TESTING
No. L2264

# ANSI C63.19

# TEST REPORT

| | |
|---|---|
| **Product Name** | HSUPA/HSDPA/UMTS triband / GSM quadband mobile phone |
| **Model Name** | Mojitolite A |
| **Marketing Name** | ONE TOUCH 991A |
| **FCC ID** | RAD254 |
| **Client** | TCT Mobile Limited |

## TA Technology (Shanghai) Co., Ltd.

# GENERAL SUMMARY

| | | | |
|---|---|---|---|
| **Product Name** | HSUPA/HSDPA/UMTS triband / GSM quadband mobile phone | **Model** | Mojitolite A |
| **Report No.** | RXA1204-0067HAC01R1 | **FCC ID** | RAD254 |
| **Client** | TCT Mobile Limited | | |
| **Manufacturer** | TCT Mobile Limited | | |
| **Reference Standard(s)** | **ANSI C63.19-2007:** American National Standard Methods of Measurement of Compatibility between Wireless Communications Devices and Hearing Aids. | | |
| **Conclusion** | This portable wireless equipment has been measured in all cases requested by the relevant standards.<br><br>General Judgment: **M3 (RF Emission)**<br><br>(Stamp)<br>**Date of issue: April 24th, 2012** | | |
| **Comment** | The test result only responds to the measured sample. | | |

**Approved by** 杨伟中 Director **Revised by** 凌敏宏 SAR Manager **Performed by** 沈辰 SAR Engineer

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# 1. General Information

## 1.1. Notes of the Test Report

**TA Technology (Shanghai) Co., Ltd.** guarantees the reliability of the data presented in this test report, which is the results of measurements and tests performed for the items under test on the date and under the conditions stated in this test report and is based on the knowledge and technical facilities available at TA Technology (Shanghai) Co., Ltd. at the time of execution of the test.

**TA Technology (Shanghai) Co., Ltd.** is liable to the client for the maintenance by its personnel of the confidentiality of all information related to the items under test and the results of the test. This report only refers to the item that has undergone the test.

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If the electrical report is inconsistent with the printed one, it should be subject to the latter.

## 1.2. Testing Laboratory

| | |
|---|---|
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## 1.3. Applicant Information

| | |
|---|---|
| Company: | TCT Mobile Limited |
| Address: | 5F, E building, No. 232, Liang Jing Road ZhangJiang High-Tech Park, Pudong Area Shanghai, P.R. China. 201203 |
| City: | Shanghai |
| Postal Code: | 201203 |
| Country: | P.R. China |
| Contact: | Gong Zhizhou |
| Telephone: | 0086-21-61460890 |
| Fax: | 0086-21-61460602 |

## 1.4. Manufacturer Information

| | |
|---|---|
| Company: | TCT Mobile Limited |
| Address: | 5F, E building, No. 232, Liang Jing Road ZhangJiang High-Tech Park, Pudong Area Shanghai, P.R. China. 201203 |
| City: | Shanghai |
| Postal Code: | 201203 |
| Country: | P.R. China |
| Telephone: | 0086-21-61460890 |
| Fax: | 0086-21-61460602 |

## 1.5. Information of EUT

**General Information**

| | | | |
|---|---|---|---|
| Device Type: | Portable Device | | |
| Product Name: | HSUPA/HSDPA/UMTS triband / GSM quadband mobile phone | | |
| IMEI: | 013111000020347 | | |
| Hardware Version: | PIO02 | | |
| Software Version: | vF1I_US | | |
| Antenna Type: | Internal Antenna | | |
| Device Operating Configurations: | | | |
| Supporting Mode(s): | GSM 850/GSM 1900; (tested) | | |
| | WCDMA Band II/WCDMA Band V; (tested) | | |
| | GSM 900/GSM 1800; (untested) | | |
| | WCDMA Band I; (untested) | | |
| | Bluetooth/WiFi; (untested) | | |
| Test Modulation: | (GSM)GMSK; (WCDMA) QPSK | | |
| Device Class: | B | | |
| HSDPA UE Category: | 8 | | |
| HSUPA UE Category: | 6 | | |
| GPRS Multislot Class(12): | Max Number of Timeslots in Uplink | | 4 |
| | Max Number of Timeslots in Downlink | | 4 |
| | Max Total Timeslot | | 5 |
| EGPRS Multislot Class(12): | Max Number of Timeslots in Uplink | | 4 |
| | Max Number of Timeslots in Downlink | | 4 |
| | Max Total Timeslot | | 5 |
| Operating Frequency Range(s): | Mode | Tx (MHz) | Rx (MHz) |
| | GSM 850 | 824.2 ~ 848.8 | 869.2 ~ 893.8 |
| | GSM 1900 | 1850.2 ~ 1909.8 | 1930.2 ~ 1989.8 |
| | WCDMA Band II | 1852.4 ~ 1907.6 | 1932.4 ~ 1987.6 |
| | WCDMA Band V | 826.4 ~ 846.6 | 871.4 ~ 891.6 |
| Test Channel:<br>(Low - Middle - High) | 128-190-251 (GSM 850) (tested)<br>512-661-810 (GSM 1900) (tested)<br>9262 - 9400 - 9538 (WCDMA Band II) (tested)<br>4132 - 4183 - 4233 (WCDMA Band V) (tested) | | |
| Power Class: | GSM 850: 4, tested with power level 5 | | |
| | GSM 1900: 1, tested with power level 0 | | |
| | WCDMA Band II: 3, tested with power control all up bits | | |
| | WCDMA Band V: 3, tested with power control all up bits | | |

**Auxiliary Equipment Details**

| Name | Model | Manufacturer | S/N |
|---|---|---|---|
| Battery 1 | CAB32A0000C1 | BYD | B36211047EA |
| Battery 2 | CAB32A0000C2 | SCUD | FMTMMBC17004036 |

Equipment Under Test (EUT) is a HSUPA/HSDPA/UMTS triband / GSM quadband mobile phone. The detail about EUT and Lithium Battery is in chapter 1.5 in this report. The device has an internal antenna for GSM/WCDMA Tx/Rx, and the other is BT/WiFi antenna that is used for Tx/Rx. It has Proximity Sensor function. The proximity sensor is a sensor able to detect the presence of nearby objects without any physical contact and It will not reduce the transmit power. HAC is tested for GSM 850, GSM 1900, WCDMA Band II and WCDMA Band V. BT/WiFi mode doesn't have voice capability, and does not operate in the held to ear mode for providing handset service.

The sample under test was selected by the Client.

Components list please refer to documents of the manufacturer.

## 1.6. The Ambient Conditions during Test

| | |
|---|---|
| Temperature | Min. = 18°C, Max. = 28 °C |
| Relative humidity | Min. = 0%, Max. = 80% |
| Ground system resistance | < 0.5 Ω |
| Ambient noise is checked and found very low and in compliance with requirement of standards. Reflection of surrounding objects is minimized and in compliance with requirement of standards. | |

## 1.7. The Total M-rating of each tested band

| Mode | Rating |
|---|---|
| GSM 850 | **M3** |
| GSM 1900 | **M3** |
| WCDMA Band II | **M4** |
| WCDMA Band V | **M4** |

## 1.8. Test Date

The test performed from April 23, 2012 to April 24, 2012.

# 2. Test Information

## 2.1. Operational Conditions during Test

### 2.1.1. General Description of Test Procedures

The phone was tested in all normal configurations for the ear use. The EUT is mounted in the device holder equivalent as for classic dosimeter measurements. The acoustic output of the EUT shall coincide with the center point of the area formed by the dielectric wire and the middle bar of the arch's top frame The EUT shall be moved vertically upwards until it touches the frame. The fine adjustment is possible by sliding the complete. The EUT holder is on the yellow base plate of the Test Arch phantom. These test configurations are tested at the high, middle and low frequency channels of each applicable operating mode; for example, GSM, WCDMA (UMTS), CDMA and TDMA.

### 2.1.2. GSM/WCDMA Test Configuration

A communication link is set up with a System Simulator (SS) by air link, and a call is established. The Absolute Radiofrequency Channel Number (ARFCN) is allocated to 128, 190 and 251 in the case of GSM 850, to 512, 661 and 810 in the case of GSM 1900, to 9262, 9400 and 9538 in the case of WCDMA Band II, to 4132, 4183 and 4233 in the case of WCDMA Band V. The EUT is commanded to operate at maximum transmitting power. Using E5515C the power lever is set to "5" for GSM 850, set to "0" for GSM 1900. Set to all up bits for WCDMA. The test in the bands of GSM 850/GSM 1900 and WCDMA Band II /WCDMA Band V are performed in the mode of speech transfer function.

## 2.2. HAC RF Measurements System Configuration

### 2.2.1. HAC Measurement Set-up

These measurements are performed using the DASY5 automated dosimetric assessment system. It is made by Schmid & Partner Engineering AG (SPEAG) in Zurich, Switzerland. It consists of high precision robotics system (Stäubli), robot controller, Intel Core2 computer, near-field probe, probe alignment sensor. The robot is a six-axis industrial robot performing precise movements. Cell controller systems contain the power supply, robot controller, teach pendant (Joystick) and remote control, and are used to drive the robot motors. The Stäubli Robot is connected to the cell controller to allow software manipulation of the robot. A data acquisition electronic (DAE) circuit performs the signal amplification; signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. is connected to the Electro-optical coupler (EOC). The EOC performs the conversion from the optical into digital electric signal of the DAE and transfers data to the PC plug-in card.

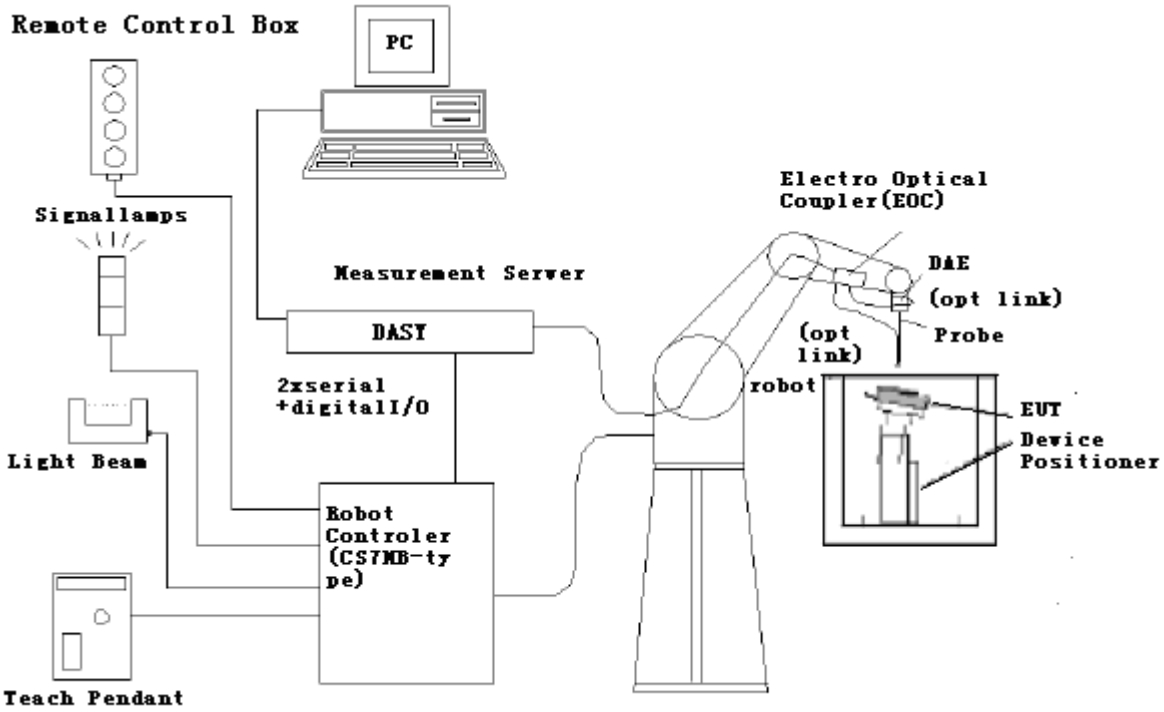



**Figure 1 HAC Test Measurement Set-up**

The DAE4 consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit. Transmission to the PC-card is accomplished through an optical downlink for data and status information and an optical uplink for commands and clock lines. The mechanical probe mounting device includes two different sensor systems for frontal and sidewise probe contacts. They are also used for mechanical surface detection and probe collision detection. The robot uses its own controller with a built in VME-bus computer.

### 2.2.2. Probe System

The HAC measurements were conducted with the E-Field Probe ER3DV6 and the H-Field Probe H3DV6 (manufactured by SPEAG), designed in the classical triangular configuration and optimized for dosimetric evaluation.

**E-Field Probe Description**

| | |
|---|---|
| Construction | One dipole parallel, two dipoles normal to probe axis<br>Built-in shielding against static charges<br>PEEK enclosure material |
| Calibration | In air from 100 MHz to 3.0 GHz (absolute accuracy ±6.0%, k=2) |
| Frequency | 40 MHz to > 6 GHz (can be extended to < 20 MHz)<br>Linearity: ± 0.2 dB (100 MHz to 3 GHz) |
| Directivity | ± 0.2 dB in air (rotation around probe axis)<br>± 0.4 dB in air (rotation normal to probe axis) |
| Dynamic Range | 2 V/m to > 1000 V/m; Linearity: ± 0.2 dB |
| Dimensions | Overall length: 330 mm (Tip: 16 mm)<br>Tip diameter: 8 mm (Body: 12 mm)<br>Distance from probe tip to dipole centers: 2.5 mm |
| Application | General near-field measurements up to 6 GHz<br>Field component measurements<br>Fast automatic scanning in phantoms |

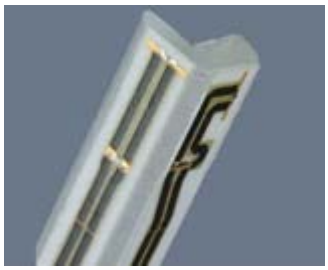


**Figure 2 ER3DV6 E-field Probe**

**H-Field Probe Description**

| | |
|---|---|
| Construction | Three concentric loop sensors with 3.8 mm loop diameters<br>Resistively loaded detector diodes for linear response<br>Built-in shielding against static charges<br>PEEK enclosure material (resistant to organic solvents, e.g., glycolether) |
| Frequency | 200 MHz to 3 GHz (absolute accuracy ± 6.0%, k=2);<br>Output linearized |
| Directivity | ± 0.2 dB (spherical isotropy error) |
| Dynamic Range | 10 mA/m to 2 A/m at 1 GHz |
| E-Field Interference | < 10% at 3 GHz (for plane wave) |
| Dimensions | Overall length: 330 mm (Tip: 40 mm)<br>Tip diameter: 6 mm (Body: 12 mm)<br>Distance from probe tip to dipole centers: 3 mm |

**Figure 3 H3DV6 H-field Probe**

| | |
|---|---|
| Application | General magnetic near-field measurements up to 3 GHz (in air or liquids)<br>Field component measurements<br>Surface current measurements<br>Low interaction with the measured field |

### 2.2.3. Test Arch Phantom & Phone Positioner

The Test Arch phantom should be positioned horizontally on a stable surface. Reference markings on the Phantom allow the complete setup of all predefined phantom positions and measurement grids by manually teaching three points in the robot. It enables easy and well defined positioning of the phone and validation dipoles as well as simple teaching of the robot (Dimensions: 370 x 370 x 370 mm).

The Device reference point is set for the EUT at 6.3 mm, the Grid reference point is on the upper surface at the origin of the coordinates, and the “user point \Height Check 0.5 mm” is 0.5mm above the center, allowing verication of the gap of 0.5mm while the probe is positioned there.

The Phone Positioner supports accurate and reliable positioning of any phone with effect on near field <±0.5 dB.

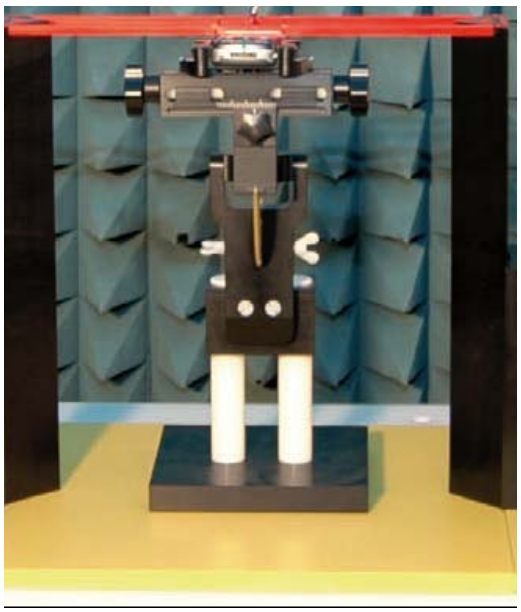


**Figure 4 HAC Phantom & Device Holder**

## 2.3. RF Test Procedures

**The evaluation was performed with the following procedure:**

1. Confirm proper operation of the field probe, probe measurement system and other instrumentation and the positioning system.
2. Position the WD in its intended test position. The gauge block can simplify this positioning. Note that a separate E-field and H-field gauge block will be needed if the center of the probe sensor elements is at different distances from the tip of the probe.
3. Configure the WD normal operation for maximum rated RF output power, at the desired channel and other operating parameters (e.g., test mode), as intended for the test.
4. The center sub-grid shall center on the center of the axial measurement point or the acoustic output, as appropriate. Locate the field probe at the initial test position in the 50 mm by 50 mm grid, which is contained in the measurement plane. If the field alignment method is used, align the probe for maximum field reception.
5. Record the reading.
6. Scan the entire 50 mm by 50 mm region in equally spaced increments and record the reading at each measurement point. The grid is 5 cm by 5 cm area that is divided into 9 evenly sized blocks or sub-grids.The distance between measurement points shall be sufficient to assure the identification of the maximum reading.
7. Identify the five contiguous sub-grids around the center sub-grid with the lowest maximum field strength readings. Thus the six areas to be used to determine the WD's highest emissions are identified and outlined for the final manual scan. Please note that a maximum of five blocks can be excluded for both E-field and H-field measurements for the WD output being measured. Stated another way, the center sub-grid and three others must be common to both the E-field and H-field measurements.
8. Identify the maximum field reading within the non-excluded sub-grids identified in Step 7.
9. Convert the maximum field strength reading identified in Step 8 to V/m or A/m, as appropriate. For probes which require a probe modulation factor, this conversion shall be done using the appropriate probe modulation factor and the calibration.
10. Repeat Step 1 through Step 10 for both the E-field and H-field measurements.
11. Compare this reading to the categories in ANSI C63.19 Clause 7 and record the resulting category. The lowest category number listed in 7.2, Table 7.4, or Table 7.5 obtained in Step 10 for either E- or H-field determines the M category for the audio coupling mode assessment. Record the WD category rating.


**Figure 5 WD reference and plane for RF emission measurements**

## 2.4. System Check

### Validation Procedure

Place a dipole antenna meeting the requirements given in ANSI C63.19 D.5 in the position normally occupied by the WD. The dipole antenna serves as a known source for an electrical and magnetic output. Position the E-field and H-field probes so that:

The probes and their cables are parallel to the coaxial feed of the dipole antenna.
The probe cables and the coaxial feed of the dipole antenna approach the measurement area from opposite directions.
The center point of the probe element(s) are 10 mm from the closest surface of the dipole elements.
Validation was performed to verify that measured E-field and H-field values are within +/-25% from the target refenence values provided by the manufacturer. ”Values within +/-25% are acceptable. Of which 12% is deviation and 13% is measurement uncertainty.”

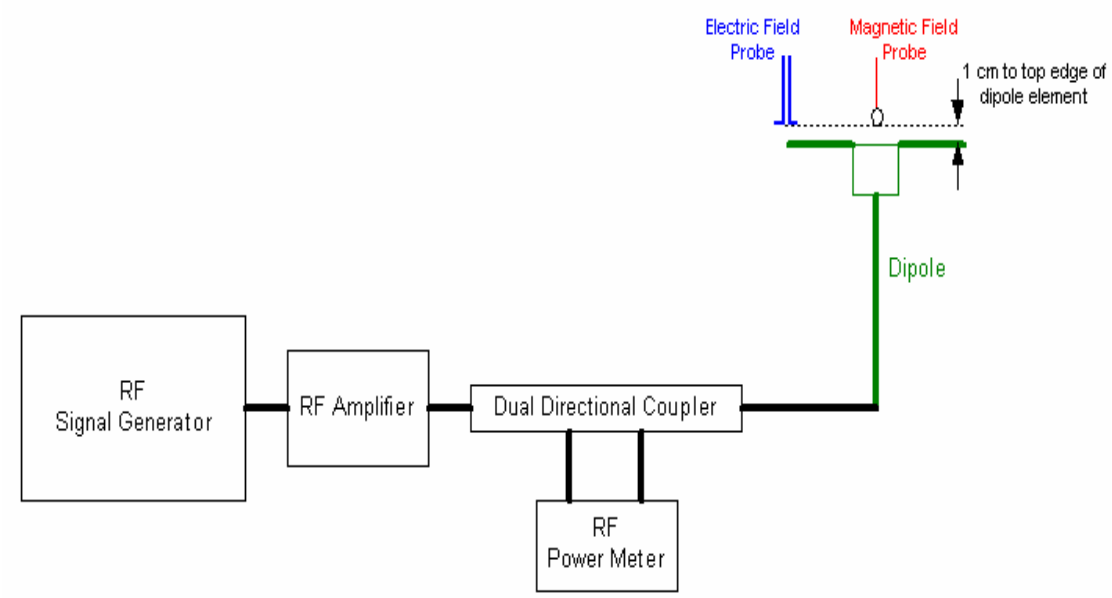



**Figure 6 Dipole Validation Setup**

**Dipole Measurement Summary**

| E-Field Scan | | | | | |
|---|---|---|---|---|---|
| **Mode** | **Frequency (MHz)** | **Input Power (mW)** | **Value** | | **Test Date** |
| CW | 835 | 100 | Target[1] Value(V/m) | 161.4 | February 21, 2012 |
| | | | Measured[2] Value(V/m) | 163.9 | April 23, 2012 |
| | | | Deviation[3](%) | -1.55 | / |
| CW | 1880 | 100 | Target[1] Value(V/m) | 143.4 | February 21, 2012 |
| | | | Measured[2] Value(V/m) | 139.4 | April 23, 2012 |
| | | | Deviation[3](%) | 2.79 | / |
| **H-Field Scan** | | | | | |
| **Mode** | **Frequency (MHz)** | **Input Power (mW)** | **Value** | | **Test Date** |
| CW | 835 | 100 | Target[1] Value(A/m) | 0.46 | February 21, 2012 |
| | | | Measured[2] Value(A/m) | 0.47 | April 23, 2012 |
| | | | Deviation[3](%) | -2.17 | / |
| CW | 1880 | 100 | Target[1] Value(A/m) | 0.47 | February 21, 2012 |
| | | | Measured[2] Value(A/m) | 0.447 | April 23, 2012 |
| | | | Deviation[3](%) | 4.89 | / |

Notes: 1. Target value is provided by SPEAD in the calibration certificate of specific dipoles.
2. Please refer to the attachment for detailed measurement data and plot.
3. Deviation (%) = 100 * (Target value minus Measured value) divided by Target value.

## 2.5. Probe Modulation Factor

The Probe Modulation Factor (PMF) is defined as the ratio of the field readings for a CW and a modulated signal with the equivalent Field Envelope Peak as defined in ANSI C63.19 (Chapter C.3.1).Calibration shall be made of the modulation response of the probe and its instrumentation chain. This Calibration shall be performed with the field probe, attached to the instrumentation that is to be used with it during the measurement. The response of the probe system to a CW field at the frequency(s) of interest is compared to its response to a modulated signal with equal peak amplitude. The field level of the test signals shall be more than 10dB above the ambient level and the noise floor of the instrumentation being used. The ratio of the CW reading to that taken with a modulated field shall be applied to the readings taken of modulated fields of the specified type.

**Modulation Factor Test Procedure**

This may be done using the following procedure:

1. Fix the field probe in a set location relative to a field generating device, such as the reference dipole antenna.
2. Illuminate the probe using the wireless device connected to the reference dipole with a test signal at the intended measurement frequency, Ensure there is sufficient field coupling between the probe and the antenna so the resulting reading is greater than 10 dB above the probe system noise floor but within the systems operating range.
3. Record the amplitude applied to the antenna during transmission and the field strength measured by the E-field probe located near the tip of the dipole antenna
4. Replace the wireless device with an RF signal generator producing an unmodulated CW signal and set to the wireless device operating frequency.
5. Set the amplitude of the unmodulated signal to equal that recorded from the wireless device.
6. Record the reading of the probe measurement system of the unmodulated signal.
7. The ratio, in linear units, of the probe reading in Step 6 to the reading in Step 3 is the E-field modulation factor. $PMF_E = E_{CW} / E_{mod}$ ($PMF_H = H_{CW} / H_{mod}$)
8. Repeat the previous steps using the H-field probe, except locate the probe at the center of the dipole.

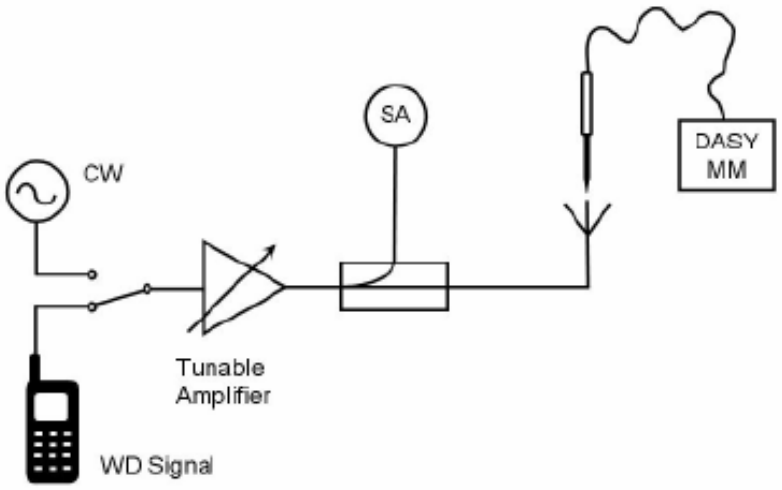



**Figure 7 Probe Modulation Factor Test Setup**

**PMF**

| Band | E-Field Probe Modulation Factor | H-Field Probe Modulation Factor |
|---|---|---|
| GSM 850 | 2.81 | 2.75 |
| GSM 1900 | 2.84 | 2.84 |
| WCDMA Band II | 1.02 | 1.01 |
| WCDMA Band V | 1.03 | 1.01 |

## 2.6. Conducted Output Power Measurement

**Summary**

The EUT is tested using an E5515C communications tester as controller unit to set test channels and maximum output power to the DUT, as well as for measuring the conducted power. Conducted output power was measured using an integrated RF connector and attached RF cable. This result contains conducted output power for the EUT.

