

# TEST REPORT

For

**Mobile Phone  
(WCDMA/HSDPA/HSUPA850)**

In conformity with

**FCC Part22H (01 Oct, 2009)**

**Model :** F-10C  
**FCC ID :** VQK-F10C  
**Test Item :** Mobile Phone  
**Report No :** RY1103P11R2  
**Issue Date :** 11 Mar, 2011

**Prepared for**

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**Prepared by**

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## History

| Report No.  | Issue Date   | Revision Contents | Issued by |
|-------------|--------------|-------------------|-----------|
| RY1103P11R2 | 11 Mar, 2011 | Initial Issue     | T.Kato    |
|             |              |                   |           |

## 1 General information

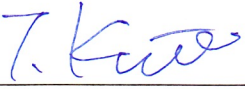
### 1.1 Product description

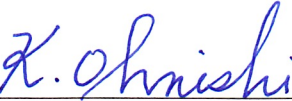
Test item : Mobile Phone  
Manufacturer : FUJITSU LIMITED  
Address : 1-1, Kamikodanaka 4-chome, Nakahara-ku, Kawasaki 211-8588,  
Japan  
Model : F-10C  
FCC ID : VQK-F10C  
Operating frequency range : TX 826.4-846.6 MHz (WCDMA850, HSDPA Cat8, HSUPA Cat6)  
: RX 871.4-891.6 MHz (WCDMA850, HSDPA Cat8, HSUPA Cat6)  
Type of Modulation : QPSK(WCDMA), 16QAM(HSDPA, HSUPA)  
Receipt date of EUT : 22 Feb, 2011  
Nominal power voltages : 3.7VDC  
Power Class : 3 (Maximum power 24dBm nominal)  
Antenna Type : Integral antenna  
Serial numbers : 3546 9004 0004 517

### 1.2 Test(s) performed/ Summary of test result

Applicable Standard(s) : FCC Part22H (01 Oct, 2009)  
Test(s) started : 01 Mar, 2011  
Test(s) completed : 04 Mar, 2011  
Purpose of test(s) : Certification of FCC  
  
Summary of test result : Complied (RF conducted test only)

Note: The above judgment is only based on the measurement data and it does not include the measurement uncertainty. Accordingly, the statement below is applied to the test result.  
The EUT complies with the limit required in the standard in case that the margin is not less than the measurement uncertainty in the Laboratory.  
Compliance of the EUT is more probable than non-compliance is case that the margin is less than the measurement uncertainty in the Laboratory.

Test engineer :   
T. Kato (Engineer, EMC testing department)

Reviewer :   
K. Ohnishi (Manager, EMC testing department)

### 1.3 Test facility

The Federal Communications Commission has reviewed the technical characteristics of the test facilities at RF Technologies Ltd., located in 472, Nippa-cho, Kohoku-ku, Yokohama, 223-0057, Japan, and has found these test facilities to be in compliance with the requirements of 47 CFR Part 15, section 2.948, per 01 October, 2009. The description of the test facilities has been filed under registration number 319924 at the Office of the Federal Communications Commission. The facility has been added to the list of laboratories performing these test services for the public on a fee basis.

The list of all public test facilities is available on the Internet at <http://www.fcc.gov>.

Registered by Voluntary Control Council for Interference by Information Technology Equipment (VCCI).

Each registered facility number is as follows;

Test site (Semi-anechoic chamber 3m) R-2393

Test site (Shielded room) C-2617

Registered by Industry Canada (IC). The registered facility number is as follows;

Test site No.1(Semi-anechoic chamber 3m) : 6974A-1

Accredited by **National Voluntary Laboratory Accreditation Program** (NVLAP) for the emission tests stated in the scope of the certificate under Certificate Number 200780-0

This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.



NVLAP LAB CODE 200780-0

### 1.4 Measurement uncertainty

The treatment of uncertainty is based on the general matters on the definition of uncertainty in “Guide to the expression of uncertainty in measurement (GUM)” published by ISO. The Lab’s uncertainty is determined by referring UKAS Publication LAB34: 2002 “The Expression of Uncertainty in EMC Testing” and CISPR16-4-2: 2003 “Uncertainty in EMC Measurements”.

The uncertainty of the measurement result in the level of confidence of approximately 95% (k=2) is as follows;

RF frequency:  $\pm 1 \times 10^{-7}$

RF power conducted:  $\pm 1.1$  dB

AC Power line emission:  $\pm 1.9$  dB

Radiated emission (30MHz - 1000MHz):  $\pm 5.9$  dB

Radiated emission (1GHz - 20GHz):  $\pm 5.8$  dB

Temperature:  $\pm 1$  degree

Humidity:  $\pm 5$  %

## 1.5 Description of essential requirements and test results

An overview of radio requirements, as laid out in FCC Part22 are given below.

### 1.5.1 Transmitter requirements

| Test Description                               | Section<br>in this report | Test<br>performed | Result      |
|--|---------------------------|-------------------|-------------|
| <b>Carrier Output Power (Conducted)</b>        | <b>2.1</b>                | <b>Yes</b>        | <b>Pass</b> |
| Carrier Output Power (Radiated)                | 2.2                       | No                | -           |
| <b>Frequency Stability (Temp. Variation)</b>   | <b>2.3</b>                | <b>Yes</b>        | <b>Pass</b> |
| <b>Frequency Stability (Voltage Variation)</b> | <b>2.4</b>                | <b>Yes</b>        | <b>Pass</b> |
| <b>Occupied Bandwidth</b>                      | <b>2.5</b>                | <b>Yes</b>        | <b>Pass</b> |
| <b>Out of Band Emissions (Conducted)</b>       | <b>2.6</b>                | <b>Yes</b>        | <b>Pass</b> |
| Out of Band Emissions (Radiated)               | 2.7                       | No                | -           |
| <b>Band Edge Emissions</b>                     | <b>2.8</b>                | <b>Yes</b>        | <b>Pass</b> |

### 1.5.2 AC Power Line Parameters

| Test Description                                | Section<br>in this report | Test<br>Performed | Result |
|---|---------------------------|-------------------|--------|
| AC power line Spurious Emissions (Traffic mode) | 2.9                       | No                | -      |

### 1.5.3 Normal test conditions

Temperature(\*) : +15 degC to +35 degC  
Relative humidity(\*) : 20 % to 75 %  
Supply voltage : 3.7 VDC (Nominal)  
Measurement Frequency : 826.4 MHz(4132ch), 836.4 MHz(4182ch), 846.6 MHz(4233ch)

\* When it is impracticable to carry out tests under these conditions, a note to this effect, stating the ambient temperature and relative humidity during the tests, must be stated separately.

### 1.5.4 Extreme test conditions

Temperature : -30 °C (min) to +50 °C (max)  
Supply voltage : 3.33 VDC [min] to 4.07 VDC [max] (declared by manufacturer)

## 1.6 Setup of equipment under test (EUT)

### 1.6.1 Test configuration of EUT

#### Equipment(s) under test:

|   | Item         | Manufacturer    | Model No. | Serial No.         |
|---|--------------|-----------------|-----------|--------------------|
| A | Mobile Phone | FUJITSU LIMITED | F-10C     | 3546 9004 0004 517 |

#### Support Equipment(s):

|   | Item | Manufacturer | Model No. | Serial No. | Comment |
|---|------|--------------|-----------|------------|---------|
| B | -    | -            | -         | -          | -       |

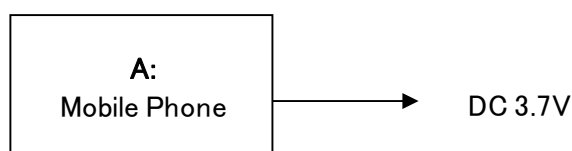
#### Connected cable(s):

| No. | Item | Identification<br>(Manu.e.t.c) | Shielded<br>Yes / No | Ferrite<br>Core<br>Yes / No | Connector<br>Type<br>Shielded<br>Yes / No | Length<br>(m) |
|-----|------|--------------------------------|----------------------|-----------------------------|---|---------------|
| -   | -    | -                              | -                    | -                           | -   | -             |

### 1.6.2 Operating condition:

Traffic mode : EUT is connected with RF tester in Max power level. (Normal/HSDPA/HSUPA mode)

### 1.6.3 Setup diagram of tested system:



## 1.7 Equipment modifications

No modifications have been made to the equipment in order to achieve compliance with the applicable standards described in clause 1.2.

