



FCC HAC Test Report

Test Report Number: WR-1175.001

Terminal device: Type: Nokia RM-66, HW: 6000, SW: V HL100b39.nep (Detailed information is listed in section 5).

Originator: Anu Balijepalli
Function: TCC – Dallas
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0.2	24 August 2006	Review	Anu Balijepalli	Submit for Approval
1.0	24 August 2006	Approval	Bob Alexander	Approved
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Testing laboratory:

Test & Certification Center (TCC)
Dallas
Nokia Inc
6021 Connection Drive
Irving, Texas 75039
U.S.A.
Tel. 972-894-5000
Fax. 972-894-4988

Client:

Nokia, Inc.
12278 Scripps Summit Dr.
San Diego, CA 92131
Tel. +1 858 831 5000
Fax +1 858 831 6500

Date and signatures:

For the Contents:

28 August 2006

Anuradha
Balijepalli

Anu Balijepalli,
Test Operator

A handwritten signature in black ink, appearing to read 'Bob Alexander'.

Bob Alexander,
Technical Review

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1. GENERAL

1.1 Objective

This test is performed to ensure that the EUT meets the requirements required by the FCC Method of Measurement for near field E and H emissions. Please note that this report is only for near field emissions, not for the T-coil HAC testing.

1.2 Test Summary

Test Results: *The test result relates only to those tested devices mentioned in Section 5 of this test report.*

Sample #	Test Performed	Reference	Category
1	Near Field Emissions- E field Near Field Emissions- H field	ANSI C63.19-2006	M3



2. LIST OF ABBREVIATIONS, ACRONYMS AND TERMS

2.1 Abbreviations

dB - decibel
dBm - decibels per milliwatt (absolute measurement)
MHz - megahertz or 1000000 Hertz
V/m – Volts per meter
A/m – Amps per meter

2.2 Acronyms

BSS - Base Station Simulator
CDMA - Code Division Multiple Access
ESN - Electronic Serial Number
EUT - Equipment under Test
GSM - Global System for Mobile communications
IMEI - International Mobile Equipment Identity
PCS - Personal Communication System
RF- Radio Frequency

2.3 Terms

Base Station Simulator (BSS) - simulates all the necessary signals that a phone would experience while on a live network. There are many types of base station simulators catering for all current protocols, i.e., GSM, CDMA.

Cellular - refers to a frequency in the 800MHz band.

PCS - refers to a frequency in the 1900MHz band.

Crest Factor - is the relation between the peak power and the average power in a signal.



3. STANDARDS BASIS

Testing has been carried out in accordance with:

REF.	Code of the standard	Name of the standard
1	-	ANSI C63.19-2006

Note: Unless otherwise stated, (by reference to a version number and a publication date), the latest version of the above documents applies.

Deviations:

Not Applicable.

4. TEST EQUIPMENT LIST

The listing below indicates the test equipment utilized for the test (s). Calibration interval on all items listed can be obtained from the Engineering Services Group within NMP, Product Creation - Dallas. Where relevant, measuring equipment is subjected to in-service checks between testing. TCC - Dallas shall notify clients promptly, in writing, of identification of defective measuring equipment that casts doubt on the validity of results given in this report.

UPDATE THIS TABLE

Test Equipment	NMP #	Calibration Interval	Calibration Expiry
SPEAG DASY4 Robot System	2056	NA	NA
SPEAG Data Acquisition Electronics (DAE)	2292	12 months	Jan - 2007
SPEAG E-field Probe ER3DV6	2955	12 months	Jan- 2007
SPEAG H-field Probe H3DV6	2957	12 months	Jan- 2007
SPEAG 835MHz Dipole CD835V3	4082	12 months	Nov-2006
SPEAG 1880MHz Dipole CD1880V3	4081	12 months	Dec-2006
Signal Generator Ag 8648C	2667	12 months	Oct-2006
Boonton Powermeter 4232A	2996	12 months	Sep-2006
AR Power Amplifier 5S1G4	0188	NA	NA
R&S CMU 200	3461	12 months	Sep-2006
R&S FSP	3463	12 months	Dec-2006

5. EQUIPMENT-UNDER-TEST (EUT)

The results in this report relate only to the items listed below:

5.1 Description of Tested Device(s):

Sample #	Mode of Operation	Date of Receipt	Condition of Sample	Item	Identifying Information
1	CDMA 800/1900	08/15/06	Good	Phone	Type: RM-66 Model: 6265i ESN: 026/01681816 HW: 6000 SW: V HL100b39.nep

5.2 Photograph of Tested Device(s):



6. TEST METHOD(S) AND SETUP(S)

Testing was performed in accordance with ANSI C63.19.

6.1 Probe Description

E field Probe Description

Construction

One dipole parallel, two dipoles normal to probe axis

Built-in shielding against static charges

Calibration

In air from 100 MHz to 3.0 GHz (absolute accuracy $\pm 6.0\%$, $k=2$)

Frequency

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: 16 mm)

Tip diameter: 8 mm (Body: 12 mm)

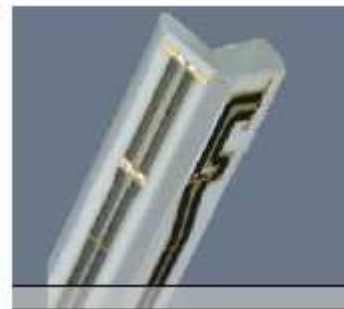
Distance from probe tip to dipole centers: 2.5 mm

Application

General near-field measurements up to 6 GHz

Field component measurements

Fast automatic scanning in phantoms



H field Probe Description

Construction

Three concentric loop sensors with 3.8 mm loop diameters

Resistively loaded detector diodes for linear response

Built-in shielding against static charges

Frequency

200 MHz to 3 GHz (absolute accuracy $\pm 6.0\%$, $k=2$); Output linearized

Directivity

± 0.25 dB (spherical isotropy error)

Dynamic Range

10 mA/m to 2 A/m at 1 GHz

E-Field Interference

$< 10\%$ at 3 GHz (for plane wave)

Dimensions

Overall length: 330 mm (Tip: 40 mm)

Tip diameter: 6 mm (Body: 12 mm)

Distance from probe tip to dipole centers: 3 mm

Application

General magnetic near-field measurements up to 3 GHz

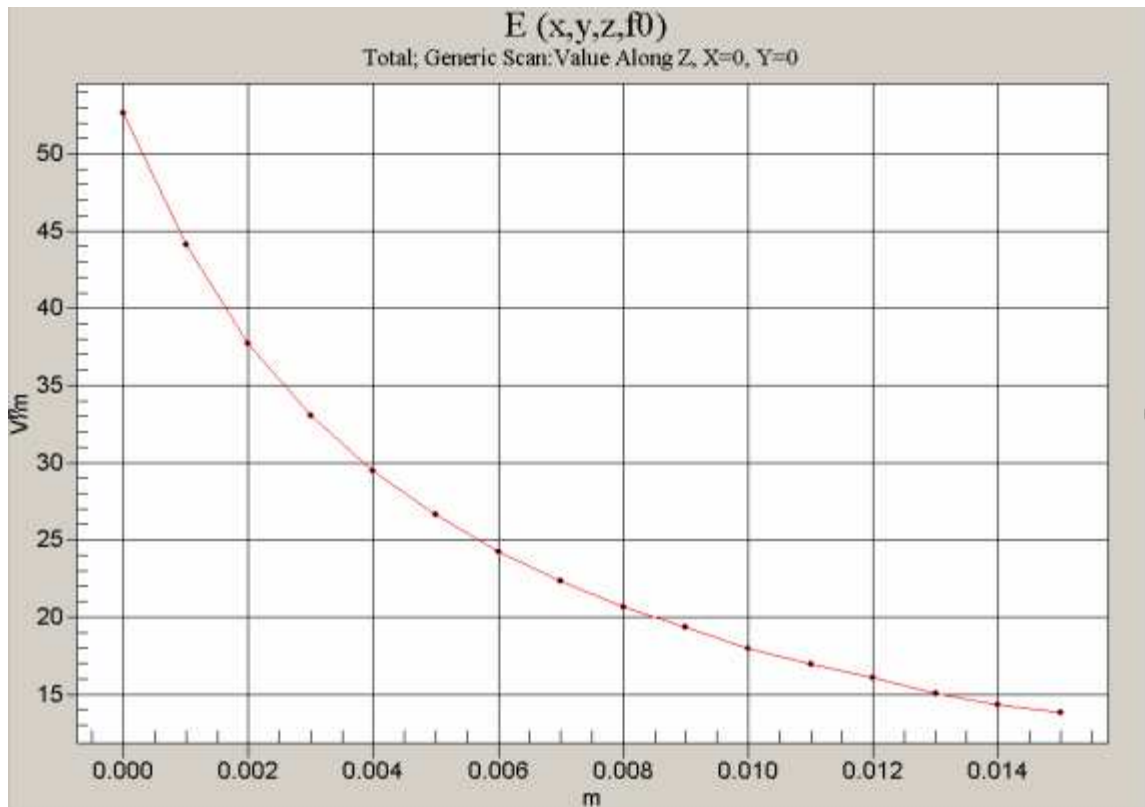


Field component measurements
Surface current measurements
Measurements in air or liquids
Low interaction with the measured field

Probe Tip Description

HAC field measurements take place in the close near field with high gradients. Increasing the measuring distance from the source will generally decrease the measured field values. Magnetic field sensors are measuring the integral of the H-field across their sensor area surrounded by the loop. They are calibrated in precise, homogenous field. When measuring a gradient field, the result will be very close to the field in the center of the loop, which is equivalent to the center value. But it will be different from the field at the border of the loop.

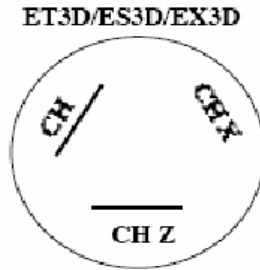
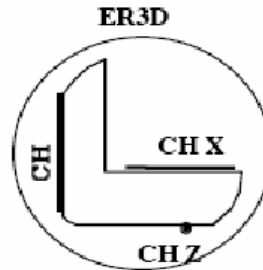
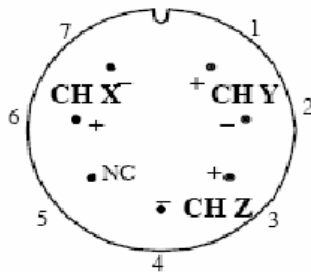
Consequently, two sensors with different loop diameters – both calibrated ideally – would give different results when measuring from the edge of the probe sensor elements. The behaviour for electrically small E-field sensors is equivalent. See below for distance plots from a WD, which show the conservative nature of field readings at the probe element center vs. measurements at the sensor end.



The magnetic field loops of the H3D probes are concentric, with the center 3mm from the tip for H3DV6. Their radius is 1.9mm.

The electric field probes have a more irregular internal geometry because it is physically not possible to have the 3 orthogonal sensors situated with the same center. The effect of the different sensor centers is accounted for in the HAC uncertainty budget. Their geometric center is at 2.5mm from the tip, and the element ends are 1.1mm closer to the tip.

Connector Plan



The antistatic shielding inside the probe is connected to the probe connector case. It is recommended to connect the probes with the amplifier using a short and well-shielded cable and to connect the cable shielding with the connector case.

Instrumentation Chain:

Conversion of Connector Voltage to E field

$$E_i = \sqrt{\frac{u_i + (u_i^2 \cdot CF) / (DCP)}{Norm_i \cdot ConvF}}$$

whereby

E_i = Electric field in V/m

u_i = Voltage of channel i at the connector in μV

$Norm_i$ = Sensitivity of channel in $\mu V / (V / m)^2$

ConvF = enhancement factor in liquid (ConvF = 1 for Air)

DCP = Diode compression point in μV

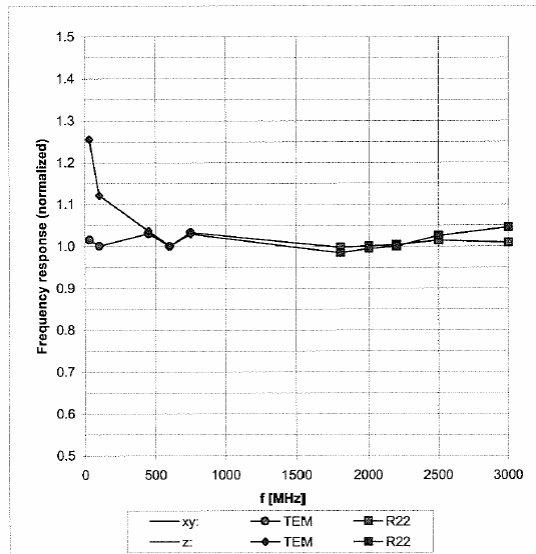
CF = Signal Crest Factor (peak power/average power)

Probe Response to Frequency

The E-field sensors have inherently a very flat frequency response. They are calibrated with a number of frequencies resulting in a common calibration factor, with the frequency behaviour documented in the calibration certificate.

Frequency Response of E-Field

(TEM-Cell:ifi110 EXX, Waveguide R22)

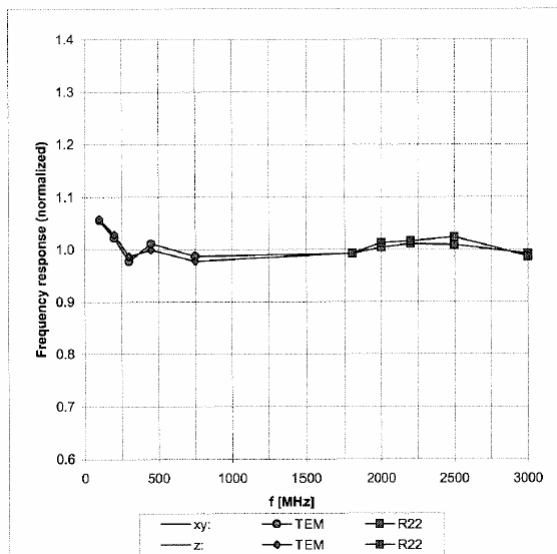


Uncertainty of Frequency Response of E-field: $\pm 6.3\%$ ($k=2$)

H-field sensors have frequency dependant sensitivity, which is evaluated for a series of frequencies also visible in the probe calibration certificate. The calibration factors result from a fitting algorithm. The proper conversion is calculated by the DASY4 software depending on the frequency setting in the procedure.

Frequency Response of H-Field

(TEM-Cell:ifi110, Waveguide R22)



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



Conversion to Peak

Peak is defined as Peak Envelope Power. All raw measurements from the HAC measurement system are RMS values. The DASY4 system incorporates the crest factor of the signal in the computation of the RMS values. Although the software also has capability to estimate the peak field by applying a square root of crest factor value to the readings, the probe modulation factor was applied manually instead per PC63.19 in the measurement tables in this report. The equation to convert the raw measurements in the data tables are:

$$\text{Peak Field} = 20 \log (\text{Raw} \times \text{PMF})$$

Where:

Peak Field = Peak field (in dBV/m or dBA/m)

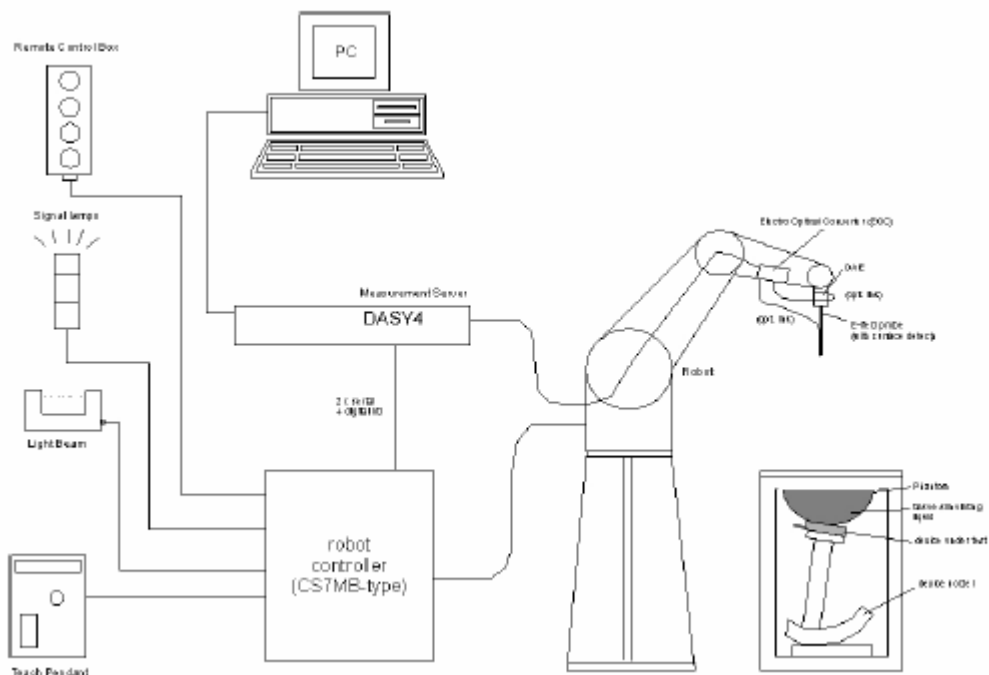
Raw = Raw field measurement from the measurement system (in V/m or A/m).

PMF = Probe Modulation Factor (in linear units).

6.2 Speag Robotic System

E-field and H-field measurements are performed using the DASY4 automated dosimetric assessment system. The DASY4 is made by Schmid & Partner Engineering AG (SPEAG) and consists of high precision robotics system (Staubli), robot controller, Pentium 4 computer, near- field probe, probe alignment sensor, and the HAC phantom. The robot is a six- axis industrial robot performing precise movements to the position the probe to the location of maximum EMF.

System Hardware



A cell controller system contains the power supply, robot controller; teach pendant, and a remote control used to drive the robot motors. The PC consists of RF measurement system DASY4 V4.5 with HAC extension, A/D interface card, monitor, mouse and keyboard. The Staubli Robot is connected to the cell controller to allow software manipulation of the robot. A data acquisition electronic (DAE) circuit that performs the signal amplification, signal multiplexing, AD conversion, offset measurements, mechanical surface detection, collision detection, etc is connected to the Electro – optical coupler (EOC). The EOC performs the conversion from the optical into digital electric signal of the DAE and transfers data to the PC plug-in card.

The DAE consists of a highly sensitive electrometer – grade preamplifier with auto-zeroing, a channel and gain switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit. Transmission to the PC-card is accomplished through an optical downlink for data and status information and an optical uplink for commands and clock lines. The mechanical probe-mounting device includes two different sensor systems for frontal and sidewise probe contacts. They are also used for mechanical surface detection and probe collision detection. The robot uses its own controller with a built- in VME-bus computer.

Data Evaluation

The first step of the evaluation is a linearization of the filtered input signal to account for the compression characteristics of the detector diode. The compensation depends on the input signal, the diode type and the DC-transmission factor from the diode to the evaluation electronics. If the exciting field is pulsed, the crest factor of the signal must be known to correctly compensate for peak power. The formula for each channel can be given as:

$$V_i = U_i + U_2 * (cf/dcpi)$$

with V_i = compensated signal of channel i ($i = x, y, z$)
 U_i = input signal of channel i ($i = x, y, z$)
 cf = crest factor of exciting field (DASY parameter)
 $dcpi$ = diode compression point (DASY parameter)

From the compensated input signals the primary field data for each channel can be evaluated:

$$\text{E-field probes: } E_i = \sqrt{\frac{V_i}{\text{Norm}_i \times \text{ConvF}}}$$

$$\text{H-field probes: } H_i = \sqrt{V_i} x \frac{a_{i0} + a_{i1}f + a_{i2}f^2}{f}$$

with V_i = compensated signal of channel i ($i = x, y, z$)
 Norm_i = sensor sensitivity of channel i ($i = x, y, z$)
 $\mu\text{V}/(\text{V/m})^2$ for E-field Probes
 ConvF = sensitivity enhancement in solution
 a_{ij} = sensor sensitivity factors for H-field probes
 f = carrier frequency [GHz]
 E_i = electric field strength of channel i in V/m
 H_i = magnetic field strength of channel i in A/m

The RSS value of the field components gives the total field strength (Hermitian magnitude):

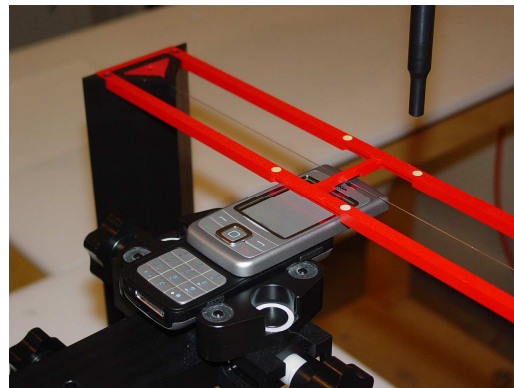
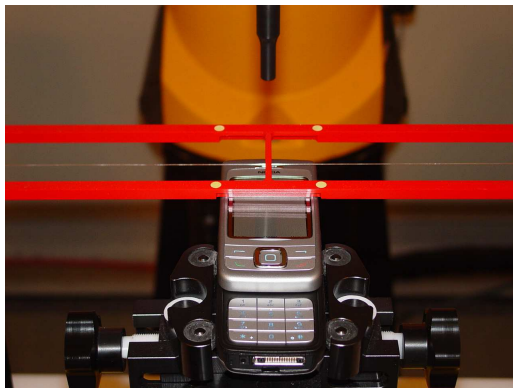
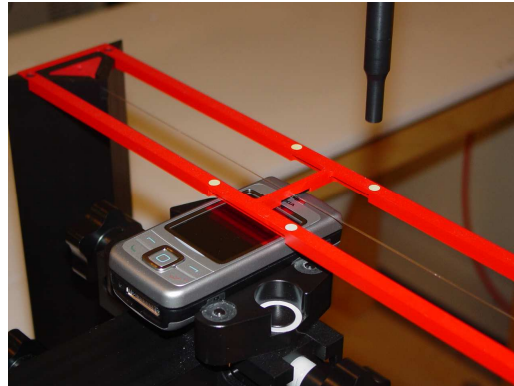
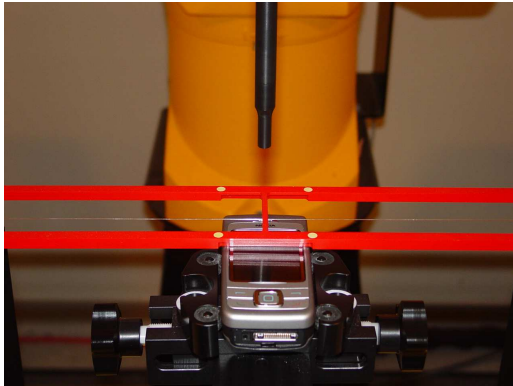
$$E_{tot} = \sqrt{E_x^2 + E_y^2 + E_z^2}$$

The signal response time is evaluated as the time required by the system to reach 90% of the expected final value after an on/off switch of the power source with an integration time of 500 ms and a probe response time of <5ms. In the current implementation, DASY4 waits longer than 100 ms after having reached the grid point before starting a measurement, i.e., the response time uncertainty is negligible.

