# TEST REPORT

## REPORT NUMBER：I12GWD342-RF-3G

## ON

**Type of Equipment: GSM QUAD Band and UMTS 850/1900 mobile phone**

**Model of Equipment: A8660**

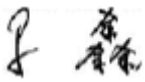
**Marketing Name: A8660/ADR21/ADR21PE/ADR21AL/ ADR21CL/ADR21EC/ADR21MV/ADR21MX /ADR21OM/ADR21CR/ADR21CA /ADR21EN/ADR21BR**

**Applicant: Cellon Communications Technology(ShenZhen)Co., Ltd.**

**China Telecommunication Technology Labs**

*Month date, year*
*June 5th, 2012*

*Signature*



*Ma Xin*
*Vice Director*

**FCC ID:** T38PCD8660

**Report Date:** 2012-06-05

**Test Firm Name:** China Telecommunication Technology Labs

**Registration Number:** 840587

Statement

The measurements shown in this report were made in accordance with the procedures described on test pages. All reported tests were carried out on a sample equipment to demonstrate limited compliance with FCC CFR 47 Parts 2, 22, and 24. The sample tested was found to comply with the requirements defined in the applied rules.

# CONTENTS

# 1 General Information

## 1.1 Notes

All reported tests were carried out on a sample equipment to demonstrate limited compliance with the following specifications.

| | | |
|---|---|---|
| FCC PART 2 | FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS | 10-1-10 Edition |
| FCC Part 24 | PERSONAL COMMUNICATIONS SERVICES | 10-1-10 Edition |
| FCC Part 22 | PUBLIC MOBILE SERVICES | 10-1-10 Edition |
| ANSI/TIA-603-C | Land Mobile FM or PM Communications Equipment Measurement and Performance standards | 2004 |
| ANSI C63.4 | Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9kHz to 40 GHz | 2003 |

The test results of this test report relate exclusively to the item(s) tested as specified in section 2.

The following deviation from, additions to, or exclusions from the test specifications have been made. See Annex C.

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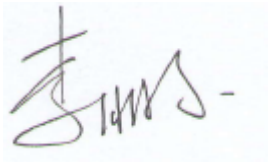
## 1.2 Testers

Name: Li Peng

Position: Engineer

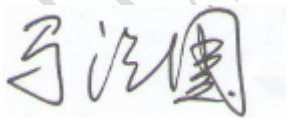
Signature: 

Technical responsibility for area of testing:

Name: Ma Zhiguo

Position: Manager

Date: 2012-06-05

Signature: 

## 1.3 Testing Laboratory information

1.3.1 Location

| | |
|---|---|
| Name: | China Telecommunication Technology Labs. |
| Address: | No. 11, Yue Tan Nan Jie, Xi Cheng District<br>BEIJING<br>P. R. CHINA, 100083 |
| Tel: | +86 10 68094053 |
| Fax: | +86 10 68011404 |
| Email: | emc@chinattl.com |

1.3.2 Details of accreditation status

| | |
|---|---|
| Accredited by: | China National Accreditation Service for Conformity Assessment (CNAS) |
| Registration number: | CNAS Registration No. CNAS L0570 |
| Standard: | ISO/IEC 17025 |

1.3.3 Test location, where different from section 1.3.1

| | |
|---|---|
| Name: | ------ |
| Street: | ------ |
| City: | ------ |
| Country: | ------ |
| Telephone: | ------ |
| Fax: | ------ |
| Postcode: | ------ |

## 1.4 Details of applicant or manufacturer

1.4.1 Applicant

| | |
|---|---|
| Name: | Cellon Communications Technology (ShenZhen) Co., Ltd |
| Address: | 13/F, Skyworth Building C Gaoxin S. Ave. 1st, High-Tech industrial Park Nanshan, Shenzhen |
| Country: | China |
| Telephone: | 0755-86365704 |
| Fax: | 0755-86365686 |
| Contact: | maggie.xu |
| Email: | Maggie.xu@cellon.com |

1.4.2 Manufacturer (if different from applicant in section 1.4.1)

| | |
|---|---|
| Name: | -- |
| Address: | -- |

1.4.3 Manufactory (if different from applicant in section 1.4.1)

| | |
|---|---|
| Name: | -- |
| Address: | -- |

# 2 Test Item

## 2.1 General Information

| | |
|---|---|
| Manufacturer: | Cellon Communications Technology (ShenZhen) Co., Ltd |
| Name: | GSM QUAD Band and UMTS 850/1900 mobile phone |
| Model Number: | A8660 |
| Serial Number: | -- |
| Production Status: | Product |
| Receipt date of test item: | 2012-5-21 |
| Transmitter Frequency range: | Band II: 1852.4-1909.8MHz,<br>Band V: 826.4-846.6MHz |
| Receiver Frequency Range: | Band II: 1932.4-1987.6MHz,<br>Band V: 871.4-891.6MHz |
| ISM Frequency Band | 2400-2480MHz |
| High Voltage Level: | 4.2 V |
| Nominal Voltage Level: | 3.7 V |
| Low Voltage Level: | 3.5 V |

## 2.2 Outline of EUT

E.U.T. is a GSM QUAD Band and UMTS 850/1900 mobile phone.

## 2.3 Modifications Incorporated in EUT

The EUT has not been modified from what is described by the brand name and unique type identification stated above.

## 2.4 Equipment Configuration

Equipment configuration list:

| Item | Generic Description | Manufacturer | Type | Serial No. | Remarks |
|---|---|---|---|---|---|
| A | handset | Cellon Communications Technology (ShenZhen) Co., Ltd | A8660 | -- | None |
| B | adapter | DVE | SPS-015757 | -- | None |
| C | battery | BAK | Li-ion | -- | None |

## 2.5 Other Information

(a) Version of hardware and software

HW Version: A8660 MainPCB P2C

SW Version: ADR21_Claro_CA_2.7

(c) Battery information:

Nominal Voltage: 3.7 V

Capacity: 1200 mAh



# 3 Summary of Test Results

A brief summary of the tests carried out is shown as following.

**WCDMA BAND V mode:**

| FCC Specification Clause | Name of Test | Result |
|---|---|---|
| 2.1051, 24.238, 22.917 | Radiated Spurious Emission | Pass |
| 22.913, 24.232 | Output Power | Pass |
| 15.107, 15.207 | Conducted Emission | Pass |
| 2.1049,22.917(b), 24.238(b) | Occupied Bandwidth | Pass |
| 22.917(b), 24.238(b) | Emission Bandwidth | Pass |
| 2.1055,22.355, 24.235 | Frequency Stability | Pass |
| 2.1057,22.917, 24.238 | Conducted spurious emissions | Pass |
| 22.917(b), 24.238(b) | Band Edge Compliance | Pass |

A brief summary of the tests carried out is shown as following.

| **WCDMA BAND II mode:** | | |
|---|---|---|
| **FCC Specification Clause** | **Name of Test** | **Result** |
| 2.1051, 24.238, 22.917 | Radiated Spurious Emission | Pass |
| 22.913, 24.232 | Output Power | Pass |
| 15.107, 15.207 | Conducted Emission | Pass |
| 2.1049,22.917(b), 24.238(b) | Occupied Bandwidth | Pass |
| 22.917(b), 24.238(b) | Emission Bandwidth | Pass |
| 2.1055,22.355, 24.235 | Frequency Stability | Pass |
| 2.1057,22.917, 24.238 | Conducted spurious emissions | Pass |
| 22.917(b), 24.238(b) | Band Edge Compliance | Pass |

| **HSDPA BAND V mode:** | | |
|---|---|---|
| **FCC Specification Clause** | **Name of Test** | **Result** |
| 22.913, 24.232 | Output Power | Pass |

| **HSUPA BAND V mode:** | | |
|---|---|---|
| **FCC Specification Clause** | **Name of Test** | **Result** |
| 22.913, 24.232 | Output Power | Pass |

| **HSDPA BAND II mode:** | | |
|---|---|---|
| **FCC Specification Clause** | **Name of Test** | **Result** |
| 22.913, 24.232 | Output Power | Pass |

| **HSUPA BAND II mode:** | | |
|---|---|---|
| **FCC Specification Clause** | **Name of Test** | **Result** |
| 22.913, 24.232 | Output Power | Pass |

# 4 Test Results of mode

## 4.1 Radiated Spurious Emission

| | |
|---|---|
| **Specifications:** | 2.1051, 24.238, 22.917 |
| **Test conditions:** | Ambient Temperature:15℃-35℃<br>Relative Humidity:30%-60%<br>Air pressure: 86-106kPa |
| **Operation Mode** | TX on, channel 4183 and 9400 |
| **Test Results:** | Pass |

**Limit Level Construction:**
According to Part 24.238 (a), i.e., Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB, so the limit level is:
P(dBm) – (43 + 10 log(P)) dB= -13dBm

| **Limits for Radiated spurious emissions(UE)** | |
|---|---|
| **Frequency range** | **Limit Level /Resolution Bandwidth** |
| 30 MHz to 20000 MHz | -13dBm/1MHz |

**Test Setup:**

The EUT was placed in an anechoic chamber, see figure SP. The Wireless Communications Test Set was used to set the TX channel and power level and modulate the TX signal with different bit patterns. The test was done using an automated test system, where all test equipments were controlled by a computer.

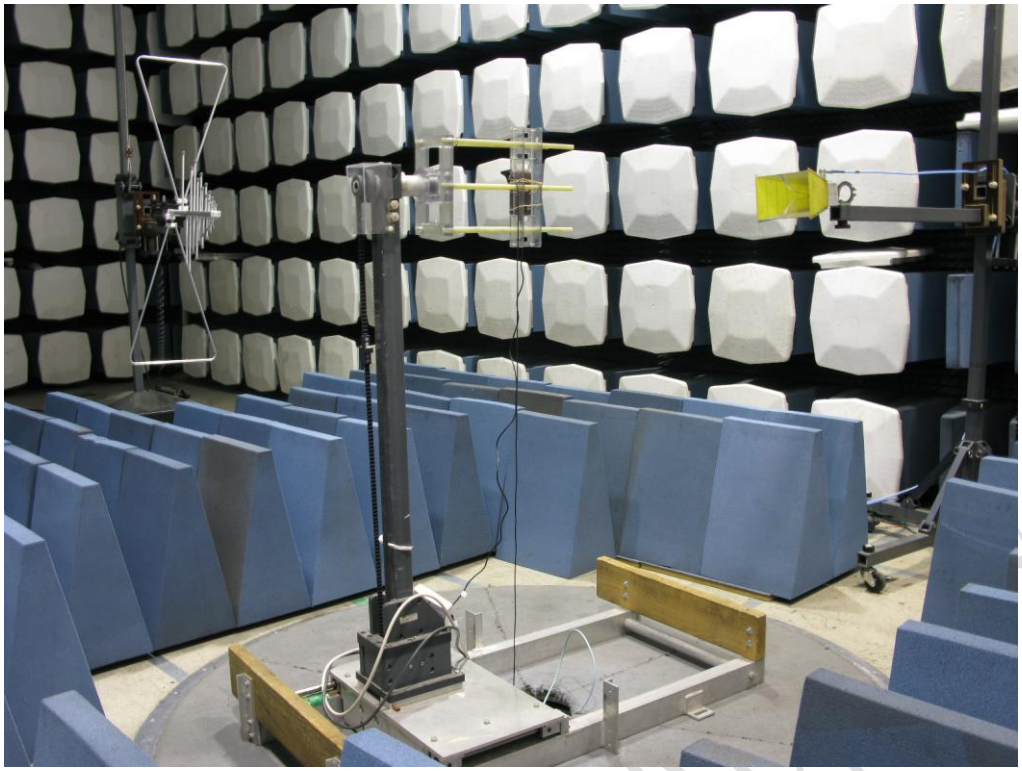


Figure SP

**Test Method:**

The measurement was performed accordance with section 2.2.12 of ANSI/TIA-603-C-2004: *Land Mobile FM or PM Communications Equipment Measurement and Performance Standards*.