## 1.8 Deviation from the standard

No deviations from the standards described in clause 1.2.

## 2 Test procedure and result

### 2.1 Carrier Output Power (Conducted)

#### Reference Standard

Part22.913, 2.1046

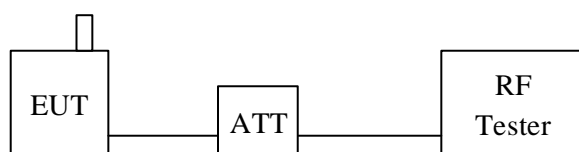
#### Test Conditions

Date: 01 Mar, 2011  
Ambient Temperature: 22 degC  
Relative humidity: 47 %  
Test Voltage: 3.7 VDC

#### Test Method

- EUT is connected to RF tester with pseudo random data modulation and set to maximum output power level.
- The output power is measured with RF tester (CMU200 etc.).

#### Test Setup



#### Test Results

| Channel         | Frequency [MHz] | Output Power [dBm] |       |       |
|-----------------|-----------------|--------------------|-------|-------|
|                 |                 | Normal             | HSDPA | HSUPA |
| Bottom (4132ch) | 826.4           | 23.4               | 22.6  | 22.8  |
| Middle (4182ch) | 836.4           | 23.4               | 22.6  | 22.7  |
| Top (4233ch)    | 846.6           | 23.6               | 22.8  | 22.9  |

#### Test Equipment Used

| Equipment name | RFT ID No. |
|----------------|------------|
| RF tester      | RC03       |
| RF cable       | CL27       |

## **2.2 Carrier Output Power (Radiated)**

### **Reference Standard**

Part22.913, 2.1046

### **Test Conditions**

Date: -  
Ambient Temperature: -  
Relative humidity: -  
Test Voltage: -

### **Test Method**

Substitution method is used for this test.

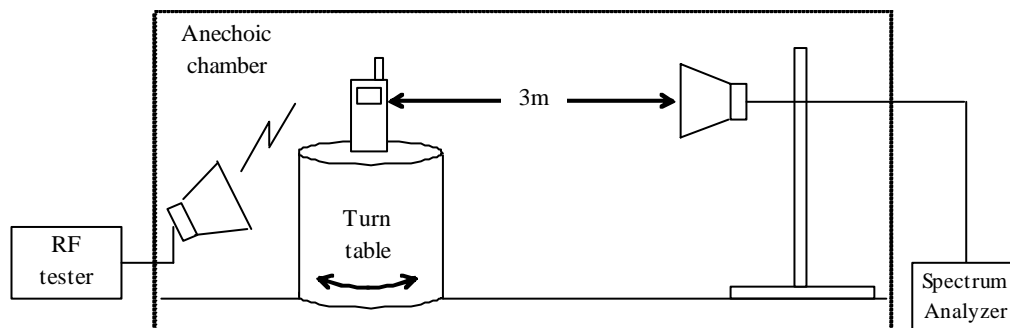
- a) EUT is set on non-conducting table and the output power is set to the maximum level.
- b) As a receive antenna, Horn antenna is used.
- c) Maximum power is measured by a spectrum analyzer (SA) in below conditions.
  - Turntable is rotated 360 degrees.
  - The height of receive antenna is changed from 1m to 4m.
  - Receive antenna polarization is set to vertical and horizontal.
  - This maximum power is recorded.
  - During this measurement, receive antenna is adjusted the direction to keep the EUT within the beamwidth of receive antenna.
- d) Reference antenna is replaced with EUT, and connected with signal generator (SG).
  - SG output power is adjusted to get same level as the recorded maximum radiated EUT power by SA.
- e) Radiated output power (Pout) is calculated with adjusted SG output (Psg) [dBm], reference antenna gain (Gref) [dBd] and cable loss between SG and reference antenna (Lcab) [dB].

$$P_{out} \text{ [dBm e.r.p]} = P_{sg} + G_{ref} + L_{cab}$$

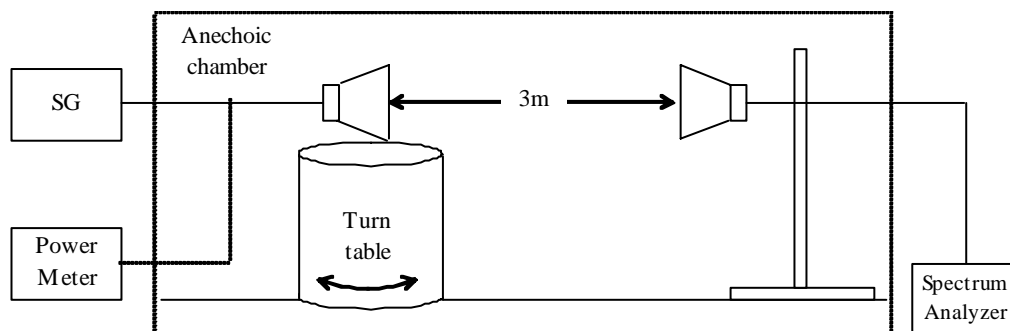


## Test Setup

[Measurement]



[Substitution]



## Test Results

## Test Equipment Used

## Final Result

This item was not tested.

## 2.3 Frequency Stability (Temperature)

### Reference Standard

Part22.355, 2.1055

### Test Conditions

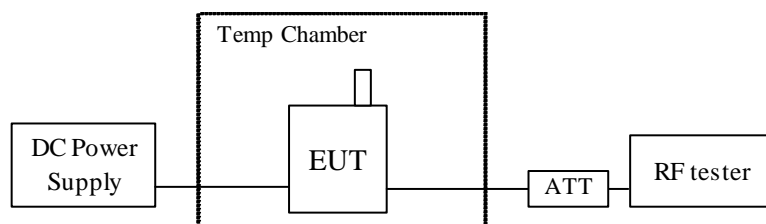
Date: 04 Mar, 2011  
Ambient Temperature: 23 degC  
Relative humidity: 20 %  
Test Voltage: 3.7 VDC

### Test Method

To measure the carrier frequency, "Frequency error measurement" function of RF tester is used.

- a) EUT is hold about 30 minutes under measurement temperature condition.
- b) EUT is powered on with nominal voltage.
- c) EUT is connected to RF tester with Max transmit power level.
- d) Frequency error is measured by RF tester for 10 minutes.
- e) Process a) to d) is repeated at 10deg increments from -30 to +50degC.

