A Test Lab Techno Corp.

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HAC EVALUATION REPORT

Test Report No.	:	1105FS12-01
Applicant	:	HTC Corporation
Trade Name	:	HTC
Model Number	:	PH39100
EUT Type	:	Smartphone
FCC ID	:	NM8PH39100
Dates of Test	:	May 04, 2011
Issued Date	:	May 06, 2011
Test Environment	:	Ambient Temperature： 22 ± 2 ℃
		Relative Humidity： 40 - 70 %
FCC Rule Part(s)	:	FCC 47 CFR § 20.19.
HAC Standard	:	ANSI C63.19-2007
C63.19 HAC Rated Category	:	M3 (RF EMISSIONS)
Test Lab.	:	Chang-An Lab

1. The test operations have to be performed with cautious behavior, the test results are as attached.
2. The test results are under chamber environment of A Test Lab Techno Corp. A Test Lab Techno Corp. does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples.
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Approved By : Sam Chuang (Sam Chuang)

Tested By : Alex Wu (Alex Wu)

Contents

1. Description of Equipment under Test (EUT)

Applicant	:	HTC Corporation
Applicant Address	:	No. 23, Xinghua Rd., Taoyuan City, Taoyuan County 330, Taiwan
Manufacturer	:	HTC Corporation
Manufacturer Address	:	No. 23, Xinghua Rd., Taoyuan City, Taoyuan County 330, Taiwan
EUT Type	:	Smartphone
Trade Name	:	HTC
Model Number	:	PH39100
FCC ID	:	NM8PH39100
IMIE No	:	356298040016347
RF Output Power	:	1.622 W (32.10 dBm) GSM 850 0.813 W (29.10 dBm) PCS 1900 0.230 W (23.61 dBm) WCDMA Band II 0.257 W (24.10 dBm) WCDMA Band V
Tx Frequency	:	824.2 - 848.8 MHz (GSM 850) 1850.2 - 1909.8 MHz (PCS 1900) 1852.6 - 1907.4 MHz (WCDMA Band II) 826.6 - 846.4 MHz (WCDMA Band V)
Antenna Type	:	PIFA Type
Test Device	:	Production Unit
Device Category	:	Portable

This wireless portable device has performed Hearing Aid Compatibility (HAC) measurements for the portable cellular phone. The measurements were performed to ensure compliance to the ANSI C63.19-2007 standards.

2. Introduction

The A Test Lab Techno Corp. has performed measurements of the maximum potential exposure to the user of **HTC Corporation Trade Name: HTC Model(s)：PH39100.** The test procedures, as described in ANSI C63.19-2007 standard were employed. A description of the product and operating configuration, detailed summary of the test results, methodology and procedures used in the equipment are included within this test report.

3. Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	Dosimetric E-Filed Probe	ER3DV6R	2256	Aug. 23, 2010	Aug. 23, 2011
SPEAG	Dosimetric H-Filed Probe	H3DV6	6076	Aug. 23, 2010	Aug. 23, 2011
SPEAG	835 MHz System Validation Kit	CD835V3	1017	Jul. 13, 2010	Jul. 13, 2011
SPEAG	1880 MHz System Validation Kit	CD1880V3	1036	Jul. 13, 2010	Jul. 13, 2011
SPEAG	Data Acquisition Electronics	DAE4	541	Jul. 21, 2010	Jul. 21, 2011
SPEAG	Device Holder	N/A	N/A	NCR	
SPEAG	Phantom	SAM V4.0	TP-1150	NCR	
SPEAG	Robot	Staubli TX90XL	F07/564ZA1/C/01	NCR	
SPEAG	Software	DASY4 V4.7 Build 80	N/A	NCR	
SPEAG	Software	SEMCAD X V1.8 Build 186	N/A	NCR	
SPEAG	Measurement Server	SE UMS 011 AA	1025	NCR	
Agilent	Wireless Communication Test Set	CMU200	109369	Jul. 29, 2009	Jul. 29, 2011
Agilent	Spectrum Analyzer(ESA-L)	E4408B	MY45107753	Jun. 23, 2009	Jun. 23, 2011
R&S	Spectrum Analyzer(FSL)	FSL6	100410	NCR	
Agilent	Power Meter	E4418B	GB40206143	Jun. 19, 20010	Jun. 19, 2011
Agilent	MXG Vector Signal Generator	N5182A	MY47420962	Jun. 25, 2009	Jun. 25, 2011
R&S	Power Sensor	8481H	3318A20779	Jun. 19, 20010	Jun. 19, 2011
Agilent	Dual Directional Coupler	778D	50334	NCR	
Mini-Circuits	Power Amplifier	ZVE-8G	D042005 671800514	NCR	
Mini-Circuits	Power Amplifier	ZHL-42W-SMA	D111103#5	NCR	

Table 1. Test Equipment List

4. Test Procedure

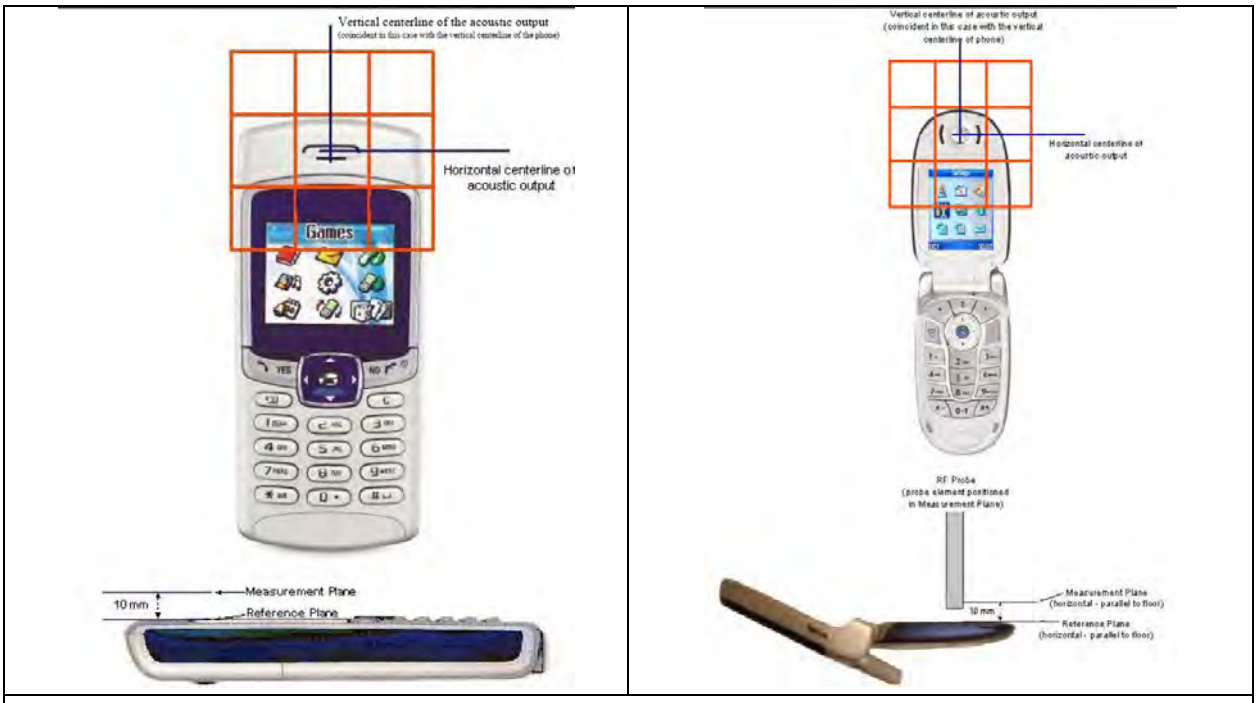


Figure 1. WD reference and plane for RF emission measurements

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 or 5mm increments in the 5 x 5 cm region were performed at a distance 15 mm from the center point of the probe measurement element to the WD. A 360o 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.

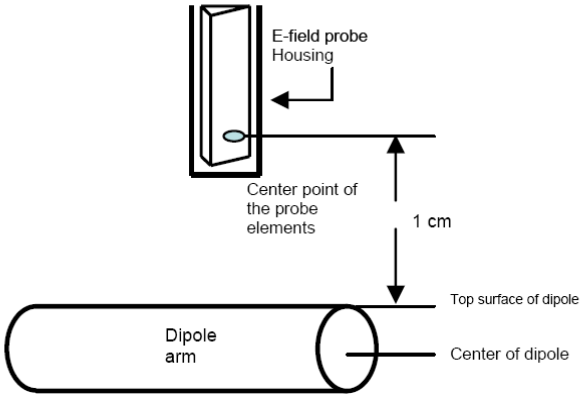
9. Steps 1-8 were done for both the E and H-Field measurements.

5. System Check

5.1 System check parameters

The input signal was an un-modulated continuous wave. The following points were taken into consideration in performing this check:

- Average Input Power P = 100mW RMS (20dBm RMS) after adjustment for return loss.
- The test fixture must meet the 2 wavelength separation criterion.
- The proper measurement of the 1 cm probe to dipole separation, which is measured from top surface of the dipole to the calibration reference point of the sensor, defined by the probe manufacturer is shown in the following diagram:



5.2 Validation Procedure

Place a dipole antenna meeting the requirements given in ANSI-PC63.19 in the position normally occupied by the WD. The dipole antenna serves as a known source for an electrical and magnetic output. Position the E-field and H-field probes so that:

- the probes and their cables are parallel to the coaxial feed of the dipole antenna
- the probe cables and the coaxial feed of the dipole antenna approach the measurement area from opposite directions; and
- the probes are 10 mm from the surface of the dipole elements.

Scan the length of the dipole with both E-field and H-field probes and record the maximum values for each. Compare the readings to expected values.

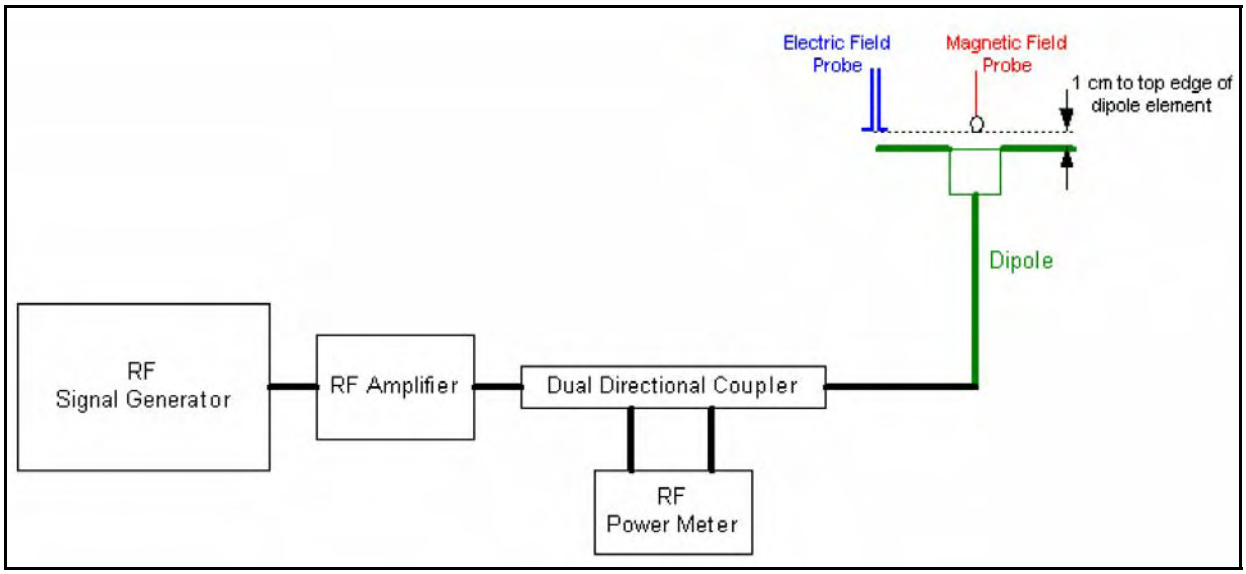


Figure 2. WD dipole calibration procedure

5.3 Illustrative dipole calculated and measured values

Baseband frequencies (MHz)	Frequency (MHz)	E-field calculated values (V/m)	E-field measured values (V/m)	E-field delta (calculated to measured) (V/m) & %	H-field calculated values (A/m)	H-field measured values (A/m)	H-field delta (calculated to measured A/m & %)
790–850	835	187			0.476		
806–821	813.5	190			0.481		
896–901	898.5	185			0.477		
1880–2000	1880	149			0.456		
		224.6–236.4			0.5139–0.5226		
		214.9–232.2			0.4954–0.5164		
		213.2–220.9			0.5032–0.5005		
		153.6–149.3			0.4478–0.4035		

NOTE 1— Numeric modeling results will vary based on several factors, including the size of the computational area, boundary conditions selected, grid resolution, accuracy of models for material properties, and other factors. Further, the results obtained by numeric modeling will vary from measured results based on many additional factors, including the degree to while the probe perturbs the field, the degree to which the probe averages the field strength over its dimensions, the linearity of the probe, the differences between the physical dipole and its modeled representation, and many other factors. Numeric computations provided to the committee showed significant variability between different results. Accordingly the values provided should be used judiciously and not interpreted to be absolutely correct. The calculated values provided for dipoles were developed using theoretical numerical computation.
NOTE 2— Delta % = 100 × (measured peak minus calculated) divided by calculated. Values within ± 25% are acceptable, of which 12% is deviation and 13% is measurement uncertainty. Values independently validated for the dipole actually used in the measurements should be used, when available.

5.4 Validation Results

Dipole	Freq. (MHz)	Protocol	Input Power (mW)	Target for Dipole (V/m)	E-Field Results (V/m)	Deviation	Date
SN:1017	835	CW	100	168.6	177.9	5.52 %	May 04, 2011
SN:1036	1880	CW	100	139.2	149.0	7.04 %	May 04, 2011

Table 2. Dipole E-Field Measurement Summary

Dipole	Freq. (MHz)	Protocol	Input Power (mW)	Target for Dipole (A/m)	H-Field Results (A/m)	Deviation	Date
SN:1017	835	CW	100	0.457	0.443	-3.06 %	May 04, 2011
SN:1036	1880	CW	100	0.468	0.449	-4.06 %	May 04, 2011

Table 3. Dipole H-Field Measurement Summary

6. Probe Modulation Factor

After every probe calibration, the response of the probe to each applicable modulated signal (CDMA, GSM, WCDMA (UMTS), etc) must be assessed at both 835 MHz, 1880 MHz. The response of the probe system to a CW field at the frequency(s) of interest is compared to its response to a modulated signal with equal peak amplitude. For each PMF assessment, a Signal Generator was used to replace the original CW signal with the desired modulated signal. The PMF results are shown in Table 4. RF Field Probe Modulation Response was measured with the field probe and associated measurement equipment. The PMF was measured per ANSI C63.19-2007 using a signal generator as follows:

1. Illuminate a dipole with a CW signal at the intended measured frequency.
2. Fix the probe at a set location relative to the dipole; typically located at the field reference point.
3. Record the reading of the probe measurement system of the CW signal.
4. Substitute a modulated signal of the same amplitude, using the same modulation as that used by the intended WD for the CW signal.
5. Record the reading of the probe measurement system of the modulated signal.
6. The ratio of the CW to modulated signal reading is the probe modulation factor.
7. Spectrum analyzer settings:
   - Center Frequency: nominal center frequency of channel
   - Span: zero
   - Resolution bandwidth >= emission bandwidth
   - Video bandwidth >= 20 kHz.
   - 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.
8. CalculatetheProbeModulationFactorastheratiobetweentheCWmultimeterfieldreadingandthereadingfortheapplicablemodulation.I.e., $\mathrm{PMF} = \frac{E_{CW}}{E_{mod}}$ and similar for H.

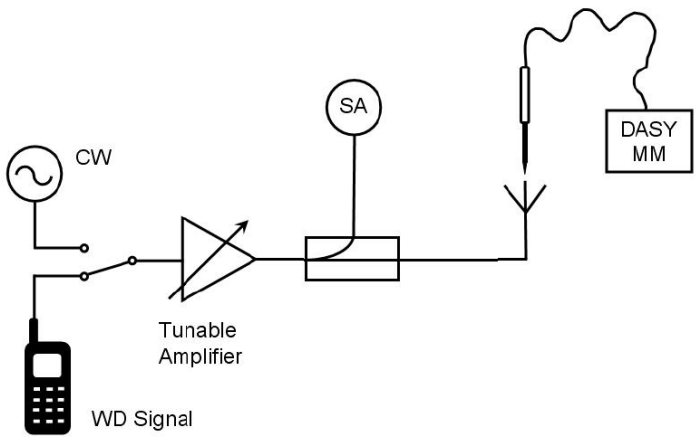


Figure 3. Probe Modulation Factor Measurement Diagram

Formula between PMF and test results

1. HAC test of device and determine the maximum value (M) of grids.
2. Determine the value (P) of PMF according to (M).
3. Find the maximum value (F) from the other data.

$$R = P * F$$

Example:

E-Field Maximum value (M) = 52, Maximum value (F) = 51.8, PMF (P) = 2.82

R = 51.8 * 2.82 = 146.076 V/m

Frequency (MHz)	Protocol	E-Field Probe SN:2256		H-Field Probe SN:6076	
		E-Field (V/m)	E-Field Modulation Factor	H-Field (A/m)	H-Field Modulation Factor
835.0	GSM	< 47	2.53	< 0.14	1.81
		47 - 63	2.54	0.14 - 0.19	2.12
		63 - 84	2.54	0.19 - 0.25	2.37
		84 - 112	2.55	0.25 - 0.34	2.57
		112 - 150	2.56	0.34 - 0.45	2.68
		150 - 200	2.56	0.45 - 0.60	2.71
		200- 266	2.57	0.60 - 0.80	2.64
		266 - 355	2.57	0.80 - 1.07	2.49
		355 - 473	2.58	1.07 - 1.43	2.26
		473 - 631	2.58	1.43 - 1.91	1.98
		631 - 841	2.59	1.91 - 2.54	1.67
		841 - 1122	2.60	2.54 - 3.39	1.36
1880.0	GSM	< 47	2.53	< 0.14	2.63
		47 - 63	2.52	0.14 - 0.19	2.59
		63 - 84	2.51	0.19 - 0.25	2.54
		84 - 112	2.50	0.25 - 0.34	2.44
		112 - 150	2.49	0.34 - 0.45	2.32
		150 - 200	2.48	0.45 - 0.60	2.18
		200- 266	2.47	0.60 - 0.80	2.02
		266 - 355	2.46	0.80 - 1.07	1.92
		355 - 473	2.45	1.07 - 1.43	1.73
		473 - 631	2.44	1.43 - 1.91	1.54
		631 - 841	2.43	1.91 - 2.54	1.36
		841 - 1122	2.42	2.54 - 3.39	1.17

Frequency (MHz)	Protocol	E-Field Probe SN:2256		H-Field Probe SN:6076	
		E-Field (V/m)	E-Field Modulation Factor	H-Field (A/m)	H-Field Modulation Factor
835.0	WCDMA(UMTS)	< 47	1.07	< 0.14	0.86
		47 - 63	1.04	0.14 - 0.19	0.86
		63 - 84	1.01	0.19 - 0.25	0.85
		84 - 112	0.98	0.25 - 0.34	0.83
		112 - 150	0.95	0.34 - 0.45	0.81
		150 - 200	0.92	0.45 - 0.60	0.78
		200- 266	0.89	0.60 - 0.80	0.75
		266 - 355	0.87	0.80 - 1.07	0.72
		355 - 473	0.84	1.07 - 1.43	0.68
		473 - 631	0.82	1.43 - 1.91	0.64
		631 - 841	0.79	1.91 - 2.54	0.61
		841 - 1122	0.77	2.54 - 3.39	0.56
1880.0	WCDMA(UMTS)	< 47	0.90	< 0.14	0.81
		47 - 63	0.89	0.14 - 0.19	0.76
		63 - 84	0.89	0.19 - 0.25	0.71
		84 - 112	0.89	0.25 - 0.34	0.65
		112 - 150	0.89	0.34 - 0.45	0.59
		150 - 200	0.89	0.45 - 0.60	0.52
		200- 266	0.89	0.60 - 0.80	0.46
		266 - 355	0.89	0.80 - 1.07	0.39
		355 - 473	0.89	1.07 - 1.43	0.33
		473 - 631	0.88	1.43 - 1.91	0.28
		631 - 841	0.88	1.91 - 2.54	0.23
		841 - 1122	0.88	2.54 - 3.39	0.19

Table 4. PMF Measurement Summary

Note: PMF measurements were verified at WD's power as an input to the dipole.

7. HAC Testing with RF Transmitters

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

CDMA Devices setup for HAC Measurement.

The signal was setup by creating and maintaining an over the coaxial connection between the DUT and an R&S CMU200 Wireless Communications Test Set. The CDMA radio is available on CDMA 2000(1X) and IS-95. The test equipment was configured to use "all up bits" for RC1 / SO2 on J-STD-008 for CDMA 1900 and TSB-84 for CDMA 800 MHz. The 5cm x 5cm area measurement grid is centered on the acoustic output of the device. The Test Arch provided by SPEAG is used to position the DUT. The WD reference plane is parallel to the device and contains the highest point on its contour in the area of the phone that normally rests against the user's ear. The measurement plane contains the nearest point on the probe sensor(s) relative to the WD. The pictures of the setup are included in 7.3.

WCDMA Devices setup for HAC Measurement.

