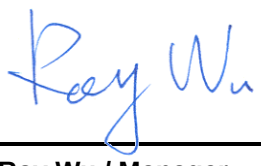
Hearing Aid Compatibility (HAC) RF Emissions Test Report

APPLICANT	:	Hewlett-Packard Company, Palm GBU
EQUIPMENT	:	Phone
BRAND NAME	:	HP
MODEL NAME	:	HSTNH-F30CN
FCC ID	:	B94HHF30CN
STANDARD	:	FCC 47 CFR §20.19 ANSI C63.19-2007
M CATEGORY	:	M3

The product was received on Feb. 14, 2011 and completely tested on Mar. 06, 2011. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures and shown the compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

Reviewed by:



Roy Wu / Manager

Testing Laboratory
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Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
HA121417A	Rev. 01	Initial issue of report	Apr. 01, 2011

1. Statement of Compliance

The maximum results of RF Emission of Hearing Aid Compliance (HAC) found during testing for the **Hewlett-Packard Company, Palm GBU Phone HP HSTNH-F30CN** are follows (with expanded uncertainly ±30.4% for E-field and ±21.6% for H-field):

Band	HAC RF Emission Test Result		M Rating
GSM850	E-Field (V/m)	177.1	M3
	H-Field (A/m)	0.184	M4
GSM1900	E-Field (V/m)	66.2	M3
	H-Field (A/m)	0.091	M4
WCDMA Band V	E-Field (V/m)	72.5	M4
	H-Field (A/m)	0.107	M4
WCDMA Band II	E-Field (V/m)	33.4	M4
	H-Field (A/m)	0.055	M4

They are in compliance with HAC limits (HAC Rated category M3) specified in guidelines FCC 47 CFR §20.19 and ANSI Standard ANSI C63.19.

Results Summary : M Category = M3 (ANSI C63.19-2007)

2. Administration Data

2.1 Testing Laboratory

Test Site	SPORTON INTERNATIONAL INC.
Test Site Location	No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL: +886-3-327-3456 FAX: +886-3-328-4978
Test Site No.	**Sporton Site No. :** SAR01-HY

2.2 Applicant

Company Name	Hewlett-Packard Company, Palm GBU
Address	950 W Maude Avenue, Sunnyvale, CA 94085

2.3 Manufacturer

Company Name	Hewlett-Packard Company, Palm GBU
Address	950 W Maude Avenue, Sunnyvale, CA 94085

2.4 Application Details

Date of Receipt of Application	Feb. 14, 2011
Date of Start during the Test	Mar. 06, 2011
Date of End during the Test	Mar. 06, 2011

3. General Information

3.1 Description of Device Under Test (DUT)

Product Feature & Specification	
DUT Type	Phone
Brand Name	HP
Model Name	HSTNH-F30CN
FCC ID	B94HHF30CN
Tx Frequency	GSM850 : 824 MHz ~ 849 MHz GSM1900 : 1850 MHz ~ 1910 MHz WCDMA Band V : 824 MHz ~ 849 MHz WCDMA Band II : 1850 MHz ~ 1910 MHz
Rx Frequency	GSM850 : 869 MHz ~ 894 MHz GSM1900 : 1930 MHz ~ 1990 MHz WCDMA Band V : 869 MHz ~ 894 MHz WCDMA Band II : 1930 MHz ~ 1990 MHz
Maximum Output Power to Antenna	GSM850 : 32.80 dBm GSM1900 : 30.28 dBm WCDMA Band V : 23.56 dBm WCDMA Band II : 22.52 dBm
Antenna Type	Fixed Internal Antenna
HW Version	D1
SW Version	WebOS 2.3
Type of Modulation	GSM : GMSK WCDMA : QPSK
DUT Stage	Identical Prototype

Remark: The above DUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

3.2 Applied Standards

The ANSI Standard ANSI C63.19-2007 represents performance requirements for acceptable interoperability of hearing aids with wireless communications devices. When these parameters are met, a hearing aid operates acceptably in close proximity to a wireless communications device.

The following AWF factors shall be used for the standard transmission protocols:

Standard	Technology	AWF (dB)
TIA/EIA/IS-2000	CDMA	0
TIA/EIA-136	TDMA (50 Hz)	0
J-STD-007	GSM (217)	-5
T1/T1P1/3GPP	UMTS (WCDMA)	0
iDENTM	TDMA (22 and 11 Hz)	0

Table 3.1 Articulation Weighting Factor (AWF)

Category	Telephone RF Parameters		
Near Field	AWF	E-Field Emissions	H-Field Emissions
< 960 MHz			
Category M1	0	631.0 – 1122.0 V/m	1.91 – 3.39 A/m
	-5	473.2 – 841.4 V/m	1.43 – 2.54 A/m
Category M2	0	354.8 – 631.0 V/m	1.07 – 1.91 A/m
	-5	266.1 – 473.2 V/m	0.80 – 1.43 A/m
Category M3	0	199.5 – 354.8 V/m	0.6 – 1.07 A/m
	-5	149.6 – 266.1 V/m	0.45 – 0.80 A/m
Category M4	0	< 199.5 V/m	< 0.60 A/m
	-5	< 149.6 V/m	< 0.45 A/m
> 960 MHz			
Category M1	0	199.5 – 354.8 V/m	0.60 – 1.07 A/m
	-5	149.6 – 266.1 V/m	0.45 – 0.80 A/m
Category M2	0	112.2 – 199.5 V/m	0.34 – 0.60 A/m
	-5	84.1 – 149.6 V/m	0.25 – 0.45 A/m
Category M3	0	63.1 – 112.2 V/m	0.19 – 0.34 A/m
	-5	47.3 – 84.1 V/m	0.14 – 0.25 A/m
Category M4	0	< 63.1 V/m	< 0.19 A/m
	-5	< 47.3 V/m	< 0.14 A/m

Table 3.2 Telephone near-field categories in linear units

3.3 Test Conditions

3.3.1 Ambient Condition

Ambient Temperature	20 to 24 ℃
Humidity	< 60 %

3.3.2 Test Configuration

The device was controlled by using a base station emulator R&S CMU200. Communication between the device and the emulator was established by air link. Measurements were performed on the low, middle and high channels of both bands. The DUT was set from the emulator to radiate maximum output power during all tests.

4. Hearing Aid Compliance (HAC)

4.1 Introduction

The federal communication commission (FCC) adopted ANSI C63.19 as HAC test standard.

5. HAC RF Emission Measurement Setup

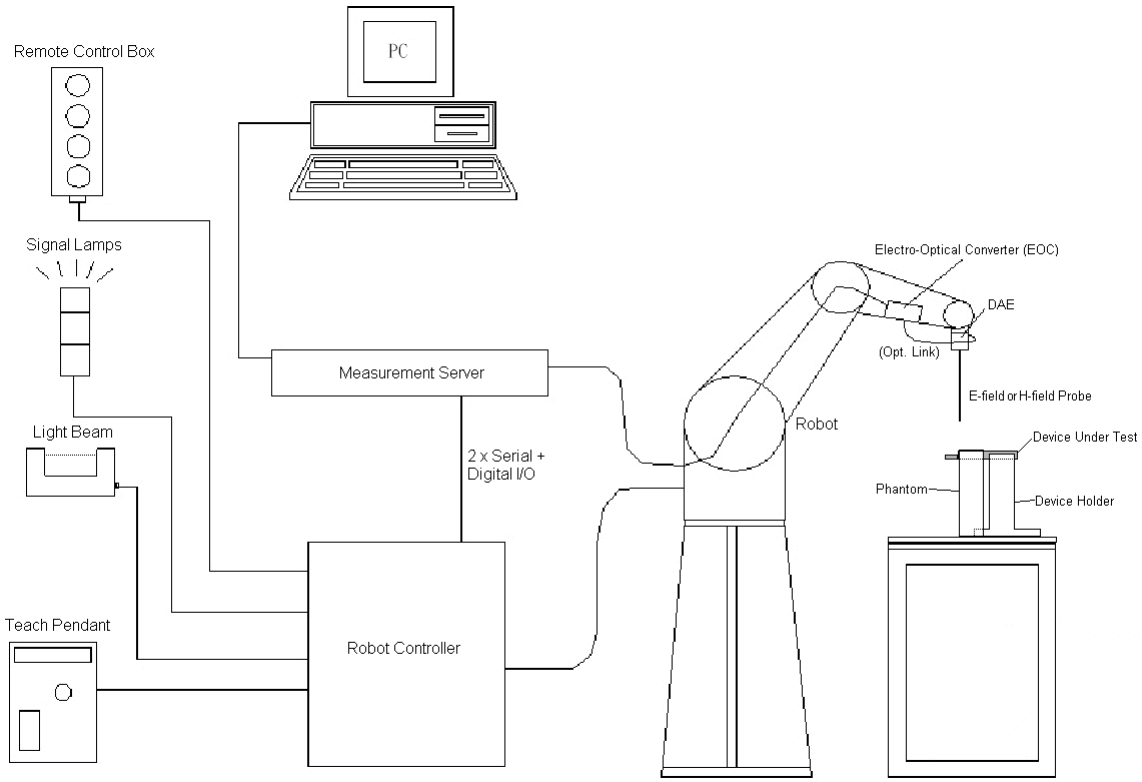


Fig 5.1 SPEAG DASY4 or DASY5 System Configurations

The DASY4 or DASY5 system for performance compliance tests is illustrated above graphically. This system consists of the following items:

- A standard high precision 6-axis robot with controller, a teach pendant and software
- A data acquisition electronic (DAE) attached to the robot arm extension
- A dosimetric probe equipped with an optical surface detector system
- The electro-optical converter (ECO) performs the conversion between optical and electrical signals
- A measurement server performs the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- A probe alignment unit which improves the accuracy of the probe positioning
- A computer operating Windows XP
- DASY4 or DASY5 software
- Remove control with teach pendant and additional circuitry for robot safety such as warming lamps, etc.
- The SAM twin phantom
- A device holder
- Tissue simulating liquid
- Dipole for evaluating the proper functioning of the system

Some of the components are described in details in the following sub-sections.

5.1 E-Field and H-Field Probe System

The HAC measurement is conducted with the dosimetric probe ER3DV6 and H3DV6 (manufactured by SPEAG). The probe is specially designed and calibrated. This probe has a built in optical surface detection system to prevent from collision with DUT.

5.1.1 E-Field Probe Specification

<ER3DV6>

Construction	One dipole parallel, two dipoles normal to probe axis Built-in shielding against static charges
Calibration	In air from 100 MHz to 3.0 GHz (absolute accuracy ±6.0%, k=2)
Frequency	100 MHz to 6 GHz; Linearity: ± 2.0 dB (100 MHz to 3 GHz)
Directivity	± 0.2 dB in air (rotation around probe axis) ± 0.4 dB in air (rotation normal to probe axis)
Dynamic Range	2 V/m to 1000 V/m (M3 or better device readings fall well below diode compression point)
Linearity	± 0.2 dB
Dimensions	Overall length: 330 mm (Tip: 16 mm) Tip diameter: 8 mm (Body: 12 mm) Distance from probe tip to dipole centers: 2.5 mm

Fig 5.2 Photo of E-field Probe

5.1.2 H-Field Probe Description

<H3DV6>

Construction	Three concentric loop sensors with 3.8 mm loop diameters Resistively loaded detector diodes for linear response Built-in shielding against static charges
Frequency	200 MHz to 3 GHz (absolute accuracy ± 6.0 %, k=2); Output linearized
Directivity	± 0.25 dB (spherical isotropy error)
Dynamic Range	10 m A/m to 2 A/m at 1 GHz (M3 or better device readings fall well below diode compression point)
Dimensions	Overall length: 330 mm (Tip: 40 mm) Tip diameter: 6 mm (Body: 12 mm) Distance from probe tip to dipole centers: 3 mm
E-Field Interference	< 10% at 3 GHz (for plane wave)

Fig 5.3 Photo of H-field Probe

5.1.3 Probe Tip Description

HAC field measurements take place in the close near field with high gradients. Increasing the measuring distance from the source will generally decrease the measured field values (in case of the validation dipole approx. 10%per mm).

Magnetic field sensors are measuring the integral of the H-field across their sensor area surrounded by the loop. They are calibrated in a precise, homogeneous field. When measuring a gradient field, the result will be very close to the field in the center of the loop which is equivalent to the value of a homogeneous field equivalent to the center value. But it will be different from the field at the field at the border of the loop.

Consequently, two sensors with different loop diameters – both calibrated ideally – would give different results when measuring from the edge of the probe sensor elements. The behavior for electrically small E-field sensors is equivalent. See below for distance plots from a WD which show the conservative nature of field readings at the probe element center vs. measurements at the sensor end:

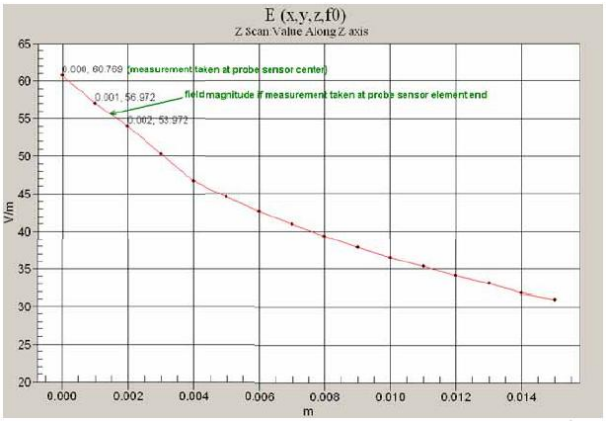


Fig 5.4 Z-Axis Scan at maximum point above a typical wireless device for E-field

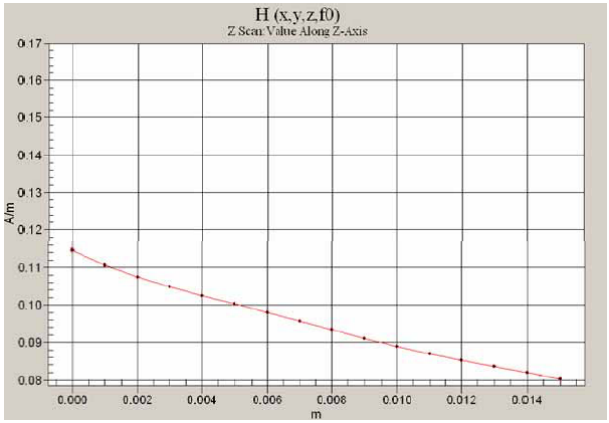


Fig 5.5 Z-Axis Scan at maximum point above a typical wireless device for H-field

The magnetic field loops of the H3D probes are concentric, with the center 3mm from the tip for H3DV6.

Their radius is 1.9 mm.

The electric field probes have a more irregular internal geometry because it is physically not possible to have the 3 orthogonal sensors situated with the same center. The effect of the different sensor centers is accounted for in the HAC uncertainty budget (“sensor displacement”). Their geometric center is at 2.5 mm from the tip, and the element ends are 1.1 mm closer to the tip.

Where:

Peak Field = Peak field (in dB V/m or dB A/m)
Raw = Raw field measurement from the measurement system (in V/m or A/m).
PMF = Probe Modulation Factor (in Linear units). See Chapter 8 of test report.

5.2 DATA Acquisition Electronics (DAE)

The data acquisition electronics (DAE) 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 measurement server is accomplished through an optical downlink for data and status information as well as an optical uplink for commands and the clock.
The input impedance of the DAE is 200 MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

Fig 5.6 Photo of DAE

5.3 Robot

The SPEAG DASY system uses the high precision robots (DASY4: RX90BL; DASY5: TX90XL) type from Stäubli SA (France). For the 6-axis controller system, the robot controller version (DASY4: CS7MB; DASY5: CS8c) from Stäubli is used. The Stäubli robot series have many features that are important for our application:

- High precision (repeatability ±0.035 mm)
- High reliability (industrial design)
- Jerk-free straight movements
- Low ELF interference (the closed metallic construction shields against motor control fields)
- 6-axis controller

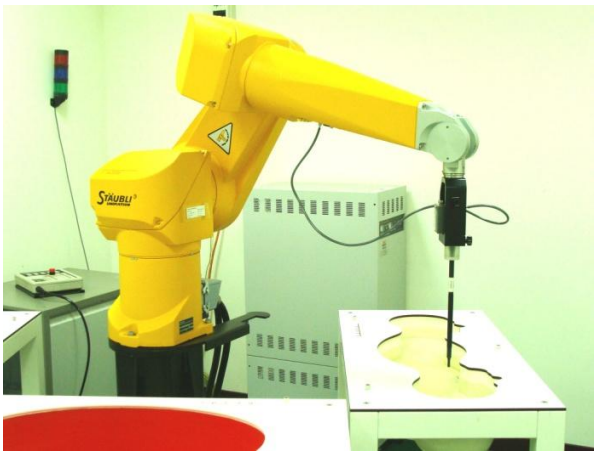


Fig 5.7 Photo of DASY4

Fig 5.8 Photo of DASY5

5.4 Measurement Server

The measurement server is based on a PC/104 CPU board with CPU (DASY4: 166 MHz, Intel Pentium; DASY5: 400 MHz, Intel Celeron), chipdisk (DASY4: 32 MB; DASY5: 128 MB), RAM (DASY4: 64 MB, DASY5: 128 MB). The necessary circuits for communication with the DAE electronic box, as well as the 16 bit AD converter system for optical detection and digital I/O interface are contained on the DASY I/O board, which is directly connected to the PC/104 bus of the CPU board.

The measurement server performs all the real-time data evaluation for field measurements and surface detection, controls robot movements and handles safety operations.

Fig 5.9 Photo of Server for DASY4

Fig 5.10 Photo of Server for DASY5

5.5 Phone Positioner

The phone positioner shown in Fig. 5.11 is used to adjust DUT to the suitable position.

Fig 5.11 Phone Positioner

5.6 Test Arch Phantom

Construction :	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

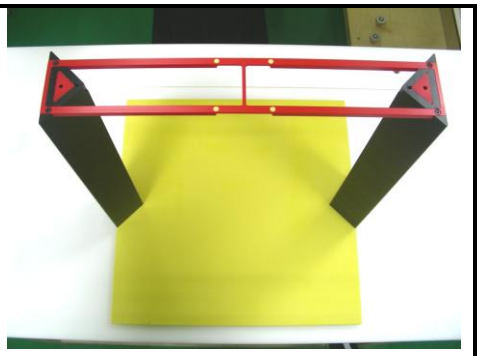


Fig 5.12 Photo of Arch Phantom

5.7 Data Storage and Evaluation

5.7.1 Data Storage

The DASY software stores the assessed data from the data acquisition electronics as raw data (in microvolt readings from the probe sensors), together with all the necessary software parameters for the data evaluation (probe calibration data, and device frequency and modulation data) in measurement files. The post-processing software evaluates the desired unit and format for output each time the data is visualized or exported. This allows verification of the complete software setup even after the measurement and allows correction of erroneous parameter settings.

5.7.2 Data Evaluation

The DASY post-processing software (SEMCAD) automatically executes the following procedures to calculate the field units from the microvolt readings at the probe connector. The parameters used in the evaluation are stored in the configuration modules of the software：

Probe parameters：	- Sensitivity	$Norm_i$, a_{i0}, a_{i1}, a_{i2}
	- Conversion factor	$ConvF_i$
	- Diode compression point	dcp_i
Device parameters：	- Frequency	f
	- Crest factor	cf
Media parameters：	- Conductivity	σ
	- Density	ρ

These parameters must be set correctly in the software. They can be found in the component documents or they can be imported into the software from the configuration files issued for the DASY components. In the direct measuring mode of the multi-meter option, the parameters of the actual system setup are used. In the scan visualization and export modes, the parameters stored in the corresponding document files are used.

The first step of the evaluation is a linearization of the filtered input signal to account for the compression characteristics of the detector diode. The compensation depends on the input signal, the diode type and the DC-transmission factor from the diode to the evaluation electronics. If the exciting field is pulsed, the crest factor of the signal must be known to correctly compensate for peak power. The formula for each channel can be given as：

$$\mathbf{V_i = U_i + U_i^2 \cdot \frac{cf}{dcp_i}}$$

with V_i = compensated signal of channel i, (i = x, y, z)
U_i = input signal of channel i, (i = x, y, z)
cf = crest factor of exciting field (DASY parameter)
dcp_i = diode compression point (DASY parameter)

From the compensated input signals, the primary field data for each channel can be evaluated：

$$\text{E-field Probes}：\mathbf{E_i} = \sqrt{\frac{\mathbf{V_i}}{\mathbf{Norm_i \cdot ConvF}}}$$

$$\text{H-field Probes}：\mathbf{H_i} = \sqrt{\mathbf{V_i}} \cdot \frac{\mathbf{a_{i0}+a_{i1}f+a_{i2}f^2}}{\mathbf{f}}$$

with V_i = compensated signal of channel i, (i = x, y, z)
$Norm_i$ = sensor sensitivity of channel i, (i = x, y, z), μV/(V/m)^2 for E-field Probes
ConvF = sensitivity enhancement in solution
a_{ij} = sensor sensitivity factors for H-field probes
f = carrier frequency [GHz]
E_i = electric field strength of channel i in V/m
H_i = magnetic field strength of channel i in A/m

The RSS value of the field components gives the total field strength (Hermitian magnitude)：

$$\mathbf{E_{tot}} = \sqrt{\mathbf{E_x^2} + \mathbf{E_y^2} + \mathbf{E_z^2}}$$

The primary field data are used to calculate the derived field units.

The measurement/integration time per point, as specified by the system manufacturer is > 500 ms. The signal response time is evaluated as the time required by the system to reach 90% of the expected final value after an on/off switch of the power source with an integration time of 500 ms and a probe response time of < 5 ms. In the current implementation, DASY waits longer than 100 ms after having reached the grid point before starting a measurement, i.e., the response time uncertainty is negligible.

If the device under test does not emit a CW signal, the integration time applied to measure the electric field at a specific point may introduce additional uncertainties due to the discretization. The tolerances for the different systems had the worst-case of 2.6%.

5.8 Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	Isotropic E-Field Probe	ER3DV6	2358	Jan. 14, 2011	Jan. 13, 2012
SPEAG	Isotropic H-Field Probe	H3DV6	6184	Jan. 25, 2011	Jan. 24, 2012
SPEAG	Audio Magnetic 1D Field Probe	AM1DV2	1038	Jan. 18, 2011	Jan. 17, 2012
SPEAG	Audio Magnetic Calibration Coil	AMCC	1049	NCR	NCR
SPEAG	Audio Measuring Instrument	AMMI	1041	NCR	NCR
SPEAG	835MHz Calibration Dipole	CD835V3	1045	Sep. 17, 2009	Sep. 16, 2011
SPEAG	1880MHz Calibration Dipole	CD1880V3	1038	Sep. 17, 2009	Sep. 16, 2011
SPEAG	2450MHz Calibration Dipole	CD2450V3	1039	Sep. 17, 2009	Sep. 16, 2011
SPEAG	Data Acquisition Electronics	DAE3	577	Aug. 18, 2010	Aug. 17, 2011
SPEAG	Data Acquisition Electronics	DAE4	778	Oct. 22, 2010	Oct. 21, 2011
SPEAG	Test Arch Phantom	N/A	N/A	NCR	NCR
SPEAG	Phone Positoiner	N/A	N/A	NCR	NCR
Agilent	Wireless Communication Test Set	E5515C	MY48360820	Jan. 12, 2010	Jan. 11, 2012
R&S	Universal Radio Communication Tester	CMU200	117995	Mar. 19, 2009	Mar. 18, 2011
Agilent	Dual Directional Coupler	778D	50422	NCR	NCR
AR	Power Amplifier	5S1G4M2	0328767	NCR	NCR
R&S	Spectrum Analyzer	FSP7	101131	Apr. 26, 2010	Apr. 25, 2011

Table 5.1 Test Equipment List

6. Uncertainty Assessment

The component of uncertainly may generally be categorized according to the methods used to evaluate them. The evaluation of uncertainly by the statistical analysis of a series of observations is termed a Type A evaluation of uncertainty. The evaluation of uncertainty by means other than the statistical analysis of a series of observation is termed a Type B evaluation of uncertainty. Each component of uncertainty, however evaluated, is represented by an estimated standard deviation, termed standard uncertainty, which is determined by the positive square root of the estimated variance.

A Type A evaluation of standard uncertainty may be based on any valid statistical method for treating data. This includes calculating the standard deviation of the mean of a series of independent observations; using the method of least squares to fit a curve to the data in order to estimate the parameter of the curve and their standard deviations; or carrying out an analysis of variance in order to identify and quantify random effects in certain kinds of measurement.

A type B evaluation of standard uncertainty is typically based on scientific judgment using all of the relevant information available. These may include previous measurement data, experience and knowledge of the behavior and properties of relevant materials and instruments, manufacture's specification, data provided in calibration reports and uncertainties assigned to reference data taken from handbooks. Broadly speaking, the uncertainty is either obtained from an outdoor source or obtained from an assumed distribution, such as the normal distribution, rectangular or triangular distributions indicated in Table 6.1.

Uncertainty Distributions	Normal	Rectangular	Triangular	U-Shape
Multi-plying Factor[a]	1/k[b]	$1/\sqrt{3}$	$1/\sqrt{6}$	$1/\sqrt{2}$

(a) standard uncertainty is determined as the product of the multiplying factor and the estimated range of variations in the measured quantity

(b) κ is the coverage factor

Table 6.1 Multiplying Factions for Various Distributions

The combined standard uncertainty of the measurement result represents the estimated standard deviation of the result. It is obtained by combining the individual standard uncertainties of both Type A and Type B evaluation using the usual "root-sum-squares" (RSS) methods of combining standard deviations by taking the positive square root of the estimated variances.

Expanded uncertainty is a measure of uncertainty that defines an interval about the measurement result within which the measured value is confidently believed to lie. It is obtained by multiplying the combined standard uncertainty by a coverage factor. Typically, the coverage factor ranges from 2 to 3. Using a coverage factor allows the true value of a measured quantity to be specified with a defined probability within the specified uncertainty range. For purpose of this document, a coverage factor two is used, which corresponds to confidence interval of about 95 %. The DASY uncertainty Budget is showed in Table 6.2.

Error Description	Uncertainty Value (±%)	Probability Distribution	Divisor	Ci (E)	Ci (H)	Standard Uncertainty (E)	Standard Uncertainty (H)
Measurement System							
Probe Calibration	5.1	Normal	1	1	1	± 5.1 %	± 5.1 %
Axial Isotropy	4.7	Rectangular	√3	1	1	± 2.7 %	± 2.7 %
Sensor Displacement	16.5	Rectangular	√3	1	0.145	± 9.5 %	± 1.4 %
Test Arch	7.2	Rectangular	√3	1	0	± 4.1 %	± 0.0 %
Linearity	4.7	Rectangular	√3	1	1	± 2.7 %	± 2.7 %
Scaling to Peak Envelope Power	0.0	Rectangular	√3	1	1	± 0.0 %	± 0.0 %
System Detection Limit	1.0	Rectangular	√3	1	1	± 0.6 %	± 0.6 %
Readout Electronics	0.3	Normal	1	1	1	± 0.3 %	± 0.3 %
Response Time	0.8	Rectangular	√3	1	1	± 0.5 %	± 0.5 %
Integration Time	2.6	Rectangular	√3	1	1	± 1.5 %	± 1.5 %
RF Ambient Conditions	3.0	Rectangular	√3	1	1	± 1.7 %	± 1.7 %
RF Reflections	12.0	Rectangular	√3	1	1	± 6.9 %	± 6.9 %
Probe Positioner	1.2	Rectangular	√3	1	0.67	± 0.7 %	± 0.5 %
Probe Positioning	4.7	Rectangular	√3	1	0.67	± 2.7 %	± 1.8 %
Extrap. and Interpolation	1.0	Rectangular	√3	1	1	± 0.6 %	± 0.6 %
Test Sample Related							
Device Positioning Vertical	4.7	Rectangular	√3	1	0.67	± 2.7 %	± 1.8 %
Device Positioning Lateral	1.0	Rectangular	√3	1	1	± 0.6 %	± 0.6 %
Device Holder and Phantom	2.4	Rectangular	√3	1	1	± 1.4 %	± 1.4 %
Power Drift	5.0	Rectangular	√3	1	1	± 2.9 %	± 2.9 %
Phantom and Setup Related							
Phantom Thickness	2.4	Rectangular	√3	1	0.67	± 1.4 %	± 0.9 %
Combined Standard Uncertainty						± 15.2 %	± 10.8 %
Coverage Factor for 95 %						K = 2	
Expanded Uncertainty						**± 30.4 %**	**± 21.6 %**

Table 6.2 Uncertainty Budget of DASY

7. HAC RF Emission Measurement Evaluation

Each DASY system is equipped with one or more system validation kits. These units, together with the predefined measurement procedures within the DASY software, enable the user to conduct the system performance check and system validation. System validation kit includes a dipole, tripod holder to fix it underneath the test Arch and a corresponding distance holder.

7.1 Purpose of System Performance Check

The system performance check verifies that the system operates within its specifications. System and operator errors can be detected and corrected. It is recommended that the system performance check be performed prior to any usage of the system in order to guarantee reproducible results. The system performance check uses normal HAC measurements in a simplified setup with a well characterized source. This setup was selected to give a high sensitivity to all parameters that might fail or vary over time. The system check does not intend to replace the calibration of the components, but indicates situations where the system uncertainty is exceeded due to drift or failure.

7.2 System Setup

In the simplified setup for system evaluation, the DUT is replaced by a calibrated dipole and the power source is replaced by a continuous wave which comes from a signal generator. The calibrated dipole must be placed beneath the arch phantom. The equipment setup is shown below:

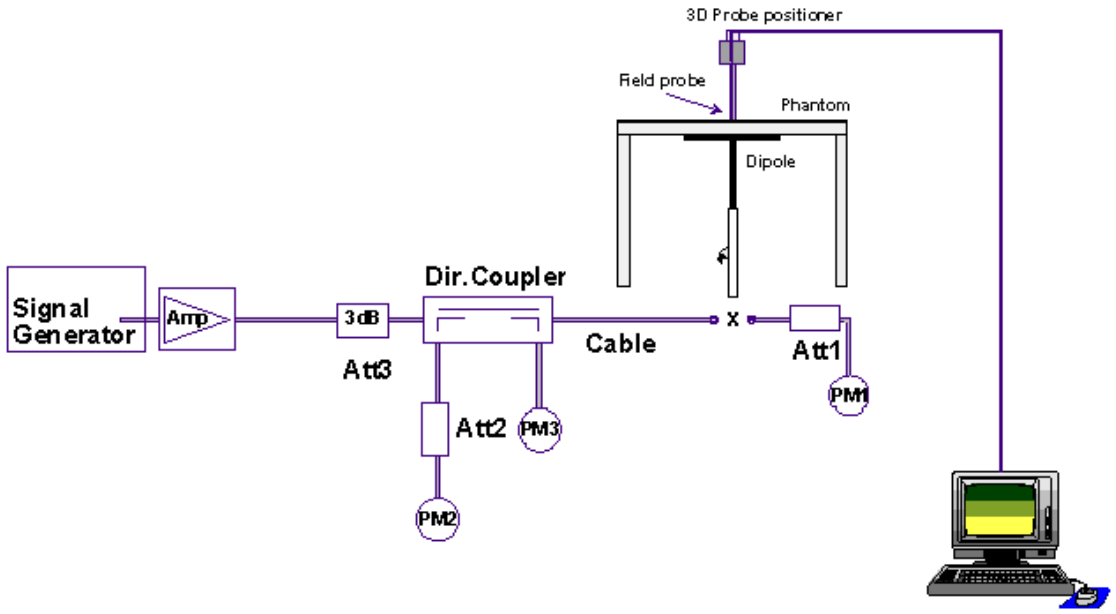


Fig. 7.1 System Setup of System Evaluation

1. Signal Generator
2. Amplifier
3. Directional Coupler
4. Power Meter
5. Calibrated Dipole

The output power on dipole port must be calibrated to 20dBm (100mW) before dipole is connected.

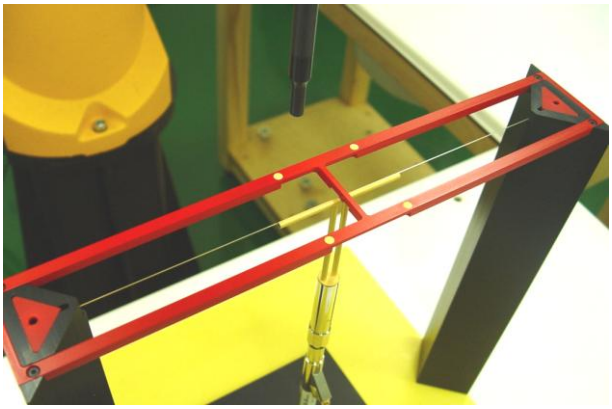


Fig 7.2 Dipole Setup

7.3 Validation Results

Comparing to the original E-field or H-field value provided by SPEAG, the validation data should be within its specification of 25 %. Table 7.1 shows the target value and measured value. The table below indicates the system performance check can meet the variation criterion and the plots can be referred to appendix A of this report.

Frequency (MHz)	Input Power (dBm)	Target Value (V/m)	E-Field 1 (V/m)	E-Field 2 (V/m)	Average Value (V/m)	Deviation (%)	Date
835	20	170.2	175.6	172.1	173.85	2.14	Mar. 06, 2011
1880	20	136.8	130.4	133.3	131.85	-3.62	Mar. 06, 2011
Frequency (MHz)	**Input Power (dBm)**	**Target Value (A/m)**	**H-Field (A/m)**			**Deviation (%)**	**Date**
835	20	0.457	0.462			1.09	Mar. 06, 2011
1880	20	0.466	0.488			4.72	Mar. 06, 2011

Table 7.1 Test Results of System Validation

Note: Deviation = ((E or H-field Result) - (Target field)) / (Target field) * 100%

8. RF Field Probe Modulation Factor

A 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 10 dB 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.

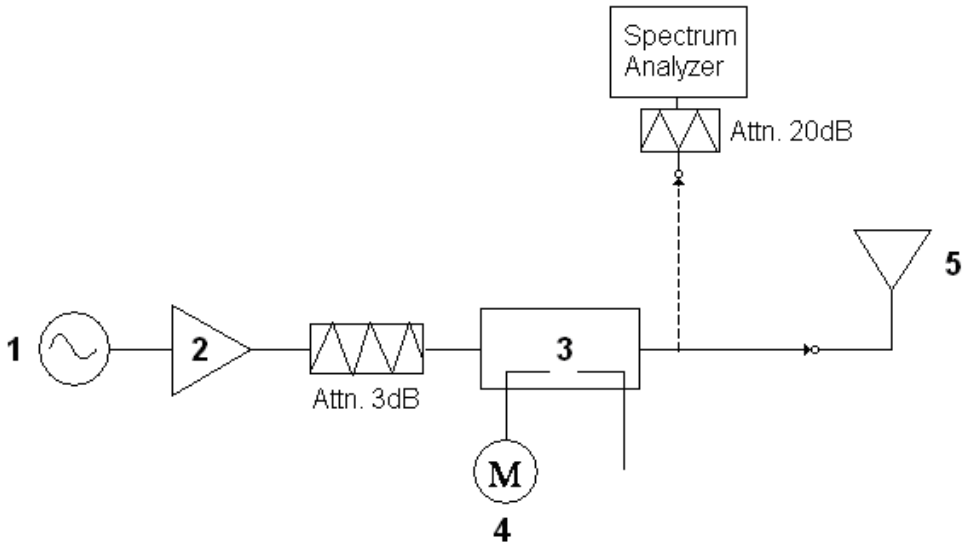


Fig. 8.1 System Calibration

This was done using the following procedure:

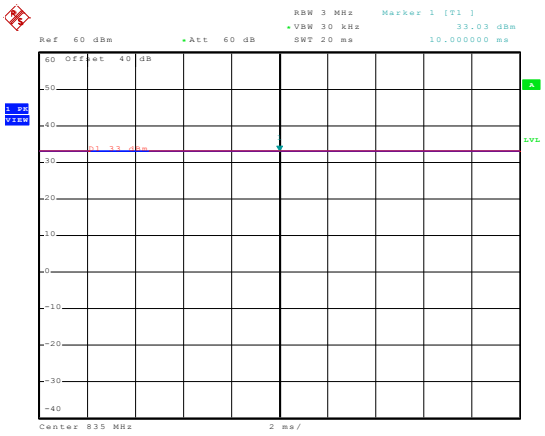
1. Fixing the probe in a set location relative to a field generating device.
2. Illuminate the probe with a CW signal at the intended measurement frequency.
3. Record the reading of the probe measurement system of the CW signal.
4. Determine the level of the CW signal being used to drive the field generating device.
5. Substitute a signal using the same modulation as that used by the intended WD for the CW signal.
6. Set the peak amplitude during transmission of the modulated signal to equal the amplitude of the CW signal.
7. Record the reading of the probe measurement system of the modulated signal.
8. The ratio of the CW to modulated signal reading is the modulation factor.
9. Repeat 2~8 steps at intended measurement frequency for both E and H field probe.