### Test Setup



**Test Results****Middle Channel (4182ch, Nominal Freq.:836.4MHz)**

| Temperature<br>[deg C] | Frequency Error<br>[Hz] | Frequency Error<br>[ppm] | Limit [ppm] | Result |
|------------------------|-------------------------|--------------------------|-------------|--------|
| -30                    | + 30                    | + 0.04                   | $\pm 2.5$   | Pass   |
| -20                    | + 21                    | + 0.03                   | $\pm 2.5$   | Pass   |
| -10                    | + 8                     | + 0.01                   | $\pm 2.5$   | Pass   |
| 0                      | +10                     | + 0.01                   | $\pm 2.5$   | Pass   |
| 10                     | - 12                    | - 0.01                   | $\pm 2.5$   | Pass   |
| 20                     | + 10                    | + 0.01                   | $\pm 2.5$   | Pass   |
| 30                     | - 11                    | - 0.01                   | $\pm 2.5$   | Pass   |
| 40                     | + 17                    | + 0.02                   | $\pm 2.5$   | Pass   |
| 50                     | + 19                    | + 0.02                   | $\pm 2.5$   | Pass   |

**Test Equipment Used**

| Equipment name | RFT ID No. |
|----------------|------------|
| RF tester      | RC03       |
| Temp Chamber   | TC01       |

**Final Result**

The EUT met the requirements of the standard for this test

## 2.4 Frequency Stability (Voltage)

### Reference Standard

Part22.355, 2.1055

### Test Conditions

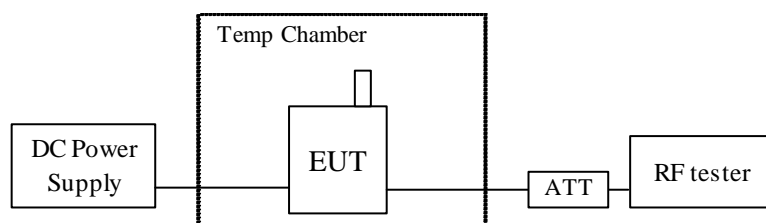
Date: 04 Mar, 2011  
Ambient Temperature: 23 degC  
Relative humidity: 20 %  
Test Voltage: 3.33 to 4.07 VDC

### Test Method

To measure the carrier frequency, "Frequency error measurement" function of RF tester is used.

- EUT is powered on with nominal voltage. Temperature is 20degC.
- EUT is connected to RF tester with Max transmitter power level.
- Frequency error is measured by RF tester for 10 minutes.
- Process a) to c) is repeated at minimum and maximum voltage condition.

### Test Setup



### Test Results

#### Middle Channel (4182ch, Nominal Freq.:836.4MHz)

| Voltage [V] | Frequency Error [Hz] | Frequency Error [ppm] | Limit [ppm] | Result |
|-------------|----------------------|-----------------------|-------------|--------|
| 3.33        | - 12                 | - 0.01                | ± 2.5       | Pass   |
| 3.70        | + 10                 | + 0.01                | ± 2.5       | Pass   |
| 4.07        | - 9                  | - 0.01                | ± 2.5       | Pass   |

### Test Equipment Used

| Equipment name | RFT ID No. |
|----------------|------------|
| RF tester      | RC03       |
| Temp chamber   | TC01       |

### Final Result

The EUT met the requirements of the standard for this test

## 2.5 Occupied Bandwidth

### Reference Standard

Part2.1049

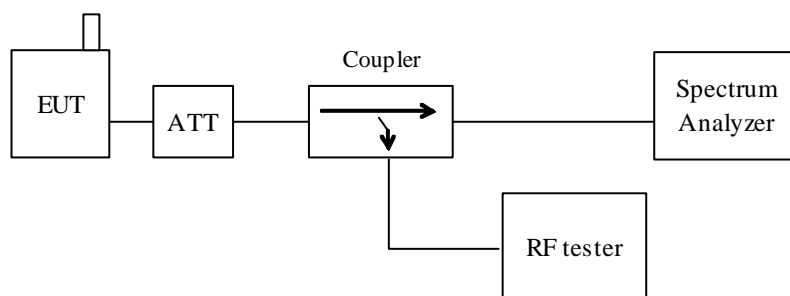
### Test Conditions

Date: 01 Mar, 2011  
Ambient Temperature: 22 degC  
Relative humidity: 47 %  
Test Voltage: 3.7 VDC

### Test Method

- EUT is connected to RF tester with Max transmitter power level.
- 26dB bandwidth is measured by Spectrum Analyzer.
- 99% occupied bandwidth of transmitter spectrum is measured by Spectrum Analyzer.

### Test Setup



### Test Results

| Channel | Frequency [MHz] | 26dB Bandwidth [MHz] |       |       | 99% Bandwidth [MHz] |       |       |
|---------|-----------------|----------------------|-------|-------|---------------------|-------|-------|
|         |                 | Normal               | HSDPA | HSUPA | Normal              | HSDPA | HSUPA |
| 4132ch  | 826.4           | 4.625                | 4.645 | 4.650 | 4.144               | 4.149 | 4.149 |
| 4182ch  | 836.4           | 4.655                | 4.640 | 4.655 | 4.144               | 4.144 | 4.144 |
| 4233ch  | 846.6           | 4.620                | 4.640 | 4.655 | 4.149               | 4.149 | 4.139 |

### Test Equipment Used

| Equipment name      | RFT ID No. |
|---------------------|------------|
| Spectrum Analyzer   | TR06       |
| RF tester           | RC03       |
| RF cable            | CL27       |
| Directional coupler | DC03       |

1 PR  
NOISE

Center 826.4 MHz 1 MHz/ Span 0.1 MHz

Ref 30 dBm \* Att 30 dB VBW 30 kHz SWF 100 nm

Marker 1 [T1] 9.91 dBm 825.549149149 MHz

ndB [T1] 24.00 dB  
BW 4.624624625 MHz  
Temp 1 [T1] ndB  
824.087687688 MHz  
Temp 2 [T1] ndB  
-15.80 dBm  
826.712312312 MHz

1  
2  
3

\* RBW 10 kHz  
 VBW 30 kHz  
 SWT 100 ms  
 Marker 1 [T1] 8.21 dBm  
 827.155755756 MHz

Ref 30 dBm  
 \* Att 30 dB

1 PR  
 HDX30

30 dBm  
 20 dBm  
 10 dBm  
 0 dBm  
 -10 dBm  
 -20 dBm  
 -30 dBm  
 -40 dBm  
 -50 dBm  
 -60 dBm  
 -70 dBm

Center 826.4 MHz  
 1 MHz/  
 Span 10 MHz

ndB [T1] 26.00 dB  
 BW 4.64964650 MHz  
 Temp 1 [T1 ndB]  
 824.07767678 MHz  
 Temp 2 [T2 ndB]  
 -17.82 dBm  
 828.72732732 MHz

T1  
 T2

\* RBW 10 kHz  
 VBW 30 kHz  
 SWT 100 ms

Ref 30 dBm  
 \* Att 30 dB

Marker 1 [T1]  
 -9.57 dBm  
 836.40000000 MHz

| ndB  | [T1]              | 20.00 dB   |
|------|-------------------|------------|
| BW   | 4.654654655 MHz   |            |
| Temp | 1 [T1] ndB        | -24.27 dBm |
|      | 834.072674673 MHz |            |
| Temp | 2 [T2] ndB        | -16.12 dBm |
|      | 836.727327327 MHz |            |

Center 836.4 MHz  
 1 MHz/  
 Span 10 MHz

[illegible]

\* RBW 10 kHz  
 VBN 30 kHz  
 SWT 100 ms  
 Marker 1 [T1] 10.15 dBm  
 845.7491491 MHz

Ref 30 dBm  
 \* Att 30 dB

ndB [T1] 24.00 dB  
 BW 4.619619620 MHz  
 Temp 1 [T1] ndB  
 -10.88 dBm  
 844.287687688 MHz  
 Temp 2 [T2] ndB  
 -15.76 dBm  
 844.907307307 MHz