The following procedures are applicable to WCDMA handsets operating under 3GPP Release 99 and Release 5. The default test configuration is to measure HAC with an established radio link between the DUT and a communication test set using a 12.2 kbps RMC (reference measurement channel) configured in Test Loop Mode 1. HAC is selectively confirmed for other physical channel configurations (DPCCH & $DPDCH_n$) according to output power, exposure conditions and device operating capabilities. Both uplink and downlink should be configured with the same RMC or AMR, when required. Maximum output power is verified according to 3GPP TS 34.121 and HAC must be measured according to these maximum output conditions.

8. Test Results

8.1 HAC E-Field measurement results

Band	Rating	E-Field
GSM 850	M3	149.6 to 266.1 V/m
	M4	< 149.6 V/m
PCS 1900	M3	47.3 to 84.1 V/m
	M4	< 47.3 V/m
WCDMA Band V	M3	199.5 to 354.8
	M4	< 199.5
WCDMA Band II	M3	63.1 to 112.2
	M4	< 63.1

Table 5. Emissions Limits

Band	Channel	Conducted Power (dBm)	Measured PMF	Drift (dB)	Excluded Cells	Peak Field (V/m)	Rating	Note
GSM 850	128	31.90	2.56	-0.094	2.3.6	128.6	M4	---
	190	32.10	2.56	-0.072	2.3.6	127.7	M4	---
	251	32.00	2.56	-0.169	2.3.6	128.8	M4	---
PCS 1900	512	29.00	2.51	-0.141	2.3.6	48.8	M3	---
	661	29.10	2.51	-0.047	1.2.3	49.7	M3	---
	810	28.90	2.51	-0.032	1.2.3	56.0	M3	---
WCDMA Band II	9262	23.61	0.90	0.020	2.3.6	28.7	M4	---
	9400	23.60	0.90	-0.009	2.3.6	27.4	M4	---
	9537	23.30	0.90	-0.118	1.2.3	28.3	M4	---
WCDMA Band V	4132	23.92	1.01	-0.058	2.3.6	56.4	M4	---
	4180	23.82	1.04	-0.029	2.3.6	59.8	M4	---
	4233	24.10	1.04	-0.233	2.3.6	61.3	M4	---

Note: HAC E-Field measurement results for the portable cellular telephone at highest possible output power.

8.2 HAC H-Field measurement results

Band	Rating	H-Field
GSM 850	M3	0.45 to 0.80 A/m
	M4	< 0.45 A/m
PCS 1900	M3	0.14 to 0.25 A/m
	M4	<0.14 A/m
WCDMA Band V	M3	0.60 to 1.07
	M4	< 0.60
WCDMA Band II	M3	0.19 to 0.34
	M4	< 0.19

Table 6. Emissions Limits

Band	Channel	Conducted Power (dBm)	Measured PMF	Drift (dB)	Excluded Cells	Peak Field (A/m)	Rating	Note
GSM 850	128	31.90	2.57	-0.153	1.4.7	0.207	M4	---
	190	32.10	2.57	-0.098	1.4.7	0.198	M4	---
	251	32.00	2.57	-0.044	1.4.7	0.202	M4	---
PCS 1900	512	29.00	2.54	0.025	1.4.7	0.154	M3	---
	661	29.10	2.54	-0.024	1.4.7	0.169	M3	---
	810	28.90	2.54	-0.020	1.2.3	0.190	M3	---
WCDMA Band II	9262	23.61	0.81	-0.029	1.4.7	0.079	M4	---
	9400	23.60	0.81	0.005	1.4.7	0.080	M4	---
	9538	23.30	0.81	-0.034	1.2.3	0.080	M4	---
WCDMA Band V	4132	23.92	0.86	-0.002	1.4.7	0.069	M4	---
	4180	23.82	0.86	-0.019	1.4.7	0.071	M4	---
	4233	24.10	0.86	-0.080	1.4.7	0.075	M4	---

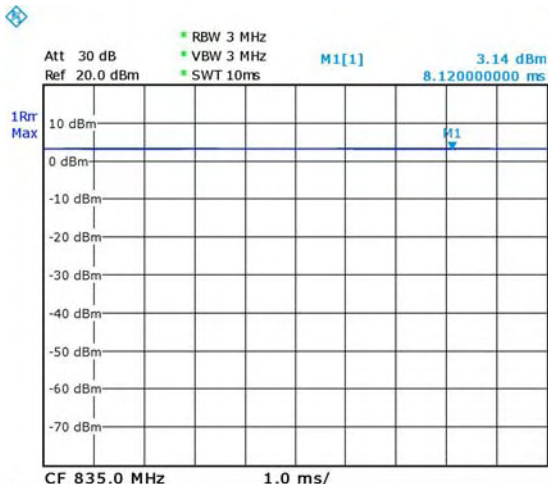
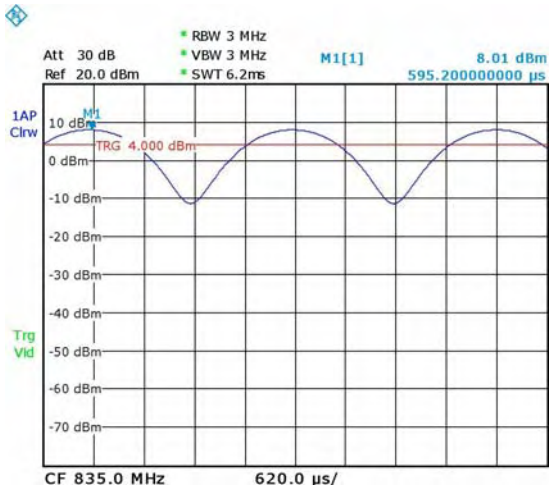
Note: HAC H-Field measurement results for the portable cellular telephone at highest possible output power.

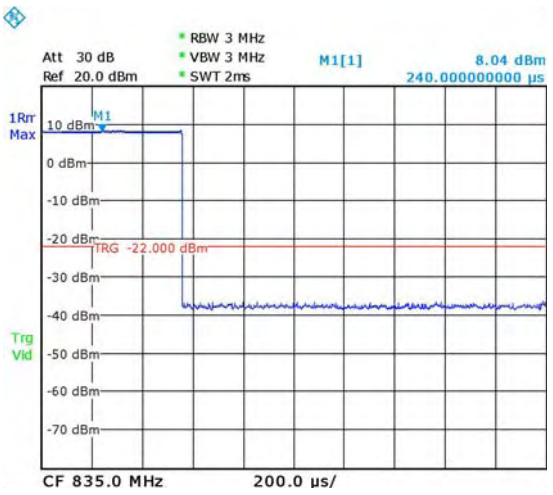
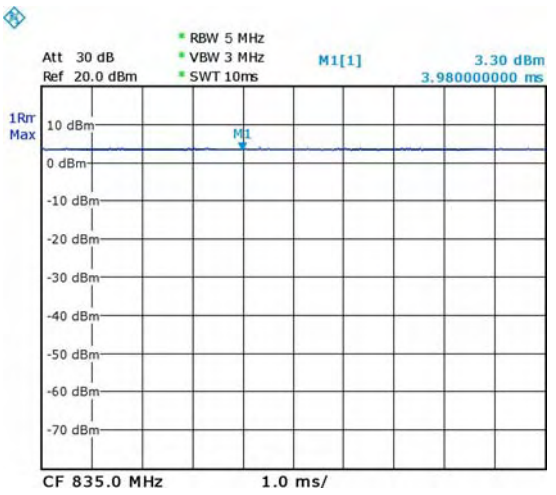
8.3 Description of the Device under Test (DUT)

Modes and Bands of Operation	GSM 850	PCS 1900	WCDMA Band V	WCDMA Band II
Modulation Mode	GMSK	GMSK	QPSK	QPSK
Duty Cycle	1/8.3	1/8.3	1/1	1/1
Transmitter Frequency Range (MHz)	824.2 - 848.8	1850.2 -1909.8	826.6 - 846.4	1852.6 - 1907.4

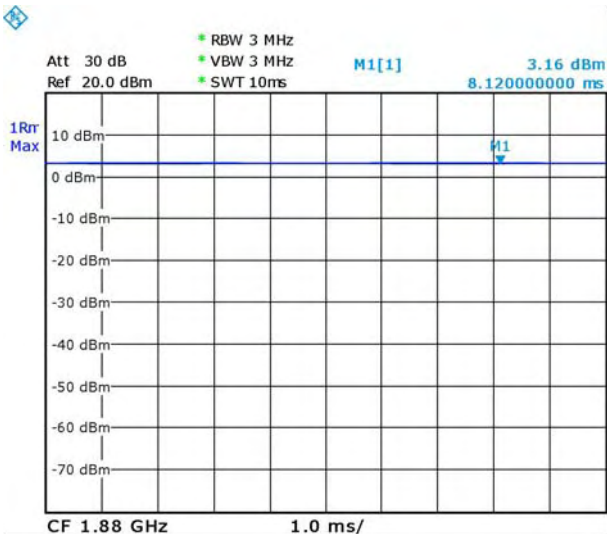
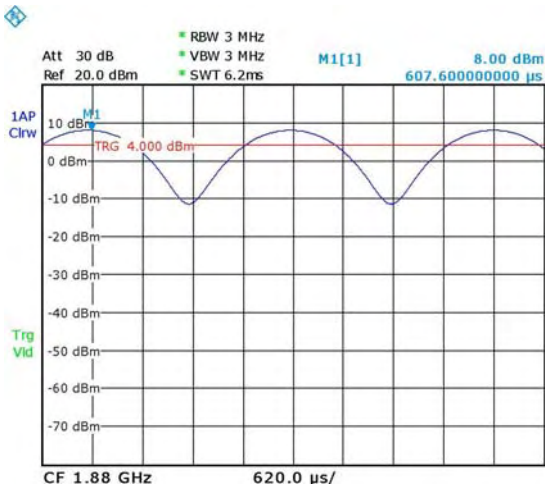
Appendix A - Details of WD signal

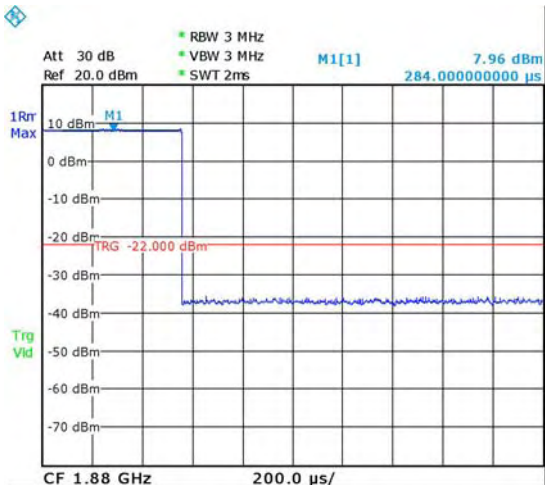
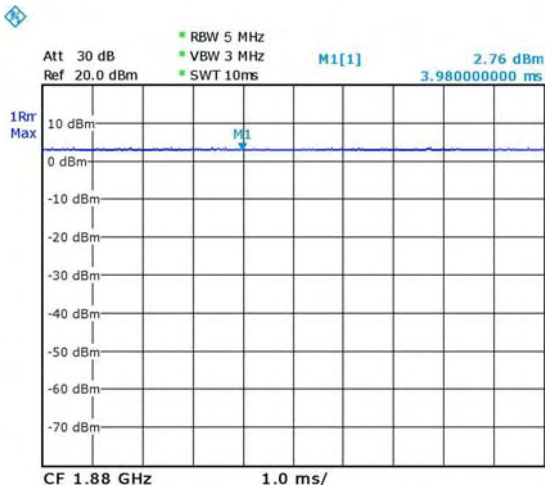
GSM 835 MHz

	
CW Signal	**AM80%**

	
GSM Signal	**WCDMA Signal**

1880 MHz

	
CW Signal	**AM80%**

	
GSM Signal	**WCDMA Signal**

Appendix B - Validation

Date/Time: 2011/5/4 AM 11:34:01

Test Laboratory: A Test Lab Techno Corp.

HAC_System Performance Check at 835MHz_20110504_E

DUT: Dipole 835 MHz; Type: CD835V3; Serial: CD835V3 - SN:1017

Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1000$ kg/m^3
Phantom section: E Dipole Section
Measurement Standard: DASY4 (High Precision Assessment)

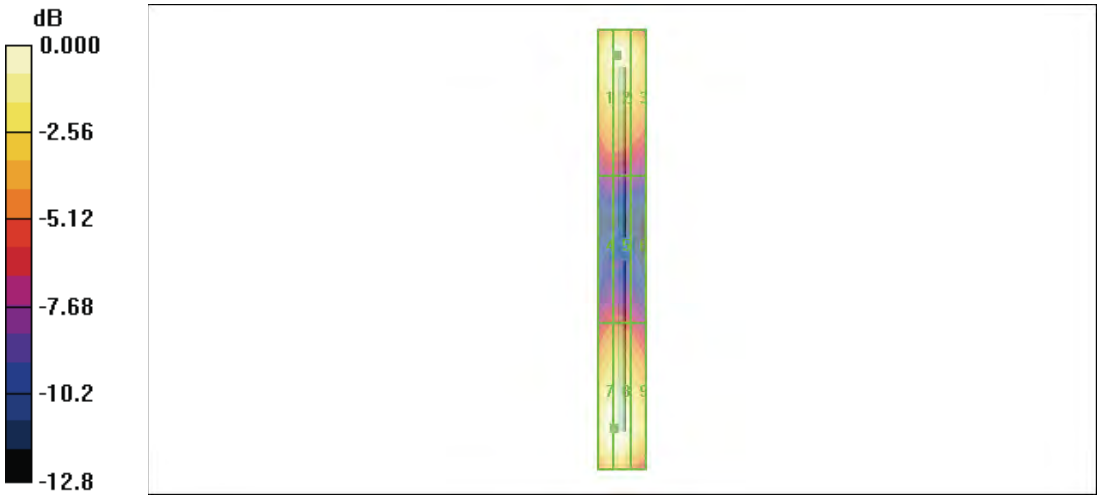
DASY4 Configuration:

- Probe: ER3DV6R - SN2256; ConvF(1, 1, 1); Calibrated: 2010/8/23
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn541; Calibrated: 2010/7/21
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: 1038
- Measurement SW: DASY4, V4.7 Build 80;Postprocessing SW: SEMCAD, V1.8 Build 186

E Scan - ER3DV6R - 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 = 177.9 V/m
Probe Modulation Factor = 1.00
Device Reference Point: 0.000, 0.000, 354.7 mm
Reference Value = 132.2 V/m; Power Drift = -0.001 dB
Hearing Aid Near-Field Category: M4 (AWF 0 dB)
Cursor:
Total = 177.9 V/m
E Category: M4
Location: 3, 73, 364.7 mm

Peak E-field in V/m

Grid 1 **166.0 M4**	Grid 2 **167.0 M4**	Grid 3 **154.3 M4**
Grid 4 **96.7 M4**	Grid 5 **97.0 M4**	Grid 6 **88.9 M4**
Grid 7 **177.5 M4**	Grid 8 **177.9 M4**	Grid 9 **162.3 M4**



0 dB = 177.9V/m

Date/Time: 2011/5/4 AM 11:50:57

Test Laboratory: A Test Lab Techno Corp.

HAC_System Performance Check at 1880MHz_20110504_E

DUT: Dipole 1880 MHz; Type: CD1880V3; Serial: CD1880V3 - SN:1036

Communication System: CW; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1000$ kg/m^3
Phantom section: E Dipole Section
Measurement Standard: DASY4 (High Precision Assessment)

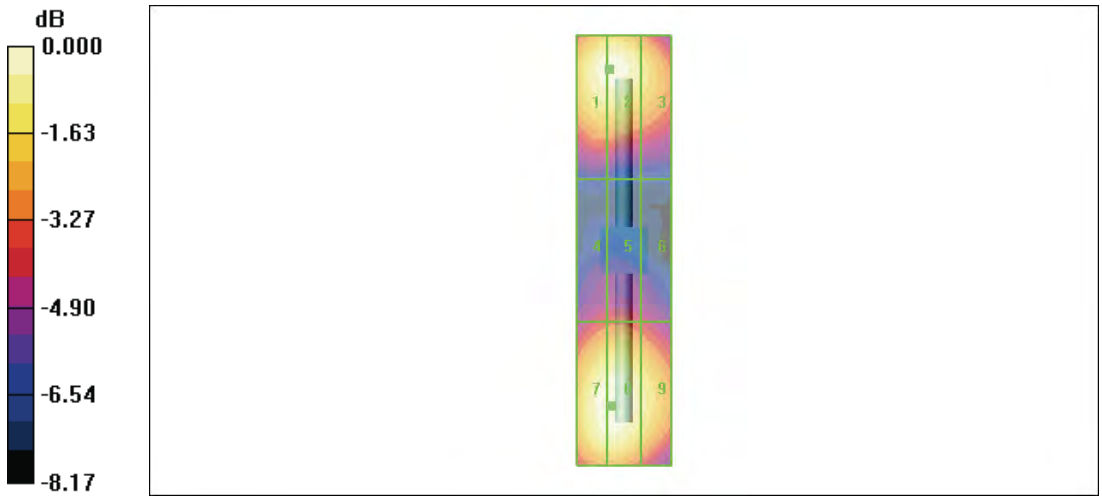
DASY4 Configuration:

- Probe: ER3DV6R - SN2256; ConvF(1, 1, 1); Calibrated: 2010/8/23
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn541; Calibrated: 2010/7/21
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: 1038
- Measurement SW: DASY4, V4.7 Build 80;Postprocessing SW: SEMCAD, V1.8 Build 186

E Scan - ER3DV6R - 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 = 149.0 V/m
Probe Modulation Factor = 1.00
Device Reference Point: 0.000, 0.000, 354.7 mm
Reference Value = 148.3 V/m; Power Drift = -0.005 dB
Hearing Aid Near-Field Category: M2 (AWF 0 dB)
Cursor:
Total = 149.0 V/m
E Category: M2
Location: 2.5, 32.5, 364.7 mm

Peak E-field in V/m

Grid 1 **146.5 M2**	Grid 2 **146.8 M2**	Grid 3 **131.2 M2**
Grid 4 **99.0 M3**	Grid 5 **100.5 M3**	Grid 6 **94.4 M3**
Grid 7 **148.5 M2**	Grid 8 **149.0 M2**	Grid 9 **136.0 M2**



0 dB = 149.0V/m

Date/Time: 2011/5/4 AM 11:17:10

Test Laboratory: A Test Lab Techno Corp.

HAC_System Performance Check at 835MHz_20110504_H

DUT: Dipole 835 MHz; Type: CD835V3; Serial: CD835V3 - SN:1017

Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Phantom section: H Dipole Section
Measurement Standard: DASY4 (High Precision Assessment)

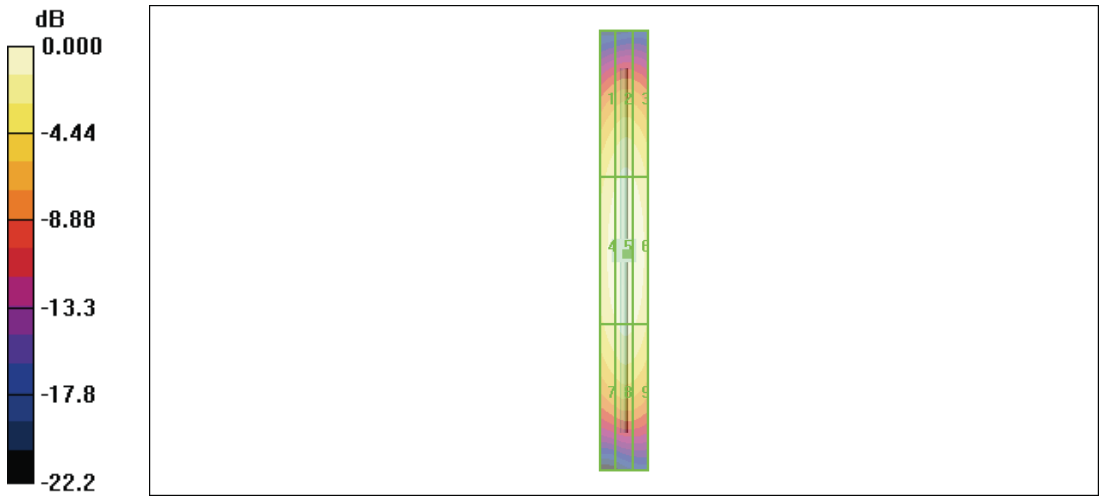
DASY4 Configuration:

- Probe: H3DV6 - SN6076; ; Calibrated: 2010/8/23
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn541; Calibrated: 2010/7/21
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: 1038
- 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 CD835 Dipole = 10mm/Hearing Aid Compatibility Test (41x361x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 0.443 A/m
Probe Modulation Factor = 1.00
Device Reference Point: 0.000, 0.000, 354.7 mm
Reference Value = 0.470 A/m; Power Drift = -0.113 dB
Hearing Aid Near-Field Category: M4 (AWF 0 dB)
Cursor:
Total = 0.443 A/m
H Category: M4
Location: -1, 1.5, 364.7 mm

Peak H-field in A/m

Grid 1 **0.363 M4**	Grid 2 **0.387 M4**	Grid 3 **0.378 M4**
Grid 4 **0.414 M4**	Grid 5 **0.443 M4**	Grid 6 **0.432 M4**
Grid 7 **0.368 M4**	Grid 8 **0.393 M4**	Grid 9 **0.382 M4**



0 dB = 0.443A/m

Date/Time: 2011/5/4 PM 12:05:28

Test Laboratory: A Test Lab Techno Corp.