PMF Measurement Summary:

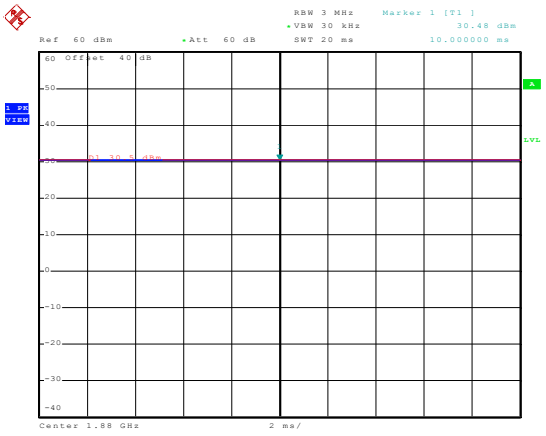
Frequency (MHz)	Functions	E-field	H-field	PMF	
		V/m	A/m	E-field	H-field
835	CW	755.0	2.050	-	-
835	AM 80%	468.0	1.650	1.61	1.24
835	GSM	286.0	1.444	2.64	1.42
1880	CW	532.7	1.753	-	-
1880	AM 80%	330.8	1.471	1.61	1.19
1880	GSM	199.9	1.470	2.66	1.19

Frequency (MHz)	Functions	E-field	H-field	PMF	
		V/m	A/m	E-field	H-field
835	CW	318.5	0.659	-	-
835	AM 80%	201.3	0.447	1.58	1.47
835	WCDMA	324.7	0.823	0.98	0.80
1880	CW	212.9	0.698	-	-
1880	AM 80%	144.0	0.571	1.48	1.22
1880	WCDMA	201.3	1.203	1.06	0.58

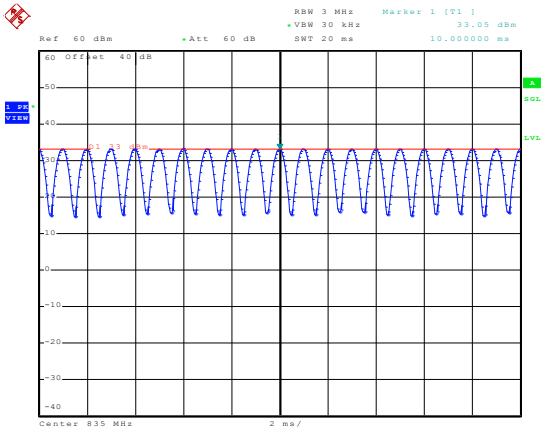
Zero span Spectrum Plots for RF Field Probe Modulation Factor



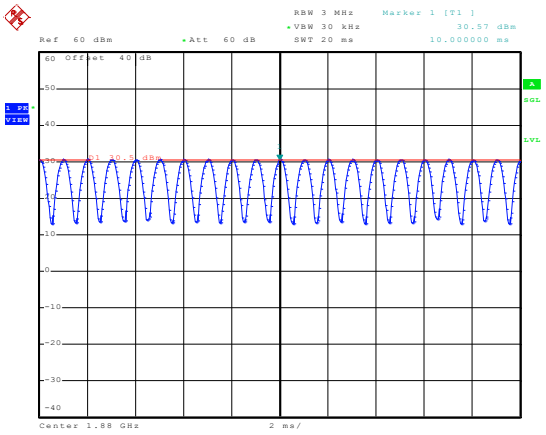
835MHz - CW



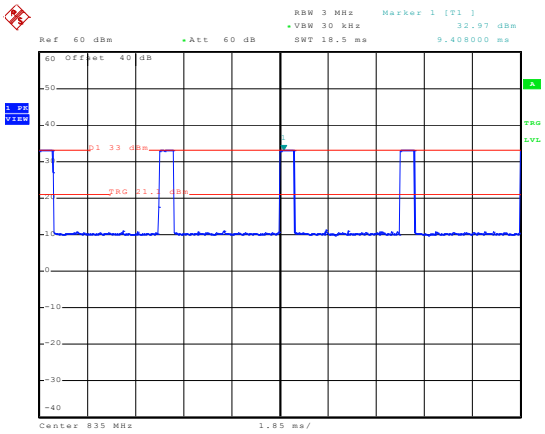
1880MHz - CW



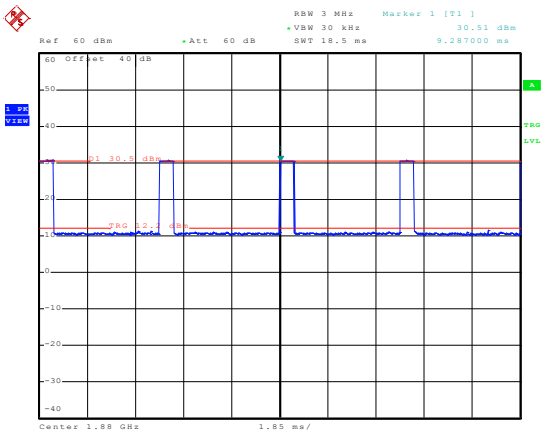
835MHz - 80% AM



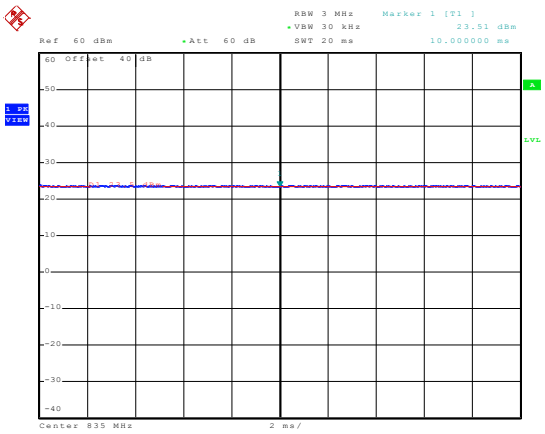
1880MHz - 80% AM



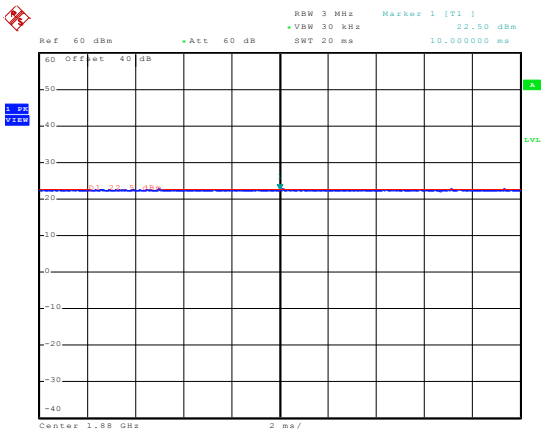
835MHz - GSM



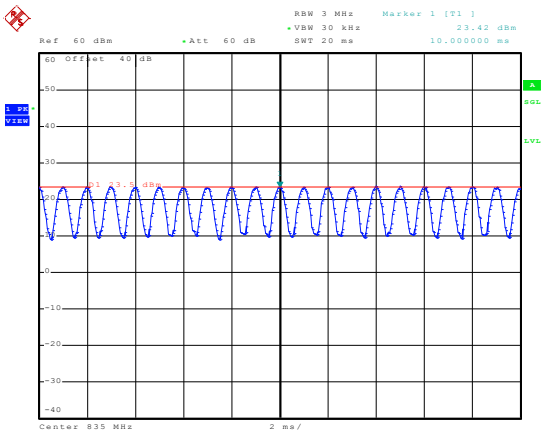
1880MHz - GSM



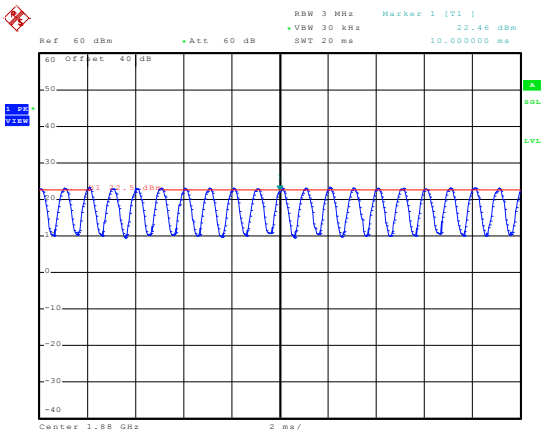
835MHz - CW



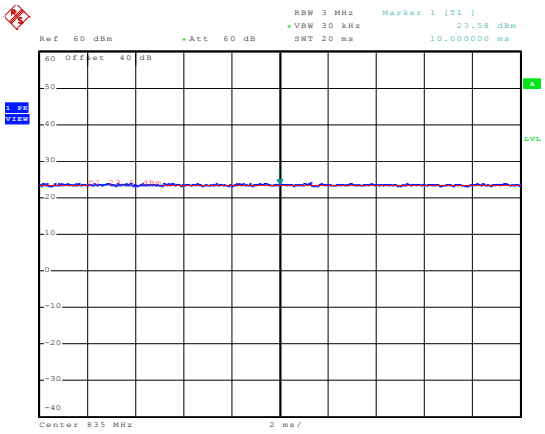
1880MHz - CW



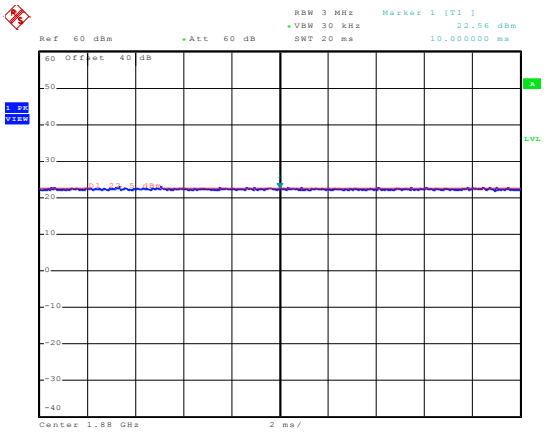
835MHz - 80% AM



1880MHz - 80% AM



835MHz - WCDMA



1880MHz - WCDMA

9. Description for DUT Testing Position

The DUT was put on device holder and adjusted to the accurate and reliable position. Please refer to Appendix E for the Setup photographs.

Fig. 9.1 illustrate the references and reference plane that shall be used in a typical DUT emissions measurement. The principle of this section is applied to DUT with similar geometry.

- The grid is 5 cm by 5 cm area that is divided into 9 evenly sized blocks or sub-grids.
- The grid is centered on the audio frequency output transducer of the DUT.
- The grid is in a reference plane, which is defined as the planar area that contains the highest point in the area of the phone that normally rests against the user's ear. It is parallel to the centerline of the receiver area of the phone and is defined by the points of the receiver-end of the DUT handset, which, in normal handset use, rest against the ear.
- The measurement plane is parallel to, and 15 mm in front of, the reference plane.

Fig 9.1 A typical DUT reference and plane for HAC measurements

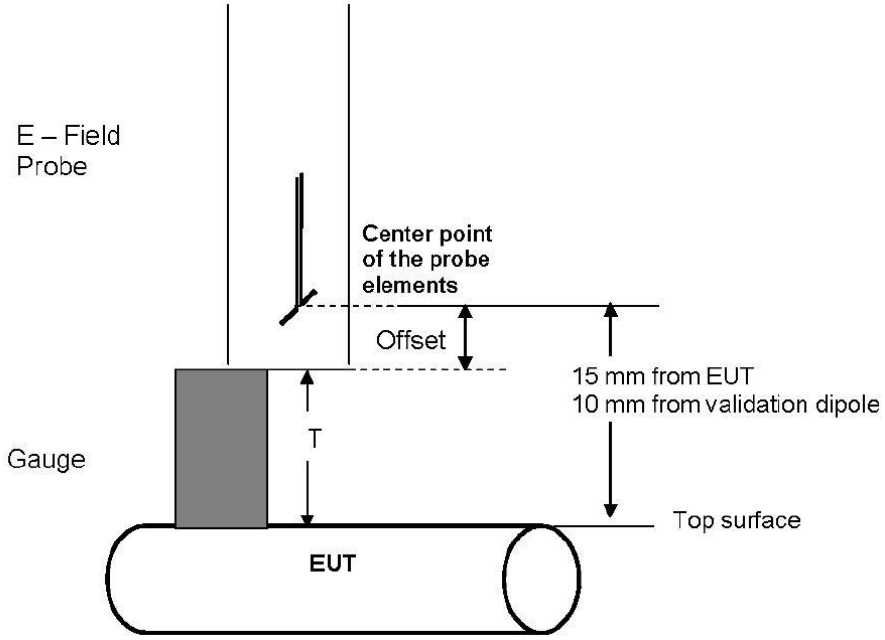


Fig. 9.2 Gauge block with E-field probe

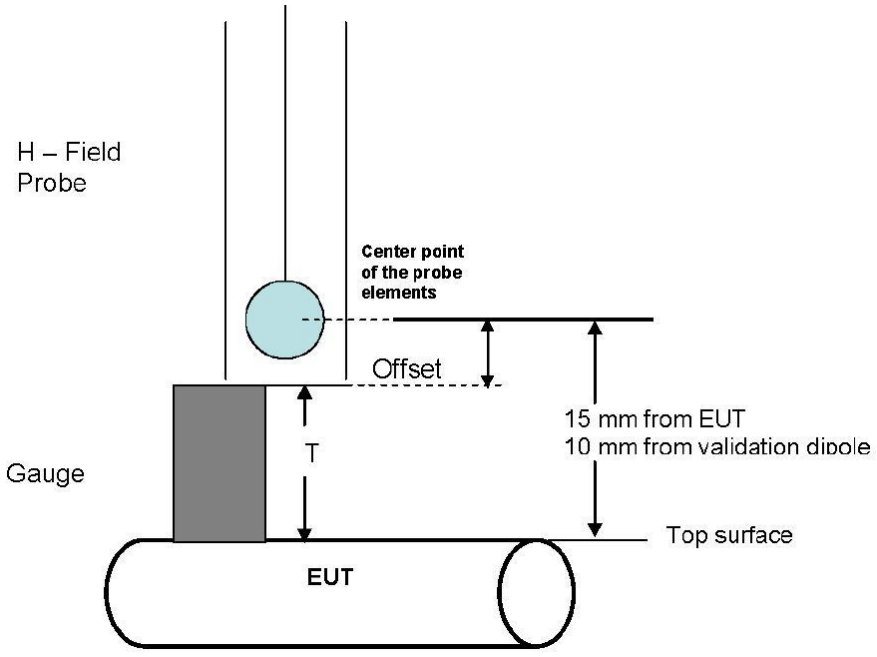


Fig. 9.3 Gauge block with H-field probe

10. RF Emissions Test Procedure

The following illustrate a typical RF emissions test scan over a wireless communications device:

1. Proper operation of the field probe, probe measurement system, other instrumentation, and the positioning system was confirmed.
2. DUT is positioned in its intended test position, acoustic output point of the device perpendicular to the field probe.
3. The DUT operation for maximum rated RF output power was configured and confirmed with the base station simulator, at the test channel and other normal operating parameters as intended for the test. The battery was ensured to be fully charged before each test.
4. The center sub-grid was centered over the center of the acoustic output (also audio band magnetic output, if applicable). The DUT audio output was positioned tangent (as physically possible) to the measurement plane.
5. A surface calibration was performed before each setup change to ensure repeatable spacing and proper maintenance of the measurement plane using the test Arch.
6. The measurement system measured the field strength at the reference location.
7. Measurements at 5 mm increments in the 5 x 5 cm region were performed and recorded. A 360° rotation about the azimuth axis at the maximum interpolated position was measured. For the worst-case condition, the peak reading from this rotation was used in re-evaluating the HAC category.
8. The system performed a drift evaluation by measuring the field at the reference location.
9. Steps 1 ~ 8 were done for both the E and H-Field measurements.

11. HAC RF Emission Test Results

11.1 Conducted Power (Unit: dBm)

Band	GSM850			GSM1900		
Channel	128	189	251	512	661	810
Frequency (MHz)	824.2	836.4	848.8	1850.2	1880.0	1909.8
GSM	32.64	32.48	32.80	30.28	30.18	30.03

Band	WCDMA Band V			WCDMA Band II		
Channel	4132	4182	4233	9262	9400	9538
Frequency (MHz)	826.4	836.4	846.6	1852.4	1880.0	1907.6
RMC 12.2K	23.14	23.56	23.45	22.42	22.52	22.31

11.2 E-Field Emission

Plot No.	Band	Mode	Channel	DUT Status	Battery	PMF	Peak E-Field (V/m)	M-Rating
9	GSM850	GSM	128	Slide Off	1	2.64	154.4	M3
10	GSM850	GSM	189	Slide Off	1	2.64	172.9	M3
11	**GSM850**	**GSM**	**251**	**Slide Off**	**1**	**2.64**	**177.1**	**M3**
12	GSM850	GSM	251	Slide Off	2	2.64	174.6	M3
13	GSM850	GSM	128	Slide Up	1	2.64	147.8	M4
14	GSM850	GSM	189	Slide Up	1	2.64	161.3	M3
15	GSM850	GSM	251	Slide Up	1	2.64	165.8	M3
16	GSM850	GSM	251	Slide Up	2	2.64	164.9	M3
1	GSM1900	GSM	512	Slide Off	1	2.66	59.2	M3
2	GSM1900	GSM	661	Slide Off	1	2.66	58.5	M3
3	GSM1900	GSM	810	Slide Off	1	2.66	54.8	M3
4	GSM1900	GSM	661	Slide Off	2	2.66	59.8	M3
5	GSM1900	GSM	512	Slide Up	1	2.66	64.9	M3
6	**GSM1900**	**GSM**	**661**	**Slide Up**	**1**	**2.66**	**66.2**	**M3**
7	GSM1900	GSM	810	Slide Up	1	2.66	64.9	M3
8	GSM1900	GSM	661	Slide Up	2	2.66	65.8	M3
25	WCDMA Band V	RMC12.2K	4132	Slide Off	1	0.98	65.1	M4
26	WCDMA Band V	RMC12.2K	4182	Slide Off	1	0.98	68.3	M4
27	WCDMA Band V	RMC12.2K	4233	Slide Off	1	0.98	72.2	M4
28	WCDMA Band V	RMC12.2K	4233	Slide Off	2	0.98	72.1	M4
29	WCDMA Band V	RMC12.2K	4132	Slide Up	1	0.98	64.5	M4
30	WCDMA Band V	RMC12.2K	4182	Slide Up	1	0.98	68.7	M4
31	**WCDMA Band V**	**RMC12.2K**	**4233**	**Slide Up**	**1**	**0.98**	**72.5**	**M4**
32	WCDMA Band V	RMC12.2K	4233	Slide Up	2	0.98	72.4	M4
17	WCDMA Band II	RMC12.2K	9262	Slide Off	1	1.06	30	M4
18	WCDMA Band II	RMC12.2K	9400	Slide Off	1	1.06	28.6	M4
19	WCDMA Band II	RMC12.2K	9538	Slide Off	1	1.06	28.6	M4
20	**WCDMA Band II**	**RMC12.2K**	**9262**	**Slide Off**	**2**	**1.06**	**33.4**	**M4**
21	WCDMA Band II	RMC12.2K	9262	Slide Up	1	1.06	32.9	M4
22	WCDMA Band II	RMC12.2K	9400	Slide Up	1	1.06	31.9	M4
23	WCDMA Band II	RMC12.2K	9538	Slide Up	1	1.06	30.7	M4
24	WCDMA Band II	RMC12.2K	9262	Slide Up	2	1.06	33	M4

11.3 H-Field Emission

Plot No.	Band	Mode	Channel	DUT Status	Battery	PMF	Peak H-Field (A/m)	M-Rating
57	GSM850	GSM	128	Slide Off	1	1.42	0.15	M4
58	GSM850	GSM	189	Slide Off	1	1.42	0.172	M4
59	GSM850	GSM	251	Slide Off	1	1.42	0.18	M4
60	**GSM850**	**GSM**	**251**	**Slide Off**	**2**	**1.42**	**0.184**	**M4**
61	GSM850	GSM	128	Slide Up	1	1.42	0.145	M4
62	GSM850	GSM	189	Slide Up	1	1.42	0.154	M4
63	GSM850	GSM	251	Slide Up	1	1.42	0.155	M4
64	GSM850	GSM	251	Slide Up	2	1.42	0.153	M4
49	GSM1900	GSM	512	Slide Off	1	1.19	0.089	M4
50	GSM1900	GSM	661	Slide Off	1	1.19	0.09	M4
51	GSM1900	GSM	810	Slide Off	1	1.19	0.088	M4
52	GSM1900	GSM	661	Slide Off	2	1.19	0.087	M4
53	GSM1900	GSM	512	Slide Up	1	1.19	0.088	M4
54	**GSM1900**	**GSM**	**661**	**Slide Up**	**1**	**1.19**	**0.091**	**M4**
55	GSM1900	GSM	810	Slide Up	1	1.19	0.091	M4
56	GSM1900	GSM	810	Slide Up	2	1.19	0.09	M4
41	WCDMA Band V	RMC12.2K	4132	Slide Off	1	0.8	0.087	M4
42	WCDMA Band V	RMC12.2K	4182	Slide Off	1	0.8	0.1	M4
43	WCDMA Band V	RMC12.2K	4233	Slide Off	1	0.8	0.104	M4
44	WCDMA Band V	RMC12.2K	4233	Slide Off	2	0.8	0.104	M4
45	**WCDMA Band V**	**RMC12.2K**	**4132**	**Slide Up**	**1**	**0.8**	**0.107**	**M4**
46	WCDMA Band V	RMC12.2K	4182	Slide Up	1	0.8	0.1	M4
47	WCDMA Band V	RMC12.2K	4233	Slide Up	1	0.8	0.103	M4
48	WCDMA Band V	RMC12.2K	4132	Slide Up	2	0.8	0.095	M4
33	**WCDMA Band II**	**RMC12.2K**	**9262**	**Slide Off**	**1**	**0.58**	**0.055**	**M4**
34	WCDMA Band II	RMC12.2K	9400	Slide Off	1	0.58	0.051	M4
35	WCDMA Band II	RMC12.2K	9538	Slide Off	1	0.58	0.051	M4
36	WCDMA Band II	RMC12.2K	9262	Slide Off	2	0.58	0.054	M4
37	WCDMA Band II	RMC12.2K	9262	Slide Up	1	0.58	0.054	M4
38	WCDMA Band II	RMC12.2K	9400	Slide Up	1	0.58	0.055	M4
39	WCDMA Band II	RMC12.2K	9538	Slide Up	1	0.58	0.055	M4
40	WCDMA Band II	RMC12.2K	9538	Slide Up	2	0.58	0.055	M4

Remark:

1. The volume was adjusted to maximum level and the backlight turned off during RF Emission testing.
2. This device does not support V.O.I.P. function. It means that the functions of WLAN and Bluetooth do not have voice capability in the held to ear mode.
3. There is no special HAC mode software on this DUT.
4. Test Engineer：Eric Huang

12. References

[1] ANSI C63.19-2007, “American National Standard for Methods of Measurement of Compatibility between Wireless Communications Devices and Hearing Aids”, 8 June 2007

[2] SPEAG DASY System Handbook

Appendix A. Plots of System Performance Check

The plots are shown as follows.

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2011/3/6

HAC_E_Dipole_835_110306

DUT: Dipole 835 MHz

Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1000$ kg/m^3
Ambient Temperature：22.5 ℃

DASY4 Configuration:
- Probe: ER3DV6 - SN2358; ConvF(1, 1, 1); Calibrated: 2011/1/14
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

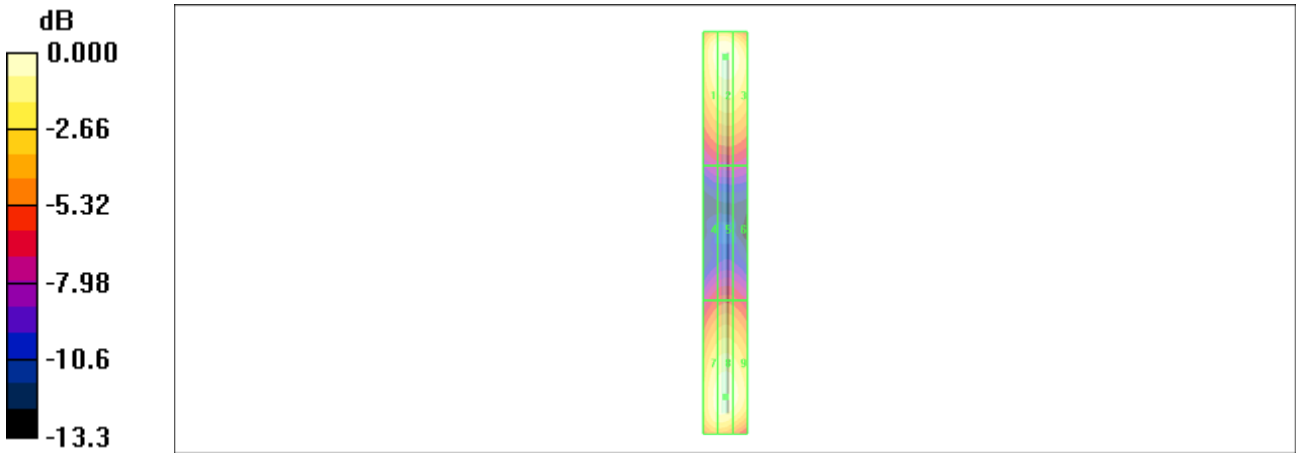
E Scan - measurement distance from the probe sensor center to CD835 Dipole = 10mm/Hearing Aid Compatibility Test (41x361x1): Measurement grid: dx=5mm, dy=5mm

Probe Modulation Factor = 1.00
Reference Value = 127.7 V/m; Power Drift = -0.042 dB
Aversge vslue of Total=(175.6 + 172.1) / 2 = 173.85 V/m

Peak E-field in V/m

Grid 1 **169.3 M4**	Grid 2 **175.6 M4**	Grid 3 **170.7 M4**
Grid 4 **88.5 M4**	Grid 5 **91.8 M4**	Grid 6 **89.7 M4**
Grid 7 **166.9 M4**	Grid 8 **172.1 M4**	Grid 9 **167.0 M4**

Cursor:
Total = 175.6 V/m
E Category: M4
Location: 0, -79, 4.7 mm



0 dB = 175.6V/m

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2011/3/6

HAC_E_Dipole_1880_110306

DUT: HAC Dipole 1880 MHz

Communication System: CW; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1000$ kg/m^3
Ambient Temperature：22.4 ℃

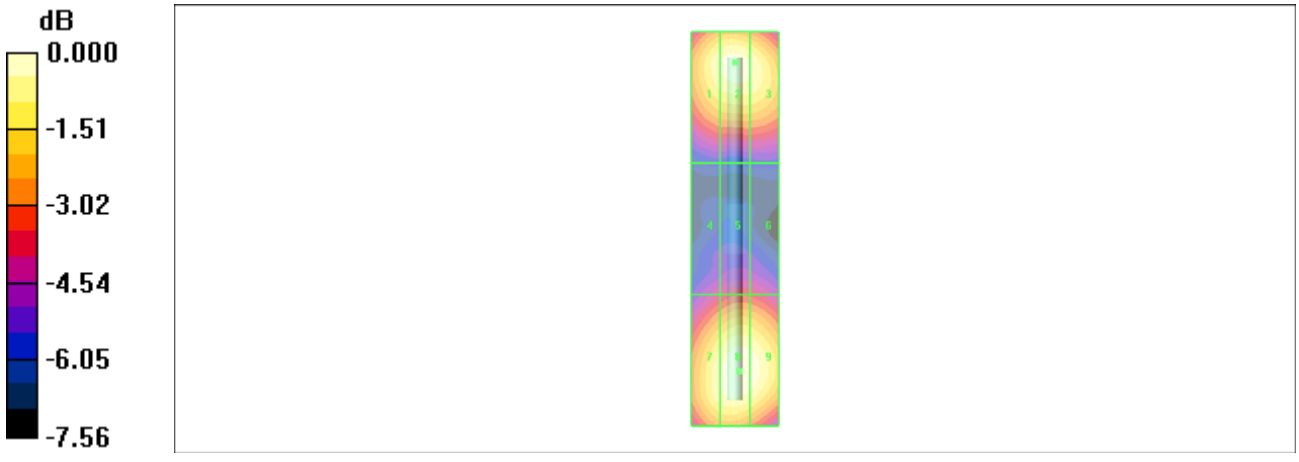
DASY4 Configuration:
- Probe: ER3DV6 - SN2358; ConvF(1, 1, 1); Calibrated: 2011/1/14
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 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
Probe Modulation Factor = 1.00
Reference Value = 138.4 V/m; Power Drift = -0.030 dB
Aversge vslue of Total=(130.4 + 133.3) / 2 = 131.85 V/m

Peak E-field in V/m

Grid 1 **126.1 M2**	Grid 2 **130.4 M2**	Grid 3 **126.9 M2**
Grid 4 **83.4 M3**	Grid 5 **88.4 M3**	Grid 6 **87.5 M3**
Grid 7 **125.8 M2**	Grid 8 **133.3 M2**	Grid 9 **131.3 M2**

Cursor:
Total = 133.3 V/m
E Category: M2
Location: -1, 32.5, 4.7 mm



0 dB = 133.3V/m

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2011/3/6

HAC_H_Dipole_835_110306

DUT: HAC-Dipole 835 MHz

Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Ambient Temperature：22.6 ℃

DASY4 Configuration:
- Probe: H3DV6 - SN6184; ; Calibrated: 2011/1/25
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

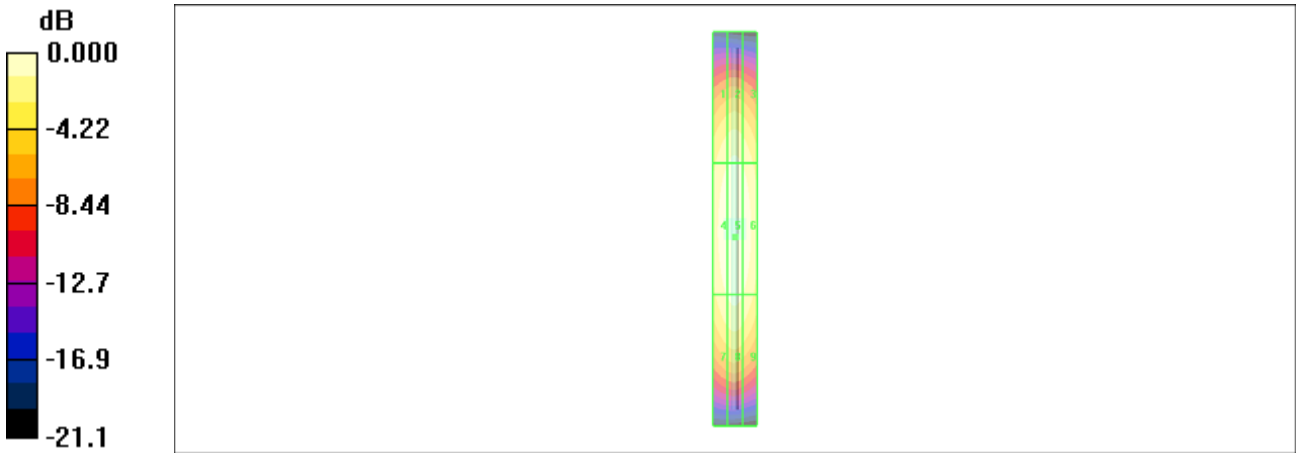
H Scan - measurement distance from the probe sensor center to CD835 Dipole = 10mm/Hearing Aid Compatibility Test (41x361x1): Measurement grid: dx=5mm, dy=5mm

Probe Modulation Factor = 1.00
Reference Value = 0.511 A/m; Power Drift = -0.008 dB
Maximum value of Total = 0.462 A/m

Peak H-field in A/m

Grid 1 **0.391 M4**	Grid 2 **0.407 M4**	Grid 3 **0.389 M4**
Grid 4 **0.442 M4**	Grid 5 **0.462 M4**	Grid 6 **0.441 M4**
Grid 7 **0.396 M4**	Grid 8 **0.414 M4**	Grid 9 **0.393 M4**

Cursor:
Total = 0.462 A/m
H Category: M4
Location: 0, 4, 5.2 mm



0 dB = 0.462A/m

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2011/3/6

HAC_H_Dipole_1880_110306

DUT: HAC Dipole 1880 MHz

Communication System: CW; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Ambient Temperature：22.6 ℃

DASY4 Configuration:
- Probe: H3DV6 - SN6184; ; Calibrated: 2011/1/25
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

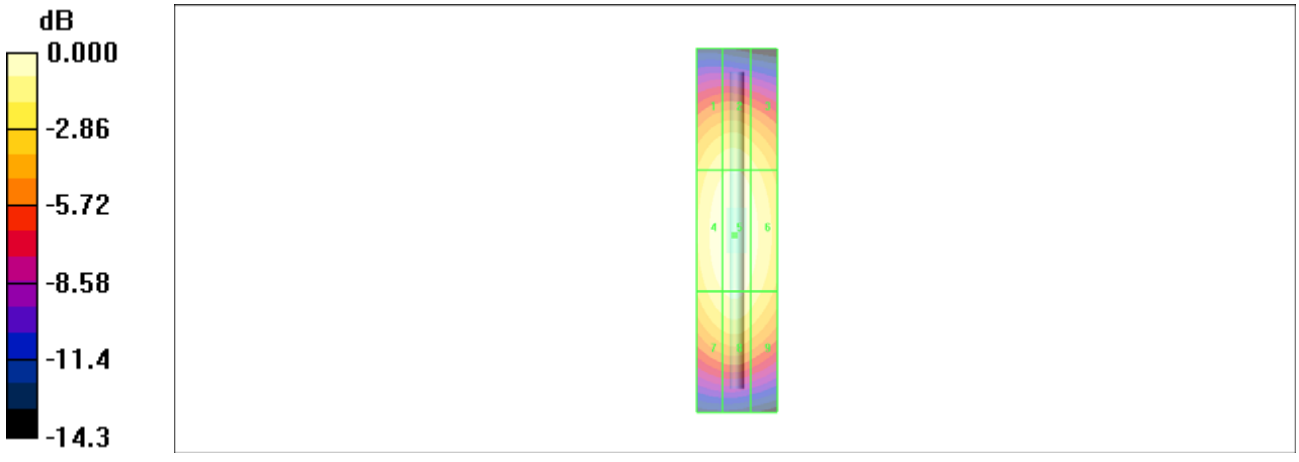
H Scan - measurement distance from the probe sensor center to CD1880 Dipole = 10mm/Hearing Aid Compatibility Test (41x181x1): Measurement grid: dx=5mm, dy=5mm

Probe Modulation Factor = 1.00
Reference Value = 0.535 A/m; Power Drift = -0.012 dB
Maximum value of Total = 0.488 A/m

Peak H-field in A/m

Grid 1 **0.428 M2**	Grid 2 **0.438 M2**	Grid 3 **0.413 M2**
Grid 4 **0.475 M2**	Grid 5 **0.488 M2**	Grid 6 **0.459 M2**
Grid 7 **0.436 M2**	Grid 8 **0.451 M2**	Grid 9 **0.423 M2**

Cursor:
Total = 0.488 A/m
H Category: M2
Location: 0.5, 1, 5.2 mm



0 dB = 0.488A/m

Appendix B. Plots of RF Emission Measurement

The plots are shown as follows.