**Conducted Power Results**

| **GSM 850** | **Conducted Power(dBm)** | | |
|---|---|---|---|
| | Channel 128 | Channel 190 | Channel 251 |
| Test Results | 33.12 | 32.44 | 32.14 |
| **GSM 1900** | **Conducted Power(dBm)** | | |
| | Channel 512 | Channel 661 | Channel 810 |
| Test Results | 28.88 | 29.15 | 29.47 |
| **WCDMA Band II** | **Conducted Power(dBm)** | | |
| | Channel 9262 | Channel 9400 | Channel 9538 |
| Test Results | 22.64 | 22.84 | 22.89 |
| **WCDMA Band V** | **Conducted Power(dBm)** | | |
| | Channel 4132 | Channel 4183 | Channel 4233 |
| Test Results | 23.04 | 21.33 | 22.6 |

# 3. Test Results

## 3.1. ANSI C63.19-2007 Limits

| Category | | Telephone RF parameters < 960 MHz | | | |
|---|---|---|---|---|---|
| **Near field** | **AWF** | **E-field emissions** | | **H-field emissions** | |
| Category M1 | 0 | 631.0 to 1122.0 | V/m | 1.91 to 3.39 | A/m |
| | –5 | 473.2 to 841.4 | V/m | 1.43 to 2.54 | A/m |
| Category M2 | 0 | 354.8 to 631.0 | V/m | 1.07 to 1.91 | A/m |
| | –5 | 266.1 to 473.2 | V/m | 0.80 to 1.43 | A/m |
| Category M3 | 0 | 199.5 to 354.8 | V/m | 0.60 to 1.07 | A/m |
| | –5 | 149.6 to 266.1 | V/m | 0.45 to 0.80 | A/m |
| Category M4 | 0 | < 199.5 | V/m | < 0.60 | A/m |
| | –5 | < 149.6 | V/m | < 0.45 | A/m |
| **Category** | | **Telephone RF parameters > 960 MHz** | | | |
| **Near field** | **AWF** | **E-field emissions** | | **H-field emissions** | |
| Category M1 | 0 | 199.5 to 354.8 | V/m | 0.60 to 1.07 | A/m |
| | –5 | 149.6 to 266.1 | V/m | 0.45 to 0.80 | A/m |
| Category M2 | 0 | 112.2 to 199.5 | V/m | 0.34 to 0.60 | A/m |
| | –5 | 84.1 to 149.6 | V/m | 0.25 to 0.45 | A/m |
| Category M3 | 0 | 63.1 to 112.2 | V/m | 0.19 to 0.34 | A/m |
| | –5 | 47.3 to 84.1 | V/m | 0.14 to 0.25 | A/m |
| Category M4 | 0 | < 63.1 | V/m | < 0.19 | A/m |
| | –5 | < 47.3 | V/m | < 0.14 | A/m |

## 3.2. Summary Test Results

**GSM 850 Results**

| E-Field with Battery 1 | | | | | |
|---|---|---|---|---|---|
| **Channel** | **Frequency (MHz)** | **Peak Field (V/m)** | **Power Drift (dB)** | **Rating** | **Graph Results** |
| High/251 | 848.8 | 171.6 | 0.032 | M3 | Figure 12 |
| Middle/190 | 836.6 | 168.8 | -0.165 | M3 | Figure 13 |
| Low/128 | 824.2 | 158.8 | -0.051 | M3 | Figure 14 |
| **E-Field with Battery 2** | | | | | |
| High/251 | 848.8 | 183.4 | -0.014 | M3 | Figure 15 |
| **H-Field with Battery 1** | | | | | |
| **Channel** | **Frequency (MHz)** | **Peak Field (A/m)** | **Power Drift (dB)** | **Rating** | **Graph Results** |
| High/251 | 848.8 | 0.237 | -0.079 | M4 | Figure 16 |
| Middle/190 | 836.6 | 0.230 | -0.099 | M4 | Figure 17 |
| Low/128 | 824.2 | 0.179 | 0.11 | M4 | Figure 18 |
| **H-Field with Battery 2** | | | | | |
| High/251 | 848.8 | 0.255 | 0.064 | M4 | Figure 19 |

**GSM 1900 Results**

| E-Field with Battery 1 | | | | | |
|---|---|---|---|---|---|
| **Channel** | **Frequency (MHz)** | **Peak Field (V/m)** | **Power Drift (dB)** | **Rating** | **Graph Results** |
| High/810 | 1909.8 | 61.0 | -0.027 | M3 | Figure 20 |
| Middle/661 | 1880 | 63.6 | -0.014 | M3 | Figure 21 |
| Low/512 | 1850.2 | 61.7 | -0.077 | M3 | Figure 22 |
| **E-Field with Battery 2** | | | | | |
| Middle/661 | 1880 | 61.5 | 0.043 | M3 | Figure 23 |
| **H-Field with Battery 1** | | | | | |
| **Channel** | **Frequency (MHz)** | **Peak Field (A/m)** | **Power Drift (dB)** | **Rating** | **Graph Results** |
| High/810 | 1909.8 | 0.200 | 0.005 | M3 | Figure 24 |
| Middle/661 | 1880 | 0.197 | 0.120 | M3 | Figure 25 |
| Low/512 | 1850.2 | 0.188 | -0.027 | M3 | Figure 26 |
| **H-Field with Battery 2** | | | | | |
| High/810 | 1909.8 | 0.195 | 0.056 | M3 | Figure 27 |

**WCDMA Band II Results**

| E-Field with Battery 1 | | | | | |
|---|---|---|---|---|---|
| **Channel** | **Frequency (MHz)** | **Peak Field (V/m)** | **Power Drift (dB)** | **Rating** | **Graph Results** |
| High/9538 | 1907.6 | 28.5 | 0.113 | M4 | Figure 28 |
| Middle/9400 | 1880 | 31.2 | 0.012 | M4 | Figure 29 |
| Low/9262 | 1852.4 | 32.1 | -0.150 | M4 | Figure 30 |
| **E-Field with Battery 2** | | | | | |
| Low/9262 | 1852.4 | 28.7 | 0.034 | M4 | Figure 31 |
| **H-Field with Battery 1** | | | | | |
| **Channel** | **Frequency (MHz)** | **Peak Field (A/m)** | **Power Drift (dB)** | **Rating** | **Graph Results** |
| High/9538 | 1907.6 | 0.095 | 0.036 | M4 | Figure 32 |
| Middle/9400 | 1880 | 0.097 | 0.099 | M4 | Figure 33 |
| Low/9262 | 1852.4 | 0.096 | 0.011 | M4 | Figure 34 |
| **H-Field with Battery 2** | | | | | |
| Middle/9400 | 1880 | 0.096 | -0.015 | M4 | Figure 35 |

**WCDMA Band V Results**

| E-Field with Battery 1 | | | | | |
|---|---|---|---|---|---|
| **Channel** | **Frequency (MHz)** | **Peak Field (V/m)** | **Power Drift (dB)** | **Rating** | **Graph Results** |
| High/4233 | 846.6 | 63.9 | -0.046 | M4 | Figure 36 |
| Middle/4183 | 836.6 | 54.1 | -0.028 | M4 | Figure 37 |
| Low/4132 | 826.4 | 59.2 | -0.030 | M4 | Figure 38 |
| **E-Field with Battery 2** | | | | | |
| High/4233 | 846.6 | 66.2 | -0.048 | M4 | Figure 39 |
| **H-Field with Battery 1** | | | | | |
| **Channel** | **Frequency (MHz)** | **Peak Field (A/m)** | **Power Drift (dB)** | **Rating** | **Graph Results** |
| High/4233 | 846.6 | 0.088 | -0.008 | M4 | Figure 40 |
| Middle/4183 | 836.6 | 0.073 | 0.080 | M4 | Figure 41 |
| Low/4132 | 826.4 | 0.079 | -0.028 | M4 | Figure 42 |
| **H-Field with Battery 2** | | | | | |
| High/4233 | 846.6 | 0.088 | 0.063 | M4 | Figure 43 |

# 4. Measurement Uncertainty

| No. | Error source | Type | Uncertainty Value (%) | Prob. Dist. | k | $c_i$/E | $c_i$\H | Standard Uncertainty (%) $u_i'$ (%) E | Standard Uncertainty (%) $u_i'$ (%) H | Degree of freedom $V_{eff}$ or $v_i$ |
|---|---|---|---|---|---|---|---|---|---|---|
| **Measurement System** | | | | | | | | | | |
| 1 | Probe Calibration | B | 5.1 | N | 1 | 1 | 1 | 5.1 | 5.1 | ∞ |
| 2 | Axial Isotropy | B | 4.7 | R | $\sqrt{3}$ | 1 | 1 | 2.7 | 2.7 | ∞ |
| 3 | Sensor Displacement | B | 16.5 | R | $\sqrt{3}$ | 1 | 0.145 | 9.5 | 1.4 | ∞ |
| 4 | Boundary Effects | B | 2.4 | R | $\sqrt{3}$ | 1 | 1 | 1.4 | 1.4 | ∞ |
| 5 | Test Arch | B | 7.2 | R | $\sqrt{3}$ | 1 | 0 | 4.1 | 0 | ∞ |
| 6 | Linearity | B | 4.7 | R | $\sqrt{3}$ | 1 | 1 | 2.7 | 2.7 | ∞ |
| 7 | Scaling to Peak Envelope Power | B | 2.0 | R | $\sqrt{3}$ | 1 | 1 | 1.2 | 1.2 | ∞ |
| 8 | System Detection Limit | B | 1.0 | R | $\sqrt{3}$ | 1 | 1 | 0.6 | 0.6 | ∞ |
| 9 | Readout Electronics | B | 0.3 | N | 1 | 1 | 1 | 0.3 | 0.3 | ∞ |
| 10 | Response Time | B | 0.8 | R | $\sqrt{3}$ | 1 | 1 | 0.5 | 0.5 | ∞ |
| 11 | Integration Time | B | 2.6 | R | $\sqrt{3}$ | 1 | 1 | 1.5 | 1.5 | ∞ |
| 12 | RF Ambient Conditions | B | 3.0 | R | $\sqrt{3}$ | 1 | 1 | 1.7 | 1.7 | ∞ |
| 13 | RF Reflections | B | 12.0 | R | $\sqrt{3}$ | 1 | 1 | 6.9 | 6.9 | ∞ |
| 14 | Probe Positioner | B | 1.2 | R | $\sqrt{3}$ | 1 | 0.67 | 0.7 | 0.5 | ∞ |
| 15 | Probe Positioning | A | 4.7 | R | $\sqrt{3}$ | 1 | 0.67 | 2.7 | 1.8 | ∞ |
| 16 | Extra. And Interpolation | B | 1.0 | R | $\sqrt{3}$ | 1 | 1 | 0.6 | 0.6 | ∞ |
| **Test Sample Related** | | | | | | | | | | |
| 17 | Device Positioning Vertical | B | 4.7 | R | $\sqrt{3}$ | 1 | 0.67 | 2.7 | 1.8 | ∞ |
| 18 | Device Positioning Lateral | B | 1.0 | R | $\sqrt{3}$ | 1 | 1 | 0.6 | 0.6 | ∞ |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 19 | Device Holder and Phantom | B | 2.4 | R | $\sqrt{3}$ | 1 | 1 | 1.4 | 1.4 | ∞ |
| 20 | Power Drift | B | 5.0 | R | $\sqrt{3}$ | 1 | 1 | 2.9 | 2.9 | ∞ |
| **Phantom and Setup related** | | | | | | | | | | |
| 21 | Phantom Thickness | B | 2.4 | R | $\sqrt{3}$ | 1 | 0.67 | 1.4 | 0.9 | ∞ |
| Combined standard uncertainty (%) | | | | | | | | 15.19 | 10.82 | |
| Expanded Std. uncertainty on power (K=2) | | | | | | | | 30.38 | 21.65 | |
| Expanded Std. uncertainty on field (K=2) | | | | | | | | 15.19 | 10.82 | |

## 5. Main Test Instruments

| No. | Name | Type | Serial Number | Calibration Date | Valid Period |
|---|---|---|---|---|---|
| 01 | Power meter | Agilent E4417A | GB41291714 | March 11, 2012 | One year |
| 02 | Power sensor | Agilent N8481H | MY50350004 | September 25, 2011 | One year |
| 03 | Signal Generator | HP 8341B | 2730A00804 | September 12, 2011 | One year |
| 04 | Amplifier | IXA-020 | 0401 | No Calibration Requested | |
| 05 | BTS | E5515C | MY48360988 | December 2, 2011 | One year |
| 06 | E-Field Probe | ER3DV6 | 2303 | February 21, 2012 | One year |
| 07 | H-Field Probe | H3DV6 | 6138 | February 21, 2012 | One year |
| 08 | DAE | DAE4 | 1317 | January 23, 2012 | One year |
| 09 | Validation Kit 835MHz | CD835V3 | 1133 | February 21, 2012 | One year |
| 10 | Validation Kit 1880MHz | CD1880V3 | 1115 | February 21, 2012 | One year |
| 11 | Hygrothermograph | WS-1 | 64591 | September 28, 2011 | One year |

*******END OF REPORT *******

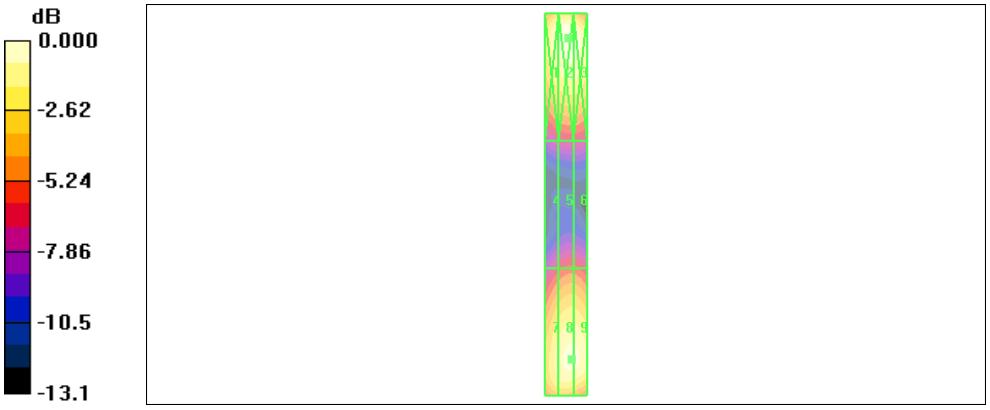
# ANNEX A: System Check Results

**HAC_System Performance Check at 835MHz_E**
**DUT: Dipole 835 MHz; Type: CD835V3; SN:1133**
Date/Time: 4/23/2012 4:15:12 PM
Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium parameters used: $\sigma$ = 0 mho/m, $\varepsilon_r$ = 1; $\rho$ = 1000 kg/m$^3$
Ambient Temperature:22.3 ℃
Phantom section: RF Section
DASY4 Configuration:
Probe: ER3DV6 - SN2303; ConvF(1, 1, 1); Calibrated: 2/21/2012
Electronics: DAE4 Sn1317; Calibrated: 1/23/2012
Phantom: HAC Test Arch; Type: SD HAC P01 BA
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**E Scan - measurement distance from the probe sensor center to CD835 Dipole = 10mm/Hearing Aid Compatibility Test (41x361x1):** Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 163.9 V/m
Probe Modulation Factor = 1.00
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 123.1 V/m; Power Drift = -0.009 dB
**Hearing Aid Near-Field Category: M4 (AWF 0 dB)**

Peak E-field in V/m

| | | |
|---|---|---|
| Grid 1 **165.0 M4** | Grid 2 **175.2 M4** | Grid 3 **172.9 M4** |
| Grid 4 **83.7 M4** | Grid 5 **90.6 M4** | Grid 6 **90.4 M4** |
| Grid 7 **151.8 M4** | Grid 8 **163.9 M4** | Grid 9 **163.7 M4** |




0 dB = 175.2V/m

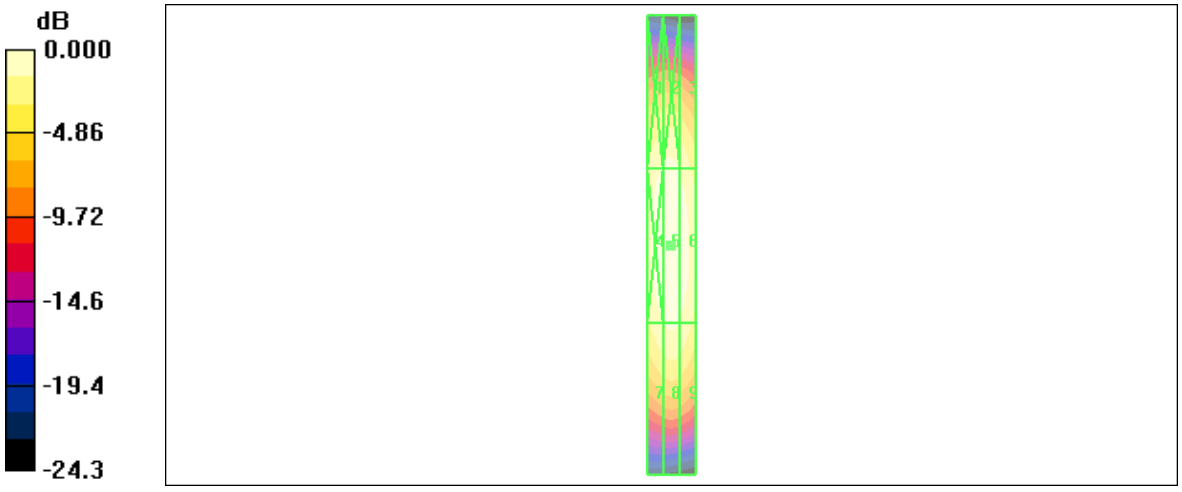
**Figure 8 System Performance Check 835MHz_E**

**HAC_System Performance Check at 835MHz_H**
**DUT: Dipole 835 MHz; Type: CD835V3; SN: 1133**
Date/Time: 4/23/2012 6:04:52 PM
Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium parameters used: $\sigma$ = 0 mho/m, $\varepsilon_r$ = 1; $\rho$ = 1 kg/$m^3$
Ambient Temperature:22.3 ℃
Phantom section: RF Section
DASY4 Configuration:
Probe: H3DV6 - SN6138; ; Calibrated: 2/21/2012
Electronics: DAE4 Sn1317; Calibrated: 1/23/2012
Phantom: HAC Test Arch; Type: SD HAC P01 BA
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**H Scan - measurement distance from the probe sensor center to CD835 Dipole = 10mm/Hearing Aid Compatibility Test (41x381x1):** Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 0.470 A/m
Probe Modulation Factor = 1.00
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 0.498 A/m; Power Drift = 0.001 dB
**Hearing Aid Near-Field Category: M4 (AWF 0 dB)**

Peak H-field in A/m

| | | |
|---|---|---|
| Grid 1 **0.400 M4** | Grid 2 **0.410 M4** | Grid 3 **0.381 M4** |
| Grid 4 **0.454 M4** | Grid 5 **0.470 M4** | Grid 6 **0.442 M4** |
| Grid 7 **0.387 M4** | Grid 8 **0.405 M4** | Grid 9 **0.385 M4** |




0 dB = 0.470A/m

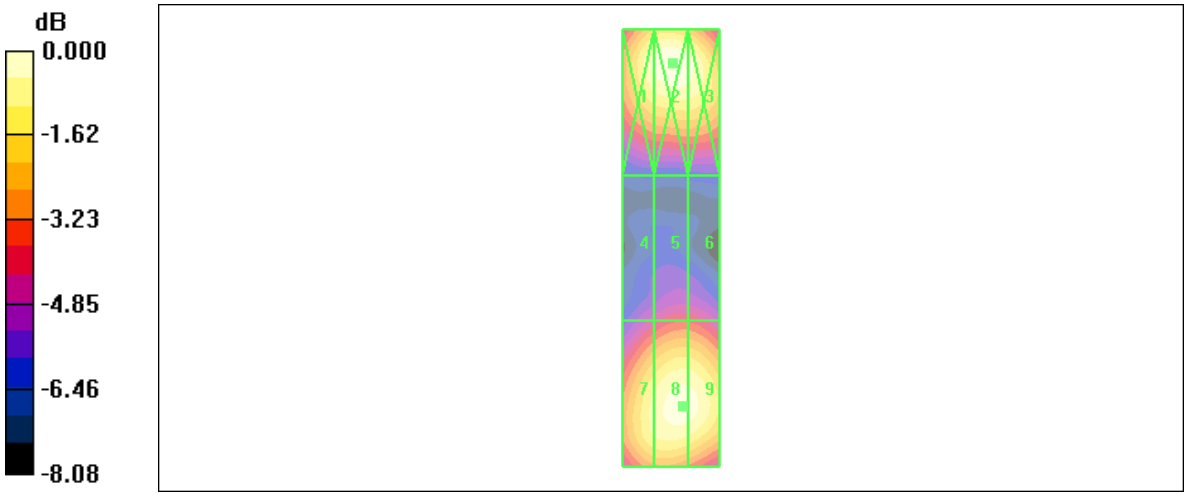
**Figure 9 System Performance Check 835MHz_H**

**HAC_System Performance Check at 1880MHz_E**
**DUT: Dipole 1880 MHz; Type: CD1880V3; SN: 1115**
Date/Time: 4/23/2012 4:31:25 PM
Communication System: CW; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: $\sigma$ = 0 mho/m, $\varepsilon_r$ = 1; $\rho$ = 1000 kg/m$^3$
Ambient Temperature:22.3 ℃
Phantom section: RF Section
DASY4 Configuration:
Probe: ER3DV6 - SN2303; ConvF(1, 1, 1); Calibrated: 2/21/2012
Electronics: DAE4 Sn1317; Calibrated: 1/23/2012
Phantom: HAC Test Arch; Type: SD HAC P01 BA
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**E Scan - measurement distance from the probe sensor center to CD1880 Dipole = 10mm/Hearing Aid Compatibility Test (41x181x1):** Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 139.4 V/m
Probe Modulation Factor = 1.00
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 142.0 V/m; Power Drift = 0.031 dB
**Hearing Aid Near-Field Category: M2 (AWF 0 dB)**

Peak E-field in V/m

| | | |
|---|---|---|
| Grid 1 **136.9 M2** | Grid 2 **143.7 M2** | Grid 3 **139.1 M2** |
| Grid 4 **85.8 M3** | Grid 5 **92.8 M3** | Grid 6 **92.6 M3** |
| Grid 7 **130.6 M2** | Grid 8 **139.4 M2** | Grid 9 **138.9 M2** |




0 dB = 143.7V/m

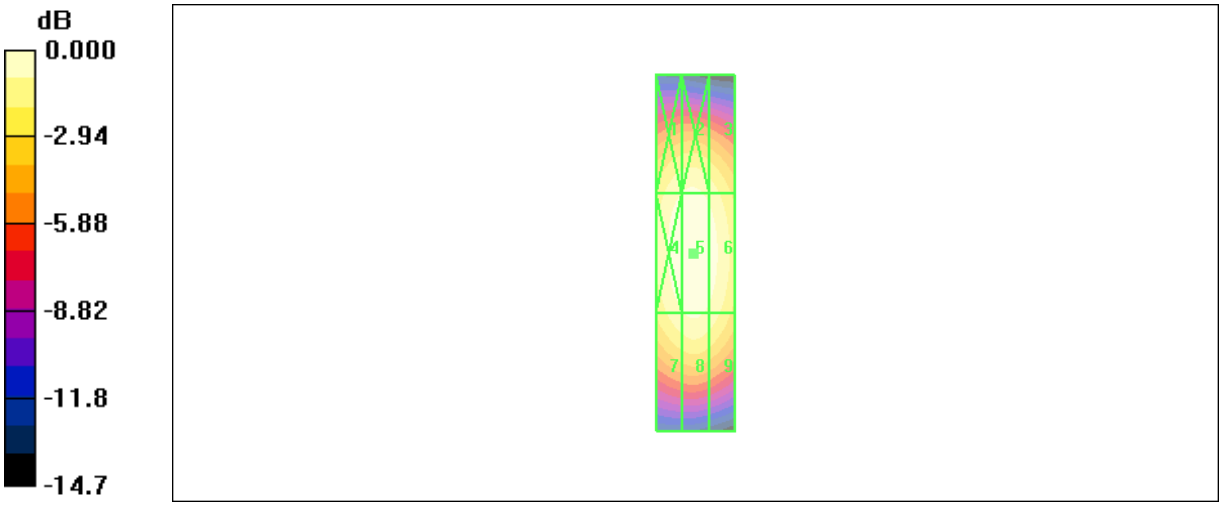
**Figure 10 System Performance Check 1880MHz_E**

**HAC_System Performance Check at 1880MHz_H**
**DUT: Dipole 1880 MHz; Type: CD1880V3; SN: 1115**
Date/Time: 4/23/2012 5:47:37 PM
Communication System: CW; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: $\sigma$ = 0 mho/m, $\varepsilon_r$ = 1; $\rho$ = 1 kg/$m^3$
Ambient Temperature:22.3 ℃
Phantom section: RF Section
DASY4 Configuration:
Probe: H3DV6 - SN6138; ; Calibrated: 2/21/2012
Electronics: DAE4 Sn1317; Calibrated: 1/23/2012
Phantom: HAC Test Arch; Type: SD HAC P01 BA
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**H Scan - measurement distance from the probe sensor center to Dipole = 10mm/Hearing Aid Compatibility Test (41x181x1):** Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 0.447 A/m
Probe Modulation Factor = 1.00
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 0.465 A/m; Power Drift = 0.099 dB
**Hearing Aid Near-Field Category: M2 (AWF 0 dB)**

Peak H-field in A/m

| | | |
|---|---|---|
| Grid 1 **0.400 M2** | Grid 2 **0.411 M2** | Grid 3 **0.385 M2** |
| Grid 4 **0.434 M2** | Grid 5 **0.447 M2** | Grid 6 **0.424 M2** |
| Grid 7 **0.395 M2** | Grid 8 **0.410 M2** | Grid 9 **0.387 M2** |




0 dB = 0.447A/m

**Figure 11 System Performance Check 1880MHz_H**

# ANNEX B: Graph Results

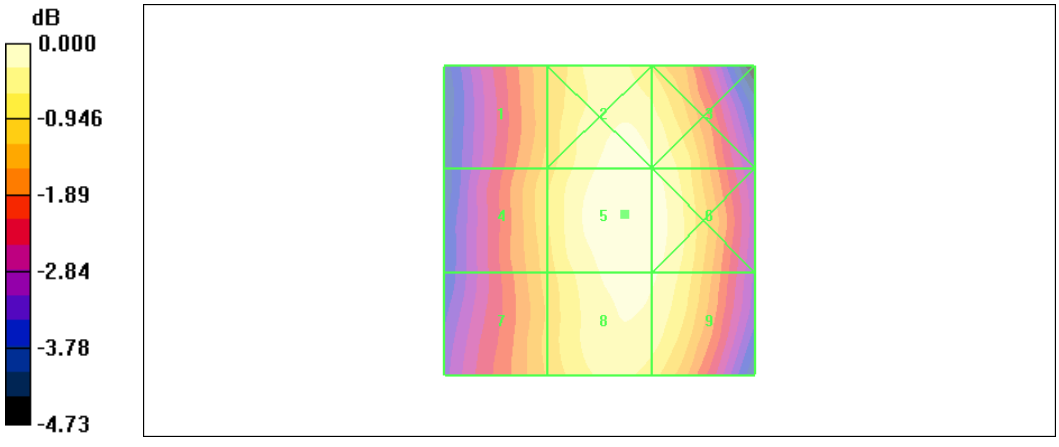
## HAC RF E-Field GSM 850 High (Battery 1)

Date/Time: 4/23/2012 10:41:57 PM
Communication System: GSM 850; Frequency: 848.8 MHz;Duty Cycle: 1:8.3
Medium parameters used: $\sigma$ = 0 mho/m, $\varepsilon_r$ = 1; $\rho$ = 1000 kg/$m^3$
Ambient Temperature:22.3 ℃
Phantom section: RF Section
DASY4 Configuration:
Probe: ER3DV6 - SN2303; ConvF(1, 1, 1); Calibrated: 2/21/2012
Electronics: DAE4 Sn1317; Calibrated: 1/23/2012
Phantom: HAC Test Arch; Type: SD HAC P01 BA
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**E Scan - ER3D - 2007: 15 mm from Probe Center to the Device High/Hearing Aid Compatibility Test (101x101x1):** Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 171.6 V/m
Probe Modulation Factor = 2.81
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 76.1 V/m; Power Drift = 0.032 dB
**Hearing Aid Near-Field Category: M3 (AWF -5 dB)**

Peak E-field in V/m

| | | |
|---|---|---|
| Grid 1 **150.6 M3** | Grid 2 **169.3 M3** | Grid 3 **166.6 M3** |
| Grid 4 **153.4 M3** | Grid 5 **171.6 M3** | Grid 6 **169.5 M3** |
| Grid 7 **150.8 M3** | Grid 8 **168.1 M3** | Grid 9 **166.5 M3** |




0 dB = 171.6V/m

**Figure 12 HAC RF E-Field GSM 850 Channel 251**

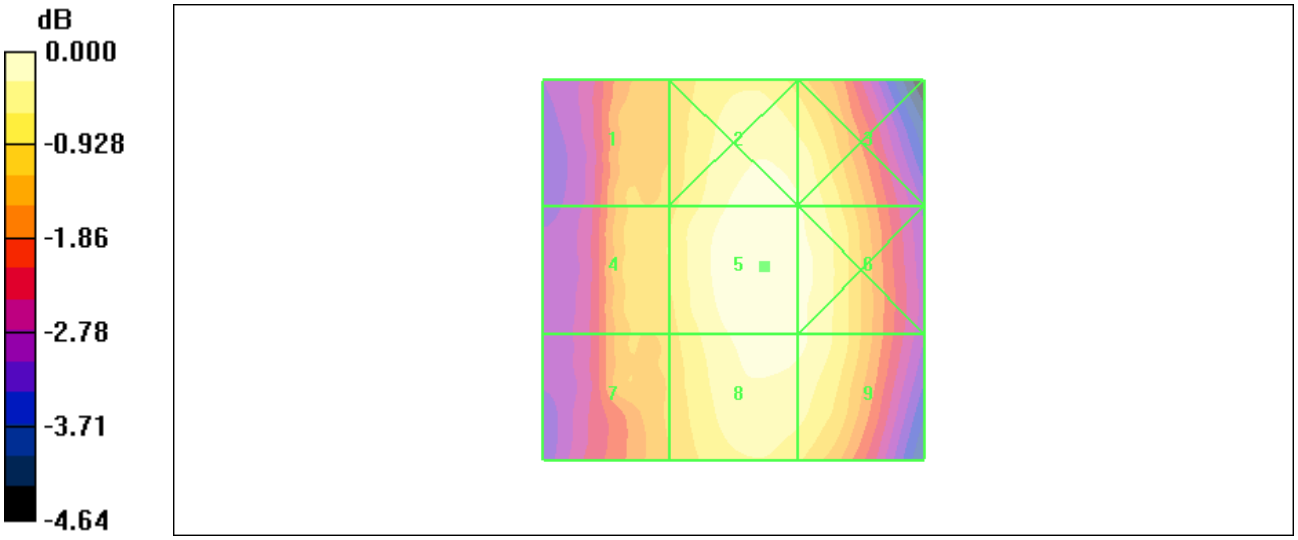
## HAC RF E-Field GSM 850 Middle (Battery 1)

Date/Time: 4/23/2012 10:37:09 PM
Communication System: GSM 850; Frequency: 836.6 MHz;Duty Cycle: 1:8.3
Medium parameters used: $\sigma$ = 0 mho/m, $\varepsilon_r$ = 1; $\rho$ = 1000 kg/m$^3$
Ambient Temperature:22.3 ℃
Phantom section: RF Section
DASY4 Configuration:
Probe: ER3DV6 - SN2303; ConvF(1, 1, 1); Calibrated: 2/21/2012
Electronics: DAE4 Sn1317; Calibrated: 1/23/2012
Phantom: HAC Test Arch; Type: SD HAC P01 BA
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**E Scan - ER3D - 2007: 15 mm from Probe Center to the Device Middle/Hearing Aid Compatibility Test (101x101x1):** Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 168.8 V/m
Probe Modulation Factor = 2.81
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 80.6 V/m; Power Drift = -0.165 dB
**Hearing Aid Near-Field Category: M3 (AWF -5 dB)**

Peak E-field in V/m

| | | |
|---|---|---|
| Grid 1 **149.5 M4** | Grid 2 **166.4 M3** | Grid 3 **163.6 M3** |
| Grid 4 **152.1 M3** | Grid 5 **168.8 M3** | Grid 6 **166.1 M3** |
| Grid 7 **149.1 M4** | Grid 8 **166.2 M3** | Grid 9 **164.4 M3** |




