

HAC RF Emissions Test Report

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Measurements made by:	Janne Hirsimäki		
Tested devices:	RM-413		
FCC ID:	PYARM-413	IC:	661V-RM413
Supplement reports:	Salo_HAC_0851_07		
Testing has been carried out in accordance with:	ANSI C63.19-2007 American National Standard for Methods of Measurement of Compatibility between Wireless Communications Devices and Hearing Aids		
Documentation:	The documentation of the testing performed on the tested devices is archived for 15 years at TCC Nokia.		
Test results:	The tested device complies with the requirements in respect of all parameters subject to the test. The test results and statements relate only to the items tested. The test report shall not be reproduced except in full, without written approval of the laboratory.		
Date and signatures:			
For the contents:			

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1. SUMMARY OF HAC RF EMISSION TEST REPORT

1.1 Test Details

Period of test	2008-11-28 to 2008-12-16
SN, HW, SW and DUT numbers of tested device	SN: 356814/02/000031/5, HW: 0420, SW: 008.38.1, DUT: 13289
Batteries used in testing	BL-4U, DUT: 13323
State of sample	
Notes	AWF = -5 for GSM, 0 for WCDMA

1.2 Maximum Results

The maximum measured HAC RF emissions values and categories for electric and magnetic fields are given in section 1.2.1 and 1.2.2 respectively.

1.2.1 Electric field measurements

Band & Mode	Ch / Freq. [MHz]	Radiated power	Limit of E-field max. value in category M3 [V/m]	Max E-field value after exclusion [V/m]	Category
GSM850	251 / 848.8	26.9 dBm ERP	149.6 – 266.1	182.6	M3 (-5dB)
WCDMA850	4233 / 846.6	17.8 dBm ERP	199.5 - 354.8	64.7	M4 (0dB)
GSM1900	661 / 1880.0	27.1 dBm EIRP	47.3 – 84.1	74.0	M3 (-5dB)
WCDMA1900	9262 / 1852.4	22.3 dBm EIRP	63.1 - 112.2	36.8	M4 (0dB)

1.2.2 Magnetic field measurements

Band & Mode	Ch / Freq. [MHz]	Radiated power	Limit of H-field max. value in category M3 [A/m]	Maximum H-field value after exclusion [A/m]	Category
GSM850	251 / 848.8	26.9 dBm ERP	0.45 – 0.80	0.297	M4 (-5dB)
WCDMA850	4233 / 846.6	17.8 dBm ERP	0.60 - 1.07	0.098	M4 (0dB)
GSM1900	661 / 1880.0	27.1 dBm EIRP	0.14 – 0.25	0.244	M3 (-5dB)
WCDMA1900	9400 / 1880.0	19.9 dBm EIRP	0.19 - 0.34	0.119	M4 (0dB)

1.2.3 Overall RF emissions category of the tested device

Band & Mode	Combined category (E- and H-fields)	Pass / Fail
GSM850	M3	Pass
WCDMA850	M4	Pass
GSM1900	M3	Pass
WCDMA1900	M4	Pass
Final Category	M3	Pass

1.2.4 Maximum Drift

Maximum drift during measurements	0.50 dB
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1.2.5 Measurement Uncertainty

Extended Uncertainty (k=2) 95%, E-field	14.7 %
Extended Uncertainty (k=2) 95%, H-field	10.9 %

2. DESCRIPTION OF THE DEVICE UNDER TEST (DUT)

Modes of Operation	Bands	Modulation Mode	Duty Cycle	Transmitter Frequency Range (MHz)
GSM	850	GMSK	1/8	824 – 849
GSM	1900	GMSK	1/8	1850 – 1910
WCDMA	850		1	826 – 847
WCDMA	1900		1	1852 - 1908

Outside of USA the transmitter of the device is capable of operating also in 900MHz, 1800MHz and 2100MHz bands, which are not part of this filing.

3. TEST CONDITIONS

3.1 Temperature and Humidity

Ambient temperature [°C]:	19.1 to 20.9
Ambient humidity [RH %]:	36 to 46

3.2 Test Signal, Frequencies, and Output Power

The transmitter of the device was put into operation by using a call tester. Communications between the device and the call tester were established by air link.

For all tests the device output power was set to maximum power level; a fully charged battery was used for every test sequence.

The transmission mode of the device in WCDMA HAC RF emission tests was configured to 12.2kbps RMC with all TPC bits set as “1”.

The measurements were performed on low, middle and high channels.

4. DESCRIPTION OF THE TEST EQUIPMENT

4.1 Measurement system and components

The measurements were performed using an automated near-field scanning system, DASY 4, manufactured by Schmid & Partner Engineering AG (SPEAG) in Switzerland.
The following table lists calibration dates of SPEAG components:

Test Equipment	Serial Number	Calibration interval	Calibration expiry
DAE 4	538	12 months	2009-07
E-field Probe ER3DV6	2333	12 months	2009-01
H-field Probe H3DV6	6053	12 months	2009-01
Dipole Validation Kit, CD835V3	1004	24 months	2009-02
Dipole Validation Kit, CD1880V3	1003	24 months	2009-02

Additional test equipment used in testing and validation:

Test Equipment	Model	Serial Number	Calibration interval	Calibration expiry
Signal Generator	SML03	101265	12 months	2009-07
Amplifier	ZHL-42 (SMA)	N072095-5	12 months	2009-07
Power Meter	NRVS	849305/028	12 months	2009-07
Power Sensor	NRV-Z32	839176/020	12 months	2009-07
Radio Communication Tester	CMU 200	101111	12 months	2009-07

4.1.1 Isotropic E-field probe ER3DV6

Construction	One dipole parallel, two dipoles normal to probe axis Built-in shielding against static charges PEEK enclosure material
Frequency	In air 100 MHz to >6 GHz; Linearity: ± 0.2 dB (100 MHz to 3 GHz)
Directivity	± 0.2 dB in air (rotation around probe axis) ± 0.4 dB in air (rotation normal to probe axis)
Dynamic Range	2 V/m to > 1000 V/m; Linearity: ± 0.2 dB
Dimensions	Overall length: 330 mm Tip length: 16 mm Body diameter: 12 mm Tip diameter: 8 mm
Application	Distance from probe tip to nearest point of dipole: 1.25 mm General near-field measurements up to 6 GHz Field component measurements Fast automatic scanning in phantoms

4.1.2 Isotropic H-field probe H3DV6

Construction	Three concentric loop sensors with 3.8 mm loop diameters Resistively loaded detector diodes for linear response Built-in shielding against static charges PEEK enclosure material
Frequency	200 MHz to 3 GHz; Output linearized (absolute accuracy $\pm 6.0\%$, $k=2$)
Directivity	± 0.25 dB (spherical isotropy error)
Dynamic Range	10 mA/m to 2 A/m at 1 GHz
Dimensions	Overall length: 330 mm Tip length: 40 mm Body diameter: 12 mm Tip diameter: 6 mm
Application	Distance from probe tip to nearest point of dipole: 1.1 mm General magnetic near-field measurements up to 3 GHz Field component measurements, surface current measurements Measurements in air or liquids, low interaction

4.1.3 Device Holder

The Device Holder and Test Arch are manufactured by Speag (<http://www.dasy4.com/hac>). Test arch is used for all tests i.e. for both validation testing and device testing. The holder and test arch conforms to the requirements of ANSI C63.19.

The SPEAG device holder (see Section 5.1) was used to position the test device in all tests.

4.2 Validation of the System

The manufacturer calibrates the probes annually. Validation measurements are made regularly using the dipole validation kit. The power level used by manufacturer in dipole calibration is supplied to the dipole antenna. The antenna is scanned at 1.0cm distance between top surface of the dipole and calibration point of the probe.

System Validation, H-field and E-field

f [MHz]	Description	E-field [V/m]	H-field [A/m]
835	Reference result	160.0	0.452
	± 10% window	144.0 – 176.0	0.406 – 0.497
	2008-11-28	157.6	0.440
1880	Reference result	128.8	0.452
	± 10% window	115.9 – 141.7	0.406 – 0.497
	2008-12-15	127.1	0.447

Plots of the system validation scans are given in Appendix A.

5. DESCRIPTION OF THE TEST PROCEDURE

5.1 Test Arch and Device Holder

The test device was placed in the Device Holder (illustrated below) that is supplied by SPEAG. Using this positioner the tested device is positioned under Test Arch.



Device holder and Test Arch supplied by SPEAG

5.2 Scan Procedures

Near field scans of 5cm x 5cm were used for determination of the field distribution. Measurement plane distance from WD reference plane is 1cm. Scans were performed for both E- and H-field using appropriate probe. DASY software divides detected values into 3 x 3 sub grids as described in the C63.19 standard.

5.3 Scan area centered at the maximum magnetic T-coil coupling

Scanning centered at the maximum magnetic T-coil coupling was not applicable for the tested device.

5.4 Probe Modulation Factor

All raw measurements in DASY4 system are presented as RMS values. The measurement software then applies Probe Modulation Factor (PMF) to convert readings to “slot averaged” peak values as required by C63.19 standard.

Therefore PMF was assessed as described in C63.19 standard along with Speag's Application Note (AN_Hearing_Aid_Compatibility.pdf, section 28.8, "Definition / Determination of the Probe Modulation Factor") and 061117a_TN_HAC_PMF_Predefined_Files.pdf.

Modulation factors, GSM

f [MHz]	p [dBm]	E-field [V/m] Probe SN: 2333		H-field [A/m] Probe SN: 6053		PMF E-field	PMF H-field
		CW	GSM	CW	GSM		
835.0	20	266	98.2	0.800	0.277	2.71	2.88
1880.0	20	84	30.2	0.250	0.098	2.78	2.55

Modulation factors, WCDMA

f [MHz]	p [dBm]	E-field [V/m] Probe SN: 2333		H-field [A/m] Probe SN: 6053		PMF E-field	PMF H-field
		CW	WCDMA	CW	WCDMA		
835.0	17	92.3	114.0	0.377	0.526	0.81	0.72
1880.0	17	91.9	113.9	0.308	0.551	0.81	0.56

Observed Modulation Factor:

$$PMF_{(E)} = \text{E-field}_{(CW)} / \text{E-field}_{(Modulated)}$$

$$PMF_{(H)} = \text{H-field}_{(CW)} / \text{H-field}_{(Modulated)}$$

Observed Crest Factor:

$$CF_{(E)} = (PMF_{(E)})^2$$

$$CF_{(H)} = (PMF_{(H)})^2$$

5.5 Slot Averaged Calculation Method

The slot-averaged values for the every measured signal type were calculated using observed duty cycles.

5.6 Sub-grid Exclusion

The measurement grid defined in C63.19 consists of 9 evenly sized blocks, which are used to define permissible exclusion areas. For both E- and H-field measurements three contiguous blocks may be excluded from the measurements except center block may never be excluded. There must be 4 blocks left that are common for both E- and H-field measurements, so maximum of 5 different blocks can be excluded (e.g. 3 blocks excluded from E-field and 2 blocks from H-field).

5.7 Category Limits

From remaining maximum values after exclusion process, Hearing Aid M-category is defined according to the category limits of C63.19 – 2007.

