



FCC RF Test Report

APPLICANT : Acer Incorporated
EQUIPMENT : Smart HandHeld
BRAND NAME : Acer
MODEL NAME : E330
FCC ID : HLZDME330NFCCE
STANDARD : FCC 47 CFR Part 2, 24(E)
CLASSIFICATION : PCS Licensed Transmitter Held to Ear (PCE)
Tx/Rx FREQUENCY RANGE : GSM1900 : 1850.2 ~ 1909.8 MHz /
1930.2 ~ 1989.8 MHz
MAX. ERP/EIRP POWER : GSM1900 (GSM) : 1.0116 W
GSM1900 (EDGE 8) : 0.4375 W

The product was received on Apr. 20, 2012 and completely tested on May 03, 2012. We, SPORTON INTERNATIONAL 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 INC., the test report shall not be reproduced except in full.

Reviewed by:

Jones Tsai / Manager



SPORTON INTERNATIONAL INC.
No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.



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APPENDIX A. PHOTOGRAPHS OF EUT

APPENDIX B. SETUP PHOTOGRAPHS



REVISION HISTORY



SUMMARY OF TEST RESULT

| Report Section | FCC Rule | IC Rule | Description | Limit | Result | Remark |
|----------------|-----------------------|----------------------------------|---|-------------------------------------|--------|--|
| 3.1 | §2.1046 | N/A | Conducted Output Power | N/A | PASS | - |
| 3.2 | §24.232(c) | RSS-133 (6.4) SRSP-510(5.1.2) | Equivalent Isotropic Radiated Power | < 2 Watts | PASS | - |
| 3.3 | §2.1049 §24.238(a) | N/A | Occupied Bandwidth | N/A | PASS | - |
| 3.4 | §2.1051 §24.238(a) | RSS-133 (6.5.1) | Band Edge Measurement | < $43+10\log_{10}(P[\text{Watts}])$ | PASS | - |
| 3.5 | §2.1051 §24.238(a) | RSS-133 (6.5.1) | Conducted Emission | < $43+10\log_{10}(P[\text{Watts}])$ | PASS | - |
| 3.6 | §2.1053 §24.238(a) | RSS-133 (6.5.1) | Field Strength of Spurious Radiation | < $43+10\log_{10}(P[\text{Watts}])$ | PASS | Under limit 12.76 dB at 13160.000 MHz |
| 3.7 | §2.1055 §24.235 | RSS-133(6.3) | Frequency Stability for Temperature & Voltage | < 2.5 ppm | PASS | - |



1 General Description

1.1 Applicant

Acer Incorporated

8F., No.88, Sec. 1, Xintai 5th Rd., Xizhi Dist., New Taipei City 22181, Taiwan (R.O.C)

1.2 Manufacturer

Qisda (Suzhou) Co., Ltd.

No. 169, Zhujiang Road, New District, Suzhou, China

1.3 Feature of Equipment Under Test

| Product Feature & Specification | |
|--|--|
| Equipment | Smart HandHeld |
| Brand Name | Acer |
| Model Name | E330 |
| FCC ID | HLZDME330NFCCE |
| Tx Frequency | 1850 MHz ~ 1910 MHz |
| Rx Frequency | 1930 MHz ~ 1990 MHz |
| Maximum Output Power to Antenna | 29.43 dBm |
| Antenna Type | PIFA Antenna |
| Type of Modulation | GSM: GMSK GPRS: GMSK EDGE: GMSK / 8PSK |
| 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 Emission Designator and Maximum ERP/EIRP Power

| FCC Rule | System | Type of Modulation | Emission Designator | Maximum ERP/EIRP |
|----------|----------------|--------------------|---------------------|------------------|
| Part 24 | GSM1900 GSM | GMSK | 248KGXW | 1.0116 W |
| Part 24 | GSM1900 EDGE 8 | GMSK / 8PSK | 252KG7W | 0.4375 W |

1.5 Testing Site

| | | | |
|--------------------|--|-----------|-------------------------|
| Test Site | SPORTON INTERNATIONAL INC. | | |
| Test Site Location | No. 52, Hwa Ya 1 st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL: +886-3-327-3456 FAX: +886-3-328-4978 | | |
| Test Site No. | Sporton Site No. | | FCC/IC Registration No. |
| | TH02-HY | 03CH06-HY | 722060/4086B-1 |

1.6 Applied Standards

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

- FCC 47 CFR Part 2, 24(E)
- ANSI / TIA / EIA-603-C-2004
- FCC KDB 971168 D01 Power Meas. License Digital Systems v01
- IC RSS-133 Issue 5

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.

1.7 Ancillary Equipment List

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



2 Test Configuration of Equipment Under Test

2.1 Test Mode

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

Frequency range investigated for radiated emission is as follows:

1. 30 MHz to 19000 MHz for GSM1900.

| Test Modes | | |
|------------|-----------------------------|-----------------------------|
| Band | Radiated TCs | Conducted TCs |
| GSM 1900 | ■ GSM Link ■ EDGE 8 Link | ■ GSM Link ■ EDGE 8 Link |

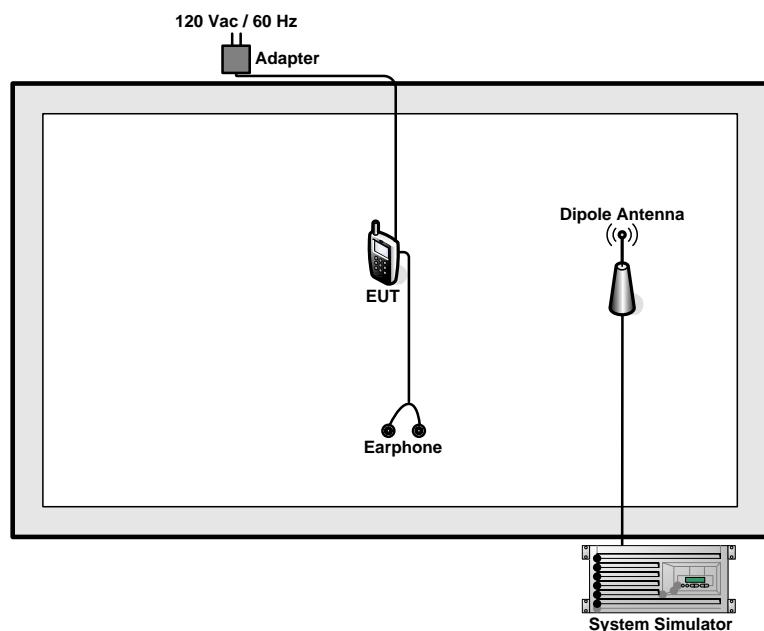
Note:

1. The maximum power levels are GSM mode for GMSK link, EDGE multi-slot class 8 mode for 8PSK link, only these modes were used for all tests.
2. Because there are individual antennas for each WWAN, WLAN, and Bluetooth, the co-location test modes are not required.

The conducted power tables are as follows:

| Conducted Power (*Unit: dBm) | | | |
|------------------------------|---------|--------|--------|
| Band | GSM1900 | | |
| Channel | 512 | 661 | 810 |
| Frequency | 1850.2 | 1880.0 | 1909.8 |
| GSM | 29.43 | 29.36 | 29.42 |
| GPRS 8 | 29.41 | 29.34 | 29.40 |
| GPRS 10 | 27.85 | 27.83 | 27.76 |
| GPRS 12 | 24.84 | 24.78 | 24.77 |
| EGPRS 8 | 26.01 | 25.92 | 25.94 |
| EGPRS 10 | 26.00 | 25.91 | 25.94 |
| EGPRS 12 | 24.72 | 24.69 | 24.58 |

2.2 Connection Diagram of Test System



3 Test Result

3.1 Conducted Output Power Measurement

3.1.1 Description of the Conducted Output Power Measurement

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

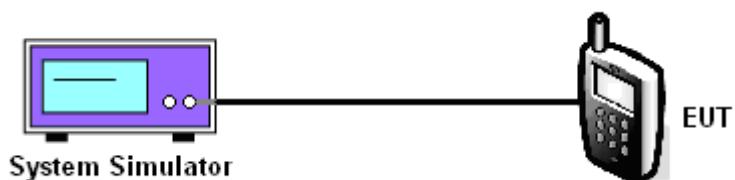
3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedures

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

3.1.4 Test Setup



3.1.5 Test Result of Conducted Output Power

| PCS Band | | | | | | |
|-------------------------|---------------|--------------|---------------|------------------|--------------|---------------|
| Modes | GSM1900 (GSM) | | | 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 |
| Conducted Power (dBm) | 29.43 | 29.36 | 29.42 | 26.01 | 25.92 | 25.94 |
| Conducted Power (Watts) | 0.88 | 0.86 | 0.87 | 0.40 | 0.39 | 0.39 |



3.2 Effective Isotropic Radiated Power Measurement

3.2.1 Description of the EIRP Measurement

The substitution method, in ANSI / TIA / EIA-603-C-2004, was used for EIRP measurement, and the spectrum analyzer configuration follows KDB 971168 D01 Power Meas. License Digital Systems v01. The EIRP of mobile transmitters are limited to 2 Watts.

3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

1. The EUT was placed on a turntable with 1.0 meter height in a fully anechoic chamber.
2. The EUT was set at 1.2 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiated power.
4. The height of the receiving antenna is adjusted to look for the maximum EIRP.
5. Taking the record of maximum EIRP.
6. A dipole antenna was substituted in place of the EUT and was driven by a signal generator.
7. The conducted power at the terminal of the dipole antenna is measured.
8. Repeat step 3 to step 5 to get the maximum EIRP of the substitution antenna.
9. $EIRP = Ps + Et - Es + Gs = Ps + Rt - Rs + Gs$

Ps (dBm) : Input power to substitution antenna.

