

HAC RF Emissions Test Report

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Measurements made by:	Ari Orte		
Tested devices:	RM-289 (Hearing aid mode), HW: 4002		
FCC ID:	QMNRM-289	IC:	661X-RM289
Supplement reports:	Salo_HAC_0719_11 Salo_HAC_0721_04_setup_photos.pdf		
Testing has been carried out in accordance with:	ANSI C63.19-2006 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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HAC RF Emissions Report

Type: RM-289

Salo_HAC_0719_10

Applicant: Nokia Corporation

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APPENDIX E: RELEVANT PAGES FROM DIPOLE VALIDATION KIT REPORT(S).....47

1. SUMMARY OF HAC RF EMISSION TEST REPORT

1.1 Test Details

Period of test	2007-04-26 to 2007-04-27, 2007-05-08 to 2007-05-10
SN, HW, SW and DUT numbers of tested device	SN: 004400/99/176008/1, HW: 4002, SW: gr06w47_07w13 DUT: 11872
Batteries used in testing	BL-5C, DUT: 11546, 11731
State of sample	Prototype unit
Notes	-

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]	Limit of E-field max. value in category M3 [V/m]	Maximum E-field value after exclusion [V/m]	Category
GSM850	Middle/ 836.6	149.6 – 266.1	226.6	M3 (-5dB)
WCDMA850	High / 846.6	199.5 - 354.8	98.9	M4 (0dB)
GSM1900	Low / 1850.2	47.3 – 84.1	70.9	M3 (-5dB)
WCDMA1900	Middle/ 1880.0	63.1 - 112.2	30.8	M4 (0dB)

1.2.2 Magnetic field measurements

Band & Mode	Ch / Freq. [MHz]	Limit of H-field max. value in category M3 [A/m]	Maximum H-field value after exclusion [A/m]	Category
GSM850	High / 848.8	0.45 – 0.80	0.311	M4 (-5dB)
WCDMA850	Middle / 835.0	0.60 - 1.07	0.114	M4 (0dB)
GSM1900	Middle/ 1880.0	0.14 – 0.25	0.167	M3 (-5dB)
WCDMA1900	High / 1907.6	0.19 - 0.34	0.064	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 (-5dB)	Pass
WCDMA850	M4 (0dB)	Pass
GSM1900	M3 (-5dB)	Pass
WCDMA1900	M4 (0dB)	Pass

1.2.4 Maximum Drift

Maximum drift during measurements	-0.19 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 %

1.3 Description of the Device under test (DUT)

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

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

2. TEST CONDITIONS

2.1 Temperature and Humidity

Ambient temperature [°C]:	21.0 to 23.0
Ambient humidity [RH %]:	36 to 45

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

3. DESCRIPTION OF THE TEST EQUIPMENT

3.1 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 V4	555	12 months	2008-03
E-field Probe ER3DV6	2333	12 months	2008-02
H-field Probe H3DV6	6053	12 months	2008-02
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	2007-07
Amplifier	ZHL-42 (SMA)	N072095-5	12 months	2007-07
Power Meter	NRVS	849305/028	12 months	2007-07
Power Sensor	NRV-Z32	839176/020	12 months	2007-07
Radio Communication Tester	CMU 200	101111	12 months	2007-07

3.1.1 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

3.1.2 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

3.1.3 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 **Error! Reference source not found.**) was used to position the test device in all tests.

3.2 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	H-field [A/m]	E-field [V/m]
835	Reference result	0.452	160.0
	± 10% window	0.406 – 0.497	144.0 – 176.0
	2007-04-26	0.489	172.2
	2007-05-08	0.490	172.5
1880	Reference result	0.452	128.8
	± 10% window	0.406 – 0.497	115.9 – 141.7
	2007-04-26	0.446	128.2
	2007-05-08	0.437	128.5

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

4. DESCRIPTION OF THE TEST PROCEDURE

4.1 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

4.2 Test Positions

4.2.1 Scan area centered at the acoustic output

The device was positioned such that Device Reference plane was touching the bottom of the Test Arch. The scan is centered at the acoustic output by aligning the acoustic output with the intersection of the Test Arch's middle bar and dielectric wire.

4.2.2 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.

4.3 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.

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

T-coil measurements are not subject of this report. See the report Salo_HAC_0719_11.

4.5 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").

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:

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

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

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	20	110.9	39.7	0.498	0.187	2.79	2.66
1880	20	143.3	51.0	0.481	0.236	2.81	2.04

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	17	92.3	114.0	0.377	0.526	0.81	0.72
1880	17	91.9	113.9	0.308	0.551	0.81	0.56

4.6 Slot Averaged Calculation Method

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

4.7 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).

4.8 Category Limits

From remaining maximum values after exclusion process, Hearing Aid M-category is defined according to the category limits of C63.19 -2006.

Category Limits for RF-parameters <960MHz

Category	AWF [dB]	Limits for E-Field Emissions [V/m]	Limits for H-Field Emissions [A/m]
M1	0	631.0 - 1122.0	1.91 - 3.39
	-5	473 - 841.4	1.43 - 2.54
M2	0	354.8 - 631.0	1.07 - 1.91
	-5	266.1 - 473.2	0.80 - 1.43
M3	0	199.5 - 354.8	0.60 - 1.07
	-5	149.6 - 266.1	0.45 - 0.80
M4	0	<199.5	<0.60
	-5	<149.6	<0.45

Category Limits for RF-parameters >960MHz

Category	AWF (dB)	Limits for E-Field Emissions [V/m]	Limits for H-Field Emissions [A/m]
M1	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M2	0	112.2 - 199.5	0.34 - 0.6
	-5	84.1 - 149.6	0.25 - 0.45
M3	0	63.1 - 112.2	0.19 - 0.34
	-5	47.3 - 84.1	0.14 - 0.25
M4	0	<63.1	<0.19
	-5	<47.3	<0.14

5. 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 Extrapolation and Interpolation	4.7	R	√3	1	0.67	2.7	1.8	
	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	

6. RESULTS

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

GSM850, E and H RF emissions results

Mode	Flip option	Test configuration	Ch 128 824.2MHz	Ch 190 836.6MHz	Ch 251 848.8MHz
GSM850	Flip open	E-field [V/M]	219.9	226.6	222.8
		H-field [A/m]	0.300	0.309	0.311
		Category	M3 (-5dB)	M3 (-5dB)	M3 (-5dB)

WCDMA850, E and H RF emissions results

Mode	Flip option	Test configuration	Ch 4132 826.4MHz	Ch 4175 835.0MHz	Ch 4233 846.6MHz
WCDMA850	Flip open	E-field [V/M]	74.4	87.1	98.9
		H-field [A/m]	0.091	0.114	0.098
		Category	M4 (0dB)	M4 (0dB)	M4 (0dB)

GSM1900, E and H RF emissions results

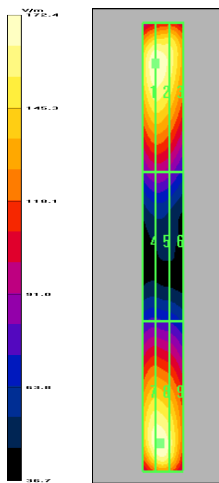
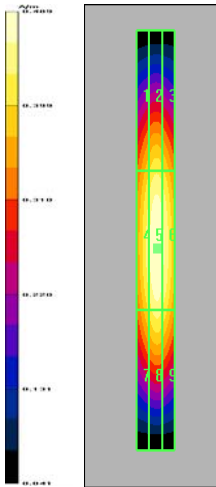
Mode	Flip option	Test configuration	Ch 512 1850.2MHz	Ch 661 1880.0MHz	Ch 810 1909.8MHz
GSM1900	Flip open	E-field [V/M]	70.9	70.7	67.0
		H-field [A/m]	0.163	0.167	0.157
		Category	M3 (-5dB)	M3 (-5dB)	M3 (-5dB)

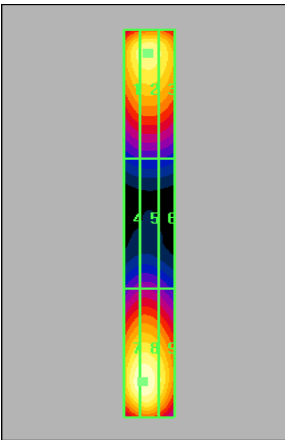
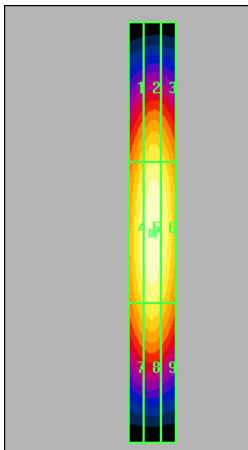
WCDMA1900, E and H RF emissions results

