

**ETSI EN 301 908-1 V11.1.1/ETSI EN 301 908-2 V11.1.2**

**TEST REPORT**

**FOR**

**Multifunctional Handheld**

**Model No.: CL7202K**

**Trademark: Hopeland**

**Report No.: ES180321026W05**

**Issue Date: May 31, 2018**

*Prepared for*

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## 1 TEST RESULT CERTIFICATION

Applicant: SHENZHEN HOPELAND TECHNOLOGIES CO., LTD.  
17/F, Block A, Clou Bldg, Baoshen Road, Hitech Industrial Park North, Nanshan District, 518007, Shenzhen, China

Manufacturer: SHENZHEN HOPELAND TECHNOLOGIES CO., LTD.  
17/F, Block A, Clou Bldg, Baoshen Road, Hitech Industrial Park North, Nanshan District, 518007, Shenzhen, China

Trademark: Hopeland

EUT: Multifunctional Handheld

Model Name: CL7202K

Measurement Procedure Used:

| APPLICABLE STANDARDS                                               |             |
|--------------------------------------------------------------------|-------------|
| STANDARD                                                           | TEST RESULT |
| ETSI EN 301 908-1 V11.1.1: 2016<br>ETSI EN 301 908-2 V11.1.2: 2017 | PASS        |

The device described above is tested by EMTEK(SHENZHEN) CO., LTD. to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion.

The measurement results are contained in this test report and EMTEK(SHENZHEN) CO., LTD. is assumed full of responsibility for the accuracy and completeness of these measurements.

Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the ETSI EN 301 908-1 and ETSI EN 301 908-2 requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of EMTEK(SHENZHEN) CO., LTD.

Date of Test : March 21, 2018 to May 18, 2018

Prepared by :   
Sevin Li/Editor

Reviewer :   
Joe Xia/Supervisor

Approved & Authorized Signer :   
Lisa Wang/Manager



## 2 EUT DESCRIPTION

|                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Device Type:</b>                                          | Portable Equipment                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Exposure Category:</b>                                    | Uncontrolled Environment/General Population                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Product Name:</b>                                         | Multifunctional Handheld                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Model Number:</b>                                         | CL7202K                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Operating Mode(s) &amp; Operating Frequency Range(s):</b> | WCDMA Band I:TX1922.4MHz~1977.6MHz/RX 2112.4MHz~2167.6MHz                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Test Modulation:</b>                                      | QPSK for WCDMA                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Transmit Power(MAX):</b>                                  | 23.26dBm                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Type of Antenna:</b>                                      | FPC Antenna                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Antenna Gain:</b>                                         | 0 dBi                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Hardware Version:</b>                                     | V4.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Software Version:</b>                                     | V1.2.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Power supply:</b>                                         | <input checked="" type="checkbox"/> DC 3.7V via Battery<br><input checked="" type="checkbox"/> DC 5V Via charging Cradle from adapter1<br><input checked="" type="checkbox"/> DC 5V Via adapter2<br><input checked="" type="checkbox"/> Adapter1<br>Model: BI24-050400-AdU<br>Input: AC 100-240V, 50/60Hz, 0.8A<br>Output: DC 5V, 4A<br><input checked="" type="checkbox"/> Adapter2<br>Model: BI20-050350-Adc<br>Input: AC 100-240V, 50/60Hz, 0.8A<br>Output: DC 5V, 3.5A |
| <b>Temperature Extreme Range:</b>                            | -20°C ~ +55°C                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

**Note:** for more details, please refer to the User's manual of the EUT.

**Modified Information**

| Rev.    | Summary         | Date of Rev. | Report No.     |
|---------|-----------------|--------------|----------------|
| Ver.1.0 | Original Report | /            | ES180321026W05 |
|         |                 |              |                |
|         |                 |              |                |

### 3 SUMMARY OF TEST RESULTS

| Clause<br>(EN 301 908-2)           | Test Parameter                                                 | Verdict | Remark |
|------------------------------------|----------------------------------------------------------------|---------|--------|
| 4.2.2                              | Transmitter maximum output power                               | PASS    |        |
| 4.2.2                              | Transmitter maximum output power with HS-DPCCH                 | PASS    |        |
| 4.2.3                              | Transmitter spectrum emission mask                             | PASS    |        |
| 4.2.3                              | Transmitter spectrum emission mask with HS-DPCCH               | PASS    |        |
| 4.2.4                              | Transmitter spurious emissions                                 | PASS    |        |
| 4.2.5                              | Transmitter minimum output power                               | PASS    |        |
| 4.2.6                              | Receiver Adjacent Channel Selectivity (ACS)                    | PASS    |        |
| 4.2.7                              | Receiver blocking characteristics                              | PASS    |        |
| 4.2.8                              | Receiver spurious response                                     | PASS    |        |
| 4.2.9                              | Receiver inter-modulation characteristics                      | PASS    |        |
| 4.2.10                             | Receiver spurious emissions                                    | PASS    |        |
| 4.2.11                             | Out-of-synchronization handling of output power                | PASS    |        |
| 4.2.12                             | Transmitter Adjacent Channel Leakage power Ratio (ACLR)        | PASS    |        |
| 4.2.12                             | Transmitter Adjacent Channel Leakage power Ratio with HS-DPCCH | PASS    |        |
| 4.2.13                             | Receiver Reference Sensitivity level                           | PASS    |        |
| Clause<br>(EN 301 908-1)           | Test Parameter                                                 | Verdict | Remark |
| 4.2.2                              | Radiated emissions (UE)                                        | PASS    |        |
| 4.2.4                              | Control and monitoring functions (UE)                          | PASS    |        |
| NOTE:<br>N/A :means not applicable |                                                                |         |        |

## 4 TEST METHODOLOGY

### 4.1 GENERAL DESCRIPTION OF APPLIED STANDARDS

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

ETSI EN 301 908-1—IMT cellular networks; Harmonized EN covering the essential requirements of article 3.2 of the Directive 2014/53/EU; Part 1: Introduction and common requirements

ETSI EN 301 908-2—IMT cellular networks; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU; Part 2: CDMA Direct Spread (UTRA FDD) User Equipment (UE)

ETSI TS 134 121-1—Universal Mobile Telecommunications System (UMTS); User Equipment (UE) conformance specification; Radio transmission and reception (FDD); Part 1: Conformance specification (3GPP TS 34.121-1 version 12.1.0 Release 12)".

### 4.2 MEASUREMENT EQUIPMENT USED

| Item | Equipment                                 | Manufacturer    | Model No.            | Serial No.                 | Last Cal.    | Cal. Interval |
|------|-------------------------------------------|-----------------|----------------------|----------------------------|--------------|---------------|
| 1    | EMI Test Receiver                         | Rohde & Schwarz | ESCI                 | 101414                     | May 20, 2017 | 1Year         |
| 2    | EMI Test Receiver                         | Rohde & Schwarz | FSV30                | 103040                     | May 20, 2017 | 1Year         |
| 3    | Pre-Amplifier                             | LUNAR-EM        | LNA30M3G-25          | J10100000071               | May 20, 2017 | 1Year         |
| 4    | Pre-Amplifier                             | Lunar EM        | LNA1G18-48           | J1011131010001             | May 20, 2017 | 1Year         |
| 5    | Pre-Amplifier                             | Lunar EM        | LNA18G26-40          | J1012131010001             | May 20, 2017 | 1Year         |
| 6    | Pre-Amplifier                             | Lunar EM        | LNA26G40-40          | J1013131028001             | May 20, 2017 | 1Year         |
| 7    | Bilog Antenna                             | Schwarzbeck     | VULB9163             | 660                        | May 21, 2017 | 1Year         |
| 8    | Horn Antenna                              | Schwarzbeck     | BBHA 9120            | 1178                       | May 21, 2017 | 1Year         |
| 9    | Horn Antenna                              | Schwarzbeck     | BBHA 9170            | RS1307229170547            | May 21, 2017 | 1Year         |
| 10   | Horn Antenna                              | AHS/USA         | SAS-573              | 184                        | May 21, 2017 | 1Year         |
| 11   | Cable                                     | H+B             | NmSm-05-C150<br>52   | /                          | May 21, 2017 | 1Year         |
| 12   | Cable                                     | H+B             | NmSm-2-C1520<br>1    | /                          | May 21, 2017 | 1Year         |
| 13   | Cable                                     | H+B             | NmNm-7-C1570<br>2    | /                          | May 21, 2017 | 1Year         |
| 14   | Cable                                     | H+B             | SAC-40G-1            | 414                        | May 21, 2017 | 1Year         |
| 15   | Cable                                     | H+B             | SUCOFLEX104          | MY14871/4                  | May 21, 2017 | 1Year         |
| 16   | Cable                                     | H+B             | BLU18A-NmSm-<br>6500 | D8501                      | May 21, 2017 | 1Year         |
| 17   | Wideband Radio<br>Communication<br>Tester | R&S             | CMW500               | 1201.0002K50-1408<br>22zk  | May 21, 2017 | 1Year         |
| 18   | CW Signal<br>Generator                    | R&S             | SMB100A              | 1406.6000K03-1760<br>23-LD | May 21, 2017 | 1Year         |
| 19   | Analog Signal<br>Generator                | Agilent         | N5171B               | My53050878                 | May 21, 2017 | 1Year         |

**Remark:** Each piece of equipment is scheduled for calibration once a year.

### 4.3 DESCRIPTION OF TEST MODES

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the instructions for use.

| Frequency Band | WCDMA BAND I | Temperature (°C) | Voltage (V) |
|----------------|--------------|------------------|-------------|
| High           | 9887         | -20 °C           | DC 4.07V    |
| Middle         | 9750         | 25 °C            | DC 3.7V     |
| Low            | 9613         | 55 °C            | DC 3.33V    |

Note: In this report

Normal Means  $T_{norm}$  (°C)=25 and  $V_{norm}$ =DC 3.7V

$V_{min}$ =DC 3.33V;  $V_{max}$ =DC 4.07

$T_{min}$ (°C)=-20;  $T_{max}$ (°C)=55;

## 5 FACILITIES AND ACCREDITATIONS

### 5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at

Bldg 69, Majialong Industry Zone District, Nanshan District, Shenzhen, China

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

### 5.2 EQUIPMENT

All test equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

### 5.3 LABORATORY ACCREDITATIONS AND LISTINGS

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Site Description |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| EMC Lab.         | <p>: Accredited by CNAS, 2016.10.24<br/>The certificate is valid until 2022.10.28<br/>The Laboratory has been assessed and proved to be in compliance with CNAS-CL01: 2006(identical to ISO/IEC17025: 2005)<br/>The Certificate Registration Number is L2291</p> <p>Accredited by TUV Rheinland Shenzhen 2015.4<br/>The Laboratory has been assessed according to the requirements ISO/IEC 17025.</p> <p>Accredited by FCC, August 03, 2017<br/>Designation Number: CN1204<br/>Test Firm Registration Number: 882943<br/>Accredited by A2LA, July 31, 2017<br/>The Certificate Registration Number is 4321.01.</p> <p>Accredited by Industry Canada, November 24, 2015<br/>The Certificate Registration Number is 4480A</p> |
| Name of Firm     | : EMTEK (SHENZHEN) CO., LTD.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Site Location    | : Bldg 69, Majialong Industry Zone,<br>Nanshan District, Shenzhen, Guangdong, China                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

## 6 TEST SYSTEM UNCERTAINTY

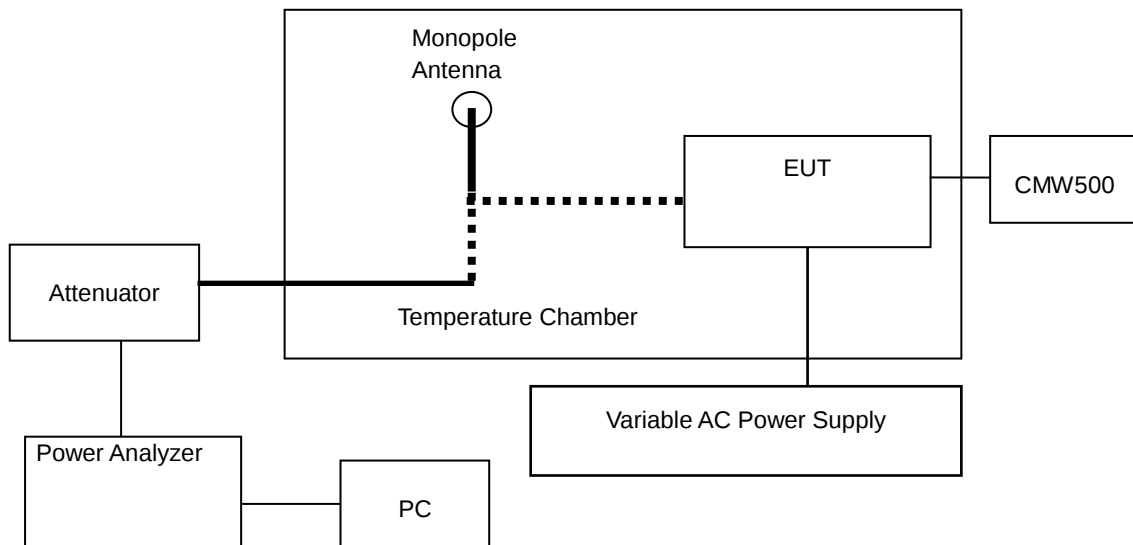
Maximum measurement uncertainty of the test system

| Test Parameter                                          | measurement uncertainty |
|---------------------------------------------------------|-------------------------|
| Transmitter output power                                | ±1.0%                   |
| Transmitter - Output RF spectrum                        | ±1.3%                   |
| Receiver inter-modulation characteristics               | ±1.2%                   |
| Transmitter Adjacent Channel Leakage power Ratio (ACLR) | ±1.4%                   |
| Conducted spurious emissions                            | ±2.7%                   |
| Radiated spurious emissions                             | ±2.7%                   |
| Temperature                                             | ±3.2%                   |
| Humidity                                                | ±2.5%                   |
| DC voltages                                             | ±2%                     |

## 7 SETUP OF EQUIPMENT UNDER TEST

### 7.1 SETUP CONFIGURATION OF EUT

Conducted measurements configuration of EUT shall be as follows:

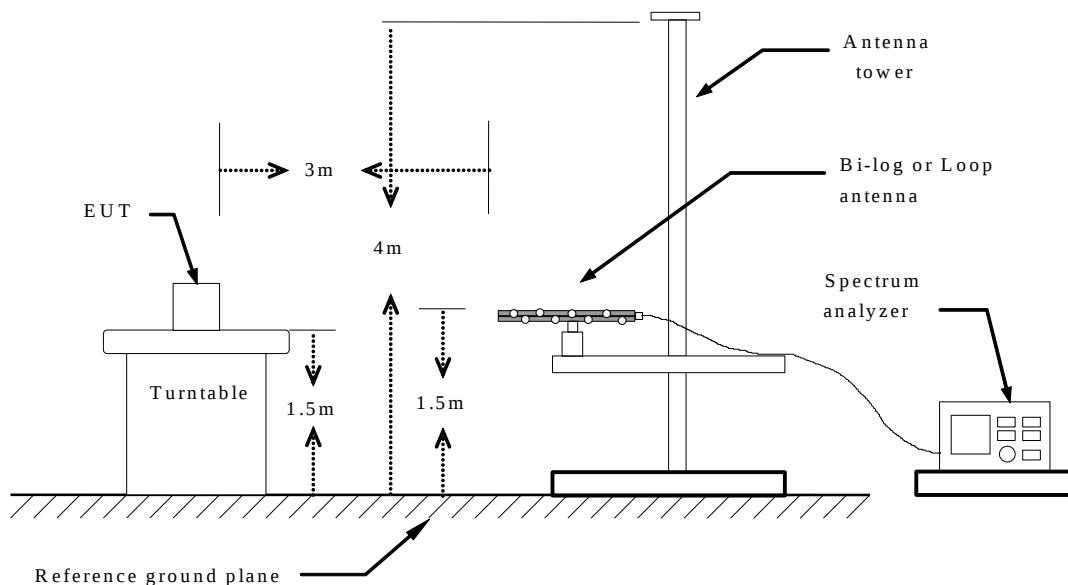


**Remarks:**

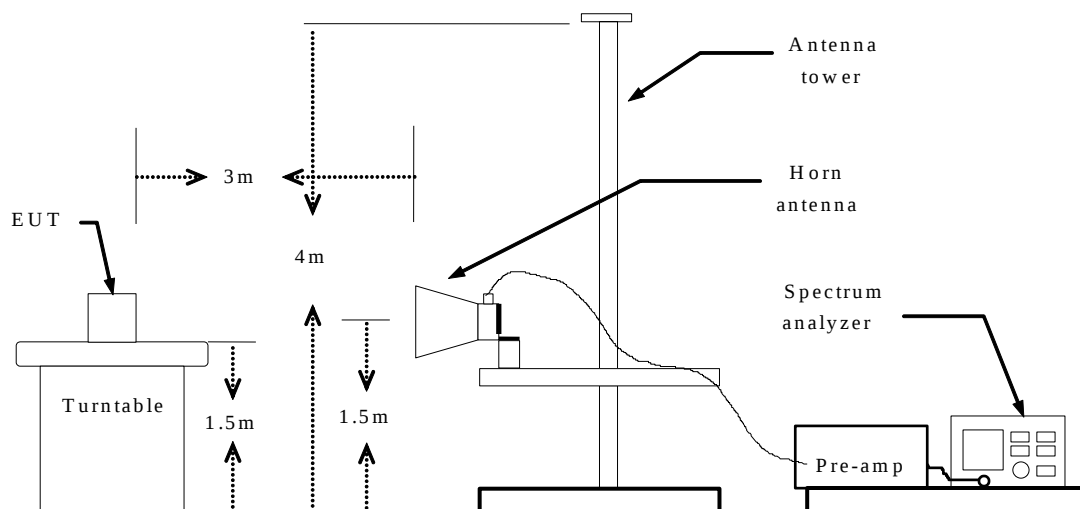
The Signal Analyzer could be connected to a monopole antenna or directly connected to the EUT, if the EUT has already employing an antenna connector.

Radiated measurements configuration of EUT shall be as follows:

#### Below 1GHz



## Above 1GHz



## 7.2 SUPPORT EQUIPMENT

| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Note |
|------|-----------|--------------|-----------|------------|-----------|------|
|      |           |              |           |            |           |      |
|      |           |              |           |            |           |      |
|      |           |              |           |            |           |      |
|      |           |              |           |            |           |      |
|      |           |              |           |            |           |      |
|      |           |              |           |            |           |      |
|      |           |              |           |            |           |      |
|      |           |              |           |            |           |      |

### Notes:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

## 8 ETSI EN 301 908-1/2 WCDMA REQUIREMENT

### 8.1 WCDMA CHARACTERISTICS

#### 8.1.1 Transmitter General Characteristics

Transmitting performance test of the EUT is implemented during communicating with the SS via air interface. The procedure is using normal call protocol until the UE is communicating on traffic channel basically. On the traffic channel, the UE provides special function for testing that is called Logical Test Interface and the UE is tested using this function. (Refer to TS 34.109 [4]).