0 dB = 168.8V/m

**Figure 13 HAC RF E-Field GSM 850 Channel 190**

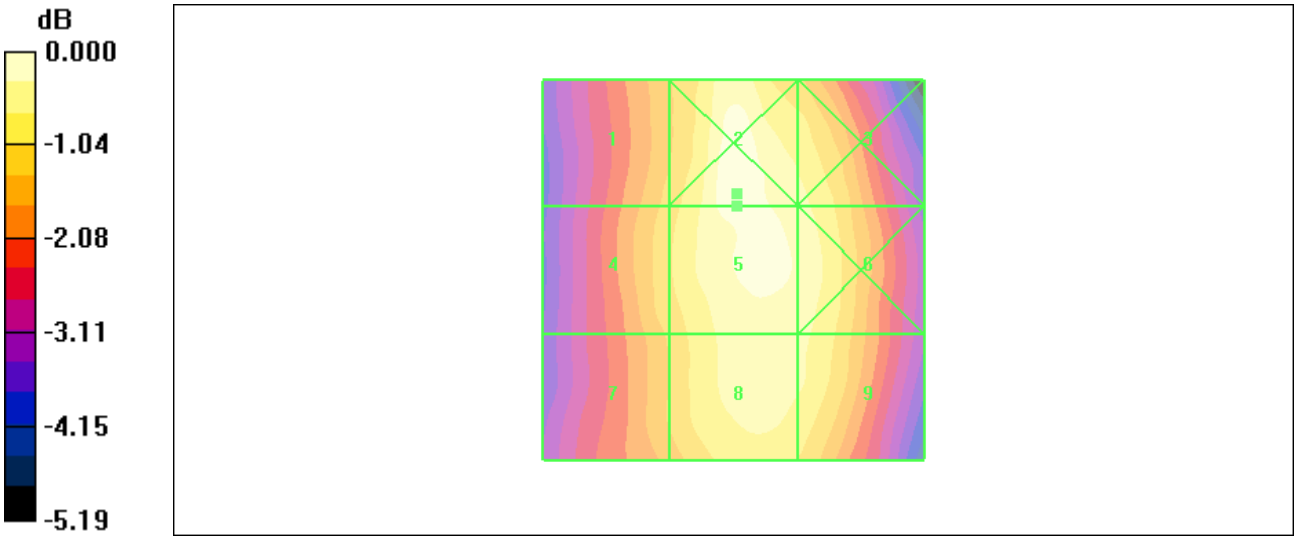
## HAC RF E-Field GSM 850 Low (Battery 1)

Date/Time: 4/23/2012 10:46:42 PM
Communication System: GSM 850; Frequency: 824.2 MHz;Duty Cycle: 1:8.3
Medium parameters used: $\sigma$ = 0 mho/m, $\varepsilon_r$ = 1; $\rho$ = 1000 kg/m$^3$
Ambient Temperature:22.3 ℃
Phantom section: RF Section
DASY4 Configuration:
Probe: ER3DV6 - SN2303; ConvF(1, 1, 1); Calibrated: 2/21/2012
Electronics: DAE4 Sn1317; Calibrated: 1/23/2012
Phantom: HAC Test Arch; Type: SD HAC P01 BA
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**E Scan - ER3D - 2007: 15 mm from Probe Center to the Device Low/Hearing Aid Compatibility Test (101x101x1):** Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 158.8 V/m
Probe Modulation Factor = 2.81
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 70.0 V/m; Power Drift = -0.051 dB
**Hearing Aid Near-Field Category: M3 (AWF -5 dB)**

Peak E-field in V/m

| | | |
|---|---|---|
| Grid 1 **139.0 M4** | Grid 2 **160.1 M3** | Grid 3 **150.2 M3** |
| Grid 4 **141.3 M4** | Grid 5 **158.8 M3** | Grid 6 **153.3 M3** |
| Grid 7 **137.6 M4** | Grid 8 **153.1 M3** | Grid 9 **150.2 M3** |




0 dB = 160.1V/m

**Figure 14 HAC RF E-Field GSM 850 Channel 128**

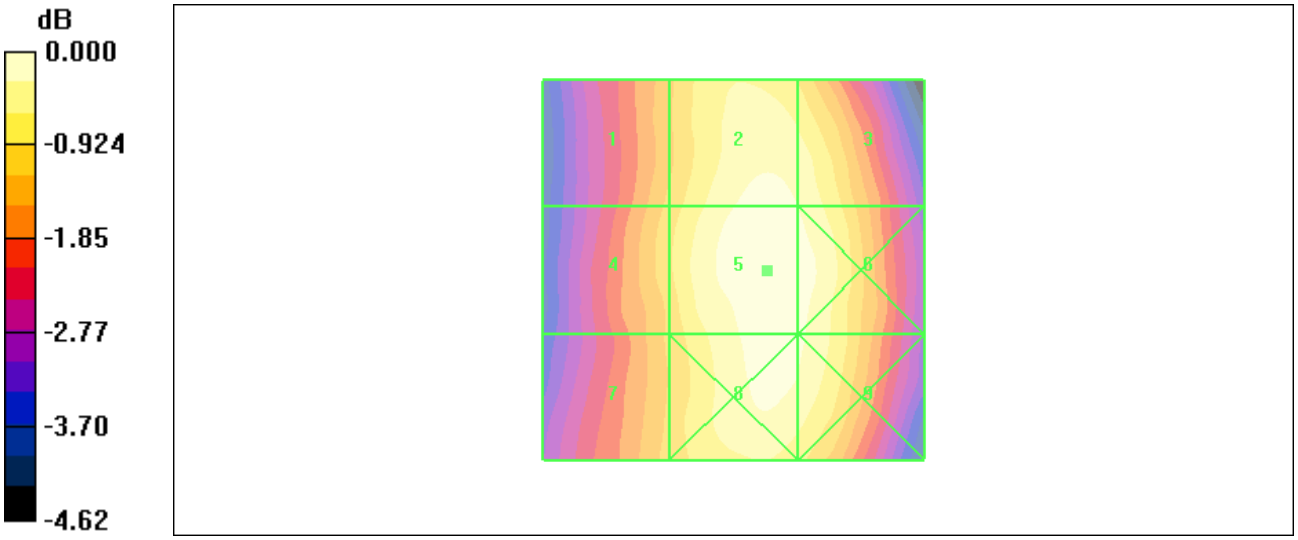
## HAC RF E-Field GSM 850 High (Battery 2)

Date/Time: 4/24/2012 12:58:49 AM
Communication System: GSM 850; Frequency: 848.8 MHz;Duty Cycle: 1:8.3
Medium parameters used: $\sigma$ = 0 mho/m, $\varepsilon_r$ = 1; $\rho$ = 1000 kg/m$^3$
Ambient Temperature:22.3 ℃
Phantom section: RF Section
DASY4 Configuration:
Probe: ER3DV6 - SN2303; ConvF(1, 1, 1); Calibrated: 2/21/2012
Electronics: DAE4 Sn1317; Calibrated: 1/23/2012
Phantom: HAC Test Arch; Type: SD HAC P01 BA
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**E Scan - ER3D - 2007: 15 mm from Probe Center to the Device High/Hearing Aid Compatibility Test (101x101x1):** Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 183.4 V/m
Probe Modulation Factor = 2.81
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 82.0 V/m; Power Drift = -0.014 dB
**Hearing Aid Near-Field Category: M3 (AWF -5 dB)**

Peak E-field in V/m

| | | |
|---|---|---|
| Grid 1 **160.9 M3** | Grid 2 **179.9 M3** | Grid 3 **176.9 M3** |
| Grid 4 **163.8 M3** | Grid 5 **183.4 M3** | Grid 6 **181.0 M3** |
| Grid 7 **161.3 M3** | Grid 8 **180.4 M3** | Grid 9 **178.3 M3** |




0 dB = 183.4V/m

**Figure 15 HAC RF E-Field GSM 850 Channel 251**

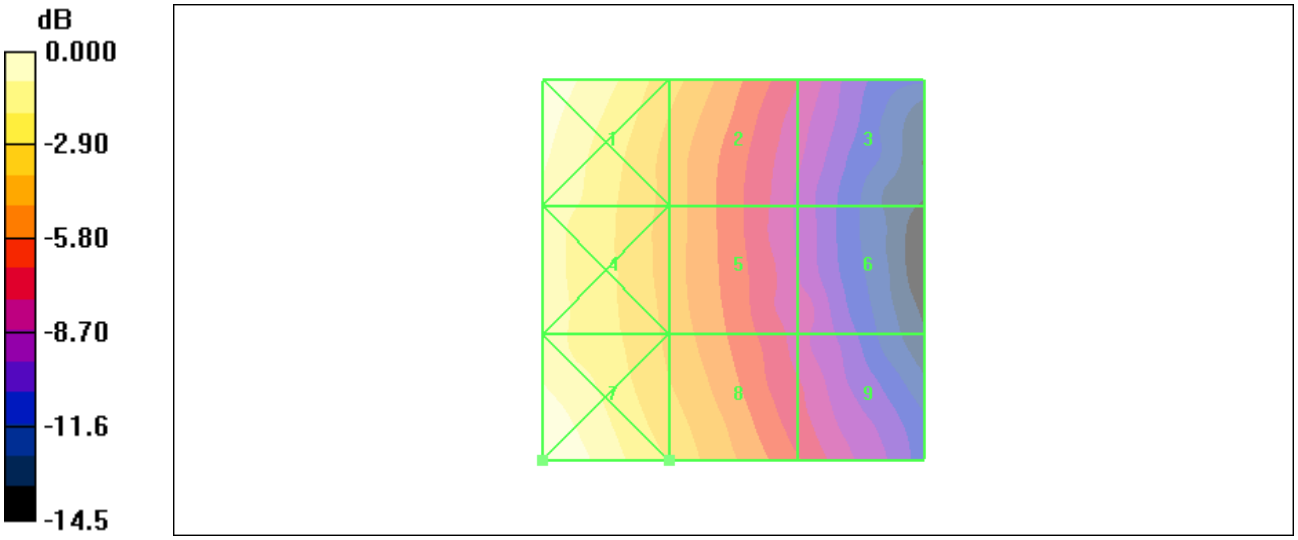
## HAC RF H-Field GSM 850 High (Battery 1)

Date/Time: 4/24/2012 5:35:21 AM
Communication System: GSM 850; Frequency: 848.8 MHz;Duty Cycle: 1:8.3
Medium parameters used: $\sigma$ = 0 mho/m, $\varepsilon_r$ = 1; $\rho$ = 1 kg/$m^3$
Ambient Temperature:22.3 ℃
Phantom section: RF Section
DASY4 Configuration:
Probe: H3DV6 - SN6138; ; Calibrated: 2/21/2012
Electronics: DAE4 Sn1317; Calibrated: 1/23/2012
Phantom: HAC Test Arch; Type: SD HAC P01 BA
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**H Scan - H3DV6 - 2007: 15 mm from Probe Center to the Device High/Hearing Aid Compatibility Test (101x101x1):** Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 0.237 A/m
Probe Modulation Factor = 2.75
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 0.061 A/m; Power Drift = -0.079 dB
**Hearing Aid Near-Field Category: M4 (AWF -5 dB)**

Peak H-field in A/m

| | | |
|---|---|---|
| Grid 1 **0.327 M4** | Grid 2 **0.225 M4** | Grid 3 **0.139 M4** |
| Grid 4 **0.292 M4** | Grid 5 **0.209 M4** | Grid 6 **0.132 M4** |
| Grid 7 **0.334 M4** | Grid 8 **0.237 M4** | Grid 9 **0.155 M4** |




0 dB = 0.334A/m

**Figure 16 HAC RF H-Field GSM 850Channel 251**

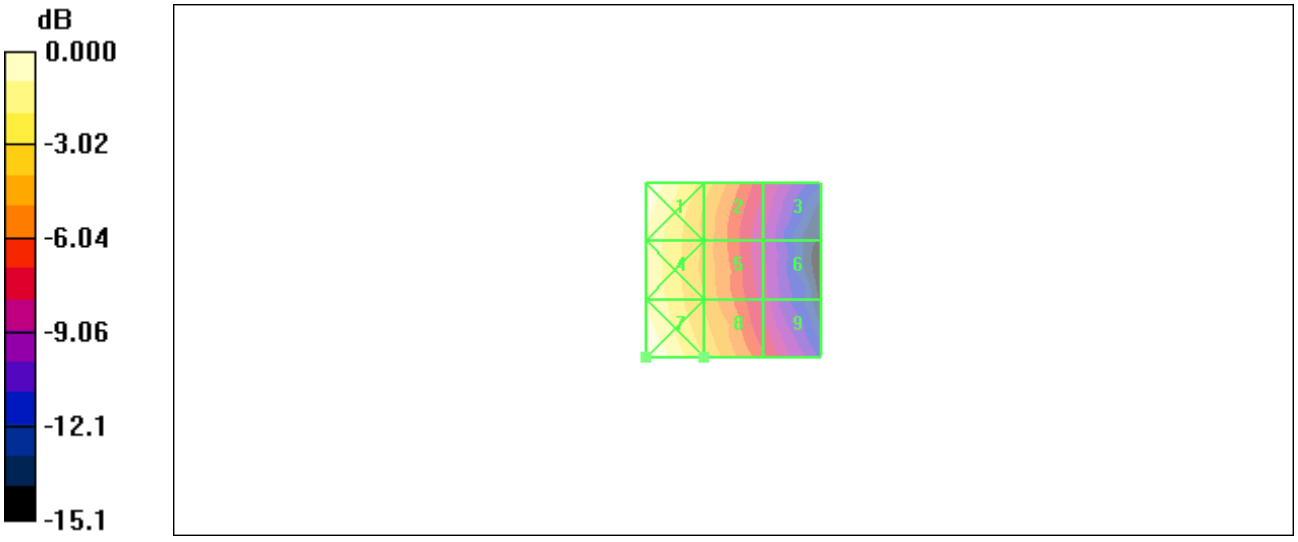
## HAC RF H-Field GSM 850 Middle (Battery 1)

Date/Time: 4/24/2012 5:26:04 AM
Communication System: GSM 850; Frequency: 836.6 MHz;Duty Cycle: 1:8.3
Medium parameters used: $\sigma$ = 0 mho/m, $\varepsilon_r$ = 1; $\rho$ = 1 kg/$m^3$
Ambient Temperature:22.3 ℃
Phantom section: RF Section
DASY4 Configuration:
Probe: H3DV6 - SN6138; ; Calibrated: 2/21/2012
Electronics: DAE4 Sn1317; Calibrated: 1/23/2012
Phantom: HAC Test Arch; Type: SD HAC P01 BA
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**H Scan - H3DV6 - 2007: 15 mm from Probe Center to the Device Middle/Hearing Aid Compatibility Test (101x101x1):** Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 0.230 A/m
Probe Modulation Factor = 2.75
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 0.059 A/m; Power Drift = -0.099 dB
**Hearing Aid Near-Field Category: M4 (AWF -5 dB)**

Peak H-field in A/m

| | | |
|---|---|---|
| Grid 1 **0.322 M4** | Grid 2 **0.219 M4** | Grid 3 **0.133 M4** |
| Grid 4 **0.286 M4** | Grid 5 **0.203 M4** | Grid 6 **0.123 M4** |
| Grid 7 **0.324 M4** | Grid 8 **0.230 M4** | Grid 9 **0.149 M4** |




0 dB = 0.324A/m

**Figure 17 HAC RF H-Field GSM 850 Channel 190**

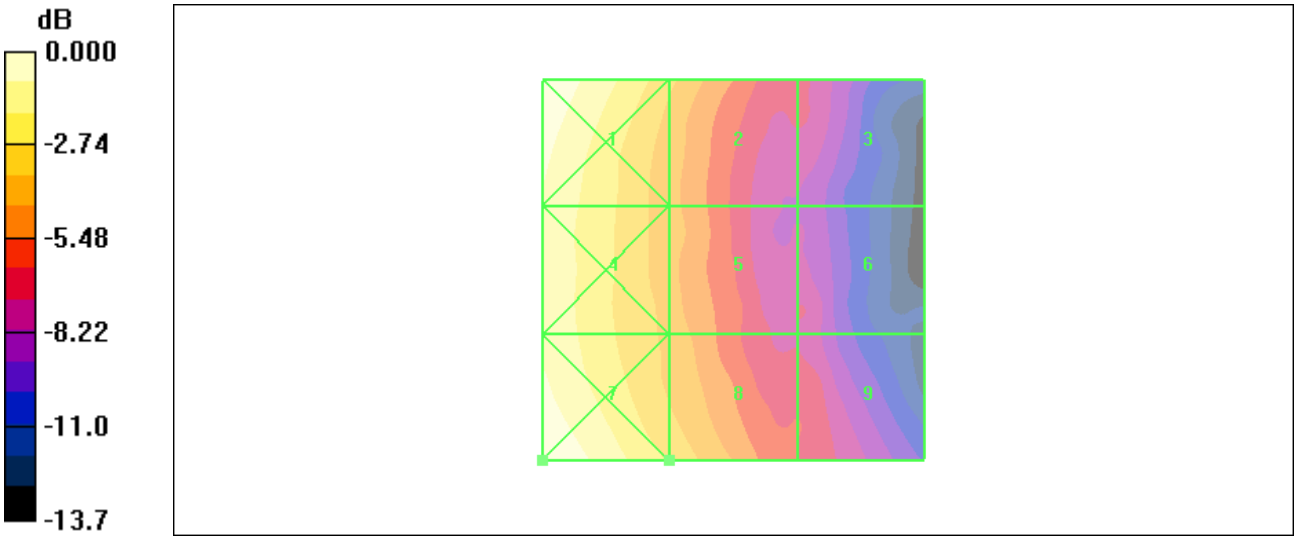
## HAC RF H-Field GSM 850 Low (Battery 1)

Date/Time: 4/24/2012 5:42:49 AM
Communication System: GSM 850; Frequency: 824.2 MHz;Duty Cycle: 1:8.3
Medium parameters used: $\sigma$ = 0 mho/m, $\varepsilon_r$ = 1; $\rho$ = 1 kg/$m^3$
Ambient Temperature:22.3 ℃
Phantom section: RF Section
DASY4 Configuration:
Probe: H3DV6 - SN6138; ; Calibrated: 2/21/2012
Electronics: DAE4 Sn1317; Calibrated: 1/23/2012
Phantom: HAC Test Arch; Type: SD HAC P01 BA
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**H Scan - H3DV6 - 2007: 15 mm from Probe Center to the Device Low/Hearing Aid Compatibility Test (101x101x1):** Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 0.179 A/m
Probe Modulation Factor = 2.75
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 0.045 A/m; Power Drift = 0.110 dB
**Hearing Aid Near-Field Category: M4 (AWF -5 dB)**

Peak H-field in A/m

| | | |
|---|---|---|
| Grid 1 **0.248 M4** | Grid 2 **0.168 M4** | Grid 3 **0.111 M4** |
| Grid 4 **0.221 M4** | Grid 5 **0.158 M4** | Grid 6 **0.108 M4** |
| Grid 7 **0.248 M4** | Grid 8 **0.179 M4** | Grid 9 **0.120 M4** |




0 dB = 0.248A/m

**Figure 18 HAC RF H-Field GSM 850 Channel 128**

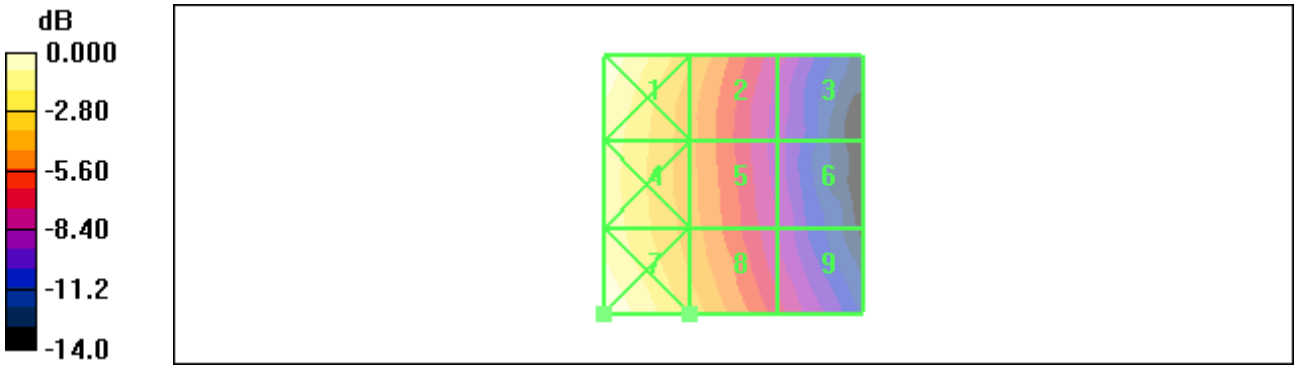
## HAC RF H-Field GSM 850 High (Battery 2)

Date/Time: 4/24/2012 6:47:14 AM
Communication System: GSM850; Frequency: 848.8 MHz;Duty Cycle: 1:8.3
Medium parameters used: $\sigma$ = 0 mho/m, $\varepsilon_r$ = 1; $\rho$ = 1 kg/$m^3$
Ambient Temperature:22.3 ℃
Phantom section: RF Section
DASY4 Configuration:
Probe: H3DV6 - SN6138; ; Calibrated: 2/21/2012
Electronics: DAE4 Sn1317; Calibrated: 1/23/2012
Phantom: HAC Test Arch; Type: SD HAC P01 BA
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**H Scan - H3DV6 - 2007: 15 mm from Probe Center to the Device High/Hearing Aid Compatibility Test (101x101x1):** Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 0.255 A/m
Probe Modulation Factor = 2.75
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 0.064 A/m; Power Drift = 0.064 dB
**Hearing Aid Near-Field Category: M4 (AWF -5 dB)**

Peak H-field in A/m

| | | |
|---|---|---|
| Grid 1 **0.357 M4** | Grid 2 **0.240 M4** | Grid 3 **0.148 M4** |
| Grid 4 **0.316 M4** | Grid 5 **0.225 M4** | Grid 6 **0.139 M4** |
| Grid 7 **0.363 M4** | Grid 8 **0.255 M4** | Grid 9 **0.161 M4** |




0 dB = 0.363A/m

**Figure 19 HAC RF H-Field GSM 850Channel 251**

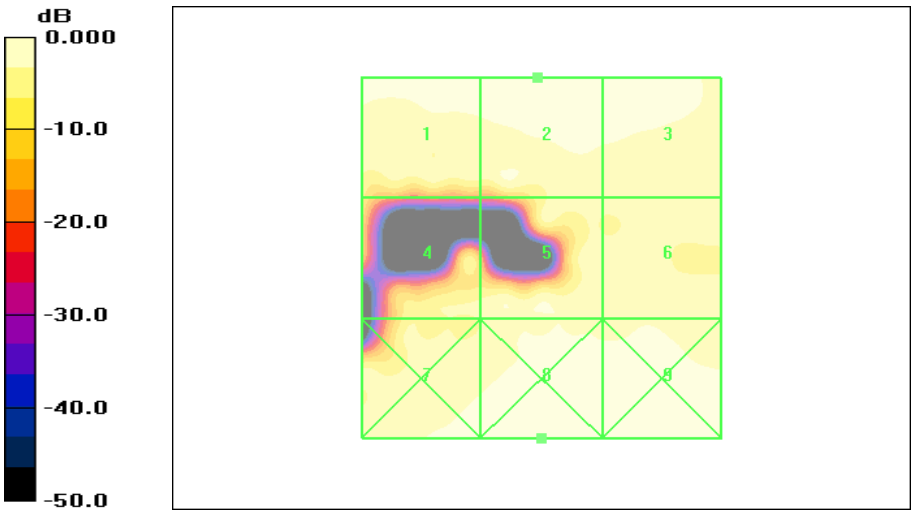
## HAC RF E-Field GSM 1900 High (Battery 1)

Date/Time: 4/23/2012 10:57:58 PM
Communication System: PCS 1900; Frequency: 1909.8 MHz;Duty Cycle: 1:8.3
Medium parameters used: $\sigma$ = 0 mho/m, $\varepsilon_r$ = 1; $\rho$ = 1000 kg/$m^3$
Ambient Temperature:22.3 ℃
Phantom section: RF Section
DASY4 Configuration:
Probe: ER3DV6 - SN2303; ConvF(1, 1, 1); Calibrated: 2/21/2012
Electronics: DAE4 Sn1317; Calibrated: 1/23/2012
Phantom: HAC Test Arch; Type: SD HAC P01 BA
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**E Scan - ER3D - 2007: 15 mm from Probe Center to the Device High/Hearing Aid Compatibility Test (101x101x1):** Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 61.0 V/m
Probe Modulation Factor = 2.84
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 9.07 V/m; Power Drift = -0.027 dB
**Hearing Aid Near-Field Category: M3 (AWF -5 dB)**

Peak E-field in V/m

| | | |
|---|---|---|
| Grid 1 **57.1 M3** | Grid 2 **61.0 M3** | Grid 3 **57.0 M3** |
| Grid 4 **34.9 M4** | Grid 5 **45.7 M4** | Grid 6 **41.5 M4** |
| Grid 7 **52.1 M3** | Grid 8 **63.9 M3** | Grid 9 **60.9 M3** |




0 dB = 63.9V/m

**Figure 20 HAC RF E-Field GSM 1900 Channel 810**

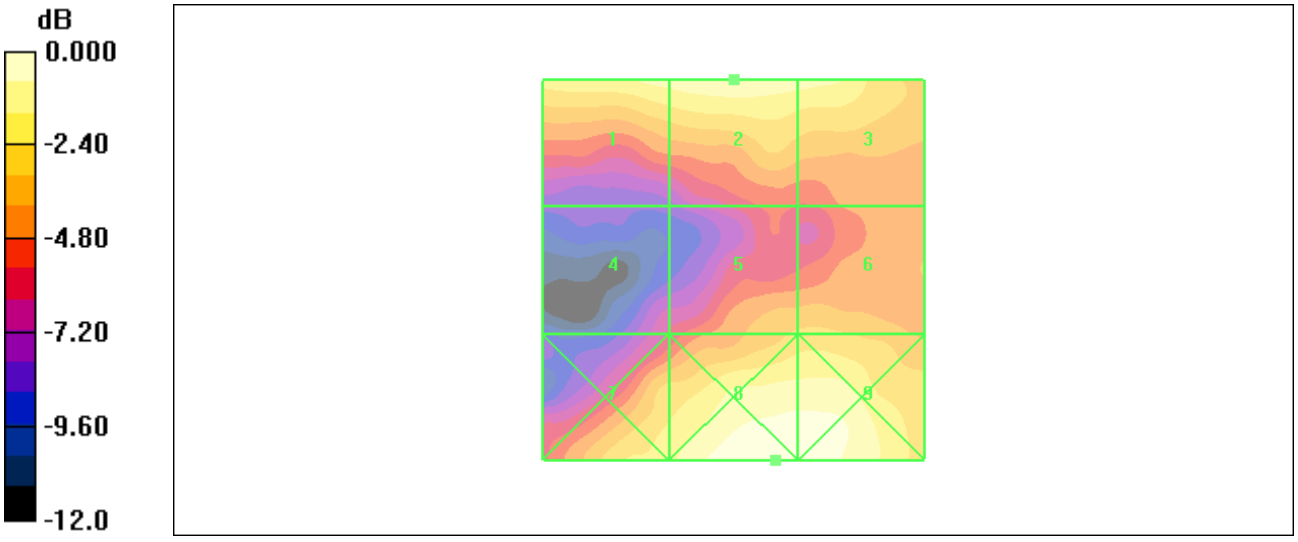
## HAC RF E-Field GSM 1900 Middle (Battery 1)

Date/Time: 4/23/2012 10:52:44 PM
Communication System: PCS 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: $\sigma$ = 0 mho/m, $\varepsilon_r$ = 1; $\rho$ = 1000 kg/m$^3$
Ambient Temperature:22.3 ℃
Phantom section: RF Section
DASY4 Configuration:
Probe: ER3DV6 - SN2303; ConvF(1, 1, 1); Calibrated: 2/21/2012
Electronics: DAE4 Sn1317; Calibrated: 1/23/2012
Phantom: HAC Test Arch; Type: SD HAC P01 BA
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**E Scan - ER3D - 2007: 15 mm from Probe Center to the Device Middle/Hearing Aid Compatibility Test (101x101x1):** Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 63.6 V/m
Probe Modulation Factor = 2.84
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 11.0 V/m; Power Drift = -0.014 dB
**Hearing Aid Near-Field Category: M3 (AWF -5 dB)**

Peak E-field in V/m

| | | |
|---|---|---|
| Grid 1 **60.8 M3** | Grid 2 **63.6 M3** | Grid 3 **61.2 M3** |
| Grid 4 **34.4 M4** | Grid 5 **49.6 M3** | Grid 6 **50.1 M3** |
| Grid 7 **56.6 M3** | Grid 8 **70.1 M3** | Grid 9 **69.4 M3** |




0 dB = 70.1V/m

**Figure 21 HAC RF E-Field GSM 1900 Channel 661**

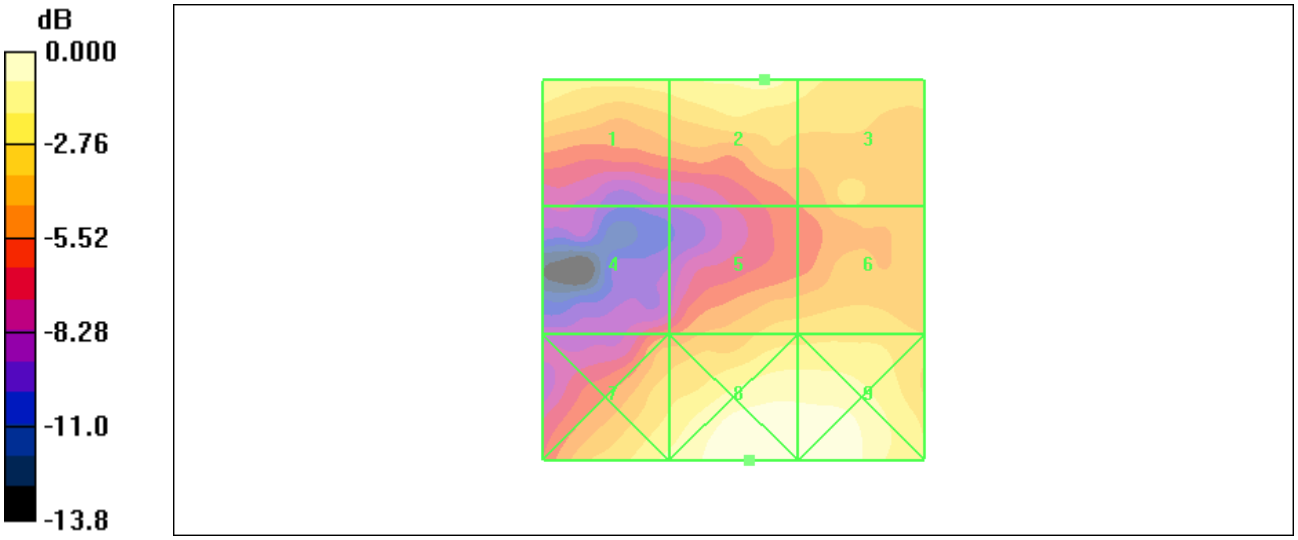
## HAC RF E-Field GSM 1900 Low (Battery 1)