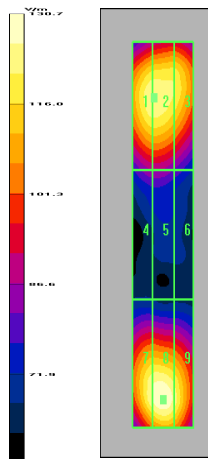
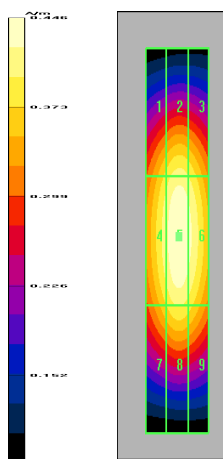
Mode	Flip option	Test configuration	Ch 9262 1852.4MHz	Ch 9400 1880.0MHz	Ch 9538 1907.6MHz
WCDMA1900	Flip open	E-field [V/M]	30.2	30.8	24.4
		H-field [A/m]	0.062	0.060	0.064
		Category	M4 (0dB)	M4 (0dB)	M4 (0dB)

Plots of the maximum measurement scans are shown in Appendix B and C. Excluded cells are colored orange.

APPENDIX A: SYSTEM VALIDATION SCANS

Date/Time: 2007-04-26 14:23:15 Test Laboratory: TCC Nokia Type: D835V3; Serial: SN 1004	Date/Time: 2007-04-26 15:23:53 Test Laboratory: TCC Nokia Type: D835V3; Serial: SN 1004																																				
Communication System: CW 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 Dipole Section	Communication System: CW 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 Dipole Section																																				
DASY4 Configuration: - Probe: ER3DV6 - SN2333; - ConvF(1, 1, 1); Calibrated: 2007-02-13 - Sensor-Surface: (Fix Surface) - Electronics: DAE4 Sn555; Calibrated: 2007-03-15 - Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: Not Specified - Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172	DASY4 Configuration: - Probe: H3DV6 - SN6053; Calibrated: 2007-02-13 - Sensor-Surface: (Fix Surface) - Electronics: DAE4 Sn555; Calibrated: 2007-03-15 - Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; - Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172																																				
E Scan - ER probe center 10mm above CD835 Dipole /Hearing Aid Compatibility Test (41x361x1): Measurement grid: dx=5mm, dy=5mm Maximum value of peak Total field = 172.4 V/m Probe Modulation Factor = 1.00 Reference Value = 108.7 V/m; Power Drift = -0.005 dB Hearing Aid Near-Field Category: M4 (AWF 0 dB)	H Scan - H3DV6 probe center 10mm above CD835 Dipole/Hearing Aid Compatibility Test (41x361x1): Measurement grid: dx=5mm, dy=5mm Maximum value of peak Total field = 0.489 A/m Probe Modulation Factor = 1.00 Reference Value = 0.520 A/m; Power Drift = 0.015 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>172.0</td><td>172.0</td><td>160.4</td></tr><tr><td>Grid 4</td><td>Grid 5</td><td>Grid 6</td></tr><tr><td>92.3</td><td>92.5</td><td>85.6</td></tr><tr><td>Grid 7</td><td>Grid 8</td><td>Grid 9</td></tr><tr><td>170.3</td><td>172.4</td><td>160.2</td></tr></table>	Grid 1	Grid 2	Grid 3	172.0	172.0	160.4	Grid 4	Grid 5	Grid 6	92.3	92.5	85.6	Grid 7	Grid 8	Grid 9	170.3	172.4	160.2	<table><tr><td>Grid 1</td><td>Grid 2</td><td>Grid 3</td></tr><tr><td>0.397</td><td>0.424</td><td>0.408</td></tr><tr><td>Grid 4</td><td>Grid 5</td><td>Grid 6</td></tr><tr><td>0.455</td><td>0.489</td><td>0.470</td></tr><tr><td>Grid 7</td><td>Grid 8</td><td>Grid 9</td></tr><tr><td>0.410</td><td>0.444</td><td>0.426</td></tr></table>	Grid 1	Grid 2	Grid 3	0.397	0.424	0.408	Grid 4	Grid 5	Grid 6	0.455	0.489	0.470	Grid 7	Grid 8	Grid 9	0.410	0.444	0.426
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Grid 7	Grid 8	Grid 9																																			
0.410	0.444	0.426																																			

Date/Time: 2007-05-08 14:15:43 Test Laboratory: TCC Nokia Type: D835V3; Serial: 1004	Date/Time: 2007-05-08 14:36:05 Test Laboratory: TCC Nokia Type: D835V3; Serial: 1004																																				
Communication System: CW 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 Dipole Section	Communication System: CW 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 Dipole Section																																				
DASY4 Configuration: - Probe: ER3DV6 - SN2333; - ConvF(1, 1, 1); Calibrated: 2007-02-13 - Sensor-Surface: (Fix Surface) - Electronics: DAE4 Sn555; Calibrated: 2007-03-15 - Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: Not Specified - Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172	DASY4 Configuration: - Probe: H3DV6 - SN6053; Calibrated: 2007-02-13 - Sensor-Surface: (Fix Surface) - Electronics: DAE4 Sn555; Calibrated: 2007-03-15 - Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: Not Specified - Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172																																				
E Scan - ER probe center 10mm above CD835 Dipole/Hearing Aid Compatibility Test (41x361x1): Measurement grid: dx=5mm, dy=5mm Maximum value of peak Total field = 177.9 V/m Probe Modulation Factor = 1.00 Reference Value = 129.4 V/m; Power Drift = 0.019 dB Hearing Aid Near-Field Category: M4 (AWF 0 dB)	H Scan - H3DV6 probe center 10mm above CD835 Dipole/Hearing Aid Compatibility Test (41x361x1): Measurement grid: dx=5mm, dy=5mm Maximum value of peak Total field = 0.490 A/m Probe Modulation Factor = 1.00 Reference Value = 0.522 A/m; Power Drift = -0.034 dB Hearing Aid Near-Field Category: M4 (AWF 0 dB)																																				
177.9 150.1 122.4 94.6 66.9 39.1  <table><tr><td>Grid 1</td><td>Grid 2</td><td>Grid 3</td></tr><tr><td>165.3</td><td>167.0</td><td>162.4</td></tr><tr><td>Grid 4</td><td>Grid 5</td><td>Grid 6</td></tr><tr><td>92.3</td><td>93.2</td><td>87.7</td></tr><tr><td>Grid 7</td><td>Grid 8</td><td>Grid 9</td></tr><tr><td>177.3</td><td>177.9</td><td>163.8</td></tr></table>	Grid 1	Grid 2	Grid 3	165.3	167.0	162.4	Grid 4	Grid 5	Grid 6	92.3	93.2	87.7	Grid 7	Grid 8	Grid 9	177.3	177.9	163.8	0.490 0.401 0.312 0.222 0.133 0.044  <table><tr><td>Grid 1</td><td>Grid 2</td><td>Grid 3</td></tr><tr><td>0.404</td><td>0.436</td><td>0.422</td></tr><tr><td>Grid 4</td><td>Grid 5</td><td>Grid 6</td></tr><tr><td>0.461</td><td>0.490</td><td>0.470</td></tr><tr><td>Grid 7</td><td>Grid 8</td><td>Grid 9</td></tr><tr><td>0.412</td><td>0.434</td><td>0.411</td></tr></table>	Grid 1	Grid 2	Grid 3	0.404	0.436	0.422	Grid 4	Grid 5	Grid 6	0.461	0.490	0.470	Grid 7	Grid 8	Grid 9	0.412	0.434	0.411
Grid 1	Grid 2	Grid 3																																			
165.3	167.0	162.4																																			
Grid 4	Grid 5	Grid 6																																			
92.3	93.2	87.7																																			
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177.3	177.9	163.8																																			
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0.404	0.436	0.422																																			
Grid 4	Grid 5	Grid 6																																			
0.461	0.490	0.470																																			
Grid 7	Grid 8	Grid 9																																			
0.412	0.434	0.411																																			

