Report No.: SZ12090024H02

# HAC TEST REPORT

TESTING
CNAS L3572

*Issued to*

**Reach Tec(Xiamen) CO.,LTD**

*For*

**REACH9771**

| | | |
|---|---|---|
| Model Name | : | REACH9771 |
| Trade Name | : | Cincinnati Bell |
| Brand Name | : | Cincinnati Bell |
| FCC ID | : | Z5J-REACH9771 |
| Standard | : | ANSI C 63.19:2007 |
| HAC Level | : | T-Coil: T3 |
| Test date | : | 2012-09-10 |
| Issue date | : | 2012-09-26 |

*by*

**Shenzhen MORLAB Communication Technology Co., Ltd.**

| | | |
|---|---|---|
| *Tested by* Samuel. peng | *Approved by* | *Review by* Li lei |
| Samuel Peng | Wu Xuewen | Li Lei |
| *Date* 2012.9.26 | *Date* 2012.09.26 | *Date* 2012.9.26 |

CTIA Authorized Test Lab LAB CODE 20081223-00 IEEE 1725 OTA

OFTA 電訊管理局

ilac-MRA

TAF Testing Laboratory

GCF Official Observer of Global Certification Forum

Bluetooth BQTF

FCC Reg. No. 741109

# Contents

## 1.1. Identification of the Responsible Testing Laboratory

| | |
|---|---|
| Company Name: | Shenzhen Morlab Communications Technology Co., Ltd. |
| Department: | Morlab Laboratory |
| Address: | 3/F, Electronic Testing Building, Shahe Road, Nanshan District, Shenzhen, 518055 P. R. China |
| Responsible Test Lab Manager: | Mr. Shu Luan |
| Telephone: | +86 755 86130268 |
| Facsimile: | +86 755 86130218 |

## 1.2. Identification of the Responsible Testing Location

| | |
|---|---|
| Name: | Shenzhen Morlab Communications Technology Co., Ltd. Morlab Laboratory |
| Address: | 3/F, Electronic Testing Building, Shahe Road, Nanshan District, Shenzhen, 518055 P. R. China |

## 1.3. Accreditation Certificate

| | |
|---|---|
| Accredited Testing Laboratory: | No. CNAS L1659 |

## 1.4. List of Test Equipments

| No. | Instrument | Type |
|---|---|---|
| 1 | PC | Dell (Pentium IV 2.4GHz, SN:X10-23533) |
| 2 | Network Emulator | Rohde&Schwarz (CMU200, SN:105894) |
| 3 | Voltmeter | Keithley (2000, SN:1000572) |
| 4 | Synthetizer | Rohde&Schwarz (SML_03, SN:101868) |
| 5 | Amplifier | Nucl udes (ALB216, SN:10800) |
| 6 | Power Meter | Rohde&Schwarz (NRVD, SN:101066) |
| 7 | Audio DAQ | NI (MonDAQ, SN:MonNumero) |
| 8 | Probe | Antennessa (SN:SN_4108_EPH17) |
| 9 | HAC holder | SN02_EPH02 (SN:SN_3608_SUPH16) |

# 2. Technical Information

Note: the following data is based on the information by the applicant.

## 2.1. Identification of Applicant

| | |
|---|---|
| Company Name: | Reach Tec(Xiamen) CO.,LTD |
| Address: | 5th Floor, 51#, Wang Hai Road, Software Park II, Xiamen, Fujian Province |

## 2.2. Identification of Manufacturer

| | |
|---|---|
| Company Name: | Reach Tec(Xiamen) CO.,LTD |
| Address: | 5th Floor, 51#, Wang Hai Road, Software Park II, Xiamen, Fujian Province |

## 2.3. Equipment Under Test (EUT)

| | |
|---|---|
| Brand Name: | Cincinnati Bell |
| Type Name: | Cincinnati Bell |
| Marking Name: | REACH9771 |
| Hardware Version: | 9771 V3.1 |
| Software Version: | E9771-eng 2.3.5 GRJ90 eng.Root.20120825.052322.test-keys |
| Frequency Bands: | GSM850MHz PCS 1900MHz<br>WCMDA 1700MHz |
| Tx Frequencies | 824.20 - 848.80 MHz (GSM 850)<br>1850.20 - 1909.80 MHz (GSM 1900)<br>1712.4MHz-1752.6MHz(WCDMA 1700) |
| Antenna type: | Fixed Internal Antenna |
| Development Stage: | Identical prototype |
| Battery Model: | 54007B |
| Battery specification: | 1200mAh 3.7V |
| Development Stage | Identical prototype |
| Classification: | Licensed Transmitter Held to Ear |
| EUT Type: | GSM850MHz PCS 1900MHz<br>WCMDA 1700MHz |
| HAC Test Configurations: | GSM 850, 975, 38, 124, BT/WIFI Off<br>GSM 1900, 512, 698, 885, BT/WIFI Off<br>WCDMA 850, 4132, 4182, 4233, BT/WIFI Off<br>WCDMA 1700, 1312, 1412, 1513, BT/WIFI Off |

### 2.3.1. Photographs of the EUT

Please see for photographs of the EUT.

### 2.3.2. Identification of all used EUTs

The EUT identity consists of numerical and letter characters, the letter character indicates the test sample, and the following two numerical characters indicate the software version of the test sample.

| EUT Identity | Hardware Version | Software Version |
|---|---|---|
| 1# | 9771 V3.1 | E9771-eng 2.3.5 GRJ90 eng.Root.20120825.052322. test-keys |

## 2.4. Applied Reference Documents

Leading reference documents for testing:

| No. | Identity | Document Title |
|---|---|---|
| 1 | **ANSI C 63.19:2007** | American National Standard Methods of Measurement of Compatibility between Wireless Communications Devices and Hearing Aids |

**Note：** Test report, reference KDB 285076 documents.

## 2.5. Test Environment/Conditions

| | | | |
|---|---|---|---|
| Normal Temperature (NT): | 20 ... 25 °C | | |
| Relative Humidity: | 30 ... 75 % | | |
| Air Pressure: | 980 ... 1020 hPa | | |
| Extreme Voltage of the EUT: | Normal Voltage (NV) | = | 3.70V |
| | Low Voltage (LV) | = | 3.60V |
| | High Voltage (HV) | = | 4.20V |
| Test frequency: | GSM 850MHz PCS 1900MHz | | |
| | WCDMA 1700MHz | | |
| Operation mode: | Call established | | |
| Power Level: | GSM 850 MHz Maximum output power(level 5) | | |
| | PCS 1900 MHz Maximum output power(level 0) | | |
| | WCDMA Maximum output powe | | |

During HAC test, EUT is in Traffic Mode (Channel Allocated) at Normal Voltage Condition. A communication link is set up with a System Simulator (SS) by air link, and a call is established.The Absolute Radio Frequency Channel Number (ARFCN) is allocated to 25, 190 and 251 respectively in the case of GSM 850 MHz, or to 512, 661 and 810 respectively in the case of PCS 1900 MHz or and is allocated to 1312, 1412 and 1513 respectively in the case of WCDMA 1700MHz. The EUT is commanded to operate at maximum transmitting power.

## 2.6. Operational Conditions During Test

### 2.6.1. INTRODUCTION

On July 10.2003.the Federal Communications Commission (FCC) adopted new rules requiring wireless manufacturers and service providers to provide digital wireless phones that are compatible with hearing aids. The FCC has modified the exemption for wireless phones under the Hearing Aid Compatibility Act of 1998 (HAC Act) in WT Docket 01-309 RM-8658 to extend the benefits of wireless telecommunications to individuals with hearing disabilities. These benefits encompass business, social and emergency communications, which increase the value of the wireless network for everyone. An estimated more than 10% of the population in the United States show signs of hearing impairment and of that fraction, almost 80% use hearing aids. Approximately 500 million people worldwide suffer from hearing loss.

Compatibility Tests involved:

The standard calls for wireless communications devices to be measured for:

- RF Electric-field emissions.
- RF Magnetic- field emissions.
- T-coil mode, magnetic-signal strength in the audio band.
- T-coil mode, magnetic-signal frequency response through the audio band.
- T-coil mode, magnetic-signal and noise articulation index.