Transmitting or receiving bit/symbol rate for test channel is shown in table 5.1.

Bit / Symbol rate for Test Channel

| Type of User Information                | User Bit Rate | DL DPCH Symbol Rate | UL DPCH Bit Rate | Remarks       |
|-----------------------------------------|---------------|---------------------|------------------|---------------|
| 12.2 kbps reference measurement channel | 12.2 kbps     | 30 kbps             | 60 kbps          | Standard Test |

Unless detailed the transmitter characteristic are specified at the antenna connector of the UE. For UE with integral antenna only, a reference antenna with a gain of 0 dBi is assumed. Transmitter characteristics for UE(s) with multiple antennas/antenna connectors are FFS.

The UE antenna performance has a significant impact on system performance, and minimum requirements on the antenna efficiency are therefore intended to be included in future versions of the present document. It is recognised that different requirements and test methods are likely to be required for the different types of UE.

All the parameters in clause 5 are defined using the UL reference measurement channel (12,2 kbps) specified in clause C.2.1 and unless stated otherwise, with the UL power control ON.

The common RF test conditions of Tx Characteristics are defined in clause E.3.1, and each test conditions in this clause (clause 5) should refer clause E.3.1. Individual test conditions are defined in the paragraph of each test.

When DCCH has been configured on downlink DCH then DCCH Data shall be continuously transmitted on downlink DCH during the measurement period. When there is no signalling to transmit on downlink DCCH then dummy DCCH transmission as described in Annex C.9 shall be used.

For HSDPA test cases and E-DCH test cases, when DTCH has been configured on downlink DCH then DTCH Data shall be continuously transmitted on downlink DCH during the measurement period.

The MAC header transmission on HS-DSCH for all E-DCH test cases shall use a correct MAC-hs header consistent with the actual HSDPA transmission.

The DL and UL RLC SDU size for all E-DCH tests in clause 5 shall be set according to Annex C.11.3.

For HSDPA test cases without E-DCH, the MAC headers on HS-DSCH shall be according to Annex C.9A. UEs supporting DC-HSUPA shall support both minimum requirements, as well as additional requirements for DCHSUPA.

For the additional requirements for DC-HSUPA, all the parameters in clause 6 are defined using the UL E-DCH reference measurement channel, specified in subclause C.2.6. For the additional requirements for DC-HSUPA, the spacing of the carrier frequencies of the two cells shall be 5 MHz.

TX Physical channel configuration

| Physical channel | Reference level                |
|------------------|--------------------------------|
| for              | -93dBm/3.84MHz                 |
| CPICH            | $CPICH_{Ec}/DPCH_{Ec} = 7dB$   |
| P-CCPCH          | $P-CCPCH_{Ec}/DPCH_{Ec} = 5dB$ |
| SCH              | $SCH_{Ec}/DPCH_{Ec} = 5dB$     |
| PICH             | $PICH_{Ec}/DPCH_{Ec} = 2dB$    |
| DPCH             | -103.3dBm/3.84MHz              |

### 8.1.2 Receiver General Characteristics

Receiving performance test of the UE is implemented during communicating with the SS via air interface. The procedure is using normal call protocol until the UE is communicating on traffic channel basically. On the traffic channel, the UE provides special function for testing that is called Logical Test Interface and the UE is tested using this function (Refer to TS 34.109 [4]).

Transmitting or receiving bit/symbol rate for test channel is shown in table 6.1.

Table 6.1: Bit / Symbol rate for Test Channel

| Type of User Information                | User bit rate | DL DPCH symbol rate | UL DPCH bit rate | Remarks       |
|-----------------------------------------|---------------|---------------------|------------------|---------------|
| 12,2 kbps reference measurement channel | 12,2 kbps     | 30 kbps             | 60 kbps          | Standard Test |

Unless otherwise stated the receiver characteristics are specified at the antenna connector of the UE. For UE(s) with an integral antenna only, a reference antenna with a gain of 0 dBi is assumed. UE with an integral antenna may be taken into account by converting these power levels into field strength requirements, assuming a 0 dBi gain antenna. For UEs with more than one receiver antenna connector the AWGN signals applied to each receiver antenna connector shall be uncorrelated. The levels of the test signals applied to each of the antenna connectors shall be as defined in the respective sections below. The UE antenna performance has a significant impact on system performance, and minimum requirements on the antenna efficiency are therefore intended to be included in future versions of the present document. It is recognised that different requirements and test methods are likely to be required for the different types of UE.

With the exception of clause 6.8, all the parameters in clause 6 are defined using the DL reference measurement channel (12,2 kbps) specified in clause C.3.1 and unless stated otherwise, with DL power control OFF.

The common RF test conditions of Rx Characteristics are defined in clause E.3.2, and each test conditions in this clause (clause 6) should refer clause E.3.2. Individual test conditions are defined in the paragraph of each test.

When DCCH has been configured on downlink DCH then DCCH Data shall be continuously transmitted on downlink DCH during the measurement period. When there is no signalling to transmit on downlink DCCH then dummy DCCH transmission as described in Annex C.9 shall be used.

For HSDPA test cases, when DTCH has been configured on downlink DCH then DTCH Data shall be continuously transmitted on downlink DCH during the measurement period.

All Bit Error ratio (BER) measurements in clause 6 shall be performed according to the general rules for statistical testing in Annex F.6.

For HSDPA test cases without E-DCH, the MAC headers on HS-DSCH shall be according to Annex C.9A. UEs supporting DC-HSDPA, regardless of MIMO configuration, shall support both minimum requirements, as well as additional requirements for DC-HSDPA.

UEs supporting DB-DC-HSDPA shall support both minimum requirements as well as additional requirements for DBDC-HSDPA.

UEs supporting DC-HSUPA shall support both minimum requirements, as well as additional requirements for DCHSUPA.

UEs supporting single band 4C-HSDPA shall support minimum requirements, additional requirements for DC-HSDPA as well as additional requirements for single band 4C-HSDPA.

UEs supporting dual band 4C-HSDPA shall support minimum requirements, additional requirements for DC-HSDPA, additional requirements for DB-DC-HSDPA as well as additional requirements for dual band 4C-HSDPA.

For the additional requirements for DC-HSDPA, DB-DC-HSDPA, DC-HSUPA or single band/dual band 4C-HSDPA, all the parameters in clause 6 are defined using the DL reference measurement channel H-Set 12 unless otherwise stated, specified in subclause C.8.1.12 and the downlink physical channel setup according to table E.5.4B.

For the additional requirements for DC-HSDPA, the spacing of the carrier frequencies of the two cells in downlink shall be 5 MHz, and it is assumed that the UE is configured with a single uplink carrier frequency. For the additional requirements for DC-HSUPA, the spacing of the carrier frequencies of the two cells in both downlink and uplink shall be 5 MHz.

For the additional requirements for single band/dual band 4C-HSDPA, the spacing of the adjacent carrier frequencies in downlink and uplink shall be 5 MHz.

For each single band/dual band 4C-HSDPA configuration, the UL-DL carrier separation is defined as minimum (maximum) when the UL carrier is placed at minimum (maximum) possible distance in frequency

from the closest carrier in the corresponding DL band for which the requirement applies.  
The requirements specified in Section 6 in general could be different for each single band/dual band 4C-HSDPA configuration within the same operating band(s).

The test conditions in this clause (this clause) should refer clause table below. Individual test conditions are defined in the paragraph of each test.

| Physical channel | Reference level                           |
|------------------|-------------------------------------------|
| CPICH            | $CPICH_{Ec} / DPCH_{Ec} = 7 \text{ dB}$   |
| P-CCPCH          | $P-CCPCH_{Ec} / DPCH_{Ec} = 5 \text{ dB}$ |
| SCH              | $SCH_{Ec} / DPCH_{Ec} = 5 \text{ dB}$     |
| PICH             | $PICH_{Ec} / DPCH_{Ec} = 2 \text{ dB}$    |
| DPCH             | Test dependent power                      |

## 8.2 TRANSMITTER MAXIMUM OUTPUT POWER

### 8.2.1 Applicable Standard

According to EN301 908-2 clause 4.2.2 and ETSI TS134 121-1 clause 5.2

### 8.2.2 Conformance Limit

Limits for the multi-code DPDCH

The UE maximum output power shall be within the shown value in table 4.2.2.1.2-1 even for the multi-code DPDCH transmission mode.

Power Class 3

| Operating band | Rated power (dBm) | tolerance (dB) |
|----------------|-------------------|----------------|
| Band I         | 24                | +1.7/-3.7      |
| Band III       | 24                | +1.7/-3.7      |
| Band VIII      | 24                | +1.7/-3.7      |

NOTE: These requirements do not take into account the maximum power reduction presence of HS-DPCCH and E-DCH specified in TS 125 101 [5].

**Table 5.2AA.2: Maximum Output Powers with HS-DPCCH for test**

| Sub-test in table C.10.1.4 | Power Class 3 |           | Power Class 4 |           |
|----------------------------|---------------|-----------|---------------|-----------|
|                            | Power (dBm)   | Tol (dB)  | Power (dBm)   | Tol (dB)  |
| 1                          | +24           | +1.7/-3.7 | +21           | +2.7/-2.7 |
| 2                          | +24           | +1.7/-3.7 | +21           | +2.7/-2.7 |
| 3                          | +23.5         | +2.2/-3.7 | +20.5         | +3.2/-2.7 |
| 4                          | +23.5         | +2.2/-3.7 | +20.5         | +3.2/-2.7 |

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

**Table 5.2B.5: Maximum Output Powers with HS-DPCCH and E-DCH for test**

| Sub-test in table C.11.1.3 | Power Class 3 |           | Power Class 4 |           |
|----------------------------|---------------|-----------|---------------|-----------|
|                            | Power (dBm)   | Tol (dB)  | Power (dBm)   | Tol (dB)  |
| 1                          | +24           | +1.7/-6.7 | +21           | +2.7/-5.7 |
| 2                          | +22           | +3.7/-5.2 | +19           | +4.7/-4.2 |
| 3                          | +23           | +2.7/-5.2 | +20           | +3.7/-4.2 |
| 4                          | +22           | +3.7/-5.2 | +19           | +4.7/-4.2 |
| 5                          | +24           | +1.7/-3.7 | +21           | +2.7/-2.7 |

NOTE 1: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

NOTE 2: The test procedure for sub-test 1 to 4 will result in a power slightly below the maximum, and therefore the lower limits in Table 5.2B.5 are made lower by 1.5 dB.

NOTE 3: The test procedure allows UE to decrease its maximum transmit power for E-TFC selection in sub-test 1, and therefore the lower limits of sub-test 1 in Table 5.2B.5 are made lower by 1.5 dB.

NOTE 4: For subtests 2, 3 and 4, UE may perform E-DPDCH power scaling at max power which could results in slightly smaller MPR values.

### 8.2.3 Test Configuration

The measurements for Transmitter-maximum output power shall be performed at both normal environmental conditions and at the extremes of the operating temperature range.

Radiated measurements shall only be used for integral antenna equipment that does not have a temporary antenna connector(s) provided.

Conducted measurements shall be used for antenna equipment provided a temporary antenna connector(s).

### 8.2.4 Test Procedure

#### ■ Initial conditions for the multi-code DPDCH

The frequencies to be tested are low range, mid range and high range as defined in ETSI TS 134 108 [2]:

- 1) Connect the SS to the UE antenna connector.
- 2) A call is set up according to the Generic call setup procedure.
- 3) Enter the UE into loopback test mode and start the loopback test.

NOTE: When reference is made to test set up, call set up and loopback test mode, guidance on the applicability of these can be found in ETSI TS 134 121-1 [1], ETSI TS 134 108 [2] and ETSI TS 134 109 [3] respectively.

- 1) Set and send continuously Up power control commands to the UE.
- 2) Measure the mean power of the UE in a bandwidth of at least  $(1 + \alpha)$  times the chip rate of the radio access mode. The mean power shall be averaged over at least one timeslot.

#### ■ Initial conditions for DC-HSUPA

The frequencies to be tested are low range, mid range and high range as defined in ETSI TS 134 108 [2]:

- 1) Connect the SS (node B emulator) to the UE antenna connector.
- 2) Set up the UL Reference Measurement Channel and parameters, and the DL Reference Measurement Channel.
- 3) An E-DCH call is set up with relevant exceptions in the RADIO BEARER SETUP message in order to allow the beta values to be set and each UL physical channel to be at constant power during the measurement. RF parameters are set up and settings for the serving cell are defined.
- 4) Enter the UE into loopback test mode 1 looping back HSDPA to E-DCH and start the loopback test.

Details of initial conditions for UEs supporting DC-HSUPA can be found in ETSI TS 134 121-1 [1], clause 5.2BA.

- 1) Set the Absolute Grant.
- 2) The SS starts transmitting HSDPA and the UE loops the received data back on E-DCH.
- 3) Generate suitable TPC commands to each individual carrier from the SS to set the total power in each of the assigned carriers to be equal to each other within  $\pm 1$  dB and the total output power of the UE to be at least 7,5 dB lower than the maximum output power. Wait 150 ms.
- 4) Set and send continuously Up power control commands to both carriers in the UE and wait 150 ms.
- 5) Measure the mean power of the UE. The mean power shall be averaged over at least one timeslot.
- 6) The SS shall verify that UE is still in a DC-HSUPA call by verifying that UE transmits signal on each carrier. If UE is not transmitting signal on each carrier the SS shall fail the UE in this test.
- 7) Repeat steps 1-6 for all the different combinations of beta values as given in tables C.11A.1.1 and C.11A.1.2 in ETSI TS 134 121-1 [1], annex C. Details of test method for UEs supporting DC-HSUPA can be found in ETSI TS 134 121-1 [1], clause 5.2BA.

### 8.2.5 Test Results

**For WCDMA**

| Frequency Band: | UMTS Band I                            |        |        |             |
|-----------------|----------------------------------------|--------|--------|-------------|
| Temperature:    | 24°C                                   |        |        | Test By: KK |
| Humidity:       | 53%                                    |        |        |             |
| Test Condition  | Transmitter-Maximum Output Power (dBm) |        |        | Verdict     |
|                 | CH9613                                 | CH9750 | CH9887 |             |
| Tnorm, Vnorm    | 22.80                                  | 23.26  | 22.84  | PASS        |
| Tmin, Vmin      | 22.83                                  | 23.24  | 22.94  | PASS        |
| Tmin, Vmax      | 22.75                                  | 23.17  | 22.77  | PASS        |
| Tmax, Vmin      | 22.89                                  | 23.15  | 22.90  | PASS        |
| Tmax, Vmax      | 22.75                                  | 23.17  | 22.83  | PASS        |

**For HSDPA**

| Frequency Band: | UMTS Band I                                                    |          |        |        |                 |         |
|-----------------|----------------------------------------------------------------|----------|--------|--------|-----------------|---------|
| Temperature:    | 24℃                                                            | Test By: |        | KK     |                 |         |
| Humidity:       | 53%                                                            |          |        |        |                 |         |
| Test Condition  | Transmitter-Maximum Output Power with HS-DPCCH (dBm)           |          |        |        |                 | Verdict |
|                 | Ratio of $\beta_c$ to $\beta_d$ for all values of $\beta_{hs}$ | CH9613   | CH9750 | CH9887 | LIMIT(dBm)      |         |
| Tnorm, Vnorm    | $\beta_c/\beta_d=2/15$                                         | 21.25    | 21.63  | 21.07  | 24 (+1.7,-3.7)  | PASS    |
|                 | $\beta_c/\beta_d=12/15$                                        | 21.20    | 21.56  | 21.10  | 24 (+1.7,-3.7)  |         |
|                 | $\beta_c/\beta_d=15/8$                                         | 21.06    | 21.50  | 20.97  | 23.5(+2.2/-3.7) |         |
|                 | $\beta_c/\beta_d=15/4$                                         | 20.93    | 21.56  | 21.12  | 23.5(+2.2/-3.7) |         |
| Tmin, Vmin      | $\beta_c/\beta_d=2/15$                                         | 21.02    | 21.49  | 21.28  | 24 (+1.7,-3.7)  | PASS    |
|                 | $\beta_c/\beta_d=12/15$                                        | 21.15    | 21.48  | 21.28  | 24 (+1.7,-3.7)  |         |
|                 | $\beta_c/\beta_d=15/8$                                         | 20.97    | 21.29  | 21.05  | 23.5(+2.2/-3.7) |         |
|                 | $\beta_c/\beta_d=15/4$                                         | 21.08    | 21.53  | 20.92  | 23.5(+2.2/-3.7) |         |
| Tmin, Vmax      | $\beta_c/\beta_d=2/15$                                         | 20.90    | 21.37  | 20.84  | 24 (+1.7,-3.7)  | PASS    |
|                 | $\beta_c/\beta_d=12/15$                                        | 20.87    | 21.31  | 21.03  | 24 (+1.7,-3.7)  |         |
|                 | $\beta_c/\beta_d=15/8$                                         | 20.98    | 21.47  | 21.03  | 23.5(+2.2/-3.7) |         |
|                 | $\beta_c/\beta_d=15/4$                                         | 21.04    | 21.46  | 20.93  | 23.5(+2.2/-3.7) |         |
| Tmax, Vmin      | $\beta_c/\beta_d=2/15$                                         | 21.13    | 21.56  | 21.20  | 24 (+1.7,-3.7)  | PASS    |
|                 | $\beta_c/\beta_d=12/15$                                        | 21.21    | 21.60  | 21.24  | 24 (+1.7,-3.7)  |         |
|                 | $\beta_c/\beta_d=15/8$                                         | 20.96    | 21.55  | 20.93  | 23.5(+2.2/-3.7) |         |
|                 | $\beta_c/\beta_d=15/4$                                         | 20.95    | 21.34  | 21.12  | 23.5(+2.2/-3.7) |         |
| Tmax, Vmax      | $\beta_c/\beta_d=2/15$                                         | 21.26    | 21.70  | 21.06  | 24 (+1.7,-3.7)  | PASS    |
|                 | $\beta_c/\beta_d=12/15$                                        | 21.07    | 21.69  | 21.22  | 24 (+1.7,-3.7)  |         |
|                 | $\beta_c/\beta_d=15/8$                                         | 20.85    | 21.30  | 20.96  | 23.5(+2.2/-3.7) |         |
|                 | $\beta_c/\beta_d=15/4$                                         | 20.81    | 21.41  | 20.84  | 23.5(+2.2/-3.7) |         |