Gs (dBi or dBd) : Substitution antenna Gain.

Et = Rt + AF

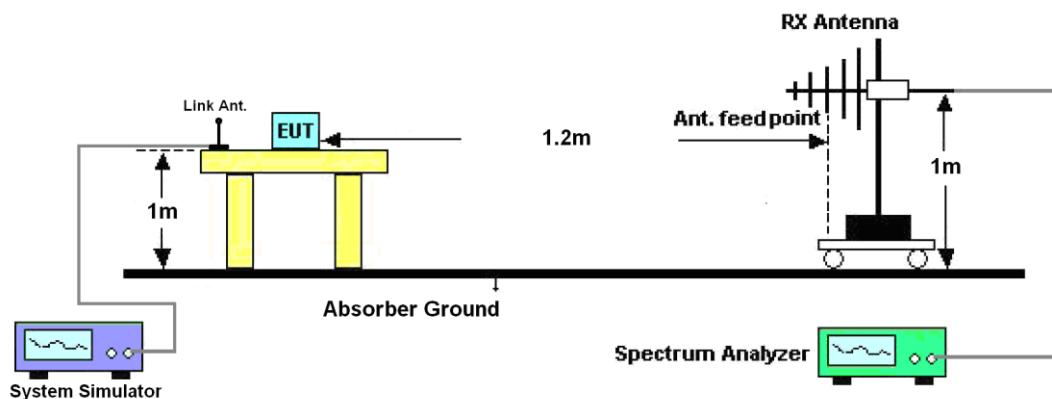
Es = Rs + AF

AF (dB/m) : Receive antenna factor

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

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

3.2.4 Test Setup





3.2.5 Test Result of EIRP

| GSM1900 (GSM) Radiated Power EIRP | | | | | | |
|-----------------------------------|----------|----------|----------|----------|------------|----------|
| Horizontal Polarization | | | | | | |
| Frequency (MHz) | Rt (dBm) | Rs (dBm) | Ps (dBm) | Gs (dBi) | EIRP (dBm) | EIRP (W) |
| 1850.20 | -23.79 | -51.88 | 0.00 | 1.96 | 30.05 | 1.0116 |
| 1880.00 | -25.69 | -52.99 | 0.00 | 2.00 | 29.30 | 0.8511 |
| 1909.80 | -27.94 | -54.28 | 0.00 | 1.98 | 28.32 | 0.6792 |

| GSM1900 (GSM) Radiated Power EIRP | | | | | | |
|-----------------------------------|----------|----------|----------|----------|------------|----------|
| Vertical Polarization | | | | | | |
| Frequency (MHz) | Rt (dBm) | Rs (dBm) | Ps (dBm) | Gs (dBi) | EIRP (dBm) | EIRP (W) |
| 1850.20 | -24.48 | -52.13 | 0.00 | 1.96 | 29.61 | 0.9141 |
| 1880.00 | -26.35 | -53.17 | 0.00 | 2.00 | 28.82 | 0.7621 |
| 1909.80 | -28.80 | -54.13 | 0.00 | 1.98 | 27.31 | 0.5383 |

| GSM1900 (EDGE 8) Radiated Power EIRP | | | | | | |
|--------------------------------------|----------|----------|----------|----------|------------|----------|
| Horizontal Polarization | | | | | | |
| Frequency (MHz) | Rt (dBm) | Rs (dBm) | Ps (dBm) | Gs (dBi) | EIRP (dBm) | EIRP (W) |
| 1850.20 | -27.43 | -51.88 | 0.00 | 1.96 | 26.41 | 0.4375 |
| 1880.00 | -29.43 | -52.99 | 0.00 | 2.00 | 25.56 | 0.3597 |
| 1909.80 | -31.57 | -54.28 | 0.00 | 1.98 | 24.69 | 0.2944 |

| GSM1900 (EDGE 8) Radiated Power EIRP | | | | | | |
|--------------------------------------|----------|----------|----------|----------|------------|----------|
| Vertical Polarization | | | | | | |
| Frequency (MHz) | Rt (dBm) | Rs (dBm) | Ps (dBm) | Gs (dBi) | EIRP (dBm) | EIRP (W) |
| 1850.20 | -27.89 | -52.13 | 0.00 | 1.96 | 26.20 | 0.4169 |
| 1880.00 | -29.75 | -53.17 | 0.00 | 2.00 | 25.42 | 0.3483 |
| 1909.80 | -32.40 | -54.13 | 0.00 | 1.98 | 23.71 | 0.2350 |

3.3 Occupied Bandwidth Measurement

3.3.1 Description of Occupied Bandwidth Measurement

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

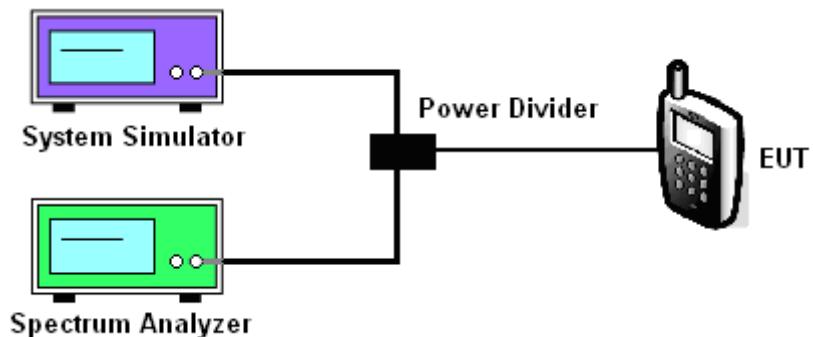
3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

3.3.3 Test Procedures

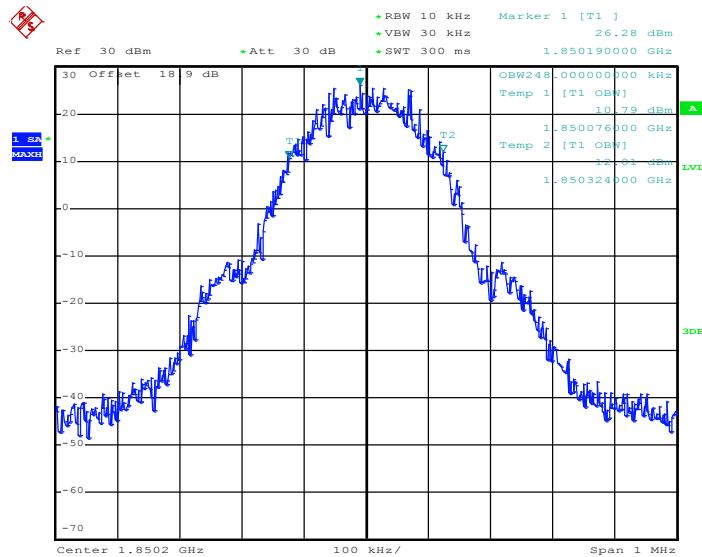
1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The 99% and 26 dB occupied bandwidth (BW) of the middle channel for the highest RF powers were measured.