1 The maximum spurious emissions were searched by turning the azimuth of the turntable, shifting the polarization of the measuring antenna and changing the pose of the EUT.

2 Levels of EUT's transmitter harmonics and suspicious signals were recorded.

3 The recorded levels were corrected in the automated test system with the correction factors given by a substitution calibration made before the measurement.

4 The corrected values of radiated spurious emissions indicated as EIRP are reported.

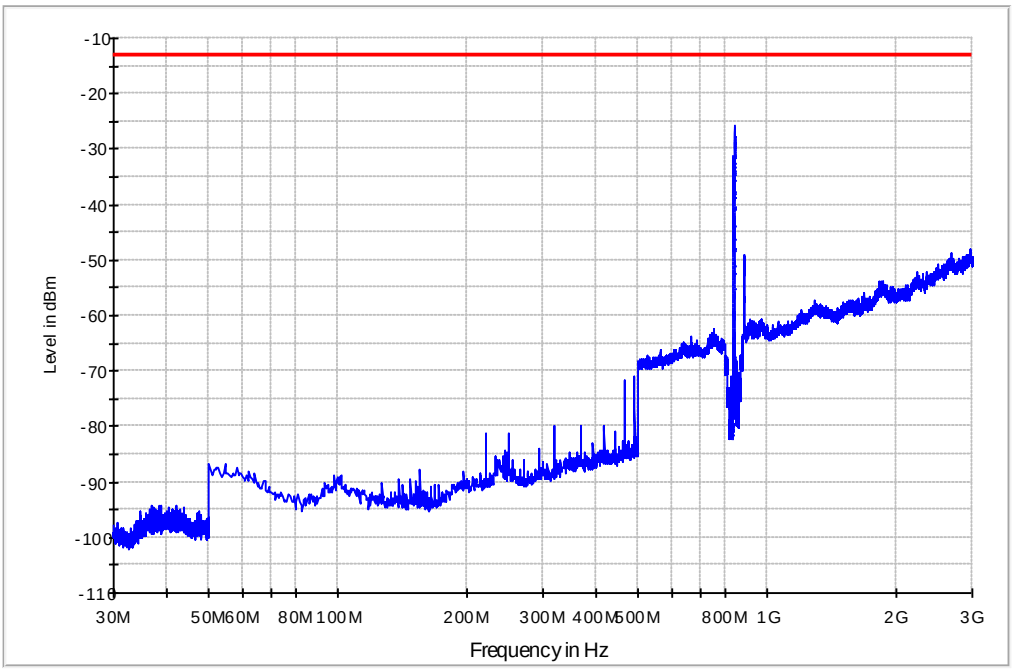
**Note:**

1 The investigated ARFCNs are 4183 (836.6 MHz) and 9400 (1880.0 MHz).

2 The investigated frequency range is 30 MHz to the 10$^{th}$ harmonic of the highest Frequency generated within the equipment.

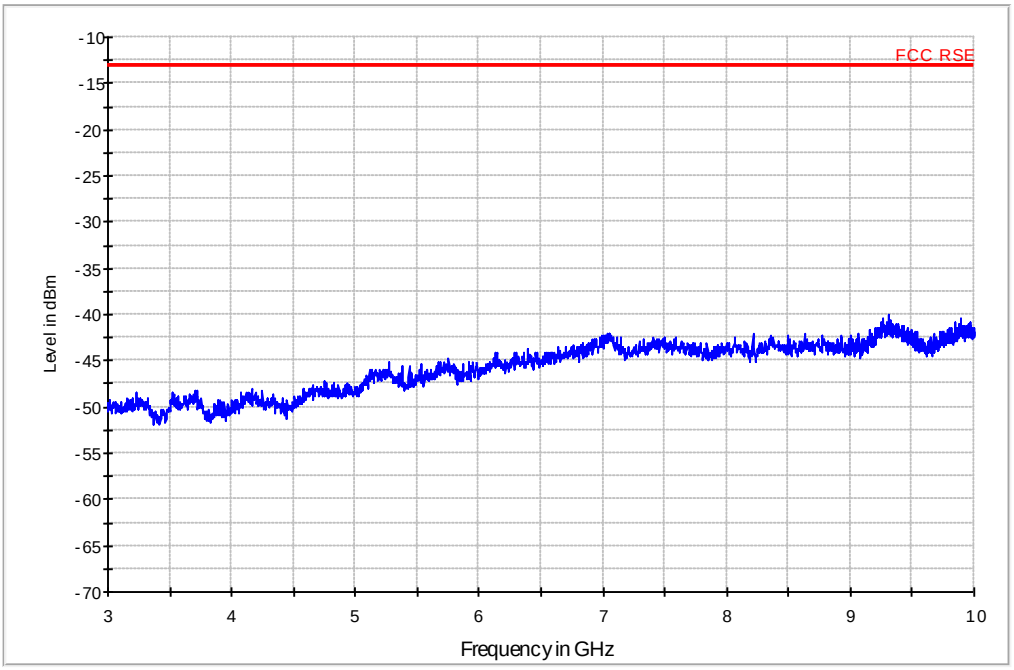
## Graphical test Results:

GSM 850 Tx 30-3GHz-FCC Test

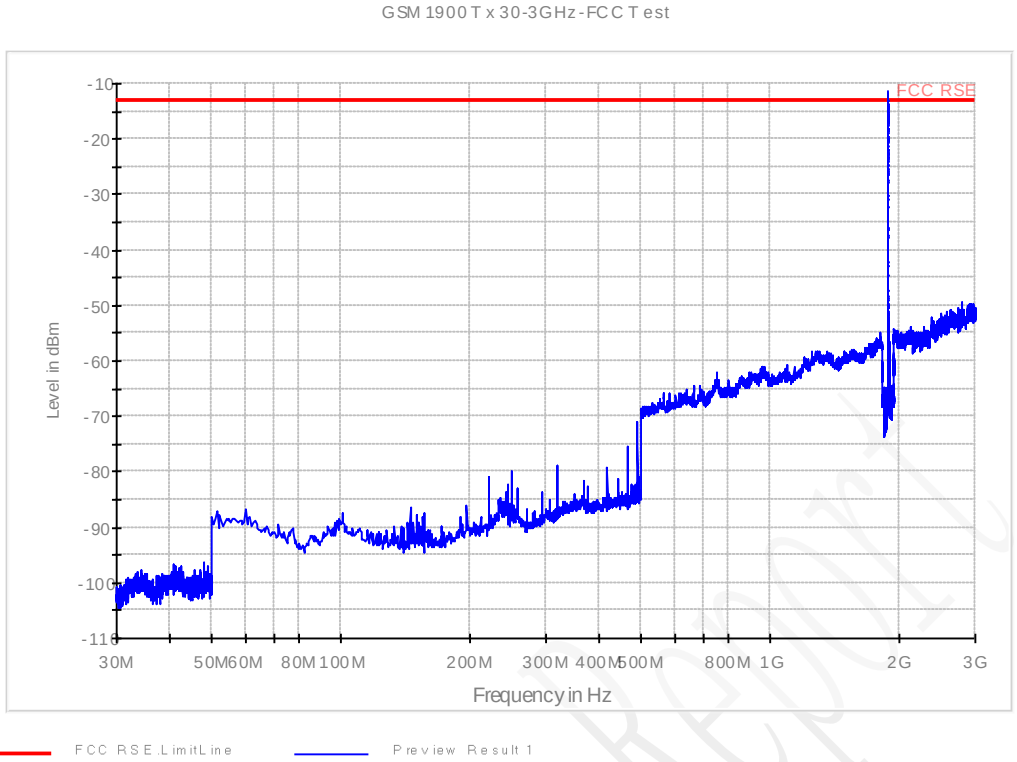



**Channel 4183 for 850MHz – 30MHz to 3GHz**

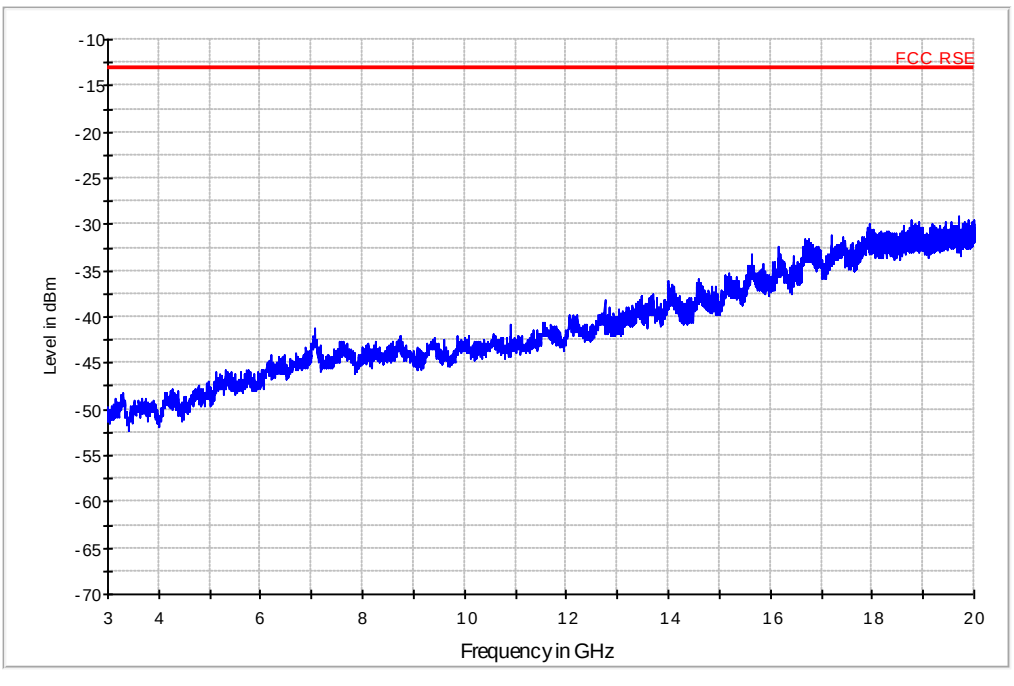
GSM 850 Tx 3-12.75GHz-FCC Test




**Channel 4183 for 850MHz – 3GHz to 10GHz**




**Channel 9400 for 1900MHz– 30MHz to 3GHz**




**Channel 9400 for 1900MHz– 3GHz to 20GHz**

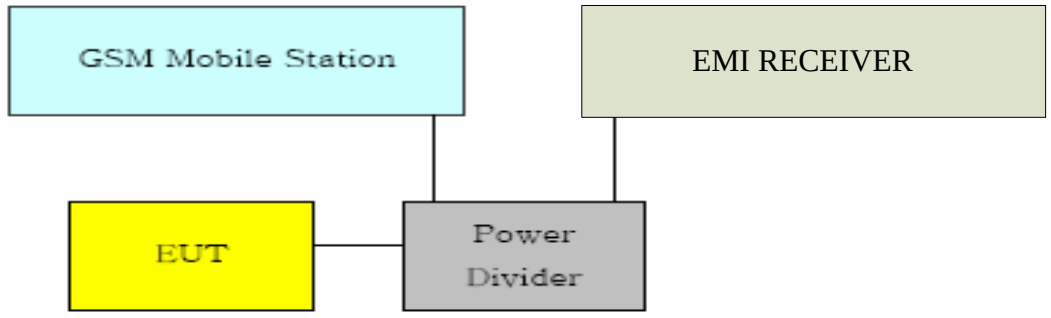
## 4.2 Output Power

### 4.2.1. Conducted Output Power

| | |
|---|---|
| **Specifications:** | 22.913, 24.232 |
| **Test conditions:** | Ambient Temperature:15℃-35℃<br>Relative Humidity:30%-60%<br>Air pressure: 86-106kPa |
| **Operation Mode** | TX on, channel 9262, 9400, 9538, 4132, 4183 and 4233 |
| **Test Results:** | Pass |

**Test Setup:**

During the process of testing, the EUT was controlled via the Wireless Communications Test Set to ensure max power transmission and proper modulation and measured by Rhode & Schwarz EMI test receiver (ESI26).