If the device under test does not emit a CW signal, the integration time applied to measure the electric field at a specific point may introduce additional uncertainties due to the discretization. The tolerances for the different systems had the worst-case of 2.6%.

6.3 Test Setup

The test setup is shown in the picture below.



7. PASS/FAIL CRITERIA

The EUT must meet the following M3 category standards –

Category	Wireless Device Parameters <960MHz		
Near field	AWF	E-field Emissions Peak – V/m	H-field Emissions Peak – A/m
Category M3	AWF =0 (TDMA, CDMA)	199.5 to 354.8	0.60 to 1.07
	AWF = -5 (GSM)	149.6 to 266.1	0.45 to 0.80
Category M4	AWF =0 (TDMA, CDMA)	< 199.5	< 0.60
	AWF = -5 (GSM)	< 149.6	< 0.45

Category	Wireless Device Parameters >960 MHz		
Near field	AWF	E-field Emissions Peak – V/m	H-field Emissions Peak – A/m
Category M3	AWF =0 (TDMA, CDMA)	63.1 to 112.2	0.19 to 0.34
	AWF = -5 (GSM)	47.3 to 84.1	0.14 to 0.25
Category M4	AWF =0 (TDMA, CDMA)	< 63.1	< 0.19
	AWF = -5 (GSM)	< 47.3	< 0.14

8. TEST PROCEDURE

The following illustrates a typical RF emissions test scan over a wireless communication device:

- Proper operation of the field probe, probe measurement system, other instrumentation, and the positioning system was confirmed.
- WD is positioned in its intended test position, acoustic output point of the device perpendicular to the field probe.
- The WD operation for maximum rated RF output power was configured and confirmed with the base station simulator, at the test channel and other normal operating parameters as intended for the test. The battery was ensured to be fully charged before each test.
- The center sub-grid was centered over the center of the acoustic output (also audio band magnetic output, if applicable). The WD audio output was positioned tangent (as physically possible) to the measurement plane.
- The measurement system measured the field strength at the reference location.
- Measurements at 2mm increments in the 5x5 cm region were performed and recorded. A 360 deg rotation about the azimuth axis at the maximum interpolated position was measured. For the worst case condition, the peak reading from this rotation was used in re-evaluating the HAC category.
- The system performed a drift evaluation by measuring the field at the reference location.
- Same steps were done for both the E and H field measurements.



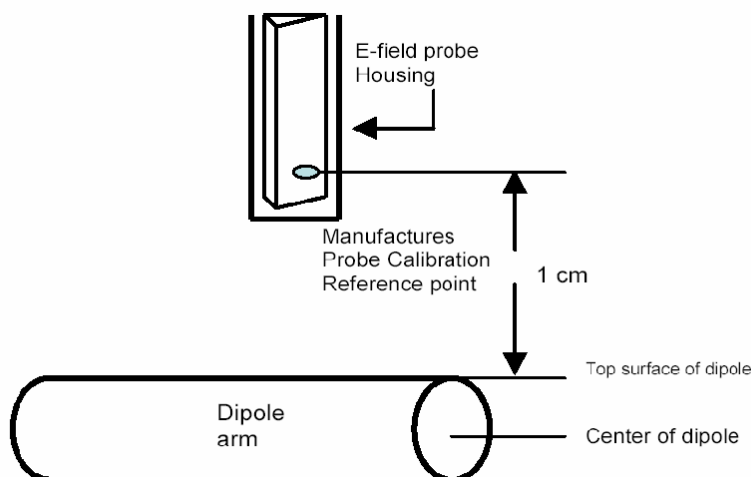
9. SYSTEM VALIDATION

The input signal was an unmodulated continuous wave. The following points were taken into consideration in performing the system validation:

Average Input Power = 100mW (20dBm RMS) after adjustment for return loss.

The test fixture must meet the 2-wavelength separation criterion.

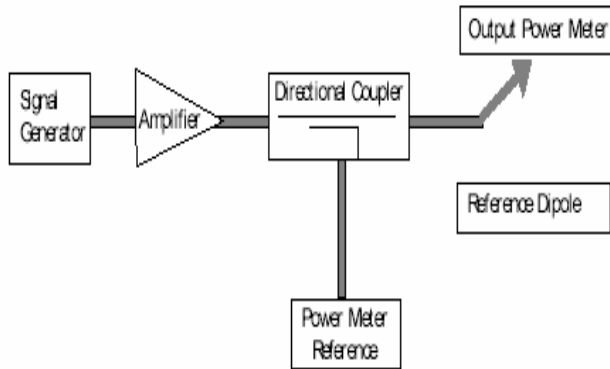
The proper measurement of the 1cm probe to dipole separation, which is measured from the top surface of the dipole to the calibration reference point of the sensor, defined by the probe manufacturer is shown in the following picture:



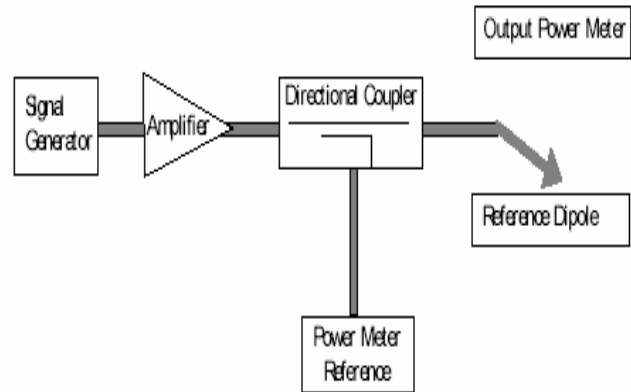
To assure proper operation of the near-field measurement probe the input power to the dipole shall be commensurate to with the full rated output power of the wireless device (eg. – for a cellular phone wireless device the average peak antenna input power will be on the order of 100mW (ie, 20dBm) RMS after adjustment for any mismatch.

A dipole antenna meeting the requirements in PC63.19 was placed in the position normally occupied by the WD. The length of the dipole was scanned with both E-field and H-field probes and the maximum values for each were recorded.

Using the near-field measurement system, scan the antenna over the radiating dipole and record the greatest field reading observed. Due to the nature of E-fields about freespace dipoles, the two E-field peaks measured over the dipole are averaged to compensate for non-parallelity of the setup, See manufacturer method on dipole calibration certificates, page 2. Field strength measurements shall be made only when the probe is stationary.



Setup for Desired Output Power to Dipole



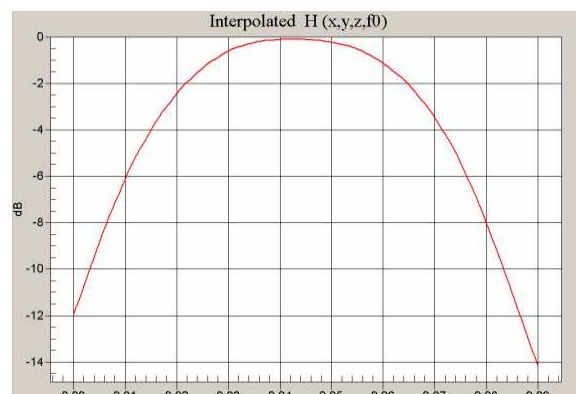
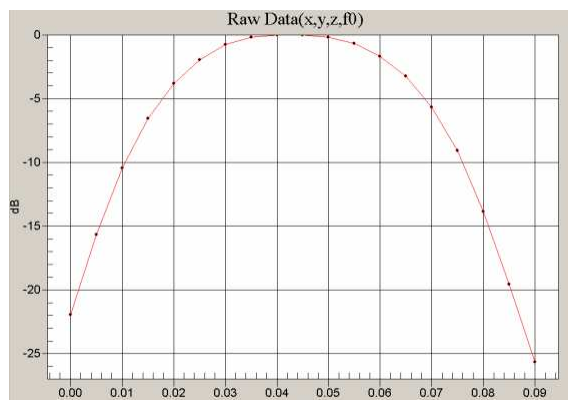
Setup to Dipole

Using this setup configuration, the signal generator was adjusted for the desired output power (100mW) at a specified frequency. The reference power from the coupled port of the directional coupler is recorded. Next, the output cable is connected to the reference dipole, as shown in the figure above.

The input signal was adjusted until the reference power from the coupled port of the directional coupler was the same as previously recorded, to compensate for the impedance mismatch between the output cable and the reference dipole.

To assure proper operation of the near-field measurement probe the input power to the reference dipole was verified to the full rated output power of the wireless device. The dipole was secured in a holder in a manner to meet the 20dB reflection. The near-field measurement probe was positioned over the dipole.

The antenna was scanned over the appropriate sized area to cover the dipole from end to end. SPEAG uses 2D interpolation algorithms between the measured points. Please see below two-dimensional plots showing that the interpolated values interpolate smoothly between 5mm steps for a free space RF dipole:





Validations were performed for CW at 20dBm peak power.

		Target Value	Recorded on 08-16-2006	% deviation	Recorded on 08-25-2006	% deviation
835 MHz	E field	163.1	163.5	0.2%	166.8	2.3%
	H field	0.469	0.448	4.7%	0.460	1.9%
1880 MHz	E field	130.1	134.2	3.1%	130.1	0.0%
	H field	0.452	0.447	1.1%	0.449	0.7%

Note: Please see Appendix A for the Validation Scans



MODULATION FACTOR

A calibration was made of the modulation response of the probe and its instrumentation chain. This calibration was performed with the field probe, attached to its instrumentation. The response of the probe system to a CW field at the frequency of interest is compared to its response to a modulated signal with equal peak amplitude to that of a CW signal. The field level of the test signals are ensured to be more than 10dB above the ambient level and the noise floor of the instrumentation being used. The ratio of the CW reading to that taken with a modulated reading was applied to the DUT measurements.

This was done using the following procedure:

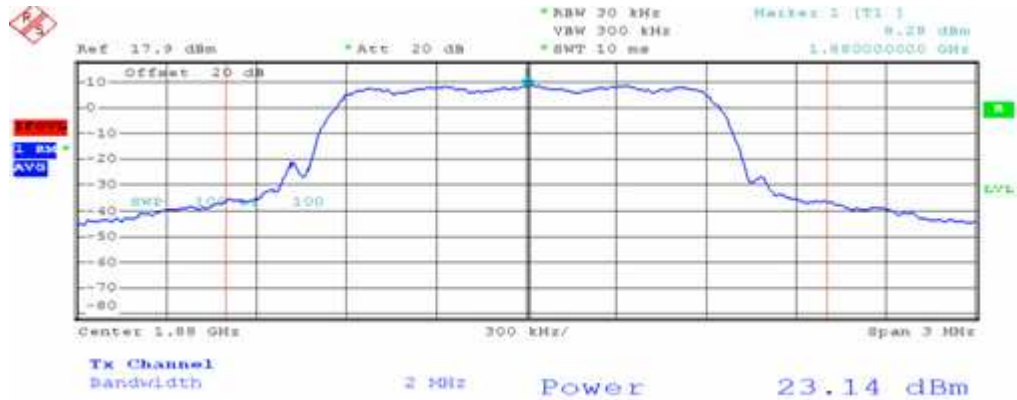
- The probe was illuminated with a CW signal at the intended measurement frequency.
- The probe was positioned at the field maxima over the dipole antenna (determined after an area scan over the dipole).
- The reading of the probe measurement system of the CW signal at the maximum point was recorded.
- Using a Spectrum Analyzer, the modulated signal adjusted with the same peak level of the CW signal was determined.
- The probe measurement system reading was recorded with the modulated signal.
- The ratio of the CW reading to the modulated signal reading is the probe modulation factor (PMF) for the modulation and field probe combination.
- Same steps are repeated at all frequency bands and for both E and H field probes.

The modulation factors obtained were applied to readings taken of the actual wireless device, in order to obtain an accurate peak field reading using the formula:

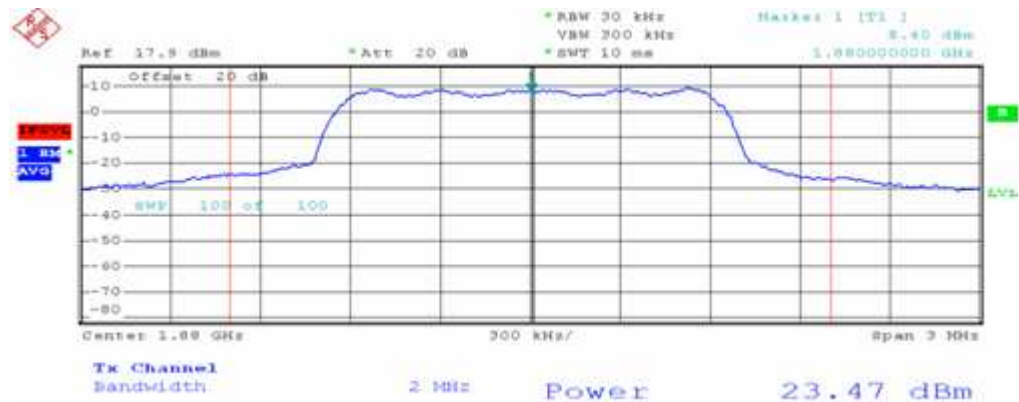
$$\text{Peak} = 20\log(\text{Raw} \times \text{PMF})$$

This method correlates well with the modulation using the DUT in the alternative substitution method. See below for correlation of signal:

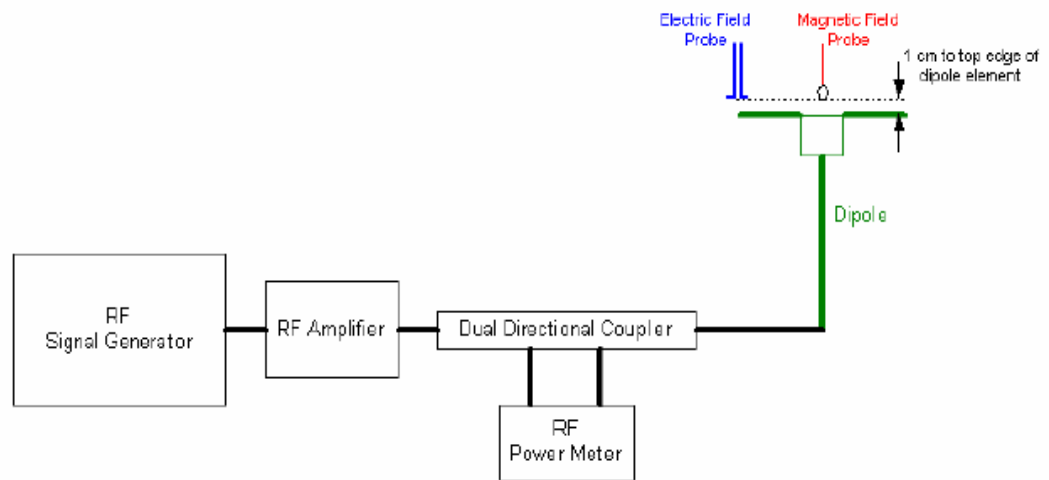
Signal Generator Modulated Signal:



Wireless Device Modulated Signal:

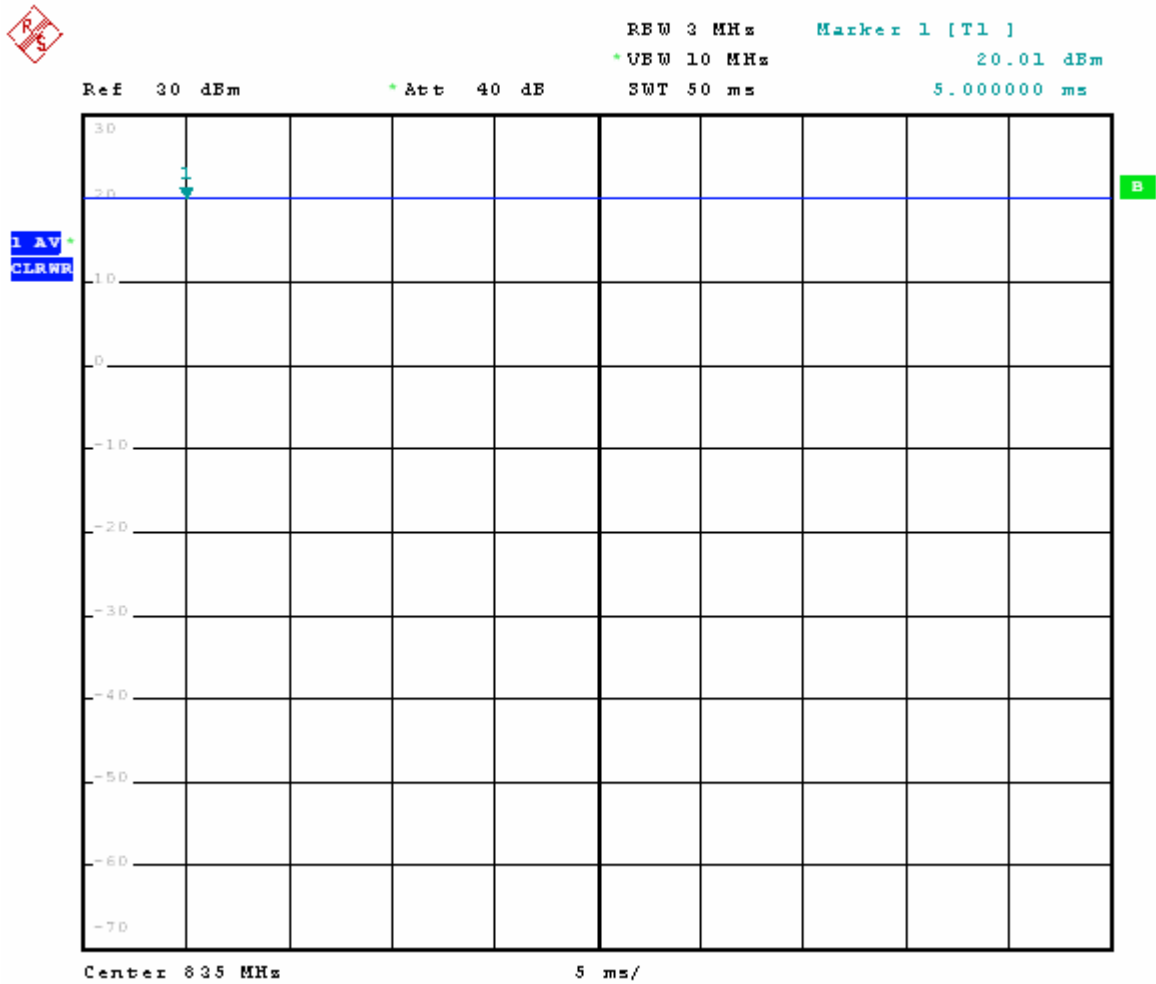


Modulation Factors were performed for CW, 80%AM and the modulated signal at 20dBm peak power, See below for the picture as well as the Spectrum Analyzer Plots.