1 PR  
 MAX

30  
 20  
 10  
 0  
 -10  
 -20  
 -30  
 -40  
 -50  
 -60  
 -70

Center 846.6 MHz  
 1 MHz/  
 Span 10 MHz

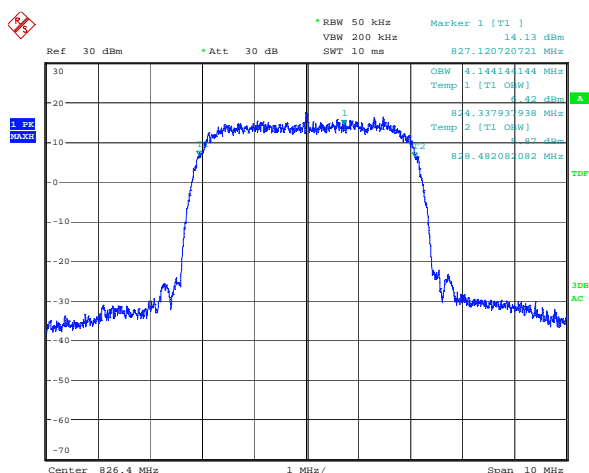
1 PR  
NA331

Ref 30 dBm Att 30 dB VBN 30 kHz SWT 100 ms Marker 1 [T1] 846.559959960 MHz

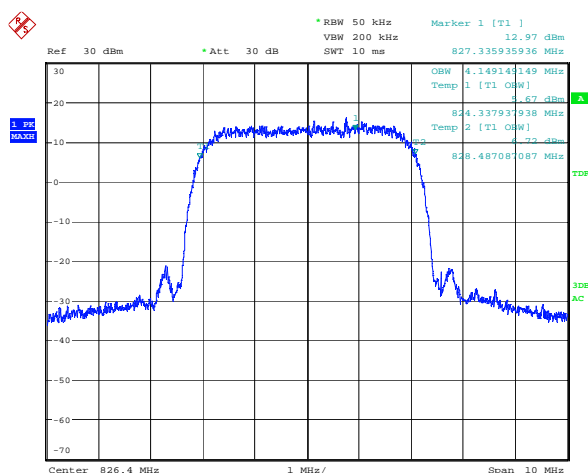
ndB [T1] 26.00 dB  
BW 4.654654655 MHz  
Temp 1 [T1 ndB] -18.24 dBm  
844.27267673 MHz  
Temp 2 [T2 ndB] -18.33 dBm  
848.927327327 MHz

Center 846.6 MHz 1 MHz/ Span 10 MHz

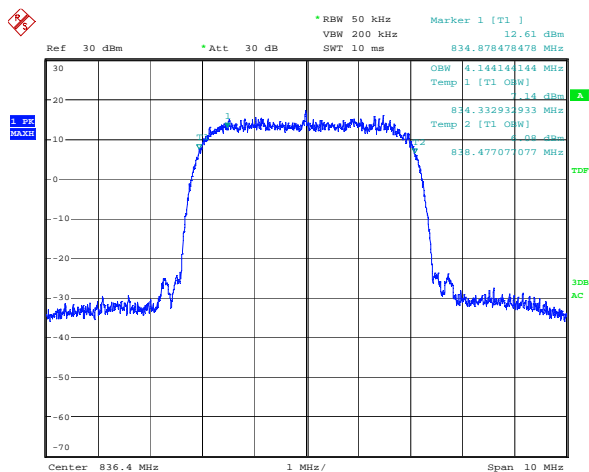
4233ch 26dB Bandwidth (HSUPA)



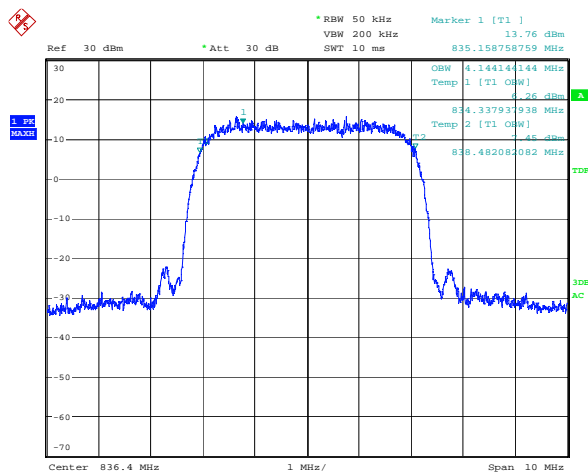
4132ch Occupied Bandwidth (Normal)



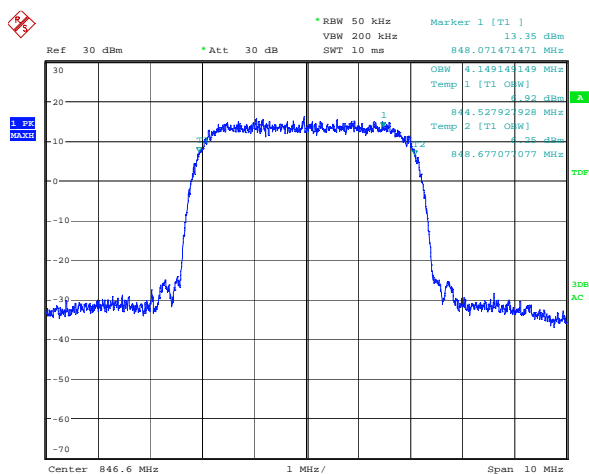
4132ch Occupied Bandwidth (HSUPA)



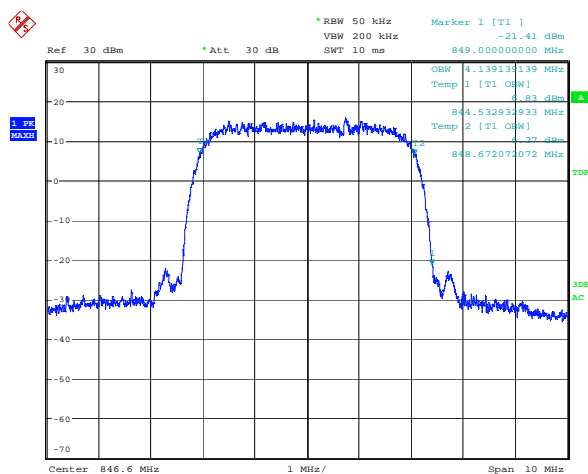
4182ch Occupied Bandwidth (Normal)



4182ch Occupied Bandwidth (HSUPA)



4233ch Occupied Bandwidth (Normal)



4233ch Occupied Bandwidth (HSUPA)

## 2.6 Transmitter Out of Band Spurious Emissions (Conducted)

### Reference Standard

Part22.917

### Test Conditions

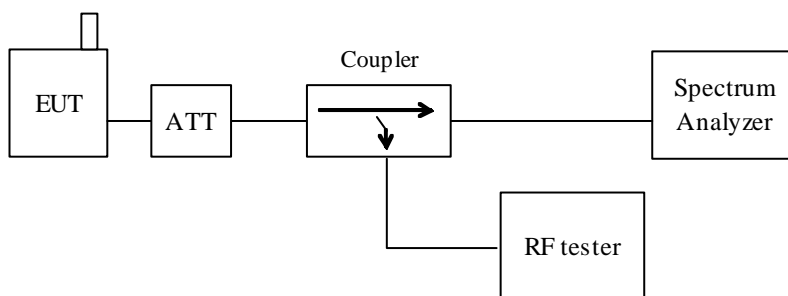
Date: 01 Mar, 2011  
Ambient Temperature: 22 degC  
Relative humidity: 47 %  
Test Voltage: 3.7 VDC