**Test Method**

1) The EUT was coupled to the EMI test receiver analyzer mode and the base station simulator through a power divider. The radio frequency load attached to the EUT antenna terminal was 50 Ohm. The lost of the cables the test system is calibrated to correct the readings.

2) The spectrum analyzer was set to Max-peak Detector function and Maximum hold mode.

3) The resolution bandwidth of the spectrum analyzer was comparable to the emission bandwidth.

**Note: --**

**Test Result:**

**WCDMA Band II**

| ARFCN | Output Power [dBm] |
|---|---|
| 9262 | 21.85 |
| 9400 | 22.00 |
| 9538 | 21.93 |

**WCDMA Band V**

| ARFCN | Output Power [dBm] |
|---|---|
| 4132 | 21.58 |
| 4183 | 21.83 |
| 4233 | 21.58 |

**HSDPA Band II**

| ARFCN | Output Power [dBm] |
|---|---|
| 9262 | 21.97 |
| 9400 | 22.00 |
| 9538 | 21.96 |

**HSUPA Band II**

| ARFCN | Output Power [dBm] |
|---|---|
| 9262 | 20.67 |
| 9400 | 20.76 |
| 9538 | 20.46 |

**HSDPA Band V**

| ARFCN | Output Power [dBm] |
|---|---|
| 9262 | 21.66 |
| 9400 | 21.83 |
| 9538 | 21.64 |

**HSUPA Band V**

| ARFCN | Output Power [dBm] |
|---|---|
| 9262 | 20.36 |
| 9400 | 20.44 |
| 9538 | 20.24 |

### 4.2.2. Radiated Output Power

**Test Setup:**

The EUT was set in an anechoic chamber, which is connected to the Wireless Communications Test Set located outside the chamber over the air. The test was done using an automated test system, where all test equipments were controlled by a computer.

**Test Method**

The measurement was performed accordance with section 2.2.17 of ANSI/TIA-603-C-2004: *Land Mobile FM or PM Communications Equipment Measurement and Performance Standards*.

1 The maximum power was searched by turning the azimuth of the turntable, shifting the polarization of the measuring antenna and changing the pose of the EUT.

2 The measured levels are EIRP values corrected in the automated test system with the correction factors given by a substitution calibration made before the measurement. The calibration is made separately for vertical and horizontal polarization and the system uses different correction factors depending on the measuring antenna polarization.

3 The corrected maximum levels were reported for EIRP values, and ERP values can be calculated from EIRP values.

**Note:**

ERP dBm = EIRP dBm – 2.15dB.

**EIRP Value for WCDMA Band V:**

**Limits**

| | Burst Peak ERP (dBm) |
|---|---|
| WCDMA Band V | ≤ 38.45 (7W) |

| ARFCN | Frequency [MHz] | ERP [dBm] |
|---|---|---|
| 4132 | 826.40 | 19.84 |
| 4183 | 836.60 | 19.96 |
| 4233 | 846.60 | 19.96 |

**EIRP Value for WCDMA Band II:**

**Limits**

| | Burst Peak EIRP (dBm) |
|---|---|
| WCDMA Band II | ≤ 33 (2W) |

| ARFCN | Frequency [MHz] | EIRP [dBm] |
|---|---|---|
| 9262 | 1852.40 | 22.17 |
| 9400 | 1880.00 | 20.29 |
| 9538 | 1907.60 | 20.06 |

## 4.3 Conducted Emission

| | |
|---|---|
| **Specifications:** | 15.107, 15.207 |
| **Test conditions:** | Ambient Temperature:15℃-35℃<br>Relative Humidity:30%-60%<br>Air pressure: 86-106kPa |
| **Operation Mode** | TX on, channel 4183 and 9400 |
| **Test Results:** | Pass |

**Test Method**

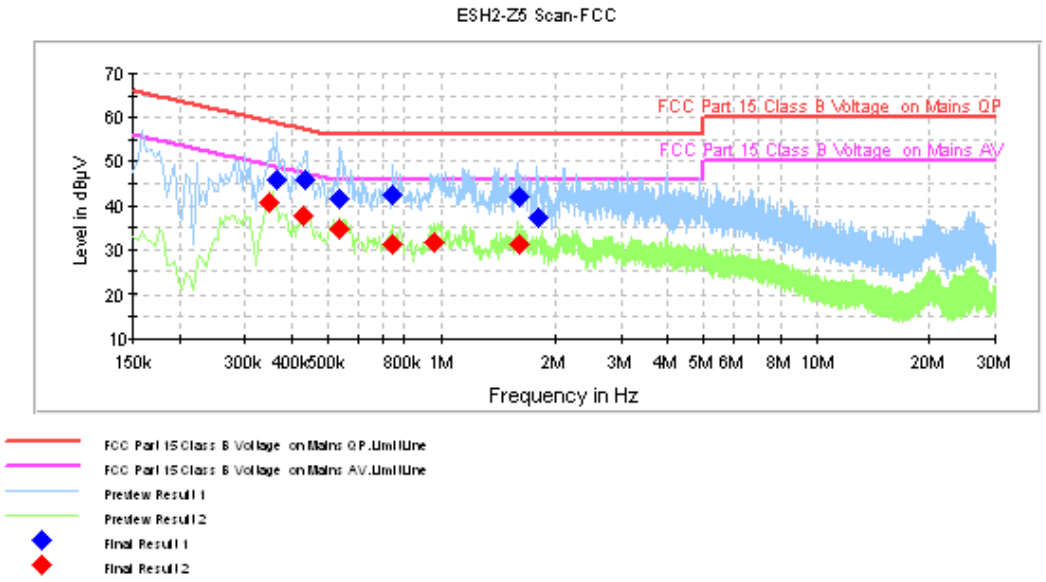
The Measure procedure is ANSI C63.4-2003 is used. Conducted Emission is measured with travel charger.

**Limit**

| Frequency of Emission (MHz) | Conducted Limit (dBμV) | |
|---|---|---|
| | Quasi-Peak | Average |
| 0.15 – 0.5 | 66 to 56* | 56 to 46* |
| 0.5 – 5 | 56 | 46 |
| 5 - 30 | 60 | 50 |
| Note: * Decreases with logarithm of the frequency | | |

**Test Result**

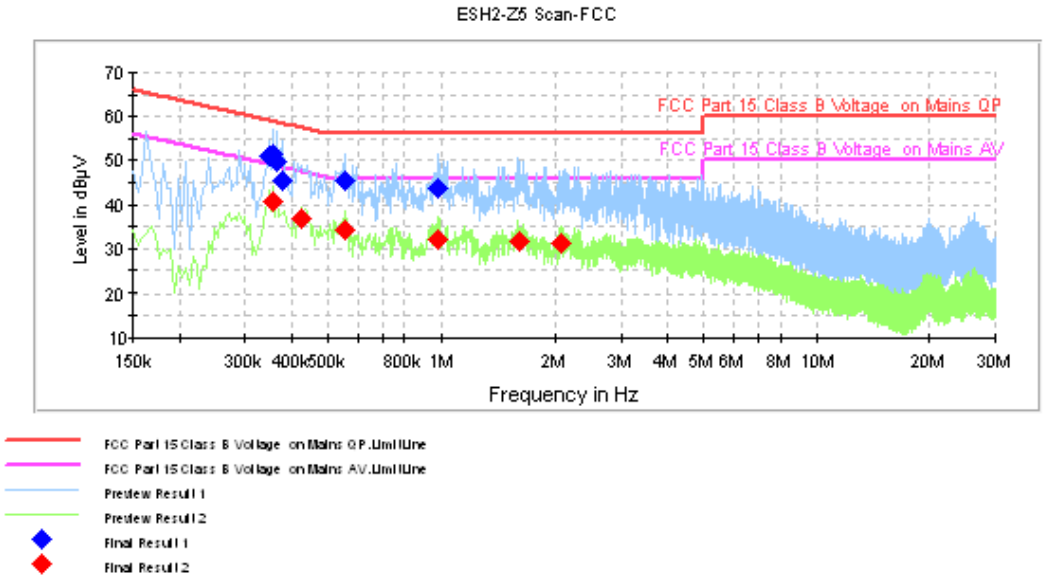
**WCDMA Band V:**




| Frequency (MHz) | QuasiPeak (dBμV) | PE | Line | Corr. (dB) | Margin (dB) | Limit (dBμV) |
|---|---|---|---|---|---|---|
| 0.366000 | 45.9 | FLO | N | 10.1 | 12.7 | 58.6 |
| 0.433500 | 45.9 | FLO | L1 | 10.0 | 11.3 | 57.2 |
| 0.532500 | 41.4 | FLO | N | 10.1 | 14.6 | 56.0 |
| 0.739500 | 42.4 | FLO | L1 | 10.0 | 13.6 | 56.0 |
| 1.603500 | 42.1 | FLO | L1 | 10.1 | 13.9 | 56.0 |
| 1.810500 | 37.0 | FLO | N | 10.1 | 19.0 | 56.0 |

| Frequency (MHz) | CAverage (dBμV) | PE | Line | Corr. (dB) | Margin (dB) | Limit (dBμV) |
|---|---|---|---|---|---|---|
| 0.348000 | 40.8 | FLO | L1 | 10.0 | 8.2 | 49.0 |
| 0.429000 | 37.6 | FLO | L1 | 10.0 | 9.7 | 47.3 |
| 0.532500 | 34.6 | FLO | L1 | 10.1 | 11.4 | 46.0 |
| 0.739500 | 31.4 | FLO | L1 | 10.0 | 14.6 | 46.0 |
| 0.955500 | 31.7 | FLO | N | 10.1 | 14.3 | 46.0 |
| 1.603500 | 31.2 | FLO | N | 10.1 | 14.8 | 46.0 |

**WCDMA Band II:**




| Frequency (MHz) | QuasiPeak (dBμV) | PE | Line | Corr. (dB) | Margin (dB) | Limit (dBμV) |
|---|---|---|---|---|---|---|
| 0.348000 | 51.2 | FLO | L1 | 10.0 | 7.8 | 59.0 |
| 0.357000 | 51.5 | FLO | L1 | 10.0 | 7.3 | 58.8 |
| 0.366000 | 49.5 | FLO | L1 | 10.0 | 9.1 | 58.6 |
| 0.375000 | 45.3 | FLO | N | 10.0 | 13.1 | 58.4 |
| 0.555000 | 45.4 | FLO | L1 | 10.1 | 10.6 | 56.0 |
| 0.978000 | 43.8 | FLO | L1 | 10.1 | 12.2 | 56.0 |

| Frequency (MHz) | CAverage (dBμV) | PE | Line | Corr. (dB) | Margin (dB) | Limit (dBμV) |
|---|---|---|---|---|---|---|
| 0.357000 | 40.7 | FLO | L1 | 10.0 | 8.1 | 48.8 |
| 0.424500 | 36.7 | FLO | N | 10.1 | 10.7 | 47.4 |
| 0.555000 | 34.0 | FLO | L1 | 10.1 | 12.0 | 46.0 |
| 0.978000 | 32.2 | FLO | N | 10.1 | 13.8 | 46.0 |
| 1.603500 | 31.5 | FLO | N | 10.1 | 14.5 | 46.0 |
| 2.080500 | 31.2 | FLO | L1 | 10.1 | 14.8 | 46.0 |

## 4.4 Occupied bandwidth

| | |
|---|---|
| **Specifications:** | 2.1049,22.917(b),24.238(b) |
| **Operation Mode** | TX on, channel 9262, 9400, 9538, 4132, 4183 and 4233 |
| **Test Results:** | Pass |

**Test Setup**

The situation under which maximum EIRP values were found in the measurement of the radiated RF power output was used to determine the 99% occupied bandwidth. The Wireless Communications Test Set was used to set the TX channel, power level and modulation.

