

HAC RF Emissions Test Report

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Measurements made by:	Ari Orte		
Tested devices:	RM-381 (Hearing aid mode active)		
FCC ID:	QMNRM-381	IC:	661X-RM381
Supplement reports:	Salo_HAC_0838_07, Salo_HAC_0838_08		
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	2008-08-07 to 2008-09-17
SN, HW, SW and DUT numbers of tested device	SN: 004401/10/205339/0, HW: S2.5, SW: sy08w11_08w28, DUT: 13077
Batteries used in testing	BP-6MT, DUT: 13081, 13083
State of sample	Prototype
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	190 / 836.6	33.7 dBm ERP	149.6 – 266.1	201.3	M3 (-5dB)
WCDMA850	4233 / 846.6	20.2 dBm ERP	199.5 – 354.8	56.0	M4 (0dB)
GSM1900	661 / 1880.0	32.5 dBm EIRP	47.3 – 84.1	68.5	M3 (-5dB)
WCDMA1900	9400 / 1880.0	21.7 dBm EIRP	63.1 – 112.2	27.4	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]	Max H-field value after exclusion [A/m]	Category
GSM850	190 / 836.6	33.7 dBm ERP	0.45 – 0.80	0.36	M4 (-5dB)
WCDMA850	4233 / 846.6	20.2 dBm ERP	0.60 – 1.07	0.08	M4 (0dB)
GSM1900	661 / 1880.0	32.5 dBm EIRP	0.14 – 0.25	0.24	M3 (-5dB)
WCDMA1900	9400 / 1880.0	21.7 dBm EIRP	0.19 – 0.34	0.06	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	0.48 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]:	21.0 to 23.0
Ambient humidity [RH %]:	30 to 60

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
DAE 4	728	12 months	2009-04
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
	2008-08-05	152.2	0.461
1880	Reference result	128.8	0.452
	± 10% window	115.9 – 141.7	0.406 – 0.497
	2008-08-05	127.2	0.478
	2008-09-09	129.2	0.458

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 1.5cm. 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:

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

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

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

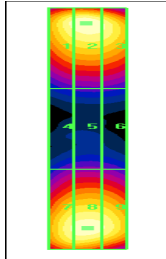
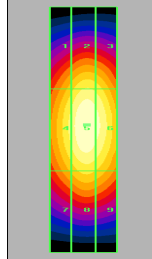
Option used	Test configuration	Ch 128 824.2MHz	Ch 190 836.6MHz	Ch 251 848.8MHz
GSM850	Power	34.5 dBm	33.7 dBm	31.3 dBm
Flip open	E-field [V/M]	169.4	201.3	195.5
	H-field [A/m]	0.304	0.358	0.355
	Category	M3 (-5dB)	M3 (-5dB)	M3 (-5dB)
Option used	Test configuration	Ch 4132 826.4MHz	Ch 4175 835.0MHz	Ch 4233 846.6MHz
WCDMA850	Power	21.8 dBm	20.8 dBm	20.2 dBm
Flip open	E-field [V/M]	50.7	54.2	56.0
	H-field [A/m]	0.075	0.078	0.084
	Category	M4 (0dB)	M4 (0dB)	M4 (0dB)

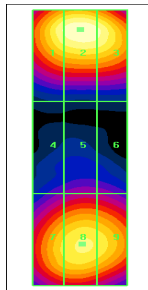
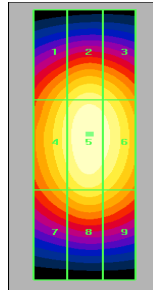
1900MHz RF emissions test results

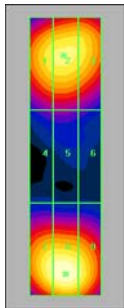
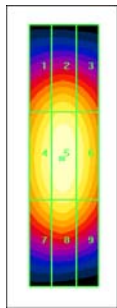
Option used	Test configuration	Ch 512 1850.2MHz	Ch 661 1880.0MHz	Ch 810 1909.8MHz
GSM 1900	Power	32.4 dBm	32.5 dBm	31.8 dBm
Flip open	E-field [V/M]	63.4	68.5	62.1
	H-field [A/m]	0.243	0.243	0.204
	Category	M3 (-5dB)	M3 (-5dB)	M3 (-5dB)
Option used	Test configuration	Ch 9262 1852.4MHz	Ch 9400 1880.0MHz	Ch 9538 1907.6MHz
WCDMA 1900	Power	24.6 dBm	21.7 dBm	22.3 dBm
Flip open	E-field [V/M]	25.5	27.4	21.1
	H-field [A/m]	0.058	0.059	0.050
	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: 2008-05-08 10:49:01 Test Laboratory: TCC Nokia Type: D835V3; Serial: 1004		Date/Time: 2008-05-08 09:43:31 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; Probe Notes: - ConvF(1, 1, 1); Calibrated: 2008-01-21 - Sensor-Surface: (Fix Surface) - Electronics: DAE4 Sn728; Calibrated: 2008-04-23 - 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; Probe Notes: - ; Calibrated: 2008-01-21 - Sensor-Surface: (Fix Surface) - Electronics: DAE4 Sn728; Calibrated: 2008-04-23 - 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 = 153.4 V/m Probe Modulation Factor = 1.00 Device Reference Point: 0.000, 0.000, 354.7 mm Reference Value = 112.8 V/m; Power Drift = -0.006 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 = 0.461 A/m Probe Modulation Factor = 1.00 Device Reference Point: 0.000, 0.000, 354.7 mm Reference Value = 0.489 A/m; Power Drift = -0.039 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>150.0 M4</td><td>153.4 M4</td><td>148.2 M4</td></tr><tr><td>Grid 4</td><td>Grid 5</td><td>Grid 6</td></tr><tr><td>81.3 M4</td><td>82.6 M4</td><td>81.6 M4</td></tr><tr><td>Grid 7</td><td>Grid 8</td><td>Grid 9</td></tr><tr><td>148.1 M4</td><td>150.9 M4</td><td>147.8 M4</td></tr></table>		Grid 1	Grid 2	Grid 3	150.0 M4	153.4 M4	148.2 M4	Grid 4	Grid 5	Grid 6	81.3 M4	82.6 M4	81.6 M4	Grid 7	Grid 8	Grid 9	148.1 M4	150.9 M4	147.8 M4	<table><tr><td>Grid 1</td><td>Grid 2</td><td>Grid 3</td></tr><tr><td>0.367 M4</td><td>0.407 M4</td><td>0.397 M4</td></tr><tr><td>Grid 4</td><td>Grid 5</td><td>Grid 6</td></tr><tr><td>0.419 M4</td><td>0.461 M4</td><td>0.448 M4</td></tr><tr><td>Grid 7</td><td>Grid 8</td><td>Grid 9</td></tr><tr><td>0.357 M4</td><td>0.387 M4</td><td>0.377 M4</td></tr></table>	Grid 1	Grid 2	Grid 3	0.367 M4	0.407 M4	0.397 M4	Grid 4	Grid 5	Grid 6	0.419 M4	0.461 M4	0.448 M4	Grid 7	Grid 8	Grid 9	0.357 M4	0.387 M4	0.377 M4
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Grid 7	Grid 8	Grid 9																																				
0.357 M4	0.387 M4	0.377 M4																																				

SYSTEM VALIDATION DATA 1900MHz																				
Date/Time: 2008-05-08 10:13:25 Test Laboratory: TCC Nokia Type: CD1880V3; Serial: 1003		Date/Time: 2008-05-08 09:58:44 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; Probe Notes: - ConvF(1, 1, 1); Calibrated: 2008-21-01 - Sensor-Surface: (Fix Surface) - Electronics: DAE4 Sn728; Calibrated: 2008-23-04 - 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; Probe Notes: - ; Calibrated: 2008-21-01 - Sensor-Surface: (Fix Surface) - Electronics: DAE4 Sn728; Calibrated: 2008-23-04 - 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 = 131.6 V/m Probe Modulation Factor = 1.00 Device Reference Point: 0.000, 0.000, 354.7 mm Reference Value = 124.1 V/m; Power Drift = 0.009 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 = 0.478 A/m Probe Modulation Factor = 1.00 Device Reference Point: 0.000, 0.000, 354.7 mm Reference Value = 0.498 A/m; Power Drift = 0.035 dB Hearing Aid Near-Field Category: M2 (AWF 0 dB)																		
																				
