

Hearing Aid Compatibility(HAC)

TEST REPORT

<For RF-Emission measurement>

Applicant Name	Motorola Mobility, Inc.
Address of Applicant	600 North U.S. Highway 45, Libertyville, IL 60048-5343
EUT Name	Edison
Model Number	MB865
Date of receive	2011.05.31
Date of Test(s)	2011.06.15
Date of Issue	2011.08.19

Standards:

ANSI C63.19-2007

FCC RULE PART(S): 47 CFR PART 20.19(B)

HAC CATEGORY: M3 (M Category)

Complies with Part 20.19 and that the tests were performed in accordance with ANSI C63.19 2007

Remarks:

This report details the results of the testing carried out on one sample, the results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. This report may only be reproduced and distributed in full. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS Taiwan Electronics & Communication Laboratory or testing done by SGS Taiwan Electronics & Communication Laboratory in connection with distribution or use of the product described in this report must be approved by SGS Taiwan Electronics & Communication Laboratory in writing.

Tested by :

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Asst. Supervisor

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Tech Manager

Date: 2011/08/19

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Version

Version No.	Date	Description
1.0	Jun. 29, 2011	Initial issue of report
1.1	Aug.19, 2011	1 st modification

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Table of Contents

1. Introduction	4
2. Testing Laboratory	5
3. Details of Applicant	5
4. Description of EUT	5
5. Test Environment	6
6. System Specifications of DASY4	7
7. Measurement Procedure	10
8. Determination of the Probe Modulation Factor (PMF) for HAC measurements.....	11
9. System Verification	17
10. Probe Modulation Factor	18
11. Test Standards and Limits	20
12. Instruments List.....	21
13. Summary of Results	22
14. Measurement Data.....	24
15. System Verification.....	73
16. DAE & Probe Calibration certificate	82
17. Uncertainty Analysis	104
18. System Validation from Original equipment supplier	105

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1. Introduction

The purpose of the Hearing Aid Compatibility extension is to enable measurements of the near electric and magnetic fields generated by wireless communication devices in the region controlled for use by a hearing aid in accordance with ANSI-C63.19-2007

FCC has granted a request for waiver of the HAC rules in section 20.19 for dual band GSM handsets. The waiver has specific conditions, as stated in the order (FCC 05-166) and expires 1 August 2006.

The purpose of this standard is to establish categories for hearing aids and for WD (wireless communications devices) that can indicate to health care practitioners and hearing aid users which hearing aids are compatible with which WD, and to provide tests that can be used to assess the electromagnetic characteristics of hearing aids and WD and assign them to these categories. The various parameters required, in order to demonstrate compatibility and accessibility are measured. The design of the standard is such that when a hearing aid and WD achieve one of the categories specified, as measured by the methodology of this standard, the indicated performance is realized.

In order to provide for the usability of a hearing aid with a WD, several factors must be coordinated:

a) Radio frequency (RF) measurements of the near-field electric and magnetic fields emitted by a WD to categorize these emissions for correlation with the RF immunity of a hearing aid.

Hence, the following are measurements made for the WD:

a) RF E-Field emissions

b) RF H-Field emissions

The measurement plane is parallel to, and 1.5cm in front of, the reference plane.

Applications for certification of equipment operation under part 20, that a manufacturer is seeking to certify as hearing aid compatible, as set forth in §20.19 of that part, shall include a statement indicating compliance with the test requirements of §20.19 and indicating the appropriate U-rating for the equipment. The manufacturer of the equipment shall be responsible for maintaining the test results.

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2. Testing Laboratory

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3. Details of Applicant

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Applicant Address	600 North U.S. Highway 45, Libertyville, IL 60048-5343
Contact Person	Doug Hammers
TEL	+1-847-523-1644
E-mail	doug.hammers@motorola.com

4. Description of EUT

EUT Name	Edison
Model Name	MB865
Brand Name	Motorola
IMEI Code	356378040035568
FCC ID	IHDT56MV1
Mode of Operation	GSM/GPRS/EGPRS/WCDMA/HSDPA/ HSUPA/WLAN802.11 b/g/n(20M) band

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Definition	Production unit			
Duty Cycle	GSM	GPRS	WCDMA B2	WCDMA B5
	1/8	1/2	1	1
TX Frequency Range (MHz)	GSM 850	GSM1900	WCDMA B2	WCDMA B5
	824.2	1850.2	1852.40	826.40
	- 848.8	- 1909.8	- 1907.60	- 846.60
Channel Number (ARFCN)	GSM 850	GSM1900	WCDMA B2	WCDMA B5
	128-251	512- 810	9262-9538	4132-4233
VOIP Function	No			

5. Test Environment

Ambient Temperature	22.2° C
Relative Humidity	<60 %

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6. System Specifications of DASY4

6.1 Measurement system Diagram for SPEAG Robotic

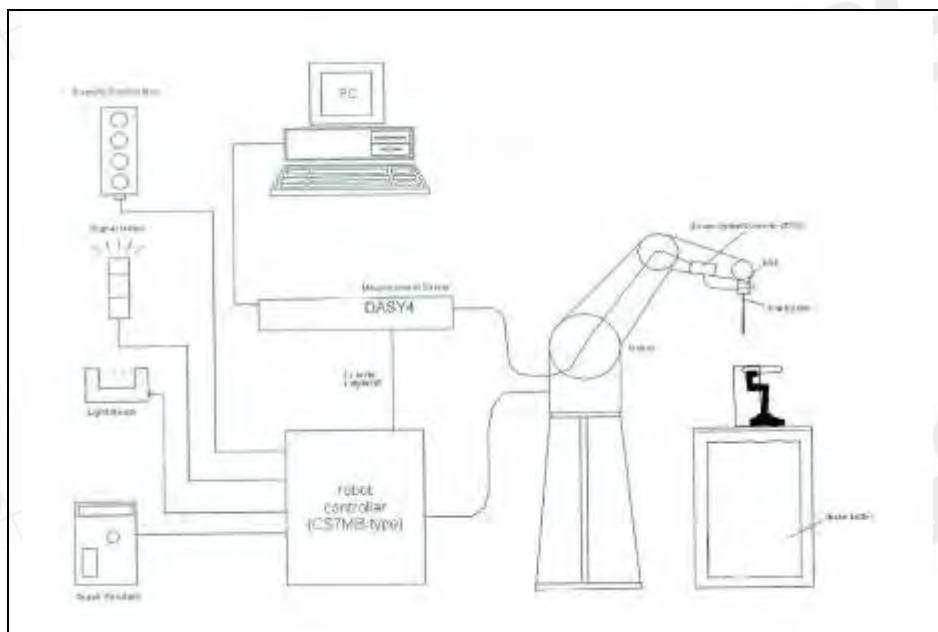


Fig 1. The SPEAG Robotic Diagram

The DASY4 system for performing compliance tests consists of the following items:

- A standard high precision 6-axis robot (Staubli RX family) with controller, teach pendant and software. An arm extension is for accommodating the data acquisition electronics (DAE).
- E and H Field probe.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-optical converter (EOC) performs the conversion between optical and electrical of the signals for the digital communication to the DAE and for the analog signal from the optical surface detection. The EOC is connected to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- A probe alignment unit which improves the (absolute) accuracy of the probe positioning.
- A computer operating Windows 2000 or Windows XP.
- DASY4 software.

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- Remote control with teach pendant and additional circuitry for robot safety such as warning lamps, etc.
- The Test Arch phantom.
- The device holder for handheld mobile phones.
- Validation dipole kits allowing to validate the proper functioning of the system.

6.2 E and H Field Probe

Construction	One dipole parallel, two dipoles normal to probe axis Built-in shielding against static charges PEEK enclosure material	 ER3DV6 E-Field Probe
Calibration	In air from 100 MHz to 3.0 GHz (absolute accuracy $\pm 6.0\%$, $k=2$)	
Frequency	100 MHz to > 6 GHz (extended to 20 MHz for MRI), Linearity: ± 0.2 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; 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	
Application	General near-field measurements up to 6 GHz Field component measurements Fast automatic scanning in phantoms	
Construction	Three concentric loop sensors with 3.8 mm loop diameters Resistively loaded detector diodes for linear response Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., glycolether)	 H3DV6 H-Field Probe
Frequency	200 MHz to 3 GHz (absolute accuracy $\pm 6.0\%$, $k=2$); Output linearized	
Directivity	± 0.2 dB (spherical isotropy error)	
Dynamic Range	10 mA/m to 2 A/m at 1 GHz	

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E-Field Interference	< 10% at 3 GHz (for plane wave)
Dimensions	Overall length: 330 mm (Tip: 40 mm) Tip diameter: 6 mm (Body: 12 mm) Distance from probe tip to dipole centers: 3 mm
Application	General magnetic near-field measurements up to 3 GHz (in air or liquids) Field component measurements Surface current measurements Low interaction with the measured field

6.3 Test Arch

Description	Enables easy and well defined positioning of the phone and validation dipoles as well as simple teaching of the robot.	
Dimensions	length: 370 mm width: 370 mm height: 370 mm	

Test Arch

6.4 Phone Holder

Description	Supports accurate and reliable positioning of any phone Effect on near field < +/- 0.5 dB	
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Phone Holder

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7. Measurement 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. WD is positioned in its intended test position, acoustic output point of the device perpendicular to the field probe.
3. the WD 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 WD 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 HAC Phantom.
6. The measurement system measured the field strength at the reference location.
7. Measurements at 2mm increments in the 5 × 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.
10. The distance between the center point of the probe measurement element and the wireless device is 15mm.

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8. Determination of the Probe Modulation Factor (PMF) for HAC measurements

Purpose

HAC standard ANSI C63.19-2006 requires measurement of the peak envelope E-and H-fields of the wireless device (WD). Para. 4.1.2.1 and C.3.1 explain the Probe Modulation Response Factor (PMF) that shall be applied to convert the probe reading to Peak Envelope Field. SPEAG E-field free space probes (ER3DVx) and H-field probe (H3DVx) are calibrated for power averaged field reading of unmodulated (CW) fields. For peak envelope field reading according to ANSI C63.19, a conversion is required. As long as such a modulation dependent calibration is not available for the specific probe, the PMF can be evaluated by the user. DASY4 HAC software V4.7 includes a HAC measurement job for standard conformant measurements.

During the evaluation in the post processor, the user is prompted for the PMF.

This note guides the user through the evaluation of the PMF.

Definitions

The Crest Factor (CF) utilized in DASY4 is the inverse of the duty cycle for TDMA systems. DASY4 probe readings base on the correct selection of the CF. (See DASY4 manual, application note "Data Storage and Evaluation") The Probe Modulation Factor (PMF) is defined as the ratio of the DASY4 field readings for a CW and a modulated signal having the same peak envelope field. Each signal shall be measured with its specific CF setting. The peak envelope field definition is given in ANSI C63.19 section C.3.1 (video bandwidth limited to 20 kHz).

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Applicability

The classification of the fields according to ANSI C63.19 (M-classes) depend on the peak envelope field of the non-excluded subgrids of a HAC-scan. The peak field is obtained from the DASY4 field reading multiplying the result with the PMF in the postprocessor. Default values for the PMF, valid for TDMA signals, based on the square-root of the CF, are proposed when displaying the fields in the postprocessor.

These default values can be applied only for E-field measurements of TDMA systems (e.g. GSM) and fully coded CDMA signals with low power.

For the following cases however, the PMF specific to the field probe shall be determined and applied:

- For any H-field scan of any modulation scheme
- For any E-field scan other than analog systems, TDMA systems and fully coded CDMA signals

Note: The CF shall be applied for the TDMA signal characteristics in DASY. For fully coded signals and analog modulations (e.g. 1 kHz 80% AM), CF is set to 1.

Evaluation Procedure for Unknown PMF

The measurement setup for determination of the PMF is given in DASY4 manual section 28.2.

The following points describe the installation, the measurement procedure and the evaluation.

1. Install the field probe in the DASY4 window setup.
2. Mount a validation dipole for the appropriate frequency band under the Test Arch. Move the probe manually to a point of high field strength for the specific field type. The probe may be very close to the dipole and might even touch it. During the fine adjustment of the probe with a signal applied to the dipole, read the x, y and z channel amplitudes in a multimeter job. They should all show a similar amplitude.
3. For comparing the peak amplitudes of modulated and CW signal, the same spectrum analyzer settings are required. The signal path (and setup geometry) between spectrum analyzer and probe must not be changed during the evaluation of the PMF! Only signal type and amplitudes as well as DASY4 settings may be varied.

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Spectrum analyzer settings:

- Center Frequency: nominal center frequency of channel
 - Span: zero
 - Resolution bandwidth $\geq$ emission bandwidth
 - Video bandwidth $\geq$ 20kHz
 - Detection: RMS detection
 - Trigger: Video or IF trigger, adjusted to give a stable display of the transmission
 - Sweep rate: Set to show a complete transmission cycle
 - Line max hold may be used temporarily to ease the peak reading.
4. Define a DASY4 document and set the procedure properties (frequency as above, modulation frequency and crest factor for the modulated signal) according to the measured signal. Define a multimeter job (continuous mode) for the field reading. The probe shall not move. A predefined document is available.
5. Define a DASY4 document with a procedure for the evaluation of the CW signal (frequency, modulation frequency = 0, crest factor = 1) with a multimeter job.

The HAC measurement procedure is as follows:

6. Prepare the evaluation sheet for the installed field probe, frequency and modulation type.
7. Modulated signal measurement: Connect the modulated signal using the appropriate frequency via the cable to the setup. Do not move the setup between the following measurements.
8. Run the multimeter job in the procedure with the corresponding modulation setting in continuous mode.
9. Adjust the signal amplitude to achieve the the desired field level display in the multimeter. (A number of levels over the full dynamic range of the probe in the desired range shall be set, including the values read during the WD scans.)
10. Read the total field for the modulated signal.
11. Read the peak envelope signal on the spectrum analyzer.
12. Repeat these readings for other amplitude settings.
13. Switch the signal source off and verify that the ambient and instrumentation noise level is at least 10 dB lower (a factor of 3 in field).

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14. CW measurement: Change the signal to CW at the same center frequency, without touching or moving dipole or probe in the setup.
 15. Adjust the CW signal amplitude to a similar range of peak levels on the spectrum analyzer.
 16. Run the multimeter in the CW procedure in continuous mode.
 17. Read the multimeter total field display.
 18. Read the signal on the spectrum analyzer.
 19. Repeat these readings for other amplitude settings.
 20. Select the correct type of predefined Excel calculation sheet and insert the readings into the appropriate measurement columns. Conversion from linear DASY readings to logarithmic will be automatically made. The diagrams contain fitting curves for the logarithmic quantities. CW and E-field values will be fitted by linear trendlines, H-field values by quadratic.
 21. Verify that the fitting quality is sufficient (value $R^2 > 0.99$). If not fulfilled, repetition or range reduction may be required.
 22. Copy the parameters of the fitting curve equation in the appropriate fields lower in the sheet.
 23. The PMF is calculated for the target peak fields in the lowest table. (The target fields values may be edited.)
- Perform the above setup and procedure for both E-field and H-field probes. (For the H-field probe, it is important that the frequency setting is correct.)

Application of the Probe Modulation Factor in the DASY4 Postprocessor

The application of the PMF within the DASY4 Postprocessor is outlined in the DASY4 manual 28.5

Use the PMF corresponding to the WD field measurement. If not exactly matching, use the next higher PMF value.

Uncertainty for PMF

PMF is specific to the channels of the probe. A major part of the uncertainty evaluation results from the fact that the ratio of the field components (channels) can vary between setups and compared to the WD measurements.

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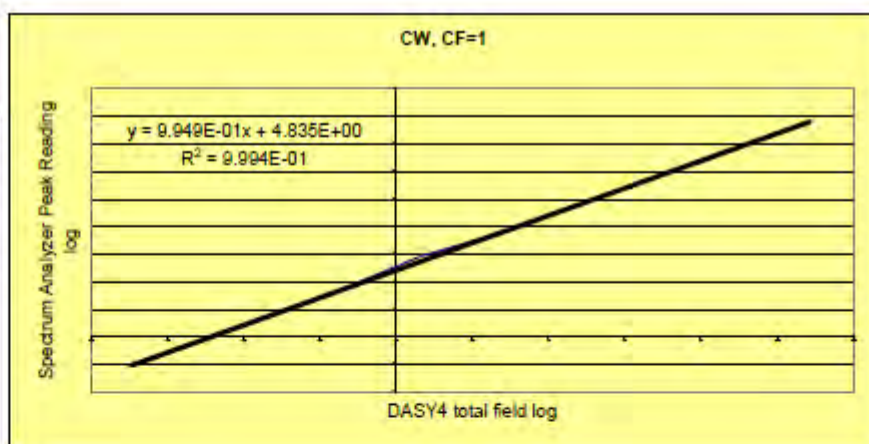
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Sample calculation

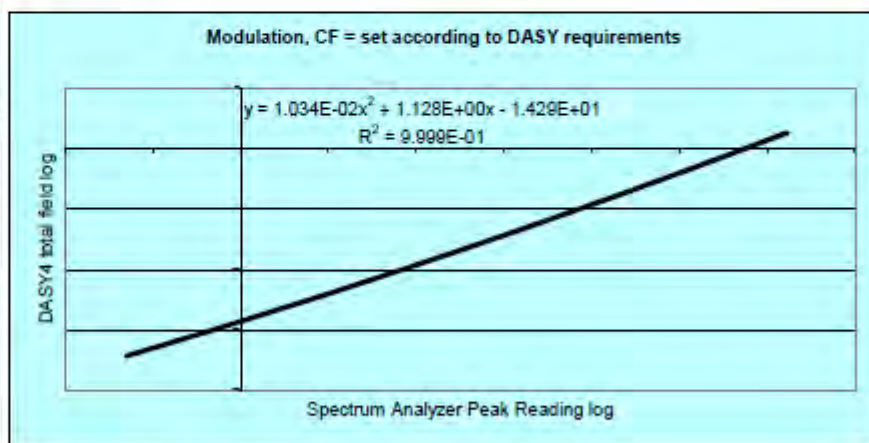
For a sample calculation sheet see the next tables.

Bold values are measured or inserted according to the above instruction in the yellow and blue columns of the first table. Then, the parameters from the graphics are inserted into the yellow and blue parameter fields. As a result, in the second table the DASY4 equivalent average field readings (blue column) and the applicable PMF appear (red column).

measured DASY CF = 1 Total Field A/m	measured Spec An Peak Reading dBm	calculated DASY4 CF = 1 Field dB A/m
0.45	-2.14	-6.94
0.6	0.37	-4.44
0.8	2.83	-1.94
1.076	5.84	0.64
1.43	7.86	3.11
1.925	10.48	5.69
2.55	12.87	8.13
3.49	15.6	10.68
		#N/A
		#N/A
		#N/A
		#N/A
		#N/A
		#N/A



measured DASY4 CF = set Field A/m	measured Spec An Peak Reading dBm	calculated DASY4 CF = set Field dB A/m
0.1385	-2.6	-17.17
0.178	-0.6	-14.99
0.23	1.3	-12.77
0.305	3.4	-10.31
0.381	5	-8.38
0.508	7	-5.88
0.68	9	-3.35
0.935	11.1	-0.58
1.173	12.4	1.39
1.17	12.46	1.36
		#N/A
		#N/A
		#N/A
		#N/A



Factors with sign from CW graphics: $y = A x + B$

A	9.949E-01
B	4.835E+00

Factors with sign from modulated graphics: $y = C x^2 + D x + E$

C	1.034E-02
D	1.128E+00
E	-1.429E+01

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Read the values of the PMF for the target field values below
(the target values may be edited)

Field_lin = Target

Field_log = 20*log(Field_lin)

PeakRead_log = A*(Field_log) + B

Probe_log = C*PeakRead_log*2 + D*PeakRead_log + E

Probe_lin = 10^(Probe_log/20)

PMF = Target / Probe_lin

Target

Peak Field lin A/m	DASY4 A/m	PMF lin	Field_log dB A/m	PeakRead_log	Probe_log dB A/m
0.14	0.05	2.95	-17.08	-12.16	-26.47
0.19	0.08	3.04	-14.42	-9.52	-24.09
0.25	0.08	3.08	-12.04	-7.14	-21.82
0.34	0.11	3.08	-9.37	-4.49	-19.14
0.45	0.15	3.03	-8.94	-2.07	-16.58
0.6	0.20	2.94	-4.44	0.42	-13.81
0.8	0.28	2.81	-1.94	2.91	-10.92
1.07	0.40	2.65	0.59	5.42	-7.87
1.43	0.58	2.46	3.11	7.93	-4.70
1.91	0.85	2.25	5.62	10.43	-1.40
2.54	1.25	2.02	8.10	12.89	1.97
3.39	1.89	1.80	10.60	15.38	5.51

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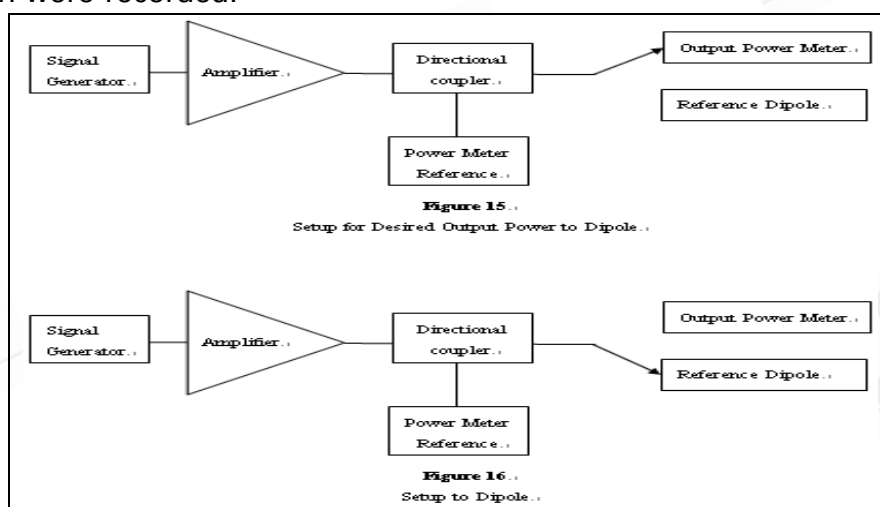
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9. System Verification

A dipole antenna meeting the requirements given in C63.19 was placed in the position normally occupied by the WD.