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2011/3/6

#01 HAC_E_GSM1900_Ch512_Slide Off_Battery1

DUT: 121417

Communication System: PCS; Frequency: 1850.2 MHz;Duty Cycle: 1:8.3
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1000$ kg/m^3
Ambient Temperature：22.6 ℃

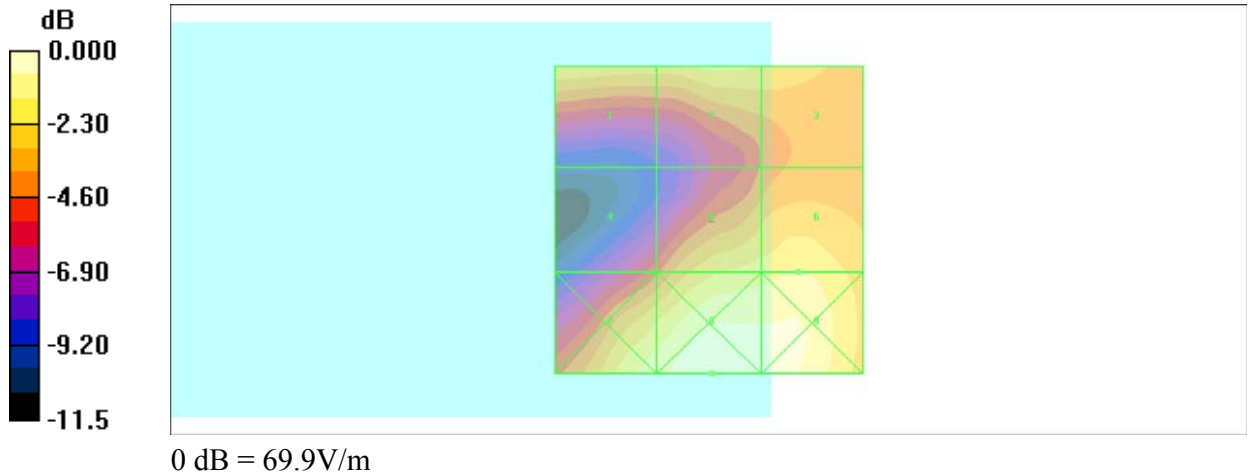
DASY4 Configuration:
- Probe: ER3DV6 - SN2358; ConvF(1, 1, 1); Calibrated: 2011/1/14
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch512/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 59.2 V/m
Probe Modulation Factor = 2.66
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 16.8 V/m; Power Drift = 0.242 dB
Hearing Aid Near-Field Category: M3 (AWF -5 dB)

Peak E-field in V/m

Grid 1 **54.4 M3**	Grid 2 **55.2 M3**	Grid 3 **53.3 M3**
Grid 4 **40.4 M4**	Grid 5 **56.4 M3**	Grid 6 **59.2 M3**
Grid 7 **62.2 M3**	Grid 8 **69.9 M3**	Grid 9 **65.7 M3**

Cursor:
Total = 69.9 V/m
E Category: M3
Location: -0.5, 25, 8.7 mm



0 dB = 69.9V/m

#02 HAC_E_GSM1900_Ch661_Slide Off_Battery1

DUT: 121417

Communication System: PCS; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1000$ kg/m^3
Ambient Temperature：22.6 ℃

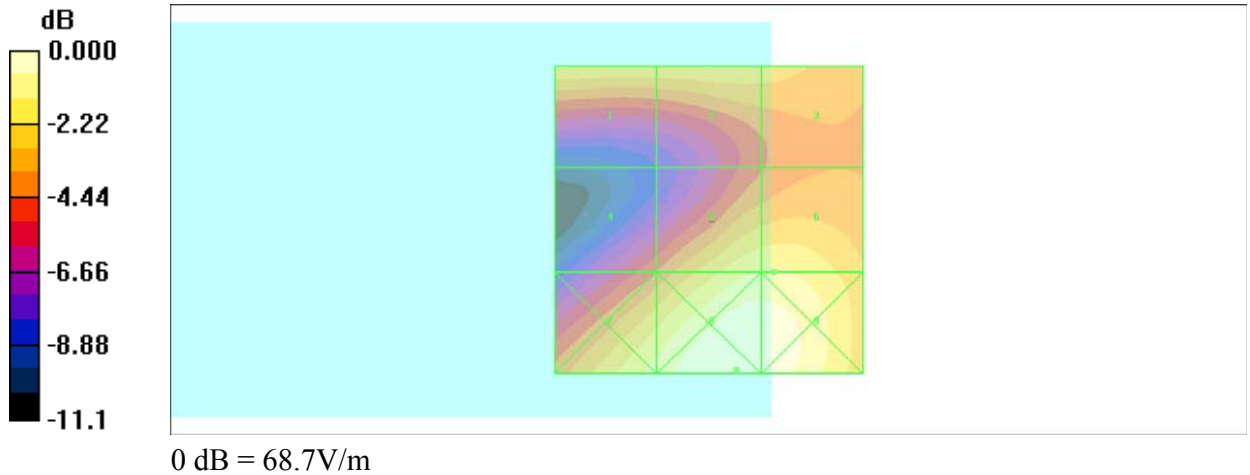
DASY4 Configuration:
- Probe: ER3DV6 - SN2358; ConvF(1, 1, 1); Calibrated: 2011/1/14
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch661/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 58.5 V/m
Probe Modulation Factor = 2.66
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 17.2 V/m; Power Drift = -0.132 dB
Hearing Aid Near-Field Category: M3 (AWF -5 dB)

Peak E-field in V/m

Grid 1 **54.0 M3**	Grid 2 **53.8 M3**	Grid 3 **52.2 M3**
Grid 4 **41.5 M4**	Grid 5 **58.2 M3**	Grid 6 **58.5 M3**
Grid 7 **60.2 M3**	Grid 8 **68.7 M3**	Grid 9 **67.8 M3**

Cursor:
Total = 68.7 V/m
E Category: M3
Location: -4.5, 24.5, 8.7 mm



0 dB = 68.7V/m

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2011/3/6

#03 HAC_E_GSM1900_Ch810_Slide Off_Battery1

DUT: 121417

Communication System: PCS; Frequency: 1909.8 MHz;Duty Cycle: 1:8.3
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1000$ kg/m^3
Ambient Temperature：22.5 ℃

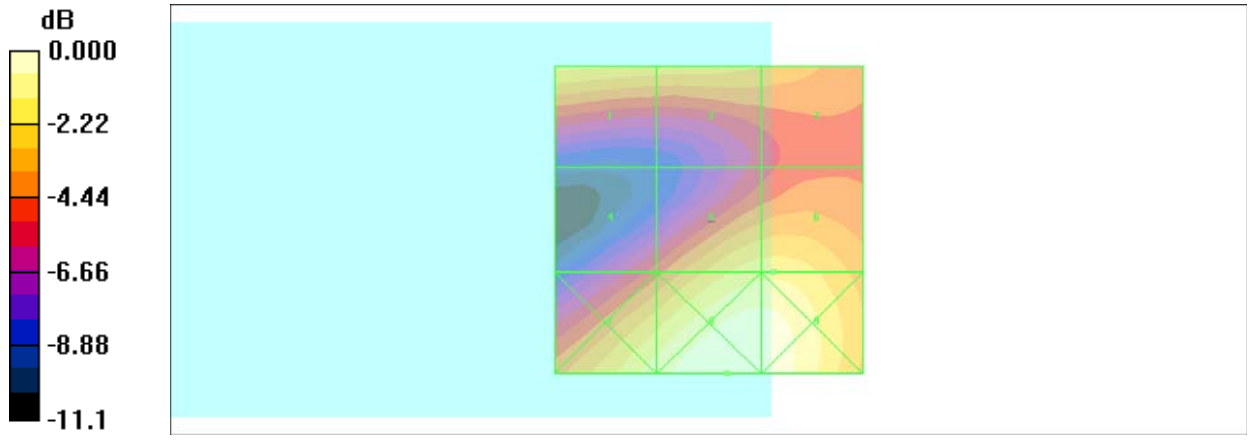
DASY4 Configuration:
- Probe: ER3DV6 - SN2358; ConvF(1, 1, 1); Calibrated: 2011/1/14
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch512/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 54.8 V/m
Probe Modulation Factor = 2.66
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 15.5 V/m; Power Drift = -0.062 dB
Hearing Aid Near-Field Category: M3 (AWF -5 dB)

Peak E-field in V/m

Grid 1 **53.3 M3**	Grid 2 **50.5 M3**	Grid 3 **47.5 M3**
Grid 4 **38.7 M4**	Grid 5 **54.5 M3**	Grid 6 **54.8 M3**
Grid 7 **59.0 M3**	Grid 8 **66.6 M3**	Grid 9 **65.4 M3**

Cursor:
Total = 66.6 V/m
E Category: M3
Location: -3, 25, 8.7 mm



0 dB = 66.6V/m

#04 HAC_E_GSM1900_Ch661_Slide Off_Battery2

DUT: 121417

Communication System: PCS; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1000$ kg/m^3
Ambient Temperature：22.5 ℃

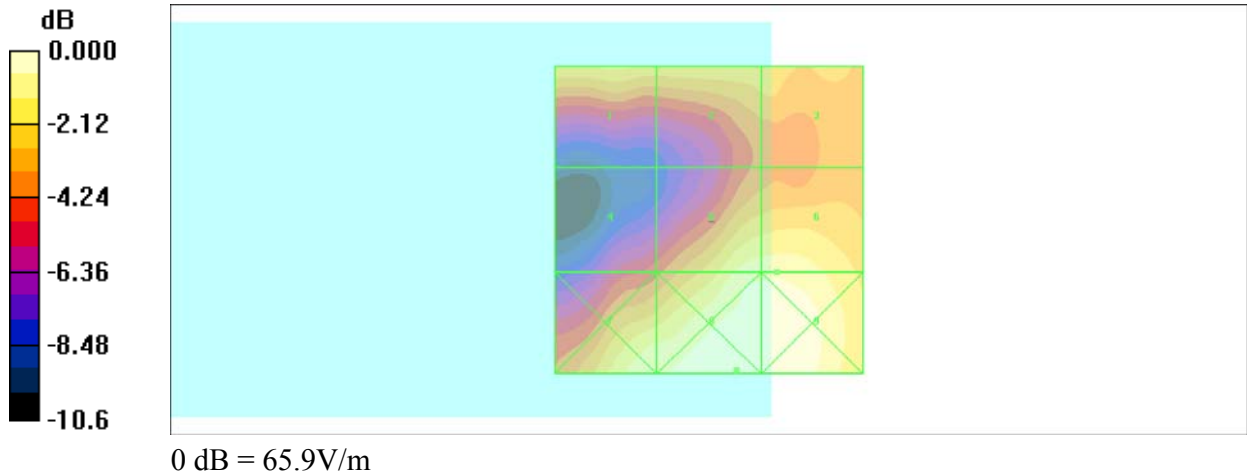
DASY4 Configuration:
- Probe: ER3DV6 - SN2358; ConvF(1, 1, 1); Calibrated: 2011/1/14
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch661/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 59.8 V/m
Probe Modulation Factor = 2.66
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 16.3 V/m; Power Drift = 0.480 dB
Hearing Aid Near-Field Category: M3 (AWF -5 dB)

Peak E-field in V/m

Grid 1 **52.7 M3**	Grid 2 **51.8 M3**	Grid 3 **50.0 M3**
Grid 4 **39.5 M4**	Grid 5 **59.4 M3**	Grid 6 **59.8 M3**
Grid 7 **60.8 M3**	Grid 8 **65.9 M3**	Grid 9 **65.1 M3**

Cursor:
Total = 65.9 V/m
E Category: M3
Location: -4.5, 24.5, 8.7 mm



0 dB = 65.9V/m

#05 HAC_E_GSM1900_Ch512_Slide Up_Battery1

DUT: 121417

Communication System: PCS; Frequency: 1850.2 MHz;Duty Cycle: 1:8.3
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1000$ kg/m^3
Ambient Temperature：22.6 ℃

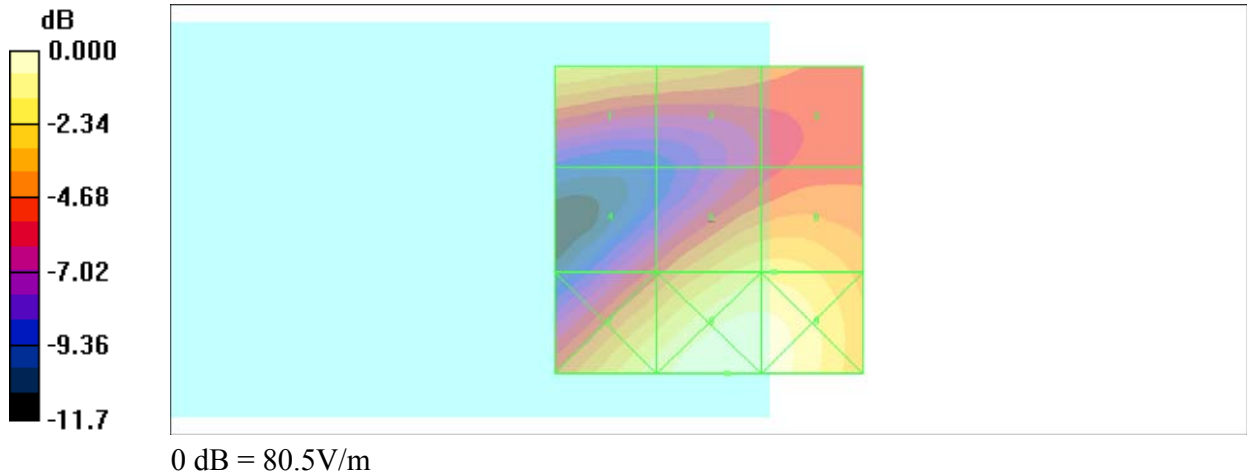
DASY4 Configuration:
- Probe: ER3DV6 - SN2358; ConvF(1, 1, 1); Calibrated: 2011/1/14
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch512/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 64.9 V/m
Probe Modulation Factor = 2.66
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 17.8 V/m; Power Drift = 0.046 dB
Hearing Aid Near-Field Category: M3 (AWF -5 dB)

Peak E-field in V/m

Grid 1 **63.4 M3**	Grid 2 **57.5 M3**	Grid 3 **50.1 M3**
Grid 4 **45.4 M4**	Grid 5 **64.6 M3**	Grid 6 **64.9 M3**
Grid 7 **71.2 M3**	Grid 8 **80.5 M3**	Grid 9 **78.7 M3**

Cursor:
Total = 80.5 V/m
E Category: M3
Location: -3, 25, 8.7 mm



0 dB = 80.5V/m

#06 HAC_E_GSM1900_Ch661_Slide Up_Battery1

DUT: 121417

Communication System: PCS; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1000$ kg/m^3
Ambient Temperature：22.6 ℃

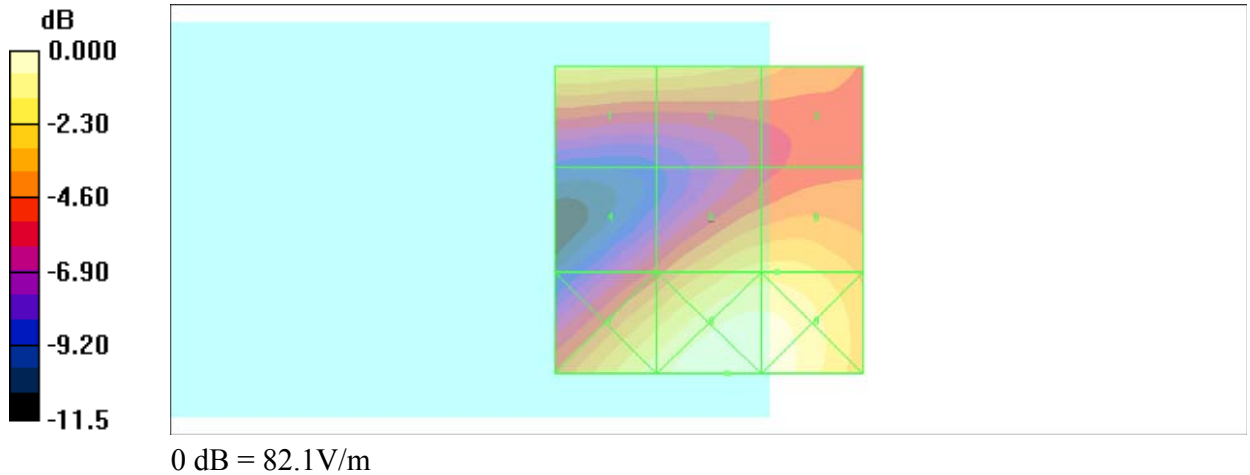
DASY4 Configuration:
- Probe: ER3DV6 - SN2358; ConvF(1, 1, 1); Calibrated: 2011/1/14
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch661/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 66.2 V/m
Probe Modulation Factor = 2.66
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 17.9 V/m; Power Drift = 0.015 dB
Hearing Aid Near-Field Category: M3 (AWF -5 dB)

Peak E-field in V/m

Grid 1 **65.1 M3**	Grid 2 **62.8 M3**	Grid 3 **55.4 M3**
Grid 4 **46.6 M4**	Grid 5 **65.8 M3**	Grid 6 **66.2 M3**
Grid 7 **72.7 M3**	Grid 8 **82.1 M3**	Grid 9 **80.5 M3**

Cursor:
Total = 82.1 V/m
E Category: M3
Location: -3, 25, 8.7 mm



0 dB = 82.1V/m

#07 HAC_E_GSM1900_Ch810_Slide Up_Battery1

DUT: 121417

Communication System: PCS; Frequency: 1909.8 MHz;Duty Cycle: 1:8.3
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1000$ kg/m^3
Ambient Temperature：22.5 ℃

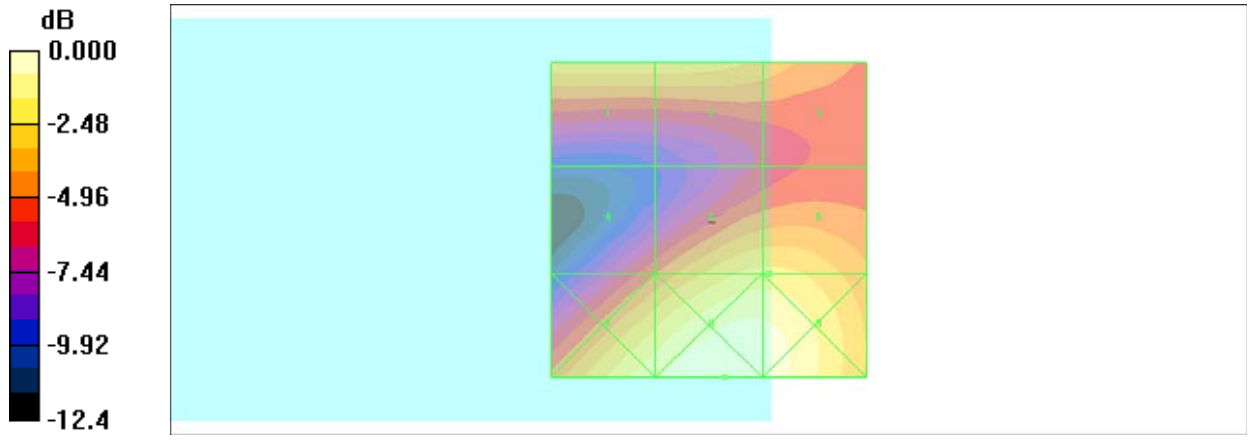
DASY4 Configuration:
- Probe: ER3DV6 - SN2358; ConvF(1, 1, 1); Calibrated: 2011/1/14
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch810/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 64.9 V/m
Probe Modulation Factor = 2.66
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 18.0 V/m; Power Drift = 0.083 dB
Hearing Aid Near-Field Category: M3 (AWF -5 dB)

Peak E-field in V/m

Grid 1 **61.6 M3**	Grid 2 **61.5 M3**	Grid 3 **55.8 M3**
Grid 4 **47.1 M4**	Grid 5 **64.9 M3**	Grid 6 **64.9 M3**
Grid 7 **74.8 M3**	Grid 8 **83.7 M3**	Grid 9 **80.8 M3**

Cursor:
Total = 83.7 V/m
E Category: M3
Location: -2.5, 25, 8.7 mm



0 dB = 83.7V/m

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2011/3/6

#08 HAC_E_GSM1900_Ch661_Slide Up_Battery2

DUT: 121417

Communication System: PCS; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1000$ kg/m^3
Ambient Temperature：22.6 ℃

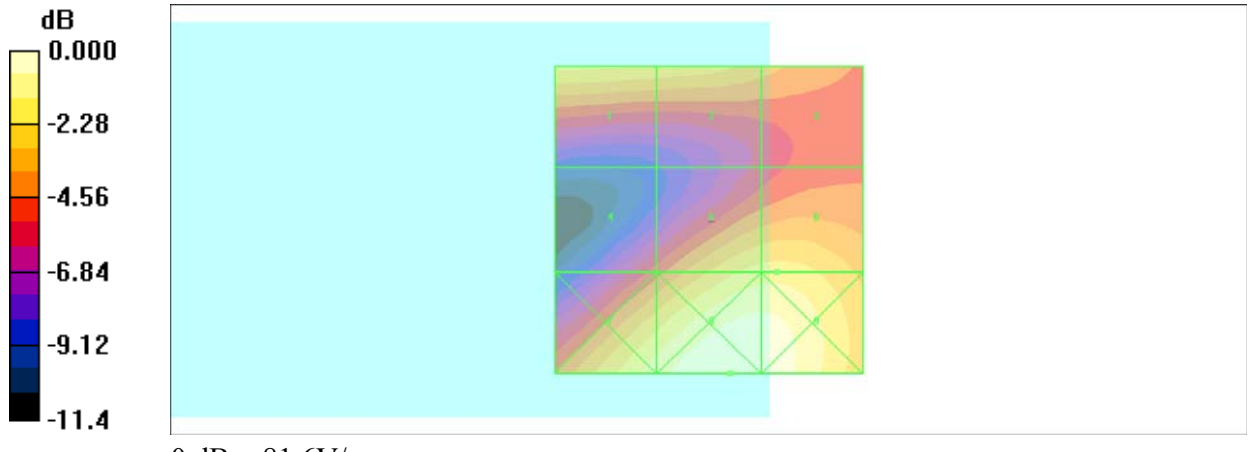
DASY4 Configuration:
- Probe: ER3DV6 - SN2358; ConvF(1, 1, 1); Calibrated: 2011/1/14
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch661/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 65.8 V/m
Probe Modulation Factor = 2.66
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 17.8 V/m; Power Drift = 0.029 dB
Hearing Aid Near-Field Category: M3 (AWF -5 dB)

Peak E-field in V/m

Grid 1 **64.6 M3**	Grid 2 **62.4 M3**	Grid 3 **55.2 M3**
Grid 4 **46.5 M4**	Grid 5 **65.3 M3**	Grid 6 **65.8 M3**
Grid 7 **72.1 M3**	Grid 8 **81.6 M3**	Grid 9 **79.9 M3**

Cursor:
Total = 81.6 V/m
E Category: M3
Location: -3.5, 25, 8.7 mm



0 dB = 81.6V/m

#09 HAC_E_GSM850_Ch128_Slide Off_Battery1

DUT: 121417

Communication System: GSM850; Frequency: 824.2 MHz;Duty Cycle: 1:8.3
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1000$ kg/m^3
Ambient Temperature：22.5 ℃

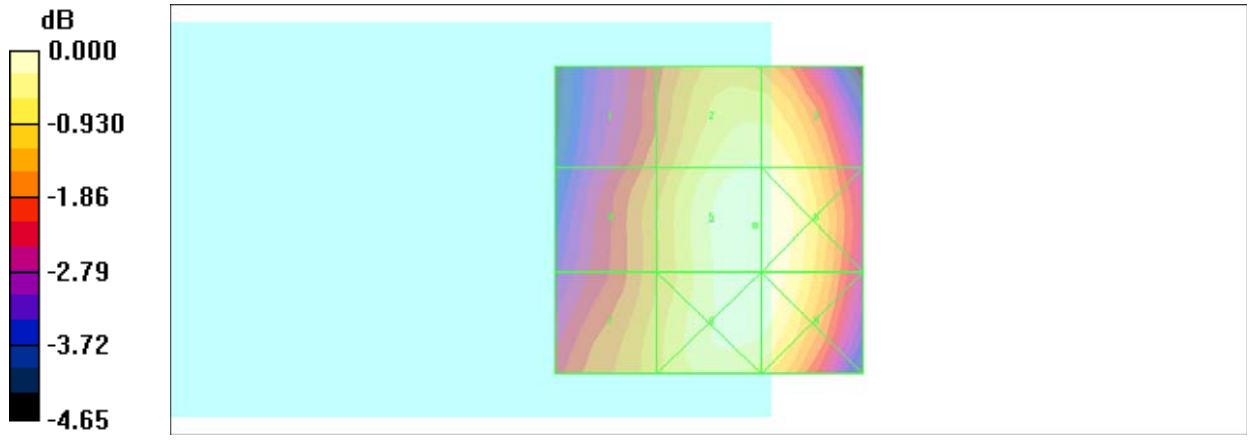
DASY4 Configuration:
- Probe: ER3DV6 - SN2358; ConvF(1, 1, 1); Calibrated: 2011/1/14
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch128/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 154.4 V/m
Probe Modulation Factor = 2.64
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 71.2 V/m; Power Drift = -0.062 dB
Hearing Aid Near-Field Category: M3 (AWF -5 dB)

Peak E-field in V/m

Grid 1 **129.1 M4**	Grid 2 **150.0 M3**	Grid 3 **149.9 M3**
Grid 4 **133.8 M4**	Grid 5 **154.4 M3**	Grid 6 **154.3 M3**
Grid 7 **137.2 M4**	Grid 8 **153.8 M3**	Grid 9 **153.8 M3**

Cursor:
Total = 154.4 V/m
E Category: M3
Location: -7.5, 1, 8.7 mm



0 dB = 154.4V/m

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2011/3/6

#10 HAC_E_GSM850_Ch189_Slide Off_Battery1

DUT: 121417

Communication System: GSM850; Frequency: 836.4 MHz;Duty Cycle: 1:8.3
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1000$ kg/m^3
Ambient Temperature：22.5 ℃

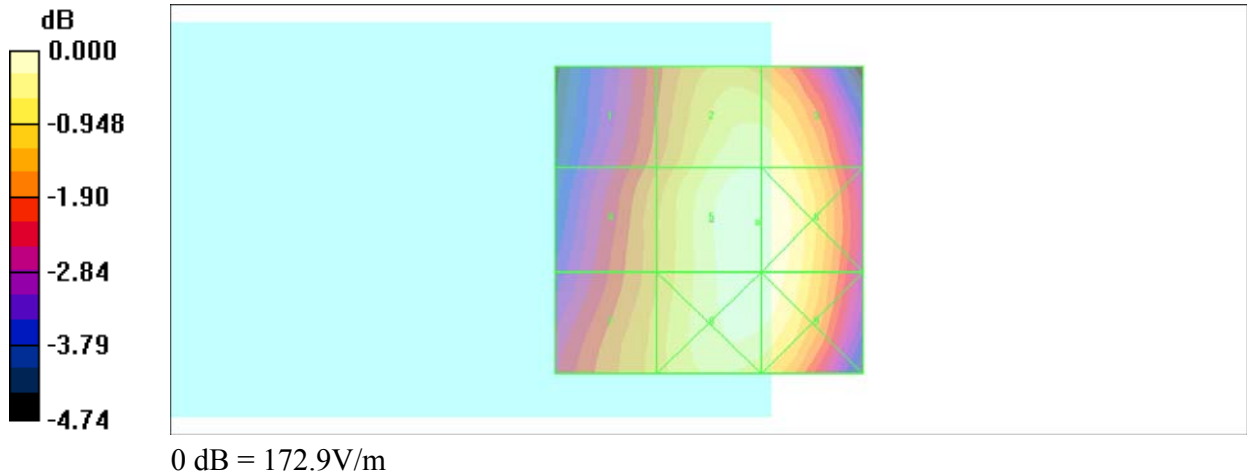
DASY4 Configuration:
- Probe: ER3DV6 - SN2358; ConvF(1, 1, 1); Calibrated: 2011/1/14
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch189/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 172.9 V/m
Probe Modulation Factor = 2.64
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 78.5 V/m; Power Drift = 0.060 dB
Hearing Aid Near-Field Category: M3 (AWF -5 dB)

Peak E-field in V/m

Grid 1 **143.2 M4**	Grid 2 **167.5 M3**	Grid 3 **167.3 M3**
Grid 4 **149.0 M4**	Grid 5 **172.9 M3**	Grid 6 **172.8 M3**
Grid 7 **152.3 M3**	Grid 8 **171.9 M3**	Grid 9 **171.7 M3**

Cursor:
Total = 172.9 V/m
E Category: M3
Location: -8, 0.5, 8.7 mm



0 dB = 172.9V/m

#11 HAC_E_GSM850_Ch251_Slide Off_Battery1

DUT: 121417

Communication System: GSM850; Frequency: 848.8 MHz;Duty Cycle: 1:8.3
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1000$ kg/m^3
Ambient Temperature：22.6 ℃

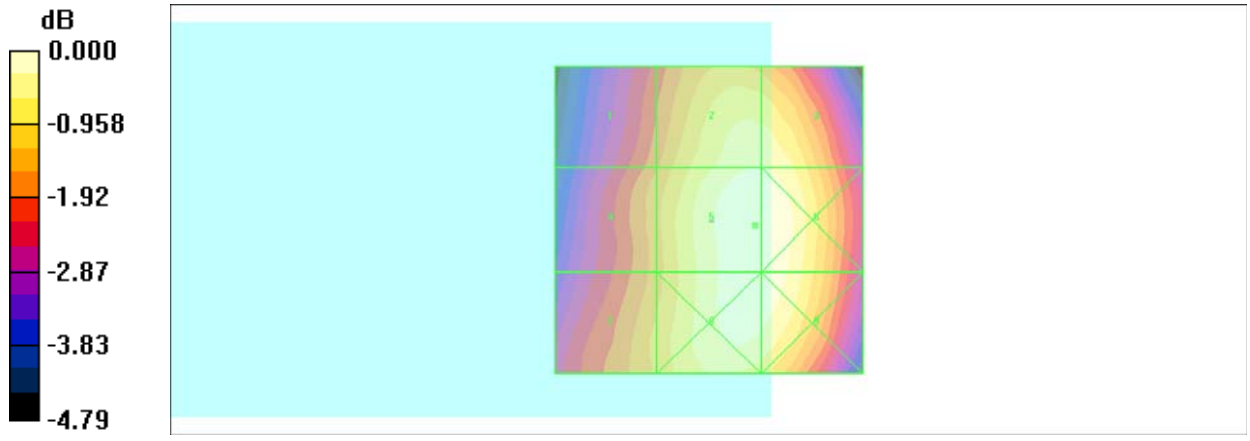
DASY4 Configuration:
- Probe: ER3DV6 - SN2358; ConvF(1, 1, 1); Calibrated: 2011/1/14
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch251/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 177.1 V/m
Probe Modulation Factor = 2.64
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 81.1 V/m; Power Drift = -0.063 dB
Hearing Aid Near-Field Category: M3 (AWF -5 dB)

Peak E-field in V/m

Grid 1 **146.7 M4**	Grid 2 **171.1 M3**	Grid 3 **171.1 M3**
Grid 4 **151.3 M3**	Grid 5 **177.1 M3**	Grid 6 **177.0 M3**
Grid 7 **154.8 M3**	Grid 8 **175.9 M3**	Grid 9 **175.9 M3**

Cursor:
Total = 177.1 V/m
E Category: M3
Location: -7.5, 1, 8.7 mm



0 dB = 177.1V/m

#12 HAC_E_GSM850_Ch251_Slide Off_Battery2

DUT: 121417

Communication System: GSM850; Frequency: 848.8 MHz;Duty Cycle: 1:8.3
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1000$ kg/m^3
Ambient Temperature：22.5 ℃

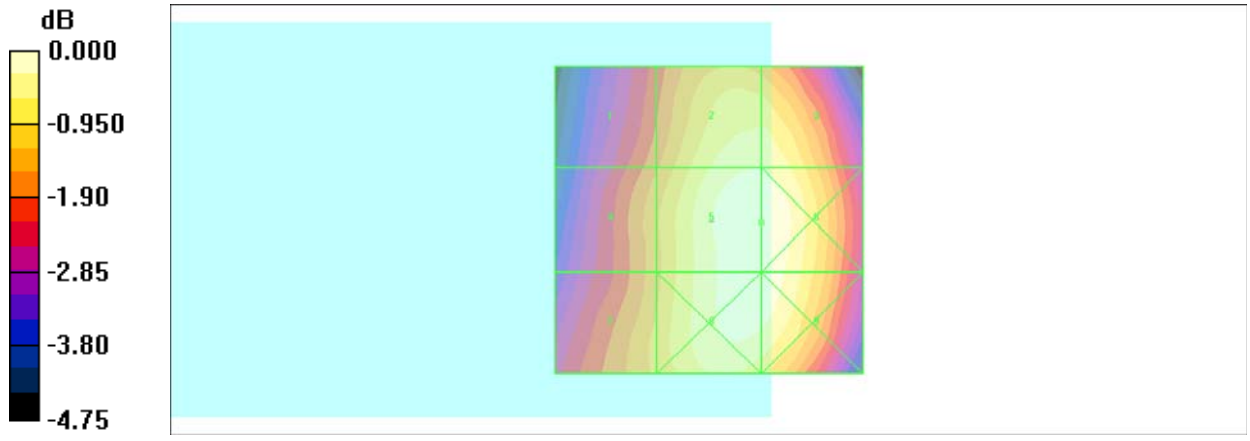
DASY4 Configuration:
- Probe: ER3DV6 - SN2358; ConvF(1, 1, 1); Calibrated: 2011/1/14
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch251/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 174.6 V/m
Probe Modulation Factor = 2.64
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 80.0 V/m; Power Drift = -0.076 dB
Hearing Aid Near-Field Category: M3 (AWF -5 dB)

Peak E-field in V/m

Grid 1 **144.9 M4**	Grid 2 **168.3 M3**	Grid 3 **168.3 M3**
Grid 4 **150.4 M3**	Grid 5 **174.6 M3**	Grid 6 **174.6 M3**
Grid 7 **153.0 M3**	Grid 8 **173.3 M3**	Grid 9 **173.2 M3**

Cursor:
Total = 174.6 V/m
E Category: M3
Location: -8.5, 0.5, 8.7 mm



0 dB = 174.6V/m

#13 HAC_E_GSM850_Ch128_Slide Up_Battery1

DUT: 121417

Communication System: GSM850; Frequency: 824.2 MHz;Duty Cycle: 1:8.3
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1000$ kg/m^3
Ambient Temperature：22.5 ℃

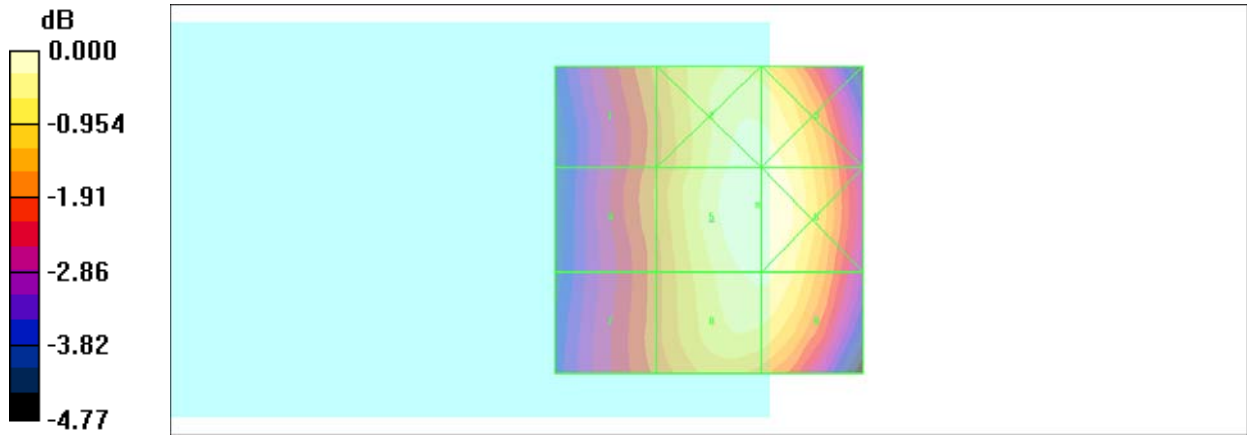
DASY4 Configuration:
- Probe: ER3DV6 - SN2358; ConvF(1, 1, 1); Calibrated: 2011/1/14
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch128/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 147.8 V/m
Probe Modulation Factor = 2.64
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 67.0 V/m; Power Drift = -0.033 dB
Hearing Aid Near-Field Category: M4 (AWF -5 dB)

Peak E-field in V/m

Grid 1 **124.8 M4**	Grid 2 **146.0 M4**	Grid 3 **145.9 M4**
Grid 4 **124.1 M4**	Grid 5 **147.8 M4**	Grid 6 **147.8 M4**
Grid 7 **121.8 M4**	Grid 8 **143.8 M4**	Grid 9 **143.8 M4**

Cursor:
Total = 147.8 V/m
E Category: M4
Location: -8, -2.5, 8.7 mm



0 dB = 147.8V/m

#14 HAC_E_GSM850_Ch189_Slide Up_Battery1

DUT: 121417

Communication System: GSM850; Frequency: 836.4 MHz;Duty Cycle: 1:8.3
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1000$ kg/m^3
Ambient Temperature：22.5 ℃

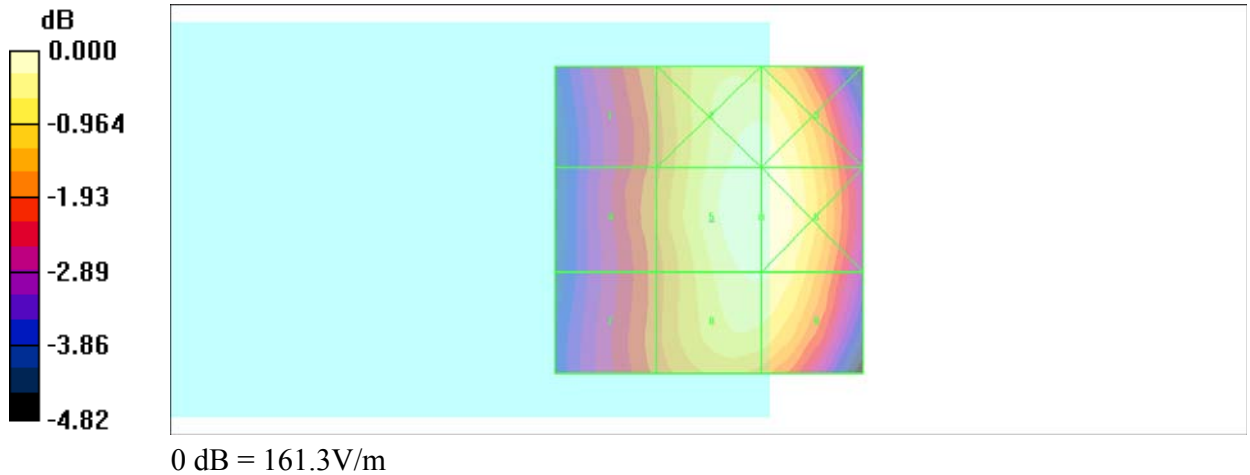
DASY4 Configuration:
- Probe: ER3DV6 - SN2358; ConvF(1, 1, 1); Calibrated: 2011/1/14
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch189/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 161.3 V/m
Probe Modulation Factor = 2.64
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 73.1 V/m; Power Drift = -0.109 dB
Hearing Aid Near-Field Category: M3 (AWF -5 dB)

Peak E-field in V/m

Grid 1 **135.1 M4**	Grid 2 **159.2 M3**	Grid 3 **159.2 M3**
Grid 4 **134.8 M4**	Grid 5 **161.3 M3**	Grid 6 **161.3 M3**
Grid 7 **132.7 M4**	Grid 8 **156.5 M3**	Grid 9 **156.5 M3**

Cursor:
Total = 161.3 V/m
E Category: M3
Location: -8.5, -0.5, 8.7 mm



0 dB = 161.3V/m

#15 HAC_E_GSM850_Ch251_Slide Up_Battery1

DUT: 121417

Communication System: GSM850; Frequency: 848.8 MHz;Duty Cycle: 1:8.3
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1000$ kg/m^3
Ambient Temperature：22.5 ℃

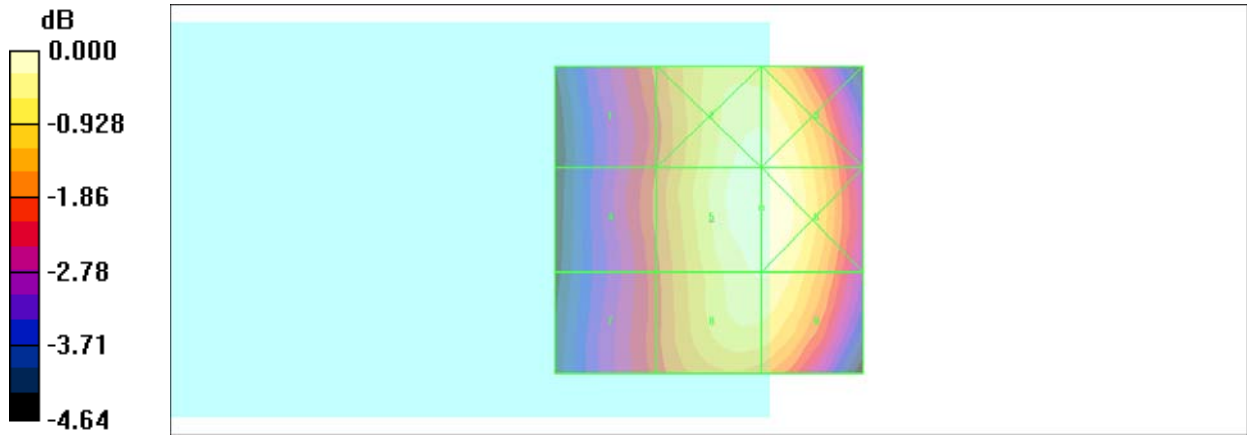
DASY4 Configuration:
- Probe: ER3DV6 - SN2358; ConvF(1, 1, 1); Calibrated: 2011/1/14
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch251/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 165.8 V/m
Probe Modulation Factor = 2.64
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 74.1 V/m; Power Drift = -0.028 dB
Hearing Aid Near-Field Category: M3 (AWF -5 dB)