Category	AWF [dB]	Limits for RF-parameters <960MHz				Limits for RF-parameters >960MHz			
		E-field [V/m]		H-field [A/m]		E-field [V/m]		H-field [A/m]	
		Min	Max	Min	Max	Min	Max	Min	Max
M1	0	631.0	1122.0	1.91	3.39	199.5	354.8	0.60	1.07
M1	-5	473.2	841.4	1.43	2.54	149.6	266.1	0.45	0.80
M2	0	354.8	631.0	1.07	1.91	112.2	199.5	0.34	0.60
M2	-5	266.1	473.2	0.80	1.43	84.1	149.6	0.25	0.45
M3	0	199.5	354.8	0.60	1.07	63.1	112.2	0.19	0.34
M3	-5	149.6	266.1	0.45	0.80	47.3	84.1	0.14	0.25
M4	0		<199.5		<0.60		<63.1		<0.19
M4	-5		<149.6		<0.45		<47.3		<0.14

6. MEASUREMENT UNCERTAINTY

Source of Uncertainty	Tolerance ±%	Probability Distribution	Div.	ci E	ci H	Standard Uncertainty ±%, E	Standard Uncertainty ±%, H	Remark
MEASUREMENT SYSTEM								
Probe Calibration	5.1	N	1	1	1	5.1	5.1	
Axial Isotropy	4.7	R	√3	1	1	2.7	2.7	
Sensor Displacement	16.5	R	√3	1	0.145	9.5	1.4	
Boundary Effect	2.4	R	√3	1	1	1.4	1.4	
Linearity	4.7	R	√3	1	1	2.7	2.7	SAR
Scaling to Peak Envelope Power	2.0	R	√3	1	1	1.2	1.2	
System Detection Limit	1.0	R	√3	1	1	0.6	0.6	
Readout Electronics	0.3	N	1	1	1	0.3	0.3	SAR
Response Time	0.8	R	√3	1	1	0.5	0.5	
Integration Time	2.6	R	√3	1	1	1.5	1.5	SAR
RF Ambient Conditions	3.0	R	√3	1	1	1.7	1.7	SAR
RF Reflections	12.0	R	√3	1	1	6.9	6.9	
Probe Positioner	1.2	R	√3	1	0.67	0.7	0.5	
Probe Positioning	4.7	R	√3	1	0.67	2.7	1.8	
Extrapolation and Interpolation	1.0	R	√3	1	1	0.6	0.6	SAR
TEST SAMPLE RELATED								
Device Positioning Vertical	4.7	R	√3	1	0.67	2.7	1.8	
Device Positioning Lateral	1.0	R	√3	1	1	0.6	0.6	
Device Holder and Test Arch	2.4	R	√3	1	1	1.4	1.4	
Power Drift	5.0	R	√3	1	1	2.9	2.9	SAR
TEST ARCH AND SETUP RELATED								
Test Arch Thickness	2.4	R	√3	1	0.67	1.4	0.9	
COMBINED STANDARD UNCERTAINTY						14.7	10.9	
Expanded Uncertainty on Power						29.4	21.8	
Expanded Uncertainty on Field						14.7	10.9	

7. RESULTS

The calculated maximum field values for the test device are tabulated below:

850MHz RF emissions test results

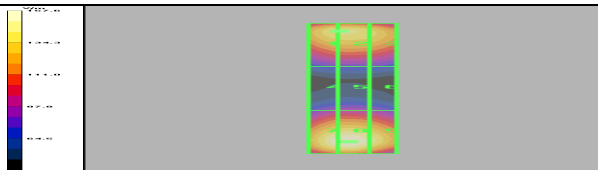
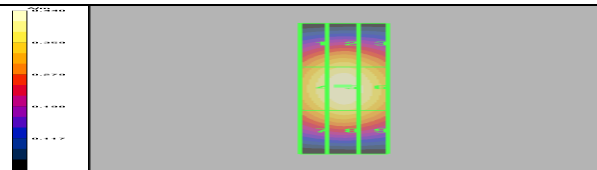
Option used	Test configuration	Ch 128 824.2MHz	Ch 190 836.6MHz	Ch 251 848.8MHz
GSM850	Power	24.2 dBm	22.7 dBm	26.9 dBm
Flip closed	E-field [V/M]	160.2	181.9	182.6
	H-field [A/m]	0.243	0.278	0.297
	Category	M3 (-5dB)	M3 (-5dB)	M3 (-5dB)
Option used	Test configuration	Ch 4132 826.4MHz	Ch 4175 835.0MHz	Ch 4233 846.6MHz
WCDMA850	Power	16.2 dBm	13.9 dBm	17.8 dBm
Flip closed	E-field [V/M]	63.9	62.5	64.7
	H-field [A/m]	0.094	0.092	0.098
	Category	M4 (0dB)	M4 (0dB)	M4 (0dB)

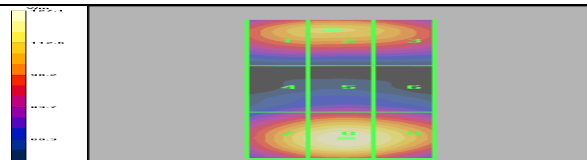
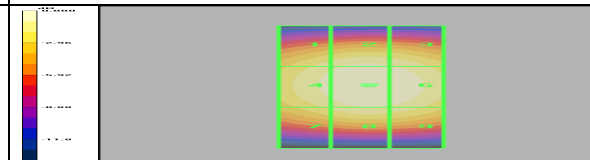
1900MHz RF emissions test results

Option used	Test configuration	Ch 512 1850.2MHz	Ch 661 1880.0MHz	Ch 810 1909.8MHz
GSM1900	Power	24.3 dBm	27.1 dBm	25.4 dBm
Flip closed	E-field [V/M]	70.8	74.0	66.2
	H-field [A/m]	0.204	0.244	0.199
	Category	M3 (-5dB)	M3 (-5dB)	M3 (-5dB)
Option used	Test configuration	Ch 9262 1852.4MHz	Ch 9400 1880.0MHz	Ch 9538 1907.6MHz
WCDMA1900	Power	22.3 dBm	19.9 dBm	20.5 dBm
Flip closed	E-field [V/M]	36.8	35.8	32.3
	H-field [A/m]	0.117	0.119	0.100
	Category	M4 (0dB)	M4 (0dB)	M4 (0dB)

Plots of the measurement scans are shown in **Appendix B**. Excluded cells are colored orange.

APPENDIX A: SYSTEM VALIDATION SCANS

SYSTEM VALIDATION DATA 850MHZ																																													
Date/Time: 2008-11-28 15:53:06 Test Laboratory: TCC Nokia Type: D835V3; Serial: 1004					Date/Time: 2008-11-28 14:58:35 Test Laboratory: TCC Nokia Type: D835V3; Serial: 1004																																								
Communication System: CW835 Frequency: 835 MHz; Duty Cycle: 1:1 Medium: Air; Medium Notes: Not Specified Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1000$ kg/m ³ Phantom section: E Dipole Section					Communication System: CW835 Frequency: 835 MHz; Duty Cycle: 1:1 Medium: Air; Medium Notes: Not Specified Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1$ kg/m ³ Phantom section: H Dipole Section																																								
DASY4 Configuration: - Probe: ER3DV6 - SN2333 - ConvF(1, 1, 1); Calibrated: 2008-01-21 - Sensor-Surface: (Fix Surface) - Electronics: DAE4 Sn538; Calibrated: 2008-07-14 - Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: Not Specified - Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176					DASY4 Configuration: - Probe: H3DV6 - SN6053 - ; Calibrated: 2008-01-21 - Sensor-Surface: (Fix Surface) - Electronics: DAE4 Sn538; Calibrated: 2008-07-14 - Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: Not Specified - Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176																																								
E Scan - ER3DV6 - 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 = 157.6 V/m Probe Modulation Factor = 1.00 Device Reference Point: 0.000, 0.000, 354.7 mm Reference Value = 118.9 V/m; Power Drift = 0.008 dB Hearing Aid Near-Field Category: M4 (AWF 0 dB)					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 = 0.440 A/m Probe Modulation Factor = 1.00 Device Reference Point: 0.000, 0.000, 354.7 mm Reference Value = 0.466 A/m; Power Drift = 0.022 dB Hearing Aid Near-Field Category: M4 (AWF 0 dB)																																								
																																													
<table><tr><td>Grid 1</td><td>Grid 2</td><td>Grid 3</td></tr><tr><td>144.5 M4</td><td>144.7 M4</td><td>138.6 M4</td></tr><tr><td>Grid 4</td><td>Grid 5</td><td>Grid 6</td></tr><tr><td>85.7 M4</td><td>87.2 M4</td><td>84.0 M4</td></tr><tr><td>Grid 7</td><td>Grid 8</td><td>Grid 9</td></tr><tr><td>155.5 M4</td><td>157.6 M4</td><td>148.5 M4</td></tr></table>					Grid 1	Grid 2	Grid 3	144.5 M4	144.7 M4	138.6 M4	Grid 4	Grid 5	Grid 6	85.7 M4	87.2 M4	84.0 M4	Grid 7	Grid 8	Grid 9	155.5 M4	157.6 M4	148.5 M4	<table><tr><td>Grid 1</td><td>Grid 2</td><td>Grid 3</td></tr><tr><td>0.368 M4</td><td>0.387 M4</td><td>0.369 M4</td></tr><tr><td>Grid 4</td><td>Grid 5</td><td>Grid 6</td></tr><tr><td>0.420 M4</td><td>0.440 M4</td><td>0.422 M4</td></tr><tr><td>Grid 7</td><td>Grid 8</td><td>Grid 9</td></tr><tr><td>0.365 M4</td><td>0.386 M4</td><td>0.370 M4</td></tr></table>					Grid 1	Grid 2	Grid 3	0.368 M4	0.387 M4	0.369 M4	Grid 4	Grid 5	Grid 6	0.420 M4	0.440 M4	0.422 M4	Grid 7	Grid 8	Grid 9	0.365 M4	0.386 M4	0.370 M4
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SYSTEM VALIDATION DATA 1900MHZ																																										
Date/Time: 2008-12-15 09:43:26 Test Laboratory: TCC Nokia Type: CD1880V3; Serial: 1003				Date/Time: 2008-12-15 10:47:22 Test Laboratory: TCC Nokia Type: CD1880V3; Serial: 1003																																						
Communication System: CW1880 Frequency: 1880 MHz; Duty Cycle: 1:1 Medium: Air; Medium Notes: Not Specified Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1000$ kg/m ³ Phantom section: E Dipole Section				Communication System: CW1880 Frequency: 1880 MHz; Duty Cycle: 1:1 Medium: Air; Medium Notes: Not Specified Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1$ kg/m ³ Phantom section: H Dipole Section																																						
DASY4 Configuration: - Probe: ER3DV6 - SN2333 - ConvF(1, 1, 1); Calibrated: 2008-01-21 - Sensor-Surface: (Fix Surface) - Electronics: DAE4 Sn538; Calibrated: 2008-07-14 - Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: Not Specified - Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176				DASY4 Configuration: - Probe: H3DV6 - SN6053 - ; Calibrated: 2008-01-21 - Sensor-Surface: (Fix Surface) - Electronics: DAE4 Sn538; Calibrated: 2008-07-14 - Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: Not Specified - Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176																																						
E Scan - ER3DV6 - 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 = 127.1 V/m Probe Modulation Factor = 1.00 Device Reference Point: 0.000, 0.000, 354.7 mm Reference Value = 131.5 V/m; Power Drift = -0.008 dB Hearing Aid Near-Field Category: M2 (AWF 0 dB)				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 = 0.447 A/m Probe Modulation Factor = 1.00 Device Reference Point: 0.000, 0.000, 354.7 mm Reference Value = 0.471 A/m; Power Drift = -0.016 dB Hearing Aid Near-Field Category: M2 (AWF 0 dB)																																						
																																										
<table><tr><td>Grid 1</td><td>Grid 2</td><td>Grid 3</td></tr><tr><td>113.2 M2</td><td>114.1 M2</td><td>110.2 M3</td></tr><tr><td>Grid 4</td><td>Grid 5</td><td>Grid 6</td></tr><tr><td>82.8 M3</td><td>86.5 M3</td><td>84.3 M3</td></tr><tr><td>Grid 7</td><td>Grid 8</td><td>Grid 9</td></tr><tr><td>120.0 M2</td><td>127.1 M2</td><td>122.9 M2</td></tr></table>				Grid 1	Grid 2	Grid 3	113.2 M2	114.1 M2	110.2 M3	Grid 4	Grid 5	Grid 6	82.8 M3	86.5 M3	84.3 M3	Grid 7	Grid 8	Grid 9	120.0 M2	127.1 M2	122.9 M2	<table><tr><td>Grid 1</td><td>Grid 2</td><td>Grid 3</td></tr><tr><td>0.386 M2</td><td>0.414 M2</td><td>0.404 M2</td></tr><tr><td>Grid 4</td><td>Grid 5</td><td>Grid 6</td></tr><tr><td>0.417 M2</td><td>0.447 M2</td><td>0.439 M2</td></tr><tr><td>Grid 7</td><td>Grid 8</td><td>Grid 9</td></tr><tr><td>0.367 M2</td><td>0.398 M2</td><td>0.390 M2</td></tr></table>			Grid 1	Grid 2	Grid 3	0.386 M2	0.414 M2	0.404 M2	Grid 4	Grid 5	Grid 6	0.417 M2	0.447 M2	0.439 M2	Grid 7	Grid 8	Grid 9	0.367 M2	0.398 M2	0.390 M2
Grid 1	Grid 2	Grid 3																																								
113.2 M2	114.1 M2	110.2 M3																																								
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APPENDIX B: MEASUREMENT SCANS