The hearing aid must be measured for:

- RF immunity in microphone mode
- RF immunity in T-coil mode

In the following tests and results, this report includes the evaluation for a wireless communications device

## 2.6.2. ANSI/IEEE PC 63.19 PERFORMANCE CATEGORIES

**4.3.2.1. T-coil**

The table below provides the signal quality requirement for the intended audio magnetic signal from a wireless device. Only the RF immunity of the hearing aid is measured in T-coil mode. It is assumed that a hearing aid can have no immunity to an interference signal in the audio band, which is the intended reception band for this mode. The only criterion that can be measured is the RF immunity in T-coil mode. This is measured using the same procedure as the audio coupling mode at the same levels.

The signal quality of the axial and radial components of the magnetic field was used to determine the T-coil mode category.

| Category | Telephone RF Parameter |
|---|---|
| | Wireless Device Signal Quality (Signal + Noise-to-noise ratio in dB) |
| T1 | 0 to 10 dB |
| T2 | 10 to 20 dB |
| T3 | 20 to 30 dB |
| T4 | ＞30 dB |
| Magnetic Coupling Parameters | |

**4.3.2.2. Articulation Weighing Factor (AWF)**

| Standard | Technology | AWF |
|---|---|---|
| T1/T1P1/3GPP | UMTS(WCDMA) | 0 |
| IS-95 | CDMA | 0 |
| iden | GSM(22and 11Hz) | 0 |
| J-STD-007 | GSM(217Hz) | -5 |
| AWF has been developed from information presented to the committee regarding the interference potential of the various modulation types according to ANSI PC 63.19 | | |

## 2.6.3. Description of Test System

### 4.3.3.1. COMOHAC E-FIELD PROBE

| | |
|---|---|
| Serial Number: | SN 41/08 EPH17 |
| Frequency: | 100MHz – 3GHz |
| Probe length: | 330mm |
| Length of one dipole: | 3.3mm |
| Maximum external diameter: | 8mm |
| Probe extremity diameter: | 6mm |
| Distance between dipoles/probe extremity: | 3mm |
| Resistance of the three dipole (at the connector ): | Dipole 1:R1=2.1807 MΩ<br>Dipole 2:R1=2.0612 MΩ<br>Dipole 3:R3=2.1892 MΩ |
| Connector (HIROSE series SR30) | 6 wire male (Hirose SR30series) |

**CALIBRATION TEST EQUIPMENT**

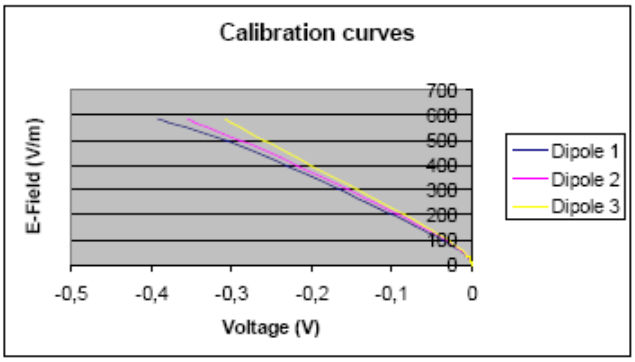
| TYPE | IDENTIFICATION |
|---|---|
| Calibration bench | SATIMO AIR CALIBRATION SOFTWARE |
| Multimeter | Keithley 2000 |

**MEASUREMENT PROCEDURE**

Probe calibration is realized by using the waveguide method. The probe was inserted in a waveguide loading by a 50 load. By controlling the input power in the waveguide, we are able to create a know EField value in the waveguide. ,

Keithley configuration:

Rate = Medium; Filter =ON; RDGS=10; FILTER TYPE =MOVING AVERAGE; RANGE AUTO




The following tables represent the calibration curves linearization by curve segment in CW signal.

### 4.3.3.2. COMOHAC H-FIELD PROBE

| | |
|---|---|
| Serial Number: | SN 41/08 HPH18 |
| Frequency: | 100MHz – 3GHz |
| Probe length: | 330mm |
| Length of one dipole: | 3.3mm |
| Maximum external diameter: | 8mm |
| Probe extremity diameter: | 6mm |
| Distance between dipoles/probe extremity: | 3mm |
| Resistance of the three dipole (at the connector ): | Dipole 1:R1=2.1650 MΩ<br>Dipole 2:R1=2.2176 MΩ<br>Dipole 3:R3=2.4084 MΩ |
| Connector (HIROSE series SR30) | 6 wire male (Hirose SR30series) |

**CALIBRATION TEST EQUIPMENT**

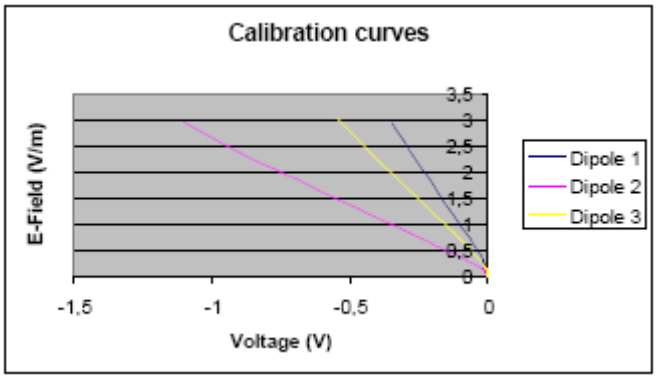
| TYPE | IDENTIFICATION |
|---|---|
| Calibration bench | SATIMO AIR CALIBRATION SOFTWARE |
| Multimeter | Keithley 2000 |

**MEASUREMENT PROCEDURE**

Probe calibration is realized by using the waveguide method. The probe was inserted in a waveguide loading by a 50 load. By controlling the input power in the waveguide, we are able to create a know HField value in the waveguide.

Keithley configuration:

Rate = Medium; Filter =ON; RDGS=10; FILTER TYPE =MOVING AVERAGE; RANGE AUTO

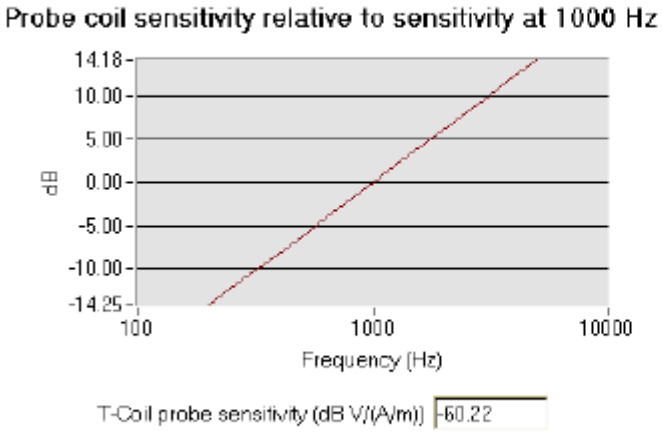



The following tables represent the calibration curves linearization by curve segment in CW signal.

### 4.3.3.3. COMOHAC T-COIL PROBE

| | |
|---|---|
| Serial Number: | SN 39/08 TCP11 |
| Dimensions: | 6.55mm length*2.29mm diameter |
| DC resistance: | 860.6Ω |
| Wire size: | 51 AWG |
| Inductance: | 132.1 mH at 1kHz |
| Sensitivity: | -60.22 dB (V/A/m) at 1kHz |

**SENSITIVITY**




| Frequency (Hz) | H (dB (V/(A/m))) |
|---|---|
| 200 | -73,92940009 |
| 250 | -72,01119983 |
| 315 | -70,06378892 |
| 400 | -67,88880017 |
| 500 | -66,00059991 |
| 630 | -64,07318901 |
| 800 | -62,00820026 |
| 1000 | -60,22 |
| 1250 | -58,29179974 |
| 1600 | -56,20760035 |
| 2000 | -54,31940009 |
| 2500 | -52,36119983 |
| 3150 | -50,38378892 |
| 4000 | -48,50880017 |
| 5000 | -46,44059991 |