**Test Method**

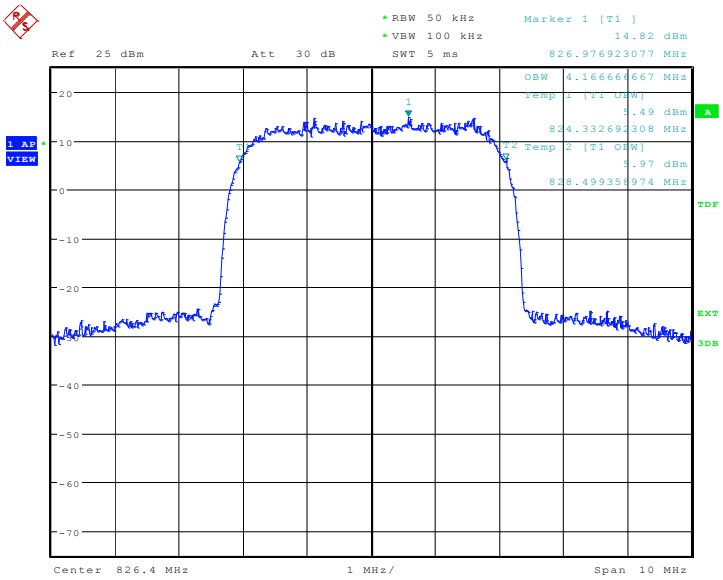
The 99% occupied bandwidth was calculated form the spectrum analyzer. Markers in the spectrum analyzer were then placed between the calculated frequencies to show the calculated 99% power band.

**Note: --**

**Results data:**

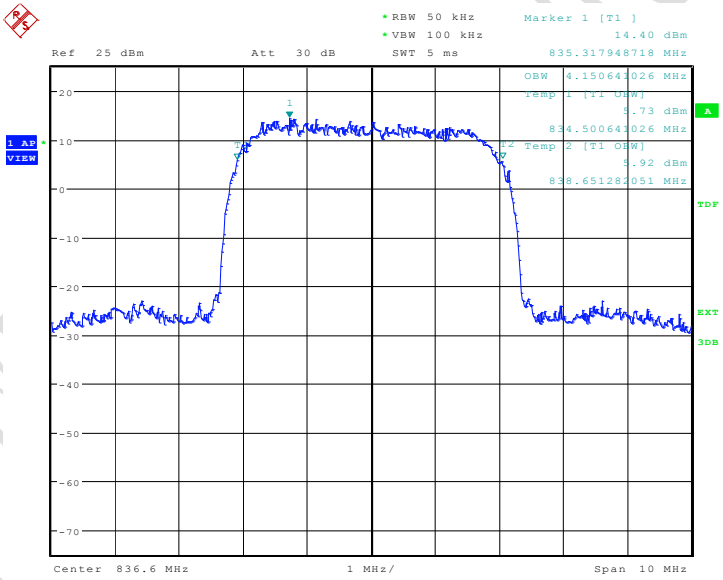
| EUT channel | 99% occupied bandwidth [MHz] |
|---|---|
| 4132 | 4.17 |
| 4183 | 4.15 |
| 4233 | 4.17 |
| 9262 | 4.18 |
| 9400 | 4.17 |
| 9538 | 4.18 |

## Graphical results:



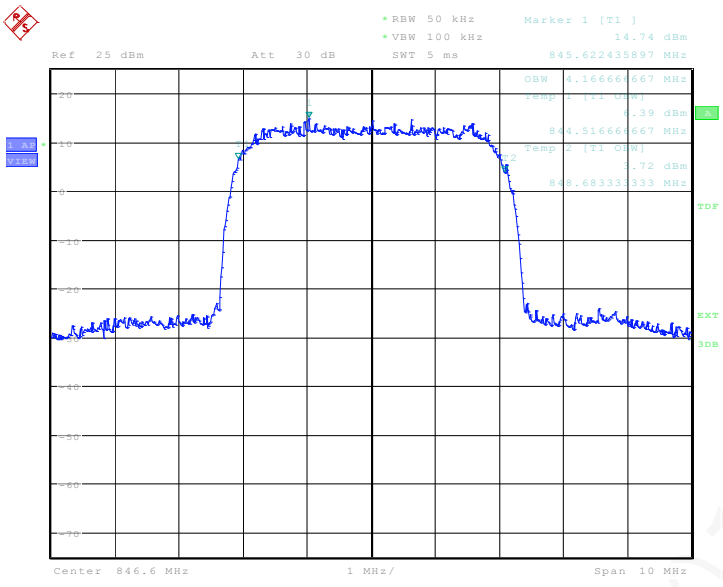

Date: 28.MAY.2012 14:35:29

**Channel 4132**




Date: 28.MAY.2012 14:36:03

**Channel 4183**

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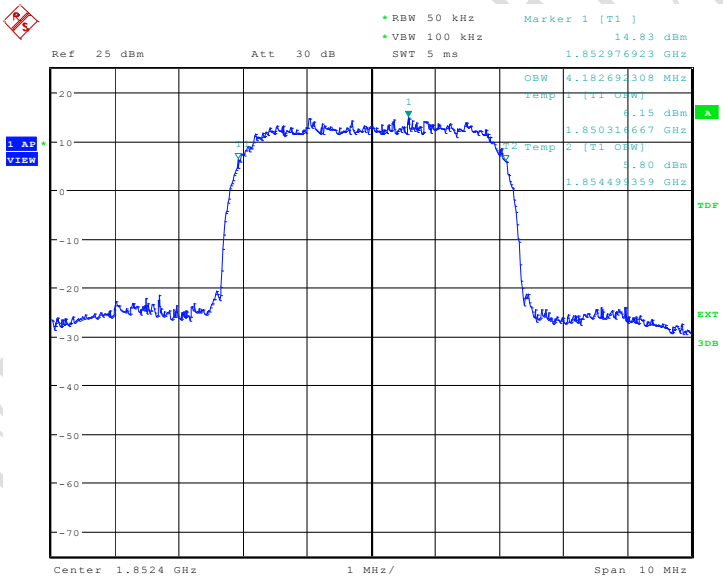
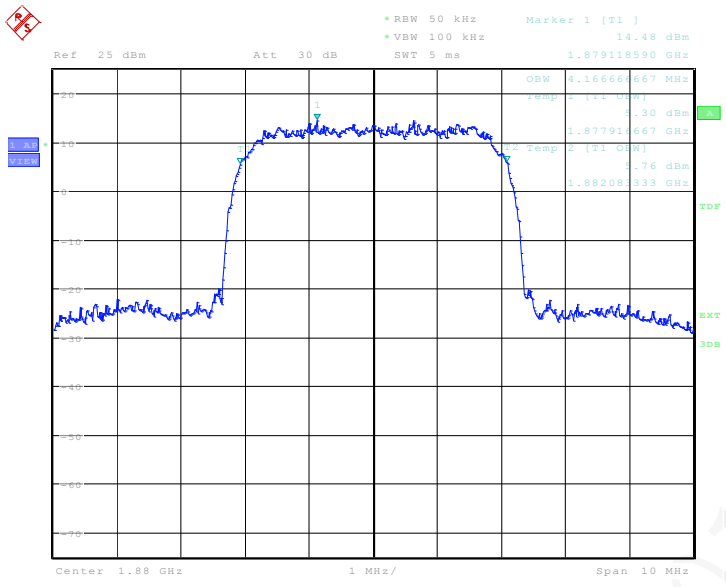
## Channel 4233




Date: 28.MAY.2012 14:18:56

## Channel 9262

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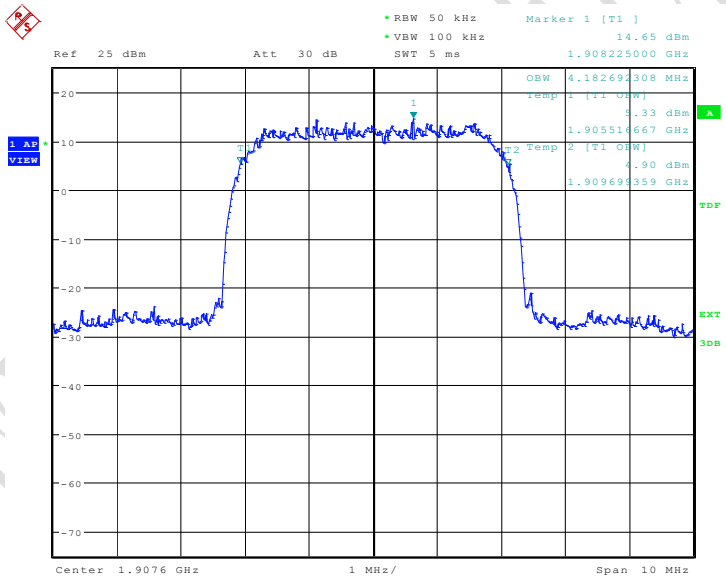
**Channel 9400**

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**Channel 9538**

## 4.5 Emission bandwidth

| | |
|---|---|
| **Specifications:** | 22.917(b), 24.238(b) |
| **Operation Mode** | TX on, channel 9262, 9400, 9538, 4132, 4183 and 4233 |
| **Test Results:** | Pass |

**Test Setup**

The setup of emission bandwidth is similar to conducted emissions.

**Test Method**

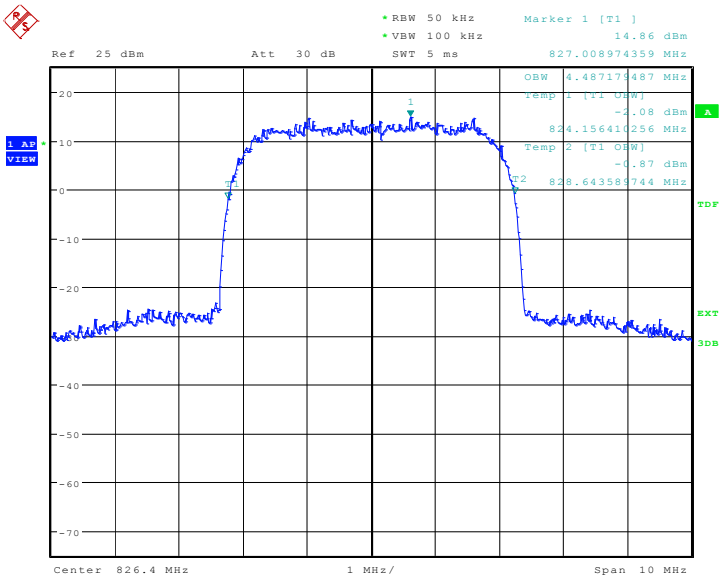
The emission bandwidth measures -26dBc Spectrum analyzer plots from frequencies of WCDMA Band II and WCDMA Band V.