HAC_System Performance Check at 1880MHz_20110504_H

DUT: Dipole 1880 MHz; Type: CD1880V3; Serial: CD1880V3 - SN:1036

Communication System: CW; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Phantom section: H Dipole Section
Measurement Standard: DASY4 (High Precision Assessment)

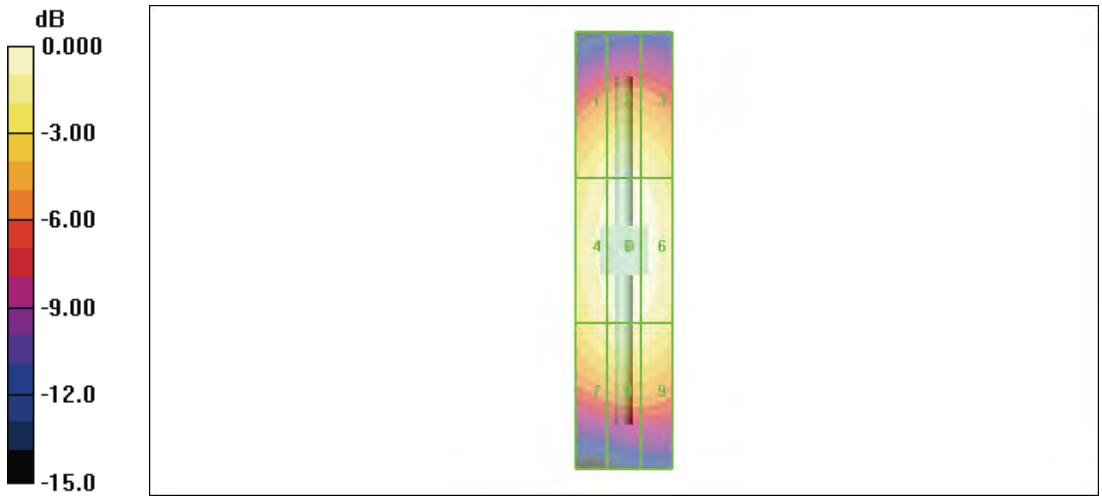
DASY4 Configuration:

- Probe: H3DV6 - SN6076; ; Calibrated: 2010/8/23
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn541; Calibrated: 2010/7/21
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: 1038
- 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 CD1880 Dipole = 10mm/Hearing Aid Compatibility Test (41x181x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 0.449 A/m
Probe Modulation Factor = 1.00
Device Reference Point: 0.000, 0.000, 354.7 mm
Reference Value = 0.473 A/m; Power Drift = -0.003 dB
Hearing Aid Near-Field Category: M2 (AWF 0 dB)
Cursor:
Total = 0.449 A/m
H Category: M2
Location: -1, -1, 364.7 mm

Peak H-field in A/m

Grid 1 **0.389 M2**	Grid 2 **0.414 M2**	Grid 3 **0.404 M2**
Grid 4 **0.421 M2**	Grid 5 **0.449 M2**	Grid 6 **0.439 M2**
Grid 7 **0.382 M2**	Grid 8 **0.405 M2**	Grid 9 **0.396 M2**



0 dB = 0.449A/m

Appendix C - HAC distribution plots for E-Field and H-Field

Date/Time: 2011/5/4 PM 04:52:04

Test Laboratory: A Test Lab Techno Corp.

HAC_GSM850 CH128_E

DUT: PH39100; Type: Smartphone; FCC ID: NM8PH39100

Communication System: GSM850; Frequency: 824.2 MHz;Duty Cycle: 1:8.3
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1000$ kg/m^3
Phantom section: E Device Section
Measurement Standard: DASY4 (High Precision Assessment)

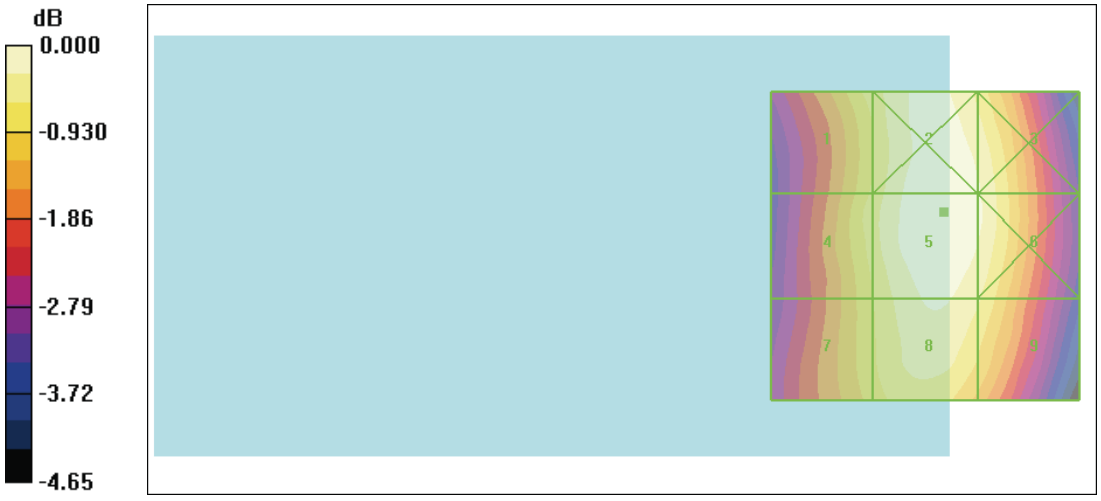
DASY4 Configuration:

- Probe: ER3DV6R - SN2256; ConvF(1, 1, 1); Calibrated: 2010/8/23
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn541; Calibrated: 2010/7/21
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: 1038
- 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 = 128.6 V/m
Probe Modulation Factor = 2.56
Device Reference Point: 0.000, 0.000, 353.7 mm
Reference Value = 64.1 V/m; Power Drift = -0.094 dB
Hearing Aid Near-Field Category: M4 (AWF -5 dB)
Cursor:
Total = 128.6 V/m
E Category: M4
Location: -3, -5.5, 368.7 mm

Peak E-field in V/m

Grid 1 **118.0 M4**	Grid 2 **128.3 M4**	Grid 3 **124.8 M4**
Grid 4 **118.3 M4**	Grid 5 **128.6 M4**	Grid 6 **125.3 M4**
Grid 7 **115.5 M4**	Grid 8 **124.7 M4**	Grid 9 **120.4 M4**



0 dB = 128.6V/m

Date/Time: 2011/5/4 PM 05:01:42

Test Laboratory: A Test Lab Techno Corp.

HAC_GSM850 CH190_E

DUT: PH39100; Type: Smartphone; FCC ID: NM8PH39100

Communication System: GSM850; Frequency: 836.6 MHz;Duty Cycle: 1:8.3
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1000$ kg/m^3
Phantom section: E Device Section
Measurement Standard: DASY4 (High Precision Assessment)

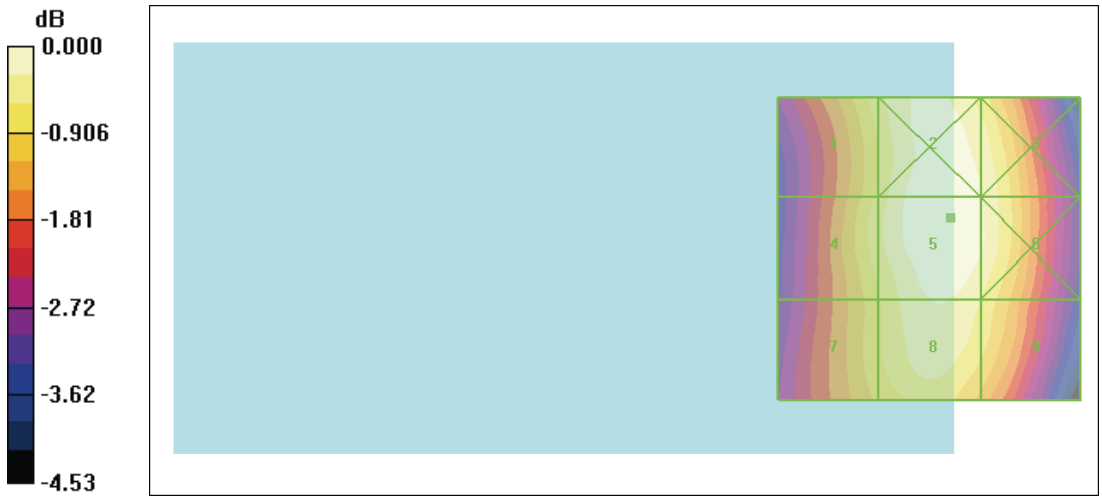
DASY4 Configuration:

- Probe: ER3DV6R - SN2256; ConvF(1, 1, 1); Calibrated: 2010/8/23
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn541; Calibrated: 2010/7/21
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: 1038
- 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 = 127.7 V/m
Probe Modulation Factor = 2.56
Device Reference Point: 0.000, 0.000, 353.7 mm
Reference Value = 63.7 V/m; Power Drift = -0.072 dB
Hearing Aid Near-Field Category: M4 (AWF -5 dB)
Cursor:
Total = 127.7 V/m
E Category: M4
Location: -3.5, -5, 368.7 mm

Peak E-field in V/m

Grid 1 **117.6 M4**	Grid 2 **127.2 M4**	Grid 3 **123.8 M4**
Grid 4 **118.0 M4**	Grid 5 **127.7 M4**	Grid 6 **124.1 M4**
Grid 7 **114.5 M4**	Grid 8 **123.6 M4**	Grid 9 **119.2 M4**



0 dB = 127.7V/m

Date/Time: 2011/5/4 PM 05:11:08

Test Laboratory: A Test Lab Techno Corp.

HAC_GSM850 CH251_E

DUT: PH39100; Type: Smartphone; FCC ID: NM8PH39100

Communication System: GSM850; Frequency: 848.8 MHz;Duty Cycle: 1:8.3
Medium parameters used: σ = 0 mho/m, ε_r = 1; ρ = 1000 kg/m^3
Phantom section: E Device Section
Measurement Standard: DASY4 (High Precision Assessment)

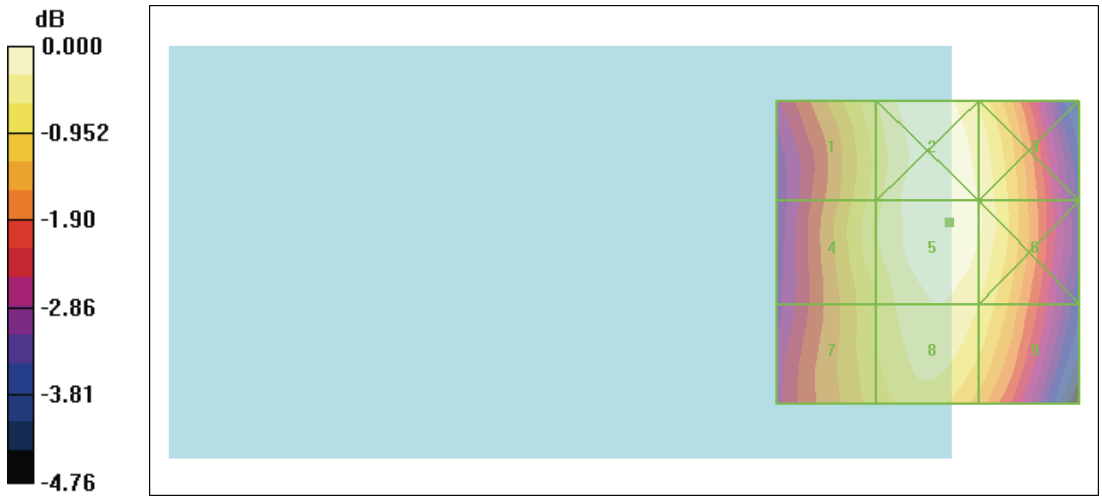
DASY4 Configuration:

- Probe: ER3DV6R - SN2256; ConvF(1, 1, 1); Calibrated: 2010/8/23
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn541; Calibrated: 2010/7/21
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: 1038
- 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 = 128.8 V/m
Probe Modulation Factor = 2.56
Device Reference Point: 0.000, 0.000, 353.7 mm
Reference Value = 64.9 V/m; Power Drift = -0.169 dB
Hearing Aid Near-Field Category: M4 (AWF -5 dB)
Cursor:
Total = 128.8 V/m
E Category: M4
Location: -3.5, -5, 368.7 mm

Peak E-field in V/m

Grid 1 **119.8 M4**	Grid 2 **128.2 M4**	Grid 3 **124.1 M4**
Grid 4 **119.4 M4**	Grid 5 **128.8 M4**	Grid 6 **125.0 M4**
Grid 7 **115.9 M4**	Grid 8 **124.2 M4**	Grid 9 **119.7 M4**



0 dB = 128.8V/m

Date/Time: 2011/5/4 PM 04:31:56

Test Laboratory: A Test Lab Techno Corp.

HAC_PCS CH512_E

DUT: PH39100; Type: Smartphone; FCC ID: NM8PH39100

Communication System: PCS; Frequency: 1850.2 MHz;Duty Cycle: 1:8.3
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1000$ kg/m^3
Phantom section: E Device Section
Measurement Standard: DASY4 (High Precision Assessment)

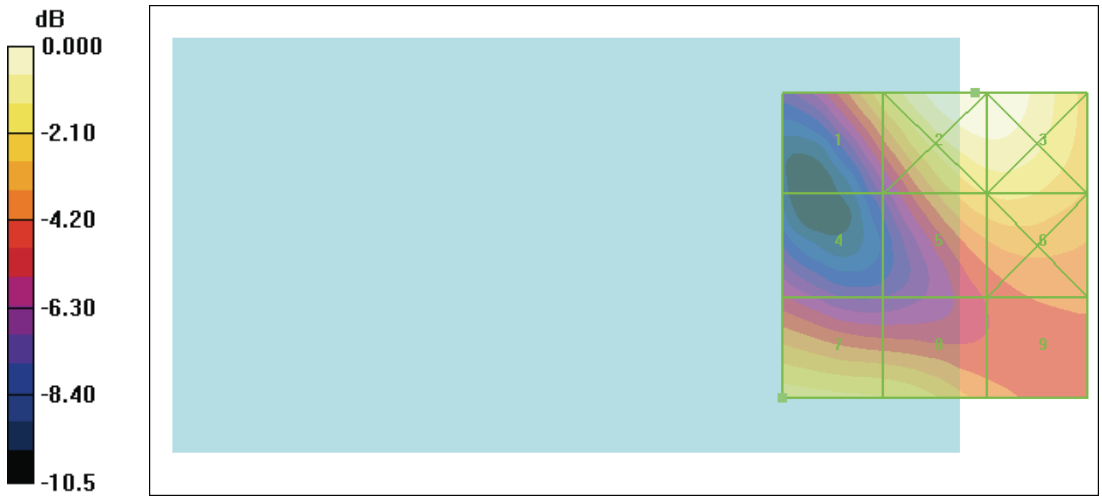
DASY4 Configuration:

- Probe: ER3DV6R - SN2256; ConvF(1, 1, 1); Calibrated: 2010/8/23
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn541; Calibrated: 2010/7/21
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: 1038
- 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 = 48.8 V/m
Probe Modulation Factor = 2.51
Device Reference Point: 0.000, 0.000, 353.7 mm
Reference Value = 14.4 V/m; Power Drift = -0.141 dB
Hearing Aid Near-Field Category: M3 (AWF -5 dB)
Cursor:
Total = 58.7 V/m
E Category: M3
Location: -6.5, -25, 368.7 mm

Peak E-field in V/m

Grid 1 **45.6 M4**	Grid 2 **58.7 M3**	Grid 3 **58.5 M3**
Grid 4 **31.5 M4**	Grid 5 **46.2 M4**	Grid 6 **47.0 M4**
Grid 7 **48.8 M3**	Grid 8 **46.4 M4**	Grid 9 **38.1 M4**



0 dB = 58.7V/m

Date/Time: 2011/5/4 PM 04:38:55

Test Laboratory: A Test Lab Techno Corp.

HAC_PCS CH661_E

DUT: PH39100; Type: Smartphone; FCC ID: NM8PH39100

Communication System: PCS; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: σ = 0 mho/m, ε_r = 1; ρ = 1000 kg/m^3
Phantom section: E Device Section
Measurement Standard: DASY4 (High Precision Assessment)

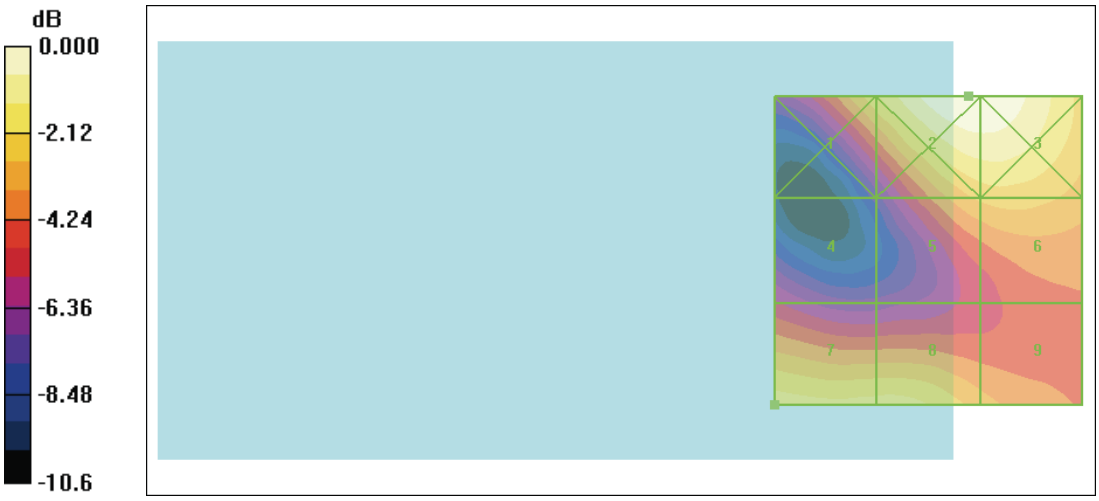
DASY4 Configuration:

- Probe: ER3DV6R - SN2256; ConvF(1, 1, 1); Calibrated: 2010/8/23
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn541; Calibrated: 2010/7/21
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: 1038
- 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 = 49.7 V/m
Probe Modulation Factor = 2.51
Device Reference Point: 0.000, 0.000, 353.7 mm
Reference Value = 12.7 V/m; Power Drift = -0.047 dB
Hearing Aid Near-Field Category: M3 (AWF -5 dB)
Cursor:
Total = 60.3 V/m
E Category: M3
Location: -6.5, -25, 368.7 mm

Peak E-field in V/m

Grid 1 **46.8 M4**	Grid 2 **60.3 M3**	Grid 3 **60.1 M3**
Grid 4 **32.1 M4**	Grid 5 **44.3 M4**	Grid 6 **45.4 M4**
Grid 7 **49.7 M3**	Grid 8 **49.2 M3**	Grid 9 **41.9 M4**



0 dB = 60.3V/m

Date/Time: 2011/5/4 PM 04:44:47

Test Laboratory: A Test Lab Techno Corp.

HAC_PCS CH810_E

DUT: PH39100; Type: Smartphone; FCC ID: NM8PH39100

Communication System: PCS; Frequency: 1909.8 MHz;Duty Cycle: 1:8.3
Medium parameters used: σ = 0 mho/m, ε_r = 1; ρ = 1000 kg/m^3
Phantom section: E Device Section
Measurement Standard: DASY4 (High Precision Assessment)

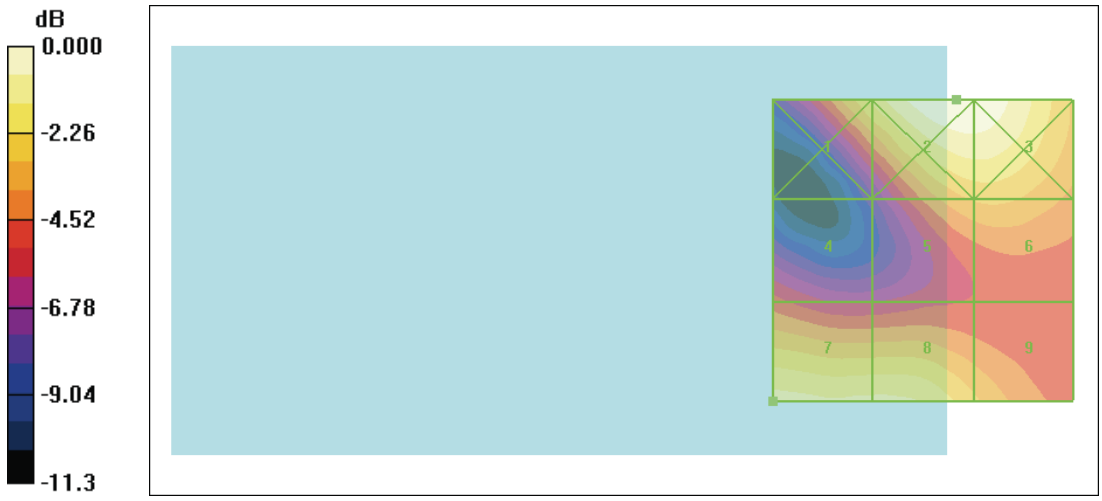
DASY4 Configuration:

- Probe: ER3DV6R - SN2256; ConvF(1, 1, 1); Calibrated: 2010/8/23
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn541; Calibrated: 2010/7/21
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: 1038
- 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 = 56.0 V/m
Probe Modulation Factor = 2.51
Device Reference Point: 0.000, 0.000, 353.7 mm
Reference Value = 14.3 V/m; Power Drift = -0.032 dB
Hearing Aid Near-Field Category: M3 (AWF -5 dB)
Cursor:
Total = 64.1 V/m
E Category: M3
Location: -5.5, -25, 368.7 mm

Peak E-field in V/m

Grid 1 **50.5 M3**	Grid 2 **64.1 M3**	Grid 3 **63.1 M3**
Grid 4 **36.4 M4**	Grid 5 **45.7 M4**	Grid 6 **46.3 M4**
Grid 7 **56.0 M3**	Grid 8 **55.1 M3**	Grid 9 **46.3 M4**



0 dB = 64.1V/m

Date/Time: 2011/5/4 PM 05:57:50

Test Laboratory: A Test Lab Techno Corp.