The length of the dipole was scanned with both E-field and H-field probes and the maximum values for each were recorded.



For E-Field Scan

Mode	Frequency (MHz)	Input Power(dBm)	Measured Value(V/m)	Target Value(V/m)	Measured Date
CW	835	20	174.8	176.1	2011/06/15
Mode	Frequency (MHz)	Input Power(dBm)	Measured Value(V/m)	Target Value(V/m)	Measured Date
CW	1880	20	142.3	144	2011/06/15

For H-Field Scan

Mode	Frequency	Input Power	Measured Value(A/m)	Target Value(A/m)	Measured Date
CW	835	20	0.452	0.472	2011/06/15
Mode	Frequency	Input Power	Measured Value(A/m)	Target Value(A/m)	Measured Date
CW	1880	20	0.464	0.469	2011/06/15

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10. Probe Modulation Factor

The measurement setup for determination of the PMF is given in DASY4 manual section 28.2. The following points describe the installation, the measurement procedure and the evaluation.

1. Install the field probe in the DASY4 window setup.
2. Mount a validation dipole for the appropriate frequency band under the Test Arch. Move the probe manually to a point of high field strength for the specific field type. The probe may be very close to the dipole and might even touch it. During the fine adjustment of the probe with a signal applied to the dipole, read the x, y and z channel amplitudes in a multimeter job. They should all show a similar amplitude.
3. For comparing the peak amplitudes of modulated and CW signal, the same spectrum analyzer settings are required. The signal path (and setup geometry) between spectrum analyzer and probe must not be changed during the evaluation of the PMF! Only signal type and amplitudes as well as DASY4 settings may be varied.

Spectrum analyzer settings:

- Center Frequency: nominal center frequency of channel
 - Span: zero
 - Resolution bandwidth $\geq$ emission bandwidth
 - Video bandwidth = 20dB
 - Detection: RMS detection
 - Trigger: Video or IF trigger, adjusted to give a stable display of the transmission
 - Sweep rate: Set to show a complete transmission cycle
 - Line max hold may be used temporarily to ease the peak reading.
4. Define a DASY4 document and set the procedure properties (frequency as above, modulation frequency and crest factor for the modulated signal) according to the measured signal. Define a multimeter job (continuous mode) for the field reading. The probe shall not move. A predefined document is available.
 5. Define a DASY4 document with a procedure for the evaluation of the CW signal (frequency, modulation frequency = 0, crest factor = 1) with a multimeter job.

The HAC measurement procedure is as follows:

6. Prepare the evaluation sheet for the installed field probe, frequency and modulation type.

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7. Modulated signal measurement: Connect the modulated signal using the appropriate frequency via the cable to the setup. Do not move the setup between the following measurements.
8. Run the multimeter job in the procedure with the corresponding modulation setting in continuous mode.
9. Adjust the signal amplitude to achieve the the desired field level display in the multimeter. (A number of levels over the full dynamic range of the probe in the desired range shall be set, including the values read during the WD scans.)
10. Read the total field for the modulated signal.
11. Read the peak envelope signal on the spectrum analyzer.
12. Repeat these readings for other amplitude settings.
13. Switch the signal source off and verify that the ambient and instrumentation noise level is at least 10dB lower (a factor of 3 in field).
14. CW measurement: Change the signal to CW at the same center frequency, without touching or moving dipole or probe in the setup.
15. Adjust the CW signal amplitude to a similar range of peak levels on the spectrum analyzer.
16. Run the multimeter in the CW procedure in continuous mode.
17. Read the multimeter total field display.
18. Read the signal on the spectrum analyzer.
19. Repeat these readings for other amplitude settings.
20. Select the correct type of predefined Excel calculation sheet and insert the readings into the appropriate measurement columns. Conversion from linear DASY readings to logarithmic will be automatically made. The diagrams contain fitting curves for the logarithmic quantities. CW and E-field values will be fitted by linear trend lines, H-field values by quadratic.

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11. Test Standards and Limits

The measurements were performed to ensure compliance to the ANSI C63.19-2007 standard,

Category	AWF (dB)	Limits for E-Field Emissions (V/m) > 960MHz	Limits for H-Field Emissions (A/m) > 960MHz
M1	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M2	0	112.2 - 199.5	0.34 - 0.6
	-5	84.1 - 149.6	0.25 - 0.45
M3	0	63.1 - 112.2	0.19 - 0.34
	-5	47.3 - 84.1	0.14 - 0.25
M4	0	<63.1	<0.19
	-5	<47.3	<0.14
Category	AWF (dB)	Limits for E-Field Emissions (V/m) < 960MHz	Limits for H-Field Emissions (A/m) < 960 MHz
M1	0	631 - 1122	1.91 - 3.39
	-5	473.2 - 841.4	1.43 - 2.54
M2	0	354.8 - 631	1.07 - 1.91
	-5	266.1 - 473.2	0.8 - 1.43
M3	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M4	0	<199.5	<0.6
	-5	<149.6	<0.45

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12. Instruments List

Manufacturer	Device	Type	Serial number	Date of last calibration
Schmid & Partner Engineering AG	E-Field and H-Field Probe	ER3DV6 H3DV6	2306 6142	Apr.18.2011 Apr.18.2011
Schmid & Partner Engineering AG	835&1880 MHz System Validation Dipole In Air	CD835V3 CD1880V3	1052 1044	Apr.12.2011 Apr.12.2011
Schmid & Partner Engineering AG	Data acquisition Electronics	DAE4	547	Aug.18.2010
Schmid & Partner Engineering AG	Software	DASY 4 V4.7 Build 80	N/A	Calibration isn't necessary
Agilent	Dielectric Probe Kit	85070D	US01440168	Calibration isn't necessary
Agilent	Dual-directional coupler	778D	50313	Aug.25.2010
Agilent	RF Signal Generator	8648D	3847M00432	Jun.01.2011
Agilent	Power Sensor	U2001B	MY48100169	Apr.28.2011
R&S	Radio Communication Test	CMU200	109326	Apr.01.2011
Schmid & Partner Engineering AG	Test Arch SD HAC	P01	1047	N/A

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13. Summary of Results

E-Field

E-Field Emission	Channel	Modulation Factor	Conducted Power at BS (dBm)	Measured Drift(%)	Time Avg. Field (V/m)	RESULT	Excl Blocks per 4.3.1.2.2
GSM850 (GMSK)	128	2.83	33.3	0.036	147.1	M4	236
	190	2.83	33.3	0.017	141.0	M4	236
	251	2.83	33.2	-0.020	164.5	M3	689
E-Field Emission	Channel	Modulation Factor	Conducted Power at BS (dBm)	Measured Drift(%)	Time Avg. Field (V/m)	RESULT	Excl Blocks per 4.3.1.2.2
GSM1900 (GMSK)	512	2.94	30.7	0.005	53.2	M3	689
	661	2.94	30.7	0.063	69.3	M3	123
	810	2.94	30.9	0.037	78.6	M3	369
E-Field Emission	Channel	Modulation Factor	Conducted Power at BS (dBm)	Measured Drift(%)	Time Avg. Field (V/m)	RESULT	Excl Blocks per 4.3.1.2.2
WCDMA B2 (R99 mode)	9262	1	23.83	-0.018	30.2	M4	689
	9400	1	23.73	0.021	34.2	M4	123
	9538	1	23.63	-0.010	37.8	M4	689
E-Field Emission	Channel	Modulation Factor	Conducted Power at BS (dBm)	Measured Drift(%)	Time Avg. Field (V/m)	RESULT	Excl Blocks per 4.3.1.2.2
WCDMA B5 (R99 mode)	4132	1	23.78	-0.079	60.5	M4	236
	4183	1	23.91	0.016	57.6	M4	236
	4233	1	23.72	0.050	60.0	M4	689

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H-Filed

H-Field Emission	Channel	Modulation Factor	Conducte d Power at BS (dBm)	Measured Drift(%)	Time Avg. Field (A / m)	RESULT	Excl Blocks per 4.3.1.2.2
GSM850 (GMSK)	128	2.99	33.3	-0.029	0.208	M4	147
	190	2.99	33.3	0.027	0.194	M4	147
	251	2.99	33.2	0.028	0.230	M4	147
H-Field Emission	Channel	Modulation Factor	Conducte d Power at BS (dBm)	Measured Drift(%)	Time Avg. Field (A / m)	RESULT	Excl Blocks per 4.3.1.2.2
GSM1900 (GMSK)	512	2.78	30.7	0.079	0.190	M3	124
	661	2.78	30.7	0.065	0.202	M3	124
	810	2.78	30.9	0.030	0.208	M3	124
H-Field Emission	Channel	Modulation Factor	Conducte d Power at BS (dBm)	Measured Drift(%)	Time Avg. Field (A / m)	RESULT	Excl Blocks per 4.3.1.2.2
WCDMA B2 (R99 mode)	9262	1	23.83	-0.104	0.104	M4	124
	9400	1	23.73	0.005	0.097	M4	124
	9538	1	23.63	-0.049	0.101	M4	124
H-Field Emission	Channel	Modulation Factor	Conducte d Power at BS (dBm)	Measured Drift(%)	Time Avg. Field (A / m)	RESULT	Excl Blocks per 4.3.1.2.2
WCDMA B5 (R99 mode)	4132	1	23.78	0.072	0.078	M4	147
	4183	1	23.91	0.021	0.074	M4	147
	4233	1	23.72	0.049	0.079	M4	147

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14. Measurement Data

Date: 2011/6/15

HAC_E GSM850_CH128

Communication System: GSM 850; Frequency: 824.2 MHz; Duty Cycle: 1:8.3
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1000$ kg/m³
Phantom section: E Device Section

DASY4 Configuration:

- Probe: ER3DV6 - SN2306; ConvF(1, 1, 1); Calibrated: 2011/4/18
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

E Scan - ER3DV6 - measurement distance from the probe sensor center to the Device = 15mm / Hearing Aid Compatibility Test (101x101x1):

Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 147.1 V/m

Probe Modulation Factor = 2.83

Device Reference Point: 0.000, 0.000, 353.7 mm

Reference Value = 65.1 V/m; Power Drift = 0.036 dB

Hearing Aid Near-Field Category: M4 (AWF -5 dB)

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Peak E-field in V/m

Grid 1 135.0 M4	Grid 2 145.6 M4	Grid 3 142.4 M4
Grid 4 135.7 M4	Grid 5 147.1 M4	Grid 6 143.7 M4
Grid 7 132.8 M4	Grid 8 143.5 M4	Grid 9 140.4 M4

Category	AWF (dB)	Limits for E-Field Emissions (V/m) > 960MHz	Limits for H-Field Emissions (A/m) > 960MHz
M1	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M2	0	112.2 - 199.5	0.34 - 0.6
	-5	84.1 - 149.6	0.25 - 0.45
M3	0	63.1 - 112.2	0.19 - 0.34
	-5	47.3 - 84.1	0.14 - 0.25
M4	0	<63.1	<0.19
	-5	<47.3	<0.14
Category	AWF (dB)	Limits for E-Field Emissions (V/m) < 960MHz	Limits for H-Field Emissions (A/m) < 960 MHz
M1	0	631 - 1122	1.91 - 3.39
	-5	473.2 - 841.4	1.43 - 2.54
M2	0	354.8 - 631	1.07 - 1.91
	-5	266.1 - 473.2	0.8 - 1.43
M3	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M4	0	<199.5	<0.6
	-5	<149.6	<0.45

Cursor:

Total = 147.1 V/m

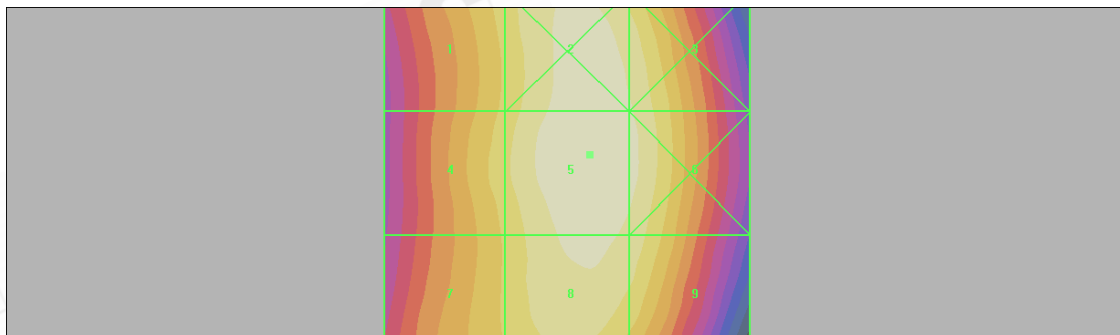
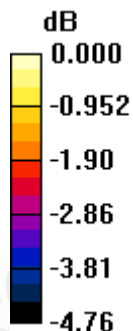
E Category: M4

Location: -3, -2.5, 368.7 mm

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0 dB = 147.1V/m

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Date: 2011/6/15

HAC_E GSM850_CH190

Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:8.3
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1000$ kg/m³
Phantom section: E Device Section

DASY4 Configuration:

- Probe: ER3DV6 - SN2306; ConvF(1, 1, 1); Calibrated: 2011/4/18
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

E Scan - ER3DV6 - measurement distance from the probe sensor center to the Device = 15mm / Hearing Aid Compatibility Test (101x101x1):

Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 141.0 V/m

Probe Modulation Factor = 2.83

Device Reference Point: 0.000, 0.000, 353.7 mm

Reference Value = 62.7 V/m; Power Drift = 0.017 dB

Hearing Aid Near-Field Category: M4 (AWF -5 dB)

Peak E-field in V/m

Grid 1 128.3 M4	Grid 2 139.7 M4	Grid 3 136.7 M4
Grid 4 130.7 M4	Grid 5 141.0 M4	Grid 6 138.2 M4
Grid 7 129.6 M4	Grid 8 138.7 M4	Grid 9 134.5 M4

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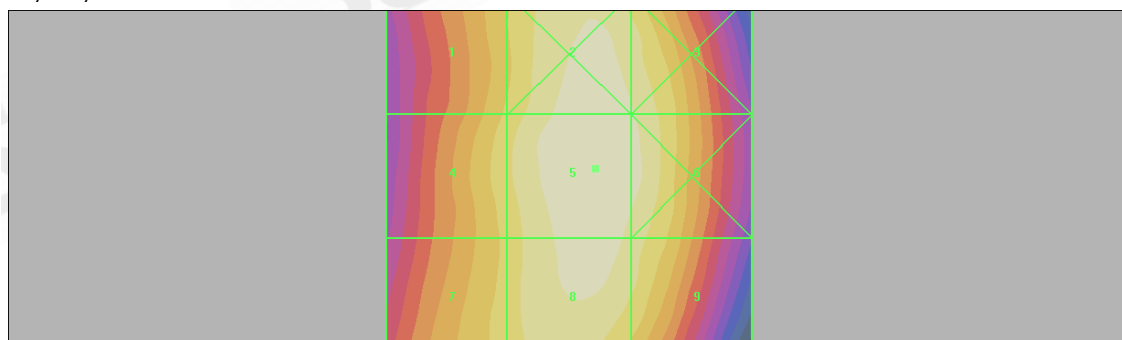
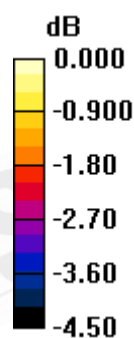
Category	AWF (dB)	Limits for E-Field Emissions (V/m) > 960MHz	Limits for H-Field Emissions (A/m) > 960MHz
M1	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M2	0	112.2 - 199.5	0.34 - 0.6
	-5	84.1 - 149.6	0.25 - 0.45
M3	0	63.1 - 112.2	0.19 - 0.34
	-5	47.3 - 84.1	0.14 - 0.25
M4	0	<63.1	<0.19
	-5	<47.3	<0.14
Category	AWF (dB)	Limits for E-Field Emissions (V/m) < 960MHz	Limits for H-Field Emissions (A/m) < 960 MHz
M1	0	631 - 1122	1.91 - 3.39
	-5	473.2 - 841.4	1.43 - 2.54
M2	0	354.8 - 631	1.07 - 1.91
	-5	266.1 - 473.2	0.8 - 1.43
M3	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M4	0	<199.5	<0.6
	-5	<149.6	<0.45

Cursor:

Total = 141.0 V/m

E Category: M4

Location: -3.5, -1, 368.7 mm



0 dB = 141.0V/m

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Date: 2011/6/15 LWL 11:23:27

HAC_E GSM850_CH251

Communication System: GSM 850; Frequency: 848.8 MHz; Duty Cycle: 1:8.3
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1000$ kg/m³
Phantom section: E Device Section

DASY4 Configuration:

- Probe: ER3DV6 - SN2306; ConvF(1, 1, 1); Calibrated: 2011/4/18
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

E Scan - ER3DV6 - measurement distance from the probe sensor center to the Device = 15mm / Hearing Aid Compatibility Test (101x101x1):

Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 164.5 V/m

Probe Modulation Factor = 2.83

Device Reference Point: 0.000, 0.000, 353.7 mm

Reference Value = 74.5 V/m; Power Drift = -0.020 dB

Hearing Aid Near-Field Category: M3 (AWF -5 dB)

Peak E-field in V/m

Grid 1 149.3 M4	Grid 2 160.4 M3	Grid 3 153.7 M3
Grid 4 153.6 M3	Grid 5 164.5 M3	Grid 6 158.7 M3
Grid 7 154.6 M3	Grid 8 163.6 M3	Grid 9 157.9 M3

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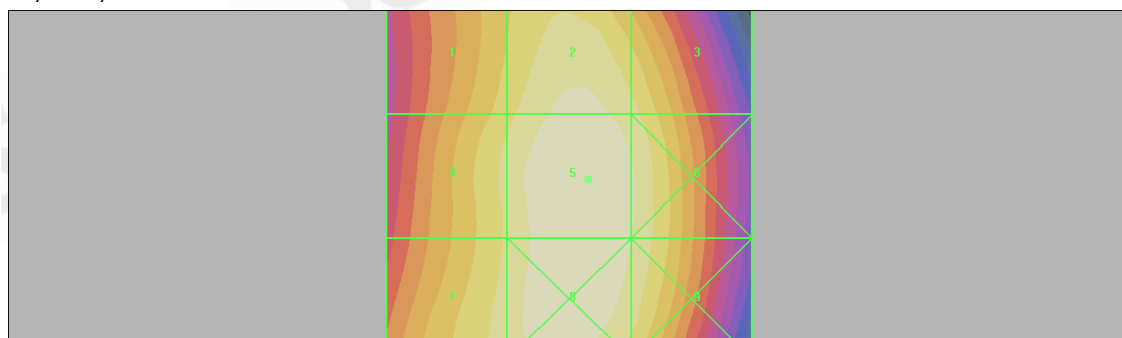
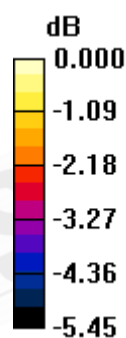
Category	AWF (dB)	Limits for E-Field Emissions (V/m) > 960MHz	Limits for H-Field Emissions (A/m) > 960MHz
M1	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M2	0	112.2 - 199.5	0.34 - 0.6
	-5	84.1 - 149.6	0.25 - 0.45
M3	0	63.1 - 112.2	0.19 - 0.34
	-5	47.3 - 84.1	0.14 - 0.25
M4	0	<63.1	<0.19
	-5	<47.3	<0.14
Category	AWF (dB)	Limits for E-Field Emissions (V/m) < 960MHz	Limits for H-Field Emissions (A/m) < 960 MHz
M1	0	631 - 1122	1.91 - 3.39
	-5	473.2 - 841.4	1.43 - 2.54
M2	0	354.8 - 631	1.07 - 1.91
	-5	266.1 - 473.2	0.8 - 1.43
M3	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M4	0	<199.5	<0.6
	-5	<149.6	<0.45

Cursor:

Total = 164.5 V/m

E Category: M3

Location: -2.5, 0.5, 368.7 mm



0 dB = 164.5V/m

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Date: 2011/6/15

HAC_E GSM1900_CH512

Communication System: GSM1900; Frequency: 1850.2 MHz; Duty Cycle: 1:8.3
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1000$ kg/m³
Phantom section: E Device Section

DASY4 Configuration:

- Probe: ER3DV6 - SN2306; ConvF(1, 1, 1); Calibrated: 2011/4/18
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

E Scan - ER3DV6 - measurement distance from the probe sensor center to the Device = 15mm / Hearing Aid Compatibility Test (101x101x1):

Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 53.2 V/m

Probe Modulation Factor = 2.94

Device Reference Point: 0.000, 0.000, 353.7 mm

Reference Value = 18.6 V/m; Power Drift = 0.005 dB

Hearing Aid Near-Field Category: M3 (AWF -5 dB)

Peak E-field in V/m

Grid 1 50.4 M3	Grid 2 47.2 M4	Grid 3 47.8 M3
Grid 4 32.3 M4	Grid 5 53.2 M3	Grid 6 53.4 M3
Grid 7 35.4 M4	Grid 8 53.7 M3	Grid 9 53.8 M3

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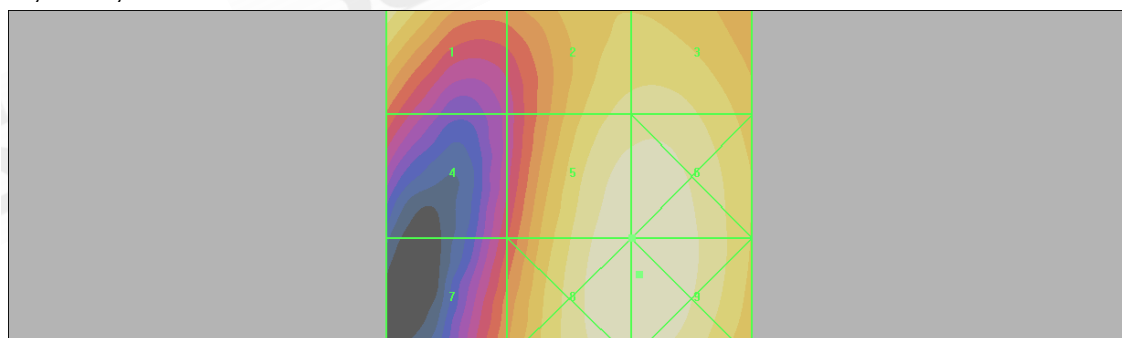
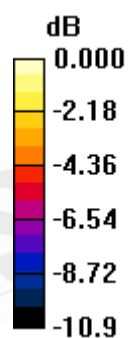
Category	AWF (dB)	Limits for E-Field Emissions (V/m) > 960MHz	Limits for H-Field Emissions (A/m) > 960MHz
M1	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M2	0	112.2 - 199.5	0.34 - 0.6
	-5	84.1 - 149.6	0.25 - 0.45
M3	0	63.1 - 112.2	0.19 - 0.34
	-5	47.3 - 84.1	0.14 - 0.25
M4	0	<63.1	<0.19
	-5	<47.3	<0.14
Category	AWF (dB)	Limits for E-Field Emissions (V/m) < 960MHz	Limits for H-Field Emissions (A/m) < 960 MHz
M1	0	631 - 1122	1.91 - 3.39
	-5	473.2 - 841.4	1.43 - 2.54
M2	0	354.8 - 631	1.07 - 1.91
	-5	266.1 - 473.2	0.8 - 1.43
M3	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M4	0	<199.5	<0.6
	-5	<149.6	<0.45

Cursor:

Total = 53.8 V/m

E Category: M3

Location: -9.5, 13.5, 368.7 mm



0 dB = 53.8V/m

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Date: 2011/6/15

HAC_E GSM1900_CH661

Communication System: GSM1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1000$ kg/m³
Phantom section: E Device Section

DASY4 Configuration:

- Probe: ER3DV6 - SN2306; ConvF(1, 1, 1); Calibrated: 2011/4/18
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

E Scan - ER3DV6 - measurement distance from the probe sensor center to the Device = 15mm / Hearing Aid Compatibility Test (101x101x1):

Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 69.3 V/m

Probe Modulation Factor = 2.94

Device Reference Point: 0.000, 0.000, 353.7 mm

Reference Value = 24.3 V/m; Power Drift = 0.063 dB

Hearing Aid Near-Field Category: M3 (AWF -5 dB)

Peak E-field in V/m

Grid 1 73.4 M3	Grid 2 61.2 M3	Grid 3 61.1 M3
Grid 4 46.0 M4	Grid 5 68.1 M3	Grid 6 68.3 M3
Grid 7 45.9 M4	Grid 8 69.3 M3	Grid 9 69.3 M3

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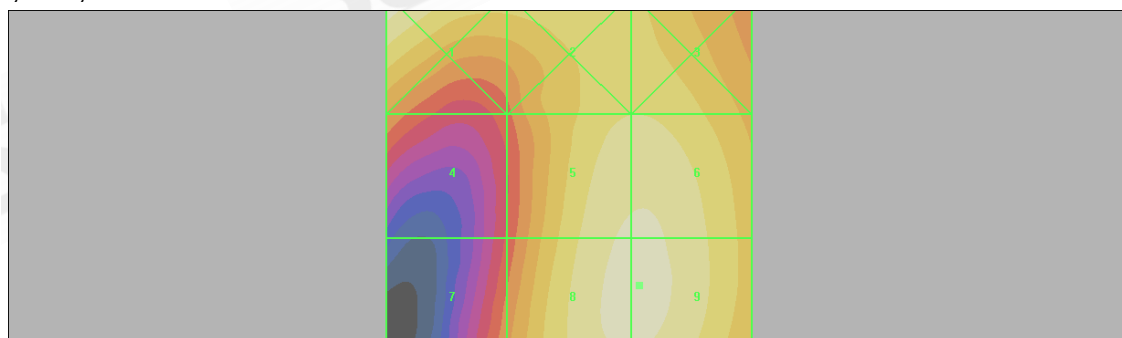
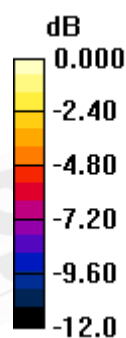
Category	AWF (dB)	Limits for E-Field Emissions (V/m) > 960MHz	Limits for H-Field Emissions (A/m) > 960MHz
M1	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M2	0	112.2 - 199.5	0.34 - 0.6
	-5	84.1 - 149.6	0.25 - 0.45
M3	0	63.1 - 112.2	0.19 - 0.34
	-5	47.3 - 84.1	0.14 - 0.25
M4	0	<63.1	<0.19
	-5	<47.3	<0.14
Category	AWF (dB)	Limits for E-Field Emissions (V/m) < 960MHz	Limits for H-Field Emissions (A/m) < 960 MHz
M1	0	631 - 1122	1.91 - 3.39
	-5	473.2 - 841.4	1.43 - 2.54
M2	0	354.8 - 631	1.07 - 1.91
	-5	266.1 - 473.2	0.8 - 1.43
M3	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M4	0	<199.5	<0.6
	-5	<149.6	<0.45

Cursor:

Total = 73.4 V/m

E Category: M3

Location: 25, -25, 368.7 mm



0 dB = 73.4V/m

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Date: 2011/6/15

HAC_E GSM1900_CH810

Communication System: GSM1900; Frequency: 1909.8 MHz; Duty Cycle: 1:8.3
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1000$ kg/m³
Phantom section: E Device Section

DASY4 Configuration:

- Probe: ER3DV6 - SN2306; ConvF(1, 1, 1); Calibrated: 2011/4/18
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

E Scan - ER3DV6 - measurement distance from the probe sensor center to the Device = 15mm / Hearing Aid Compatibility Test (101x101x1):

Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 78.6 V/m

Probe Modulation Factor = 2.94

Device Reference Point: 0.000, 0.000, 353.7 mm

Reference Value = 29.8 V/m; Power Drift = 0.037 dB

Hearing Aid Near-Field Category: M3 (AWF -5 dB)

Peak E-field in V/m

Grid 1 72.4 M3	Grid 2 77.4 M3	Grid 3 77.4 M3
Grid 4 51.3 M3	Grid 5 78.6 M3	Grid 6 78.7 M3
Grid 7 44.6 M4	Grid 8 77.3 M3	Grid 9 77.5 M3

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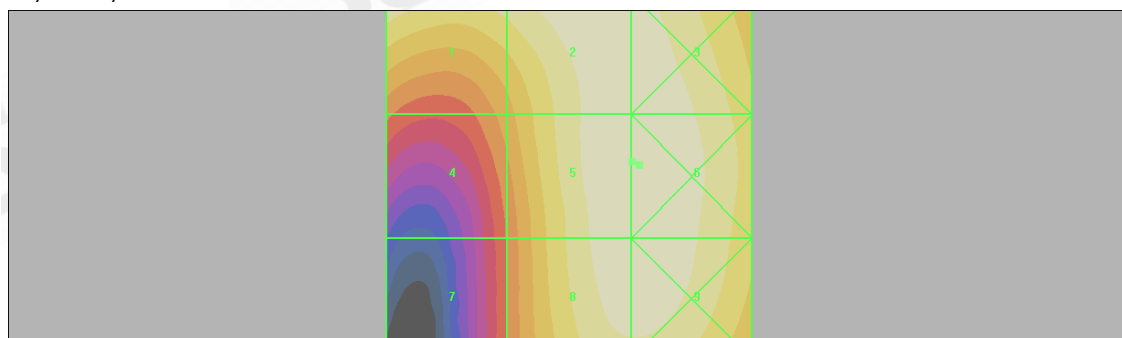
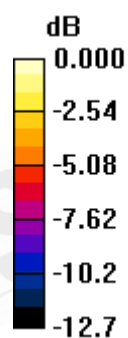
Category	AWF (dB)	Limits for E-Field Emissions (V/m) > 960MHz	Limits for H-Field Emissions (A/m) > 960MHz
M1	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M2	0	112.2 - 199.5	0.34 - 0.6
	-5	84.1 - 149.6	0.25 - 0.45
M3	0	63.1 - 112.2	0.19 - 0.34
	-5	47.3 - 84.1	0.14 - 0.25
M4	0	<63.1	<0.19
	-5	<47.3	<0.14
Category	AWF (dB)	Limits for E-Field Emissions (V/m) < 960MHz	Limits for H-Field Emissions (A/m) < 960 MHz
M1	0	631 - 1122	1.91 - 3.39
	-5	473.2 - 841.4	1.43 - 2.54
M2	0	354.8 - 631	1.07 - 1.91
	-5	266.1 - 473.2	0.8 - 1.43
M3	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M4	0	<199.5	<0.6
	-5	<149.6	<0.45

Cursor:

Total = 78.7 V/m

E Category: M3

Location: -9.5, -1.5, 368.7 mm



0 dB = 78.7V/m

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Date: 2011/6/15

HAC_E WCDMA B2_CH9262

Communication System: WCDMA BAND2; Frequency: 1852.4 MHz; Duty Cycle: 1:1
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1000$ kg/m³
Phantom section: E Device Section

DASY4 Configuration:

- Probe: ER3DV6 - SN2306; ConvF(1, 1, 1); Calibrated: 2011/4/18
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

E Scan - ER3DV6 - measurement distance from the probe sensor center to the Device = 15mm / Hearing Aid Compatibility Test (101x101x1):

Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 30.2 V/m

Probe Modulation Factor = 1.00

Device Reference Point: 0.000, 0.000, 353.7 mm

Reference Value = 31.6 V/m; Power Drift = -0.018 dB

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

Peak E-field in V/m

Grid 1 28.4 M4	Grid 2 26.5 M4	Grid 3 26.7 M4
Grid 4 17.9 M4	Grid 5 30.2 M4	Grid 6 30.3 M4
Grid 7 20.1 M4	Grid 8 30.6 M4	Grid 9 30.6 M4

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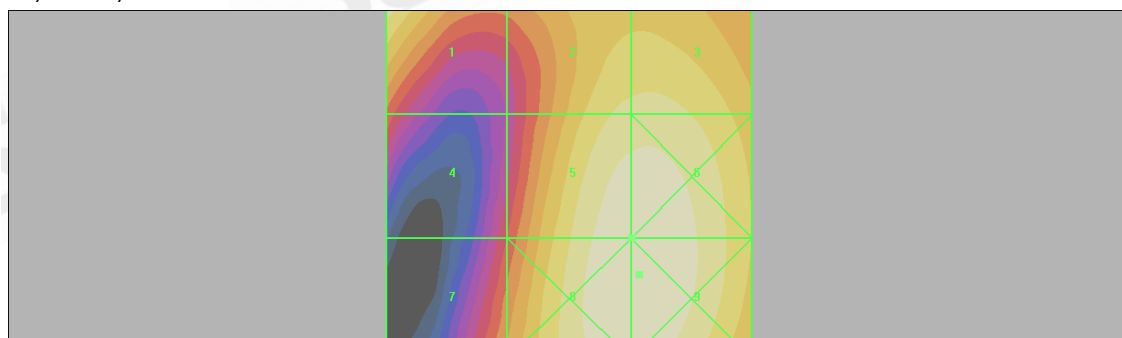
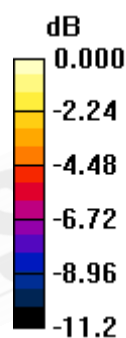
Category	AWF (dB)	Limits for E-Field Emissions (V/m) > 960MHz	Limits for H-Field Emissions (A/m) > 960MHz
M1	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M2	0	112.2 - 199.5	0.34 - 0.6
	-5	84.1 - 149.6	0.25 - 0.45
M3	0	63.1 - 112.2	0.19 - 0.34
	-5	47.3 - 84.1	0.14 - 0.25
M4	0	<63.1	<0.19
	-5	<47.3	<0.14
Category	AWF (dB)	Limits for E-Field Emissions (V/m) < 960MHz	Limits for H-Field Emissions (A/m) < 960 MHz
M1	0	631 - 1122	1.91 - 3.39
	-5	473.2 - 841.4	1.43 - 2.54
M2	0	354.8 - 631	1.07 - 1.91
	-5	266.1 - 473.2	0.8 - 1.43
M3	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M4	0	<199.5	<0.6
	-5	<149.6	<0.45

Cursor:

Total = 30.6 V/m

E Category: M4

Location: -9.5, 13.5, 368.7 mm



0 dB = 30.6V/m

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Date: 2011/6/15

HAC_E WCDMA B2_CH9400

Communication System: WCDMA BAND2; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1000$ kg/m³
Phantom section: E Device Section

DASY4 Configuration:

- Probe: ER3DV6 - SN2306; ConvF(1, 1, 1); Calibrated: 2011/4/18
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

E Scan - ER3DV6 - measurement distance from the probe sensor center to the Device = 15mm / Hearing Aid Compatibility Test (101x101x1):

Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 34.2 V/m

Probe Modulation Factor = 1.00

Device Reference Point: 0.000, 0.000, 353.7 mm

Reference Value = 35.3 V/m; Power Drift = 0.021 dB

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

Peak E-field in V/m

Grid 1 35.6 M4	Grid 2 29.8 M4	Grid 3 29.8 M4
Grid 4 22.3 M4	Grid 5 33.6 M4	Grid 6 33.7 M4
Grid 7 22.3 M4	Grid 8 34.2 M4	Grid 9 34.2 M4

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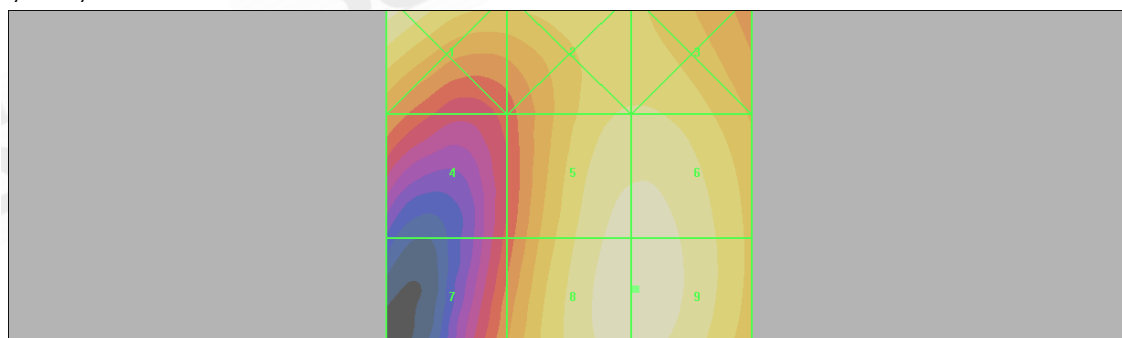
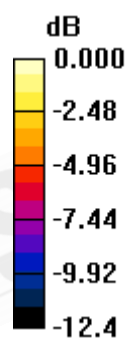
Category	AWF (dB)	Limits for E-Field Emissions (V/m) > 960MHz	Limits for H-Field Emissions (A/m) > 960MHz
M1	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M2	0	112.2 - 199.5	0.34 - 0.6
	-5	84.1 - 149.6	0.25 - 0.45
M3	0	63.1 - 112.2	0.19 - 0.34
	-5	47.3 - 84.1	0.14 - 0.25
M4	0	<63.1	<0.19
	-5	<47.3	<0.14
Category	AWF (dB)	Limits for E-Field Emissions (V/m) < 960MHz	Limits for H-Field Emissions (A/m) < 960 MHz
M1	0	631 - 1122	1.91 - 3.39
	-5	473.2 - 841.4	1.43 - 2.54
M2	0	354.8 - 631	1.07 - 1.91
	-5	266.1 - 473.2	0.8 - 1.43
M3	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M4	0	<199.5	<0.6
	-5	<149.6	<0.45

Cursor:

Total = 35.6 V/m

E Category: M4

Location: 25, -25, 368.7 mm



0 dB = 35.6V/m

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Date: 2011/6/15

HAC_E WCDMA B2_CH9538

Communication System: WCDMA BAND2; Frequency: 1907.6 MHz; Duty Cycle: 1:1
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1000$ kg/m³
Phantom section: E Device Section

DASY4 Configuration:

- Probe: ER3DV6 - SN2306; ConvF(1, 1, 1); Calibrated: 2011/4/18
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

E Scan - ER3DV6 - measurement distance from the probe sensor center to the Device = 15mm / Hearing Aid Compatibility Test (101x101x1):

Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 37.8 V/m

Probe Modulation Factor = 1.00

Device Reference Point: 0.000, 0.000, 353.7 mm

Reference Value = 42.1 V/m; Power Drift = -0.010 dB

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

Peak E-field in V/m

Grid 1 35.5 M4	Grid 2 36.9 M4	Grid 3 36.9 M4
Grid 4 23.8 M4	Grid 5 37.8 M4	Grid 6 37.9 M4
Grid 7 21.3 M4	Grid 8 37.4 M4	Grid 9 37.5 M4

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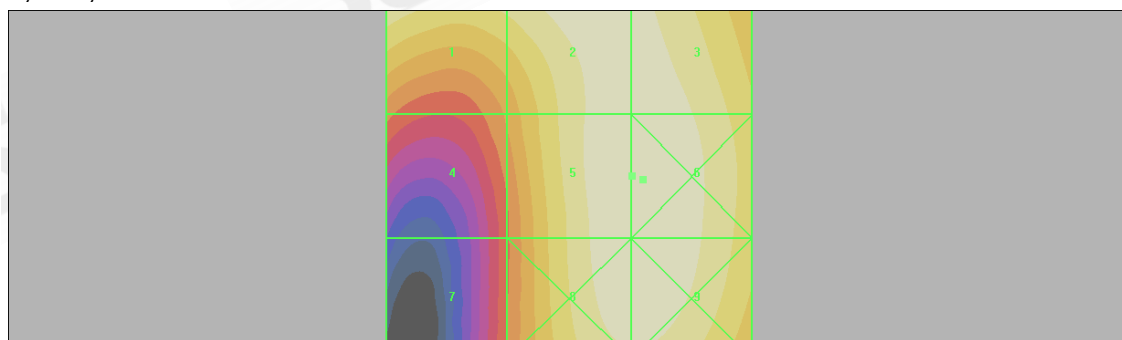
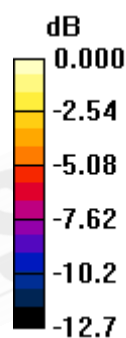
Category	AWF (dB)	Limits for E-Field Emissions (V/m) > 960MHz	Limits for H-Field Emissions (A/m) > 960MHz
M1	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M2	0	112.2 - 199.5	0.34 - 0.6
	-5	84.1 - 149.6	0.25 - 0.45
M3	0	63.1 - 112.2	0.19 - 0.34
	-5	47.3 - 84.1	0.14 - 0.25
M4	0	<63.1	<0.19
	-5	<47.3	<0.14
Category	AWF (dB)	Limits for E-Field Emissions (V/m) < 960MHz	Limits for H-Field Emissions (A/m) < 960 MHz
M1	0	631 - 1122	1.91 - 3.39
	-5	473.2 - 841.4	1.43 - 2.54
M2	0	354.8 - 631	1.07 - 1.91
	-5	266.1 - 473.2	0.8 - 1.43
M3	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M4	0	<199.5	<0.6
	-5	<149.6	<0.45