**Note: --**

**Results data:**

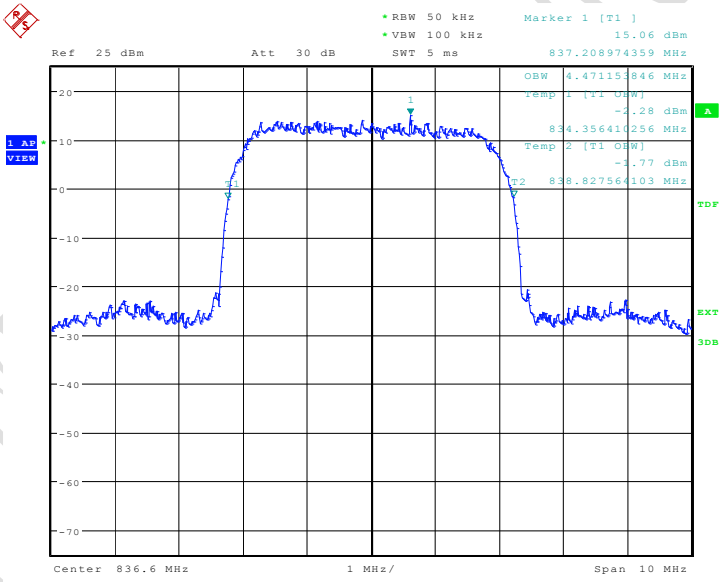
| EUT channel | -26dBc Emission bandwidth [MHz] |
|---|---|
| 4132 | 4.49 |
| 4183 | 4.47 |
| 4233 | 4.49 |
| 9262 | 4.49 |
| 9400 | 4.47 |
| 9538 | 4.49 |

**Graphical results:**



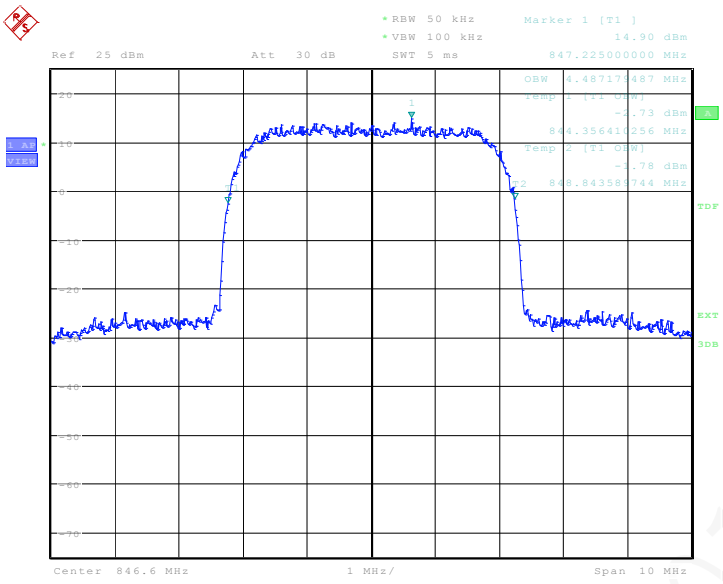

Date: 28.MAY.2012 14:37:14

**Channel 4132**



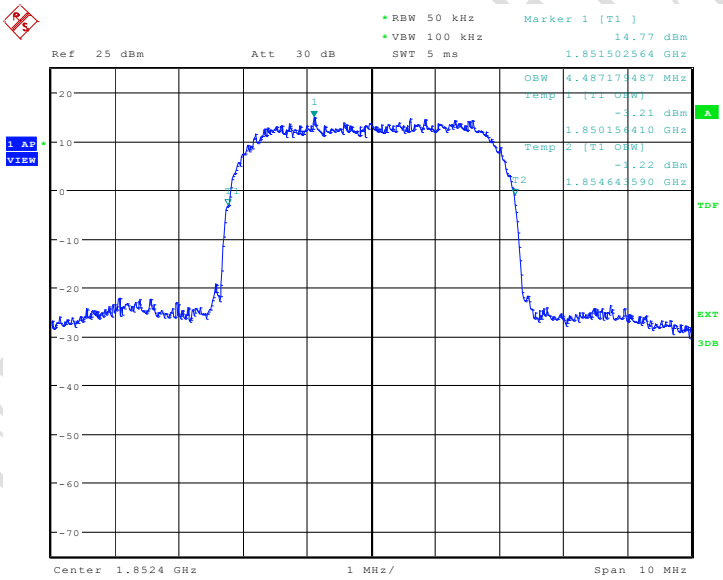

Date: 28.MAY.2012 14:37:49

**Channel 4183**



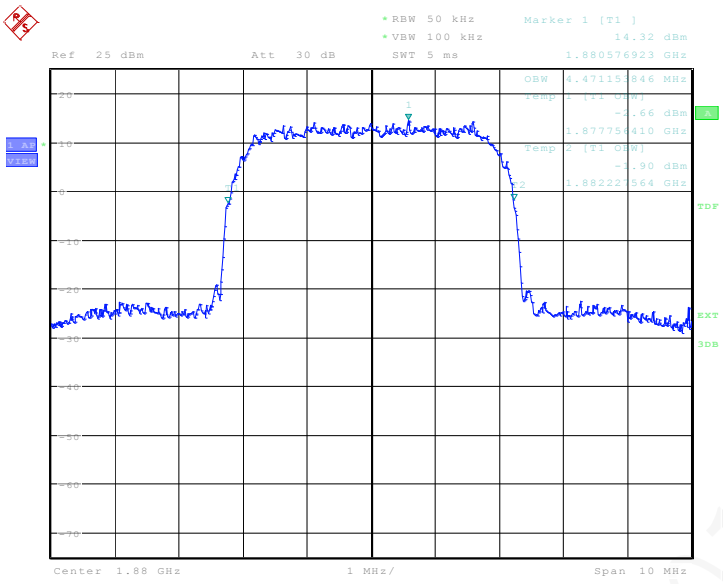

Date: 28.MAY.2012 14:38:23

**Channel 4233**



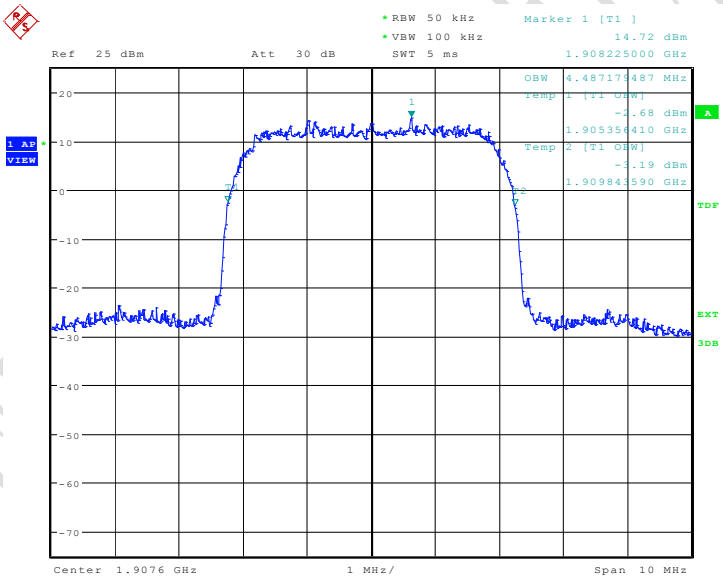

Date: 28.MAY.2012 14:20:41

**Channel 9262**




Date: 28.MAY.2012 14:21:16

**Channel 9400**




Date: 28.MAY.2012 14:21:51

**Channel 9538**

## 4.6 Frequency Stability

| | |
|---|---|
| **Specifications:** | 2.1055,22.355, 24.235 |
| **Test conditions:** | Ambient Temperature:-30℃-50℃<br>Relative Humidity:30%-60%<br>Air pressure: 86-106kPa |
| **Operation Mode** | TX on, channel 4183 and 9400 |
| **Test Results:** | Pass |
| **Limit** | |
| Frequency deviation [ppm] | ±2.5 |

### 4.6.1 Frequency stability over temperature variation

**Test Setup**

The EUT was placed in a temperature chamber, demonstrated as figure T. The wireless communications test set (test simulator) was used to set the TX channel and power levels, modulate the TX signal with different bit patterns and measure the frequency of TX.

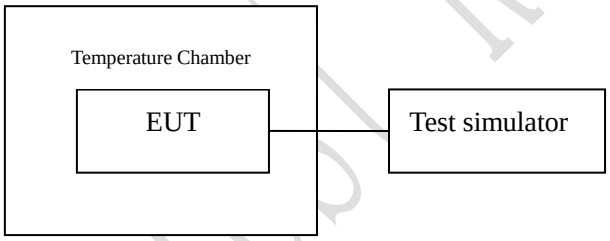



Figure T: setup for measurement of frequency stability over temperature variation

**Test Method**

1. The EUT was turned off and placed in the temperature chamber.
2. The temperature of the chamber was set to -30℃ and allowed to stabilize.
3. The EUT temperature was allowed to stabilize for 45 minutes.
4. The EUT was turned on and set to transmit with CMU200.
5. The maximum transmit frequency deviation during one minute period was measured by Wireless Communications Test Set.
6. The steps 3-5 were repeated for -20℃, -10℃, 0℃, 10℃, 20℃, 30℃, 40℃ and 50℃.

**Test results data:**

Channel 4183:

| Temperature[℃] | Deviation[Hz] | Remarks |
|---|---|---|
| -30 | -15 | Pass |
| -20 | -15 | Pass |
| -10 | -15 | Pass |
| 0 | -14 | Pass |
| 10 | -14 | Pass |
| 20 | -14 | Pass |
| 30 | -14 | Pass |
| 40 | -15 | Pass |
| 50 | -15 | Pass |

Channel 9400:

| Temperature[℃] | Deviation[Hz] | Remarks |
|---|---|---|
| -30 | -19 | Pass |
| -20 | -19 | Pass |
| -10 | -18 | Pass |
| 0 | -18 | Pass |
| 10 | -17 | Pass |
| 20 | -17 | Pass |
| 30 | -17 | Pass |
| 40 | -17 | Pass |
| 50 | -18 | Pass |

### 4.6.2 Frequency Stability over Voltage Variation

| | |
|---|---|
| **Specifications:** | 2.1055,22.355,24.235 |
| **Test conditions:** | Ambient Temperature:15℃-35℃<br>Relative Humidity:30%-60%<br>Air pressure: 86-106kPa |
| **Operation Mode** | TX on, channel 4183 and 9400 |
| **Test Results:** | Pass |
| **Limit** | |
| Frequency deviation [ppm] | ±2.5 |

**Test Setup**

The EUT was placed in a shielding chamber and powered by the dummy battery which is connected to a DC power source, demonstrated as figure V. The wireless communications test set was used to set the TX channel and power level, modulate the TX signal with different bit patterns and measure the frequency of TX.