**For HSUPA**

| Frequency Band: | UMTS Band I                                                    |          |        |        |               |         |
|-----------------|----------------------------------------------------------------|----------|--------|--------|---------------|---------|
| Temperature:    | 24℃                                                            | Test By: |        | KK     |               |         |
| Humidity:       | 53%                                                            |          |        |        |               |         |
| Test Condition  | Transmitter-Maximum Output Power with HS-DPCCH and E-DCH (dBm) |          |        |        |               | Verdict |
|                 | Ratio of $\beta_c$ to $\beta_d$ for all values of $\beta_{hs}$ | CH9613   | CH9750 | CH9887 | LIMIT(dBm)    |         |
| Tnorm, Vnorm    | $\beta_c/\beta_d=11/15$                                        | 20.48    | 20.49  | 20.44  | 24(+1.7/-6.7) | PASS    |
|                 | $\beta_c/\beta_d=16/15$                                        | 19.74    | 19.61  | 19.74  | 22(+3.7/-5.2) |         |
|                 | $\beta_c/\beta_d=15/9$                                         | 20.44    | 20.58  | 20.38  | 23(+2.7/-5.2) |         |
|                 | $\beta_c/\beta_d=2/15$                                         | 19.70    | 19.69  | 19.63  | 24(+3.7/-5.2) |         |
|                 | $\beta_c/\beta_d=15/15$                                        | 21.12    | 21.05  | 20.94  | 24(+1.7/-3.7) |         |
| Tmin, Vmin      | $\beta_c/\beta_d=11/15$                                        | 21.00    | 21.16  | 21.00  | 24(+1.7/-6.7) | PASS    |
|                 | $\beta_c/\beta_d=16/15$                                        | 19.72    | 19.71  | 19.67  | 22(+3.7/-5.2) |         |
|                 | $\beta_c/\beta_d=15/9$                                         | 20.53    | 20.54  | 20.35  | 23(+2.7/-5.2) |         |
|                 | $\beta_c/\beta_d=2/15$                                         | 19.62    | 19.71  | 19.63  | 24(+3.7/-5.2) |         |
|                 | $\beta_c/\beta_d=15/15$                                        | 21.11    | 21.04  | 20.85  | 24(+1.7/-3.7) |         |
| Tmin, Vmax      | $\beta_c/\beta_d=11/15$                                        | 21.14    | 21.09  | 21.04  | 24(+1.7/-6.7) | PASS    |
|                 | $\beta_c/\beta_d=16/15$                                        | 19.59    | 19.60  | 19.58  | 22(+3.7/-5.2) |         |
|                 | $\beta_c/\beta_d=15/9$                                         | 20.55    | 20.48  | 20.47  | 23(+2.7/-5.2) |         |
|                 | $\beta_c/\beta_d=2/15$                                         | 19.62    | 19.70  | 19.68  | 24(+3.7/-5.2) |         |
|                 | $\beta_c/\beta_d=15/15$                                        | 21.08    | 20.97  | 20.92  | 24(+1.7/-3.7) |         |
| Tmax, Vmin      | $\beta_c/\beta_d=11/15$                                        | 21.03    | 21.15  | 21.01  | 24(+1.7/-6.7) | PASS    |
|                 | $\beta_c/\beta_d=16/15$                                        | 19.61    | 19.72  | 19.61  | 22(+3.7/-5.2) |         |
|                 | $\beta_c/\beta_d=15/9$                                         | 20.56    | 20.44  | 20.38  | 23(+2.7/-5.2) |         |
|                 | $\beta_c/\beta_d=2/15$                                         | 19.66    | 19.67  | 19.74  | 24(+3.7/-5.2) |         |
|                 | $\beta_c/\beta_d=15/15$                                        | 21.01    | 20.95  | 20.83  | 24(+1.7/-3.7) |         |
| Tmax, Vmax      | $\beta_c/\beta_d=11/15$                                        | 21.00    | 21.09  | 21.09  | 24(+1.7/-6.7) | PASS    |
|                 | $\beta_c/\beta_d=16/15$                                        | 19.61    | 19.71  | 19.76  | 22(+3.7/-5.2) |         |
|                 | $\beta_c/\beta_d=15/9$                                         | 20.55    | 20.52  | 20.45  | 23(+2.7/-5.2) |         |
|                 | $\beta_c/\beta_d=2/15$                                         | 19.70    | 19.70  | 19.61  | 24(+3.7/-5.2) |         |
|                 | $\beta_c/\beta_d=15/15$                                        | 21.08    | 20.90  | 20.92  | 24(+1.7/-3.7) |         |

All the modulation modes were tested and the data of WCDMA normal mode are described in appendix I

## 8.3 TRANSMITTER SPECTRUM EMISSION MASK

### 8.3.1 Applicable Standard

According to EN301 908-2 clause 4.2.3

### 8.3.2 Conformance Limit

The spectrum emission mask of the UE applies to frequencies, which are between 2,5 MHz and 12,5 MHz away from the UE centre carrier frequency. The out of channel emission is specified relative to the RRC filtered mean power of the UE carrier.

The power of any UE emission shall not exceed the levels specified in table 4.2.3.2-1. The requirements are applicable for all for the values of  $\beta_c$ ,  $\beta_d$ ,  $\beta_{hs}$ ,  $\beta_{ec}$  and  $\beta_{ed}$  defined in TS 125 214 [8].

| $\Delta f$ in MHz<br>(note 1) | Minimum requirement Band I, II, III, VIII(note 5)                               |                                                    | Measurement Bandwidth |
|-------------------------------|---------------------------------------------------------------------------------|----------------------------------------------------|-----------------------|
|                               | Relative requirement                                                            | Absolute Requirement<br>(in measurement bandwidth) |                       |
| 2,5 to 3,5                    | $\left\{ -35 - 15 \cdot \left( \frac{\Delta f}{MHz} - 2.5 \right) \right\} dBc$ | -69.6dBm                                           | 30 kHz(note 3)        |
| 3,5 to 7,5                    | $\left\{ -35 - 1 \cdot \left( \frac{\Delta f}{MHz} - 3.5 \right) \right\} dBc$  | -54.3 dBm                                          | 1 MHz(note 4)         |
| 7,5 to 8,5                    | $\left\{ -39 - 10 \cdot \left( \frac{\Delta f}{MHz} - 7.5 \right) \right\} dBc$ | -54.3 dBm                                          | 1 MHz(note 4)         |
| 8,5 to 12,5                   | -47,5dBc                                                                        | -54.3 dBm                                          | 1 MHz(note 4)         |

NOTE 1:  $\Delta f$  is the separation between the carrier frequency and the centre of the measurement bandwidth.

NOTE 2: The minimum requirement is calculated from the relative requirement or the absolute requirement, whichever is the higher power.

NOTE 3: The first and last measurement position with a 30 kHz filter is at  $\Delta f$  equals to 2,515 MHz and 3,485 MHz.

NOTE 4: The first and last measurement position with a 1 MHz filter is at  $\Delta f$  equals to 4 MHz and 12 MHz.

NOTE 5: As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth. However, to improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth may be smaller than the measurement bandwidth. When the resolution bandwidth is smaller than the measurement bandwidth, the result should be integrated over the measurement bandwidth in order to obtain the equivalent noise bandwidth of the measurement bandwidth.

### Limits for DC-HSUPA

The power of any UE emission, during DC-HSUPA transmission, shall not exceed the prescribed limits of table 4.2.3.2A-1. The requirements are applicable for all for the values of  $\beta_c$ ,  $\beta_d$ ,  $\beta_{hs}$ ,  $\beta_{ec}$  and  $\beta_{ed}$  defined in TS 125 214 [8].

| $\Delta f$ in MHz                                                                                             | Spectrum emission limit (dBm) | Measurement bandwidth |
|---------------------------------------------------------------------------------------------------------------|-------------------------------|-----------------------|
| ±5 to 6                                                                                                       | -16.5                         | 30 kHz                |
| ±6 to 10                                                                                                      | -8.5                          | 1 MHz                 |
| ±10 to 19                                                                                                     | -11.5                         | 1 MHz                 |
| ±19 to 20                                                                                                     | -23.5                         | 1 MHz                 |
| NOTE: $\Delta f$ is the separation between the carrier frequency and the centre of the measurement bandwidth. |                               |                       |

### 8.3.3 Test Configuration

The measurements for Transmitter- Spectrum Emission Mask shall be performed at normal environmental conditions of the operating temperature range.

Radiated measurements shall only be used for integral antenna equipment that does not have a temporary antenna connector(s) provided.

Conducted measurements shall be used for antenna equipment provided a temporary antenna connector(s).

### 8.3.4 Test Procedure

#### ■ Initial conditions for UEs not supporting HSDPA and/or E-DCH

Test environment: normal (see annex B).

The frequencies to be tested are low range, mid range and high range as defined in ETSI TS 134 108 [2]:

- 1) Connect the SS to the UE antenna connector.
- 2) A call is set up according to the Generic call setup procedure.
- 3) Enter the UE into loopback test mode and start the loopback test.

NOTE: When reference is made to test set up, call set up and loopback test mode, guidance on the applicability of these can be found in ETSI TS 134 121-1 [1], ETSI TS 134 108 [2] and ETSI TS 134 109 [3] respectively.

#### ● Procedure for UEs not supporting HSDPA and/or E-DCH

1) Set and send continuously Up power control commands to the UE until the UE output power shall be at the maximum level.

2) Measure the power of the transmitted signal with a measurement filter of bandwidths according to table 4.2.3.2-1. Measurements with an offset from the carrier centre frequency between 2,515 MHz and 3,485 MHz shall use a 30 kHz measurement filter. Measurements with an offset from the carrier centre frequency between 4 MHz and 12 MHz shall use 1 MHz measurement bandwidth and the result may be calculated by integrating multiple 50 kHz or narrower filter measurements. The characteristic of the filter shall be approximately Gaussian (typical spectrum analyzer filter). The centre frequency of the filter shall be stepped in contiguous steps according to table 4.2.3.2-1. The measured power shall be recorded for each step.

3) Measure the RRC filtered mean power centred on the assigned channel frequency.

4) Calculate the ratio of the power 2) with respect to 3) in dBc.

#### ■ Initial conditions for UEs supporting HSDPA and/or E-DCH

Details of initial conditions for UEs supporting HSDPA can be found in ETSI TS 134 121-1 [1], clause 5.9A. Details of test method for UEs supporting E-DCH can be found in ETSI TS 134 121-1 [1], clause 5.9B.

#### ● Procedure for UEs supporting HSDPA and/or E-DCH

Details of procedure for UEs supporting HSDPA can be found in ETSI TS 134 121-1 [1], clause 5.9A. Details of test method for UEs supporting E-DCH can be found in ETSI TS 134 121-1 [1], clause 5.9B.

#### ■ Initial conditions for DC-HSUPA

Test environment: normal (see annex B).

The frequencies to be tested are low range, mid range and high range as defined in ETSI TS 134 108 [2]:

- 1) Connect the SS (node B emulator) to the UE antenna connector.
- 2) Set up the UL Reference Measurement Channel and parameters, and the DL Reference Measurement Channel.
- 3) An E-DCH call is set up with relevant exceptions in the RADIO BEARER SETUP message in order to allow the beta values to be set and each UL physical channel to be at constant power during the measurement. RF parameters are set up and settings for the serving cell are defined.

4) Enter the UE into loopback test mode and start the loopback test.

Details of initial conditions for UEs supporting DC-HSUPA can be found in ETSI TS 134 121-1 [1], clause 5.9C.

- Procedure for DC-HSUPA

1) Set the UE to maximum output power according to 5.3.1.1.2A steps 1 to 4.

2) When UE has reached the maximum power, measure the power of the transmitted signal with a measurement filter of bandwidths according to table 4.2.3.2A-1. For measurements using 1 MHz or 100 KHz measurement bandwidths the result may be calculated by integrating multiple 50 kHz or narrower filter ( $\geq 3$  kHz) measurements. The characteristic of the filter shall be approximately Gaussian (typical spectrum analyzer filter). The centre frequency of the filter shall be stepped in contiguous steps according to table 4.2.3.2A-1.

The measured power shall be recorded for each step. The measurement duration with the filter on one frequency shall last at least the filter settling time and the measurement period shall be inside the HS-DPCCH on-period.

3) Repeat steps 1-2 for all the different combinations of beta values as given in ETSI TS 134 121-1 [1].

Details of test method for UEs supporting DC-HSUPA can be found in ETSI TS 134 121-1 [1], clause 5.9C.

### 8.3.5 Test Result

#### Pass

All the modulation modes were tested and the data of the worst mode are described in appendix II

## 8.4 TRANSMITTER SPURIOUS EMISSIONS

### 8.4.1 Applicable Standard

According to EN301 908-2 clause 4.2.4 and ETSI TS134 121-1 clause 5.11

### 8.4.2 Conformance Limit

The power of spurious emissions shall not exceed the limits defined in tables 4.2.4.2-1 and 4.2.4.2-2. The limits shown in tables 4.2.4.2-1 and 4.2.4.2-2 are only applicable for frequencies, which are greater than 12,5 MHz away from the UE centre carrier frequency.

Table 4.2.4.2-1: General spurious emissions requirements

| Frequency Bandwidth          | Measurement Bandwidth | Minimum requirement |
|------------------------------|-----------------------|---------------------|
| 9 kHz $\leq f < 150$ kHz     | 1 kHz                 | -36 dBm             |
| 150 kHz $\leq f < 30$ MHz    | 10 kHz                | -36 dBm             |
| 30 MHz $\leq f < 1\,000$ MHz | 100 kHz               | -36 dBm             |
| 1 GHz $\leq f < 12,75$ GHz   | 1 MHz                 | -30 dBm             |

Table 4.2.4.2-2: Additional spurious emissions requirements

| Operating band | Frequency Bandwidth             | Measurement Bandwidth | Minimum requirement     |
|----------------|---------------------------------|-----------------------|-------------------------|
| Band I         | 791 MHz $\leq f \leq 821$ MHz   | 3,84 MHz              | -60 dBm                 |
|                | 921 MHz $\leq f \leq 925$ MHz   | 100 kHz               | -60 dBm (note 1)        |
|                | 925 MHz $\leq f \leq 935$ MHz   | 100 kHz               | -67 dBm (note 1)        |
|                | 935 MHz $< f \leq 960$ MHz      | 100 kHz               | -79 dBm (note 1)        |
|                | 1805 MHz $< f \leq 1880$ MHz    | 100 kHz               | -71 dBm (note 1)        |
|                | 2110 MHz $\leq f \leq 2170$ MHz | 3.84 MHz              | -60 dBm                 |
| Band III       | 2585 MHz $\leq f \leq 2690$ MHz | 3.84 MHz              | -60 dBm                 |
|                | 791 MHz $\leq f \leq 821$ MHz   | 3,84 MHz              | -60 dBm                 |
|                | 921 MHz $\leq f \leq 925$ MHz   | 100 kHz               | -60 dBm (note 1)        |
|                | 925 MHz $\leq f \leq 935$ MHz   | 100 kHz               | -67 dBm (note 1)        |
|                | 935 MHz $< f \leq 960$ MHz      | 100 kHz               | -79 dBm (note 1)        |
|                | 1805 MHz $< f \leq 1880$ MHz    | 100 kHz               | -71 dBm (note 1)        |
| Band VIII      | 2110 MHz $\leq f \leq 2170$ MHz | 3.84 MHz              | -60 dBm                 |
|                | 2585 MHz $\leq f \leq 2690$ MHz | 3.84 MHz              | -60 dBm                 |
|                | 791 MHz $\leq f \leq 821$ MHz   | 3,84 MHz              | -60 dBm                 |
|                | 921 MHz $\leq f \leq 925$ MHz   | 100 kHz               | -60 dBm (note 1)        |
|                | 925 MHz $\leq f \leq 935$ MHz   | 100 kHz               | -67 dBm (note 1)        |
|                | 935 MHz $< f \leq 960$ MHz      | 100 kHz               | -79 dBm (note 1)        |
|                | 1805 MHz $< f \leq 1830$ MHz    | 100 kHz               | -71 dBm (notes 1 and 2) |
|                | 1830 MHz $< f \leq 1880$ MHz    | 3.84 MHz              | -71 dBm (note 1)        |
|                | 2110 MHz $\leq f \leq 2170$ MHz | 3.84 MHz              | -60 dBm                 |
|                | 2585 MHz $\leq f \leq 2690$ MHz | 3.84 MHz              | -60 dBm                 |

NOTE 1: The measurements are made on frequencies which are integer multiples of 200 kHz. As exceptions, up to five measurements with a level up to the applicable requirements defined in table 4.2.4.2-1 are permitted for each UARFCN used in the measurement.

NOTE 2: The measurements are made on frequencies which are integer multiples of 200 kHz. As exceptions, measurements with a level up to the applicable requirements defined in table 4.2.4.2-1 are permitted for each UARFCN used in the measurement due to 2nd or 3rd harmonic spurious emissions.

NOTE 3: The conformance shall be assessed using the measurement position placed at the following centre frequencies: 474 MHz, 586 MHz, 690 MHz, 754 MHz, 770 MHz and 786 MHz.

### 8.4.3 Test Configuration

The measurements for transmitter spurious emissions shall be performed at normal environmental conditions of the operating temperature range.

Radiated measurements shall only be used for integral antenna equipment that does not have a temporary antenna connector(s) provided.

Conducted measurements shall be used for antenna equipment provided a temporary antenna connector(s).

### 8.4.4 Test Procedure

#### ■ Initial conditions

Test environment: normal (see annex B).

The frequencies to be tested are low range, mid range and high range as defined in ETSI TS 134 108 [2]:

- 1) Connect the SS to the UE antenna connector.
- 2) A call is set up according to the Generic call setup procedure.
- 3) Enter the UE into loopback test mode and start the loopback test.

NOTE: When reference is made to test set up, call set up and loopback test mode, guidance on the applicability of these can be found in ETSI TS 134 121-1 [1], ETSI TS 134 108 [2] and ETSI TS 134 109 [3] respectively.

#### ● Procedure

- 1) Set and send continuously Up power control commands to the UE until the UE output power shall be maximum level.
- 2) Sweep the spectrum analyser (or equivalent equipment) over a frequency range and measure the average power of spurious emission.

#### ■ Initial conditions for DC-HSUPA

Test environment: normal (see annex B).

The frequencies to be tested are low range, mid range and high range as defined in ETSI TS 134 108 [2]:

- 1) Connect the SS (node B emulator) to the UE antenna connector.
- 2) Set up the UL Reference Measurement Channel and parameters, and the DL Reference Measurement Channel.
- 3) An E-DCH call is set up with relevant exceptions in the RADIO BEARER SETUP message in order to allow the beta values to be set and each UL physical channel to be at constant power during the measurement. RF parameters are set up and settings for the serving cell are defined.
- 4) Enter the UE into loopback test mode and start the loopback test.

Details of initial conditions for UEs supporting DC-HSUPA can be found in ETSI TS 134 121-1 [1], clause 5.11A.

#### ● Procedure for DC-HSUPA

- 1) Set the UE to maximum output power according to 5.3.1.1.2A steps 1 to 4.
- 2) Sweep the spectrum analyzer (or equivalent equipment) over a frequency range and measure the average power of spurious emission.