**LINEARITY**

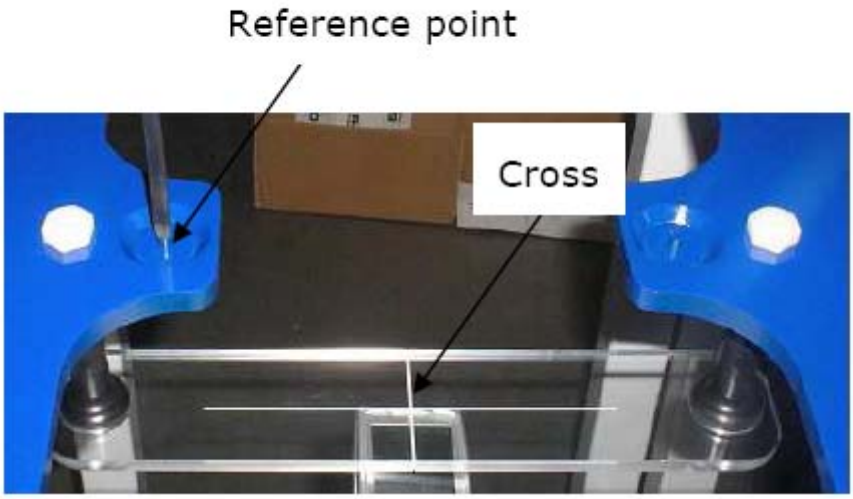
Linearity = 0.27 dB

| Power (dB) relative to 1 A/m | 0 | -10 | -20 | -30 | -40 | -50 |
|---|---|---|---|---|---|---|
| H (dB (V/(A/m))) | 0 | -9,95 | -19,95 | -30 | -39,9 | -49,73 |

**4.3.3.4. System Hardware**

The HAC positioning ruler is used to position the phone properly with the regard to the position of the probe during a measurement. The positioning system is made of a dedicated frame that can be fixed on the table. The tip of the probe is positioned on a reference point located on the top of the positioning ruler. The distance between this reference point and the cross located on the ruler being known, the speaker of the phone is positioned on this cross in order to make sure both probe and phone are positioned properly.

During the measurement, the HAC ruler has to be removed so that it does not interfere with the measurement.

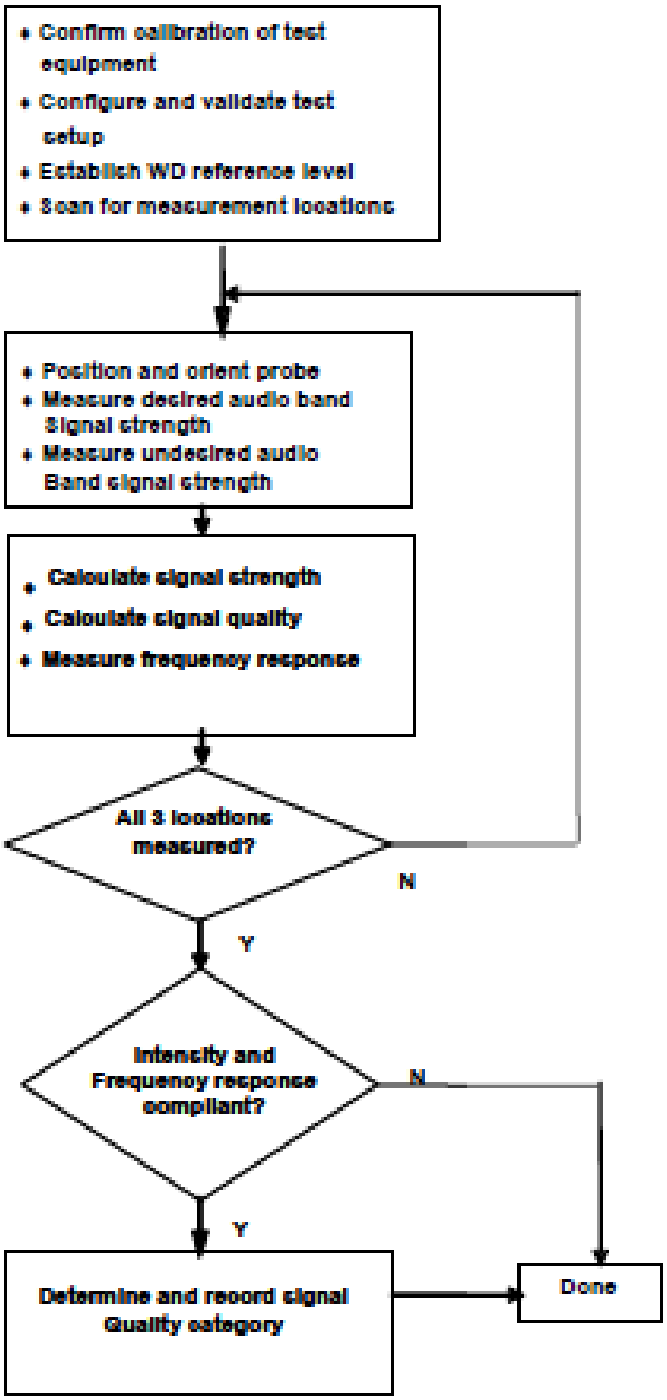



HAC positioning ruler

## 2.6.4. TEST PROCEDURE

### 4.3.4.1. T-coil Test Flow

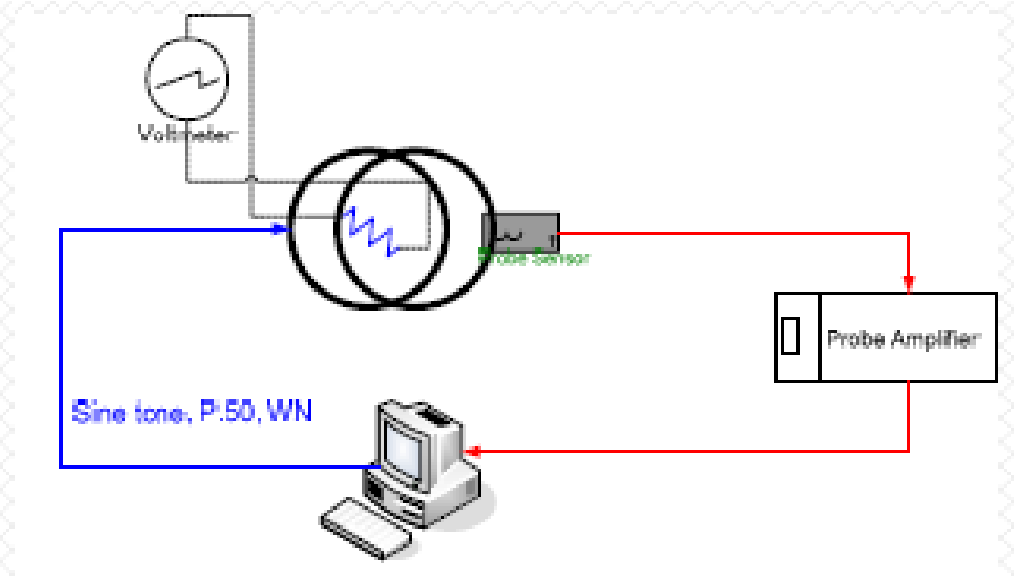
The flow diagram below was followed (From C63.19):



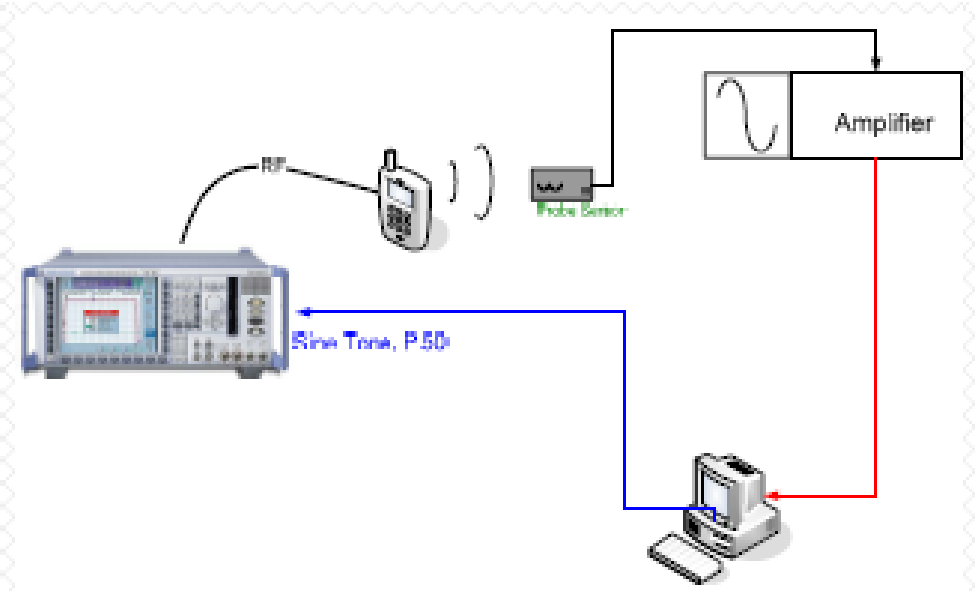

C63.19 T-Coil Signal Test Process

**4.3.4.2. TEST Setup**

The equipment was connected as shown in an acoustic/RF hemi-anechoic chamber:




Validation Setup with Helmholtz Coil




T-Coil Test Setup

**4.3.4.3.T-coil Test Procedure**

Frequency Response Validation

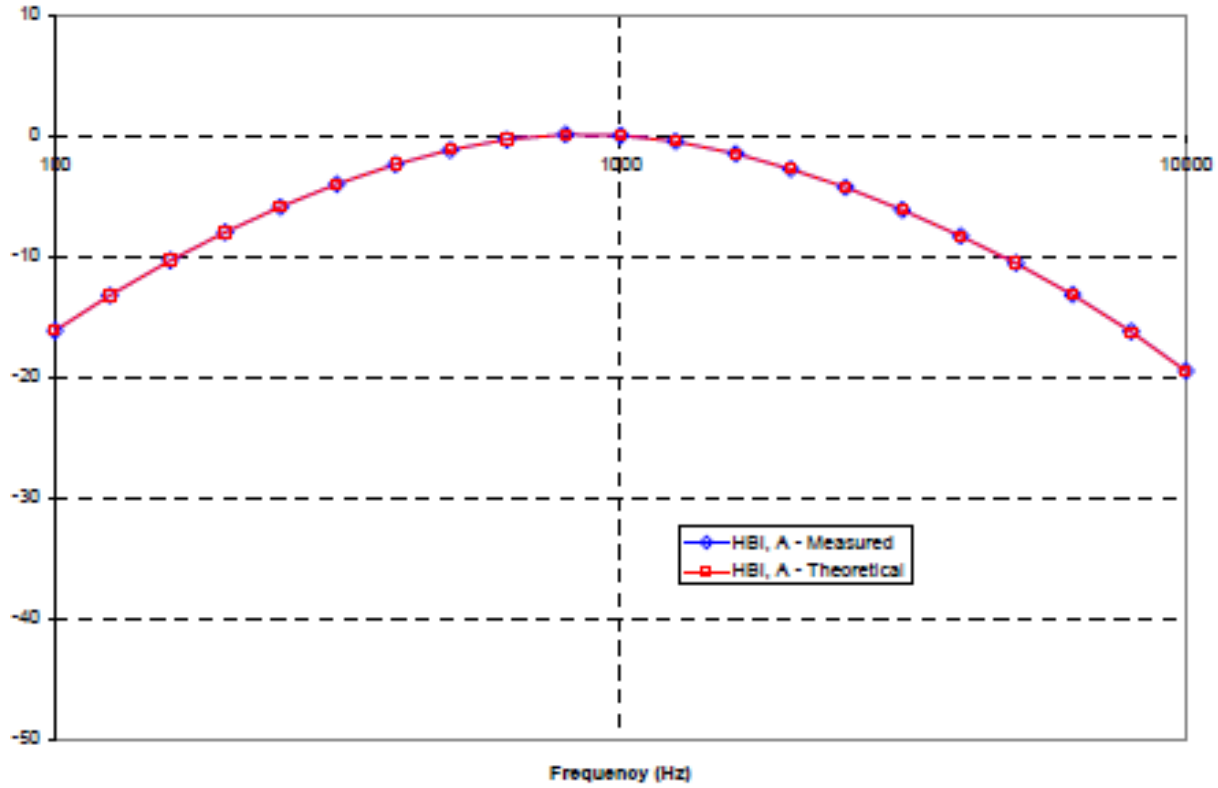
The frequency response through the Helmholtz Coil was verified to be within 0.5 dB relative to 1 kHz, between 300 – 3000 Hz using the ITU-P.50 artificial speech signal as shown below:


Frequency Response Validation

Measurement Validation

WD noise measurements are filtered with A-weighting and Half-Band Integration over a frequency range of 100Hz – 10kHz to process ABM2 measurements. Below is the verification of the system processing A-weighting and Half-Band integration between system input to output within 0.5 dB of the theoretical result:

| f(Hz) | HBI, A- Measured (dB re 1kHz) | HBI, A- Theoretical (dB re 1kHz) | dB Var. |
|---|---|---|---|
| 100 | -16.150 | -16.170 | 0.020 |
| 125 | -13.241 | -13.250 | 0.009 |
| 160 | -10.333 | -10.340 | 0.007 |
| 200 | -8.005 | -8.010 | 0.005 |
| 250 | -5.915 | -5.920 | 0.005 |
| 315 | -4.035 | -4.040 | 0.005 |
| 400 | -2.395 | -2.400 | 0.005 |
| 500 | -1.207 | -1.210 | 0.003 |
| 630 | -0.347 | -0.350 | 0.003 |
| 800 | 0.068 | 0.070 | 0.002 |
| 1000 | 0.001 | 0.000 | 0.001 |
| 1250 | -0.501 | -0.500 | -0.001 |
| 1600 | -1.511 | -1.510 | -0.001 |
| 2000 | -2.783 | -2.780 | -0.003 |
| 2500 | -4.323 | -4.320 | -0.003 |
| 3150 | -6.175 | -6.170 | -0.005 |
| 4000 | -8.338 | -8.330 | -0.008 |
| 5000 | -10.599 | -10.590 | -0.009 |
| 6300 | -13.212 | -13.200 | -0.012 |
| 8000 | -16.284 | -16.270 | -0.014 |
| 10000 | -19.539 | -19.520 | -0.019 |




Frequency Response Validation

## 2.6.5. Uncertainty Estimation Table

| a | b | c | d | e= f(d,k) | f | g | h= c*f/e | i= c*g/e | k |
|---|---|---|---|---|---|---|---|---|---|
| Uncertainty Component | Sec. | Tol (+- %) | Prob. Dist. | Div. | Ci (1g) | Ci (10g) | 1g Ui (+-%) | 10g Ui (+-%) | V i |
| **Measurement System** | | | | | | | | | |
| Probe calibration | E.2.1 | 7.0 | N | 1 | 1 | 1 | 7.00 | 7.00 | |
| Axial Isotropy | E.2.2 | 2.5 | R | √3 | | | 1.02 | 1.02 | |
| Hemispherical Isotropy | E.2.2 | 4.0 | R | √3 | | | 1.63 | 1.63 | |
| Boundary effect | E.2.3 | 1.0 | R | √3 | 1 | 1 | 0.58 | 0.58 | |
| Linearity | E.2.4 | 5.0 | R | √3 | 1 | 1 | 2.89 | 2.89 | |
| System detection limits | E.2.5 | 1.0 | R | √3 | 1 | 1 | 0.58 | 0.58 | |
| Readout Electronics | E.2.6 | 0.02 | N | 1 | 1 | 1 | 0.02 | 0.02 | |
| Reponse Time | E.2.7 | 3.0 | R | √3 | 1 | 1 | 1.73 | 1.73 | |
| Integration Time | E.2.8 | 2.0 | R | √3 | 1 | 1 | 1.15 | 1.15 | |
| RF ambient Conditions | E.6.1 | 3.0 | R | √3 | 1 | 1 | 1.73 | 1.73 | |
| Probe positioner Mechanical Tolerance | E.6.2 | 2.0 | R | √3 | 1 | 1 | 1.15 | 1.15 | |
| Probe positioning with respect to Phantom Shell | E.6.3 | 0.05 | R | √3 | 1 | 1 | 0.03 | 0.03 | |
| Extrapolation, interpolation and integration Algoritms for Max. SAR Evaluation | E.5.2 | 5.0 | R | √3 | 1 | 1 | 2.89 | 2.89 | |
| **Test sample Related** | | | | | | | | | |
| Test sample positioning | E.4.2.1 | 0.03 | N | 1 | 1 | 1 | 0.03 | 0.03 | N-1 |
| Device Holder Uncertainty | E.4.1.1 | 5.00 | N | 1 | 1 | 1 | 5.00 | 5.00 | |
| Output power Variation - drift measurement | 6.6.2 | 5.78 | R | | 1 | 1 | 3.34 | 3.34 | |