Cursor:

Total = 37.9 V/m

E Category: M4

Location: -10, 0.5, 368.7 mm



0 dB = 37.9V/m

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Date: 2011/6/15

HAC_E WCDMA B5_CH4132

Communication System: WCDMA BAND5; Frequency: 826.4 MHz; Duty Cycle: 1:1
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1000$ kg/m³
Phantom section: E Device Section

DASY4 Configuration:

- Probe: ER3DV6 - SN2306; ConvF(1, 1, 1); Calibrated: 2011/4/18
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

E Scan - ER3DV6 - measurement distance from the probe sensor center to the Device = 15mm / Hearing Aid Compatibility Test (101x101x1):

Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 60.5 V/m

Probe Modulation Factor = 1.00

Device Reference Point: 0.000, 0.000, 353.7 mm

Reference Value = 76.5 V/m; Power Drift = -0.079 dB

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

Peak E-field in V/m

Grid 1 54.9 M4	Grid 2 59.8 M4	Grid 3 58.8 M4
Grid 4 55.5 M4	Grid 5 60.5 M4	Grid 6 59.3 M4
Grid 7 54.5 M4	Grid 8 59.0 M4	Grid 9 57.7 M4

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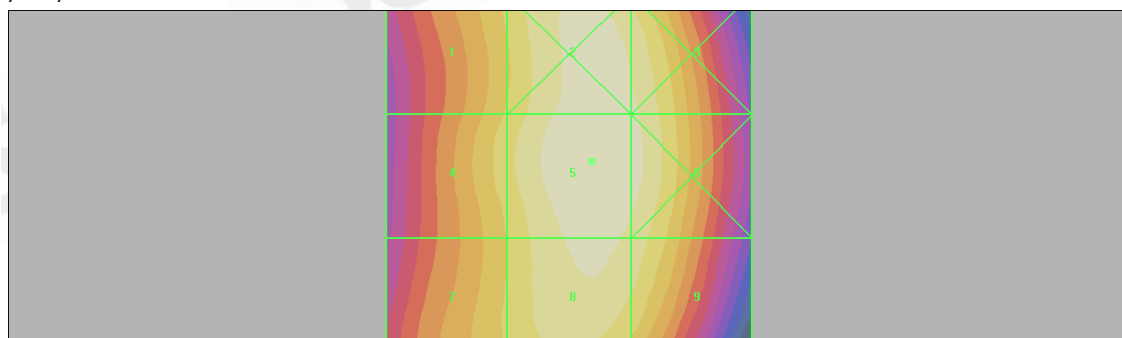
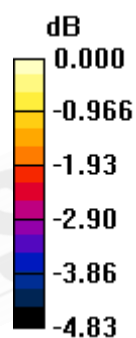
Category	AWF (dB)	Limits for E-Field Emissions (V/m) > 960MHz	Limits for H-Field Emissions (A/m) > 960MHz
M1	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M2	0	112.2 - 199.5	0.34 - 0.6
	-5	84.1 - 149.6	0.25 - 0.45
M3	0	63.1 - 112.2	0.19 - 0.34
	-5	47.3 - 84.1	0.14 - 0.25
M4	0	<63.1	<0.19
	-5	<47.3	<0.14
Category	AWF (dB)	Limits for E-Field Emissions (V/m) < 960MHz	Limits for H-Field Emissions (A/m) < 960 MHz
M1	0	631 - 1122	1.91 - 3.39
	-5	473.2 - 841.4	1.43 - 2.54
M2	0	354.8 - 631	1.07 - 1.91
	-5	266.1 - 473.2	0.8 - 1.43
M3	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M4	0	<199.5	<0.6
	-5	<149.6	<0.45

Cursor:

Total = 60.5 V/m

E Category: M4

Location: -3, -2, 368.7 mm



0 dB = 60.5V/m

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Date: 2011/6/15

HAC_E WCDMA B5_CH4183

Communication System: WCDMA BAND5; Frequency: 836.6 MHz; Duty Cycle: 1:1
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1000$ kg/m³
Phantom section: E Device Section

DASY4 Configuration:

- Probe: ER3DV6 - SN2306; ConvF(1, 1, 1); Calibrated: 2011/4/18
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

E Scan - ER3DV6 - measurement distance from the probe sensor center to the Device = 15mm / Hearing Aid Compatibility Test (101x101x1):

Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 57.6 V/m

Probe Modulation Factor = 1.00

Device Reference Point: 0.000, 0.000, 353.7 mm

Reference Value = 72.4 V/m; Power Drift = 0.016 dB

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

Peak E-field in V/m

Grid 1 51.7 M4	Grid 2 56.8 M4	Grid 3 55.8 M4
Grid 4 52.9 M4	Grid 5 57.6 M4	Grid 6 56.5 M4
Grid 7 52.8 M4	Grid 8 56.6 M4	Grid 9 55.4 M4

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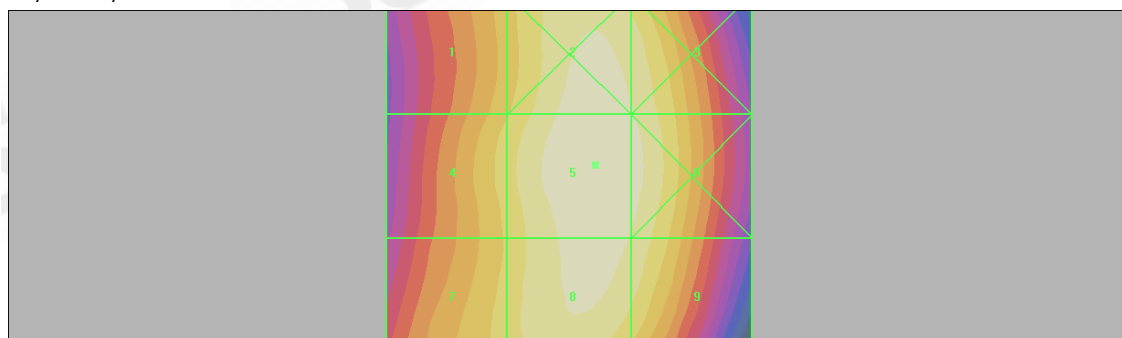
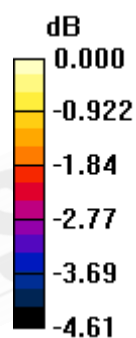
Category	AWF (dB)	Limits for E-Field Emissions (V/m) > 960MHz	Limits for H-Field Emissions (A/m) > 960MHz
M1	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M2	0	112.2 - 199.5	0.34 - 0.6
	-5	84.1 - 149.6	0.25 - 0.45
M3	0	63.1 - 112.2	0.19 - 0.34
	-5	47.3 - 84.1	0.14 - 0.25
M4	0	<63.1	<0.19
	-5	<47.3	<0.14
Category	AWF (dB)	Limits for E-Field Emissions (V/m) < 960MHz	Limits for H-Field Emissions (A/m) < 960 MHz
M1	0	631 - 1122	1.91 - 3.39
	-5	473.2 - 841.4	1.43 - 2.54
M2	0	354.8 - 631	1.07 - 1.91
	-5	266.1 - 473.2	0.8 - 1.43
M3	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M4	0	<199.5	<0.6
	-5	<149.6	<0.45

Cursor:

Total = 57.6 V/m

E Category: M4

Location: -3.5, -1.5, 368.7 mm



0 dB = 57.6V/m

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Date: 2011/6/15

HAC_E WCDMA B5_CH4233

Communication System: WCDMA BAND5; Frequency: 846.6 MHz; Duty Cycle: 1:1
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1000$ kg/m³
Phantom section: E Device Section

DASY4 Configuration:

- Probe: ER3DV6 - SN2306; ConvF(1, 1, 1); Calibrated: 2011/4/18
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

E Scan - ER3DV6 - measurement distance from the probe sensor center to the Device = 15mm / Hearing Aid Compatibility Test (101x101x1):

Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 60.0 V/m

Probe Modulation Factor = 1.00

Device Reference Point: 0.000, 0.000, 353.7 mm

Reference Value = 76.6 V/m; Power Drift = 0.050 dB

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

Peak E-field in V/m

Grid 1 53.8 M4	Grid 2 58.1 M4	Grid 3 56.3 M4
Grid 4 55.6 M4	Grid 5 60.0 M4	Grid 6 58.2 M4
Grid 7 56.4 M4	Grid 8 59.5 M4	Grid 9 57.8 M4

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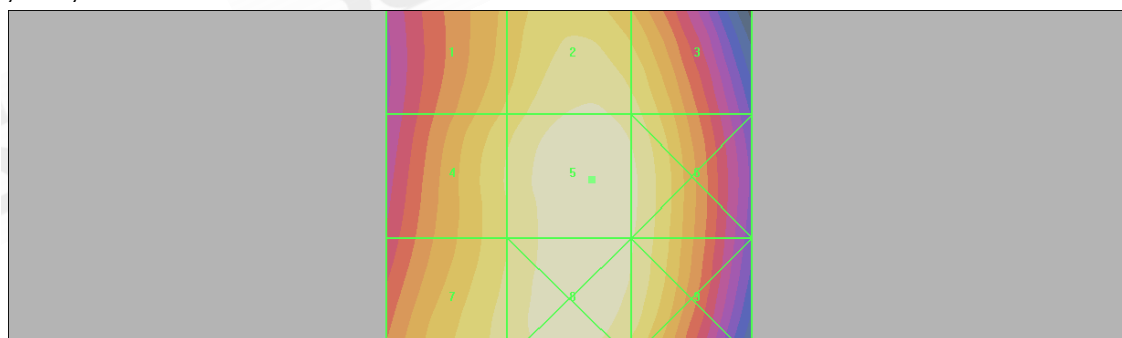
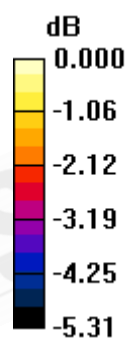
Category	AWF (dB)	Limits for E-Field Emissions (V/m) > 960MHz	Limits for H-Field Emissions (A/m) > 960MHz
M1	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M2	0	112.2 - 199.5	0.34 - 0.6
	-5	84.1 - 149.6	0.25 - 0.45
M3	0	63.1 - 112.2	0.19 - 0.34
	-5	47.3 - 84.1	0.14 - 0.25
M4	0	<63.1	<0.19
	-5	<47.3	<0.14
Category	AWF (dB)	Limits for E-Field Emissions (V/m) < 960MHz	Limits for H-Field Emissions (A/m) < 960 MHz
M1	0	631 - 1122	1.91 - 3.39
	-5	473.2 - 841.4	1.43 - 2.54
M2	0	354.8 - 631	1.07 - 1.91
	-5	266.1 - 473.2	0.8 - 1.43
M3	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M4	0	<199.5	<0.6
	-5	<149.6	<0.45

Cursor:

Total = 60.0 V/m

E Category: M4

Location: -3, 0.5, 368.7 mm



0 dB = 60.0V/m

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Date: 2011/6/15

HAC_H_GSM 850_CH128

Communication System: GSM 850; Frequency: 824.2 MHz; Duty Cycle: 1:8.3
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³
Phantom section: H Device Section

DASY4 Configuration:

- Probe: H3DV6 - SN6142; ; Calibrated: 2011/4/18
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

H Scan - H3DV6 - measurement distance from the probe sensor center to the Device = 15mm / Hearing Aid Compatibility Test (101x101x1):

Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 0.208 A/m

Probe Modulation Factor = 2.99

Device Reference Point: 0.000, 0.000, 353.7 mm

Reference Value = 0.043 A/m; Power Drift = -0.029 dB

Hearing Aid Near-Field Category: M4 (AWF -5 dB)

Peak H-field in A/m

Grid 1 0.291 M4	Grid 2 0.189 M4	Grid 3 0.112 M4
Grid 4 0.272 M4	Grid 5 0.180 M4	Grid 6 0.110 M4
Grid 7 0.305 M4	Grid 8 0.208 M4	Grid 9 0.131 M4

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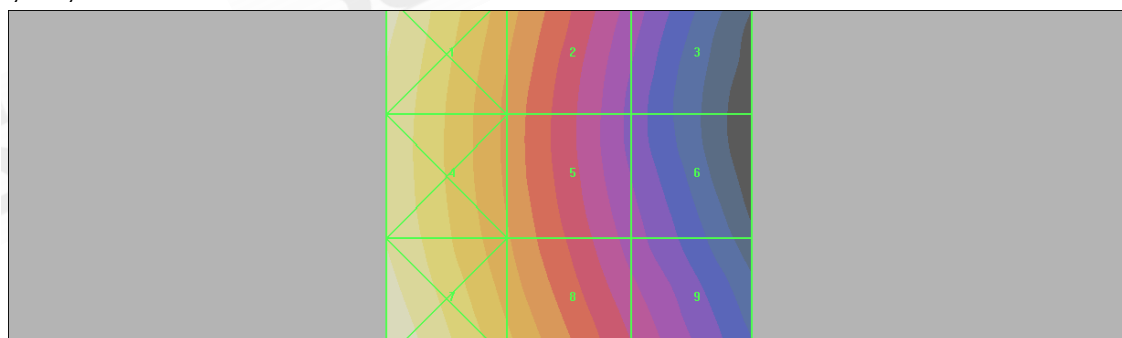
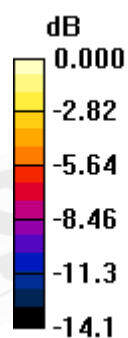
Category	AWF (dB)	Limits for E-Field Emissions (V/m) > 960MHz	Limits for H-Field Emissions (A/m) > 960MHz
M1	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M2	0	112.2 - 199.5	0.34 - 0.6
	-5	84.1 - 149.6	0.25 - 0.45
M3	0	63.1 - 112.2	0.19 - 0.34
	-5	47.3 - 84.1	0.14 - 0.25
M4	0	<63.1	<0.19
	-5	<47.3	<0.14
Category	AWF (dB)	Limits for E-Field Emissions (V/m) < 960MHz	Limits for H-Field Emissions (A/m) < 960 MHz
M1	0	631 - 1122	1.91 - 3.39
	-5	473.2 - 841.4	1.43 - 2.54
M2	0	354.8 - 631	1.07 - 1.91
	-5	266.1 - 473.2	0.8 - 1.43
M3	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M4	0	<199.5	<0.6
	-5	<149.6	<0.45

Cursor:

Total = 0.305 A/m

H Category: M4

Location: 25, 25, 368.7 mm



0 dB = 0.305A/m

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Date: 2011/6/15

HAC_H_GSM 850_CH190

Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:8.3
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³
Phantom section: H Device Section

DASY4 Configuration:

- Probe: H3DV6 - SN6142; ; Calibrated: 2011/4/18
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

H Scan - H3DV6 - measurement distance from the probe sensor center to the Device = 15mm / Hearing Aid Compatibility Test (101x101x1):

Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 0.194 A/m

Probe Modulation Factor = 2.99

Device Reference Point: 0.000, 0.000, 353.7 mm

Reference Value = 0.044 A/m; Power Drift = 0.027 dB

Hearing Aid Near-Field Category: M4 (AWF -5 dB)

Peak H-field in A/m

Grid 1 0.287 M4	Grid 2 0.194 M4	Grid 3 0.124 M4
Grid 4 0.258 M4	Grid 5 0.174 M4	Grid 6 0.108 M4
Grid 7 0.284 M4	Grid 8 0.192 M4	Grid 9 0.124 M4

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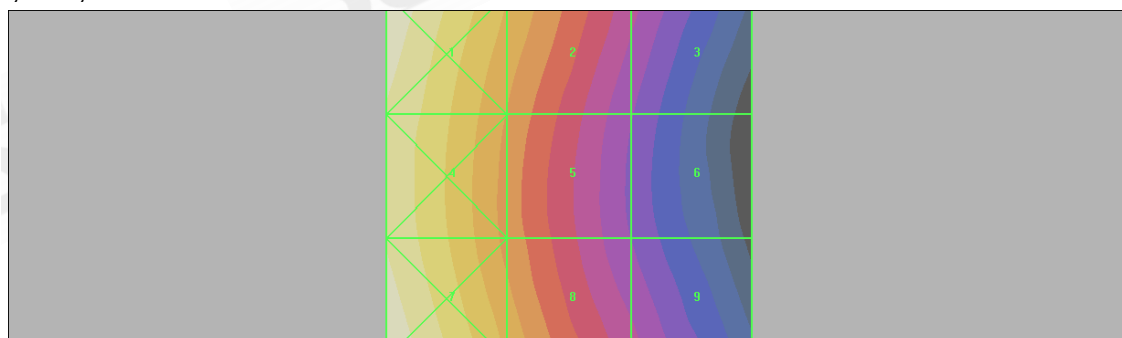
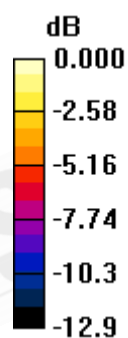
Category	AWF (dB)	Limits for E-Field Emissions (V/m) > 960MHz	Limits for H-Field Emissions (A/m) > 960MHz
M1	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M2	0	112.2 - 199.5	0.34 - 0.6
	-5	84.1 - 149.6	0.25 - 0.45
M3	0	63.1 - 112.2	0.19 - 0.34
	-5	47.3 - 84.1	0.14 - 0.25
M4	0	<63.1	<0.19
	-5	<47.3	<0.14
Category	AWF (dB)	Limits for E-Field Emissions (V/m) < 960MHz	Limits for H-Field Emissions (A/m) < 960 MHz
M1	0	631 - 1122	1.91 - 3.39
	-5	473.2 - 841.4	1.43 - 2.54
M2	0	354.8 - 631	1.07 - 1.91
	-5	266.1 - 473.2	0.8 - 1.43
M3	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M4	0	<199.5	<0.6
	-5	<149.6	<0.45

Cursor:

Total = 0.287 A/m

H Category: M4

Location: 25, -25, 368.7 mm



0 dB = 0.287A/m

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Date: 2011/6/15

HAC_H_GSM 850_CH251

Communication System: GSM 850; Frequency: 848.8 MHz; Duty Cycle: 1:8.3
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³
Phantom section: H Device Section

DASY4 Configuration:

- Probe: H3DV6 - SN6142; ; Calibrated: 2011/4/18
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

H Scan - H3DV6 - measurement distance from the probe sensor center to the Device = 15mm / Hearing Aid Compatibility Test (101x101x1):

Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 0.230 A/m

Probe Modulation Factor = 2.99

Device Reference Point: 0.000, 0.000, 353.7 mm

Reference Value = 0.052 A/m; Power Drift = 0.028 dB

Hearing Aid Near-Field Category: M4 (AWF -5 dB)

Peak H-field in A/m

Grid 1 0.325 M4	Grid 2 0.230 M4	Grid 3 0.145 M4
Grid 4 0.290 M4	Grid 5 0.206 M4	Grid 6 0.124 M4
Grid 7 0.305 M4	Grid 8 0.199 M4	Grid 9 0.112 M4

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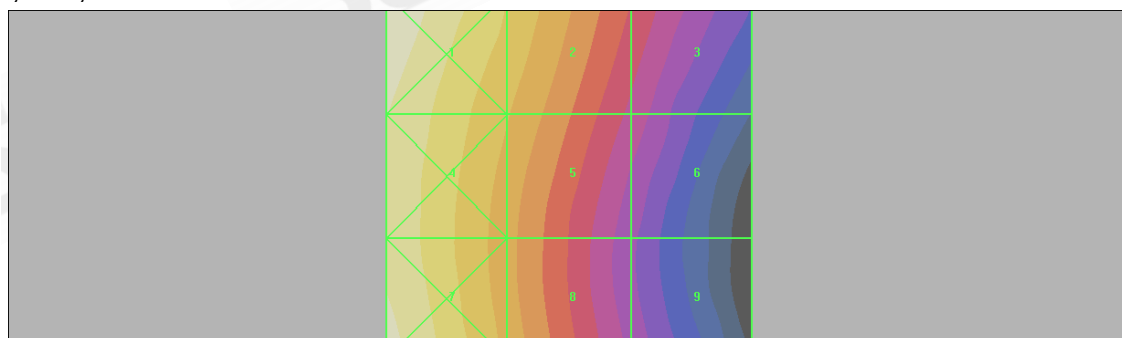
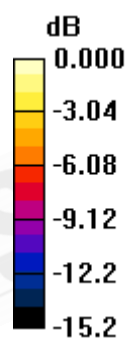
Category	AWF (dB)	Limits for E-Field Emissions (V/m) > 960MHz	Limits for H-Field Emissions (A/m) > 960MHz
M1	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M2	0	112.2 - 199.5	0.34 - 0.6
	-5	84.1 - 149.6	0.25 - 0.45
M3	0	63.1 - 112.2	0.19 - 0.34
	-5	47.3 - 84.1	0.14 - 0.25
M4	0	<63.1	<0.19
	-5	<47.3	<0.14
Category	AWF (dB)	Limits for E-Field Emissions (V/m) < 960MHz	Limits for H-Field Emissions (A/m) < 960 MHz
M1	0	631 - 1122	1.91 - 3.39
	-5	473.2 - 841.4	1.43 - 2.54
M2	0	354.8 - 631	1.07 - 1.91
	-5	266.1 - 473.2	0.8 - 1.43
M3	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M4	0	<199.5	<0.6
	-5	<149.6	<0.45