<table><tr><td>Grid 1 127.3 M2</td><td>Grid 2 131.6 M2</td><td>Grid 3 128.5 M2</td></tr><tr><td>Grid 4 83.8 M3</td><td>Grid 5 88.2 M3</td><td>Grid 6 87.1 M3</td></tr><tr><td>Grid 7 118.4 M2</td><td>Grid 8 122.7 M2</td><td>Grid 9 121.0 M2</td></tr></table>		Grid 1 127.3 M2	Grid 2 131.6 M2	Grid 3 128.5 M2	Grid 4 83.8 M3	Grid 5 88.2 M3	Grid 6 87.1 M3	Grid 7 118.4 M2	Grid 8 122.7 M2	Grid 9 121.0 M2	<table><tr><td>Grid 1 0.408 M2</td><td>Grid 2 0.443 M2</td><td>Grid 3 0.431 M2</td></tr><tr><td>Grid 4 0.440 M2</td><td>Grid 5 0.478 M2</td><td>Grid 6 0.466 M2</td></tr><tr><td>Grid 7 0.388 M2</td><td>Grid 8 0.420 M2</td><td>Grid 9 0.408 M2</td></tr></table>	Grid 1 0.408 M2	Grid 2 0.443 M2	Grid 3 0.431 M2	Grid 4 0.440 M2	Grid 5 0.478 M2	Grid 6 0.466 M2	Grid 7 0.388 M2	Grid 8 0.420 M2	Grid 9 0.408 M2
Grid 1 127.3 M2	Grid 2 131.6 M2	Grid 3 128.5 M2																		
Grid 4 83.8 M3	Grid 5 88.2 M3	Grid 6 87.1 M3																		
Grid 7 118.4 M2	Grid 8 122.7 M2	Grid 9 121.0 M2																		
Grid 1 0.408 M2	Grid 2 0.443 M2	Grid 3 0.431 M2																		
Grid 4 0.440 M2	Grid 5 0.478 M2	Grid 6 0.466 M2																		
Grid 7 0.388 M2	Grid 8 0.420 M2	Grid 9 0.408 M2																		

SYSTEM VALIDATION DATA 1900MHZ																				
Date/Time: 2008-09-09 15:12:26 Test Laboratory: TCC Nokia Type: CD1880V3; Serial: 1003		Date/Time: 2008-09-09 15:01:48 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; Probe Notes: - ConvF(1, 1, 1); Calibrated: 2008-01-21 - Sensor-Surface: (Fix Surface) - Electronics: DAE4 Sn538; Calibrated: DAE not calibrated - 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; Probe Notes: - ; 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 = 133.3 V/m Probe Modulation Factor = 1.00 Device Reference Point: 0.000, 0.000, 354.7 mm Reference Value = 149.4 V/m; Power Drift = 0.011 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 = 0.458 A/m Probe Modulation Factor = 1.00 Device Reference Point: 0.000, 0.000, 354.7 mm Reference Value = 0.486 A/m; Power Drift = 0.004 dB Hearing Aid Near-Field Category: M2 (AWF 0 dB)																		
																				
<table><tr><td>Grid 1 123.4 M2</td><td>Grid 2 125.0 M2</td><td>Grid 3 122.6 M2</td></tr><tr><td>Grid 4 85.3 M3</td><td>Grid 5 86.1 M3</td><td>Grid 6 82.4 M3</td></tr><tr><td>Grid 7 129.3 M2</td><td>Grid 8 133.3 M2</td><td>Grid 9 127.1 M2</td></tr></table>		Grid 1 123.4 M2	Grid 2 125.0 M2	Grid 3 122.6 M2	Grid 4 85.3 M3	Grid 5 86.1 M3	Grid 6 82.4 M3	Grid 7 129.3 M2	Grid 8 133.3 M2	Grid 9 127.1 M2	<table><tr><td>Grid 1 0.394 M2</td><td>Grid 2 0.410 M2</td><td>Grid 3 0.389 M2</td></tr><tr><td>Grid 4 0.442 M2</td><td>Grid 5 0.458 M2</td><td>Grid 6 0.435 M2</td></tr><tr><td>Grid 7 0.402 M2</td><td>Grid 8 0.419 M2</td><td>Grid 9 0.392 M2</td></tr></table>	Grid 1 0.394 M2	Grid 2 0.410 M2	Grid 3 0.389 M2	Grid 4 0.442 M2	Grid 5 0.458 M2	Grid 6 0.435 M2	Grid 7 0.402 M2	Grid 8 0.419 M2	Grid 9 0.392 M2
Grid 1 123.4 M2	Grid 2 125.0 M2	Grid 3 122.6 M2																		
Grid 4 85.3 M3	Grid 5 86.1 M3	Grid 6 82.4 M3																		
Grid 7 129.3 M2	Grid 8 133.3 M2	Grid 9 127.1 M2																		
Grid 1 0.394 M2	Grid 2 0.410 M2	Grid 3 0.389 M2																		
Grid 4 0.442 M2	Grid 5 0.458 M2	Grid 6 0.435 M2																		
Grid 7 0.402 M2	Grid 8 0.419 M2	Grid 9 0.392 M2																		

APPENDIX B: MEASUREMENT SCANS

MEASUREMENT DATA GSM850, CHANNEL LOW (824.2 MHz)

Date/Time: 2008-08-07 12:01:41
Test Laboratory: TCC Nokia
Type: RM-381; Serial: 004401/10/205339/0

Date/Time: 2008-08-08 10:48:20
Test Laboratory: TCC Nokia
Type: RM-381; Serial: 004401/10/205339/0

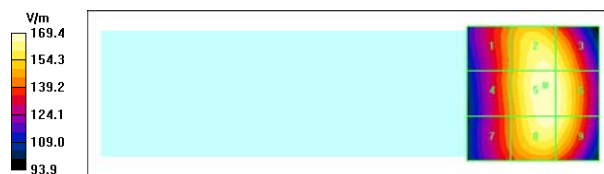
Communication System: GSM850 (ER3DV6)
Frequency: 824.2 MHz; Duty Cycle: 1:7.34
Medium: Air; Medium Notes: Not Specified
Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1000$ kg/m³
Phantom section: E Device Section

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 Sn728; Calibrated: 2008-04-23
- 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

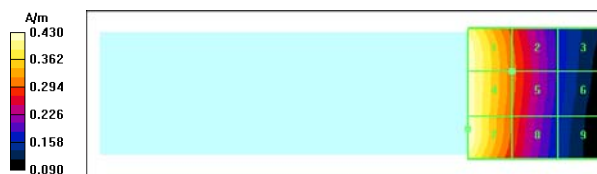
DASY4 Configuration:
- Probe: H3DV6 - SN6053
- ; Calibrated: 2008-01-21
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn728; Calibrated: 2008-04-23
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: Not Specified
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 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 = 169.4 V/m
Probe Modulation Factor = 2.71
Device Reference Point: 0.000, 0.000, 353.7 mm
Reference Value = 78.6 V/m; Power Drift = 0.055 dB
Hearing Aid Near-Field Category: M3 (AWF -5 dB)



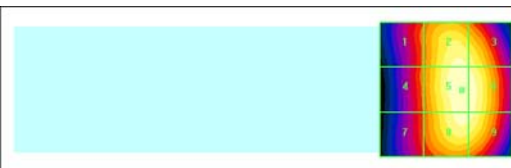
Grid 1	Grid 2	Grid 3
147.3 M4	167.0 M3	163.8 M3
Grid 4	Grid 5	Grid 6
148.4 M4	169.4 M3	167.7 M3
Grid 7	Grid 8	Grid 9
145.2 M4	167.3 M3	165.9 M3

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 = 0.430 A/m
Probe Modulation Factor = 2.88
Device Reference Point: 0.000, 0.000, 353.7 mm
Reference Value = 0.088 A/m; Power Drift = -0.004 dB
Hearing Aid Near-Field Category: M4 (AWF -5 dB)