## 2.6.6. OVERALL MEASUREMENT SUMMARY

**4.3.7.1 T-coil**

| Mode | Channel | Antenna | T ESULT | Output power (dBm) |
|---|---|---|---|---|
| T-coil | | | | |
| GSM850 | 128 | Fixed | T3 | 31.72 |
| GSM850 | 189 | Fixed | T3 | 31.52 |
| GSM850 | 250 | Fixed | T3 | 31.39 |
| GSM1900 | 513 | Fixed | T3 | 28.07 |
| GSM1900 | 661 | Fixed | T3 | 28.11 |
| GSM1900 | 809 | Fixed | T3 | 28.11 |

| Mode | Channel | Antenna | T ESULT | Output power (dBm) |
|---|---|---|---|---|
| T-coil | | | | |
| WCDMA1700 | 1312 | Fixed | T4 | 21.66 |
| WCDMA1700 | 1412 | Fixed | T4 | 21.45 |
| WCDMA1700 | 1513 | Fixed | T4 | 21.61 |

## 2.6.7. TEST DATA

| FREQUENCY | PARAMETERS |
|---|---|
| **GSM 850** | Measurement 1: T-coil on Low Channel<br>Measurement 2: T-coil on Middle Channel<br>Measurement 3: T-coil on High Channel |
| **GSM 1900** | Measurement 4: T-coil on Low Channel<br>Measurement 5: T-coil on Middle Channel<br>Measurement 6: T-coil on High Channel |
| **WCDMA 1900** | Measurement 7: T-coil on Low Channel<br>Measurement 8: T-coil on Middle Channel<br>Measurement 9: T-coil on High Channel |

# MEASUREMENT 1

## A. Experimental conditions.

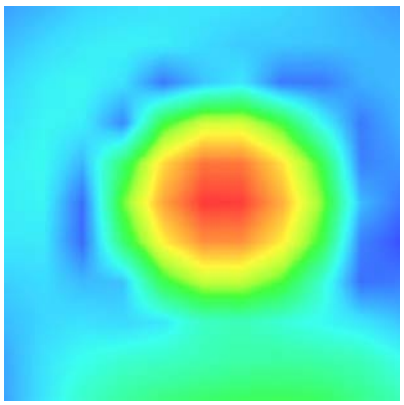
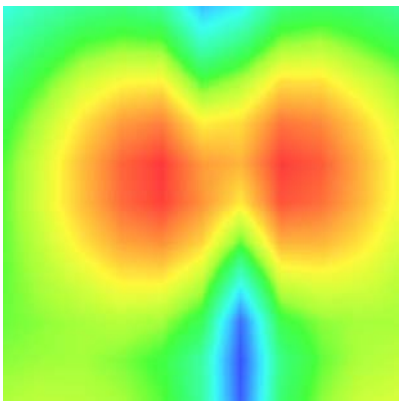
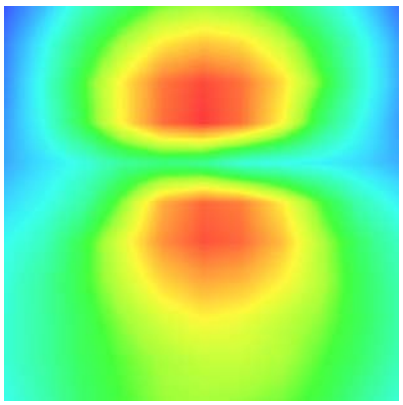
| | |
|---|---|
| **Grid size (mm x mm)** | 50.0, 50.0 |
| **Step (mm)** | 5 |
| **Scanning Height (mm)** | 10.0 |
| **Band** | GSM850 |
| **Channel** | Low |
| **Date of measurement** | 10/9/2012 |

## B. HAC Measurement Results

Frequency (MHz): 836.400000

| C63.19 | Mode | Band | Test Description | Minimum Limit | Location | Measured | Category | Verdict |
|---|---|---|---|---|---|---|---|---|
| | | | | dBA/m | - | dBA/m | - | Pass/Fail |
| 7.3.1.1 | GSM | GSM850 | Intensity, Axial | -18 | Max | 5.74 | - | PASS |
| 7.3.1.2 | | | Intensity, RadialH | -18 | Max | 5.53 | - | PASS |
| | | | | - | - | - | - | - |
| 7.3.1.2 | | | Intensity, RadialV | -18 | Max | 4.74 | - | PASS |
| | | | | - | - | - | - | - |
| | | | | dB | | dB | | |
| 7.3.3 | | | Signal to noise/noise, Axial | 5 | Max | 27.63 | T3 | PASS |
| 7.3.3 | | | Signal to noise/noise, RadialH | 5 | Max | 26.89 | T3 | PASS |
| | | | | - | - | - | - | - |
| 7.3.3 | | | Signal to noise/noise, RadialV | 5 | Max | 20.50 | T3 | PASS |
| | | | | - | - | - | - | - |
| 7.3.2 | | | Frequency reponse, Axial | - | - | - | - | - |

# T.Coil Scan Overlay Magnetic Field Distributions

| AXIAL | RADIAL H | RADIAL V |
|---|---|---|
|  |  |  |

# MEASUREMENT 2

## A. Experimental conditions.

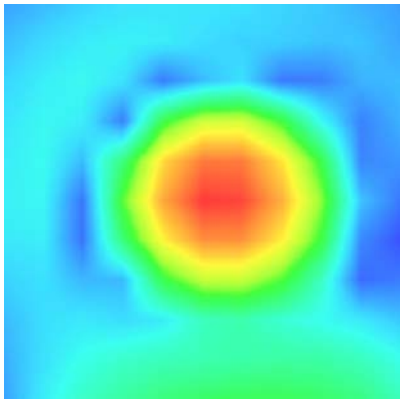
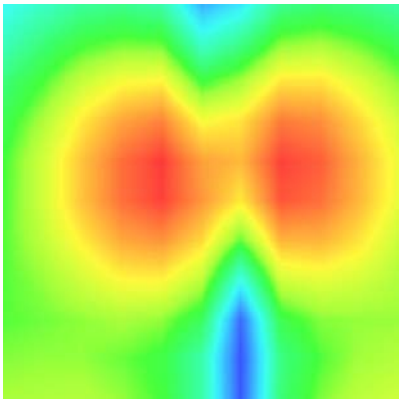
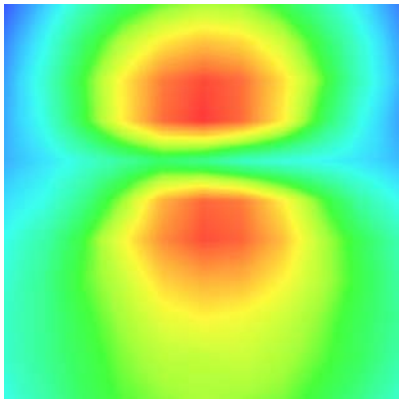
| | |
|---|---|
| **Grid size (mm x mm)** | 50.0, 50.0 |
| **Step (mm)** | 5 |
| **Scanning Height (mm)** | 10.0 |
| **Band** | GSM850 |
| **Channel** | Middle |
| **Date of measurement** | 10/9/2012 |

## B. HAC Measurement Results

Frequency (MHz): 836.400000

| C63.19 | Mode | Band | Test Description | Minimum Limit | Location | Measured | Category | Verdict |
|---|---|---|---|---|---|---|---|---|
| | | | | dBA/m | - | dBA/m | - | Pass/Fail |
| 7.3.1.1 | GSM | GSM850 | Intensity, Axial | -18 | Max | 6.52 | - | PASS |
| 7.3.1.2 | | | Intensity, RadialH | -18 | Max | 6.73 | - | PASS |
| | | | | - | - | - | - | - |
| 7.3.1.2 | | | Intensity, RadialV | -18 | Max | 4.10 | - | PASS |
| | | | | - | - | - | - | - |
| | | | | dB | | dB | | |
| 7.3.3 | | | Signal to noise/noise, Axial | 5 | Max | 30.39 | T4 | PASS |
| 7.3.3 | | | Signal to noise/noise, RadialH | 5 | Max | 26.19 | T3 | PASS |
| | | | | - | - | - | - | - |
| 7.3.3 | | | Signal to noise/noise, RadialV | 5 | Max | 24.74 | T3 | PASS |
| | | | | - | - | - | - | - |
| 7.3.2 | | | Frequency reponse, Axial | - | - | - | - | - |