Peak E-field in V/m

Grid 1 **135.7 M4**	Grid 2 **162.9 M3**	Grid 3 **162.9 M3**
Grid 4 **135.5 M4**	Grid 5 **165.8 M3**	Grid 6 **165.8 M3**
Grid 7 **132.7 M4**	Grid 8 **160.6 M3**	Grid 9 **160.6 M3**

Cursor:
Total = 165.8 V/m
E Category: M3
Location: -8.5, -2, 8.7 mm



0 dB = 165.8V/m

#16 HAC_E_GSM850_Ch251_Slide Up_Battery2

DUT: 121417

Communication System: GSM850; Frequency: 848.8 MHz;Duty Cycle: 1:8.3
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1000$ kg/m^3
Ambient Temperature：22.5 ℃

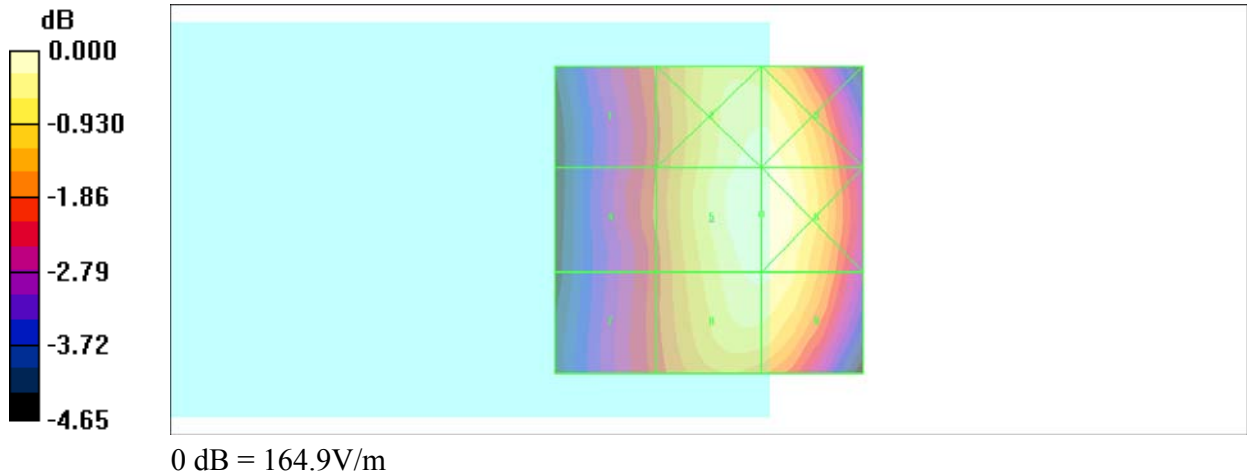
DASY4 Configuration:
- Probe: ER3DV6 - SN2358; ConvF(1, 1, 1); Calibrated: 2011/1/14
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch251/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 164.9 V/m
Probe Modulation Factor = 2.64
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 73.7 V/m; Power Drift = -0.044 dB
Hearing Aid Near-Field Category: M3 (AWF -5 dB)

Peak E-field in V/m

Grid 1 **134.2 M4**	Grid 2 **162.4 M3**	Grid 3 **162.4 M3**
Grid 4 **134.5 M4**	Grid 5 **164.9 M3**	Grid 6 **164.9 M3**
Grid 7 **132.1 M4**	Grid 8 **160.3 M3**	Grid 9 **160.3 M3**

Cursor:
Total = 164.9 V/m
E Category: M3
Location: -8.5, -1, 8.7 mm



0 dB = 164.9V/m

#17 HAC_E_WCDMA II_RMC12.2K_Ch9262_Slide Off_Battery1

DUT: 121417

Communication System: WCDMA; Frequency: 1852.4 MHz;Duty Cycle: 1:1
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1000$ kg/m^3
Ambient Temperature：22.6 ℃

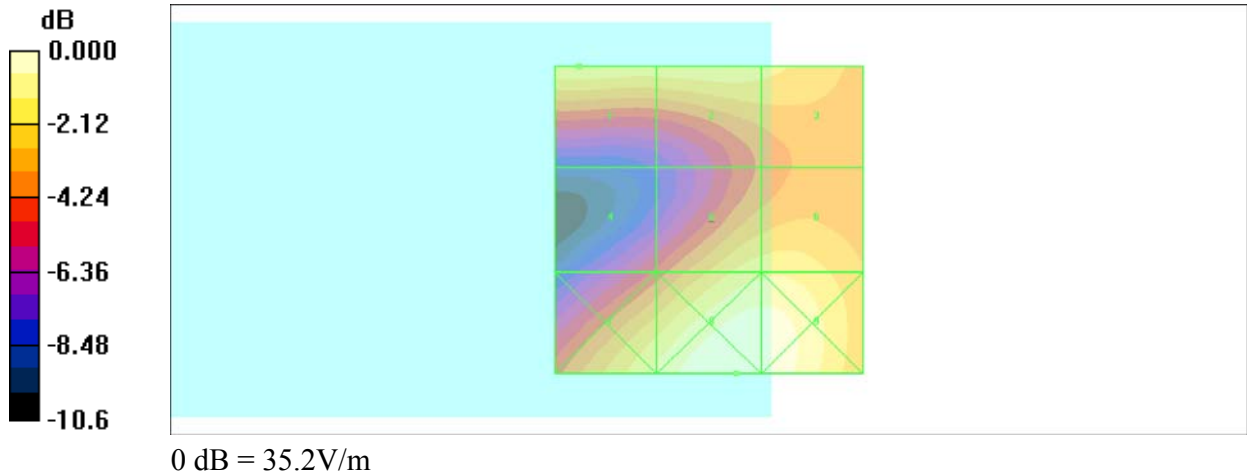
DASY4 Configuration:
- Probe: ER3DV6 - SN2358; ConvF(1, 1, 1); Calibrated: 2011/1/14
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch9262/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 30.0 V/m
Probe Modulation Factor = 1.06
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 21.4 V/m; Power Drift = 0.006 dB
Hearing Aid Near-Field Category: M4 (AWF 0 dB)

Peak E-field in V/m

Grid 1 **30.0 M4**	Grid 2 **30.0 M4**	Grid 3 **28.7 M4**
Grid 4 **20.6 M4**	Grid 5 **29.3 M4**	Grid 6 **29.6 M4**
Grid 7 **30.6 M4**	Grid 8 **35.2 M4**	Grid 9 **34.8 M4**

Cursor:
Total = 35.2 V/m
E Category: M4
Location: -4.5, 25, 8.7 mm



0 dB = 35.2V/m

#18 HAC_E_WCDMA II_RMC12.2K_Ch9400_Slide Off_Battery1

DUT: 121417

Communication System: WCDMA; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1000$ kg/m^3
Ambient Temperature：22.5 ℃

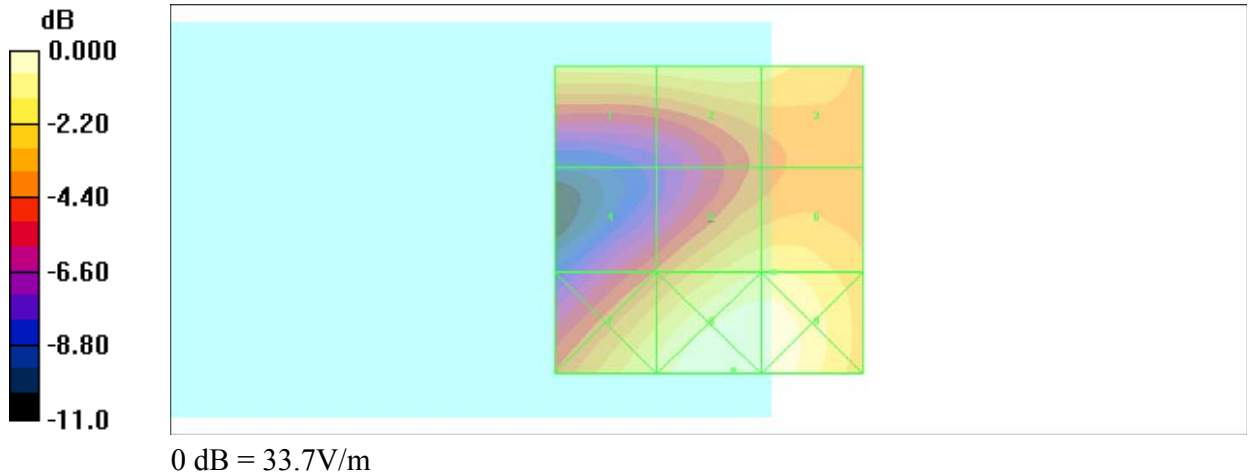
DASY4 Configuration:
- Probe: ER3DV6 - SN2358; ConvF(1, 1, 1); Calibrated: 2011/1/14
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch9400/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 28.6 V/m
Probe Modulation Factor = 1.06
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 21.2 V/m; Power Drift = 0.031 dB
Hearing Aid Near-Field Category: M4 (AWF 0 dB)

Peak E-field in V/m

Grid 1 **27.8 M4**	Grid 2 **28.4 M4**	Grid 3 **27.4 M4**
Grid 4 **20.7 M4**	Grid 5 **28.4 M4**	Grid 6 **28.6 M4**
Grid 7 **29.5 M4**	Grid 8 **33.7 M4**	Grid 9 **33.4 M4**

Cursor:
Total = 33.7 V/m
E Category: M4
Location: -4, 24.5, 8.7 mm



0 dB = 33.7V/m

#19 HAC_E_WCDMA II_RMC12.2K_Ch9538_Slide Off_Battery1

DUT: 121417

Communication System: WCDMA; Frequency: 1907.6 MHz;Duty Cycle: 1:1
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1000$ kg/m^3
Ambient Temperature：22.3 ℃

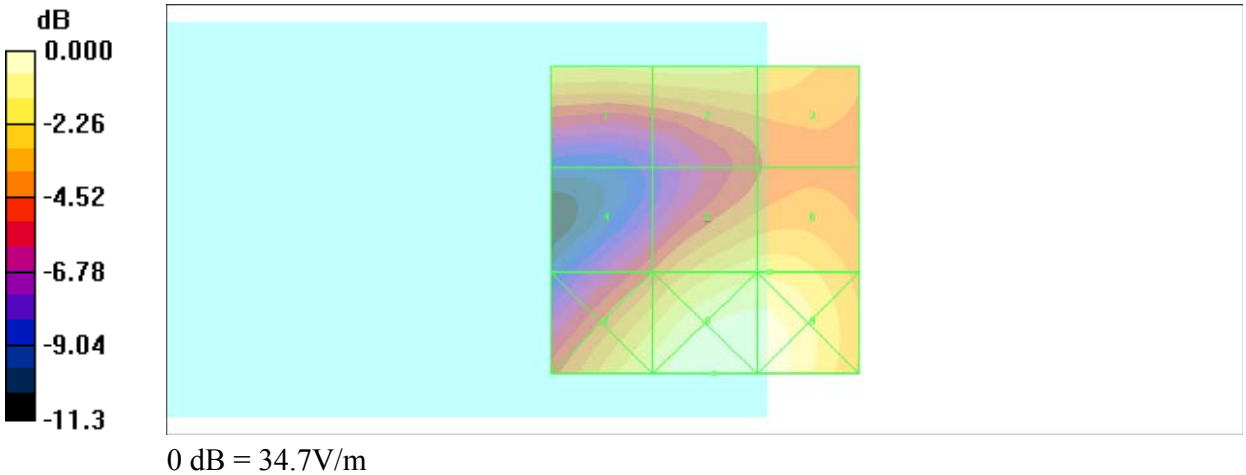
DASY4 Configuration:
- Probe: ER3DV6 - SN2358; ConvF(1, 1, 1); Calibrated: 2011/1/14
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch9538/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 28.6 V/m
Probe Modulation Factor = 1.06
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 20.5 V/m; Power Drift = 0.293 dB
Hearing Aid Near-Field Category: M4 (AWF 0 dB)

Peak E-field in V/m

Grid 1 **27.8 M4**	Grid 2 **28.0 M4**	Grid 3 **26.9 M4**
Grid 4 **20.8 M4**	Grid 5 **28.4 M4**	Grid 6 **28.6 M4**
Grid 7 **30.3 M4**	Grid 8 **34.7 M4**	Grid 9 **34.0 M4**

Cursor:
Total = 34.7 V/m
E Category: M4
Location: -1.5, 25, 8.7 mm



0 dB = 34.7V/m

#20 HAC_E_WCDMA II_RMC12.2K_Ch9262_Slide Off_Battery2

DUT: 121417

Communication System: WCDMA; Frequency: 1852.4 MHz;Duty Cycle: 1:1
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1000$ kg/m^3
Ambient Temperature：22.4 ℃

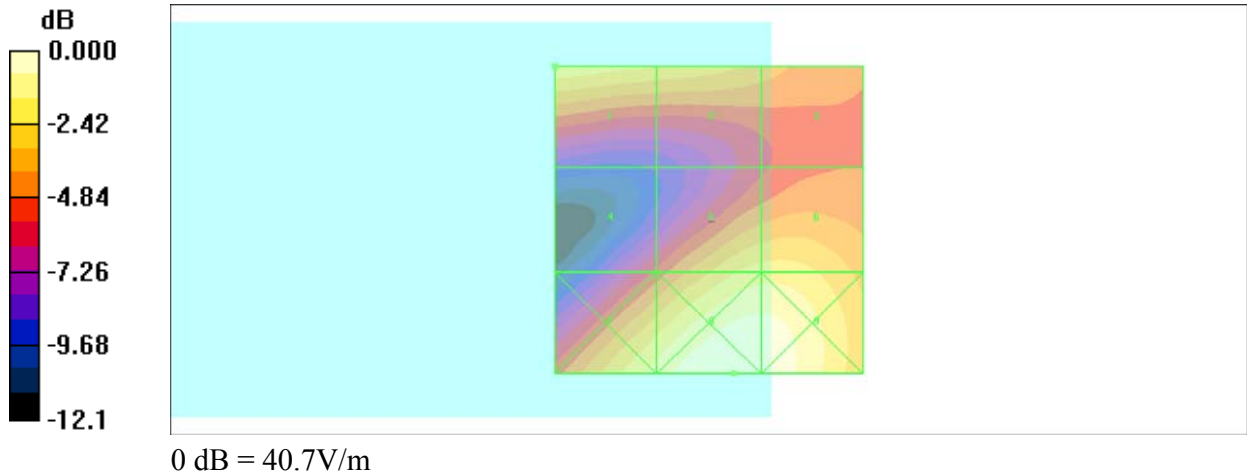
DASY4 Configuration:
- Probe: ER3DV6 - SN2358; ConvF(1, 1, 1); Calibrated: 2011/1/14
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch9262/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 33.4 V/m
Probe Modulation Factor = 1.06
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 22.1 V/m; Power Drift = -0.042 dB
Hearing Aid Near-Field Category: M4 (AWF 0 dB)

Peak E-field in V/m

Grid 1 **33.4 M4**	Grid 2 **30.9 M4**	Grid 3 **27.2 M4**
Grid 4 **22.0 M4**	Grid 5 **32.2 M4**	Grid 6 **32.4 M4**
Grid 7 **35.3 M4**	Grid 8 **40.7 M4**	Grid 9 **40.0 M4**

Cursor:
Total = 40.7 V/m
E Category: M4
Location: -4, 25, 8.7 mm



0 dB = 40.7V/m

#21 HAC_E_WCDMA II_RMC12.2K_Ch9262_Slide Up_Battery1

DUT: 121417

Communication System: WCDMA; Frequency: 1852.4 MHz;Duty Cycle: 1:1
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1000$ kg/m^3
Ambient Temperature：22.6 ℃

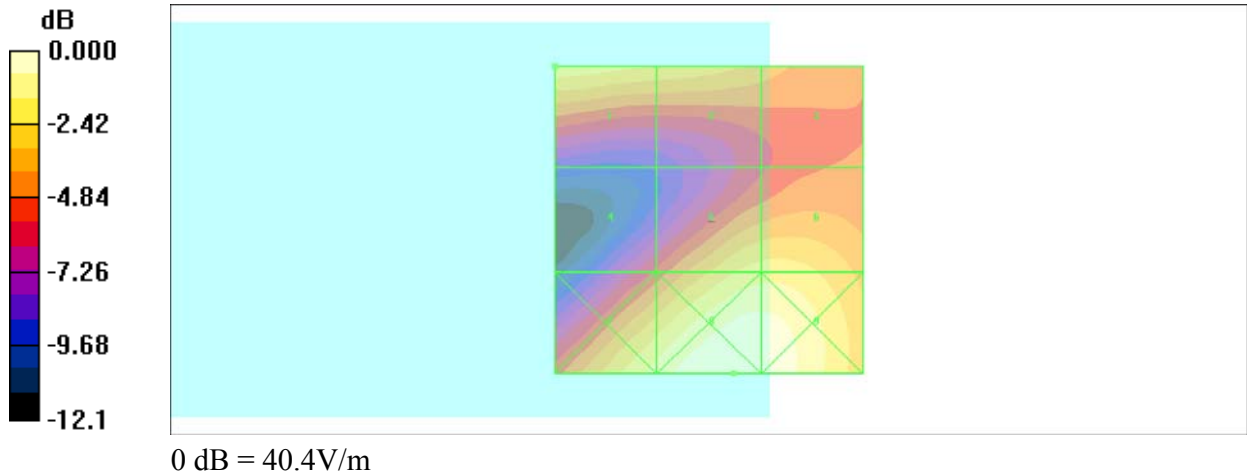
DASY4 Configuration:
- Probe: ER3DV6 - SN2358; ConvF(1, 1, 1); Calibrated: 2011/1/14
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch9262/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 32.9 V/m
Probe Modulation Factor = 1.06
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 21.9 V/m; Power Drift = 0.059 dB
Hearing Aid Near-Field Category: M4 (AWF 0 dB)

Peak E-field in V/m

Grid 1 **32.9 M4**	Grid 2 **30.7 M4**	Grid 3 **26.9 M4**
Grid 4 **21.8 M4**	Grid 5 **32.1 M4**	Grid 6 **32.3 M4**
Grid 7 **35.0 M4**	Grid 8 **40.4 M4**	Grid 9 **39.6 M4**

Cursor:
Total = 40.4 V/m
E Category: M4
Location: -4, 25, 8.7 mm



0 dB = 40.4V/m

#22 HAC_E_WCDMA II_RMC12.2K_Ch9400_Slide Up_Battery1

DUT: 121417

Communication System: WCDMA; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1000$ kg/m^3
Ambient Temperature：22.5 ℃

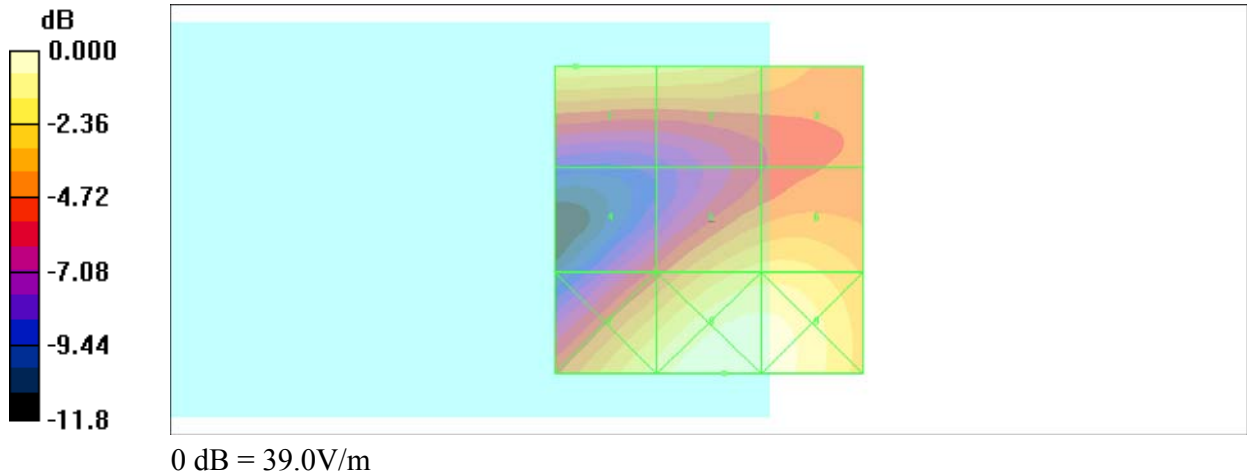
DASY4 Configuration:
- Probe: ER3DV6 - SN2358; ConvF(1, 1, 1); Calibrated: 2011/1/14
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch9400/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 31.9 V/m
Probe Modulation Factor = 1.06
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 21.0 V/m; Power Drift = -0.088 dB
Hearing Aid Near-Field Category: M4 (AWF 0 dB)

Peak E-field in V/m

Grid 1 **31.9 M4**	Grid 2 **31.1 M4**	Grid 3 **27.4 M4**
Grid 4 **21.7 M4**	Grid 5 **31.0 M4**	Grid 6 **31.2 M4**
Grid 7 **34.1 M4**	Grid 8 **39.0 M4**	Grid 9 **38.3 M4**

Cursor:
Total = 39.0 V/m
E Category: M4
Location: -2.5, 25, 8.7 mm



0 dB = 39.0V/m

#23 HAC_E_WCDMA II_RMC12.2K_Ch9538_Slide Up_Battery1

DUT: 121417

Communication System: WCDMA; Frequency: 1907.6 MHz;Duty Cycle: 1:1
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1000$ kg/m^3
Ambient Temperature：22.6 ℃

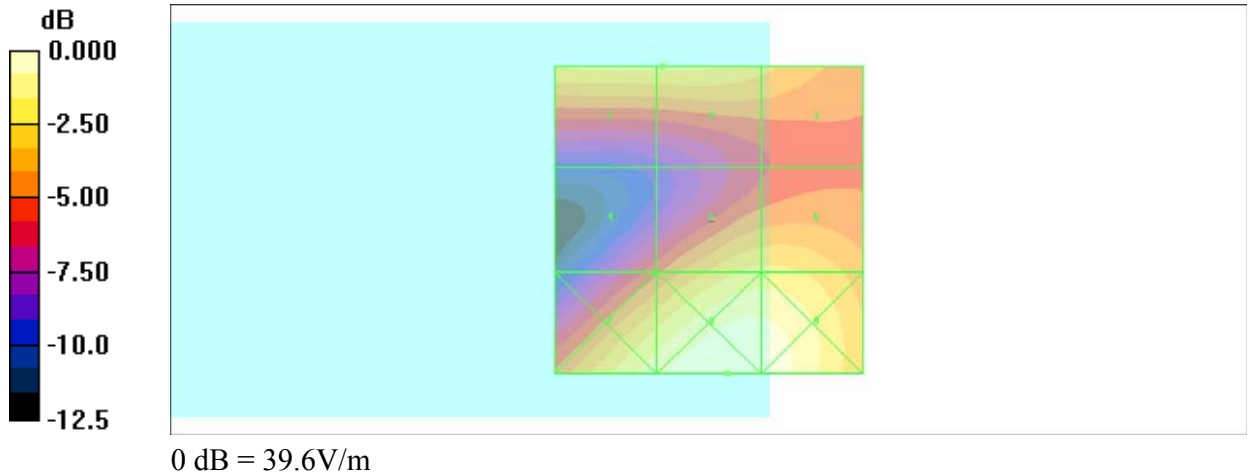
DASY4 Configuration:
- Probe: ER3DV6 - SN2358; ConvF(1, 1, 1); Calibrated: 2011/1/14
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch9538/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 30.7 V/m
Probe Modulation Factor = 1.06
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 21.1 V/m; Power Drift = 0.149 dB
Hearing Aid Near-Field Category: M4 (AWF 0 dB)

Peak E-field in V/m

Grid 1 **30.7 M4**	Grid 2 **30.7 M4**	Grid 3 **28.0 M4**
Grid 4 **21.8 M4**	Grid 5 **30.6 M4**	Grid 6 **30.7 M4**
Grid 7 **35.0 M4**	Grid 8 **39.6 M4**	Grid 9 **38.5 M4**

Cursor:
Total = 39.6 V/m
E Category: M4
Location: -3, 25, 8.7 mm



0 dB = 39.6V/m

#24 HAC_E_WCDMA II_RMC12.2K_Ch9262_Slide Up_Battery2

DUT: 121417

Communication System: WCDMA; Frequency: 1852.4 MHz;Duty Cycle: 1:1
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1000$ kg/m^3
Ambient Temperature：22.6 ℃

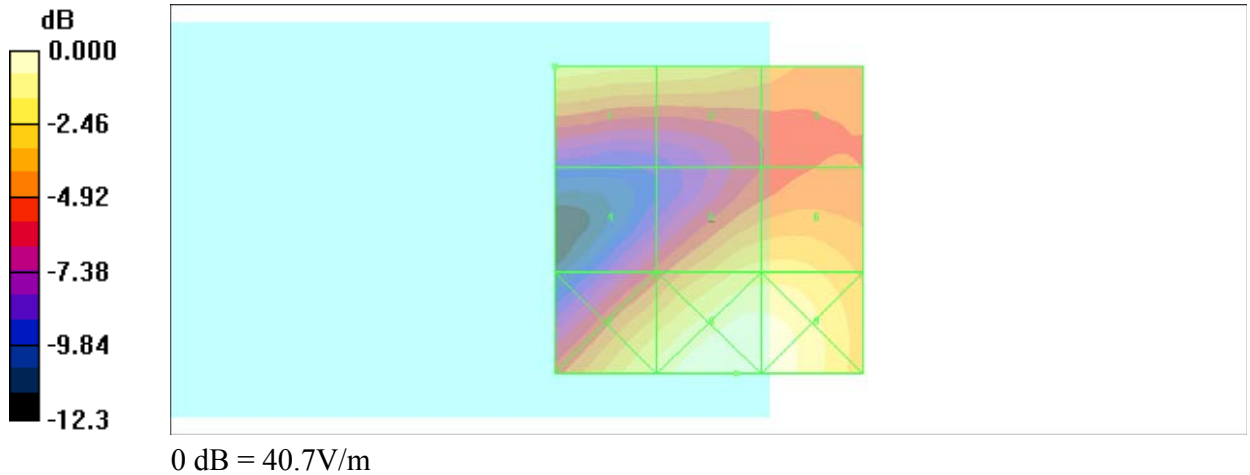
DASY4 Configuration:
- Probe: ER3DV6 - SN2358; ConvF(1, 1, 1); Calibrated: 2011/1/14
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch9262/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 33.0 V/m
Probe Modulation Factor = 1.06
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 21.7 V/m; Power Drift = 0.164 dB
Hearing Aid Near-Field Category: M4 (AWF 0 dB)

Peak E-field in V/m

Grid 1 **33.0 M4**	Grid 2 **31.1 M4**	Grid 3 **27.3 M4**
Grid 4 **21.8 M4**	Grid 5 **32.1 M4**	Grid 6 **32.3 M4**
Grid 7 **35.0 M4**	Grid 8 **40.7 M4**	Grid 9 **40.0 M4**

Cursor:
Total = 40.7 V/m
E Category: M4
Location: -4.5, 25, 8.7 mm



0 dB = 40.7V/m

#25 HAC_E_WCDMA V_RMC12.2K_Ch4132_Slide Off_Battery1

DUT: 121417

Communication System: WCDMA; Frequency: 826.4 MHz;Duty Cycle: 1:1
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1000$ kg/m^3
Ambient Temperature：22.6 ℃

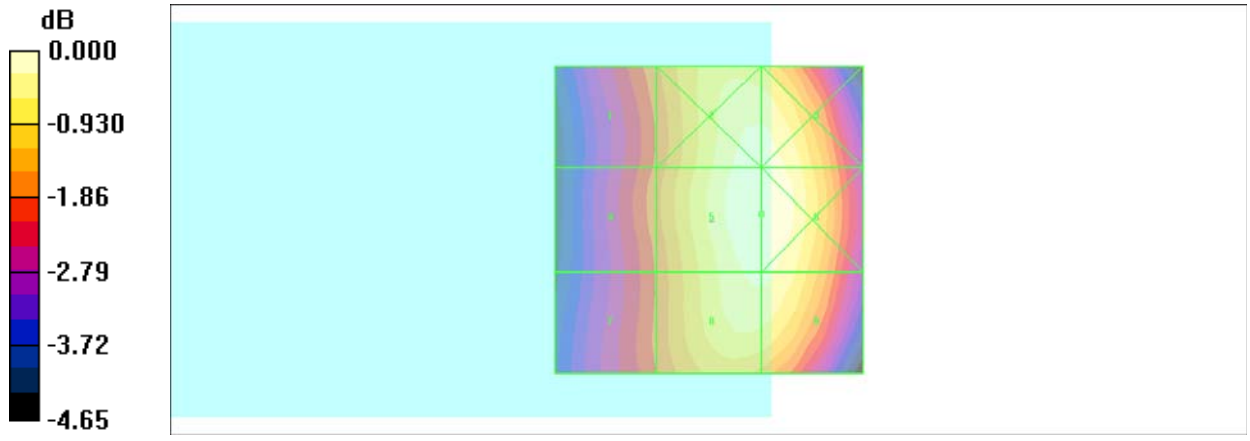
DASY4 Configuration:
- Probe: ER3DV6 - SN2358; ConvF(1, 1, 1); Calibrated: 2011/1/14
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch4132/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 65.1 V/m
Probe Modulation Factor = 0.980
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 78.8 V/m; Power Drift = -0.011 dB
Hearing Aid Near-Field Category: M4 (AWF 0 dB)

Peak E-field in V/m

Grid 1 **54.2 M4**	Grid 2 **64.2 M4**	Grid 3 **64.2 M4**
Grid 4 **54.0 M4**	Grid 5 **65.1 M4**	Grid 6 **65.1 M4**
Grid 7 **53.1 M4**	Grid 8 **63.3 M4**	Grid 9 **63.3 M4**

Cursor:
Total = 65.1 V/m
E Category: M4
Location: -8.5, -1, 8.7 mm



0 dB = 65.1V/m

#26 HAC_E_WCDMA V_RMC12.2K_Ch4182_Slide Off_Battery1

DUT: 121417

Communication System: WCDMA; Frequency: 836.4 MHz;Duty Cycle: 1:1
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1000$ kg/m^3
Ambient Temperature：22.6 ℃

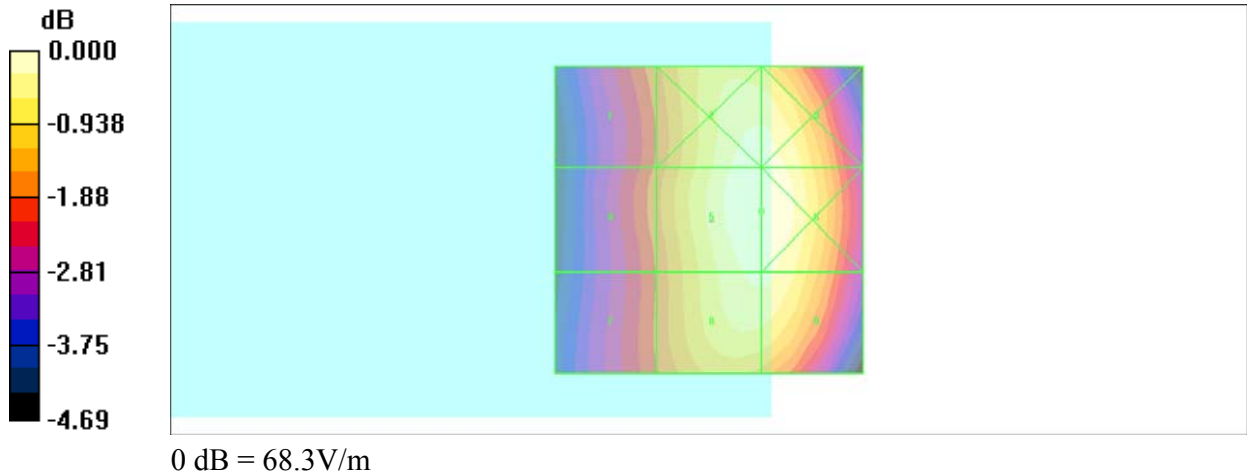
DASY4 Configuration:
- Probe: ER3DV6 - SN2358; ConvF(1, 1, 1); Calibrated: 2011/1/14
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch4182/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 68.3 V/m
Probe Modulation Factor = 0.980
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 82.8 V/m; Power Drift = -0.039 dB
Hearing Aid Near-Field Category: M4 (AWF 0 dB)

Peak E-field in V/m

Grid 1 **56.6 M4**	Grid 2 **67.4 M4**	Grid 3 **67.4 M4**
Grid 4 **56.5 M4**	Grid 5 **68.3 M4**	Grid 6 **68.3 M4**
Grid 7 **55.5 M4**	Grid 8 **66.5 M4**	Grid 9 **66.5 M4**

Cursor:
Total = 68.3 V/m
E Category: M4
Location: -8.5, -1.5, 8.7 mm



0 dB = 68.3V/m

#27 HAC_E_WCDMA V_RMC12.2K_Ch4233_Slide Off_Battery1

DUT: 121417

Communication System: WCDMA; Frequency: 846.6 MHz;Duty Cycle: 1:1
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1000$ kg/m^3
Ambient Temperature：22.6 ℃

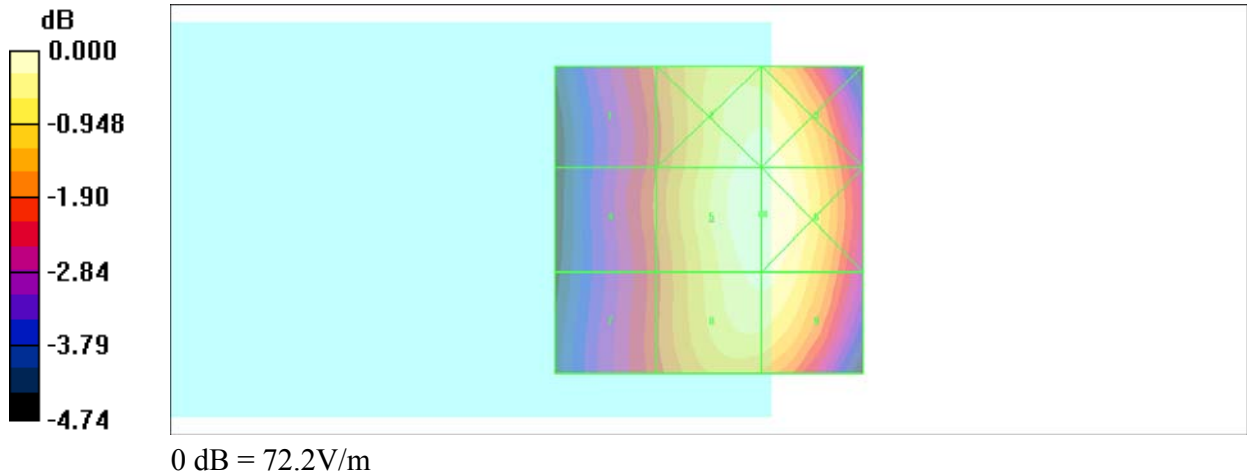
DASY4 Configuration:
- Probe: ER3DV6 - SN2358; ConvF(1, 1, 1); Calibrated: 2011/1/14
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch4233/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 72.2 V/m
Probe Modulation Factor = 0.980
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 86.7 V/m; Power Drift = -0.017 dB
Hearing Aid Near-Field Category: M4 (AWF 0 dB)

Peak E-field in V/m

Grid 1 **58.7 M4**	Grid 2 **71.2 M4**	Grid 3 **71.2 M4**
Grid 4 **58.7 M4**	Grid 5 **72.2 M4**	Grid 6 **72.2 M4**
Grid 7 **57.8 M4**	Grid 8 **70.4 M4**	Grid 9 **70.4 M4**

Cursor:
Total = 72.2 V/m
E Category: M4
Location: -9, -1, 8.7 mm



0 dB = 72.2V/m

#28 HAC_E_WCDMA V_RMC12.2K_Ch4233_Slide Off_Battery2

DUT: 121417

Communication System: WCDMA; Frequency: 846.6 MHz;Duty Cycle: 1:1
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1000$ kg/m^3
Ambient Temperature：22.3 ℃

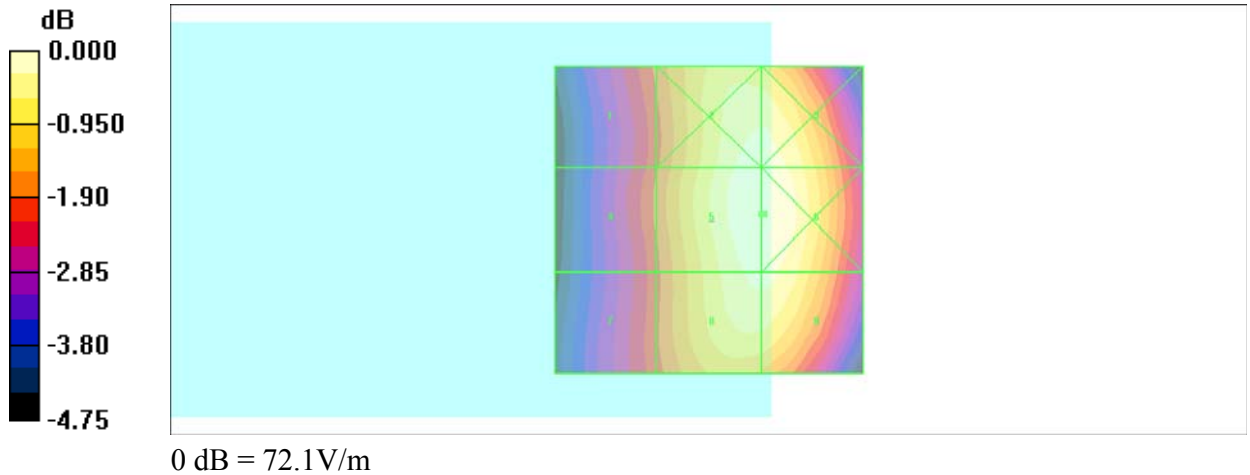
DASY4 Configuration:
- Probe: ER3DV6 - SN2358; ConvF(1, 1, 1); Calibrated: 2011/1/14
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch4233/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 72.1 V/m
Probe Modulation Factor = 0.980
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 86.6 V/m; Power Drift = -0.026 dB
Hearing Aid Near-Field Category: M4 (AWF 0 dB)