MEASUREMENT DATA GSM850, CHANNEL LOW (824.2 MHz)

Date/Time: 2008-11-28 17:05:36
Test Laboratory: TCC Nokia
Type: RM-413; Serial: 356814/02/000031/5

Date/Time: 2008-11-28 19:43:42
Test Laboratory: TCC Nokia
Type: RM-413; Serial: 356814/02/000031/5

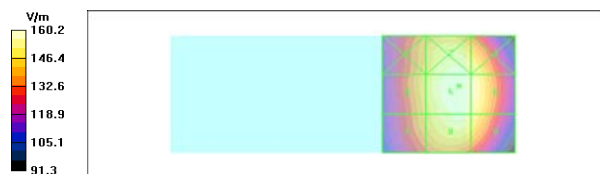
Communication System: GSM850 (ER3DV6)
Frequency: 824.2 MHz; Duty Cycle: 1:7.34
Medium: Air; Medium Notes: Not Specified
Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1000$ kg/m³
Phantom section: E Device Section

Communication System: GSM850 (H3DV6)
Frequency: 824.2 MHz; Duty Cycle: 1:8.29
Medium: Air; Medium Notes: Not Specified
Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³
Phantom section: H Device Section

DASY4 Configuration:
- Probe: ER3DV6 - SN2333
- ConvF(1, 1, 1); Calibrated: 2008-01-21
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn538; Calibrated: 2008-07-14
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: Not Specified
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

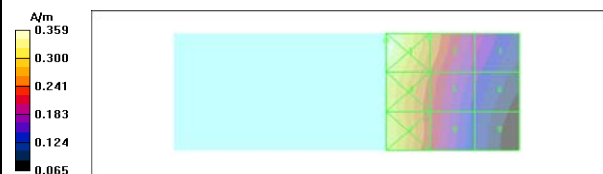
DASY4 Configuration:
- Probe: H3DV6 - SN6053
- ; Calibrated: 2008-01-21
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn538; Calibrated: 2008-07-14
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: Not Specified
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

E Scan - ER3DV6 - measurement distance, sensor center to the Device = 15mm, Low/Hearing Aid Compatibility Test (101x101x1):
Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 160.2 V/m
Probe Modulation Factor = 2.71
Device Reference Point: 0.000, 0.000, 353.7 mm
Reference Value = 74.5 V/m; Power Drift = -0.028 dB
Hearing Aid Near-Field Category: M3 (AWF -5 dB)

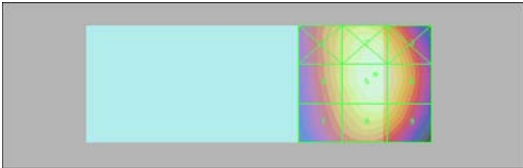
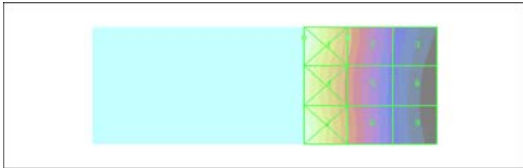


Grid 1	Grid 2	Grid 3
145.2 M4	158.1 M3	155.1 M3
Grid 4	Grid 5	Grid 6
147.0 M4	160.2 M3	157.6 M3
Grid 7	Grid 8	Grid 9
143.8 M4	157.3 M3	153.6 M3

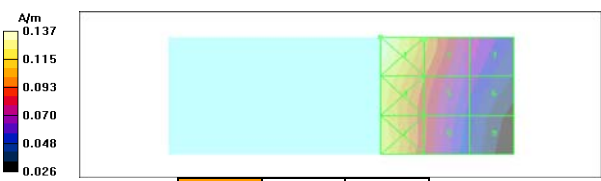
H Scan - H3DV6 - measurement distance, sensor center to the Device = 15mm, Low/Hearing Aid Compatibility Test (101x101x1):
Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 0.265 A/m
Probe Modulation Factor = 2.88
Device Reference Point: 0.000, 0.000, 353.7 mm
Reference Value = 0.067 A/m; Power Drift = -0.076 dB
Hearing Aid Near-Field Category: M4 (AWF -5 dB)



Grid 1	Grid 2	Grid 3
0.359 M4	0.265 M4	0.177 M4
Grid 4	Grid 5	Grid 6
0.332 M4	0.243 M4	0.154 M4
Grid 7	Grid 8	Grid 9
0.326 M4	0.228 M4	0.134 M4

MEASUREMENT DATA GSM850, CHANNEL MIDDLE (836.6 MHz)																																				
Date/Time: 2008-11-28 16:53:35 Test Laboratory: TCC Nokia Type: RM-413; Serial: 356814/02/000031/5	Date/Time: 2008-11-28 19:32:30 Test Laboratory: TCC Nokia Type: RM-413; Serial: 356814/02/000031/5																																			
Communication System: GSM850 (ER3DV6) Frequency: 836.6 MHz; Duty Cycle: 1:7.34 Medium: Air; Medium Notes: Not Specified Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1000$ kg/m ³ Phantom section: E Device Section	Communication System: GSM850 (H3DV6) Frequency: 836.6 MHz; Duty Cycle: 1:8.29 Medium: Air; Medium Notes: Not Specified Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1$ kg/m ³ Phantom section: H Device Section																																			
DASY4 Configuration: - Probe: ER3DV6 - SN2333 - ConvF(1, 1, 1); Calibrated: 2008-01-21 - Sensor-Surface: (Fix Surface) - Electronics: DAE4 Sn538; Calibrated: 2008-07-14 - Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: Not Specified - Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176	DASY4 Configuration: - Probe: H3DV6 - SN6053 - ; Calibrated: 2008-01-21 - Sensor-Surface: (Fix Surface) - Electronics: DAE4 Sn538; Calibrated: 2008-07-14 - Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: Not Specified - Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176																																			
E Scan - ER3DV6 - measurement distance, sensor center to the Device = 15mm, Mid/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm Maximum value of peak Total field = 181.9 V/m Probe Modulation Factor = 2.71 Device Reference Point: 0.000, 0.000, 353.7 mm Reference Value = 83.5 V/m; Power Drift = -0.054 dB Hearing Aid Near-Field Category: M3 (AWF -5 dB)	H Scan - H3DV6 - measurement distance, sensor center to the Device = 15mm, mid/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm Maximum value of peak Total field = 0.284 A/m Probe Modulation Factor = 2.88 Device Reference Point: 0.000, 0.000, 353.7 mm Reference Value = 0.076 A/m; Power Drift = -0.041 dB Hearing Aid Near-Field Category: M4 (AWF -5 dB)																																			
V/m 181.9 165.6 149.4 133.1 116.9 100.6  <table><tr><td>Grid 1</td><td>Grid 2</td><td>Grid 3</td></tr><tr><td>165.9 M3</td><td>179.2 M3</td><td>176.6 M3</td></tr><tr><td>Grid 4</td><td>Grid 5</td><td>Grid 6</td></tr><tr><td>166.3 M3</td><td>181.9 M3</td><td>179.3 M3</td></tr><tr><td>Grid 7</td><td>Grid 8</td><td>Grid 9</td></tr><tr><td>159.8 M3</td><td>175.5 M3</td><td>172.1 M3</td></tr></table> A/m 0.394 0.334 0.274 0.215 0.155 0.095  <table><tr><td>Grid 1</td><td>Grid 2</td><td>Grid 3</td></tr><tr><td>0.394 M4</td><td>0.284 M4</td><td>0.180 M4</td></tr><tr><td>Grid 4</td><td>Grid 5</td><td>Grid 6</td></tr><tr><td>0.373 M4</td><td>0.272 M4</td><td>0.168 M4</td></tr><tr><td>Grid 7</td><td>Grid 8</td><td>Grid 9</td></tr><tr><td>0.391 M4</td><td>0.278 M4</td><td>0.168 M4</td></tr></table>	Grid 1	Grid 2	Grid 3	165.9 M3	179.2 M3	176.6 M3	Grid 4	Grid 5	Grid 6	166.3 M3	181.9 M3	179.3 M3	Grid 7	Grid 8	Grid 9	159.8 M3	175.5 M3	172.1 M3	Grid 1	Grid 2	Grid 3	0.394 M4	0.284 M4	0.180 M4	Grid 4	Grid 5	Grid 6	0.373 M4	0.272 M4	0.168 M4	Grid 7	Grid 8	Grid 9	0.391 M4	0.278 M4	0.168 M4
Grid 1	Grid 2	Grid 3																																		
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Grid 4	Grid 5	Grid 6																																		
0.373 M4	0.272 M4	0.168 M4																																		
Grid 7	Grid 8	Grid 9																																		
0.391 M4	0.278 M4	0.168 M4																																		

MEASUREMENT DATA GSM850, CHANNEL HIGH (848.8 MHz)																																					
Date/Time: 2008-11-28 17:00:02 Test Laboratory: TCC Nokia Type: RM-413; Serial: 356814/02/000031/5	Date/Time: 2008-11-28 19:37:53 Test Laboratory: TCC Nokia Type: RM-413; Serial: 356814/02/000031/5																																				
Communication System: GSM850 (ER3DV6) Frequency: 848.8 MHz; Duty Cycle: 1:7.34 Medium: Air; Medium Notes: Not Specified Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1000$ kg/m³ Phantom section: E Device Section	Communication System: GSM850 (H3DV6) Frequency: 848.8 MHz; Duty Cycle: 1:8.29 Medium: Air; Medium Notes: Not Specified Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³ Phantom section: H Device Section																																				
DASY4 Configuration: - Probe: ER3DV6 - SN2333 - ConvF(1, 1, 1); Calibrated: 2008-01-21 - Sensor-Surface: (Fix Surface) - Electronics: DAE4 Sn538; Calibrated: 2008-07-14 - Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: Not Specified - Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176	DASY4 Configuration: - Probe: H3DV6 - SN6053 - ; Calibrated: 2008-01-21 - Sensor-Surface: (Fix Surface) - Electronics: DAE4 Sn538; Calibrated: 2008-07-14 - Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: Not Specified - Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176																																				
E Scan - ER3DV6 - measurement distance, sensor center to the Device = 15mm, High/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm Maximum value of peak Total field = 182.6 V/m Probe Modulation Factor = 2.71 Device Reference Point: 0.000, 0.000, 353.7 mm Reference Value = 84.3 V/m; Power Drift = -0.106 dB Hearing Aid Near-Field Category: M3 (AWF -5 dB) V/m 182.6 167.4 152.2 136.9 121.7 106.5  <table><tr><td>Grid 1</td><td>Grid 2</td><td>Grid 3</td></tr><tr><td>162.1 M3</td><td>180.5 M3</td><td>178.4 M3</td></tr><tr><td>Grid 4</td><td>Grid 5</td><td>Grid 6</td></tr><tr><td>164.3 M3</td><td>182.6 M3</td><td>180.5 M3</td></tr><tr><td>Grid 7</td><td>Grid 8</td><td>Grid 9</td></tr><tr><td>159.2 M3</td><td>178.9 M3</td><td>175.7 M3</td></tr></table> <tr><td> H Scan - H3DV6 - measurement distance, sensor center to the Device = 15mm, high/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm Maximum value of peak Total field = 0.299 A/m Probe Modulation Factor = 2.88 Device Reference Point: 0.000, 0.000, 353.7 mm Reference Value = 0.079 A/m; Power Drift = 0.092 dB Hearing Aid Near-Field Category: M4 (AWF -5 dB) A/m 0.420 0.357 0.294 0.230 0.167 0.104  <table><tr><td>Grid 1</td><td>Grid 2</td><td>Grid 3</td></tr><tr><td>0.409 M4</td><td>0.299 M4</td><td>0.190 M4</td></tr><tr><td>Grid 4</td><td>Grid 5</td><td>Grid 6</td></tr><tr><td>0.395 M4</td><td>0.286 M4</td><td>0.176 M4</td></tr><tr><td>Grid 7</td><td>Grid 8</td><td>Grid 9</td></tr><tr><td>0.420 M4</td><td>0.297 M4</td><td>0.182 M4</td></tr></table> </td></tr>	Grid 1	Grid 2	Grid 3	162.1 M3	180.5 M3	178.4 M3	Grid 4	Grid 5	Grid 6	164.3 M3	182.6 M3	180.5 M3	Grid 7	Grid 8	Grid 9	159.2 M3	178.9 M3	175.7 M3	H Scan - H3DV6 - measurement distance, sensor center to the Device = 15mm, high/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm Maximum value of peak Total field = 0.299 A/m Probe Modulation Factor = 2.88 Device Reference Point: 0.000, 0.000, 353.7 mm Reference Value = 0.079 A/m; Power Drift = 0.092 dB Hearing Aid Near-Field Category: M4 (AWF -5 dB) A/m 0.420 0.357 0.294 0.230 0.167 0.104  <table><tr><td>Grid 1</td><td>Grid 2</td><td>Grid 3</td></tr><tr><td>0.409 M4</td><td>0.299 M4</td><td>0.190 M4</td></tr><tr><td>Grid 4</td><td>Grid 5</td><td>Grid 6</td></tr><tr><td>0.395 M4</td><td>0.286 M4</td><td>0.176 M4</td></tr><tr><td>Grid 7</td><td>Grid 8</td><td>Grid 9</td></tr><tr><td>0.420 M4</td><td>0.297 M4</td><td>0.182 M4</td></tr></table>	Grid 1	Grid 2	Grid 3	0.409 M4	0.299 M4	0.190 M4	Grid 4	Grid 5	Grid 6	0.395 M4	0.286 M4	0.176 M4	Grid 7	Grid 8	Grid 9	0.420 M4	0.297 M4	0.182 M4
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Grid 7	Grid 8	Grid 9																																			
0.420 M4	0.297 M4	0.182 M4																																			