Details of test method for UEs supporting DC-HSUPA can be found in ETSI TS 134 121-1 [1], clause 5.11A.

### 8.4.5 Test Result

| Operating Band:                 | UMTS Band I                                |                                            |                                            |
|---------------------------------|--------------------------------------------|--------------------------------------------|--------------------------------------------|
| Temperature:                    | 24°C                                       | Test By:                                   | KK                                         |
| Humidity:                       | 53%                                        |                                            |                                            |
| Frequency<br>(MHz)              | Transmitter Spurious Emission (dBm)        |                                            |                                            |
|                                 | <input checked="" type="checkbox"/> CH9613 | <input checked="" type="checkbox"/> CH9750 | <input checked="" type="checkbox"/> CH9887 |
| 9 kHz < f < 150 kHz             | PASS                                       | PASS                                       | PASS                                       |
| 150 kHz < f < 30 MHz            | PASS                                       | PASS                                       | PASS                                       |
| 30 MHz < f < 791 MHz            | PASS                                       | PASS                                       | PASS                                       |
| 791MHz < f < 821 MHz            | PASS                                       | PASS                                       | PASS                                       |
| 821 MHz < f < 921 MHz           | PASS                                       | PASS                                       | PASS                                       |
| 921MHz < f < 925 MHz            | PASS                                       | PASS                                       | PASS                                       |
| 925 MHz < f < 935 MHz           | PASS                                       | PASS                                       | PASS                                       |
| 935 MHz < f < 960 MHz           | PASS                                       | PASS                                       | PASS                                       |
| 960 MHz<f< 1 000 MHz            | PASS                                       | PASS                                       | PASS                                       |
| 1 000 MHz<f<1805 MHz            | PASS                                       | PASS                                       | PASS                                       |
| 1805 MHz< f <1880 MHz           | PASS                                       | PASS                                       | PASS                                       |
| 1880 MHz<f<1920 MHz             | PASS                                       | PASS                                       | PASS                                       |
| 1920 MHz <f< 1980 MHz           | PASS                                       | PASS                                       | PASS                                       |
| 1980 MHz <f<2110 MHz            | PASS                                       | PASS                                       | PASS                                       |
| 2110 MHz <f<2170 MHz            | PASS                                       | PASS                                       | PASS                                       |
| 2170 MHz <f<2585 MHz            | PASS                                       | PASS                                       | PASS                                       |
| 2585 MHz <f<2690 MHz            | PASS                                       | PASS                                       | PASS                                       |
| 2690 MHz <f<12750 MHz           | PASS                                       | PASS                                       | PASS                                       |
| NOTE: N/A :means not applicable |                                            |                                            |                                            |

All the modulation modes were tested and the data of the worst mode are described in appendix III

## 8.5 TRANSMITTER MINIMUM OUTPUT POWER

### 8.5.1 Applicable Standard

According to EN301 908-2 clause 4.2.5

### 8.5.2 Conformance Limit

The minimum output power shall be less than -49 dBm.

Limits for DC-HSUPA

The minimum output power in each carrier shall be less than -49 dBm, when both carriers are set to minimum output power.

### 8.5.3 Test Configuration

The measurements for transmitter minimum output power shall be performed at both normal environmental conditions and at the extremes of the operating temperature range.

Radiated measurements shall only be used for integral antenna equipment that does not have a temporary antenna connector(s) provided.

Conducted measurements shall be used for antenna equipment provided a temporary antenna connector(s).

### 8.5.4 Test Procedure

#### ■ Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH (see annex B).

The frequencies to be tested are mid range as defined in ETSI TS 134 108 [2]:

- 1) Connect the SS to the UE antenna connector.
- 2) A call is set up according to the Generic call setup procedure.
- 3) Enter the UE into loopback test mode and start the loopback test.

NOTE: When reference is made to test set up, call set up and loopback test mode, guidance on the applicability of these can be found in ETSI TS 134 121-1 [1], ETSI TS 134 108 [2] and ETSI TS 134 109 [3].

#### ● Procedure

- 1) Set and send continuously Down power control commands to the UE.
- 2) Measure the mean power of the UE.

#### ■ Initial conditions for DC-HSUPA

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH (see annex B).

Frequencies to be tested are low range, mid range, high range as defined in ETSI TS 134 108 [2]:

- 1) Connect the SS to the UE antenna connector.
- 2) Set up the UL Reference Measurement Channel and parameters, and the DL Reference Measurement Channel.
- 3) An E-DCH call is set up with relevant exceptions in the RADIO BEARER SETUP message in order to allow the beta values to be set and each UL physical channel to be at constant power during the measurement. RF parameters are set up and settings for the serving cell are defined.
- 4) Enter the UE into loopback test mode 1 looping back HSDPA to E-DCH and start the loopback test. Details of initial conditions for UEs supporting DC-HSUPA can be found in ETSI TS 134 121-1 [1], clause 5.4.3A.

#### ● Procedure for DC-HSUPA

- 1) Set and send continuously Down power control commands to the UE.
  - 2) Measure the mean power in each carrier of the UE.
- Details of test method for UEs supporting DC-HSUPA can be found in ETSI TS 134 121-1 [1], clause 5.4.3A.

### 8.5.5 Test Result

| Frequency Band: | UMTS Band I                            |             |
|-----------------|----------------------------------------|-------------|
| Temperature:    | 24°C                                   | Test By: KK |
| Humidity:       | 53%                                    |             |
| Test Condition  | Transmitter-Minimum Output Power (dBm) | Verdict     |
|                 | CH9750                                 |             |
| Tnorm, Vnorm    | -53.59                                 | PASS        |
| Tmin, Vmin      | -53.74                                 | PASS        |
| Tmin, Vmax      | -53.65                                 | PASS        |
| Tmax, Vmin      | -53.57                                 | PASS        |
| Tmax, Vmax      | -53.68                                 | PASS        |

All the modulation modes were tested and the data of the worst mode are described in appendix IV

## 8.6 TRANSMITTER ADJACENT CHANNEL LEAKAGE POWER RATIO

### 8.6.1 Applicable Standard

According to EN301 908-2 clause 4.2.12 and ETSI TS134 121-1 clause 5.10

### 8.6.2 Conformance Limit

If the adjacent channel power is greater than -50 dBm then the ACLR shall be higher than the value specified in table 4.2.12.2-1. The requirements are applicable for all for the values of  $\beta_c$ ,  $\beta_d$ ,  $\beta_{hs}$ ,  $\beta_{ec}$  and  $\beta_{ed}$  defined in TS 125 214 [8].

Table 4.2.12.2-1: UE ACLR

| Power Class | Adjacent channel frequency relative to assigned channel frequency | ACLR limit |
|-------------|-------------------------------------------------------------------|------------|
| 3           | +5 MHz or -5MHz                                                   | 32.2 dB    |
| 3           | +10 MHz or -10MHz                                                 | 42.2 dB    |

Limits for DC-HSUPA

If the adjacent channel power is greater than -50 dBm then the ACLR shall be higher than the value specified in table 4.2.12.2A-1. The requirements are applicable for all for the values of  $\beta_c$ ,  $\beta_d$ ,  $\beta_{hs}$ ,  $\beta_{ec}$  and  $\beta_{ed}$  defined in TS 125 214 [8].

Table 4.2.12.2A-1: UE ACLR for DC-HSUPA

| Power Class | Adjacent channel frequency relative to the center of two assigned channel frequencies | ACLR limit |
|-------------|---------------------------------------------------------------------------------------|------------|
| 3           | +5 MHz or -5MHz                                                                       | 32.2 dB    |
| 3           | +10 MHz or -10MHz                                                                     | 42.2 dB    |

### 8.6.3 Test Configuration

The measurements for transmitter adjacent channel leakage power ratio shall be performed at both normal environmental conditions and at the extremes of the operating temperature range.

Radiated measurements shall only be used for integral antenna equipment that does not have a temporary antenna connector(s) provided.

Conducted measurements shall be used for antenna equipment provided a temporary antenna connector(s).

### 8.6.4 Test Procedure

■ Initial conditions for UEs not supporting HSDPA and/or E-DCH

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH (see annex B).

The frequencies to be tested are mid range as defined in ETSI TS 134 108 [2]:

- 1) Connect the SS to the UE antenna connector.
- 2) A call is set up according to the Generic call setup procedure.
- 3) Enter the UE into loopback test mode and start the loopback test.

NOTE: When reference is made to test set up, call set up and loopback test mode, guidance on the applicability of these can be found in ETSI TS 134 121-1 [1], ETSI TS 134 108 [2] and ETSI TS 134 109 [3] respectively.

● Procedure for UEs not supporting HSDPA and/or E-DCH

- 1) The SS sends continuously Up power control commands to the UE until the UE transmitter power reaches maximum level.
- 2) Measure the RRC filtered mean power.
- 3) Measure the RRC filtered mean power of the first adjacent channels and the second adjacent channels.
- 4) Calculate the ratio of the power between the values measured in steps 2 and 3 above.

■ Initial conditions for UEs supporting HSDPA and/or E-DCH

Details of initial conditions for UEs supporting HSDPA can be found in ETSI TS 134 121-1 [1], clause 5.10A. Details of test method for UEs supporting E-DCH can be found in ETSI TS 134 121-1 [1], clause 5.10B.

● Procedure for UEs supporting HSDPA and/or E-DCH

Details of procedure for UEs supporting HSDPA can be found in ETSI TS 134 121-1 [1], clause 5.10A.

Details of test method for UEs supporting E-DCH can be found in ETSI TS 134 121-1 [1], clause 5.10B.

■ Initial conditions for DC-HSUPA

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH (see annex B).

The frequencies to be tested are low range, mid range and high range as defined in ETSI TS 134 108 [2]:

- 1) Connect the SS (node B emulator) to the UE antenna connector.
- 2) Set up the UL Reference Measurement Channel and parameters, and the DL Reference Measurement Channel.

3) An E-DCH call is set up with relevant exceptions in the RADIO BEARER SETUP message in order to allow the beta values to be set and each UL physical channel to be at constant power during the measurement. RF parameters are set up and settings for the serving cell are defined.

4) Enter the UE into loopback test mode 1 looping back HSDPA to E-DCH and start the loopback test.

Details of initial conditions for UEs supporting DC-HSUPA can be found in ETSI TS 134 121-1 [1], clause 5.10C.

● Procedure for DC-HSUPA

- 1) Set the UE to maximum output power according to clause 5.3.1.1.2A steps 1 to 4.
- 2) Measure the sum of the RRC filtered mean powers centered on each of the two assigned channel frequencies. The measurement period shall be inside the HS-DPCCH on-period for the wanted and the adjacent channels.
- 3) Measure the RRC filtered mean power of the first adjacent channels and the second adjacent channels.
- 4) Calculate the ratio of the power between the values measured in steps 2 and 3 above.

Details of test method for UEs supporting DC-HSUPA can be found in ETSI TS 134 121-1 [1], clause 5.10C.

#### **8.6.5 Test Result**

##### **Pass**

All the modulation modes were tested and the data of the worst mode are described in appendix V

## 8.7 TRANSMITTER ADJACENT CHANNEL LEAKAGE POWER RATIO WITH HS-DPCCH

### 8.7.1 Applicable Standard

According to EN301 908-2 clause 4.2.12

### 8.7.2 Conformance Limit

If the adjacent channel RRC filtered mean power is greater than  $-50\text{dBm}$  then the ACLR shall be higher than the value specified in table 5.10A.1. This is applicable for all values of  $\beta_c$ ,  $\beta_d$ ,  $\beta_{hs}$  as specified in [5].

Table 5.10A.1: UE ACLR

| Power Class | UE channel        | ACLR limit |
|-------------|-------------------|------------|
| 3           | +5 MHz or -5MHz   | 33 dB      |
| 3           | +10 MHz or -10MHz | 43 dB      |

NOTE 1: The requirement shall still be met in the presence of switching transients.

NOTE 2: The ACLR requirements reflect what can be achieved with present state of the art technology.

NOTE 3: Requirement on the UE shall be reconsidered when the state of the art technology progresses. The normative reference for this requirement is TS 25.101 [1] clause 6.6.2.2.1.

### 8.7.3 Test Configuration

The measurements for transmitter adjacent channel leakage power ratio with HS-DPCCH shall be performed at both normal environmental conditions and at the extremes of the operating temperature range.

Radiated measurements shall only be used for integral antenna equipment that does not have a temporary antenna connector(s) provided.

Conducted measurements shall be used for antenna equipment provided a temporary antenna connector(s).

### 8.7.4 Test Procedure

Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2. Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

1) Connect the SS (node B emulator) to the UE antenna connector as shown in figure A.1.

2) The UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1, QPSK version) are specified in Annex C.10.1 and C.8.1.1.

3) An HSDPA call is set up according to TS 34.108 [3] clause 7.3.6. RF parameters are set up according to table E.5.1 and table E.5.10. Settings for the serving cell are defined in table 5.10A.2.

4) Enter the UE into loopback test mode in the presence of HSDPA and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding loopback test mode for HSDPA.

Table 5.10A.2: Settings for the serving cell during the measurement of Adjacent Channel Leakage Power Ratio (ACLR) with HS-DPCCH

| Parameter                                                                                                                                                                  | Unit         | Cell 1                        |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-------------------------------|
| Cell type                                                                                                                                                                  |              | Serving cell                  |
| UTRA RF Channel Number                                                                                                                                                     |              | As defined in clause 5.2A.4.1 |
| Qqualmin                                                                                                                                                                   | dB           | -24                           |
| Qrxlevmin                                                                                                                                                                  | dBm          | -115                          |
| UE_TXPWR_MAX_RACH                                                                                                                                                          | dBm          | +21                           |
| $\bar{I}_{or}$ (see notes 1 and 2)                                                                                                                                         | dBm/3.84 MHz | -86                           |
| NOTE 1: The power level is specified in terms of $\bar{I}_{or}$ instead of CPICH_RSCP because RSCP is a receiver measurement, whereas the SS can only set $\bar{I}_{or}$ . |              |                               |
| NOTE 2: The cell fulfils TS 25.304, clause 5.2.3.1.2.                                                                                                                      |              |                               |

Procedure

1) Send Transport Channel Reconfiguration message to set the beta values according to table C.10.1.4 and the DPCH frame offset according the HS-DPCCH slot offset required for measurements.

2) Set and send continuously Up power control commands to the UE.

3) Start transmitting HSDPA Data.

- 4) When UE has reached the maximum power, measure the RRC filtered mean power on the wanted channel. The measurement period shall be inside the HS-DPCCH on-period for the wanted and the adjacent channels.
  - 5) Measure the RRC filtered mean power of the first adjacent channels and the second adjacent channels.
  - 6) Calculate the ratio of the power between the values measured in step 4) and step 5).
  - 7) Repeat steps 1-6 for all the different combinations of beta values as given in table C.10.1.4.
- All messages indicated above shall use the same content as described in the default message content in clause 9 of TS 34.108 [3], except the Transport Channel Reconfiguration message which is defined in Annex I.

#### **8.7.5 Test Result**

##### **Pass**

All the modulation modes were tested and the data of the worst mode are described in appendix V

## 8.8 RECEIVER ADJACENT CHANNEL SELECTIVITY (ACS)

### 8.8.1 Applicable Standard

According to EN301 908-2 clause 4.2.6 and ETSI TS134 121-1 clause 6.4

### 8.8.2 Conformance Limit

For the UE of power class 3 and 4, the BER shall not exceed 0,001 for the parameters specified in table 4.2.6.2-1. This test condition is equivalent to the ACS value 33 dB.

**Table 4.2.6.2-1: Test parameters for adjacent channel selectivity**

| Parameter                                                                                                                                   | Unit         | Case 1                                           | Case 2                                           |
|---------------------------------------------------------------------------------------------------------------------------------------------|--------------|--------------------------------------------------|--------------------------------------------------|
| DPCH_Ec                                                                                                                                     | dBm/3,84 MHz | <REFSENS> + 14 dB                                | <REFSENS> + 41 dB                                |
| $I_{or}$                                                                                                                                    | dBm/3,84 MHz | <REF $I_{or}$ > + 14 dB                          | <REF $I_{or}$ > + 41 dB                          |
| $I_{oac}$ mean power (modulated)                                                                                                            | dBm          | -52                                              | -25                                              |
| $F_{uw}$ (offset)                                                                                                                           | MHz          | +5 or -5                                         | +5 or -5                                         |
| UE transmitted mean power                                                                                                                   | dBm          | 20 (for Power class 3)<br>18 (for Power class 4) | 20 (for Power class 3)<br>18 (for Power class 4) |
| NOTE 1: <REFSENS> and <REF $I_{or}$ > as specified in TS 134 121-1 [2].                                                                     |              |                                                  |                                                  |
| NOTE 2: The $I_{oac}$ (modulated) signal consists of the common channels and the 16 dedicated data channels as specified in TS 125 101 [5]. |              |                                                  |                                                  |

### 8.8.3 Test Configuration

The measurements for receiver adjacent channel selectivity shall be performed at normal environmental conditions of the operating temperature range.

Radiated measurements shall only be used for integral antenna equipment that does not have a temporary antenna connector(s) provided.

Conducted measurements shall be used for antenna equipment provided a temporary antenna connector(s).

### 8.8.4 Test Procedure

- 1) Set the parameters of the interference signal generator as shown in table 4.2.6.2-1 case 1.
- 2) Set the power level of UE according to the table 4.2.6.2-1 case 1 with  $\pm 1$  dB tolerance.
- 3) Measure the BER of DCH received from the UE at the SS.
- 4) Set the parameters of the interference signal generator as shown in table 4.2.6.2-1 case 2.
- 5) Set the power level of UE according to the table 4.2.6.2-1 case 2 with  $\pm 1$  dB tolerance.
- 6) Measure the BER of DCH received from the UE at the SS.

### 8.8.5 Test Result

| WCDMA Band I                |      |          |          |
|-----------------------------|------|----------|----------|
| Parameter                   | Unit | Case 1   | Case 2   |
| loac mean power (modulated) | dBm  | -52      | -25      |
| Fuw (offset)                | MHz  | +5 or -5 | +5 or -5 |
| UE transmitted mean power   | dBm  | 20       | 20       |
| BER                         | %    | 0        | 0        |
| Limit                       | %    | 0.1      | 0.1      |
| Result                      |      | PASS     | PASS     |

## 8.9 RECEIVER BLOCKING CHARACTERISTICS

### 8.9.1 Applicable Standard

According to EN301 908-2 clause 4.2.7 and ETSI TS134 121-1 clause 6.5

### 8.9.2 Conformance Limit

The BER shall not exceed 0,001 for the parameters specified in tables 4.2.7.2-1 and 4.2.7.2-2. For table 4.2.7.2-2 up to 24 exceptions are allowed for spurious response frequencies in each assigned frequency channel when measured using a 1 MHz step size.