Cursor:

Total = 0.325 A/m

H Category: M4

Location: 25, -25, 368.7 mm



0 dB = 0.325A/m

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Date: 2011/6/15

HAC_H_GSM 1900_CH512

Communication System: GSM1900; Frequency: 1850.2 MHz; Duty Cycle: 1:8.3
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³
Phantom section: H Device Section

DASY4 Configuration:

- Probe: H3DV6 - SN6142; ; Calibrated: 2011/4/18
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

H Scan - H3DV6 - measurement distance from the probe sensor center to the Device = 15mm / Hearing Aid Compatibility Test (101x101x1):

Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 0.190 A/m

Probe Modulation Factor = 2.78

Device Reference Point: 0.000, 0.000, 353.7 mm

Reference Value = 0.062 A/m; Power Drift = 0.079 dB

Hearing Aid Near-Field Category: M3 (AWF -5 dB)

Peak H-field in A/m

Grid 1 0.256 M2	Grid 2 0.207 M3	Grid 3 0.156 M3
Grid 4 0.203 M3	Grid 5 0.190 M3	Grid 6 0.147 M3
Grid 7 0.170 M3	Grid 8 0.164 M3	Grid 9 0.125 M4

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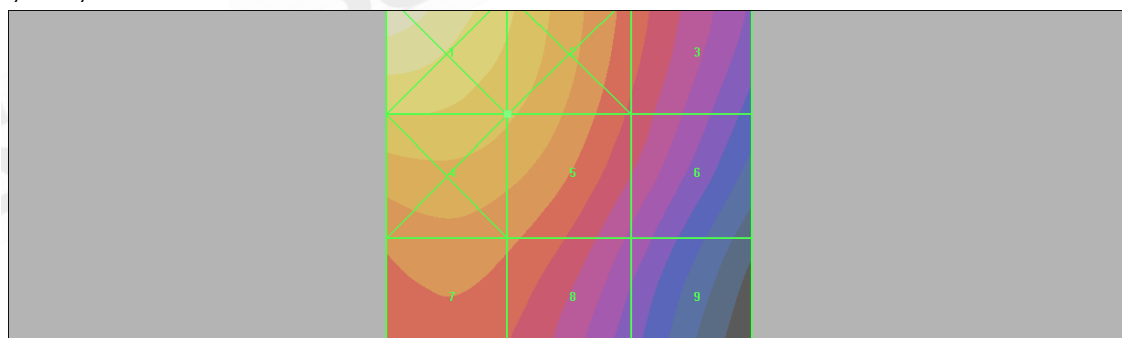
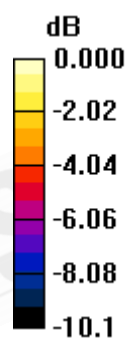
Category	AWF (dB)	Limits for E-Field Emissions (V/m) > 960MHz	Limits for H-Field Emissions (A/m) > 960MHz
M1	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M2	0	112.2 - 199.5	0.34 - 0.6
	-5	84.1 - 149.6	0.25 - 0.45
M3	0	63.1 - 112.2	0.19 - 0.34
	-5	47.3 - 84.1	0.14 - 0.25
M4	0	<63.1	<0.19
	-5	<47.3	<0.14
Category	AWF (dB)	Limits for E-Field Emissions (V/m) < 960MHz	Limits for H-Field Emissions (A/m) < 960 MHz
M1	0	631 - 1122	1.91 - 3.39
	-5	473.2 - 841.4	1.43 - 2.54
M2	0	354.8 - 631	1.07 - 1.91
	-5	266.1 - 473.2	0.8 - 1.43
M3	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M4	0	<199.5	<0.6
	-5	<149.6	<0.45

Cursor:

Total = 0.256 A/m

H Category: M2

Location: 25, -25, 368.7 mm



0 dB = 0.256A/m

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Date: 2011/6/15

HAC_H_GSM 1900_CH661

Communication System: GSM1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³
Phantom section: H Device Section

DASY4 Configuration:

- Probe: H3DV6 - SN6142; ; Calibrated: 2011/4/18
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

H Scan - H3DV6 - measurement distance from the probe sensor center to the Device = 15mm / Hearing Aid Compatibility Test (101x101x1):

Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 0.202 A/m

Probe Modulation Factor = 2.78

Device Reference Point: 0.000, 0.000, 353.7 mm

Reference Value = 0.065 A/m; Power Drift = 0.065 dB

Hearing Aid Near-Field Category: M3 (AWF -5 dB)

Peak H-field in A/m

Grid 1 0.260 M2	Grid 2 0.207 M3	Grid 3 0.153 M3
Grid 4 0.217 M3	Grid 5 0.202 M3	Grid 6 0.148 M3
Grid 7 0.195 M3	Grid 8 0.185 M3	Grid 9 0.135 M4

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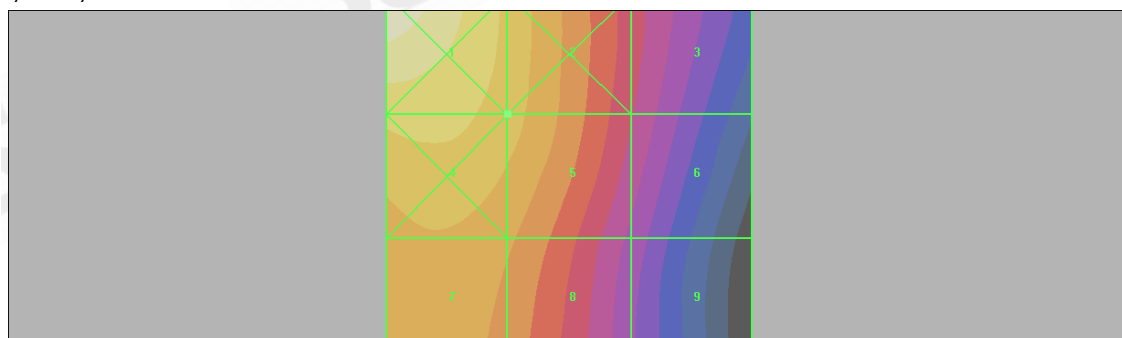
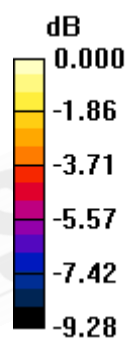
Category	AWF (dB)	Limits for E-Field Emissions (V/m) > 960MHz	Limits for H-Field Emissions (A/m) > 960MHz
M1	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M2	0	112.2 - 199.5	0.34 - 0.6
	-5	84.1 - 149.6	0.25 - 0.45
M3	0	63.1 - 112.2	0.19 - 0.34
	-5	47.3 - 84.1	0.14 - 0.25
M4	0	<63.1	<0.19
	-5	<47.3	<0.14
Category	AWF (dB)	Limits for E-Field Emissions (V/m) < 960MHz	Limits for H-Field Emissions (A/m) < 960 MHz
M1	0	631 - 1122	1.91 - 3.39
	-5	473.2 - 841.4	1.43 - 2.54
M2	0	354.8 - 631	1.07 - 1.91
	-5	266.1 - 473.2	0.8 - 1.43
M3	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M4	0	<199.5	<0.6
	-5	<149.6	<0.45

Cursor:

Total = 0.260 A/m

H Category: M2

Location: 25, -25, 368.7 mm



0 dB = 0.260A/m

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Date: 2011/6/15

HAC_H_GSM 1900_CH810**DUT: MB865;**

Communication System: GSM1900; Frequency: 1909.8 MHz; Duty Cycle: 1:8.3
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³
Phantom section: H Device Section

DASY4 Configuration:

- Probe: H3DV6 - SN6142; ; Calibrated: 2011/4/18
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

H Scan - H3DV6 - measurement distance from the probe sensor center to the Device = 15mm / Hearing Aid Compatibility Test (101x101x1):

Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 0.208 A/m

Probe Modulation Factor = 2.78

Device Reference Point: 0.000, 0.000, 353.7 mm

Reference Value = 0.069 A/m; Power Drift = 0.030 dB

Hearing Aid Near-Field Category: M3 (AWF -5 dB)

Peak H-field in A/m

Grid 1 0.250 M2	Grid 2 0.213 M3	Grid 3 0.157 M3
Grid 4 0.220 M3	Grid 5 0.208 M3	Grid 6 0.154 M3
Grid 7 0.204 M3	Grid 8 0.194 M3	Grid 9 0.143 M3

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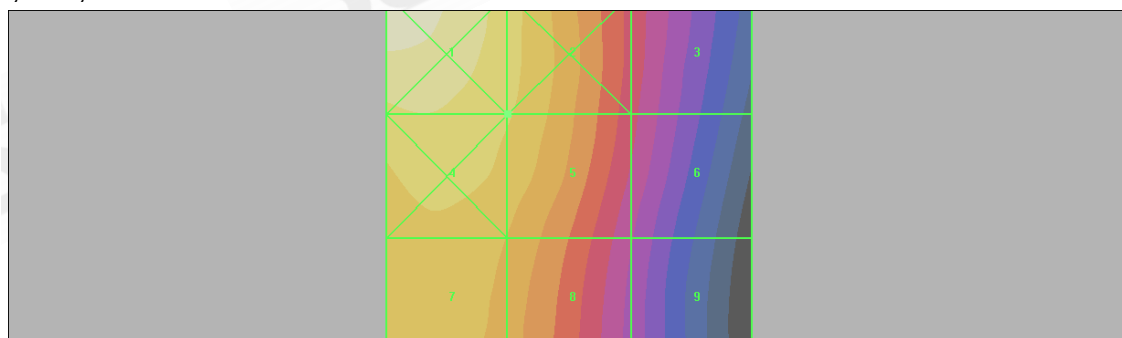
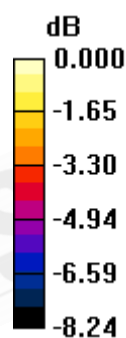
Category	AWF (dB)	Limits for E-Field Emissions (V/m) > 960MHz	Limits for H-Field Emissions (A/m) > 960MHz
M1	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M2	0	112.2 - 199.5	0.34 - 0.6
	-5	84.1 - 149.6	0.25 - 0.45
M3	0	63.1 - 112.2	0.19 - 0.34
	-5	47.3 - 84.1	0.14 - 0.25
M4	0	<63.1	<0.19
	-5	<47.3	<0.14
Category	AWF (dB)	Limits for E-Field Emissions (V/m) < 960MHz	Limits for H-Field Emissions (A/m) < 960 MHz
M1	0	631 - 1122	1.91 - 3.39
	-5	473.2 - 841.4	1.43 - 2.54
M2	0	354.8 - 631	1.07 - 1.91
	-5	266.1 - 473.2	0.8 - 1.43
M3	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M4	0	<199.5	<0.6
	-5	<149.6	<0.45

Cursor:

Total = 0.250 A/m

H Category: M2

Location: 25, -25, 368.7 mm



0 dB = 0.250A/m

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Date: 2011/6/15

HAC_H_WCDMA B2_CH9262

Communication System: WCDMA BAND2; Frequency: 1852.4 MHz; Duty Cycle: 1:1
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³
Phantom section: H Device Section

DASY4 Configuration:

- Probe: H3DV6 - SN6142; ; Calibrated: 2011/4/18
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

H Scan - H3DV6 - measurement distance from the probe sensor center to the Device = 15mm / Hearing Aid Compatibility Test (101x101x1):

Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 0.104 A/m

Probe Modulation Factor = 1.00

Device Reference Point: 0.000, 0.000, 353.7 mm

Reference Value = 0.096 A/m; Power Drift = -0.104 dB

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

Peak H-field in A/m

Grid 1 0.138 M4	Grid 2 0.113 M4	Grid 3 0.085 M4
Grid 4 0.109 M4	Grid 5 0.104 M4	Grid 6 0.081 M4
Grid 7 0.093 M4	Grid 8 0.090 M4	Grid 9 0.069 M4

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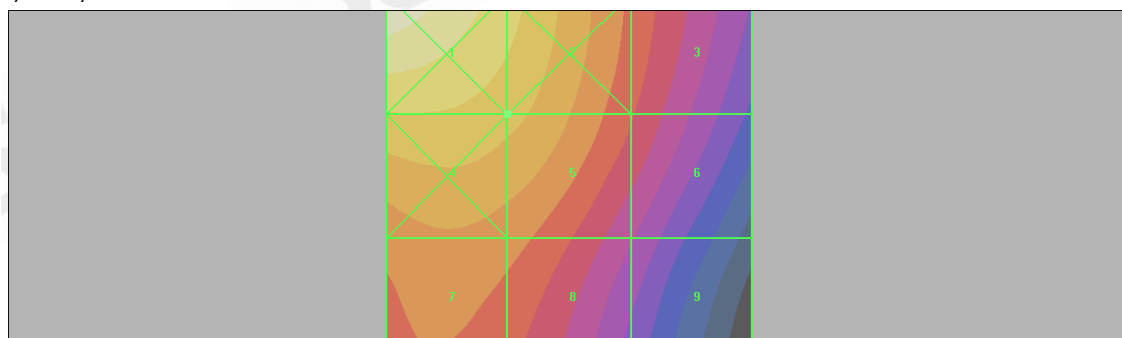
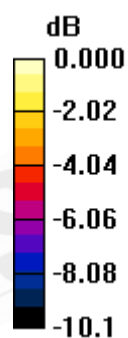
Category	AWF (dB)	Limits for E-Field Emissions (V/m) > 960MHz	Limits for H-Field Emissions (A/m) > 960MHz
M1	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M2	0	112.2 - 199.5	0.34 - 0.6
	-5	84.1 - 149.6	0.25 - 0.45
M3	0	63.1 - 112.2	0.19 - 0.34
	-5	47.3 - 84.1	0.14 - 0.25
M4	0	<63.1	<0.19
	-5	<47.3	<0.14
Category	AWF (dB)	Limits for E-Field Emissions (V/m) < 960MHz	Limits for H-Field Emissions (A/m) < 960 MHz
M1	0	631 - 1122	1.91 - 3.39
	-5	473.2 - 841.4	1.43 - 2.54
M2	0	354.8 - 631	1.07 - 1.91
	-5	266.1 - 473.2	0.8 - 1.43
M3	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M4	0	<199.5	<0.6
	-5	<149.6	<0.45

Cursor:

Total = 0.138 A/m

H Category: M4

Location: 25, -25, 368.7 mm



0 dB = 0.138A/m

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Date: 2011/6/15

HAC_H_WCDMA B2_CH9400

Communication System: WCDMA BAND2; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³
Phantom section: H Device Section

DASY4 Configuration:

- Probe: H3DV6 - SN6142; ; Calibrated: 2011/4/18
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

H Scan - H3DV6 - measurement distance from the probe sensor center to the Device = 15mm / Hearing Aid Compatibility Test (101x101x1):

Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 0.097 A/m

Probe Modulation Factor = 1.00

Device Reference Point: 0.000, 0.000, 353.7 mm

Reference Value = 0.088 A/m; Power Drift = 0.005 dB

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

Peak H-field in A/m

Grid 1 0.123 M4	Grid 2 0.100 M4	Grid 3 0.076 M4
Grid 4 0.102 M4	Grid 5 0.097 M4	Grid 6 0.073 M4
Grid 7 0.093 M4	Grid 8 0.089 M4	Grid 9 0.066 M4

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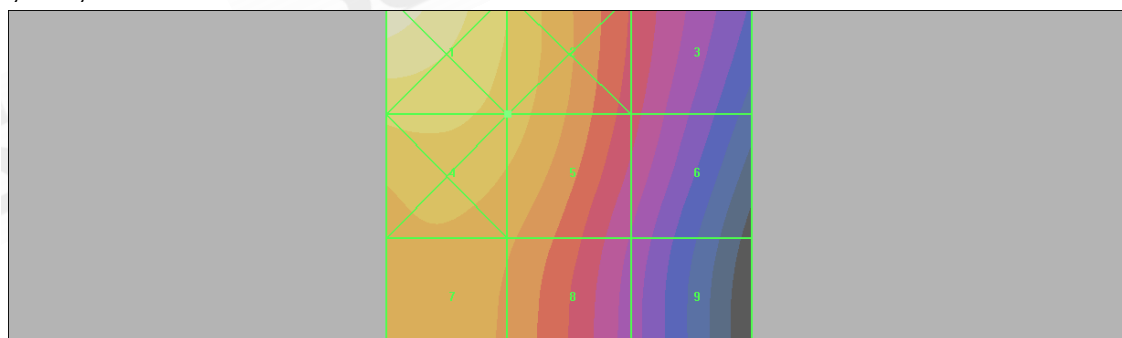
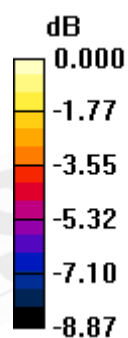
Category	AWF (dB)	Limits for E-Field Emissions (V/m) > 960MHz	Limits for H-Field Emissions (A/m) > 960MHz
M1	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M2	0	112.2 - 199.5	0.34 - 0.6
	-5	84.1 - 149.6	0.25 - 0.45
M3	0	63.1 - 112.2	0.19 - 0.34
	-5	47.3 - 84.1	0.14 - 0.25
M4	0	<63.1	<0.19
	-5	<47.3	<0.14
Category	AWF (dB)	Limits for E-Field Emissions (V/m) < 960MHz	Limits for H-Field Emissions (A/m) < 960 MHz
M1	0	631 - 1122	1.91 - 3.39
	-5	473.2 - 841.4	1.43 - 2.54
M2	0	354.8 - 631	1.07 - 1.91
	-5	266.1 - 473.2	0.8 - 1.43
M3	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M4	0	<199.5	<0.6
	-5	<149.6	<0.45

Cursor:

Total = 0.123 A/m

H Category: M4

Location: 25, -25, 368.7 mm



0 dB = 0.123A/m

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Date: 2011/6/15

HAC_H_WCDMA B2_CH9538

Communication System: WCDMA BAND2; Frequency: 1907.6 MHz; Duty Cycle: 1:1
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³
Phantom section: H Device Section

DASY4 Configuration:

- Probe: H3DV6 - SN6142; ; Calibrated: 2011/4/18
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

H Scan - H3DV6 - measurement distance from the probe sensor center to the Device = 15mm / Hearing Aid Compatibility Test (101x101x1):

Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 0.101 A/m

Probe Modulation Factor = 1.00

Device Reference Point: 0.000, 0.000, 353.7 mm

Reference Value = 0.094 A/m; Power Drift = -0.049 dB

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

Peak H-field in A/m

Grid 1 0.119 M4	Grid 2 0.104 M4	Grid 3 0.079 M4
Grid 4 0.105 M4	Grid 5 0.101 M4	Grid 6 0.078 M4
Grid 7 0.098 M4	Grid 8 0.094 M4	Grid 9 0.071 M4

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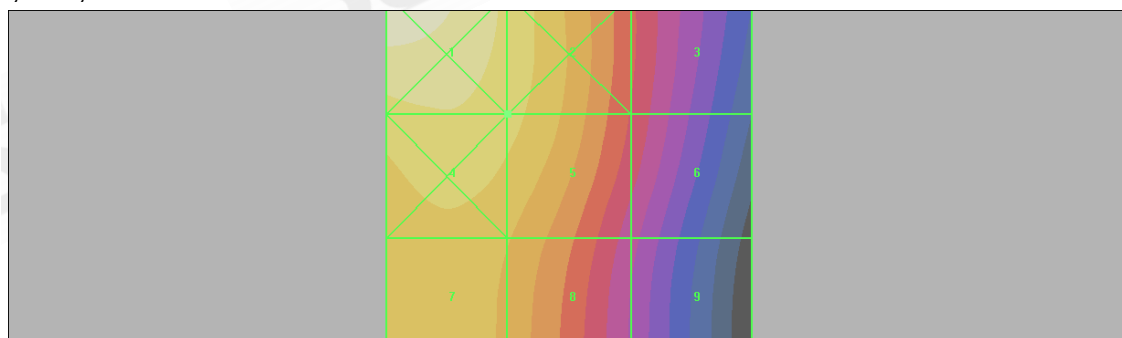
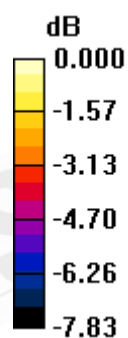
Category	AWF (dB)	Limits for E-Field Emissions (V/m) > 960MHz	Limits for H-Field Emissions (A/m) > 960MHz
M1	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M2	0	112.2 - 199.5	0.34 - 0.6
	-5	84.1 - 149.6	0.25 - 0.45
M3	0	63.1 - 112.2	0.19 - 0.34
	-5	47.3 - 84.1	0.14 - 0.25
M4	0	<63.1	<0.19
	-5	<47.3	<0.14
Category	AWF (dB)	Limits for E-Field Emissions (V/m) < 960MHz	Limits for H-Field Emissions (A/m) < 960 MHz
M1	0	631 - 1122	1.91 - 3.39
	-5	473.2 - 841.4	1.43 - 2.54
M2	0	354.8 - 631	1.07 - 1.91
	-5	266.1 - 473.2	0.8 - 1.43
M3	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M4	0	<199.5	<0.6
	-5	<149.6	<0.45