Date/Time: 2007-04-26 14:46:41 Test Laboratory: TCC Nokia Type: CD1880V3; Serial: S/N=1003	Date/Time: 2007-04-26 15:07:34 Test Laboratory: TCC Nokia Type: CD1880V3; Serial: S/N=1003																																				
Communication System: CW 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: CW 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: 2007-02-13 - Sensor-Surface: (Fix Surface) - Electronics: DAE4 Sn555; Calibrated: 2007-03-15 - Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; - Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172	DASY4 Configuration: - Probe: H3DV6 - SN6053; Calibrated: 2007-02-13 - Sensor-Surface: (Fix Surface) - Electronics: DAE4 Sn555; Calibrated: 2007-03-15 - Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; - Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172																																				
E Scan - ER probe center 10mm above CD1880 Dipole/Hearing Aid Compatibility Test (41x181x1): Measurement grid: dx=5mm, dy=5mm Maximum value of peak Total field = 130.7 V/m Probe Modulation Factor = 1.00 Reference Value = 147.2 V/m; Power Drift = 0.005 dB Hearing Aid Near-Field Category: M2 (AWF 0 dB)	H Scan - H3DV6 probe center 10mm above CD1880 Dipole/Hearing Aid Compatibility Test (41x181x1): Measurement grid: dx=5mm, dy=5mm Maximum value of peak Total field = 0.446 A/m Probe Modulation Factor = 1.00 Reference Value = 0.472 A/m; Power Drift = 0.011 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>125.5</td><td>125.6</td><td>121.4</td></tr><tr><td>Grid 4</td><td>Grid 5</td><td>Grid 6</td></tr><tr><td>86.5</td><td>86.7</td><td>81.5</td></tr><tr><td>Grid 7</td><td>Grid 8</td><td>Grid 9</td></tr><tr><td>126.8</td><td>130.7</td><td>124.6</td></tr></table>	Grid 1	Grid 2	Grid 3	125.5	125.6	121.4	Grid 4	Grid 5	Grid 6	86.5	86.7	81.5	Grid 7	Grid 8	Grid 9	126.8	130.7	124.6	 <table><tr><td>Grid 1</td><td>Grid 2</td><td>Grid 3</td></tr><tr><td>0.382</td><td>0.411</td><td>0.398</td></tr><tr><td>Grid 4</td><td>Grid 5</td><td>Grid 6</td></tr><tr><td>0.415</td><td>0.446</td><td>0.432</td></tr><tr><td>Grid 7</td><td>Grid 8</td><td>Grid 9</td></tr><tr><td>0.373</td><td>0.400</td><td>0.386</td></tr></table>	Grid 1	Grid 2	Grid 3	0.382	0.411	0.398	Grid 4	Grid 5	Grid 6	0.415	0.446	0.432	Grid 7	Grid 8	Grid 9	0.373	0.400	0.386
Grid 1	Grid 2	Grid 3																																			
125.5	125.6	121.4																																			
Grid 4	Grid 5	Grid 6																																			
86.5	86.7	81.5																																			
Grid 7	Grid 8	Grid 9																																			
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0.382	0.411	0.398																																			
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0.415	0.446	0.432																																			
Grid 7	Grid 8	Grid 9																																			
0.373	0.400	0.386																																			

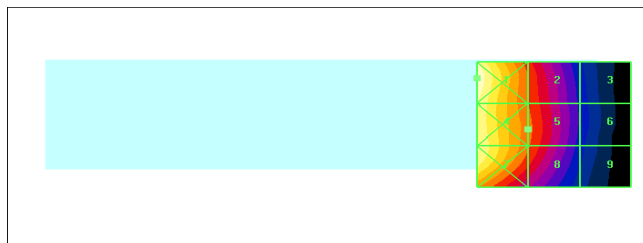
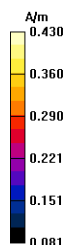
Date/Time: 2007-05-08 13:03:46 Test Laboratory: TCC Nokia Type: CD1880V3; Serial: 1003	Date/Time: 2007-05-08 14:57:42 Test Laboratory: TCC Nokia Type: CD1880V3; Serial: 1003																																				
Communication System: CW Frequency: 1880 MHz; Duty Cycle: 1:1 Medium: Air; Medium Notes: Not Specified Medium parameters used: $\sigma = 0$ mho/m, $\epsilon_r = 1$; $\rho = 1000$ kg/m³ Phantom section: E Dipole Section	Communication System: CW 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 Dipole Section																																				
DASY4 Configuration: - Probe: ER3DV6 - SN2333; - ConvF(1, 1, 1); Calibrated: 2007-02-13 - Sensor-Surface: (Fix Surface) - Electronics: DAE4 Sn555; Calibrated: 2007-03-15 - Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: Not Specified - Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172	DASY4 Configuration: - Probe: H3DV6 - SN6053; Calibrated: 2007-02-13 - Sensor-Surface: (Fix Surface) - Electronics: DAE4 Sn555; Calibrated: 2007-03-15 - Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: Not Specified - Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172																																				
E Scan - ER probe center 10mm above CD1880 Dipole/Hearing Aid Compatibility Test (41x181x1): Measurement grid: dx=5mm, dy=5mm Maximum value of peak Total field = 133.7 V/m Probe Modulation Factor = 1.00 Reference Value = 137.8 V/m; Power Drift = 0.000 dB Hearing Aid Near-Field Category: M2 (AWF 0 dB)	H Scan - H3DV6 probe center 10mm above CD1880 Dipole/Hearing Aid Compatibility Test (41x181x1): Measurement grid: dx=5mm, dy=5mm Maximum value of peak Total field = 0.437 A/m Probe Modulation Factor = 1.00 Reference Value = 0.462 A/m; Power Drift = 0.001 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>122.1</td><td>123.3</td><td>120.3</td></tr><tr><td>Grid 4</td><td>Grid 5</td><td>Grid 6</td></tr><tr><td>90.0</td><td>90.8</td><td>85.4</td></tr><tr><td>Grid 7</td><td>Grid 8</td><td>Grid 9</td></tr><tr><td>132.4</td><td>133.7</td><td>123.3</td></tr></table>	Grid 1	Grid 2	Grid 3	122.1	123.3	120.3	Grid 4	Grid 5	Grid 6	90.0	90.8	85.4	Grid 7	Grid 8	Grid 9	132.4	133.7	123.3	<table><tr><td>Grid 1</td><td>Grid 2</td><td>Grid 3</td></tr><tr><td>0.376</td><td>0.400</td><td>0.389</td></tr><tr><td>Grid 4</td><td>Grid 5</td><td>Grid 6</td></tr><tr><td>0.411</td><td>0.437</td><td>0.424</td></tr><tr><td>Grid 7</td><td>Grid 8</td><td>Grid 9</td></tr><tr><td>0.371</td><td>0.394</td><td>0.380</td></tr></table>	Grid 1	Grid 2	Grid 3	0.376	0.400	0.389	Grid 4	Grid 5	Grid 6	0.411	0.437	0.424	Grid 7	Grid 8	Grid 9	0.371	0.394	0.380
Grid 1	Grid 2	Grid 3																																			
122.1	123.3	120.3																																			
Grid 4	Grid 5	Grid 6																																			
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Grid 1	Grid 2	Grid 3																																			
0.376	0.400	0.389																																			
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0.411	0.437	0.424																																			
Grid 7	Grid 8	Grid 9																																			
0.371	0.394	0.380																																			

APPENDIX B: MEASUREMENT SCANS, GSM

MEASUREMENT DATA GSM850, CHANNEL LOW (824.2 MHz)	
Date/Time: 2007-04-27 16:48:16 Test Laboratory: TCC Nokia Type: RM-289; Serial: 004400/99/176008/1	Date/Time: 2007-04-27 11:03:31 Test Laboratory: TCC Nokia Type: RM-289; Serial: 004400/99/176008/1
Communication System: GSM850 Frequency: 824.2 MHz; Duty Cycle: 1:8.3 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 Frequency: 824.2 MHz; Duty Cycle: 1:8.3 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: 2007-02-13 - Sensor-Surface: (Fix Surface) - Electronics: DAE4 Sn555; Calibrated: 2007-03-15 - Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: Not Specified - Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172	DASY4 Configuration: - Probe: H3DV6 - SN6053; Calibrated: 2007-02-13 - Sensor-Surface: (Fix Surface) - Electronics: DAE4 Sn555; Calibrated: 2007-03-15 - Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: Not Specified - Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172
E Scan - ER probe tip 10mm above Device Reference, Low/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm Maximum value of peak Total field = 219.9 V/m Probe Modulation Factor = 2.79 Reference Value = 82.5 V/m; Power Drift = -0.026 dB Hearing Aid Near-Field Category: M3 (AWF -5 dB)	H Scan - H3DV6 probe tip 10mm above Device Reference low/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm Maximum value of peak Total field = 0.300 A/m Probe Modulation Factor = 2.66 Reference Value = 0.094 A/m; Power Drift = -0.016 dB Hearing Aid Near-Field Category: M4 (AWF -5 dB)