Grid 1	Grid 2	Grid 3
0.424 M4	0.304 M4	0.178 M4
Grid 4	Grid 5	Grid 6
0.427 M4	0.304 M4	0.178 M4
Grid 7	Grid 8	Grid 9
0.430 M4	0.294 M4	0.168 M4

MEASUREMENT DATA GSM850, CHANNEL MIDDLE (836.6 MHz)																																					
Date/Time: 2008-08-07 11:51:30 Test Laboratory: TCC Nokia Type: RM-381; Serial: 004401/10/205339/0	Date/Time: 2008-08-08 10:38:34 Test Laboratory: TCC Nokia Type: RM-381; Serial: 004401/10/205339/0																																				
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 Sn728; Calibrated: 2008-04-23 - 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 Sn728; Calibrated: 2008-04-23 - 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 = 201.3 V/m Probe Modulation Factor = 2.71 Device Reference Point: 0.000, 0.000, 353.7 mm Reference Value = 93.2 V/m; Power Drift = -0.186 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 = 0.499 A/m Probe Modulation Factor = 2.88 Device Reference Point: 0.000, 0.000, 353.7 mm Reference Value = 0.103 A/m; Power Drift = 0.037 dB Hearing Aid Near-Field Category: M3 (AWF -5 dB)																																				
V/m 201.3 182.6 163.9 145.1 126.4 107.7 <table><tr><td>Grid 1</td><td>Grid 2</td><td>Grid 3</td></tr><tr><td>175.4 M3</td><td>196.8 M3</td><td>193.8 M3</td></tr><tr><td>Grid 4</td><td>Grid 5</td><td>Grid 6</td></tr><tr><td>174.7 M3</td><td>201.3 M3</td><td>198.3 M3</td></tr><tr><td>Grid 7</td><td>Grid 8</td><td>Grid 9</td></tr><tr><td>166.5 M3</td><td>194.2 M3</td><td>193.7 M3</td></tr></table>	Grid 1	Grid 2	Grid 3	175.4 M3	196.8 M3	193.8 M3	Grid 4	Grid 5	Grid 6	174.7 M3	201.3 M3	198.3 M3	Grid 7	Grid 8	Grid 9	166.5 M3	194.2 M3	193.7 M3	A/m 0.499 0.420 0.341 0.262 0.183 0.104 <table><tr><td>Grid 1</td><td>Grid 2</td><td>Grid 3</td></tr><tr><td>0.499 M3</td><td>0.358 M4</td><td>0.210 M4</td></tr><tr><td>Grid 4</td><td>Grid 5</td><td>Grid 6</td></tr><tr><td>0.493 M3</td><td>0.358 M4</td><td>0.209 M4</td></tr><tr><td>Grid 7</td><td>Grid 8</td><td>Grid 9</td></tr><tr><td>0.490 M3</td><td>0.337 M4</td><td>0.191 M4</td></tr></table>	Grid 1	Grid 2	Grid 3	0.499 M3	0.358 M4	0.210 M4	Grid 4	Grid 5	Grid 6	0.493 M3	0.358 M4	0.209 M4	Grid 7	Grid 8	Grid 9	0.490 M3	0.337 M4	0.191 M4
Grid 1	Grid 2	Grid 3																																			
175.4 M3	196.8 M3	193.8 M3																																			
Grid 4	Grid 5	Grid 6																																			
174.7 M3	201.3 M3	198.3 M3																																			
Grid 7	Grid 8	Grid 9																																			
166.5 M3	194.2 M3	193.7 M3																																			
Grid 1	Grid 2	Grid 3																																			
0.499 M3	0.358 M4	0.210 M4																																			
Grid 4	Grid 5	Grid 6																																			
0.493 M3	0.358 M4	0.209 M4																																			
Grid 7	Grid 8	Grid 9																																			
0.490 M3	0.337 M4	0.191 M4																																			

MEASUREMENT DATA GSM850, CHANNEL HIGH (848.8 MHz)																																					
Date/Time: 2008-08-07 11:56:38 Test Laboratory: TCC Nokia Type: RM-381; Serial: 004401/10/205339/0	Date/Time: 2008-08-08 10:43:29 Test Laboratory: TCC Nokia Type: RM-381; Serial: 004401/10/205339/0																																				
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 Sn728; Calibrated: 2008-04-23 - 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 Sn728; Calibrated: 2008-04-23 - 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 = 195.5 V/m Probe Modulation Factor = 2.71 Device Reference Point: 0.000, 0.000, 353.7 mm Reference Value = 89.3 V/m; Power Drift = 0.045 dB Hearing Aid Near-Field Category: M3 (AWF -5 dB) V/m 195.5 177.5 159.6 141.6 123.7 105.7  <table><tr><td>Grid 1</td><td>Grid 2</td><td>Grid 3</td></tr><tr><td>163.9 M3</td><td>192.2 M3</td><td>189.3 M3</td></tr><tr><td>Grid 4</td><td>Grid 5</td><td>Grid 6</td></tr><tr><td>164.7 M3</td><td>195.5 M3</td><td>194.5 M3</td></tr><tr><td>Grid 7</td><td>Grid 8</td><td>Grid 9</td></tr><tr><td>160.8 M3</td><td>192.9 M3</td><td>192.2 M3</td></tr></table>	Grid 1	Grid 2	Grid 3	163.9 M3	192.2 M3	189.3 M3	Grid 4	Grid 5	Grid 6	164.7 M3	195.5 M3	194.5 M3	Grid 7	Grid 8	Grid 9	160.8 M3	192.9 M3	192.2 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 = 0.484 A/m Probe Modulation Factor = 2.88 Device Reference Point: 0.000, 0.000, 353.7 mm Reference Value = 0.103 A/m; Power Drift = 0.160 dB Hearing Aid Near-Field Category: M3 (AWF -5 dB) A/m 0.484 0.409 0.334 0.258 0.183 0.108  <table><tr><td>Grid 1</td><td>Grid 2</td><td>Grid 3</td></tr><tr><td>0.484 M3</td><td>0.355 M4</td><td>0.215 M4</td></tr><tr><td>Grid 4</td><td>Grid 5</td><td>Grid 6</td></tr><tr><td>0.481 M3</td><td>0.355 M4</td><td>0.212 M4</td></tr><tr><td>Grid 7</td><td>Grid 8</td><td>Grid 9</td></tr><tr><td>0.480 M3</td><td>0.334 M4</td><td>0.194 M4</td></tr></table>	Grid 1	Grid 2	Grid 3	0.484 M3	0.355 M4	0.215 M4	Grid 4	Grid 5	Grid 6	0.481 M3	0.355 M4	0.212 M4	Grid 7	Grid 8	Grid 9	0.480 M3	0.334 M4	0.194 M4
Grid 1	Grid 2	Grid 3																																			
163.9 M3	192.2 M3	189.3 M3																																			
Grid 4	Grid 5	Grid 6																																			
164.7 M3	195.5 M3	194.5 M3																																			
Grid 7	Grid 8	Grid 9																																			
160.8 M3	192.9 M3	192.2 M3																																			
Grid 1	Grid 2	Grid 3																																			
0.484 M3	0.355 M4	0.215 M4																																			
Grid 4	Grid 5	Grid 6																																			
0.481 M3	0.355 M4	0.212 M4																																			
Grid 7	Grid 8	Grid 9																																			
0.480 M3	0.334 M4	0.194 M4																																			

MEASUREMENT DATA WCDMA850, CHANNEL LOW (826.4 MHz)

Date/Time: 2008-08-07 12:47:45
Test Laboratory: TCC Nokia
Type: RM-381; Serial: 004401/10/205339/0

Date/Time: 2008-08-08 08:54:12
Test Laboratory: TCC Nokia
Type: RM-381; Serial: 004401/10/205339/0

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/m³
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/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 Sn728; Calibrated: 2008-04-23
- 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