Table 4.2.7.2-1: Test parameters for in-band blocking characteristics

| Table 4.2.7.2 1: Test parameters for in-band blocking characteristics                                                                                   |             |                                            |          |                                            |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|--------------------------------------------|----------|--------------------------------------------|
| Parameter                                                                                                                                               | Unit        | Level                                      |          |                                            |
|                                                                                                                                                         |             | BAND I                                     | BAND III | BAND VIII                                  |
| DPCH_Ec                                                                                                                                                 | dBm/3.84MHz | -117                                       | -114     | -114                                       |
| I <sub>or</sub>                                                                                                                                         | dBm/3.84MHz | -106.7                                     | -103.7   | -103.7                                     |
| I <sub>blocking</sub> mean power (modulated)                                                                                                            | dBm         | -56<br>(for F <sub>uw</sub> offset ±10MHz) |          | -44<br>(for F <sub>uw</sub> offset ±15MHz) |
| UE transmitted mean power                                                                                                                               | dBm         | 20dBm                                      |          |                                            |
| NOTE 1: The I <sub>blocking</sub> (modulated) signal consists of the common channels and the 16 dedicated data channels as specified in TS 125 101 [5]. |             |                                            |          |                                            |

Table 4.2.7.2-2: Test parameters for out-of-band blocking characteristics

| Parameter                                                                                                                                               | Unit        | Level                      |                            |                          |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|----------------------------|----------------------------|--------------------------|
|                                                                                                                                                         |             | -117                       | -114                       | -114                     |
| DPCH_Ec                                                                                                                                                 | dBm/3.84MHz | -106.7                     | -103.7                     | -103.7                   |
| I <sub>or</sub>                                                                                                                                         | dBm/3.84MHz | -117                       | -114                       | -114                     |
| I <sub>blocking</sub> (CW)                                                                                                                              | dBm         | -44                        | -30                        | -15                      |
| F <sub>uw</sub> (Band I operation)                                                                                                                      | MHz         | 2050<f<2095<br>2185<f<2230 | 2025<f<2050<br>2230<f<2255 | 1<f<2025<br>2255<f<12750 |
| F <sub>uw</sub> (Band I operation)                                                                                                                      | MHz         | 1745<f<1790<br>1895<f<1940 | 1720<f<1745<br>1940<f<1965 | 1<f<1720<br>1965<f<12750 |
| F <sub>uw</sub> (Band VIII operation)                                                                                                                   | MHz         | 865<f<910<br>975<f<1020    | 840<f<865<br>1020<f<1045   | 1<f<840<br>1045<f<12750  |
| UE transmitted mean power                                                                                                                               | dBm         | 20dBm                      |                            |                          |
| NOTE 1: The I <sub>blocking</sub> (modulated) signal consists of the common channels and the 16 dedicated data channels as specified in TS 125 101 [5]. |             |                            |                            |                          |

Table 4.2.7.2-3: Test parameters for narrow band blocking

| Parameter                                                                                                                                                                                                                                                                                                       | Unit         | Band III, VIII                                   |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|--------------------------------------------------|
| DPCH_Ec                                                                                                                                                                                                                                                                                                         | dBm/3,84 MHz | <REFSENS> + 10 dB                                |
| I <sub>or</sub>                                                                                                                                                                                                                                                                                                 | dBm/3,84 MHz | <REFI <sub>or</sub> > + 10 dB                    |
| I <sub>blocking</sub> (GMSK)                                                                                                                                                                                                                                                                                    | dBm          | -56                                              |
| F <sub>uw</sub> (offset)                                                                                                                                                                                                                                                                                        | MHz          | 2,8                                              |
| UE transmitted mean power                                                                                                                                                                                                                                                                                       | dBm          | 20 (for Power class 3)<br>18 (for Power class 4) |
| NOTE 1: <REFSENS> and <REFI <sub>or</sub> > as specified in TS 134 121-1 [2].                                                                                                                                                                                                                                   |              |                                                  |
| NOTE 2: I <sub>blocking</sub> (GMSK) is an interfering signal as defined in TS 145 004 [9]. It is a continuous GMSK modulated carrier following the structure of the GSM signals, but with all modulating bits (including the midamble period) derived directly from a random or any pseudo random data stream. |              |                                                  |

### 8.9.3 Test Configuration

The measurements for receiver blocking characteristics shall be performed at normal environmental conditions of the operating temperature range.

Radiated measurements shall only be used for integral antenna equipment that does not have a temporary antenna connector(s) provided.

Conducted measurements shall be used for antenna equipment provided a temporary antenna connector(s) .

### 8.9.4 Test Procedure

Initial requirements

Test environment: normal (see annex B).

For in-band case, the frequencies to be tested are mid range as defined in ETSI TS 134 108 [2]. For out-of-band case, frequencies to be tested are mid range as defined in ETSI TS 134 108 [2].

For narrow band case, frequencies to be tested are mid range as defined in ETSI TS 134 108 [2]:

- 1) Connect the SS to the UE antenna connector.
- 2) A call is set up according to the Generic call setup procedure, and RF parameters are set up according to tables 4.2.7.2-1, 4.2.7.2-2 and 4.2.7.2-3.
- 3) Enter the UE into loopback test mode and start the loopback test.

NOTE: When reference is made to test set up, call set up and loopback test mode, guidance on the applicability of these can be found in ETSI TS 134 121-1 [1], ETSI TS 134 108 [2] and ETSI TS 134 109 [3] respectively.

Procedure

- 1) Set the parameters of the CW generator or the interference signal generator as shown in tables 4.2.7.2-1, 4.2.7.2-2 and 4.2.7.2-3. For table 4.2.7.2-2 the frequency step size is 1 MHz.
- 2) Set the power level of the UE according to tables 4.2.7.2-1, 4.2.7.2-2 and 4.2.7.2-3 with a  $\pm 1$  dB tolerance.
- 3) Measure the BER of DCH received from the UE at the SS.
- 4) For table 4.2.7.2-2, record the frequencies for which the BER exceeds the test requirements.

### 8.9.5 Test Result

#### ■ Receiver blocking characteristics for in-band

Frequency Band: UMTS Band I

Temperature: 24°C

Humidity: 53%

Test By: KK

|            |                                   |         |         |         |          |
|------------|-----------------------------------|---------|---------|---------|----------|
| Humidity:  | 55%                               |         |         |         |          |
| Test Items | Receiver Blocking Characteristics |         |         |         | Limit(%) |
|            | CH9750                            |         |         |         |          |
|            | -15 MHz                           | -10 MHz | +10 MHz | +15 MHz |          |
| BER(%)     | 0.00                              | 0.00    | 0.00    | 0.00    | 0.1      |
| Verdict    | PASS                              |         |         |         |          |

#### ■ Receiver blocking characteristics for out-of-band

Frequency Band: UMTS Band I

Temperature: 24°C

Humidity: 53%

Test By: KK

| Test Items | Receiver Blocking Characteristics |             |             |             |             |              |
|------------|-----------------------------------|-------------|-------------|-------------|-------------|--------------|
|            | CH9750                            |             |             |             |             |              |
|            | 1<f<2025                          | 2025<f<2050 | 2050<f<2095 | 2185<f<2230 | 2230<f<2255 | 2255<f<12750 |
| BER(%)     | 0.00                              | 0.00        | 0.00        | 0.00        | 0.00        | 0.00         |
| Limit(%)   | 0.1                               | 0.1         | 0.1         | 0.1         | 0.1         | 0.1          |
| Verdict    | PASS                              |             |             |             |             |              |

## 8.10 RECEIVER SPURIOUS RESPONSE

### 8.10.1 Applicable Standard

According to EN301 908-2 clause 4.2.8 and ETSI TS134 121-1 clause 6.6

### 8.10.2 Conformance Limit

The BER shall not exceed 0,001 for the parameters specified in table 4.2.8.2-1.

Table 4.2.8.2-1: Test parameters for spurious response

| Parameter                 | Level                         |          |           | Unit          |
|---------------------------|-------------------------------|----------|-----------|---------------|
|                           | BAND I                        | BAND III | BAND VIII |               |
| DPCH $E_c$                | -117                          | -114     | -114      | dBm / 3,84MHz |
| $\hat{I}_{or}$            | -106.7                        | -103.7   | -103.7    | dBm / 3,84MHz |
| $I_{blocking}(CW)$        | -44                           |          |           | dBm           |
| $F_{uw}$                  | Spurious response frequencies |          |           | MHz           |
| UE transmitted mean power | 20 (for Power class 3)        |          |           | dBm           |

### 8.10.3 Test Configuration

The measurements for receiver spurious response shall be performed at normal environmental conditions of the operating temperature range.

Radiated measurements shall only be used for integral antenna equipment that does not have a temporary antenna connector(s) provided.

Conducted measurements shall be used for antenna equipment provided a temporary antenna connector(s).

### 8.10.4 Test Procedure

Initial conditions

Test environment: normal (see annex B).

The frequencies to be tested are mid range as defined in ETSI TS 134 108 [2]:

- 1) Connect the SS to the UE antenna connector.
- 2) A call is set up according to the Generic call setup procedure, and RF parameters are set up according to table 4.2.8.2-1.
- 3) Enter the UE into loopback test mode and start the loopback test.

NOTE: When reference is made to test set up, call set up and loopback test mode, guidance on the applicability of these can be found in ETSI TS 134 121-1 [1], ETSI TS 134 108 [2] and ETSI TS 134 109 [3] respectively.

Procedure

- 1) Set the parameter of the CW generator as shown in table 4.2.8.2-1. The spurious response frequencies are determined in step 4 of clause 5.3.6.1.2.
- 2) Set the power level of the UE according to table 4.2.8.2-1 with a  $\pm 1$  dB tolerance.
- 3) Measure the BER of DCH received from the UE at the SS.

**8.10.5 Test Result**

Pass

See the section 8.9.5

## 8.11 RECEIVER INTERMODULATION CHARACTERISTICS

### 8.11.1 Applicable Standard

According to EN301 908-2 clause 4.2.9 and ETSI TS134 121-1 clause 6.7

### 8.11.2 Conformance Limit

The BER shall not exceed 0,001 for the parameters specified in table 4.2.9.2-1.

Table 4.2.9.2-1: Receive intermodulation characteristics

| Parameter                                                                                                                                | Unit        | Level                 |          |           |
|------------------------------------------------------------------------------------------------------------------------------------------|-------------|-----------------------|----------|-----------|
|                                                                                                                                          |             | BAND I                | BAND III | BAND VIII |
| DPCH_Ec                                                                                                                                  | dBm/3.84MHz | -117                  | -114     | -114      |
| I <sub>or</sub>                                                                                                                          | dBm/3.84MHz | -106.7                | -103.7   | -103.7    |
| I <sub>ouw1</sub> (CW)                                                                                                                   | dBm         | -46                   |          |           |
| I <sub>ouw2</sub> (modulated)                                                                                                            | dBm/3.84MHz | -46                   |          |           |
| F <sub>uw1</sub> (offset)                                                                                                                | MHz         | 10                    |          | -10       |
| F <sub>uw2</sub> (offset)                                                                                                                | MHz         | 20                    |          | -20       |
| UE transmitted mean power                                                                                                                | dBm         | 20(for power class 3) |          |           |
| NOTE 1: I <sub>ouw2</sub> (modulated) consists of the common channels and the 16 dedicated data channels as specified in TS 125 101 [5]. |             |                       |          |           |

### 8.11.3 Test Configuration

The measurements for receiver intermodulation characteristics shall be performed at normal environmental conditions of the operating temperature range.

Radiated measurements shall only be used for integral antenna equipment that does not have a temporary antenna connector(s) provided.

Conducted measurements shall be used for antenna equipment provided a temporary antenna connector(s).

### 8.11.4 Test Procedure

Initial conditions

Test environment: normal (see annex B).

The frequencies to be tested are mid range as defined in ETSI TS 134 108 [2]:

- 1) Connect the SS to the UE antenna connector.
- 2) A call is set up according to the Generic call setup procedure as per ETSI TS 134 108 [2], and RF parameters are set up according to tables 4.2.9.2-1 and 4.2.9.2-2.
- 3) Enter the UE into loopback test mode and start the loopback test using the procedure defined in ETSI TS 134 109 [3].

NOTE: When reference is made to test set up, call set up and loopback test mode, guidance on the applicability of these can be found in ETSI TS 134 121-1 [1], ETSI TS 134 108 [2] and ETSI TS 134 109 [3].

Procedure

- 1) Set the parameters of the CW generator and interference generator as shown in tables 4.2.9.2-1 and 4.2.9.2-2.
- 2) Set the power level of the UE according to tables 4.2.9.2-1 and 4.2.9.2-2 with a  $\pm 1$  dB tolerance.
- 3) Measure the BER of DCH received from the UE at the SS.

### 8.11.5 TEST RESULT

|                 |                                          |      |                       |      |                       |      |                       |      |          |  |
|-----------------|------------------------------------------|------|-----------------------|------|-----------------------|------|-----------------------|------|----------|--|
| Frequency Band: | UMTS Band I                              |      |                       |      |                       |      |                       |      |          |  |
| Temperature:    | 24℃                                      |      |                       |      | Test By:              | KK   |                       |      |          |  |
| Humidity:       | 53%                                      |      |                       |      |                       |      |                       |      |          |  |
| Test Items      | Receiver Intermodulation Characteristics |      |                       |      |                       |      |                       |      | Limit(%) |  |
|                 | CH9750                                   |      |                       |      |                       |      |                       |      |          |  |
|                 | Fuw (offset)<br>(MHz)                    |      | Fuw (offset)<br>(MHz) |      | Fuw (offset)<br>(MHz) |      | Fuw (offset)<br>(MHz) |      |          |  |
|                 | Fuw1                                     | Fuw2 | Fuw1                  | Fuw2 | Fuw1                  | Fuw2 | Fuw1                  | Fuw2 |          |  |
|                 | 10                                       | 20   | 10                    | -20  | -10                   | 20   | -10                   | -20  |          |  |
| BER(%)          | 0.00                                     |      | 0.00                  |      | 0.00                  |      | 0.00                  |      | 0.1      |  |
| Verdict         | PASS                                     |      |                       |      |                       |      |                       |      |          |  |

## 8.12 RECEIVER SPURIOUS EMISSIONS

### 8.12.1 Applicable Standard

According to EN301 908-2 clause 4.2.10 and ETSI TS134 121-1 clause 6.8

### 8.12.2 Conformance Limit

The power of any narrow band CW spurious emission shall not exceed the maximum level specified in tables 4.2.10.2-1 and 4.2.10.2-2.

Table 4.2.10.2-1: General receiver spurious emission requirements

| Frequency Band        | Measurement Bandwidth | Maximum level | Note |
|-----------------------|-----------------------|---------------|------|
| 30 MHz ≤ f < 1 GHz    | 100 kHz               | -57 dBm       | /    |
| 1 GHz ≤ f ≤ 12,75 GHz | 1 MHz                 | -47 dBm       | /    |

Table 4.2.10.2-2: Additional receiver spurious emission requirements

| Operating band | Frequency Band           | Measurement Bandwidth | Maximum level | Note |
|----------------|--------------------------|-----------------------|---------------|------|
| I              | 791 MHz ≤ f ≤ 821 MHz    | 100 kHz               | -60 dBm       | /    |
|                | 921 MHz ≤ f ≤ 925 MHz    | 100 kHz               | -60 dBm       | /    |
|                | 925 MHz ≤ f ≤ 935 MHz    | 100 kHz               | -67 dBm       | /    |
|                | 935 MHz ≤ f ≤ 960 MHz    | 100 kHz               | -79 dBm       | /    |
|                | 1 805 MHz ≤ f ≤ 1880 MHz | 100 kHz               | -71 dBm       | /    |
|                | 1920 MHz ≤ f ≤ 1980 MHz  | 3.84 MHz              | -60 dBm       | /    |
|                | 2 110 MHz ≤ f ≤ 2170 MHz | 3.84 MHz              | -60 dBm       | /    |
|                | 2 620 MHz ≤ f ≤ 2690 MHz | 3.84 MHz              | -60 dBm       | /    |

| Operating band | Frequency Band            | Measurement Bandwidth | Maximum level | Note |
|----------------|---------------------------|-----------------------|---------------|------|
| III            | 791 MHz ≤ f ≤ 821 MHz     | 100 kHz               | -60 dBm       | /    |
|                | 921 MHz ≤ f ≤ 925 MHz     | 100 kHz               | -60 dBm       | /    |
|                | 925 MHz ≤ f ≤ 935 MHz     | 100 kHz               | -67 dBm       | /    |
|                | 935 MHz ≤ f ≤ 960 MHz     | 100 kHz               | -79 dBm       | /    |
|                | 1 710 MHz ≤ f ≤ 1 785 MHz | 100 kHz               | -60 dBm       | /    |
|                | 1 805 MHz ≤ f ≤ 1 880 MHz | 3.84 MHz              | -60 dBm       | /    |
|                | 2 110 MHz ≤ f ≤ 2170 MHz  | 3.84 MHz              | -60 dBm       | /    |
|                | 2 585 MHz ≤ f ≤ 2690 MHz  | 3.84 MHz              | -60 dBm       | /    |

| Operating band | Frequency Band           | Measurement Bandwidth | Maximum level | Note |
|----------------|--------------------------|-----------------------|---------------|------|
| VIII           | 791 MHz ≤ f ≤ 821 MHz    | 100 kHz               | -60 dBm       | /    |
|                | 880 MHz ≤ f ≤ 915 MHz    | 3.84 MHz              | -60 dBm       | /    |
|                | 921 MHz ≤ f ≤ 925 MHz    | 100 kHz               | -60 dBm       | /    |
|                | 925 MHz ≤ f ≤ 935 MHz    | 100 kHz               | -67 dBm       | /    |
|                | 935 MHz ≤ f ≤ 960 MHz    | 100 kHz               | -79 dBm       | /    |
|                | 1 805 MHz ≤ f ≤ 1880 MHz | 3.84 MHz              | -60 dBm       | /    |
|                | 2 110 MHz ≤ f ≤ 2170 MHz | 3.84 MHz              | -60 dBm       | /    |
|                | 2 620 MHz ≤ f ≤ 2690 MHz | 3.84 MHz              | -60 dBm       | /    |

### 8.12.3 Test Configuration

The measurements for receiver spurious emissions shall be performed at normal environmental conditions of the operating temperature range.

Radiated measurements shall only be used for integral antenna equipment that does not have a temporary antenna connector(s) provided.

Conducted measurements shall be used for antenna equipment provided a temporary antenna connector(s).

#### 8.12.4 Test Procedure

Initial conditions

Test environment: normal (see annex B).

The frequencies to be tested are mid range as defined in ETSI TS 134 108 [2]:

1) Connect a spectrum analyser (or other suitable test equipment) to the UE antenna connector.

2) UE shall be in CELL\_FACH state.

3) The UE shall be setup such that UE will not transmit during the measurement. (For guidance see ETSI TS 134 121-1 [1]).