Cursor:

Total = 0.119 A/m

H Category: M4

Location: 25, -25, 368.7 mm



0 dB = 0.119A/m

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Date: 2011/6/15

HAC_H_WCDMA B5_CH4132

Communication System: WCDMA BAND5; Frequency: 826.4 MHz; Duty Cycle: 1:1
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³
Phantom section: H Device Section

DASY4 Configuration:

- Probe: H3DV6 - SN6142; ; Calibrated: 2011/4/18
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

H Scan - H3DV6 - measurement distance from the probe sensor center to the Device = 15mm / Hearing Aid Compatibility Test (101x101x1):

Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 0.078 A/m

Probe Modulation Factor = 1.00

Device Reference Point: 0.000, 0.000, 353.7 mm

Reference Value = 0.049 A/m; Power Drift = 0.072 dB

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

Peak H-field in A/m

Grid 1 0.111 M4	Grid 2 0.073 M4	Grid 3 0.045 M4
Grid 4 0.102 M4	Grid 5 0.068 M4	Grid 6 0.043 M4
Grid 7 0.114 M4	Grid 8 0.078 M4	Grid 9 0.050 M4

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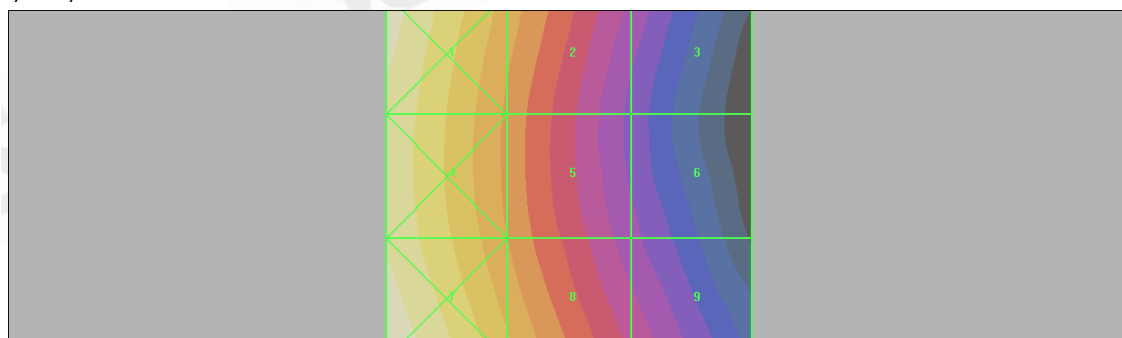
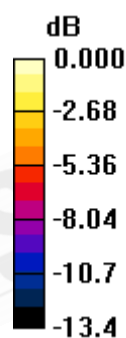
Category	AWF (dB)	Limits for E-Field Emissions (V/m) > 960MHz	Limits for H-Field Emissions (A/m) > 960MHz
M1	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M2	0	112.2 - 199.5	0.34 - 0.6
	-5	84.1 - 149.6	0.25 - 0.45
M3	0	63.1 - 112.2	0.19 - 0.34
	-5	47.3 - 84.1	0.14 - 0.25
M4	0	<63.1	<0.19
	-5	<47.3	<0.14
Category	AWF (dB)	Limits for E-Field Emissions (V/m) < 960MHz	Limits for H-Field Emissions (A/m) < 960 MHz
M1	0	631 - 1122	1.91 - 3.39
	-5	473.2 - 841.4	1.43 - 2.54
M2	0	354.8 - 631	1.07 - 1.91
	-5	266.1 - 473.2	0.8 - 1.43
M3	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M4	0	<199.5	<0.6
	-5	<149.6	<0.45

Cursor:

Total = 0.114 A/m

H Category: M4

Location: 25, 25, 368.7 mm



0 dB = 0.114A/m

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Date: 2011/6/15

HAC_H_WCDMA B5_CH4183**DUT: MB865;**

Communication System: WCDMA BAND5; Frequency: 836.6 MHz; Duty Cycle: 1:1
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³
Phantom section: H Device Section

DASY4 Configuration:

- Probe: H3DV6 - SN6142; ; Calibrated: 2011/4/18
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

H Scan - H3DV6 - measurement distance from the probe sensor center to the Device = 15mm / Hearing Aid Compatibility Test (101x101x1):

Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 0.074 A/m

Probe Modulation Factor = 1.00

Device Reference Point: 0.000, 0.000, 353.7 mm

Reference Value = 0.050 A/m; Power Drift = 0.021 dB

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

Peak H-field in A/m

Grid 1 0.107 M4	Grid 2 0.074 M4	Grid 3 0.047 M4
Grid 4 0.096 M4	Grid 5 0.066 M4	Grid 6 0.041 M4
Grid 7 0.105 M4	Grid 8 0.072 M4	Grid 9 0.046 M4

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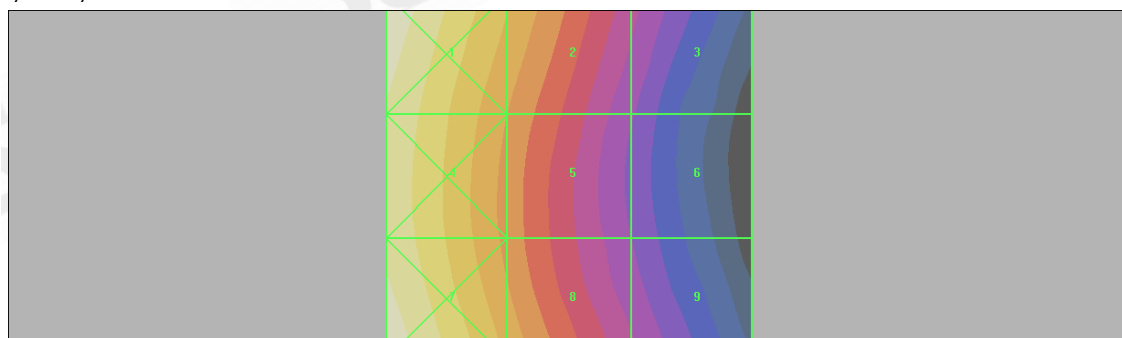
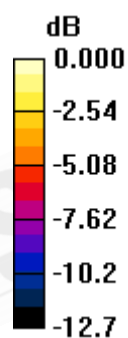
Category	AWF (dB)	Limits for E-Field Emissions (V/m) > 960MHz	Limits for H-Field Emissions (A/m) > 960MHz
M1	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M2	0	112.2 - 199.5	0.34 - 0.6
	-5	84.1 - 149.6	0.25 - 0.45
M3	0	63.1 - 112.2	0.19 - 0.34
	-5	47.3 - 84.1	0.14 - 0.25
M4	0	<63.1	<0.19
	-5	<47.3	<0.14
Category	AWF (dB)	Limits for E-Field Emissions (V/m) < 960MHz	Limits for H-Field Emissions (A/m) < 960 MHz
M1	0	631 - 1122	1.91 - 3.39
	-5	473.2 - 841.4	1.43 - 2.54
M2	0	354.8 - 631	1.07 - 1.91
	-5	266.1 - 473.2	0.8 - 1.43
M3	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M4	0	<199.5	<0.6
	-5	<149.6	<0.45

Cursor:

Total = 0.107 A/m

H Category: M4

Location: 25, -25, 368.7 mm



0 dB = 0.107A/m

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Date: 2011/6/15

HAC_H_WCDMA B5_CH4233

Communication System: WCDMA BAND5; Frequency: 846.6 MHz; Duty Cycle: 1:1
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³
Phantom section: H Device Section

DASY4 Configuration:

- Probe: H3DV6 - SN6142; ; Calibrated: 2011/4/18
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

H Scan - H3DV6 - measurement distance from the probe sensor center to the Device = 15mm / Hearing Aid Compatibility Test (101x101x1):

Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 0.079 A/m

Probe Modulation Factor = 1.00

Device Reference Point: 0.000, 0.000, 353.7 mm

Reference Value = 0.054 A/m; Power Drift = 0.049 dB

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

Peak H-field in A/m

Grid 1 0.110 M4	Grid 2 0.079 M4	Grid 3 0.051 M4
Grid 4 0.096 M4	Grid 5 0.070 M4	Grid 6 0.043 M4
Grid 7 0.101 M4	Grid 8 0.067 M4	Grid 9 0.038 M4

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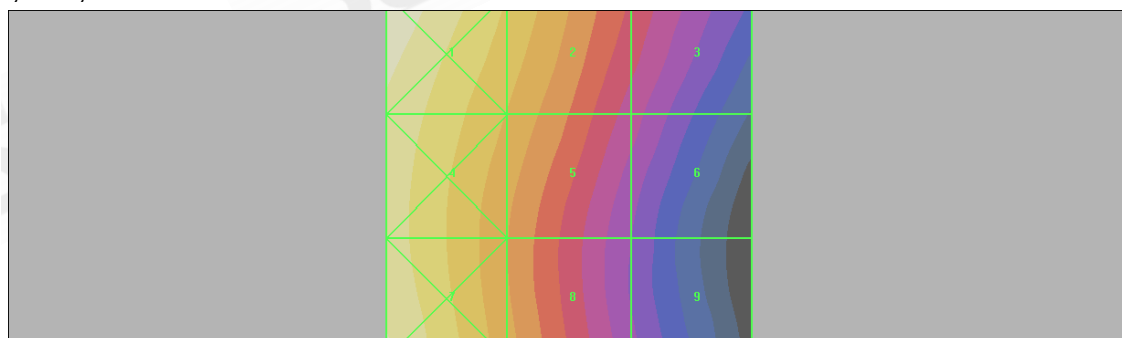
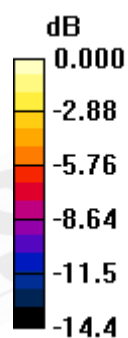
Category	AWF (dB)	Limits for E-Field Emissions (V/m) > 960MHz	Limits for H-Field Emissions (A/m) > 960MHz
M1	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M2	0	112.2 - 199.5	0.34 - 0.6
	-5	84.1 - 149.6	0.25 - 0.45
M3	0	63.1 - 112.2	0.19 - 0.34
	-5	47.3 - 84.1	0.14 - 0.25
M4	0	<63.1	<0.19
	-5	<47.3	<0.14
Category	AWF (dB)	Limits for E-Field Emissions (V/m) < 960MHz	Limits for H-Field Emissions (A/m) < 960 MHz
M1	0	631 - 1122	1.91 - 3.39
	-5	473.2 - 841.4	1.43 - 2.54
M2	0	354.8 - 631	1.07 - 1.91
	-5	266.1 - 473.2	0.8 - 1.43
M3	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M4	0	<199.5	<0.6
	-5	<149.6	<0.45

Cursor:

Total = 0.110 A/m

H Category: M4

Location: 25, -25, 368.7 mm



0 dB = 0.110A/m

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15. System Verification

Date: 2011/6/15

HAC_E_Dipole_835MHz

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1

Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1000$ kg/m³

Phantom section: E Dipole Section

DASY4 Configuration:

- Probe: ER3DV6 - SN2306; ConvF(1, 1, 1); Calibrated: 2011/4/18
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

E Scan - ER probe center 10mm above CD835 Dipole/Hearing Aid Compatibility Test (41x361x1):

Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 174.8 V/m

Probe Modulation Factor = 1.00

Device Reference Point: 0.000, 0.000, 354.7 mm

Reference Value = 131.0 V/m; Power Drift = -0.008 dB

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

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Peak E-field in V/m

Grid 1 167.5 M4	Grid 2 174.8 M4	Grid 3 174.0 M4
Grid 4 92.3 M4	Grid 5 97.0 M4	Grid 6 96.5 M4
Grid 7 199.1 M4	Grid 8 223.2 M3	Grid 9 222.6 M3

Category	AWF (dB)	Limits for E-Field Emissions (V/m) > 960MHz	Limits for H-Field Emissions (A/m) > 960MHz
M1	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M2	0	112.2 - 199.5	0.34 - 0.6
	-5	84.1 - 149.6	0.25 - 0.45
M3	0	63.1 - 112.2	0.19 - 0.34
	-5	47.3 - 84.1	0.14 - 0.25
M4	0	<63.1	<0.19
	-5	<47.3	<0.14
Category	AWF (dB)	Limits for E-Field Emissions (V/m) < 960MHz	Limits for H-Field Emissions (A/m) < 960 MHz
M1	0	631 - 1122	1.91 - 3.39
	-5	473.2 - 841.4	1.43 - 2.54
M2	0	354.8 - 631	1.07 - 1.91
	-5	266.1 - 473.2	0.8 - 1.43
M3	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M4	0	<199.5	<0.6
	-5	<149.6	<0.45

Cursor:

Total = 223.2 V/m

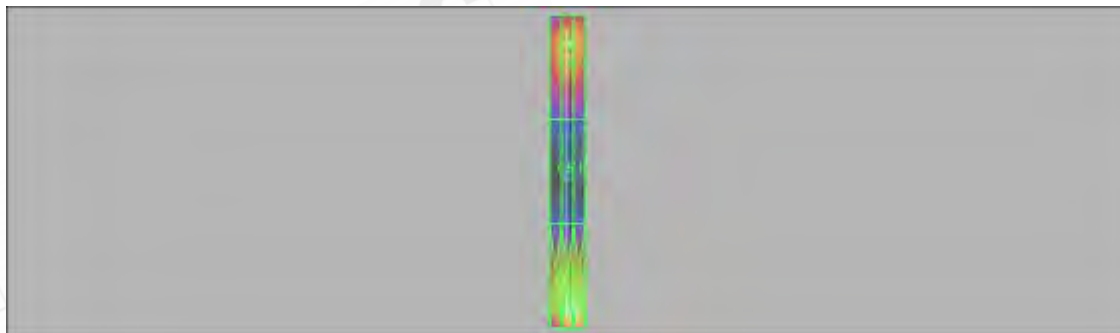
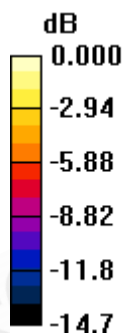
E Category: M3

Location: -3, 80.5, 364.7 mm

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0 dB = 223.2V/m

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Date: 2011/6/15

HAC_H_Dipole_835MHz

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³
Phantom section: H Dipole Section

DASY4 Configuration:

- Probe: H3DV6 - SN6142; ; Calibrated: 2011/4/18
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

H Scan - H3DV6 probe center 10mm above CD835 Dipole/Hearing Aid

Compatibility Test (41x361x1): Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 0.452 A/m

Probe Modulation Factor = 1.00

Device Reference Point: 0.000, 0.000, 354.7 mm

Reference Value = 0.462 A/m; Power Drift = -0.029 dB

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

Peak H-field in A/m

Grid 1 0.338 M4	Grid 2 0.390 M4	Grid 3 0.389 M4
Grid 4 0.392 M4	Grid 5 0.452 M4	Grid 6 0.451 M4
Grid 7 0.355 M4	Grid 8 0.412 M4	Grid 9 0.411 M4

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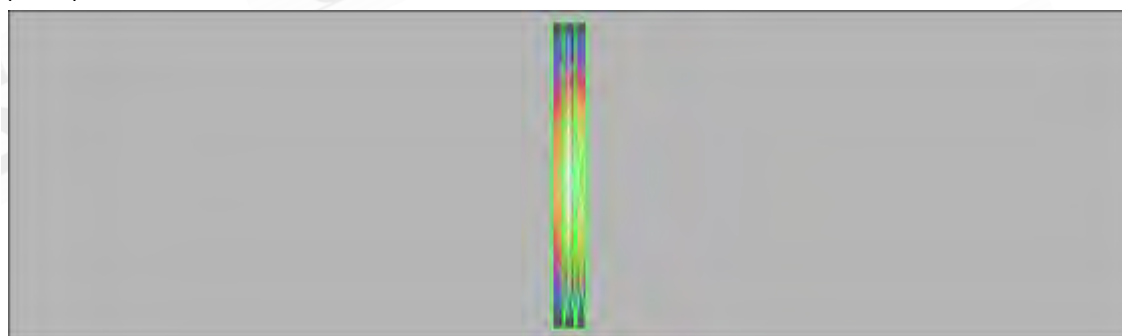
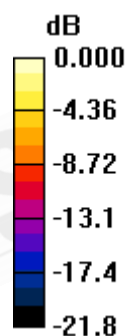
Category	AWF (dB)	Limits for E-Field Emissions (V/m) > 960MHz	Limits for H-Field Emissions (A/m) > 960MHz
M1	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M2	0	112.2 - 199.5	0.34 - 0.6
	-5	84.1 - 149.6	0.25 - 0.45
M3	0	63.1 - 112.2	0.19 - 0.34
	-5	47.3 - 84.1	0.14 - 0.25
M4	0	<63.1	<0.19
	-5	<47.3	<0.14
Category	AWF (dB)	Limits for E-Field Emissions (V/m) < 960MHz	Limits for H-Field Emissions (A/m) < 960 MHz
M1	0	631 - 1122	1.91 - 3.39
	-5	473.2 - 841.4	1.43 - 2.54
M2	0	354.8 - 631	1.07 - 1.91
	-5	266.1 - 473.2	0.8 - 1.43
M3	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M4	0	<199.5	<0.6
	-5	<149.6	<0.45

Cursor:

Total = 0.452 A/m

H Category: M4

Location: -3, 6.5, 364.7 mm



0 dB = 0.452A/m

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Date: 2011/6/15

HAC_E_Dipole_1880MHz

Communication System: CW; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1000$ kg/m³
Phantom section: E Dipole Section

DASY4 Configuration:

- Probe: ER3DV6 - SN2306; ConvF(1, 1, 1); Calibrated: 2011/4/18
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

E Scan - ER probe center 10mm above CD1880 Dipole/Hearing Aid

Compatibility Test (41x181x1): Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 142.3 V/m

Probe Modulation Factor = 1.00

Device Reference Point: 0.000, 0.000, 354.7 mm

Reference Value = 171.4 V/m; Power Drift = 0.027 dB

Hearing Aid Near-Field Category: M2 (AWF 0 dB)

Peak E-field in V/m

Grid 1 132.7 M2	Grid 2 142.3 M2	Grid 3 142.1 M2
Grid 4 91.3 M3	Grid 5 95.8 M3	Grid 6 94.8 M3
Grid 7 143.1 M2	Grid 8 155.5 M2	Grid 9 155.2 M2

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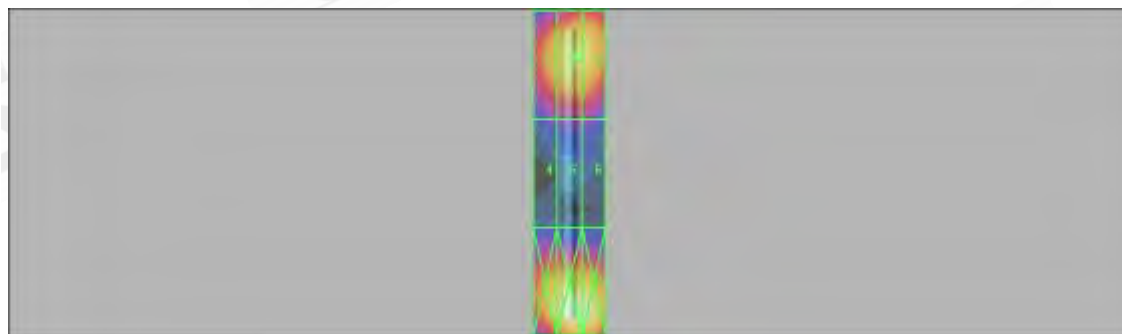
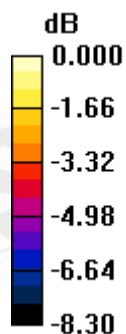
Category	AWF (dB)	Limits for E-Field Emissions (V/m) > 960MHz	Limits for H-Field Emissions (A/m) > 960MHz
M1	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M2	0	112.2 - 199.5	0.34 - 0.6
	-5	84.1 - 149.6	0.25 - 0.45
M3	0	63.1 - 112.2	0.19 - 0.34
	-5	47.3 - 84.1	0.14 - 0.25
M4	0	<63.1	<0.19
	-5	<47.3	<0.14
Category	AWF (dB)	Limits for E-Field Emissions (V/m) < 960MHz	Limits for H-Field Emissions (A/m) < 960 MHz
M1	0	631 - 1122	1.91 - 3.39
	-5	473.2 - 841.4	1.43 - 2.54
M2	0	354.8 - 631	1.07 - 1.91
	-5	266.1 - 473.2	0.8 - 1.43
M3	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M4	0	<199.5	<0.6
	-5	<149.6	<0.45

Cursor:

Total = 155.5 V/m

E Category: M2

Location: -2.5, 38, 364.7 mm



0 dB = 155.5V/m

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Date: 2011/6/15

HAC_H_Dipole_1880MHz

Communication System: CW; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: Air Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³
Phantom section: H Dipole Section

DASY4 Configuration:

- Probe: H3DV6 - SN6142; ; Calibrated: 2011/4/18
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

H Scan - H3DV6 probe center 10mm above CD1880 Dipole/Hearing Aid Compatibility Test (41x181x1): Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 0.464 A/m

Probe Modulation Factor = 1.00

Device Reference Point: 0.000, 0.000, 354.7 mm

Reference Value = 0.477 A/m; Power Drift = -0.043 dB

Hearing Aid Near-Field Category: M2 (AWF 0 dB)