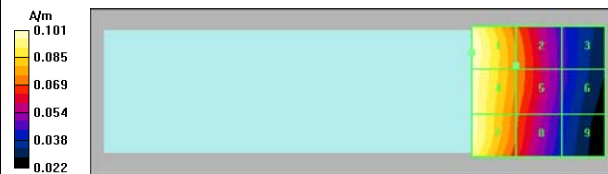
DASY4 Configuration:
- Probe: H3DV6 - SN6053
- ; Calibrated: 2008-01-21
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn728; Calibrated: 2008-04-23
- Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: Not Specified
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 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 = 50.7 V/m
Probe Modulation Factor = 0.810
Device Reference Point: 0.000, 0.000, 353.7 mm
Reference Value = 79.1 V/m; Power Drift = -0.002 dB
Hearing Aid Near-Field Category: M4 (AWF 0 dB)

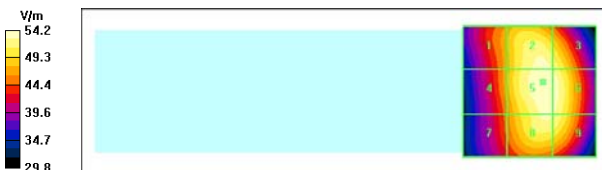
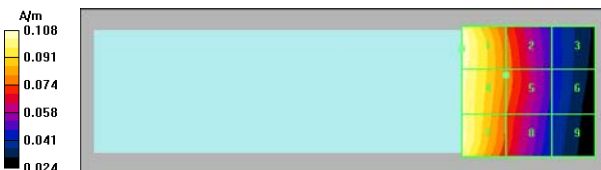


Grid 1	Grid 2	Grid 3
44.5 M4	50.2 M4	49.3 M4
Grid 4	Grid 5	Grid 6
43.9 M4	50.7 M4	50.3 M4
Grid 7	Grid 8	Grid 9
42.0 M4	49.4 M4	49.3 M4

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 = 0.101 A/m
Probe Modulation Factor = 0.720
Device Reference Point: 0.000, 0.000, 353.7 mm
Reference Value = 0.092 A/m; Power Drift = 0.021 dB
Hearing Aid Near-Field Category: M4 (AWF 0 dB)



Grid 1	Grid 2	Grid 3
0.101 M4	0.075 M4	0.046 M4
Grid 4	Grid 5	Grid 6
0.100 M4	0.075 M4	0.046 M4
Grid 7	Grid 8	Grid 9
0.099 M4	0.072 M4	0.042 M4

MEASUREMENT DATA WCDMA850, CHANNEL MIDDLE (835 MHz)																																					
Date/Time: 2008-08-07 12:34:50 Test Laboratory: TCC Nokia Type: RM-381; Serial: 004401/10/205339/0	Date/Time: 2008-08-08 08:44:04 Test Laboratory: TCC Nokia Type: RM-381; Serial: 004401/10/205339/0																																				
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/m ³ 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/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 Sn728; Calibrated: 2008-04-23 - 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 Sn728; Calibrated: 2008-04-23 - 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 = 54.2 V/m Probe Modulation Factor = 0.810 Device Reference Point: 0.000, 0.000, 353.7 mm Reference Value = 87.9 V/m; Power Drift = -0.436 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 = 0.108 A/m Probe Modulation Factor = 0.720 Device Reference Point: 0.000, 0.000, 353.7 mm Reference Value = 0.099 A/m; Power Drift = -0.360 dB Hearing Aid Near-Field Category: M4 (AWF 0 dB)																																				
V/m 54.2 49.3 44.4 39.6 34.7 29.8  <table><tr><td>Grid 1</td><td>Grid 2</td><td>Grid 3</td></tr><tr><td>47.7 M4</td><td>53.6 M4</td><td>52.6 M4</td></tr><tr><td>Grid 4</td><td>Grid 5</td><td>Grid 6</td></tr><tr><td>47.5 M4</td><td>54.2 M4</td><td>53.8 M4</td></tr><tr><td>Grid 7</td><td>Grid 8</td><td>Grid 9</td></tr><tr><td>45.7 M4</td><td>53.0 M4</td><td>52.8 M4</td></tr></table>	Grid 1	Grid 2	Grid 3	47.7 M4	53.6 M4	52.6 M4	Grid 4	Grid 5	Grid 6	47.5 M4	54.2 M4	53.8 M4	Grid 7	Grid 8	Grid 9	45.7 M4	53.0 M4	52.8 M4	A/m 0.108 0.091 0.074 0.058 0.041 0.024  <table><tr><td>Grid 1</td><td>Grid 2</td><td>Grid 3</td></tr><tr><td>0.108 M4</td><td>0.078 M4</td><td>0.047 M4</td></tr><tr><td>Grid 4</td><td>Grid 5</td><td>Grid 6</td></tr><tr><td>0.105 M4</td><td>0.078 M4</td><td>0.047 M4</td></tr><tr><td>Grid 7</td><td>Grid 8</td><td>Grid 9</td></tr><tr><td>0.105 M4</td><td>0.075 M4</td><td>0.044 M4</td></tr></table>	Grid 1	Grid 2	Grid 3	0.108 M4	0.078 M4	0.047 M4	Grid 4	Grid 5	Grid 6	0.105 M4	0.078 M4	0.047 M4	Grid 7	Grid 8	Grid 9	0.105 M4	0.075 M4	0.044 M4
Grid 1	Grid 2	Grid 3																																			
47.7 M4	53.6 M4	52.6 M4																																			
Grid 4	Grid 5	Grid 6																																			
47.5 M4	54.2 M4	53.8 M4																																			
Grid 7	Grid 8	Grid 9																																			
45.7 M4	53.0 M4	52.8 M4																																			
Grid 1	Grid 2	Grid 3																																			
0.108 M4	0.078 M4	0.047 M4																																			
Grid 4	Grid 5	Grid 6																																			
0.105 M4	0.078 M4	0.047 M4																																			
Grid 7	Grid 8	Grid 9																																			
0.105 M4	0.075 M4	0.044 M4																																			

MEASUREMENT DATA WCDMA850, CHANNEL HIGH (846.6 MHz)																																					
Date/Time: 2008-08-07 12:39:51 Test Laboratory: TCC Nokia Type: RM-381; Serial: 004401/10/205339/0	Date/Time: 2008-08-08 08:49:04 Test Laboratory: TCC Nokia Type: RM-381; Serial: 004401/10/205339/0																																				
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 Sn728; Calibrated: 2008-04-23 - 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 Sn728; Calibrated: 2008-04-23 - 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 = 56.0 V/m Probe Modulation Factor = 0.810 Device Reference Point: 0.000, 0.000, 353.7 mm Reference Value = 87.8 V/m; Power Drift = -0.080 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 = 0.110 A/m Probe Modulation Factor = 0.720 Device Reference Point: 0.000, 0.000, 353.7 mm Reference Value = 0.104 A/m; Power Drift = -0.017 dB Hearing Aid Near-Field Category: M4 (AWF 0 dB)																																				
V/m 56.0 50.8 45.7 40.5 35.4 30.2  <table><tr><td>Grid 1</td><td>Grid 2</td><td>Grid 3</td></tr><tr><td>47.6 M4</td><td>55.2 M4</td><td>54.7 M4</td></tr><tr><td>Grid 4</td><td>Grid 5</td><td>Grid 6</td></tr><tr><td>47.4 M4</td><td>56.0 M4</td><td>55.9 M4</td></tr><tr><td>Grid 7</td><td>Grid 8</td><td>Grid 9</td></tr><tr><td>45.6 M4</td><td>55.0 M4</td><td>54.9 M4</td></tr></table>	Grid 1	Grid 2	Grid 3	47.6 M4	55.2 M4	54.7 M4	Grid 4	Grid 5	Grid 6	47.4 M4	56.0 M4	55.9 M4	Grid 7	Grid 8	Grid 9	45.6 M4	55.0 M4	54.9 M4	A/m 0.110 0.093 0.077 0.060 0.044 0.027  <table><tr><td>Grid 1</td><td>Grid 2</td><td>Grid 3</td></tr><tr><td>0.110 M4</td><td>0.084 M4</td><td>0.051 M4</td></tr><tr><td>Grid 4</td><td>Grid 5</td><td>Grid 6</td></tr><tr><td>0.109 M4</td><td>0.084 M4</td><td>0.051 M4</td></tr><tr><td>Grid 7</td><td>Grid 8</td><td>Grid 9</td></tr><tr><td>0.109 M4</td><td>0.080 M4</td><td>0.048 M4</td></tr></table>	Grid 1	Grid 2	Grid 3	0.110 M4	0.084 M4	0.051 M4	Grid 4	Grid 5	Grid 6	0.109 M4	0.084 M4	0.051 M4	Grid 7	Grid 8	Grid 9	0.109 M4	0.080 M4	0.048 M4
Grid 1	Grid 2	Grid 3																																			
47.6 M4	55.2 M4	54.7 M4																																			
Grid 4	Grid 5	Grid 6																																			
47.4 M4	56.0 M4	55.9 M4																																			
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45.6 M4	55.0 M4	54.9 M4																																			
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Grid 4	Grid 5	Grid 6																																			
0.109 M4	0.084 M4	0.051 M4																																			
Grid 7	Grid 8	Grid 9																																			
0.109 M4	0.080 M4	0.048 M4																																			