HAC_WCDMA Band II CH9262_E

DUT: PH39100; Type: Smartphone; FCC ID: NM8PH39100

Communication System: WCDMA Band II; Frequency: 1852.4 MHz;Duty Cycle: 1:1
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1000$ kg/m^3
Phantom section: E Device Section
Measurement Standard: DASY4 (High Precision Assessment)

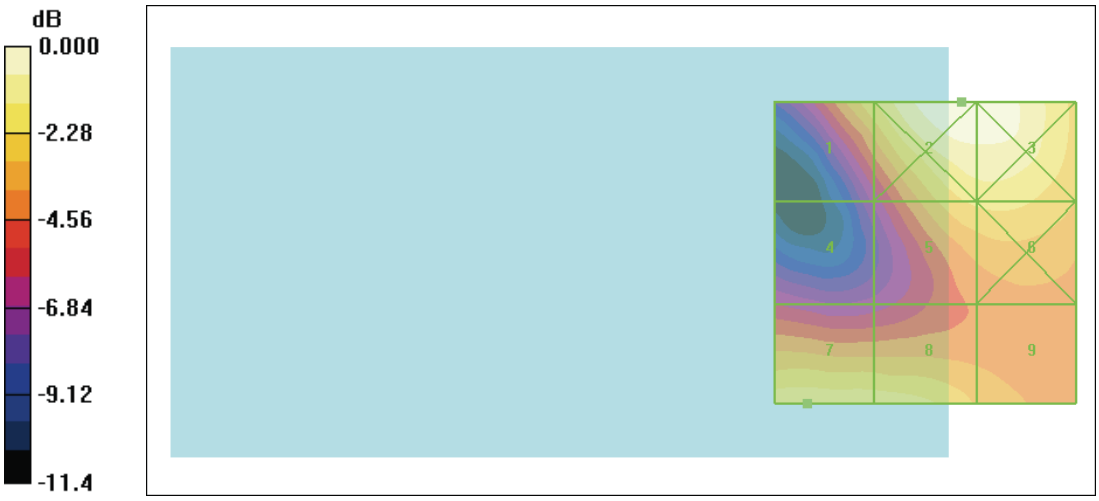
DASY4 Configuration:

- Probe: ER3DV6R - SN2256; ConvF(1, 1, 1); Calibrated: 2010/8/23
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn541; Calibrated: 2010/7/21
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: 1038
- 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 = 28.7 V/m
Probe Modulation Factor = 0.900
Device Reference Point: 0.000, 0.000, 353.7 mm
Reference Value = 24.7 V/m; Power Drift = 0.020 dB
Hearing Aid Near-Field Category: M4 (AWF 0 dB)
Cursor:
Total = 34.8 V/m
E Category: M4
Location: -6, -25, 368.7 mm

Peak E-field in V/m

Grid 1 **26.9 M4**	Grid 2 **34.8 M4**	Grid 3 **34.6 M4**
Grid 4 **17.4 M4**	Grid 5 **27.3 M4**	Grid 6 **27.6 M4**
Grid 7 **28.7 M4**	Grid 8 **28.6 M4**	Grid 9 **24.3 M4**



0 dB = 34.8V/m

Date/Time: 2011/5/4 PM 06:02:58

Test Laboratory: A Test Lab Techno Corp.

HAC_WCDMA Band II CH9400_E

DUT: PH39100; Type: Smartphone; FCC ID: NM8PH39100

Communication System: WCDMA Band II; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1000$ kg/m^3
Phantom section: E Device Section
Measurement Standard: DASY4 (High Precision Assessment)

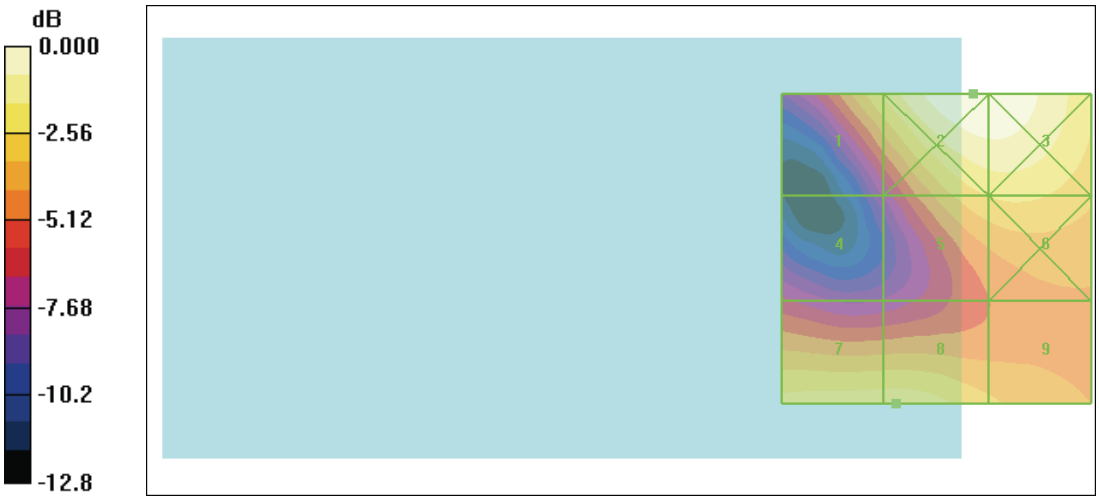
DASY4 Configuration:

- Probe: ER3DV6R - SN2256; ConvF(1, 1, 1); Calibrated: 2010/8/23
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn541; Calibrated: 2010/7/21
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: 1038
- 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 = 27.4 V/m
Probe Modulation Factor = 0.900
Device Reference Point: 0.000, 0.000, 353.7 mm
Reference Value = 22.2 V/m; Power Drift = -0.009 dB
Hearing Aid Near-Field Category: M4 (AWF 0 dB)
Cursor:
Total = 34.3 V/m
E Category: M4
Location: -6, -25, 368.7 mm

Peak E-field in V/m

Grid 1 **26.1 M4**	Grid 2 **34.3 M4**	Grid 3 **34.1 M4**
Grid 4 **16.2 M4**	Grid 5 **25.6 M4**	Grid 6 **26.1 M4**
Grid 7 **27.2 M4**	Grid 8 **27.4 M4**	Grid 9 **23.8 M4**



0 dB = 34.3V/m

Date/Time: 2011/5/4 PM 06:16:09

Test Laboratory: A Test Lab Techno Corp.

HAC_WCDMA Band II CH9538_E

DUT: PH39100; Type: Smartphone; FCC ID: NM8PH39100

Communication System: WCDMA Band II; Frequency: 1907.6 MHz;Duty Cycle: 1:1
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1000$ kg/m^3
Phantom section: E Device Section
Measurement Standard: DASY4 (High Precision Assessment)

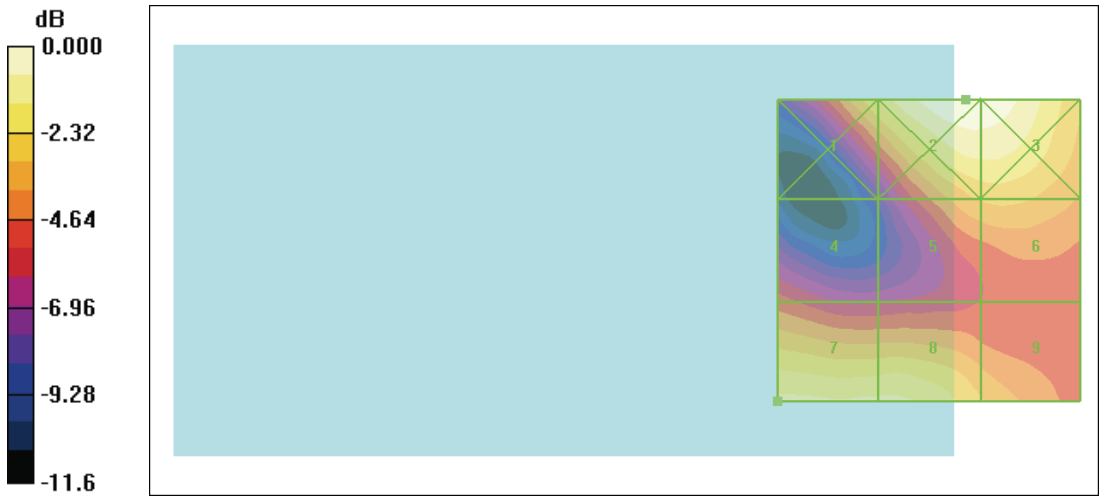
DASY4 Configuration:

- Probe: ER3DV6R - SN2256; ConvF(1, 1, 1); Calibrated: 2010/8/23
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn541; Calibrated: 2010/7/21
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: 1038
- 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 = 28.3 V/m
Probe Modulation Factor = 0.900
Device Reference Point: 0.000, 0.000, 353.7 mm
Reference Value = 19.5 V/m; Power Drift = 0.118 dB
Hearing Aid Near-Field Category: M4 (AWF 0 dB)
Cursor:
Total = 32.9 V/m
E Category: M4
Location: -6, -25, 368.7 mm

Peak E-field in V/m

Grid 1 **25.6 M4**	Grid 2 **32.9 M4**	Grid 3 **32.6 M4**
Grid 4 **18.5 M4**	Grid 5 **23.3 M4**	Grid 6 **23.7 M4**
Grid 7 **28.3 M4**	Grid 8 **28.1 M4**	Grid 9 **23.3 M4**



0 dB = 32.9V/m

Date/Time: 2011/5/4 PM 05:33:13

Test Laboratory: A Test Lab Techno Corp.

HAC_WCDMA Band V CH4132_E

DUT: PH39100; Type: Smartphone; FCC ID: NM8PH39100

Communication System: WCDMA Band V; Frequency: 826.4 MHz;Duty Cycle: 1:1
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1000$ kg/m^3
Phantom section: E Device Section
Measurement Standard: DASY4 (High Precision Assessment)

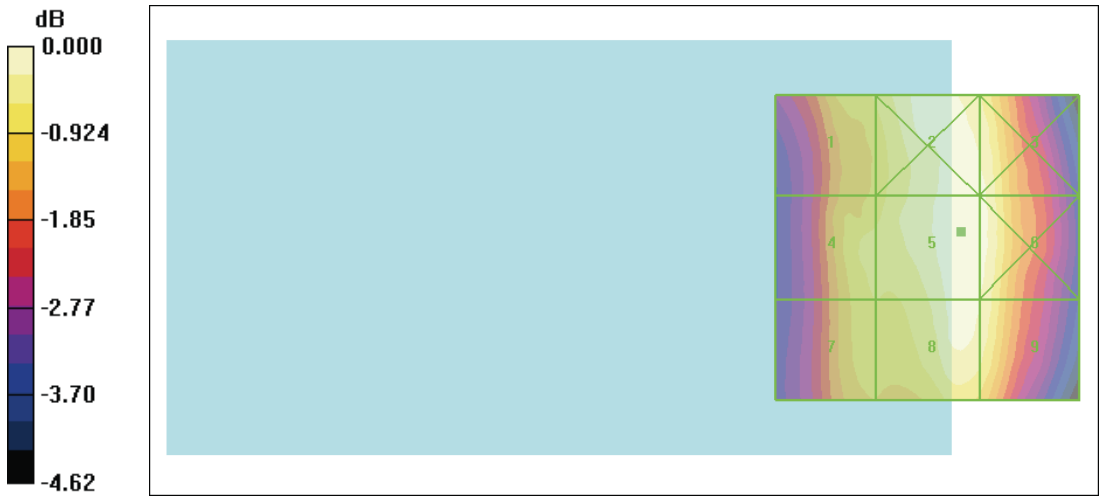
DASY4 Configuration:

- Probe: ER3DV6R - SN2256; ConvF(1, 1, 1); Calibrated: 2010/8/23
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn541; Calibrated: 2010/7/21
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: 1038
- 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 = 56.4 V/m
Probe Modulation Factor = 1.01
Device Reference Point: 0.000, 0.000, 353.7 mm
Reference Value = 69.6 V/m; Power Drift = -0.058 dB
Hearing Aid Near-Field Category: M4 (AWF 0 dB)
Cursor:
Total = 56.4 V/m
E Category: M4
Location: -5.5, -2.5, 368.7 mm

Peak E-field in V/m

Grid 1 **51.1 M4**	Grid 2 **56.0 M4**	Grid 3 **55.3 M4**
Grid 4 **52.0 M4**	Grid 5 **56.4 M4**	Grid 6 **55.7 M4**
Grid 7 **50.8 M4**	Grid 8 **55.4 M4**	Grid 9 **54.6 M4**



0 dB = 56.4V/m

Date/Time: 2011/5/4 PM 05:44:02

Test Laboratory: A Test Lab Techno Corp.

HAC_WCDMA Band V CH4183_E

DUT: PH39100; Type: Smartphone; FCC ID: NM8PH39100

Communication System: WCDMA Band V; Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1000$ kg/m^3
Phantom section: E Device Section
Measurement Standard: DASY4 (High Precision Assessment)

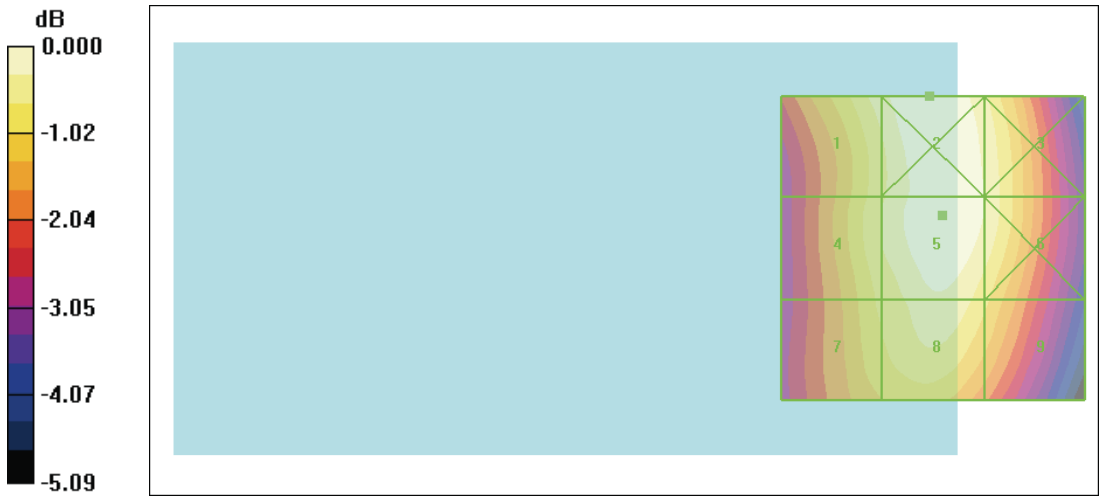
DASY4 Configuration:

- Probe: ER3DV6R - SN2256; ConvF(1, 1, 1); Calibrated: 2010/8/23
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn541; Calibrated: 2010/7/21
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: 1038
- 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 = 59.8 V/m
Probe Modulation Factor = 1.04
Device Reference Point: 0.000, 0.000, 353.7 mm
Reference Value = 73.9 V/m; Power Drift = -0.029 dB
Hearing Aid Near-Field Category: M4 (AWF 0 dB)
Cursor:
Total = 59.9 V/m
E Category: M4
Location: 0.5, -25, 368.7 mm

Peak E-field in V/m

Grid 1 **56.8 M4**	Grid 2 **59.9 M4**	Grid 3 **57.5 M4**
Grid 4 **55.6 M4**	Grid 5 **59.8 M4**	Grid 6 **57.5 M4**
Grid 7 **53.8 M4**	Grid 8 **57.4 M4**	Grid 9 **53.9 M4**



0 dB = 59.9V/m

Date/Time: 2011/5/4 PM 05:50:14

Test Laboratory: A Test Lab Techno Corp.

HAC_WCDMA Band V CH4233_E

DUT: PH39100; Type: Smartphone; FCC ID: NM8PH39100

Communication System: WCDMA Band V; Frequency: 846.6 MHz;Duty Cycle: 1:1
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1000$ kg/m^3
Phantom section: E Device Section
Measurement Standard: DASY4 (High Precision Assessment)

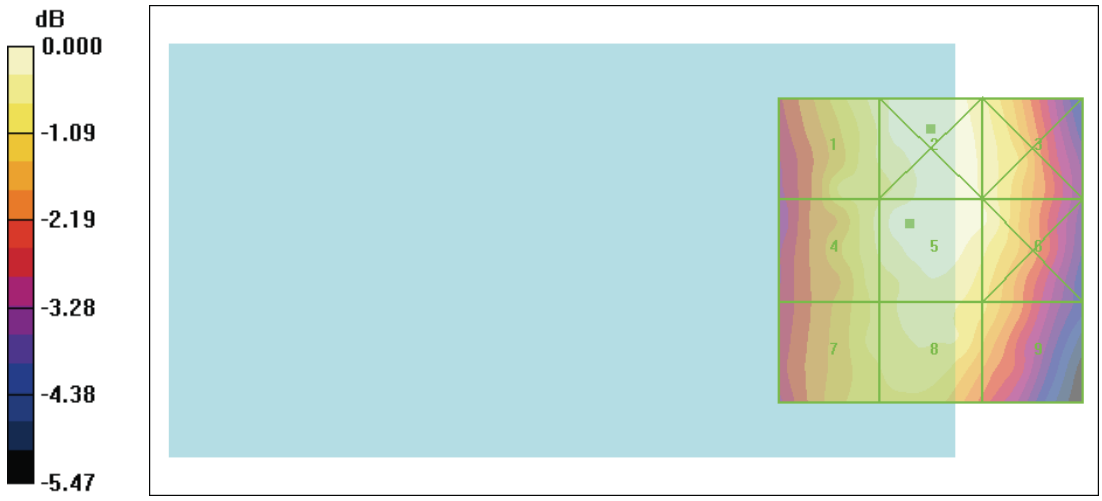
DASY4 Configuration:

- Probe: ER3DV6R - SN2256; ConvF(1, 1, 1); Calibrated: 2010/8/23
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn541; Calibrated: 2010/7/21
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: 1038
- 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 = 61.3 V/m
Probe Modulation Factor = 1.04
Device Reference Point: 0.000, 0.000, 353.7 mm
Reference Value = 76.9 V/m; Power Drift = -0.233 dB
Hearing Aid Near-Field Category: M4 (AWF 0 dB)
Cursor:
Total = 61.8 V/m
E Category: M4
Location: 0, -20, 368.7 mm

Peak E-field in V/m

Grid 1 **58.2 M4**	Grid 2 **61.8 M4**	Grid 3 **59.0 M4**
Grid 4 **57.6 M4**	Grid 5 **61.3 M4**	Grid 6 **59.7 M4**
Grid 7 **55.6 M4**	Grid 8 **58.3 M4**	Grid 9 **55.1 M4**



0 dB = 61.8V/m

Date/Time: 2011/5/4 PM 03:29:53

Test Laboratory: A Test Lab Techno Corp.