### Test Method

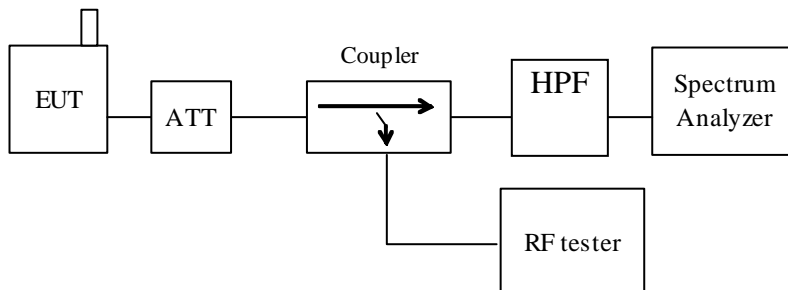
- EUT is connected to RF tester with Max transmitter power level.
- Out of band Spurious is measured by Spectrum Analyzer.
- Resolution band width of spectrum analyzer is set to 1MHz (above 1GHz) or 100kHz (below 1GHz).

### Test Setup

30MHz to 1500MHz



above 1500MHz





## Test Results

### Bottom Channel (4132ch, Nominal Freq.:826.4MHz)

| Measurement Frequency [MHz] | Measurement Bandwidth [MHz] | Emission Level [dBm] |         |         | Limit [dBm] | Result Pass/Fail |
|-----------------------------|-----------------------------|----------------------|---------|---------|-------------|------------------|
|                             |                             | Normal               | HSDPA   | HSUPA   |             |                  |
| 1652.8                      | 1                           | -40.2                | -40.3   | -38.6   | -13.0       | Pass             |
| 2479.2                      | 1                           | -55.5                | -55.1   | -50.8   | -13.0       | Pass             |
| 3305.6                      | 1                           | -57.1                | -57.3   | -55.9   | -13.0       | Pass             |
| 4132.0                      | 1                           | -57.3                | -57.9   | -56.2   | -13.0       | Pass             |
| 4958.4                      | 1                           | -58.9                | -59.2   | -58.4   | -13.0       | Pass             |
| 5784.8                      | 1                           | < -60.0              | < -60.0 | < -60.0 | -13.0       | Pass             |
| 6611.2                      | 1                           | < -60.0              | < -60.0 | < -60.0 | -13.0       | Pass             |
| 7437.6                      | 1                           | < -60.0              | < -60.0 | < -60.0 | -13.0       | Pass             |
| 8264.0                      | 1                           | < -60.0              | < -60.0 | < -60.0 | -13.0       | Pass             |
| others                      |                             | -                    | -       | -       | -13.0       | Pass             |

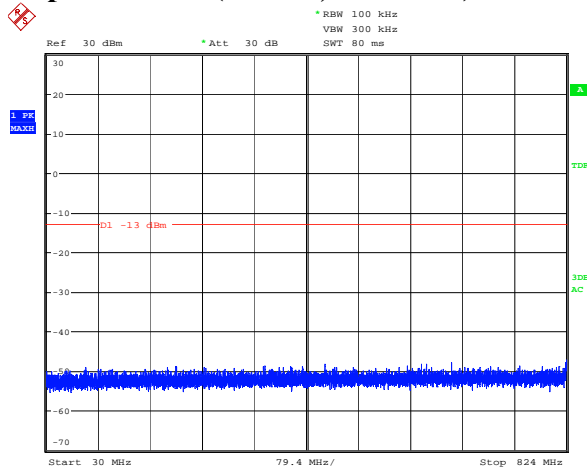
### Middle Channel (4182ch, Nominal Freq.:836.4MHz)

| Measurement Frequency [MHz] | Measurement Bandwidth [MHz] | Emission Level [dBm] |         |         | Limit [dBm] | Result Pass/Fail |
|-----------------------------|-----------------------------|----------------------|---------|---------|-------------|------------------|
|                             |                             | Normal               | HSDPA   | HSUPA   |             |                  |
| 1672.8                      | 1                           | -42.0                | -42.1   | -40.7   | -13.0       | Pass             |
| 2509.2                      | 1                           | -56.0                | -56.9   | -52.8   | -13.0       | Pass             |
| 3345.6                      | 1                           | -57.1                | -57.5   | -56.2   | -13.0       | Pass             |
| 4182.0                      | 1                           | -56.1                | -57.2   | -55.1   | -13.0       | Pass             |
| 5018.4                      | 1                           | < -60.0              | < -60.0 | < -60.0 | -13.0       | Pass             |
| 5854.8                      | 1                           | < -60.0              | < -60.0 | < -60.0 | -13.0       | Pass             |
| 6691.2                      | 1                           | < -60.0              | < -60.0 | < -60.0 | -13.0       | Pass             |
| 7527.6                      | 1                           | < -60.0              | < -60.0 | < -60.0 | -13.0       | Pass             |
| 8364.0                      | 1                           | < -60.0              | < -60.0 | < -60.0 | -13.0       | Pass             |
| others                      |                             | -                    | -       | -       | -13.0       | Pass             |

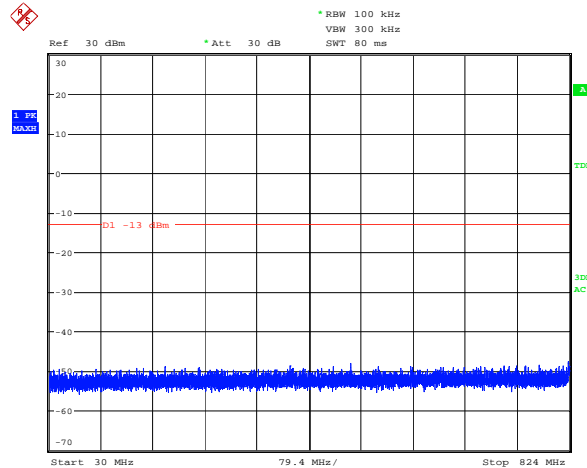
## Top Channel (4233ch, Nominal Freq.:846.6MHz)

| Measurement Frequency [MHz] | Measurement Bandwidth [MHz] | Emission Level [dBm] |         |         | Limit [dBm] | Result Pass/Fail |
|-----------------------------|-----------------------------|----------------------|---------|---------|-------------|------------------|
|                             |                             | Normal               | HSDPA   | HSUPA   |             |                  |
| 1693.2                      | 1                           | -45.1                | -45.5   | -44.4   | -13.0       | Pass             |
| 2539.8                      | 1                           | -51.2                | -51.3   | -46.5   | -13.0       | Pass             |
| 3386.4                      | 1                           | -57.4                | -57.5   | -56.7   | -13.0       | Pass             |
| 4233.0                      | 1                           | -54.4                | -55.0   | -53.5   | -13.0       | Pass             |
| 5079.6                      | 1                           | < -60.0              | < -60.0 | < -60.0 | -13.0       | Pass             |
| 5926.2                      | 1                           | < -60.0              | < -60.0 | < -60.0 | -13.0       | Pass             |
| 6772.8                      | 1                           | < -60.0              | < -60.0 | < -60.0 | -13.0       | Pass             |
| 7619.4                      | 1                           | < -60.0              | < -60.0 | < -60.0 | -13.0       | Pass             |
| 8466.0                      | 1                           | < -60.0              | < -60.0 | < -60.0 | -13.0       | Pass             |
| others                      |                             | -                    | -       | -       | -13.0       | Pass             |