MEASUREMENT DATA WCDMA850, CHANNEL LOW (826.4 MHz)																																					
Date/Time: 2008-11-28 18:08:55 Test Laboratory: TCC Nokia Type: RM-413; Serial: 356814/02/000031/5	Date/Time: 2008-11-28 18:31:56 Test Laboratory: TCC Nokia Type: RM-413; Serial: 356814/02/000031/5																																				
Communication System: WCDMA850 Frequency: 826.4 MHz; Duty Cycle: 1:1 Medium: Air; Medium Notes: Not Specified Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1000$ kg/m ³ Phantom section: E Device Section	Communication System: WCDMA850 Frequency: 826.4 MHz; Duty Cycle: 1:1 Medium: Air; Medium Notes: Not Specified Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1$ kg/m ³ Phantom section: H Device Section																																				
DASY4 Configuration: - Probe: ER3DV6 - SN2333 - ConvF(1, 1, 1); Calibrated: 2008-01-21 - Sensor-Surface: (Fix Surface) - Electronics: DAE4 Sn538; Calibrated: 2008-07-14 - Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: Not Specified - Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176	DASY4 Configuration: - Probe: H3DV6 - SN6053 - ; Calibrated: 2008-01-21 - Sensor-Surface: (Fix Surface) - Electronics: DAE4 Sn538; Calibrated: 2008-07-14 - Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: Not Specified - Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176																																				
E Scan - ER3DV6 - measurement distance, sensor center to the Device = 15mm, Low/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm Maximum value of peak Total field = 63.9 V/m Probe Modulation Factor = 1.00 Device Reference Point: 0.000, 0.000, 353.7 mm Reference Value = 81.2 V/m; Power Drift = -0.086 dB Hearing Aid Near-Field Category: M4 (AWF 0 dB)	H Scan - H3DV6 - measurement distance, sensor center to the Device = 15mm, Low/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm Maximum value of peak Total field = 0.103 A/m Probe Modulation Factor = 1.00 Device Reference Point: 0.000, 0.000, 353.7 mm Reference Value = 0.075 A/m; Power Drift = -0.082 dB Hearing Aid Near-Field Category: M4 (AWF 0 dB)																																				
V/m 63.9 58.5 53.1 47.7 42.3 36.9  <table><tr><td>Grid 1</td><td>Grid 2</td><td>Grid 3</td></tr><tr><td>57.6 M4</td><td>62.8 M4</td><td>61.7 M4</td></tr><tr><td>Grid 4</td><td>Grid 5</td><td>Grid 6</td></tr><tr><td>58.2 M4</td><td>63.9 M4</td><td>62.9 M4</td></tr><tr><td>Grid 7</td><td>Grid 8</td><td>Grid 9</td></tr><tr><td>56.9 M4</td><td>62.6 M4</td><td>61.2 M4</td></tr></table>	Grid 1	Grid 2	Grid 3	57.6 M4	62.8 M4	61.7 M4	Grid 4	Grid 5	Grid 6	58.2 M4	63.9 M4	62.9 M4	Grid 7	Grid 8	Grid 9	56.9 M4	62.6 M4	61.2 M4	A/m 0.137 0.115 0.093 0.070 0.048 0.026  <table><tr><td>Grid 1</td><td>Grid 2</td><td>Grid 3</td></tr><tr><td>0.137 M4</td><td>0.103 M4</td><td>0.070 M4</td></tr><tr><td>Grid 4</td><td>Grid 5</td><td>Grid 6</td></tr><tr><td>0.125 M4</td><td>0.094 M4</td><td>0.061 M4</td></tr><tr><td>Grid 7</td><td>Grid 8</td><td>Grid 9</td></tr><tr><td>0.122 M4</td><td>0.087 M4</td><td>0.053 M4</td></tr></table>	Grid 1	Grid 2	Grid 3	0.137 M4	0.103 M4	0.070 M4	Grid 4	Grid 5	Grid 6	0.125 M4	0.094 M4	0.061 M4	Grid 7	Grid 8	Grid 9	0.122 M4	0.087 M4	0.053 M4
Grid 1	Grid 2	Grid 3																																			
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0.137 M4	0.103 M4	0.070 M4																																			
Grid 4	Grid 5	Grid 6																																			
0.125 M4	0.094 M4	0.061 M4																																			
Grid 7	Grid 8	Grid 9																																			
0.122 M4	0.087 M4	0.053 M4																																			

MEASUREMENT DATA WCDMA850, CHANNEL MIDDLE (835 MHz)

Date/Time: 2008-11-28 17:57:16
Test Laboratory: TCC Nokia
Type: RM-413; Serial: 356814/02/000031/5

Date/Time: 2008-11-28 18:20:14
Test Laboratory: TCC Nokia
Type: RM-413; Serial: 356814/02/000031/5

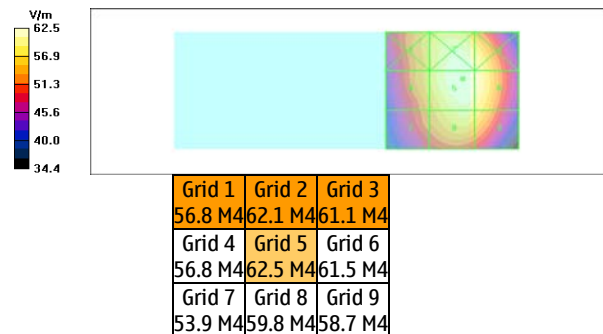
Communication System: WCDMA850
Frequency: 835 MHz; Duty Cycle: 1:1
Medium: Air; Medium Notes: Not Specified
Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1000$ kg/m³
Phantom section: E Device Section

Communication System: WCDMA850
Frequency: 835 MHz; Duty Cycle: 1:1
Medium: Air; Medium Notes: Not Specified
Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³
Phantom section: H Device Section

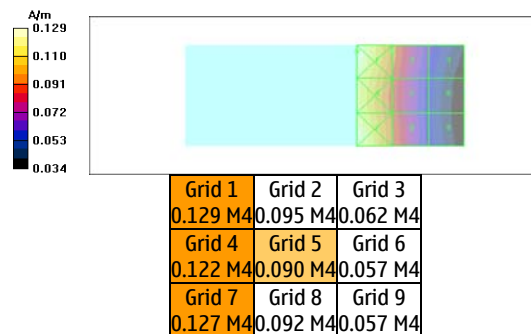
DASY4 Configuration:
- Probe: ER3DV6 - SN2333
- ConvF(1, 1, 1); Calibrated: 2008-01-21
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn538; Calibrated: 2008-07-14
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: Not Specified
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

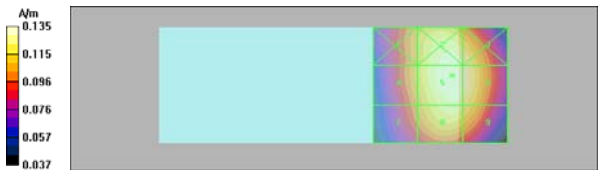
DASY4 Configuration:
- Probe: H3DV6 - SN6053
- ; Calibrated: 2008-01-21
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn538; Calibrated: 2008-07-14
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: Not Specified
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

E Scan - ER3DV6 - measurement distance, sensor center to the Device = 15mm, Mid/Hearing Aid Compatibility Test (101x101x1):
Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 62.5 V/m
Probe Modulation Factor = 1.00
Device Reference Point: 0.000, 0.000, 353.7 mm
Reference Value = 79.4 V/m; Power Drift = -0.179 dB
Hearing Aid Near-Field Category: M4 (AWF 0 dB)



H Scan - H3DV6 - measurement distance, sensor center to the Device = 15mm, mid/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 0.095 A/m
Probe Modulation Factor = 1.00
Device Reference Point: 0.000, 0.000, 353.7 mm
Reference Value = 0.075 A/m; Power Drift = -0.102 dB
Hearing Aid Near-Field Category: M4 (AWF 0 dB)

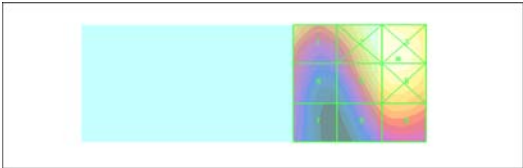


MEASUREMENT DATA WCDMA850, CHANNEL HIGH (846.6 MHz)																																					
Date/Time: 2008-11-28 18:03:15 Test Laboratory: TCC Nokia Type: RM-413; Serial: 356814/02/000031/5	Date/Time: 2008-11-28 18:26:19 Test Laboratory: TCC Nokia Type: RM-413; Serial: 356814/02/000031/5																																				
Communication System: WCDMA850 Frequency: 846.6 MHz; Duty Cycle: 1:1 Medium: Air; Medium Notes: Not Specified Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1000$ kg/m ³ Phantom section: E Device Section	Communication System: WCDMA850 Frequency: 846.6 MHz; Duty Cycle: 1:1 Medium: Air; Medium Notes: Not Specified Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1$ kg/m ³ Phantom section: H Device Section																																				
DASY4 Configuration: - Probe: ER3DV6 - SN2333 - ConvF(1, 1, 1); Calibrated: 2008-01-21 - Sensor-Surface: (Fix Surface) - Electronics: DAE4 Sn538; Calibrated: 2008-07-14 - Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: Not Specified - Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176	DASY4 Configuration: - Probe: H3DV6 - SN6053 - ; Calibrated: 2008-01-21 - Sensor-Surface: (Fix Surface) - Electronics: DAE4 Sn538; Calibrated: 2008-07-14 - Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: Not Specified - Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176																																				
E Scan - ER3DV6 - measurement distance, sensor center to the Device = 15mm, High/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm Maximum value of peak Total field = 64.7 V/m Probe Modulation Factor = 1.00 Device Reference Point: 0.000, 0.000, 353.7 mm Reference Value = 81.5 V/m; Power Drift = -0.106 dB Hearing Aid Near-Field Category: M4 (AWF 0 dB)	H Scan - H3DV6 - measurement distance, sensor center to the Device = 15mm, high/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm Maximum value of peak Total field = 0.098 A/m Probe Modulation Factor = 1.00 Device Reference Point: 0.000, 0.000, 353.7 mm Reference Value = 0.078 A/m; Power Drift = -0.027 dB Hearing Aid Near-Field Category: M4 (AWF 0 dB)																																				
V/m 64.7 59.1 53.6 48.0 42.5 36.9  <table><tr><td>Grid 1</td><td>Grid 2</td><td>Grid 3</td></tr><tr><td>57.8 M4</td><td>64.2 M4</td><td>63.4 M4</td></tr><tr><td>Grid 4</td><td>Grid 5</td><td>Grid 6</td></tr><tr><td>58.2 M4</td><td>64.7 M4</td><td>64.1 M4</td></tr><tr><td>Grid 7</td><td>Grid 8</td><td>Grid 9</td></tr><tr><td>55.8 M4</td><td>62.7 M4</td><td>61.6 M4</td></tr></table>	Grid 1	Grid 2	Grid 3	57.8 M4	64.2 M4	63.4 M4	Grid 4	Grid 5	Grid 6	58.2 M4	64.7 M4	64.1 M4	Grid 7	Grid 8	Grid 9	55.8 M4	62.7 M4	61.6 M4	A/m 0.135 0.115 0.096 0.076 0.057 0.037  <table><tr><td>Grid 1</td><td>Grid 2</td><td>Grid 3</td></tr><tr><td>0.134 M4</td><td>0.098 M4</td><td>0.063 M4</td></tr><tr><td>Grid 4</td><td>Grid 5</td><td>Grid 6</td></tr><tr><td>0.128 M4</td><td>0.094 M4</td><td>0.060 M4</td></tr><tr><td>Grid 7</td><td>Grid 8</td><td>Grid 9</td></tr><tr><td>0.135 M4</td><td>0.098 M4</td><td>0.062 M4</td></tr></table>	Grid 1	Grid 2	Grid 3	0.134 M4	0.098 M4	0.063 M4	Grid 4	Grid 5	Grid 6	0.128 M4	0.094 M4	0.060 M4	Grid 7	Grid 8	Grid 9	0.135 M4	0.098 M4	0.062 M4
Grid 1	Grid 2	Grid 3																																			
57.8 M4	64.2 M4	63.4 M4																																			
Grid 4	Grid 5	Grid 6																																			
58.2 M4	64.7 M4	64.1 M4																																			
Grid 7	Grid 8	Grid 9																																			
55.8 M4	62.7 M4	61.6 M4																																			
Grid 1	Grid 2	Grid 3																																			
0.134 M4	0.098 M4	0.063 M4																																			
Grid 4	Grid 5	Grid 6																																			
0.128 M4	0.094 M4	0.060 M4																																			
Grid 7	Grid 8	Grid 9																																			
0.135 M4	0.098 M4	0.062 M4																																			