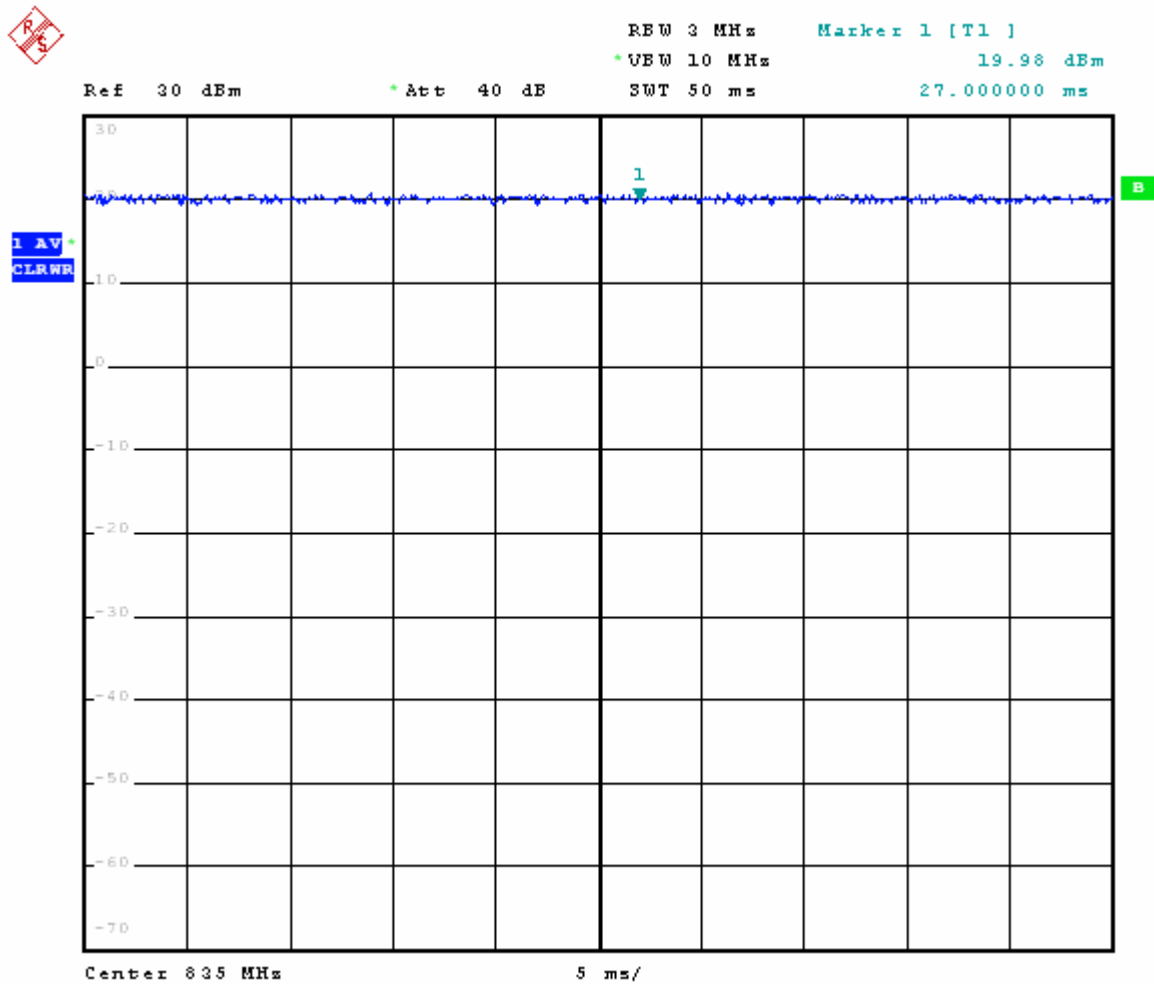


Determining Modulation Factor Probe Setup

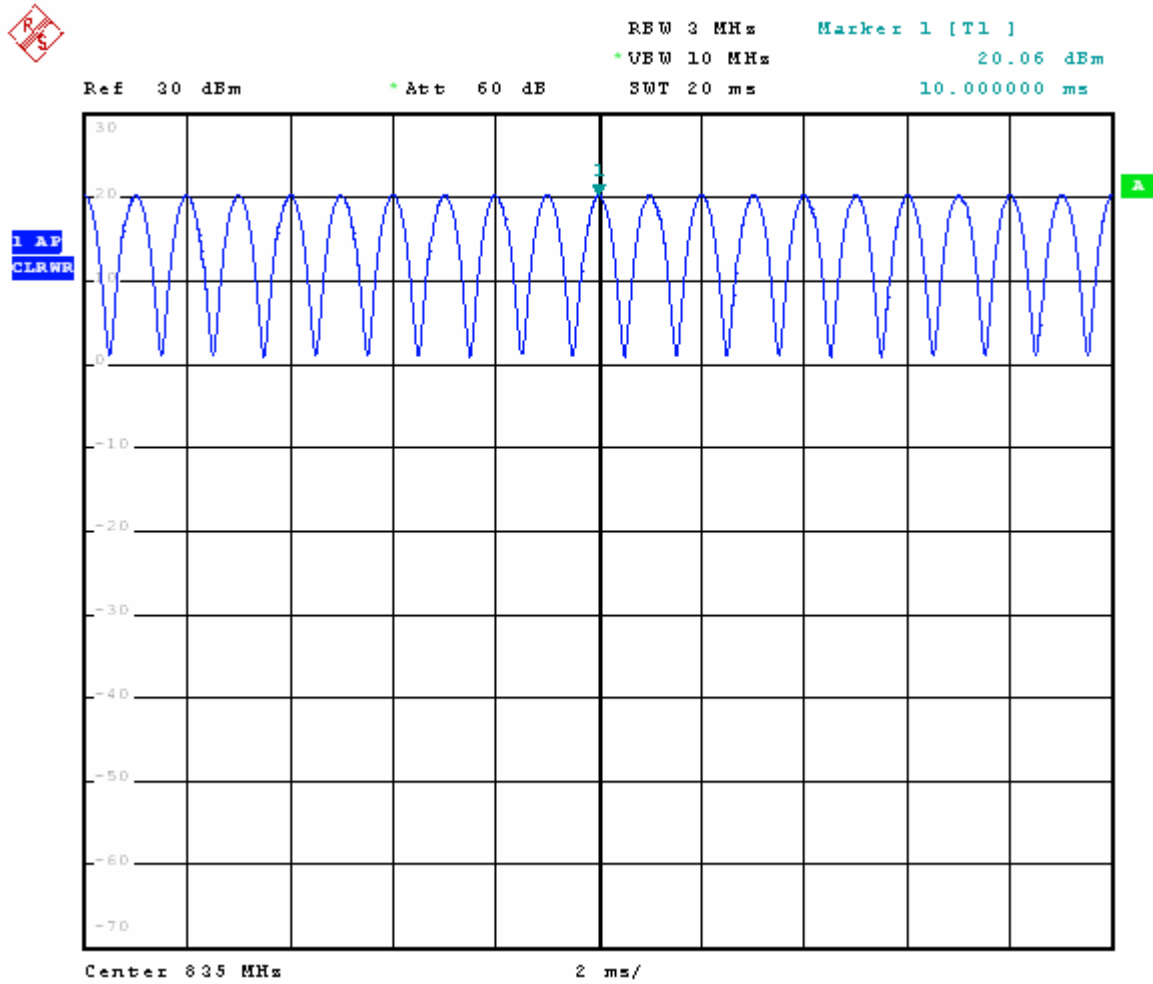
CW Signal for 850MHz band



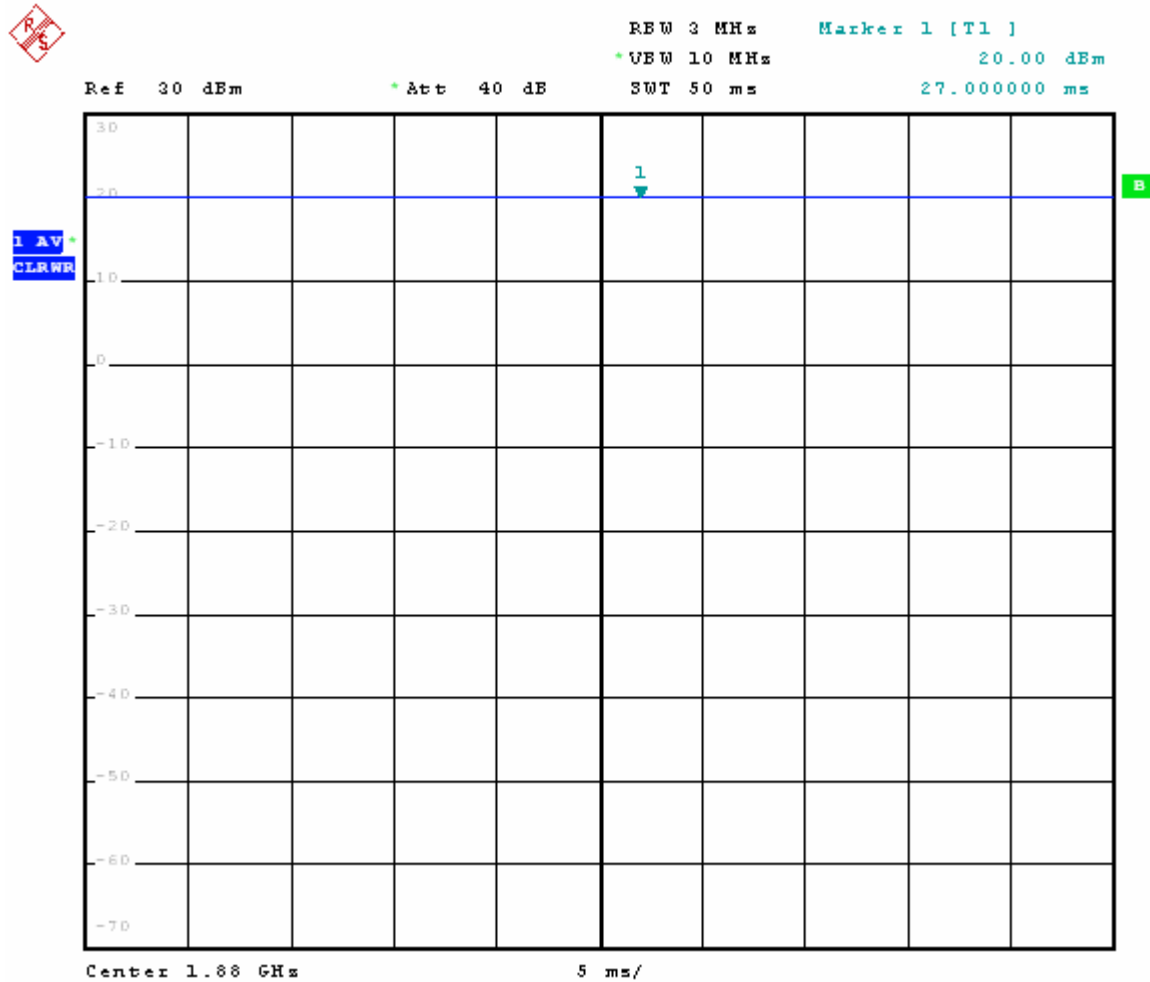
CDMA Signal for 850MHz band



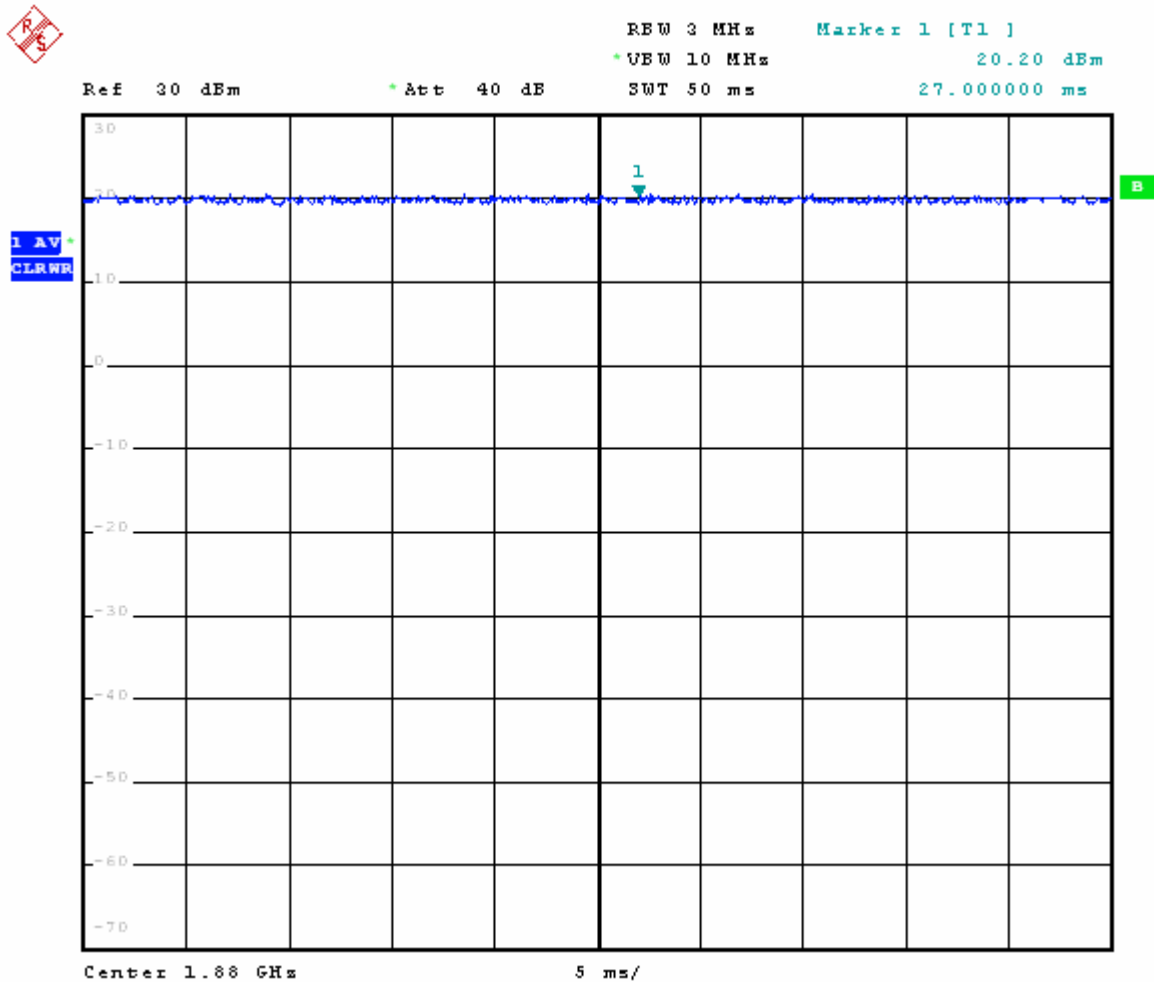
80%AM Signal for 850MHz band



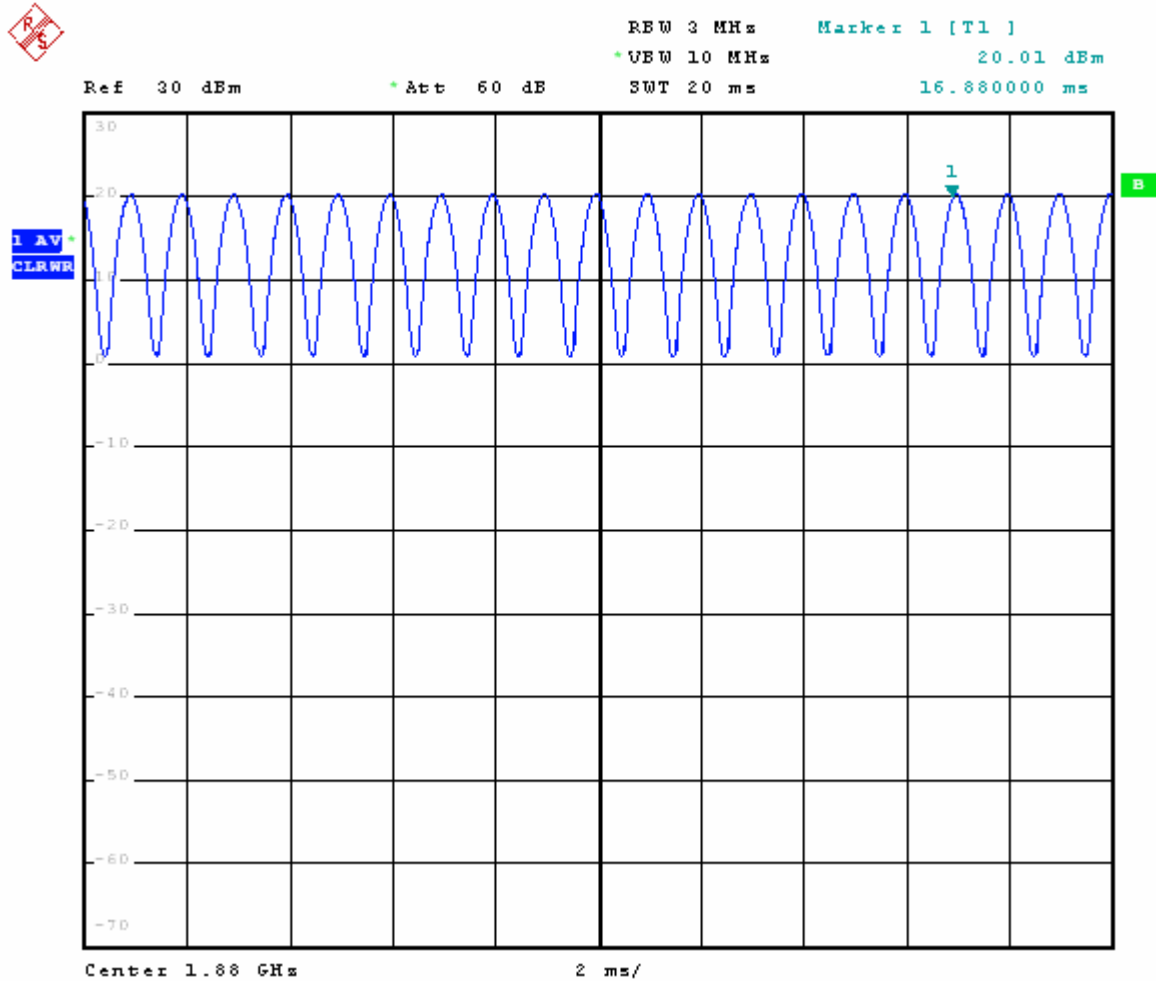
CW Signal for 1900MHz band



CDMA Signal for 1900MHz band



80%AM Signal for 1900MHz band





835 MHz	E-Field (V/m)	H-Field (A/m)	Modulation Factor (MF) for E-field	Modulation Factor (MF) for H-field
CDMA	95.0	0.501	1.0	1.0
CW	90.9	0.477		
80%AM	57.5	0.289		

1880 MHz	E-Field (V/m)	H-Field (A/m)	Modulation Factor (MF) for E-field	Modulation Factor (MF) for H-field
CDMA	136.7	0.698	1.0	0.6
CW	129.7	0.421		
80%AM	77.2	0.293		

10. DETAILED TEST RESULTS

Test Technician / Engineer	Bob Alexander; Anu Balijepalli		
Date of Measurement	21 August 2006- 22 August 2006		
Temperature / Humidity / Pressure	20-22	50-65	29-31
Test Result	Complies		

10.1 Near Field E and H RF emissions measurements

10.1.1 Test Results

Note: See Appendix B for the grids and plots of these cases.

CDMA CELLULAR E – FIELD

Slide Closed

Celluar	Conducted Power (dBm)	Power Drift (dB)	E (V/m)	Modulation Factor	Excluded Blocks
Ch 1013	25.0	0.317	69.5	1.0	6,8,9
Ch 384	24.7	0.012	77.8	1.0	6,8,9
Ch 777	24.7	0.024	88.5	1.0	6,8,9

Slide Open

Celluar	Conducted Power (dBm)	Power Drift (dB)	E (V/m)	Modulation Factor	Excluded Blocks
Ch 1013	25.0	0.099	95.0	1.0	2,3,6
Ch 384	24.7	-0.088	98.3	1.0	2,3,6
Ch 777	24.7	-0.073	105.5	1.0	2,3,6

CDMA CELLULAR H- FIELD

Slide Closed

Celluar	Conducted Power (dBm)	Power Drift (dB)	H (A/m)	Modulation Factor	Excluded Blocks
Ch 1013	25.0	0.053	0.230	1.0	4,7,8
Ch 384	24.7	-0.052	0.237	1.0	4,7,8
Ch 777	24.7	-0.063	0.246	1.0	4,7,8

Slide Open

Celluar	Conducted Power (dBm)	Power Drift (dB)	H (A/m)	Modulation Factor	Excluded Blocks
Ch 1013	25.0	0.073	0.186	1.0	1,4,7
Ch 384	24.7	0.348	0.172	1.0	1,4,7
Ch 777	24.7	-0.051	0.180	1.0	1,4,7

CDMA PCS E – FIELD

Slide Closed

PCS	Conducted Power (dBm)	Power Drift (dB)	E (V/m)	Modulation Factor	Excluded Blocks
Ch 25	22.9	0.150	50.6	1.0	7,8,9
Ch 600	23.4	-0.268	51.9	1.0	7,8,9
Ch 1175	23.5	0.106	48.8	1.0	7,8,9

Slide Open

PCS	Conducted Power (dBm)	Power Drift (dB)	E (V/m)	Modulation Factor	Excluded Blocks
Ch 25	22.9	0.086	50.3	1.0	6,8,9
Ch 600	23.4	0.034	50.3	1.0	6,8,9
Ch 1175	23.5	-0.023	46.6	1.0	6,8,9

CDMA PCS H – FIELD

Slide Closed

PCS	Conducted Power (dBm)	Power Drift (dB)	H (A/m)	Modulation Factor	Excluded Blocks
Ch 25	22.9	-0.235	0.097	0.6	7,8,9
Ch 600	23.4	0.191	0.098	0.6	6,8,9
Ch 1175	23.5	-0.041	0.086	0.6	7,8,9

Slide Open

PCS	Conducted Power (dBm)	Power Drift (dB)	H (A/m)	Modulation Factor	Excluded Blocks
Ch 25	22.9	0.0	0.060	0.6	4,7,8
Ch 600	23.4	-0.151	0.063	0.6	4,7,8
Ch 1175	23.5	0.078	0.051	0.6	4,7,8

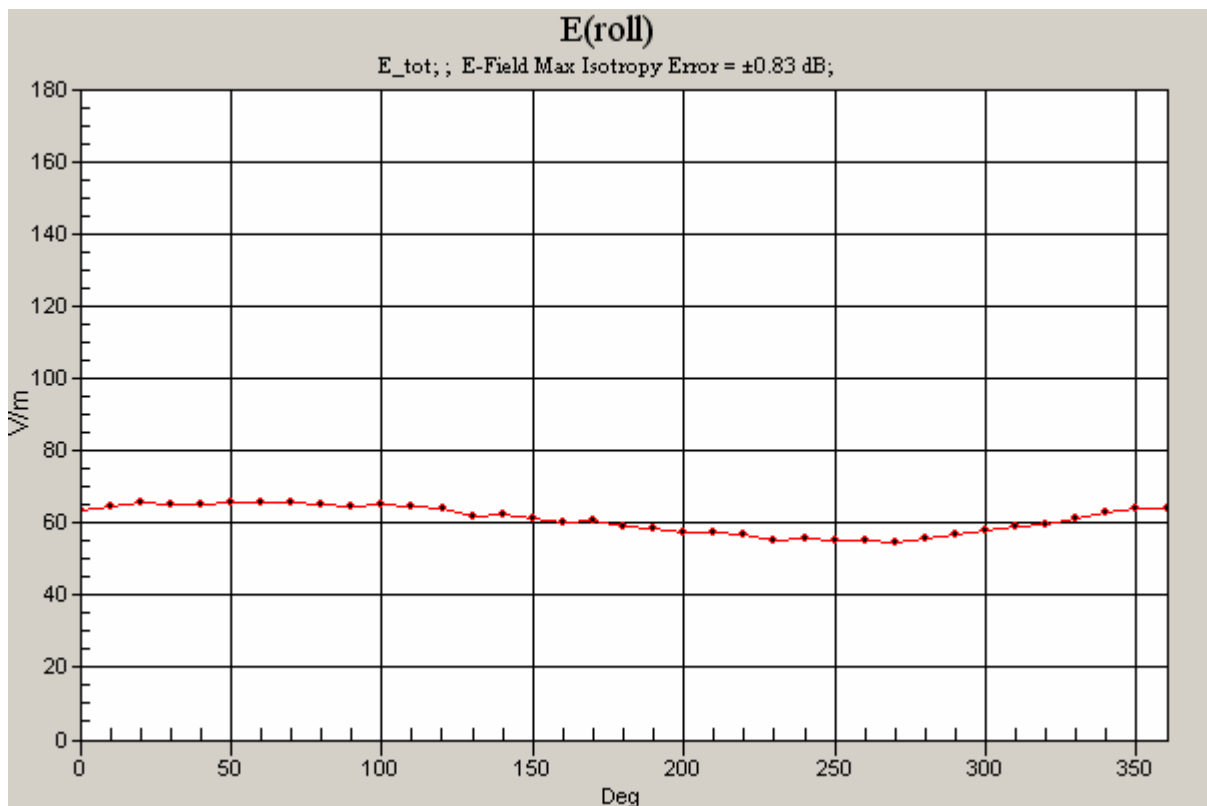
WORST CASE EMISSIONS AT T-COIL CENTER

Band	Channel	Configuration	Power Drift (dB)	E (V/m)	Modulation Factor	Category
CDMA 800	Ch 777	Slide Open	-0.15	109.9	1.0	M3
CDMA 1900	Ch 600	Slide Closed	0.059	58.0	1.0	M3