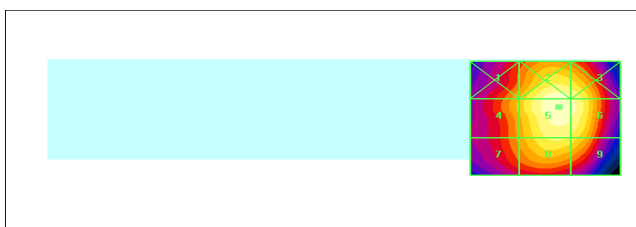
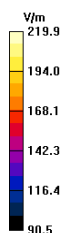
IMAGES GSM850, CHANNEL LOW

H - f ield



Grid 1	Grid 2	Grid 3
0.430	0.292	0.169
Grid 4	Grid 5	Grid 6
0.412	0.300	0.172
Grid 7	Grid 8	Grid 9
0.412	0.295	0.163

E - f ield

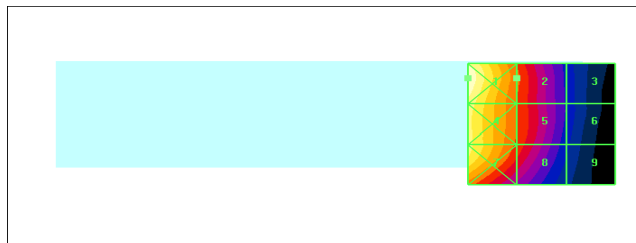
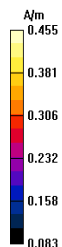


Grid 1	Grid 2	Grid 3
186.8	217.2	212.9
Grid 4	Grid 5	Grid 6
189.6	219.9	215.4
Grid 7	Grid 8	Grid 9
180.5	205.4	200.7

MEASUREMENT DATA GSM850, CHANNEL MIDDLE (836.6 MHz)	
Date/Time: 2007-04-27 16:39:31 Test Laboratory: TCC Nokia Type: RM-289; Serial: 004400/99/176008/1	Date/Time: 2007-04-27 10:48:02 Test Laboratory: TCC Nokia Type: RM-289; Serial: 004400/99/176008/1
Communication System: GSM850 Frequency: 836.6 MHz; Duty Cycle: 1:8.3 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 Frequency: 836.6 MHz; Duty Cycle: 1:8.3 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: 2007-02-13 - Sensor-Surface: (Fix Surface) - Electronics: DAE4 Sn555; Calibrated: 2007-03-15 - Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: Not Specified - Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172	DASY4 Configuration: - Probe: H3DV6 - SN6053; Calibrated: 2007-02-13 - Sensor-Surface: (Fix Surface) - Electronics: DAE4 Sn555; Calibrated: 2007-03-15 - Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: Not Specified - Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172
E Scan - ER probe tip 10mm above Device Reference, Middle/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm Maximum value of peak Total field = 226.6 V/m Probe Modulation Factor = 2.79 Reference Value = 84.8 V/m; Power Drift = -0.058 dB Hearing Aid Near-Field Category: M3 (AWF -5 dB)	H Scan - H3DV6 probe tip 10mm above Device Reference MID/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm Maximum value of peak Total field = 0.315 A/m Probe Modulation Factor = 2.66 Reference Value = 0.099 A/m; Power Drift = -0.076 dB Hearing Aid Near-Field Category: M4 (AWF -5 dB)

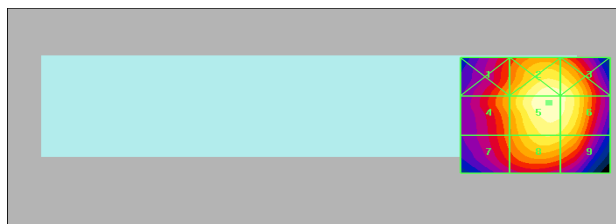
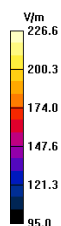
IMAGES GSM850, CHANNEL MIDDLE (836.6 MHz)

H – f field



Grid 1	Grid 2	Grid 3
0.455	0.315	0.178
Grid 4	Grid 5	Grid 6
0.425	0.309	0.180
Grid 7	Grid 8	Grid 9
0.417	0.301	0.166

E – f field

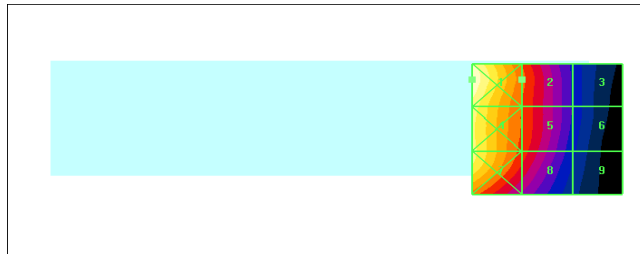
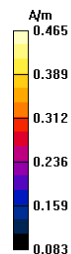


Grid 1	Grid 2	Grid 3
190.3	225.1	221.5
Grid 4	Grid 5	Grid 6
192.4	226.6	222.0
Grid 7	Grid 8	Grid 9
180.6	210.3	206.2

MEASUREMENT DATA GSM850, CHANNEL HIGH (848.8 MHz)	
Date/Time: 2007-04-27 17:00:58 Test Laboratory: TCC Nokia Type: RM-289; Serial: 004400/99/176008/1	Date/Time: 2007-04-27 10:56:54 Test Laboratory: TCC Nokia Type: RM-289; Serial: 004400/99/176008/1
Communication System: GSM850 Frequency: 848.8 MHz; Duty Cycle: 1:8.3 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 Frequency: 848.8 MHz; Duty Cycle: 1:8.3 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: 2007-02-13 - Sensor-Surface: (Fix Surface) - Electronics: DAE4 Sn555; Calibrated: 2007-03-15 - Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: Not Specified - Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172	DASY4 Configuration: - Probe: H3DV6 - SN6053; Calibrated: 2007-02-13 - Sensor-Surface: (Fix Surface) - Electronics: DAE4 Sn555; Calibrated: 2007-03-15 - Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: Not Specified - Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172
E Scan - ER probe tip 10mm above Device Reference, High/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm Maximum value of peak Total field = 222.8 V/m Probe Modulation Factor = 2.79 Reference Value = 83.5 V/m; Power Drift = -0.111 dB Hearing Aid Near-Field Category: M3 (AWF -5 dB)	H Scan - H3DV6 probe tip 10mm above Device Reference High/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm Maximum value of peak Total field = 0.323 A/m Probe Modulation Factor = 2.66 Reference Value = 0.100 A/m; Power Drift = -0.015 dB Hearing Aid Near-Field Category: M4 (AWF -5 dB)

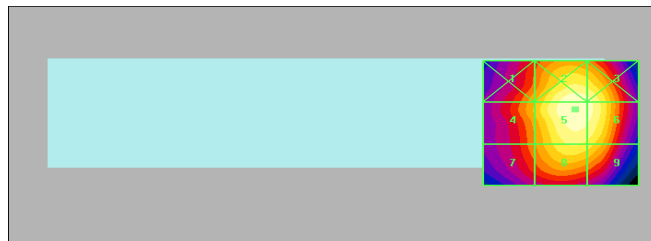
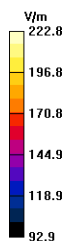
IMAGES GSM850, CHANNEL HIGH (848.8 MHz)

H - field



Grid 1	Grid 2	Grid 3
0.465	0.323	0.182
Grid 4	Grid 5	Grid 6
0.432	0.311	0.183
Grid 7	Grid 8	Grid 9
0.427	0.302	0.167

E - field

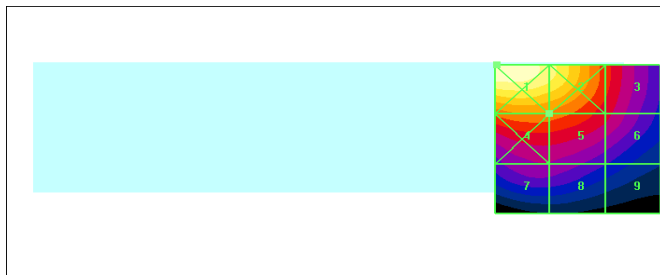
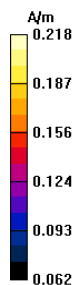


Grid 1	Grid 2	Grid 3
187.3	221.4	217.8
Grid 4	Grid 5	Grid 6
189.8	222.8	218.9
Grid 7	Grid 8	Grid 9
178.3	206.5	202.5