MEASUREMENT DATA GSM1900, CHANNEL LOW (1850.2 MHz)

Date/Time: 2008-12-15 10:15:54 Test Laboratory: TCC Nokia Type: RM-413; Serial: 356814/02/000031/5	Date/Time: 2008-12-15 11:07:10 Test Laboratory: TCC Nokia Type: RM-413; Serial: 356814/02/000031/5																																				
Communication System: GSM1900 (ER3DV6) Frequency: 1850.2 MHz; Duty Cycle: 1:7.73 Medium: Air; Medium Notes: Not Specified Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1000$ kg/m³ Phantom section: E Device Section	Communication System: GSM1900 (H3DV6) Frequency: 1850.2 MHz; Duty Cycle: 1:6.5 Medium: Air; Medium Notes: Not Specified Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³ Phantom section: H Device Section																																				
DASY4 Configuration: - Probe: ER3DV6 - SN2333 - ConvF(1, 1, 1); Calibrated: 2008-01-21 - Sensor-Surface: (Fix Surface) - Electronics: DAE4 Sn538; Calibrated: 2008-07-14 - Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: Not Specified - Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176	DASY4 Configuration: - Probe: H3DV6 - SN6053 - ; Calibrated: 2008-01-21 - Sensor-Surface: (Fix Surface) - Electronics: DAE4 Sn538; Calibrated: 2008-07-14 - Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: Not Specified - Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176																																				
E Scan - ER3DV6 - measurement distance, sensor center to the Device = 15mm, Low/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm Maximum value of peak Total field = 70.8 V/m Probe Modulation Factor = 2.78 Device Reference Point: 0.000, 0.000, 353.7 mm Reference Value = 20.9 V/m; Power Drift = 0.089 dB Hearing Aid Near-Field Category: M3 (AWF -5 dB) V/m 76.3 65.8 55.3 44.8 34.3 23.8 <table><tr><td>Grid 1</td><td>Grid 2</td><td>Grid 3</td></tr><tr><td>56.5 M3</td><td>74.9 M3</td><td>76.3 M3</td></tr><tr><td>Grid 4</td><td>Grid 5</td><td>Grid 6</td></tr><tr><td>48.0 M3</td><td>70.8 M3</td><td>73.8 M3</td></tr><tr><td>Grid 7</td><td>Grid 8</td><td>Grid 9</td></tr><tr><td>44.4 M4</td><td>56.1 M3</td><td>60.9 M3</td></tr></table> <td> H Scan - H3DV6 - measurement distance, sensor center to the Device = 15mm, Low/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm Maximum value of peak Total field = 0.204 A/m Probe Modulation Factor = 2.55 Device Reference Point: 0.000, 0.000, 353.7 mm Reference Value = 0.070 A/m; Power Drift = 0.093 dB Hearing Aid Near-Field Category: M3 (AWF -5 dB) A/m 0.257 0.227 0.196 0.166 0.135 0.105 <table><tr><td>Grid 1</td><td>Grid 2</td><td>Grid 3</td></tr><tr><td>0.257 M2</td><td>0.230 M3</td><td>0.163 M3</td></tr><tr><td>Grid 4</td><td>Grid 5</td><td>Grid 6</td></tr><tr><td>0.207 M3</td><td>0.204 M3</td><td>0.152 M3</td></tr><tr><td>Grid 7</td><td>Grid 8</td><td>Grid 9</td></tr><tr><td>0.175 M3</td><td>0.176 M3</td><td>0.146 M3</td></tr></table> </td>	Grid 1	Grid 2	Grid 3	56.5 M3	74.9 M3	76.3 M3	Grid 4	Grid 5	Grid 6	48.0 M3	70.8 M3	73.8 M3	Grid 7	Grid 8	Grid 9	44.4 M4	56.1 M3	60.9 M3	H Scan - H3DV6 - measurement distance, sensor center to the Device = 15mm, Low/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm Maximum value of peak Total field = 0.204 A/m Probe Modulation Factor = 2.55 Device Reference Point: 0.000, 0.000, 353.7 mm Reference Value = 0.070 A/m; Power Drift = 0.093 dB Hearing Aid Near-Field Category: M3 (AWF -5 dB) A/m 0.257 0.227 0.196 0.166 0.135 0.105 <table><tr><td>Grid 1</td><td>Grid 2</td><td>Grid 3</td></tr><tr><td>0.257 M2</td><td>0.230 M3</td><td>0.163 M3</td></tr><tr><td>Grid 4</td><td>Grid 5</td><td>Grid 6</td></tr><tr><td>0.207 M3</td><td>0.204 M3</td><td>0.152 M3</td></tr><tr><td>Grid 7</td><td>Grid 8</td><td>Grid 9</td></tr><tr><td>0.175 M3</td><td>0.176 M3</td><td>0.146 M3</td></tr></table>	Grid 1	Grid 2	Grid 3	0.257 M2	0.230 M3	0.163 M3	Grid 4	Grid 5	Grid 6	0.207 M3	0.204 M3	0.152 M3	Grid 7	Grid 8	Grid 9	0.175 M3	0.176 M3	0.146 M3
Grid 1	Grid 2	Grid 3																																			
56.5 M3	74.9 M3	76.3 M3																																			
Grid 4	Grid 5	Grid 6																																			
48.0 M3	70.8 M3	73.8 M3																																			
Grid 7	Grid 8	Grid 9																																			
44.4 M4	56.1 M3	60.9 M3																																			
Grid 1	Grid 2	Grid 3																																			
0.257 M2	0.230 M3	0.163 M3																																			
Grid 4	Grid 5	Grid 6																																			
0.207 M3	0.204 M3	0.152 M3																																			
Grid 7	Grid 8	Grid 9																																			
0.175 M3	0.176 M3	0.146 M3																																			

MEASUREMENT DATA GSM1900, CHANNEL MIDDLE (1880 MHz)

Date/Time: 2008-12-15 10:05:10 Test Laboratory: TCC Nokia Type: RM-413; Serial: 356814/02/000031/5	Date/Time: 2008-12-15 10:56:53 Test Laboratory: TCC Nokia Type: RM-413; Serial: 356814/02/000031/5																																				
Communication System: GSM1900 (ER3DV6) Frequency: 1880 MHz; Duty Cycle: 1:7.73 Medium: Air; Medium Notes: Not Specified Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1000$ kg/m³ Phantom section: E Device Section	Communication System: GSM1900 (H3DV6) Frequency: 1880 MHz; Duty Cycle: 1:6.5 Medium: Air; Medium Notes: Not Specified Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³ Phantom section: H Device Section																																				
DASY4 Configuration: - Probe: ER3DV6 - SN2333 - ConvF(1, 1, 1); Calibrated: 2008-01-21 - Sensor-Surface: (Fix Surface) - Electronics: DAE4 Sn538; Calibrated: 2008-07-14 - Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: Not Specified - Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176	DASY4 Configuration: - Probe: H3DV6 - SN6053 - ; Calibrated: 2008-01-21 - Sensor-Surface: (Fix Surface) - Electronics: DAE4 Sn538; Calibrated: 2008-07-14 - Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: Not Specified - Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176																																				
E Scan - ER3DV6 - measurement distance, sensor center to the Device = 15mm, Mid/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm Maximum value of peak Total field = 74.0 V/m Probe Modulation Factor = 2.78 Device Reference Point: 0.000, 0.000, 353.7 mm Reference Value = 22.5 V/m; Power Drift = -0.254 dB Hearing Aid Near-Field Category: M3 (AWF -5 dB) V/m 79.0 67.1 55.3 43.4 31.6 19.7  <table><tr><td>Grid 1</td><td>Grid 2</td><td>Grid 3</td></tr><tr><td>67.2 M3</td><td>77.5 M3</td><td>79.0 M3</td></tr><tr><td>Grid 4</td><td>Grid 5</td><td>Grid 6</td></tr><tr><td>50.6 M3</td><td>74.0 M3</td><td>78.1 M3</td></tr><tr><td>Grid 7</td><td>Grid 8</td><td>Grid 9</td></tr><tr><td>43.4 M4</td><td>59.8 M3</td><td>63.6 M3</td></tr></table>	Grid 1	Grid 2	Grid 3	67.2 M3	77.5 M3	79.0 M3	Grid 4	Grid 5	Grid 6	50.6 M3	74.0 M3	78.1 M3	Grid 7	Grid 8	Grid 9	43.4 M4	59.8 M3	63.6 M3	H Scan - H3DV6 - measurement distance, sensor center to the Device = 15mm, mid/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm Maximum value of peak Total field = 0.244 A/m Probe Modulation Factor = 2.55 Device Reference Point: 0.000, 0.000, 353.7 mm Reference Value = 0.086 A/m; Power Drift = 0.000 dB Hearing Aid Near-Field Category: M3 (AWF -5 dB) A/m 0.296 0.260 0.224 0.188 0.152 0.116  <table><tr><td>Grid 1</td><td>Grid 2</td><td>Grid 3</td></tr><tr><td>0.296 M2</td><td>0.270 M2</td><td>0.193 M3</td></tr><tr><td>Grid 4</td><td>Grid 5</td><td>Grid 6</td></tr><tr><td>0.249 M3</td><td>0.244 M3</td><td>0.186 M3</td></tr><tr><td>Grid 7</td><td>Grid 8</td><td>Grid 9</td></tr><tr><td>0.207 M3</td><td>0.207 M3</td><td>0.170 M3</td></tr></table>	Grid 1	Grid 2	Grid 3	0.296 M2	0.270 M2	0.193 M3	Grid 4	Grid 5	Grid 6	0.249 M3	0.244 M3	0.186 M3	Grid 7	Grid 8	Grid 9	0.207 M3	0.207 M3	0.170 M3
Grid 1	Grid 2	Grid 3																																			
67.2 M3	77.5 M3	79.0 M3																																			
Grid 4	Grid 5	Grid 6																																			
50.6 M3	74.0 M3	78.1 M3																																			
Grid 7	Grid 8	Grid 9																																			
43.4 M4	59.8 M3	63.6 M3																																			
Grid 1	Grid 2	Grid 3																																			
0.296 M2	0.270 M2	0.193 M3																																			
Grid 4	Grid 5	Grid 6																																			
0.249 M3	0.244 M3	0.186 M3																																			
Grid 7	Grid 8	Grid 9																																			
0.207 M3	0.207 M3	0.170 M3																																			