WORST CASE CONFIGURATION

Celluar	Configuration	E (V/m)	Modulation Factor	FCC M3 Limits (V/m)	Category
Ch 600	Slide Closed	65.7	1.0	63.1 to 112.2	M3

The probe rotation was done at the sub grid 7 for Channel 600, E field, Slide Closed Position



11. MEASUREMENT UNCERTAINTY

HAC Uncertainty Budget									
Error Description	Uncertainty value	Prob. Dist.	Div.	(ci) E	(ci) H	Std. Unc. E	Std. Unc. H	Squared E	Squared H
Measurement System									
Probe Calibration	5.1	N	1	1	1	5.1	5.1	26.0	26.0
Axial Isotropy	4.7	R	1.7321	1	1	2.7	2.7	7.4	7.4
Sensor Displacement	16.5	R	1.7321	1	0.145	9.5	1.4	90.7	1.9
Boundary Effects	2.4	R	1.7321	1	1	1.4	1.4	1.9	1.9
Linearity	4.7	R	1.7321	1	1	2.7	2.7	7.4	7.4
Scaling to Peak Envelope Power	2	R	1.7321	1	1	1.2	1.2	1.3	1.3
System Detection Limit	1	R	1.7321	1	1	0.6	0.6	0.3	0.3
Readout Electronics	0.3	N	1	1	1	0.3	0.3	0.1	0.1
Response Time	0.8	R	1.7321	1	1	0.5	0.5	0.2	0.2
Integration Time	2.6	R	1.7321	1	1	1.5	1.5	2.3	2.3
RF Ambient Conditions	3	R	1.7321	1	1	1.7	1.7	3.0	3.0
RF Reflections	12	R	1.7321	1	1	6.9	6.9	48.0	48.0
Probe Positioner	1.2	R	1.7321	1	0.67	0.7	0.5	0.5	0.2
Probe Positioning	4.7	R	1.7321	1	0.67	2.7	1.8	7.4	3.3
Extrap. And Interpolation	1	R	1.7321	1	1	0.6	0.6	0.3	0.3
Test Sample Related								0.0	0.0
Device Positioning Vertical	10	R	1.7321	1	0.67	2.7	1.8	7.4	3.3
Device Positioning Lateral	10	R	1.7321	1	1	0.6	0.6	0.3	0.3
Device Holder	2.4	R	1.7321	1	1	1.4	1.4	1.9	1.9
Power Drift	5	R	1.7321	1	1	2.9	2.9	8.3	8.3
Phantom and Setup Related								0.0	0.0
Phantom Thickness	2.4	R	1.7321	1	0.67	1.4	0.9	1.9	0.9
Combined Std. Uncertainty								16.6	12.8
Expanded Std. Uncertainty on Field (k=2)								33.2%	21.8%



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APPENDIX A: VALIDATIONS SCANS

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Number: 1819-01

Ver 2.0

Date/Time: 8/16/2006 1:45:42 PM

Test Laboratory: TCC Dallas

835MHz, E field, CW Validation

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

DASY4 Configuration:

- Probe: ER3DV4R - SN2240; ConvF(1, 1, 1); Calibrated: 1/24/2006
- Sensor-Surface: (Fix Surface)
- Electronics: DAE3 Sn389; Calibrated: 1/20/2006
- Phantom: HAC Test Arch 4.6; Phantom section: E Dipole Section
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

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 = 164.4 V/m

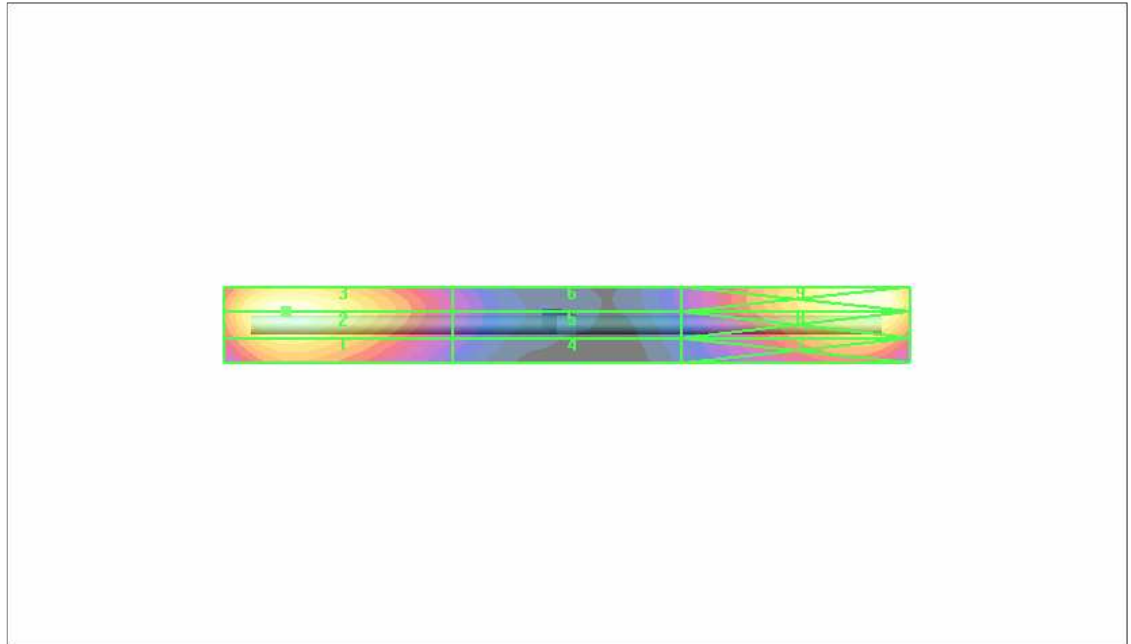
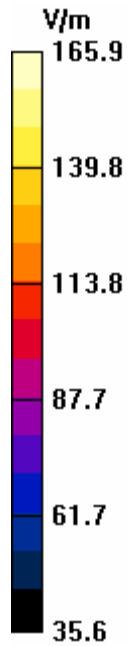
Probe Modulation Factor = 1.00

Reference Value = 95.6 V/m; Power Drift = -0.024 dB

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

Peak E-field in V/m

Grid 1	Grid 2	Grid 3
146.1	164.4	164.4
Grid 4	Grid 5	Grid 6
79.6	89.6	89.6
Grid 7	Grid 8	Grid 9
132.8	161.7	165.9



Date/Time: 8/25/2006 8:53:47 AM

Test Laboratory: TCC Dallas

835MHz, E field, CW Validation

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

DASY4 Configuration:

- Probe: ER3DV4R - SN2240; ConvF(1, 1, 1); Calibrated: 1/24/2006
- Sensor-Surface: (Fix Surface)
- Electronics: DAE3 Sn389; Calibrated: 1/20/2006
- Phantom: HAC Test Arch 4.6; Phantom section: E Dipole Section
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

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 = 164.5 V/m

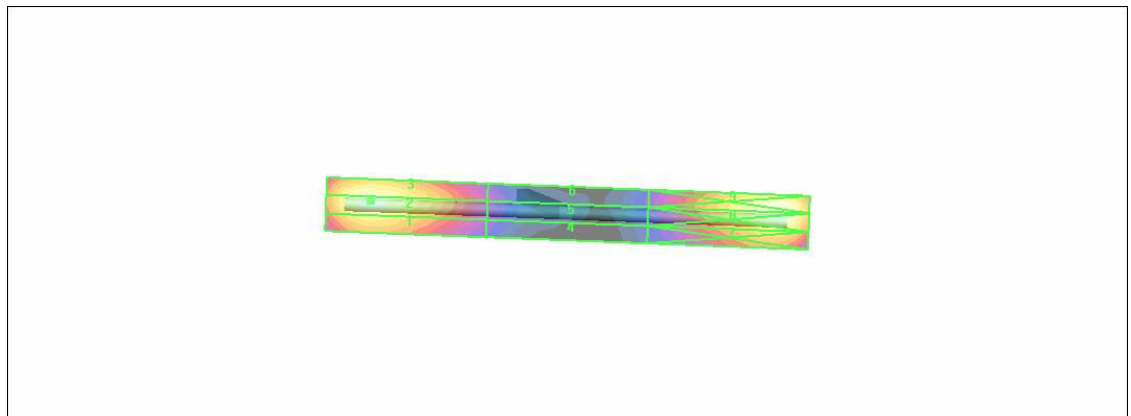
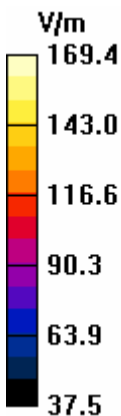
Probe Modulation Factor = 1.00

Reference Value = 103.7 V/m; Power Drift = -0.047 dB

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

Peak E-field in V/m

Grid 1 151.1	Grid 2 164.5	Grid 3 163.4
Grid 4 82.1	Grid 5 89.4	Grid 6 89.1
Grid 7 145.5	Grid 8 169.1	Grid 9 169.4



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Date/Time: 8/16/2006 2:02:40 PM

Test Laboratory: TCC Dallas

835MHz, H field, CW Validation

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

DASY4 Configuration:

- Probe: H3DV6 - SN6058; ; Calibrated: 1/24/2006
- Sensor-Surface: (Fix Surface)
- Electronics: DAE3 Sn389; Calibrated: 1/20/2006
- Phantom: HAC Test Arch 4.6; Phantom section: H Dipole Section
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

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 = 0.469 A/m

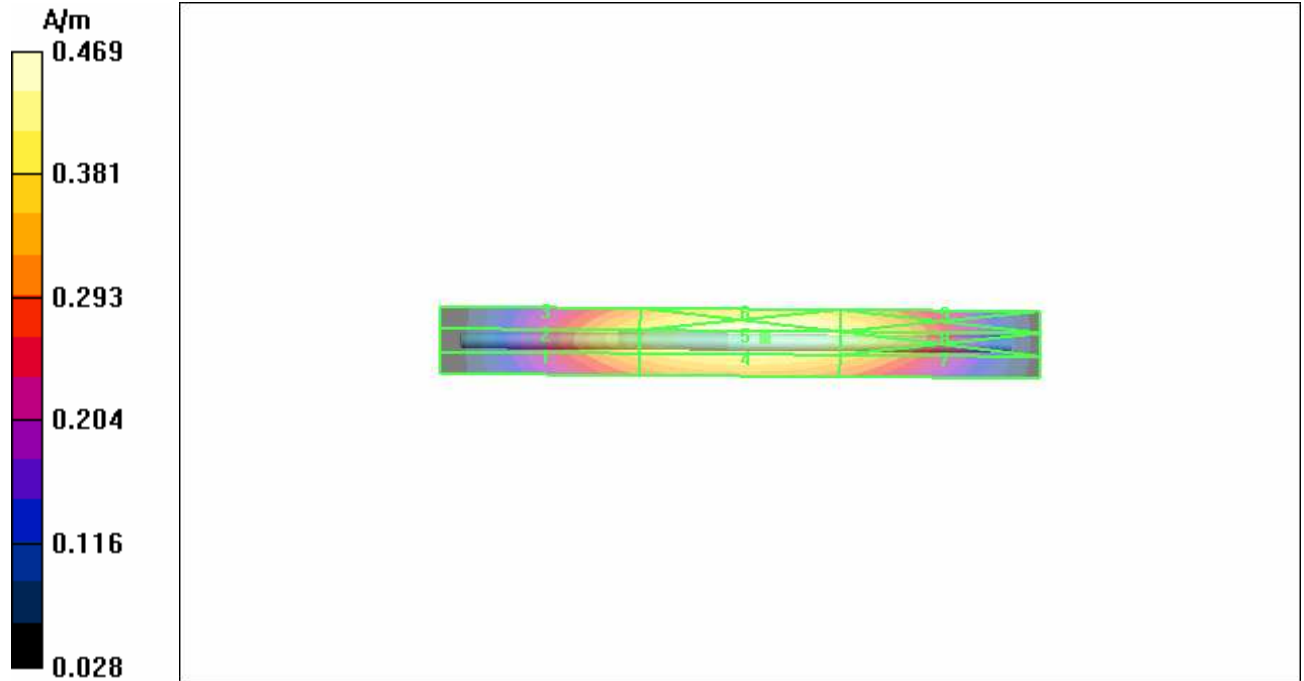
Probe Modulation Factor = 1.00

Reference Value = 0.493 A/m; Power Drift = -0.047 dB

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

Peak H-field in A/m

Grid 1	Grid 2	Grid 3
0.370	0.406	0.394
Grid 4	Grid 5	Grid 6
0.426	0.469	0.463
Grid 7	Grid 8	Grid 9
0.382	0.432	0.429



Date/Time: 8/25/2006 9:11:02 AM

Test Laboratory: TCC Dallas

835MHz, H field, CW Validation

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

DASY4 Configuration:

- Probe: H3DV6 - SN6058; ; Calibrated: 1/24/2006
- Sensor-Surface: (Fix Surface)
- Electronics: DAE3 Sn389; Calibrated: 1/20/2006
- Phantom: HAC Test Arch 4.6; Phantom section: H Dipole Section
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

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 = 0.460 A/m

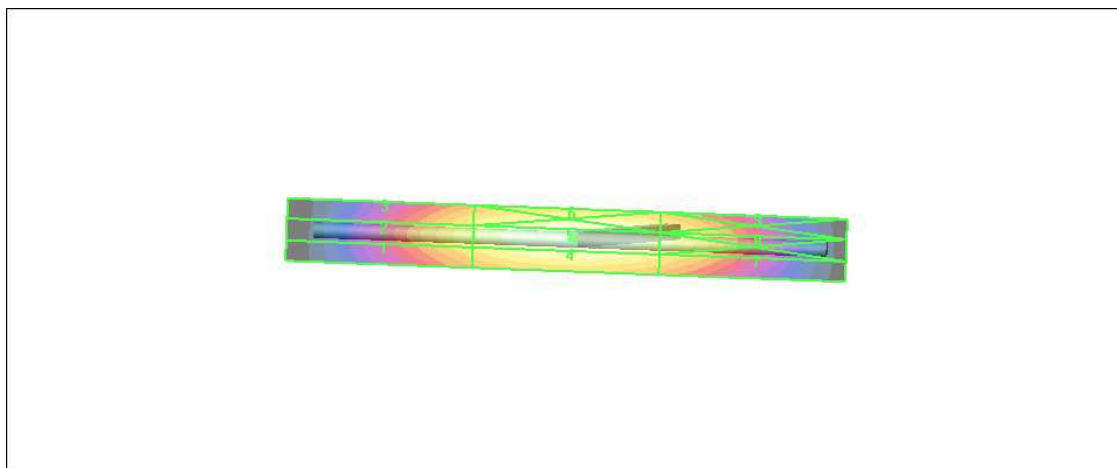
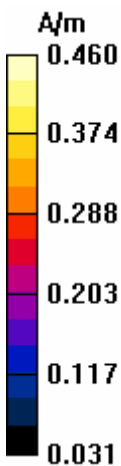
Probe Modulation Factor = 1.00

Reference Value = 0.492 A/m; Power Drift = 0.050 dB

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

Peak H-field in A/m

Grid 1	Grid 2	Grid 3
0.379	0.401	0.387
Grid 4	Grid 5	Grid 6
0.433	0.460	0.447
Grid 7	Grid 8	Grid 9
0.389	0.419	0.410



Date/Time: 8/16/2006 2:24:29 PM

Test Laboratory: TCC Dallas

1880MHz, E field, CW Validation

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

DASY4 Configuration:

- Probe: ER3DV4R - SN2240; ConvF(1, 1, 1); Calibrated: 1/24/2006
- Sensor-Surface: (Fix Surface)
- Electronics: DAE3 Sn389; Calibrated: 1/20/2006
- Phantom: HAC Test Arch 4.6; Phantom section: E Dipole Section
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

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 = 131.0 V/m

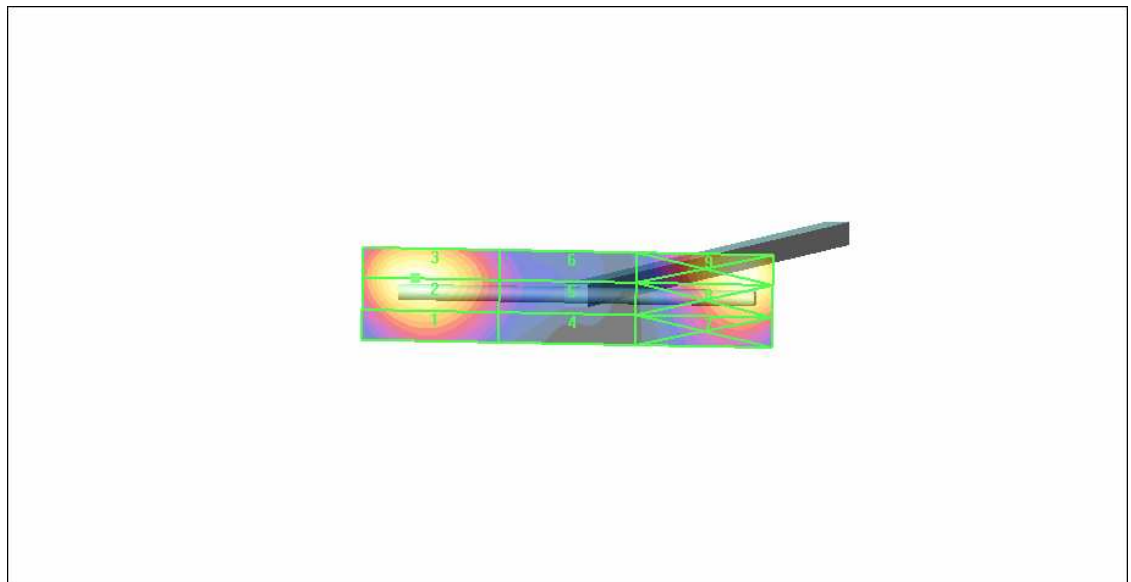
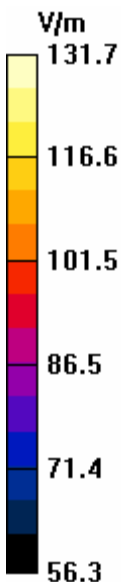
Probe Modulation Factor = 1.00

Reference Value = 135.4 V/m; Power Drift = -0.004 dB

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

Peak E-field in V/m

Grid 1 114.9	Grid 2 131.0	Grid 3 131.0
Grid 4 82.8	Grid 5 89.4	Grid 6 89.2
Grid 7 106.9	Grid 8 130.1	Grid 9 131.7



Date/Time: 8/25/2006 9:46:03 AM

Test Laboratory: TCC Dallas

1880MHz, E field, CW Validation

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

DASY4 Configuration:

- Probe: ER3DV4R - SN2240; ConvF(1, 1, 1); Calibrated: 1/24/2006

- Sensor-Surface: (Fix Surface)

- Electronics: DAE3 Sn389; Calibrated: 1/20/2006

- Phantom: HAC Test Arch 4.6; Phantom section: E Dipole Section

- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

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 = 127.3 V/m

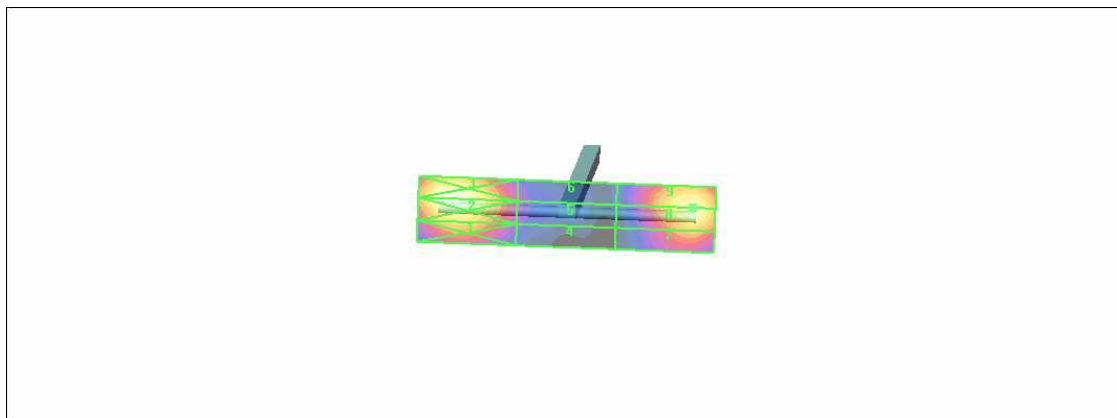
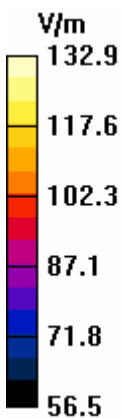
Probe Modulation Factor = 1.00

Reference Value = 137.7 V/m; Power Drift = 0.003 dB

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

Peak E-field in V/m

Grid 1	Grid 2	Grid 3
115.4	132.9	132.9
Grid 4	Grid 5	Grid 6
81.0	86.9	86.7
Grid 7	Grid 8	Grid 9
110.7	127.3	127.3



Date/Time: 8/16/2006 2:15:30 PM

Test Laboratory: TCC Dallas

1880MHz, H field, CW Validation

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

- Probe: H3DV6 - SN6058; ; Calibrated: 1/24/2006

- Sensor-Surface: (Fix Surface)