MEASUREMENT DATA GSM1900, CHANNEL LOW (1850.2 MHz)	
Date/Time: 2007-04-27 16:05:09 Test Laboratory: TCC Nokia Type: RM-289; Serial: 004400/99/176008/1	Date/Time: 2007-04-27 11:49:49 Test Laboratory: TCC Nokia Type: RM-289; Serial: 004400/99/176008/1
Communication System: GSM1900 Frequency: 1850.2 MHz; Duty Cycle: 1:8.3 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 Frequency: 1850.2 MHz; Duty Cycle: 1:8.3 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: 2007-02-13 - Sensor-Surface: (Fix Surface) - Electronics: DAE4 Sn555; Calibrated: 2007-03-15 - Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: Not Specified - Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172	DASY4 Configuration: - Probe: H3DV6 - SN6053; Calibrated: 2007-02-13 - Sensor-Surface: (Fix Surface) - Electronics: DAE4 Sn555; Calibrated: 2007-03-15 - Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: Not Specified - Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172
E Scan - ER probe tip 10mm above Device Reference, Low/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm Maximum value of peak Total field = 70.9 V/m Probe Modulation Factor = 2.81 Reference Value = 20.0 V/m; Power Drift = -0.043 dB Hearing Aid Near-Field Category: M3 (AWF -5 dB)	H Scan - H3DV6 probe tip 10mm above Device Reference Low/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm Maximum value of peak Total field = 0.163 A/m Probe Modulation Factor = 2.04 Reference Value = 0.073 A/m; Power Drift = 0.001 dB Hearing Aid Near-Field Category: M3 (AWF -5 dB)

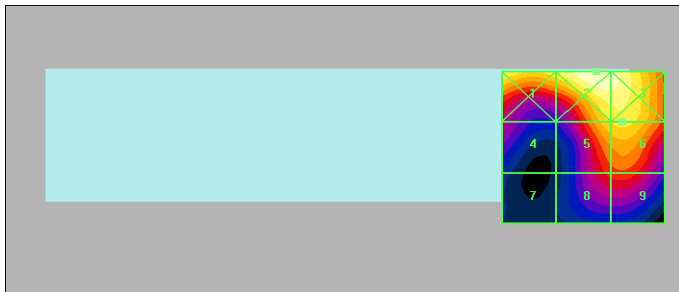
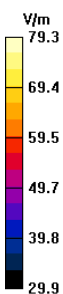
IMAGES GSM1900, CHANNEL LOW (1850.2 MHz)

H - f ield



Grid 1	Grid 2	Grid 3
0.218	0.202	0.150
Grid 4	Grid 5	Grid 6
0.166	0.163	0.139
Grid 7	Grid 8	Grid 9
0.124	0.124	0.104

E - f ield

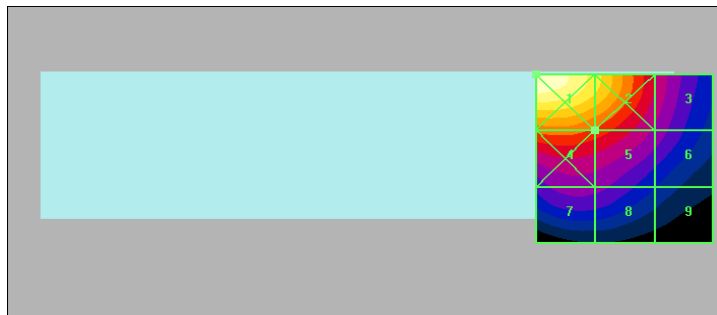
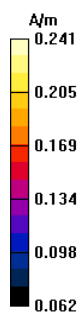


Grid 1	Grid 2	Grid 3
75.0	79.3	77.5
Grid 4	Grid 5	Grid 6
51.9	69.7	70.9
Grid 7	Grid 8	Grid 9
39.3	57.7	58.7

MEASUREMENT DATA GSM1900, CHANNEL MIDDLE (1880 MHz)	
Date/Time: 2007-04-27 15:58:40 Test Laboratory: TCC Nokia Type: RM-289; Serial: 004400/99/176008/1	Date/Time: 2007-04-27 11:37:20 Test Laboratory: TCC Nokia Type: RM-289; Serial: 004400/99/176008/1
Communication System: GSM1900 Frequency: 1880 MHz; Duty Cycle: 1:8.3 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: GSM1900 Frequency: 1880 MHz; Duty Cycle: 1:8.3 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: 2007-02-13 - Sensor-Surface: (Fix Surface) - Electronics: DAE4 Sn555; Calibrated: 2007-03-15 - Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: Not Specified - Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172	DASY4 Configuration: - Probe: H3DV6 - SN6053; Calibrated: 2007-02-13 - Sensor-Surface: (Fix Surface) - Electronics: DAE4 Sn555; Calibrated: 2007-03-15 - Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: Not Specified - Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172
E Scan - ER probe tip 10mm above Device Reference, Middle/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm Maximum value of peak Total field = 70.7 V/m Probe Modulation Factor = 2.81 Reference Value = 19.4 V/m; Power Drift = 0.013 dB Hearing Aid Near-Field Category: M3 (AWF -5 dB)	H Scan - H3DV6 probe tip 10mm above Device Reference Mid/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm Maximum value of peak Total field = 0.167 A/m Probe Modulation Factor = 2.04 Reference Value = 0.071 A/m; Power Drift = -0.039 dB Hearing Aid Near-Field Category: M3 (AWF -5 dB)

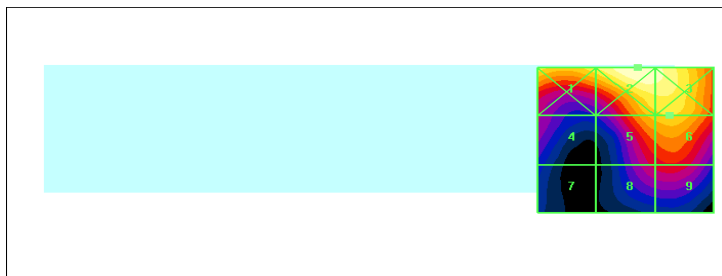
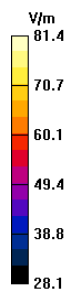
IMAGES GSM1900, CHANNEL MIDDLE (1880 MHz)

H – f ield



Grid 1	Grid 2	Grid 3
0.241	0.211	0.146
Grid 4	Grid 5	Grid 6
0.177	0.167	0.131
Grid 7	Grid 8	Grid 9
0.128	0.126	0.099

E – f ield

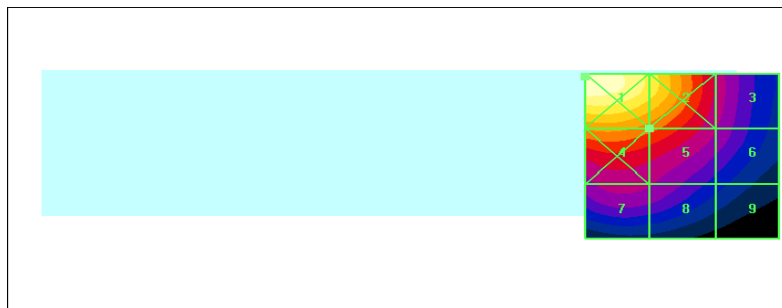
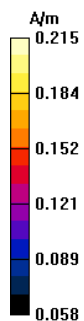


Grid 1	Grid 2	Grid 3
73.7	81.4	79.3
Grid 4	Grid 5	Grid 6
50.6	69.2	70.7
Grid 7	Grid 8	Grid 9
41.4	54.5	56.3

MEASUREMENT DATA GSM1900, CHANNEL HIGH (1909.8 MHz)	
Date/Time: 2007-04-27 16:12:21 Test Laboratory: TCC Nokia Type: RM-289; Serial: 004400/99/176008/1	Date/Time: 2007-04-27 11:43:25 Test Laboratory: TCC Nokia Type: RM-289; Serial: 004400/99/176008/1
Communication System: GSM1900 Frequency: 1909.8 MHz; Duty Cycle: 1:8.3 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: GSM1900 Frequency: 1909.8 MHz; Duty Cycle: 1:8.3 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: 2007-02-13 - Sensor-Surface: (Fix Surface) - Electronics: DAE4 Sn555; Calibrated: 2007-03-15 - Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: Not Specified - Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172	DASY4 Configuration: - Probe: H3DV6 - SN6053; Calibrated: 2007-02-13 - Sensor-Surface: (Fix Surface) - Electronics: DAE4 Sn555; Calibrated: 2007-03-15 - Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: Not Specified - Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172
E Scan - ER probe tip 10mm above Device Reference, High/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm Maximum value of peak Total field = 67.0 V/m Probe Modulation Factor = 2.81 Reference Value = 19.5 V/m; Power Drift = -0.080 dB Hearing Aid Near-Field Category: M3 (AWF -5 dB)	H Scan - H3DV6 probe tip 10mm above Device Reference High/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm Maximum value of peak Total field = 0.157 A/m Probe Modulation Factor = 2.04 Reference Value = 0.067 A/m; Power Drift = -0.022 dB Hearing Aid Near-Field Category: M3 (AWF -5 dB)