Peak E-field in V/m

Grid 1 **58.6 M4**	Grid 2 **71.1 M4**	Grid 3 **71.1 M4**
Grid 4 **58.5 M4**	Grid 5 **72.1 M4**	Grid 6 **72.1 M4**
Grid 7 **57.7 M4**	Grid 8 **70.3 M4**	Grid 9 **70.3 M4**

Cursor:
Total = 72.1 V/m
E Category: M4
Location: -9, -1, 8.7 mm



0 dB = 72.1V/m

#29 HAC_E_WCDMA V_RMC12.2K_Ch4132_Slide Up_Battery1

DUT: 121417

Communication System: WCDMA; Frequency: 826.4 MHz;Duty Cycle: 1:1
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1000$ kg/m^3
Ambient Temperature：22.5 ℃

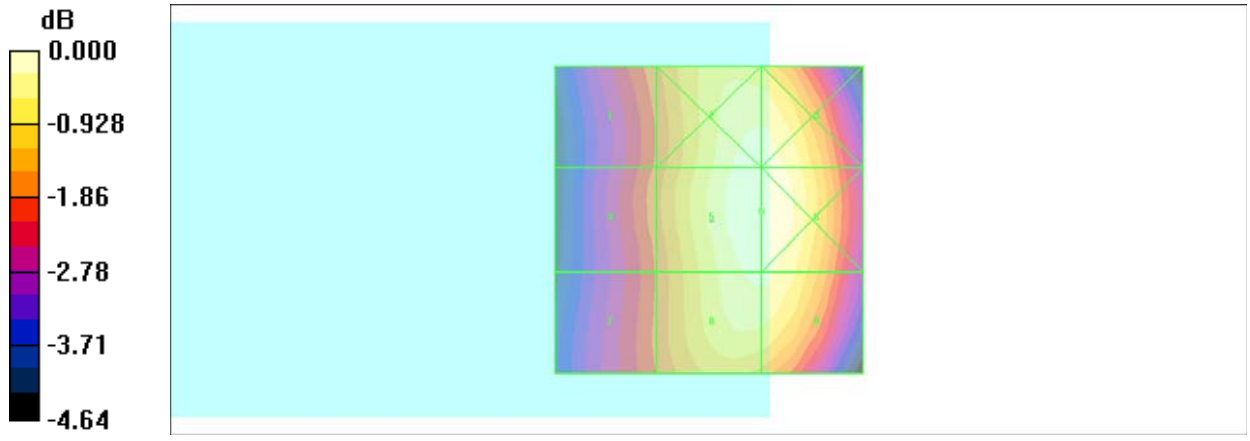
DASY4 Configuration:
- Probe: ER3DV6 - SN2358; ConvF(1, 1, 1); Calibrated: 2011/1/14
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch4132/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 64.5 V/m
Probe Modulation Factor = 0.980
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 77.7 V/m; Power Drift = 0.032 dB
Hearing Aid Near-Field Category: M4 (AWF 0 dB)

Peak E-field in V/m

Grid 1 **53.6 M4**	Grid 2 **63.6 M4**	Grid 3 **63.6 M4**
Grid 4 **53.4 M4**	Grid 5 **64.5 M4**	Grid 6 **64.5 M4**
Grid 7 **52.7 M4**	Grid 8 **62.8 M4**	Grid 9 **62.8 M4**

Cursor:
Total = 64.5 V/m
E Category: M4
Location: -8.5, -1.5, 8.7 mm



0 dB = 64.5V/m

#30 HAC_E_WCDMA V_RMC12.2K_Ch4182_Slide Up_Battery1

DUT: 121417

Communication System: WCDMA; Frequency: 836.4 MHz;Duty Cycle: 1:1
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1000$ kg/m^3
Ambient Temperature：22.6 ℃

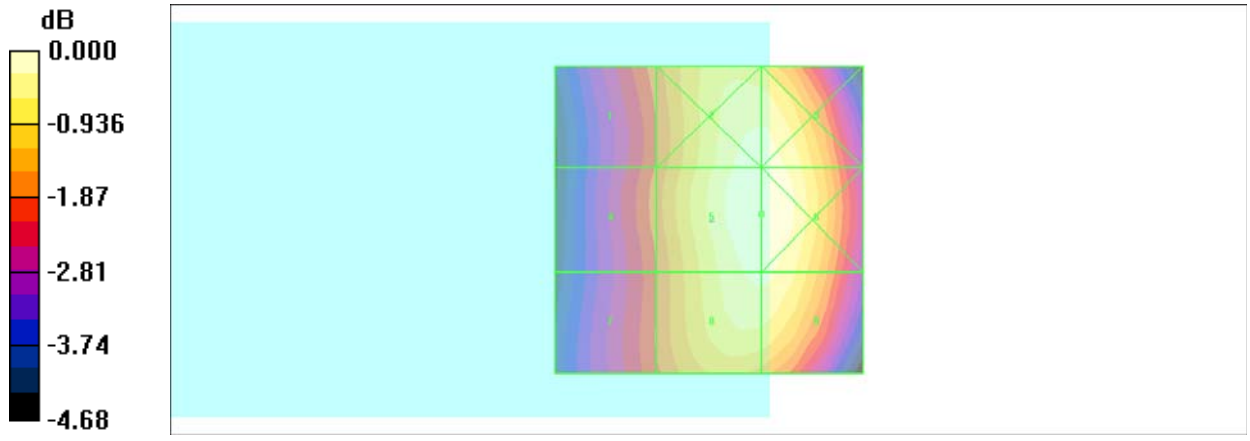
DASY4 Configuration:
- Probe: ER3DV6 - SN2358; ConvF(1, 1, 1); Calibrated: 2011/1/14
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch4182/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 68.7 V/m
Probe Modulation Factor = 0.980
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 83.0 V/m; Power Drift = -0.007 dB
Hearing Aid Near-Field Category: M4 (AWF 0 dB)

Peak E-field in V/m

Grid 1 **56.7 M4**	Grid 2 **67.8 M4**	Grid 3 **67.8 M4**
Grid 4 **56.6 M4**	Grid 5 **68.7 M4**	Grid 6 **68.7 M4**
Grid 7 **55.6 M4**	Grid 8 **66.8 M4**	Grid 9 **66.8 M4**

Cursor:
Total = 68.7 V/m
E Category: M4
Location: -8.5, -1, 8.7 mm



0 dB = 68.7V/m

#31 HAC_E_WCDMA V_RMC12.2K_Ch4233_Slide Up_Battery1

DUT: 121417

Communication System: WCDMA; Frequency: 846.6 MHz;Duty Cycle: 1:1
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1000$ kg/m^3
Ambient Temperature：22.5 ℃

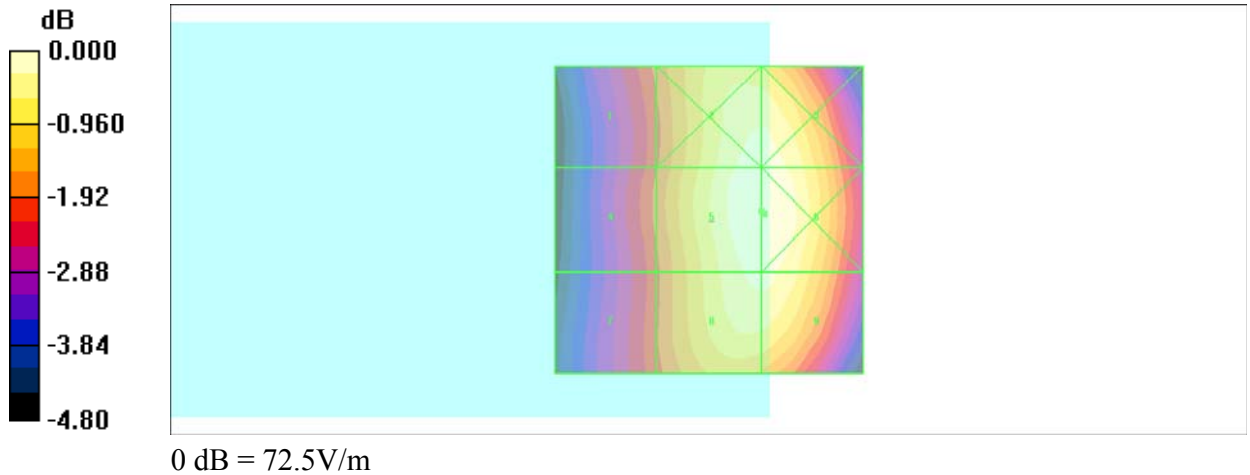
DASY4 Configuration:
- Probe: ER3DV6 - SN2358; ConvF(1, 1, 1); Calibrated: 2011/1/14
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch4233/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 72.5 V/m
Probe Modulation Factor = 0.980
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 85.9 V/m; Power Drift = 0.089 dB
Hearing Aid Near-Field Category: M4 (AWF 0 dB)

Peak E-field in V/m

Grid 1 **58.9 M4**	Grid 2 **71.4 M4**	Grid 3 **71.4 M4**
Grid 4 **58.8 M4**	Grid 5 **72.5 M4**	Grid 6 **72.5 M4**
Grid 7 **57.9 M4**	Grid 8 **70.7 M4**	Grid 9 **70.7 M4**

Cursor:
Total = 72.5 V/m
E Category: M4
Location: -9, -1, 8.7 mm



0 dB = 72.5V/m

#32 HAC_E_WCDMA V_RMC12.2K_Ch4233_Slide Up_Battery2

DUT: 121417

Communication System: WCDMA; Frequency: 846.6 MHz;Duty Cycle: 1:1
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1000$ kg/m^3
Ambient Temperature：22.6 ℃

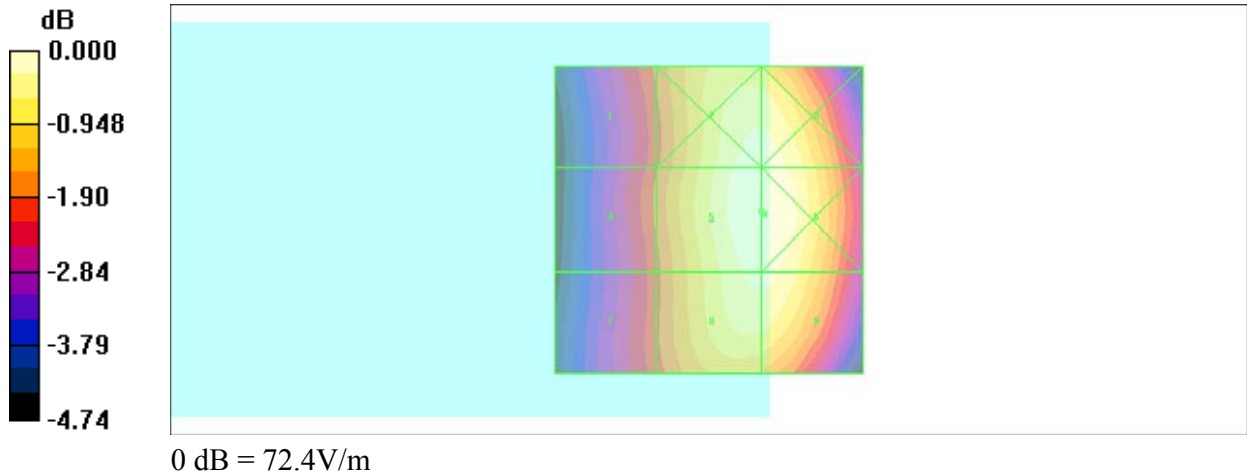
DASY4 Configuration:
- Probe: ER3DV6 - SN2358; ConvF(1, 1, 1); Calibrated: 2011/1/14
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch4233/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 72.4 V/m
Probe Modulation Factor = 0.980
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 87.0 V/m; Power Drift = -0.048 dB
Hearing Aid Near-Field Category: M4 (AWF 0 dB)

Peak E-field in V/m

Grid 1 **58.9 M4**	Grid 2 **71.4 M4**	Grid 3 **71.4 M4**
Grid 4 **58.8 M4**	Grid 5 **72.4 M4**	Grid 6 **72.4 M4**
Grid 7 **57.9 M4**	Grid 8 **70.7 M4**	Grid 9 **70.7 M4**

Cursor:
Total = 72.4 V/m
E Category: M4
Location: -9, -1, 8.7 mm



0 dB = 72.4V/m

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2011/3/6

#33 HAC_H_WCDMA II_RMC12.2K Ch9262_Slide Off_Battery1

DUT: 121417

Communication System: WCDMA; Frequency: 1852.4 MHz;Duty Cycle: 1:1
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Ambient Temperature：22.5 ℃

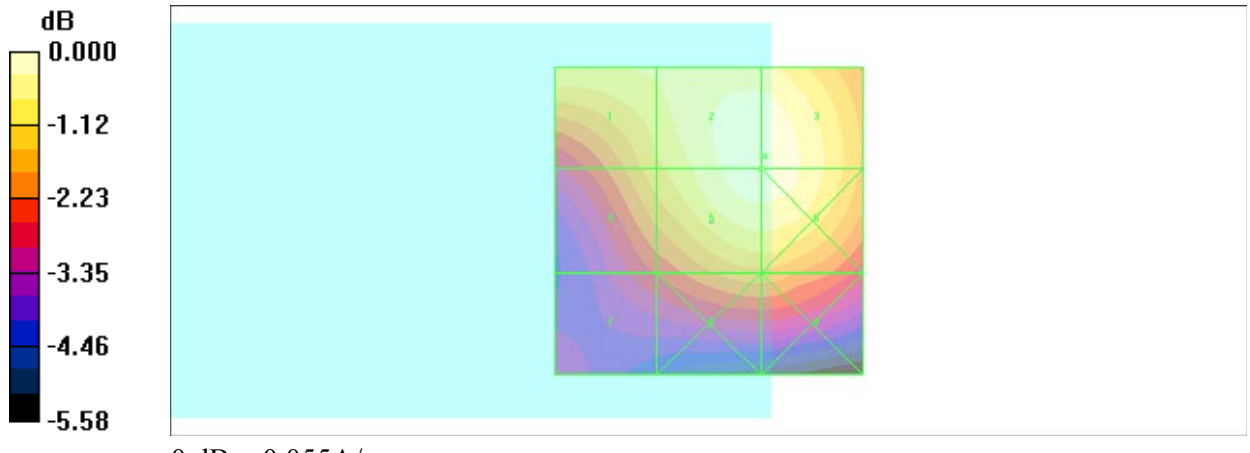
DASY4 Configuration:
- Probe: H3DV6 - SN6184; ; Calibrated: 2011/1/25
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch9262/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 0.055 A/m
Probe Modulation Factor = 0.580
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 0.092 A/m; Power Drift = -0.045 dB
Hearing Aid Near-Field Category: M4 (AWF 0 dB)

Peak H-field in A/m

Grid 1 **0.051 M4**	Grid 2 **0.055 M4**	Grid 3 **0.055 M4**
Grid 4 **0.048 M4**	Grid 5 **0.054 M4**	Grid 6 **0.054 M4**
Grid 7 **0.041 M4**	Grid 8 **0.046 M4**	Grid 9 **0.046 M4**

Cursor:
Total = 0.055 A/m
H Category: M4
Location: -9, -10.5, 8.7 mm



0 dB = 0.055A/m

#34 HAC_H_WCDMA II_RMC12.2K Ch9400_Slide Off_Battery1

DUT: 121417

Communication System: WCDMA; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Ambient Temperature：22.6 ℃

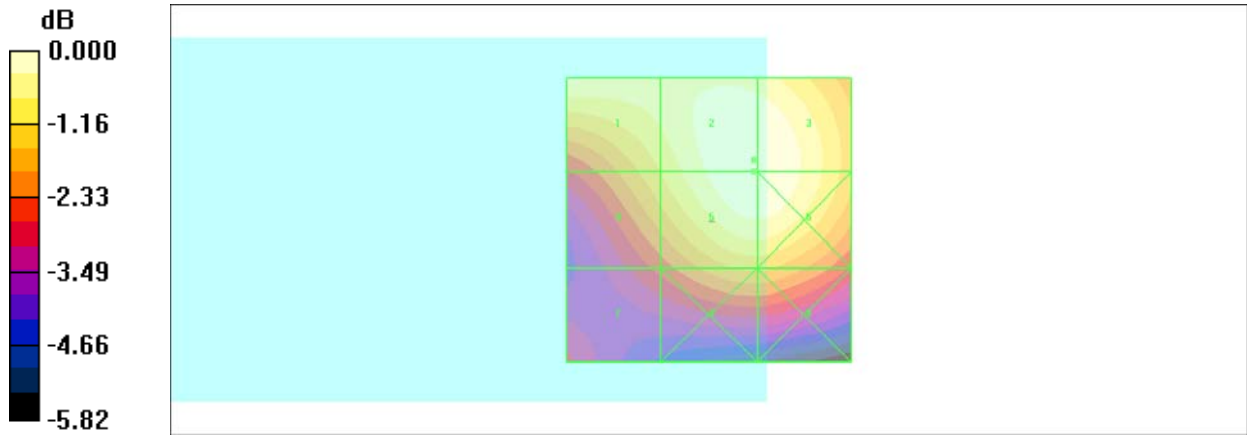
DASY4 Configuration:
- Probe: H3DV6 - SN6184; ; Calibrated: 2011/1/25
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch9400/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 0.051 A/m
Probe Modulation Factor = 0.580
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 0.087 A/m; Power Drift = -0.096 dB
Hearing Aid Near-Field Category: M4 (AWF 0 dB)

Peak H-field in A/m

Grid 1 **0.049 M4**	Grid 2 **0.051 M4**	Grid 3 **0.051 M4**
Grid 4 **0.045 M4**	Grid 5 **0.051 M4**	Grid 6 **0.051 M4**
Grid 7 **0.038 M4**	Grid 8 **0.043 M4**	Grid 9 **0.043 M4**

Cursor:
Total = 0.051 A/m
H Category: M4
Location: -8, -10.5, 8.7 mm



0 dB = 0.051A/m

#35 HAC_H_WCDMA II_RMC12.2K Ch9538_Slide Off_Battery1

DUT: 121417

Communication System: WCDMA; Frequency: 1907.6 MHz;Duty Cycle: 1:1
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Ambient Temperature：22.6 ℃

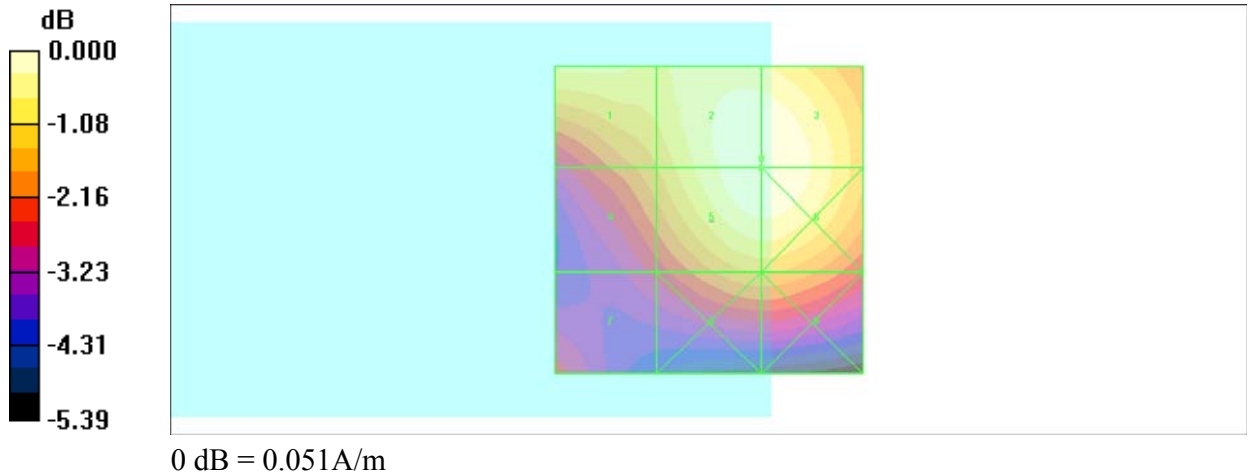
DASY4 Configuration:
- Probe: H3DV6 - SN6184; ; Calibrated: 2011/1/25
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch9538/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 0.051 A/m
Probe Modulation Factor = 0.580
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 0.087 A/m; Power Drift = -0.141 dB
Hearing Aid Near-Field Category: M4 (AWF 0 dB)

Peak H-field in A/m

Grid 1 **0.048 M4**	Grid 2 **0.051 M4**	Grid 3 **0.051 M4**
Grid 4 **0.043 M4**	Grid 5 **0.051 M4**	Grid 6 **0.051 M4**
Grid 7 **0.038 M4**	Grid 8 **0.043 M4**	Grid 9 **0.043 M4**

Cursor:
Total = 0.051 A/m
H Category: M4
Location: -8.5, -10, 8.7 mm



0 dB = 0.051A/m

#36 HAC_H_WCDMA II_RMC12.2K Ch9262_Slide Off_Battery2

DUT: 121417

Communication System: WCDMA; Frequency: 1852.4 MHz;Duty Cycle: 1:1
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Ambient Temperature：22.3 ℃

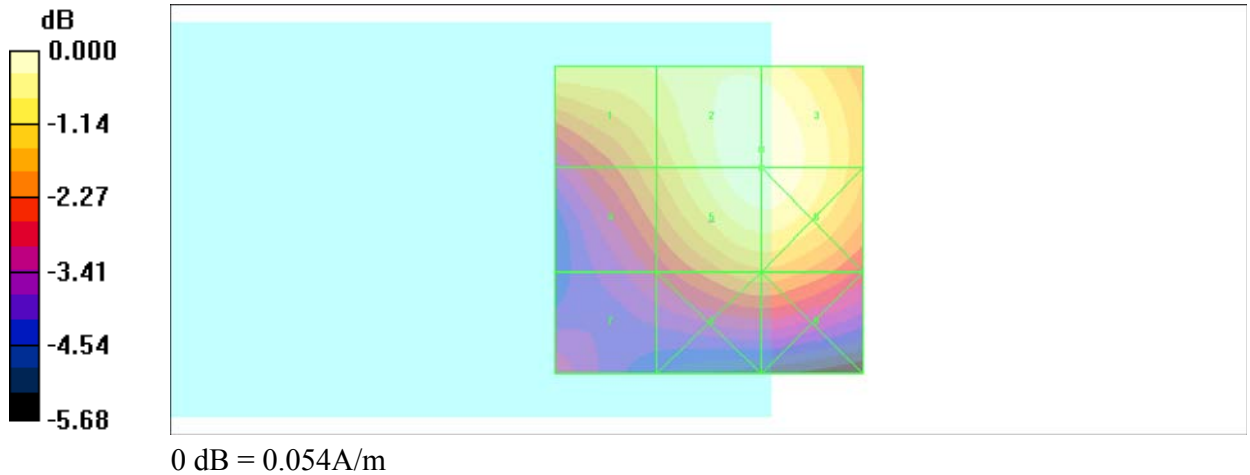
DASY4 Configuration:
- Probe: H3DV6 - SN6184; ; Calibrated: 2011/1/25
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch9262/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 0.054 A/m
Probe Modulation Factor = 0.580
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 0.087 A/m; Power Drift = 0.072 dB
Hearing Aid Near-Field Category: M4 (AWF 0 dB)

Peak H-field in A/m

Grid 1 **0.050 M4**	Grid 2 **0.054 M4**	Grid 3 **0.054 M4**
Grid 4 **0.045 M4**	Grid 5 **0.054 M4**	Grid 6 **0.054 M4**
Grid 7 **0.039 M4**	Grid 8 **0.045 M4**	Grid 9 **0.045 M4**

Cursor:
Total = 0.054 A/m
H Category: M4
Location: -8.5, -11.5, 8.7 mm



0 dB = 0.054A/m

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2011/3/6

#37 HAC_H_WCDMA II_RMC12.2K Ch9262_Slide Up_Battery1

DUT: 121417

Communication System: WCDMA; Frequency: 1852.4 MHz;Duty Cycle: 1:1
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Ambient Temperature：22.5 ℃

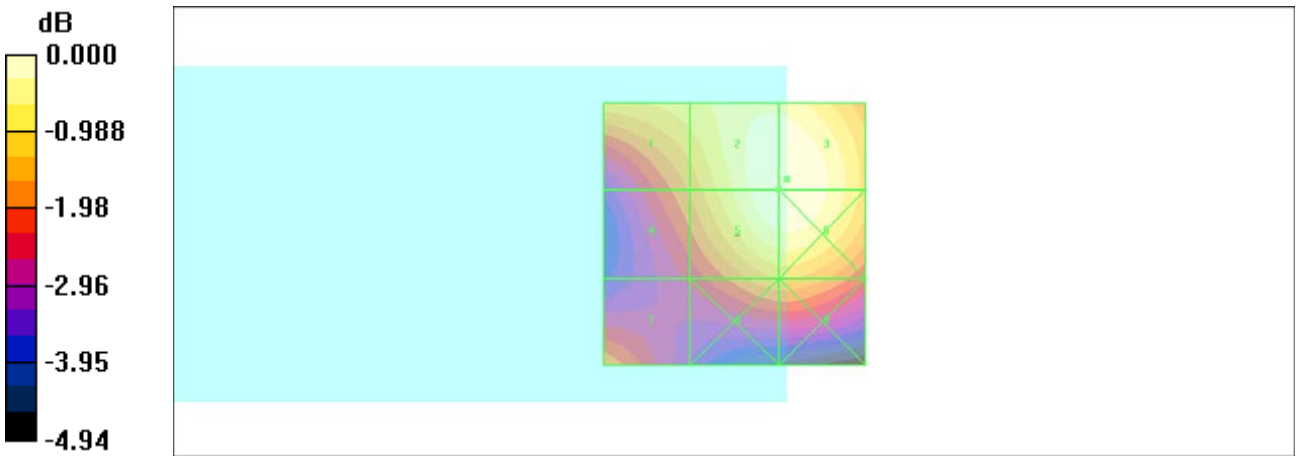
DASY4 Configuration:
- Probe: H3DV6 - SN6184; ; Calibrated: 2011/1/25
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch9262/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 0.054 A/m
Probe Modulation Factor = 0.580
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 0.090 A/m; Power Drift = -0.015 dB
Hearing Aid Near-Field Category: M4 (AWF 0 dB)

Peak H-field in A/m

Grid 1 **0.049 M4**	Grid 2 **0.054 M4**	Grid 3 **0.054 M4**
Grid 4 **0.045 M4**	Grid 5 **0.054 M4**	Grid 6 **0.054 M4**
Grid 7 **0.045 M4**	Grid 8 **0.046 M4**	Grid 9 **0.047 M4**

Cursor:
Total = 0.054 A/m
H Category: M4
Location: -10, -10.5, 8.7 mm



0 dB = 0.054A/m

#38 HAC_H_WCDMA II_RMC12.2K Ch9400_Slide Up_Battery1

DUT: 121417

Communication System: WCDMA; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Ambient Temperature：22.6 ℃

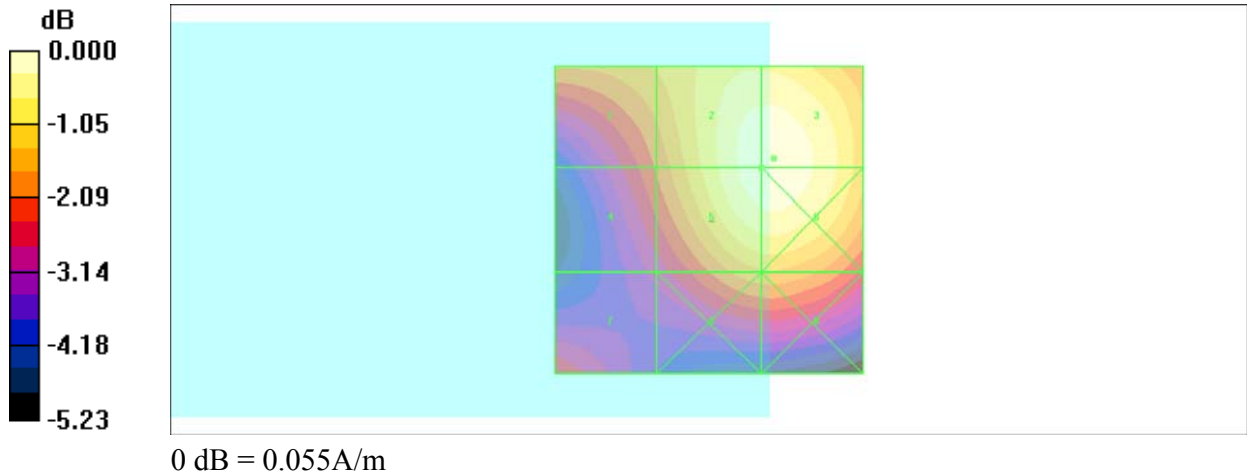
DASY4 Configuration:
- Probe: H3DV6 - SN6184; ; Calibrated: 2011/1/25
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch9400/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 0.055 A/m
Probe Modulation Factor = 0.580
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 0.089 A/m; Power Drift = -0.079 dB
Hearing Aid Near-Field Category: M4 (AWF 0 dB)

Peak H-field in A/m

Grid 1 **0.047 M4**	Grid 2 **0.054 M4**	Grid 3 **0.055 M4**
Grid 4 **0.043 M4**	Grid 5 **0.054 M4**	Grid 6 **0.054 M4**
Grid 7 **0.042 M4**	Grid 8 **0.047 M4**	Grid 9 **0.047 M4**

Cursor:
Total = 0.055 A/m
H Category: M4
Location: -10.5, -10, 8.7 mm



0 dB = 0.055A/m

#39 HAC_H_WCDMA II_RMC12.2K Ch9538_Slide Up_Battery1

DUT: 121417

Communication System: WCDMA; Frequency: 1907.6 MHz;Duty Cycle: 1:1
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Ambient Temperature：22.3 ℃

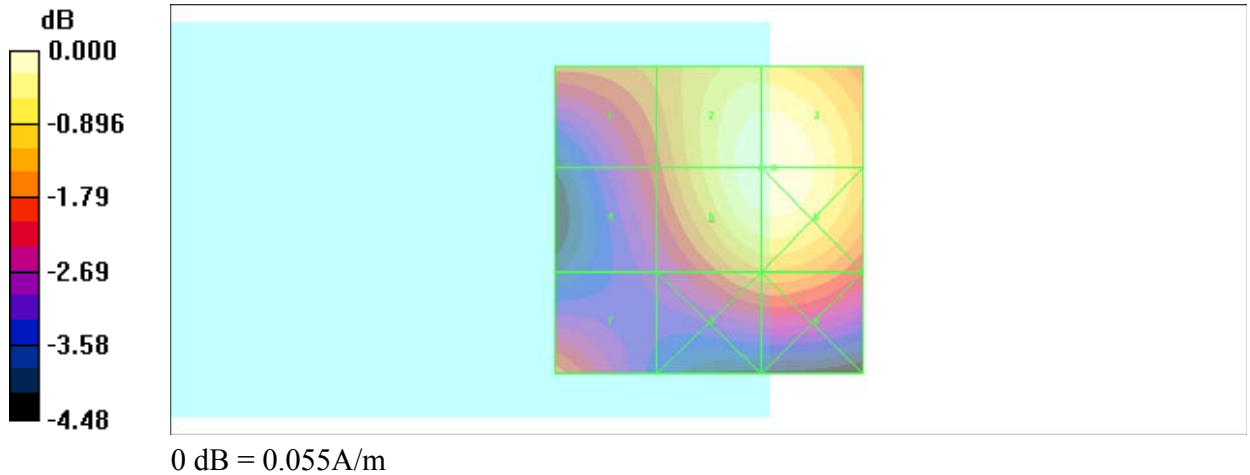
DASY4 Configuration:
- Probe: H3DV6 - SN6184; ; Calibrated: 2011/1/25
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch9538/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 0.055 A/m
Probe Modulation Factor = 0.580
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 0.091 A/m; Power Drift = -0.026 dB
Hearing Aid Near-Field Category: M4 (AWF 0 dB)

Peak H-field in A/m

Grid 1 **0.047 M4**	Grid 2 **0.055 M4**	Grid 3 **0.055 M4**
Grid 4 **0.044 M4**	Grid 5 **0.055 M4**	Grid 6 **0.055 M4**
Grid 7 **0.046 M4**	Grid 8 **0.048 M4**	Grid 9 **0.048 M4**

Cursor:
Total = 0.055 A/m
H Category: M4
Location: -10.5, -8.5, 8.7 mm



0 dB = 0.055A/m

#40 HAC_H_WCDMA II_RMC12.2K Ch9538_Slide Up_Battery2

DUT: 121417

Communication System: WCDMA; Frequency: 1907.6 MHz;Duty Cycle: 1:1
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Ambient Temperature：22.6 ℃

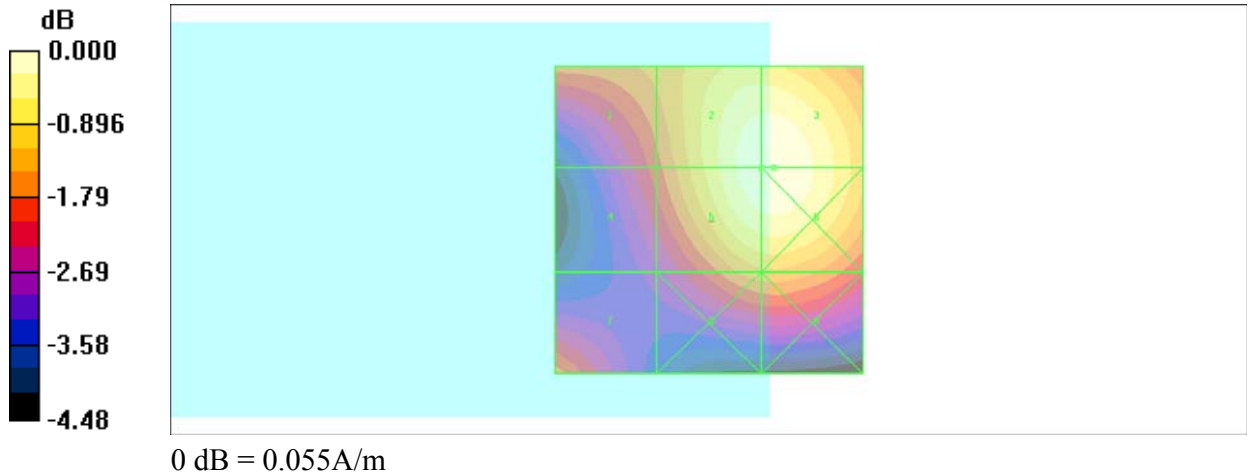
DASY4 Configuration:
- Probe: H3DV6 - SN6184; ; Calibrated: 2011/1/25
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch9538/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 0.055 A/m
Probe Modulation Factor = 0.580
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 0.091 A/m; Power Drift = -0.029 dB
Hearing Aid Near-Field Category: M4 (AWF 0 dB)

Peak H-field in A/m

Grid 1 **0.047 M4**	Grid 2 **0.055 M4**	Grid 3 **0.055 M4**
Grid 4 **0.044 M4**	Grid 5 **0.055 M4**	Grid 6 **0.055 M4**
Grid 7 **0.046 M4**	Grid 8 **0.047 M4**	Grid 9 **0.048 M4**

Cursor:
Total = 0.055 A/m
H Category: M4
Location: -10.5, -8.5, 8.7 mm



0 dB = 0.055A/m

#41 HAC_H_WCDMA V_RMC12.2K Ch4132_Slide Off_Battery1

DUT: 121417

Communication System: WCDMA; Frequency: 826.4 MHz;Duty Cycle: 1:1
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Ambient Temperature：22.6 ℃

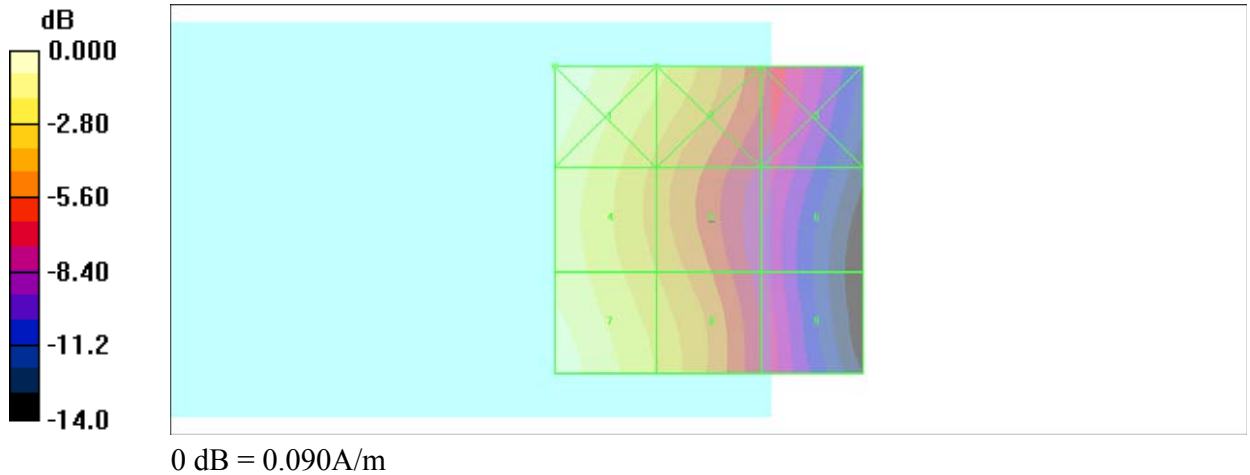
DASY4 Configuration:
- Probe: H3DV6 - SN6184; ; Calibrated: 2011/1/25
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch4132/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 0.087 A/m
Probe Modulation Factor = 0.800
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 0.056 A/m; Power Drift = 0.208 dB
Hearing Aid Near-Field Category: M4 (AWF 0 dB)