Peak H-field in A/m

Grid 1 0.372 M2	Grid 2 0.426 M2	Grid 3 0.426 M2
Grid 4 0.408 M2	Grid 5 0.464 M2	Grid 6 0.464 M2
Grid 7 0.372 M2	Grid 8 0.425 M2	Grid 9 0.425 M2

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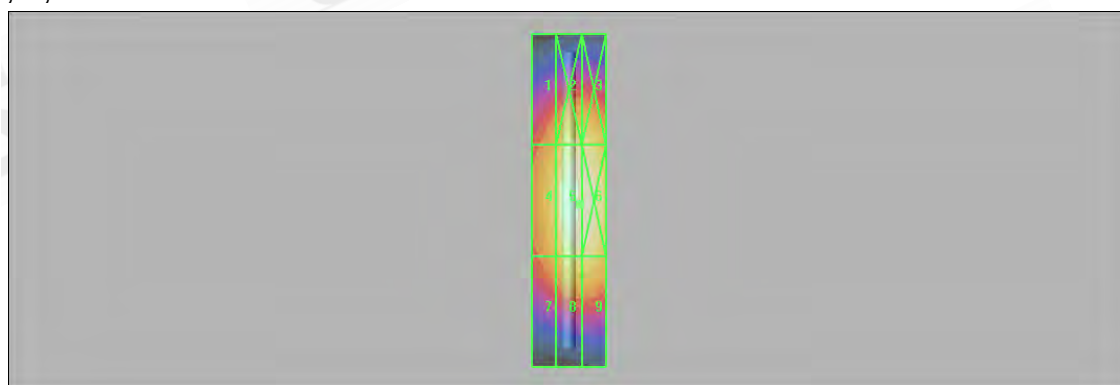
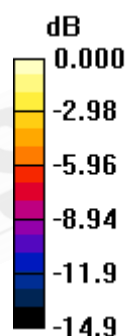
Category	AWF (dB)	Limits for E-Field Emissions (V/m) > 960MHz	Limits for H-Field Emissions (A/m) > 960MHz
M1	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M2	0	112.2 - 199.5	0.34 - 0.6
	-5	84.1 - 149.6	0.25 - 0.45
M3	0	63.1 - 112.2	0.19 - 0.34
	-5	47.3 - 84.1	0.14 - 0.25
M4	0	<63.1	<0.19
	-5	<47.3	<0.14
Category	AWF (dB)	Limits for E-Field Emissions (V/m) < 960MHz	Limits for H-Field Emissions (A/m) < 960 MHz
M1	0	631 - 1122	1.91 - 3.39
	-5	473.2 - 841.4	1.43 - 2.54
M2	0	354.8 - 631	1.07 - 1.91
	-5	266.1 - 473.2	0.8 - 1.43
M3	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M4	0	<199.5	<0.6
	-5	<149.6	<0.45

Cursor:

Total = 0.464 A/m

H Category: M2

Location: -3, 1, 364.7 mm



0 dB = 0.464A/m

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16. DAE & Probe Calibration certificate

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



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

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

Accreditation No.: SCS 108

Client SGS-TW

Certificate No: DAE4-547_Aug10

CALIBRATION CERTIFICATE

Object DAE4 - SD 000 D04 BJ - SN: 547

Calibration procedure(s) QA CAL-06.v22
Calibration procedure for the data acquisition electronics (DAE)

Calibration date: August 18, 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 $(22 \pm 3)^{\circ}\text{C}$ 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	1-Oct-09 (No: 9055)	Oct-10
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

Calibrated by:	Name Dominique Steffen	Function Technician	Signature
Approved by:	Fin Bornholt	R&D Director	

Issued: August 18, 2010

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Certificate No: DAE4-547_Aug10

Page 1 of 5

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Accreditation No.: SCS 108

Client SGS-TW (Auden)

Certificate No: ER3-2306_Apr11

CALIBRATION CERTIFICATE

Object ER3DV6 - SN:2306

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: April 18, 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 $(22 \pm 3)^{\circ}\text{C}$ and humidity $< 70\%$.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	31-Mar-11 (No. 217-01372)	Apr-12
Power sensor E4412A	MY41495277	31-Mar-11 (No. 217-01372)	Apr-12
Power sensor E4412A	MY41498087	31-Mar-11 (No. 217-01372)	Apr-12
Reference 3 dB Attenuator	SN: S5054 (3c)	29-Mar-11 (No. 217-01369)	Apr-12
Reference 20 dB Attenuator	SN: S5086 (20b)	29-Mar-11 (No. 217-01367)	Apr-12
Reference 30 dB Attenuator	SN: S5129 (30b)	29-Mar-11 (No. 217-01370)	Apr-12
Reference Probe ER3DV6	SN: 2328	4-Oct-10 (No. ER3-2328_Oct10)	Oct-11
DAE4	SN: 789	16-Feb-11 (No. DAE4-789_Feb11)	Feb-12
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

Calibrated by:	Name Jeton Kastrati	Function Laboratory Technician	Signature
Approved by:	Katja Pokovic	Technical Manager	

Issued: April 18, 2011

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Certificate No: ER3-2306_Apr11

Page 1 of 10

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Accreditation No.: **SCS 108**

Glossary:

NORM _{x,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., $\vartheta = 0$ 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:

- 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:

- NORM_{x,y,z}**: Assessed for E-field polarization $\vartheta = 0$ for XY sensors and $\vartheta = 90$ for Z sensor ($f \leq 900$ MHz in TEM-cell; $f > 1800$ MHz: R22 waveguide).
- NORM(f)_{x,y,z} = NORM_{x,y,z} * frequency_response** (see Frequency Response Chart).
- DCP_{x,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.
- A_{x,y,z}; B_{x,y,z}; C_{x,y,z}; VR_{x,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 NORM_x (no uncertainty required).

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ER3DV6 – SN:2306

April 18, 2011

Probe ER3DV6

SN:2306

Manufactured: December 17, 2002

Calibrated: April 18, 2011

Calibrated for DASY/EASY Systems

(Note: non-compatible with DASY2 system!)

Certificate No: ER3-2306_Apr11

Page 3 of 10

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ER3DV6- SN:2306

April 18, 2011

DASY/EASY - Parameters of Probe: ER3DV6 - SN:2306**Basic Calibration Parameters**

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu\text{V}/(\text{V/m})^2$)	1.11	1.14	1.27	$\pm 10.1\%$
DCP (mV) ^a	100.0	100.9	100.2	

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	114.4	$\pm 1.9\%$
			Y	0.00	0.00	1.00	91.8	
			Z	0.00	0.00	1.00	87.0	

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

^a 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.

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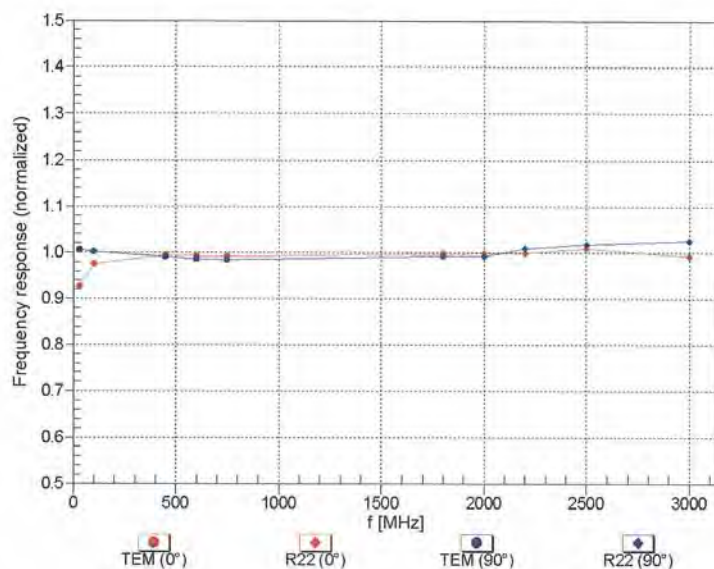
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ER3DV6- SN:2306

April 18, 2011

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

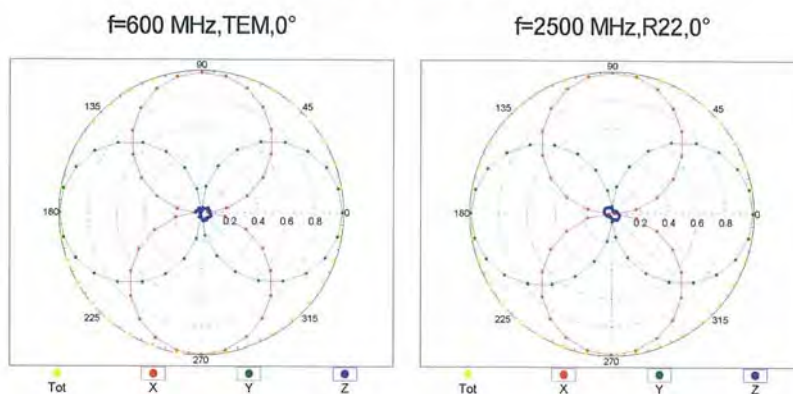
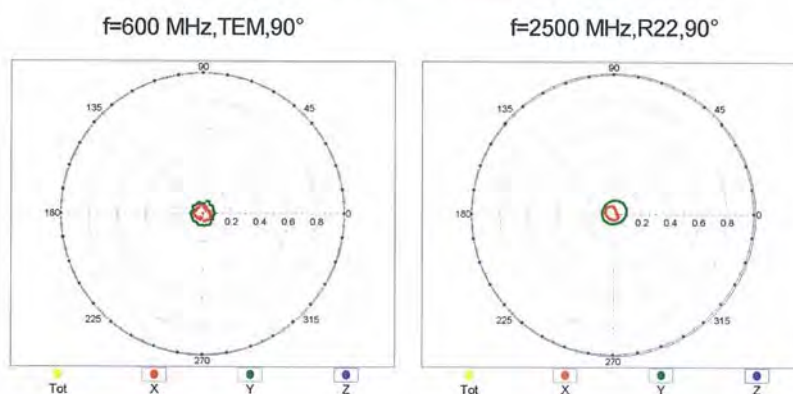
Uncertainty of Frequency Response of E-field: $\pm 6.3\%$ ($k=2$)

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ER3DV6- SN:2306

April 18, 2011

Receiving Pattern (ϕ), $\vartheta = 0^\circ$ Receiving Pattern (ϕ), $\vartheta = 90^\circ$ 

Certificate No: ER3-2306_Apr11

Page 6 of 10

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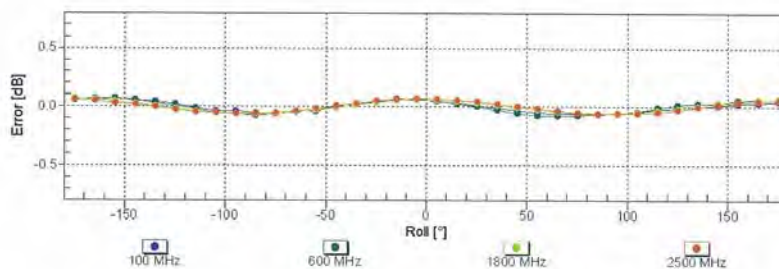
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ER3DV6-SN:2306

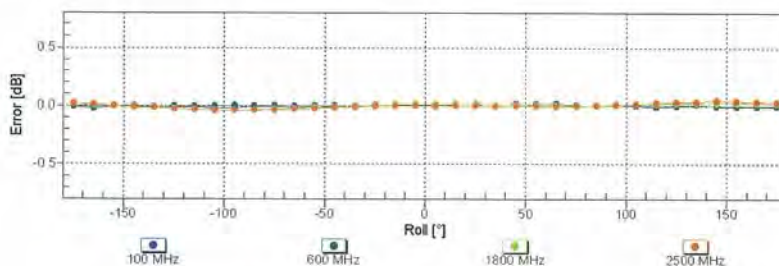
April 18, 2011

Receiving Pattern (ϕ), $\theta = 0^\circ$



Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ ($k=2$)

Receiving Pattern (ϕ), $\theta = 90^\circ$



Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ ($k=2$)

Certificate No: ER3-2306_Apr11

Page 7 of 10

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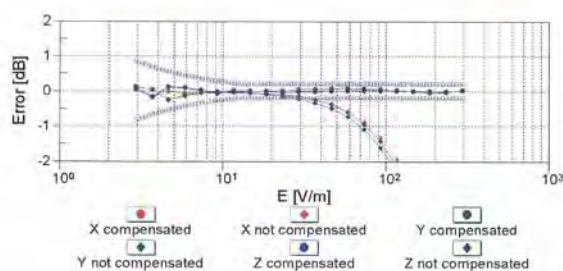
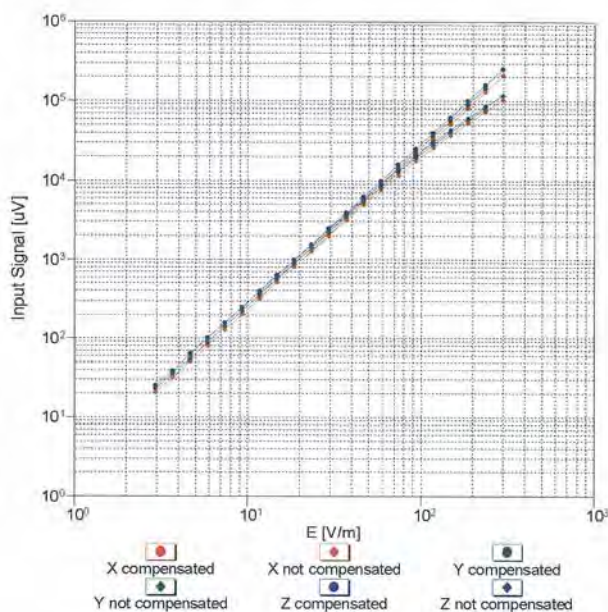
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ER3DV6- SN:2306

April 18, 2011

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



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

Certificate No: ER3-2306_Apr11

Page 8 of 10

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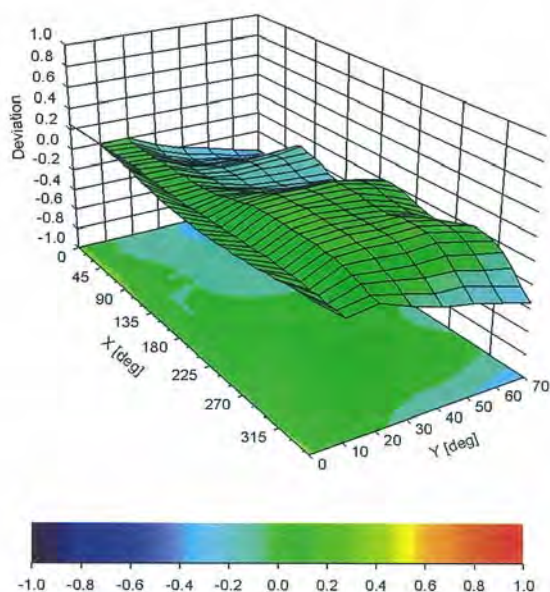
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ER3DV6-SN:2306

April 18, 2011

Deviation from Isotropy in Air

Error (ϕ , θ), $f = 900$ MHz



Uncertainty of Spherical Isotropy Assessment: $\pm 2.6\%$ ($k=2$)

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ER3DV6- SN:2306

April 18, 2011

DASY/EASY - Parameters of Probe: ER3DV6 - SN:2306**Other Probe Parameters**

Sensor Arrangement	Rectangular
Connector Angle (°)	-44.8
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	10 mm
Tip Diameter	8 mm
Probe Tip to Sensor X Calibration Point	2.5 mm
Probe Tip to Sensor Y Calibration Point	2.5 mm
Probe Tip to Sensor Z Calibration Point	2.5 mm

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Accreditation No.: SCS 108

Client SGS-TW (Auden)

Certificate No: H3-6142_Apr11

CALIBRATION CERTIFICATE

Object H3DV6 - SN:6142

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: April 18, 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 $(22 \pm 3)^{\circ}\text{C}$ and humidity $< 70\%$.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	31-Mar-11 (No. 217-01372)	Apr-12
Power sensor E4412A	MY41495277	31-Mar-11 (No. 217-01372)	Apr-12
Power sensor E4412A	MY41498087	31-Mar-11 (No. 217-01372)	Apr-12
Reference 3 dB Attenuator	SN: S5054 (3c)	29-Mar-11 (No. 217-01369)	Apr-12
Reference 20 dB Attenuator	SN: S5086 (20b)	29-Mar-11 (No. 217-01367)	Apr-12
Reference 30 dB Attenuator	SN: S5129 (30b)	29-Mar-11 (No. 217-01370)	Apr-12
Reference Probe H3DV6	SN: 6182	4-Oct-10 (No. H3-6182 Oct10)	Oct-11
DAE4	SN: 789	16-Feb-11 (No. DAE4-789 Feb11)	Feb-12
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:	Jeton Kastrati	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	
Issued: April 19, 2011			

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Certificate No: H3-6142_Apr11

Page 1 of 10

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



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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Glossary:

NORM_{x,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., $\vartheta = 0$ 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:

- 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:

- NORM_{x,y,z}**: Assessed for E-field polarization $\vartheta = 0$ for XY sensors and $\vartheta = 90$ for Z sensor ($f \leq 900$ MHz in TEM-cell; $f > 1800$ MHz: R22 waveguide).
- X, Y, Z(f)_a0a1a2**: $X, Y, Z_a0a1a2 \cdot \text{frequency_response}$ (see Frequency Response Chart).
- DCP_{x,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.
- A_{x,y,z}; B_{x,y,z}; C_{x,y,z}; VR_{x,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).

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H3DV6 – SN:6142

April 18, 2011

Probe H3DV6

SN:6142

Manufactured: July 3, 2002
Calibrated: April 18, 2011

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

Certificate No: H3-6142_Apr11

Page 3 of 10

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H3DV6 SN:6142

April 26, 2010

DASY - Parameters of Probe: H3DV6 SN:6142**Basic Calibration Parameters**

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm (A/m / $\sqrt{(\mu V)}$)	a0 2.73E-3	2.71E-3	3.08E-3	$\pm 5.1\%$
Norm (A/m / $\sqrt{(\mu V)}$)	a1 -6.53E-5	-1.16E-4	-3.09E-4	$\pm 5.1\%$
Norm (A/m / $\sqrt{(\mu V)}$)	a2 -1.83E-5	4.57E-6	3.49E-5	$\pm 5.1\%$
DCP (mV) ^A	91.3	82.0	82.1	

Modulation Calibration Parameters

UID	Communication System Name	PAR		A dB	B dBuV	C	VR mV	Unc ^E (k=2)
10000	CW	0.00	X	0.00	0.00	1.00	300	$\pm 1.5\%$
			Y	0.00	0.00	1.00	300	
			Z	0.00	0.00	1.00	300	

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%.

^A numerical linearization parameter: uncertainty not required

^E Uncertainty is determined using the maximum deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

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H3DV6- SN:6142

April 18, 2011

DASY/EASY - Parameters of Probe: H3DV6 - SN:6142**Basic Calibration Parameters**

		Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm (A/m / $\sqrt{\text{mV}}$)	a0	2.75E-003	2.73E-003	3.09E-003	$\pm 5.1 \%$
Norm (A/m / $\sqrt{\text{mV}}$)	a1	-8.24E-005	-1.19E-004	-3.03E-004	$\pm 5.1 \%$
Norm (A/m / $\sqrt{\text{mV}}$)	a2	-1.43E-005	7.23E-006	3.64E-005	$\pm 5.1 \%$
DCP (mV) ^B		92.4	88.1	92.2	

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	95.6	$\pm 3.0 \%$
			Y	0.00	0.00	1.00	96.8	
			Z	0.00	0.00	1.00	97.5	

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.