3.3.4 Test Setup

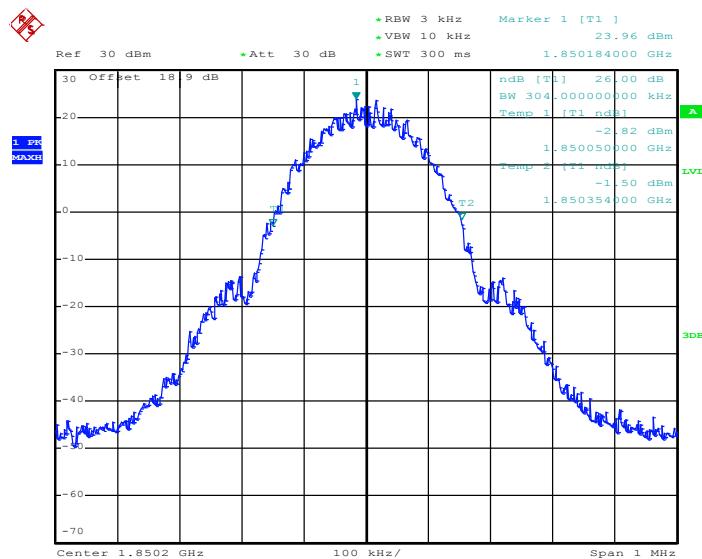


3.3.5 Test Result (Plots) of Occupied Bandwidth

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

99% Occupied Bandwidth Plot on Channel 512


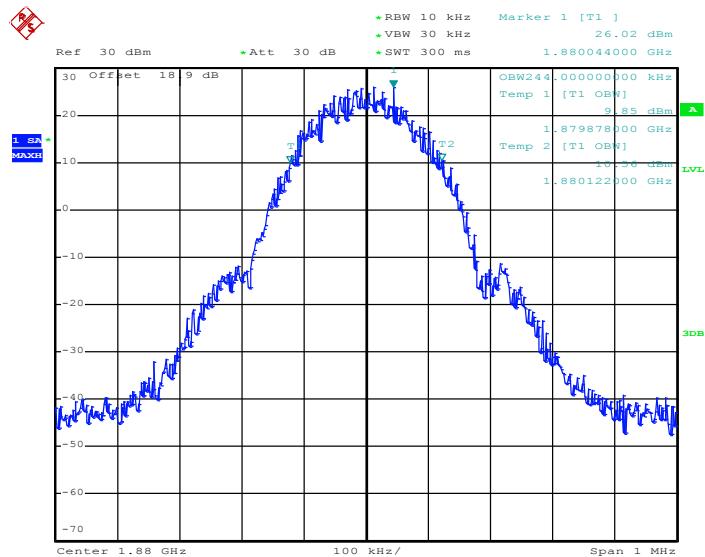
Date: 3.MAY.2012 17:24:14

26dB Bandwidth Plot on Channel 512


Date: 3.MAY.2012 17:22:54

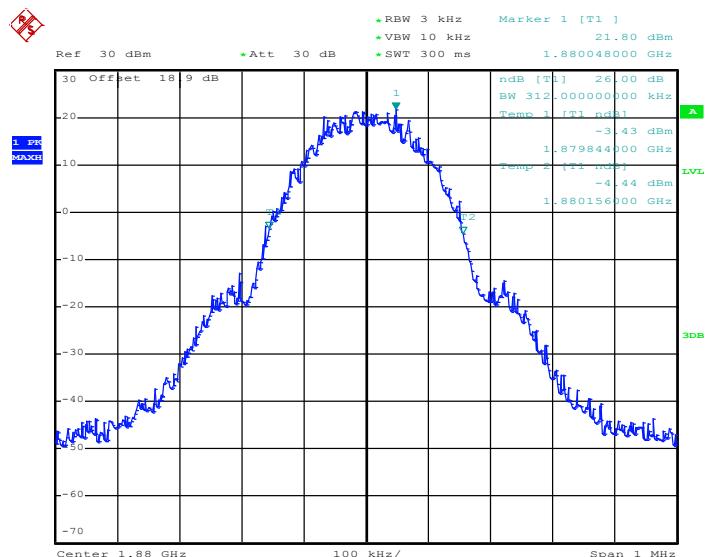


99% Occupied Bandwidth Plot on Channel 661

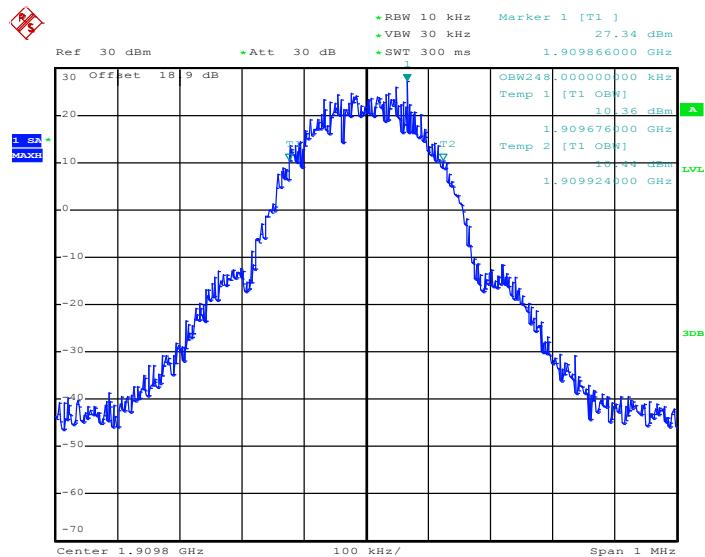


Date: 3.MAY.2012 17:24:40

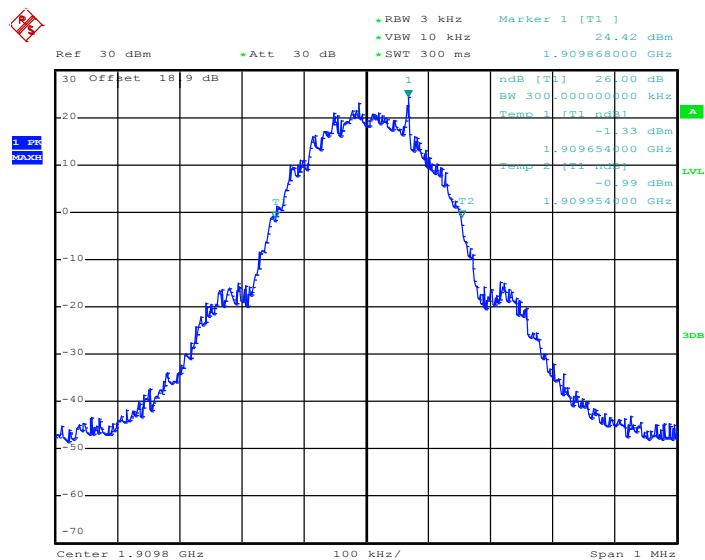
26dB Bandwidth Plot on Channel 661



Date: 3.MAY.2012 17:23:21

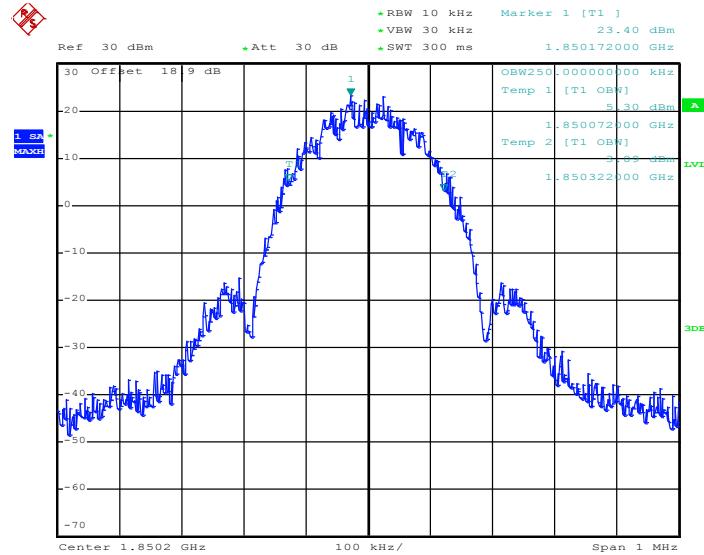
99% Occupied Bandwidth Plot on Channel 810


Date: 3.MAY.2012 17:25:07

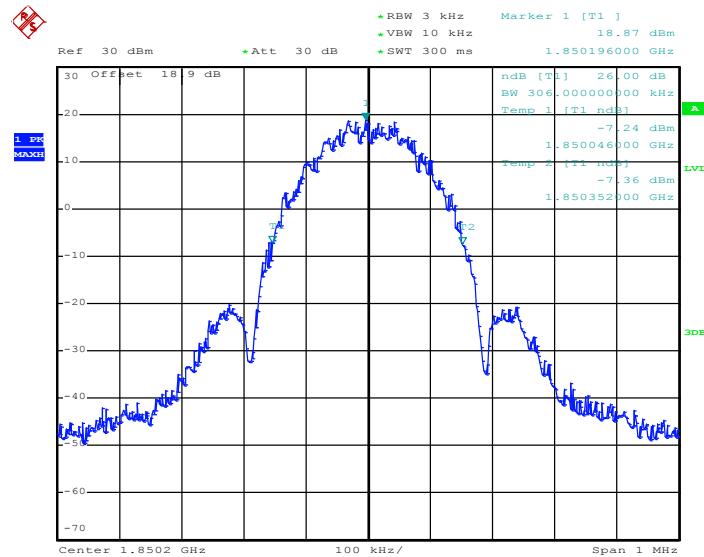
26dB Bandwidth Plot on Channel 810


Date: 3.MAY.2012 17:23:48

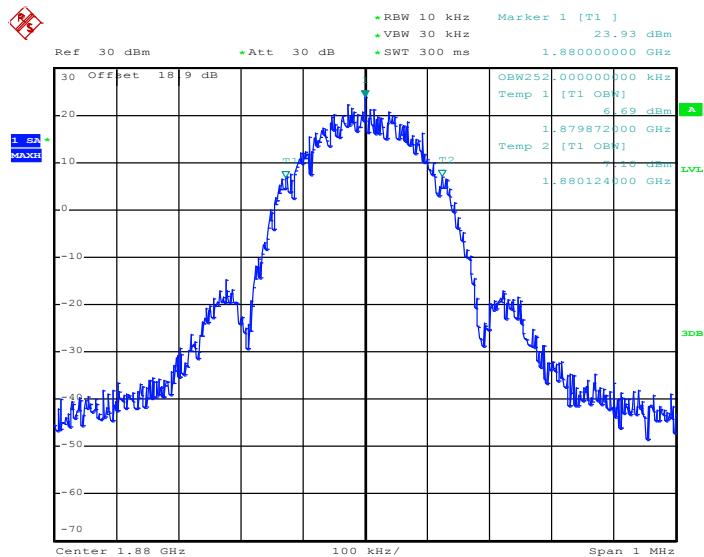
| | | | |
|--------------------|-------------|----------------------|------|
| Band : | GSM 1900 | Power Stage : | High |
| Test Mode : | EDGE 8 Link | | |