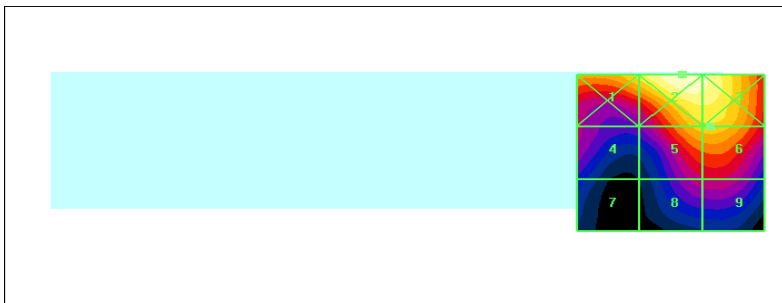
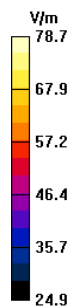
IMAGES GSM1900, CHANNEL HIGH (1909.8 MHz)

H - f field



Grid 1	Grid 2	Grid 3
0.215	0.191	0.130
Grid 4	Grid 5	Grid 6
0.167	0.157	0.122
Grid 7	Grid 8	Grid 9
0.126	0.122	0.095

E - f field



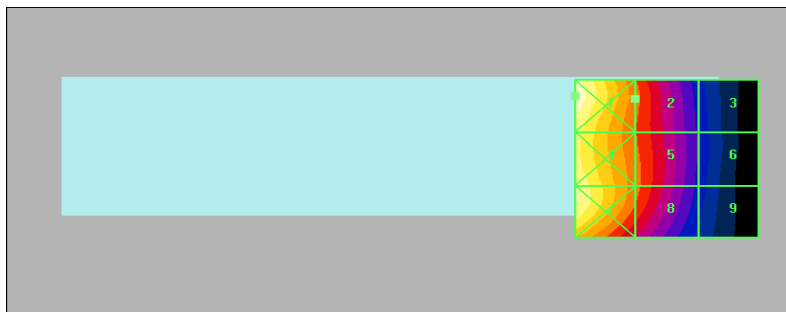
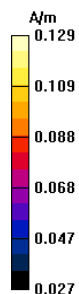
Grid 1	Grid 2	Grid 3
69.9	78.7	76.5
Grid 4	Grid 5	Grid 6
48.1	66.6	67.0
Grid 7	Grid 8	Grid 9
38.8	49.4	50.2

APPENDIX C: MEASUREMENT SCANS, WCDMA

MEASUREMENT DATA WCDMA850, CHANNEL LOW (826.4 MHz)	
Date/Time: 2007-04-27 14:26:01 Test Laboratory: TCC Nokia Type: RM-289; Serial: 004400/99/176008/1	Date/Time: 2007-04-27 13:43:27 Test Laboratory: TCC Nokia Type: RM-289; Serial: 004400/99/176008/1
Communication System: US 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: US 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: 2007-02-13 - Sensor-Surface: (Fix Surface) - Electronics: DAE4 Sn555; Calibrated: 2007-03-15 - Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: Not Specified - Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172	DASY4 Configuration: - Probe: H3DV6 - SN6053; Calibrated: 2007-02-13 - Sensor-Surface: (Fix Surface) - Electronics: DAE4 Sn555; Calibrated: 2007-03-15 - Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: Not Specified - Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172
E Scan - ER probe tip 10mm above Device Reference, Low/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm Maximum value of peak Total field = 74.4 V/m Probe Modulation Factor = 0.81 Reference Value = 95.2 V/m; Power Drift = 0.017 dB Hearing Aid Near-Field Category: M4 (AWF 0 dB)	H Scan - H3DV6 probe tip 10mm above Device Reference low/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm Maximum value of peak Total field = 0.091 A/m Probe Modulation Factor = 0.72 Reference Value = 0.107 A/m; Power Drift = -0.096 dB Hearing Aid Near-Field Category: M4 (AWF 0 dB)

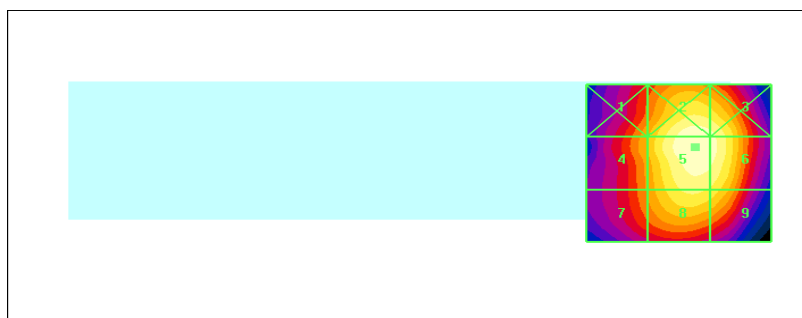
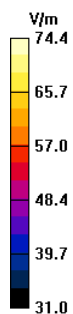
IMAGES WCDMA850, CHANNEL LOW (826.4 MHz)

H - f ield



Grid 1 0.129	Grid 2 0.091	Grid 3 0.053
Grid 4 0.123	Grid 5 0.091	Grid 6 0.054
Grid 7 0.124	Grid 8 0.091	Grid 9 0.052

E - f ield

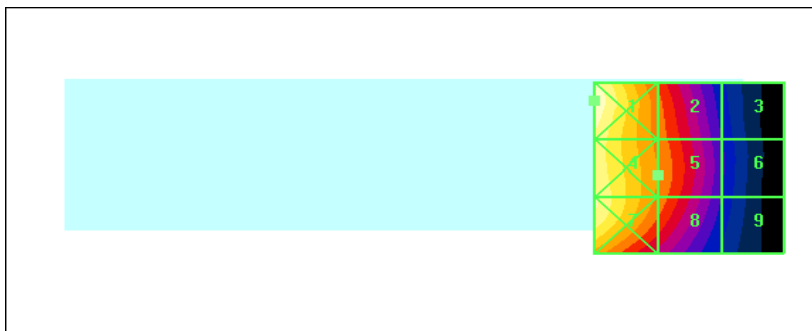
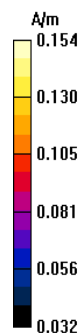


Grid 1 62.6	Grid 2 73.8	Grid 3 72.6
Grid 4 63.4	Grid 5 74.4	Grid 6 73.1
Grid 7 60.5	Grid 8 69.4	Grid 9 68.1

MEASUREMENT DATA WCDMA850, CHANNEL MIDDLE (835 MHz)	
Date/Time: 2007-04-27 14:32:10 Test Laboratory: TCC Nokia Type: RM-289; Serial: 004400/99/176008/1	Date/Time: 2007-05-10 14:53:54 Test Laboratory: TCC Nokia Type: RM-289; Serial: 004400/99/176008/1
Communication System: US 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: US 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: 2007-02-13 - Sensor-Surface: (Fix Surface) - Electronics: DAE4 Sn555; Calibrated: 2007-03-15 - Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: Not Specified - Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172	DASY4 Configuration: - Probe: H3DV6 - SN6053; Calibrated: 2007-02-13 - Sensor-Surface: (Fix Surface) - Electronics: DAE4 Sn555; Calibrated: 2007-03-15 - Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: Not Specified - Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172
E Scan - ER probe tip 10mm above Device Reference, Middle/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm Maximum value of peak Total field = 87.1 V/m Probe Modulation Factor = 0.81 Reference Value = 111.0 V/m; Power Drift = 0.026 dB Hearing Aid Near-Field Category: M4 (AWF 0 dB)	H Scan - H3DV6 probe tip 10mm above Device Reference MID retest 2/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm Maximum value of peak Total field = 0.114 A/m Probe Modulation Factor = 0.72 Reference Value = 0.137 A/m; Power Drift = 0.011 dB Hearing Aid Near-Field Category: M4 (AWF 0 dB)