HAC_GSM850 CH128_H

DUT: PH39100; Type: Smartphone; FCC ID: NM8PH39100

Communication System: GSM850; Frequency: 824.2 MHz;Duty Cycle: 1:8.3
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Phantom section: H Device Section
Measurement Standard: DASY4 (High Precision Assessment)

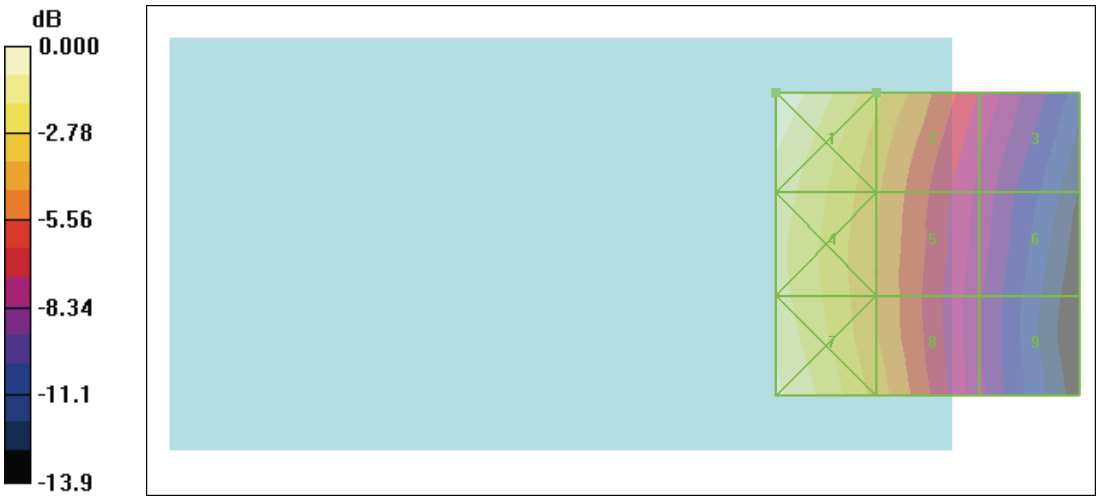
DASY4 Configuration:

- Probe: H3DV6 - SN6076; ; Calibrated: 2010/8/23
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn541; Calibrated: 2010/7/21
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: 1038
- Measurement SW: DASY4, V4.7 Build 80;Postprocessing SW: SEMCAD, V1.8 Build 186

H Scan - H3DV6 - measurement discance 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 = 0.207 A/m
Probe Modulation Factor = 2.57
Device Reference Point: 0.000, 0.000, 353.7 mm
Reference Value = 0.057 A/m; Power Drift = -0.153 dB
Hearing Aid Near-Field Category: M4 (AWF -5 dB)
Cursor:
Total = 0.307 A/m
H Category: M4
Location: 25, -25, 368.7 mm

Peak H-field in A/m

Grid 1 **0.307 M4**	Grid 2 **0.207 M4**	Grid 3 **0.130 M4**
Grid 4 **0.264 M4**	Grid 5 **0.184 M4**	Grid 6 **0.114 M4**
Grid 7 **0.283 M4**	Grid 8 **0.192 M4**	Grid 9 **0.110 M4**



0 dB = 0.307A/m

Date/Time: 2011/5/4 PM 03:39:05

Test Laboratory: A Test Lab Techno Corp.

HAC_GSM850 CH190_H

DUT: PH39100; Type: Smartphone; FCC ID: NM8PH39100

Communication System: GSM850; Frequency: 836.6 MHz;Duty Cycle: 1:8.3
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Phantom section: H Device Section
Measurement Standard: DASY4 (High Precision Assessment)

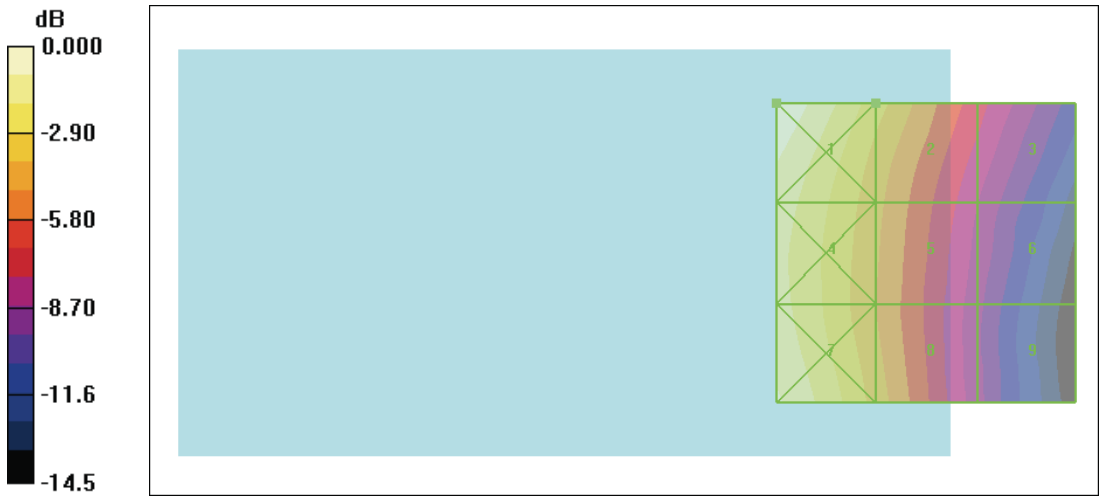
DASY4 Configuration:

- Probe: H3DV6 - SN6076; ; Calibrated: 2010/8/23
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn541; Calibrated: 2010/7/21
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: 1038
- Measurement SW: DASY4, V4.7 Build 80;Postprocessing SW: SEMCAD, V1.8 Build 186

H Scan - H3DV6 - measurement discance 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 = 0.198 A/m
Probe Modulation Factor = 2.57
Device Reference Point: 0.000, 0.000, 353.7 mm
Reference Value = 0.053 A/m; Power Drift = -0.098 dB
Hearing Aid Near-Field Category: M4 (AWF -5 dB)
Cursor:
Total = 0.293 A/m
H Category: M4
Location: 25, -25, 368.7 mm

Peak H-field in A/m

Grid 1 **0.293 M4**	Grid 2 **0.198 M4**	Grid 3 **0.127 M4**
Grid 4 **0.250 M4**	Grid 5 **0.175 M4**	Grid 6 **0.109 M4**
Grid 7 **0.267 M4**	Grid 8 **0.180 M4**	Grid 9 **0.101 M4**



0 dB = 0.293A/m

Date/Time: 2011/5/4 PM 03:47:27

Test Laboratory: A Test Lab Techno Corp.

HAC_GSM850 CH251_H

DUT: PH39100; Type: Smartphone; FCC ID: NM8PH39100

Communication System: GSM850; Frequency: 848.8 MHz;Duty Cycle: 1:8.3
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Phantom section: H Device Section
Measurement Standard: DASY4 (High Precision Assessment)

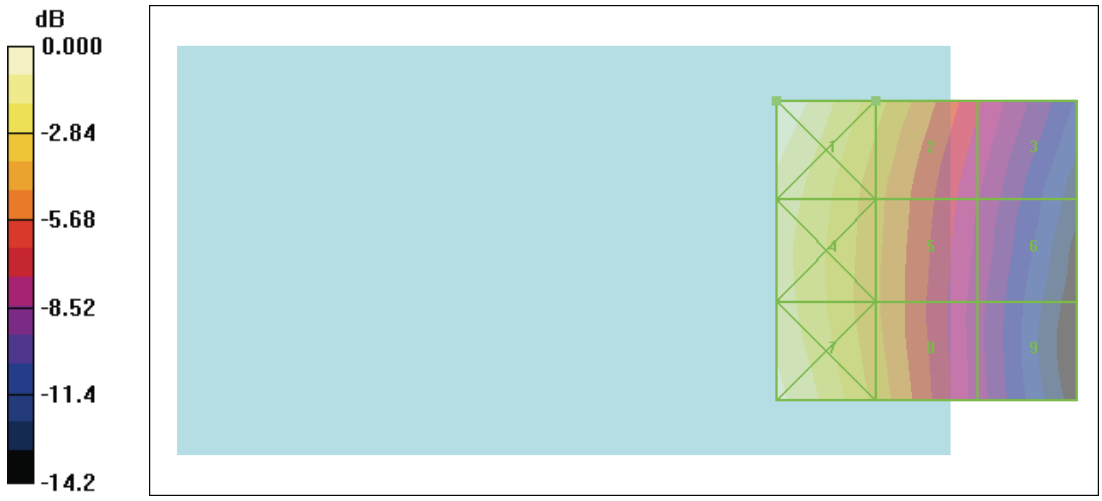
DASY4 Configuration:

- Probe: H3DV6 - SN6076; ; Calibrated: 2010/8/23
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn541; Calibrated: 2010/7/21
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: 1038
- Measurement SW: DASY4, V4.7 Build 80;Postprocessing SW: SEMCAD, V1.8 Build 186

H Scan - H3DV6 - measurement discance 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 = 2.57
Device Reference Point: 0.000, 0.000, 353.7 mm
Reference Value = 0.055 A/m; Power Drift = -0.044 dB
Hearing Aid Near-Field Category: M4 (AWF -5 dB)
Cursor:
Total = 0.296 A/m
H Category: M4
Location: 25, -25, 368.7 mm

Peak H-field in A/m

Grid 1 **0.296 M4**	Grid 2 **0.202 M4**	Grid 3 **0.127 M4**
Grid 4 **0.256 M4**	Grid 5 **0.179 M4**	Grid 6 **0.112 M4**
Grid 7 **0.273 M4**	Grid 8 **0.185 M4**	Grid 9 **0.106 M4**



0 dB = 0.296A/m

Date/Time: 2011/5/4 PM 04:02:44

Test Laboratory: A Test Lab Techno Corp.

HAC_PCS CH512_H

DUT: PH39100; Type: Smartphone; FCC ID: NM8PH39100

Communication System: PCS; Frequency: 1850.2 MHz;Duty Cycle: 1:8.3
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Phantom section: H Device Section
Measurement Standard: DASY4 (High Precision Assessment)

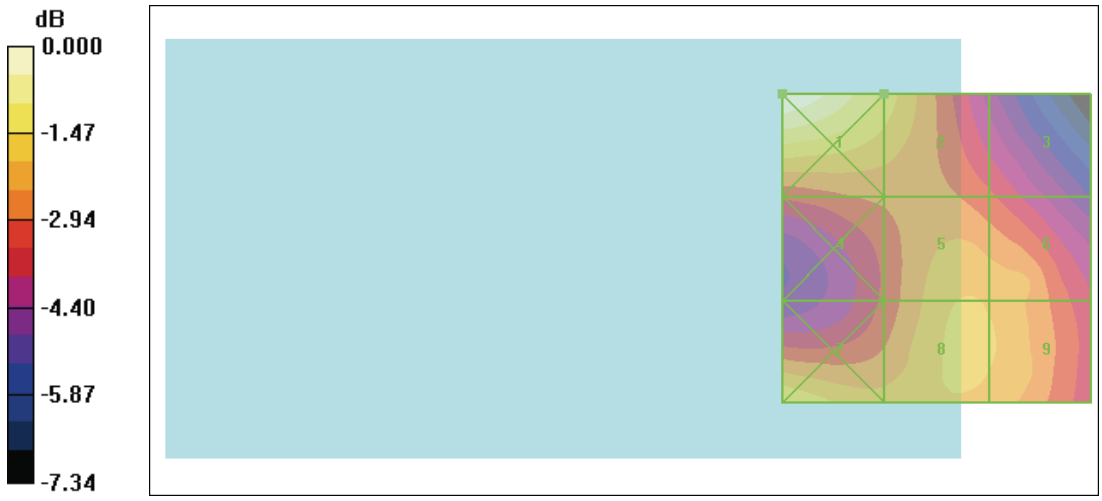
DASY4 Configuration:

- Probe: H3DV6 - SN6076; ; Calibrated: 2010/8/23
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn541; Calibrated: 2010/7/21
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: 1038
- Measurement SW: DASY4, V4.7 Build 80;Postprocessing SW: SEMCAD, V1.8 Build 186

H Scan - H3DV6 - measurement discance 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 = 0.154 A/m
Probe Modulation Factor = 2.54
Device Reference Point: 0.000, 0.000, 353.7 mm
Reference Value = 0.062 A/m; Power Drift = 0.025 dB
Hearing Aid Near-Field Category: M3 (AWF -5 dB)
Cursor:
Total = 0.186 A/m
H Category: M3
Location: 25, -25, 368.7 mm

Peak H-field in A/m

Grid 1 **0.186 M3**	Grid 2 **0.154 M3**	Grid 3 **0.127 M4**
Grid 4 **0.135 M4**	Grid 5 **0.149 M3**	Grid 6 **0.147 M3**
Grid 7 **0.160 M3**	Grid 8 **0.151 M3**	Grid 9 **0.150 M3**



0 dB = 0.186A/m

Date/Time: 2011/5/4 PM 04:09:36

Test Laboratory: A Test Lab Techno Corp.

HAC_PCS CH661_H

DUT: PH39100; Type: Smartphone; FCC ID: NM8PH39100

Communication System: PCS; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Phantom section: H Device Section
Measurement Standard: DASY4 (High Precision Assessment)

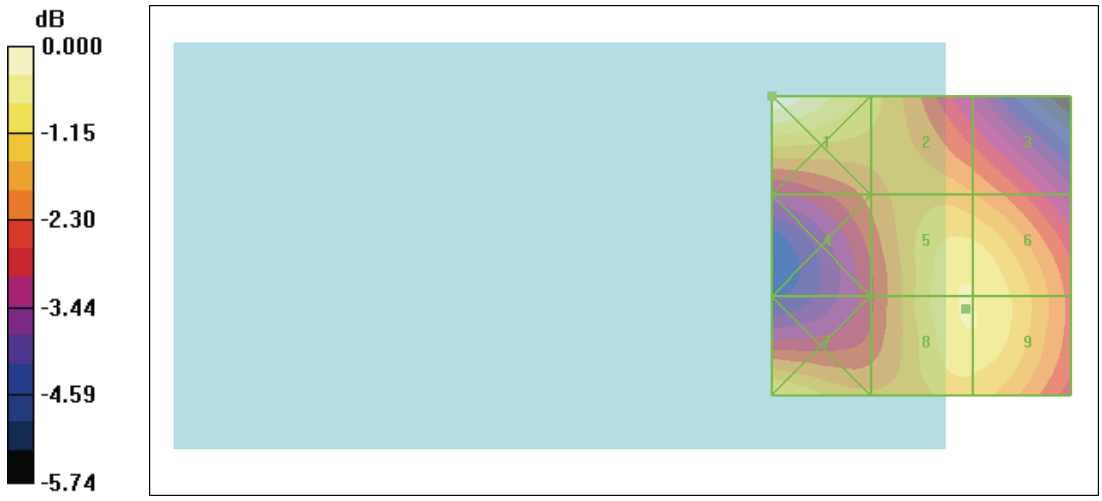
DASY4 Configuration:

- Probe: H3DV6 - SN6076; ; Calibrated: 2010/8/23
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn541; Calibrated: 2010/7/21
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: 1038
- Measurement SW: DASY4, V4.7 Build 80;Postprocessing SW: SEMCAD, V1.8 Build 186

H Scan - H3DV6 - measurement discance 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 = 0.169 A/m
Probe Modulation Factor = 2.54
Device Reference Point: 0.000, 0.000, 353.7 mm
Reference Value = 0.070 A/m; Power Drift = -0.024 dB
Hearing Aid Near-Field Category: M3 (AWF -5 dB)
Cursor:
Total = 0.184 A/m
H Category: M3
Location: 25, -25, 368.7 mm

Peak H-field in A/m

Grid 1 **0.184 M3**	Grid 2 **0.158 M3**	Grid 3 **0.148 M3**
Grid 4 **0.144 M3**	Grid 5 **0.169 M3**	Grid 6 **0.169 M3**
Grid 7 **0.165 M3**	Grid 8 **0.169 M3**	Grid 9 **0.169 M3**



0 dB = 0.184A/m

Date/Time: 2011/5/4 PM 04:15:28

Test Laboratory: A Test Lab Techno Corp.

HAC_PCS CH810_H

DUT: PH39100; Type: Smartphone; FCC ID: NM8PH39100

Communication System: PCS; Frequency: 1909.8 MHz;Duty Cycle: 1:8.3
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Phantom section: H Device Section
Measurement Standard: DASY4 (High Precision Assessment)

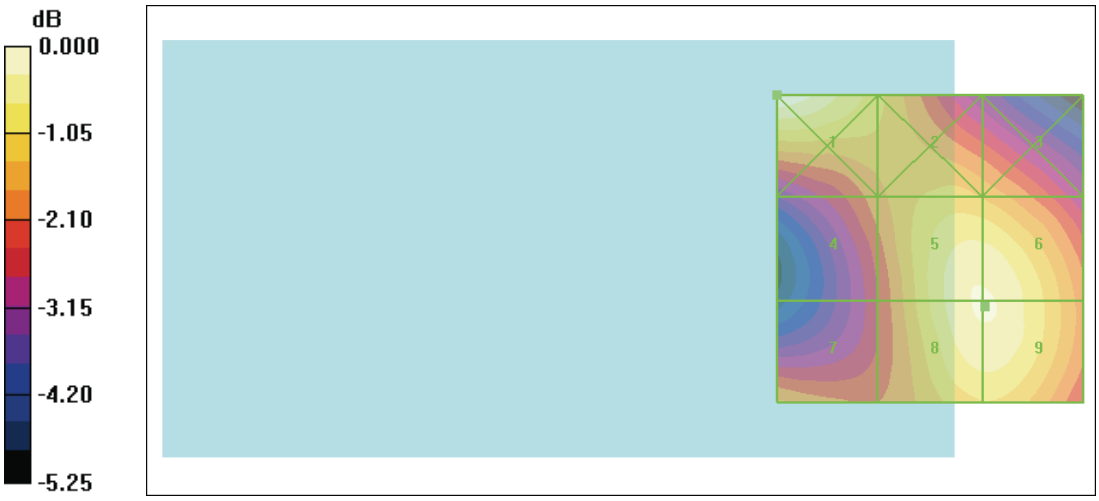
DASY4 Configuration:

- Probe: H3DV6 - SN6076; ; Calibrated: 2010/8/23
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn541; Calibrated: 2010/7/21
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: 1038
- Measurement SW: DASY4, V4.7 Build 80;Postprocessing SW: SEMCAD, V1.8 Build 186

H Scan - H3DV6 - measurement discance 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 = 2.54
Device Reference Point: 0.000, 0.000, 353.7 mm
Reference Value = 0.079 A/m; Power Drift = -0.020 dB
Hearing Aid Near-Field Category: M3 (AWF -5 dB)
Cursor:
Total = 0.197 A/m
H Category: M3
Location: 25, -25, 368.7 mm

Peak H-field in A/m

Grid 1 **0.197 M3**	Grid 2 **0.171 M3**	Grid 3 **0.167 M3**
Grid 4 **0.159 M3**	Grid 5 **0.190 M3**	Grid 6 **0.190 M3**
Grid 7 **0.163 M3**	Grid 8 **0.190 M3**	Grid 9 **0.190 M3**



0 dB = 0.197A/m

Date/Time: 2011/5/4 PM 07:06:37

Test Laboratory: A Test Lab Techno Corp.

HAC_WCDMA Band II CH9262_H

DUT: PH39100; Type: Smartphone; FCC ID: NM8PH39100

Communication System: WCDMA Band II; Frequency: 1852.4 MHz;Duty Cycle: 1:1
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Phantom section: H Device Section
Measurement Standard: DASY4 (High Precision Assessment)

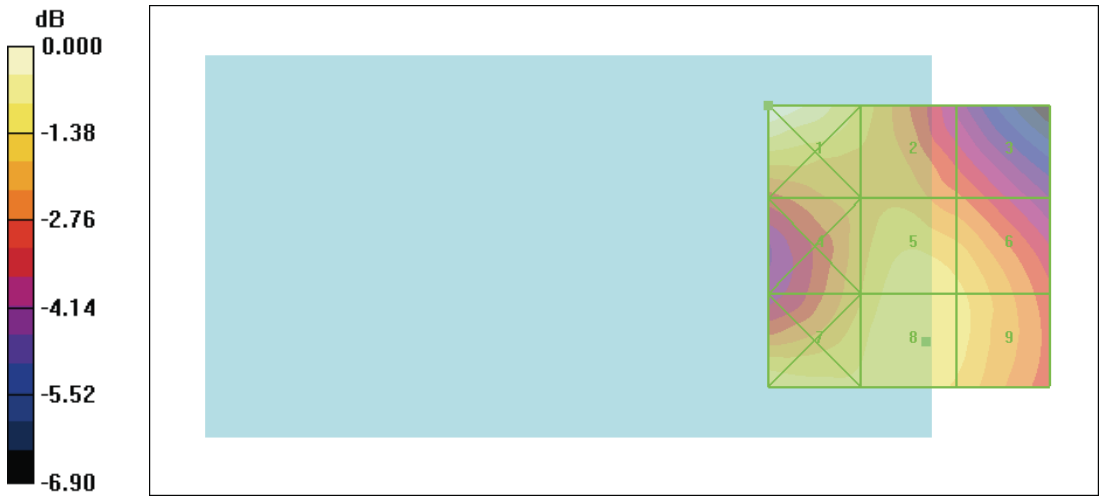
DASY4 Configuration:

- Probe: H3DV6 - SN6076; ; Calibrated: 2010/8/23
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn541; Calibrated: 2010/7/21
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: 1038
- Measurement SW: DASY4, V4.7 Build 80;Postprocessing SW: SEMCAD, V1.8 Build 186

H Scan - H3DV6 - measurement discance 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 = 0.810
Device Reference Point: 0.000, 0.000, 353.7 mm
Reference Value = 0.106 A/m; Power Drift = -0.029 dB
Hearing Aid Near-Field Category: M4 (AWF 0 dB)
Cursor:
Total = 0.088 A/m
H Category: M4
Location: 25, -25, 368.7 mm

Peak H-field in A/m

Grid 1 **0.088 M4**	Grid 2 **0.074 M4**	Grid 3 **0.065 M4**
Grid 4 **0.071 M4**	Grid 5 **0.078 M4**	Grid 6 **0.076 M4**
Grid 7 **0.079 M4**	Grid 8 **0.079 M4**	Grid 9 **0.077 M4**



0 dB = 0.088A/m

Date/Time: 2011/5/4 PM 07:12:30

Test Laboratory: A Test Lab Techno Corp.