99% Occupied Bandwidth Plot on Channel 512


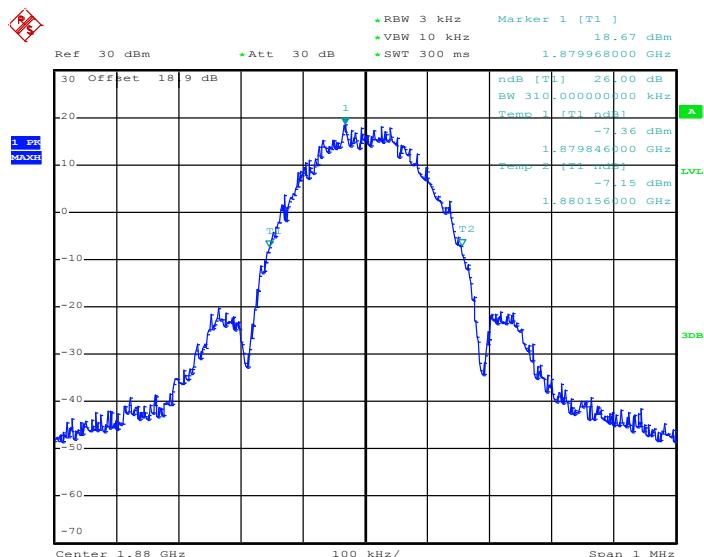
Date: 3.MAY.2012 17:40:46

26dB Bandwidth Plot on Channel 512


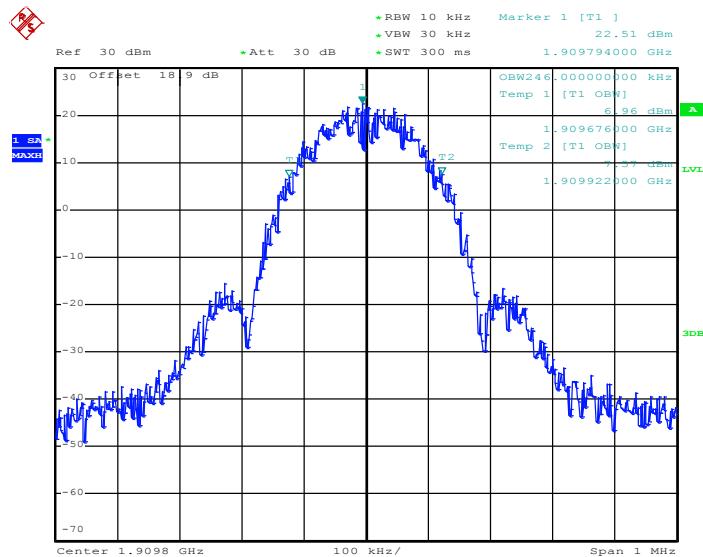
Date: 3.MAY.2012 17:39:26

99% Occupied Bandwidth Plot on Channel 661


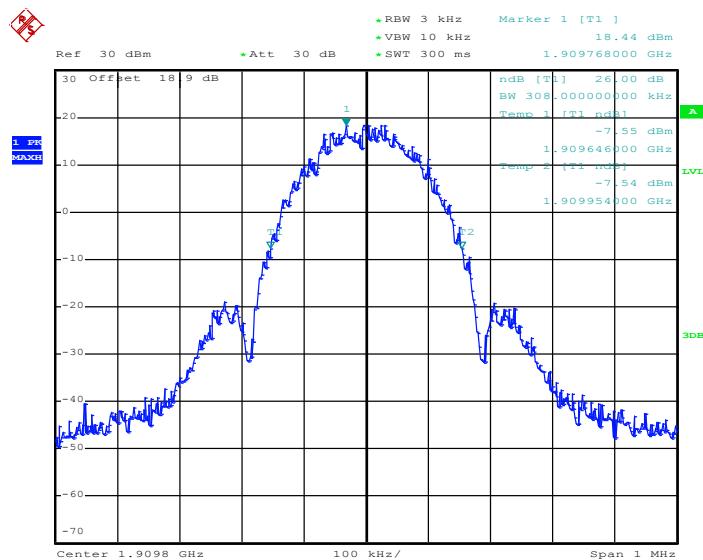
Date: 3.MAY.2012 17:41:12

26dB Bandwidth Plot on Channel 661


Date: 3.MAY.2012 17:39:53

99% Occupied Bandwidth Plot on Channel 810


Date: 3.MAY.2012 17:41:38

26dB Bandwidth Plot on Channel 810


Date: 3.MAY.2012 17:40:19

3.4 Band Edge Measurement

3.4.1 Description of Band Edge Measurement

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

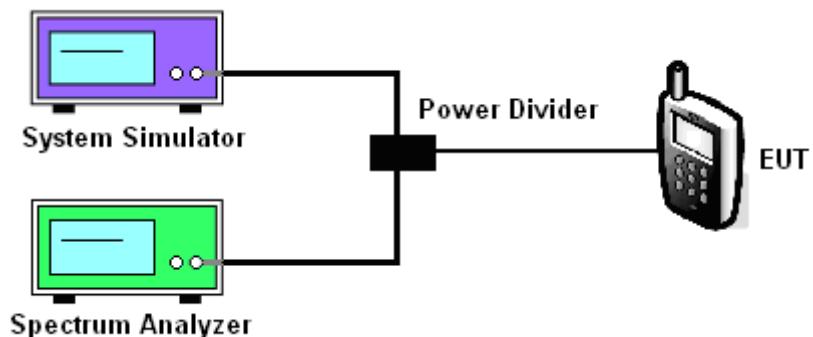
3.4.2 Measuring Instruments

See list of measuring instruments of this test report.

3.4.3 Test Procedures

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The band edges of low and high channels for the highest RF powers were measured. Setting RBW as roughly BW/100.

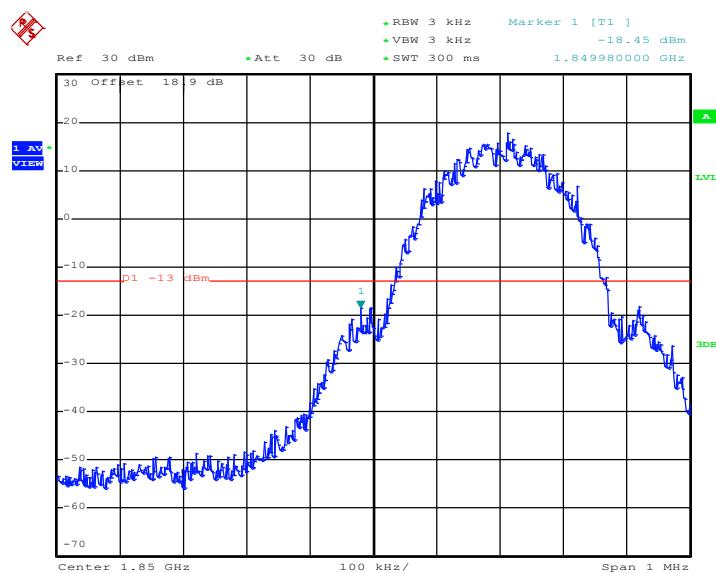
3.4.4 Test Setup



3.4.5 Test Result (Plots) of Conducted Band Edge

| | | | |
|----------------------------|-----------|---------------------------------|-----------|
| Band : | GSM1900 | Power Stage : | High |
| Test Mode : | GSM Link | Maximum 26dB Bandwidth : | 0.312MHz |
| Correction Factor : | 0.17dB | Measurement Value : | -18.45dBm |
| Band Edge : | -18.28dBm | | |

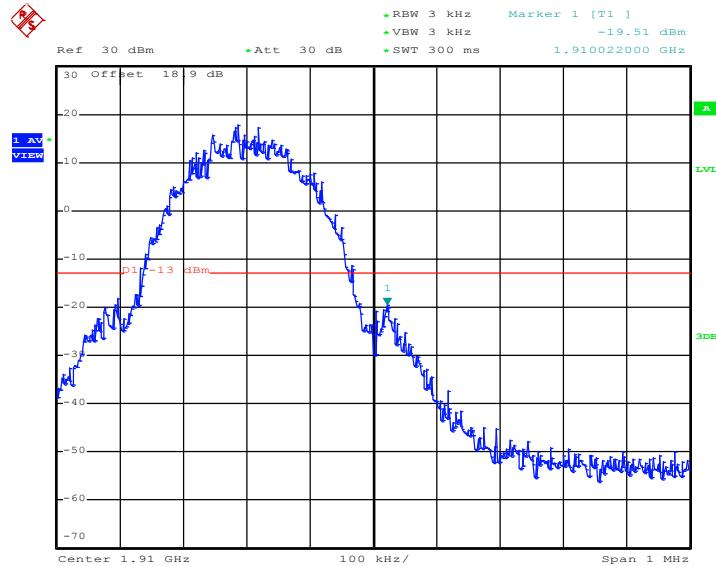
Lower Band Edge Plot on Channel 512



Date: 3.MAY.2012 17:26:33

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

| | | | |
|----------------------------|-----------|---------------------------------|-----------|
| Band : | GSM1900 | Power Stage : | High |
| Test Mode : | GSM Link | Maximum 26dB Bandwidth : | 0.312MHz |
| Correction Factor : | 0.17dB | Measurement Value : | -19.51dBm |
| Band Edge : | -19.34dBm | | |

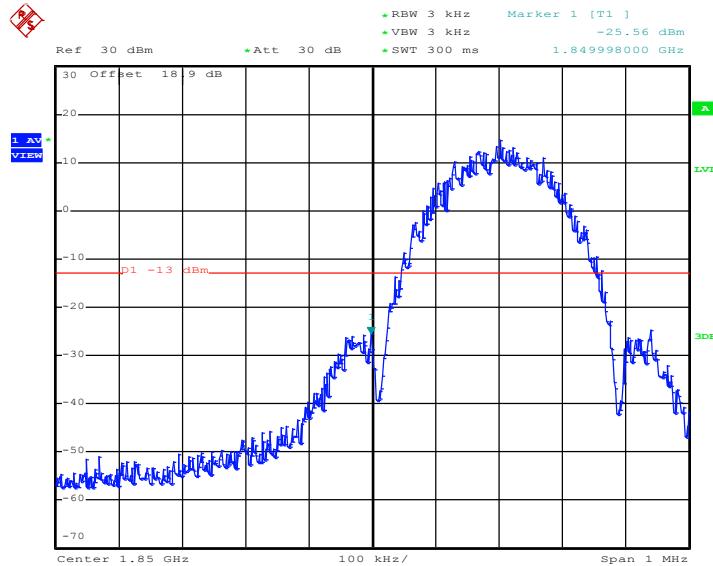
Higher Band Edge Plot on Channel 810


Date: 3.MAY.2012 17:27:00

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



| | | | |
|----------------------------|-------------|---------------------------------|-----------|
| Band : | GSM1900 | Power Stage : | High |
| Test Mode : | EDGE 8 Link | Maximum 26dB Bandwidth : | 0.310MHz |
| Correction Factor : | 0.14dB | Measurement Value : | -25.56dBm |
| Band Edge : | -25.42dBm | | |