Procedure

Sweep the spectrum analyser (or other suitable test equipment) over a frequency range from 30 MHz to 12,75 GHz and measure the average power of the spurious emissions.

#### 8.12.5 Test Result

| Operating Band:                 | UMTS Band I                                |                                            |                                            |
|---------------------------------|--------------------------------------------|--------------------------------------------|--------------------------------------------|
| Temperature:                    | 24°C                                       | Test By:                                   | KK                                         |
| Humidity:                       | 53%                                        |                                            |                                            |
| Frequency<br>(MHz)              | Transmitter Spurious Emission (dBm)        |                                            |                                            |
|                                 | <input checked="" type="checkbox"/> CH9612 | <input checked="" type="checkbox"/> CH9750 | <input checked="" type="checkbox"/> CH9888 |
| 9 kHz < f < 150 kHz             | PASS                                       | PASS                                       | PASS                                       |
| 150 kHz < f < 30 MHz            | PASS                                       | PASS                                       | PASS                                       |
| 30 MHz < f < 925 MHz            | PASS                                       | PASS                                       | PASS                                       |
| 921MHz < f < 925 MHz            | PASS                                       | PASS                                       | PASS                                       |
| 925 MHz < f < 935 MHz           | PASS                                       | PASS                                       | PASS                                       |
| 935 MHz < f < 960 MHz           | PASS                                       | PASS                                       | PASS                                       |
| 960 MHz<f< 1 000 MHz            | PASS                                       | PASS                                       | PASS                                       |
| 1 000 MHz<f<1805 MHz            | PASS                                       | PASS                                       | PASS                                       |
| 1805 MHz< f <1880 MHz           | PASS                                       | PASS                                       | PASS                                       |
| 1880 MHz<f<1920 MHz             | PASS                                       | PASS                                       | PASS                                       |
| 1920 MHz <f< 1980 MHz           | PASS                                       | PASS                                       | PASS                                       |
| 1980 MHz <f<2110 MHz            | PASS                                       | PASS                                       | PASS                                       |
| 2110 MHz <f<2170 MHz            | PASS                                       | PASS                                       | PASS                                       |
| 2170 MHz <f<2620 MHz            | PASS                                       | PASS                                       | PASS                                       |
| 2620 MHz <f<2690 MHz            | PASS                                       | PASS                                       | PASS                                       |
| 2690 MHz <f<12750 MHz           | PASS                                       | PASS                                       | PASS                                       |
| NOTE: N/A :means not applicable |                                            |                                            |                                            |

All the modulation modes were tested and the data of the worst mode are described in appendix VI

## 8.13 OUT-OF-SYNCHRONIZATION HANDLING OF OUTPUT POWER

### 8.13.1 Applicable Standard

According to EN301 908-2 clause 4.2.11

### 8.13.2 Conformance Limit

When the UE estimates the DPCCH quality over the last 160 ms period to be worse than a threshold  $Q_{out}$ , the UE shall shut its transmitter off within 40 ms.

The quality level at the thresholds  $Q_{out}$  corresponds to different signal levels depending on the downlink conditions DCH parameters. For the conditions in table 4.2.11.2-1, a signal with the quality at the level  $Q_{out}$  can be generated by a DPCCH\_Ec/Ior ratio of -25 dB. The DL reference measurement channel 12,2 kbit/s is specified in ETSI TS 134 121-1 [1] and with static propagation conditions. The downlink physical channels, other than those specified in table 4.2.11.2-1, are as specified in ETSI TS 134 121-1 [1].

Table 4.2.11.2-1: DCH parameters for test of out-of-synchronization handling

| Parameter             | Value                                                                                                                                                                                                      | Unit         |
|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| $\hat{I}_{or}/I_{oc}$ | -1                                                                                                                                                                                                         | dB           |
| $I_{oc}$              | -60                                                                                                                                                                                                        | dBm/3,84 MHz |
| DPDCH_Ec/Ior          | See figure 4.2.11.2-1:<br>Before point A:<br>-16,6 for UEs not supporting enhanced performance type 1 for DCH<br>-19,6 for UEs supporting enhanced performance type 1 for DCH<br>After point A not defined | dB           |
| DPCCH_Ec/Ior          | See figure 4.2.11.2-1                                                                                                                                                                                      | dB           |
| Information Data Rate | 12,2                                                                                                                                                                                                       | kbit/s       |

Figure 4.2.11.2-1 and table 4.2.11.2-2 show an example scenario where the DPCCH\_Ec/Ior ratio varies from a level where the DPCH is demodulated under normal conditions, down to a level below  $Q_{out}$  where the UE shall shut its power off.

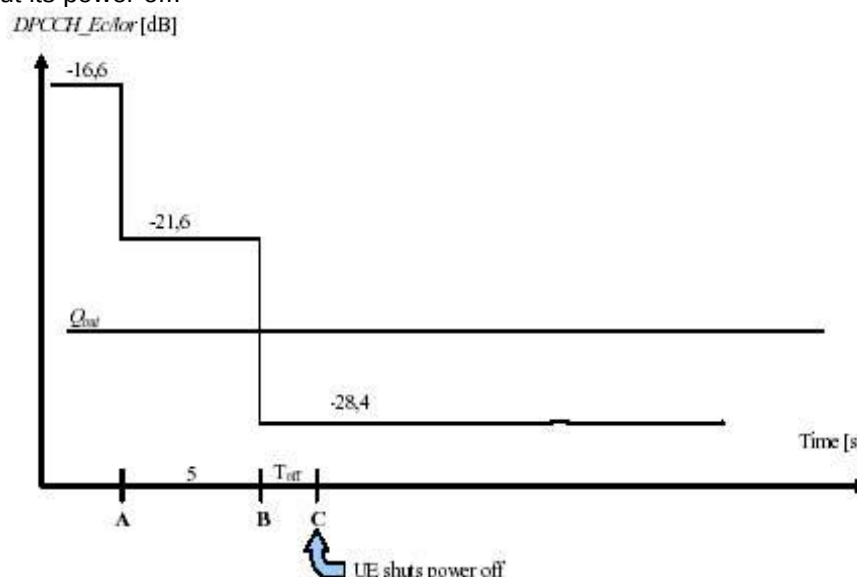


Table 4.2.11.2-2: Conditions for out-of-synchronization handling in the UE

| Clause from figure 4.2.11.2-1 | DPCCH_Ec/Ior (UE, not supporting enhanced performance requirements type 1 for DCH) | DPCCH_Ec/Ior (UE, supporting enhanced performance requirements type 1 for DCH) | Unit |
|-------------------------------|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|------|
| Before A                      | -16,6                                                                              | -19,6                                                                          | dB   |
| A to B                        | -21,6                                                                              | -24,6                                                                          | dB   |
| After B                       | -28,4                                                                              | -31,4                                                                          | dB   |

The requirements for the UE are that it shall shut its transmitter off before point C.  
The UE transmitter is considered to be OFF if the measured RRC filtered mean power is less than -55 dBm.

### 8.13.3 Test Configuration

The measurements for out-of-synchronization handling of output power shall be performed at normal environmental conditions of the operating temperature range.

Radiated measurements shall only be used for integral antenna equipment that does not have a temporary antenna connector(s) provided.

Conducted measurements shall be used for antenna equipment provided a temporary antenna connector(s).

### 8.13.4 Test Procedure

Initial conditions

Test environment: normal (see annex B).

The frequencies to be tested are mid range as defined in ETSI TS 134 108 [2]:

- 1) Connect the SS to the UE antenna connector.
- 2) A call is set up according to the Generic call setup procedure, with the following exception according to table 5.3.10.1.1-1 for information elements in System Information Block type 1 found in ETSI TS 134 108 [2].
- 3) RF parameters are set up according to table 4.2.11.2-1 with DPCCH\_Ec/Ior ratio level according to table 4.2.11.2-2, 'before A'.
- 4) Enter the UE into loopback test mode and start the loopback test.

NOTE: When reference is made to test set up, call set up and loopback test mode, guidance on the applicability of these can be found in ETSI TS 134 121-1 [1], ETSI TS 134 108 [2] and ETSI TS 134 109 [3] respectively.

Procedure

- 1) The SS sends continuously up power control commands to the UE until the UE transmitter power reach maximum level.
- 2) The SS controls the DPCCH\_Ec/Ior ratio level according to table 4.2.11.2-2, 'A to B'.
- 3) The SS controls the DPCCH\_Ec/Ior ratio level according to table 4.2.11.2-2, 'after B'. The SS waits 200 ms and then verifies that the UE transmitter has been switched off.
- 4) The SS monitors the UE transmitted power for 5 s and verifies that the UE transmitter is not switched on during this time.

### 8.13.5 Test Result

| Frequency Band: | UMTS Band I           | Test By:    | KK      |
|-----------------|-----------------------|-------------|---------|
| Temperature:    | 24℃                   |             |         |
| Humidity:       | 53%                   |             |         |
| Test Condition  | Measurement Data(dBm) | LIMIT (dBm) | Verdict |
|                 | CH9750                |             |         |
| Normal          | -60.21                | -55         | PASS    |

## 8.14 RECEIVER REFERENCE SENSITIVITY

### 8.14.1 Applicable Standard

According to EN301 908-2 clause 4.2.13

### 8.14.2 Conformance Limit.

The measured BER shall not exceed 0,001.

**Table 4.2.13.2-1: Test parameters for Reference Sensitivity Level**

| Operating Band                                                                | Unit         | DPCH_Ec<br><REFSENS> | <REFI <sub>or</sub> > |
|-------------------------------------------------------------------------------|--------------|----------------------|-----------------------|
| I                                                                             | dBm/3,84 MHz | -116,3               | -106                  |
| III                                                                           | dBm/3,84 MHz | -113,3               | -103                  |
| VII                                                                           | dBm/3,84 MHz | -114,3               | -104                  |
| VIII                                                                          | dBm/3,84 MHz | -113,3               | -103                  |
| XX                                                                            | dBm/3,84 MHz | -113,3               | -103                  |
| XXII                                                                          | dBm/3,84 MHz | -113,3               | -103                  |
| NOTE 1: For Power class 3 and 3bis this shall be at the maximum output power. |              |                      |                       |
| NOTE 2: For Power class 4 this shall be at the maximum output power.          |              |                      |                       |

NOTE: These requirements do not take into account the allowed increase of the reference sensitivity level of DPCH\_Ec <REFSENS> and corresponding <REFI<sub>or</sub>> in ETSI TS 134 121-1 [1], table 6.2.2 by the amount defined in minimum requirement clause for the UE, which supports DB-DC-HSDPA or dual band 4C-HSDPA and/or E-UTRA inter-band carrier aggregation.

### 8.14.3 Test Procedure

Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH (see annex B).

The frequencies to be tested are low range, mid range, high range as defined in ETSI TS 134 108 [2]:

- 1) Connect the SS to the UE antenna connector.
- 2) A call is set up according to the Generic call setup procedure as per ETSI TS 134 108 [2], and RF parameters are set up according to table 4.2.13.2-1.
- 3) Enter the UE into loopback test mode and start the loopback test using the procedure defined in ETSI TS 134 109 [3].

NOTE: When reference is made to test set up, call set up and loopback test mode, guidance on the applicability of these can be found in ETSI TS 134 121-1 [1], ETSI TS 134 108 [2] and ETSI TS 134 109 [3]. Details of initial conditions for UEs supporting UTRA FDD can be found in ETSI TS 134 121-1 [1], clause 6.2.

1) Set and send continuously Up power control commands to the UE until the UE output power shall be maximum level.

2) Measure the BER of DCH received from the UE at the SS.

Details of initial conditions for UEs supporting UTRA FDD can be found in ETSI TS 134 121-1 [1], clause 6.2

#### 8.14.4 Test Result

|                       |             |        |        |          |         |
|-----------------------|-------------|--------|--------|----------|---------|
| Frequency Band:       | UMTS Band I |        |        | Test By: | KK      |
| Temperature:          | 24℃         |        |        |          |         |
| Humidity:             | 53%         |        |        |          |         |
| REFERENCE SENSITIVITY |             |        |        |          |         |
| Test Condition        | BER(%)      |        |        | Limit(%) | Verdict |
|                       | CH9613      | CH9750 | CH9887 |          |         |
| Tnorm, Vnorm          | 0.00        | 0.00   | 0.00   | 0.1      | PASS    |
| Tmin, Vmin            | 0.00        | 0.00   | 0.00   | 0.1      | PASS    |
| Tmin, Vmax            | 0.00        | 0.00   | 0.00   | 0.1      | PASS    |
| Tmax, Vmin            | 0.00        | 0.00   | 0.00   | 0.1      | PASS    |
| Tmax, Vmax            | 0.00        | 0.00   | 0.00   | 0.1      | PASS    |

## 8.15 RADIATED SPURIOUS EMISSIONS

### 8.15.1 Applicable Standard

According to EN301 908-1 clause 4.2.2

### 8.15.2 Conformance Limit

The frequency boundary and reference bandwidths for the detailed transitions of the limits between the requirements for out-of-band emissions and spurious emissions are based on ITU-R Recommendations SM.329-12 [3] and SM.1539-1 [4].

The requirements shown in table 4.2.2.2-1 are only applicable for frequencies in the spurious domain.

Table 4.2.2.2-1: Radiated spurious emissions requirements (UE)

| Frequency                                             | Minimum requirement (e.r.p.) /<br>Reference Bandwidth<br>Idle Mode | Minimum requirement (e.r.p.) /<br>Reference Bandwidth<br>Traffic Mode |
|-------------------------------------------------------|--------------------------------------------------------------------|-----------------------------------------------------------------------|
| 30 MHz < f < 1000 MHz                                 | -57dBm / 100 kHz                                                   | -36 dBm / 100 kHz                                                     |
| 1 GHz < f < 12.75 GHz                                 | -47dBm / 1MHz                                                      | -30 dBm / 1 MHz                                                       |
| $f_c - 12.5 \text{ MHz} < f < f_c + 12.5 \text{ MHz}$ | Not defined                                                        | Not defined                                                           |

NOTE:  $f_c$  is the centre frequency of the carrier.

### 8.15.3 Test Configuration

The measurements for radiated spurious emissions shall be performed at normal environmental conditions of the operating temperature range.

Radiated measurements shall only be used for integral antenna equipment that does not have a temporary antenna connector(s) provided.

Conducted measurements shall be used for antenna equipment provided a temporary antenna connector(s).

### 8.15.4 Test Procedure

#### ■ Test method

Whenever possible the test site should be a fully anechoic chamber simulating the free-space conditions. EUT shall be placed on a non-conducting support. Mean power of any spurious components shall be detected by the test antenna and measuring receiver (e.g. a spectrum analyser).

At each frequency at which a component is detected, the EUT shall be rotated to obtain maximum response, and the effective radiated power (e.r.p.) of that component determined by a substitution measurement, which shall be the reference method. The measurement shall be repeated with the test antenna in the orthogonal polarization plane. Test systems are allowed to be pre-substituted by carrying out the substitution measurement for each frequency and by recording the obtained value into test system software as a correction factor.

NOTE: Effective radiated power (e.r.p.) refers to the radiation of a half wave tuned dipole instead of an isotropic antenna. There is a constant difference of 2,15 dB between e.i.r.p. and e.r.p.

$\text{e.r.p. (dBm)} = \text{e.i.r.p. (dBm)} - 2,15$  (ITU-R Recommendation SM.329-12 [3], annex 1).

Measurements are made with a tuned dipole antenna or a reference antenna with a known gain referenced to an isotropic antenna. Unless otherwise stated, all measurements are done as mean power (RMS).

If a different test site or method is used, this shall be stated in the test report. The results shall be converted to the reference method values and the validity of the conversion shall be demonstrated.

#### ■ Test configurations

This clause defines the configurations for emission tests as follows:

- the equipment shall be tested under normal test conditions;
- the test configuration shall be as close to normal intended use as possible;
- if the equipment is part of a system, or can be connected to ancillary equipment, then it shall be acceptable to test the equipment while connected to the minimum configuration of ancillary equipment necessary to exercise the ports;
- if the equipment has a large number of ports, then a sufficient number shall be selected to simulate actual operation conditions and to ensure that all the different types of termination are tested;
- the test conditions, test configuration and mode of operation shall be recorded in the test report;

- ports which in normal operation are connected shall be connected to an ancillary equipment or to a representative piece of cable correctly terminated to simulate the input/output characteristics of the ancillary equipment, RF input/output ports shall be correctly terminated;
  - ports that are not connected to cables during normal operation, e.g. service connectors, programming connectors; temporary connectors, etc. Shall not be connected to any cables for the purpose of this test. Where cables have to be connected to these ports, or interconnecting cables have to be extended in length in order to exercise the EUT, precautions shall be taken to ensure that the evaluation of the EUT is not affected by the addition or extension of these cables:
    - emission tests shall be performed in two modes of operation:
      - with a communication link established (traffic mode); and
      - in the idle mode;
    - the traffic mode configuration which uses the UE maximum output power for testing shall be declared by the manufacturer.
- Ancillary equipment shall be tested with it connected to a UE in which case compliance shall be demonstrated to the appropriate clauses of the present document.
- The results obtained shall be compared to the limits in clause 4.2.2.2 in order to prove compliance.