Date/Time: 4/23/2012 11:02:45 PM
Communication System: PCS 1900; Frequency: 1850.2 MHz;Duty Cycle: 1:8.3
Medium parameters used: $\sigma$ = 0 mho/m, $\varepsilon_r$ = 1; $\rho$ = 1000 kg/m$^3$
Ambient Temperature:22.3 ℃
Phantom section: RF Section
DASY4 Configuration:
Probe: ER3DV6 - SN2303; ConvF(1, 1, 1); Calibrated: 2/21/2012
Electronics: DAE4 Sn1317; Calibrated: 1/23/2012
Phantom: HAC Test Arch; Type: SD HAC P01 BA
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**E Scan - ER3D - 2007: 15 mm from Probe Center to the Device Low/Hearing Aid Compatibility Test (101x101x1):** Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 61.7 V/m
Probe Modulation Factor = 2.84
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 12.5 V/m; Power Drift = -0.077 dB
**Hearing Aid Near-Field Category: M3 (AWF -5 dB)**

Peak E-field in V/m

| | | |
|---|---|---|
| Grid 1 **57.7 M3** | Grid 2 **61.7 M3** | Grid 3 **55.6 M3** |
| Grid 4 **37.6 M4** | Grid 5 **50.9 M3** | Grid 6 **51.9 M3** |
| Grid 7 **60.5 M3** | Grid 8 **72.7 M3** | Grid 9 **69.9 M3** |




0 dB = 72.7V/m

**Figure 22 HAC RF E-Field GSM 1900 Channel 512**

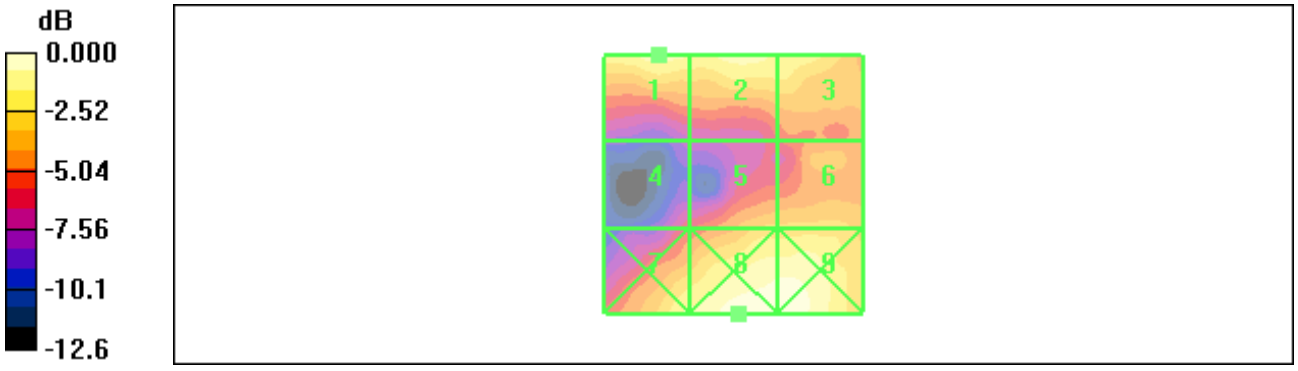
## HAC RF E-Field GSM 1900 Middle (Battery 2)

Date/Time: 4/24/2012 12:52:30 AM
Communication System: PCS 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: $\sigma$ = 0 mho/m, $\varepsilon_r$ = 1; $\rho$ = 1000 kg/m$^3$
Ambient Temperature:22.3 ℃
Phantom section: RF Section
DASY4 Configuration:
Probe: ER3DV6 - SN2303; ConvF(1, 1, 1); Calibrated: 2/21/2012
Electronics: DAE4 Sn1317; Calibrated: 1/23/2012
Phantom: HAC Test Arch; Type: SD HAC P01 BA
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**E Scan - ER3D - 2007: 15 mm from Probe Center to the Device Middle/Hearing Aid Compatibility Test (101x101x1):** Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 61.5 V/m
Probe Modulation Factor = 2.84
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 11.2 V/m; Power Drift = 0.043 dB
**Hearing Aid Near-Field Category: M3 (AWF -5 dB)**

Peak E-field in V/m

| | | |
|---|---|---|
| Grid 1 **61.5 M3** | Grid 2 **60.5 M3** | Grid 3 **56.4 M3** |
| Grid 4 **35.7 M4** | Grid 5 **49.3 M3** | Grid 6 **50.6 M3** |
| Grid 7 **59.8 M3** | Grid 8 **70.3 M3** | Grid 9 **69.6 M3** |




0 dB = 70.3V/m

**Figure 23 HAC RF E-Field GSM 1900 Channel 661**

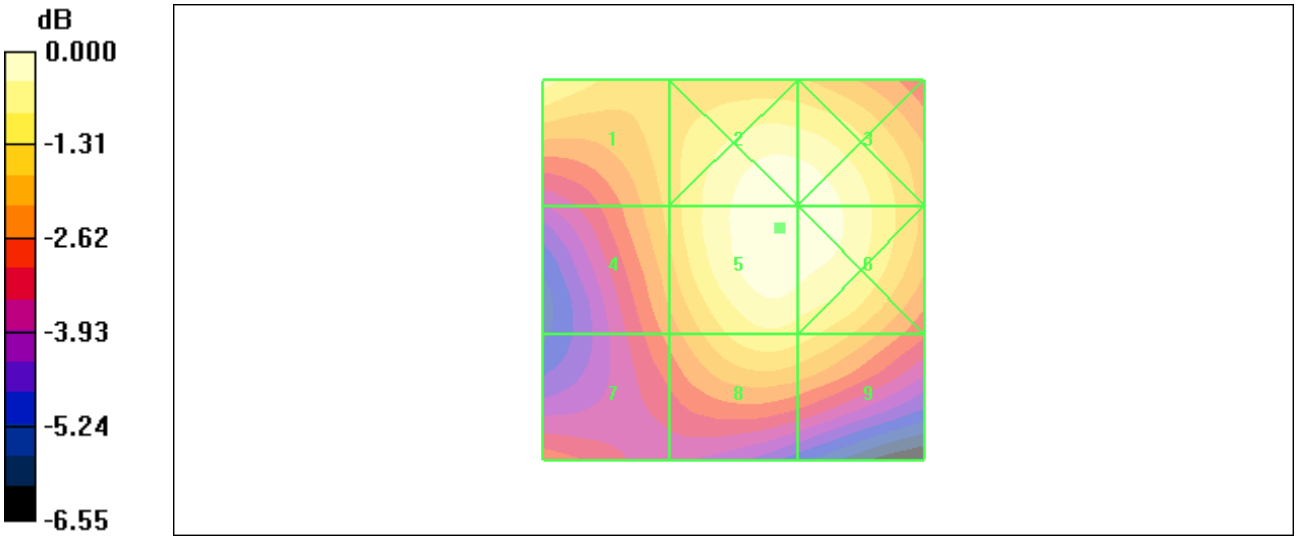
## HAC RF H-Field GSM 1900 High (Battery 1)

Date/Time: 4/24/2012 5:57:21 AM
Communication System: PCS 1900; Frequency: 1909.8 MHz;Duty Cycle: 1:8.3
Medium parameters used: $\sigma$ = 0 mho/m, $\varepsilon_r$ = 1; $\rho$ = 1 kg/$m^3$
Ambient Temperature:22.3 ℃
Phantom section: RF Section
DASY4 Configuration:
Probe: H3DV6 - SN6138; ; Calibrated: 2/21/2012
Electronics: DAE4 Sn1317; Calibrated: 1/23/2012
Phantom: HAC Test Arch; Type: SD HAC P01 BA
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**H Scan - H3DV6 - 2007: 15 mm from Probe Center to the Device High/Hearing Aid Compatibility Test (101x101x1):** Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 0.200 A/m
Probe Modulation Factor = 2.84
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 0.080 A/m; Power Drift = 0.005 dB
**Hearing Aid Near-Field Category: M3 (AWF -5 dB)**

Peak H-field in A/m

| | | |
|---|---|---|
| Grid 1 **0.186 M3** | Grid 2 **0.199 M3** | Grid 3 **0.198 M3** |
| Grid 4 **0.167 M3** | Grid 5 **0.200 M3** | Grid 6 **0.198 M3** |
| Grid 7 **0.151 M3** | Grid 8 **0.179 M3** | Grid 9 **0.176 M3** |




0 dB = 0.200A/m

**Figure 24 HAC RF H-Field GSM 1900 Channel 810**

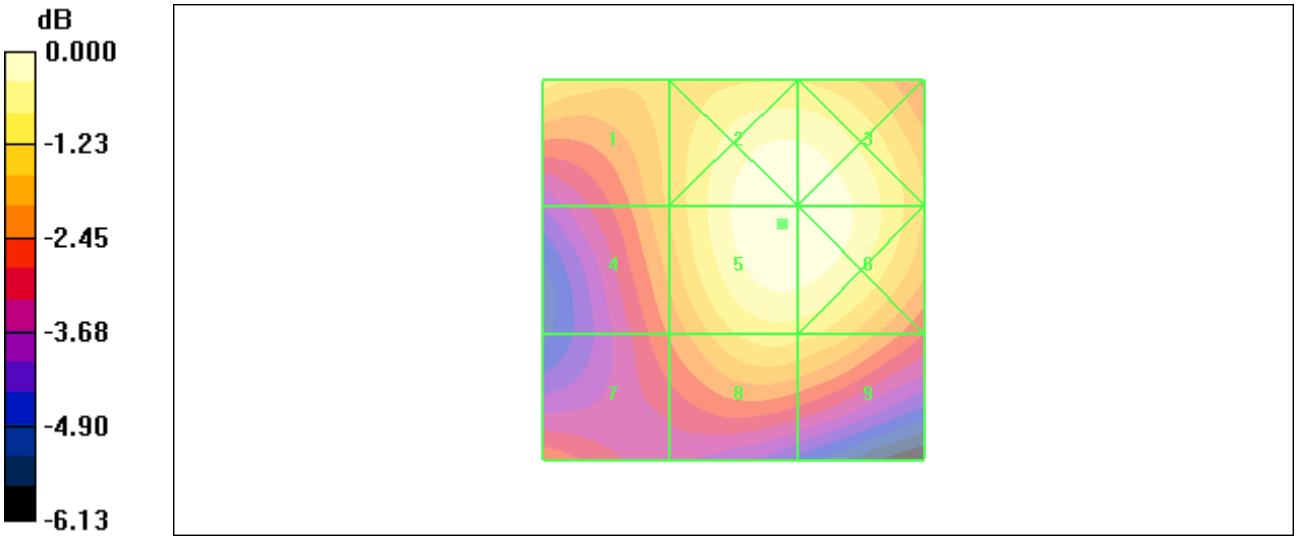
## HAC RF H-Field GSM 1900 Middle (Battery 1)

Date/Time: 4/24/2012 5:52:17 AM
Communication System: PCS 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: $\sigma$ = 0 mho/m, $\varepsilon_r$ = 1; $\rho$ = 1 kg/$m^3$
Ambient Temperature:22.3 ℃
Phantom section: RF Section
DASY4 Configuration:
Probe: H3DV6 - SN6138; ; Calibrated: 2/21/2012
Electronics: DAE4 Sn1317; Calibrated: 1/23/2012
Phantom: HAC Test Arch; Type: SD HAC P01 BA
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**H Scan - H3DV6 - 2007: 15 mm from Probe Center to the Device Middle/Hearing Aid Compatibility Test (101x101x1):** Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 0.197 A/m
Probe Modulation Factor = 2.84
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 0.076 A/m; Power Drift = 0.120 dB
**Hearing Aid Near-Field Category: M3 (AWF -5 dB)**

Peak H-field in A/m

| | | |
|---|---|---|
| Grid 1 **0.176 M3** | Grid 2 **0.197 M3** | Grid 3 **0.196 M3** |
| Grid 4 **0.164 M3** | Grid 5 **0.197 M3** | Grid 6 **0.197 M3** |
| Grid 7 **0.149 M3** | Grid 8 **0.176 M3** | Grid 9 **0.174 M3** |




0 dB = 0.197A/m

**Figure 25 HAC RF H-Field GSM 1900 Channel 661**

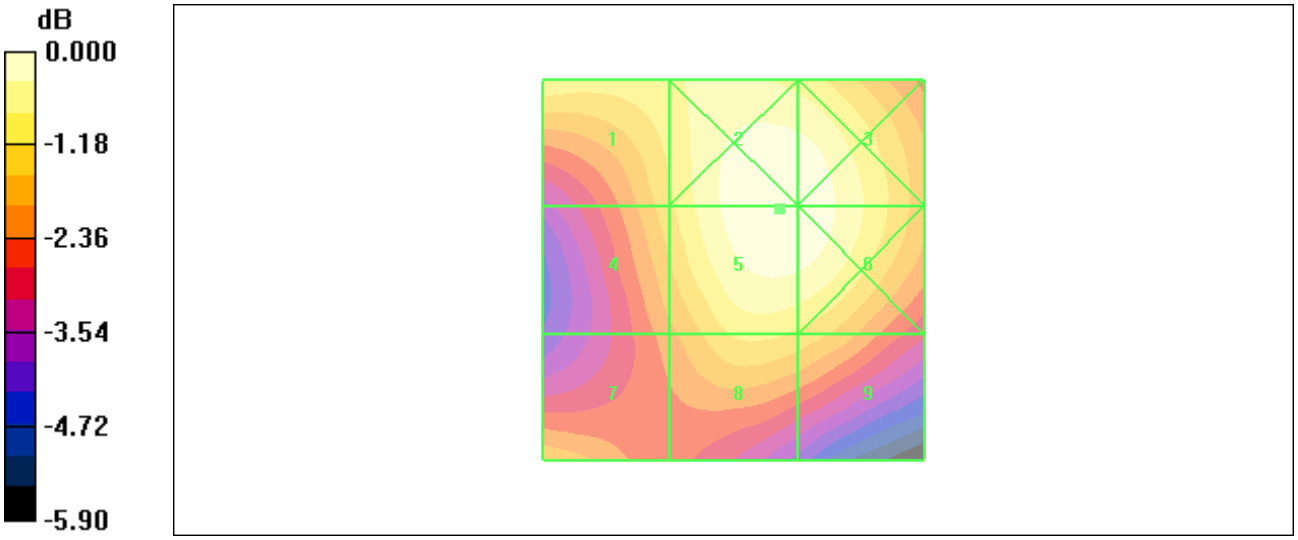
## HAC RF H-Field GSM 1900 Low (Battery 1)

Date/Time: 4/24/2012 6:02:31 AM
Communication System: PCS 1900; Frequency: 1850.2 MHz;Duty Cycle: 1:8.3
Medium parameters used: $\sigma$ = 0 mho/m, $\varepsilon_r$ = 1; $\rho$ = 1 kg/$m^3$
Ambient Temperature:22.3 ℃
Phantom section: RF Section
DASY4 Configuration:
Probe: H3DV6 - SN6138; ; Calibrated: 2/21/2012
Electronics: DAE4 Sn1317; Calibrated: 1/23/2012
Phantom: HAC Test Arch; Type: SD HAC P01 BA
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**H Scan - H3DV6 - 2007: 15 mm from Probe Center to the Device Low/Hearing Aid Compatibility Test (101x101x1):** Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 0.188 A/m
Probe Modulation Factor = 2.84
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 0.074 A/m; Power Drift = -0.027 dB
**Hearing Aid Near-Field Category: M3 (AWF -5 dB)**

Peak H-field in A/m

| | | |
|---|---|---|
| Grid 1 **0.172 M3** | Grid 2 **0.188 M3** | Grid 3 **0.187 M3** |
| Grid 4 **0.162 M3** | Grid 5 **0.188 M3** | Grid 6 **0.187 M3** |
| Grid 7 **0.156 M3** | Grid 8 **0.166 M3** | Grid 9 **0.162 M3** |




0 dB = 0.188A/m

**Figure 26 HAC RF H-Field GSM 1900 Channel 512**

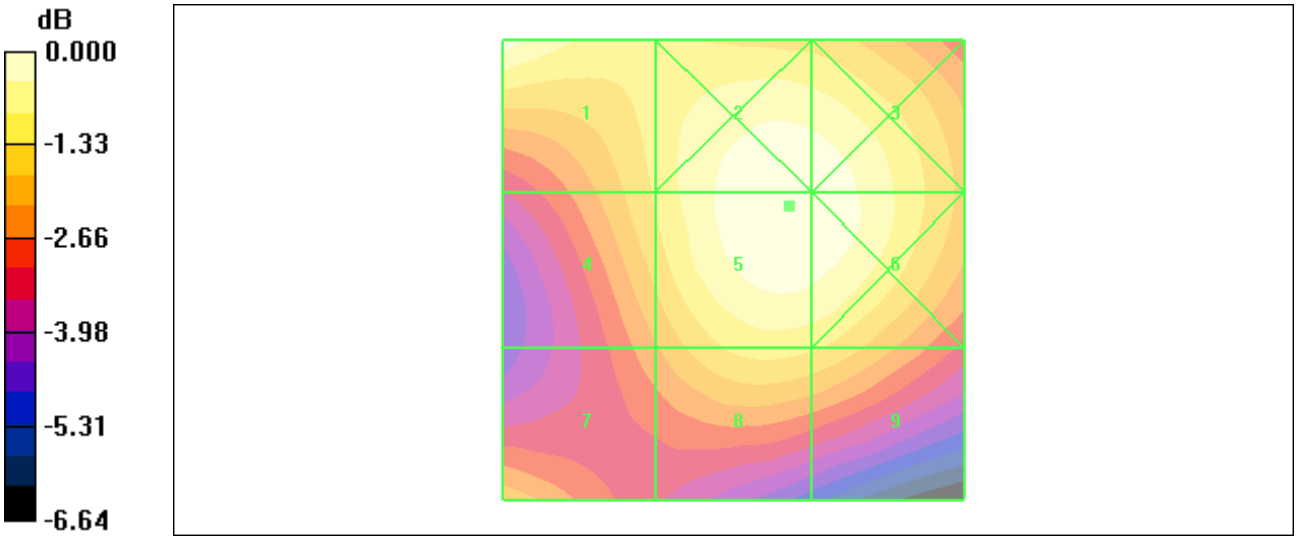
## HAC RF H-Field GSM 1900 High (Battery 2)

Date/Time: 4/24/2012 6:54:10 AM
Communication System: PCS 1900; Frequency: 1909.8 MHz;Duty Cycle: 1:8.3
Medium parameters used: $\sigma$ = 0 mho/m, $\varepsilon_r$ = 1; $\rho$ = 1 kg/$m^3$
Ambient Temperature:22.3 ℃
Phantom section: RF Section
DASY4 Configuration:
Probe: H3DV6 - SN6138; ; Calibrated: 2/21/2012
Electronics: DAE4 Sn1317; Calibrated: 1/23/2012
Phantom: HAC Test Arch; Type: SD HAC P01 BA
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**H Scan - H3DV6 - 2007: 15 mm from Probe Center to the Device High/Hearing Aid Compatibility Test (101x101x1):** Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 0.195 A/m
Probe Modulation Factor = 2.84
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 0.077 A/m; Power Drift = 0.056 dB
**Hearing Aid Near-Field Category: M3 (AWF -5 dB)**

Peak H-field in A/m

| | | |
|---|---|---|
| Grid 1 **0.191 M3** | Grid 2 **0.194 M3** | Grid 3 **0.193 M3** |
| Grid 4 **0.169 M3** | Grid 5 **0.195 M3** | Grid 6 **0.194 M3** |
| Grid 7 **0.158 M3** | Grid 8 **0.171 M3** | Grid 9 **0.169 M3** |




0 dB = 0.195A/m

**Figure 27 HAC RF H-Field GSM 1900 Channel 810**

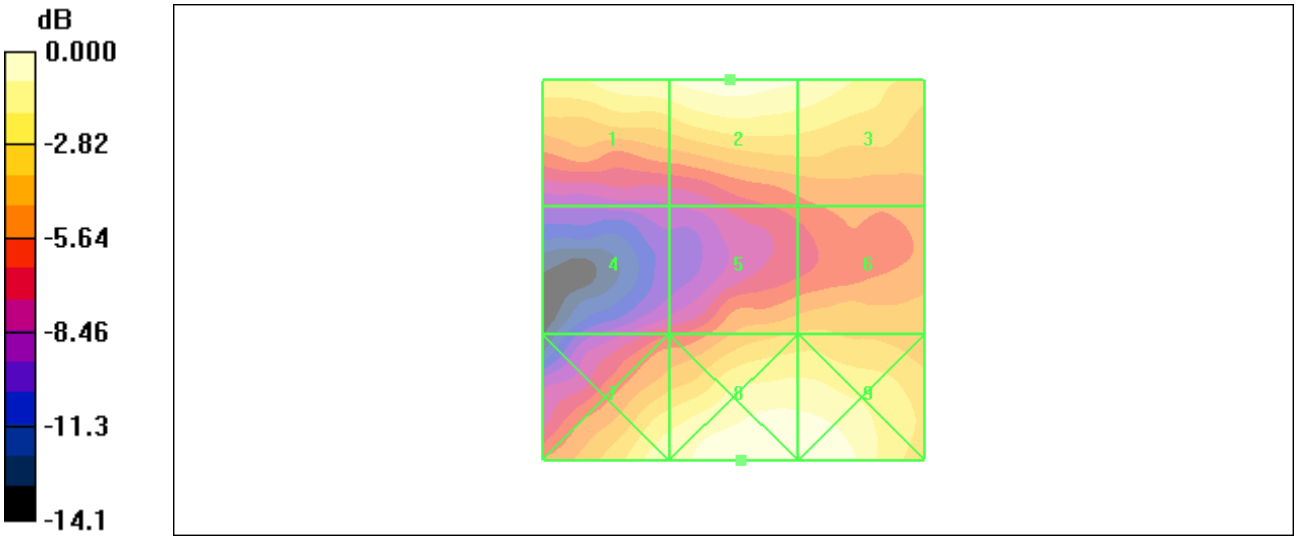
## HAC RF E-Field WCDMA Band II High (Battery 1)

Date/Time: 4/23/2012 11:14:26 PM
Communication System: WCDMA Band II; Frequency: 1907.6 MHz;Duty Cycle: 1:1
Medium parameters used: $\sigma$ = 0 mho/m, $\varepsilon_r$ = 1; $\rho$ = 1000 kg/m$^3$
Ambient Temperature:22.3 ℃
Phantom section: RF Section
DASY4 Configuration:
Probe: ER3DV6 - SN2303; ConvF(1, 1, 1); Calibrated: 2/21/2012
Electronics: DAE4 Sn1317; Calibrated: 1/23/2012
Phantom: HAC Test Arch; Type: SD HAC P01 BA
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**E Scan - ER3D - 2007: 15 mm from Probe Center to the Device High/Hearing Aid Compatibility Test (101x101x1):** Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 28.5 V/m
Probe Modulation Factor = 1.02
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 11.7 V/m; Power Drift = 0.113 dB
**Hearing Aid Near-Field Category: M4 (AWF 0 dB)**

Peak E-field in V/m

| | | |
|---|---|---|
| Grid 1 **27.0 M4** | Grid 2 **28.5 M4** | Grid 3 **27.3 M4** |
| Grid 4 **13.8 M4** | Grid 5 **19.7 M4** | Grid 6 **19.9 M4** |
| Grid 7 **26.4 M4** | Grid 8 **29.9 M4** | Grid 9 **29.3 M4** |




0 dB = 29.9V/m

**Figure 28 HAC RF E-Field WCDMA Band II Channel 9538**

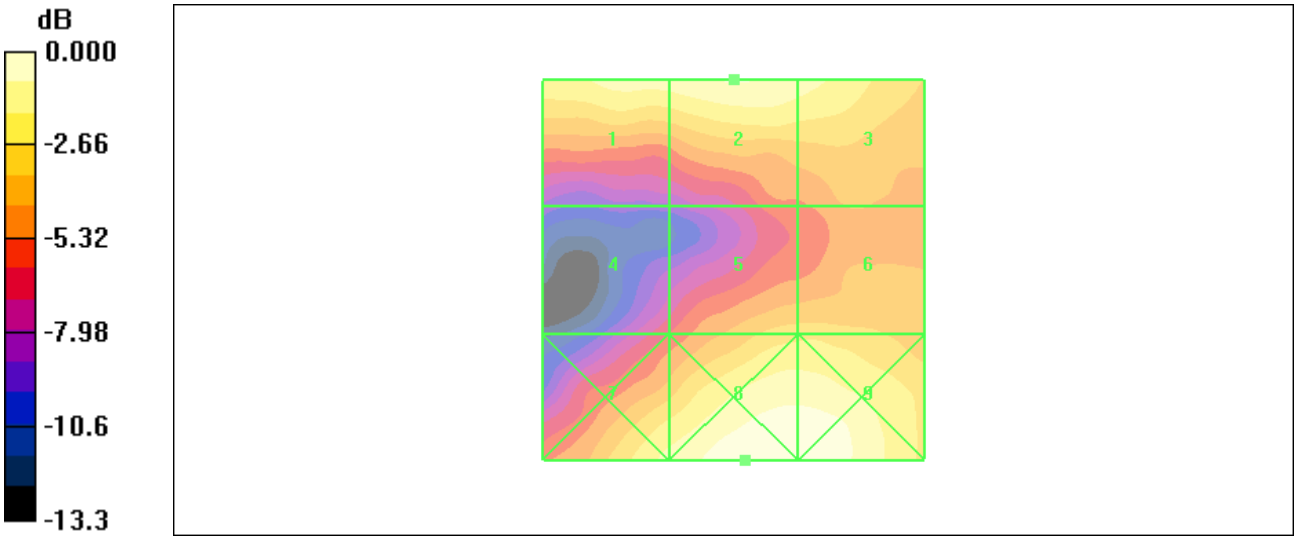
## HAC RF E-Field WCDMA Band II Middle (Battery 1)

Date/Time: 4/23/2012 11:09:13 PM
Communication System: WCDMA Band II; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: $\sigma$ = 0 mho/m, $\varepsilon_r$ = 1; $\rho$ = 1000 kg/m$^3$
Ambient Temperature:22.3 ℃
Phantom section: RF Section
DASY4 Configuration:
Probe: ER3DV6 - SN2303; ConvF(1, 1, 1); Calibrated: 2/21/2012
Electronics: DAE4 Sn1317; Calibrated: 1/23/2012
Phantom: HAC Test Arch; Type: SD HAC P01 BA
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**E Scan - ER3D - 2007: 15 mm from Probe Center to the Device Middle/Hearing Aid Compatibility Test (101x101x1):** Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 31.2 V/m
Probe Modulation Factor = 1.02
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 15.5 V/m; Power Drift = 0.012 dB
**Hearing Aid Near-Field Category: M4 (AWF 0 dB)**

Peak E-field in V/m

| | | |
|---|---|---|
| Grid 1 **29.4 M4** | Grid 2 **31.2 M4** | Grid 3 **29.4 M4** |
| Grid 4 **16.9 M4** | Grid 5 **24.4 M4** | Grid 6 **24.6 M4** |
| Grid 7 **29.0 M4** | Grid 8 **34.3 M4** | Grid 9 **34.0 M4** |




0 dB = 34.3V/m

**Figure 29 HAC RF E-Field WCDMA Band II Channel 9400**

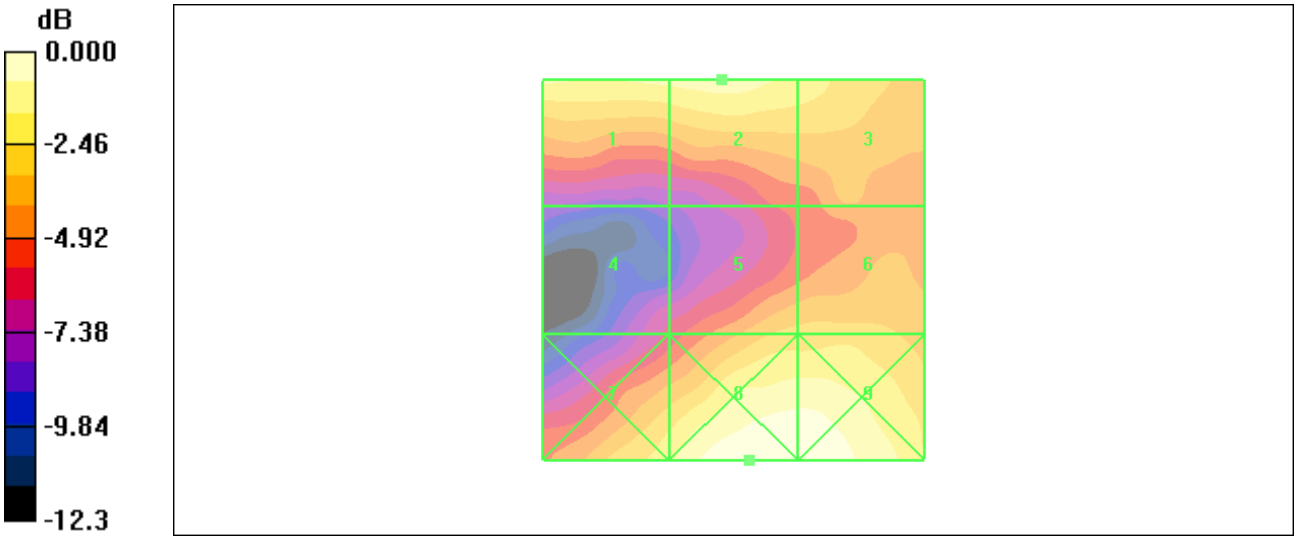
## HAC RF E-Field WCDMA Band II Low (Battery 1)

