65.63 | 0.78 | 5.16 | H | Pass |
| 3345 | -63.39 | -13 | -50.39 | -65.33 | -67.03 | 0.87 | 6.66 | H | Pass |



| | | | |
|------------------------|--|----------------------------|----------|
| Band : | WCDMA Band V | Temperature : | 21~22°C |
| Test Mode : | RMC 12.2Kbps Link | Relative Humidity : | 42~43% |
| Test Engineer : | Allen Cheng | Polarization : | Vertical |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |

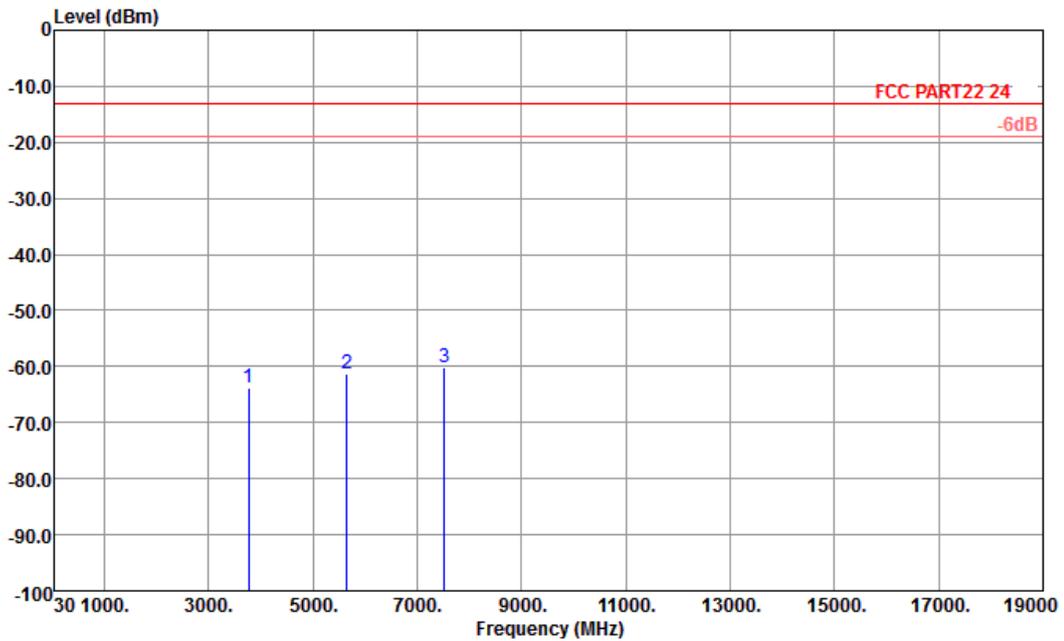


Site : 03CH01-KS
 Condition : FCC PART22 24 HF EIRP FACTOR-09020 VERTICAL
 Project : (FG) 2N3001

| 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 | -70.92 | -13 | -57.92 | -66.57 | -71.57 | 0.57 | 3.37 | V | Pass |
| 2509 | -62.52 | -13 | -49.52 | -65.63 | -64.75 | 0.78 | 5.16 | V | Pass |
| 3345 | -63.02 | -13 | -50.02 | -65.00 | -66.66 | 0.87 | 6.66 | V | Pass |



| | | | |
|------------------------|--|----------------------------|------------|
| Band : | WCDMA Band II | Temperature : | 21~22°C |
| Test Mode : | RMC 12.2Kbps Link | Relative Humidity : | 42~43% |
| Test Engineer : | Allen Cheng | Polarization : | Horizontal |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |

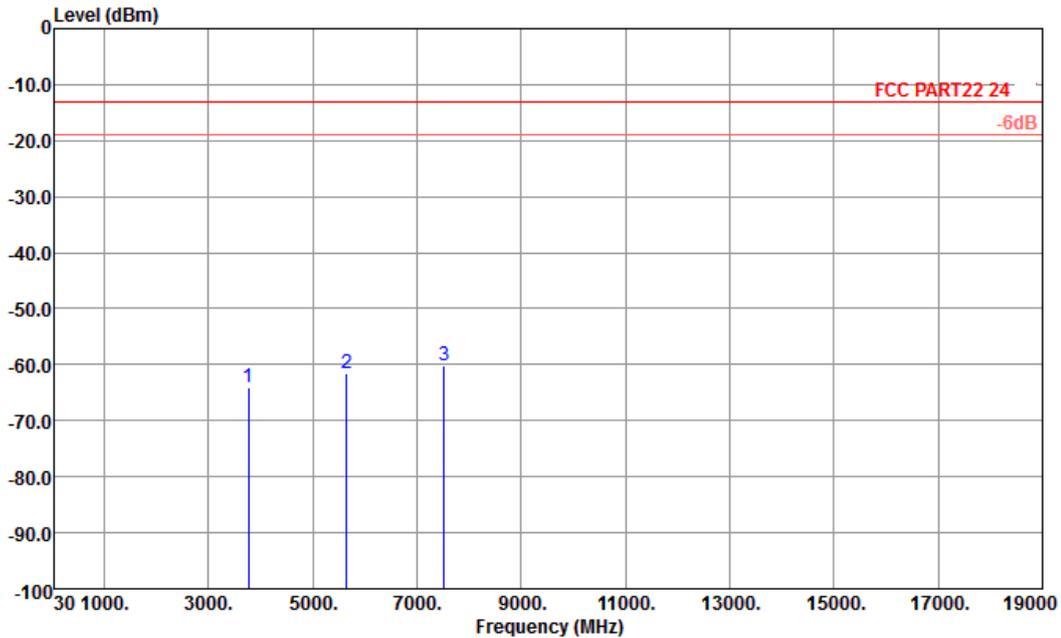


Site : 03CH01-KS
 Condition : FCC PART22 24 HF EIRP FACTOR-09020 HORIZONTAL
 Project : (FG) 2N3001

| 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 | -63.91 | -13 | -50.91 | -64.88 | -70.29 | 0.78 | 7.16 | H | Pass |
| 5640 | -61.20 | -13 | -48.20 | -65.38 | -69.74 | 1.04 | 9.58 | H | Pass |
| 7520 | -60.06 | -13 | -47.06 | -65.19 | -70.17 | 1.35 | 11.46 | H | Pass |



| | | | |
|------------------------|--|----------------------------|----------|
| Band : | WCDMA Band II | Temperature : | 21~22°C |
| Test Mode : | RMC 12.2Kbps Link | Relative Humidity : | 42~43% |
| Test Engineer : | Allen Cheng | Polarization : | Vertical |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |



Site : 03CH01-KS
 Condition : FCC PART22 24 HF EIRP FACTOR-09020 VERTICAL
 Project : (FG) 2N3001

| 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 | -64.20 | -13 | -51.20 | -65.57 | -70.58 | 0.78 | 7.16 | V | Pass |
| 5640 | -61.68 | -13 | -48.68 | -64.9 | -70.22 | 1.04 | 9.58 | V | Pass |
| 7520 | -60.12 | -13 | -47.12 | -64.61 | -70.23 | 1.35 | 11.46 | 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.

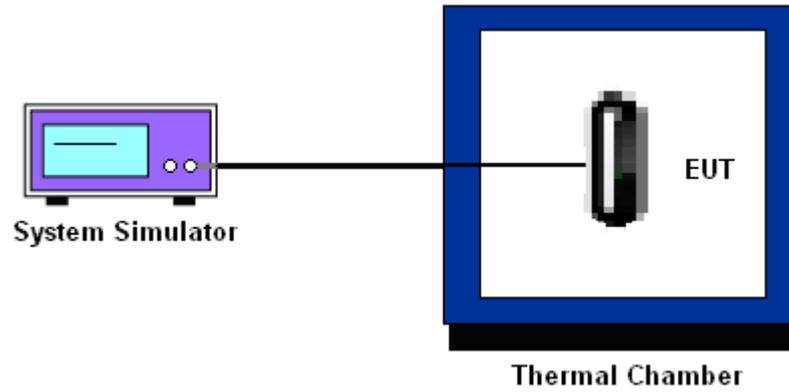
3.8.3 Test Procedures for Temperature Variation

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.
4. If the EUT cannot be turned on at -30°C , the testing lowest temperature will be raised in 10°C step until the EUT can be turned on.