# T.Coil Scan Overlay Magnetic Field Distributions

| AXIAL | RADIAL H | RADIAL V |
|---|---|---|
|  |  |  |

# MEASUREMENT 3

## A. Experimental conditions.

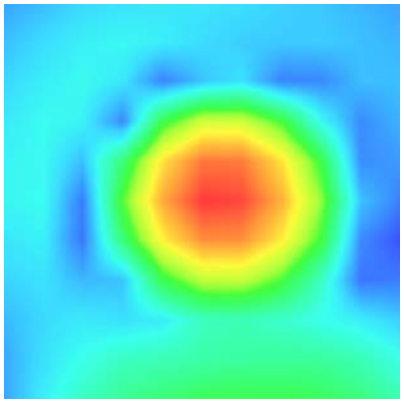
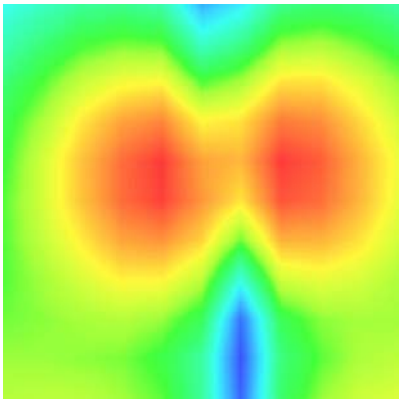
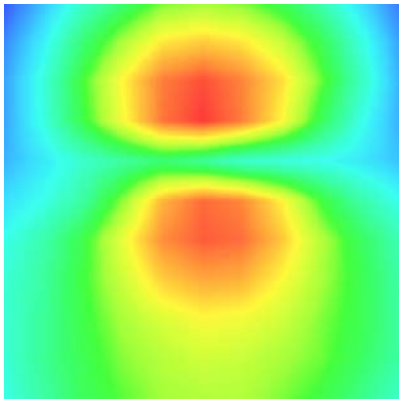
| | |
|---|---|
| **Grid size (mm x mm)** | 50.0, 50.0 |
| **Step (mm)** | 5 |
| **Scanning Height (mm)** | 10.0 |
| **Band** | GSM850 |
| **Channel** | High |
| **Date of measurement** | 10/9/2012 |

## B. HAC Measurement Results

Frequency (MHz): 836.400000

| C63.19 | Mode | Band | Test Description | Minimum Limit | Location | Measured | Category | Verdict |
|---|---|---|---|---|---|---|---|---|
| | | | | dBA/m | - | dBA/m | - | Pass/Fail |
| 7.3.1.1 | GSM | GSM850 | Intensity, Axial | -18 | Max | 7.85 | - | PASS |
| 7.3.1.2 | | | Intensity, RadialH | -18 | Max | 6.88 | - | PASS |
| | | | | - | - | - | - | - |
| 7.3.1.2 | | | Intensity, RadialV | -18 | Max | 5.15 | - | PASS |
| | | | | - | - | - | - | - |
| | | | | dB | | dB | | |
| 7.3.3 | | | Signal to noise/noise, Axial | 5 | Max | 32.71 | T4 | PASS |
| 7.3.3 | | | Signal to noise/noise, RadialH | 5 | Max | 30.60 | T4 | PASS |
| | | | | - | - | - | - | - |
| 7.3.3 | | | Signal to noise/noise, RadialV | 5 | Max | 28.71 | T3 | PASS |
| | | | | - | - | - | - | - |
| 7.3.2 | | | Frequency reponse, Axial | - | - | - | - | - |

# T.Coil Scan Overlay Magnetic Field Distributions

| AXIAL | RADIAL H | RADIAL V |
|---|---|---|
|  |  |  |

# MEASUREMENT 4

## A. Experimental conditions.

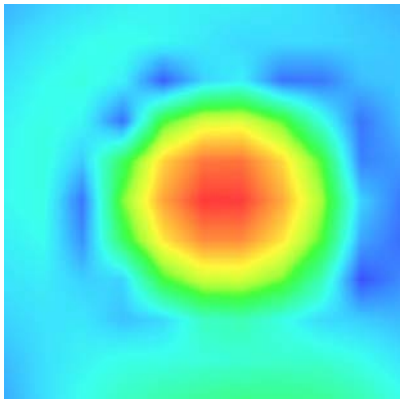
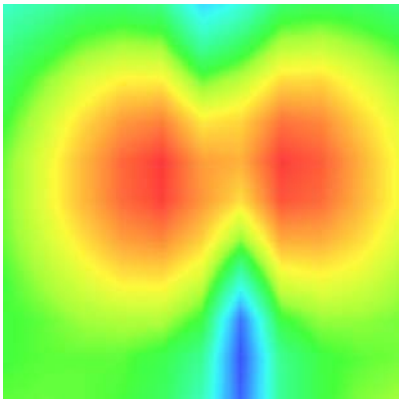
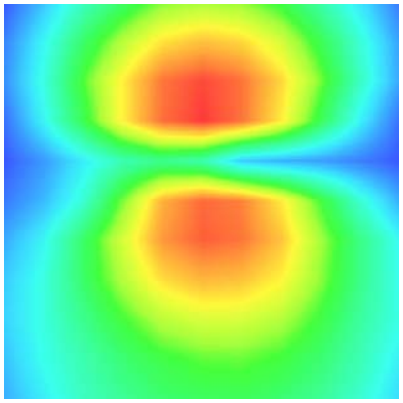
| | |
|---|---|
| **Grid size (mm x mm)** | 50.0, 50.0 |
| **Step (mm)** | 5 |
| **Scanning Height (mm)** | 10.0 |
| **Band** | GSM1900 |
| **Channel** | Low |
| **Date of measurement** | 10/9/2012 |

## B. HAC Measurement Results

Frequency (MHz): 1880.000000

| C63.19 | Mode | Band | Test Description | Minimum Limit | Location | Measured | Category | Verdict |
|---|---|---|---|---|---|---|---|---|
| | | | | dBA/m | - | dBA/m | - | Pass/Fail |
| 7.3.1.1 | GSM | GSM1900 | Intensity, Axial | -18 | Max | 10.38 | - | PASS |
| 7.3.1.2 | | | Intensity, RadialH | -18 | Max | 8.52 | - | PASS |
| | | | | - | - | - | - | - |
| 7.3.1.2 | | | Intensity, RadialV | -18 | Max | 5.74 | - | PASS |
| | | | | - | - | - | - | - |
| | | | | dB | | dB | | |
| 7.3.3 | | | Signal to noise/noise, Axial | 5 | Max | 31.73 | T4 | PASS |
| 7.3.3 | | | Signal to noise/noise, RadialH | 5 | Max | 27.80 | T3 | PASS |
| | | | | - | - | - | - | - |
| 7.3.3 | | | Signal to noise/noise, RadialV | 5 | Max | 26.85 | T3 | PASS |
| | | | | - | - | - | - | - |
| 7.3.2 | | | Frequency reponse, Axial | - | - | - | - | - |