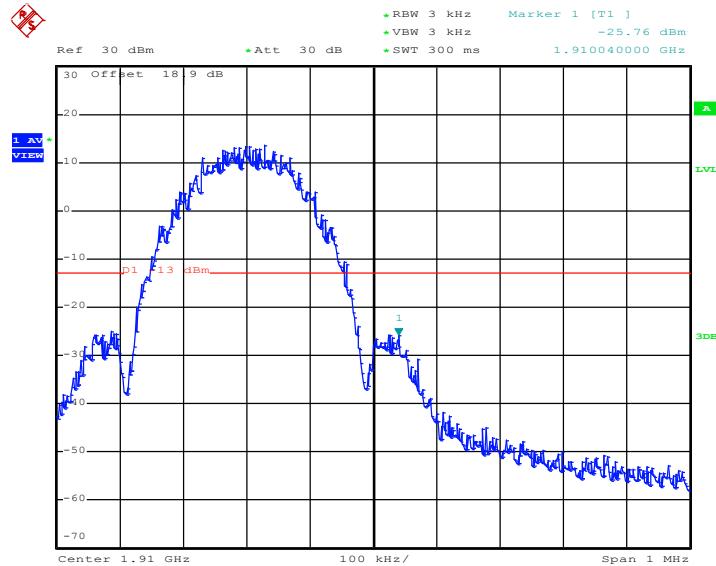
Lower Band Edge Plot on Channel 512

Date: 3.MAY.2012 17:43:05

1. Correction Factor(dB)= $10\log(1\% \text{ Emission BW}/\text{RBW})$

2. Band Edge= Measurement Value + Correction Factor(dB)

| | | | |
|----------------------------|-------------|---------------------------------|-----------|
| Band : | GSM1900 | Power Stage : | High |
| Test Mode : | EDGE 8 Link | Maximum 26dB Bandwidth : | 0.310MHz |
| Correction Factor : | 0.14dB | Measurement Value : | -25.76dBm |
| Band Edge : | -25.62dBm | | |

Higher Band Edge Plot on Channel 810


Date: 3.MAY.2012 17:43:31

1. Correction Factor(dB)= $10\log(1\% \text{ Emission BW}/\text{RBW})$

2. Band Edge= Measurement Value + Correction Factor(dB)

3.5 Conducted Emission Measurement

3.5.1 Description of Conducted Emission Measurement

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

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

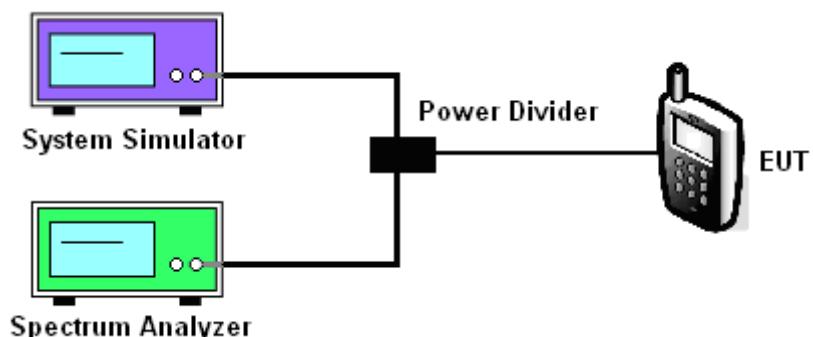
3.5.2 Measuring Instruments

See list of measuring instruments of this test report.

3.5.3 Test Procedures

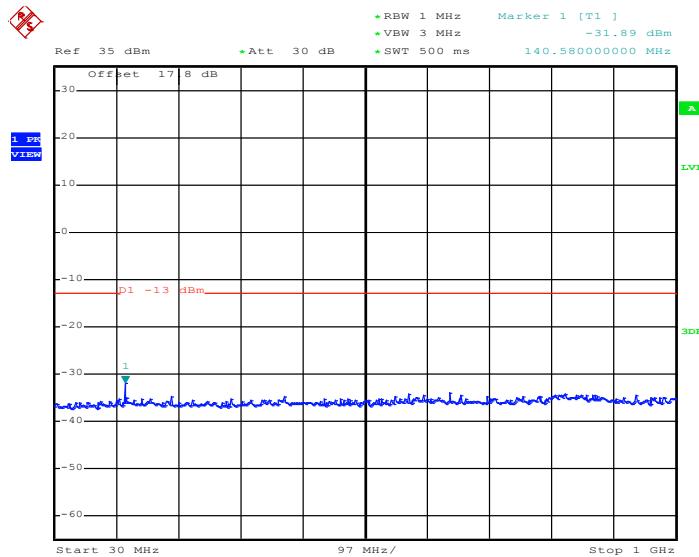
1. The EUT was connected to spectrum analyzer and base station via power divider.
2. The middle channel for the highest RF power within the transmitting frequency was measured.
3. The conducted spurious emission for the whole frequency range was taken.

3.5.4 Test Setup

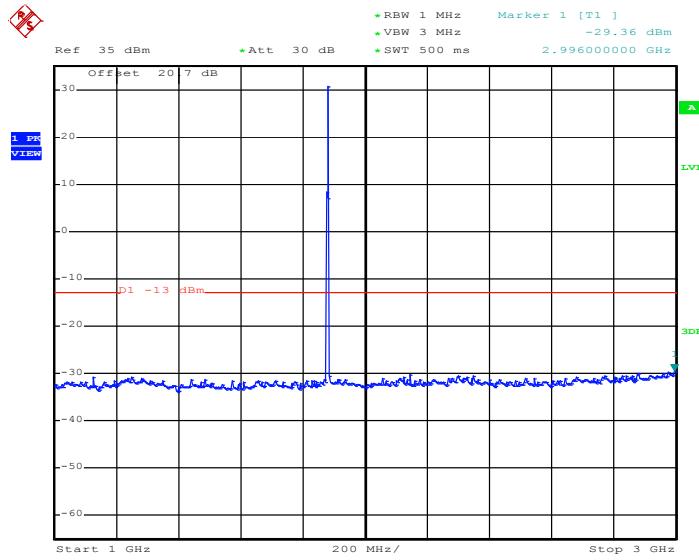


3.5.5 Test Result (Plots) of Conducted Emission

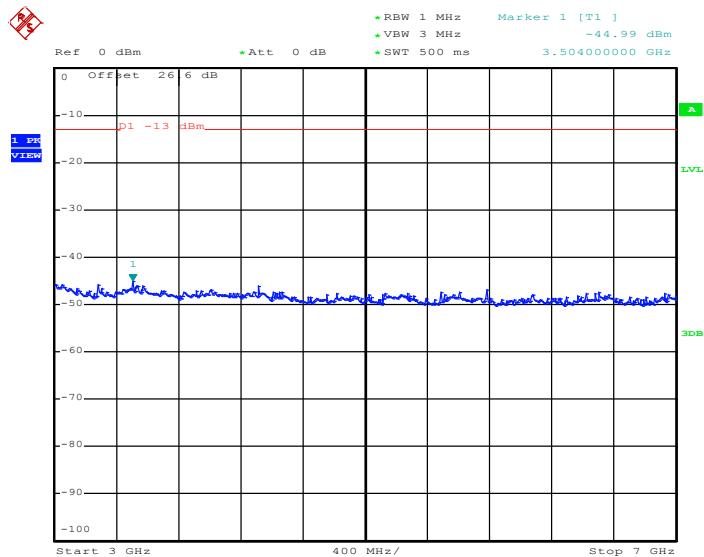
| | | | |
|--------------------|----------|------------------|-------|
| Band : | GSM1900 | Channel : | CH661 |
| Test Mode : | GSM Link | | |

Conducted Emission Plot between 30MHz ~ 1GHz


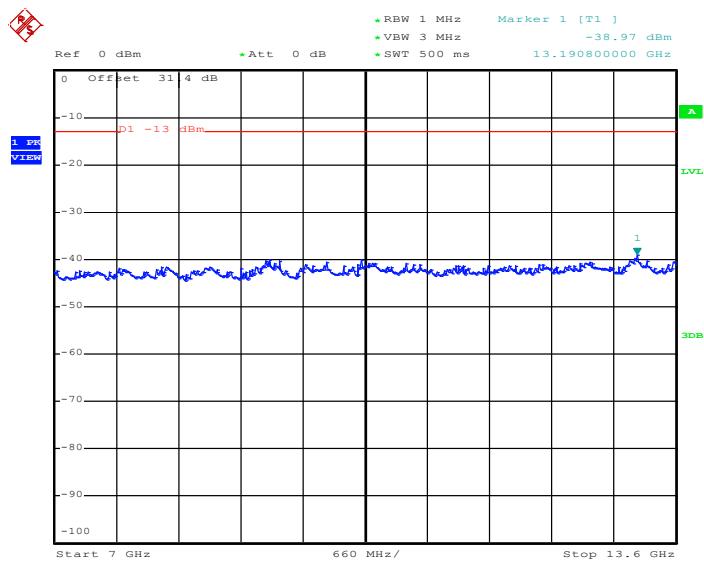
Date: 3.MAY.2012 20:55:46

Conducted Emission Plot between 1GHz ~ 3GHz


Date: 3.MAY.2012 20:55:59

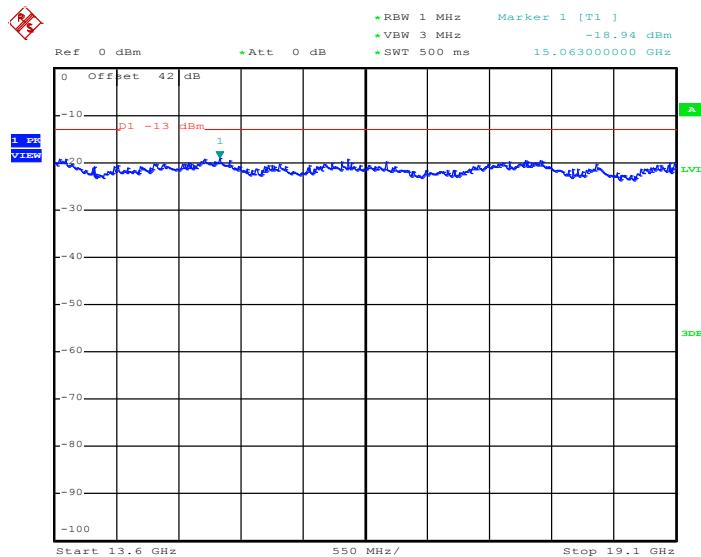
Conducted Emission Plot between 3GHz ~ 7GHz