3.8.4 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 8 | | EDGE 8 | | Result |
|------------------|-----------------|-----------------|-----------------|-----------------|--------|
| | Freq. Dev. (Hz) | Deviation (ppm) | Freq. Dev. (Hz) | Deviation (ppm) | |
| -30 | 41 | 0.05 | 36 | 0.04 | PASS |
| -20 | 43 | 0.05 | 32 | 0.04 | |
| -10 | 20 | 0.02 | 29 | 0.03 | |
| 0 | 40 | 0.05 | 26 | 0.03 | |
| 10 | 34 | 0.04 | -30 | -0.04 | |
| 20 | 32 | 0.04 | -29 | -0.03 | |
| 30 | 29 | 0.03 | -31 | -0.04 | |
| 40 | 38 | 0.04 | 27 | 0.03 | |
| 50 | -46 | -0.05 | 33 | 0.04 | |
| 55 | -50 | -0.06 | 30 | 0.04 | |

Note: The manufacturer declared that the EUT could work properly at temperature 55°C.

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

| Temperature (°C) | GPRS 8 | | EDGE 8 | | Result |
|------------------|-----------------|-----------------|-----------------|-----------------|--------|
| | Freq. Dev. (Hz) | Deviation (ppm) | Freq. Dev. (Hz) | Deviation (ppm) | |
| -30 | -49 | -0.03 | -56 | -0.03 | PASS |
| -20 | 60 | 0.03 | -49 | -0.03 | |
| -10 | 72 | 0.04 | -51 | -0.03 | |
| 0 | 85 | 0.04 | 43 | 0.02 | |
| 10 | 61 | 0.03 | 40 | 0.02 | |
| 20 | -46 | -0.02 | 39 | 0.02 | |
| 30 | -53 | -0.03 | 46 | 0.02 | |
| 40 | -78 | -0.04 | 49 | 0.03 | |
| 50 | -66 | -0.03 | 45 | 0.02 | |
| 55 | -51 | -0.03 | 53 | 0.03 | |

Note: The manufacturer declared that the EUT could work properly at temperature 55°C.



| | | | |
|---------------|--------------|-------------|-----------|
| 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 | 18 | 0.02 | PASS |
| -20 | -16 | -0.02 | |
| -10 | 15 | 0.02 | |
| 0 | 16 | 0.02 | |
| 10 | -9 | -0.01 | |
| 20 | -7 | -0.01 | |
| 30 | 6 | 0.01 | |
| 40 | 13 | 0.02 | |
| 50 | 14 | 0.02 | |
| 55 | 17 | 0.02 | |

Note: The manufacturer declared that the EUT could work properly at temperature 55°C.

| | | | |
|---------------|---------------|-------------|------------|
| Band : | WCDMA Band II | Channel : | 9400 |
| Limit (ppm) : | 2.5 | Frequency : | 1880.0 MHz |

| Temperature (°C) | RMC 12.2Kbps | | Result |
|------------------|-----------------|-----------------|--------|
| | Freq. Dev. (Hz) | Deviation (ppm) | |
| -30 | 25 | 0.01 | PASS |
| -20 | -24 | -0.01 | |
| -10 | 23 | 0.01 | |
| 0 | 22 | 0.01 | |
| 10 | 19 | 0.01 | |
| 20 | -18 | -0.01 | |
| 30 | 25 | 0.01 | |
| 40 | 27 | 0.01 | |
| 50 | -32 | -0.02 | |
| 55 | -29 | -0.02 | |

Note: The manufacturer declared that the EUT could work properly at temperature 55°C.



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 8 | 5 | 38 | 0.04 | 2.5 | PASS |
| | | 4.8 | 43 | 0.05 | | |
| | | 5.2 | 49 | 0.06 | | |
| | EDGE 8 | 5 | 22 | 0.03 | | |
| | | 4.8 | 26 | 0.03 | | |
| | | 5.2 | 21 | 0.02 | | |
| GSM 1900 CH661 | GPRS 8 | 5 | 76 | 0.04 | | |
| | | 4.8 | 73 | 0.04 | | |
| | | 5.2 | 69 | 0.04 | | |
| | EDGE 8 | 5 | 49 | 0.03 | | |
| | | 4.8 | 46 | 0.02 | | |
| | | 5.2 | 43 | 0.02 | | |
| WCDMA Band V CH4182 | RMC 12.2Kbps | 5 | -13 | -0.02 | | |
| | | 4.8 | -12 | -0.01 | | |
| | | 5.2 | -20 | -0.02 | | |
| WCDMA Band II CH9400 | RMC 12.2Kbps | 5 | -22 | -0.01 | | |
| | | 4.8 | -25 | -0.01 | | |
| | | 5.2 | -30 | -0.02 | | |

Note: Normal Voltage = 5.0V.