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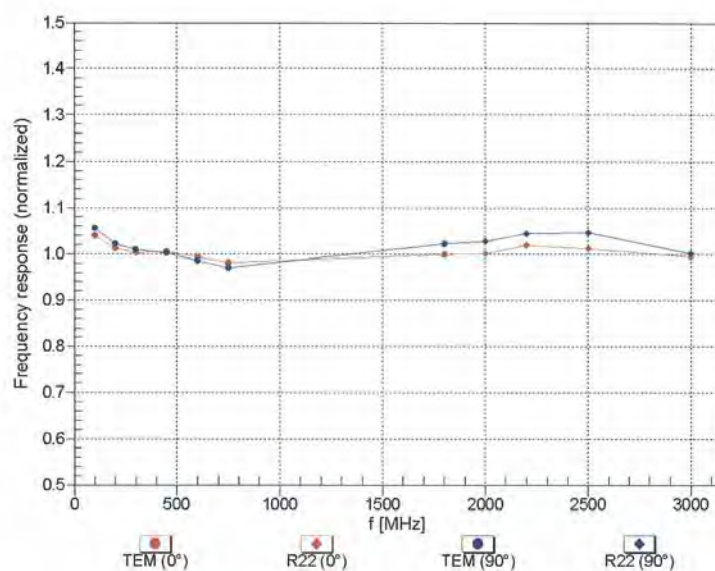
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H3DV6-- SN:6142

April 18, 2011

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

Uncertainty of Frequency Response of H-field: $\pm 6.3\%$ ($k=2$)

Certificate No: H3-6142_Apr11

Page 5 of 10

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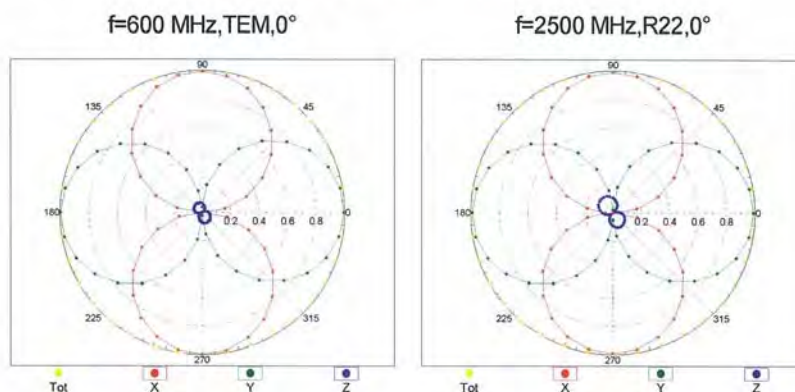
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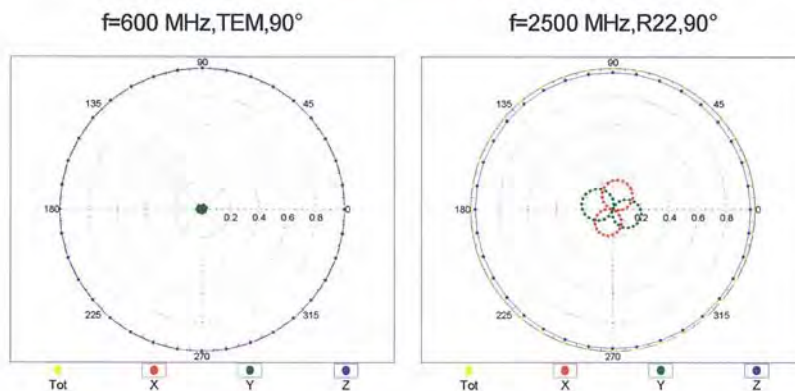
H3DV6-- SN:6142

April 18, 2011

Receiving Pattern (ϕ), $\theta = 0^\circ$



Receiving Pattern (ϕ), $\theta = 90^\circ$



Certificate No: H3-6142_Apr11

Page 6 of 10

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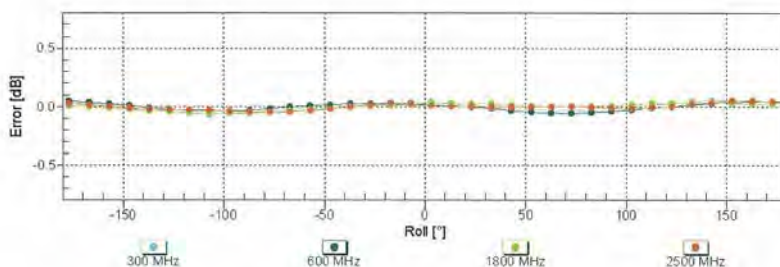
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H3DV6-SN:6142

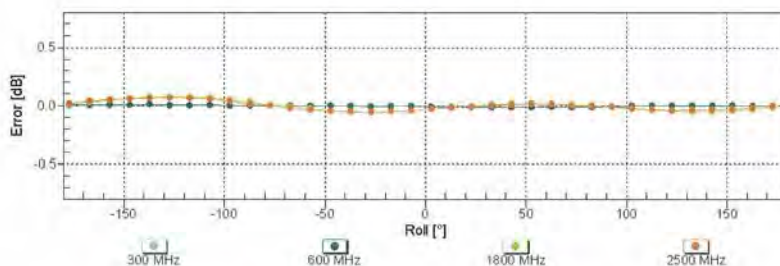
April 18, 2011

Receiving Pattern (ϕ), $\theta = 0^\circ$



Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ ($k=2$)

Receiving Pattern (ϕ), $\theta = 90^\circ$



Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ ($k=2$)

Certificate No: H3-6142_Apr11

Page 7 of 10

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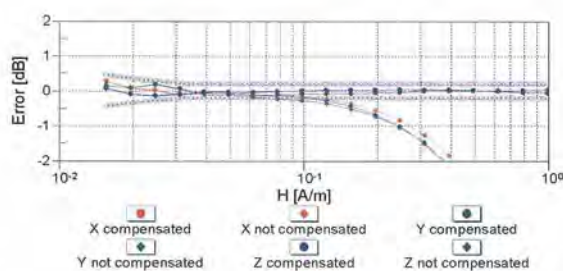
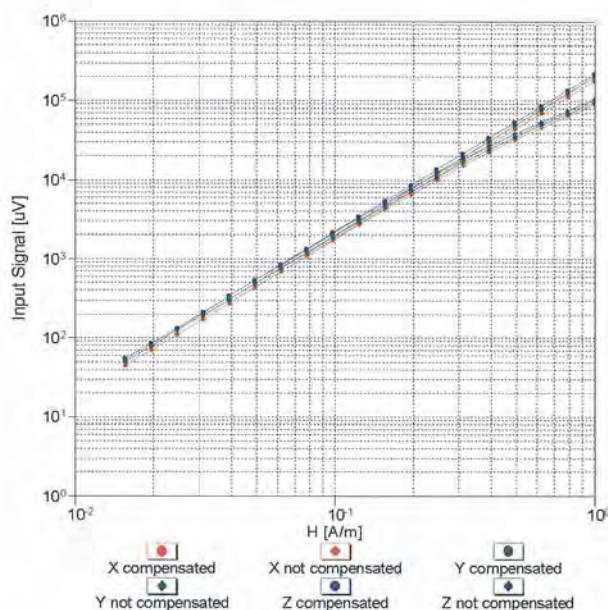
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H3DV6-SN:6142

April 18, 2011

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



Uncertainty of Linearity Assessment: $\pm 0.6\%$ (k=2)

Certificate No: H3-6142_Apr11

Page 8 of 10

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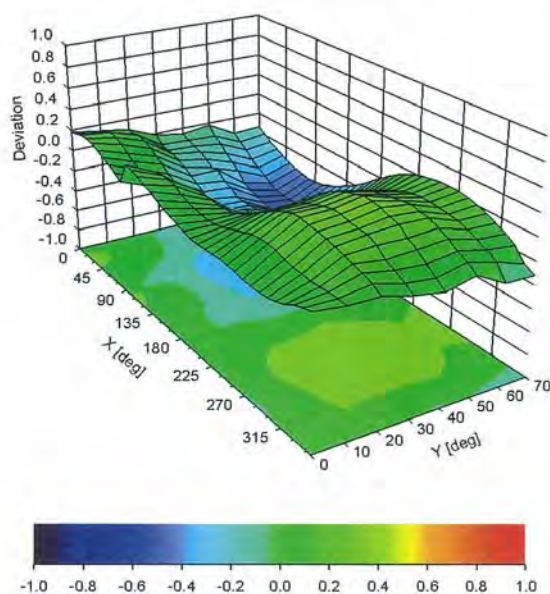
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H3DV6-SN:6142

April 18, 2011

Deviation from Isotropy in Air

Error (ϕ , θ), $f = 900$ MHz



Uncertainty of Spherical Isotropy Assessment: $\pm 2.6\%$ ($k=2$)

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H3DV6- SN:6142

April 18, 2011

DASY/EASY - Parameters of Probe: H3DV6 - SN:6142**Other Probe Parameters**

Sensor Arrangement	Rectangular
Connector Angle (°)	-67.1
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

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17. Uncertainty Analysis

HAC-Extension Setup Performance Test Using SPEAG Calibration Dipoles							
Error Description	Uncertainty value	Prob. Dist.	Div.	(c_1) E	(c_2) H	Std. Unc. E	Std. Unc. H
Measurement System							
Probe Calibration	±5.1 %	N	1	1	1	±5.1 %	±5.1 %
Axial Isotropy	±4.7 %	R	$\sqrt{3}$	1	1	±2.7 %	±2.7 %
Sensor Displacement	±16.5 %	R	$\sqrt{3}$	1	0.145	±9.5 %	±1.4 %
Boundary Effects	±2.4 %	R	$\sqrt{3}$	1	1	±1.4 %	±1.4 %
Linearity	±4.7 %	R	$\sqrt{3}$	1	1	±2.7 %	±2.7 %
Scaling to Peak Envelope Power	±0 %	R	$\sqrt{3}$	1	1	±0 %	±0 %
System Detection Limit	±1.0 %	R	$\sqrt{3}$	1	1	±0.6 %	±0.6 %
Readout Electronics	±0.3 %	N	1	1	1	±0.3 %	±0.3 %
Response Time	±0 %	R	$\sqrt{3}$	1	1	±0 %	±0 %
Integration Time	±0 %	R	$\sqrt{3}$	1	1	±0 %	±0 %
RF Ambient Conditions	±3.0 %	R	$\sqrt{3}$	1	1	±1.7 %	±1.7 %
RF Reflections	±6.0 %	R	$\sqrt{3}$	1	1	±3.5 %	±3.5 %
Probe Positioner	±1.2 %	R	$\sqrt{3}$	1	0.67	±0.7 %	±0.5 %
Probe Positioning	±4.7 %	R	$\sqrt{3}$	1	0.67	±2.7 %	±1.8 %
Extrap. and Interpolation	±1.0 %	R	$\sqrt{3}$	1	1	±0.6 %	±0.6 %
Dipole Related							
Distance Dipole Scanning Plane	±5.2 %	R	$\sqrt{3}$	1	0.3	±3.0 %	±0.9 %
Input power	±4.7 %	N	1	1	1	±4.7 %	±4.7 %
Combined Std. Uncertainty						±13.7 %	±9.3 %
Expanded Std. Uncertainty on Power						±27.4 %	±18.6 %
Expanded Std. Uncertainty on Field						±13.7 %	±9.3 %

Table 28.1: Uncertainty budget for HAC setup performance test. The budget is valid for the frequency range 800 MHz - 3 GHz and represents a worst-case analysis with respect to power uncertainty of the field. Some of the parameters are dependent on the user situations and need adjustment according to the actual laboratory conditions.

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18. System Validation from Original equipment supplier

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



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

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

Accreditation No.: SCS 108

Client **SGS TW (Auden)**

Certificate No: **CD835V3-1052_Apr11**

CALIBRATION CERTIFICATE

Object **CD835V3 - SN: 1052**

Calibration procedure(s) **QA CAL-20.v5
Calibration procedure for dipoles in air**

Calibration date: **April 12, 2011**

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	06-Oct-10 (No. 217-01266)	Oct-11
Power sensor HP 8481A	US37292783	06-Oct-10 (No. 217-01266)	Oct-11
Probe ER3DV6	SN: 2336	29-Dec-10 (No. ER3-2336_Dec10)	Dec-11
Probe H3DV6	SN: 6065	29-Dec-10 (No. H3-6065_Dec10)	Dec-11
DAE4	SN: 781	20-Oct-10 (No. DAE4-781_Oct10)	Oct-11
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter Agilent 4419B	SN: GB42420191	09-Oct-09 (in house check Oct-10)	In house check: Oct-11
Power sensor HP 8482H	SN: 3318A09450	09-Oct-09 (in house check Oct-10)	In house check: Oct-11
Power sensor HP 8482A	SN: US37295597	09-Oct-09 (in house check Oct-10)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-10)	In house check: Oct-11
RF generator E4433B	MY 41000675	03-Nov-04 (in house check Oct-09)	In house check: Oct-11

Calibrated by: **Name** Claudio Leubler **Function** Laboratory Technician **Signature**

Approved by: **Name** Fin Bornholt **Function** R&D Director **Signature**

Issued: April 12, 2011

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Certificate No: CD835V3-1052_Apr11

Page 1 of 6

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3.3.3 DASY4 H-field Result

Date/Time: 12.04.2011 12:10:13

Test Laboratory: SPEAG Lab2

HAC RF_CD835_1052_H_110412_CL

DUT: HAC-Dipole 835 MHz; Type: CD835V3; Serial: 1052

Communication System: CW; Frequency: 835 MHz

Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Phantom section: RF Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: H3DV6 - SN6065; ; Calibrated: 29.12.2010
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn781; Calibrated: 20.10.2010
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA; Serial: 1070
- Measurement SW: DASY52, V52.6 Build 2, Version 52.6.2 (424)
- Postprocessing SW: SEMCAD X, V14.4 Build 4, Version 14.4.4 (2829)

Dipole H-Field measurement @ 835MHz/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 = 0.472 A/m

Probe Modulation Factor = 1.000

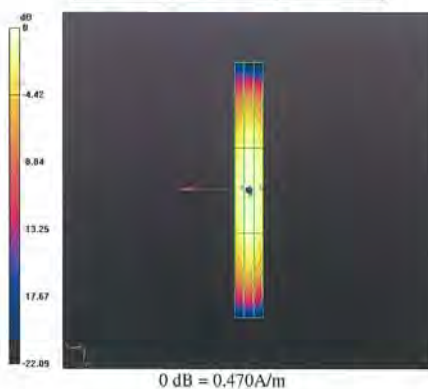
Device Reference Point: 0, 0, -6.3 mm

Reference Value = 0.501 A/m; Power Drift = 0.0075 dB

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

Peak H-field in A/m

Grid 1 0.379 M4	Grid 2 0.412 M4	Grid 3 0.400 M4
Grid 4 0.435 M4	Grid 5 0.472 M4	Grid 6 0.457 M4
Grid 7 0.390 M4	Grid 8 0.424 M4	Grid 9 0.411 M4



Certificate No: CD835V3-1052_Apr11

Page 5 of 6

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3.3.2 DASY4 E-field Result

Date/Time: 12.04.2011 16:48:35

Test Laboratory: SPEAG Lab2

HAC RF_CD835_1052_E_110412_CL**DUT: HAC-Dipole 835 MHz; Type: CD835V3; Serial: 1052**

Communication System: CW; Frequency: 835 MHz

Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1000$ kg/m³

Phantom section: RF Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ER3DV6 - SN2336; ConvF(1, 1, 1); Calibrated: 29.12.2010
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn781; Calibrated: 20.10.2010
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA; Serial: 1070
- Measurement SW: DASY52, V52.6 Build 2, Version 52.6.2 (424)
- Postprocessing SW: SEMCAD X, V14.4 Build 4, Version 14.4.4 (2829)

Dipole E-Field measurement @ 835MHz/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 = 176.1 V/m

Probe Modulation Factor = 1.000

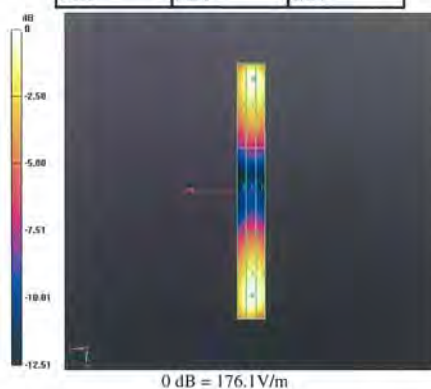
Device Reference Point: 0, 0, -6.3 mm

Reference Value = 129.9 V/m; Power Drift = -0.0049 dB

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

Peak E-field in V/m

Grid 1 157.6 M4	Grid 2 173.4 M4	Grid 3 171.1 M4
Grid 4 86.358 M4	Grid 5 93.677 M4	Grid 6 92.609 M4
Grid 7 162.8 M4	Grid 8 176.1 M4	Grid 9 173.4 M4



Certificate No: CD835V3-1052_Apr11

Page 6 of 6

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



S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
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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 SGS TW (Auden)

Certificate No: CD1880V3-1044_Apr11

CALIBRATION CERTIFICATE

Object CD1880V3 - SN: 1044

Calibration procedure(s) QA CAL-20.v5
Calibration procedure for dipoles in air

Calibration date: April 12, 2011

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	06-Oct-10 (No. 217-01266)	Oct-11
Power sensor HP 8481A	US37292783	06-Oct-10 (No. 217-01266)	Oct-11
Probe ER3DV6	SN: 2336	29-Dec-10 (No. ER3-2336_Dec10)	Dec-11
Probe H3DV6	SN: 6065	29-Dec-10 (No. H3-6065_Dec10)	Dec-11
DAE4	SN: 781	20-Oct-10 (No. DAE4-781_Oct10)	Oct-11
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter Agilent 4419B	SN: GB42420191	09-Oct-09 (in house check Oct-10)	In house check: Oct-11
Power sensor HP 8482H	SN: 3318A09450	09-Oct-09 (in house check Oct-10)	In house check: Oct-11
Power sensor HP 8482A	SN: US37295597	09-Oct-09 (in house check Oct-10)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-10)	In house check: Oct-11
RF generator E4433B	MY 41000675	03-Nov-04 (in house check Oct-09)	In house check: Oct-11

Calibrated by: Name Claudio Leubler Function Laboratory Technician Signature

Approved by: Fin Bornholt R&D Director

Issued: April 12, 2011

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Certificate No: CD1880V3-1044_Apr11

Page 1 of 6

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3.3.2 DASY4 H-Field Result

Date/Time: 12.04.2011 12:50:55

Test Laboratory: SPEAG Lab2

HAC_RF_CD1880_1044_H_110412_CL

DUT: HAC Dipole 1880 MHz; Type: CD1880V3; Serial: 1044

Communication System: CW; Frequency: 1880 MHz

Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³

Phantom section: RF Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: H3DV6 - SN6065; : Calibrated: 29.12.2010
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn781; Calibrated: 20.10.2010
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA; Serial: 1070
- Measurement SW: DASY52, V52.6 Build 2, Version 52.6.2 (424)
- Postprocessing SW: SEMCAD X, V14.4 Build 4, Version 14.4.4 (2829)

Dipole H-Field measurement @ 1880MHz/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 = 0.469 A/m

Probe Modulation Factor = 1.000

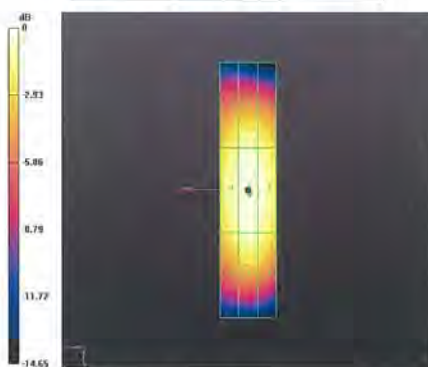
Device Reference Point: 0, 0, -6.3 mm

Reference Value = 0.495 A/m; Power Drift = 0.02 dB

Hearing Aid Near-Field Category: M2 (AWF 0 dB)

Peak H-field in A/m

Grid 1 0.399 M2	Grid 2 0.426 M2	Grid 3 0.413 M2
Grid 4 0.438 M2	Grid 5 0.469 M2	Grid 6 0.454 M2
Grid 7 0.402 M2	Grid 8 0.435 M2	Grid 9 0.420 M2



0 dB = 0.470 A/m

Certificate No: CD1880V3-1044_Apr11

Page 5 of 6

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3.3.3 DASY4 E-Field Result

Date/Time: 12.04.2011 15:23:54

Test Laboratory: SPEAG Lab2

HAC_RF_CD1880_1044_E_110412_CL

DUT: HAC Dipole 1880 MHz; Type: CD1880V3; Serial: 1044

Communication System: CW; Frequency: 1880 MHz

Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1000$ kg/m³

Phantom section: RF Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ER3DV6 - SN2336; ConvF(1, 1, 1); Calibrated: 29.12.2010
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn781; Calibrated: 20.10.2010
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA; Serial: 1070
- Measurement SW: DASY52, V52.6 Build 2, Version 52.6.2 (424)
- Postprocessing SW: SEMCAD X, V14.4 Build 4, Version 14.4.4 (2829)

Dipole E-Field measurement @ 1880MHz/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 = 144.0 V/m

Probe Modulation Factor = 1.000

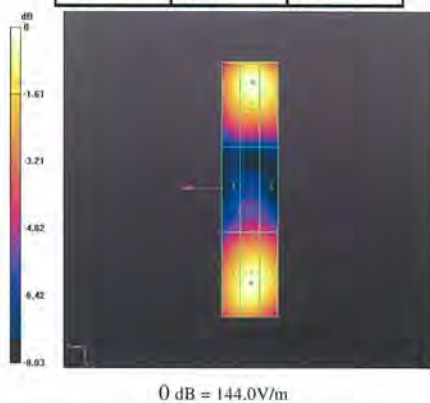
Device Reference Point: 0, 0, -6.3 mm

Reference Value = 142.5 V/m; Power Drift = -0.00043 dB

Hearing Aid Near-Field Category: M2 (AWF 0 dB)

Peak E-field in V/m

Grid 1 132.6 M2	Grid 2 144.0 M2	Grid 3 140.8 M2
Grid 4 85.400 M3	Grid 5 91.149 M3	Grid 6 90.076 M3
Grid 7 131.5 M2	Grid 8 138.5 M2	Grid 9 135.3 M2



Certificate No: CD1880V3-1044_Apr11

Page 6 of 6

End of 1st part of report

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