Date: 3.MAY.2012 20:56:19

Conducted Emission Plot between 7GHz ~ 13.6GHz


Date: 3.MAY.2012 20:56:31

Conducted Emission Plot between 13.6GHz ~ 19.1GHz

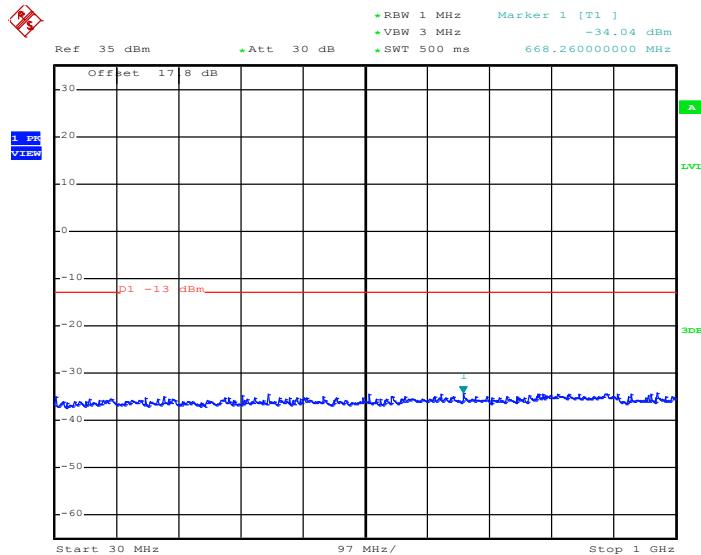


Date: 3.MAY.2012 20:56:44



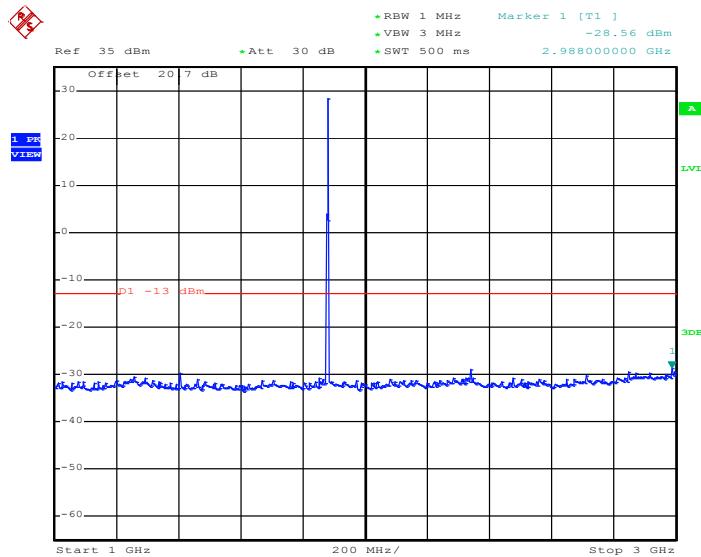
| | | | |
|-------------|-------------|-----------|-------|
| Band : | GSM1900 | Channel : | CH661 |
| Test Mode : | EDGE 8 Link | | |

Conducted Emission Plot between 30MHz ~ 1GHz

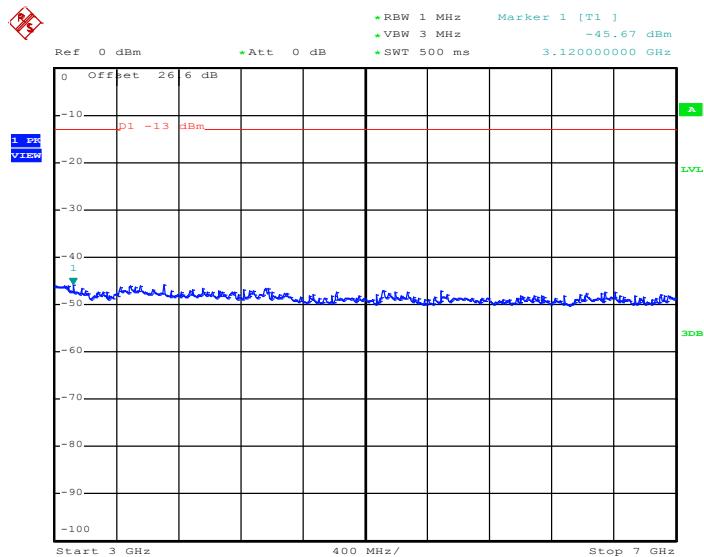


Date: 3.MAY.2012 20:52:26

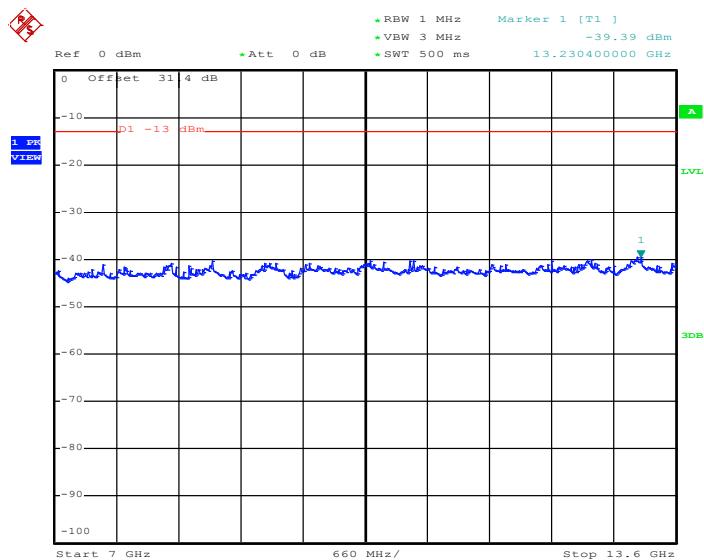
Conducted Emission Plot between 1GHz ~ 3GHz



Date: 3.MAY.2012 20:52:38

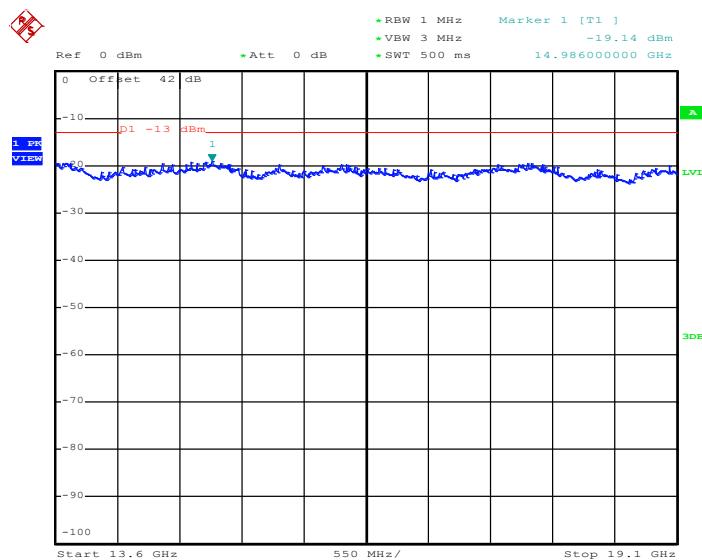
Conducted Emission Plot between 3GHz ~ 7GHz


Date: 3.MAY.2012 20:52:57

Conducted Emission Plot between 7GHz ~ 13.6GHz


Date: 3.MAY.2012 20:53:10

Conducted Emission Plot between 13.6GHz ~ 19.1GHz



Date: 3.MAY.2012 20:53:23



3.6 Field Strength of Spurious Radiation Measurement

3.6.1 Description of Field Strength of Spurious Radiated Measurement

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

3.6.2 Measuring Instruments

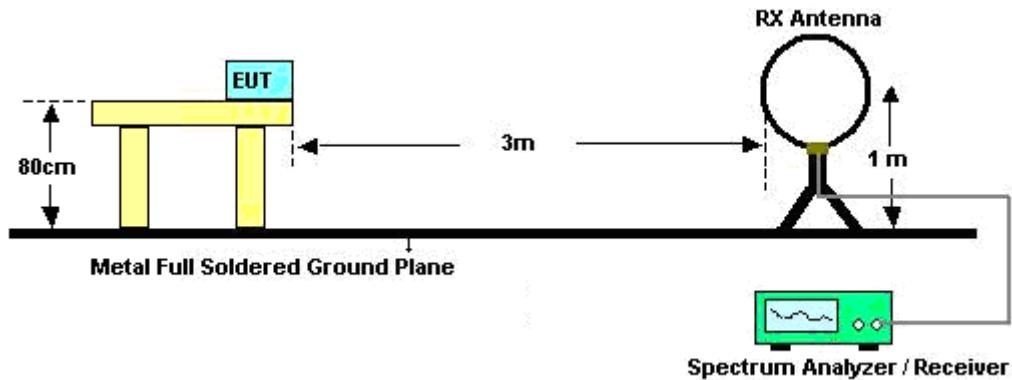
See list of measuring instruments of this test report.