Date/Time: 4/23/2012 11:20:44 PM
Communication System: WCDMA Band II; Frequency: 1852.4 MHz;Duty Cycle: 1:1
Medium parameters used: $\sigma$ = 0 mho/m, $\varepsilon_r$ = 1; $\rho$ = 1000 kg/m$^3$
Ambient Temperature:22.3 ℃
Phantom section: RF Section
DASY4 Configuration:
Probe: ER3DV6 - SN2303; ConvF(1, 1, 1); Calibrated: 2/21/2012
Electronics: DAE4 Sn1317; Calibrated: 1/23/2012
Phantom: HAC Test Arch; Type: SD HAC P01 BA
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**E Scan - ER3D - 2007: 15 mm from Probe Center to the Device Low/Hearing Aid Compatibility Test (101x101x1):** Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 32.1 V/m
Probe Modulation Factor = 1.02
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 17.1 V/m; Power Drift = -0.150 dB
**Hearing Aid Near-Field Category: M4 (AWF 0 dB)**

Peak E-field in V/m

| | | |
|---|---|---|
| Grid 1 **31.3 M4** | Grid 2 **32.1 M4** | Grid 3 **30.2 M4** |
| Grid 4 **18.0 M4** | Grid 5 **26.2 M4** | Grid 6 **26.8 M4** |
| Grid 7 **29.7 M4** | Grid 8 **36.9 M4** | Grid 9 **35.8 M4** |




0 dB = 36.9V/m

**Figure 30 HAC RF E-Field WCDMA Band II Channel 9262**

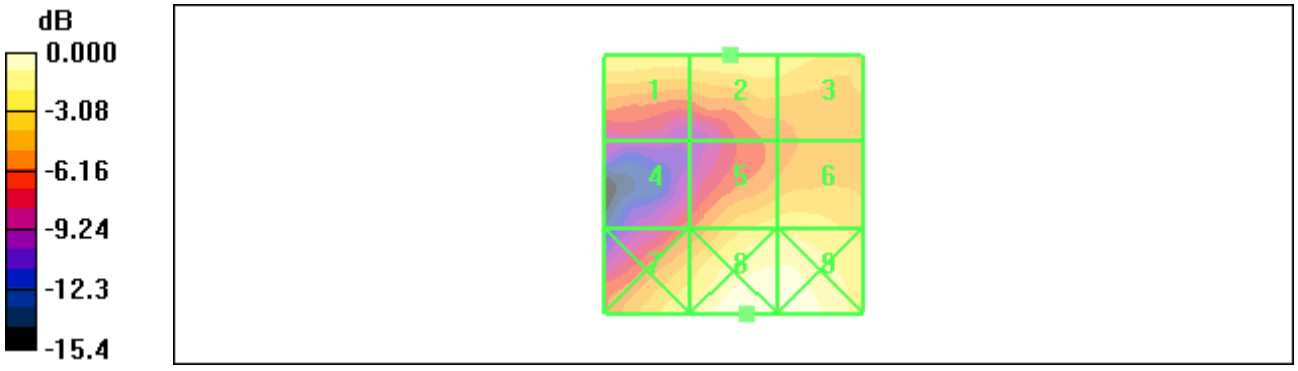
## HAC RF E-Field WCDMA Band II Low (Battery 2)

Date/Time: 4/24/2012 12:43:43 AM
Communication System: WCDMA Band II; Frequency: 1852.4 MHz;Duty Cycle: 1:1
Medium parameters used: $\sigma$ = 0 mho/m, $\varepsilon_r$ = 1; $\rho$ = 1000 kg/m$^3$
Ambient Temperature:22.3 ℃
Phantom section: RF Section
DASY4 Configuration:
Probe: ER3DV6 - SN2303; ConvF(1, 1, 1); Calibrated: 2/21/2012
Electronics: DAE4 Sn1317; Calibrated: 1/23/2012
Phantom: HAC Test Arch; Type: SD HAC P01 BA
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**E Scan - ER3D - 2007: 15 mm from Probe Center to the Device Low/Hearing Aid Compatibility Test (101x101x1):** Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 28.7 V/m
Probe Modulation Factor = 1.02
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 18.2 V/m; Power Drift = 0.034 dB
**Hearing Aid Near-Field Category: M4 (AWF 0 dB)**

Peak E-field in V/m

| | | |
|---|---|---|
| Grid 1 **28.3 M4** | Grid 2 **28.7 M4** | Grid 3 **27.6 M4** |
| Grid 4 **17.5 M4** | Grid 5 **27.3 M4** | Grid 6 **27.5 M4** |
| Grid 7 **30.1 M4** | Grid 8 **36.2 M4** | Grid 9 **35.8 M4** |




0 dB = 36.2V/m

**Figure 31 HAC RF E-Field WCDMA Band II Channel 9262**

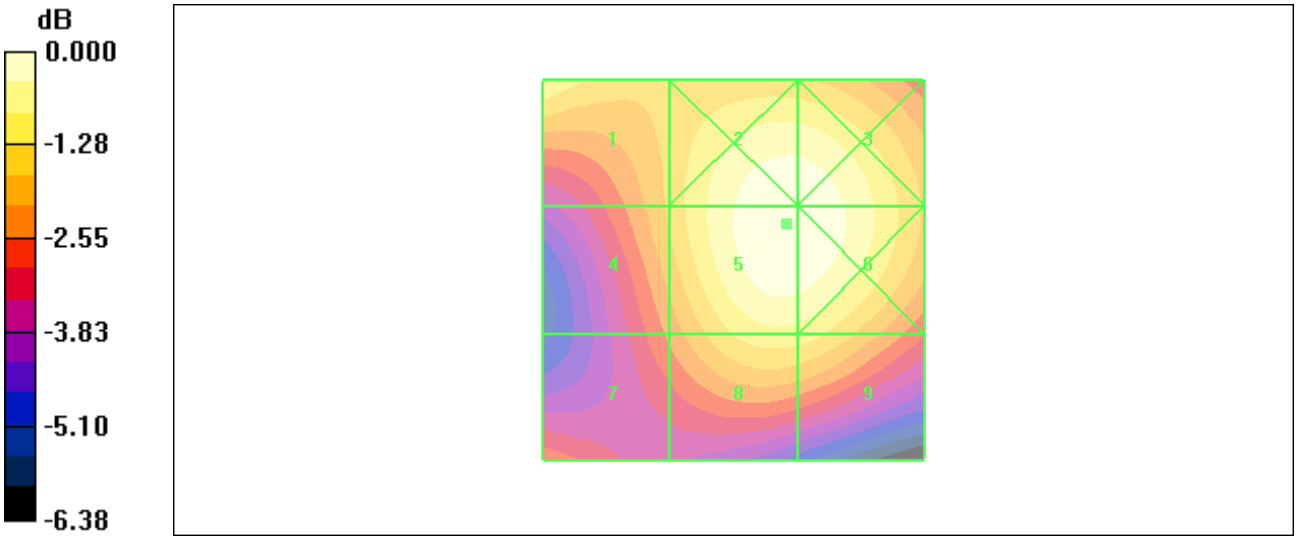
## HAC RF H-Field WCDMA Band II High (Battery 1)

Date/Time: 4/24/2012 4:58:55 AM
Communication System: WCDMA Band II; Frequency: 1907.6 MHz;Duty Cycle: 1:1
Medium parameters used: $\sigma$ = 0 mho/m, $\varepsilon_r$ = 1; $\rho$ = 1 kg/$m^3$
Ambient Temperature:22.3 ℃
Phantom section: RF Section
DASY4 Configuration:
Probe: H3DV6 - SN6138; ; Calibrated: 2/21/2012
Electronics: DAE4 Sn1317; Calibrated: 1/23/2012
Phantom: HAC Test Arch; Type: SD HAC P01 BA
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**H Scan - H3DV6 - 2007: 15 mm from Probe Center to the Device High/Hearing Aid Compatibility Test (101x101x1):** Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 0.095 A/m
Probe Modulation Factor = 1.01
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 0.105 A/m; Power Drift = 0.036 dB
**Hearing Aid Near-Field Category: M4 (AWF 0 dB)**

Peak H-field in A/m

| | | |
|---|---|---|
| Grid 1 **0.087 M4** | Grid 2 **0.094 M4** | Grid 3 **0.094 M4** |
| Grid 4 **0.079 M4** | Grid 5 **0.095 M4** | Grid 6 **0.094 M4** |
| Grid 7 **0.072 M4** | Grid 8 **0.085 M4** | Grid 9 **0.084 M4** |




0 dB = 0.095A/m

**Figure 32 HAC RF H-Field WCDMA Band II Channel 9538**

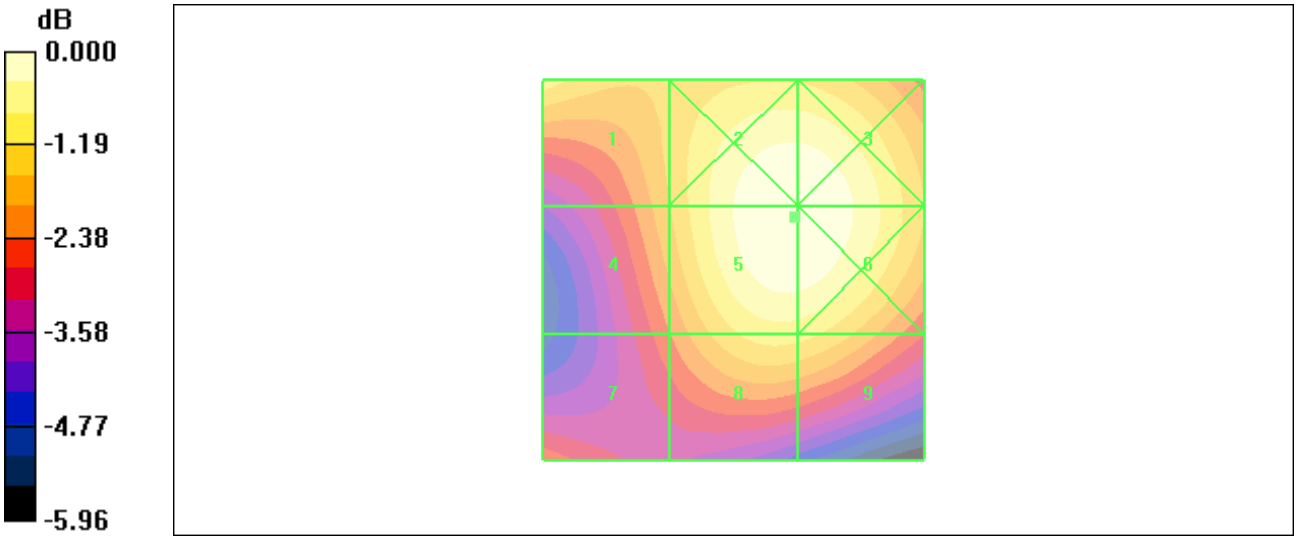
## HAC RF H-Field WCDMA Band II Middle (Battery 1)

Date/Time: 4/24/2012 4:49:24 AM
Communication System: WCDMA Band II; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: $\sigma$ = 0 mho/m, $\varepsilon_r$ = 1; $\rho$ = 1 kg/$m^3$
Ambient Temperature:22.3 ℃
Phantom section: RF Section
DASY4 Configuration:
Probe: H3DV6 - SN6138; ; Calibrated: 2/21/2012
Electronics: DAE4 Sn1317; Calibrated: 1/23/2012
Phantom: HAC Test Arch; Type: SD HAC P01 BA
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**H Scan - H3DV6 - 2007: 15 mm from Probe Center to the Device Middle/Hearing Aid Compatibility Test (101x101x1):** Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 0.097 A/m
Probe Modulation Factor = 1.01
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 0.104 A/m; Power Drift = 0.099 dB
**Hearing Aid Near-Field Category: M4 (AWF 0 dB)**

Peak H-field in A/m

| | | |
|---|---|---|
| Grid 1 **0.087 M4** | Grid 2 **0.097 M4** | Grid 3 **0.097 M4** |
| Grid 4 **0.081 M4** | Grid 5 **0.097 M4** | Grid 6 **0.097 M4** |
| Grid 7 **0.073 M4** | Grid 8 **0.087 M4** | Grid 9 **0.086 M4** |




0 dB = 0.097A/m

**Figure 33 HAC RF H-Field WCDMA Band II Channel 9400**

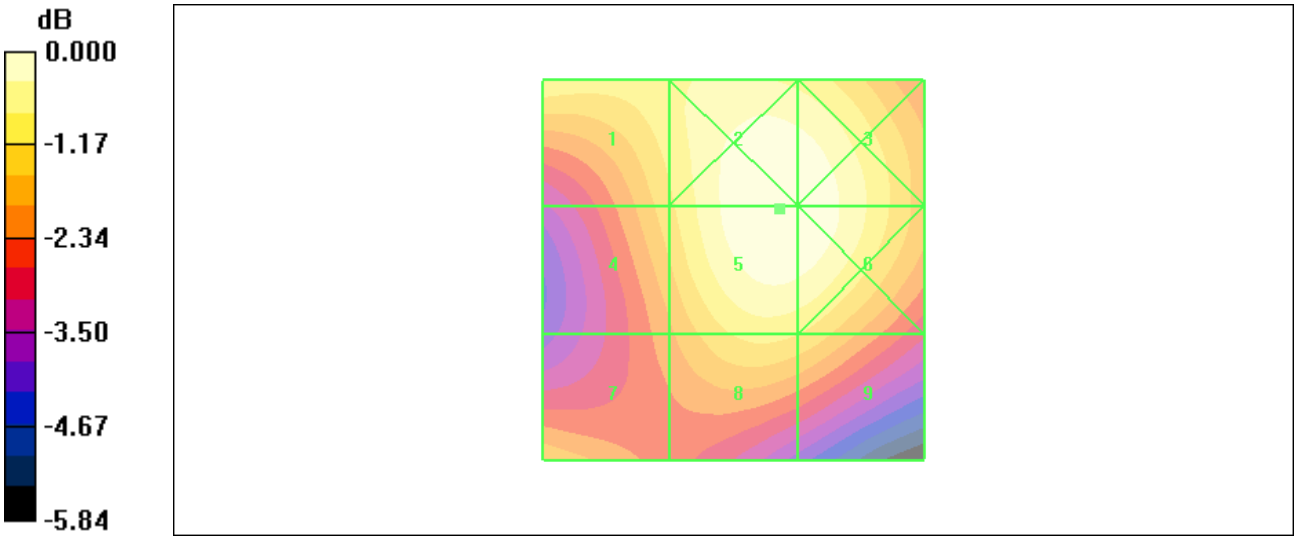
## HAC RF H-Field WCDMA Band II Low (Battery 1)

Date/Time: 4/24/2012 5:05:00 AM
Communication System: WCDMA Band II; Frequency: 1852.4 MHz;Duty Cycle: 1:1
Medium parameters used: $\sigma$ = 0 mho/m, $\varepsilon_r$ = 1; $\rho$ = 1 kg/$m^3$
Ambient Temperature:22.3 ℃
Phantom section: RF Section
DASY4 Configuration:
Probe: H3DV6 - SN6138; ; Calibrated: 2/21/2012
Electronics: DAE4 Sn1317; Calibrated: 1/23/2012
Phantom: HAC Test Arch; Type: SD HAC P01 BA
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**H Scan - H3DV6 - 2007: 15 mm from Probe Center to the Device Low/Hearing Aid Compatibility Test (101x101x1):** Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 0.096 A/m
Probe Modulation Factor = 1.01
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 0.105 A/m; Power Drift = 0.011 dB
**Hearing Aid Near-Field Category: M4 (AWF 0 dB)**

Peak H-field in A/m

| | | |
|---|---|---|
| Grid 1 **0.088 M4** | Grid 2 **0.096 M4** | Grid 3 **0.096 M4** |
| Grid 4 **0.083 M4** | Grid 5 **0.096 M4** | Grid 6 **0.096 M4** |
| Grid 7 **0.081 M4** | Grid 8 **0.085 M4** | Grid 9 **0.084 M4** |




0 dB = 0.096A/m

**Figure 34 HAC RF H-Field WCDMA Band II Channel 9262**

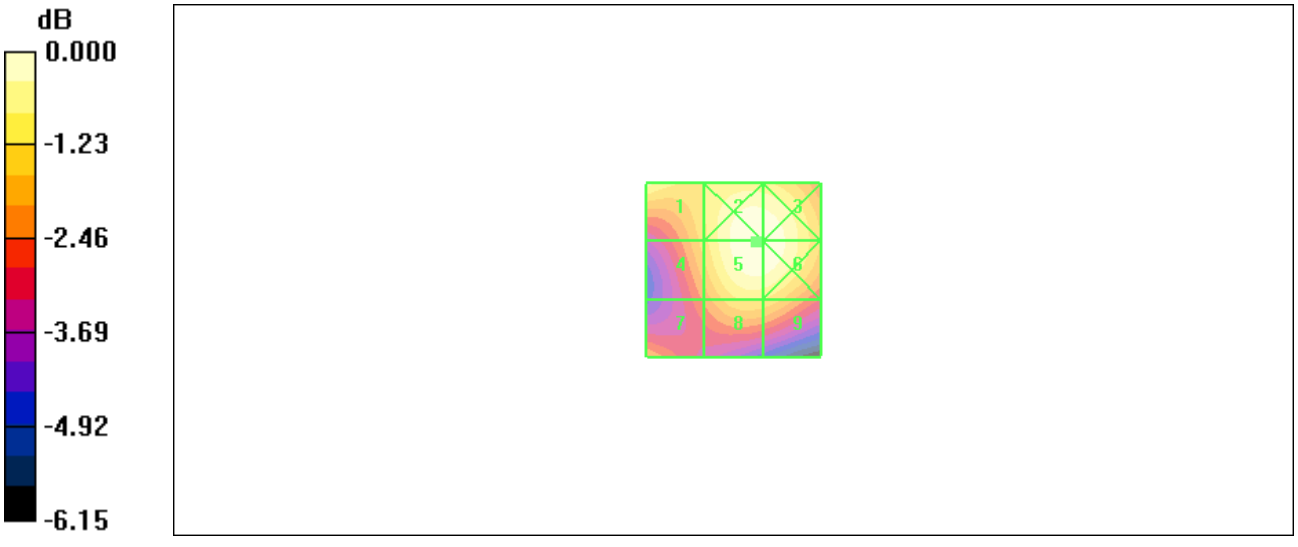
## HAC RF H-Field WCDMA Band II Middle (Battery 2)

Date/Time: 4/24/2012 7:02:27 AM
Communication System: WCDMA Band II; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: $\sigma$ = 0 mho/m, $\varepsilon_r$ = 1; $\rho$ = 1 kg/$m^3$
Ambient Temperature:22.3 ℃
Phantom section: RF Section
DASY4 Configuration:
Probe: H3DV6 - SN6138; ; Calibrated: 2/21/2012
Electronics: DAE4 Sn1317; Calibrated: 1/23/2012
Phantom: HAC Test Arch; Type: SD HAC P01 BA
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**H Scan - H3DV6 - 2007: 15 mm from Probe Center to the Device Middle/Hearing Aid Compatibility Test (101x101x1):** Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 0.096 A/m
Probe Modulation Factor = 1.01
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 0.105 A/m; Power Drift = -0.015 dB
**Hearing Aid Near-Field Category: M4 (AWF 0 dB)**

Peak H-field in A/m

| | | |
|---|---|---|
| Grid 1 **0.090 M4** | Grid 2 **0.096 M4** | Grid 3 **0.096 M4** |
| Grid 4 **0.082 M4** | Grid 5 **0.096 M4** | Grid 6 **0.096 M4** |
| Grid 7 **0.077 M4** | Grid 8 **0.084 M4** | Grid 9 **0.083 M4** |




0 dB = 0.096A/m

**Figure 35 HAC RF H-Field WCDMA Band II Channel 9400**

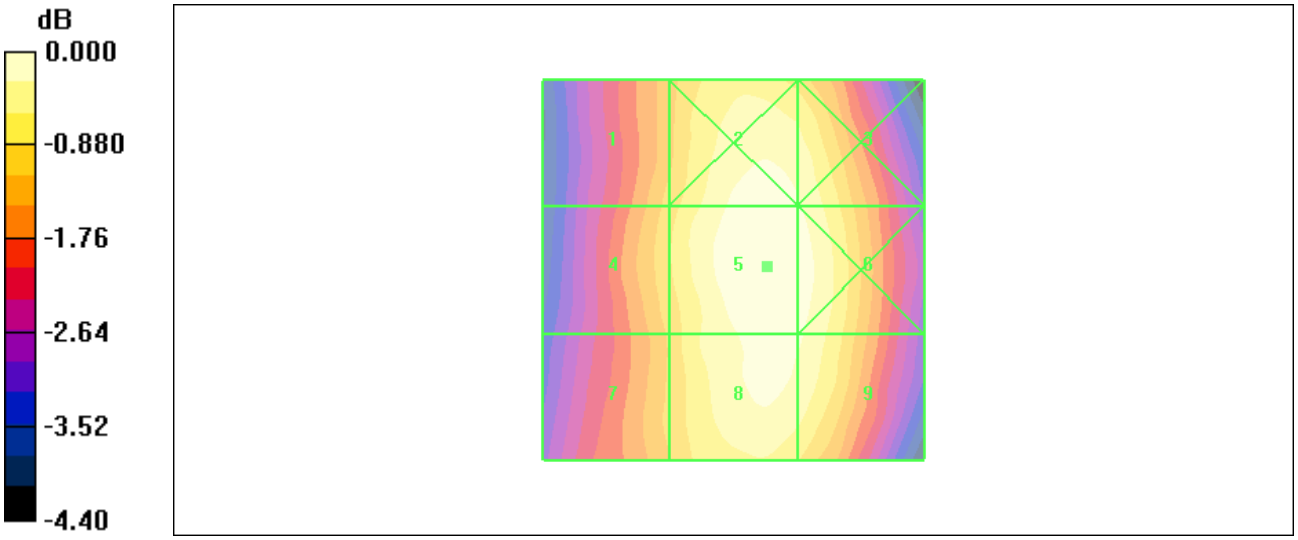
## HAC RF E-Field WCDMA Band V High (Battery 1)

Date/Time: 4/24/2012 12:09:33 AM
Communication System: WCDMA Band V; Frequency: 846.6 MHz;Duty Cycle: 1:1
Medium parameters used: $\sigma$ = 0 mho/m, $\varepsilon_r$ = 1; $\rho$ = 1000 kg/m$^3$
Ambient Temperature:22.3 ℃
Phantom section: RF Section
DASY4 Configuration:
Probe: ER3DV6 - SN2303; ConvF(1, 1, 1); Calibrated: 2/21/2012
Electronics: DAE4 Sn1317; Calibrated: 1/23/2012
Phantom: HAC Test Arch; Type: SD HAC P01 BA
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**E Scan - ER3D - 2007: 15 mm from Probe Center to the Device High/Hearing Aid Compatibility Test (101x101x1):** Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 63.9 V/m
Probe Modulation Factor = 1.03
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 77.1 V/m; Power Drift = -0.046 dB
**Hearing Aid Near-Field Category: M4 (AWF 0 dB)**

Peak E-field in V/m

| | | |
|---|---|---|
| Grid 1 **56.6 M4** | Grid 2 **63.1 M4** | Grid 3 **62.0 M4** |
| Grid 4 **57.5 M4** | Grid 5 **63.9 M4** | Grid 6 **63.0 M4** |
| Grid 7 **56.4 M4** | Grid 8 **62.6 M4** | Grid 9 **62.0 M4** |




0 dB = 63.9V/m

**Figure 36 HAC RF E-Field WCDMA Band V Channel 4233**

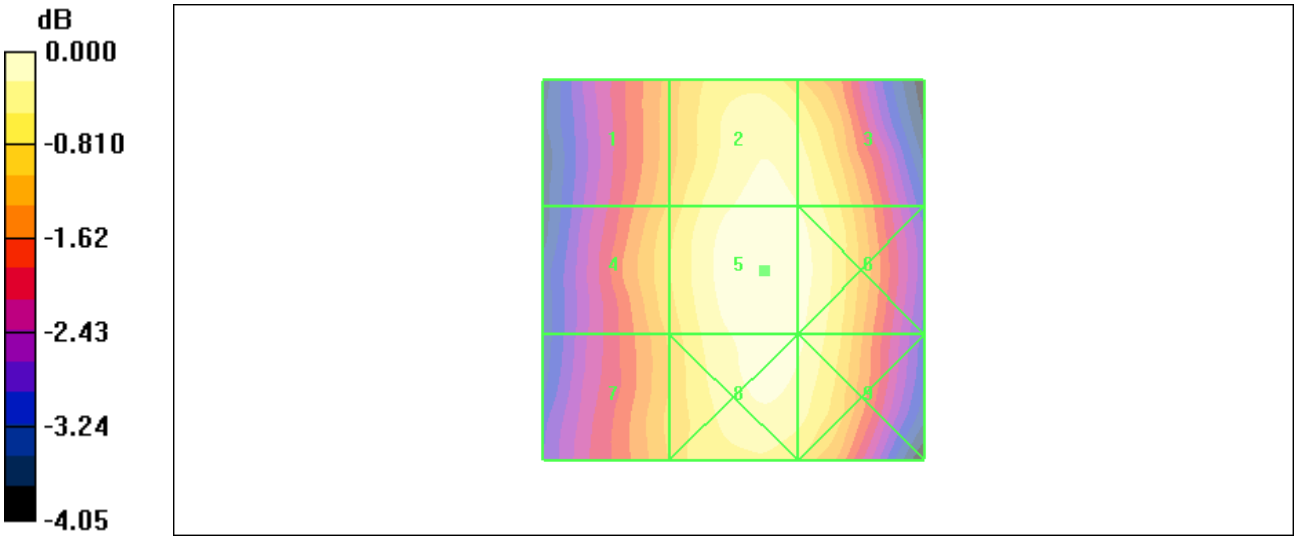
## HAC RF E-Field WCDMA Band V Middle (Battery 1)

Date/Time: 4/24/2012 12:03:47 AM
Communication System: WCDMA Band V; Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium parameters used: $\sigma$ = 0 mho/m, $\varepsilon_r$ = 1; $\rho$ = 1000 kg/m$^3$
Ambient Temperature:22.3 ℃
Phantom section: RF Section
DASY4 Configuration:
Probe: ER3DV6 - SN2303; ConvF(1, 1, 1); Calibrated: 2/21/2012
Electronics: DAE4 Sn1317; Calibrated: 1/23/2012
Phantom: HAC Test Arch; Type: SD HAC P01 BA
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**E Scan - ER3D - 2007: 15 mm from Probe Center to the Device Middle/Hearing Aid Compatibility Test (101x101x1):** Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 54.1 V/m
Probe Modulation Factor = 1.03
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 65.6 V/m; Power Drift = -0.028 dB
**Hearing Aid Near-Field Category: M4 (AWF 0 dB)**

Peak E-field in V/m

| | | |
|---|---|---|
| Grid 1 **48.0 M4** | Grid 2 **53.2 M4** | Grid 3 **52.4 M4** |
| Grid 4 **49.2 M4** | Grid 5 **54.1 M4** | Grid 6 **53.3 M4** |
| Grid 7 **48.2 M4** | Grid 8 **53.6 M4** | Grid 9 **52.8 M4** |




0 dB = 54.1V/m

**Figure 37 HAC RF E-Field WCDMA Band V Channel 4183**

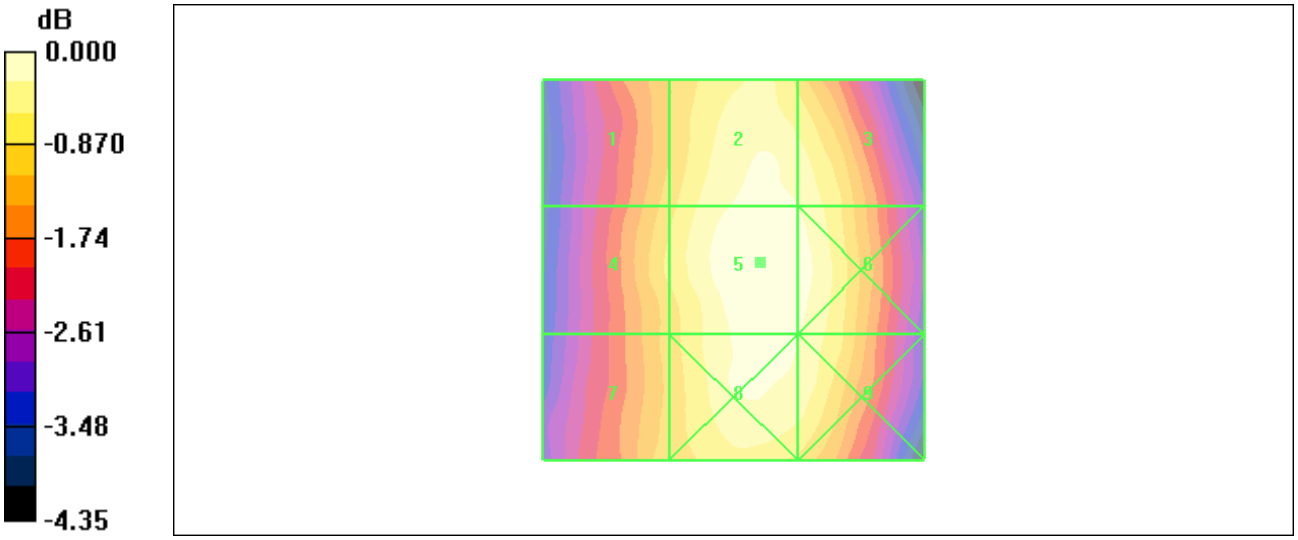
## HAC RF E-Field WCDMA Band V Low (Battery 1)