HAC_WCDMA Band II CH9400_H

DUT: PH39100; Type: Smartphone; FCC ID: NM8PH39100

Communication System: WCDMA Band II; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Phantom section: H Device Section
Measurement Standard: DASY4 (High Precision Assessment)

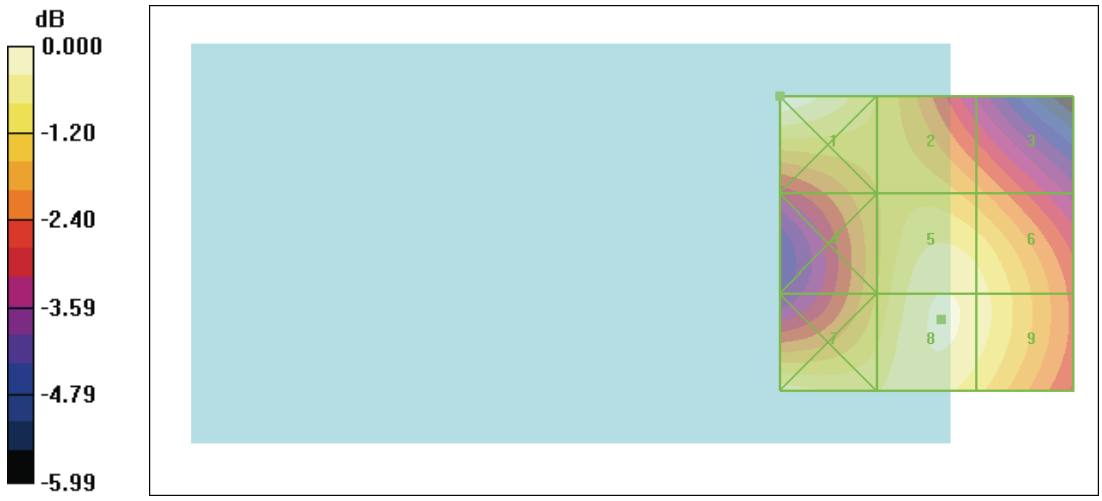
DASY4 Configuration:

- Probe: H3DV6 - SN6076; ; Calibrated: 2010/8/23
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn541; Calibrated: 2010/7/21
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: 1038
- Measurement SW: DASY4, V4.7 Build 80;Postprocessing SW: SEMCAD, V1.8 Build 186

H Scan - H3DV6 - measurement discance 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 = 0.080 A/m
Probe Modulation Factor = 0.810
Device Reference Point: 0.000, 0.000, 353.7 mm
Reference Value = 0.106 A/m; Power Drift = 0.005 dB
Hearing Aid Near-Field Category: M4 (AWF 0 dB)
Cursor:
Total = 0.083 A/m
H Category: M4
Location: 25, -25, 368.7 mm

Peak H-field in A/m

Grid 1 **0.083 M4**	Grid 2 **0.072 M4**	Grid 3 **0.067 M4**
Grid 4 **0.069 M4**	Grid 5 **0.079 M4**	Grid 6 **0.077 M4**
Grid 7 **0.078 M4**	Grid 8 **0.080 M4**	Grid 9 **0.078 M4**



0 dB = 0.083A/m

Date/Time: 2011/5/4 PM 07:17:40

Test Laboratory: A Test Lab Techno Corp.

HAC_WCDMA Band II CH9538_H

DUT: PH39100; Type: Smartphone; FCC ID: NM8PH39100

Communication System: WCDMA Band II; Frequency: 1907.6 MHz;Duty Cycle: 1:1
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Phantom section: H Device Section
Measurement Standard: DASY4 (High Precision Assessment)

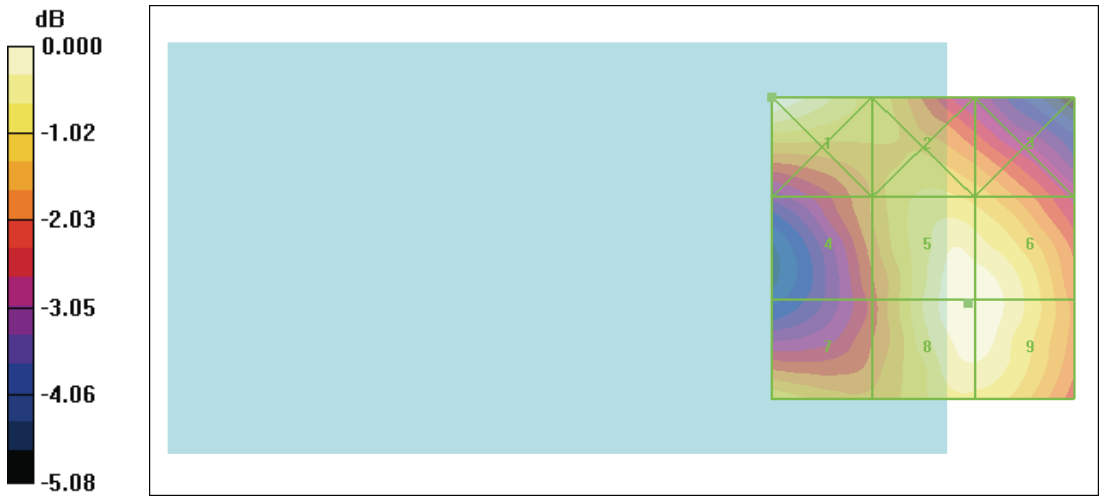
DASY4 Configuration:

- Probe: H3DV6 - SN6076; ; Calibrated: 2010/8/23
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn541; Calibrated: 2010/7/21
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: 1038
- Measurement SW: DASY4, V4.7 Build 80;Postprocessing SW: SEMCAD, V1.8 Build 186

H Scan - H3DV6 - measurement discance 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 = 0.080 A/m
Probe Modulation Factor = 0.810
Device Reference Point: 0.000, 0.000, 353.7 mm
Reference Value = 0.105 A/m; Power Drift = -0.034 dB
Hearing Aid Near-Field Category: M4 (AWF 0 dB)
Cursor:
Total = 0.081 A/m
H Category: M4
Location: 25, -25, 368.7 mm

Peak H-field in A/m

Grid 1 **0.081 M4**	Grid 2 **0.073 M4**	Grid 3 **0.071 M4**
Grid 4 **0.067 M4**	Grid 5 **0.080 M4**	Grid 6 **0.080 M4**
Grid 7 **0.072 M4**	Grid 8 **0.080 M4**	Grid 9 **0.080 M4**



0 dB = 0.081A/m

Date/Time: 2011/5/4 PM 06:46:29

Test Laboratory: A Test Lab Techno Corp.

HAC_WCDMA Band V CH4132_H

DUT: PH39100; Type: Smartphone; FCC ID: NM8PH39100

Communication System: WCDMA Band V; Frequency: 826.4 MHz;Duty Cycle: 1:1
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Phantom section: H Device Section
Measurement Standard: DASY4 (High Precision Assessment)

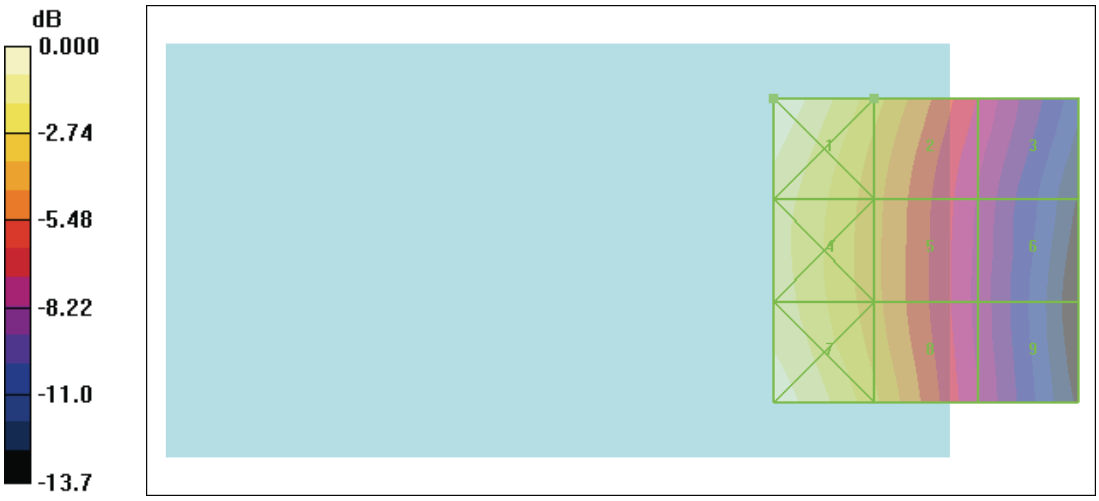
DASY4 Configuration:

- Probe: H3DV6 - SN6076; ; Calibrated: 2010/8/23
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn541; Calibrated: 2010/7/21
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: 1038
- Measurement SW: DASY4, V4.7 Build 80;Postprocessing SW: SEMCAD, V1.8 Build 186

H Scan - H3DV6 - measurement discance 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 = 0.069 A/m
Probe Modulation Factor = 0.860
Device Reference Point: 0.000, 0.000, 353.7 mm
Reference Value = 0.058 A/m; Power Drift = -0.002 dB
Hearing Aid Near-Field Category: M4 (AWF 0 dB)
Cursor:
Total = 0.100 A/m
H Category: M4
Location: 25, -25, 368.7 mm

Peak H-field in A/m

Grid 1 **0.100 M4**	Grid 2 **0.069 M4**	Grid 3 **0.043 M4**
Grid 4 **0.086 M4**	Grid 5 **0.062 M4**	Grid 6 **0.039 M4**
Grid 7 **0.096 M4**	Grid 8 **0.068 M4**	Grid 9 **0.039 M4**



0 dB = 0.100A/m

Date/Time: 2011/5/4 PM 06:54:26

Test Laboratory: A Test Lab Techno Corp.

HAC_WCDMA Band V CH4183_H

DUT: PH39100; Type: Smartphone; FCC ID: NM8PH39100

Communication System: WCDMA Band V; Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Phantom section: H Device Section
Measurement Standard: DASY4 (High Precision Assessment)

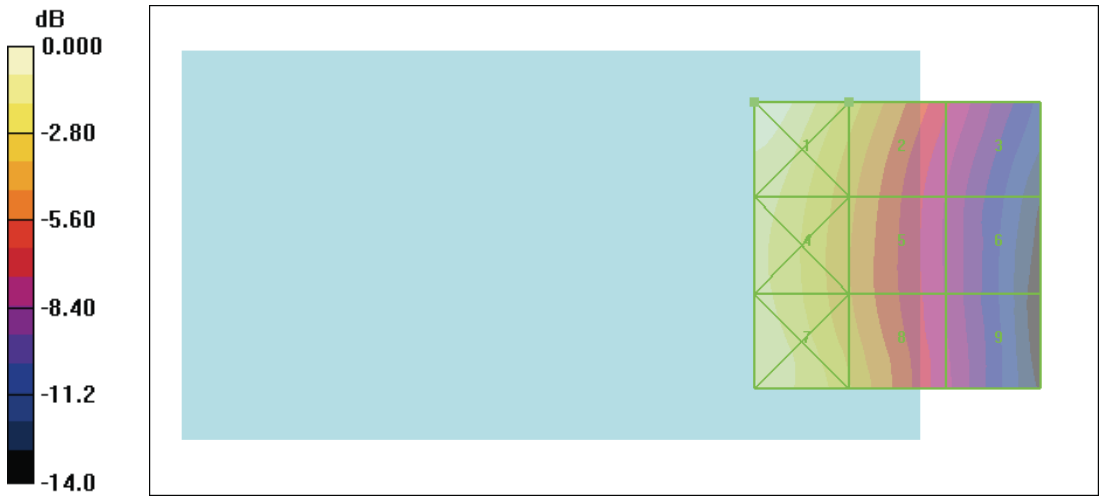
DASY4 Configuration:

- Probe: H3DV6 - SN6076; ; Calibrated: 2010/8/23
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn541; Calibrated: 2010/7/21
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: 1038
- Measurement SW: DASY4, V4.7 Build 80;Postprocessing SW: SEMCAD, V1.8 Build 186

H Scan - H3DV6 - measurement discance 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 = 0.071 A/m
Probe Modulation Factor = 0.860
Device Reference Point: 0.000, 0.000, 353.7 mm
Reference Value = 0.056 A/m; Power Drift = -0.019 dB
Hearing Aid Near-Field Category: M4 (AWF 0 dB)
Cursor:
Total = 0.102 A/m
H Category: M4
Location: 25, -25, 368.7 mm

Peak H-field in A/m

Grid 1 **0.102 M4**	Grid 2 **0.071 M4**	Grid 3 **0.044 M4**
Grid 4 **0.087 M4**	Grid 5 **0.062 M4**	Grid 6 **0.039 M4**
Grid 7 **0.093 M4**	Grid 8 **0.067 M4**	Grid 9 **0.040 M4**



0 dB = 0.102A/m

Date/Time: 2011/5/4 PM 06:59:49

Test Laboratory: A Test Lab Techno Corp.

HAC_WCDMA Band V CH4233_H

DUT: PH39100; Type: Smartphone; FCC ID: NM8PH39100

Communication System: WCDMA Band V; Frequency: 846.6 MHz;Duty Cycle: 1:1
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Phantom section: H Device Section
Measurement Standard: DASY4 (High Precision Assessment)

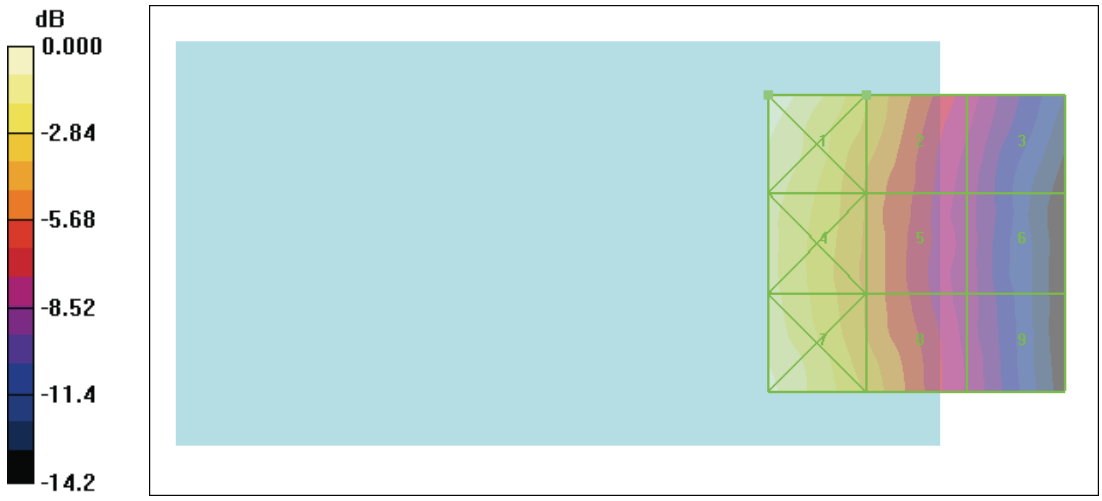
DASY4 Configuration:

- Probe: H3DV6 - SN6076; ; Calibrated: 2010/8/23
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn541; Calibrated: 2010/7/21
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: 1038
- Measurement SW: DASY4, V4.7 Build 80;Postprocessing SW: SEMCAD, V1.8 Build 186

H Scan - H3DV6 - measurement discance 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 = 0.075 A/m
Probe Modulation Factor = 0.860
Device Reference Point: 0.000, 0.000, 353.7 mm
Reference Value = 0.060 A/m; Power Drift = -0.080 dB
Hearing Aid Near-Field Category: M4 (AWF 0 dB)
Cursor:
Total = 0.115 A/m
H Category: M4
Location: 25, -25, 368.7 mm

Peak H-field in A/m

Grid 1 **0.115 M4**	Grid 2 **0.075 M4**	Grid 3 **0.046 M4**
Grid 4 **0.098 M4**	Grid 5 **0.066 M4**	Grid 6 **0.041 M4**
Grid 7 **0.107 M4**	Grid 8 **0.073 M4**	Grid 9 **0.043 M4**



0 dB = 0.115A/m

Appendix D - Calibration

All of the instruments Calibration information are listed below.

- Dipole _ CD835V3 SN:1017 Calibration No.CD835V3-1017_Jul10
- Dipole _ CD1880V3 SN:1036 Calibration No.CD1880V3-1036_Jul10
- Probe _ ER3DV6R SN: 2256 Calibration No. ER3-2256_Aug10
- Probe _ H3DV6 SN: 6076 Calibration No. H3-6076_ Aug10
- DAE _ DAE4 SN:541 Calibration No.DAE4-541_ Jul10

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 ATL (Auden) **Certificate No: CD835V3-1017_Jul10**

CALIBRATION CERTIFICATE

Object	CD835V3 - SN: 1017
Calibration procedure(s)	QA CAL-20.v5 Calibration procedure for dipoles in air
Calibration date:	July 13, 2010

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-09 (No. 217-01086)	Oct-10
Power sensor HP 8481A	US37292783	06-Oct-09 (No. 217-01086)	Oct-10
Probe ER3DV6	SN: 2336	30-Dec-09 (No. ER3-2336_Dec09)	Dec-10
Probe H3DV6	SN: 6065	30-Dec-09 (No. H3-6065_Dec09)	Dec-10
DAE4	SN: 781	22-Jan-10 (No. DAE4-781_Jan10)	Jan-11

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter Agilent 4419B	SN: GB42420191	09-Oct-09 (in house check Oct-09)	In house check: Oct-10
Power sensor HP 8482H	SN: 3318A09450	09-Oct-09 (in house check Oct-09)	In house check: Oct-10
Power sensor HP 8482A	SN: US37295597	09-Oct-09 (in house check Oct-09)	In house check: Oct-10
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-09)	In house check: Oct-10
RF generator E4433B	MY 41000675	03-Nov-04 (in house check Oct-09)	In house check: Oct-11

	Name	Function	Signature
Calibrated by:	Mike Meili	Laboratory Technician	
Approved by:	Fin Bomholt	Technical Director	

Issued: July 15, 2010

References

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

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

Methods Applied and Interpretation of Parameters:

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

1 Measurement Conditions

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

DASY Version	DASY5	V52.2 B0
DASY PP Version	SEMCAD X	V14.2 B2
Phantom	HAC Test Arch	SD HAC P01 BA, #1070
Distance Dipole Top - Probe Center	10 mm	
Scan resolution	dx, dy = 5 mm	area = 20 x 180 mm
Frequency	**835 MHz** ± 1 MHz	
Forward power at dipole connector	20.0 dBm = 100mW	
Input power drift	< 0.05 dB	

2 Maximum Field values

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

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

E-field 10 mm above dipole surface	condition	**Interpolated maximum**
Maximum measured above high end-	100 mW forward power	168.6 V/m
Maximum measured above low end	100 mW forward power	155.7 V/m
Averaged maximum above arm	100 mW forward power	**162.2 V/m**

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

3 Appendix

3.1 Antenna Parameters

Frequency	**Return Loss**	**Impedance**
800 MHz	16.2 dB	(42.3 – j12.1) Ohm
835 MHz	**28.6 dB**	**(50.2 + j3.7) Ohm**
900 MHz	17.7 dB	(56.1 – j12.6) Ohm
950 MHz	20.8 dB	(45.5 + j7.5) Ohm
960 MHz	15.5 dB	(51.3 + j17.2) Ohm

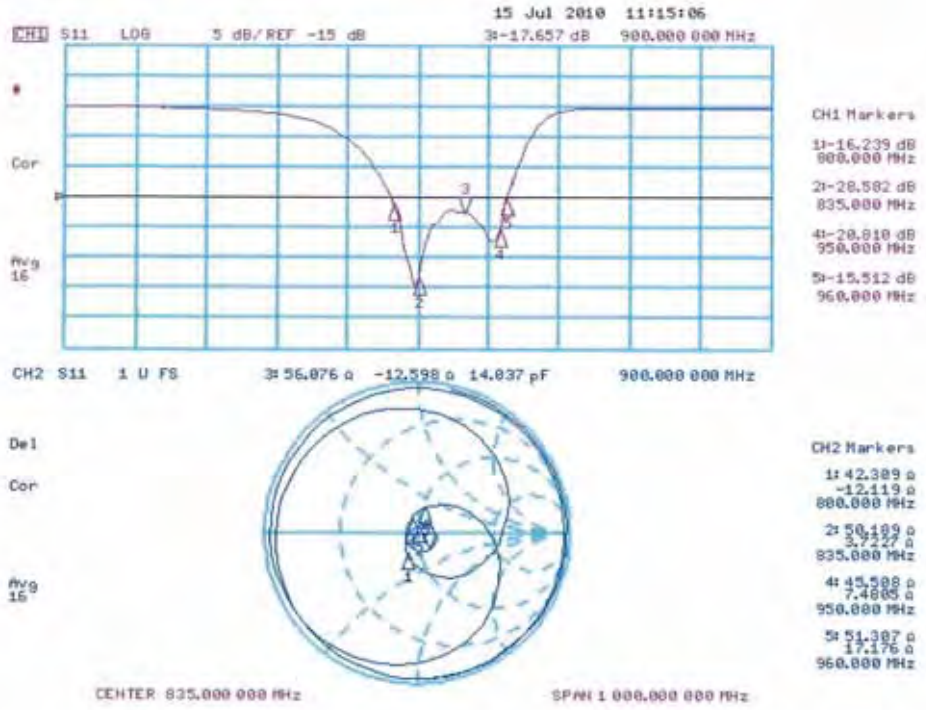
3.2 Antenna Design and Handling

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

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

3.3 Measurement Sheets

3.3.1 Return Loss and Smith Chart



3.3.2 DASY4 H-field Result

Date/Time: 13.07.2010 18:17:07

Test Laboratory: SPEAG Lab2

DUT: HAC-Dipole 835 MHz; Type: CD835V3; Serial: 1017

Communication System: CW; Communication System Band: CD835 (835.0 MHz); Frequency: 835 MHz; Communication System PAR: 0 dB
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Phantom section: RF Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