- Electronics: DAE3 Sn389; Calibrated: 1/20/2006

- Phantom: HAC Test Arch 4.6; Phantom section: H Dipole Section

- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

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 = 0.452 A/m

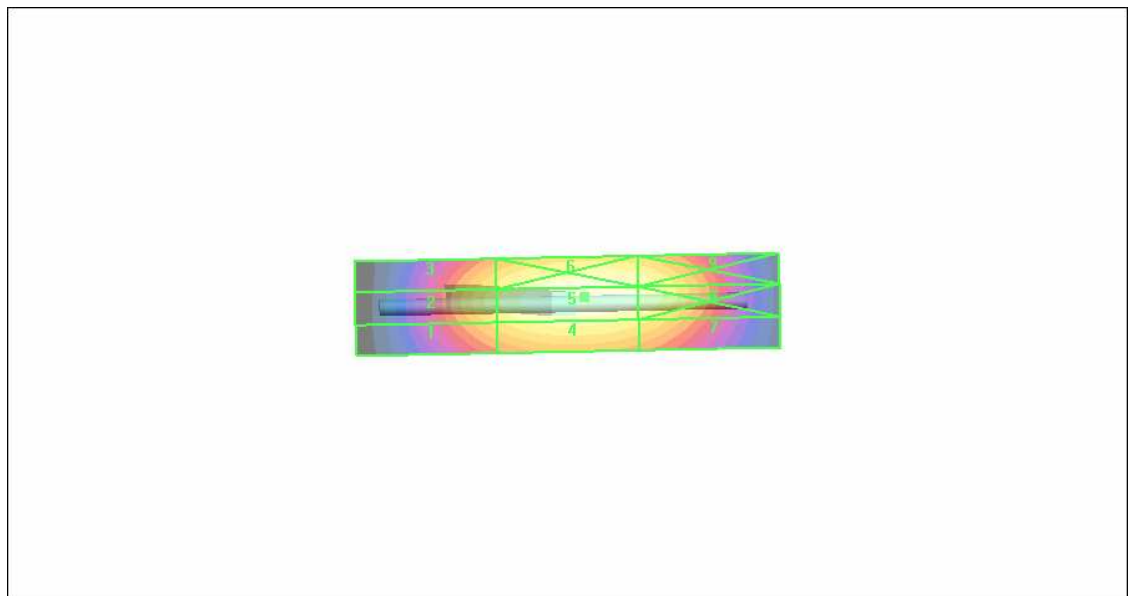
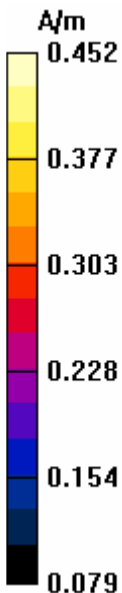
Probe Modulation Factor = 1.00

Reference Value = 0.469 A/m; Power Drift = -0.036 dB

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

Peak H-field in A/m

Grid 1	Grid 2	Grid 3
0.370	0.399	0.389
Grid 4	Grid 5	Grid 6
0.417	0.452	0.445
Grid 7	Grid 8	Grid 9
0.392	0.433	0.428



Date/Time: 8/25/2006 9:28:55 AM

Test Laboratory: TCC Dallas

1880MHz, H field, CW Validation

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

DASY4 Configuration:

- Probe: H3DV6 - SN6058; ; Calibrated: 1/24/2006
- Sensor-Surface: (Fix Surface)
- Electronics: DAE3 Sn389; Calibrated: 1/20/2006
- Phantom: HAC Test Arch 4.6; Phantom section: H Dipole Section
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

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 = 0.449 A/m

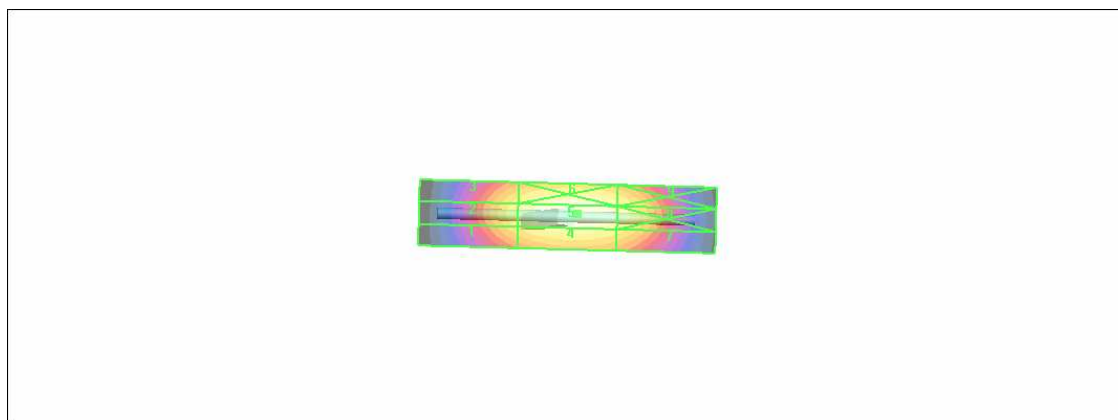
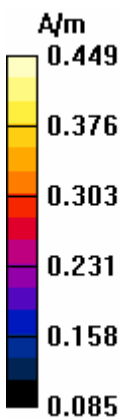
Probe Modulation Factor = 1.00

Reference Value = 0.471 A/m; Power Drift = -0.009 dB

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

Peak H-field in A/m

Grid 1	Grid 2	Grid 3
0.378	0.404	0.393
Grid 4	Grid 5	Grid 6
0.418	0.449	0.437
Grid 7	Grid 8	Grid 9
0.393	0.424	0.413





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APPENDIX B: MEASUREMENT SCANS



Date/Time: 8/22/2006 12:07:47 PM

Test Laboratory: TCC Dallas

RM-66, CDMA 800, Ch 1013, E field, Slide Closed Position

Communication System: CDMA800; Frequency: 824.7 MHz; Duty Cycle: 1:1
DASY4 Configuration:

- Probe: ER3DV4R - SN2240; ConvF(1, 1, 1); Calibrated: 1/24/2006
- Sensor-Surface: (Fix Surface)
- Electronics: DAE3 Sn389; Calibrated: 1/20/2006
- Phantom: HAC Test Arch 4.6; Phantom section: E Device Section
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

E Scan - ER probe center 10mm above Device Reference/Hearing Aid Compatibility Test (251x251x1): Measurement grid:
dx=2mm, dy=2mm

Maximum value of peak Total field = 69.5 V/m

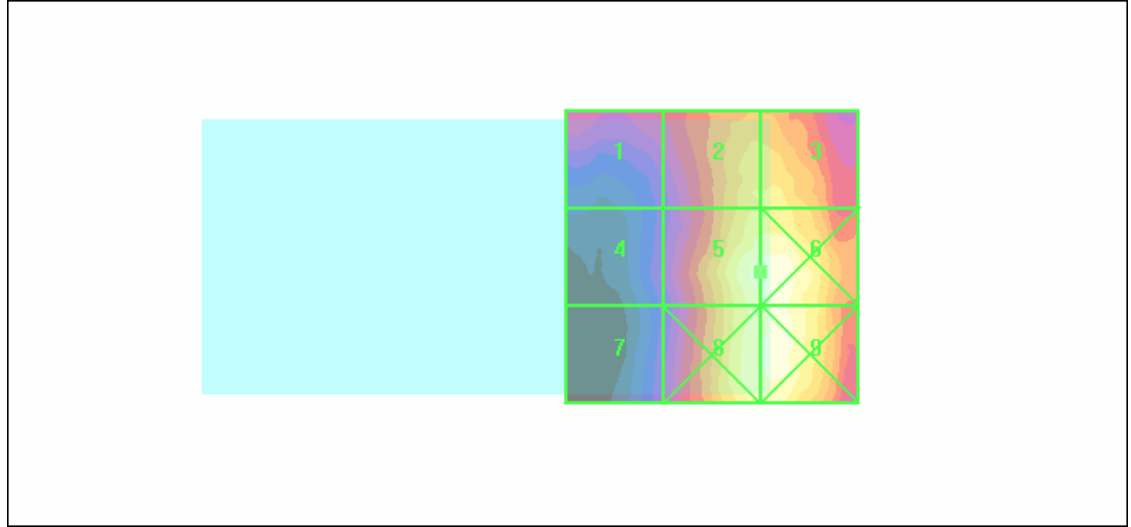
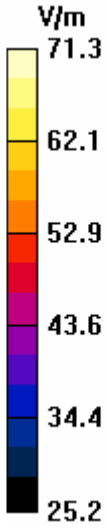
Probe Modulation Factor = 1.00

Reference Value = 56.2 V/m; Power Drift = 0.317 dB

Hearing Aid Near-Field Category: M3 (AWF 0 dB)

Peak E-field in V/m

Grid 1	Grid 2	Grid 3
47.2	62.4	63.5
Grid 4	Grid 5	Grid 6
41.6	69.5	71.3
Grid 7	Grid 8	Grid 9
40.6	68.6	69.6





Date/Time: 8/22/2006 10:27:53 AM

Test Laboratory: TCC Dallas

RM-66, CDMA 800, Ch 1013, E field, Slide Open Position

Communication System: CDMA800; Frequency: 824.7 MHz; Duty Cycle: 1:1
DASY4 Configuration:

- Probe: ER3DV4R - SN2240; ConvF(1, 1, 1); Calibrated: 1/24/2006
- Sensor-Surface: (Fix Surface)
- Electronics: DAE3 Sn389; Calibrated: 1/20/2006
- Phantom: HAC Test Arch 4.6; Phantom section: E Device Section
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

E Scan - ER probe center 10mm above Device Reference/Hearing Aid Compatibility Test (251x251x1): Measurement grid:
dx=2mm, dy=2mm

Maximum value of peak Total field = 95.0 V/m

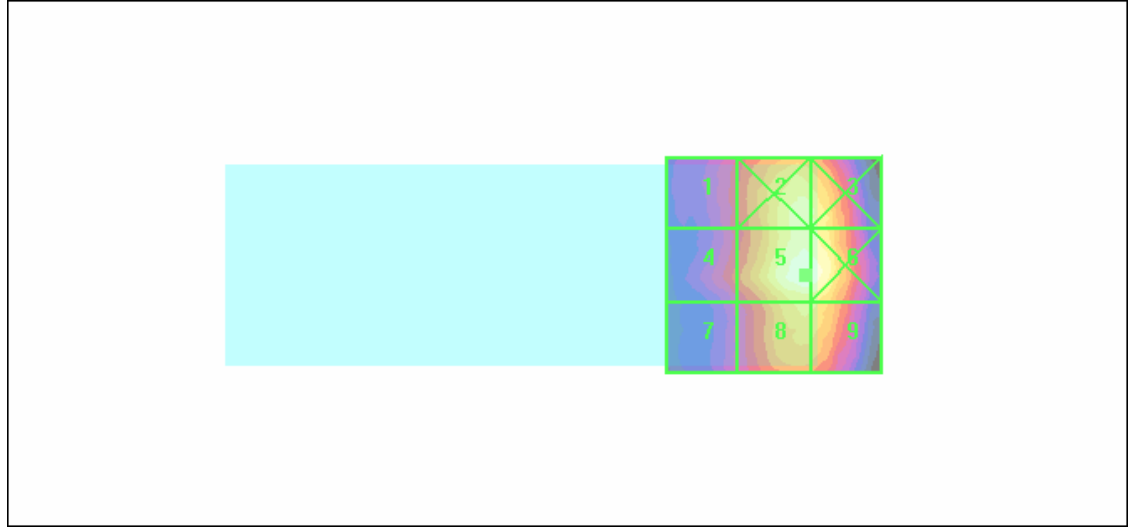
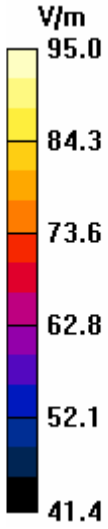
Probe Modulation Factor = 1.00

Reference Value = 86.4 V/m; Power Drift = 0.099 dB

Hearing Aid Near-Field Category: M3 (AWF 0 dB)

Peak E-field in V/m

Grid 1	Grid 2	Grid 3
70.0	90.5	89.9
Grid 4	Grid 5	Grid 6
72.9	95.0	94.6
Grid 7	Grid 8	Grid 9
66.2	86.8	86.3





Date/Time: 8/22/2006 11:46:24 AM

Test Laboratory: TCC Dallas

RM-66, CDMA 800, Ch 384, E field, Slide Closed Position

Communication System: CDMA800; Frequency: 836.52 MHz; Duty Cycle: 1:1
DASY4 Configuration:

- Probe: ER3DV4R - SN2240; ConvF(1, 1, 1); Calibrated: 1/24/2006
- Sensor-Surface: (Fix Surface)
- Electronics: DAE3 Sn389; Calibrated: 1/20/2006
- Phantom: HAC Test Arch 4.6; Phantom section: E Device Section
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

E Scan - ER probe center 10mm above Device Reference/Hearing Aid Compatibility Test (251x251x1): Measurement grid:
dx=2mm, dy=2mm

Maximum value of peak Total field = 77.8 V/m

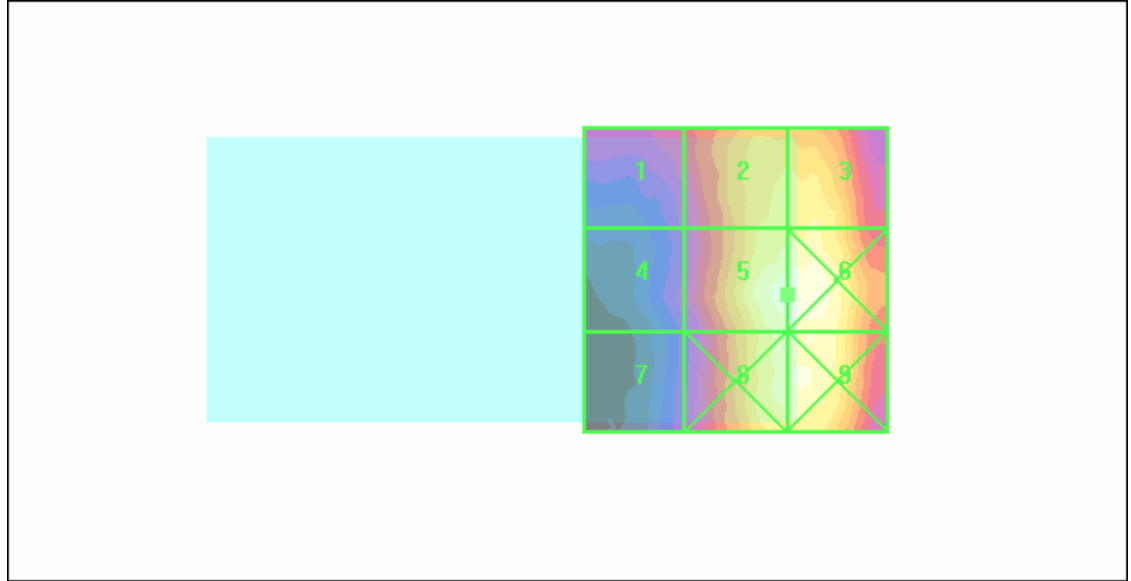
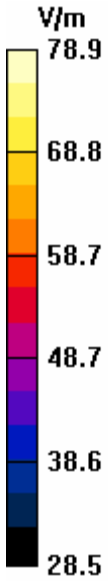
Probe Modulation Factor = 1.00

Reference Value = 65.6 V/m; Power Drift = 0.012 dB

Hearing Aid Near-Field Category: M3 (AWF 0 dB)

Peak E-field in V/m

Grid 1	Grid 2	Grid 3
52.9	71.9	72.9
Grid 4	Grid 5	Grid 6
48.2	77.8	78.9
Grid 7	Grid 8	Grid 9
45.5	74.9	76.6





Date/Time: 8/22/2006 10:06:50 AM

Test Laboratory: TCC Dallas

RM-66, CDMA 800, Ch 384, E field, Slide Open Position

Communication System: CDMA800; Frequency: 836.52 MHz; Duty Cycle: 1:1
DASY4 Configuration:

- Probe: ER3DV4R - SN2240; ConvF(1, 1, 1); Calibrated: 1/24/2006
- Sensor-Surface: (Fix Surface)
- Electronics: DAE3 Sn389; Calibrated: 1/20/2006
- Phantom: HAC Test Arch 4.6; Phantom section: E Device Section
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

E Scan - ER probe center 10mm above Device Reference/Hearing Aid Compatibility Test (251x251x1): Measurement grid:
dx=2mm, dy=2mm

Maximum value of peak Total field = 98.3 V/m

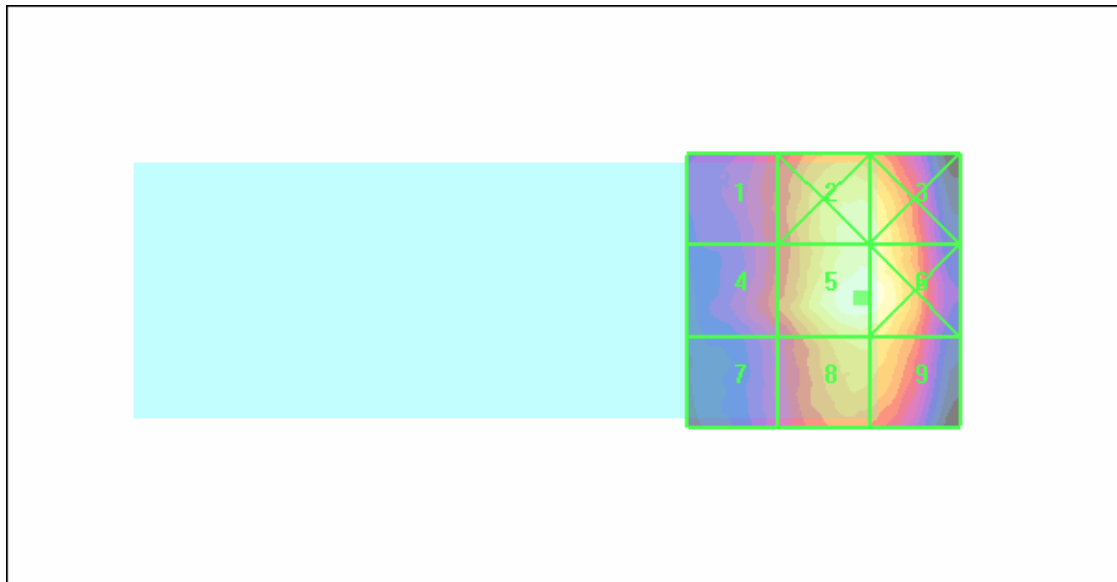
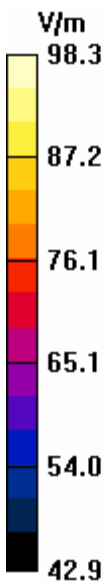
Probe Modulation Factor = 1.00

Reference Value = 91.1 V/m; Power Drift = -0.088 dB

Hearing Aid Near-Field Category: M3 (AWF 0 dB)

Peak E-field in V/m

Grid 1	Grid 2	Grid 3
74.2	93.5	92.9
Grid 4	Grid 5	Grid 6
76.4	98.3	97.7
Grid 7	Grid 8	Grid 9
68.0	89.4	88.3





Date/Time: 8/22/2006 12:30:13 PM

Test Laboratory: TCC Dallas

RM-66, CDMA 800, Ch 777, E field, Slide Closed Position

Communication System: CDMA800; Frequency: 848.31 MHz; Duty Cycle: 1:1
DASY4 Configuration:

- Probe: ER3DV4R - SN2240; ConvF(1, 1, 1); Calibrated: 1/24/2006
- Sensor-Surface: (Fix Surface)
- Electronics: DAE3 Sn389; Calibrated: 1/20/2006
- Phantom: HAC Test Arch 4.6; Phantom section: E Device Section
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

E Scan - ER probe center 10mm above Device Reference/Hearing Aid Compatibility Test (251x251x1): Measurement grid:
dx=2mm, dy=2mm

Maximum value of peak Total field = 88.5 V/m

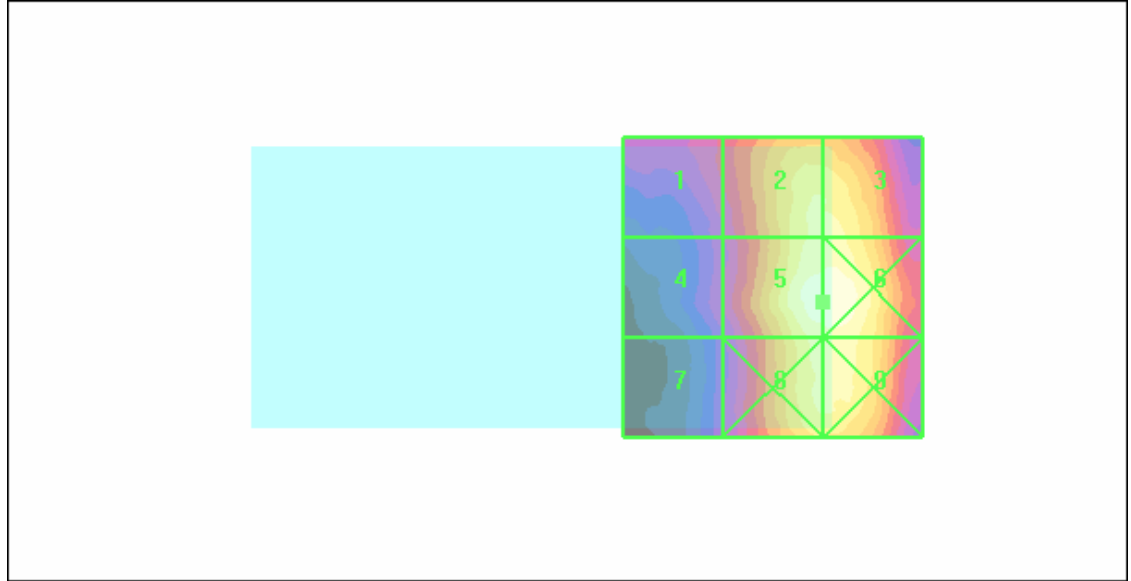
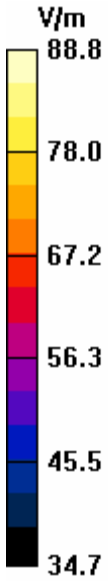
Probe Modulation Factor = 1.00

Reference Value = 75.8 V/m; Power Drift = 0.024 dB

Hearing Aid Near-Field Category: M3 (AWF 0 dB)

Peak E-field in V/m

Grid 1	Grid 2	Grid 3
61.4	83.3	83.2
Grid 4	Grid 5	Grid 6
56.9	88.5	88.8
Grid 7	Grid 8	Grid 9
52.5	84.1	84.6





Date/Time: 8/22/2006 10:48:21 AM

Test Laboratory: TCC Dallas

RM-66, CDMA 800, Ch 777, E field, Slide Open Position

Communication System: CDMA800; Frequency: 848.31 MHz; Duty Cycle: 1:1
DASY4 Configuration:

- Probe: ER3DV4R - SN2240; ConvF(1, 1, 1); Calibrated: 1/24/2006
- Sensor-Surface: (Fix Surface)
- Electronics: DAE3 Sn389; Calibrated: 1/20/2006
- Phantom: HAC Test Arch 4.6; Phantom section: E Device Section
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

E Scan - ER probe center 10mm above Device Reference/Hearing Aid Compatibility Test (251x251x1): Measurement grid:
dx=2mm, dy=2mm

Maximum value of peak Total field = 105.5 V/m

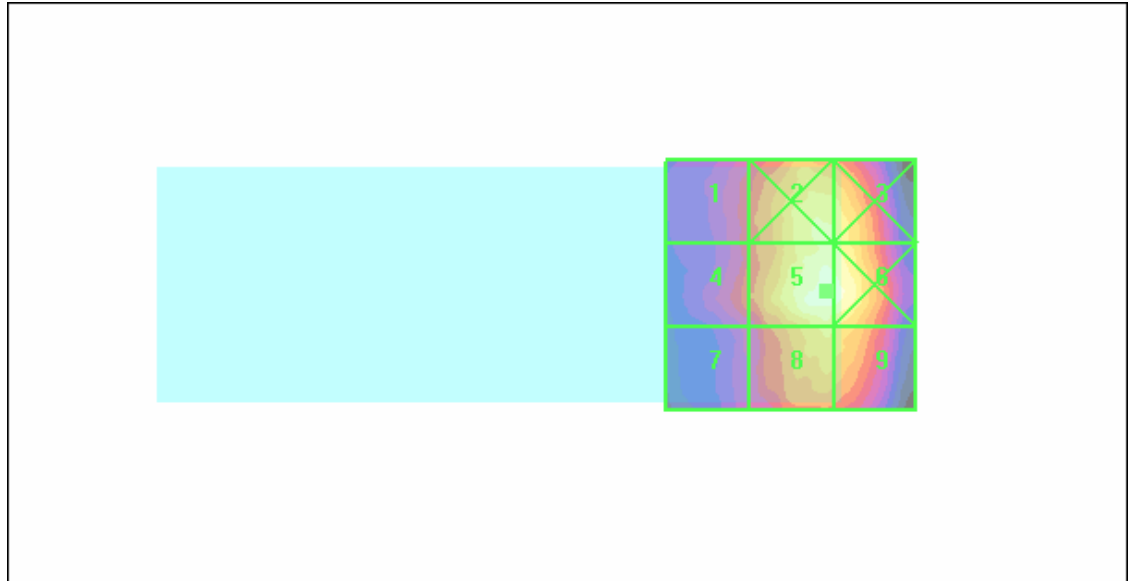
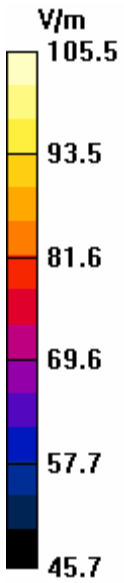
Probe Modulation Factor = 1.00

Reference Value = 97.0 V/m; Power Drift = -0.073 dB

Hearing Aid Near-Field Category: M3 (AWF 0 dB)

Peak E-field in V/m

Grid 1	Grid 2	Grid 3
78.2	99.0	98.6
Grid 4	Grid 5	Grid 6
81.6	105.5	103.7
Grid 7	Grid 8	Grid 9
72.4	95.6	94.4





Date/Time: 8/21/2006 3:20:19 PM

Test Laboratory: TCC Dallas

RM-66, CDMA 800, Ch 1013, H field, Slide Closed Position

Communication System: CDMA800; Frequency: 824.7 MHz; Duty Cycle: 1:1
DASY4 Configuration:

- Probe: H3DV6 - SN6058; ; Calibrated: 1/24/2006
- Sensor-Surface: (Fix Surface)
- Electronics: DAE3 Sn389; Calibrated: 1/20/2006
- Phantom: HAC Test Arch 4.6; Phantom section: H Device Section
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

H Scan - H3DV6 probe center 10mm above Device Reference/Hearing Aid Compatibility Test (251x251x1): Measurement grid: dx=2mm, dy=2mm

Maximum value of peak Total field = 0.230 A/m

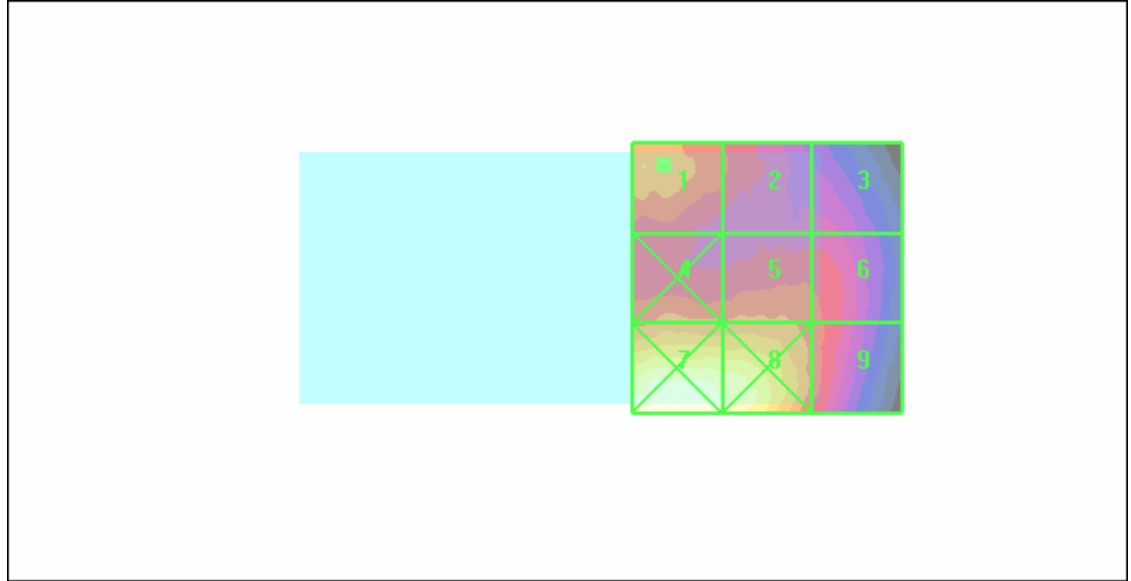
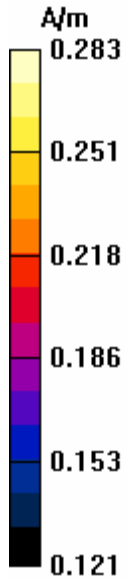
Probe Modulation Factor = 1.00

Reference Value = 0.201 A/m; Power Drift = 0.053 dB

Hearing Aid Near-Field Category: M3 (AWF 0 dB)

Peak H-field in A/m

Grid 1	Grid 2	Grid 3
0.230	0.212	0.192
Grid 4	Grid 5	Grid 6
0.225	0.223	0.212
Grid 7	Grid 8	Grid 9
0.283	0.274	0.216





Date/Time: 8/21/2006 11:37:48 AM

Test Laboratory: TCC Dallas

RM-66, CDMA 800, Ch 1013, H field, Slide Open Position

Communication System: CDMA800; Frequency: 824.7 MHz; Duty Cycle: 1:1
DASY4 Configuration:

- Probe: H3DV6 - SN6058; ; Calibrated: 1/24/2006
- Sensor-Surface: (Fix Surface)
- Electronics: DAE3 Sn389; Calibrated: 1/20/2006
- Phantom: HAC Test Arch 4.6; Phantom section: H Device Section
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

H Scan - H3DV6 probe center 10mm above Device Reference/Hearing Aid Compatibility Test (251x251x1): Measurement grid: dx=2mm, dy=2mm

Maximum value of peak Total field = 0.130 A/m

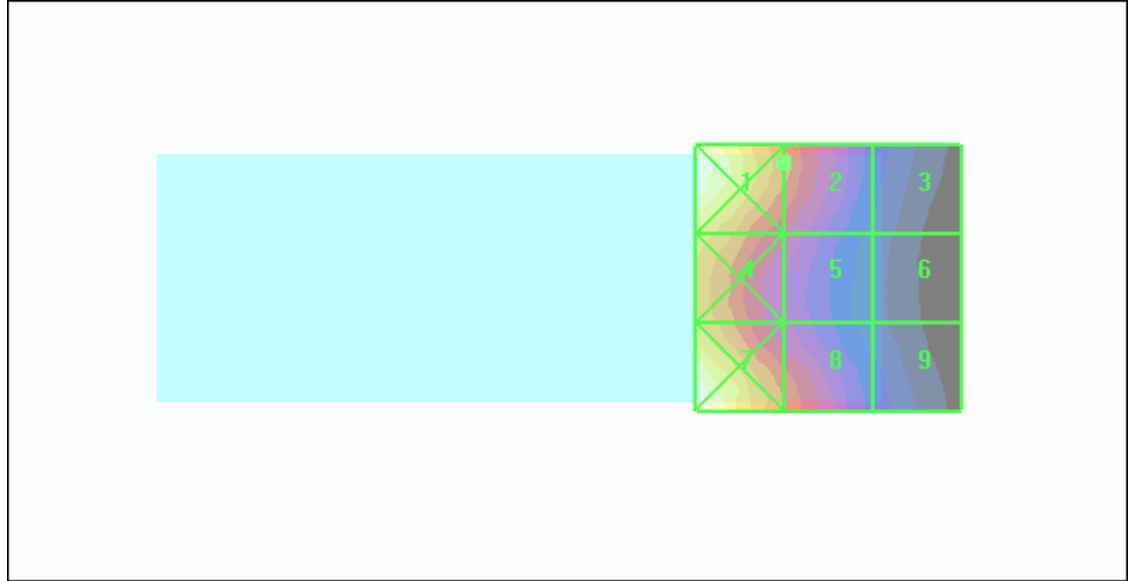
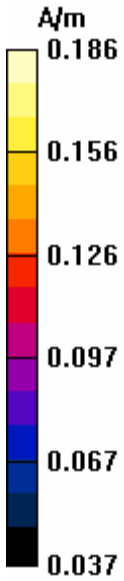
Probe Modulation Factor = 1.00

Reference Value = 0.079 A/m; Power Drift = 0.073 dB

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

Peak H-field in A/m

Grid 1	Grid 2	Grid 3
0.184	0.130	0.074
Grid 4	Grid 5	Grid 6
0.155	0.109	0.063
Grid 7	Grid 8	Grid 9
0.186	0.126	0.073





Date/Time: 8/21/2006 2:59:47 PM

Test Laboratory: TCC Dallas

RM-66, CDMA 800, Ch 384, H field, Slide Closed Position

Communication System: CDMA800; Frequency: 836.52 MHz; Duty Cycle: 1:1
DASY4 Configuration:

- Probe: H3DV6 - SN6058; ; Calibrated: 1/24/2006
- Sensor-Surface: (Fix Surface)
- Electronics: DAE3 Sn389; Calibrated: 1/20/2006
- Phantom: HAC Test Arch 4.6; Phantom section: H Device Section
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

H Scan - H3DV6 probe center 10mm above Device Reference/Hearing Aid Compatibility Test (251x251x1): Measurement grid: dx=2mm, dy=2mm

Maximum value of peak Total field = 0.237 A/m

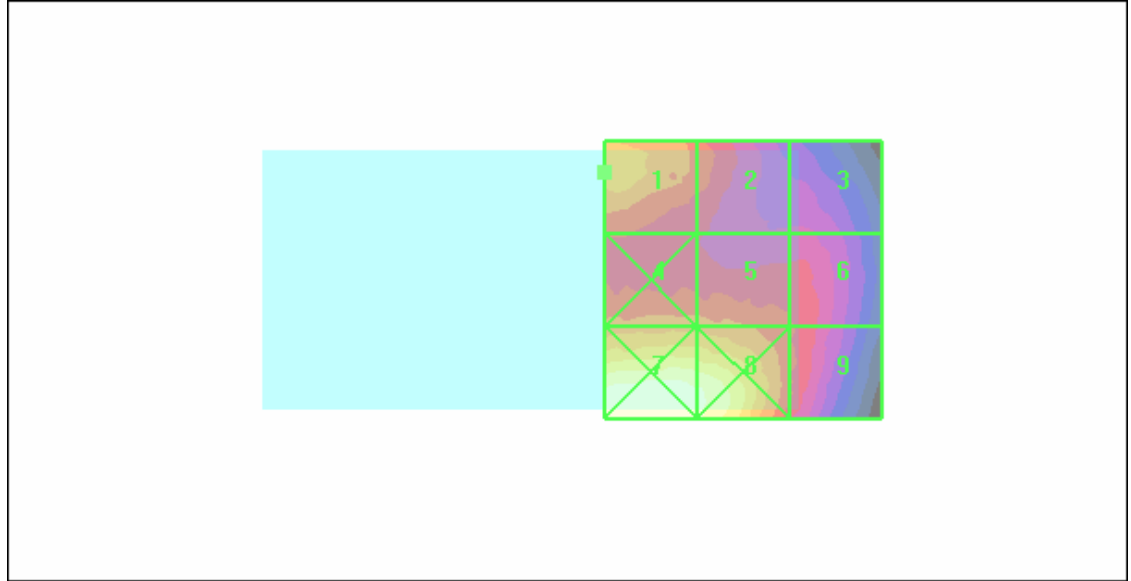
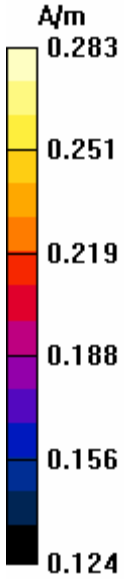
Probe Modulation Factor = 1.00

Reference Value = 0.201 A/m; Power Drift = -0.052 dB

Hearing Aid Near-Field Category: M3 (AWF 0 dB)

Peak H-field in A/m

Grid 1	Grid 2	Grid 3
0.237	0.217	0.190
Grid 4	Grid 5	Grid 6
0.227	0.227	0.210
Grid 7	Grid 8	Grid 9
0.283	0.278	0.213





Date/Time: 8/21/2006 10:41:55 AM

Test Laboratory: TCC Dallas

RM-66, CDMA 800, Ch 384, H field, Slide Open Position

Communication System: CDMA800; Frequency: 836.52 MHz; Duty Cycle: 1:1
DASY4 Configuration:

- Probe: H3DV6 - SN6058; ; Calibrated: 1/24/2006
- Sensor-Surface: (Fix Surface)
- Electronics: DAE3 Sn389; Calibrated: 1/20/2006
- Phantom: HAC Test Arch 4.6; Phantom section: H Device Section
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

H Scan - H3DV6 probe center 10mm above Device Reference/Hearing Aid Compatibility Test (251x251x1): Measurement grid: dx=2mm, dy=2mm

Maximum value of peak Total field = 0.124 A/m

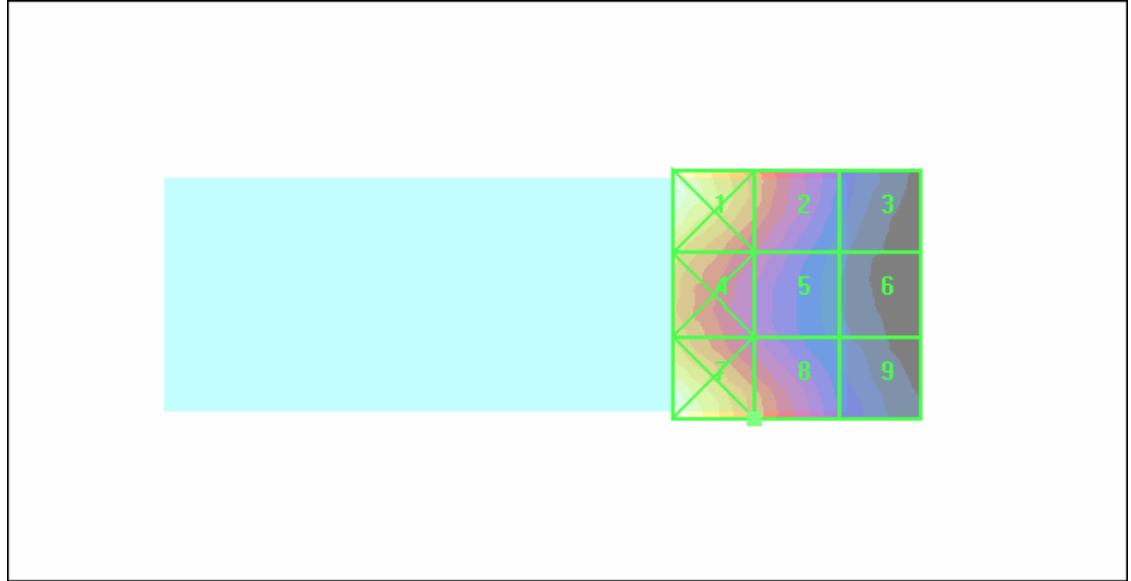
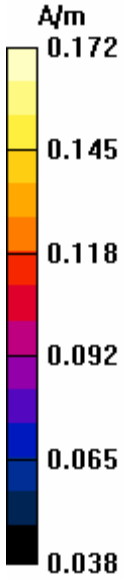
Probe Modulation Factor = 1.00

Reference Value = 0.073 A/m; Power Drift = 0.348 dB

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

Peak H-field in A/m

Grid 1 0.171	Grid 2 0.124	Grid 3 0.074
Grid 4 0.142	Grid 5 0.102	Grid 6 0.061
Grid 7 0.172	Grid 8 0.124	Grid 9 0.077





Date/Time: 8/21/2006 3:51:02 PM

Test Laboratory: TCC Dallas

RM-66, CDMA 800, Ch 777, H field, Slide Closed Position

Communication System: CDMA800; Frequency: 848.31 MHz; Duty Cycle: 1:1
DASY4 Configuration:

- Probe: H3DV6 - SN6058; ; Calibrated: 1/24/2006
- Sensor-Surface: (Fix Surface)
- Electronics: DAE3 Sn389; Calibrated: 1/20/2006
- Phantom: HAC Test Arch 4.6; Phantom section: H Device Section
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

H Scan - H3DV6 probe center 10mm above Device Reference/Hearing Aid Compatibility Test (251x251x1): Measurement grid: dx=2mm, dy=2mm

Maximum value of peak Total field = 0.246 A/m

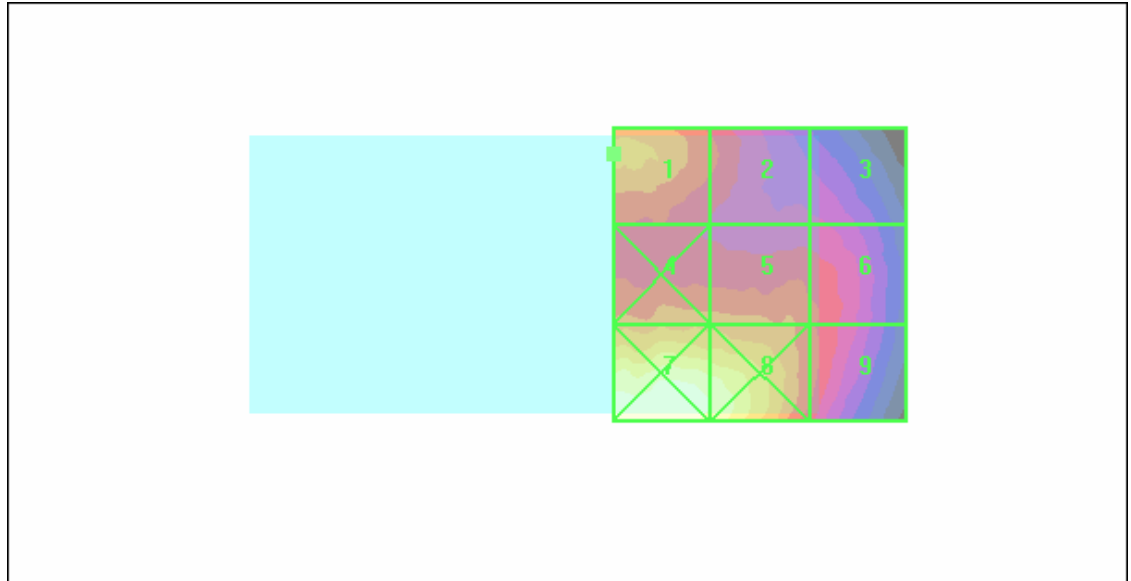
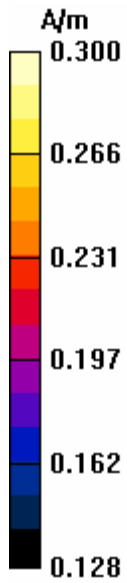
Probe Modulation Factor = 1.00

Reference Value = 0.215 A/m; Power Drift = -0.063 dB

Hearing Aid Near-Field Category: M3 (AWF 0 dB)

Peak H-field in A/m

Grid 1	Grid 2	Grid 3
0.246	0.224	0.201
Grid 4	Grid 5	Grid 6
0.241	0.239	0.224
Grid 7	Grid 8	Grid 9
0.300	0.289	0.226





Date/Time: 8/21/2006 11:58:39 AM

Test Laboratory: TCC Dallas

RM-66, CDMA 800, Ch 777, H field, Slide Open Position

Communication System: CDMA800; Frequency: 848.31 MHz; Duty Cycle: 1:1
DASY4 Configuration:

- Probe: H3DV6 - SN6058; ; Calibrated: 1/24/2006
- Sensor-Surface: (Fix Surface)
- Electronics: DAE3 Sn389; Calibrated: 1/20/2006
- Phantom: HAC Test Arch 4.6; Phantom section: H Device Section
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

H Scan - H3DV6 probe center 10mm above Device Reference/Hearing Aid Compatibility Test (251x251x1): Measurement grid: dx=2mm, dy=2mm