Peak H-field in A/m

Grid 1 **0.090 M4**	Grid 2 **0.068 M4**	Grid 3 **0.044 M4**
Grid 4 **0.080 M4**	Grid 5 **0.059 M4**	Grid 6 **0.037 M4**
Grid 7 **0.087 M4**	Grid 8 **0.065 M4**	Grid 9 **0.038 M4**

Cursor:
Total = 0.090 A/m
H Category: M4
Location: 25, -25, 8.7 mm



0 dB = 0.090A/m

#42 HAC_H_WCDMA V_RMC12.2K Ch41842_Slide Off_Battery1

DUT: 121417

Communication System: WCDMA; Frequency: 836.4 MHz;Duty Cycle: 1:1
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Ambient Temperature：22.6 ℃

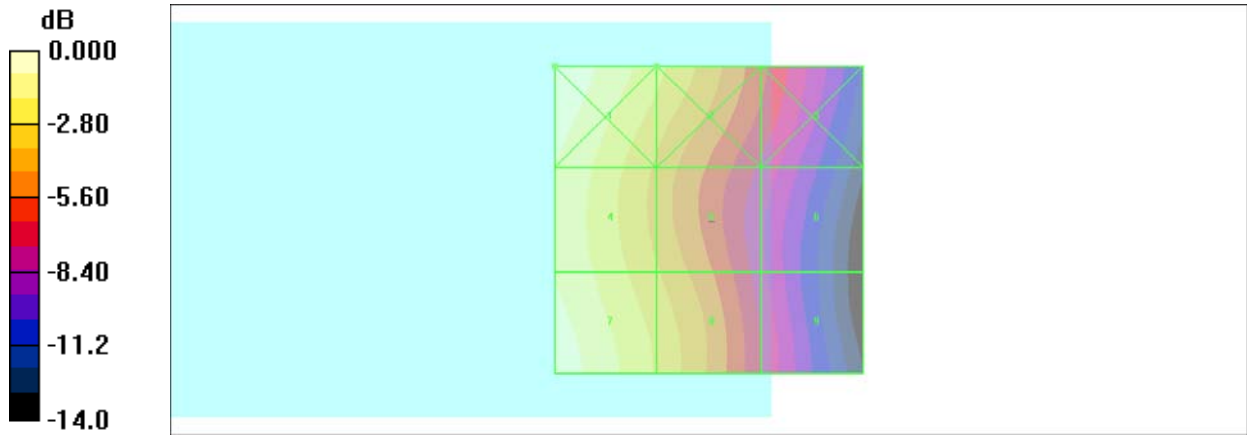
DASY4 Configuration:
- Probe: H3DV6 - SN6184; ; Calibrated: 2011/1/25
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch4182/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 0.100 A/m
Probe Modulation Factor = 0.800
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 0.066 A/m; Power Drift = -0.006 dB
Hearing Aid Near-Field Category: M4 (AWF 0 dB)

Peak H-field in A/m

Grid 1 **0.103 M4**	Grid 2 **0.077 M4**	Grid 3 **0.050 M4**
Grid 4 **0.092 M4**	Grid 5 **0.068 M4**	Grid 6 **0.043 M4**
Grid 7 **0.100 M4**	Grid 8 **0.074 M4**	Grid 9 **0.044 M4**

Cursor:
Total = 0.103 A/m
H Category: M4
Location: 25, -25, 8.7 mm



0 dB = 0.103A/m

#43 HAC_H_WCDMA V_RMC12.2K Ch4233_Slide Off_Battery1

DUT: 121417

Communication System: WCDMA; Frequency: 846.6 MHz;Duty Cycle: 1:1
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Ambient Temperature：22.6 ℃

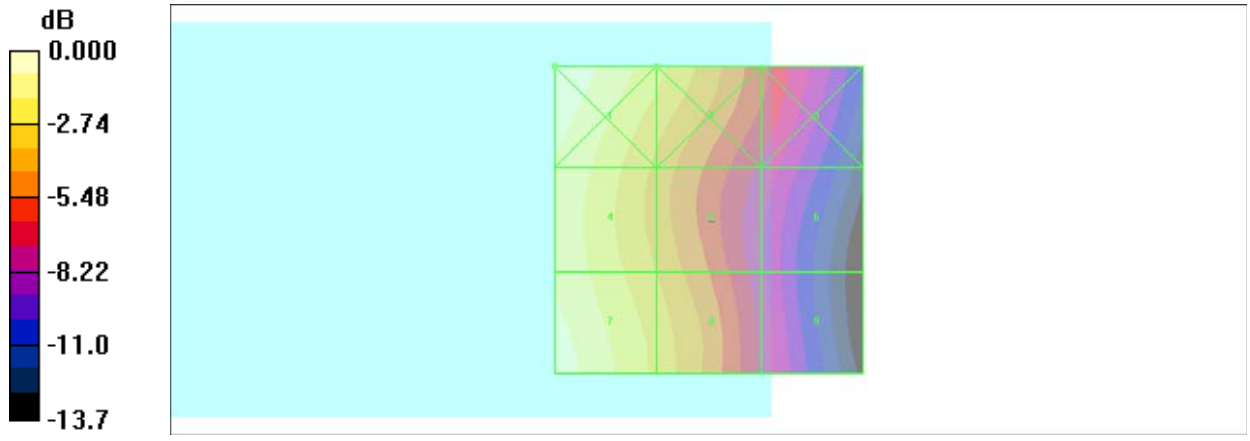
DASY4 Configuration:
- Probe: H3DV6 - SN6184; ; Calibrated: 2011/1/25
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch4233/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 0.104 A/m
Probe Modulation Factor = 0.800
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 0.070 A/m; Power Drift = 0.026 dB
Hearing Aid Near-Field Category: M4 (AWF 0 dB)

Peak H-field in A/m

Grid 1 **0.109 M4**	Grid 2 **0.082 M4**	Grid 3 **0.054 M4**
Grid 4 **0.097 M4**	Grid 5 **0.072 M4**	Grid 6 **0.046 M4**
Grid 7 **0.104 M4**	Grid 8 **0.077 M4**	Grid 9 **0.046 M4**

Cursor:
Total = 0.109 A/m
H Category: M4
Location: 25, -25, 8.7 mm



0 dB = 0.109A/m

#44 HAC_H_WCDMA V_RMC12.2K Ch4233_Slide Off_Battery2

DUT: 121417

Communication System: WCDMA; Frequency: 846.6 MHz;Duty Cycle: 1:1
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Ambient Temperature：22.6 ℃

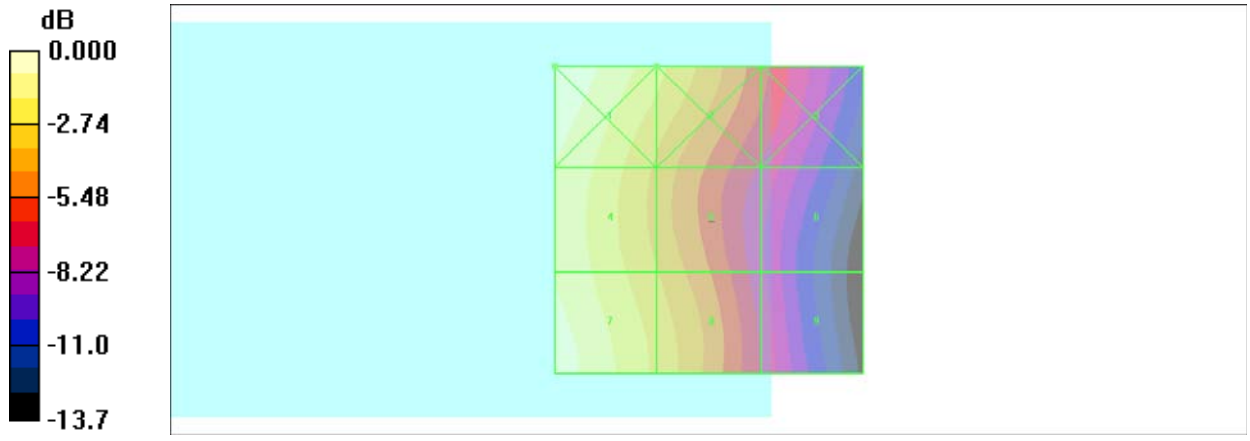
DASY4 Configuration:
- Probe: H3DV6 - SN6184; ; Calibrated: 2011/1/25
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch4233/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 0.104 A/m
Probe Modulation Factor = 0.800
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 0.070 A/m; Power Drift = -0.018 dB
Hearing Aid Near-Field Category: M4 (AWF 0 dB)

Peak H-field in A/m

Grid 1 **0.108 M4**	Grid 2 **0.082 M4**	Grid 3 **0.054 M4**
Grid 4 **0.097 M4**	Grid 5 **0.071 M4**	Grid 6 **0.046 M4**
Grid 7 **0.104 M4**	Grid 8 **0.077 M4**	Grid 9 **0.046 M4**

Cursor:
Total = 0.108 A/m
H Category: M4
Location: 25, -25, 8.7 mm



0 dB = 0.108A/m

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2011/3/6

#45 HAC_H_WCDMA V_RMC12.2K Ch4132_Slide Up_Battery1

DUT: 121417

Communication System: WCDMA; Frequency: 826.4 MHz;Duty Cycle: 1:1
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Ambient Temperature：22.5 ℃

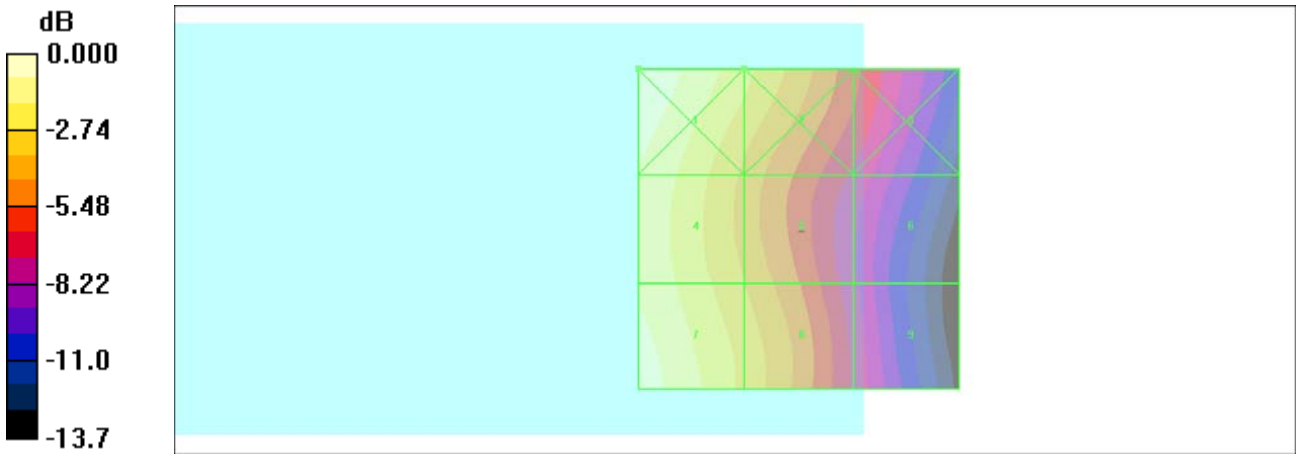
DASY4 Configuration:
- Probe: H3DV6 - SN6184; ; Calibrated: 2011/1/25
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch4132/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 0.107 A/m
Probe Modulation Factor = 0.800
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 0.072 A/m; Power Drift = -0.018 dB
Hearing Aid Near-Field Category: M4 (AWF 0 dB)

Peak H-field in A/m

Grid 1 **0.111 M4**	Grid 2 **0.084 M4**	Grid 3 **0.055 M4**
Grid 4 **0.099 M4**	Grid 5 **0.073 M4**	Grid 6 **0.047 M4**
Grid 7 **0.107 M4**	Grid 8 **0.079 M4**	Grid 9 **0.047 M4**

Cursor:
Total = 0.111 A/m
H Category: M4
Location: 25, -25, 8.7 mm



0 dB = 0.111A/m

#46 HAC_H_WCDMA V_RMC12.2K Ch4182_Slide Up_Battery1

DUT: 121417

Communication System: WCDMA; Frequency: 836.4 MHz;Duty Cycle: 1:1
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Ambient Temperature：22.5 ℃

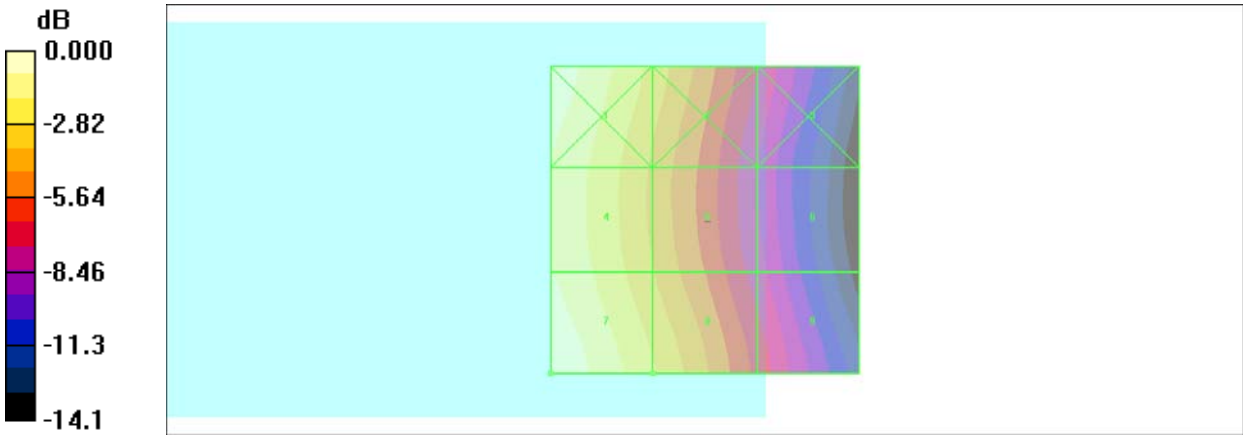
DASY4 Configuration:
- Probe: H3DV6 - SN6184; ; Calibrated: 2011/1/25
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch4182/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 0.100 A/m
Probe Modulation Factor = 0.800
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 0.063 A/m; Power Drift = 0.037 dB
Hearing Aid Near-Field Category: M4 (AWF 0 dB)

Peak H-field in A/m

Grid 1 **0.097 M4**	Grid 2 **0.070 M4**	Grid 3 **0.042 M4**
Grid 4 **0.090 M4**	Grid 5 **0.065 M4**	Grid 6 **0.040 M4**
Grid 7 **0.100 M4**	Grid 8 **0.073 M4**	Grid 9 **0.045 M4**

Cursor:
Total = 0.100 A/m
H Category: M4
Location: 25, 25, 8.7 mm



0 dB = 0.100A/m

#47 HAC_H_WCDMA V_RMC12.2K Ch4233_Slide Up_Battery1

DUT: 121417

Communication System: WCDMA; Frequency: 846.6 MHz;Duty Cycle: 1:1
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Ambient Temperature：22.6 ℃

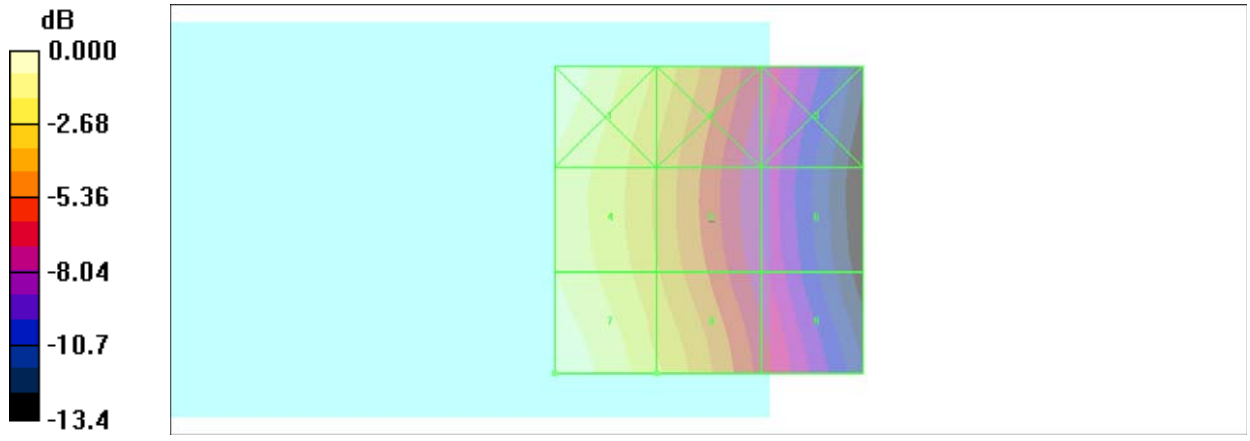
DASY4 Configuration:
- Probe: H3DV6 - SN6184; ; Calibrated: 2011/1/25
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch4233/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 0.103 A/m
Probe Modulation Factor = 0.800
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 0.062 A/m; Power Drift = 0.568 dB
Hearing Aid Near-Field Category: M4 (AWF 0 dB)

Peak H-field in A/m

Grid 1 **0.101 M4**	Grid 2 **0.074 M4**	Grid 3 **0.046 M4**
Grid 4 **0.093 M4**	Grid 5 **0.069 M4**	Grid 6 **0.042 M4**
Grid 7 **0.103 M4**	Grid 8 **0.078 M4**	Grid 9 **0.048 M4**

Cursor:
Total = 0.103 A/m
H Category: M4
Location: 25, 25, 8.7 mm



0 dB = 0.103A/m

#48 HAC_H_WCDMA V_RMC12.2K Ch4132_Slide Up_Battery2

DUT: 121417

Communication System: WCDMA; Frequency: 826.4 MHz;Duty Cycle: 1:1
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Ambient Temperature：22.6 ℃

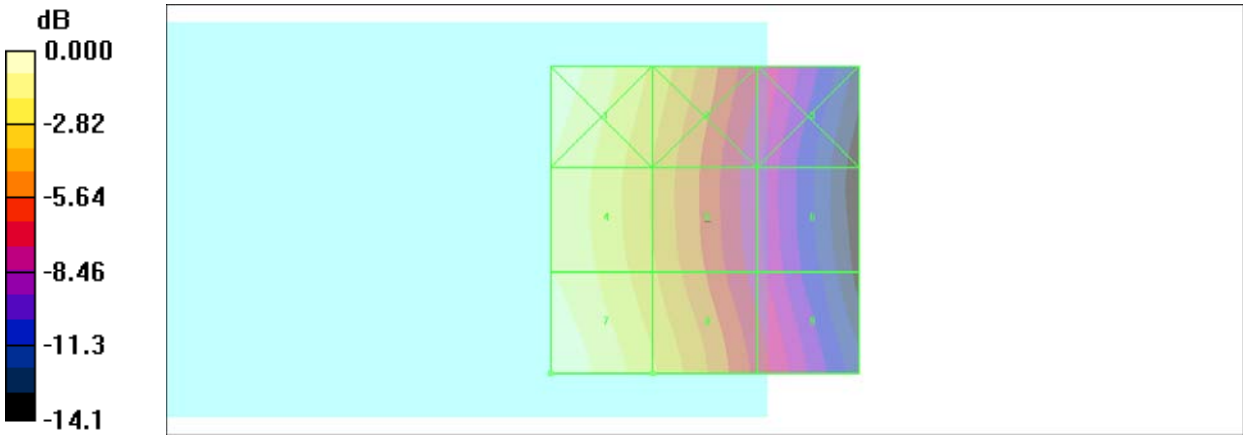
DASY4 Configuration:
- Probe: H3DV6 - SN6184; ; Calibrated: 2011/1/25
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch4132/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 0.095 A/m
Probe Modulation Factor = 0.800
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 0.060 A/m; Power Drift = 0.091 dB
Hearing Aid Near-Field Category: M4 (AWF 0 dB)

Peak H-field in A/m

Grid 1 **0.093 M4**	Grid 2 **0.067 M4**	Grid 3 **0.041 M4**
Grid 4 **0.086 M4**	Grid 5 **0.063 M4**	Grid 6 **0.038 M4**
Grid 7 **0.095 M4**	Grid 8 **0.070 M4**	Grid 9 **0.043 M4**

Cursor:
Total = 0.095 A/m
H Category: M4
Location: 25, 25, 8.7 mm



0 dB = 0.095A/m

#49 HAC_H_GSM1900 Ch512_Slide Off_Battery1

DUT: 121417

Communication System: PCS; Frequency: 1850.2 MHz;Duty Cycle: 1:8.3
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Ambient Temperature：22.3 ℃

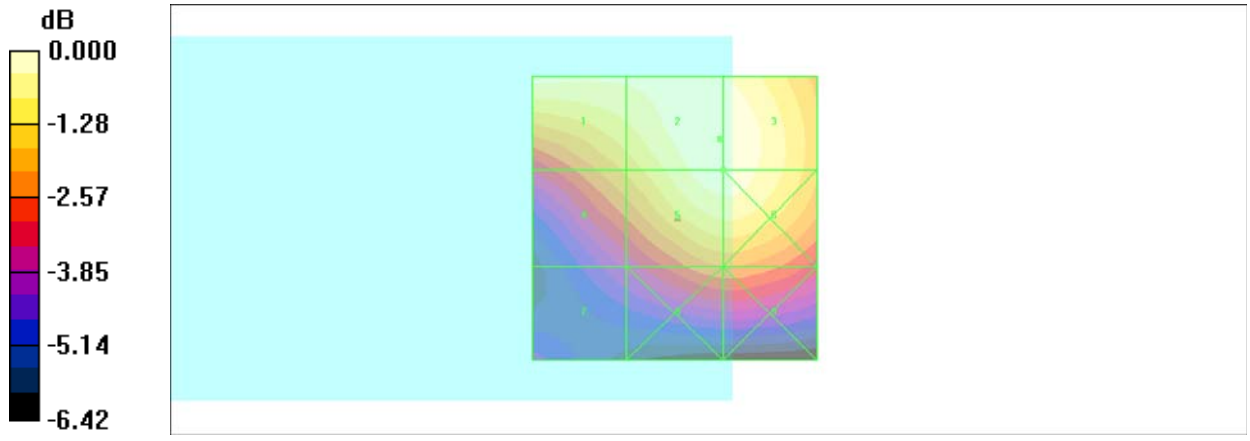
DASY4 Configuration:
- Probe: H3DV6 - SN6184; ; Calibrated: 2011/1/25
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch512/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 0.089 A/m
Probe Modulation Factor = 1.19
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 0.070 A/m; Power Drift = -0.200 dB
Hearing Aid Near-Field Category: M4 (AWF -5 dB)

Peak H-field in A/m

Grid 1 **0.087 M4**	Grid 2 **0.089 M4**	Grid 3 **0.088 M4**
Grid 4 **0.074 M4**	Grid 5 **0.087 M4**	Grid 6 **0.087 M4**
Grid 7 **0.058 M4**	Grid 8 **0.070 M4**	Grid 9 **0.070 M4**

Cursor:
Total = 0.089 A/m
H Category: M4
Location: -8, -14, 8.7 mm



0 dB = 0.089A/m

#50 HAC_H_GSM1900 Ch661_Slide Off_Battery1

DUT: 121417

Communication System: PCS; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Ambient Temperature：22.6 ℃

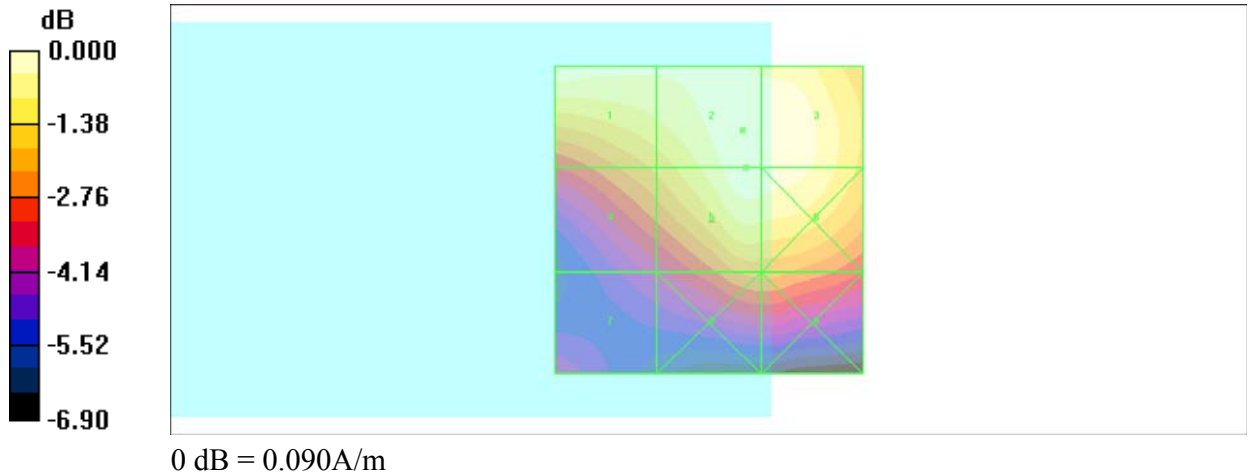
DASY4 Configuration:
- Probe: H3DV6 - SN6184; ; Calibrated: 2011/1/25
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch661/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 0.090 A/m
Probe Modulation Factor = 1.19
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 0.069 A/m; Power Drift = -0.041 dB
Hearing Aid Near-Field Category: M4 (AWF -5 dB)

Peak H-field in A/m

Grid 1 **0.090 M4**	Grid 2 **0.090 M4**	Grid 3 **0.089 M4**
Grid 4 **0.074 M4**	Grid 5 **0.089 M4**	Grid 6 **0.088 M4**
Grid 7 **0.057 M4**	Grid 8 **0.071 M4**	Grid 9 **0.071 M4**

Cursor:
Total = 0.090 A/m
H Category: M4
Location: -5.5, -14.5, 8.7 mm



0 dB = 0.090A/m

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2011/3/6

#51 HAC_H_GSM1900 Ch810_Slide Off_Battery1

DUT: 121417

Communication System: PCS; Frequency: 1909.8 MHz;Duty Cycle: 1:8.3
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Ambient Temperature：22.6 ℃

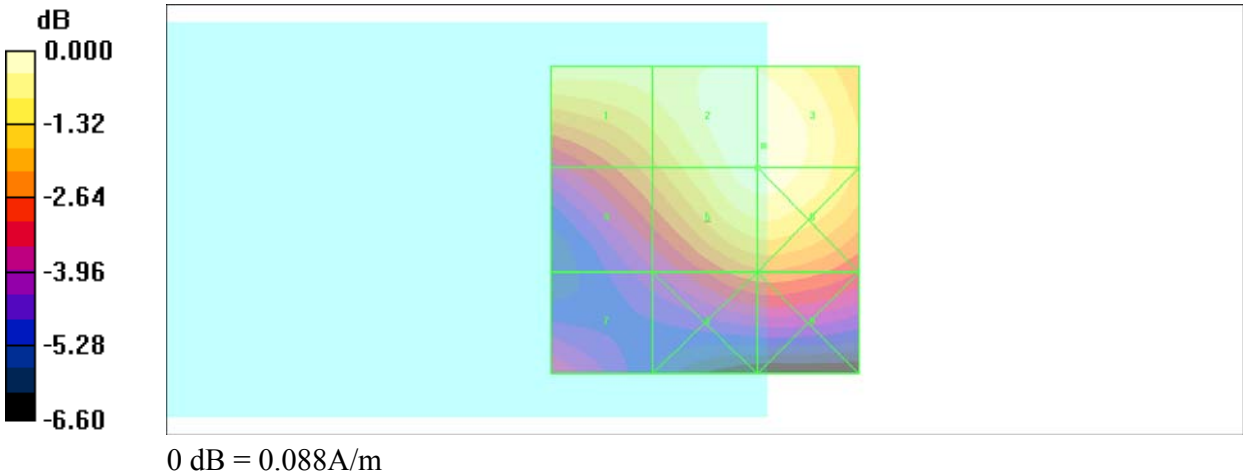
DASY4 Configuration:
- Probe: H3DV6 - SN6184; ; Calibrated: 2011/1/25
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch810/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 0.088 A/m
Probe Modulation Factor = 1.19
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 0.067 A/m; Power Drift = -0.048 dB
Hearing Aid Near-Field Category: M4 (AWF -5 dB)

Peak H-field in A/m

Grid 1 **0.083 M4**	Grid 2 **0.088 M4**	Grid 3 **0.088 M4**
Grid 4 **0.071 M4**	Grid 5 **0.086 M4**	Grid 6 **0.087 M4**
Grid 7 **0.059 M4**	Grid 8 **0.068 M4**	Grid 9 **0.068 M4**

Cursor:
Total = 0.088 A/m
H Category: M4
Location: -9.5, -12, 8.7 mm



0 dB = 0.088A/m

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2011/3/6

#52 HAC_H_GSM1900 Ch661_Slide Off_Battery2

DUT: 121417

Communication System: PCS; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Ambient Temperature：22.7 ℃

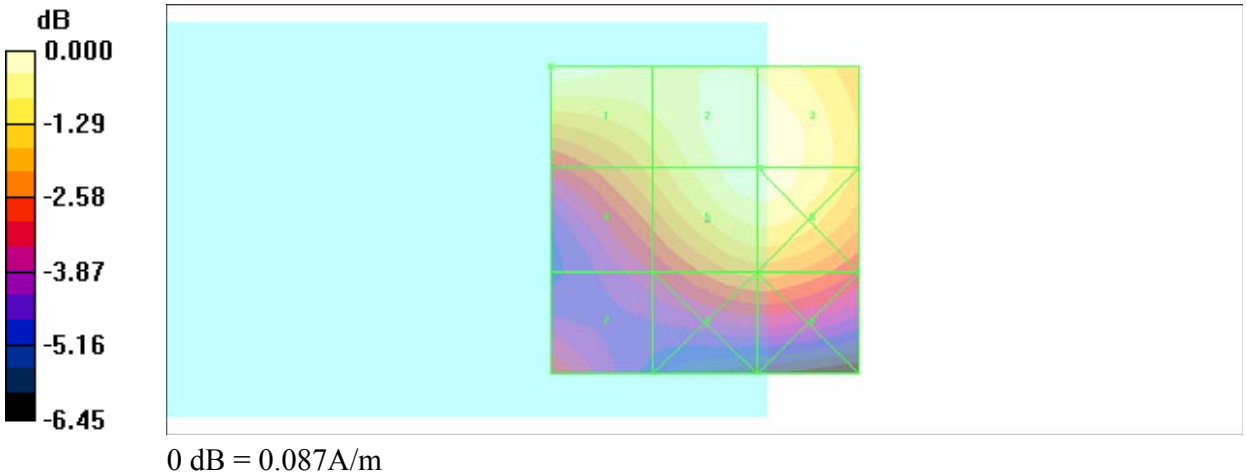
DASY4 Configuration:
- Probe: H3DV6 - SN6184; ; Calibrated: 2011/1/25
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch661/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 0.087 A/m
Probe Modulation Factor = 1.19
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 0.069 A/m; Power Drift = -0.024 dB
Hearing Aid Near-Field Category: M4 (AWF -5 dB)

Peak H-field in A/m

Grid 1 **0.087 M4**	Grid 2 **0.086 M4**	Grid 3 **0.086 M4**
Grid 4 **0.073 M4**	Grid 5 **0.086 M4**	Grid 6 **0.086 M4**
Grid 7 **0.062 M4**	Grid 8 **0.069 M4**	Grid 9 **0.070 M4**

Cursor:
Total = 0.087 A/m
H Category: M4
Location: 25, -25, 8.7 mm



0 dB = 0.087A/m

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2011/3/6

#53 HAC_H_GSM1900 Ch512_Slide Up_Battery1

DUT: 121417

Communication System: PCS; Frequency: 1850.2 MHz;Duty Cycle: 1:8.3
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Ambient Temperature：22.4 ℃

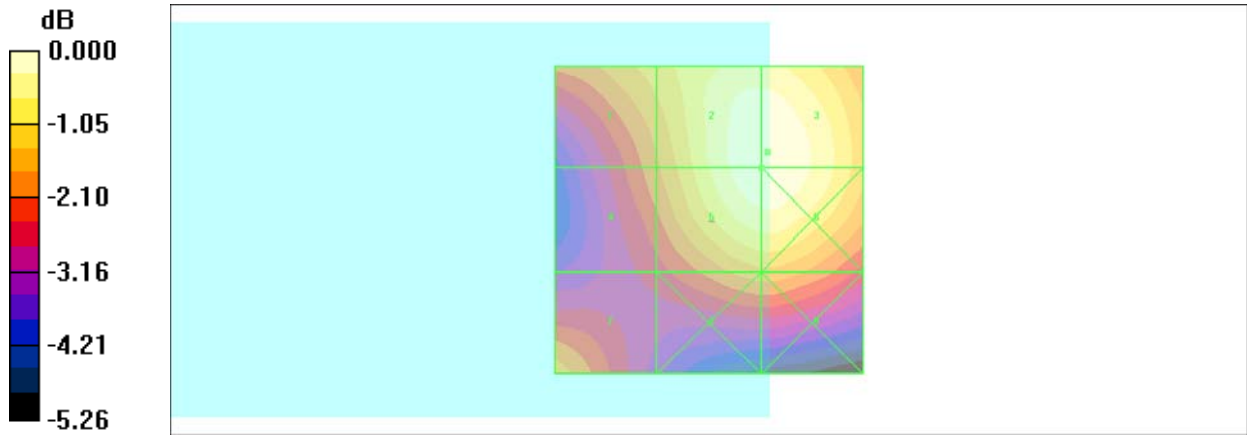
DASY4 Configuration:
- Probe: H3DV6 - SN6184; ; Calibrated: 2011/1/25
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch512/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 0.088 A/m
Probe Modulation Factor = 1.19
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 0.071 A/m; Power Drift = 0.100 dB
Hearing Aid Near-Field Category: M4 (AWF -5 dB)

Peak H-field in A/m

Grid 1 **0.077 M4**	Grid 2 **0.088 M4**	Grid 3 **0.088 M4**
Grid 4 **0.071 M4**	Grid 5 **0.087 M4**	Grid 6 **0.087 M4**
Grid 7 **0.074 M4**	Grid 8 **0.074 M4**	Grid 9 **0.074 M4**

Cursor:
Total = 0.088 A/m
H Category: M4
Location: -9.5, -11, 8.7 mm



0 dB = 0.088A/m

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2011/3/6

#54 HAC_H_GSM1900 Ch661_Slide Up_Battery1

DUT: 121417

Communication System: PCS; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Ambient Temperature：22.6 ℃

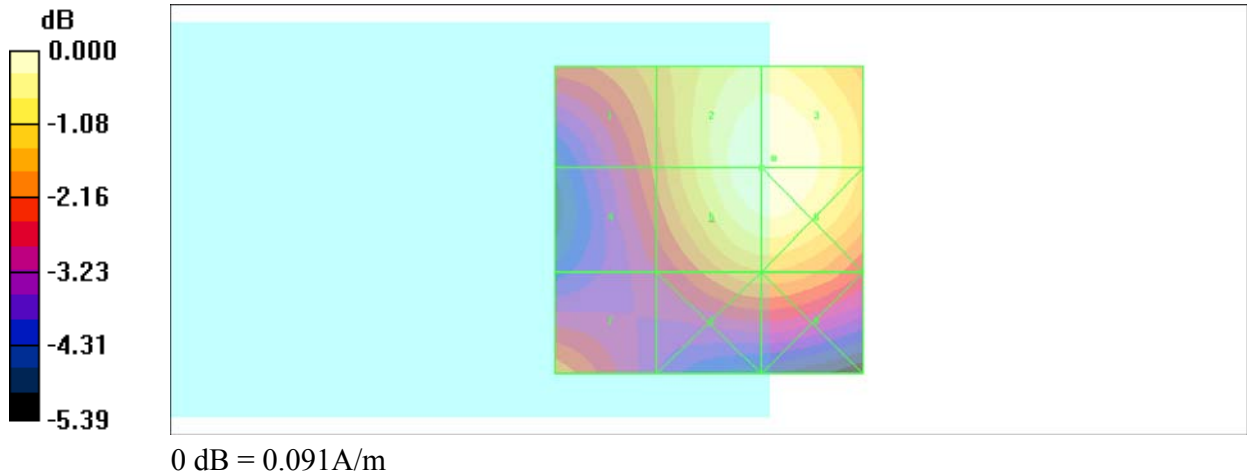
DASY4 Configuration:
- Probe: H3DV6 - SN6184; ; Calibrated: 2011/1/25
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch661/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 0.091 A/m
Probe Modulation Factor = 1.19
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 0.074 A/m; Power Drift = 0.002 dB
Hearing Aid Near-Field Category: M4 (AWF -5 dB)

Peak H-field in A/m

Grid 1 **0.076 M4**	Grid 2 **0.091 M4**	Grid 3 **0.091 M4**
Grid 4 **0.072 M4**	Grid 5 **0.091 M4**	Grid 6 **0.091 M4**
Grid 7 **0.073 M4**	Grid 8 **0.077 M4**	Grid 9 **0.077 M4**

Cursor:
Total = 0.091 A/m
H Category: M4
Location: -10.5, -10, 8.7 mm



0 dB = 0.091A/m

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2011/3/6

#55 HAC_H_GSM1900 Ch810_Slide Up_Battery1

DUT: 121417

Communication System: PCS; Frequency: 1909.8 MHz;Duty Cycle: 1:8.3
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Ambient Temperature：22.3 ℃