# T.Coil Scan Overlay Magnetic Field Distributions

| AXIAL | RADIAL H | RADIAL V |
|---|---|---|
|  |  |  |

# MEASUREMENT 5

## A. Experimental conditions.

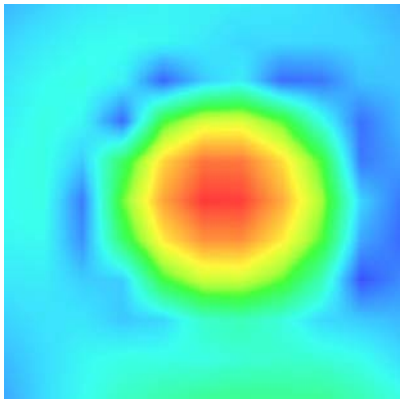
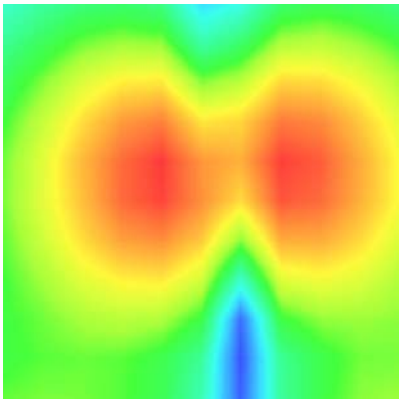
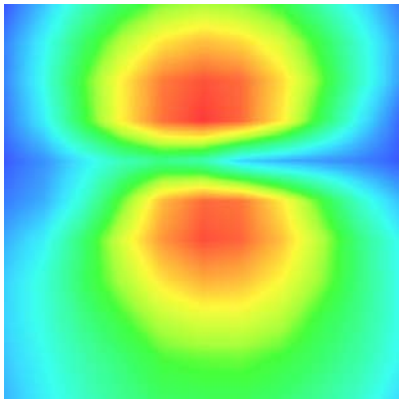
| | |
|---|---|
| **Grid size (mm x mm)** | 50.0, 50.0 |
| **Step (mm)** | 5 |
| **Scanning Height (mm)** | 10.0 |
| **Band** | GSM1900 |
| **Channel** | Middle |
| **Date of measurement** | 10/9/2012 |

## B. HAC Measurement Results

Frequency (MHz): 1880.000000

| C63.19 | Mode | Band | Test Description | Minimum Limit | Location | Measured | Category | Verdict |
|---|---|---|---|---|---|---|---|---|
| | | | | dBA/m | - | dBA/m | - | Pass/Fail |
| 7.3.1.1 | GSM | GSM1900 | Intensity, Axial | -18 | Max | 10.41 | - | PASS |
| 7.3.1.2 | | | Intensity, RadialH | -18 | Max | 8.40 | - | PASS |
| | | | | - | - | - | - | - |
| 7.3.1.2 | | | Intensity, RadialV | -18 | Max | 7.48 | - | PASS |
| | | | | - | - | - | - | - |
| | | | | dB | | dB | | |
| 7.3.3 | | | Signal to noise/noise, Axial | 5 | Max | 33.83 | T4 | PASS |
| 7.3.3 | | | Signal to noise/noise, RadialH | 5 | Max | 31.50 | T4 | PASS |
| | | | | - | - | - | - | - |
| 7.3.3 | | | Signal to noise/noise, RadialV | 5 | Max | 27.62 | T3 | PASS |
| | | | | - | - | - | - | - |
| 7.3.2 | | | Frequency reponse, Axial | - | - | - | - | - |

# T.Coil Scan Overlay Magnetic Field Distributions

| AXIAL | RADIAL H | RADIAL V |
|---|---|---|
|  |  |  |

# MEASUREMENT 6

## A. Experimental conditions.

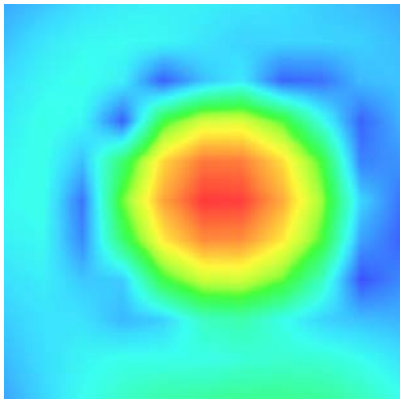
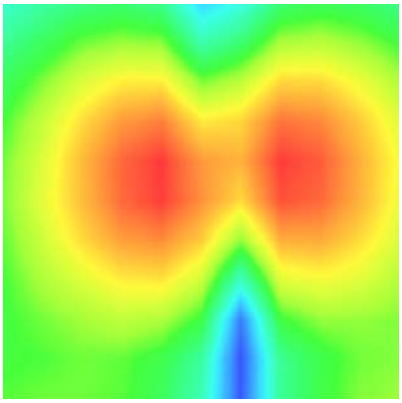
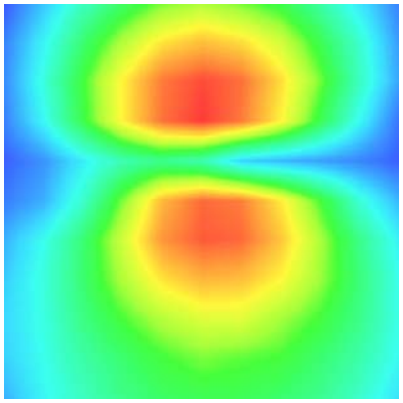
| | |
|---|---|
| **Grid size (mm x mm)** | 50.0, 50.0 |
| **Step (mm)** | 5 |
| **Scanning Height (mm)** | 10.0 |
| **Band** | GSM1900 |
| **Channel** | High |
| **Date of measurement** | 10/9/2012 |

## B. HAC Measurement Results

Frequency (MHz): 1880.000000

| C63.19 | Mode | Band | Test Description | Minimum Limit | Location | Measured | Category | Verdict |
|---|---|---|---|---|---|---|---|---|
| | | | | dBA/m | - | dBA/m | - | Pass/Fail |
| 7.3.1.1 | GSM | GSM1900 | Intensity, Axial | -18 | Max | 11.52 | - | PASS |
| 7.3.1.2 | | | Intensity, RadialH | -18 | Max | 9.63 | - | PASS |
| | | | | - | - | - | - | - |
| 7.3.1.2 | | | Intensity, RadialV | -18 | Max | 7.42 | - | PASS |
| | | | | - | - | - | - | - |
| | | | | dB | | dB | | |
| 7.3.3 | | | Signal to noise/noise, Axial | 5 | Max | 32.35 | T4 | PASS |
| 7.3.3 | | | Signal to noise/noise, RadialH | 5 | Max | 30.87 | T4 | PASS |
| | | | | - | - | - | - | - |
| 7.3.3 | | | Signal to noise/noise, RadialV | 5 | Max | 26.16 | T3 | PASS |
| | | | | - | - | - | - | - |
| 7.3.2 | | | Frequency reponse, Axial | - | - | - | - | - |

# T.Coil Scan Overlay Magnetic Field Distributions

| AXIAL | RADIAL H | RADIAL V |
|---|---|---|
|  |  |  |

# MEASUREMENT 7

## A. Experimental conditions.

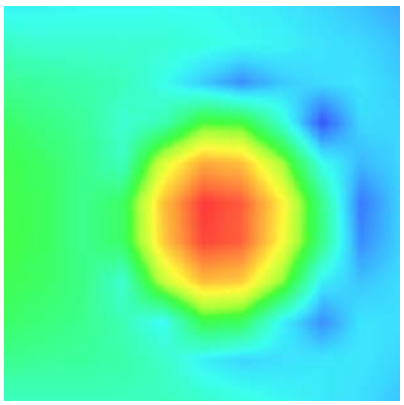
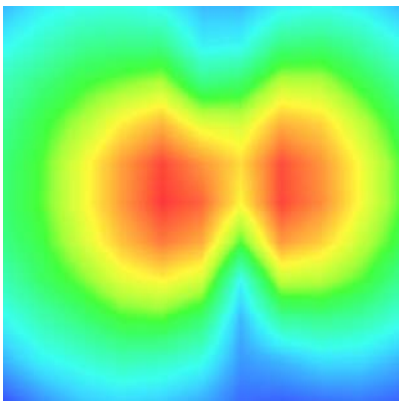
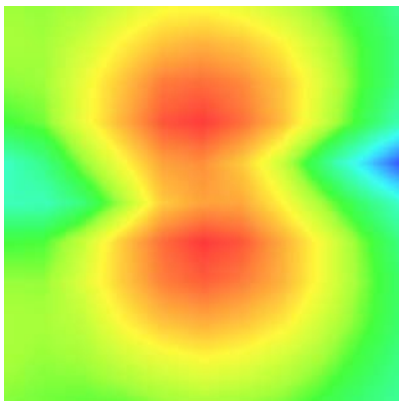
| | |
|---|---|
| **Grid size (mm x mm)** | 50.0, 50.0 |
| **Step (mm)** | 5 |
| **Scanning Height (mm)** | 10.0 |
| **Band** | WCDMA1700 |
| **Channel** | Low |
| **Date of measurement** | 10/9/2012 |