Maximum value of peak Total field = 0.135 A/m

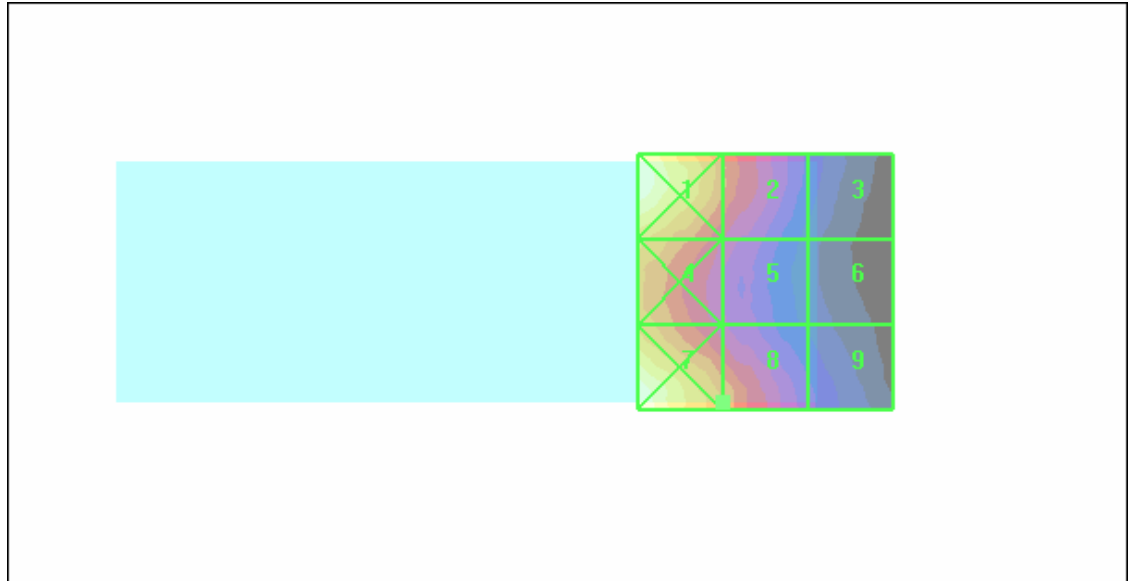
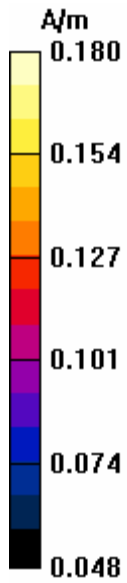
Probe Modulation Factor = 1.00

Reference Value = 0.083 A/m; Power Drift = -0.051 dB

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

Peak H-field in A/m

Grid 1 0.178	Grid 2 0.131	Grid 3 0.082
Grid 4 0.149	Grid 5 0.110	Grid 6 0.073
Grid 7 0.180	Grid 8 0.135	Grid 9 0.087





Date/Time: 8/22/2006 9:30:09 AM

Test Laboratory: TCC Dallas

RM-66, CDMA 1900, Ch 25, E field, Slide Closed Position

Communication System: CDMA1900; Frequency: 1851.25 MHz; Duty Cycle: 1:1
DASY4 Configuration:

- Probe: ER3DV4R - SN2240; ConvF(1, 1, 1); Calibrated: 1/24/2006
- Sensor-Surface: (Fix Surface)
- Electronics: DAE3 Sn389; Calibrated: 1/20/2006
- Phantom: HAC Test Arch 4.6; Phantom section: E Device Section
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

E Scan - ER probe center 10mm above Device Reference/Hearing Aid Compatibility Test (251x251x1): Measurement grid:
dx=2mm, dy=2mm

Maximum value of peak Total field = 50.6 V/m

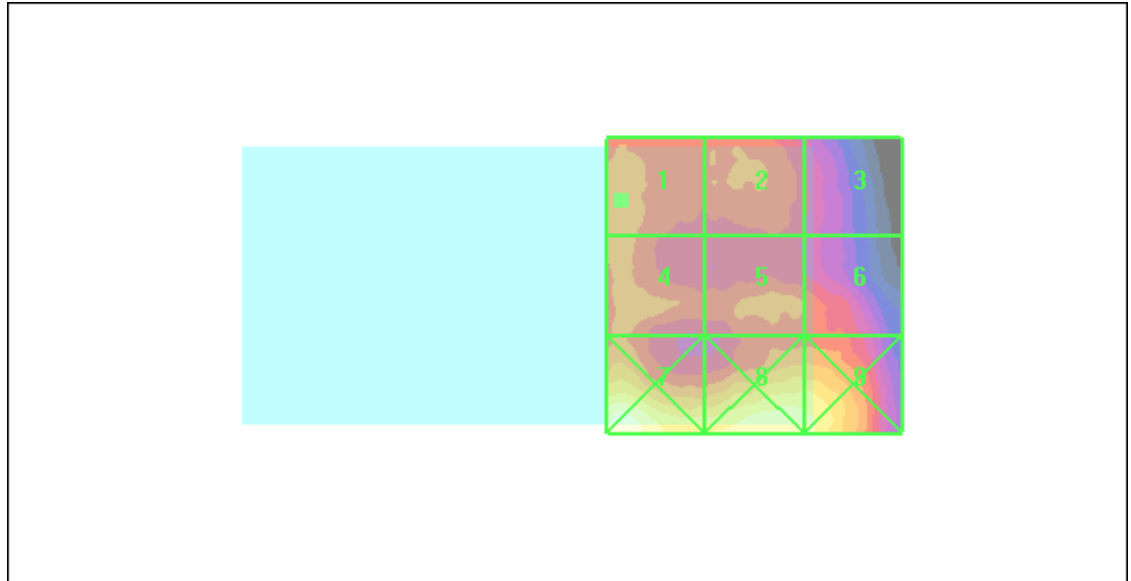
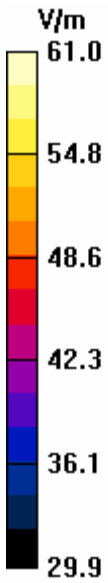
Probe Modulation Factor = 1.00

Reference Value = 46.1 V/m; Power Drift = 0.150 dB

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

Peak E-field in V/m

Grid 1	Grid 2	Grid 3
50.6	49.1	45.5
Grid 4	Grid 5	Grid 6
50.3	49.8	48.6
Grid 7	Grid 8	Grid 9
61.0	58.8	58.0





Date/Time: 8/22/2006 8:03:37 AM

Test Laboratory: TCC Dallas

RM-66, CDMA 1900, Ch 25, E field, Slide Open PositionCommunication System: CDMA1900; Frequency: 1851.25 MHz; Duty Cycle: 1:1
DASY4 Configuration:

- Probe: ER3DV4R - SN2240; ConvF(1, 1, 1); Calibrated: 1/24/2006
- Sensor-Surface: (Fix Surface)
- Electronics: DAE3 Sn389; Calibrated: 1/20/2006
- Phantom: HAC Test Arch 4.6; Phantom section: E Device Section
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

E Scan - ER probe center 10mm above Device Reference/Hearing Aid Compatibility Test (251x251x1): Measurement grid:
dx=2mm, dy=2mm

Maximum value of peak Total field = 50.3 V/m

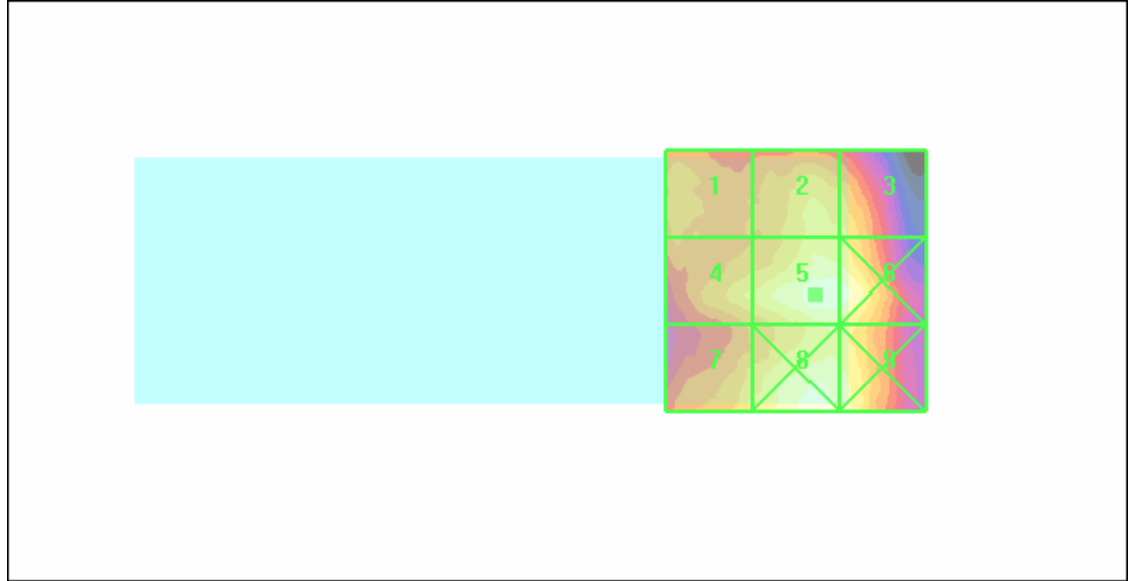
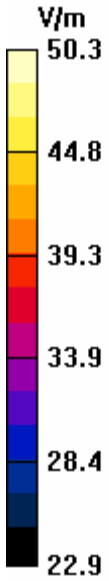
Probe Modulation Factor = 1.00

Reference Value = 47.7 V/m; Power Drift = 0.086 dB

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

Peak E-field in V/m

Grid 1	Grid 2	Grid 3
42.7	46.0	45.6
Grid 4	Grid 5	Grid 6
45.2	50.3	49.6
Grid 7	Grid 8	Grid 9
45.1	49.3	48.0





Date/Time: 8/22/2006 9:09:13 AM

Test Laboratory: TCC Dallas

RM-66, CDMA 1900, Ch 600, E field, Slide Closed Position

Communication System: CDMA1900; Frequency: 1880 MHz; Duty Cycle: 1:1
DASY4 Configuration:

- Probe: ER3DV4R - SN2240; ConvF(1, 1, 1); Calibrated: 1/24/2006
- Sensor-Surface: (Fix Surface)
- Electronics: DAE3 Sn389; Calibrated: 1/20/2006
- Phantom: HAC Test Arch 4.6; Phantom section: E Device Section
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

E Scan - ER probe center 10mm above Device Reference/Hearing Aid Compatibility Test (251x251x1): Measurement grid:
dx=2mm, dy=2mm

Maximum value of peak Total field = 51.9 V/m

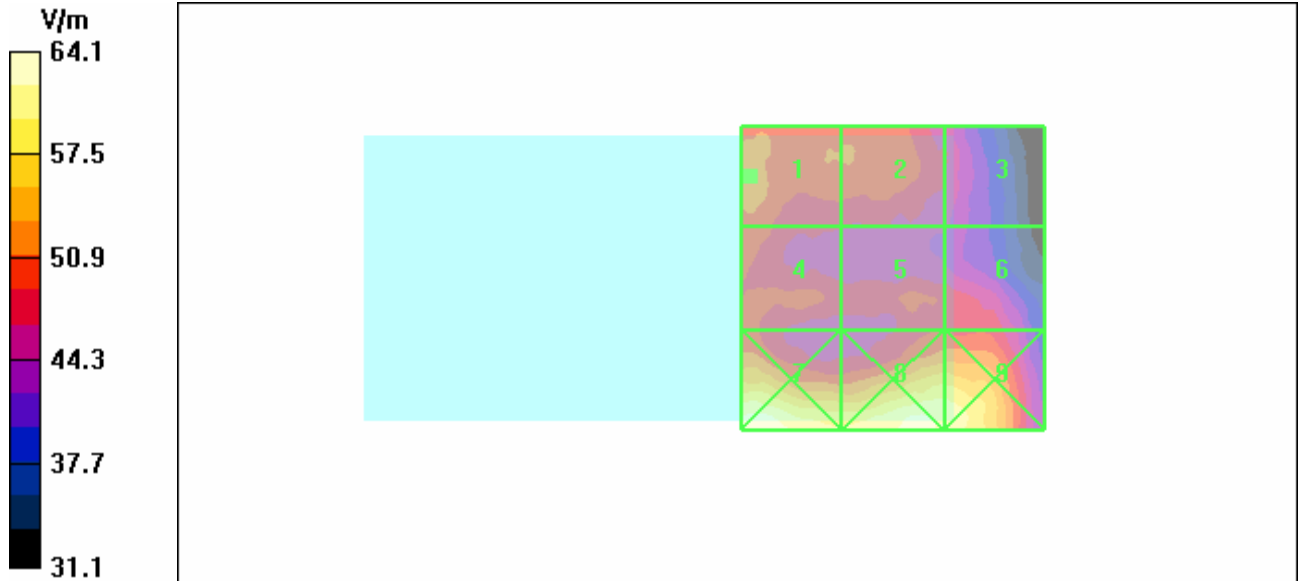
Probe Modulation Factor = 1.00

Reference Value = 46.1 V/m; Power Drift = -0.268 dB

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

Peak E-field in V/m

Grid 1	Grid 2	Grid 3
51.9	51.2	46.9
Grid 4	Grid 5	Grid 6
50.8	49.4	48.7
Grid 7	Grid 8	Grid 9
64.1	63.0	62.0





Date/Time: 8/22/2006 7:42:01 AM

Test Laboratory: TCC Dallas

RM-66, CDMA 1900, Ch 600, E field, Slide Open Position

Communication System: CDMA1900; Frequency: 1880 MHz; Duty Cycle: 1:1
DASY4 Configuration:

- Probe: ER3DV4R - SN2240; ConvF(1, 1, 1); Calibrated: 1/24/2006
- Sensor-Surface: (Fix Surface)
- Electronics: DAE3 Sn389; Calibrated: 1/20/2006
- Phantom: HAC Test Arch 4.6; Phantom section: E Device Section
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

E Scan - ER probe center 10mm above Device Reference/Hearing Aid Compatibility Test (251x251x1): Measurement grid:
dx=2mm, dy=2mm

Maximum value of peak Total field = 50.3 V/m

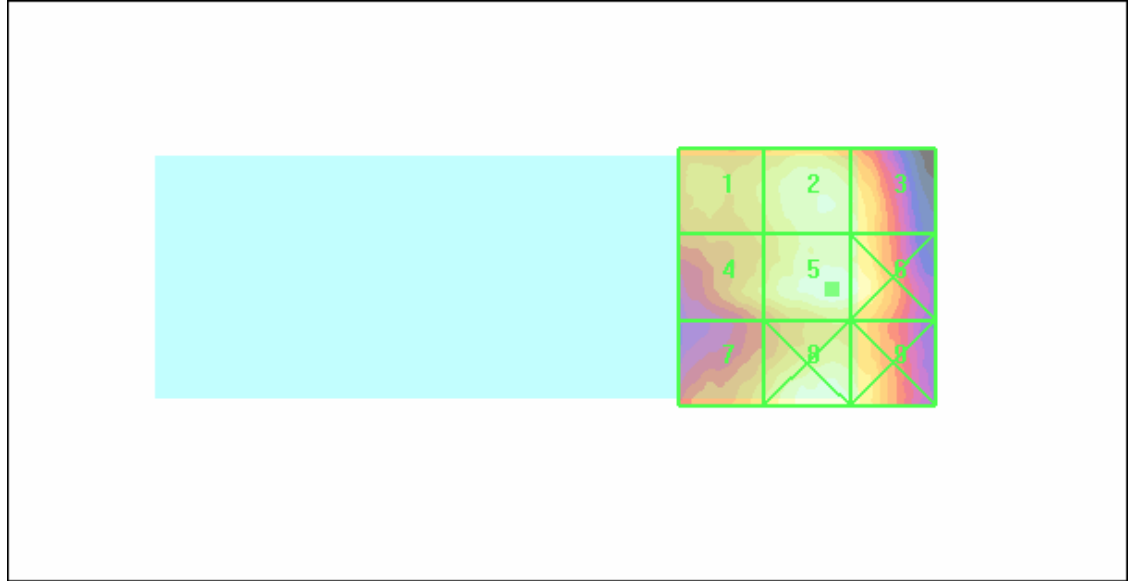
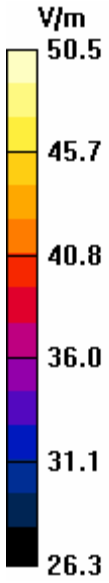
Probe Modulation Factor = 1.00

Reference Value = 49.3 V/m; Power Drift = 0.034 dB

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

Peak E-field in V/m

Grid 1	Grid 2	Grid 3
46.1	49.4	48.1
Grid 4	Grid 5	Grid 6
46.2	50.3	49.7
Grid 7	Grid 8	Grid 9
45.9	50.5	48.7





Date/Time: 8/22/2006 8:48:16 AM

Test Laboratory: TCC Dallas

RM-66, CDMA 1900, Ch 1175, E field, Slide Closed Position

Communication System: CDMA1900; Frequency: 1908.75 MHz; Duty Cycle: 1:1
DASY4 Configuration:

- Probe: ER3DV4R - SN2240; ConvF(1, 1, 1); Calibrated: 1/24/2006
- Sensor-Surface: (Fix Surface)
- Electronics: DAE3 Sn389; Calibrated: 1/20/2006
- Phantom: HAC Test Arch 4.6; Phantom section: E Device Section
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

E Scan - ER probe center 10mm above Device Reference/Hearing Aid Compatibility Test (251x251x1): Measurement grid:
dx=2mm, dy=2mm

Maximum value of peak Total field = 48.8 V/m

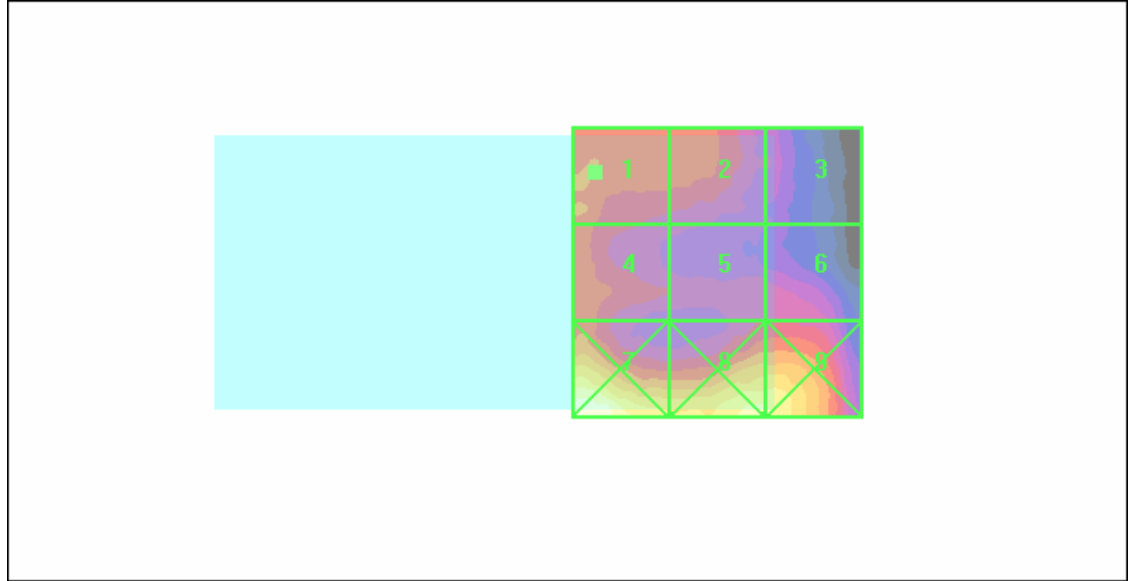
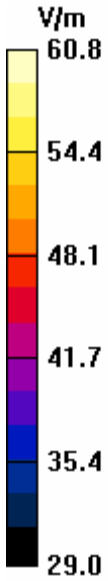
Probe Modulation Factor = 1.00

Reference Value = 41.0 V/m; Power Drift = 0.106 dB

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

Peak E-field in V/m

Grid 1	Grid 2	Grid 3
48.8	47.9	42.3
Grid 4	Grid 5	Grid 6
48.1	44.0	44.0
Grid 7	Grid 8	Grid 9
60.8	57.4	56.8





Date/Time: 8/22/2006 8:24:23 AM

Test Laboratory: TCC Dallas

RM-66, CDMA 1900, Ch 1175, E field, Slide Open Position

Communication System: CDMA1900; Frequency: 1908.75 MHz; Duty Cycle: 1:1
DASY4 Configuration:

- Probe: ER3DV4R - SN2240; ConvF(1, 1, 1); Calibrated: 1/24/2006
- Sensor-Surface: (Fix Surface)
- Electronics: DAE3 Sn389; Calibrated: 1/20/2006
- Phantom: HAC Test Arch 4.6; Phantom section: E Device Section
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

E Scan - ER probe center 10mm above Device Reference/Hearing Aid Compatibility Test (251x251x1): Measurement grid:
dx=2mm, dy=2mm

Maximum value of peak Total field = 46.6 V/m

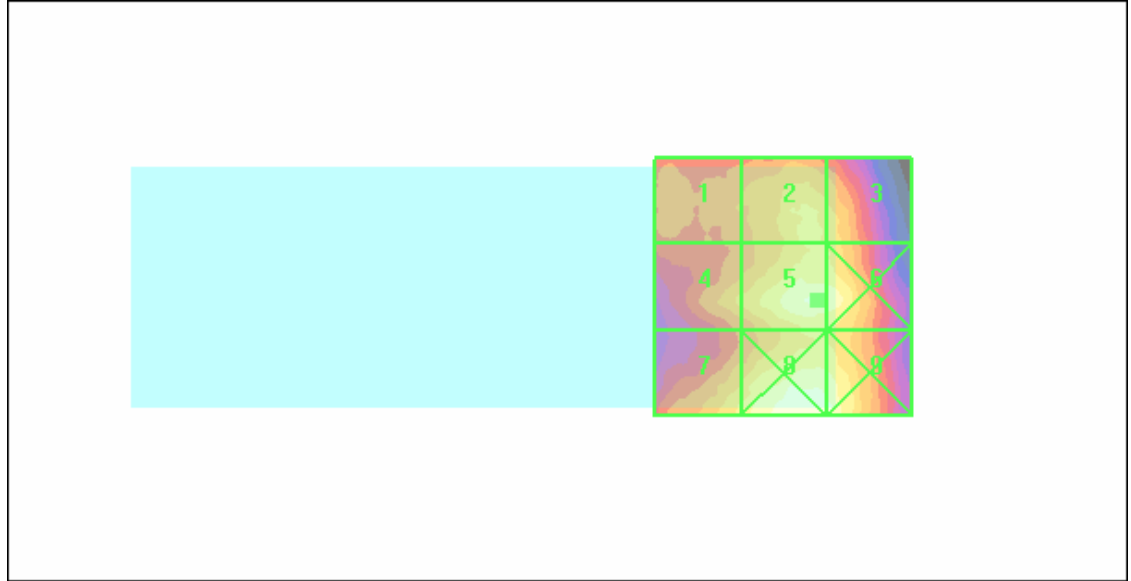
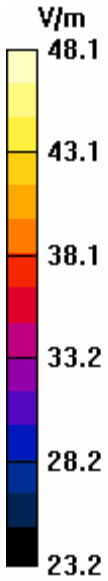
Probe Modulation Factor = 1.00