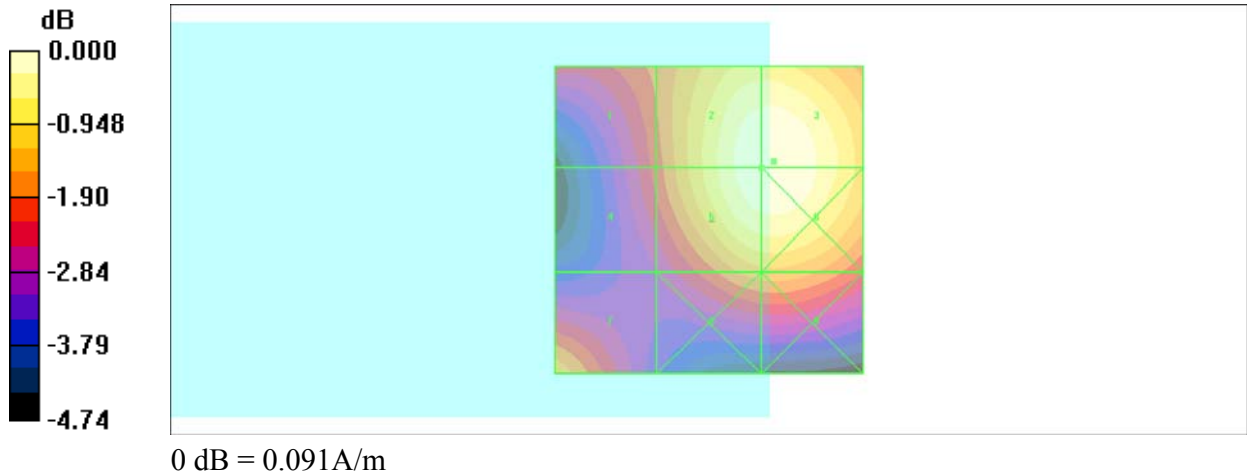
DASY4 Configuration:
- Probe: H3DV6 - SN6184; ; Calibrated: 2011/1/25
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch810/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 0.091 A/m
Probe Modulation Factor = 1.19
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 0.074 A/m; Power Drift = -0.001 dB
Hearing Aid Near-Field Category: M4 (AWF -5 dB)

Peak H-field in A/m

Grid 1 **0.074 M4**	Grid 2 **0.091 M4**	Grid 3 **0.091 M4**
Grid 4 **0.072 M4**	Grid 5 **0.091 M4**	Grid 6 **0.091 M4**
Grid 7 **0.079 M4**	Grid 8 **0.078 M4**	Grid 9 **0.078 M4**

Cursor:
Total = 0.091 A/m
H Category: M4
Location: -10.5, -9.5, 8.7 mm



0 dB = 0.091A/m

#56 HAC_H_GSM1900 Ch810_Slide Up_Battery2

DUT: 121417

Communication System: PCS; Frequency: 1909.8 MHz;Duty Cycle: 1:8.3
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Ambient Temperature：22.3 ℃

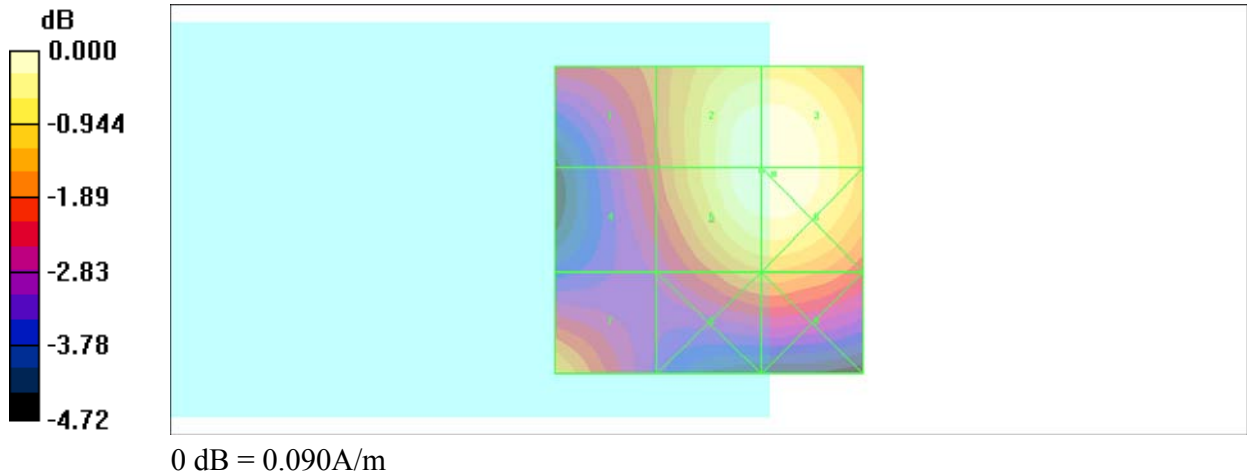
DASY4 Configuration:
- Probe: H3DV6 - SN6184; ; Calibrated: 2011/1/25
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch810/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 0.090 A/m
Probe Modulation Factor = 1.19
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 0.074 A/m; Power Drift = -0.063 dB
Hearing Aid Near-Field Category: M4 (AWF -5 dB)

Peak H-field in A/m

Grid 1 **0.074 M4**	Grid 2 **0.090 M4**	Grid 3 **0.090 M4**
Grid 4 **0.072 M4**	Grid 5 **0.090 M4**	Grid 6 **0.090 M4**
Grid 7 **0.079 M4**	Grid 8 **0.077 M4**	Grid 9 **0.078 M4**

Cursor:
Total = 0.090 A/m
H Category: M4
Location: -10.5, -7.5, 8.7 mm



0 dB = 0.090A/m

#57 HAC_H_GSM850 Ch128_Slide Off_Battery1

DUT: 121417

Communication System: GSM850; Frequency: 824.2 MHz;Duty Cycle: 1:8.3
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Ambient Temperature：22.5 ℃

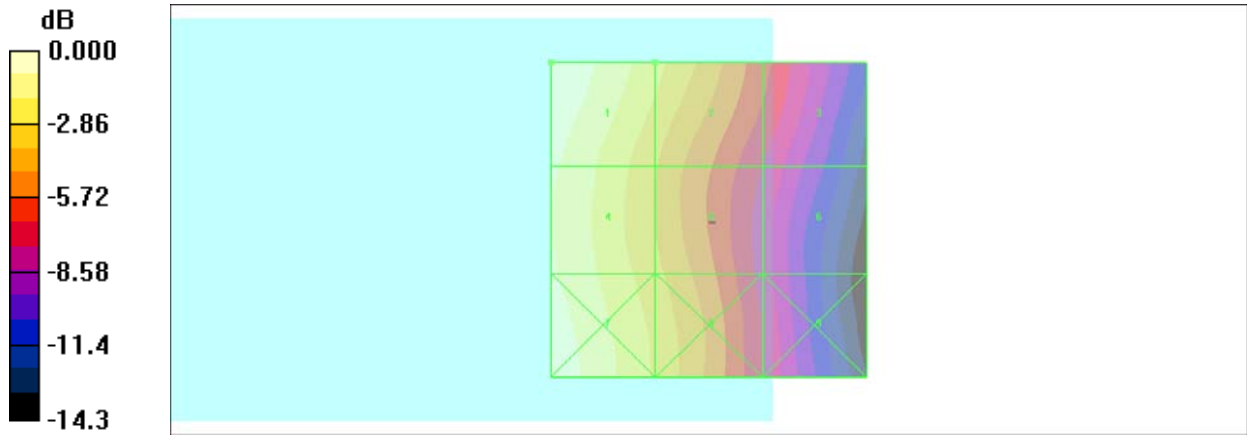
DASY4 Configuration:
- Probe: H3DV6 - SN6184; ; Calibrated: 2011/1/25
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch128/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 0.150 A/m
Probe Modulation Factor = 1.42
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 0.056 A/m; Power Drift = 0.364 dB
Hearing Aid Near-Field Category: M4 (AWF -5 dB)

Peak H-field in A/m

Grid 1 **0.150 M4**	Grid 2 **0.112 M4**	Grid 3 **0.073 M4**
Grid 4 **0.137 M4**	Grid 5 **0.100 M4**	Grid 6 **0.062 M4**
Grid 7 **0.145 M4**	Grid 8 **0.106 M4**	Grid 9 **0.063 M4**

Cursor:
Total = 0.150 A/m
H Category: M4
Location: 25, -25, 8.7 mm



0 dB = 0.150A/m

#58 HAC_H_GSM850 Ch189_Slide Off_Battery1

DUT: 121417

Communication System: GSM850; Frequency: 836.4 MHz;Duty Cycle: 1:8.3
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Ambient Temperature：22.7 ℃

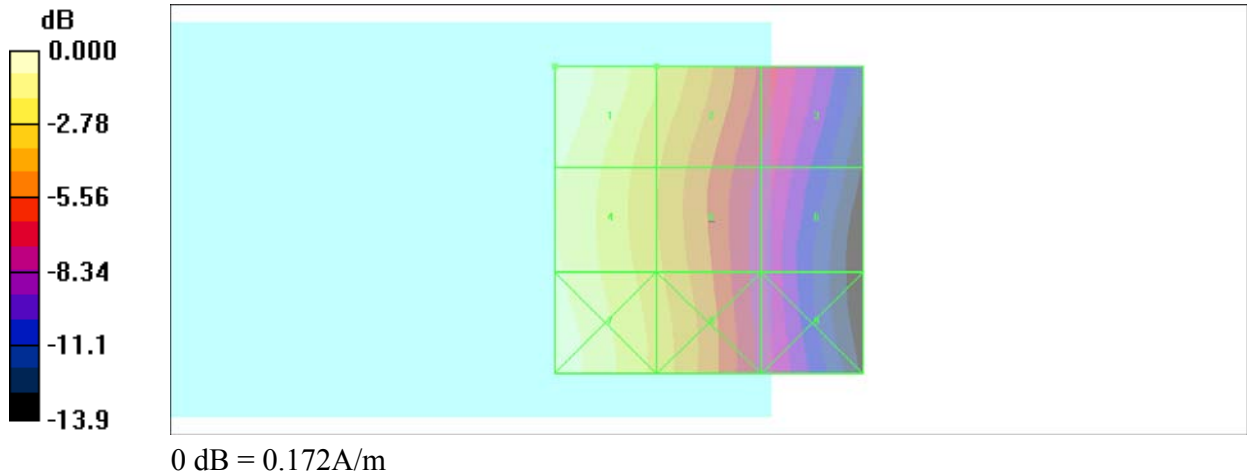
DASY4 Configuration:
- Probe: H3DV6 - SN6184; ; Calibrated: 2011/1/25
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch189/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 0.172 A/m
Probe Modulation Factor = 1.42
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 0.066 A/m; Power Drift = 0.085 dB
Hearing Aid Near-Field Category: M4 (AWF -5 dB)

Peak H-field in A/m

Grid 1 **0.172 M4**	Grid 2 **0.127 M4**	Grid 3 **0.080 M4**
Grid 4 **0.158 M4**	Grid 5 **0.116 M4**	Grid 6 **0.072 M4**
Grid 7 **0.167 M4**	Grid 8 **0.121 M4**	Grid 9 **0.071 M4**

Cursor:
Total = 0.172 A/m
H Category: M4
Location: 25, -25, 8.7 mm



0 dB = 0.172A/m

#59 HAC_H_GSM850 Ch251_Slide Off_Battery1

DUT: 121417

Communication System: GSM850; Frequency: 848.8 MHz;Duty Cycle: 1:8.3
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Ambient Temperature：22.7 ℃

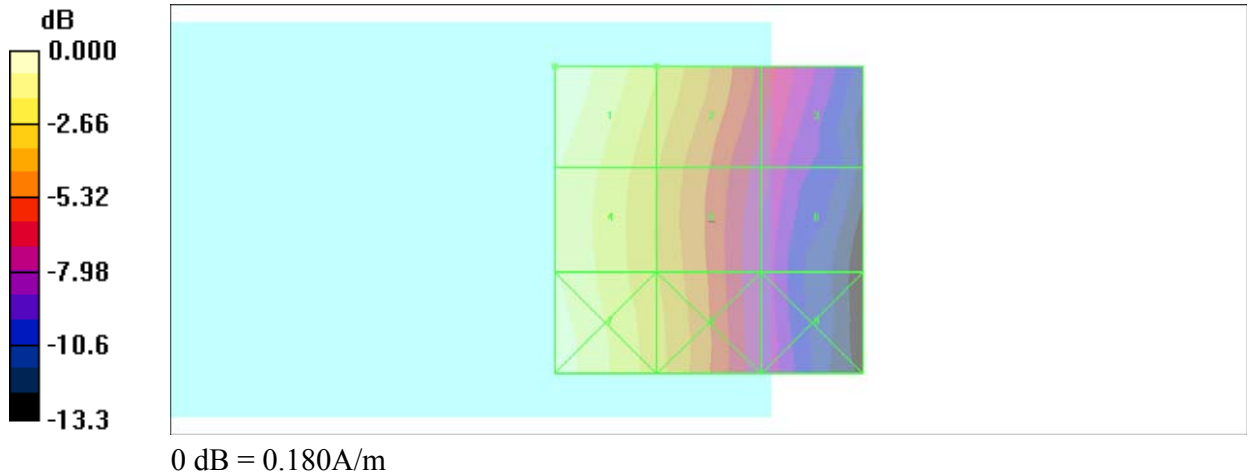
DASY4 Configuration:
- Probe: H3DV6 - SN6184; ; Calibrated: 2011/1/25
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch251/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 0.180 A/m
Probe Modulation Factor = 1.42
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 0.071 A/m; Power Drift = 0.699 dB
Hearing Aid Near-Field Category: M4 (AWF -5 dB)

Peak H-field in A/m

Grid 1 **0.180 M4**	Grid 2 **0.134 M4**	Grid 3 **0.086 M4**
Grid 4 **0.165 M4**	Grid 5 **0.121 M4**	Grid 6 **0.076 M4**
Grid 7 **0.172 M4**	Grid 8 **0.125 M4**	Grid 9 **0.073 M4**

Cursor:
Total = 0.180 A/m
H Category: M4
Location: 25, -25, 8.7 mm



0 dB = 0.180A/m

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2011/3/6

#60 HAC_H_GSM850 Ch251_Slide Off_Battery2

DUT: 121417

Communication System: GSM850; Frequency: 848.8 MHz;Duty Cycle: 1:8.3
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Ambient Temperature：22.3 ℃

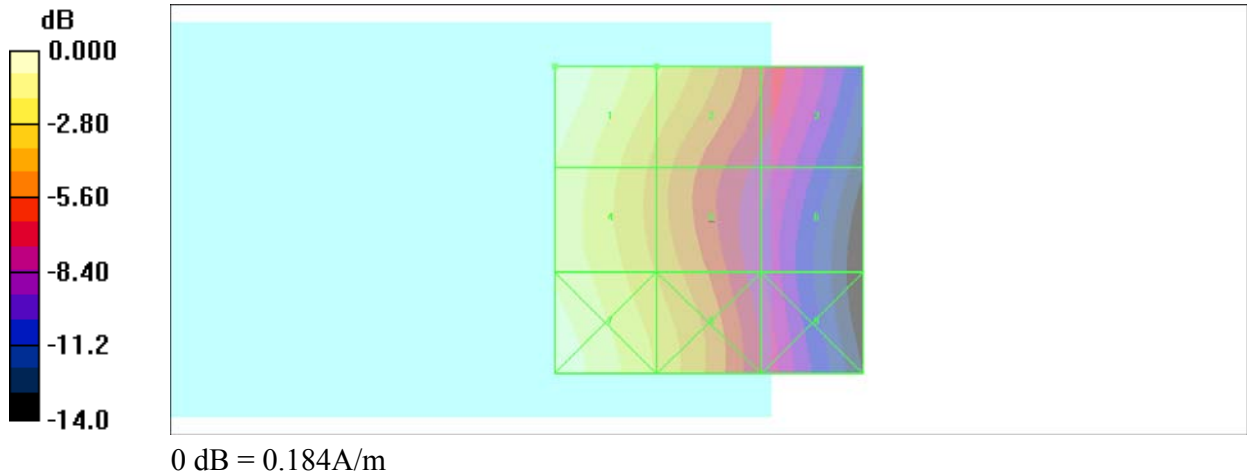
DASY4 Configuration:
- Probe: H3DV6 - SN6184; ; Calibrated: 2011/1/25
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch251/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 0.184 A/m
Probe Modulation Factor = 1.42
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 0.064 A/m; Power Drift = -0.042 dB
Hearing Aid Near-Field Category: M4 (AWF -5 dB)

Peak H-field in A/m

Grid 1 **0.184 M4**	Grid 2 **0.137 M4**	Grid 3 **0.089 M4**
Grid 4 **0.164 M4**	Grid 5 **0.119 M4**	Grid 6 **0.075 M4**
Grid 7 **0.180 M4**	Grid 8 **0.132 M4**	Grid 9 **0.078 M4**

Cursor:
Total = 0.184 A/m
H Category: M4
Location: 25, -25, 8.7 mm



0 dB = 0.184A/m

#61 HAC_H_GSM850 Ch128_Slide Up_Battery1

DUT: 121417

Communication System: GSM850; Frequency: 824.2 MHz;Duty Cycle: 1:8.3
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Ambient Temperature：22.5 ℃

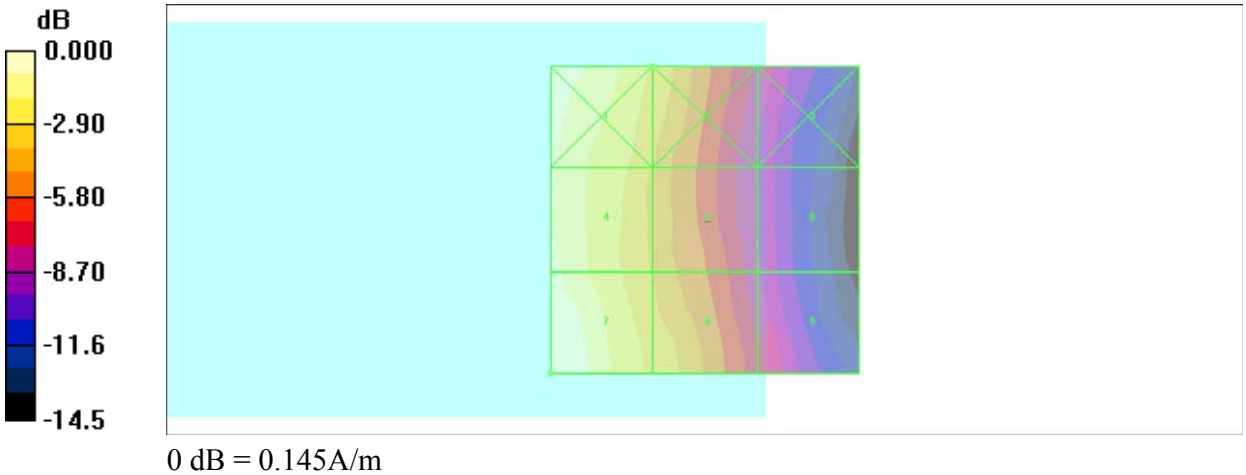
DASY4 Configuration:
- Probe: H3DV6 - SN6184; ; Calibrated: 2011/1/25
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch128/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 0.145 A/m
Probe Modulation Factor = 1.42
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 0.053 A/m; Power Drift = -0.234 dB
Hearing Aid Near-Field Category: M4 (AWF -5 dB)

Peak H-field in A/m

Grid 1 **0.144 M4**	Grid 2 **0.102 M4**	Grid 3 **0.058 M4**
Grid 4 **0.135 M4**	Grid 5 **0.093 M4**	Grid 6 **0.055 M4**
Grid 7 **0.145 M4**	Grid 8 **0.101 M4**	Grid 9 **0.063 M4**

Cursor:
Total = 0.145 A/m
H Category: M4
Location: 25, 25, 8.7 mm



0 dB = 0.145A/m

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2011/3/6

#62 HAC_H_GSM850 Ch189_Slide Up_Battery1

DUT: 121417

Communication System: GSM850; Frequency: 836.4 MHz;Duty Cycle: 1:8.3
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Ambient Temperature：22.4 ℃

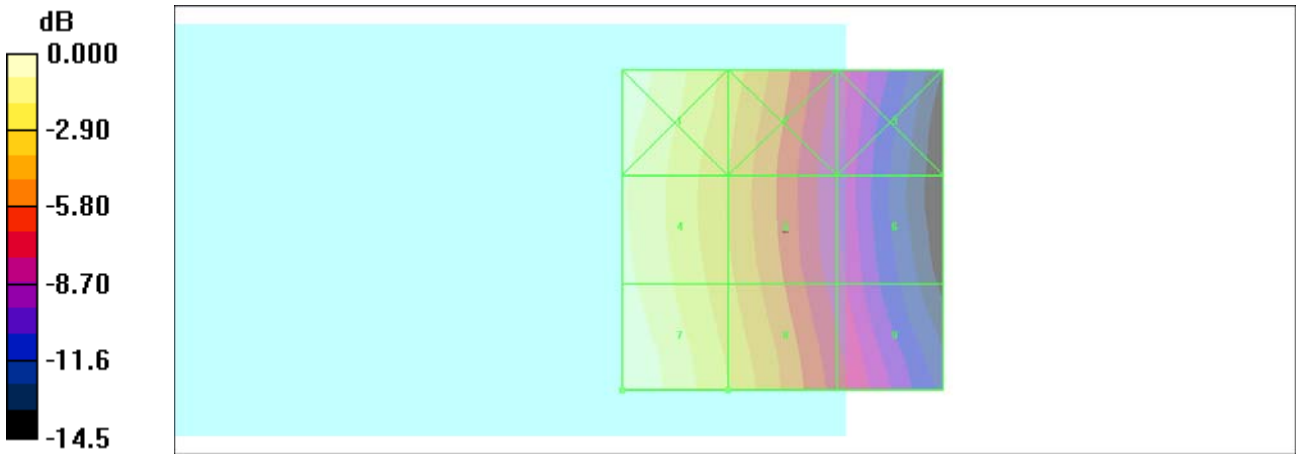
DASY4 Configuration:
- Probe: H3DV6 - SN6184; ; Calibrated: 2011/1/25
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch189/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 0.154 A/m
Probe Modulation Factor = 1.42
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 0.055 A/m; Power Drift = -0.003 dB
Hearing Aid Near-Field Category: M4 (AWF -5 dB)

Peak H-field in A/m

Grid 1 **0.150 M4**	Grid 2 **0.106 M4**	Grid 3 **0.061 M4**
Grid 4 **0.143 M4**	Grid 5 **0.102 M4**	Grid 6 **0.060 M4**
Grid 7 **0.154 M4**	Grid 8 **0.111 M4**	Grid 9 **0.067 M4**

Cursor:
Total = 0.154 A/m
H Category: M4
Location: 25, 25, 8.7 mm



0 dB = 0.154A/m

#63 HAC_H_GSM850 Ch251_Slide Up_Battery1

DUT: 121417

Communication System: GSM850; Frequency: 848.8 MHz;Duty Cycle: 1:8.3
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Ambient Temperature：22.3 ℃

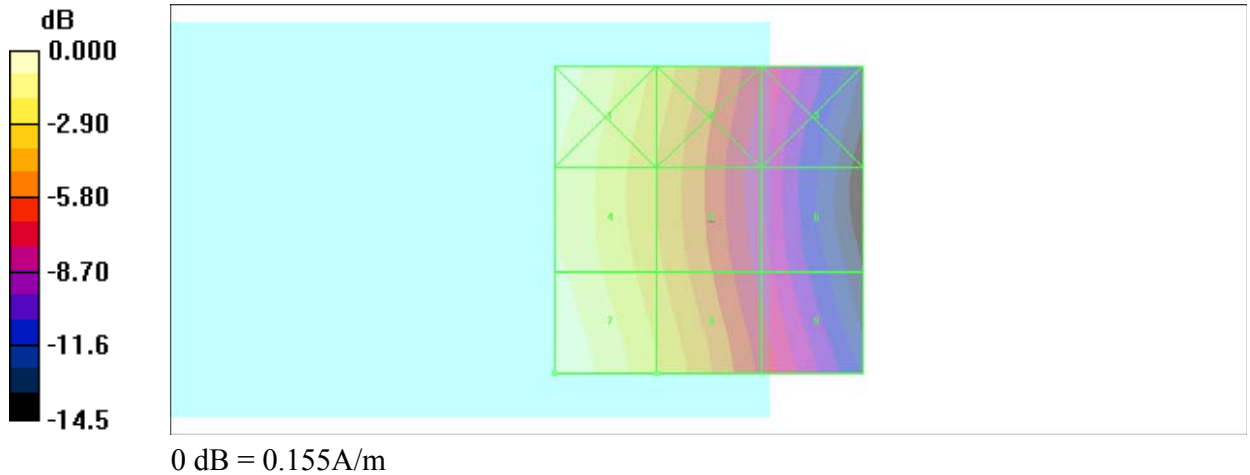
DASY4 Configuration:
- Probe: H3DV6 - SN6184; ; Calibrated: 2011/1/25
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch251/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 0.155 A/m
Probe Modulation Factor = 1.42
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 0.055 A/m; Power Drift = 0.047 dB
Hearing Aid Near-Field Category: M4 (AWF -5 dB)

Peak H-field in A/m

Grid 1 **0.150 M4**	Grid 2 **0.108 M4**	Grid 3 **0.064 M4**
Grid 4 **0.143 M4**	Grid 5 **0.103 M4**	Grid 6 **0.061 M4**
Grid 7 **0.155 M4**	Grid 8 **0.113 M4**	Grid 9 **0.069 M4**

Cursor:
Total = 0.155 A/m
H Category: M4
Location: 25, 25, 8.7 mm



0 dB = 0.155A/m

#64 HAC_H_GSM850 Ch251_Slide Up_Battery2

DUT: 121417

Communication System: GSM850; Frequency: 848.8 MHz;Duty Cycle: 1:8.3
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Ambient Temperature：22.3 ℃

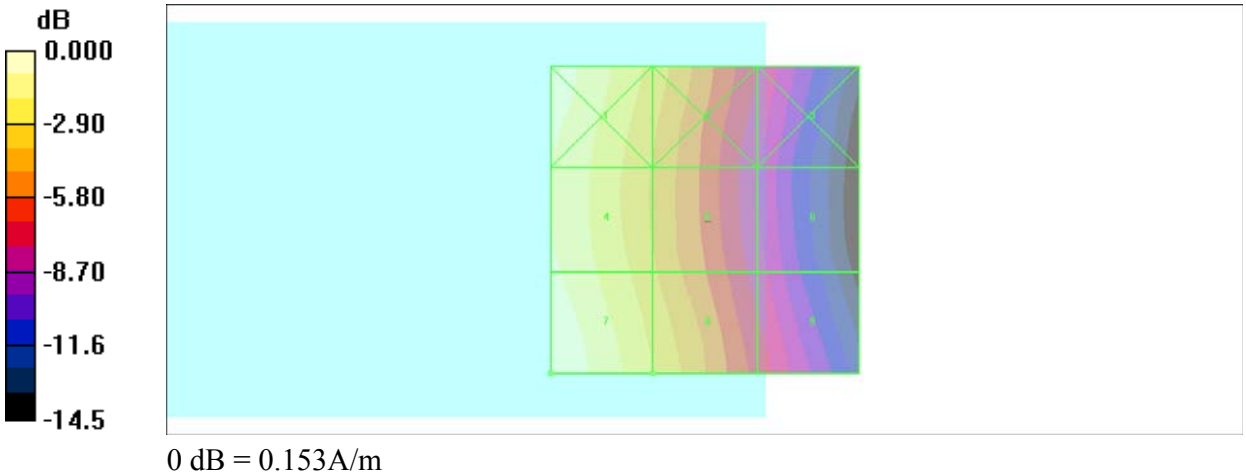
DASY4 Configuration:
- Probe: H3DV6 - SN6184; ; Calibrated: 2011/1/25
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch251/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 0.153 A/m
Probe Modulation Factor = 1.42
Device Reference Point: 0.000, 0.000, -6.30 mm
Reference Value = 0.055 A/m; Power Drift = -0.200 dB
Hearing Aid Near-Field Category: M4 (AWF -5 dB)

Peak H-field in A/m

Grid 1 **0.148 M4**	Grid 2 **0.106 M4**	Grid 3 **0.063 M4**
Grid 4 **0.141 M4**	Grid 5 **0.100 M4**	Grid 6 **0.060 M4**
Grid 7 **0.153 M4**	Grid 8 **0.110 M4**	Grid 9 **0.067 M4**

Cursor:
Total = 0.153 A/m
H Category: M4
Location: 25, 25, 8.7 mm



0 dB = 0.153A/m

Appendix C. DASY Calibration Certificate

The DASY calibration certificates are shown as follows.

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
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 **Sporton (Auden)** Certificate No: **CD835V3-1045_Sep09**

CALIBRATION CERTIFICATE

Object	CD835V3 - SN: 1045
Calibration procedure(s)	QA CAL-20.v4 Calibration procedure for dipoles in air
Calibration date:	September 17, 2009
Condition of the calibrated item	In Tolerance

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
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	08-Oct-08 (No. 217-00898)	Oct-09
Power sensor HP 8481A	US37292783	08-Oct-08 (No. 217-00898)	Oct-09
Probe ER3DV6	SN: 2336	22-Dec-08 (No. ER3-2336_Dec08)	Dec-09
Probe H3DV6	SN: 6065	22-Dec-08 (No. H3-6065_-Dec08)	Dec-09
DAE4	SN: 781	20-Feb-09 (No. DAE4-781_Feb09)	Feb-10

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter R&S NRP	SN: 101748	23-Sep-08 (in house check Dec-08)	In house check: Dec-10
Power sensor R&S NRP-Z91	SN: 100711	25-Aug-08 (in house check Dec-08)	In house check: Dec-10
Power sensor R&S NRP-Z91	SN: 100712	25-Aug-08 (in house check Dec-08)	In house check: Dec-10
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-08)	In house check: Oct-09
RF generator E4433B	MY 41310391	03-Nov-04 (in house check Oct-07)	In house check: Oct-09

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

Issued: September 17, 2009

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

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Accreditation No.: SCS 108

References

[1] ANSI-C63.19-2006
American National Standard for Methods of Measurement of Compatibility between Wireless Communications Devices and Hearing Aids.

[2] 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, 2], 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 DASY4 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, 2], 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.

1 Measurement Conditions

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

DASY Version	DASY5	V5.0 B127
DASY PP Version	SEMCAD X	V13.4 B125
Phantom	HAC Test Arch	SD HAC P01 BA, #1070
Distance Dipole Top - Probe Center	10 mm	
Scan resolution	dx, dy = 5 mm	area = 20 x 180 mm
Frequency	**835 MHz** ± 1 MHz	
Forward power at dipole connector	20.0 dBm = 100mW	
Input power drift	< 0.05 dB	

2 Maximum Field values

H-field 10 mm above dipole surface	condition	**interpolated maximum**
Maximum measured	100 mW forward power	**0.457 A/m**

Uncertainty for H-field measurement: 8.2% (k=2)

E-field 10 mm above dipole surface	condition	**Interpolated maximum**
Maximum measured above high end-	100 mW forward power	170.6 V/m
Maximum measured above low end	100 mW forward power	169.8 V/m
Averaged maximum above arm	100 mW forward power	**170.2 V/m**

Uncertainty for E-field measurement: 12.8% (k=2)

3 Appendix

3.1 Antenna Parameters

Frequency	**Return Loss**	**Impedance**
800 MHz	15.7 dB	(44.9 – j14.9) Ohm
835 MHz	**40.5 dB**	**(49.2 - j0.5) Ohm**
900 MHz	17.4 dB	(53.0 – j13.7) Ohm
950 MHz	20.2 dB	(47.5 + j9.2) Ohm
960 MHz	14.8 dB	(53.9 + j18.8) Ohm

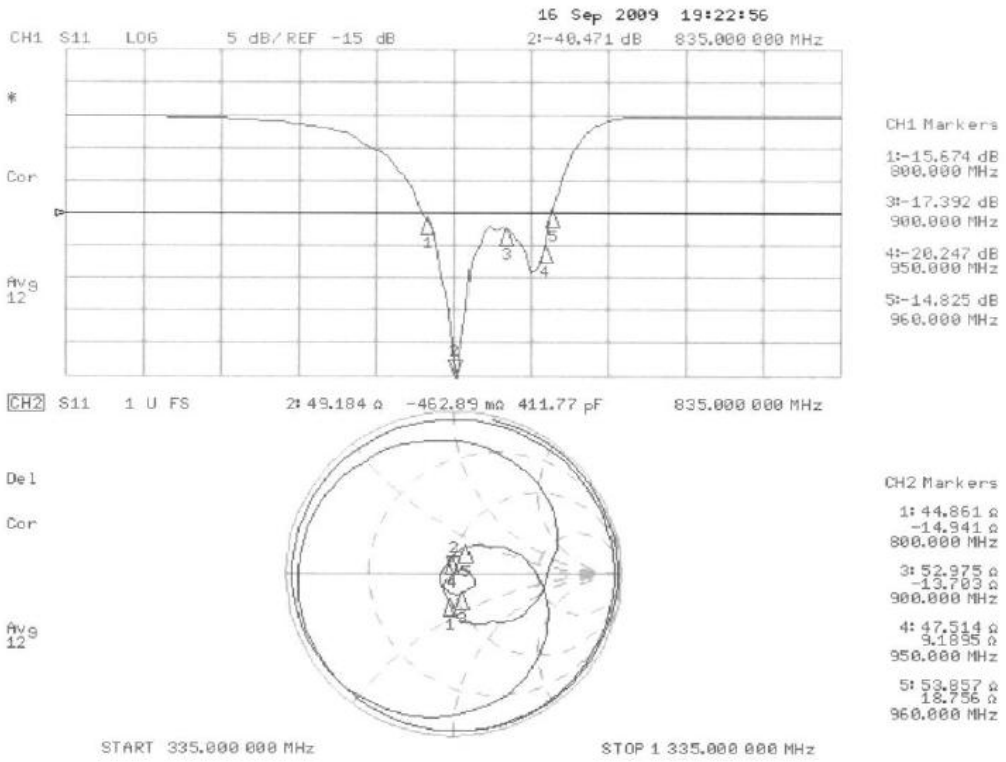
3.2 Antenna Design and Handling

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.

3.3 Measurement Sheets

3.3.1 Return Loss and Smith Chart



3.3.2 DASY4 H-field Result

Date/Time: 16.09.2009 10:26:07

Test Laboratory: SPEAG Lab2

H_CD835_1045_090916.da5

DUT: HAC-Dipole 835 MHz; Type: D835V3; Serial: 1045

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

Phantom section: RF Section

Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: H3DV6 - SN6065; ; Calibrated: 22.12.2008
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn781; Calibrated: 20.02.2009
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA; Serial: 1070
- Measurement SW: DASY5, V5.0 Build 127; SEMCAD X Version 13.4 Build 125

H 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 = 0.457 A/m

Probe Modulation Factor = 1

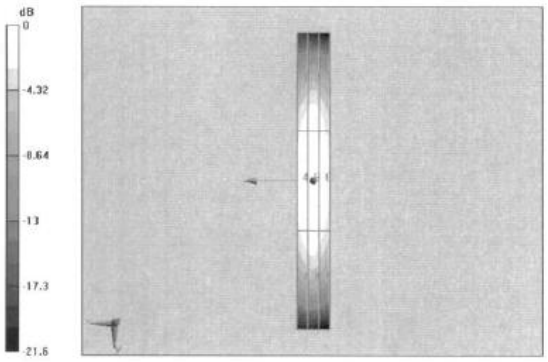
Device Reference Point: 0, 0, -6.3 mm

Reference Value = 0.487 A/m; Power Drift = 0.00195 dB

Hearing Aid Near-Field Category: M4 (AWF 0 dB)

Peak H-field in A/m

Grid 1 **0.384 M4**	Grid 2 **0.410 M4**	Grid 3 **0.385 M4**
Grid 4 **0.431 M4**	Grid 5 **0.457 M4**	Grid 6 **0.429 M4**
Grid 7 **0.383 M4**	Grid 8 **0.401 M4**	Grid 9 **0.369 M4**



0 dB = 0.457A/m

3.3.3 DASY4 E-field Result

Date/Time: 17.09.2009 09:59:19

Test Laboratory: SPEAG Lab2

E_CD835_1045_090917.da5

DUT: HAC-Dipole 835 MHz; Type: D835V3; Serial: 1045

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

Phantom section: RF Section

Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: ER3DV6 - SN2336; ConvF(1, 1, 1); Calibrated: 22.12.2008
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn781; Calibrated: 20.02.2009
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA; Serial: 1070
- Measurement SW: DASY5, V5.0 Build 127; SEMCAD X Version 13.4 Build 125

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 = 170.6 V/m

Probe Modulation Factor = 1

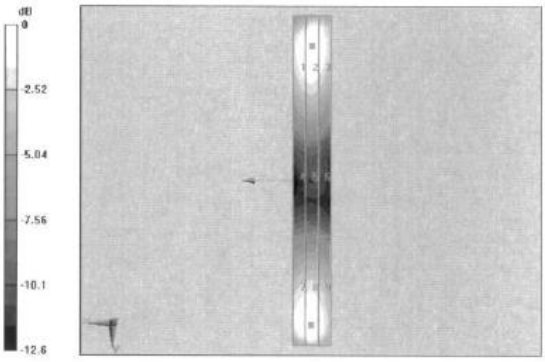
Device Reference Point: 0, 0, -6.3 mm

Reference Value = 109.7 V/m; Power Drift = -0.035 dB

Hearing Aid Near-Field Category: M4 (AWF 0 dB)

Peak E-field in V/m

Grid 1 **164.9 M4**	Grid 2 **170.6 M4**	Grid 3 **164.4 M4**
Grid 4 **87.7 M4**	Grid 5 **89.9 M4**	Grid 6 **86.1 M4**
Grid 7 **165.1 M4**	Grid 8 **169.8 M4**	Grid 9 **159.4 M4**



0 dB = 170.6V/m

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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 **Sporton (Auden)**

Certificate No: **CD1880V3-1038_Sep09**

CALIBRATION CERTIFICATE

Object	CD1880V3 - SN: 1038
Calibration procedure(s)	QA CAL-20.v4 Calibration procedure for dipoles in air
Calibration date:	September 17, 2009
Condition of the calibrated item	In Tolerance

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
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	08-Oct-08 (No. 217-00898)	Oct-09
Power sensor HP 8481A	US37292783	08-Oct-08 (No. 217-00898)	Oct-09
Probe ER3DV6	SN: 2336	22-Dec-08 (No. ER3-2336_Dec08)	Dec-09
Probe H3DV6	SN: 6065	22-Dec-08 (No. H3-6065_-Dec08)	Dec-09
DAE4	SN 781	20-Feb-09 (No. DAE4-781_Feb09)	Feb-10

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter R&S NRP	SN: 101748	23-Sep-08 (in house check Dec-08)	In house check: Dec-10
Power sensor R&S NRP-Z91	SN: 100711	25-Aug-08 (in house check Dec-08)	In house check: Dec-10
Power sensor R&S NRP-Z91	SN: 100712	25-Aug-08 (in house check Dec-08)	In house check: Dec-10
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-08)	In house check: Oct-09
RF generator E4433B	MY 41310391	22-Nov-04 (in house check Oct-07)	In house check: Oct-09

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

Issued: September 17, 2009

Calibration Laboratory of
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Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

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Accreditation No.: **SCS 108**

References

[1] ANSI-C63.19-2006
American National Standard for Methods of Measurement of Compatibility between Wireless Communications Devices and Hearing Aids.