Date/Time: 4/24/2012 12:14:31 AM
Communication System: WCDMA Band V; Frequency: 826.4 MHz;Duty Cycle: 1:1
Medium parameters used: $\sigma$ = 0 mho/m, $\varepsilon_r$ = 1; $\rho$ = 1000 kg/m$^3$
Ambient Temperature:22.3 ℃
Phantom section: RF Section
DASY4 Configuration:
Probe: ER3DV6 - SN2303; ConvF(1, 1, 1); Calibrated: 2/21/2012
Electronics: DAE4 Sn1317; Calibrated: 1/23/2012
Phantom: HAC Test Arch; Type: SD HAC P01 BA
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**E Scan - ER3D - 2007: 15 mm from Probe Center to the Device Low/Hearing Aid Compatibility Test (101x101x1):** Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 59.2 V/m
Probe Modulation Factor = 1.03
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 71.9 V/m; Power Drift = -0.030 dB
**Hearing Aid Near-Field Category: M4 (AWF 0 dB)**

Peak E-field in V/m

| | | |
|---|---|---|
| Grid 1 **52.8 M4** | Grid 2 **58.0 M4** | Grid 3 **57.2 M4** |
| Grid 4 **54.0 M4** | Grid 5 **59.2 M4** | Grid 6 **58.3 M4** |
| Grid 7 **52.8 M4** | Grid 8 **58.4 M4** | Grid 9 **57.4 M4** |




0 dB = 59.2V/m

**Figure 38 HAC RF E-Field WCDMA Band V Channel 4132**

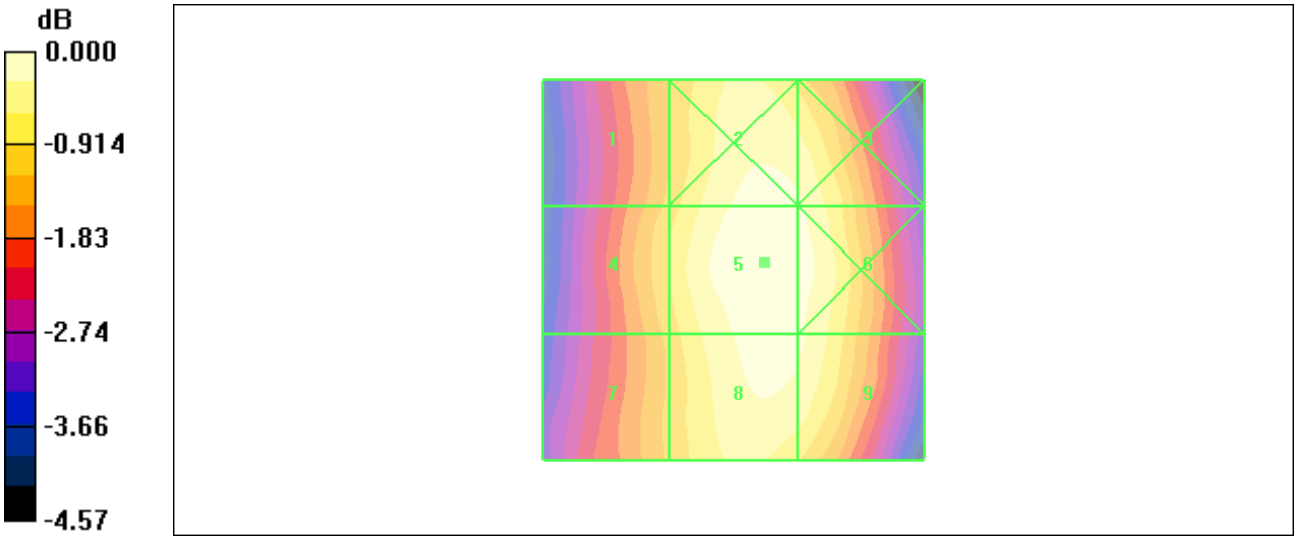
## HAC RF E-Field WCDMA Band V High (Battery 2)

Date/Time: 4/24/2012 12:37:09 AM
Communication System: WCDMA Band V; Frequency: 846.6 MHz;Duty Cycle: 1:1
Medium parameters used: $\sigma$ = 0 mho/m, $\varepsilon_r$ = 1; $\rho$ = 1000 kg/m$^3$
Ambient Temperature:22.3 ℃
Phantom section: RF Section
DASY4 Configuration:
Probe: ER3DV6 - SN2303; ConvF(1, 1, 1); Calibrated: 2/21/2012
Electronics: DAE4 Sn1317; Calibrated: 1/23/2012
Phantom: HAC Test Arch; Type: SD HAC P01 BA
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**E Scan - ER3D - 2007: 15 mm from Probe Center to the Device High/Hearing Aid Compatibility Test (101x101x1):** Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 66.2 V/m
Probe Modulation Factor = 1.03
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 81.4 V/m; Power Drift = -0.048 dB
**Hearing Aid Near-Field Category: M4 (AWF 0 dB)**

Peak E-field in V/m

| | | |
|---|---|---|
| Grid 1 **58.3 M4** | Grid 2 **65.3 M4** | Grid 3 **64.3 M4** |
| Grid 4 **59.7 M4** | Grid 5 **66.2 M4** | Grid 6 **65.2 M4** |
| Grid 7 **58.3 M4** | Grid 8 **65.1 M4** | Grid 9 **64.3 M4** |




0 dB = 66.2V/m

**Figure 39 HAC RF E-Field WCDMA Band V Channel 4233**

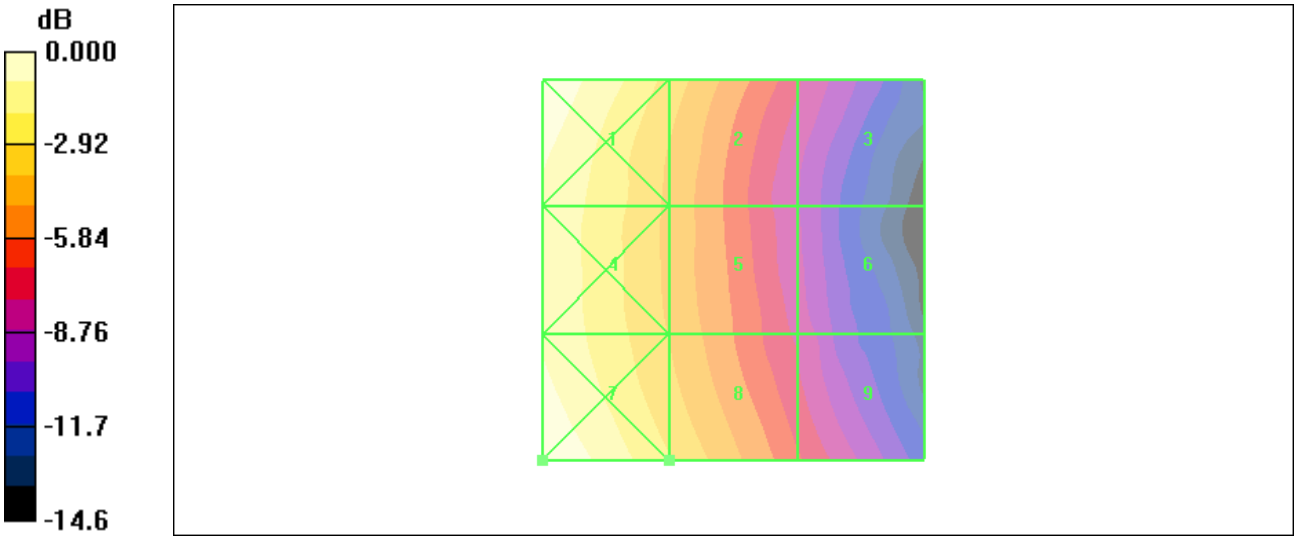
## HAC RF H-Field WCDMA Band V High (Battery 1)

Date/Time: 4/24/2012 4:33:08 AM
Communication System: WCDMA Band V; Frequency: 846.6 MHz;Duty Cycle: 1:1
Medium parameters used: $\sigma$ = 0 mho/m, $\varepsilon_r$ = 1; $\rho$ = 1 kg/$m^3$
Ambient Temperature:22.3 ℃
Phantom section: RF Section
DASY4 Configuration:
Probe: H3DV6 - SN6138; ; Calibrated: 2/21/2012
Electronics: DAE4 Sn1317; Calibrated: 1/23/2012
Phantom: HAC Test Arch; Type: SD HAC P01 BA
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**H Scan - H3DV6 - 2007: 15 mm from Probe Center to the Device High/Hearing Aid Compatibility Test (101x101x1):** Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 0.088 A/m
Probe Modulation Factor = 1.01
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 0.061 A/m; Power Drift = -0.008 dB
**Hearing Aid Near-Field Category: M4 (AWF 0 dB)**

Peak H-field in A/m

| | | |
|---|---|---|
| Grid 1 **0.120 M4** | Grid 2 **0.083 M4** | Grid 3 **0.050 M4** |
| Grid 4 **0.107 M4** | Grid 5 **0.077 M4** | Grid 6 **0.048 M4** |
| Grid 7 **0.121 M4** | Grid 8 **0.088 M4** | Grid 9 **0.056 M4** |




0 dB = 0.121A/m

**Figure 40 HAC RF H-Field WCDMA Band V Channel 4233**

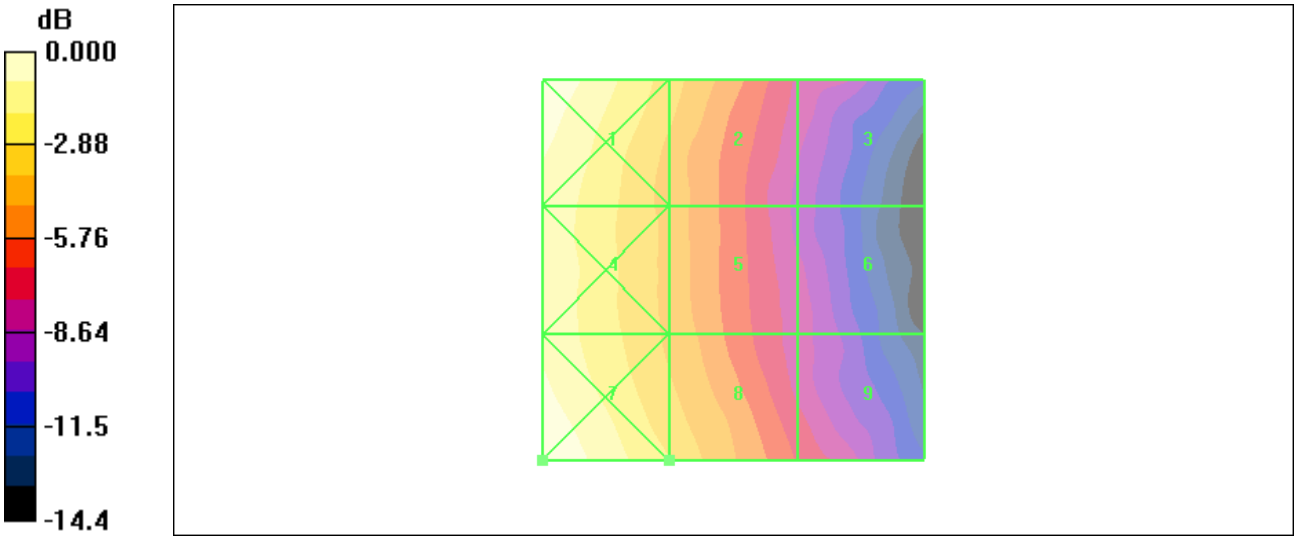
## HAC RF H-Field WCDMA Band V Middle (Battery 1)

Date/Time: 4/24/2012 4:39:16 AM
Communication System: WCDMA Band V; Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium parameters used: $\sigma$ = 0 mho/m, $\varepsilon_r$ = 1; $\rho$ = 1 kg/$m^3$
Ambient Temperature:22.3 ℃
Phantom section: RF Section
DASY4 Configuration:
Probe: H3DV6 - SN6138; ; Calibrated: 2/21/2012
Electronics: DAE4 Sn1317; Calibrated: 1/23/2012
Phantom: HAC Test Arch; Type: SD HAC P01 BA
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**H Scan - H3DV6 - 2007: 15 mm from Probe Center to the Device Middle/Hearing Aid Compatibility Test (101x101x1):** Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 0.073 A/m
Probe Modulation Factor = 1.01
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 0.050 A/m; Power Drift = 0.080 dB
**Hearing Aid Near-Field Category: M4 (AWF 0 dB)**

Peak H-field in A/m

| | | |
|---|---|---|
| Grid 1 **0.099 M4** | Grid 2 **0.069 M4** | Grid 3 **0.041 M4** |
| Grid 4 **0.088 M4** | Grid 5 **0.064 M4** | Grid 6 **0.040 M4** |
| Grid 7 **0.101 M4** | Grid 8 **0.073 M4** | Grid 9 **0.046 M4** |




0 dB = 0.101A/m

**Figure 41 HAC RF H-Field WCDMA Band V Channel 4183**

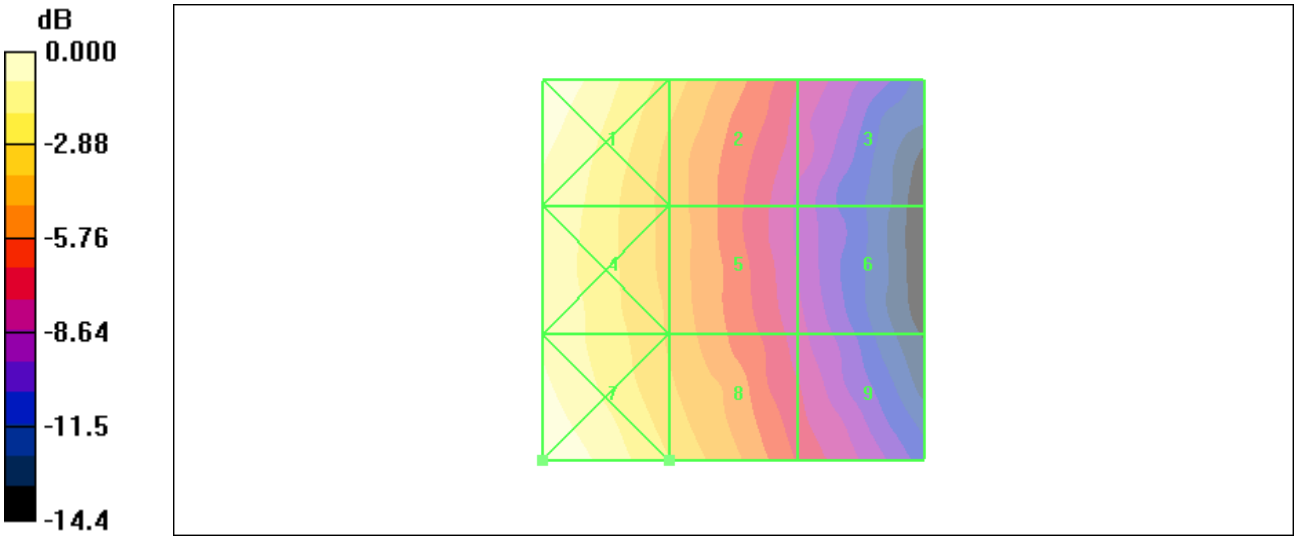
## HAC RF H-Field WCDMA Band V Low (Battery 1)

Date/Time: 4/24/2012 4:44:17 AM
Communication System: WCDMA Band V; Frequency: 826.4 MHz;Duty Cycle: 1:1
Medium parameters used: $\sigma$ = 0 mho/m, $\varepsilon_r$ = 1; $\rho$ = 1 kg/$m^3$
Ambient Temperature:22.3 ℃
Phantom section: RF Section
DASY4 Configuration:
Probe: H3DV6 - SN6138; ; Calibrated: 2/21/2012
Electronics: DAE4 Sn1317; Calibrated: 1/23/2012
Phantom: HAC Test Arch; Type: SD HAC P01 BA
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**H Scan - H3DV6 - 2007: 15 mm from Probe Center to the Device Low/Hearing Aid Compatibility Test (101x101x1):** Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 0.079 A/m
Probe Modulation Factor = 1.01
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 0.054 A/m; Power Drift = -0.028 dB
**Hearing Aid Near-Field Category: M4 (AWF 0 dB)**

Peak H-field in A/m

| | | |
|---|---|---|
| Grid 1 **0.109 M4** | Grid 2 **0.075 M4** | Grid 3 **0.046 M4** |
| Grid 4 **0.096 M4** | Grid 5 **0.069 M4** | Grid 6 **0.042 M4** |
| Grid 7 **0.109 M4** | Grid 8 **0.079 M4** | Grid 9 **0.050 M4** |




0 dB = 0.109A/m

**Figure 42 HAC RF H-Field WCDMA Band V Channel 4132**

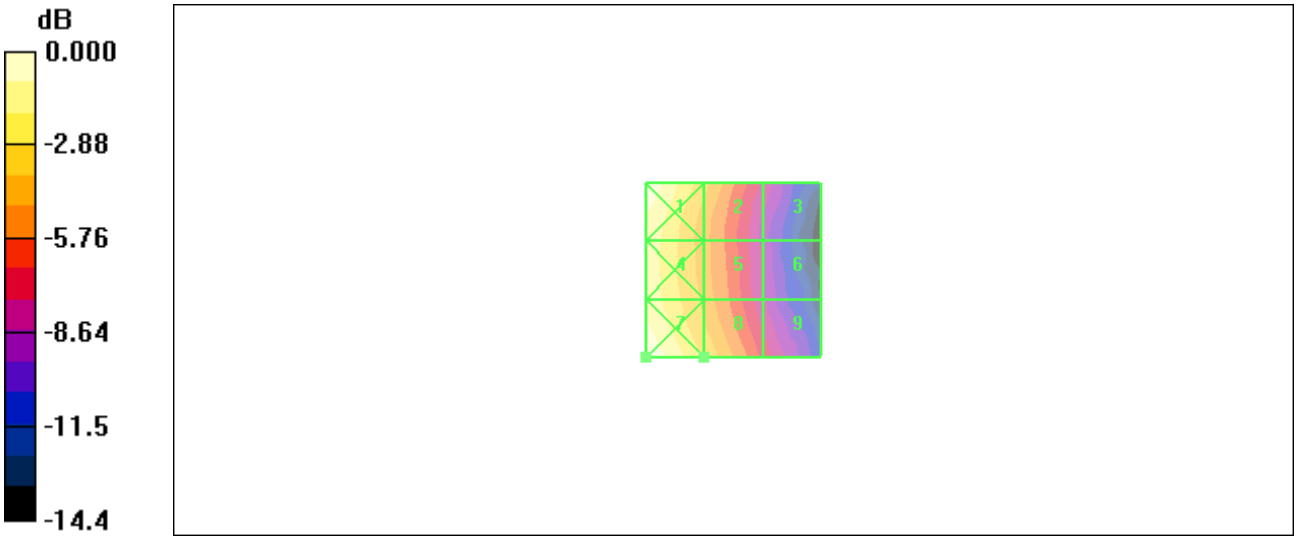
## HAC RF H-Field WCDMA Band V High (Battery 2)

Date/Time: 4/24/2012 7:07:21 AM
Communication System: WCDMA Band V; Frequency: 846.6 MHz;Duty Cycle: 1:1
Medium parameters used: $\sigma$ = 0 mho/m, $\varepsilon_r$ = 1; $\rho$ = 1 kg/$m^3$
Ambient Temperature:22.3 ℃
Phantom section: RF Section
DASY4 Configuration:
Probe: H3DV6 - SN6138; ; Calibrated: 2/21/2012
Electronics: DAE4 Sn1317; Calibrated: 1/23/2012
Phantom: HAC Test Arch; Type: SD HAC P01 BA
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**H Scan - H3DV6 - 2007: 15 mm from Probe Center to the Device High/Hearing Aid Compatibility Test (101x101x1):** Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 0.088 A/m
Probe Modulation Factor = 1.01
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 0.062 A/m; Power Drift = 0.063 dB
**Hearing Aid Near-Field Category: M4 (AWF 0 dB)**

Peak H-field in A/m

| | | |
|---|---|---|
| Grid 1 **0.123 M4** | Grid 2 **0.084 M4** | Grid 3 **0.050 M4** |
| Grid 4 **0.108 M4** | Grid 5 **0.078 M4** | Grid 6 **0.048 M4** |
| Grid 7 **0.125 M4** | Grid 8 **0.088 M4** | Grid 9 **0.056 M4** |




0 dB = 0.125A/m

**Figure 43 HAC RF H-Field WCDMA Band V Channel 4233**

# ANNEX C: E-Probe Calibration Certificate

**Calibration Laboratory of**
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

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Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

Client: TA Shanghai (Auden)

Certificate No: ER3-2303_Feb12

## CALIBRATION CERTIFICATE

Object: ER3DV6 - SN:2303

Calibration procedure(s): QA CAL-02.v6, QA CAL-25.v4
Calibration procedure for E-field probes optimized for close near field evaluations in air

Calibration date: February 21, 2012

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards | ID | Cal Date (Certificate No.) | Scheduled Calibration |
|---|---|---|---|
| Power meter E4419B | GB41293874 | 31-Mar-11 (No. 217-01372) | Apr-12 |
| Power sensor E4412A | MY41496087 | 31-Mar-11 (No. 217-01372) | Apr-12 |
| Reference 3 dB Attenuator | SN: S5054 (3c) | 29-Mar-11 (No. 217-01369) | Apr-12 |
| Reference 20 dB Attenuator | SN: S5086 (20b) | 29-Mar-11 (No. 217-01367) | Apr-12 |
| Reference 30 dB Attenuator | SN: S5129 (30b) | 29-Mar-11 (No. 217-01370) | Apr-12 |
| Reference Probe ER3DV6 | SN: 2328 | 11-Oct-11 (No. ER3-2328_Oct11) | Oct-12 |
| DAE4 | SN: 789 | 30-Jan-12 (No. DAE4-789_Jan12) | Jan-13 |
| | | | |
| Secondary Standards | ID | Check Date (in house) | Scheduled Check |
| RF generator HP 8648C | US3642U01700 | 4-Aug-99 (in house check Apr-11) | In house check: Apr-13 |
| Network Analyzer HP 8753E | US37390585 | 18-Oct-01 (in house check Oct-11) | In house check: Oct-12 |

| | Name | Function | Signature |
|---|---|---|---|
| Calibrated by: | Claudio Leubler | Laboratory Technician | |
| Approved by: | Katja Pokovic | Technical Manager | |

Issued: February 22, 2012

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

**Calibration Laboratory of**
Schmid & Partner
Engineering AG
**Zeughausstrasse 43, 8004 Zurich, Switzerland**

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Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS) **Accreditation No.: SCS 108**
**The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates**

## Glossary:

| | |
|---|---|
| NORMx,y,z | sensitivity in free space |
| DCP | diode compression point |
| CF | crest factor (1/duty_cycle) of the RF signal |
| A, B, C | modulation dependent linearization parameters |
| Polarization φ | φ rotation around probe axis |
| Polarization ϑ | ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., ϑ = 0 is normal to probe axis |
| Connector Angle | information used in DASY system to align probe sensor X to the robot coordinate system |

## Calibration is Performed According to the Following Standards:

a) IEEE Std 1309-2005, " IEEE Standard for calibration of electromagnetic field sensors and probes, excluding antennas, from 9 kHz to 40 GHz", December 2005.

## Methods Applied and Interpretation of Parameters:

- *NORMx,y,z:* Assessed for E-field polarization ϑ = 0 for XY sensors and ϑ = 90 for Z sensor (f ≤ 900 MHz in TEM-cell; f > 1800 MHz: R22 waveguide).
- *NORM(f)x,y,z = NORMx,y,z * frequency_response* (see Frequency Response Chart).
- *DCPx,y,z:* DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- *PAR:* PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- *Ax,y,z; Bx,y,z; Cx,y,z, VRx,y,z: A, B, C* are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. *VR* is the maximum calibration range expressed in RMS voltage across the diode.
- *Spherical isotropy (3D deviation from isotropy)*: in a locally homogeneous field realized using an open waveguide setup.
- *Sensor Offset*: The sensor offset corresponds to the offset of virtual measurement center from the probe-tip (on probe axis). No tolerance required.
- *Connector Angle*: The angle is assessed using the information gained by determining the *NORMx* (no uncertainty required).

# Probe ER3DV6

## SN:2303

Manufactured: November 6, 2002
Calibrated: February 21, 2012

Calibrated for DASY/EASY Systems
(Note: non-compatible with DASY2 system!)

ER3DV6– SN:2303 February 21, 2012

# DASY/EASY - Parameters of Probe: ER3DV6 - SN:2303

## Basic Calibration Parameters

| | Sensor X | Sensor Y | Sensor Z | Unc (k=2) |
|---|---|---|---|---|
| Norm ($\mu V/(V/m)^2$) | 1.40 | 1.42 | 1.43 | ± 10.1 % |
| DCP (mV)[B] | 100.7 | 99.2 | 104.7 | |

## Modulation Calibration Parameters

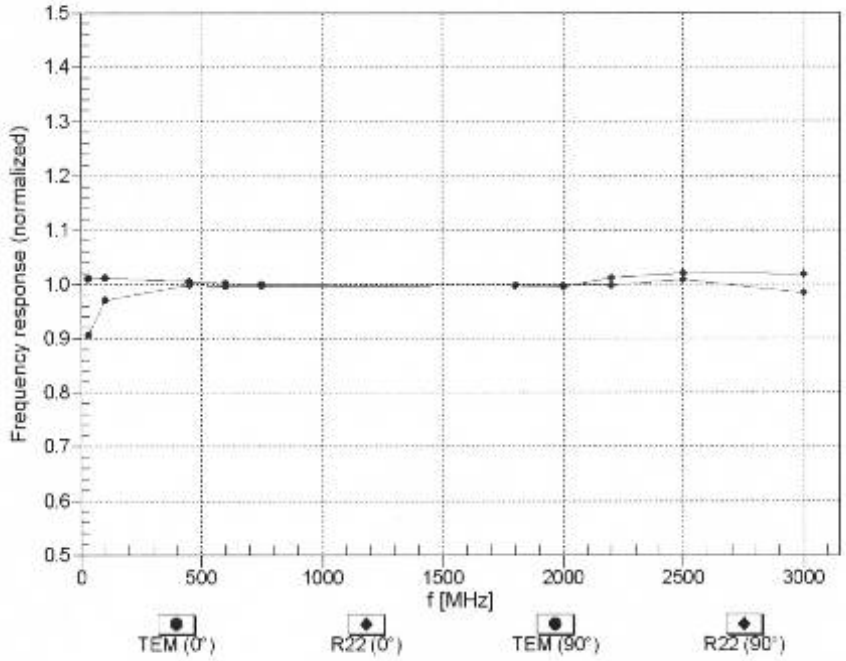
| UID | Communication System Name | PAR | | A dB | B dB | C dB | VR mV | Unc[E] (k=2) |
|---|---|---|---|---|---|---|---|---|
| 10000 | CW | 0.00 | X | 0.00 | 0.00 | 1.00 | 111.4 | ±3.0 % |
| | | | Y | 0.00 | 0.00 | 1.00 | 139.9 | |
| | | | Z | 0.00 | 0.00 | 1.00 | 133.1 | |

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

[B] Numerical linearization parameter: uncertainty not required.
[E] Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