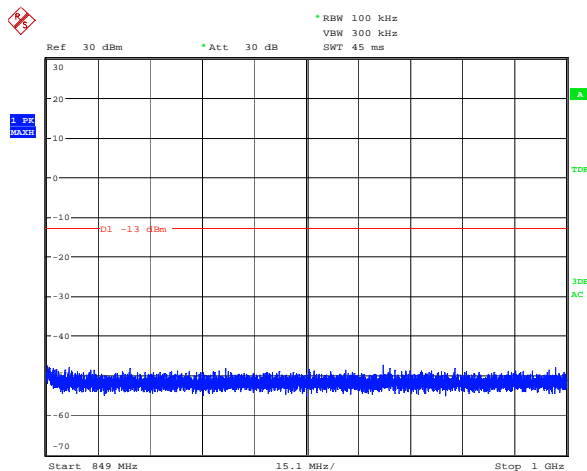
## Graphical Data (4182ch, Pre-scan)



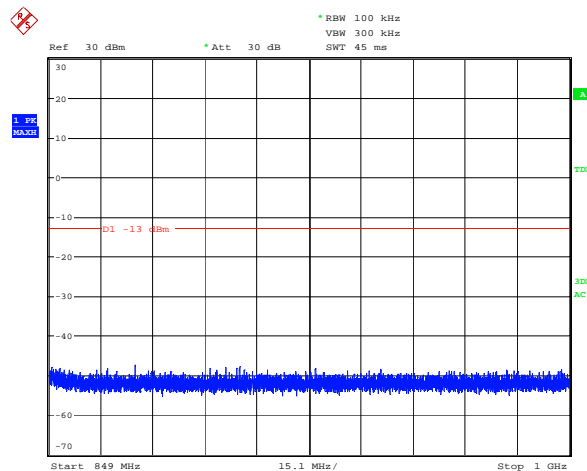
Normal



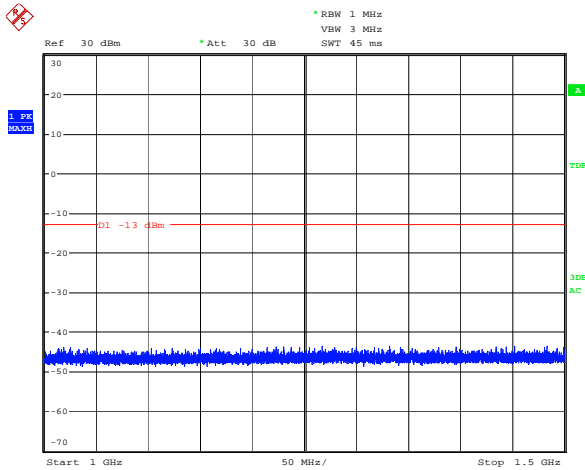
HSUPA



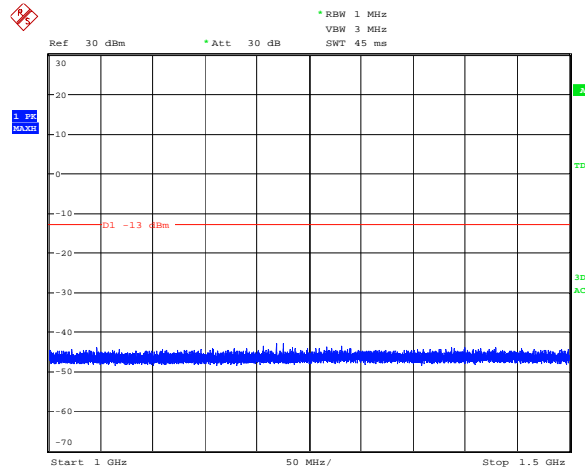
Normal



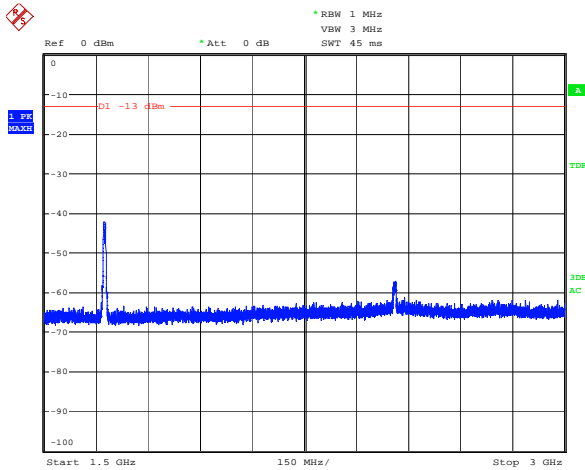
HSUPA



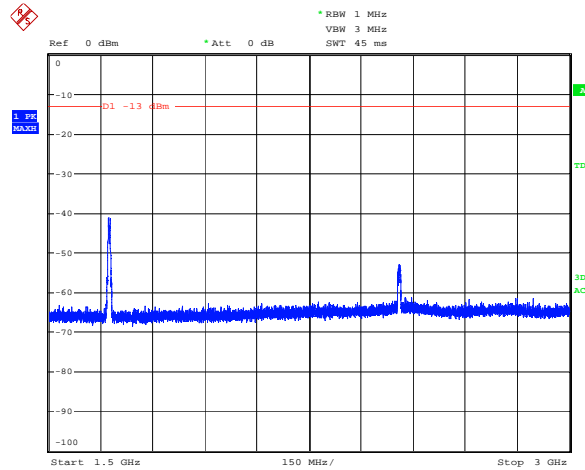
Normal



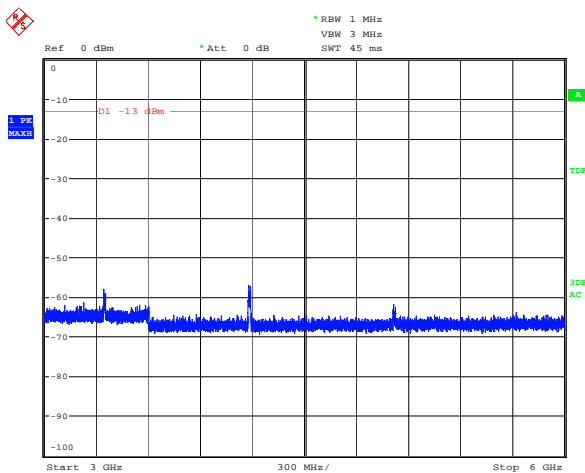
HSUPA



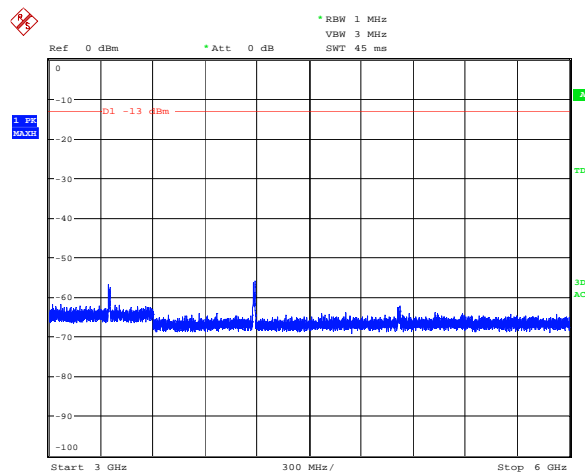
Normal



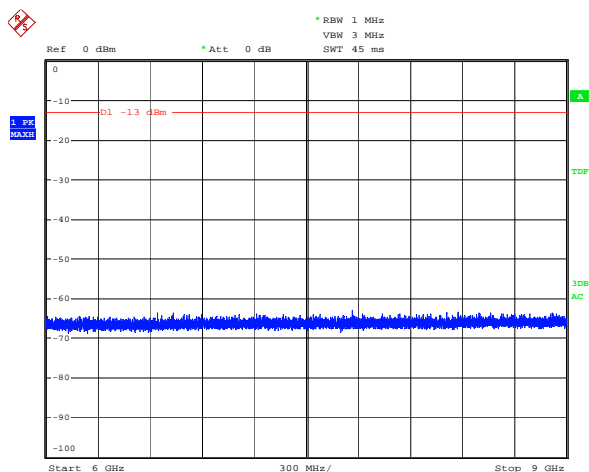
HSUPA



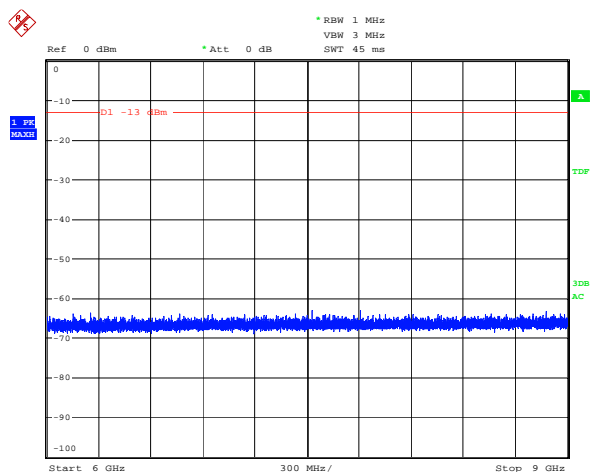
Normal



HSUPA



Normal



HSUPA

## Test Equipment Used

| Equipment name      | RFT ID No. |
|---------------------|------------|
| Spectrum Analyzer   | TR06       |
| RF tester           | RC03       |
| RF cable            | CL27       |
| Directional coupler | DC03       |
| High pass filter    | HPF2       |

## Final Result

The EUT met the requirements of the standard for this test.

## **2.7 Transmitter Out of Band Spurious Emissions (Radiated)**

### **Reference Standard**

Part22.917

### **Test Conditions**

Date: -  
Ambient Temperature: -  
Relative humidity: -  
Test Voltage: -

### **Test Method**

Substitution method is used for this test.

- a) EUT is set on non-conducting table and the output power is set to the maximum level.
- b) As a receive antenna, Horn antenna is used for high frequency range (above 1GHz), and Bilogical antenna is used for low frequency range (30MHz to 1GHz).
- c) The maximum level of each spurious emission is measured by a spectrum analyzer (SA) in below conditions.
  - Turntable is rotated 360 degrees.