[2] 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, 2], 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 DASY4 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, 2], 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.

1. Measurement Conditions

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

DASY Version	DASY5	V5.0 B127
DASY PP Version	SEMCAD X	V13.4 B125
Phantom	HAC Test Arch	SD HAC P01 BA, #1070
Distance Dipole Top - Probe Center	10 mm	
Scan resolution	dx, dy = 5 mm	area = 20 x 90 mm
Frequency	**1880 MHz** ± 1 MHz	
Forward power at dipole connector	20.0 dBm = 100mW	
Input power drift	< 0.05 dB	

2. Maximum Field values

H-field 10 mm above dipole surface	condition	**Interpolated maximum**
Maximum measured	100 mW forward power	**0.466 A/m**

Uncertainty for H-field measurement: 8.2% (k=2)

E-field 10 mm above dipole surface	condition	**Interpolated maximum**
Maximum measured above high end	100 mW forward power	138.2 V/m
Maximum measured above low end	100 mW forward power	135.3 V/m
Averaged maximum above arm	100 mW forward power	**136.8 V/m**

Uncertainty for E-field measurement: 12.8% (k=2)

3. Appendix

3.1 Antenna Parameters

Frequency	**Return Loss**	**Impedance**
1710 MHz	18.6 dB	(48.6 + j11.6) Ohm
1880 MHz	**21.3 dB**	**(52.9 + j8.4) Ohm**
1900 MHz	22.1 dB	(55.5 + j6.3) Ohm
1950 MHz	28.1 dB	(52.8 - j2.9) Ohm
2000 MHz	18.7 dB	(39.6 - j1.0) Ohm

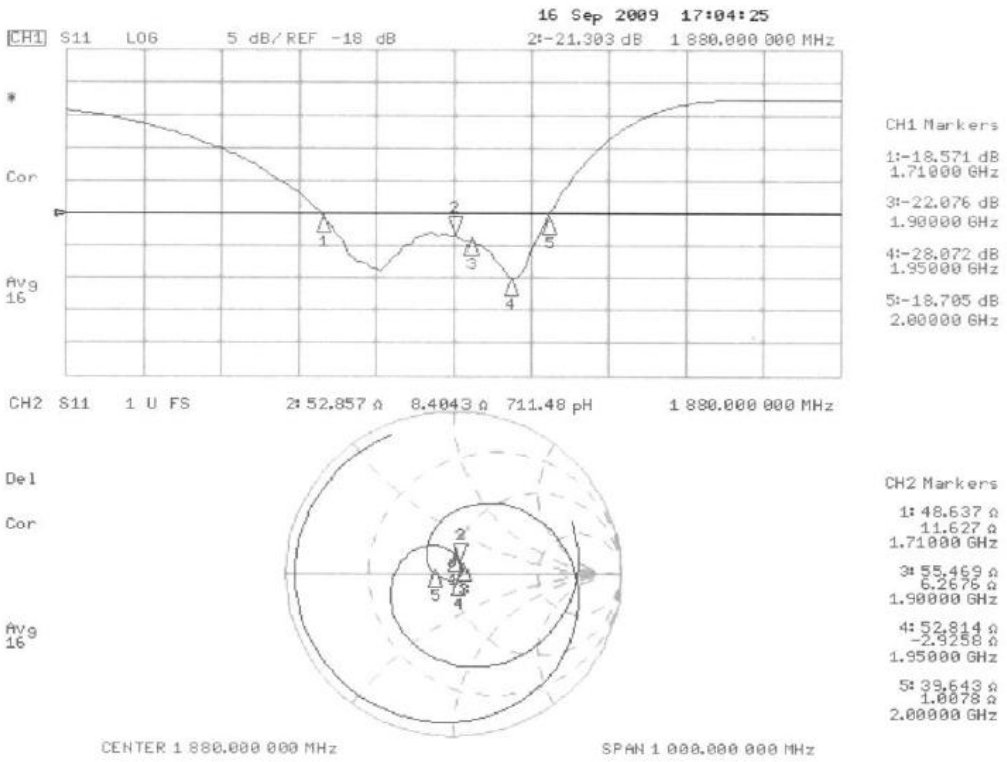
3.2 Antenna Design and Handling

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.

3.3 Measurement Sheets

3.3.1 Return Loss and Smith Chart



3.3.2 DASY4 H-Field Result

Date/Time: 16.09.2009 14:27:59

Test Laboratory: SPEAG Lab2

H_CD1880_1038_090916.da5
DUT: HAC Dipole 1880 MHz; Type: CD1880V3; Serial: 1038
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
Phantom section: RF Section
Measurement Standard: DASY5 (IEEE/IEC)
DASY5 Configuration:

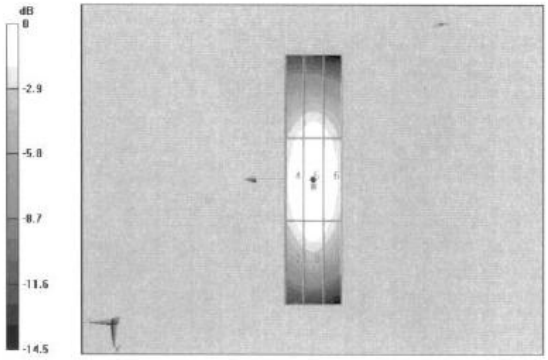
- Probe: H3DV6 - SN6065; ; Calibrated: 22.12.2008
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn781; Calibrated: 20.02.2009
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA; Serial: 1070
- Measurement SW: DASY5, V5.0 Build 127; SEMCAD X Version 13.4 Build 125

H 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 = 0.466 A/m
Probe Modulation Factor = 1
Device Reference Point: 0, 0, -6.3 mm
Reference Value = 0.493 A/m; Power Drift = -0.010 dB
Hearing Aid Near-Field Category: M2 (AWF 0 dB)

Peak H-field in A/m

Grid 1 **0.397 M2**	Grid 2 **0.420 M2**	Grid 3 **0.403 M2**
Grid 4 **0.442 M2**	Grid 5 **0.466 M2**	Grid 6 **0.445 M2**
Grid 7 **0.407 M2**	Grid 8 **0.432 M2**	Grid 9 **0.410 M2**



0 dB = 0.466A/m

3.3.3 DASY4 E-Field Result

Date/Time: 17.09.2009 15:13:12

Test Laboratory: SPEAG Lab2

E_CD1880_1038_090917.da5
DUT: HAC Dipole 1880 MHz; Type: CD1880V3; Serial: 1038
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
Phantom section: RF Section
Measurement Standard: DASY5 (IEEE/IEC)
DASY5 Configuration:

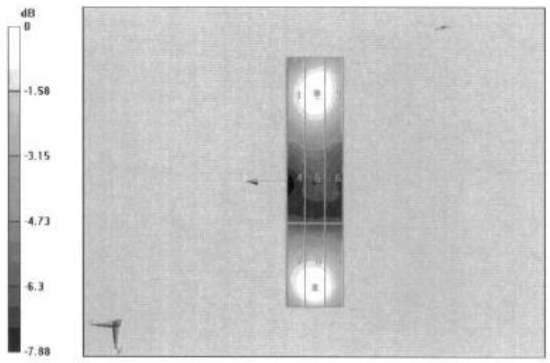
- Probe: ER3DV6 - SN2336; ConvF(1, 1, 1); Calibrated: 22.12.2008
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn781; Calibrated: 20.02.2009
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA; Serial: 1070
- Measurement SW: DASY5, V5.0 Build 127; SEMCAD X Version 13.4 Build 125

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 = 138.2 V/m
Probe Modulation Factor = 1
Device Reference Point: 0, 0, -6.3 mm
Reference Value = 155.9 V/m; Power Drift = -0.00724 dB
Hearing Aid Near-Field Category: M2 (AWF 0 dB)

Peak E-field in V/m

Grid 1 **130.2 M2**	Grid 2 **135.3 M2**	Grid 3 **132.4 M2**
Grid 4 **89 M3**	Grid 5 **91.6 M3**	Grid 6 **88.1 M3**
Grid 7 **132.8 M2**	Grid 8 **138.2 M2**	Grid 9 **132.4 M2**



0 dB = 138.2V/m

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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 **Sporton (Auden)**

Certificate No: DAE4-778_Oct10

CALIBRATION CERTIFICATE

Object	DAE4 - SD 000 D04 BJ - SN: 778
Calibration procedure(s)	QA CAL-06.v22 Calibration procedure for the data acquisition electronics (DAE)
Calibration date:	October 22, 2010

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-10 (No:10376)	Sep-11
Secondary Standards	**ID #**	**Check Date (in house)**	**Scheduled Check**
Calibrator Box V1.1	SE UMS 006 AB 1004	07-Jun-10 (in house check)	In house check: Jun-11

	Name	Function	Signature
Calibrated by:	Eric Hainfeld	Technician	
Approved by:	Fin Bomholt	R&D Director	

Issued: October 22, 2010

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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	404.679 ± 0.1% (k=2)	403.480 ± 0.1% (k=2)	405.025 ± 0.1% (k=2)
Low Range	3.98633 ± 0.7% (k=2)	3.96375 ± 0.7% (k=2)	3.99940 ± 0.7% (k=2)

Connector Angle

Connector Angle to be used in DASY system	64.5 ° ± 1 °

Appendix

1. DC Voltage Linearity

High Range		Reading (μV)	Difference (μV)	Error (%)
Channel X	+ Input	200004.4	1.89	0.00
Channel X	+ Input	20001.11	1.41	0.01
Channel X	- Input	-19998.36	1.54	-0.01
Channel Y	+ Input	199996.1	3.42	0.00
Channel Y	+ Input	19999.75	0.35	0.00
Channel Y	- Input	-19999.92	-0.12	0.00
Channel Z	+ Input	200002.7	1.29	0.00
Channel Z	+ Input	19996.85	-2.55	-0.01
Channel Z	- Input	-20004.31	-4.61	0.02

Low Range		Reading (μV)	Difference (μV)	Error (%)
Channel X	+ Input	2000.0	0.09	0.00
Channel X	+ Input	200.02	0.02	0.01
Channel X	- Input	-198.62	1.48	-0.74
Channel Y	+ Input	1999.6	-0.58	-0.03
Channel Y	+ Input	199.13	-0.57	-0.29
Channel Y	- Input	-200.71	-0.61	0.31
Channel Z	+ Input	2000.1	-0.01	-0.00
Channel Z	+ Input	198.96	-1.14	-0.57
Channel Z	- Input	-200.98	-0.98	0.49

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	-5.28	-6.07
	- 200	6.79	6.12
Channel Y	200	-1.80	-1.60
	- 200	0.97	0.35
Channel Z	200	-9.76	-9.86
	- 200	7.56	7.61

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	-	1.86	-0.66
Channel Y	200	2.28	-	2.89
Channel Z	200	1.68	-0.15	-

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	16056	16950
Channel Y	16153	13741
Channel Z	16441	16086

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	0.32	-2.35	2.08	0.55
Channel Y	-1.83	-2.96	-0.72	0.47
Channel Z	-1.93	-3.00	-0.90	0.45

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

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Accreditation No.: SCS 108

Client: Sporton-TW (Auden)

Certificate No: ER3-2358_Jan11

CALIBRATION CERTIFICATE

Object: ER3DV6 - SN:2358

Calibration procedure(s): QA CAL-02.v6, QA CAL-25.v3
Calibration procedure for E-field probes optimized for close near field evaluations in air

Calibration date: January 14, 2011

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	01-Apr-10 (No. 217-01136)	Apr-11
Power sensor E4412A	MY41495277	01-Apr-10 (No. 217-01136)	Apr-11
Power sensor E4412A	MY41498087	01-Apr-10 (No. 217-01136)	Apr-11
Reference 3 dB Attenuator	SN: S5054 (3c)	30-Mar-10 (No. 217-01159)	Mar-11
Reference 20 dB Attenuator	SN: S5086 (20b)	30-Mar-10 (No. 217-01161)	Mar-11
Reference 30 dB Attenuator	SN: S5129 (30b)	30-Mar-10 (No. 217-01160)	Mar-11
Reference Probe ER3DV6	SN: 2328	4-Oct-10 (No. ER3-2328_Oct10)	Oct-11
DAE4	SN: 789	31-Aug-10 (No. DAE4-789_Aug10)	Aug-11
Secondary Standards	ID	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-10)	In house check: Oct-11

	Name	Function	Signature
Calibrated by:	Marcel Fehr	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: January 25, 2011

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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).
- *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.
- *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:2358

Manufactured: July 7, 2005
Calibrated: January 14, 2011

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

DASY/EASY - Parameters of Probe: ER3DV6 - SN:2358

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$)	1.72	1.56	1.59	± 10.1 %
DCP (mV)[B]	98.6	97.8	99.6	

Modulation Calibration Parameters

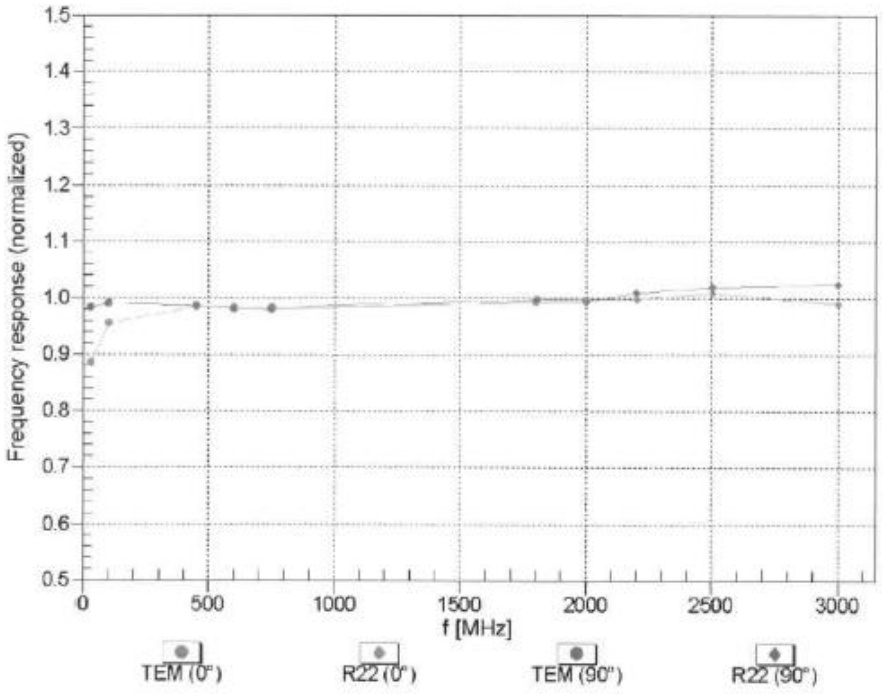
UID	Communication System Name	PAR		A dB	B dB	C dB	VR mV	Unc[E] (k=2)
10000	CW	0.00	X	0.00	0.00	1.00	151.8	±1.6 %
			Y	0.00	0.00	1.00	153.3	
			Z	0.00	0.00	1.00	138.4	

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:2358 January 14, 2011

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

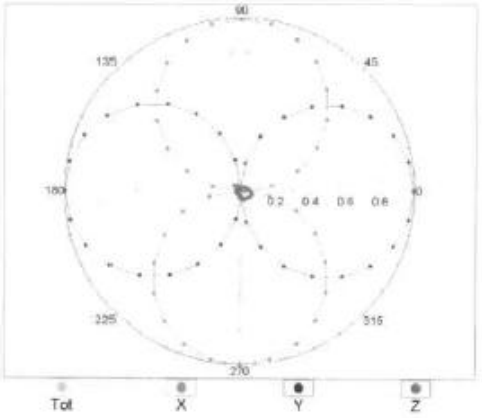


Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

ER3DV6– SN:2358 January 14, 2011

Receiving Pattern (ϕ), ϑ = 0°

f=600 MHz,TEM,0°

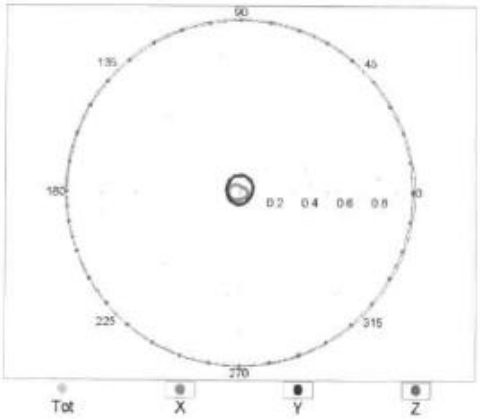


f=2500 MHz,R22,0°

Receiving Pattern (ϕ), ϑ = 90°

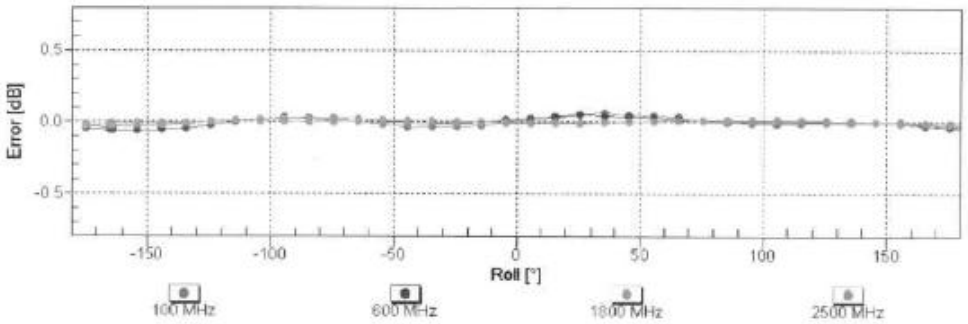
f=600 MHz,TEM,90°

f=2500 MHz,R22,90°



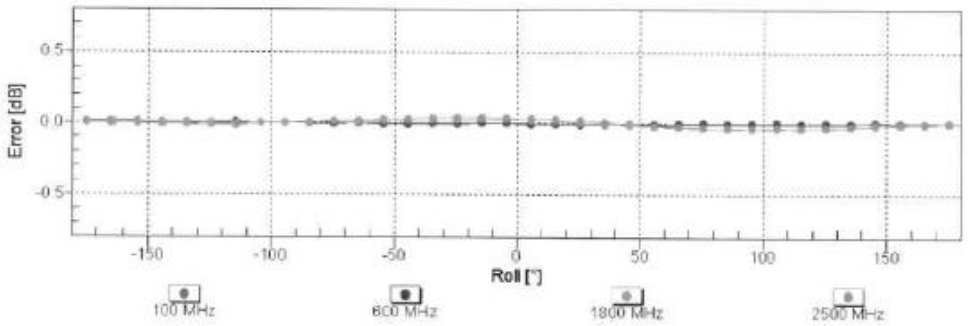
ER3DV6– SN:2358 January 14, 2011

Receiving Pattern (ϕ), ϑ = 0°



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

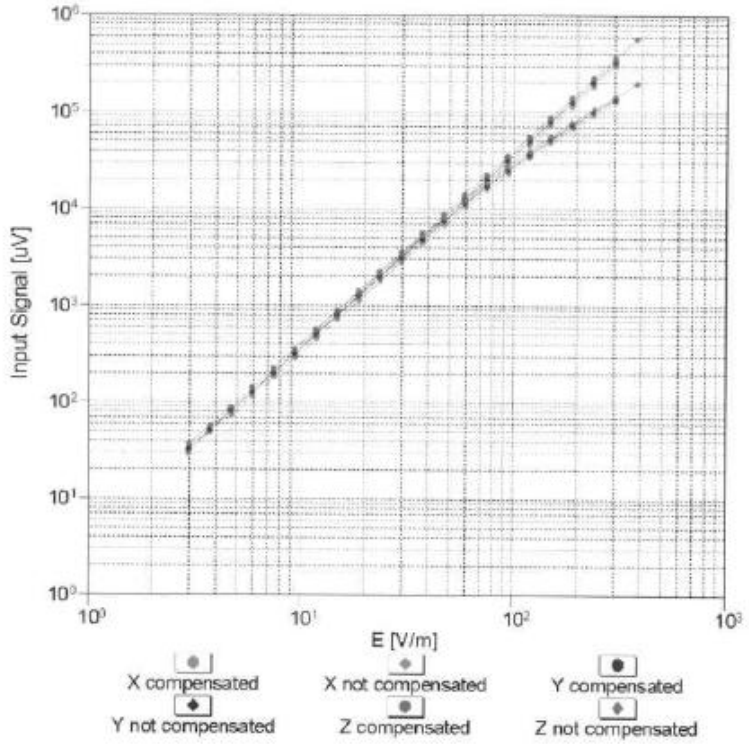
Receiving Pattern (ϕ), ϑ = 90°

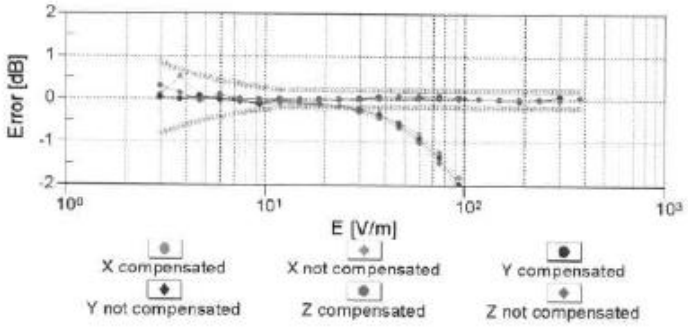


Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

ER3DV6– SN:2358 January 14, 2011

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

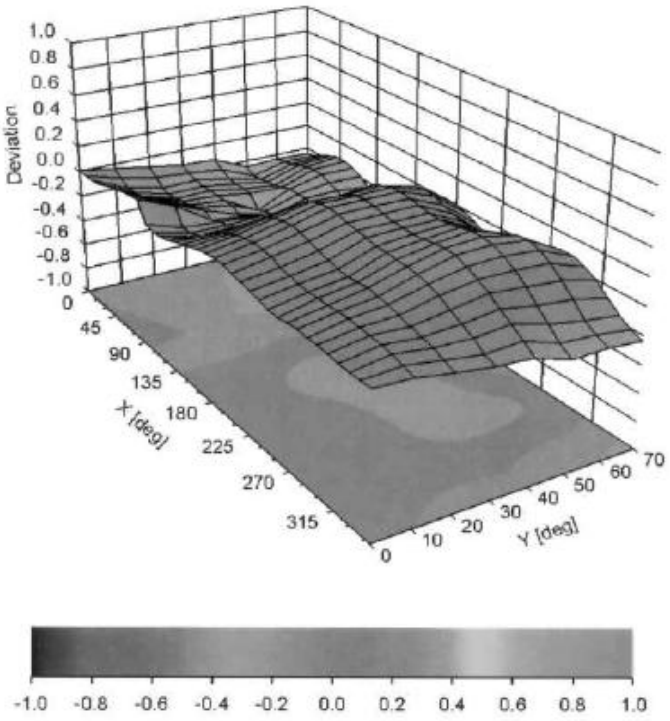




Uncertainty of Linearity Assessment: ± 0.6% (k=2)

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:2358

Other Probe Parameters

Sensor Arrangement	Rectangular
Connector Angle (°)	115.6
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

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Accreditation No.: SCS 108

Client Sporton-TW (Auden)

Certificate No: H3-6184_Jan11

CALIBRATION CERTIFICATE

Object: H3DV6 - SN:6184

Calibration procedure(s): QA CAL-03.v6, QA CAL-25.v3
Calibration procedure for H-field probes optimized for close near field evaluations in air

Calibration date: January 25, 2011

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	01-Apr-10 (No. 217-01136)	Apr-11
Power sensor E4412A	MY41495277	01-Apr-10 (No. 217-01136)	Apr-11
Power sensor E4412A	MY41498087	01-Apr-10 (No. 217-01136)	Apr-11
Reference 3 dB Attenuator	SN: S5054 (3c)	30-Mar-10 (No. 217-01159)	Mar-11
Reference 20 dB Attenuator	SN: S5086 (20b)	30-Mar-10 (No. 217-01161)	Mar-11
Reference 30 dB Attenuator	SN: S5129 (30b)	30-Mar-10 (No. 217-01160)	Mar-11
Reference Probe H3DV6	SN: 6182	4-Oct-10 (No. H3-6182_Oct10)	Oct-11
DAE4	SN: 789	31-Aug-10 (No. DAE4-789_Aug10)	Aug-11
Secondary Standards	ID	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-10)	In house check: Oct-11

	Name	Function	Signature
Calibrated by:	Marcel Fehr	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: January 25, 2011

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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.
- *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:6184

Manufactured: June 8, 2004
Calibrated: January 25, 2011

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

DASY/EASY - Parameters of Probe: H3DV6 - SN:6184

Basic Calibration Parameters

		Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm (A/m / √(mV))	a0	2.53E-003	2.58E-003	3.00E-003	± 5.1 %
Norm (A/m / √(mV))	a1	-2.60E-005	-9.54E-005	-1.07E-004	± 5.1 %
Norm (A/m / √(mV))	a2	1.54E-005	2.86E-006	6.42E-005	± 5.1 %
DCP (mV)[B]		91.0	90.6	91.7	

Modulation Calibration Parameters

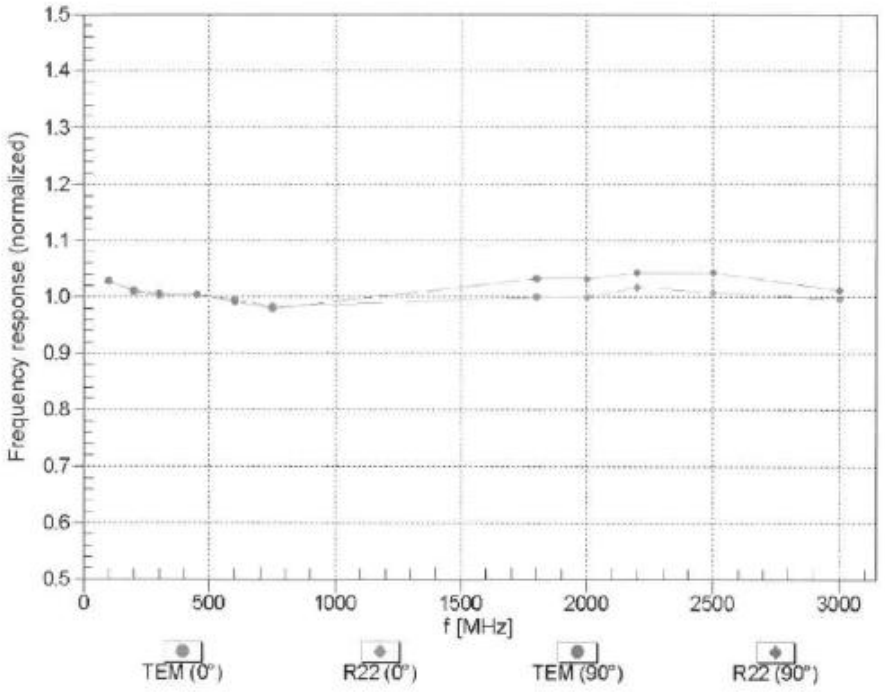
UID	Communication System Name	PAR		A dB	B dB	C dB	VR mV	Unc[E] (k=2)
10000	CW	0.00	X	0.00	0.00	1.00	251.5	±1.6 %
			Y	0.00	0.00	1.00	252.0	
			Z	0.00	0.00	1.00	238.8	

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:6184 January 25, 2011

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

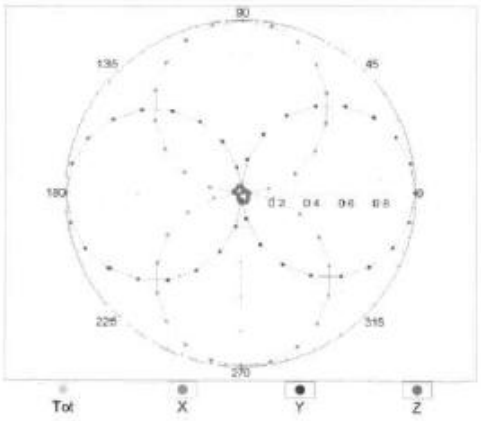


Uncertainty of Frequency Response of H-field: ± 6.3% (k=2)

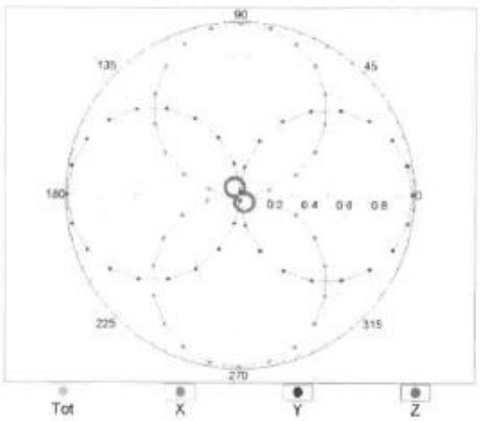
H3DV6– SN:6184 January 25, 2011

Receiving Pattern (ϕ), ϑ = 0°

f=600 MHz,TEM,0°

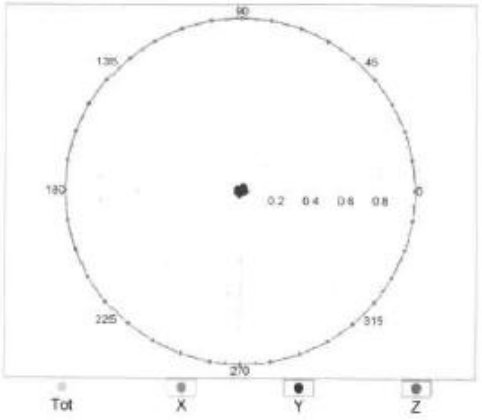


f=2500 MHz,R22,0°

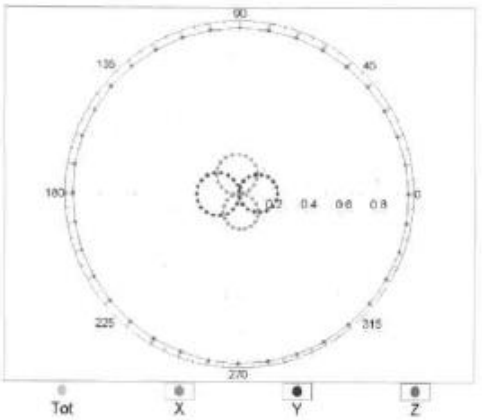


Receiving Pattern (ϕ), ϑ = 90°

f=600 MHz,TEM,90°

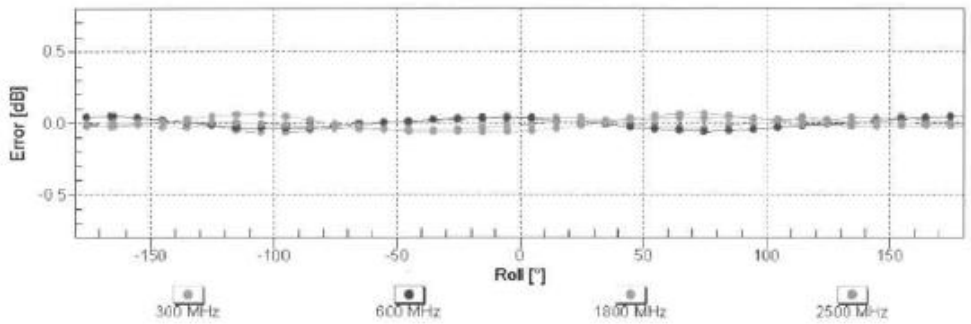


f=2500 MHz,R22,90°



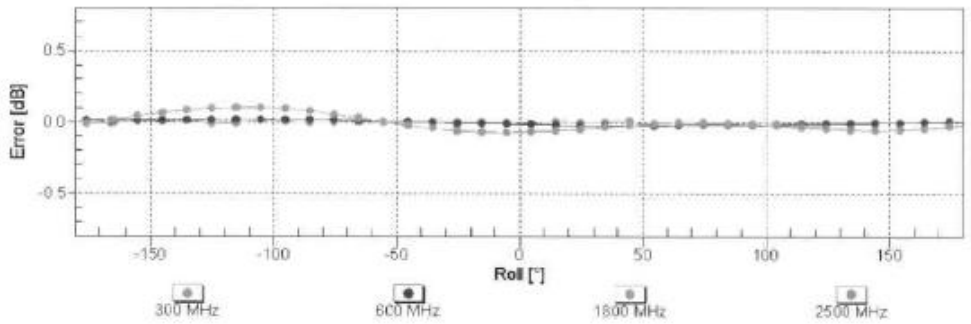
H3DV6– SN:6184 January 25, 2011

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)

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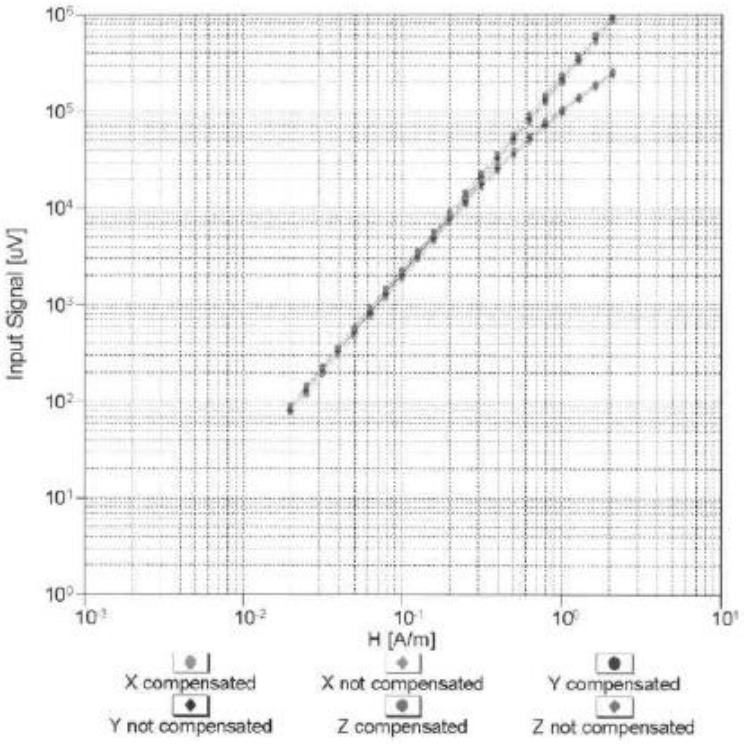
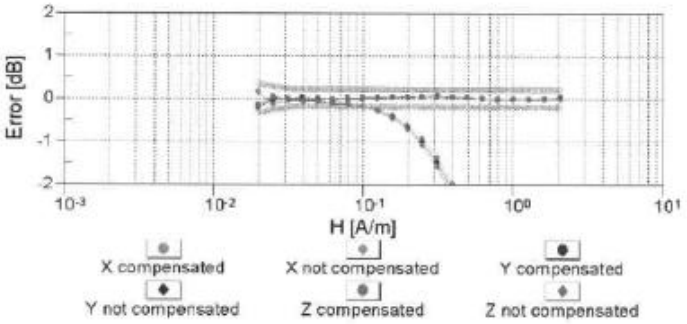
Dynamic Range f(H-field)
(TEM cell, f = 900 MHz)

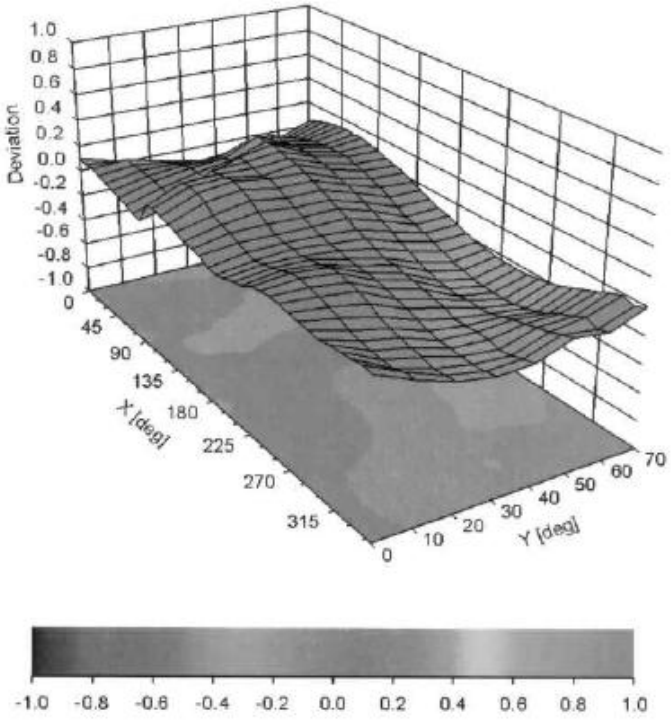




Uncertainty of Linearity Assessment: ± 0.6% (k=2)

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: H3DV6 - SN:6184

Other Probe Parameters

Sensor Arrangement	Rectangular
Connector Angle (°)	-65.4
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