### 8.15.5 Test Result

#### Band I

| Operating Mode    |                      |                      | Traffic Mode(BELOW 1GHz) |           |         |
|-------------------|----------------------|----------------------|--------------------------|-----------|---------|
| Temperature: 24°C |                      |                      | Test By: KK              |           |         |
| Humidity: 53%     |                      |                      |                          |           |         |
| Frequency (MHz)   | Antenna Polarization | Emission level (dBm) | Limit (dBm)              | Over (dB) | Verdict |
| 67.25             | V                    | -61.35               | -36.00                   | -25.35    | PASS    |
| 155.05            | V                    | -62.07               | -36.00                   | -26.07    | PASS    |
| 166.19            | V                    | -64.53               | -36.00                   | -28.53    | PASS    |
| 74.20             | H                    | -74.14               | -36.00                   | -38.14    | PASS    |
| 153.67            | H                    | -67.30               | -36.00                   | -31.30    | PASS    |
| 730.23            | H                    | -64.46               | -36.00                   | -28.46    | PASS    |

| Operating Mode    |                      |                      | Traffic Mode(ABOVE 1GHz) |           |         |
|-------------------|----------------------|----------------------|--------------------------|-----------|---------|
| Temperature: 24°C |                      |                      | Test By: KK              |           |         |
| Humidity: 53%     |                      |                      |                          |           |         |
| Frequency (MHz)   | Antenna Polarization | Emission level (dBm) | Limit (dBm)              | Over (dB) | Verdict |
| 3900.00           | V                    | -65.60               | -30.00                   | -18.60    | PASS    |
| 5850.00           | V                    | -60.20               | -30.00                   | -13.20    | PASS    |
| 8523.00           | V                    | -59.18               | -30.00                   | -12.18    | PASS    |
| 3900.00           | H                    | -64.17               | -30.00                   | -17.17    | PASS    |
| 5850.00           | H                    | -60.52               | -30.00                   | -13.52    | PASS    |
| 9321.00           | H                    | -55.32               | -30.00                   | -8.32     | PASS    |

| Operating Mode    |                      |                      | Idle mode(BELOW 1GHz) |           |         |
|-------------------|----------------------|----------------------|-----------------------|-----------|---------|
| Temperature: 24°C |                      |                      | Test By: KK           |           |         |
| Humidity: 53%     |                      |                      |                       |           |         |
| Frequency (MHz)   | Antenna Polarization | Emission level (dBm) | Limit (dBm)           | Over (dB) | Verdict |
| 67.69             | V                    | -62.48               | -57.00                | -5.48     | PASS    |
| 155.54            | V                    | -64.34               | -57.00                | -7.34     | PASS    |
| 166.81            | V                    | -65.94               | -57.00                | -8.94     | PASS    |
| 74.97             | H                    | -74.47               | -57.00                | -17.47    | PASS    |
| 153.28            | H                    | -67.76               | -57.00                | -10.76    | PASS    |
| 731.64            | H                    | -65.71               | -57.00                | -8.71     | PASS    |

| Operating Mode    |                      |                      | Idle mode(ABOVE 1GHz) |           |         |
|-------------------|----------------------|----------------------|-----------------------|-----------|---------|
| Temperature: 24°C |                      |                      | Test By: KK           |           |         |
| Humidity: 53%     |                      |                      |                       |           |         |
| Frequency (MHz)   | Antenna Polarization | Emission level (dBm) | Limit (dBm)           | Over (dB) | Verdict |
| 1374.00           | V                    | -65.89               | -47.00                | -18.89    | PASS    |
| 3751.00           | V                    | -58.08               | -47.00                | -11.08    | PASS    |
| 8482.00           | V                    | -57.47               | -47.00                | -10.47    | PASS    |
| 1659.00           | V                    | -66.01               | -47.00                | -19.01    | PASS    |
| 4081.00           | V                    | -66.24               | -47.00                | -19.24    | PASS    |
| 8074.00           | V                    | -55.32               | -47.00                | -8.32     | PASS    |

## **8.16 CONTROL AND MONITORING FUNCTION**

### **8.16.1 Applicable Standard**

According to EN301 908-1 clause 4.2.4

### **8.16.2 Conformance Limit**

The maximum measured power during the duration of the test shall not exceed -30 dBm.

### **8.16.3 Test Configuration**

The measurements for control and monitoring function shall be performed at normal environmental conditions of the operating temperature range.

Radiated measurements shall only be used for integral antenna equipment that does not have a temporary antenna connector(s) provided.

Conducted measurements shall be used for antenna equipment provided a temporary antenna connector(s).

### **8.16.4 Test Procedure**

This requirement, together with other control and monitoring technical requirements identified in the table of cross references in the applicable part, verifies that the control and monitoring functions of the UE prevent it from transmitting in the absence of a valid network.

This test is applicable to radio communications equipment and ancillary equipment in the operating band defined in the applicable part of this multipart harmonized standard.

This test shall be performed on the radio communications equipment and/or a representative configuration of the ancillary equipment.

#### **■ Test method**

a) At the start of the test, the UE shall be switched off. The UE antenna connector shall be connected to a power measuring equipment, with the following characteristics:

- the RF bandwidth shall exceed the total operating transmit frequency range of the UE for operation with an applicable part;
- the response time of the power measuring equipment shall be such that the measured power has reached within 1 dB of its steady state value within 100 µs of a CW signal being applied;
- it shall record the maximum power measured.

NOTE: The equipment may include a video low pass filter to minimize its response to transients or Gaussian noise peaks.

b) The UE shall be switched on for a period of approximately fifteen minutes, and then switched off.

c) The EUT shall remain switched off for a period of at least thirty seconds, and shall then be switched on for a period of approximately one minute.

d) The maximum power emitted from the UE throughout the duration of the test shall be recorded.

The results obtained shall be compared to the limits in clause 4.2.4.2 in order to prove compliance.

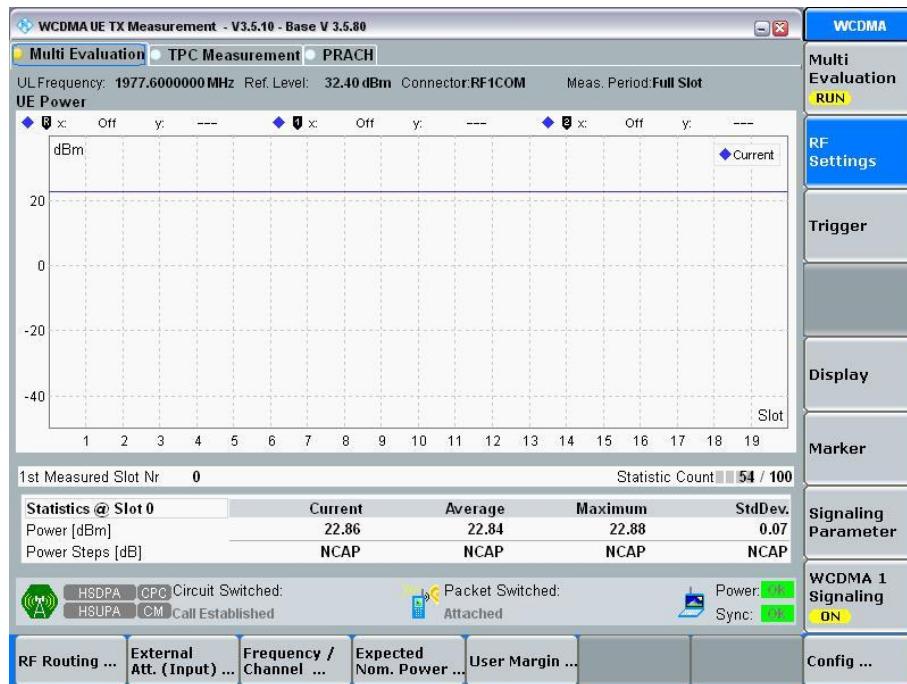
#### 8.16.5 Test Result

|                                   |                                           |             |        |                |         |
|-----------------------------------|-------------------------------------------|-------------|--------|----------------|---------|
| Frequency Band:                   |                                           | UMTS Band I |        |                |         |
| Temperature:                      |                                           | 24°C        |        | Test By: KK    |         |
| Humidity:                         |                                           | 53%         |        |                |         |
| Frequency Range<br>(1910-1990MHz) | Control And Monitoring Function (dBm/MHz) |             |        | LIMIT<br>(dBm) | Verdict |
|                                   | CH9613                                    | CH9750      | CH9887 |                |         |
| 1910-1990MHz                      | -50.98                                    | -50.74      | -50.71 | -30            | PASS    |

## 9 APPENDIXES

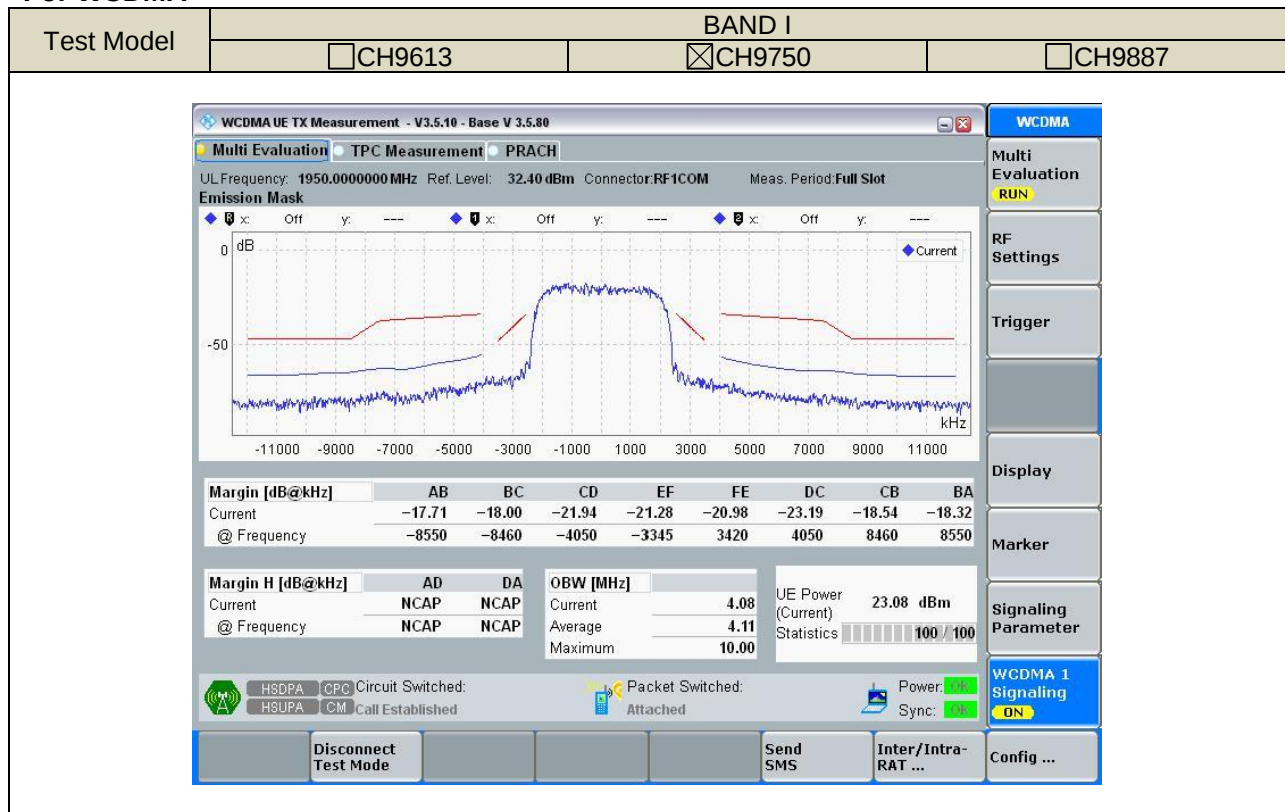
### 9.1 APPENDIX I TRANSMITTER-MAXIMUM OUTPUT POWER



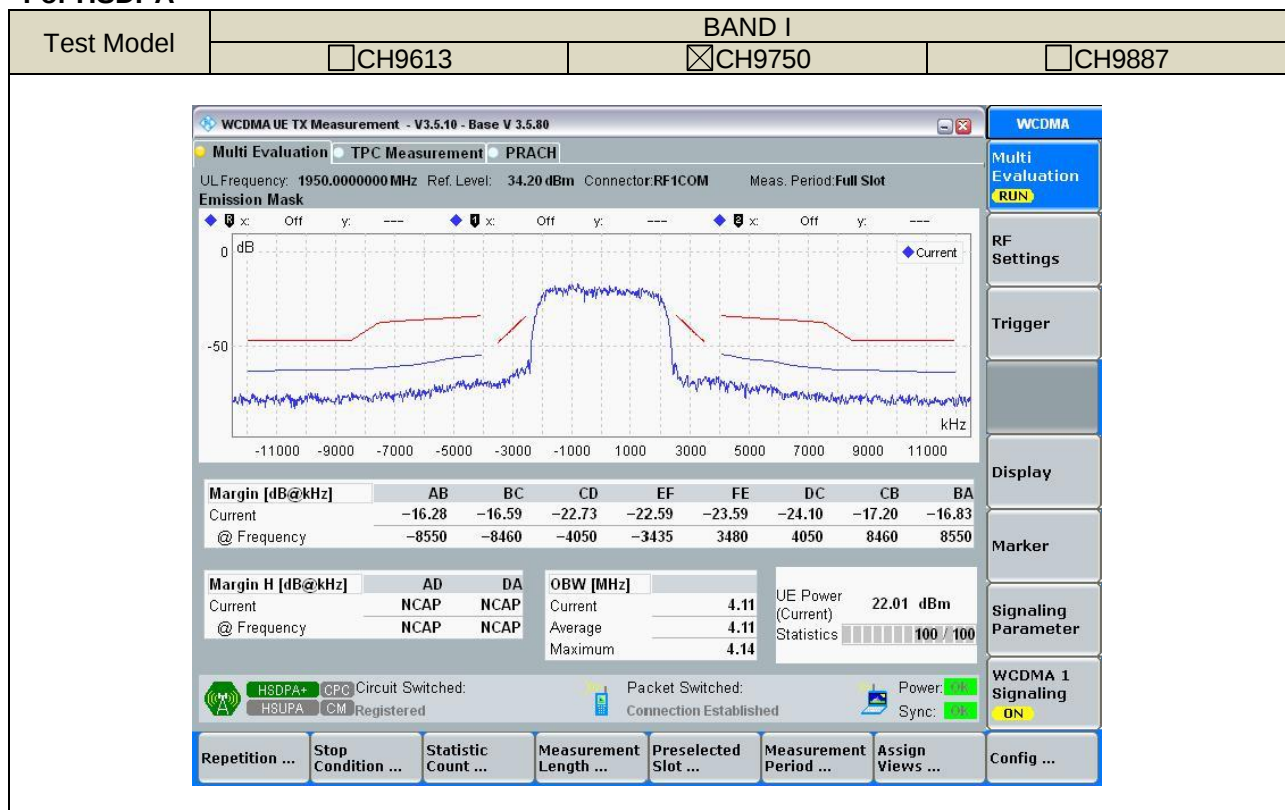


## 9.2 APPENDIX II TRANSMITTER- SPECTRUM EMISSION MASK

For WCDMA



For HSDPA



**For HSUPA**

| Test Model | BAND 1                          |                                            |                                 |
|------------|---------------------------------|--------------------------------------------|---------------------------------|
|            | <input type="checkbox"/> CH9613 | <input checked="" type="checkbox"/> CH9750 | <input type="checkbox"/> CH9887 |

**WCDMA UE TX Measurement - V3.5.10 - Base V 3.5.80**

● Multi Evaluation  
 ● TPC Measurement  
 ● PRACH

UL Frequency: 1950.000000 MHz  
 Ref. Level: 34.90 dBm  
 Connector: RF1COM  
 Meas. Period: Full Slot

**Emission Mask**

◆ x: Off   y: ---

◆ x: Off   y: ---

◆ x: Off   y: ---

◆ x: Off   y: ---

◆ x: Off   y: ---

◆ x: Off   y: ---

| Margin [dB@kHz] | AB     | BC     | CD     | EF     | FE     | DC     | CB     | BA     |
|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|
| Current         | -14.13 | -14.51 | -22.19 | -21.83 | -22.03 | -22.88 | -14.44 | -14.03 |
| @ Frequency     | -8550  | -8460  | -4050  | -3435  | 3345   | 4050   | 8460   | 8550   |

| Margin H [dB@kHz] | AD   | DA   |
|-------------------|------|------|
| Current           | NCAP | NCAP |
| @ Frequency       | NCAP | NCAP |

| OBW [MHz] |      |
|-----------|------|
| Current   | 4.14 |
| Average   | 4.12 |
| Maximum   | 4.61 |

UE Power (Current) **19.62 dBm**

Statistics  100 / 100

● HSDPA+ ● CPC Circuit Switched:

● HSUPA ● CM Registered

● Packet Switched:

Connection Established

Power: ● 50%

Sync: ● 50%

RF Routing ...

External Att. (Input) ...

Frequency / Channel ...

Expected Nom. Power ...

User Margin ...