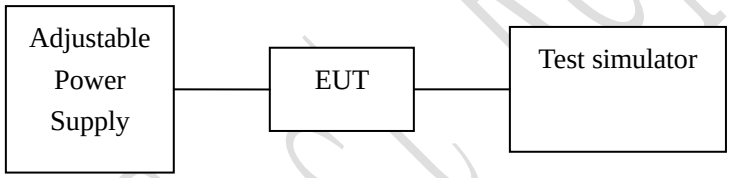



Figure V: test setup for measurement of frequency stability over voltage variation

**Test Results data:**

Channel 4183:

| Level | Voltage[V] | Deviation[Hz] | Remarks |
|---|---|---|---|
| Maximum | 4.2 | -15 | Pass |
| Nominal | 3.7 | -14 | Pass |
| Minimum | 3.5 | -14 | Pass |

Channel 9400:

| Level | Voltage[V] | Deviation[Hz] | Remarks |
|---|---|---|---|
| Maximum | 4.2 | -19 | Pass |
| Nominal | 3.7 | -17 | Pass |
| Minimum | 3.5 | -18 | Pass |

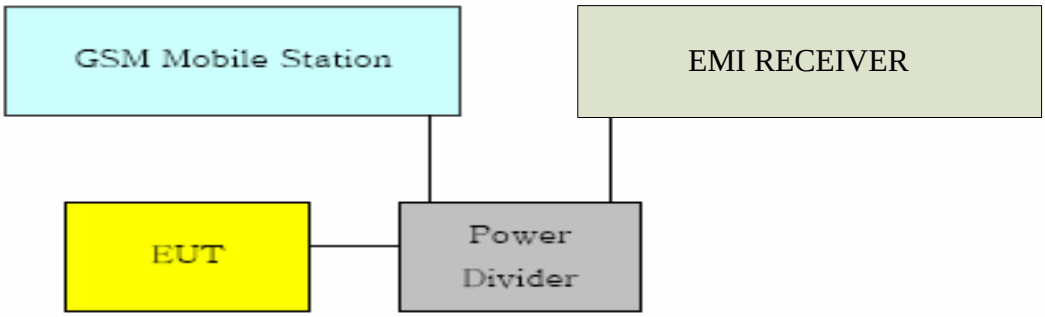
## 4.7 Conducted Spurious Emission

| | |
|---|---|
| **Specifications:** | 2.1051,22.917,24.238 |
| **Test conditions:** | Ambient Temperature:15℃-35℃<br>Relative Humidity:30%-60%<br>Air pressure: 86-106kPa |
| **Operation Mode** | TX on, channel 4183 and 9400 |
| **Test Results:** | Pass |

**Limit Level Construction:**
According to Part 24.238 (a), i.e., Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB, so the limit level is:
P(dBm) – (43 + 10 log(P)) dB= -13dBm

| **Limits for Radiated spurious emissions(UE)** | |
|---|---|
| **Frequency range** | **Limit Level /Resolution Bandwidth** |
| 30 MHz to 20000 MHz | -13dBm/1MHz |

**Test Setup:**
During the process of testing, the EUT was controlled via Wireless Communications Test Set to ensure max power transmission and proper modulation and measured by Rhode & Schwarz EMI test receiver (ESI26)



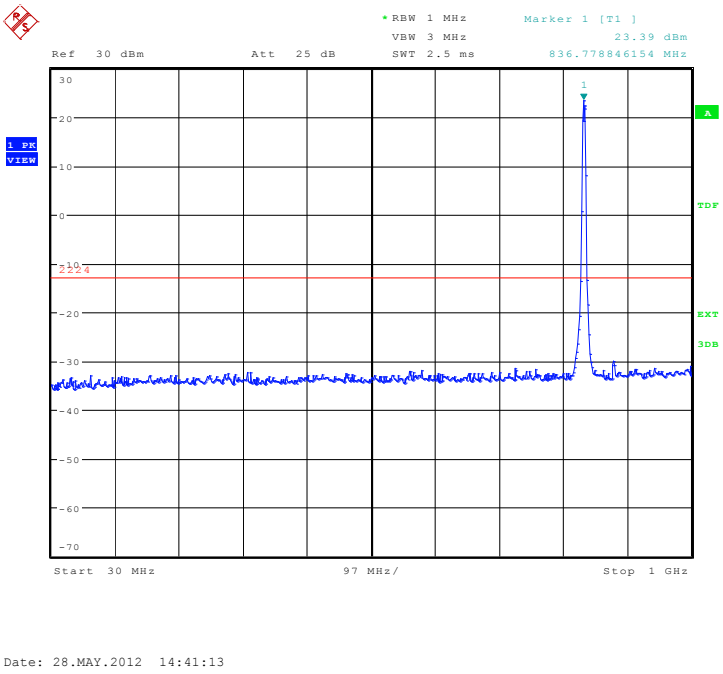

**Test Method**
The measurement was performed accordance with section 2.2.13 of ANSI/TIA-603-C-2004: *Land Mobile FM or PM Communications Equipment Measurement and Performance Standards*.
The following steps outline the procedure used to measure the conducted emissions from the EUT.
1. Determine frequency range for measurements: From CFR 2.1057 the spectrum should be investigated from the lowest radio frequency generated in the equipment up to at least the 10th harmonic of the carrier frequency. For the equipment under test, this equates to a frequency range of 30 MHz to 19.1 GHz,

data taken from 30 MHz to 20 GHz.

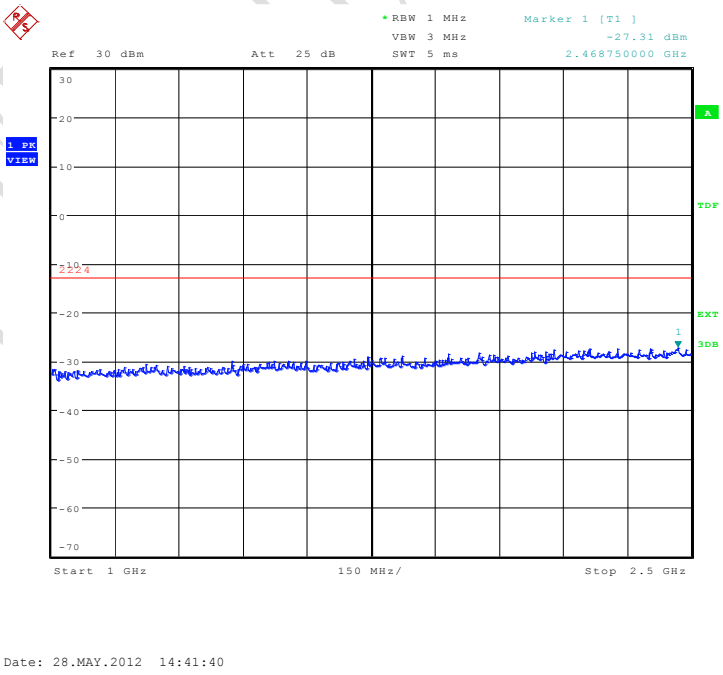
2. Determine EUT transmit frequencies: below outlines the band edge frequencies pertinent to conducted emissions testing.