MEASUREMENT DATA GSM1900, CHANNEL LOW (1850.2 MHz)

Date/Time: 2008-08-07 14:14:38
Test Laboratory: TCC Nokia
Type: RM-381; Serial: 004401/10/205339/0

Date/Time: 2008-08-08 10:23:49
Test Laboratory: TCC Nokia
Type: RM-381; Serial: 004401/10/205339/0

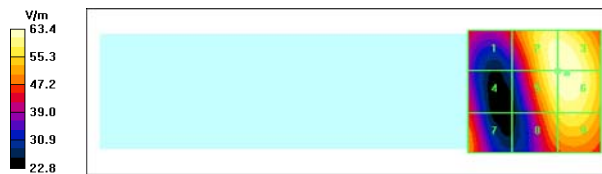
Communication System: GSM1900 (ER3DV6)
Frequency: 1850.2 MHz; Duty Cycle: 1:7.73
Medium: Air; Medium Notes: Not Specified
Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1000$ kg/m³
Phantom section: E Device Section

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 Sn728; Calibrated: 2008-04-23
- 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 Sn728; Calibrated: 2008-04-23
- 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 = 63.4 V/m
Probe Modulation Factor = 2.78
Device Reference Point: 0.000, 0.000, 353.7 mm
Reference Value = 21.9 V/m; Power Drift = 0.151 dB
Hearing Aid Near-Field Category: M3 (AWF -5 dB)



Grid 1	Grid 2	Grid 3
45.7 M4	62.6 M3	63.4 M3
Grid 4	Grid 5	Grid 6
44.9 M4	62.4 M3	63.4 M3
Grid 7	Grid 8	Grid 9
51.0 M3	56.1 M3	58.7 M3

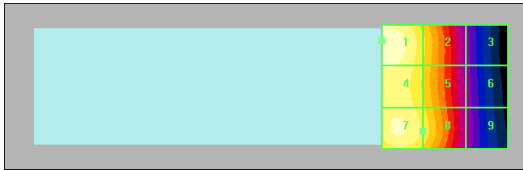
H Scan - H3DV6 - measurement distance, sensor center to the Device = 15mm, Low/Hearing Aid Compatibility Test (101x101x1):
Measurement grid: dx=5mm, dy=5mm
Maximum value of peak Total field = 0.251 A/m
Probe Modulation Factor = 2.55
Device Reference Point: 0.000, 0.000, 353.7 mm
Reference Value = 0.087 A/m; Power Drift = -0.058 dB
Hearing Aid Near-Field Category: M2 (AWF -5 dB)

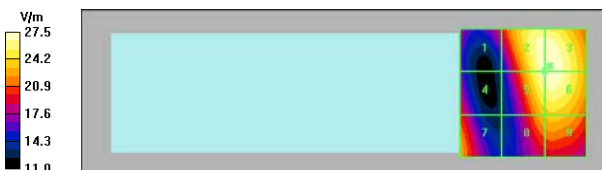
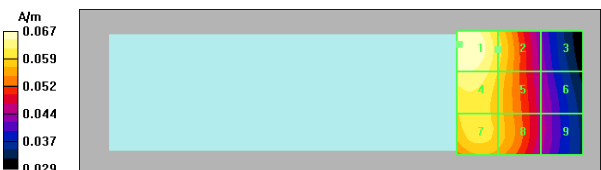


Grid 1	Grid 2	Grid 3
0.251 M2	0.235 M3	0.173 M3
Grid 4	Grid 5	Grid 6
0.248 M3	0.239 M3	0.182 M3
Grid 7	Grid 8	Grid 9
0.249 M3	0.243 M3	0.183 M3

MEASUREMENT DATA GSM1900, CHANNEL MIDDLE (1880 MHz)																																					
Date/Time: 2008-08-07 14:03:15 Test Laboratory: TCC Nokia Type: RM-381; Serial: 004401/10/205339/0	Date/Time: 2008-08-08 10:13:28 Test Laboratory: TCC Nokia Type: RM-381; Serial: 004401/10/205339/0																																				
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 Sn728; Calibrated: 2008-04-23 - 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 Sn728; Calibrated: 2008-04-23 - 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 = 69.4 V/m Probe Modulation Factor = 2.78 Device Reference Point: 0.000, 0.000, 353.7 mm Reference Value = 21.6 V/m; Power Drift = 0.034 dB Hearing Aid Near-Field Category: M3 (AWF -5 dB) V/m 69.4 61.4 53.4 45.3 37.3 29.3 <table><tr><td>Grid 1</td><td>Grid 2</td><td>Grid 3</td></tr><tr><td>51.9 M3</td><td>69.3 M3</td><td>69.4 M3</td></tr><tr><td>Grid 4</td><td>Grid 5</td><td>Grid 6</td></tr><tr><td>56.5 M3</td><td>67.2 M3</td><td>68.5 M3</td></tr><tr><td>Grid 7</td><td>Grid 8</td><td>Grid 9</td></tr><tr><td>64.9 M3</td><td>55.1 M3</td><td>58.7 M3</td></tr></table> <tr><td> 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 = 0.256 A/m Probe Modulation Factor = 2.55 Device Reference Point: 0.000, 0.000, 353.7 mm Reference Value = 0.090 A/m; Power Drift = -0.060 dB Hearing Aid Near-Field Category: M2 (AWF -5 dB) A/m 0.256 0.229 0.203 0.176 0.150 0.123 <table><tr><td>Grid 1</td><td>Grid 2</td><td>Grid 3</td></tr><tr><td>0.256 M2</td><td>0.242 M3</td><td>0.184 M3</td></tr><tr><td>Grid 4</td><td>Grid 5</td><td>Grid 6</td></tr><tr><td>0.252 M2</td><td>0.241 M3</td><td>0.196 M3</td></tr><tr><td>Grid 7</td><td>Grid 8</td><td>Grid 9</td></tr><tr><td>0.244 M3</td><td>0.243 M3</td><td>0.199 M3</td></tr></table> </td></tr>	Grid 1	Grid 2	Grid 3	51.9 M3	69.3 M3	69.4 M3	Grid 4	Grid 5	Grid 6	56.5 M3	67.2 M3	68.5 M3	Grid 7	Grid 8	Grid 9	64.9 M3	55.1 M3	58.7 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 = 0.256 A/m Probe Modulation Factor = 2.55 Device Reference Point: 0.000, 0.000, 353.7 mm Reference Value = 0.090 A/m; Power Drift = -0.060 dB Hearing Aid Near-Field Category: M2 (AWF -5 dB) A/m 0.256 0.229 0.203 0.176 0.150 0.123 <table><tr><td>Grid 1</td><td>Grid 2</td><td>Grid 3</td></tr><tr><td>0.256 M2</td><td>0.242 M3</td><td>0.184 M3</td></tr><tr><td>Grid 4</td><td>Grid 5</td><td>Grid 6</td></tr><tr><td>0.252 M2</td><td>0.241 M3</td><td>0.196 M3</td></tr><tr><td>Grid 7</td><td>Grid 8</td><td>Grid 9</td></tr><tr><td>0.244 M3</td><td>0.243 M3</td><td>0.199 M3</td></tr></table>	Grid 1	Grid 2	Grid 3	0.256 M2	0.242 M3	0.184 M3	Grid 4	Grid 5	Grid 6	0.252 M2	0.241 M3	0.196 M3	Grid 7	Grid 8	Grid 9	0.244 M3	0.243 M3	0.199 M3
Grid 1	Grid 2	Grid 3																																			
51.9 M3	69.3 M3	69.4 M3																																			
Grid 4	Grid 5	Grid 6																																			
56.5 M3	67.2 M3	68.5 M3																																			
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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 = 0.256 A/m Probe Modulation Factor = 2.55 Device Reference Point: 0.000, 0.000, 353.7 mm Reference Value = 0.090 A/m; Power Drift = -0.060 dB Hearing Aid Near-Field Category: M2 (AWF -5 dB) A/m 0.256 0.229 0.203 0.176 0.150 0.123 <table><tr><td>Grid 1</td><td>Grid 2</td><td>Grid 3</td></tr><tr><td>0.256 M2</td><td>0.242 M3</td><td>0.184 M3</td></tr><tr><td>Grid 4</td><td>Grid 5</td><td>Grid 6</td></tr><tr><td>0.252 M2</td><td>0.241 M3</td><td>0.196 M3</td></tr><tr><td>Grid 7</td><td>Grid 8</td><td>Grid 9</td></tr><tr><td>0.244 M3</td><td>0.243 M3</td><td>0.199 M3</td></tr></table>	Grid 1	Grid 2	Grid 3	0.256 M2	0.242 M3	0.184 M3	Grid 4	Grid 5	Grid 6	0.252 M2	0.241 M3	0.196 M3	Grid 7	Grid 8	Grid 9	0.244 M3	0.243 M3	0.199 M3																			
Grid 1	Grid 2	Grid 3																																			
0.256 M2	0.242 M3	0.184 M3																																			
Grid 4	Grid 5	Grid 6																																			
0.252 M2	0.241 M3	0.196 M3																																			
Grid 7	Grid 8	Grid 9																																			
0.244 M3	0.243 M3	0.199 M3																																			