**WCDMA**

Multi Evaluation

RF Settings

Trigger

Display

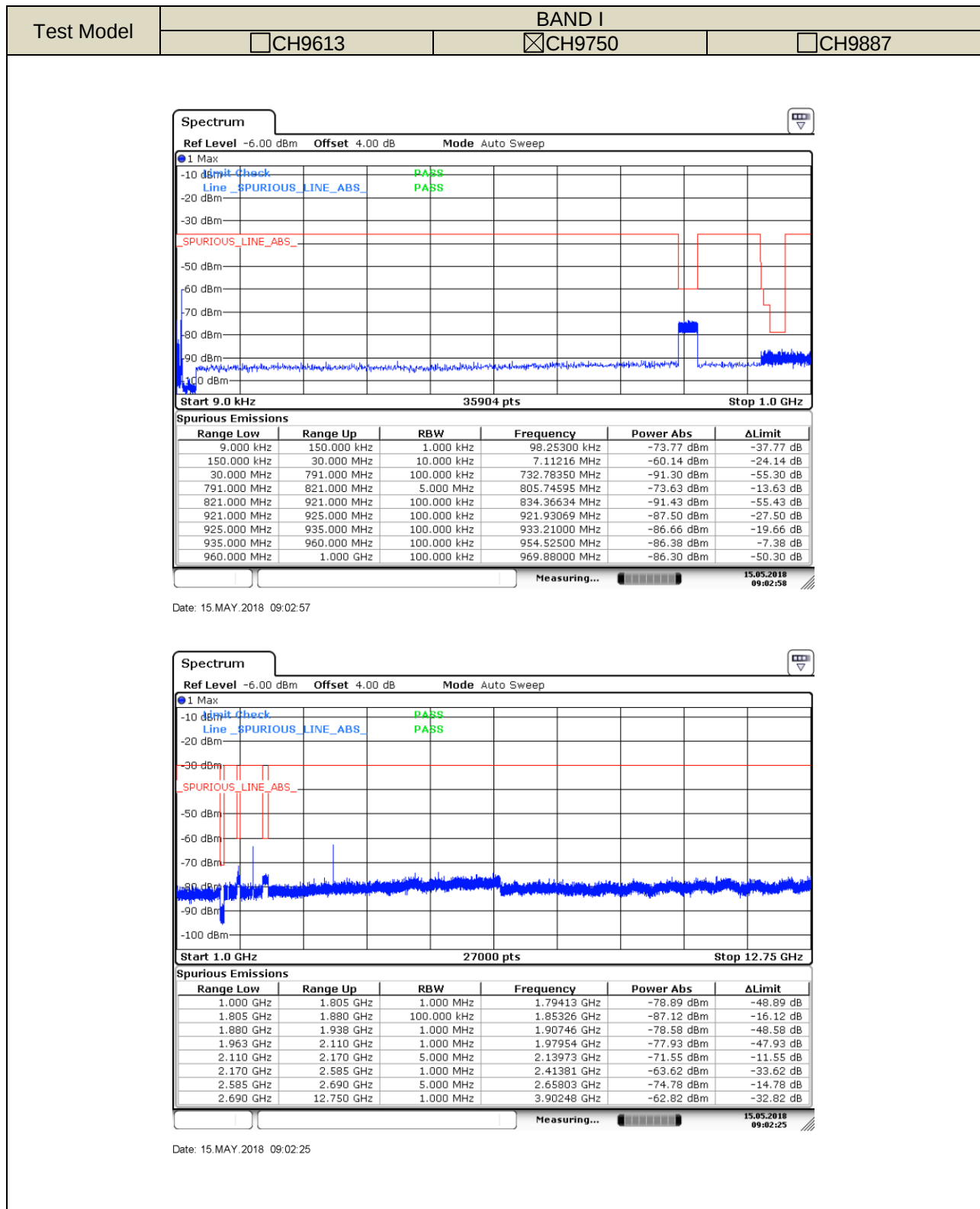
Marker

Signaling Parameter

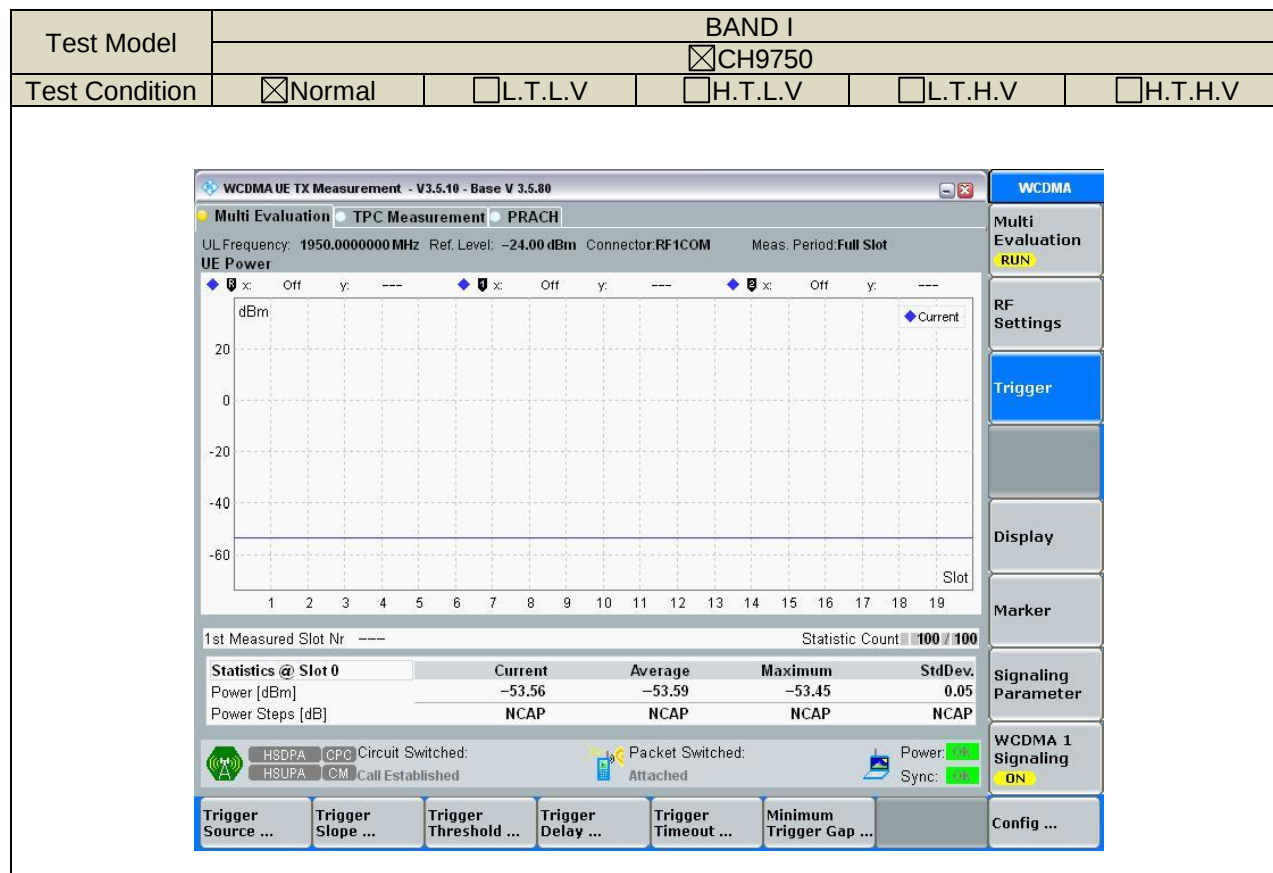
WCDMA 1 Signaling ON

Config ...

### 9.3 APPENDIX III TRANSMITTER SPURIOUS EMISSIONS

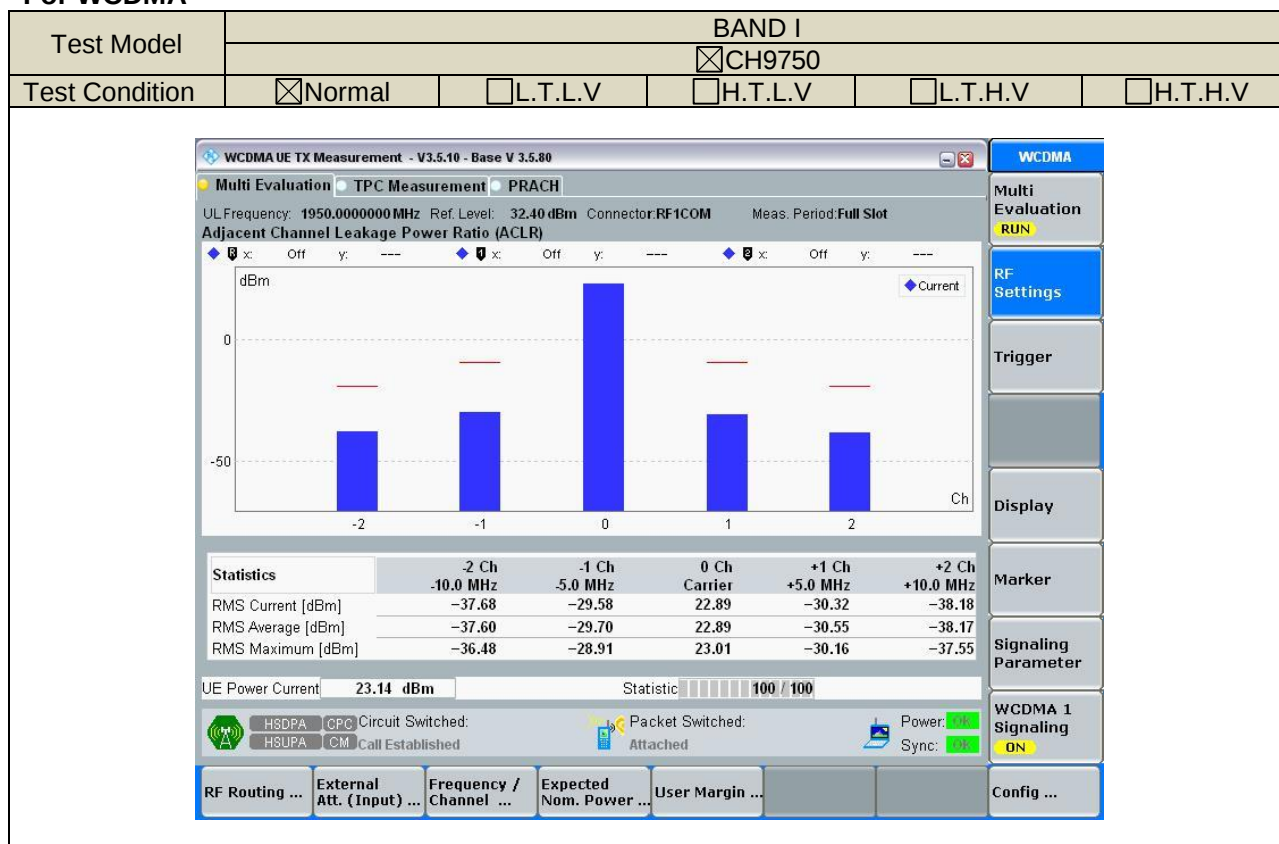


## 9.4 APPENDIX IV TRANSMITTER MINIMUM OUTPUT POWER

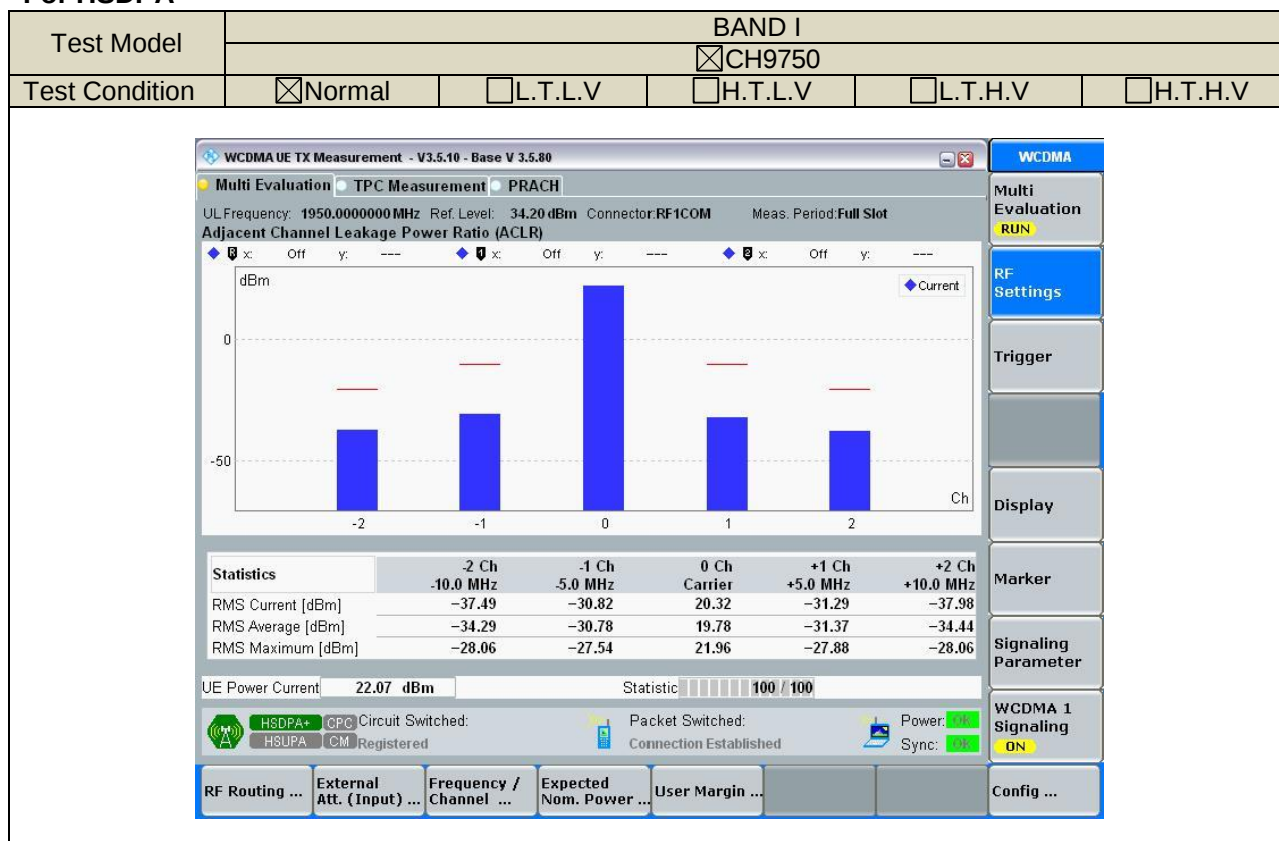


## 9.5 APPENDIX V TRANSMITTER ADJACENT CHANNEL LEAKAGE POWER RATIO

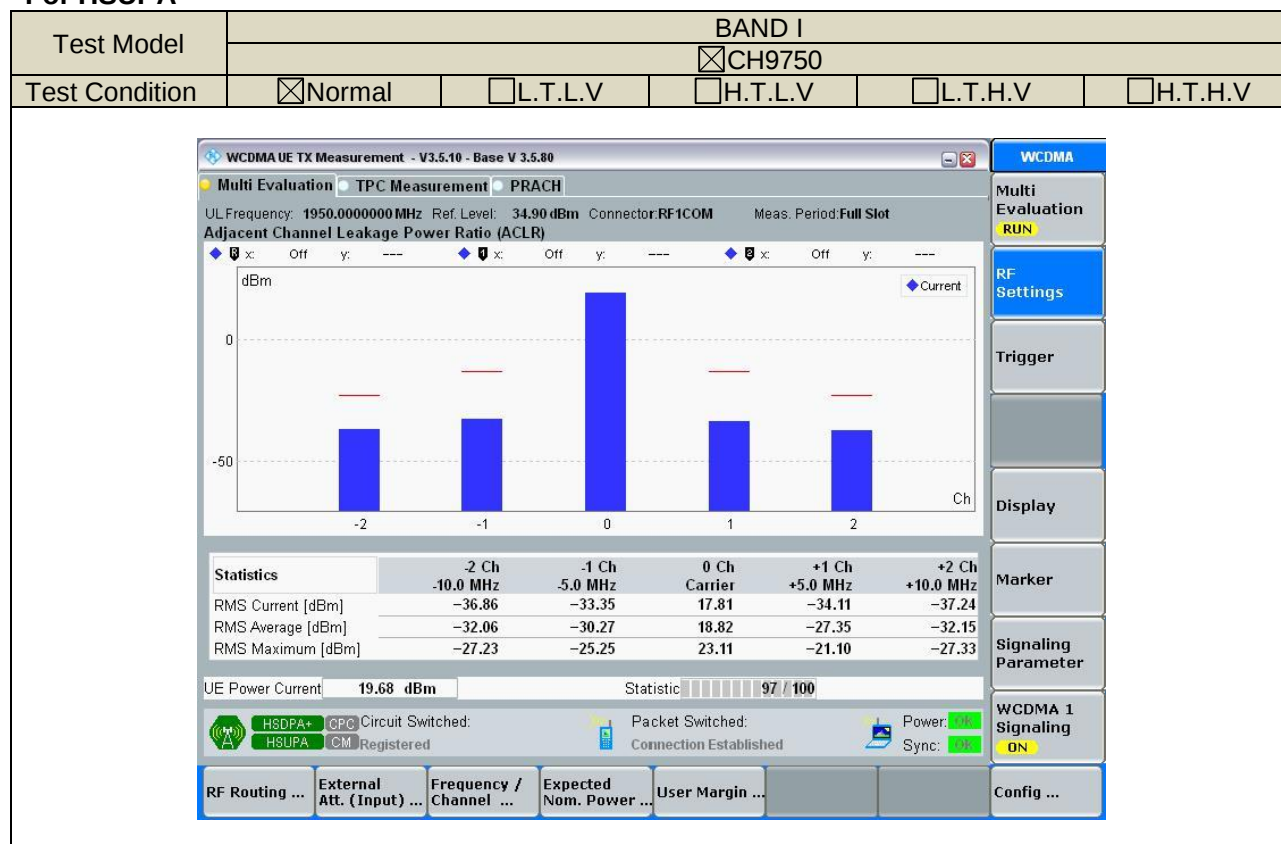
### For WCDMA



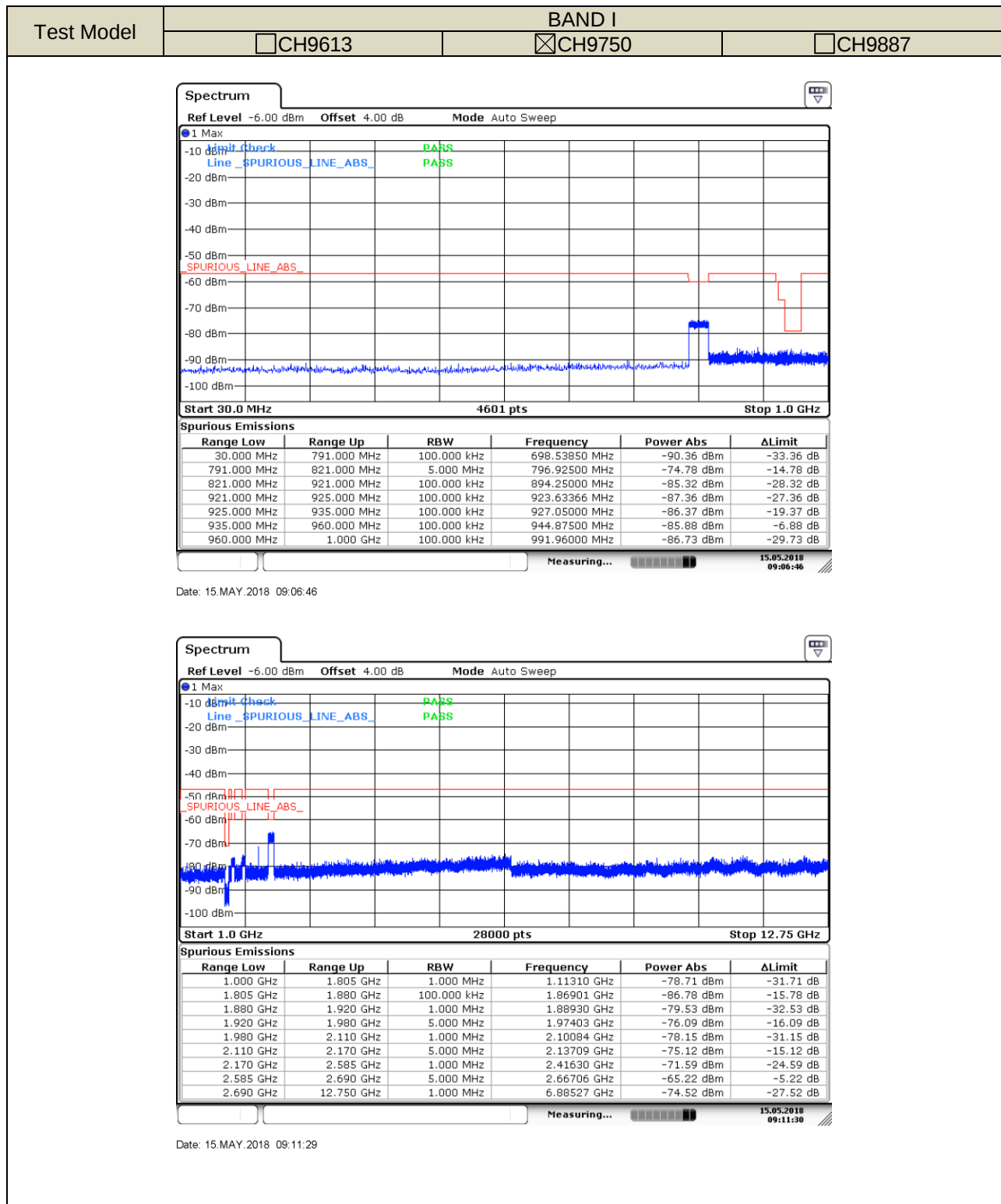
### For HSDPA



# For HSUPA



## 9.6 APPENDIX VI RECEIVER SPURIOUS EMISSIONS



## 9.7 APPENDIX XIII RADIATED EMISSION TEST UP PHOTO

### Spurious Emission Test Setup (Below 1GHz)



### Spurious Emission Test Setup (Above 1GHz)



*END OF REPORT*