**Note: --**

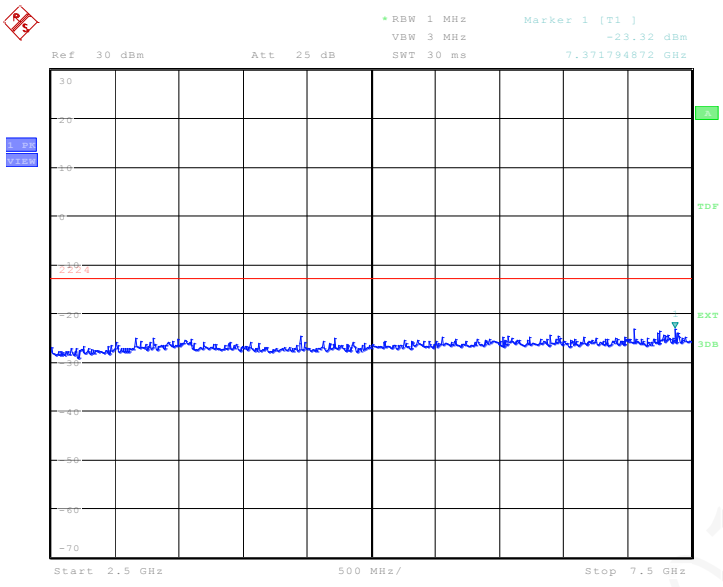
**Graphical results:**




**Channel 4183-30MHz to 1GHz**

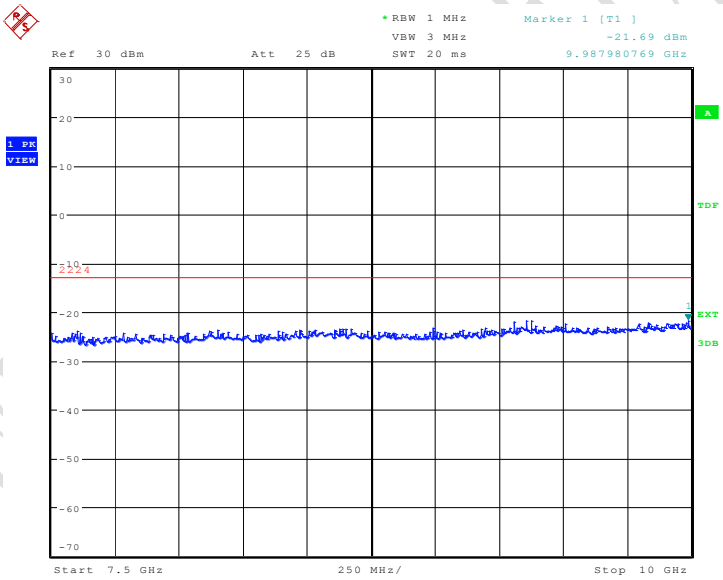



**Channel 4183-1GHz to 2.5GHz**



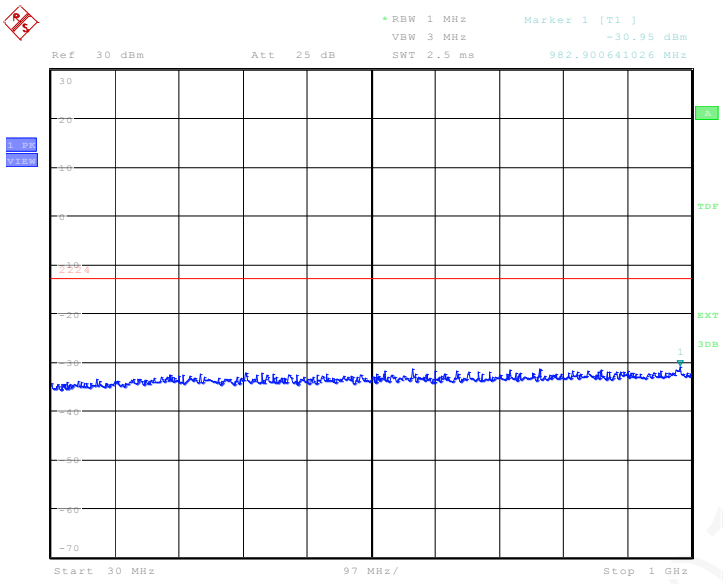

Date: 28.MAY.2012 14:42:08

**Channel 4183-2.5GHz to 7.5GHz**



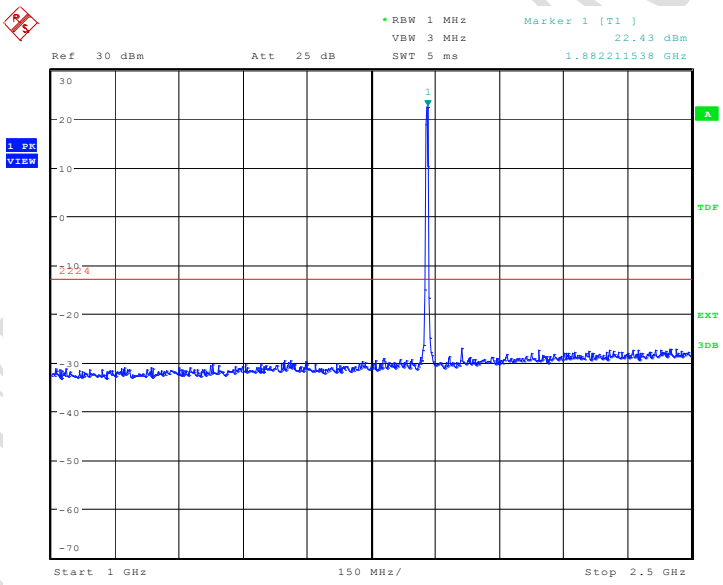

Date: 28.MAY.2012 14:42:37

**Channel 4183-7.5GHz to 10GHz**



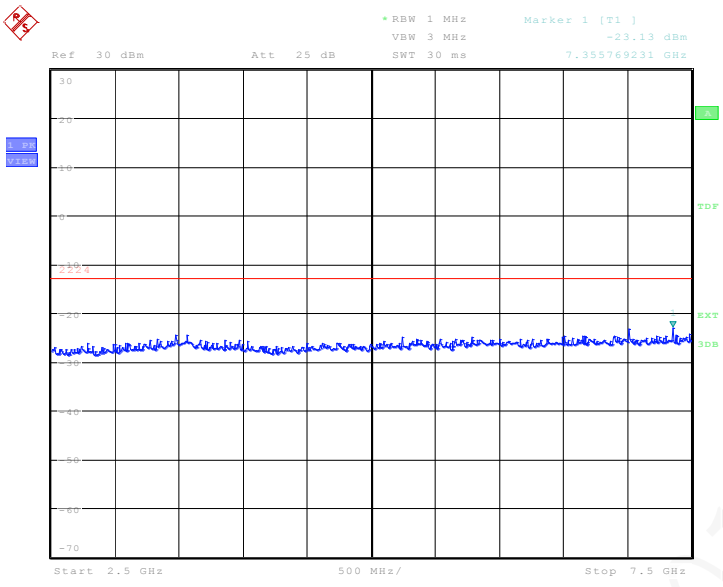

Date: 28.MAY.2012 14:25:37

**Channel 9400-30MHz to 1GHz**



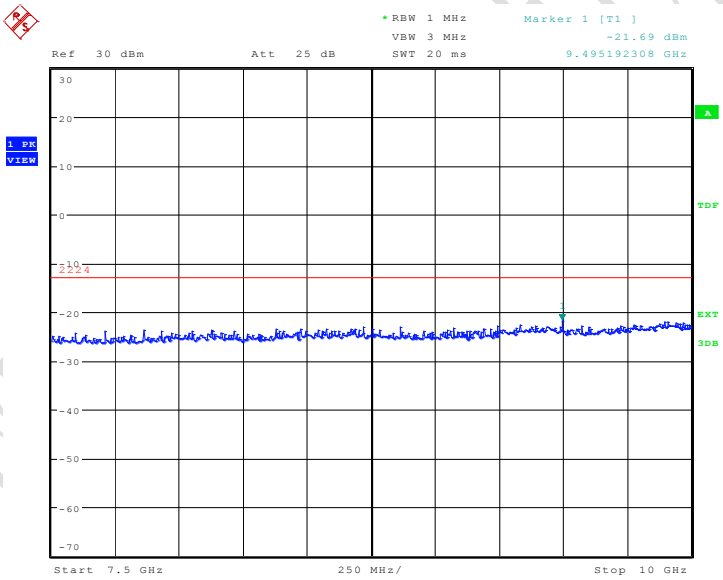

Date: 28.MAY.2012 14:26:05

**Channel 9400- 1GHz to 2.5GHz**



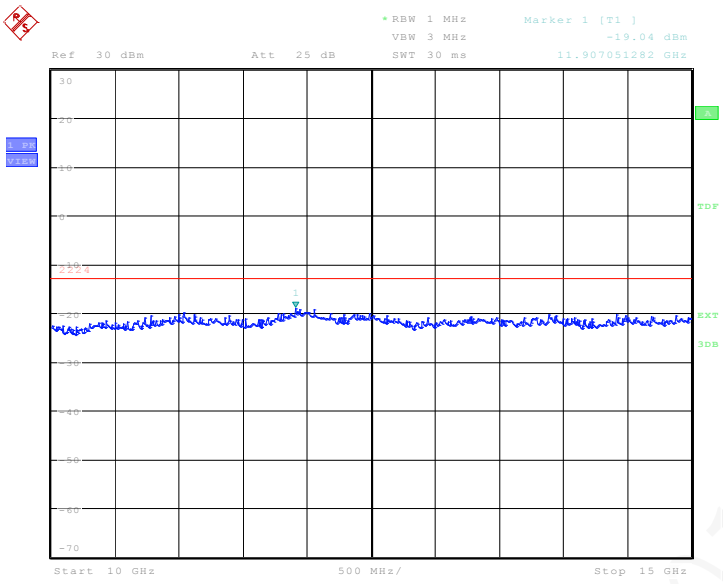

Date: 28.MAY.2012 14:26:33

**Channel 9400- 2.5GHz to 7.5GHz**



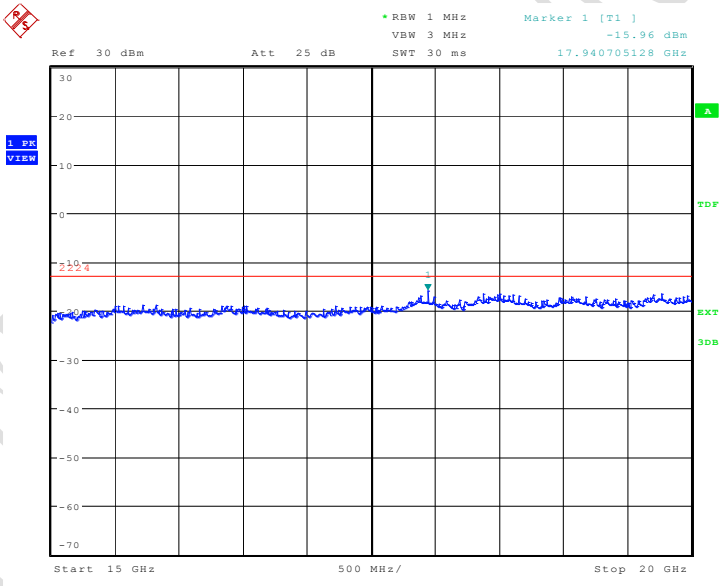

Date: 28.MAY.2012 14:27:01

**Channel 9400- 7.5GHz to 10GHz**




Date: 28.MAY.2012 14:27:30

**Channel 9400- 10GHz to 15GHz**




Date: 28.MAY.2012 14:27:58

**Channel 9400- 15GHz to 20GHz**

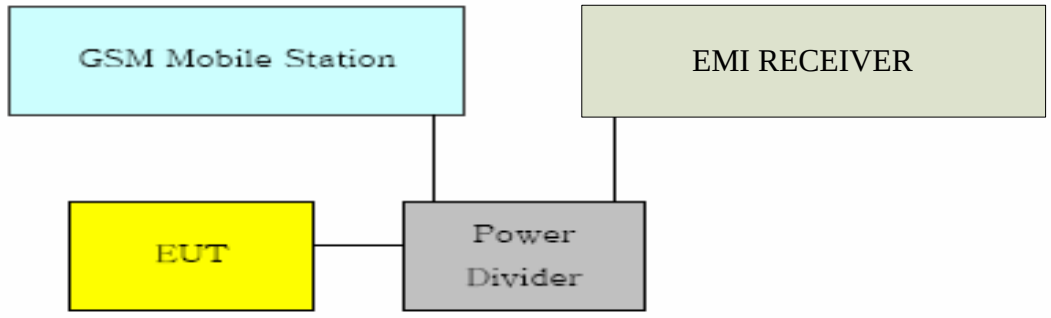
## 4.8 Band Edge Compliance

| | |
|---|---|
| **Specifications:** | 22.917(b), 24.238(b) |
| **Test conditions:** | Ambient Temperature:15℃-35℃<br>Relative Humidity:30%-60%<br>Air pressure: 86-106kPa |
| **Operation Mode** | TX on, channel 4132, 4233, 9262 and 9538 |
| **Test Results:** | Pass |

**Limit Level Construction:**
According to Part 24.238 (a), i.e., Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB, so the limit level is:
P(dBm) – (43 + 10 log(P)) dB= -13dBm

| **Limits for Radiated spurious emissions(UE)** | |
|---|---|
| **Frequency range** | **Limit Level /Resolution Bandwidth** |
| 30 MHz to 20000 MHz | -13dBm/1MHz |

**Test Setup:**
During the process of testing, the EUT was controlled via the Wireless Communications Test Set to ensure max power transmission and proper modulation and measured by Rhode & Schwarz EMI test receiver (ESI26).




**Test Method**
1) The EUT was coupled to the EMI test receiver analyzer mode and the base station simulator through a power divider. The radio frequency load attached to the EUT antenna terminal was 50 Ohm. The attenuation of every cables of the test system is being taken into account by calibration to ensure measurement accuracy
2) The spectrum analyzer was set to Maxpeak Detector function and Maximum hold mode.
3) The resolution bandwidth of the spectrum analyzer was comparable to the

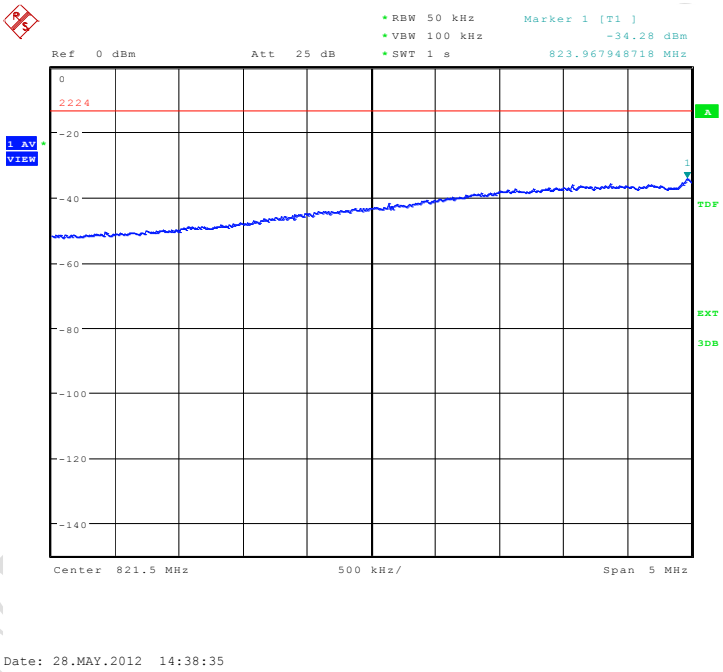
emission bandwidth.