ER3DV6– SN:2303 February 21, 2012

## Frequency Response of E-Field
(TEM-Cell:ifi110 EXX, Waveguide: R22)

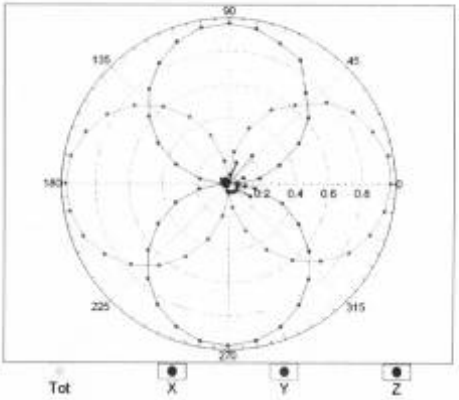



Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

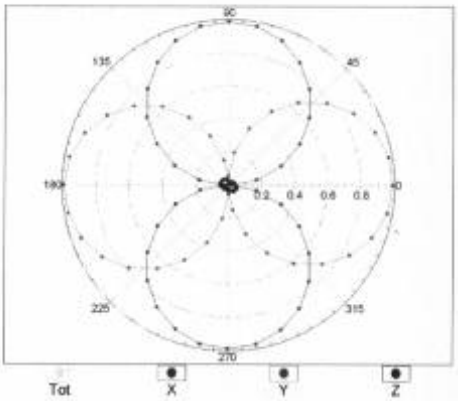
ER3DV6– SN:2303 February 21, 2012

## Receiving Pattern (ϕ), ϑ = 0°

f=600 MHz,TEM,0°

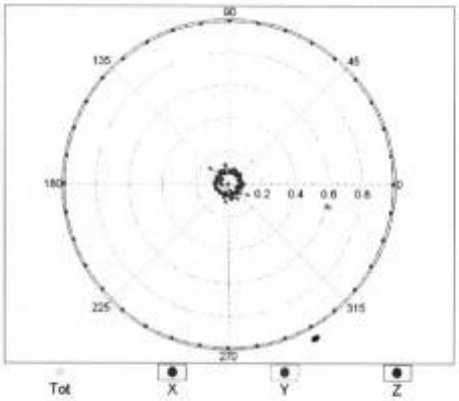



f=2500 MHz,R22,0°

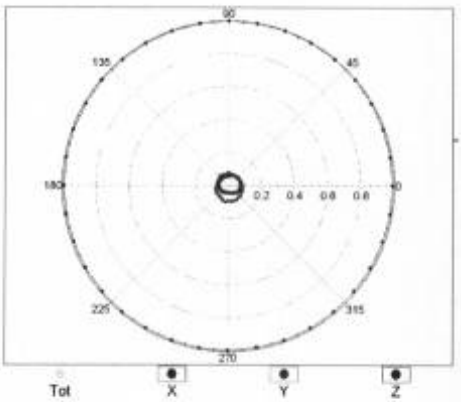



## Receiving Pattern (ϕ), ϑ = 90°

f=600 MHz,TEM,90°

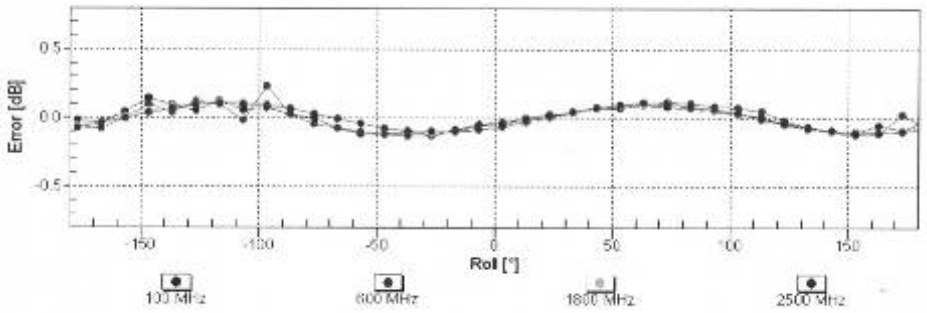



f=2500 MHz,R22,90°



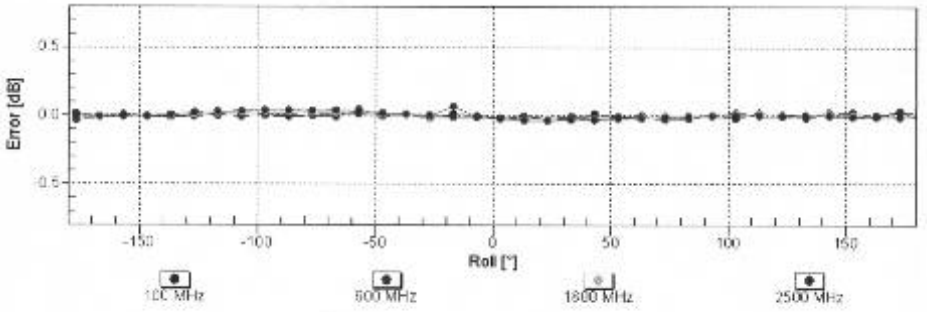
ER3DV6– SN:2303 February 21, 2012

## Receiving Pattern (ϕ), ϑ = 0°




**Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)**

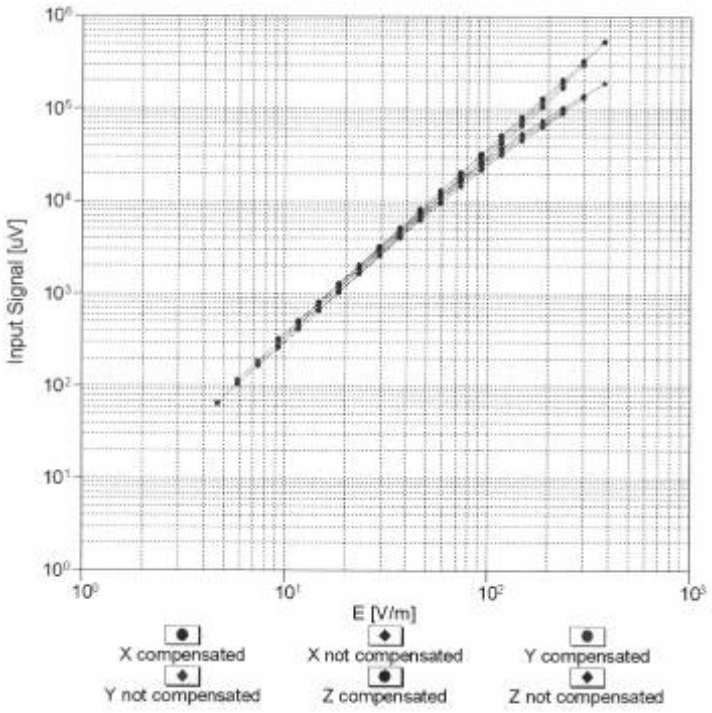
## Receiving Pattern (ϕ), ϑ = 90°

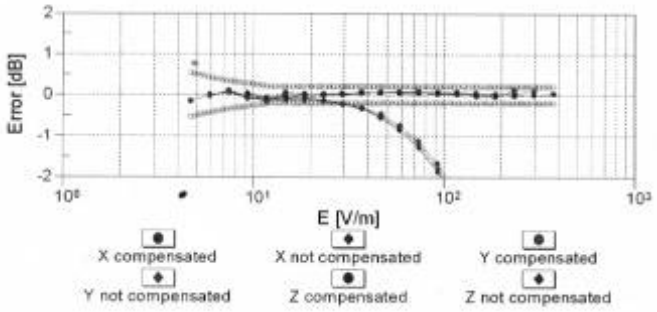



**Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)**

ER3DV6– SN:2303 February 21, 2012

## Dynamic Range f(E-field)
(TEM cell , f = 900 MHz)



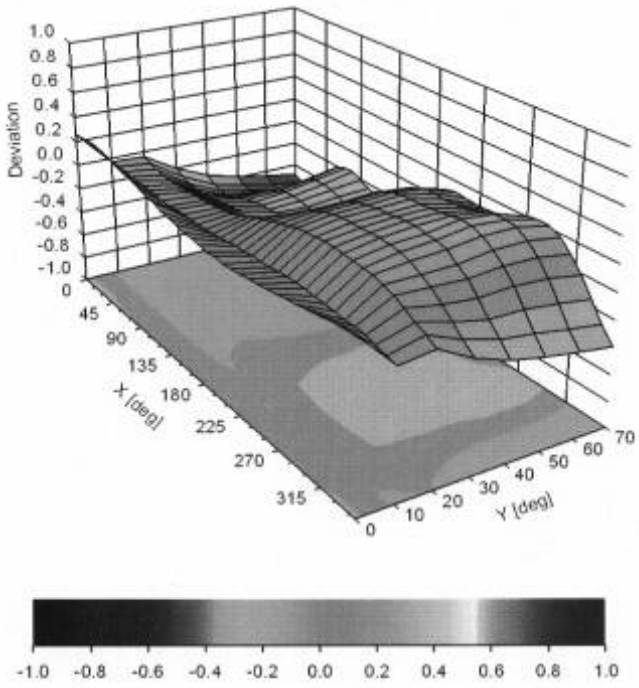




**Uncertainty of Linearity Assessment: ± 0.6% (k=2)**

ER3DV6- SN:2303 February 21, 2012

## Deviation from Isotropy in Air

**Error (ϕ, ϑ), f = 900 MHz**







**Uncertainty of Spherical Isotropy Assessment: ± 2.6% (k=2)**

# DASY/EASY - Parameters of Probe: ER3DV6 - SN:2303

## Other Probe Parameters

| | |
|---|---|
| Sensor Arrangement | Rectangular |
| Connector Angle (°) | -156.8 |
| Mechanical Surface Detection Mode | enabled |
| Optical Surface Detection Mode | disabled |
| Probe Overall Length | 337 mm |
| Probe Body Diameter | 10 mm |
| Tip Length | 10 mm |
| Tip Diameter | 8 mm |
| Probe Tip to Sensor X Calibration Point | 2.5 mm |
| Probe Tip to Sensor Y Calibration Point | 2.5 mm |
| Probe Tip to Sensor Z Calibration Point | 2.5 mm |

# ANNEX D: H-Probe Calibration Certificate

**Calibration Laboratory of**
Schmid & Partner
Engineering AG
**Zeughausstrasse 43, 8004 Zurich, Switzerland**

S C S Schweizerischer Kalibrierdienst
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**Accreditation No.: SCS 108**

**Client** TA Shanghai (Auden)

**Certificate No: H3-6138_Feb12**

## CALIBRATION CERTIFICATE

Object: H3DV6 - SN:6138

Calibration procedure(s): QA CAL-03.v6, QA CAL-25.v4
Calibration procedure for H-field probes optimized for close near field evaluations in air

Calibration date: February 21, 2012

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards | ID | Cal Date (Certificate No.) | Scheduled Calibration |
|---|---|---|---|
| Power meter E4419B | GB41293874 | 31-Mar-11 (No. 217-01372) | Apr-12 |
| Power sensor E4412A | MY41498087 | 31-Mar-11 (No. 217-01372) | Apr-12 |
| Reference 3 dB Attenuator | SN: S5054 (3c) | 29-Mar-11 (No. 217-01369) | Apr-12 |
| Reference 20 dB Attenuator | SN: S5086 (20b) | 29-Mar-11 (No. 217-01367) | Apr-12 |
| Reference 30 dB Attenuator | SN: S5129 (30b) | 29-Mar-11 (No. 217-01370) | Apr-12 |
| Reference Probe H3DV6 | SN: 6182 | 11-Oct-11 (No. H3-6182_Oct11) | Oct-12 |
| DAE4 | SN: 789 | 30-Jan-12 (No. DAE4-789_Jan12) | Jan-13 |
| | | | |
| Secondary Standards | ID | Check Date (in house) | Scheduled Check |
| RF generator HP 8648C | US3642U01700 | 4-Aug-99 (in house check Apr-11) | In house check: Apr-13 |
| Network Analyzer HP 8753E | US37390585 | 18-Oct-01 (in house check Oct-11) | In house check: Oct-12 |

| | Name | Function | Signature |
|---|---|---|---|
| Calibrated by: | Claudio Leubler | Laboratory Technician | |
| Approved by: | Katja Pokovic | Technical Manager | |

Issued: February 23, 2012

**Calibration Laboratory of**
Schmid & Partner
Engineering AG
**Zeughausstrasse 43, 8004 Zurich, Switzerland**

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Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
**The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates**

**Accreditation No.: SCS 108**

## Glossary:

| | |
|---|---|
| NORMx,y,z | sensitivity in free space |
| DCP | diode compression point |
| CF | crest factor (1/duty_cycle) of the RF signal |
| A, B, C | modulation dependent linearization parameters |
| Polarization φ | φ rotation around probe axis |
| Polarization ϑ | ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., ϑ = 0 is normal to probe axis |
| Connector Angle | information used in DASY system to align probe sensor X to the robot coordinate system |

## Calibration is Performed According to the Following Standards:

a) IEEE Std 1309-2005, " IEEE Standard for calibration of electromagnetic field sensors and probes, excluding antennas, from 9 kHz to 40 GHz", December 2005.

## Methods Applied and Interpretation of Parameters:

- *NORMx,y,z:* Assessed for E-field polarization ϑ = 0 for XY sensors and ϑ = 90 for Z sensor (f ≤ 900 MHz in TEM-cell; f > 1800 MHz: R22 waveguide).
- *X,Y,Z(f)_a0a1a2= X,Y,Z_a0a1a2* frequency_response* (see Frequency Response Chart).
- *DCPx,y,z:* DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- *PAR:* PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- *Ax,y,z; Bx,y,z; Cx,y,z, VRx,y,z: A, B, C* are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. *VR* is the maximum calibration range expressed in RMS voltage across the diode.
- *Spherical isotropy (3D deviation from isotropy)*: in a locally homogeneous field realized using an open waveguide setup.
- *Sensor Offset*: The sensor offset corresponds to the offset of virtual measurement center from the probe.tip (on probe axis). No tolerance required.
- *Connector Angle*: The angle is assessed using the information gained by determining the *X_a0a1a2* (no uncertainty required).

# Probe H3DV6

## SN:6138

Manufactured: July 3, 2002
Calibrated: February 21, 2012

Calibrated for DASY/EASY Systems
(Note: non-compatible with DASY2 system!)

# DASY/EASY - Parameters of Probe: H3DV6 - SN:6138

## Basic Calibration Parameters

| | | Sensor X | Sensor Y | Sensor Z | Unc (k=2) |
|---|---|---|---|---|---|
| Norm (A/m / √(mV)) | a0 | 2.73E-003 | 2.93E-003 | 3.18E-003 | ± 5.1 % |
| Norm (A/m / √(mV)) | a1 | -5.89E-005 | -2.38E-004 | -2.18E-004 | ± 5.1 % |
| Norm (A/m / √(mV)) | a2 | -5.50E-006 | -3.95E-006 | -8.28E-007 | ± 5.1 % |
| DCP (mV)[B] | | 93.5 | 92.1 | 94.8 | |

## Modulation Calibration Parameters

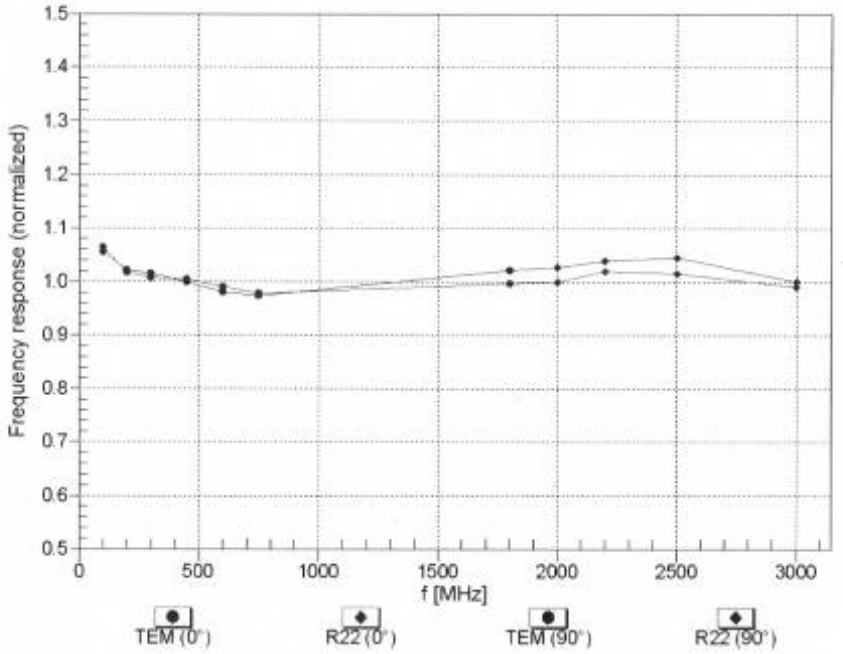
| UID | Communication System Name | PAR | | A dB | B dB | C dB | VR mV | Unc[E] (k=2) |
|---|---|---|---|---|---|---|---|---|
| 10000 | CW | 0.00 | X | 0.00 | 0.00 | 1.00 | 130.7 | ±3.3 % |
| | | | Y | 0.00 | 0.00 | 1.00 | 125.5 | |
| | | | Z | 0.00 | 0.00 | 1.00 | 133.0 | |

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

[B] Numerical linearization parameter: uncertainty not required.
[E] Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

H3DV6– SN:6138 February 21, 2012

## Frequency Response of H-Field
(TEM-Cell:ifi110 EXX, Waveguide: R22)

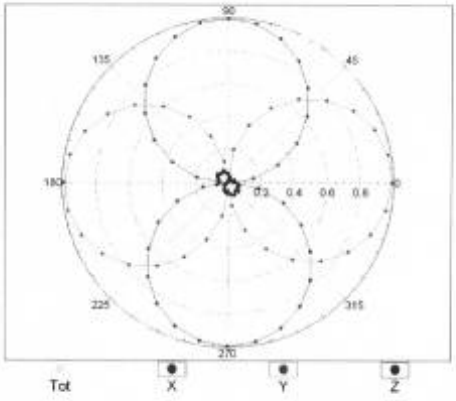



**Uncertainty of Frequency Response of H-field: ± 6.3% (k=2)**

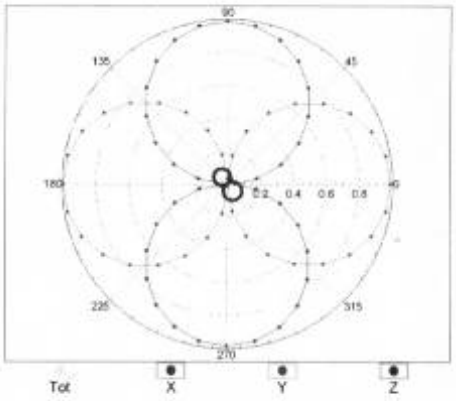
H3DV6– SN:6138 February 21, 2012

## Receiving Pattern (ϕ), ϑ = 0°

f=600 MHz,TEM,0°

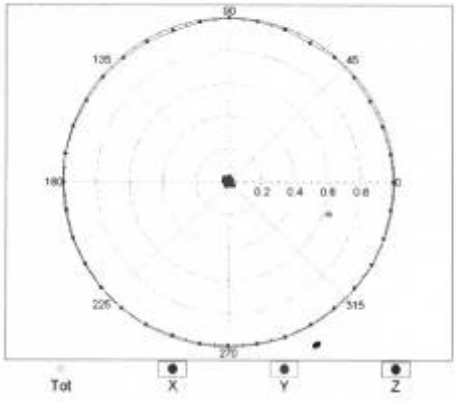



f=2500 MHz,R22,0°

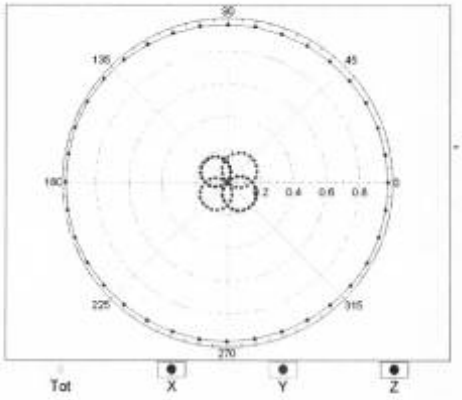



## Receiving Pattern (ϕ), ϑ = 90°

f=600 MHz,TEM,90°

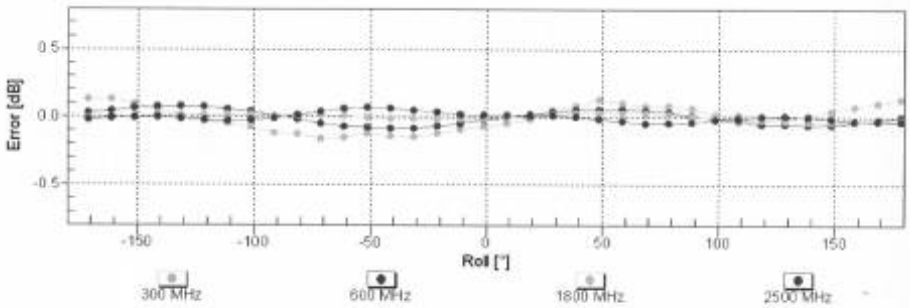



f=2500 MHz,R22,90°



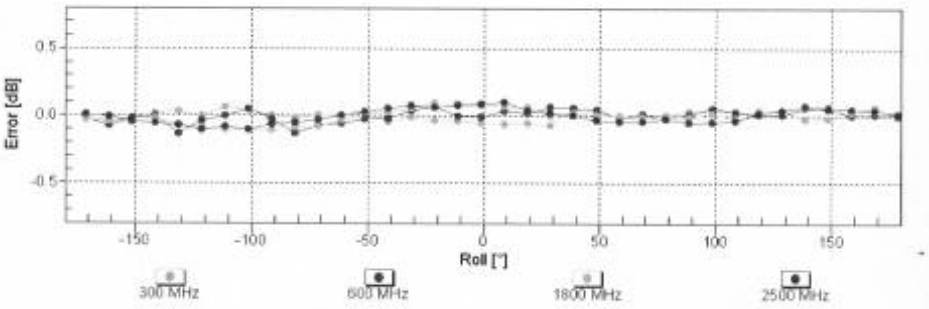
H3DV6– SN:6138 February 21, 2012

## Receiving Pattern (ϕ), ϑ = 0°




**Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)**

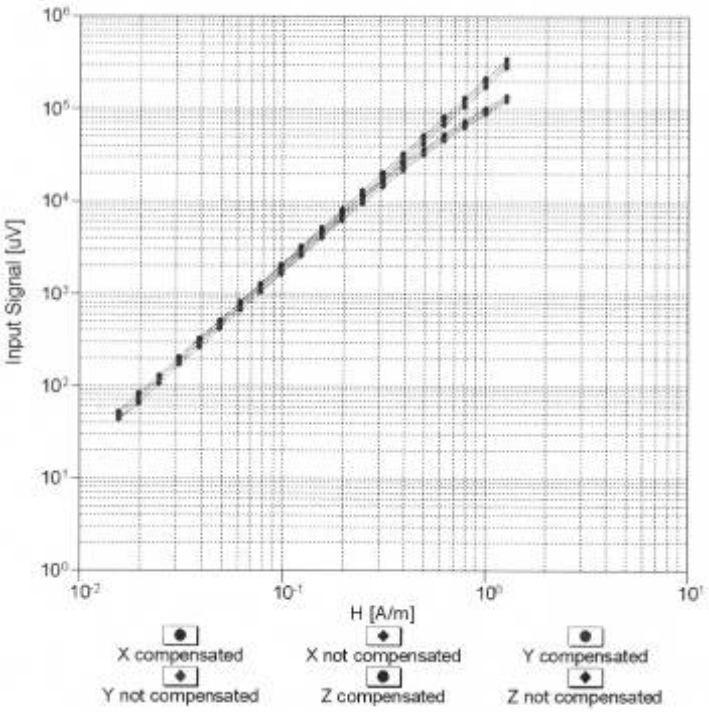
## Receiving Pattern (ϕ), ϑ = 90°

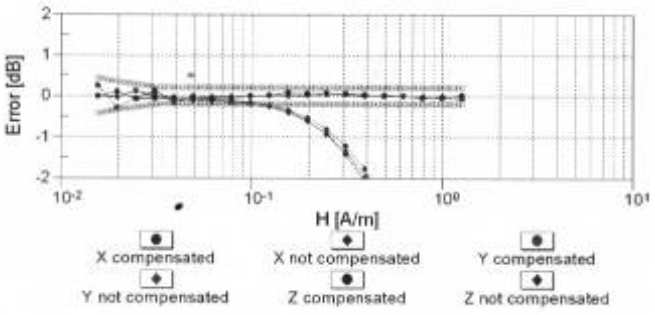



**Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)**

H3DV6– SN:6138 February 21, 2012

## Dynamic Range f(H-field)
(TEM cell, f = 900 MHz)



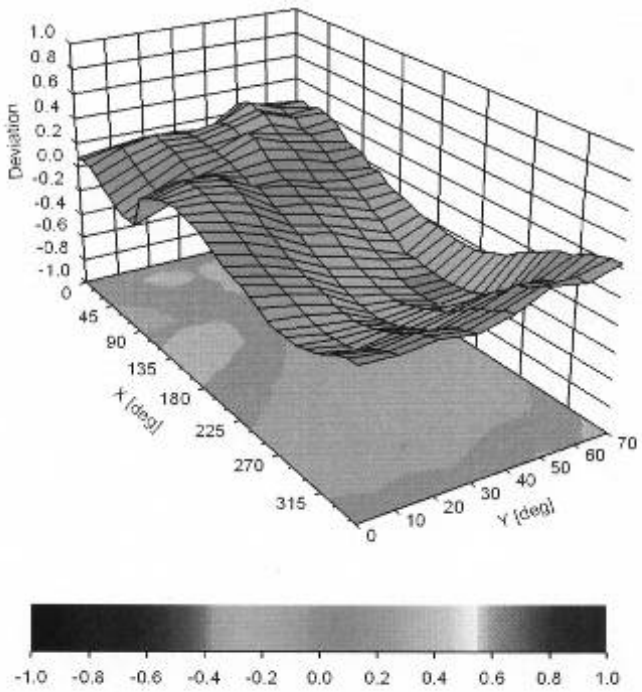




**Uncertainty of Linearity Assessment: ± 0.6% (k=2)**

H3DV6– SN:6138 February 21, 2012

## Deviation from Isotropy in Air

**Error ($\phi$, $\vartheta$), f = 900 MHz**







**Uncertainty of Spherical Isotropy Assessment: ± 2.6% (k=2)**

# DASY/EASY - Parameters of Probe: H3DV6 - SN:6138

**Other Probe Parameters**

| | |
|---|---|
| Sensor Arrangement | Rectangular |
| Connector Angle (°) | 168.6 |
| Mechanical Surface Detection Mode | enabled |
| Optical Surface Detection Mode | disabled |
| Probe Overall Length | 337 mm |
| Probe Body Diameter | 10 mm |
| Tip Length | 20 mm |
| Tip Diameter | 6 mm |
| Probe Tip to Sensor X Calibration Point | 3 mm |
| Probe Tip to Sensor Y Calibration Point | 3 mm |
| Probe Tip to Sensor Z Calibration Point | 3 mm |

# ANNEX E: CD835V3 Dipole Calibration Certificate

**Calibration Laboratory of**
Schmid & Partner
Engineering AG
**Zeughausstrasse 43, 8004 Zurich, Switzerland**

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
**The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates**

**Accreditation No.: SCS 108**

Client **TA Shanghai (Auden)**

**Certificate No: CD835V3-1133_Feb12**

## CALIBRATION CERTIFICATE

Object: CD835V3 - SN: 1133

Calibration procedure(s): QA CAL-20.v6
Calibration procedure for dipoles in air

Calibration date: February 21, 2012

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards | ID # | Cal Date (Certificate No.) | Scheduled Calibration |
|---|---|---|---|
| Power meter EPM-442A | GB37480704 | 05-Oct-11 (No. 217-01451) | Oct-12 |
| Power sensor HP 8481A | US37292783 | 05-Oct-11 (No. 217-01451) | Oct-12 |
| Probe ER3DV6 | SN: 2336 | 29-Dec-11 (No. ER3-2336_Dec11) | Dec-12 |
| Probe H3DV6 | SN: 6065 | 29-Dec-11 (No. H3-6065_Dec11) | Dec-12 |
| DAE4 | SN: 781 | 20-Apr-11 (No. DAE4-781_Apr11) | Apr-12 |

| Secondary Standards | ID # | Check Date (in house) | Scheduled Check |
|---|---|---|---|
| Power meter Agilent 4419B | SN: GB42420191 | 09-Oct-09 (in house check Oct-11) | In house check: Oct-12 |
| Power sensor HP 8482H | SN: 3318A09450 | 09-Oct-09 (in house check Oct-11) | In house check: Oct-12 |
| Power sensor HP 8482A | SN: US37295597 | 09-Oct-09 (in house check Oct-11) | In house check: Oct-12 |
| Network Analyzer HP 8753E | US37390585 | 18-Oct-01 (in house check Oct-11) | In house check: Oct-12 |
| RF generator E4433B | MY 41000675 | 03-Nov-04 (in house check Oct-11) | In house check: Oct-13 |

| | Name | Function | Signature |
|---|---|---|---|
| Calibrated by: | Dimce Iliev | Laboratory Technician | D. Iliev |
| Approved by: | Fin Bomholt | R&D Director | F. Bomholt |

Issued: February 22, 2012

**Calibration Laboratory of**
Schmid & Partner
Engineering AG
**Zeughausstrasse 43, 8004 Zurich, Switzerland**

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
**The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates**

**Accreditation No.: SCS 108**

**References**

[1] ANSI-C63.19-2007
American National Standard for Methods of Measurement of Compatibility between Wireless Communications Devices and Hearing Aids.

**Methods Applied and Interpretation of Parameters:**

- *Coordinate System:* y-axis is in the direction of the dipole arms. z-axis is from the basis of the antenna (mounted on the table) towards its feed point between the two dipole arms. x-axis is normal to the other axes. In coincidence with the standards [1], the measurement planes (probe sensor center) are selected to be at a distance of 10 mm above the top edge of the dipole arms.
- *Measurement Conditions:* Further details are available from the hardcopies at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated. The forward power to the dipole connector is set with a calibrated power meter connected and monitored with an auxiliary power meter connected to a directional coupler. While the dipole under test is connected, the forward power is adjusted to the same level.
- *Antenna Positioning:* The dipole is mounted on a HAC Test Arch phantom using the matching dipole positioner with the arms horizontal and the feeding cable coming from the floor. The measurements are performed in a shielded room with absorbers around the setup to reduce the reflections.
  It is verified before the mounting of the dipole under the Test Arch phantom, that its arms are perfectly in a line. It is installed on the HAC dipole positioner with its arms parallel below the dielectric reference wire and able to move elastically in vertical direction without changing its relative position to the top center of the Test Arch phantom. The vertical distance to the probe is adjusted after dipole mounting with a DASY5 Surface Check job. Before the measurement, the distance between phantom surface and probe tip is verified. The proper measurement distance is selected by choosing the matching section of the HAC Test Arch phantom with the proper device reference point (upper surface of the dipole) and the matching grid reference point (tip of the probe) considering the probe sensor offset. The vertical distance to the probe is essential for the accuracy.
- *Feed Point Impedance and Return Loss:* These parameters are measured using a HP 8753E Vector Network Analyzer. The impedance is specified at the SMA connector of the dipole. The influence of reflections was eliminating by applying the averaging function while moving the dipole in the air, at least 70cm away from any obstacles.
- *E-field distribution:* E field is measured in the x-y-plane with an isotropic ER3D-field probe with 100 mW forward power to the antenna feed point. In accordance with [1], the scan area is 20mm wide, its length exceeds the dipole arm length (180 or 90mm). The sensor center is 10 mm (in z) above the top of the dipole arms. Two 3D maxima are available near the end of the dipole arms. Assuming the dipole arms are perfectly in one line, the average of these two maxima (in subgrid 2 and subgrid 8) is determined to compensate for any non-parallelity to the measurement plane as well as the sensor displacement. The E-field value stated as calibration value represents the maximum of the interpolated 3D-E-field, 10mm above the dipole surface.
- *H-field distribution:* H-field is measured with an isotropic H-field probe with 100mW forward power to the antenna feed point, in the x-y-plane. The scan area and sensor distance is equivalent to the E-field scan. The maximum of the field is available at the center (subgrid 5) above the feed point. The H-field value stated as calibration value represents the maximum of the interpolated H-field, 10mm above the dipole surface at the feed point.