## B. HAC Measurement Results

Frequency (MHz): 1712.400000

| C63.19 | Mode | Band | Test Description | Minimum Limit | Location | Measured | Category | Verdict |
|---|---|---|---|---|---|---|---|---|
| | | | | dBA/m | - | dBA/m | - | Pass/Fail |
| 7.3.1.1 | CDMA | CDMA1900 | Intensity, Axial | -18 | Max | 4.14 | - | PASS |
| 7.3.1.2 | | | Intensity, RadialH | -18 | Max | 3.55 | - | PASS |
| | | | | - | - | - | - | - |
| 7.3.1.2 | | | Intensity, RadialV | -18 | Max | 1.52 | - | PASS |
| | | | | - | - | - | - | - |
| | | | | dB | | dB | | |
| 7.3.3 | | | Signal to noise/noise, Axial | 5 | Max | 24.15 | T3 | PASS |
| 7.3.3 | | | Signal to noise/noise, RadialH | 5 | Max | 23.70 | T3 | PASS |
| | | | | - | - | - | - | - |
| 7.3.3 | | | Signal to noise/noise, RadialV | 5 | Max | 22.19 | T3 | PASS |
| | | | | - | - | - | - | - |
| 7.3.2 | | | Frequency reponse, Axial | - | - | - | - | - |

# T.Coil Scan Overlay Magnetic Field Distributions

| AXIAL | RADIAL H | RADIAL V |
|---|---|---|
|  |  |  |

# MEASUREMENT 8

## A. Experimental conditions.

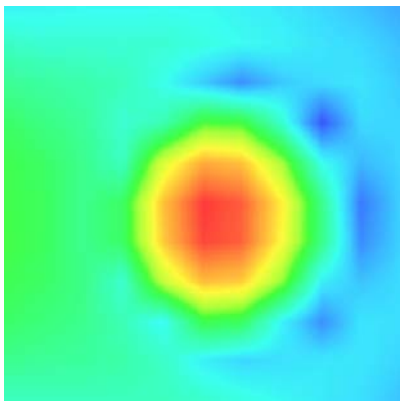
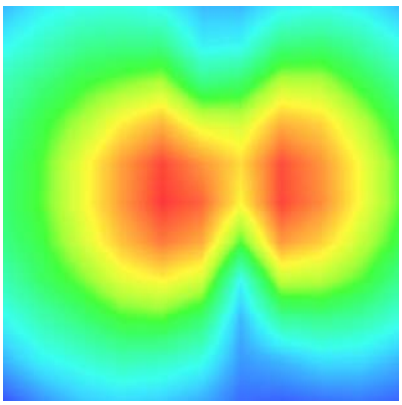
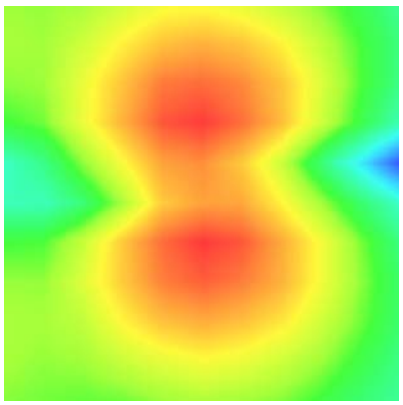
| | |
|---|---|
| **Grid size (mm x mm)** | 50.0, 50.0 |
| **Step (mm)** | 5 |
| **Scanning Height (mm)** | 10.0 |
| **Band** | WCDMA1700 |
| **Channel** | Middle |
| **Date of measurement** | 10/9/2012 |

## B. HAC Measurement Results

Frequency (MHz): 1732.400000

| C63.19 | Mode | Band | Test Description | Minimum Limit | Location | Measured | Category | Verdict |
|---|---|---|---|---|---|---|---|---|
| | | | | dBA/m | - | dBA/m | - | Pass/Fail |
| 7.3.1.1 | CDMA | CDMA1900 | Intensity, Axial | -18 | Max | 3.63 | - | PASS |
| 7.3.1.2 | | | Intensity, RadialH | -18 | Max | 1.52 | - | PASS |
| | | | | - | - | - | - | - |
| 7.3.1.2 | | | Intensity, RadialV | -18 | Max | -0.15 | - | PASS |
| | | | | - | - | - | - | - |
| | | | | dB | | dB | | |
| 7.3.3 | | | Signal to noise/noise, Axial | 5 | Max | 26.80 | T3 | PASS |
| 7.3.3 | | | Signal to noise/noise, RadialH | 5 | Max | 24.63 | T3 | PASS |
| | | | | - | - | - | - | - |
| 7.3.3 | | | Signal to noise/noise, RadialV | 5 | Max | 23.74 | T3 | PASS |
| | | | | - | - | - | - | - |
| 7.3.2 | | | Frequency reponse, Axial | - | - | - | - | - |

# T.Coil Scan Overlay Magnetic Field Distributions

| AXIAL | RADIAL H | RADIAL V |
|---|---|---|
|  |  |  |

# MEASUREMENT 9

## A. Experimental conditions.

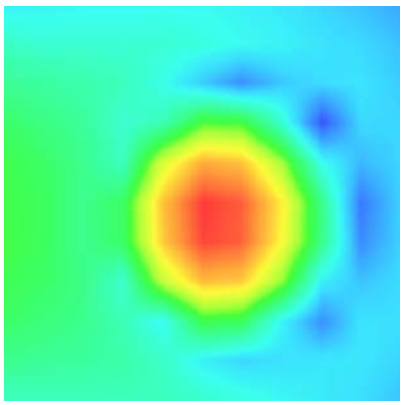
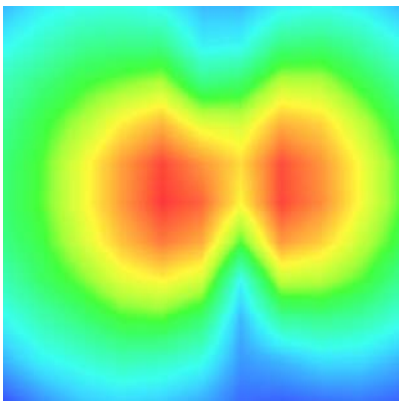
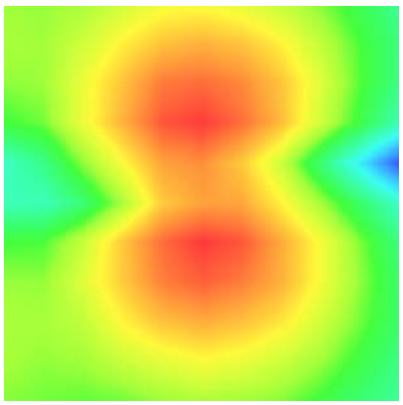
| | |
|---|---|
| **Grid size (mm x mm)** | 50.0, 50.0 |
| **Step (mm)** | 5 |
| **Scanning Height (mm)** | 10.0 |
| **Band** | WCDMA1700 |
| **Channel** | High |
| **Date of measurement** | 10/9/2012 |

## B. HAC Measurement Results

Frequency (MHz): 1752.600000

| C63.19 | Mode | Band | Test Description | Minimum Limit | Location | Measured | Category | Verdict |
|---|---|---|---|---|---|---|---|---|
| | | | | dBA/m | - | dBA/m | - | Pass/Fail |
| 7.3.1.1 | CDMA | CDMA1900 | Intensity, Axial | -18 | Max | 3.12 | - | PASS |
| 7.3.1.2 | | | Intensity, RadialH | -18 | Max | 2.77 | - | PASS |
| | | | | - | - | - | - | - |
| 7.3.1.2 | | | Intensity, RadialV | -18 | Max | 1.64 | - | PASS |
| | | | | - | - | - | - | - |
| | | | | dB | | dB | | |
| 7.3.3 | | | Signal to noise/noise, Axial | 5 | Max | 25.47 | T3 | PASS |
| 7.3.3 | | | Signal to noise/noise, RadialH | 5 | Max | 26.81 | T3 | PASS |
| | | | | - | - | - | - | - |
| 7.3.3 | | | Signal to noise/noise, RadialV | 5 | Max | 22.33 | T3 | PASS |
| | | | | - | - | - | - | - |
| 7.3.2 | | | Frequency reponse, Axial | - | - | - | - | - |

# T.Coil Scan Overlay Magnetic Field Distributions

| AXIAL | RADIAL H | RADIAL V |
|---|---|---|
|  |  |  |

# Annex A EUT Setup photo

1. EUT Keyboard Upward

2. EUT Back upward