**Note: --**

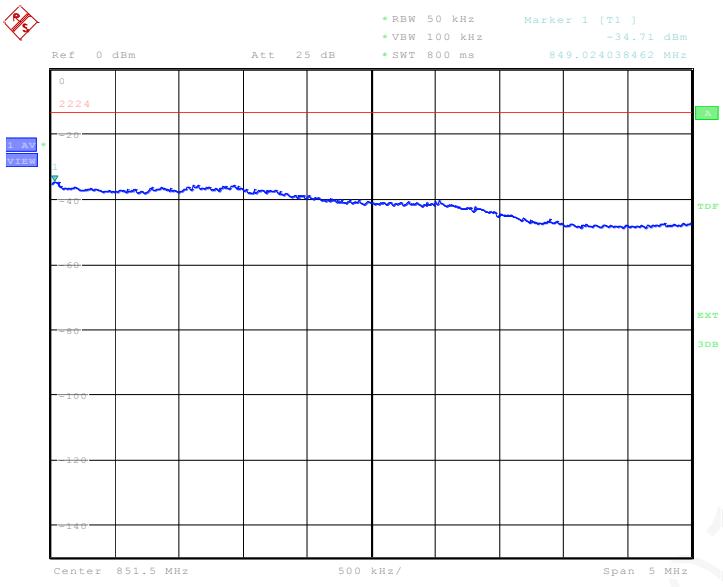
**Test Results:**

| Band-edge emission | | |
|---|---|---|
| EUT Channel | Frequency [MHz] | Level [dBm] |
| 4132 Left band edge | 824.000 | -34.28 |
| 4233 Right band edge | 849.000 | -34.71 |
| 9262 Left band edge | 1850.000 | -30.66 |
| 9538 Right band edge | 1910.000 | -32.18 |

**Graphical results:**

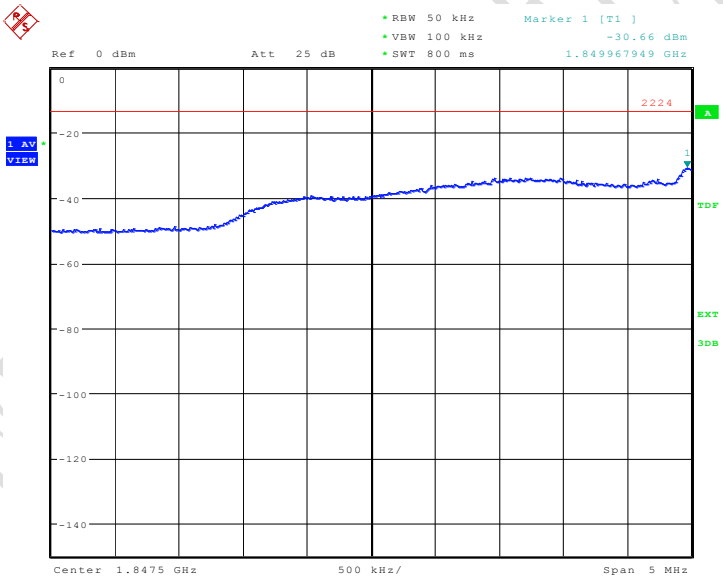



**Channel 4132 Left band edge**



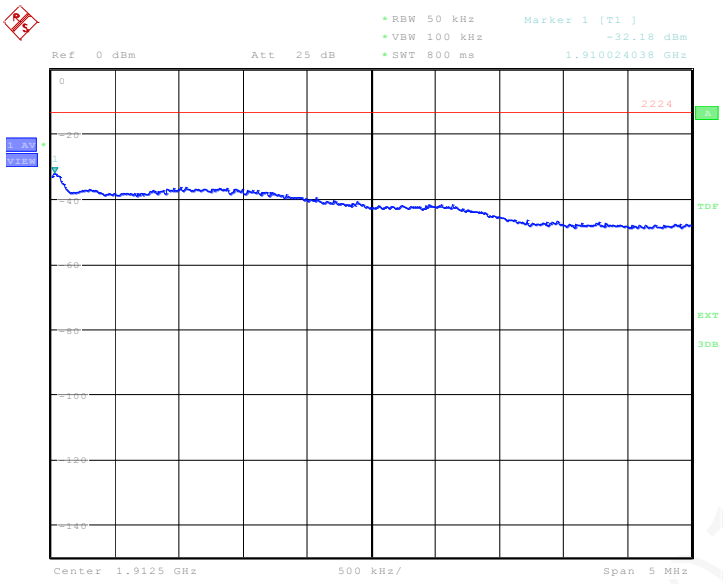

Date: 28.MAY.2012 14:38:46

**Channel 4233 Right band edge**




Date: 28.MAY.2012 14:22:02

**Channel 9262 Left band edge**




**Channel 9538 Right band edge**

# 5 Test Equipments and Ancillaries Used For Tests

The test equipments and ancillaries used are as follows.

## 5.1 Test Equipments for RF Test

| Ref No. | Instrument/ Ancillary | Type | Manufacturer | Serial No. | Cal Due Date |
|---|---|---|---|---|---|
| 1 | Universal Radio Communication Tester | CMU200 | Rohde&Schwarz | 114828 | 2013.01.19 |
| 2 | Spectrum Analyzer | FSU | Rohde&Schwarz | 200679 | 2013.01.18 |
| 3 | Temperature Chamber | SH-241 | ESPEC | 92007516 | 2013.02.24 |
| 4 | DC Power Supply | U3606A | Agilent Technologies | MY50450012 | 2013.11.15 |
| 5 | RF Switch Matrix | OSP130 | Rohde&Schwarz | 100086 | 2013.03.28 |
| 6 | Vector Signal Generator | SMU200A | Rohde&Schwarz | 104072 | 2013.03.28 |
| 7 | MXG Analog Signal Generator | N5183A | Agilent Technologies | MY50140012 | 2013.11.15 |
| 8 | Wireless Communications Test Set | Agilent | 8960(E5515C) | GB41450323 | 2012.06.13 |

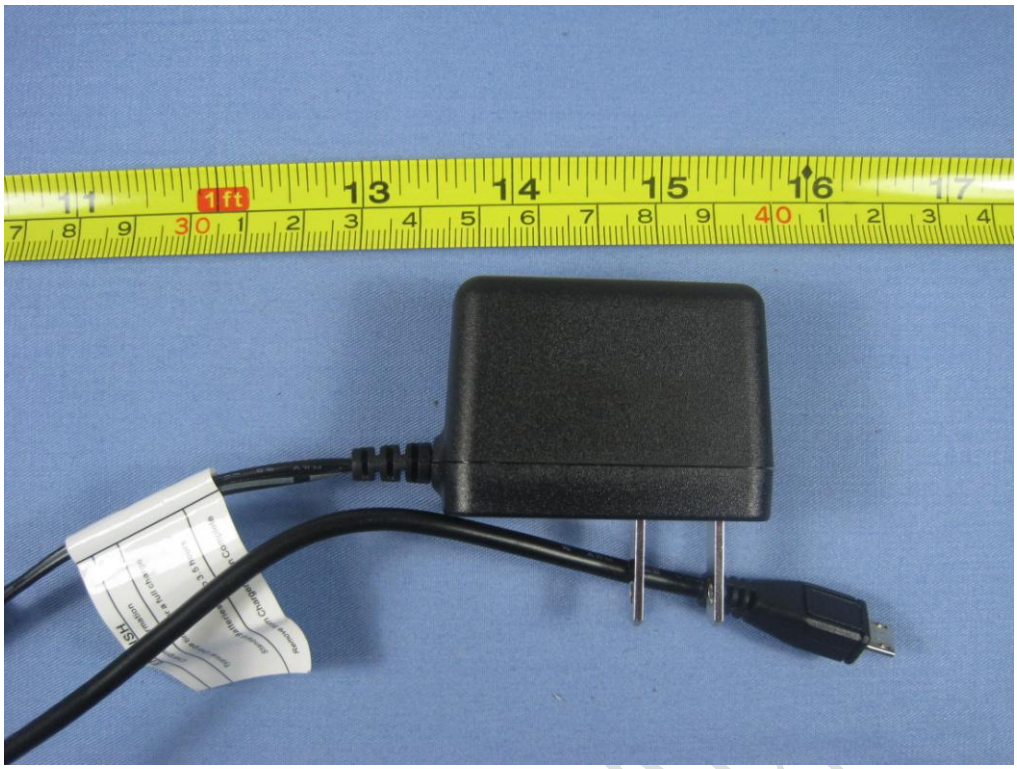
## 5.2 Test Equiments for RSE Test

| Ref No. | Instrument/ Ancillary | Type | Manufacturer | Serial No. | Cal Due Date |
|---|---|---|---|---|---|
| 1 | Universal Radio Communication | CMU200 | Rohde&Schwarz | 114545 | 2013.03.23 |
| 2 | Test Receiver | ESCI | Rohde&Schwarz | 100701 | 2013.12.30 |
| 3 | BiLog Antenna | 9163 | Schwarzbeck | 9163-330 | 2014.03.02 |
| 4 | Double-Ridged Waveguide Horn Antenna | 3164-05 | ETS-Lindgren | 00085724 | 2014.02.18 |
| 5 | Spectrum Analyzer | FSP40 | Rohde&Schwarz | 100378 | 2013.12.23 |
| 6 | Fully Anechoic Chamber | n/a | ETS-Lindgren | n/a | 2013.04.17 |

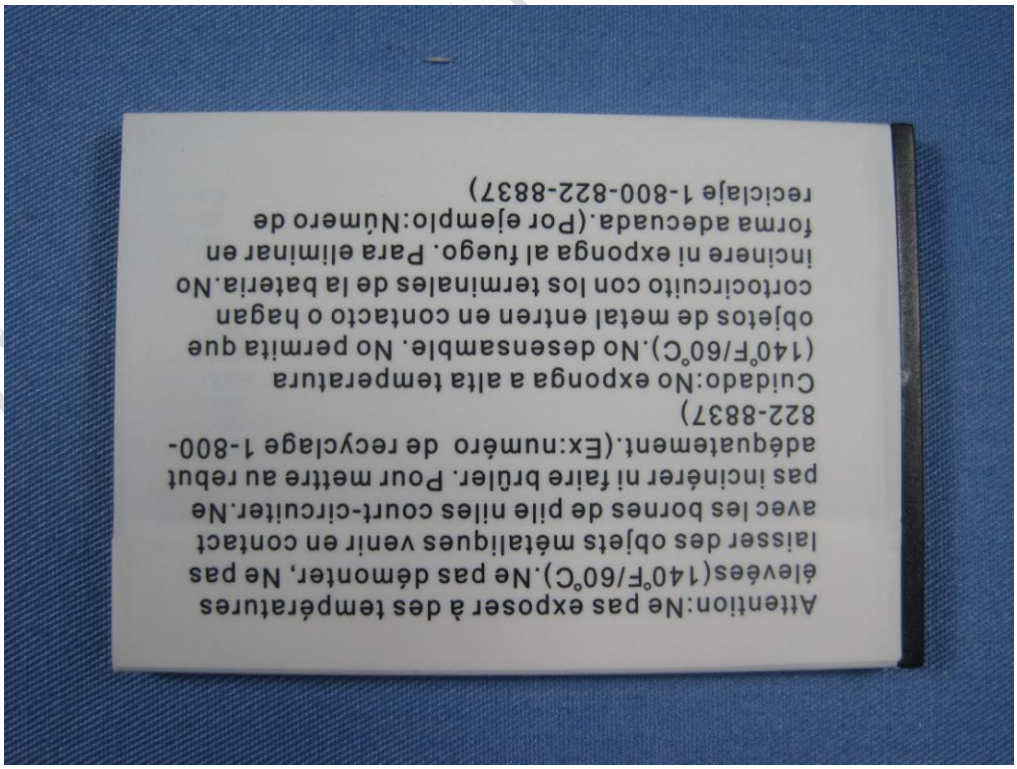
# Annex A External Photos

Front view

Back view



Adaptor and cable




battery

# ANNEX B Deviations from Prescribed Test Methods

No deviation from Prescribed Test Methods.

**The End of this Report**