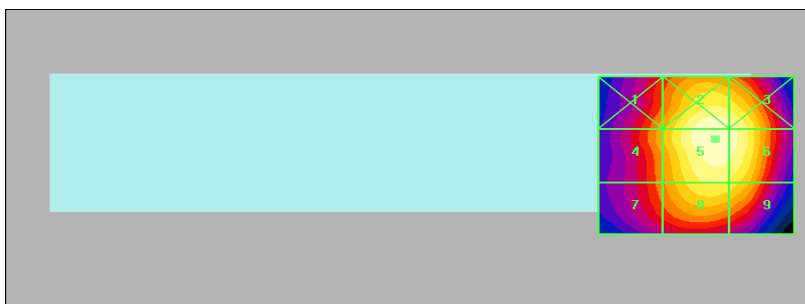
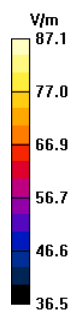
IMAGES WCDMA850, CHANNEL MIDDLE (835 MHz)

H – f field



Grid 1	Grid 2	Grid 3
0.154	0.111	0.065
Grid 4	Grid 5	Grid 6
0.147	0.114	0.067
Grid 7	Grid 8	Grid 9
0.147	0.112	0.064

E – f field

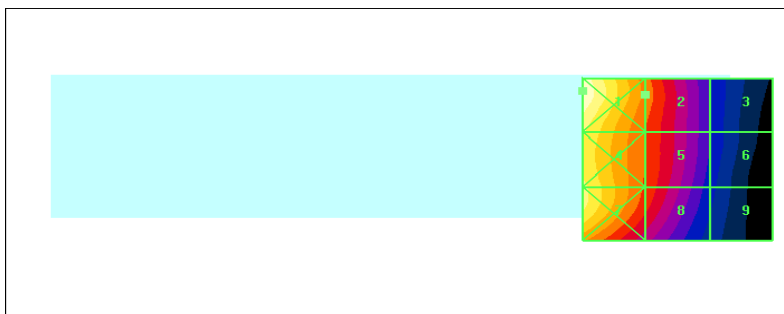
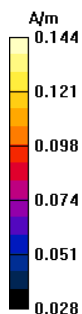


Grid 1	Grid 2	Grid 3
72.6	86.6	85.4
Grid 4	Grid 5	Grid 6
73.4	87.1	85.8
Grid 7	Grid 8	Grid 9
69.6	80.9	79.6

MEASUREMENT DATA WCDMA850, CHANNEL HIGH (846.6 MHz)	
Date/Time: 2007-04-27 14:20:26 Test Laboratory: TCC Nokia Type: RM-289; Serial: 004400/99/176008/1	Date/Time: 2007-04-27 13:54:30 Test Laboratory: TCC Nokia Type: RM-289; Serial: 004400/99/176008/1
Communication System: US 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: US 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: 2007-02-13 - Sensor-Surface: (Fix Surface) - Electronics: DAE4 Sn555; Calibrated: 2007-03-15 - Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: Not Specified - Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172	DASY4 Configuration: - Probe: H3DV6 - SN6053; Calibrated: 2007-02-13 - Sensor-Surface: (Fix Surface) - Electronics: DAE4 Sn555; Calibrated: 2007-03-15 - Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: Not Specified - Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172
E Scan - ER probe tip 10mm above Device Reference, High/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm Maximum value of peak Total field = 98.9 V/m Probe Modulation Factor = 0.81 Reference Value = 102.9 V/m; Power Drift = -0.008 dB Hearing Aid Near-Field Category: M4 (AWF 0 dB)	H Scan - H3DV6 probe tip 10mm above Device Reference High/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm Maximum value of peak Total field = 0.103 A/m Probe Modulation Factor = 0.72 Reference Value = 0.117 A/m; Power Drift = -0.025 dB Hearing Aid Near-Field Category: M4 (AWF 0 dB)

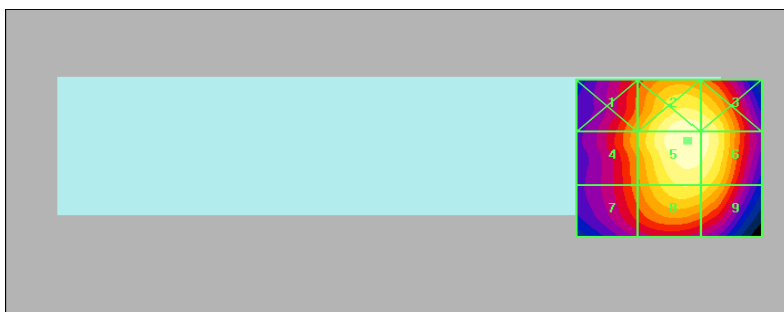
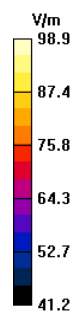
IMAGES WCDMA850, CHANNEL HIGH (846.6 MHz)

H - f field



Grid 1 0.144	Grid 2 0.103	Grid 3 0.060
Grid 4 0.131	Grid 5 0.098	Grid 6 0.060
Grid 7 0.132	Grid 8 0.096	Grid 9 0.055

E - f field

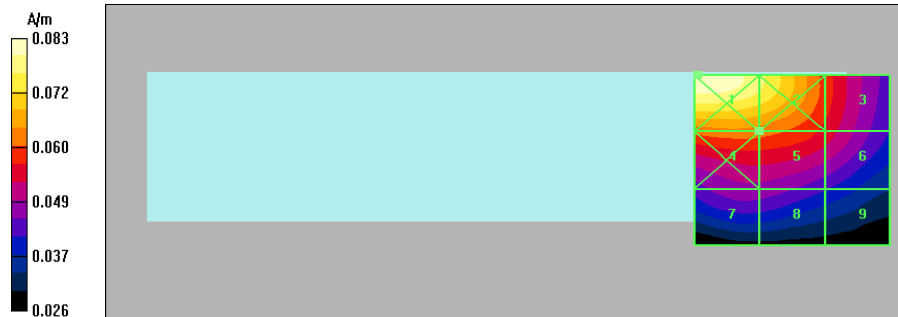


Grid 1 82.5	Grid 2 98.4	Grid 3 97.1
Grid 4 83.4	Grid 5 98.9	Grid 6 97.6
Grid 7 78.6	Grid 8 91.6	Grid 9 90.4

MEASUREMENT DATA WCDMA1900, CHANNEL LOW (1852.4 MHz)	
Date/Time: 2007-04-27 15:00:01 Test Laboratory: TCC Nokia Type: RM-289; Serial: 004400/99/176008/1	Date/Time: 2007-04-27 12:37:02 Test Laboratory: TCC Nokia Type: RM-289; Serial: 004400/99/176008/1
Communication System: US 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/m ³ Phantom section: E Device Section	Communication System: US 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/m ³ Phantom section: H Device Section
DASY4 Configuration: - Probe: ER3DV6 - SN2333; - ConvF(1, 1, 1); Calibrated: 2007-02-13 - Sensor-Surface: (Fix Surface) - Electronics: DAE4 Sn555; Calibrated: 2007-03-15 - Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: Not Specified - Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172	DASY4 Configuration: - Probe: H3DV6 - SN6053; Calibrated: 2007-02-13 - Sensor-Surface: (Fix Surface) - Electronics: DAE4 Sn555; Calibrated: 2007-03-15 - Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: Not Specified - Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172
E Scan - ER probe tip 10mm above Device Reference, Low/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm Maximum value of peak Total field = 30.2 V/m Probe Modulation Factor = 0.81 Reference Value = 29.7 V/m; Power Drift = 0.033 dB Hearing Aid Near-Field Category: M4 (AWF 0 dB)	H Scan - H3DV6 probe tip 10mm above Device Reference Low/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm Maximum value of peak Total field = 0.062 A/m Probe Modulation Factor = 0.56 Reference Value = 0.104 A/m; Power Drift = -0.021 dB Hearing Aid Near-Field Category: M4 (AWF 0 dB)

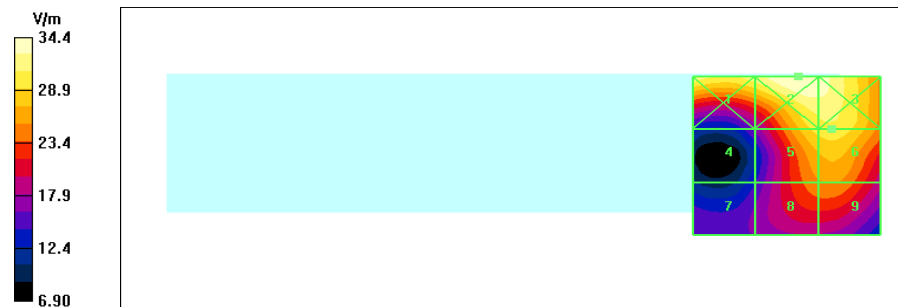
IMAGES WCDMA1900, CHANNEL LOW (1852.4 MHz)