MEASUREMENT DATA GSM1900, CHANNEL HIGH (1909.8 MHz)																																					
Date/Time: 2008-08-07 14:09:36 Test Laboratory: TCC Nokia Type: RM-381; Serial: 004401/10/205339/0	Date/Time: 2008-08-08 10:18:51 Test Laboratory: TCC Nokia Type: RM-381; Serial: 004401/10/205339/0																																				
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 Sn728; Calibrated: 2008-04-23 - 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 Sn728; Calibrated: 2008-04-23 - 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 = 63.0 V/m Probe Modulation Factor = 2.78 Device Reference Point: 0.000, 0.000, 353.7 mm Reference Value = 19.5 V/m; Power Drift = 0.044 dB Hearing Aid Near-Field Category: M3 (AWF -5 dB) V/m <table><tr><td>Grid 1</td><td>Grid 2</td><td>Grid 3</td></tr><tr><td>46.2 M3</td><td>62.7 M3</td><td>63.0 M3</td></tr><tr><td>Grid 4</td><td>Grid 5</td><td>Grid 6</td></tr><tr><td>49.6 M3</td><td>60.5 M3</td><td>62.1 M3</td></tr><tr><td>Grid 7</td><td>Grid 8</td><td>Grid 9</td></tr><tr><td>59.0 M3</td><td>50.4 M3</td><td>53.0 M3</td></tr></table>	Grid 1	Grid 2	Grid 3	46.2 M3	62.7 M3	63.0 M3	Grid 4	Grid 5	Grid 6	49.6 M3	60.5 M3	62.1 M3	Grid 7	Grid 8	Grid 9	59.0 M3	50.4 M3	53.0 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 = 0.217 A/m Probe Modulation Factor = 2.55 Device Reference Point: 0.000, 0.000, 353.7 mm Reference Value = 0.072 A/m; Power Drift = 0.418 dB Hearing Aid Near-Field Category: M3 (AWF -5 dB) A/m <table><tr><td>Grid 1</td><td>Grid 2</td><td>Grid 3</td></tr><tr><td>0.217 M3</td><td>0.201 M3</td><td>0.157 M3</td></tr><tr><td>Grid 4</td><td>Grid 5</td><td>Grid 6</td></tr><tr><td>0.210 M3</td><td>0.202 M3</td><td>0.171 M3</td></tr><tr><td>Grid 7</td><td>Grid 8</td><td>Grid 9</td></tr><tr><td>0.205 M3</td><td>0.204 M3</td><td>0.173 M3</td></tr></table>	Grid 1	Grid 2	Grid 3	0.217 M3	0.201 M3	0.157 M3	Grid 4	Grid 5	Grid 6	0.210 M3	0.202 M3	0.171 M3	Grid 7	Grid 8	Grid 9	0.205 M3	0.204 M3	0.173 M3
Grid 1	Grid 2	Grid 3																																			
46.2 M3	62.7 M3	63.0 M3																																			
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Grid 7	Grid 8	Grid 9																																			
59.0 M3	50.4 M3	53.0 M3																																			
Grid 1	Grid 2	Grid 3																																			
0.217 M3	0.201 M3	0.157 M3																																			
Grid 4	Grid 5	Grid 6																																			
0.210 M3	0.202 M3	0.171 M3																																			
Grid 7	Grid 8	Grid 9																																			
0.205 M3	0.204 M3	0.173 M3																																			

MEASUREMENT DATA WCDMA1900, CHANNEL LOW (1852.4MHZ)																																					
Date/Time: 2008-09-17 10:36:32 Test Laboratory: TCC Nokia Type: RM-381; Serial: 004401/10/205339/0	Date/Time: 2008-09-17 10:09:04 Test Laboratory: TCC Nokia Type: RM-381; Serial: 004401/10/205339/0																																				
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; Probe Notes: - 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; Probe Notes: - ; 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 = 25.5 V/m Probe Modulation Factor = 0.810 Device Reference Point: 0.000, 0.000, 353.7 mm Reference Value = 33.4 V/m; Power Drift = -0.333 dB Hearing Aid Near-Field Category: M4 (AWF 0 dB) V/m 25.5 22.5 19.6 16.6 13.7 10.7  <table><tr><td>Grid 1</td><td>Grid 2</td><td>Grid 3</td></tr><tr><td>17.2 M4</td><td>24.7 M4</td><td>25.1 M4</td></tr><tr><td>Grid 4</td><td>Grid 5</td><td>Grid 6</td></tr><tr><td>17.2 M4</td><td>25.0 M4</td><td>25.5 M4</td></tr><tr><td>Grid 7</td><td>Grid 8</td><td>Grid 9</td></tr><tr><td>18.9 M4</td><td>24.2 M4</td><td>24.8 M4</td></tr></table>	Grid 1	Grid 2	Grid 3	17.2 M4	24.7 M4	25.1 M4	Grid 4	Grid 5	Grid 6	17.2 M4	25.0 M4	25.5 M4	Grid 7	Grid 8	Grid 9	18.9 M4	24.2 M4	24.8 M4	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 = 0.063 A/m Probe Modulation Factor = 0.560 Device Reference Point: 0.000, 0.000, 353.7 mm Reference Value = 0.093 A/m; Power Drift = -0.288 dB Hearing Aid Near-Field Category: M4 (AWF 0 dB) A/m 0.063 0.056 0.049 0.042 0.035 0.028  <table><tr><td>Grid 1</td><td>Grid 2</td><td>Grid 3</td></tr><tr><td>0.063 M4</td><td>0.057 M4</td><td>0.041 M4</td></tr><tr><td>Grid 4</td><td>Grid 5</td><td>Grid 6</td></tr><tr><td>0.061 M4</td><td>0.056 M4</td><td>0.042 M4</td></tr><tr><td>Grid 7</td><td>Grid 8</td><td>Grid 9</td></tr><tr><td>0.061 M4</td><td>0.058 M4</td><td>0.042 M4</td></tr></table>	Grid 1	Grid 2	Grid 3	0.063 M4	0.057 M4	0.041 M4	Grid 4	Grid 5	Grid 6	0.061 M4	0.056 M4	0.042 M4	Grid 7	Grid 8	Grid 9	0.061 M4	0.058 M4	0.042 M4
Grid 1	Grid 2	Grid 3																																			
17.2 M4	24.7 M4	25.1 M4																																			
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18.9 M4	24.2 M4	24.8 M4																																			
Grid 1	Grid 2	Grid 3																																			
0.063 M4	0.057 M4	0.041 M4																																			
Grid 4	Grid 5	Grid 6																																			
0.061 M4	0.056 M4	0.042 M4																																			
Grid 7	Grid 8	Grid 9																																			
0.061 M4	0.058 M4	0.042 M4																																			