4 List of Measuring Equipment

| Instrument | Manufacturer | Model No. | Serial No. | Characteristics | Calibration Date | Test Date | Due Date | Remark |
|---------------------------|--------------|-----------|------------|-----------------|------------------|-----------------------------|---------------|-----------------------|
| Spectrum Analyzer | R&S | FSP40 | 100319 | 9kHz~40GHz | Nov. 29, 2012 | Dec. 03, 2012~Jan. 31, 2013 | Nov. 28, 2013 | Conducted (TH01-KS) |
| System Simulator | R&S | CMU200 | 837587/066 | 2G Full-Band | Nov. 29, 2012 | Dec. 03, 2012~Jan. 31, 2013 | Nov. 28, 2013 | Conducted (TH01-KS) |
| DC Power Supply | GWINSTEK | GPS-3030D | E1884515 | N/A | Aug. 22, 2012 | Dec. 03, 2012~Jan. 31, 2013 | Aug. 21, 2013 | Conducted (TH01-KS) |
| Thermal Chamber | Ten Billion | TTC-B3S | TBN-960502 | N/A | Nov. 29, 2012 | Dec. 03, 2012~Jan. 31, 2013 | Nov. 28, 2013 | Conducted (TH01-KS) |
| EMI Test Receiver | R&S | ESCI | 100534 | 9kHz~3GHz | Nov. 08, 2012 | Dec. 05, 2012 | Nov. 07, 2013 | Radiation (03CH01-KS) |
| Spectrum Analyzer | R&S | FSP30 | 100400 | 9kHz~30GHz | Jun. 01, 2012 | Dec. 05, 2012 | May 31, 2013 | Radiation (03CH01-KS) |
| Bilog Antenna | SCHAFFNER | CBL6112D | 23182 | 25MHz~2GHz | Dec. 08, 2011 | Dec. 05, 2012 | Dec. 07, 2012 | Radiation (03CH01-KS) |
| Double Ridge Horn Antenna | EMCO | 3117 | 00075959 | 1GHz~18GHz | Jan. 07, 2012 | Dec. 05, 2012 | Jan. 06, 2013 | Radiation (03CH01-KS) |
| Amplifier | com-power | PA-103A | 161069 | 1MHz~1GHz | Jun. 01, 2012 | Dec. 05, 2012 | May 31, 2013 | Radiation (03CH01-KS) |
| Amplifier | Agilent | 8449B | 3008A02370 | 1GHz~26.5GHz | Dec. 30, 2011 | Dec. 05, 2012 | Dec. 29, 2012 | Radiation (03CH01-KS) |
| SHF-EHF Horn | Schwarzbeck | BBHA 9170 | 9170249 | 15GHz~40GHz | Nov. 23, 2012 | Dec. 05, 2012 | Nov. 22, 2013 | Radiation (03CH01-KS) |
| Loop Antenna | R&S | HFH2-Z2 | 860004/001 | 9KHz ~ 30MHz | Jul. 03, 2012 | Dec. 05, 2012 | Jul. 02, 2014 | Radiation (03CH01-KS) |
| Signal Generator | R&S | SMR40 | 100455 | 10MHz-40GHz | Dec. 30, 2011 | Dec. 05, 2012 | Dec. 29, 2012 | Radiation (03CH01-KS) |
| System Simulator | R&S | CMU200 | 116456 | Full-Band | Sep. 19, 2012 | Dec. 05, 2012 | Sep. 18, 2013 | Radiation (03CH01-KS) |



5 Uncertainty of Evaluation

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

| | |
|---|------|
| Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y)) | 2.54 |
|---|------|

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

| | |
|---|------|
| Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y)) | 4.72 |
|---|------|



Appendix A. Photographs of EUT

Please refer to Sporton report number EP2N3001 as below.