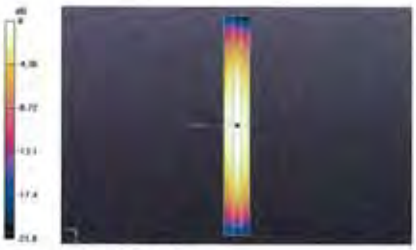
DASY5 Configuration:

- Probe: H3DV6 - SN6065; ; Calibrated: 30.12.2009
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn781; Calibrated: 22.01.2010
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA; Serial: 1070
- Measurement SW: DASY52, V52.2 Build 0; Postprocessing SW: SEMCAD X, V14.2 Build 2Version 14.2.2 (1685)

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 = 0.457 A/m
Probe Modulation Factor = 1
Device Reference Point: 0, 0, -6.3 mm
Reference Value = 0.486 A/m; Power Drift = -9.15e-005 dB
Hearing Aid Near-Field Category: M4 (AWF 0 dB)

Peak H-field in A/m

Grid 1 **0.381** **M4**	Grid 2 **0.397** **M4**	Grid 3 **0.373** **M4**
Grid 4 **0.431** **M4**	Grid 5 **0.457** **M4**	Grid 6 **0.435** **M4**
Grid 7 **0.377** **M4**	Grid 8 **0.403** **M4**	Grid 9 **0.387** **M4**



0 dB = 0.457A/m

3.3.3 DASY4 E-field Result

Date/Time: 13.07.2010 12:42:14

Test Laboratory: SPEAG Lab2

DUT: HAC-Dipole 835 MHz; Type: CD835V3; Serial: 1017

Communication System: CW; Communication System Band: CD835 (835.0 MHz); Frequency: 835 MHz; Communication System PAR: 0 dB
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1000$ kg/m^3
Phantom section: RF Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

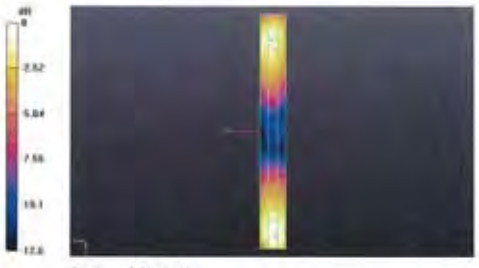
DASY5 Configuration:

- Probe: ER3DV6 - SN2336; ConvF(1, 1, 1); Calibrated: 30.12.2009
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn781; Calibrated: 22.01.2010
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA; Serial: 1070
- Measurement SW: DASY52, V52.2 Build 0; Postprocessing SW: SEMCAD X, V14.2 Build 2Version 14.2.2 (1685)

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 = 168.6 V/m
Probe Modulation Factor = 1
Device Reference Point: 0, 0, -6.3 mm
Reference Value = 106.1 V/m; Power Drift = -0.050 dB
Hearing Aid Near-Field Category: M4 (AWF 0 dB)

Peak E-field in V/m

Grid 1 **154.5** **M4**	Grid 2 **155.7** **M4**	Grid 3 **147.4** **M4**
Grid 4 **87.8** **M4**	Grid 5 **89.1** **M4**	Grid 6 **85.4** **M4**
Grid 7 **157.6** **M4**	Grid 8 **168.6** **M4**	Grid 9 **166.9** **M4**



0 dB = 168.6V/m

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 ATL (Auden)

Certificate No: CD1880V3-1036_Jul10

CALIBRATION CERTIFICATE

Object	CD1880V3 - SN: 1036
Calibration procedure(s)	QA CAL-20.v5 Calibration procedure for dipoles in air
Calibration date:	July 13, 2010

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-09 (No. 217-01086)	Oct-10
Power sensor HP 8481A	US37292783	06-Oct-09 (No. 217-01086)	Oct-10
Probe ER3DV6	SN: 2336	30-Dec-09 (No. ER3-2336_Dec09)	Dec-10
Probe H3DV6	SN: 6065	30-Dec-09 (No. H3-6065_Dec09)	Dec-10
DAE4	SN: 781	22-Jan-10 (No. DAE4-781_Jan10)	Jan-11

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter Agilent 4419B	SN: GB42420191	09-Oct-09 (in house check Oct-09)	In house check: Oct-10
Power sensor HP 8482H	SN: 3318A09450	09-Oct-09 (in house check Oct-09)	In house check: Oct-10
Power sensor HP 8482A	SN: US37295597	09-Oct-09 (in house check Oct-09)	In house check: Oct-10
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-09)	In house check: Oct-10
RF generator E4433B	MY 41000675	03-Nov-04 (in house check Oct-09)	In house check: Oct-11

	Name	Function	Signature
Calibrated by:	Mike Meili	Laboratory Technician	
Approved by:	Fin Bomholt	Technical Director	

Issued: July 15, 2010

References

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

Methods Applied and Interpretation of Parameters:

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

1. Measurement Conditions

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

DASY Version	DASY5	V52.2 B0
DASY PP Version	SEMCAD X	V14.2 B2
Phantom	HAC Test Arch	SD HAC P01 BA, #1070
Distance Dipole Top - Probe Center	10 mm	
Scan resolution	dx, dy = 5 mm	area = 20 x 90 mm
Frequency	**1880 MHz** ± 1 MHz	
Forward power at dipole connector	20.0 dBm = 100mW	
Input power drift	< 0.05 dB	

2. Maximum Field values

H-field 10 mm above dipole surface	condition	**Interpolated maximum**
Maximum measured	100 mW forward power	**0.468 A/m**

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

E-field 10 mm above dipole surface	condition	**Interpolated maximum**
Maximum measured above high end	100 mW forward power	139.2 V/m
Maximum measured above low end	100 mW forward power	136.7 V/m
Averaged maximum above arm	100 mW forward power	**138.0 V/m**

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

3. Appendix

3.1 Antenna Parameters

Frequency	**Return Loss**	**Impedance**
1710 MHz	19.6 dB	(50.2 + j10.6) Ohm
1880 MHz	**22.4 dB**	**(52.1 + j7.5) Ohm**
1900 MHz	22.8 dB	(54.1 + j6.3) Ohm
1950 MHz	31.1 dB	(52.7 – j1.0) Ohm
2000 MHz	20.2 dB	(41.3 + j2.0) Ohm

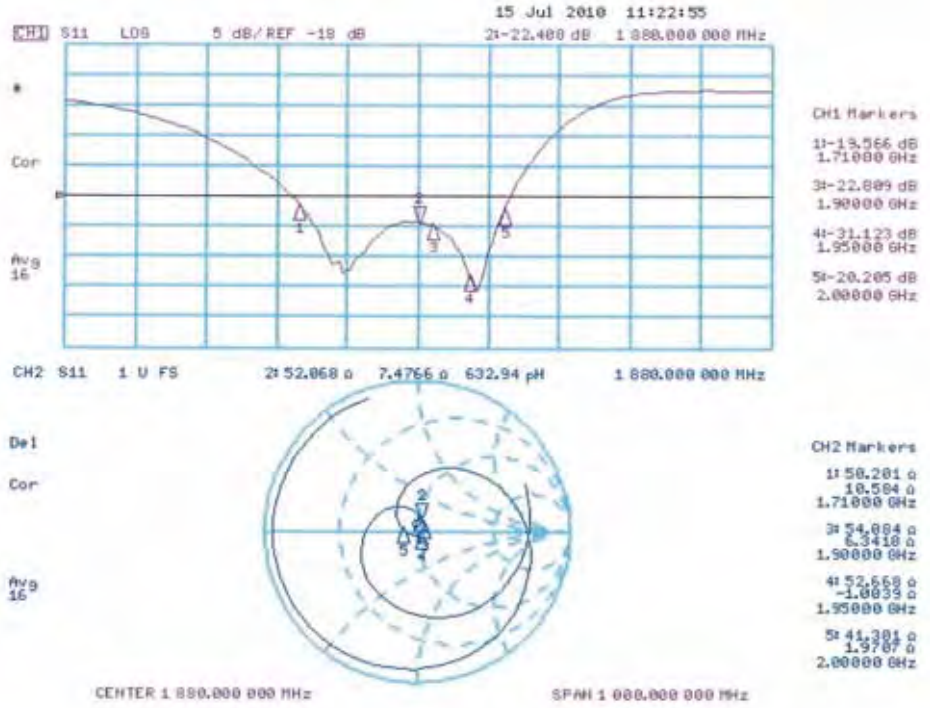
3.2 Antenna Design and Handling

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

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

3.3 Measurement Sheets

3.3.1 Return Loss and Smith Chart



3.3.2 DASY4 H-Field Result

Date/Time: 13.07.2010 17:49:33

Test Laboratory: SPEAG Lab2

DUT: HAC Dipole 1880 MHz; Type: CD1880V3; Serial: 1036

Communication System: CW; Communication System Band: CD1880 (1880.0 MHz); Frequency: 1880 MHz;
Communication System PAR: 0 dB
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Phantom section: RF Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

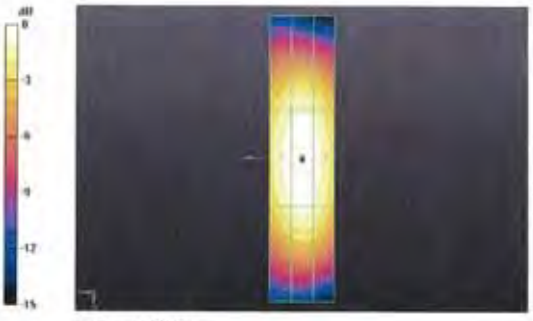
- Probe: H3DV6 - SN6065; ; Calibrated: 30.12.2009
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn781; Calibrated: 22.01.2010
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA; Serial: 1070
- Measurement SW: DASY52, V52.2 Build 0; Postprocessing SW: SEMCAD X, V14.2 Build 2Version 14.2.2 (1685)

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 = 0.468 A/m
Probe Modulation Factor = 1
Device Reference Point: 0, 0, -6.3 mm
Reference Value = 0.496 A/m; Power Drift = -0.00099 dB
Hearing Aid Near-Field Category: M2 (AWF 0 dB)

Peak H-field in A/m

Grid 1 **0.404** **M2**	Grid 2 **0.422** **M2**	Grid 3 **0.400** **M2**
Grid 4 **0.447** **M2**	Grid 5 **0.468** **M2**	Grid 6 **0.446** **M2**
Grid 7 **0.408** **M2**	Grid 8 **0.433** **M2**	Grid 9 **0.411** **M2**



0 dB = 0.468A/m

3.3.3 DASY4 E-Field Result

Date/Time: 13.07.2010 14:56:29

Test Laboratory: SPEAG Lab2

DUT: HAC Dipole 1880 MHz; Type: CD1880V3; Serial: 1036

Communication System: CW; Communication System Band: CD1880 (1880.0 MHz); Frequency: 1880 MHz;
Communication System PAR: 0 dB
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1000$ kg/m^3
Phantom section: RF Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

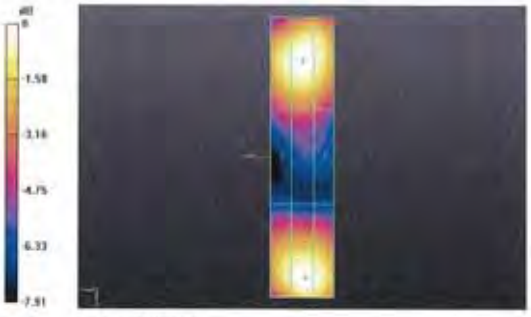
- Probe: ER3DV6 - SN2336; ConvF(1, 1, 1); Calibrated: 30.12.2009
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn781; Calibrated: 22.01.2010
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA; Serial: 1070
- Measurement SW: DASY52, V52.2 Build 0; Postprocessing SW: SEMCAD X, V14.2 Build 2Version 14.2.2 (1685)

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 = 139.2 V/m
Probe Modulation Factor = 1
Device Reference Point: 0, 0, -6.3 mm
Reference Value = 156.8 V/m; Power Drift = 0.043 dB
Hearing Aid Near-Field Category: M2 (AWF 0 dB)

Peak E-field in V/m

Grid 1 **132.8** **M2**	Grid 2 **136.7** **M2**	Grid 3 **133.9** **M2**
Grid 4 **92.6** **M3**	Grid 5 **95.1** **M3**	Grid 6 **91.8** **M3**
Grid 7 **130.6** **M2**	Grid 8 **139.2** **M2**	Grid 9 **137.4** **M2**



0 dB = 139.2V/m

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Accreditation No.: SCS 108

Client ATL (Auden)

Certificate No: ER3-2256_Aug10

CALIBRATION CERTIFICATE

Object: ER3DV6R - SN:2256

Calibration procedure(s): QA CAL-02.v5 and QA CAL-25.v2
Calibration procedure for E-field probes optimized for close near field evaluations in air

Calibration date: August 23, 2010

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	1-Apr-10 (No. 217-01136)	Apr-11
Power sensor E4412A	MY41495277	1-Apr-10 (No. 217-01136)	Apr-11
Power sensor E4412A	MY41498087	1-Apr-10 (No. 217-01136)	Apr-11
Reference 3 dB Attenuator	SN: S5054 (3c)	30-Mar-10 (No. 217-01159)	Mar-11
Reference 20 dB Attenuator	SN: S5086 (20b)	30-Mar-10 (No. 217-01161)	Mar-11
Reference 30 dB Attenuator	SN: S5129 (30b)	30-Mar-10 (No. 217-01160)	Mar-11
Reference Probe ER3DV6	SN: 2328	3-Oct-09 (No. ER3-2328_Oct09)	Oct-10
DAE4	SN: 789	23-Dec-09 (No. DAE4-789_Dec09)	Dec-10

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-09)	In house check: Oct10

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

Issued: August 24, 2010

Glossary:

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

Calibration is Performed According to the Following Standards:

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

Methods Applied and Interpretation of Parameters:

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

Probe ER3DV6R

SN:2256

Manufactured:	March 15, 2001
Last calibrated:	August 21, 2009
Recalibrated:	August 23, 2010

Calibrated for DASY/EASY Systems

(Note: non-compatible with DASY2 system!)

DASY/EASY - Parameters of Probe: ER3DV6R SN:2256

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$)	2.21	1.59	1.68	± 10.1%
DCP (mV)[A]	94.2	93.8	101.1	

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	± 1.5 %
			Y	0.00	0.00	1.00	300	
			Z	0.00	0.00	1.00	300	

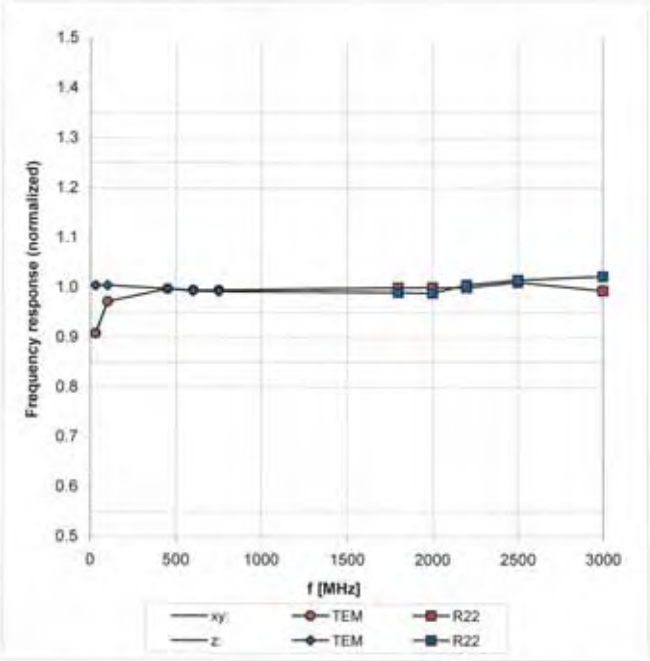
The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

[A] numerical linearization parameter: uncertainty not required

[E] Uncertainty is determined using the maximum deviation from linear response applying recatangular distribution and is expressed for the square of the field value

Frequency Response of E-Field

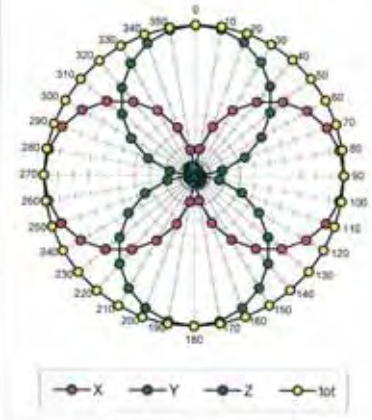
(TEM-Cell:ifi110 EXX, Waveguide R22)



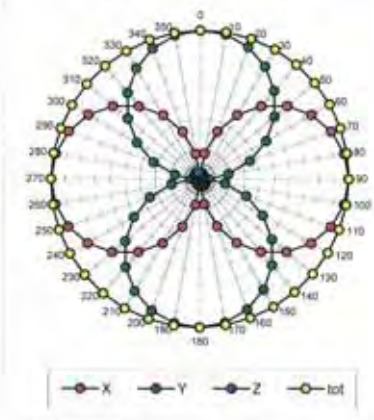
Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

Receiving Pattern (ϕ), ϑ = 0°

f = 600 MHz, TEM ifi110EXX

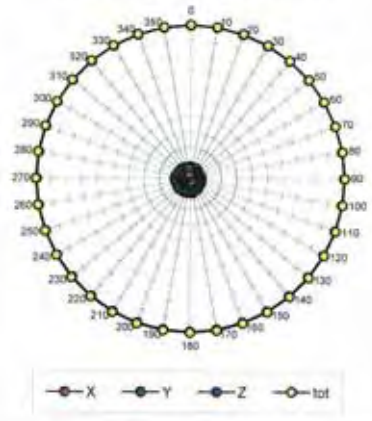


f = 2500 MHz, WG R22

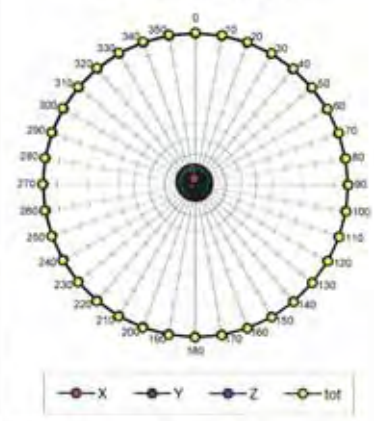


Receiving Pattern (ϕ), ϑ = 90°

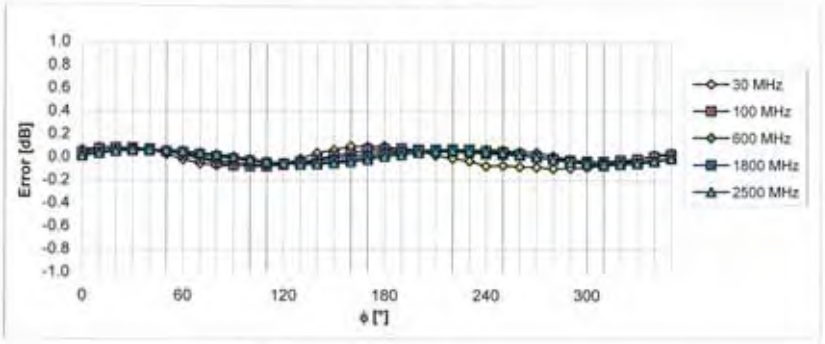
f = 600 MHz, TEM ifi110EXX



f = 2500 MHz, WG R22

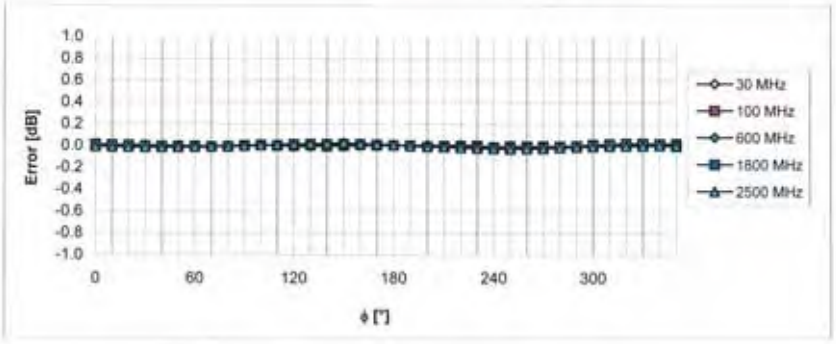


Receiving Pattern (ϕ), ϑ = 0°



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

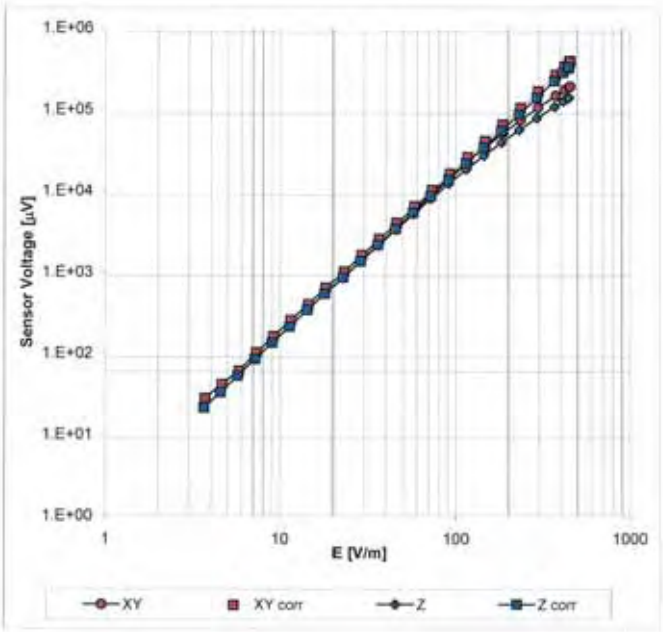
Receiving Pattern (ϕ), ϑ = 90°

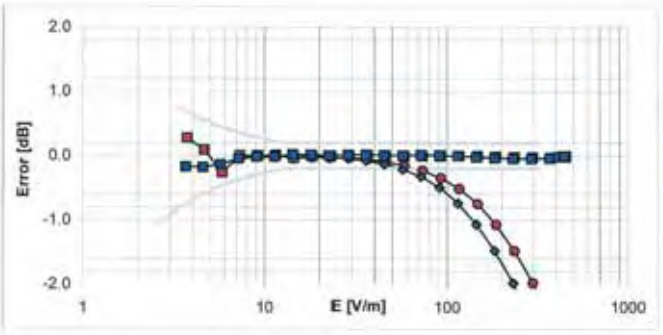


Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

Dynamic Range f(E-field)