H - field



Grid 1	Grid 2	Grid 3
0.083	0.077	0.059
Grid 4	Grid 5	Grid 6
0.063	0.062	0.055
Grid 7	Grid 8	Grid 9
0.048	0.048	0.042

E - field

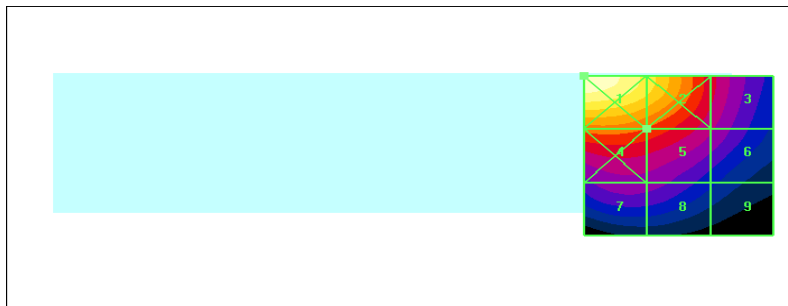
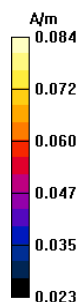


Grid 1	Grid 2	Grid 3
32.3	34.4	33.6
Grid 4	Grid 5	Grid 6
16.7	29.7	30.2
Grid 7	Grid 8	Grid 9
16.6	25.0	25.4

MEASUREMENT DATA WCDMA1900, CHANNEL MIDDLE (1880 MHz)	
Date/Time: 2007-05-10 11:52:03 Test Laboratory: TCC Nokia Type: RM-289; Serial: 004400/99/176008/1	Date/Time: 2007-04-27 12:48:05 Test Laboratory: TCC Nokia Type: RM-289; Serial: 004400/99/176008/1
Communication System: US 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: US 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; - ConvF(1, 1, 1); Calibrated: 2007-02-13 - Sensor-Surface: (Fix Surface) - Electronics: DAE4 Sn555; Calibrated: 2007-03-15 - Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: Not Specified - Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172	DASY4 Configuration: - Probe: H3DV6 - SN6053; Calibrated: 2007-02-13 - Sensor-Surface: (Fix Surface) - Electronics: DAE4 Sn555; Calibrated: 2007-03-15 - Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: Not Specified - Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172
E Scan - ER probe tip 10mm above Device Reference, Middle /Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm Maximum value of peak Total field = 30.8 V/m Probe Modulation Factor = 0.81 Reference Value = 33.6 V/m; Power Drift = -0.192 dB Hearing Aid Near-Field Category: M4 (AWF 0 dB)	H Scan - H3DV6 probe tip 10mm above Device Reference Mid/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm Maximum value of peak Total field = 0.060 A/m Probe Modulation Factor = 0.56 Reference Value = 0.094 A/m; Power Drift = 0.026 dB Hearing Aid Near-Field Category: M4 (AWF 0 dB)

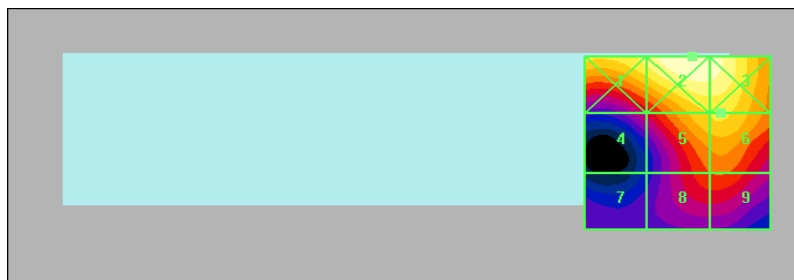
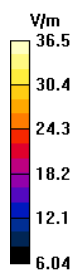
IMAGES WCDMA850, CHANNEL MIDDLE (1880 MHz)

H - field



Grid 1 0.084	Grid 2 0.074	Grid 3 0.053
Grid 4 0.062	Grid 5 0.060	Grid 6 0.048
Grid 7 0.046	Grid 8 0.046	Grid 9 0.037

E - field

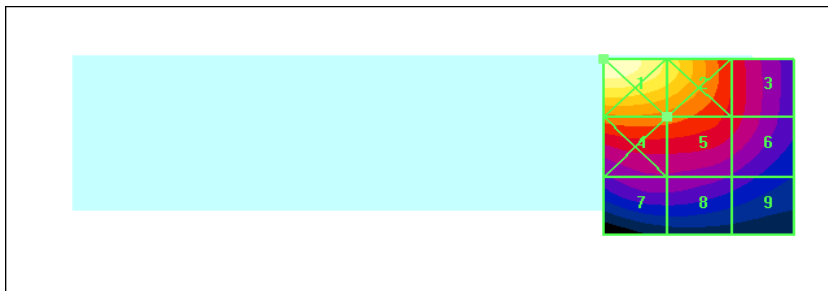
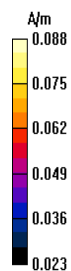


Grid 1 33.4	Grid 2 36.5	Grid 3 35.7
Grid 4 20.8	Grid 5 30.6	Grid 6 30.8
Grid 7 16.5	Grid 8 24.3	Grid 9 24.7

MEASUREMENT DATA WCDMA1900, CHANNEL HIGH (1907.6 MHz)	
Date/Time: 2007-04-27 15:09:58 Test Laboratory: TCC Nokia Type: RM-289; Serial: 004400/99/176008/1	Date/Time: 2007-05-10 14:41:07 Test Laboratory: TCC Nokia Type: RM-289; Serial: 004400/99/176008/1
Communication System: US 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: US 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: 2007-02-13 - Sensor-Surface: (Fix Surface) - Electronics: DAE4 Sn555; Calibrated: 2007-03-15 - Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: Not Specified - Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172	DASY4 Configuration: - Probe: H3DV6 - SN6053; Calibrated: 2007-02-13 - Sensor-Surface: (Fix Surface) - Electronics: DAE4 Sn555; Calibrated: 2007-03-15 - Phantom: HAC Test Arch 4.6; Type: SD HAC P01 BA; Serial: Not Specified - Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172
E Scan - ER probe tip 10mm above Device Reference, High/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm Maximum value of peak Total field = 24.4 V/m Probe Modulation Factor = 0.81 Reference Value = 24.7 V/m; Power Drift = -0.106 dB Hearing Aid Near-Field Category: M4 (AWF 0 dB)	H Scan - H3DV6 probe tip 10mm above Device Reference High retest/Hearing Aid Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm Maximum value of peak Total field = 0.064 A/m Probe Modulation Factor = 0.56 Reference Value = 0.108 A/m; Power Drift = -0.105 dB Hearing Aid Near-Field Category: M4 (AWF 0 dB)

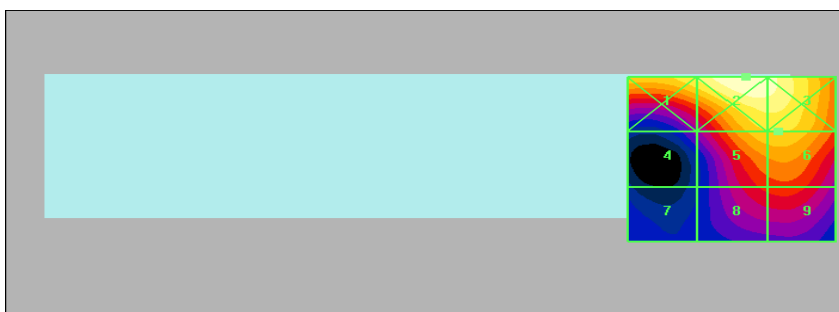
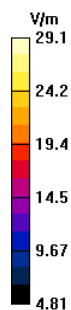
IMAGES WCDMA850, CHANNEL HIGH (1907.6 MHz)

H – f ield



Grid 1	Grid 2	Grid 3
0.088	0.078	0.058
Grid 4	Grid 5	Grid 6
0.066	0.064	0.056
Grid 7	Grid 8	Grid 9
0.049	0.049	0.044

E – f ield



Grid 1	Grid 2	Grid 3
26.3	29.1	28.2
Grid 4	Grid 5	Grid 6
14.0	24.2	24.4
Grid 7	Grid 8	Grid 9
11.4	18.4	18.8

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

E-field probe ER3DV6, SN: 2333
H-field probe H3DV6, SN: 6053

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

835MHz dipole CD835V3, SN: 1004
1880MHz dipole CD1880V3, SN: 1003