MEASUREMENT DATA WCDMA1900, CHANNEL MIDDLE (1880MHz)																																					
Date/Time: 2008-09-17 10:21:47 Test Laboratory: TCC Nokia Type: RM-381; Serial: 004401/10/205339/0	Date/Time: 2008-09-17 09:58:38 Test Laboratory: TCC Nokia Type: RM-381; Serial: 004401/10/205339/0																																				
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/m ³ 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/m ³ Phantom section: H Device Section																																				
DASY4 Configuration: - Probe: ER3DV6 - SN2333; Probe Notes: - 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; Probe Notes: - ; 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 = 27.5 V/m Probe Modulation Factor = 0.810 Device Reference Point: 0.000, 0.000, 353.7 mm Reference Value = 33.6 V/m; Power Drift = -0.408 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 = 0.067 A/m Probe Modulation Factor = 0.560 Device Reference Point: 0.000, 0.000, 353.7 mm Reference Value = 0.099 A/m; Power Drift = -0.484 dB Hearing Aid Near-Field Category: M4 (AWF 0 dB)																																				
V/m 27.5 24.2 20.9 17.6 14.3 11.0  <table><tr><td>Grid 1</td><td>Grid 2</td><td>Grid 3</td></tr><tr><td>19.7 M4</td><td>27.2 M4</td><td>27.5 M4</td></tr><tr><td>Grid 4</td><td>Grid 5</td><td>Grid 6</td></tr><tr><td>20.1 M4</td><td>27.1 M4</td><td>27.4 M4</td></tr><tr><td>Grid 7</td><td>Grid 8</td><td>Grid 9</td></tr><tr><td>22.9 M4</td><td>23.5 M4</td><td>24.0 M4</td></tr></table>	Grid 1	Grid 2	Grid 3	19.7 M4	27.2 M4	27.5 M4	Grid 4	Grid 5	Grid 6	20.1 M4	27.1 M4	27.4 M4	Grid 7	Grid 8	Grid 9	22.9 M4	23.5 M4	24.0 M4	A/m 0.067 0.059 0.052 0.044 0.037 0.029  <table><tr><td>Grid 1</td><td>Grid 2</td><td>Grid 3</td></tr><tr><td>0.067 M4</td><td>0.060 M4</td><td>0.044 M4</td></tr><tr><td>Grid 4</td><td>Grid 5</td><td>Grid 6</td></tr><tr><td>0.064 M4</td><td>0.059 M4</td><td>0.045 M4</td></tr><tr><td>Grid 7</td><td>Grid 8</td><td>Grid 9</td></tr><tr><td>0.061 M4</td><td>0.059 M4</td><td>0.046 M4</td></tr></table>	Grid 1	Grid 2	Grid 3	0.067 M4	0.060 M4	0.044 M4	Grid 4	Grid 5	Grid 6	0.064 M4	0.059 M4	0.045 M4	Grid 7	Grid 8	Grid 9	0.061 M4	0.059 M4	0.046 M4
Grid 1	Grid 2	Grid 3																																			
19.7 M4	27.2 M4	27.5 M4																																			
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0.064 M4	0.059 M4	0.045 M4																																			
Grid 7	Grid 8	Grid 9																																			
0.061 M4	0.059 M4	0.046 M4																																			

MEASUREMENT DATA WCDMA1900, CHANNEL HIGH (1907.6MHz)																																					
Date/Time: 2008-09-17 10:31:25 Test Laboratory: TCC Nokia Type: RM-381; Serial: 004401/10/205339/0	Date/Time: 2008-09-17 10:03:36 Test Laboratory: TCC Nokia Type: RM-381; Serial: 004401/10/205339/0																																				
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/m³ 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/m³ Phantom section: H Device Section																																				
DASY4 Configuration: - Probe: ER3DV6 - SN2333; Probe Notes: - 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; Probe Notes: - ; 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 = 21.1 V/m Probe Modulation Factor = 0.810 Device Reference Point: 0.000, 0.000, 353.7 mm Reference Value = 24.0 V/m; Power Drift = -0.042 dB Hearing Aid Near-Field Category: M4 (AWF 0 dB) V/m 21.1 18.6 16.0 13.5 10.9 8.36 <table><tr><td>Grid 1</td><td>Grid 2</td><td>Grid 3</td></tr><tr><td>15.3 M4</td><td>20.8 M4</td><td>21.1 M4</td></tr><tr><td>Grid 4</td><td>Grid 5</td><td>Grid 6</td></tr><tr><td>16.7 M4</td><td>20.6 M4</td><td>21.1 M4</td></tr><tr><td>Grid 7</td><td>Grid 8</td><td>Grid 9</td></tr><tr><td>19.6 M4</td><td>18.2 M4</td><td>19.1 M4</td></tr></table>	Grid 1	Grid 2	Grid 3	15.3 M4	20.8 M4	21.1 M4	Grid 4	Grid 5	Grid 6	16.7 M4	20.6 M4	21.1 M4	Grid 7	Grid 8	Grid 9	19.6 M4	18.2 M4	19.1 M4	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 = 0.054 A/m Probe Modulation Factor = 0.560 Device Reference Point: 0.000, 0.000, 353.7 mm Reference Value = 0.084 A/m; Power Drift = -0.183 dB Hearing Aid Near-Field Category: M4 (AWF 0 dB) A/m 0.054 0.049 0.043 0.038 0.032 0.027 <table><tr><td>Grid 1</td><td>Grid 2</td><td>Grid 3</td></tr><tr><td>0.054 M4</td><td>0.050 M4</td><td>0.038 M4</td></tr><tr><td>Grid 4</td><td>Grid 5</td><td>Grid 6</td></tr><tr><td>0.053 M4</td><td>0.049 M4</td><td>0.040 M4</td></tr><tr><td>Grid 7</td><td>Grid 8</td><td>Grid 9</td></tr><tr><td>0.051 M4</td><td>0.050 M4</td><td>0.041 M4</td></tr></table>	Grid 1	Grid 2	Grid 3	0.054 M4	0.050 M4	0.038 M4	Grid 4	Grid 5	Grid 6	0.053 M4	0.049 M4	0.040 M4	Grid 7	Grid 8	Grid 9	0.051 M4	0.050 M4	0.041 M4
Grid 1	Grid 2	Grid 3																																			
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0.053 M4	0.049 M4	0.040 M4																																			
Grid 7	Grid 8	Grid 9																																			
0.051 M4	0.050 M4	0.041 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