MEASUREMENT DATA GSM1900, CHANNEL HIGH (1909.8 MHz)																																					
Date/Time: 2008-12-15 10:10:28 Test Laboratory: TCC Nokia Type: RM-413; Serial: 356814/02/000031/5	Date/Time: 2008-12-15 11:02:03 Test Laboratory: TCC Nokia Type: RM-413; Serial: 356814/02/000031/5																																				
Communication System: GSM1900 (ER3DV6) Frequency: 1909.8 MHz; Duty Cycle: 1:7.73 Medium: Air; Medium Notes: Not Specified Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1000$ kg/m³ Phantom section: E Device Section	Communication System: GSM1900 (H3DV6) Frequency: 1909.8 MHz; Duty Cycle: 1:6.5 Medium: Air; Medium Notes: Not Specified Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³ Phantom section: H Device Section																																				
DASY4 Configuration: - Probe: ER3DV6 - SN2333 - ConvF(1, 1, 1); Calibrated: 2008-01-21 - Sensor-Surface: (Fix Surface) - Electronics: DAE4 Sn538; Calibrated: 2008-07-14 - Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: Not Specified - Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176	DASY4 Configuration: - Probe: H3DV6 - SN6053 - ; Calibrated: 2008-01-21 - Sensor-Surface: (Fix Surface) - Electronics: DAE4 Sn538; Calibrated: 2008-07-14 - Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: Not Specified - Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176																																				
E Scan - ER3DV6 - measurement distance, sensor center to the Device = 15mm, High/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm Maximum value of peak Total field = 66.2 V/m Probe Modulation Factor = 2.78 Device Reference Point: 0.000, 0.000, 353.7 mm Reference Value = 18.6 V/m; Power Drift = 0.042 dB Hearing Aid Near-Field Category: M3 (AWF -5 dB) V/m 70.5 61.2 51.9 42.5 33.2 23.9  <table><tr><td>Grid 1</td><td>Grid 2</td><td>Grid 3</td></tr><tr><td>59.4 M3</td><td>69.8 M3</td><td>70.5 M3</td></tr><tr><td>Grid 4</td><td>Grid 5</td><td>Grid 6</td></tr><tr><td>50.4 M3</td><td>66.2 M3</td><td>69.0 M3</td></tr><tr><td>Grid 7</td><td>Grid 8</td><td>Grid 9</td></tr><tr><td>47.5 M3</td><td>53.7 M3</td><td>57.8 M3</td></tr></table>	Grid 1	Grid 2	Grid 3	59.4 M3	69.8 M3	70.5 M3	Grid 4	Grid 5	Grid 6	50.4 M3	66.2 M3	69.0 M3	Grid 7	Grid 8	Grid 9	47.5 M3	53.7 M3	57.8 M3	H Scan - H3DV6 - measurement distance, sensor center to the Device = 15mm, high/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm Maximum value of peak Total field = 0.199 A/m Probe Modulation Factor = 2.55 Device Reference Point: 0.000, 0.000, 353.7 mm Reference Value = 0.070 A/m; Power Drift = 0.083 dB Hearing Aid Near-Field Category: M3 (AWF -5 dB) A/m 0.243 0.214 0.185 0.157 0.128 0.099  <table><tr><td>Grid 1</td><td>Grid 2</td><td>Grid 3</td></tr><tr><td>0.243 M3</td><td>0.223 M3</td><td>0.159 M3</td></tr><tr><td>Grid 4</td><td>Grid 5</td><td>Grid 6</td></tr><tr><td>0.206 M3</td><td>0.199 M3</td><td>0.153 M3</td></tr><tr><td>Grid 7</td><td>Grid 8</td><td>Grid 9</td></tr><tr><td>0.170 M3</td><td>0.170 M3</td><td>0.143 M3</td></tr></table>	Grid 1	Grid 2	Grid 3	0.243 M3	0.223 M3	0.159 M3	Grid 4	Grid 5	Grid 6	0.206 M3	0.199 M3	0.153 M3	Grid 7	Grid 8	Grid 9	0.170 M3	0.170 M3	0.143 M3
Grid 1	Grid 2	Grid 3																																			
59.4 M3	69.8 M3	70.5 M3																																			
Grid 4	Grid 5	Grid 6																																			
50.4 M3	66.2 M3	69.0 M3																																			
Grid 7	Grid 8	Grid 9																																			
47.5 M3	53.7 M3	57.8 M3																																			
Grid 1	Grid 2	Grid 3																																			
0.243 M3	0.223 M3	0.159 M3																																			
Grid 4	Grid 5	Grid 6																																			
0.206 M3	0.199 M3	0.153 M3																																			
Grid 7	Grid 8	Grid 9																																			
0.170 M3	0.170 M3	0.143 M3																																			

MEASUREMENT DATA WCDMA1900, CHANNEL LOW (1852.4MHz)

Date/Time: 2008-12-15 10:34:08 Test Laboratory: TCC Nokia Type: RM-413; Serial: 356814/02/000031/5	Date/Time: 2008-12-15 14:09:45 Test Laboratory: TCC Nokia Type: RM-413; Serial: 356814/02/000031/5																																			
Communication System: WCDMA1900 Frequency: 1852.4 MHz; Duty Cycle: 1:1 Medium: Air; Medium Notes: Not Specified Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1000$ kg/m³ Phantom section: E Device Section	Communication System: WCDMA1900 Frequency: 1852.4 MHz; Duty Cycle: 1:1 Medium: Air; Medium Notes: Not Specified Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³ Phantom section: H Device Section																																			
DASY4 Configuration: - Probe: ER3DV6 - SN2333 - ConvF(1, 1, 1); Calibrated: 2008-01-21 - Sensor-Surface: (Fix Surface) - Electronics: DAE4 Sn538; Calibrated: 2008-07-14 - Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: Not Specified - Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176	DASY4 Configuration: - Probe: H3DV6 - SN6053 - ; Calibrated: 2008-01-21 - Sensor-Surface: (Fix Surface) - Electronics: DAE4 Sn538; Calibrated: 2008-07-14 - Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: Not Specified - Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176																																			
E Scan - ER3DV6 - measurement distance, sensor center to the Device = 15mm, Low/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm Maximum value of peak Total field = 36.8 V/m Probe Modulation Factor = 1.00 Device Reference Point: 0.000, 0.000, 353.7 mm Reference Value = 31.5 V/m; Power Drift = -0.353 dB Hearing Aid Near-Field Category: M4 (AWF 0 dB)	H Scan - H3DV6 - measurement distance, sensor center to the Device = 15mm, Low/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm Maximum value of peak Total field = 0.117 A/m Probe Modulation Factor = 1.00 Device Reference Point: 0.000, 0.000, 353.7 mm Reference Value = 0.106 A/m; Power Drift = -0.319 dB Hearing Aid Near-Field Category: M4 (AWF 0 dB)																																			
V/m 38.8 33.4 27.9 22.5 17.0 11.6 <table><tr><td>Grid 1</td><td>Grid 2</td><td>Grid 3</td></tr><tr><td>29.4 M4</td><td>38.4 M4</td><td>38.8 M4</td></tr><tr><td>Grid 4</td><td>Grid 5</td><td>Grid 6</td></tr><tr><td>22.7 M4</td><td>36.8 M4</td><td>38.1 M4</td></tr><tr><td>Grid 7</td><td>Grid 8</td><td>Grid 9</td></tr><tr><td>20.2 M4</td><td>29.9 M4</td><td>31.6 M4</td></tr></table> A/m 0.145 0.128 0.110 0.093 0.075 0.058 <table><tr><td>Grid 1</td><td>Grid 2</td><td>Grid 3</td></tr><tr><td>0.145 M4</td><td>0.135 M4</td><td>0.099 M4</td></tr><tr><td>Grid 4</td><td>Grid 5</td><td>Grid 6</td></tr><tr><td>0.122 M4</td><td>0.117 M4</td><td>0.091 M4</td></tr><tr><td>Grid 7</td><td>Grid 8</td><td>Grid 9</td></tr><tr><td>0.101 M4</td><td>0.100 M4</td><td>0.082 M4</td></tr></table>	Grid 1	Grid 2	Grid 3	29.4 M4	38.4 M4	38.8 M4	Grid 4	Grid 5	Grid 6	22.7 M4	36.8 M4	38.1 M4	Grid 7	Grid 8	Grid 9	20.2 M4	29.9 M4	31.6 M4	Grid 1	Grid 2	Grid 3	0.145 M4	0.135 M4	0.099 M4	Grid 4	Grid 5	Grid 6	0.122 M4	0.117 M4	0.091 M4	Grid 7	Grid 8	Grid 9	0.101 M4	0.100 M4	0.082 M4
Grid 1	Grid 2	Grid 3																																		
29.4 M4	38.4 M4	38.8 M4																																		
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20.2 M4	29.9 M4	31.6 M4																																		
Grid 1	Grid 2	Grid 3																																		
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0.122 M4	0.117 M4	0.091 M4																																		
Grid 7	Grid 8	Grid 9																																		
0.101 M4	0.100 M4	0.082 M4																																		

MEASUREMENT DATA WCDMA1900, CHANNEL MIDDLE (1880MHz)

Date/Time: 2008-12-15 10:23:26
Test Laboratory: TCC Nokia
Type: RM-413; Serial: 356814/02/000031/5

Date/Time: 2008-12-15 13:52:33
Test Laboratory: TCC Nokia
Type: RM-413; Serial: 356814/02/000031/5

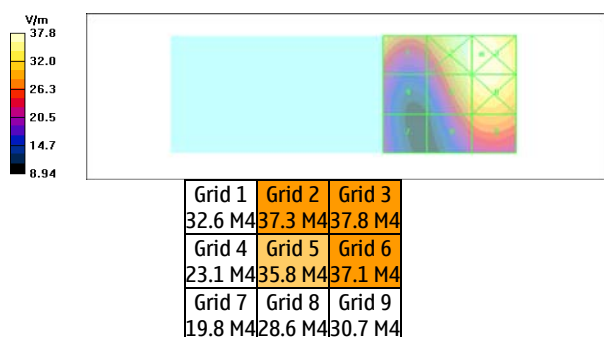
Communication System: WCDMA1900
Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: Air; Medium Notes: Not Specified
Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1000$ kg/m³
Phantom section: E Device Section

Communication System: WCDMA1900
Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: Air; Medium Notes: Not Specified
Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1$ kg/m³
Phantom section: H Device Section

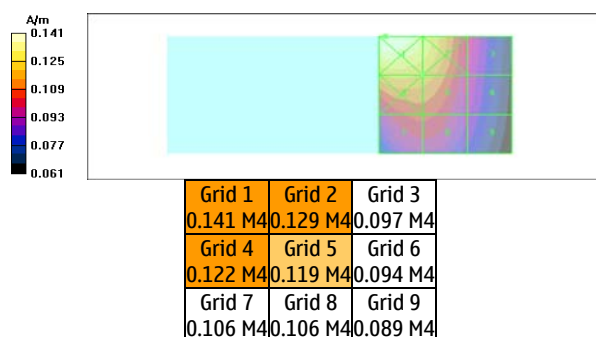
DASY4 Configuration:
- Probe: ER3DV6 - SN2333
- ConvF(1, 1, 1); Calibrated: 2008-01-21
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn538; Calibrated: 2008-07-14
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: Not Specified
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

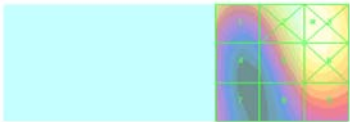
DASY4 Configuration:
- Probe: H3DV6 - SN6053
- ; Calibrated: 2008-01-21
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn538; Calibrated: 2008-07-14
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: Not Specified
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

E Scan - ER3DV6 - measurement distance, sensor center to the Device = 15mm, Mid/Hearing Aid Compatibility Test (101x101x1):
Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 35.8 V/m
Probe Modulation Factor = 1.00
Device Reference Point: 0.000, 0.000, 353.7 mm
Reference Value = 30.1 V/m; Power Drift = -0.318 dB
Hearing Aid Near-Field Category: M4 (AWF 0 dB)



H Scan - H3DV6 - measurement distance, sensor center to the Device = 15mm, mid/Hearing Aid Compatibility Test (101x101x1):
Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 0.119 A/m
Probe Modulation Factor = 1.00
Device Reference Point: 0.000, 0.000, 353.7 mm
Reference Value = 0.114 A/m; Power Drift = -0.366 dB
Hearing Aid Near-Field Category: M4 (AWF 0 dB)