  - The height of receive antenna is changed from 1m to 4m.
  - Receive antenna polarization is set to vertical and horizontal.
  - EUT was placed at three different orientations (X, Y and Z axis) in order to find the worst orientation.This emission level is recorded.

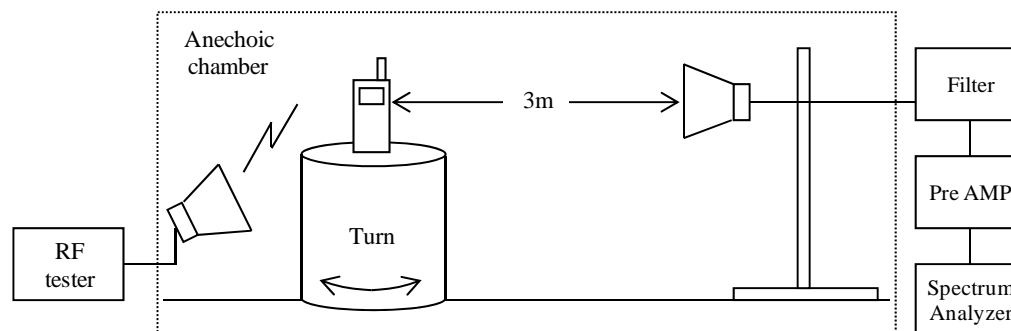
During this measurement, receive antenna is adjusted the direction to keep the EUT within the beamwidth of receive antenna.
- d) Reference antenna is replaced with EUT, and connected with signal generator (SG).

SG output power is adjusted to get same level as the recorded maximum radiated EUT power by SA.
- e) Radiated output power (Pout) is calculated with adjusted SG output (Psg) [dBm], reference antenna gain (Gref) [dBd] and cable loss between SG and reference antenna (Lcab) [dB].

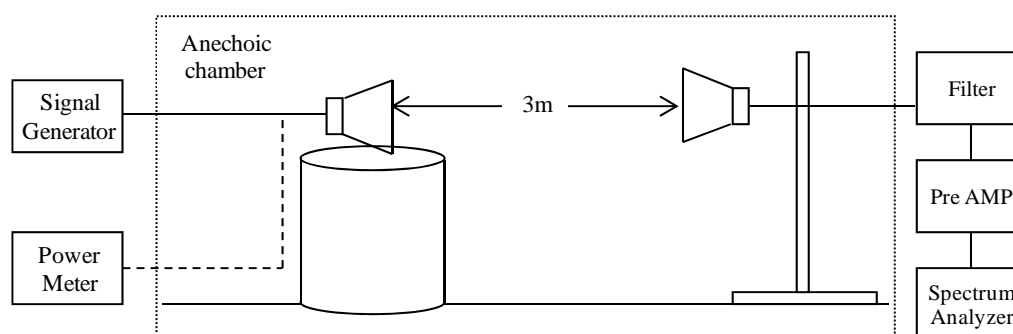
$$P_{out} [dBm \text{ e.r.p}] = P_{sg} + G_{ref} + L_{cab}$$

## Test Setup

### [Measurement]



### [Substitution]



## Test Results

## Test Equipment Used

## Final Result

This item was not tested.

## 2.8 Band Edge Emissions

### Reference Standard

Part22.917

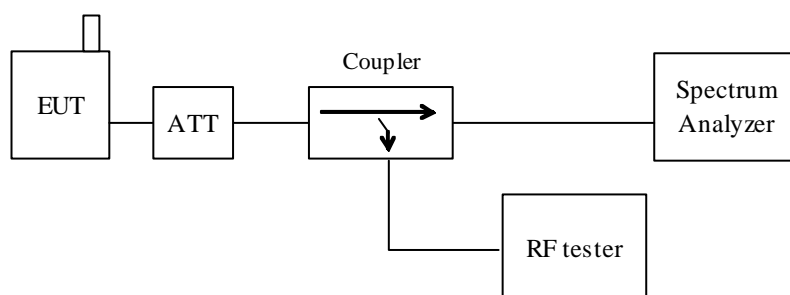
### Test Conditions

Date: 01 Mar, 2011  
Ambient Temperature: 22 degC  
Relative humidity: 47 %  
Test Voltage: 3.7 VDC

### Test Method

- EUT is connected to RF tester with Max transmitter power level.
- Lower band edge level is measured in bottom channel transmission.
- Higher band edge level is measured in top channel transmission.
- 1% of band width is used for resolution band width for spectrum analyzer.