3.6.3 Test Procedures

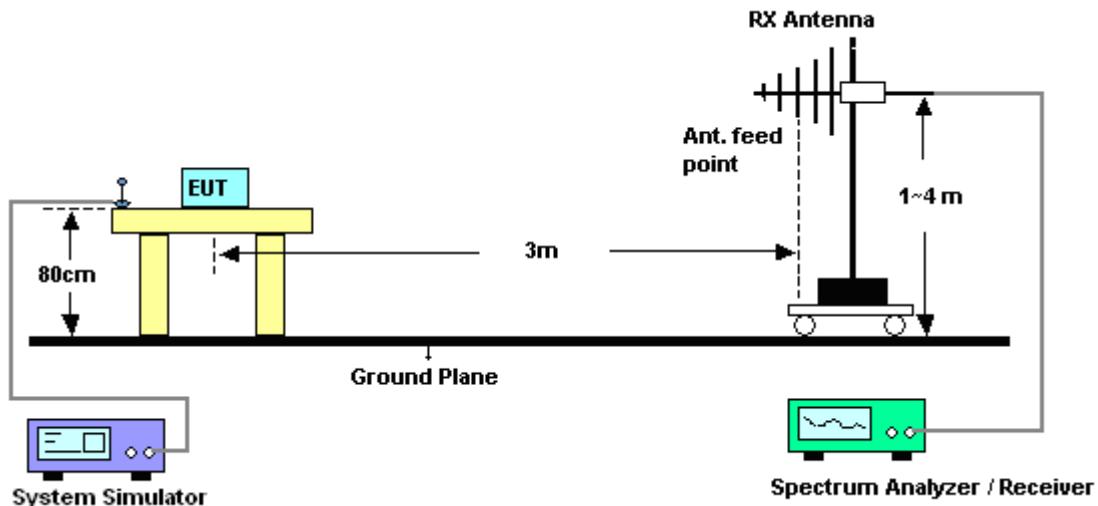
1. The EUT was placed on a rotatable wooden table with 0.8 meter about ground.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations.
5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, Sweep = 500ms, 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. $ERP \text{ (dBm)} = EIRP - 2.15$

3.6.4 Test Setup

For radiated emissions below 30MHz



For radiated emissions above 30MHz

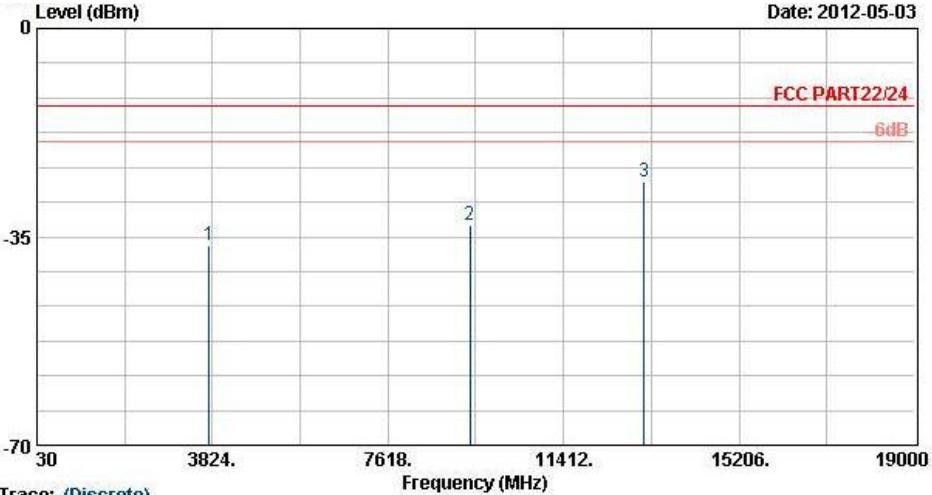


3.6.5 Test Results of Radiated Emissions (9 KHz ~ 30 MHz)

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.

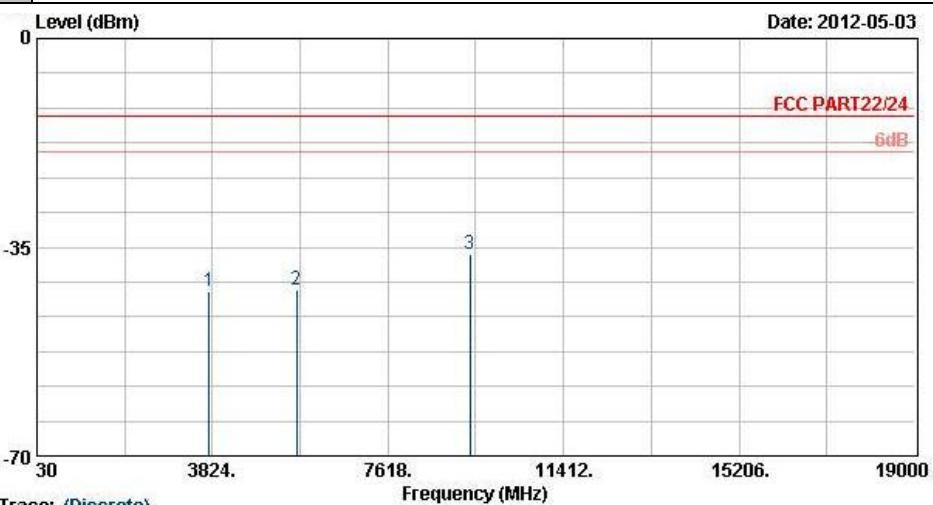


3.6.6 Test Result of Field Strength of Spurious Radiated

| Band : | GSM1900 | Temperature : | 21~24°C | | | | | | |
|--|--|---------------------|------------------|-------------------|------------------|--------------------|-----------------------|--------------------|--------|
| Test Mode : | GSM Link | Relative Humidity : | 55~56% | | | | | | |
| Test Engineer : | Wii Chang | Polarization : | Horizontal | | | | | | |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | | | | | | | |
|  | | | Date: 2012-05-03 | | | | | | |
| Trace: (Discrete) Site : 03CH06-HY Condition : FCC PART22/24 ETRP_100524 HORIZONTAL Project : FG 242016 | | | | | | | | | |
| 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 | -36.46 | -13 | -23.46 | -55.36 | -42.71 | 2.56 | 8.81 | H | Pass |
| 9396 | -33.01 | -13 | -20.01 | -61.46 | -42.55 | 3.66 | 13.20 | H | Pass |
| 13160 | -25.76 | -13 | -12.76 | -61.65 | -36.07 | 3.48 | 13.79 | H | Pass |



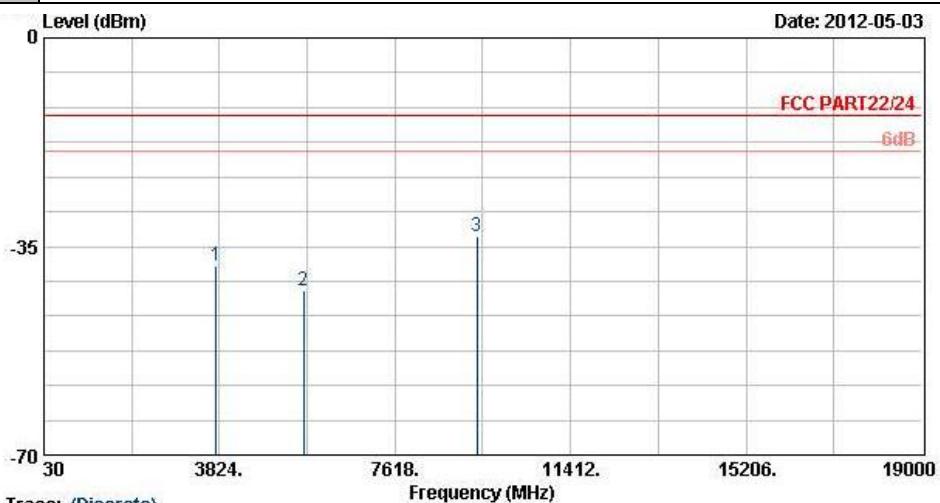
| | | | |
|------------------------|--|----------------------------|----------|
| Band : | GSM1900 | Temperature : | 21~24°C |
| Test Mode : | GSM Link | Relative Humidity : | 55~56% |
| Test Engineer : | Wii Chang | Polarization : | Vertical |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |



| Frequency | EIRP | Limit | Over | SPA | S.G. | TX Cable | TX Antenna | Polarization | Result |
|-----------|---------|---------|--------|---------|--------|----------|------------|--------------|--------|
| (MHz) | (dBm) | (dBm) | Limit | Reading | Power | loss | Gain | (H/V) | |
| 3760 | -42.43 | -13 | -29.43 | -61.34 | -48.68 | 2.56 | 8.81 | V | Pass |
| 5636 | -42.07 | -13 | -29.07 | -66.26 | -49.81 | 2.96 | 10.70 | V | Pass |
| 9396 | -36.16 | -13 | -23.16 | -64.60 | -45.70 | 3.66 | 13.20 | V | Pass |