## Measurement Conditions

DASY system configuration, as far as not given on page 1.

| | | |
|---|---|---|
| **DASY Version** | DASY5 | V52.8.0 |
| **Extrapolation** | Advanced Extrapolation | |
| **Phantom** | HAC Test Arch | |
| **Distance Dipole Top - Probe Center** | 10mm | |
| **Scan resolution** | dx, dy = 5 mm | |
| **Frequency** | 835MHz ± 1 MHz | |
| **Input power drift** | < 0.05 dB | |

## Maximum Field values

| **H-field 10 mm above dipole surface** | condition | **interpolated maximum** |
|---|---|---|
| Maximum measured | 100 mW input power | **0.456 A / m ± 8.2 % (k=2)** |

| **E-field 10 mm above dipole surface** | condition | **Interpolated maximum** |
|---|---|---|
| Maximum measured above high end | 100 mW input power | 161.4 V / m |
| Maximum measured above low end | 100 mW input power | 160.0 V / m |
| Averaged maximum above arm | 100 mW input power | **160.7 V / m ± 12.8 % (k=2)** |

## Appendix

## Antenna Parameters

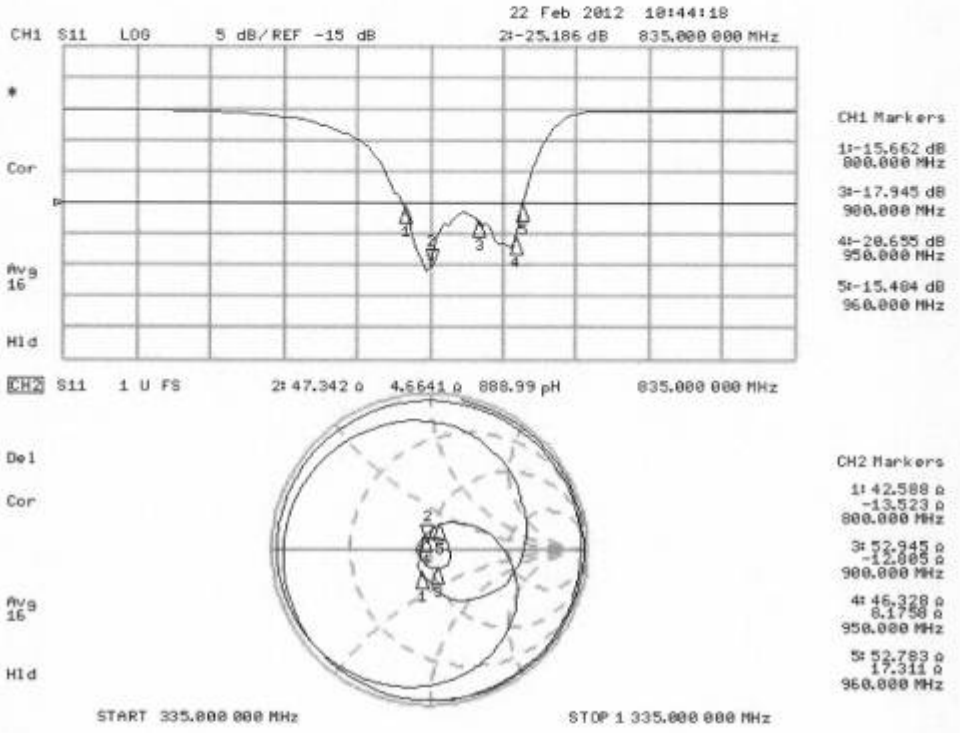
| **Frequency** | **Return Loss** | **Impedance** |
|---|---|---|
| 800 MHz | 15.7 dB | 42.6 Ω - 13.5 jΩ |
| 835 MHz | 25.2 dB | 47.3 Ω + 4.7 jΩ |
| 900 MHz | 17.9 dB | 52.9 Ω - 12.8 jΩ |
| 950 MHz | 20.7 dB | 46.3 Ω + 8.2 jΩ |
| 960 MHz | 15.5 dB | 52.8 Ω + 17.3 jΩ |

### 3.2 Antenna Design and Handling

The calibration dipole has a symmetric geometry with a built-in two stub matching network, which leads to the enhanced bandwidth.
The dipole is built of standard semirigid coaxial cable. The internal matching line is open ended. The antenna is therefore open for DC signals.
Do not apply force to dipole arms, as they are liable to bend. The soldered connections near the feedpoint may be damaged. After excessive mechanical stress or overheating, check the impedance characteristics to ensure that the internal matching network is not affected.

After long term use with 40W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

**Impedance Measurement Plot**



**DASY5 H-field Result**

Date: 21.02.2012

Test Laboratory: SPEAG Lab2

**DUT: HAC-Dipole 835 MHz; Type: CD835V3; Serial: CD835V3 - SN: 1133**

Communication System: CW; Frequency: 835 MHz
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m$^3$
Phantom section: RF Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

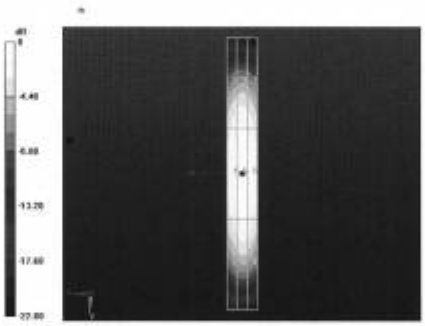
DASY52 Configuration:

- Probe: H3DV6 - SN6065; ; Calibrated: 29.12.2011
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn781; Calibrated: 20.04.2011
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA; Serial: 1070
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Dipole H-Field measurement @ 835MHz/H-Scan - 835MHz d=10mm/Hearing Aid Compatibility Test (41x361x1):** Measurement grid: dx=5mm, dy=5mm
Device Reference Point: 0, 0, -6.3 mm
Reference Value = 0.49 V/m; Power Drift = 0.00 dB
PMR not calibrated. PMF = 1.000 is applied.
H-field emissions = 0.46 A/m
**Near-field category: M4 (AWF 0 dB)**

PMF scaled H-field

| | | |
|---|---|---|
| Grid 1 **M4** **0.38 A/m** | Grid 2 **M4** **0.40 A/m** | Grid 3 **M4** **0.39 A/m** |
| Grid 4 **M4** **0.43 A/m** | Grid 5 **M4** **0.46 A/m** | Grid 6 **M4** **0.44 A/m** |
| Grid 7 **M4** **0.37 A/m** | Grid 8 **M4** **0.40 A/m** | Grid 9 **M4** **0.39 A/m** |



0 dB = 0.46A/m = -6.74 dB A/m

**DASY5 E-field Result**

Date: 21.02.2012

Test Laboratory: SPEAG Lab2

**DUT: HAC-Dipole 835 MHz; Type: CD835V3; Serial: CD835V3 - SN: 1133**

Communication System: CW; Frequency: 835 MHz
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1000$ kg/m$^3$
Phantom section: RF Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

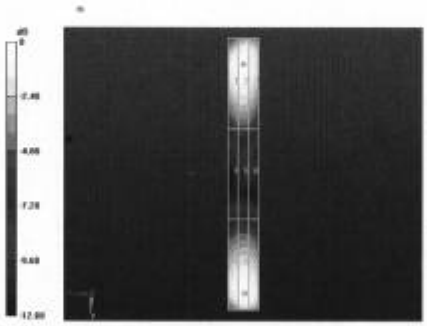
DASY52 Configuration:

- Probe: ER3DV6 - SN2336; ConvF(1, 1, 1); Calibrated: 29.12.2011
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn781; Calibrated: 20.04.2011
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA; Serial: 1070
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Dipole E-Field measurement @ 835MHz/E-Scan - 835MHz d=10mm/Hearing Aid Compatibility Test (41x361x1):** Measurement grid: dx=5mm, dy=5mm
Device Reference Point: 0, 0, -6.3 mm
Reference Value = 104.5 V/m; Power Drift = 0.00 dB
PMR not calibrated. PMF = 1.000 is applied.
E-field emissions = 161.4 V/m
**Near-field category: M4 (AWF 0 dB)**

PMF scaled E-field

| | | |
|---|---|---|
| Grid 1 **M4** **156.3 V/m** | Grid 2 **M4** **161.4 V/m** | Grid 3 **M4** **157.3 V/m** |
| Grid 4 **M4** **86.05 V/m** | Grid 5 **M4** **88.80 V/m** | Grid 6 **M4** **86.30 V/m** |
| Grid 7 **M4** **151.4 V/m** | Grid 8 **M4** **160.0 V/m** | Grid 9 **M4** **157.8 V/m** |



0 dB = 161.4V/m = 44.16 dB V/m

# ANNEX F: CD1880V3 Dipole Calibration Certificate

**Calibration Laboratory of**
Schmid & Partner
Engineering AG
**Zeughausstrasse 43, 8004 Zurich, Switzerland**

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Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
**The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates**

**Accreditation No.: SCS 108**

**Client** TA Shanghai (Auden)

**Certificate No: CD1880V3-1115_Feb12**

## CALIBRATION CERTIFICATE

| | |
|---|---|
| Object | CD1880V3 - SN: 1115 |
| Calibration procedure(s) | QA CAL-20.v6<br>Calibration procedure for dipoles in air |
| Calibration date: | February 21, 2012 |

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards | ID # | Cal Date (Certificate No.) | Scheduled Calibration |
|---|---|---|---|
| Power meter EPM-442A | GB37480704 | 05-Oct-11 (No. 217-01451) | Oct-12 |
| Power sensor HP 8481A | US37292783 | 05-Oct-11 (No. 217-01451) | Oct-12 |
| Probe ER3DV6 | SN: 2336 | 29-Dec-11 (No. ER3-2336_Dec11) | Dec-12 |
| Probe H3DV6 | SN: 6065 | 29-Dec-11 (No. H3-6065_Dec11) | Dec-12 |
| DAE4 | SN: 781 | 20-Apr-11 (No. DAE4-781_Apr11) | Apr-12 |

| Secondary Standards | ID # | Check Date (in house) | Scheduled Check |
|---|---|---|---|
| Power meter Agilent 4419B | SN: GB42420191 | 09-Oct-09 (in house check Oct-11) | In house check: Oct-12 |
| Power sensor HP 8482H | SN: 3318A09450 | 09-Oct-09 (in house check Oct-11) | In house check: Oct-12 |
| Power sensor HP 8482A | SN: US37295597 | 09-Oct-09 (in house check Oct-11) | In house check: Oct-12 |
| Network Analyzer HP 8753E | US37390585 | 18-Oct-01 (in house check Oct-11) | In house check: Oct-12 |
| RF generator E4433B | MY 41000675 | 03-Nov-04 (in house check Oct-11) | In house check: Oct-13 |

| | Name | Function | Signature |
|---|---|---|---|
| Calibrated by: | Dimce Iliev | Laboratory Technician | D. Iliev |
| Approved by: | Fin Bomholt | R&D Director | F. Bomholt |

Issued: February 22, 2012

**Calibration Laboratory of**
Schmid & Partner
Engineering AG
**Zeughausstrasse 43, 8004 Zurich, Switzerland**

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C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
**The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates**

**Accreditation No.: SCS 108**

**References**

[1] ANSI-C63.19-2007
American National Standard for Methods of Measurement of Compatibility between Wireless Communications Devices and Hearing Aids.

**Methods Applied and Interpretation of Parameters:**

- *Coordinate System:* y-axis is in the direction of the dipole arms. z-axis is from the basis of the antenna (mounted on the table) towards its feed point between the two dipole arms. x-axis is normal to the other axes. In coincidence with the standards [1], the measurement planes (probe sensor center) are selected to be at a distance of 10 mm above the top edge of the dipole arms.
- *Measurement Conditions:* Further details are available from the hardcopies at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated. The forward power to the dipole connector is set with a calibrated power meter connected and monitored with an auxiliary power meter connected to a directional coupler. While the dipole under test is connected, the forward power is adjusted to the same level.
- *Antenna Positioning:* The dipole is mounted on a HAC Test Arch phantom using the matching dipole positioner with the arms horizontal and the feeding cable coming from the floor. The measurements are performed in a shielded room with absorbers around the setup to reduce the reflections.
  It is verified before the mounting of the dipole under the Test Arch phantom, that its arms are perfectly in a line. It is installed on the HAC dipole positioner with its arms parallel below the dielectric reference wire and able to move elastically in vertical direction without changing its relative position to the top center of the Test Arch phantom. The vertical distance to the probe is adjusted after dipole mounting with a DASY5 Surface Check job. Before the measurement, the distance between phantom surface and probe tip is verified. The proper measurement distance is selected by choosing the matching section of the HAC Test Arch phantom with the proper device reference point (upper surface of the dipole) and the matching grid reference point (tip of the probe) considering the probe sensor offset. The vertical distance to the probe is essential for the accuracy.
- *Feed Point Impedance and Return Loss:* These parameters are measured using a HP 8753E Vector Network Analyzer. The impedance is specified at the SMA connector of the dipole. The influence of reflections was eliminating by applying the averaging function while moving the dipole in the air, at least 70cm away from any obstacles.
- *E-field distribution:* E field is measured in the x-y-plane with an isotropic ER3D-field probe with 100 mW forward power to the antenna feed point. In accordance with [1], the scan area is 20mm wide, its length exceeds the dipole arm length (180 or 90mm). The sensor center is 10 mm (in z) above the top of the dipole arms. Two 3D maxima are available near the end of the dipole arms. Assuming the dipole arms are perfectly in one line, the average of these two maxima (in subgrid 2 and subgrid 8) is determined to compensate for any non-parallelity to the measurement plane as well as the sensor displacement. The E-field value stated as calibration value represents the maximum of the interpolated 3D-E-field, 10mm above the dipole surface.
- *H-field distribution:* H-field is measured with an isotropic H-field probe with 100mW forward power to the antenna feed point, in the x-y-plane. The scan area and sensor distance is equivalent to the E-field scan. The maximum of the field is available at the center (subgrid 5) above the feed point. The H-field value stated as calibration value represents the maximum of the interpolated H-field, 10mm above the dipole surface at the feed point.

## Measurement Conditions

DASY system configuration, as far as not given on page 1.

| DASY Version | DASY5 | V52.8.0 |
|---|---|---|
| Extrapolation | Advanced Extrapolation | |
| Phantom | HAC Test Arch | |
| Distance Dipole Top - Probe Center | 10mm | |
| Scan resolution | dx, dy = 5 mm | |
| Frequency | 1880MHz ± 1 MHz | |
| Input power drift | < 0.05 dB | |

## Maximum Field values

| H-field 10 mm above dipole surface | condition | Interpolated maximum |
|---|---|---|
| Maximum measured | 100 mW input power | **0.473 A / m ± 8.2 % (k=2)** |

| E-field 10 mm above dipole surface | condition | Interpolated maximum |
|---|---|---|
| Maximum measured above high end | 100 mW input power | 143.4 V / m |
| Maximum measured above low end | 100 mW input power | 139.6 V / m |
| Averaged maximum above arm | 100 mW input power | **141.5 V / m ± 12.8 % (k=2)** |

## Appendix

## Antenna Parameters

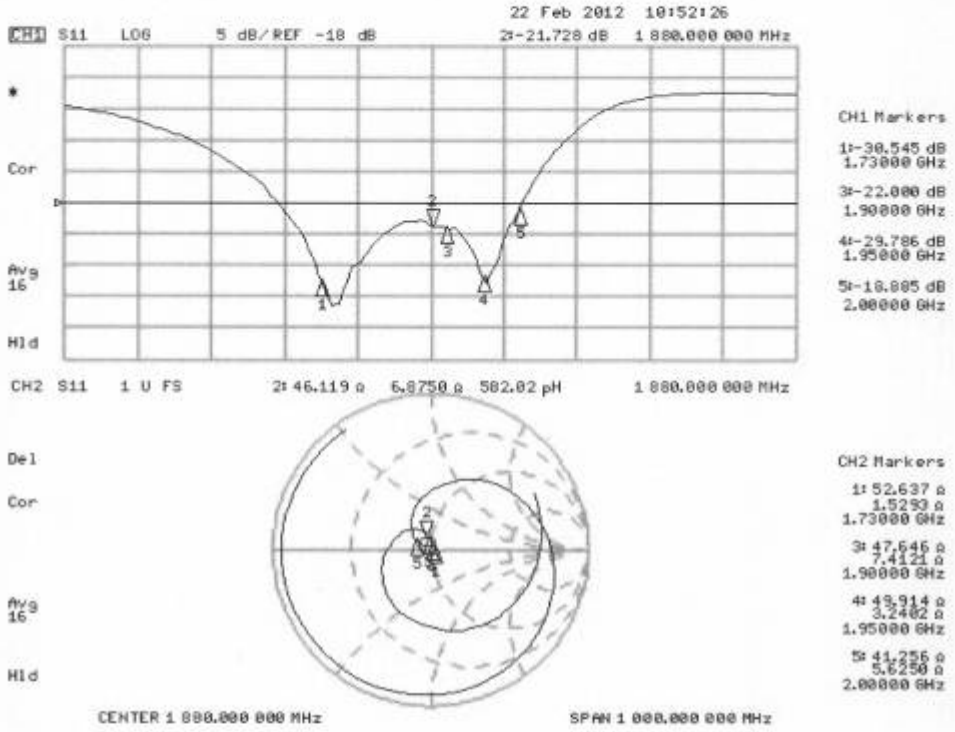
| Frequency | Return Loss | Impedance |
|---|---|---|
| 1730 MHz | 30.5 dB | 52.6 Ω + 1.5 jΩ |
| 1880 MHz | 21.7 dB | 46.1 Ω + 6.9 jΩ |
| 1900 MHz | 22.0 dB | 47.6 Ω + 7.4 jΩ |
| 1950 MHz | 29.8 dB | 49.9 Ω + 3.2 jΩ |
| 2000 MHz | 18.9 dB | 41.3 Ω + 5.6 jΩ |

### 3.2 Antenna Design and Handling

The calibration dipole has a symmetric geometry with a built-in two stub matching network, which leads to the enhanced bandwidth.
The dipole is built of standard semirigid coaxial cable. The internal matching line is open ended. The antenna is therefore open for DC signals.
Do not apply force to dipole arms, as they are liable to bend. The soldered connections near the feedpoint may be damaged. After excessive mechanical stress or overheating, check the impedance characteristics to ensure that the internal matching network is not affected.

After long term use with 40W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

**Impedance Measurement Plot**



**DASY5 H-field Result**

Date: 21.02.2012

Test Laboratory: SPEAG Lab2

**DUT: HAC Dipole 1880 MHz; Type: CD1880V3; Serial: CD1880V3 - SN: 1115**

Communication System: CW; Frequency: 1880 MHz
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m$^3$
Phantom section: RF Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

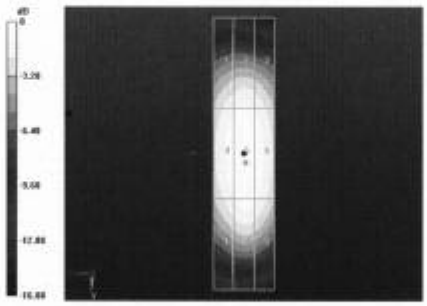
DASY52 Configuration:

- Probe: H3DV6 - SN6065; ; Calibrated: 29.12.2011
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn781; Calibrated: 20.04.2011
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA; Serial: 1070
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Dipole H-Field measurement @ 1880MHz/H-Scan - 1880MHz d=10mm/Hearing Aid Compatibility Test (41x181x1):** Measurement grid: dx=5mm, dy=5mm
Device Reference Point: 0, 0, -6.3 mm
Reference Value = 0.50 V/m; Power Drift = -0.01 dB
PMR not calibrated. PMF = 1.000 is applied.
H-field emissions = 0.47 A/m
**Near-field category: M2 (AWF 0 dB)**

PMF scaled H-field

| | | |
|---|---|---|
| Grid 1 **M2** **0.40 A/m** | Grid 2 **M2** **0.43 A/m** | Grid 3 **M2** **0.41 A/m** |
| Grid 4 **M2** **0.45 A/m** | Grid 5 **M2** **0.47 A/m** | Grid 6 **M2** **0.46 A/m** |
| Grid 7 **M2** **0.41 A/m** | Grid 8 **M2** **0.44 A/m** | Grid 9 **M2** **0.42 A/m** |



0 dB = 0.47A/m = -6.56 dB A/m

**DASY5 E-field Result**

Date: 21.02.2012

Test Laboratory: SPEAG Lab2

**DUT: HAC Dipole 1880 MHz; Type: CD1880V3; Serial: CD1880V3 - SN: 1115**

Communication System: CW; Frequency: 1880 MHz
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1000$ kg/m$^3$
Phantom section: RF Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

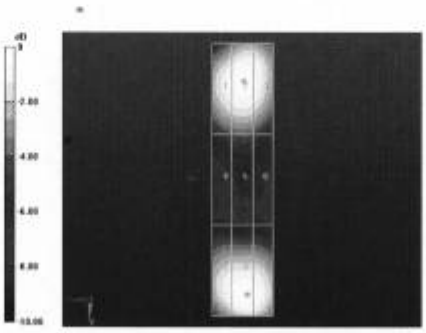
DASY52 Configuration:

- Probe: ER3DV6 - SN2336; ConvF(1, 1, 1); Calibrated: 29.12.2011
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn781; Calibrated: 20.04.2011
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA; Serial: 1070
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

**Dipole E-Field measurement @ 1880MHz/E-Scan - 1880MHz d=10mm/Hearing Aid Compatibility Test (41x181x1):** Measurement grid: dx=5mm, dy=5mm
Device Reference Point: 0, 0, -6.3 mm
Reference Value = 161.1 V/m; Power Drift = -0.01 dB
PMR not calibrated. PMF = 1.000 is applied.
E-field emissions = 143.4 V/m
**Near-field category: M2 (AWF 0 dB)**

PMF scaled E-field

| | | |
|---|---|---|
| Grid 1 **M2** **134.3 V/m** | Grid 2 **M2** **139.6 V/m** | Grid 3 **M2** **136.5 V/m** |
| Grid 4 **M3** **90.34 V/m** | Grid 5 **M3** **93.17 V/m** | Grid 6 **M3** **89.93 V/m** |
| Grid 7 **M2** **134.3 V/m** | Grid 8 **M2** **143.4 V/m** | Grid 9 **M2** **141.8 V/m** |



0 dB = 143.4V/m = 43.13 dB V/m

# ANNEX G: DAE4 Calibration Certificate

**Calibration Laboratory of**
Schmid & Partner
Engineering AG
**Zeughausstrasse 43, 8004 Zurich, Switzerland**

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
**The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates**

Accreditation No.: **SCS 108**

Client **TA Shanghai (Auden)** Certificate No: **DAE4-1317_Jan12**

## CALIBRATION CERTIFICATE

| | |
|---|---|
| Object | DAE4 - SD 000 D04 BJ - SN: 1317 |
| Calibration procedure(s) | QA CAL-06.v24<br>Calibration procedure for the data acquisition electronics (DAE) |
| Calibration date: | January 23, 2012 |

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards | ID # | Cal Date (Certificate No.) | Scheduled Calibration |
|---|---|---|---|
| Keithley Multimeter Type 2001 | SN: 0810278 | 28-Sep-11 (No:11450) | Sep-12 |
| **Secondary Standards** | **ID #** | **Check Date (in house)** | **Scheduled Check** |
| Calibrator Box V2.1 | SE UWS 053 AA 1001 | 05-Jan-12 (in house check) | In house check: Jan-13 |

| | Name | Function | Signature |
|---|---|---|---|
| Calibrated by: | Dominique Steffen | Technician | |
| Approved by: | Fin Bomholt | R&D Director | |

Issued: January 23, 2012

**Calibration Laboratory of**
Schmid & Partner
Engineering AG
**Zeughausstrasse 43, 8004 Zurich, Switzerland**

S Schweizerischer Kalibrierdienst
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Accreditation No.: **SCS 108**

**Glossary**

| | |
|---|---|
| DAE | data acquisition electronics |
| Connector angle | information used in DASY system to align probe sensor X to the robot coordinate system. |

**Methods Applied and Interpretation of Parameters**

- *DC Voltage Measurement:* Calibration Factor assessed for use in DASY system by comparison with a calibrated instrument traceable to national standards. The figure given corresponds to the full scale range of the voltmeter in the respective range.
- *Connector angle*: The angle of the connector is assessed measuring the angle mechanically by a tool inserted. Uncertainty is not required.
- The following parameters as documented in the Appendix contain technical information as a result from the performance test and require no uncertainty.
  - *DC Voltage Measurement Linearity:* Verification of the Linearity at +10% and -10% of the nominal calibration voltage. Influence of offset voltage is included in this measurement.
  - *Common mode sensitivity:* Influence of a positive or negative common mode voltage on the differential measurement.
  - *Channel separation:* Influence of a voltage on the neighbor channels not subject to an input voltage.
  - *AD Converter Values with inputs shorted:* Values on the internal AD converter corresponding to zero input voltage
  - *Input Offset Measurement*: Output voltage and statistical results over a large number of zero voltage measurements.
  - *Input Offset Current:* Typical value for information; Maximum channel input offset current, not considering the input resistance.
  - *Input resistance:* Typical value for information: DAE input resistance at the connector, during internal auto-zeroing and during measurement.
  - *Low Battery Alarm Voltage:* Typical value for information. Below this voltage, a battery alarm signal is generated.
  - *Power consumption:* Typical value for information. Supply currents in various operating modes.

## DC Voltage Measurement

A/D - Converter Resolution nominal

| | | | | |
|---|---|---|---|---|
| High Range: | 1LSB = | 6.1μV , | full range = | -100...+300 mV |
| Low Range: | 1LSB = | 61nV , | full range = | -1.....+3mV |

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

| Calibration Factors | X | Y | Z |
|---|---|---|---|
| High Range | 404.064 ± 0.1% (k=2) | 404.056 ± 0.1% (k=2) | 403.955 ± 0.1% (k=2) |
| Low Range | 3.98762 ± 0.7% (k=2) | 3.98737 ± 0.7% (k=2) | 3.98343 ± 0.7% (k=2) |

## Connector Angle

| | |
|---|---|
| **Connector Angle** to be used in DASY system | 117.0 ° ± 1 ° |

## Appendix

### 1. DC Voltage Linearity

| High Range | | Reading (μV) | Difference (μV) | Error (%) |
|---|---|---|---|---|
| Channel X | + Input | 199992.18 | -1.75 | -0.00 |
| Channel X | + Input | 20001.35 | 0.46 | 0.00 |
| Channel X | - Input | -19997.31 | 1.96 | -0.01 |
| Channel Y | + Input | 199993.18 | -1.24 | -0.00 |
| Channel Y | + Input | 20001.40 | 0.60 | 0.00 |
| Channel Y | - Input | -20000.04 | -0.70 | 0.00 |
| Channel Z | + Input | 199991.58 | -2.43 | -0.00 |
| Channel Z | + Input | 19999.62 | -1.14 | -0.01 |
| Channel Z | - Input | -20001.31 | -1.83 | 0.01 |

| Low Range | | Reading (μV) | Difference (μV) | Error (%) |
|---|---|---|---|---|
| Channel X | + Input | 2000.74 | -0.89 | -0.04 |
| Channel X | + Input | 202.18 | -0.01 | -0.01 |
| Channel X | - Input | -197.58 | 0.36 | -0.18 |
| Channel Y | + Input | 2000.34 | -1.20 | -0.06 |
| Channel Y | + Input | 199.67 | -2.39 | -1.18 |
| Channel Y | - Input | -197.64 | 0.32 | -0.16 |
| Channel Z | + Input | 2000.69 | -0.78 | -0.04 |
| Channel Z | + Input | 200.84 | -1.16 | -0.57 |
| Channel Z | - Input | -198.45 | -0.47 | 0.24 |

### 2. Common mode sensitivity

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

| | Common mode Input Voltage (mV) | High Range Average Reading (μV) | Low Range Average Reading (μV) |
|---|---|---|---|
| Channel X | 200 | -23.40 | -24.98 |
| | - 200 | 28.01 | 26.12 |
| Channel Y | 200 | -2.57 | -2.75 |
| | - 200 | 1.67 | 1.31 |
| Channel Z | 200 | -11.92 | -11.43 |
| | - 200 | 9.80 | 9.45 |

### 3. Channel separation

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

| | Input Voltage (mV) | Channel X (μV) | Channel Y (μV) | Channel Z (μV) |
|---|---|---|---|---|
| Channel X | 200 | - | -2.15 | -4.41 |
| Channel Y | 200 | 7.18 | - | -2.47 |
| Channel Z | 200 | 7.44 | 5.46 | - |

## 4. AD-Converter Values with inputs shorted

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

| | High Range (LSB) | Low Range (LSB) |
|---|---|---|
| Channel X | 16081 | 17027 |
| Channel Y | 16103 | 16170 |
| Channel Z | 16221 | 16651 |

## 5. Input Offset Measurement

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec
Input 10MΩ

| | Average (μV) | min. Offset (μV) | max. Offset (μV) | Std. Deviation (μV) |
|---|---|---|---|---|
| Channel X | -0.45 | -1.32 | 0.40 | 0.32 |
| Channel Y | -2.63 | -3.99 | -1.68 | 0.42 |
| Channel Z | -0.67 | -3.07 | 1.36 | 0.50 |

## 6. Input Offset Current

Nominal Input circuitry offset current on all channels: <25fA

## 7. Input Resistance (Typical values for information)

| | Zeroing (kOhm) | Measuring (MOhm) |
|---|---|---|
| Channel X | 200 | 200 |
| Channel Y | 200 | 200 |
| Channel Z | 200 | 200 |

## 8. Low Battery Alarm Voltage (Typical values for information)

| Typical values | Alarm Level (VDC) |
|---|---|
| Supply (+ Vcc) | +7.9 |
| Supply (- Vcc) | -7.6 |

## 9. Power Consumption (Typical values for information)

| Typical values | Switched off (mA) | Stand by (mA) | Transmitting (mA) |
|---|---|---|---|
| Supply (+ Vcc) | +0.01 | +6 | +14 |
| Supply (- Vcc) | –0.01 | -8 | -9 |