MEASUREMENT DATA WCDMA1900, CHANNEL HIGH (1907.6MHz)																																				
Date/Time: 2008-12-15 10:28:50 Test Laboratory: TCC Nokia Type: RM-413; Serial: 356814/02/000031/5	Date/Time: 2008-12-16 10:28:39 Test Laboratory: TCC Nokia Type: RM-413; Serial: 356814/02/000031/5																																			
Communication System: WCDMA1900 Frequency: 1907.6 MHz; Duty Cycle: 1:1 Medium: Air; Medium Notes: Not Specified Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1000$ kg/m ³ Phantom section: E Device Section	Communication System: WCDMA1900 Frequency: 1907.6 MHz; Duty Cycle: 1:1 Medium: Air; Medium Notes: Not Specified Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1$ kg/m ³ Phantom section: H Device Section																																			
DASY4 Configuration: - Probe: ER3DV6 - SN2333 - ConvF(1, 1, 1); Calibrated: 2008-01-21 - Sensor-Surface: (Fix Surface) - Electronics: DAE4 Sn538; Calibrated: 2008-07-14 - Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: Not Specified - Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176	DASY4 Configuration: - Probe: H3DV6 - SN6053 - ; Calibrated: 2008-01-21 - Sensor-Surface: (Fix Surface) - Electronics: DAE4 Sn538; Calibrated: 2008-07-14 - Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: Not Specified - Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176																																			
E Scan - ER3DV6 - measurement distance, sensor center to the Device = 15mm, High/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm Maximum value of peak Total field = 32.3 V/m Probe Modulation Factor = 1.00 Device Reference Point: 0.000, 0.000, 353.7 mm Reference Value = 26.5 V/m; Power Drift = -0.498 dB Hearing Aid Near-Field Category: M4 (AWF 0 dB)	H Scan - H3DV6 - measurement distance, sensor center to the Device = 15mm, high/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm Maximum value of peak Total field = 0.100 A/m Probe Modulation Factor = 1.00 Device Reference Point: 0.000, 0.000, 353.7 mm Reference Value = 0.095 A/m; Power Drift = -0.460 dB Hearing Aid Near-Field Category: M4 (AWF 0 dB)																																			
V/m 34.2 29.4 24.7 19.9 15.2 10.4  <table><tr><td>Grid 1</td><td>Grid 2</td><td>Grid 3</td></tr><tr><td>28.9 M4</td><td>33.9 M4</td><td>34.2 M4</td></tr><tr><td>Grid 4</td><td>Grid 5</td><td>Grid 6</td></tr><tr><td>21.9 M4</td><td>32.3 M4</td><td>33.5 M4</td></tr><tr><td>Grid 7</td><td>Grid 8</td><td>Grid 9</td></tr><tr><td>21.4 M4</td><td>26.1 M4</td><td>27.9 M4</td></tr></table> A/m 0.118 0.104 0.091 0.077 0.064 0.050  <table><tr><td>Grid 1</td><td>Grid 2</td><td>Grid 3</td></tr><tr><td>0.118 M4</td><td>0.110 M4</td><td>0.083 M4</td></tr><tr><td>Grid 4</td><td>Grid 5</td><td>Grid 6</td></tr><tr><td>0.103 M4</td><td>0.100 M4</td><td>0.081 M4</td></tr><tr><td>Grid 7</td><td>Grid 8</td><td>Grid 9</td></tr><tr><td>0.087 M4</td><td>0.088 M4</td><td>0.074 M4</td></tr></table>	Grid 1	Grid 2	Grid 3	28.9 M4	33.9 M4	34.2 M4	Grid 4	Grid 5	Grid 6	21.9 M4	32.3 M4	33.5 M4	Grid 7	Grid 8	Grid 9	21.4 M4	26.1 M4	27.9 M4	Grid 1	Grid 2	Grid 3	0.118 M4	0.110 M4	0.083 M4	Grid 4	Grid 5	Grid 6	0.103 M4	0.100 M4	0.081 M4	Grid 7	Grid 8	Grid 9	0.087 M4	0.088 M4	0.074 M4
Grid 1	Grid 2	Grid 3																																		
28.9 M4	33.9 M4	34.2 M4																																		
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Grid 7	Grid 8	Grid 9																																		
0.087 M4	0.088 M4	0.074 M4																																		

APPENDIX C: RELEVANT PAGES FROM PROBE CALIBRATION REPORT(S)



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 **Nokia Salo TCC**

Certificate No: ER3-2333_Jan08

CALIBRATION CERTIFICATE

Object **ER3DV6 - SN:2333**

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

Calibration date: **January 21, 2008**

Condition of the calibrated item **In Tolerance**

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 (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	29-Mar-07 (METAS, No. 217-00670)	Mar-08
Power sensor E4412A	MY41495277	29-Mar-07 (METAS, No. 217-00670)	Mar-08
Power sensor E4412A	MY41498087	29-Mar-07 (METAS, No. 217-00670)	Mar-08
Reference 3 dB Attenuator	SN: S5054 (3c)	8-Aug-07 (METAS, No. 217-00719)	Aug-08
Reference 20 dB Attenuator	SN: S5086 (20b)	29-Mar-07 (METAS, No. 217-00671)	Mar-08
Reference 30 dB Attenuator	SN: S5129 (30b)	8-Aug-07 (METAS, No. 217-00720)	Aug-08
Reference Probe ER3DV6	SN: 2328	2-Oct-07 (SPEAG, No. ER3-2328_Oct07)	Oct-08
DAE4	SN: 654	20-Apr-07 (SPEAG, No. DAE4-654_Apr07)	Apr-08

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (SPEAG, in house check Oct-07)	In house check: Oct-09
Network Analyzer HP 8753E	US37390585	18-Oct-01 (SPEAG, in house check Oct-07)	In house check: Oct-08

	Name	Function	Signature
Calibrated by:	Katja Pokovic	Technical Manager	
Approved by:	Niels Kuster	Quality Manager	

Issued: January 21, 2008

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



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 **Nokia Salo TCC**

Certificate No: **H3-6053_Jan08**

CALIBRATION CERTIFICATE

Object	H3DV6 - SN:6053
Calibration procedure(s)	QA CAL-03.v5 Calibration procedure for H-field probes optimized for close near field evaluations in air
Calibration date:	January 21, 2008
Condition of the calibrated item	In Tolerance

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 (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	29-Mar-07 (METAS, No. 217-00670)	Mar-08
Power sensor E4412A	MY41495277	29-Mar-07 (METAS, No. 217-00670)	Mar-08
Power sensor E4412A	MY41498087	29-Mar-07 (METAS, No. 217-00670)	Mar-08
Reference 3 dB Attenuator	SN: S5054 (3c)	8-Aug-07 (METAS, No. 217-00719)	Aug-08
Reference 20 dB Attenuator	SN: S5086 (20b)	29-Mar-07 (METAS, No. 217-00671)	Mar-08
Reference 30 dB Attenuator	SN: S5129 (30b)	8-Aug-07 (METAS, No. 217-00720)	Aug-08
Reference Probe H3DV6	SN: 6182	2-Oct-07 (SPEAG, No. H3-6182_Oct07)	Oct-08
DAE4	SN: 654	20-Apr-07 (SPEAG, No. DAE4-654_Apr07)	Apr-08

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (SPEAG, in house check Oct-07)	In house check: Oct-09
Network Analyzer HP 8753E	US37390585	18-Oct-01 (SPEAG, in house check Oct-07)	In house check: Oct-08

	Name	Function	Signature
Calibrated by:	Katja Pokovic	Technical Manager	
Approved by:	Niels Kuster	Quality Manager	

Issued: January 21, 2008

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

APPENDIX D: RELEVANT PAGES FROM DIPOLE VALIDATION KIT REPORT(S)



Accredited by the Swiss Federal Office of Metrology and Accreditation
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 **Nokia Salo TCC**

Certificate No: **CD835V3-1004_Feb07**

CALIBRATION CERTIFICATE

Object **CD835V3 - SN: 1004**

Calibration procedure(s) **QA CAL-20.v4
Calibration procedure for dipoles in air**

Calibration date: **February 13, 2007**

Condition of the calibrated item **In Tolerance**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
DAE4	SN: 660	1-Mar-06 (SPEAG, No. DAE4-660_Mar06)	Calibration, Mar-07
Probe ER3DV6	SN: 2336	27-Dec-06 (SPEAG, No. ER3-2336_Dec06)	Calibration, Dec-07
Probe H3DV6	SN: 6065	27-Dec-06 (SPEAG, No. H3-6065-Dec06)	Calibration, Dec-07
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-4419B	GB43310788	12-Aug-03 (SPEAG, in house check Oct-06)	In house check: Oct-07
Power sensor HP 8481A	MY41093312	10-Aug-03 (SPEAG, in house check Oct-06)	In house check: Oct-08
Power sensor HP 8481A	MY41093315	10-Aug-03 (SPEAG, in house check Oct-06)	In house check: Oct-08
Network Analyzer HP 8753E	US37390585	18-Oct-01 (SPEAG, in house check Oct-06)	In house check: Oct-07
RF generator R&S SMT06	SN: 100005	26-Jul-04 (SPEAG, in house check Nov-05)	In house check: Nov-07

Calibrated by:	Name Claudio Leubler	Function Laboratory Technician	Signature
Approved by:	Fin Bomholt	Technical Director	

Issued: March 6, 2007

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

1 Measurement Conditions

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

DASY Version	DASY4	V4.7 B53
DASY PP Version	SEMCAD	V1.8 B172
Phantom	HAC Test Arch	SD HAC P01 BA, #1002
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	< 0.07 dB	

2 Maximum Field values

H-field 10 mm above dipole surface	condition	interpolated maximum
Maximum measured	100 mW forward power	0.452 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	161.7 V/m
Maximum measured above low end	100 mW forward power	158.3 V/m
Averaged maximum above arm	100 mW forward power	160.0 V/m

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

3 Appendix

3.1 Antenna Parameters

Frequency	Return Loss	Impedance
800 MHz	16.8 dB	(42.5 – j11.2) Ohm
835 MHz	26.1 dB	(52.9 + j4.2) Ohm
900 MHz	15.6 dB	(57.3 – j16.4) Ohm
950 MHz	24.7 dB	(45.3 + j2.9) Ohm
960 MHz	19.1 dB	(51.7 + j11.2) 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.

3.3.2 DASY4 H-Field Result

Date/Time: 2/13/2007 10:40:13 AM

Test Laboratory: SPEAG, Zurich, Switzerland
DUT: HAC-Dipole 835 MHz; Type: CD835V3; Serial: 1004

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

DASY4 Configuration:

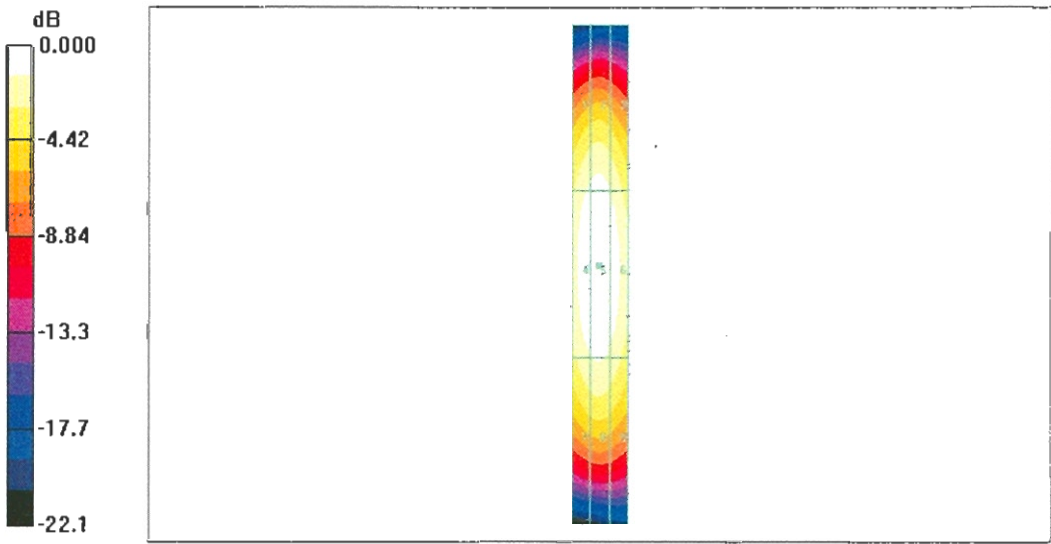
- Probe: H3DV6 - SN6065; ; Calibrated: 12/27/2006
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn660: Calibrated: 3/1/2006
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: 1002
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