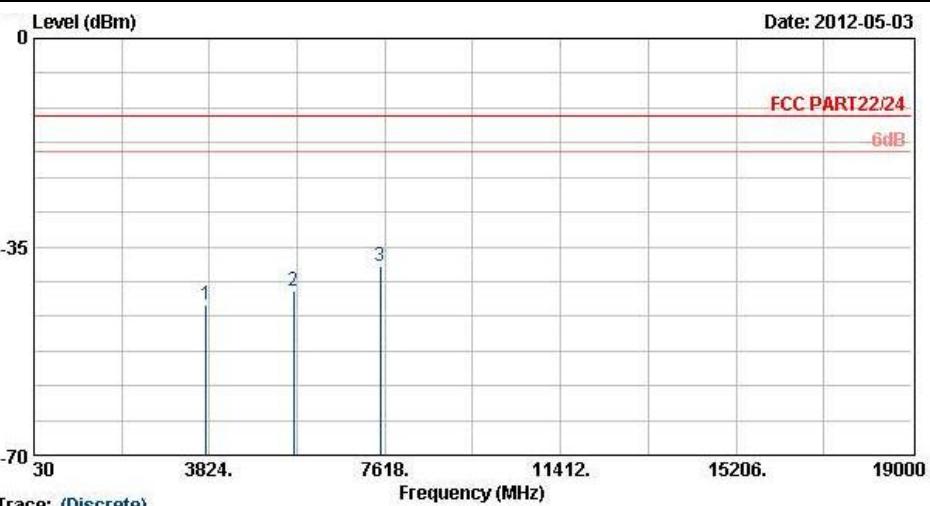
| | | | |
|------------------------|--|----------------------------|------------|
| Band : | GSM1900 | Temperature : | 21~24°C |
| Test Mode : | EDGE 8 Link | Relative Humidity : | 55~56% |
| Test Engineer : | Wii Chang | Polarization : | Horizontal |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |



| Frequency (MHz) | EIRP (dBm) | Limit (dBm) | Over Limit (dB) | SPA (dBm) | S.G. Power (dBm) | TX Cable loss (dB) | TX Antenna Gain (dBi) | Polarization (H/V) | Result |
|-----------------|------------|-------------|-----------------|-----------|------------------|--------------------|-----------------------|--------------------|--------|
| 3760 | -38.29 | -13 | -25.29 | -57.20 | -44.54 | 2.56 | 8.81 | H | Pass |
| 5636 | -42.52 | -13 | -29.52 | -66.71 | -50.26 | 2.96 | 10.70 | H | Pass |
| 9396 | -33.20 | -13 | -20.20 | -61.64 | -42.74 | 3.66 | 13.20 | H | Pass |



| | | | |
|------------------------|--|----------------------------|----------|
| Band : | GSM1900 | Temperature : | 21~24°C |
| Test Mode : | EDGE 8 Link | Relative Humidity : | 55~56% |
| Test Engineer : | Wii Chang | Polarization : | Vertical |
| Remark : | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. | | |



Site : 03CH06-HV
Condition : FCC PART22/24 ETRP_I00524 VERTICAL
Project : FG 242016

| Frequency (MHz) | EIRP (dBm) | Limit (dBm) | Over Limit (dB) | SPA (dBm) | S.G. (dBm) | TX Cable loss (dB) | TX Antenna Gain (dBi) | Polarization (H/V) | Result |
|-----------------|------------|-------------|-----------------|-----------|------------|--------------------|-----------------------|--------------------|--------|
| 3760 | -44.76 | -13 | -31.76 | -63.67 | -51.01 | 2.56 | 8.81 | V | Pass |
| 5636 | -42.33 | -13 | -29.33 | -66.52 | -50.07 | 2.96 | 10.70 | V | Pass |
| 7520 | -38.14 | -13 | -25.14 | -66.47 | -47.04 | 3.22 | 12.12 | V | Pass |



3.7 Frequency Stability Measurement

3.7.1 Description of Frequency Stability Measurement

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

3.7.2 Measuring Instruments

See list of measuring instruments of this test report.

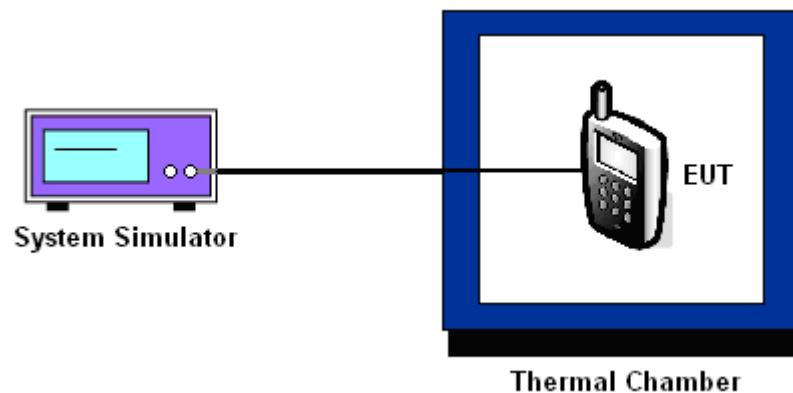
3.7.3 Test Procedures for Temperature Variation

1. The EUT was set up in the thermal chamber and connected with the base station.
2. With power OFF, the temperature was decreased to -30°C and the EUT was stabilized 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.

3.7.4 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.

3.7.5 Test Setup





3.7.6 Test Result of Temperature Variation

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

| Temperature (°C) | GSM | | EDGE 8 | | Result |
|---------------------|--------------------|--------------------|--------------------|--------------------|--------|
| | Freq. Dev. (Hz) | Deviation (ppm) | Freq. Dev. (Hz) | Deviation (ppm) | |
| -30 | -47 | -0.02 | -48 | -0.03 | PASS |
| -20 | -61 | -0.03 | -43 | -0.02 | |
| -10 | -43 | -0.02 | -58 | -0.03 | |
| 0 | -54 | -0.03 | 32 | 0.02 | |
| 10 | -46 | -0.02 | -44 | -0.02 | |
| 20 | -36 | -0.02 | -54 | -0.03 | |
| 30 | -43 | -0.02 | -42 | -0.02 | |
| 40 | -69 | -0.04 | -53 | -0.03 | |
| 50 | -62 | -0.03 | -58 | -0.03 | |

3.7.7 Test Result of Voltage Variation

| Band & Channel | Mode | Voltage (Volt) | Freq. Dev. (Hz) | Deviation (ppm) | Limit (ppm) | Result |
|-------------------|--------|-------------------|--------------------|--------------------|----------------|--------|
| GSM 1900 CH661 | GSM | 3.8 | -69 | -0.04 | 2.5 | PASS |
| | | BEP | -58 | -0.03 | | |
| | | 4.2 | -79 | -0.04 | | |
| | EDGE 8 | 3.8 | -47 | -0.02 | | |
| | | BEP | -49 | -0.03 | | |
| | | 4.2 | -50 | -0.03 | | |

Note:

1. Normal Voltage = 3.8V.
2. Battery End Point (BEP) = 3.4 V.



4 List of Measuring Equipment

| Instrument | Manufacturer | Model No. | Serial No. | Characteristics | Calibration Date | Test Date | Due Date | Remark |
|---------------------------|--------------|-----------|--------------|-----------------|------------------|--------------|---------------|-----------------------|
| System Simulator | R&S | CMU200 | 117995 | N/A | Jul. 28, 2011 | May 03, 2012 | Jul. 27, 2012 | Conducted (TH02-HY) |
| Spectrum Analyzer | R&S | FSP40 | 100055 | 9kHz~40GHz | Jun. 13, 2011 | May 03, 2012 | Jun. 12, 2012 | Conducted (TH02-HY) |
| Thermal Chamber | Ten Billion | TTH-D35P | TBN-930701 | N/A | Jul. 27, 2011 | May 03, 2012 | Jul. 26, 2012 | Conducted (TH02-HY) |
| Spectrum Analyzer | Agilent | E4408B | MY44211030 | 9KHz ~ 26.5GHz | Nov. 23, 2011 | May 03, 2012 | Nov. 22, 2012 | Radiation (03CH06-HY) |
| Spectrum Analyzer | R&S | FSP30 | 101352 | 9KHz-30GHz | Nov. 01, 2011 | May 03, 2012 | Oct. 31, 2012 | Radiation (03CH06-HY) |
| EMI Test Receiver | R&S | ESVS10 | 834468/003 | 20MHz ~ 1000MHz | May 10, 2011 | May 03, 2012 | May 09, 2012 | Radiation (03CH06-HY) |
| Bilog Antenna | SCHAFFNER | CBL6112B | 2885 | 30MHz ~ 2GHz | Oct. 22, 2011 | May 03, 2012 | Oct. 21, 2012 | Radiation (03CH06-HY) |
| Double Ridge Horn Antenna | EMCO | 3117 | 00066583 | 1GHz ~ 18GHz | Aug. 01, 2011 | May 03, 2012 | Jul. 31, 2012 | Radiation (03CH06-HY) |
| SHF-EHF Horn Antenna | SCHWARZBECK | BBHA 9170 | BBHA917025 1 | 15GHz ~ 40GHz | Oct. 21, 2011 | May 03, 2012 | Oct. 20, 2012 | Radiation (03CH06-HY) |
| Pre Amplifier | Agilent | 8449B | 3008A01917 | 1GHz ~ 26.5GHz | Apr. 13, 2012 | May 03, 2012 | Apr. 12, 2013 | Radiation (03CH06-HY) |
| Amplifier | Agilent | 310N | 186713 | 9KHz ~ 1GHz | Apr. 11, 2012 | May 03, 2012 | Apr. 10, 2013 | Radiation (03CH06-HY) |
| Pre Amplifier | EMCI | EMC051845 | SN980048 | 1GHz ~ 18GHz | Jul. 18, 2011 | May 03, 2012 | Jul. 17, 2012 | Radiation (03CH06-HY) |
| Loop Antenna | R&S | HFH2-Z2 | 860004/001 | 9KHz ~ 30MHz | Jul. 29, 2010 | May 03, 2012 | Jul. 28, 2012 | Radiation (03CH06-HY) |
| System Simulator | R&S | CMU200 | 117591 | N/A | Oct. 21, 2011 | May 03, 2012 | Oct. 20, 2012 | Radiation (03CH06-HY) |



5 Uncertainty of Evaluation

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

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

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

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



Appendix A. Photographs of EUT

Please refer to Sporton report number EP242016 as below.