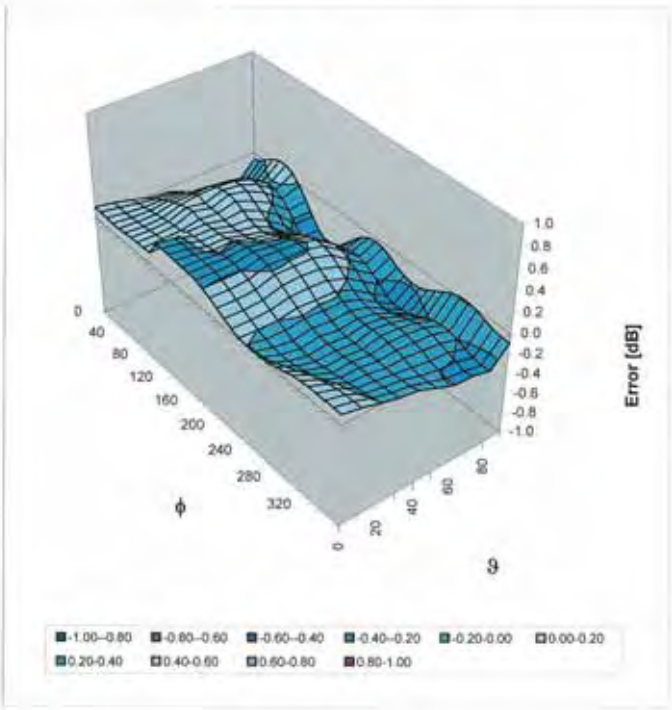
(Waveguide R22, f = 1800 MHz)





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

Deviation from Isotropy in Air
Error (ϕ, ϑ), f = 900 MHz



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

Other Probe Parameters

Sensor Arrangement	Rectangular
Connector Angle (°)	-244.9
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	8.0 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 **ATL (Auden)**

Certificate No: **H3-6076_Aug10**

CALIBRATION CERTIFICATE

Object	H3DV6 - SN:6076
Calibration procedure(s)	QA CAL-03.v5 and QA CAL-25.v2 Calibration procedure for H-field probes optimized for close near field evaluations in air
Calibration date:	August 23, 2010

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	1-Apr-10 (No. 217-01136)	Apr-11
Power sensor E4412A	MY41495277	1-Apr-10 (No. 217-01136)	Apr-11
Power sensor E4412A	MY41498087	1-Apr-10 (No. 217-01136)	Apr-11
Reference 3 dB Attenuator	SN: S5054 (3c)	30-Mar-10 (No. 217-01159)	Mar-11
Reference 20 dB Attenuator	SN: S5086 (20b)	30-Mar-10 (No. 217-01161)	Mar-11
Reference 30 dB Attenuator	SN: S5129 (30b)	30-Mar-10 (No. 217-01160)	Mar-11
Reference Probe H3DV6	SN: 6182	3-Oct-09 (No. H3-6182_Oct09)	Oct-10
DAE4	SN: 789	23-Dec-09 (No. DAE4-789_Dec09)	Dec-10

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-09)	In house check: Oct10

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

Issued: August 24, 2010

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Zeughausstrasse 43, 8004 Zurich, Switzerland

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S Swiss Calibration Service

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Accreditation No.: SCS 108

Glossary:

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

Calibration is Performed According to the Following Standards:

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

Methods Applied and Interpretation of Parameters:

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

Probe H3DV6

SN:6076

Manufactured:	October 2, 2000
Last calibrated:	August 19, 2009
Recalibrated:	August 23, 2010

Calibrated for DASY/EASY Systems

(Note: non-compatible with DASY2 system!)

DASY/EASY - Parameters of Probe: H3DV6 SN:6076

Basic Calibration Parameters

		Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm (A/m / √(μV))	a0	2.85E-3	2.72E-3	3.05E-3	± 5.1%
Norm (A/m / √(μV))	a1	-8.80E-5	-2.35E-4	-3.28E-5	± 5.1%
Norm (A/m / √(μV))	a2	3.38E-5	1.15E-5	-1.72E-4	± 5.1%
DCP (mV)[A]		92.1	81.7	78.1	

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	± 1.5 %
			Y	0.00	0.00	1.00	300	
			Z	0.00	0.00	1.00	300	

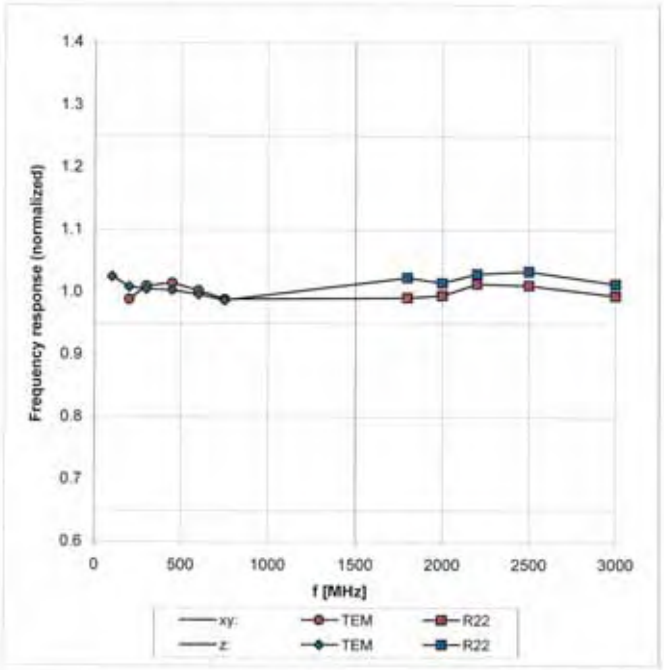
The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

[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.

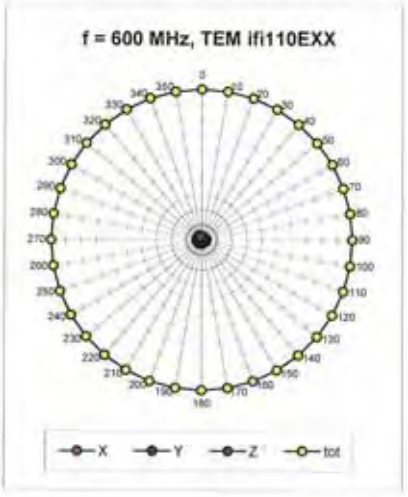
Frequency Response of H-Field

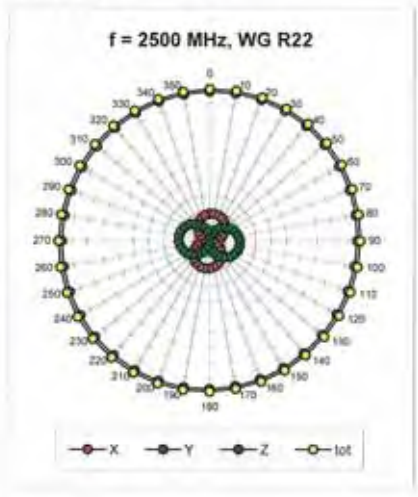
(TEM-Cell:ifi110 EXX, Waveguide R22)



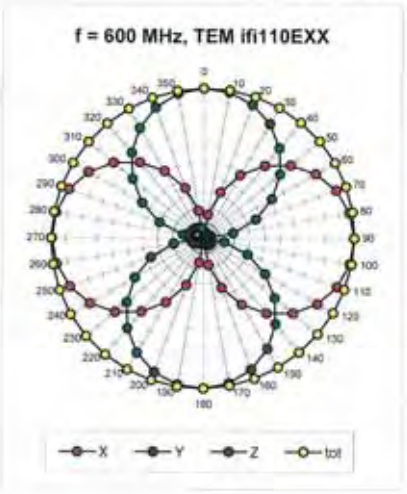
Uncertainty of Frequency Response of H-field: ± 6.3% (k=2)

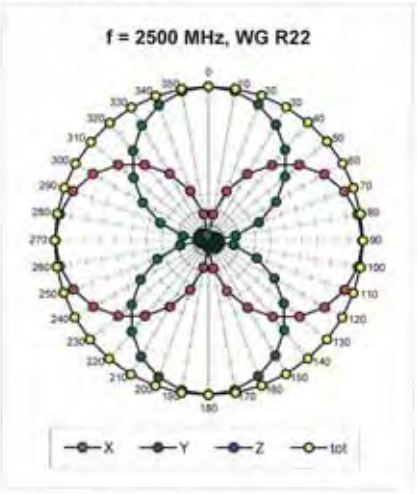
Receiving Pattern (ϕ), ϑ = 90°



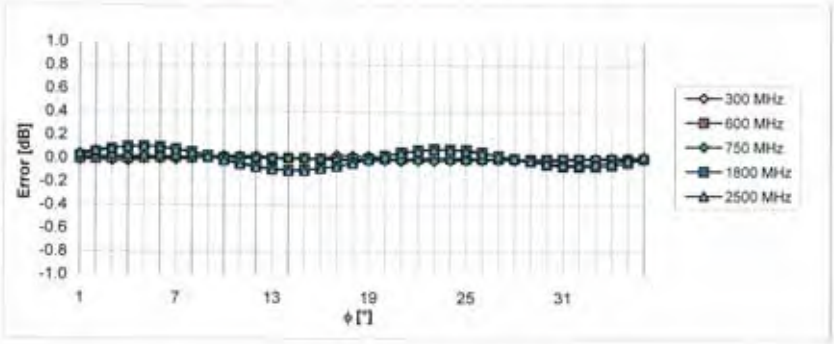


Receiving Pattern (ϕ), ϑ = 0°



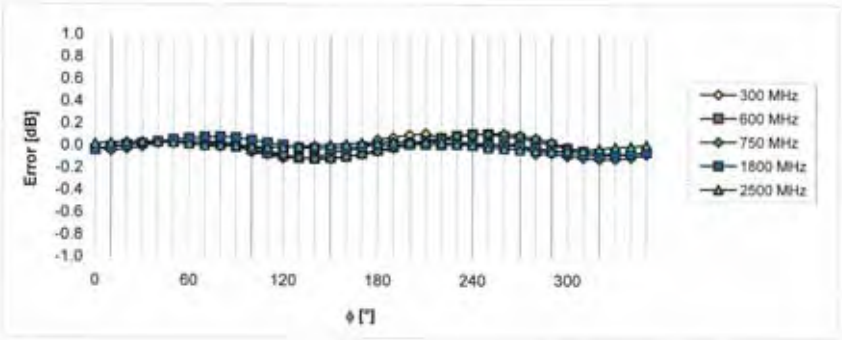


Receiving Pattern (ϕ), ϑ = 90°



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

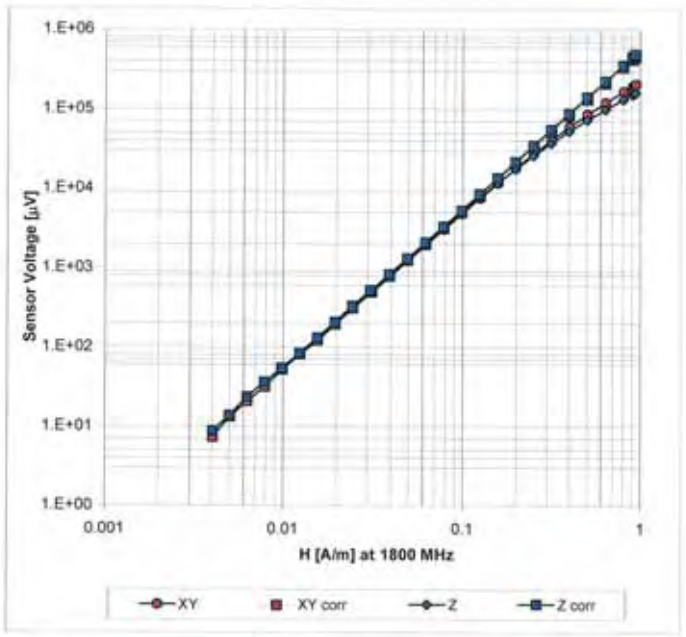
Receiving Pattern (ϕ), ϑ = 0°

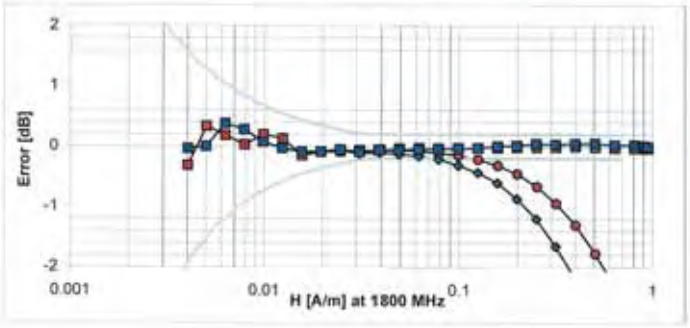


Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

Dynamic Range f(H-field)

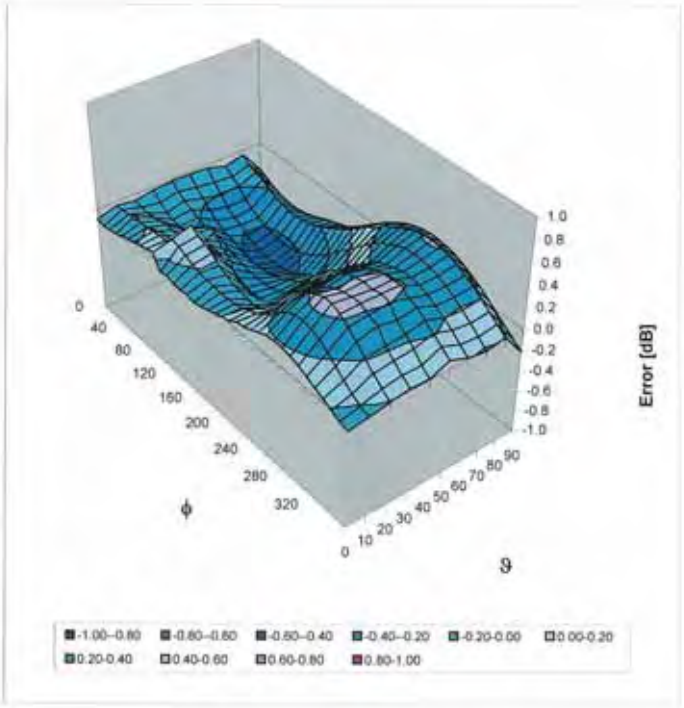
(Waveguide R22, f = 1800 MHz)





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

Deviation from Isotropy in Air
Error (ϕ, ϑ), f = 900 MHz



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

Other Probe Parameters

Sensor Arrangement	Rectangular
Connector Angle (°)	81.5
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	6.0 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

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 **ATL (Auden)**

Certificate No: **DAE4-541_Jul10**

CALIBRATION CERTIFICATE

Object: DAE4 - SD 000 D04 BJ - SN: 541

Calibration procedure(s): QA CAL-06.v21
Calibration procedure for the data acquisition electronics (DAE)

Calibration date: July 21, 2010

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Keithley Multimeter Type 2001	SN: 0810278	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

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

Issued: July 21, 2010

Glossary

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

Methods Applied and Interpretation of Parameters

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

DC Voltage Measurement

A/D - Converter Resolution nominal

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

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

Calibration Factors	X	Y	Z
High Range	404.537 ± 0.1% (k=2)	404.418 ± 0.1% (k=2)	404.182 ± 0.1% (k=2)
Low Range	3.96832 ± 0.7% (k=2)	3.93576 ± 0.7% (k=2)	3.97526 ± 0.7% (k=2)

Connector Angle

Connector Angle to be used in DASY system	290.5 ° ± 1 °

Appendix

1. DC Voltage Linearity

High Range		Reading (µV)	Difference (µV)	Error (%)
Channel X	+ Input	200007.6	-2.45	-0.00
Channel X	+ Input	20002.71	3.11	0.02
Channel X	- Input	-19993.80	5.60	-0.03
Channel Y	+ Input	200009.7	0.90	0.00
Channel Y	+ Input	19997.49	-2.11	-0.01
Channel Y	- Input	-20001.06	-0.96	0.00
Channel Z	+ Input	200007.5	-0.73	-0.00
Channel Z	+ Input	20001.10	1.40	0.01
Channel Z	- Input	-19996.58	3.52	-0.02

Low Range		Reading (µV)	Difference (µV)	Error (%)
Channel X	+ Input	2000.2	0.31	0.02
Channel X	+ Input	199.75	-0.05	-0.03
Channel X	- Input	-200.44	-0.34	0.17
Channel Y	+ Input	2001.5	1.51	0.08
Channel Y	+ Input	199.36	-0.64	-0.32
Channel Y	- Input	-200.93	-0.93	0.47
Channel Z	+ Input	2000.3	0.13	0.01
Channel Z	+ Input	198.98	-1.02	-0.51
Channel Z	- Input	-201.02	-1.02	0.51

2. Common mode sensitivity

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

	Common mode Input Voltage (mV)	High Range Average Reading (µV)	Low Range Average Reading (µV)
Channel X	200	11.44	10.03
	- 200	-8.47	-10.20
Channel Y	200	1.54	1.18
	- 200	-2.96	-2.67
Channel Z	200	1.08	0.90
	- 200	-2.05	-2.13

3. Channel separation

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

	Input Voltage (mV)	Channel X (µV)	Channel Y (µV)	Channel Z (µV)
Channel X	200	-	1.55	-0.83
Channel Y	200	2.34	-	3.70
Channel Z	200	0.27	-0.67	-

4. AD-Converter Values with inputs shorted

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

	High Range (LSB)	Low Range (LSB)
Channel X	16010	15908
Channel Y	15784	14840
Channel Z	15973	16097

5. Input Offset Measurement

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

	Average (μV)	min. Offset (μV)	max. Offset (μV)	Std. Deviation (μV)
Channel X	-0.03	-0.96	1.03	0.29
Channel Y	-0.54	-1.32	0.40	0.34
Channel Z	-0.86	-1.49	-0.32	0.26

6. Input Offset Current

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

7. Input Resistance

	Zeroing (MOhm)	Measuring (MOhm)
Channel X	0.2000	199.5
Channel Y	0.2000	203.1
Channel Z	0.2001	203.2

8. Low Battery Alarm Voltage (verified during pre test)

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

9. Power Consumption (verified during pre test)

Typical values	Switched off (mA)	Stand by (mA)	Transmitting (mA)
Supply (+ Vcc)	+0.0	+6	+14
Supply (- Vcc)	-0.01	-8	-9

Appendix E - Uncertainty

HAC Uncertainty Budget According to NSIC63.19 [1], [2]							
Error Description	Uncertainty value	Prob. Dist.	Div.	(ci) E	(ci) 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%
Test Arch	±7.2%	R	$\sqrt{3}$	1	0	±4.02%	±0.0%
Linearity	±4.7%	R	$\sqrt{3}$	1	1	±2.7%	±2.7%
Probe modulation Factor	±15.0%	R	$\sqrt{3}$	1	1	±8.7%	±8.7%
Scaling to Peak Envelope Power	±0.0%	R	$\sqrt{3}$	1	1	±0.0%	±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	±0.8%	R	$\sqrt{3}$	1	1	±0.5%	±0.5%
Integration Time	±2.6%	R	$\sqrt{3}$	1	1	±1.5%	±1.5%
RF Ambient Conditions	±3.0%	R	$\sqrt{3}$	1	1	±1.7%	±1.7%
RF Reflections	±12.0%	R	$\sqrt{3}$	1	1	±6.9%	±6.9%
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%
Test Sample Related							
Device Positioning Vertical	±4.7%	R	$\sqrt{3}$	1	0.67	±2.7%	±1.8%
Device Positioning Lateral	±1.0%	R	$\sqrt{3}$	1	1	±0.6%	±0.6%
Device Holder and Phantom	±2.4%	R	$\sqrt{3}$	1	1	±1.4%	±1.4%
Power Drift	±5.0%	R	$\sqrt{3}$	1	1	±2.9%	±2.9%
Phantom and Setup Related							
Phantom Thickness	±2.4%	R	$\sqrt{3}$	1	0.67	±1.4%	±0.9%
Combined Std. Uncertainty		RSS				±17.5%	±13.8%
Expanded Std. Uncertainty on Power		K=2				±35.0%	±27.6%
Expanded Std. Uncertainty on Field						±17.5%	±13.8%