### Test Setup



### Test Results

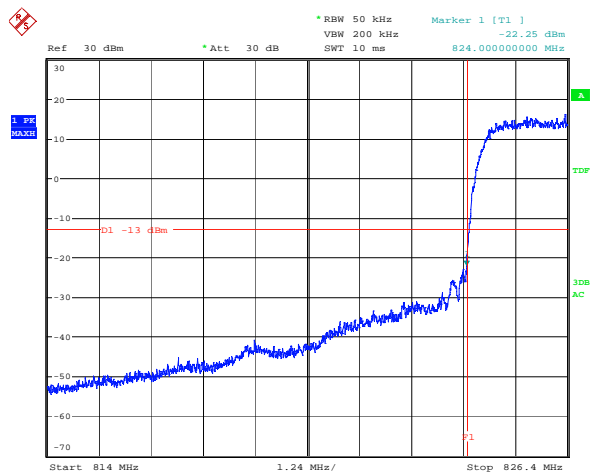
#### Bottom Band Edge

| Mode   | Measured Frequency [MHz] | Peak Level [dBm] | Limit [dBm] | Result |
|--------|--------------------------|------------------|-------------|--------|
| Normal | 824.000                  | -22.2            | -13.0       | Pass   |
| HSDPA  | 823.901                  | -22.2            | -13.0       | Pass   |
| HSUPA  | 823.662                  | -21.7            | -13.0       | Pass   |

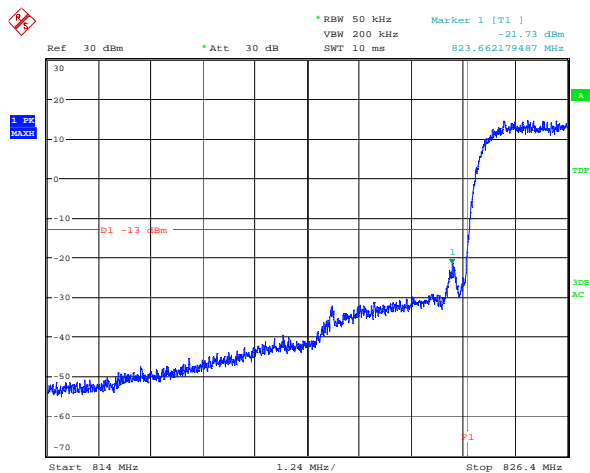
#### Top Band Edge

| Mode   | Measured Frequency [MHz] | Peak Level [dBm] | Limit [dBm] | Result |
|--------|--------------------------|------------------|-------------|--------|
| Normal | 849.000                  | -20.1            | -13.0       | Pass   |
| HSDPA  | 849.099                  | -22.0            | -13.0       | Pass   |
| HSUPA  | 849.000                  | -21.1            | -13.0       | Pass   |

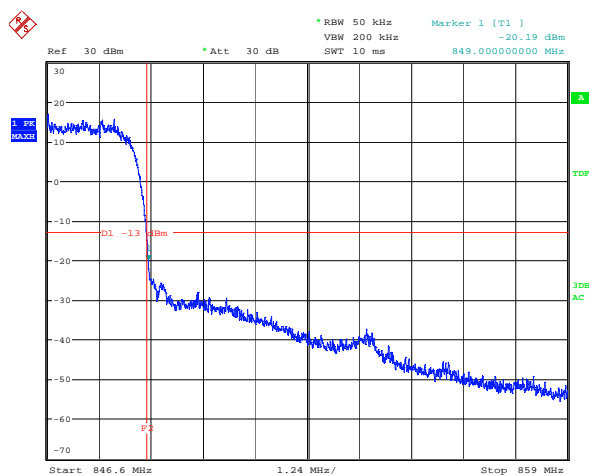
## Graphical Data



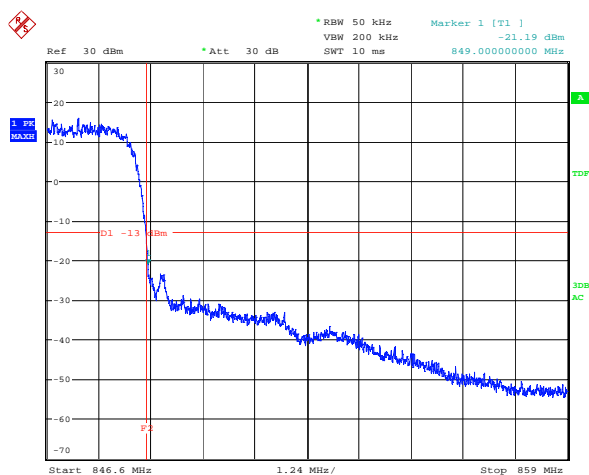
Bottom Band Edge (Normal)



Bottom Band Edge (HSUPA)



Top Band Edge (Normal)



Top Band Edge (HSUPA)

## Test Equipment Used

| Equipment name      | RFT ID No. |
|---------------------|------------|
| Spectrum Analyzer   | TR06       |
| RF tester           | RC03       |
| RF cable            | CL27       |
| Directional coupler | DC03       |

## Final Result

The EUT met the requirements of the standard for this test.



## 2.9 Transmitter AC Power Line Emission requirement

### Reference Standard

Part15.207

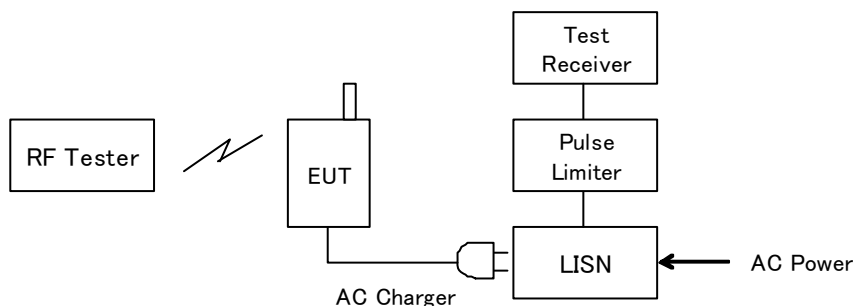
### Test Conditions

Date: -  
Ambient Temperature: -  
Relative humidity: -  
Test Voltage: -

### Test Method

- EUT is connected to RF tester with Max transmitter power level.
- AC power is supplied to AC charger through LISN.
- AC charger is connected to EUT.
- AC Line conducted emission is measured by EMI receiver.  
Both Va/Vb line are measured emission level.

### Test Setup



### Limit

| Frequency<br>[MHz] | Limit QP<br>[dBμV] | Limit AVE<br>[dBμV] |
|--------------------|--------------------|---------------------|
| 0.15 - 0.5         | 66 - 56            | 56 - 46             |
| 0.5 - 5            | 56                 | 46                  |
| 5 - 30             | 60                 | 50                  |

### Test Results

### Graphical Data

### Test Equipment Used

### Final Result

This item was not tested.

## 4 List of utilized test equipment/ calibration

| RFT ID No. | Kind of Equipment and Precision                  | Manufacturer    | Model No.     | Serial Number | Calibration Date | Calibrated until |
|------------|--|-----------------|---------------|---------------|------------------|------------------|
| CL27       | RF Cable 0.5m                                    | SUHNER          | SUCOFLEX104   | 230286        | 2010/6/15        | 2011/6/30        |
| DC03       | Directional Coupler                              | Merrimac        | CWM-10R-10.2G | 83263         | 2010/7/2         | 2011/7/31        |
| HPF2       | High Pass Filter (1500MHz)                       | M-City          | HPF0900-01    | RF0003-01     | 2010/6/15        | 2011/6/30        |
| TR06       | Test Receiver<br>(F/W : 3.93 SP2)                | Rohde & Schwarz | ESU26         | 100002        | 2010/9/2         | 2011/9/30        |
| RC03       | Radio communication tester<br>(F/W : 10.20 #005) | Anritsu         | MT8820B       | 6200636657    | 2010/6/10        | 2011/6/30        |
| TC01       | Temperature Chamber                              | ESPEC           | SH-641        | 92000964      | 2010/11/19       | 2011/11/30       |

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.