H Scan - Sensor Center 10mm above CD835 Dipole/Hearing Aid Compatibility Test (41x361x1):

Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 0.452 A/m
Probe Modulation Factor = 1.00
Reference Value = 0.479 A/m; Power Drift = 0.012 dB
Hearing Aid Near-Field Category: M4 (AWF 0 dB)

Peak H-field in A/m

Grid 1	Grid 2	Grid 3
0.393	0.408	0.380
Grid 4	Grid 5	Grid 6
0.436	0.452	0.425
Grid 7	Grid 8	Grid 9
0.374	0.387	0.365



0 dB = 0.452A/m

3.3.3 DASY4 E-Field Result

Date/Time: 2/13/2007 2:25:30 PM

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: HAC-Dipole 835 MHz; Type: D835V3; Serial: 1004

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

Medium: Air

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

Phantom section: E Dipole Section

DASY4 Configuration:

- Probe: ER3DV6 - SN2336; ConvF(1, 1, 1); Calibrated: 12/27/2006
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn660; Calibrated: 3/1/2006
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: 1002
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

E Scan - Sensor Center 10mm above CD835 Dipole/Hearing Aid Compatibility Test (41x361x1):

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

Maximum value of peak Total field = 161.7 V/m

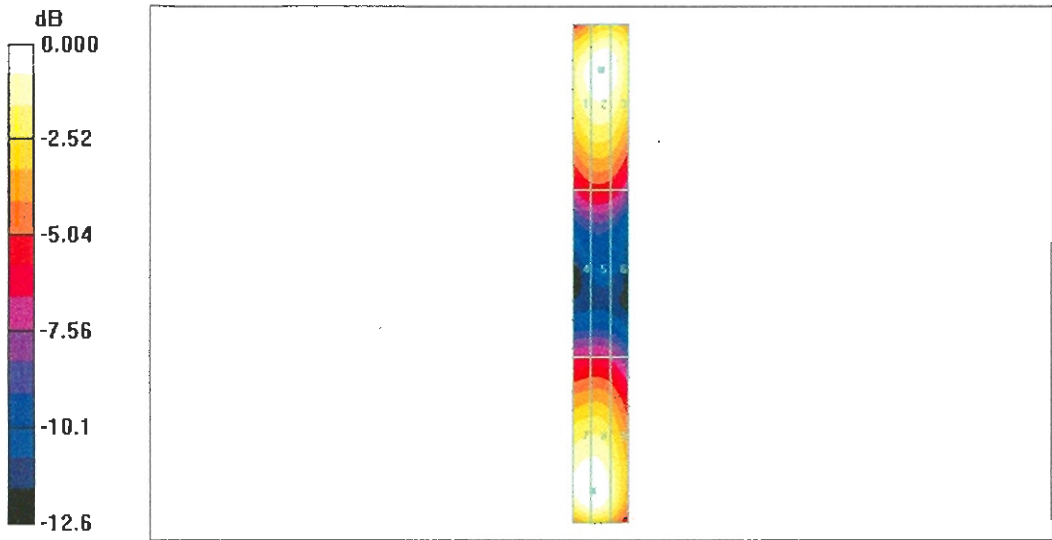
Probe Modulation Factor = 1.00

Reference Value = 107.2 V/m; Power Drift = 0.001 dB

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

Peak E-field in V/m

Grid 1	Grid 2	Grid 3
153.2	158.3	154.4
Grid 4	Grid 5	Grid 6
84.7	85.8	82.6
Grid 7	Grid 8	Grid 9
161.6	161.7	143.5



0 dB = 161.7V/m



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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 **Nokia Salo TCC**

Certificate No: **CD1880V3-1003_Feb07**

CALIBRATION CERTIFICATE

Object	CD1880V3 - SN: 1003
Calibration procedure(s)	QA CAL-20.v4 Calibration procedure for dipoles in air
Calibration date:	February 12, 2007
Condition of the calibrated item	In Tolerance

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
DAE4	SN: 660	1-Mar-06 (SPEAG, No. DAE4-660_Mar06)	Calibration, Mar-07
Probe ER3DV6	SN: 2336	27-Dec-06 (SPEAG, No. ER3-2336_Dec06)	Calibration, Dec-07
Probe H3DV6	SN: 6065	27-Dec-06 (SPEAG, No. H3-6065-Dec06)	Calibration, Dec-07
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-4419B	GB43310788	12-Aug-03 (SPEAG, in house check Oct-06)	In house check: Oct-07
Power sensor HP 8481A	MY41093312	10-Aug-03 (SPEAG, in house check Oct-06)	In house check: Oct-08
Power sensor HP 8481A	MY41093315	10-Aug-03 (SPEAG, in house check Oct-06)	In house check: Oct-08
Network Analyzer HP 8753E	US37390585	18-Oct-01 (SPEAG, in house check Oct-06)	In house check: Oct-07
RF generator R&S SMT06	SN: 100005	26-Jul-04 (SPEAG, in house check Nov-05)	In house check: Nov-07

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

Issued: February 14, 2007

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

1 Measurement Conditions

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

DASY Version	DASY4	V4.7 B53
DASY PP Version	SEMCAD	V1.8 B172
Phantom	HAC Test Arch	SD HAC P01 BA, #1002
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	0.452 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	130.9 V/m
Maximum measured above low end	100 mW forward power	126.7 V/m
Averaged maximum above arm	100 mW forward power	128.8 V/m

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

3 Appendix

3.1 Antenna Parameters

Frequency	Return Loss	Impedance
1710 MHz	19.0 dB	(49.8 + j11.3) Ohm
1880 MHz	19.9 dB	(53.7 + j9.9) Ohm
1900 MHz	19.8 dB	(56.3 + j9.0) Ohm
1950 MHz	23.7 dB	(57.0 – j0.7) Ohm
2000 MHz	26.2 dB	(45.4 + j0.7) 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.

3.3.2 DASY4 H-Field Result

Date/Time: 2/12/2007 4:55:48 PM

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: HAC Dipole 1880 MHz; Type: CD1880V3; Serial: 1003

Communication System: CW; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: Air

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

Phantom section: H Dipole Section

DASY4 Configuration:

- Probe: H3DV6 - SN6065; ; Calibrated: 12/27/2006
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn660; Calibrated: 3/1/2006
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: 1002
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

H Scan - Sensor Center 10mm above CD1880V3 Dipole/Hearing Aid Compatibility Test (41x181x1):

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

Maximum value of peak Total field = 0.452 A/m

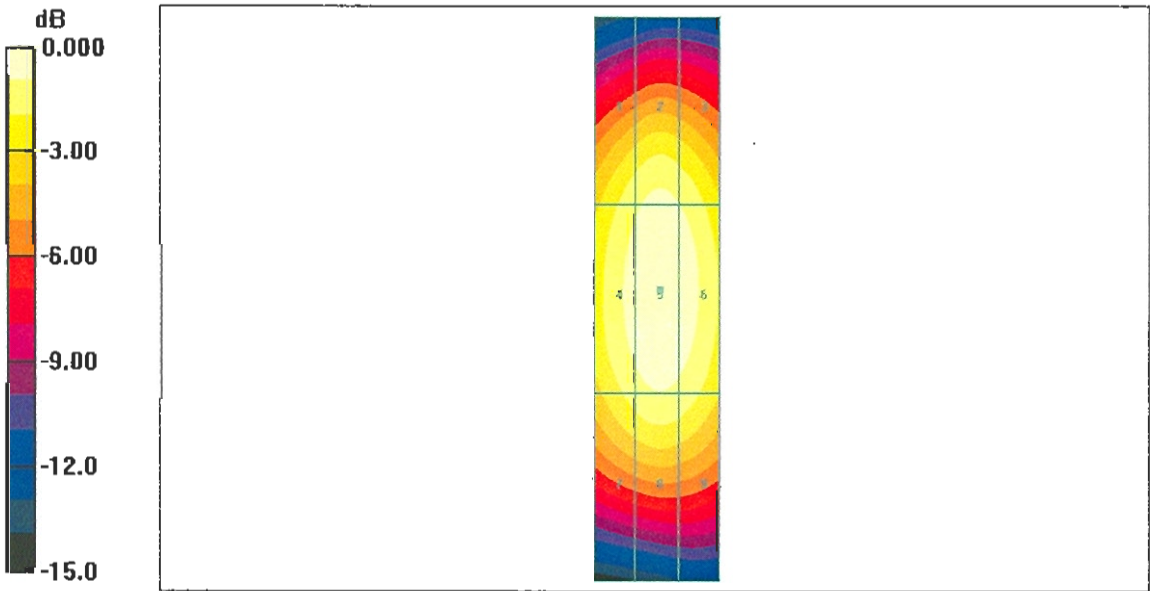
Probe Modulation Factor = 1.00

Reference Value = 0.476 A/m; Power Drift = 0.007 dB

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

Peak H-field in A/m

Grid 1	Grid 2	Grid 3
0.392	0.419	0.404
Grid 4	Grid 5	Grid 6
0.425	0.452	0.437
Grid 7	Grid 8	Grid 9
0.378	0.401	0.388



0 dB = 0.452A/m

3.3.3 DASY4 E-Field Result

Date/Time: 2/12/2007 2:59:33 PM

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: HAC Dipole 1880 MHz; Type: CD1880V3; Serial: 1003

Communication System: CW; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: Air

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

Phantom section: E Dipole Section

DASY4 Configuration:

- Probe: ER3DV6 - SN2336; ConvF(1, 1, 1); Calibrated: 12/27/2006
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn660; Calibrated: 3/1/2006
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: 1002
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

E Scan - Sensor Center 10mm above CD1880V3 Dipole/Hearing Aid Compatibility Test (41x181x1):

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

Maximum value of peak Total field = 130.9 V/m

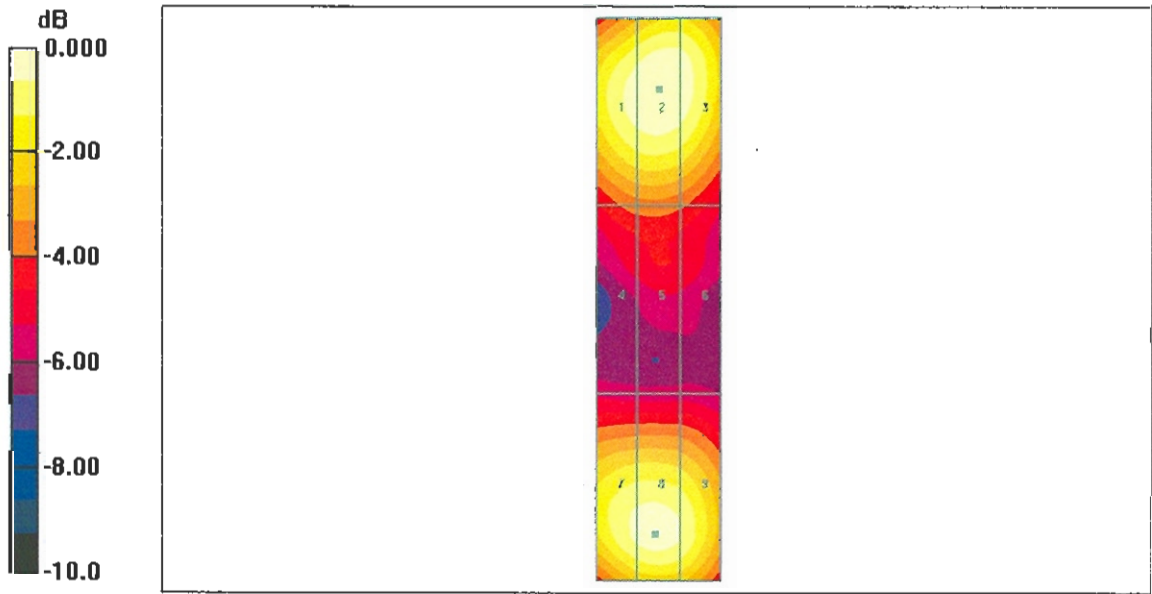
Probe Modulation Factor = 1.00

Reference Value = 139.0 V/m; Power Drift = 0.015 dB

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

Peak E-field in V/m

Grid 1	Grid 2	Grid 3
126.8	130.9	127.9
Grid 4	Grid 5	Grid 6
86.2	87.1	84.0
Grid 7	Grid 8	Grid 9
123.9	126.7	121.4



0 dB = 130.9V/m