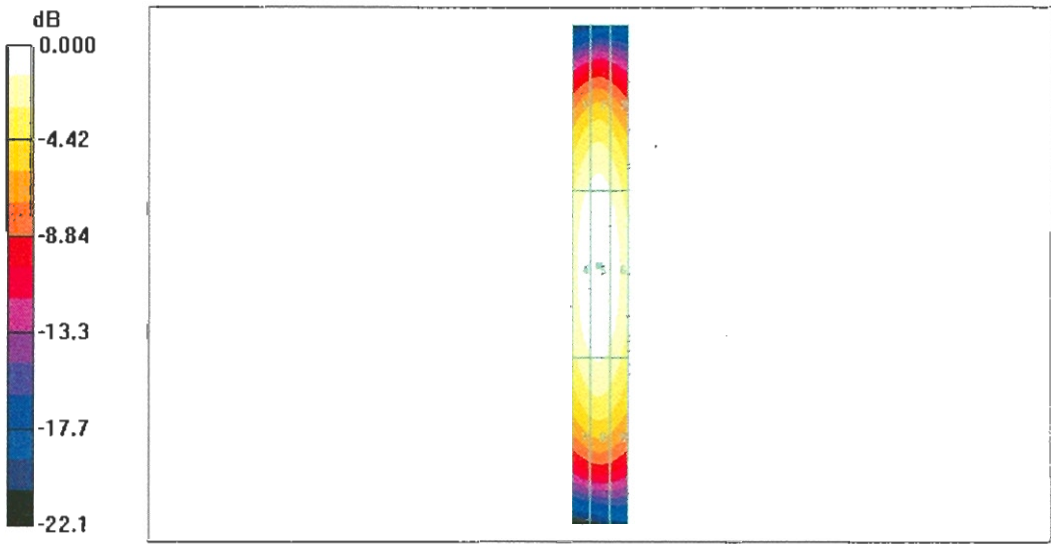
Probe Modulation Factor = 1.00

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



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

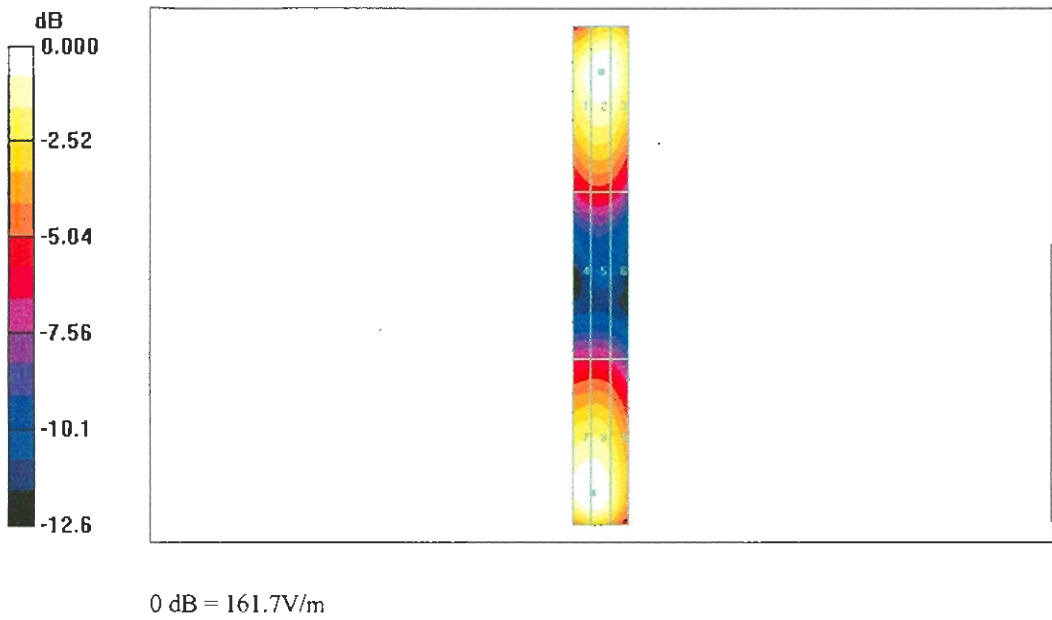
Probe Modulation Factor = 1.00

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





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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

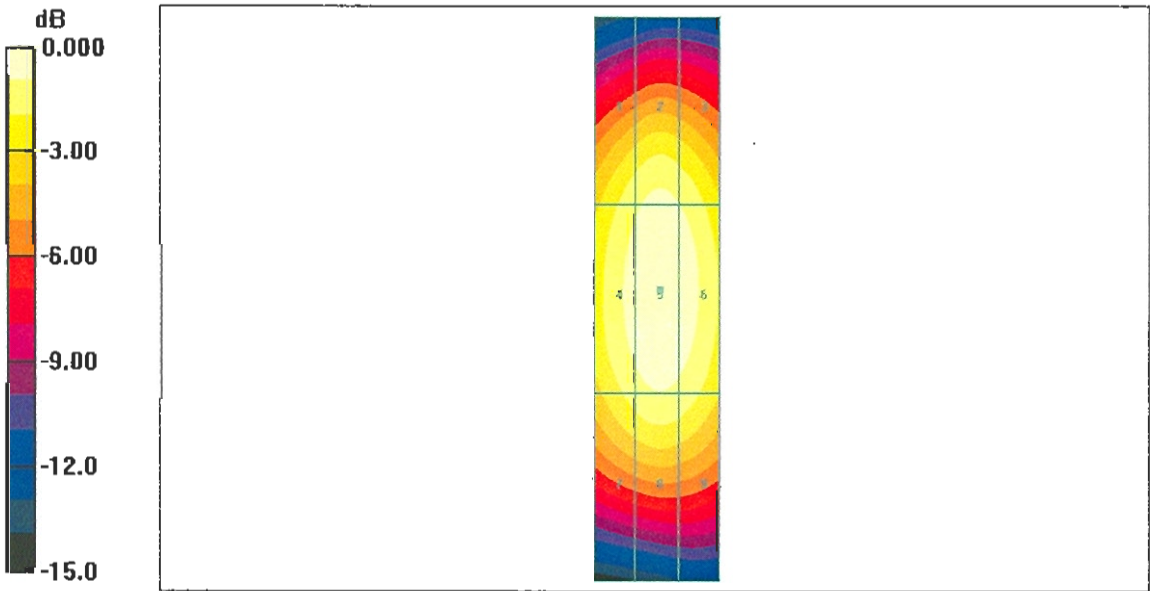
Probe Modulation Factor = 1.00

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

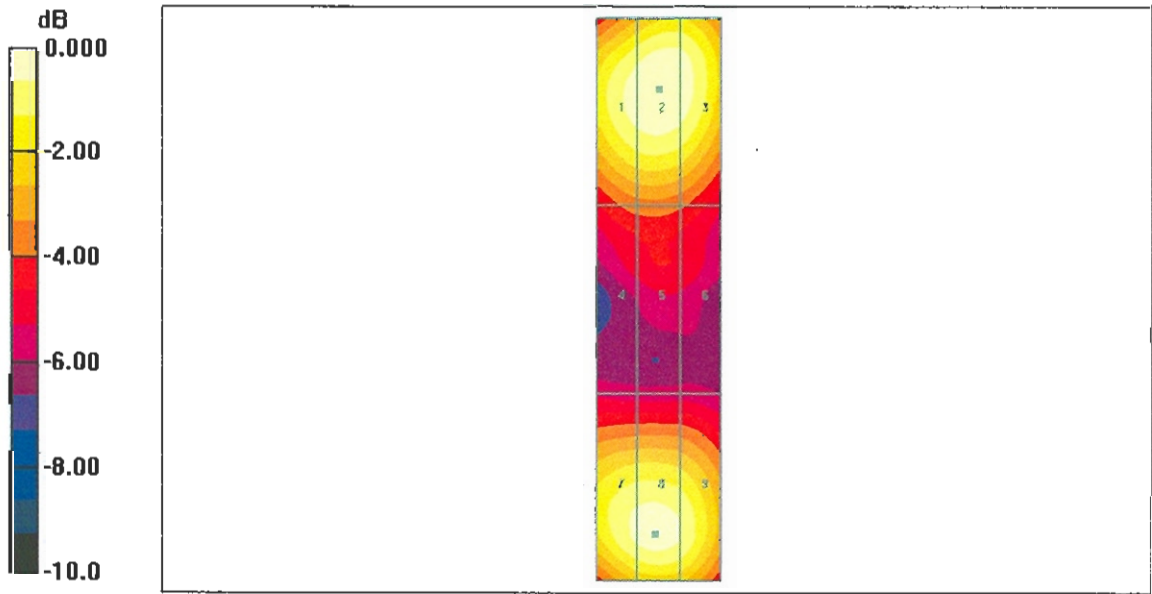
Probe Modulation Factor = 1.00

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