Reference Value = 44.4 V/m; Power Drift = -0.023 dB

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

Peak E-field in V/m

Grid 1	Grid 2	Grid 3
39.9	43.5	43.0
Grid 4	Grid 5	Grid 6
41.9	46.6	45.9
Grid 7	Grid 8	Grid 9
43.6	48.1	46.8





Date/Time: 8/21/2006 2:14:24 PM

Test Laboratory: TCC Dallas

RM-66, CDMA 1900, Ch 25, H field, Slide Closed Position

Communication System: CDMA1900; Frequency: 1851.25 MHz; Duty Cycle: 1:1
DASY4 Configuration:

- Probe: H3DV6 - SN6058; ; Calibrated: 1/24/2006
- Sensor-Surface: (Fix Surface)
- Electronics: DAE3 Sn389; Calibrated: 1/20/2006
- Phantom: HAC Test Arch 4.6; Phantom section: H Device Section
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

H Scan - H3DV6 probe center 10mm above Device Reference/Hearing Aid Compatibility Test (251x251x1): Measurement grid: dx=2mm, dy=2mm

Maximum value of peak Total field = 0.097 A/m

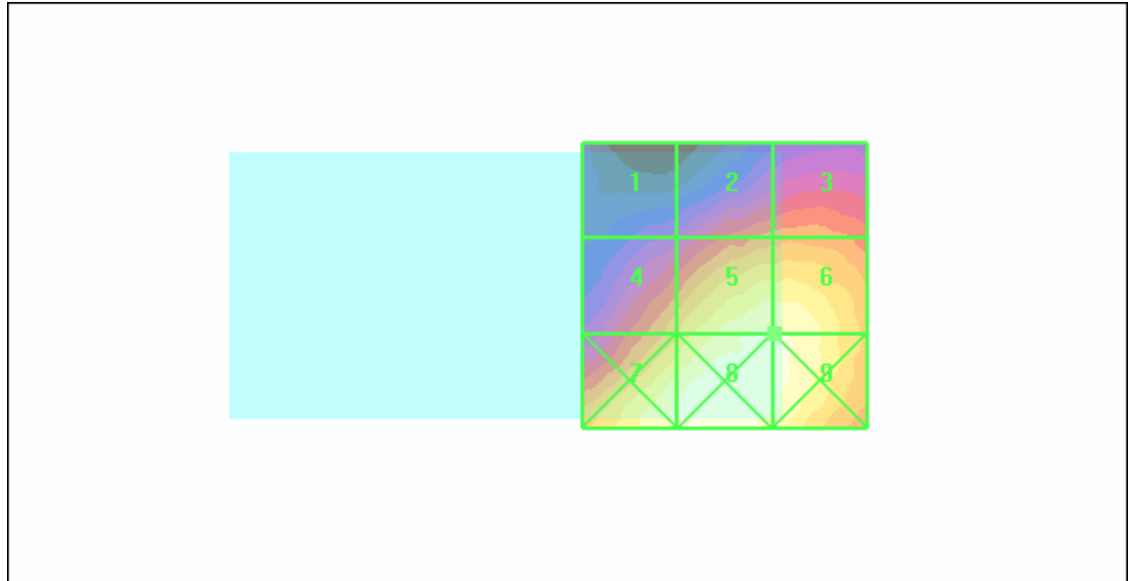
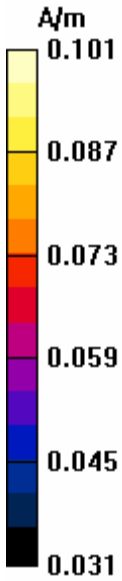
Probe Modulation Factor = 0.600

Reference Value = 0.137 A/m; Power Drift = -0.235 dB

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

Peak H-field in A/m

Grid 1	Grid 2	Grid 3
0.058	0.075	0.076
Grid 4	Grid 5	Grid 6
0.082	0.097	0.097
Grid 7	Grid 8	Grid 9
0.097	0.101	0.100





Date/Time: 8/21/2006 12:45:04 PM

Test Laboratory: TCC Dallas

RM-66, CDMA 1900, Ch 25, H field, Slide Open Position

Communication System: CDMA1900; Frequency: 1851.25 MHz; Duty Cycle: 1:1
DASY4 Configuration:

- Probe: H3DV6 - SN6058; ; Calibrated: 1/24/2006
- Sensor-Surface: (Fix Surface)
- Electronics: DAE3 Sn389; Calibrated: 1/20/2006
- Phantom: HAC Test Arch 4.6; Phantom section: H Device Section
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

H Scan - H3DV6 probe center 10mm above Device Reference/Hearing Aid Compatibility Test (251x251x1): Measurement grid: dx=2mm, dy=2mm

Maximum value of peak Total field = 0.060 A/m

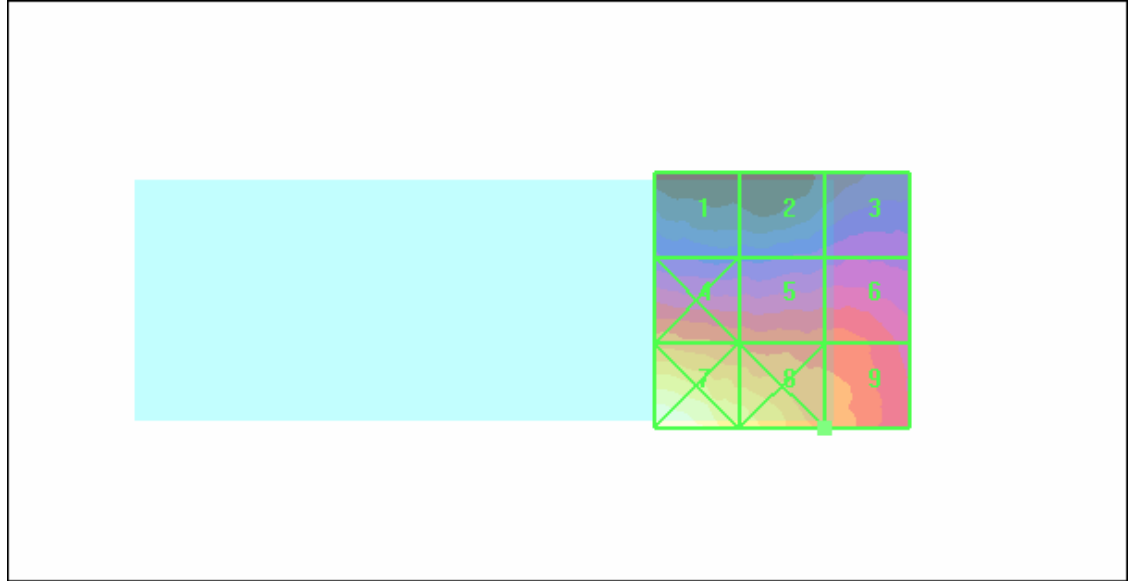
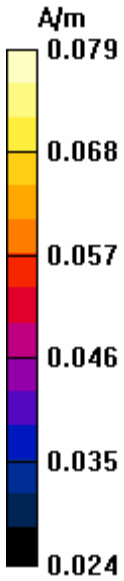
Probe Modulation Factor = 0.600

Reference Value = 0.080 A/m; Power Drift = 0.000 dB

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

Peak H-field in A/m

Grid 1	Grid 2	Grid 3
0.040	0.041	0.042
0.060	0.056	0.055
0.079	0.070	0.060





Date/Time: 8/21/2006 1:49:06 PM

Test Laboratory: TCC Dallas

RM-66, CDMA 1900, Ch 600, H field, Slide Closed Position

Communication System: CDMA1900; Frequency: 1880 MHz; Duty Cycle: 1:1
DASY4 Configuration:

- Probe: H3DV6 - SN6058; ; Calibrated: 1/24/2006
- Sensor-Surface: (Fix Surface)
- Electronics: DAE3 Sn389; Calibrated: 1/20/2006
- Phantom: HAC Test Arch 4.6; Phantom section: H Device Section
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

H Scan - H3DV6 probe center 10mm above Device Reference/Hearing Aid Compatibility Test (251x251x1): Measurement grid: dx=2mm, dy=2mm

Maximum value of peak Total field = 0.098 A/m

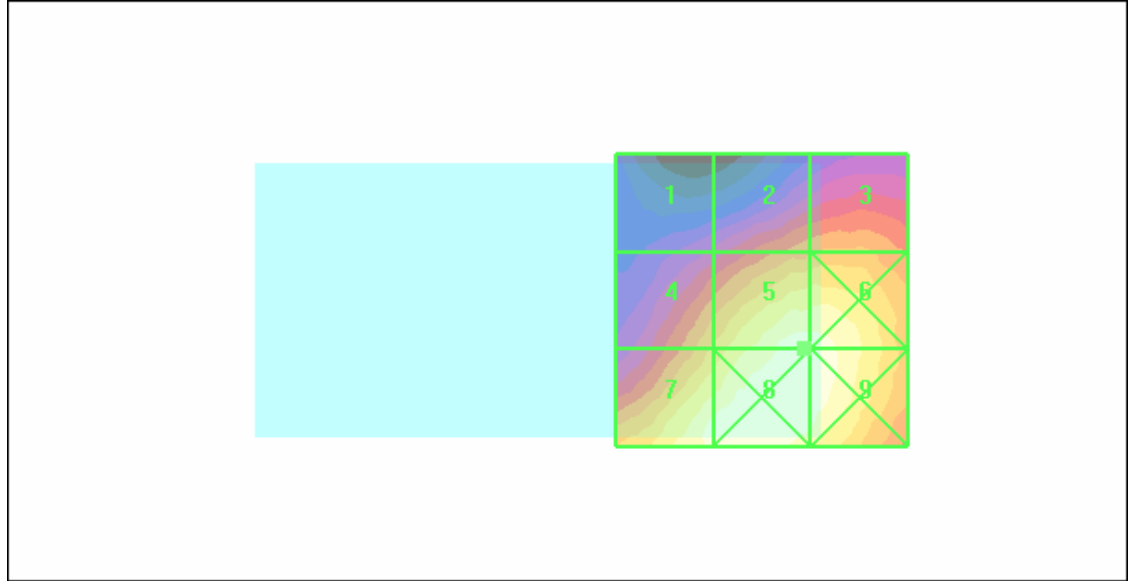
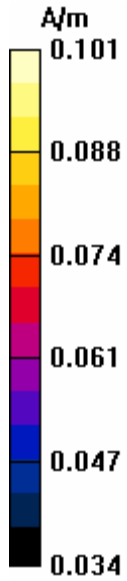
Probe Modulation Factor = 0.600

Reference Value = 0.140 A/m; Power Drift = 0.191 dB

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

Peak H-field in A/m

Grid 1	Grid 2	Grid 3
0.062	0.078	0.080
Grid 4	Grid 5	Grid 6
0.084	0.098	0.098
Grid 7	Grid 8	Grid 9
0.098	0.101	0.100





Date/Time: 8/21/2006 12:23:21 PM

Test Laboratory: TCC Dallas

RM-66, CDMA 1900, Ch 600, H field, Slide Open Position

Communication System: CDMA1900; Frequency: 1880 MHz; Duty Cycle: 1:1
DASY4 Configuration:

- Probe: H3DV6 - SN6058; ; Calibrated: 1/24/2006
- Sensor-Surface: (Fix Surface)
- Electronics: DAE3 Sn389; Calibrated: 1/20/2006
- Phantom: HAC Test Arch 4.6; Phantom section: H Device Section
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

H Scan - H3DV6 probe center 10mm above Device Reference/Hearing Aid Compatibility Test (251x251x1): Measurement grid: dx=2mm, dy=2mm

Maximum value of peak Total field = 0.063 A/m

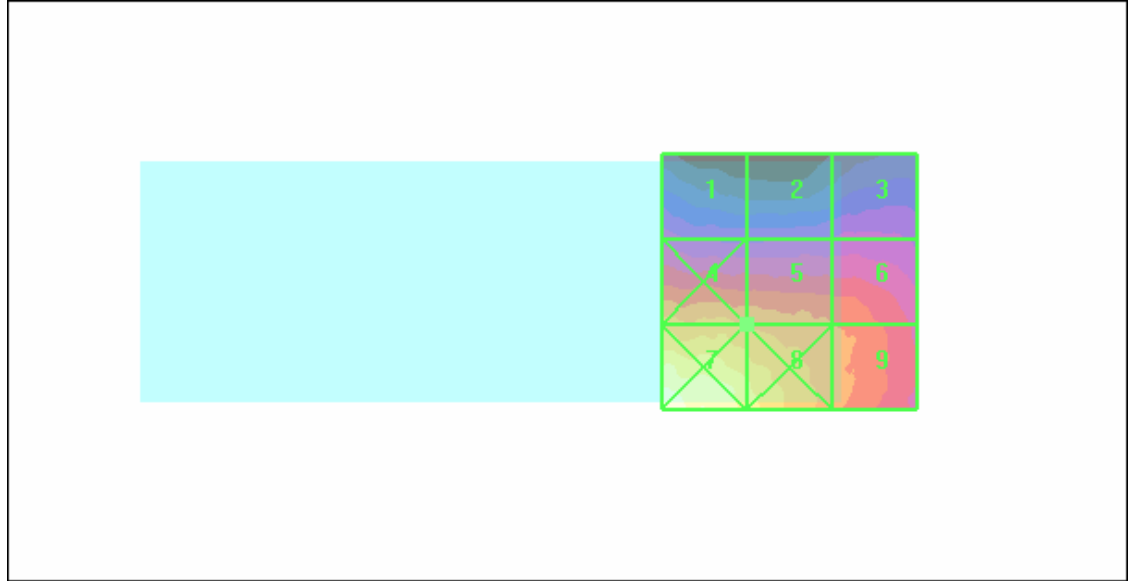
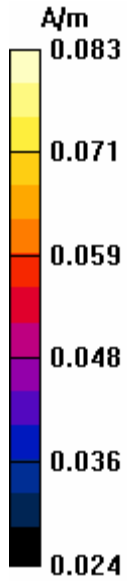
Probe Modulation Factor = 0.600

Reference Value = 0.089 A/m; Power Drift = -0.151 dB

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

Peak H-field in A/m

Grid 1	Grid 2	Grid 3
0.047	0.044	0.045
Grid 4	Grid 5	Grid 6
0.066	0.063	0.060
Grid 7	Grid 8	Grid 9
0.083	0.074	0.061





Date/Time: 8/21/2006 2:34:57 PM

Test Laboratory: TCC Dallas

RM-66, CDMA 1900, Ch 1175, H field, Slide Closed Position

Communication System: CDMA1900; Frequency: 1908.75 MHz; Duty Cycle: 1:1
DASY4 Configuration:

- Probe: H3DV6 - SN6058; ; Calibrated: 1/24/2006
- Sensor-Surface: (Fix Surface)
- Electronics: DAE3 Sn389; Calibrated: 1/20/2006
- Phantom: HAC Test Arch 4.6; Phantom section: H Device Section
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

H Scan - H3DV6 probe center 10mm above Device Reference/Hearing Aid Compatibility Test (251x251x1): Measurement grid: dx=2mm, dy=2mm

Maximum value of peak Total field = 0.086 A/m

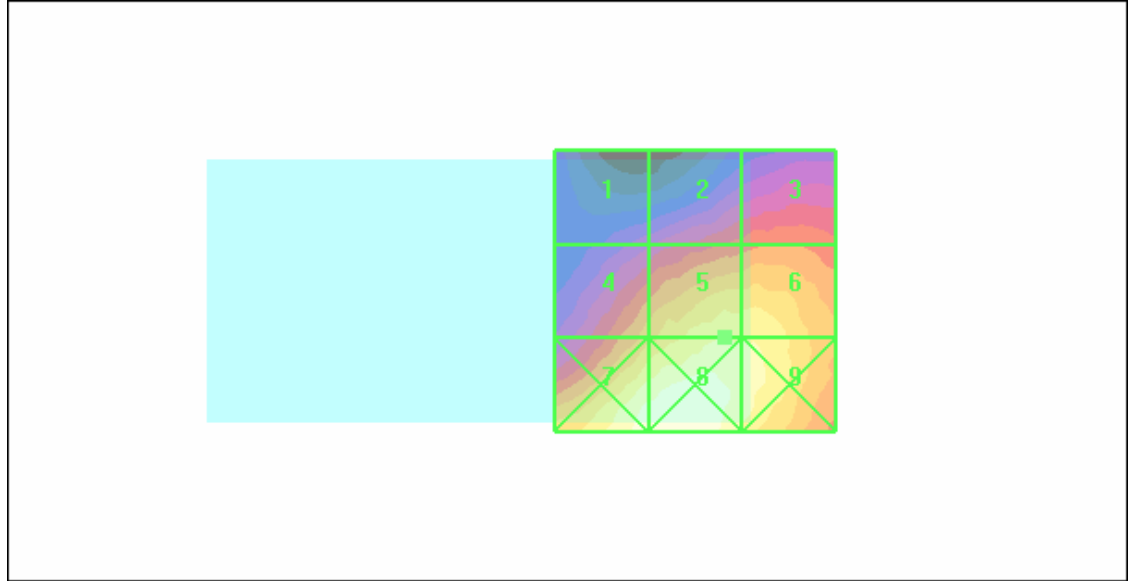
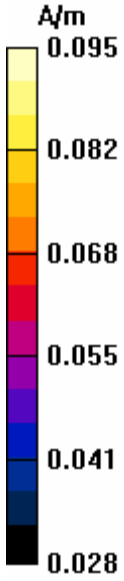
Probe Modulation Factor = 0.600

Reference Value = 0.124 A/m; Power Drift = -0.041 dB

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

Peak H-field in A/m

Grid 1	Grid 2	Grid 3
0.054	0.066	0.068
Grid 4	Grid 5	Grid 6
0.076	0.086	0.086
Grid 7	Grid 8	Grid 9
0.094	0.095	0.089





Date/Time: 8/21/2006 1:11:53 PM

Test Laboratory: TCC Dallas

RM-66, CDMA 1900, Ch 1175, H field, Slide Open Position

Communication System: CDMA1900; Frequency: 1908.75 MHz; Duty Cycle: 1:1
DASY4 Configuration:

- Probe: H3DV6 - SN6058; ; Calibrated: 1/24/2006
- Sensor-Surface: (Fix Surface)
- Electronics: DAE3 Sn389; Calibrated: 1/20/2006
- Phantom: HAC Test Arch 4.6; Phantom section: H Device Section
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

H Scan - H3DV6 probe center 10mm above Device Reference/Hearing Aid Compatibility Test (251x251x1): Measurement grid: dx=2mm, dy=2mm

Maximum value of peak Total field = 0.051 A/m

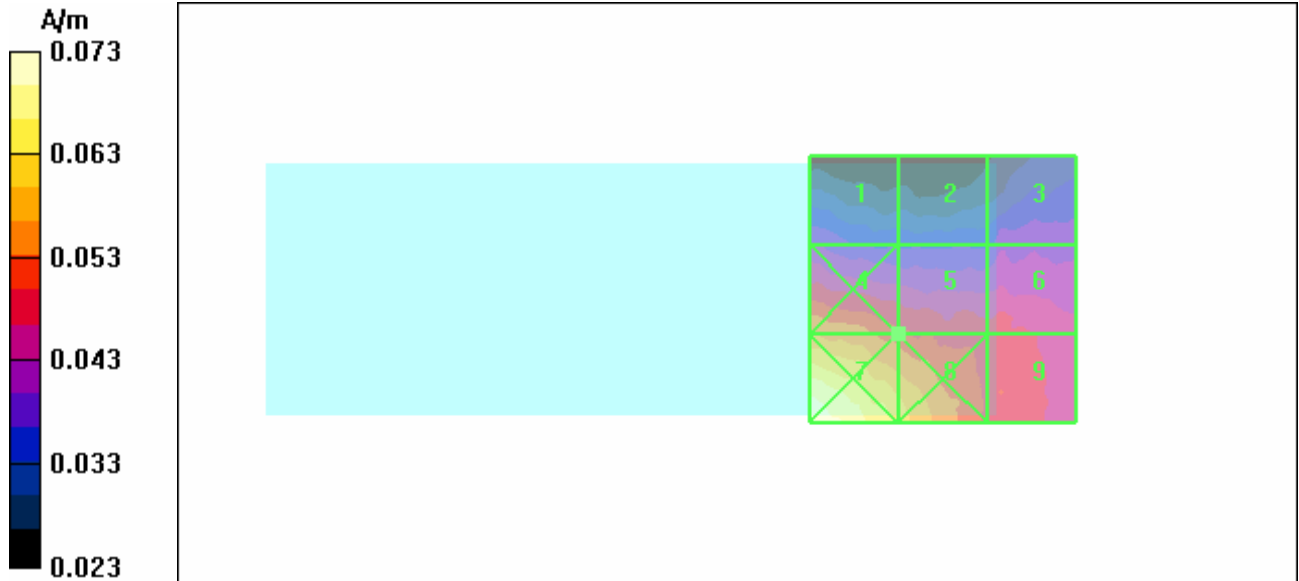
Probe Modulation Factor = 0.600

Reference Value = 0.072 A/m; Power Drift = 0.078 dB

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

Peak H-field in A/m

Grid 1	Grid 2	Grid 3
0.040	0.036	0.039
0.057	0.051	0.048
0.073	0.062	0.050





Date/Time: 8/28/2006 4:29:23 PM

Test Laboratory: TCC Dallas

RM-66, CDMA800, Ch777, E field, Slide Open Position, At T-coil Axial Location

Communication System: CDMA800; Frequency: 848.31 MHz; Duty Cycle: 1:1
DASY4 Configuration:

- Probe: ER3DV4R - SN2240; ConvF(1, 1, 1); Calibrated: 1/24/2006
- Sensor-Surface: (Fix Surface)
- Electronics: DAE3 Sn389; Calibrated: 1/20/2006
- Phantom: HAC Test Arch 4.6; Phantom section: E Device Section
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

E Scan - ER probe center 10mm above Device Reference/Hearing Aid Compatibility Test (251x251x1): Measurement grid:
dx=2mm, dy=2mm

Maximum value of peak Total field = 109.9 V/m

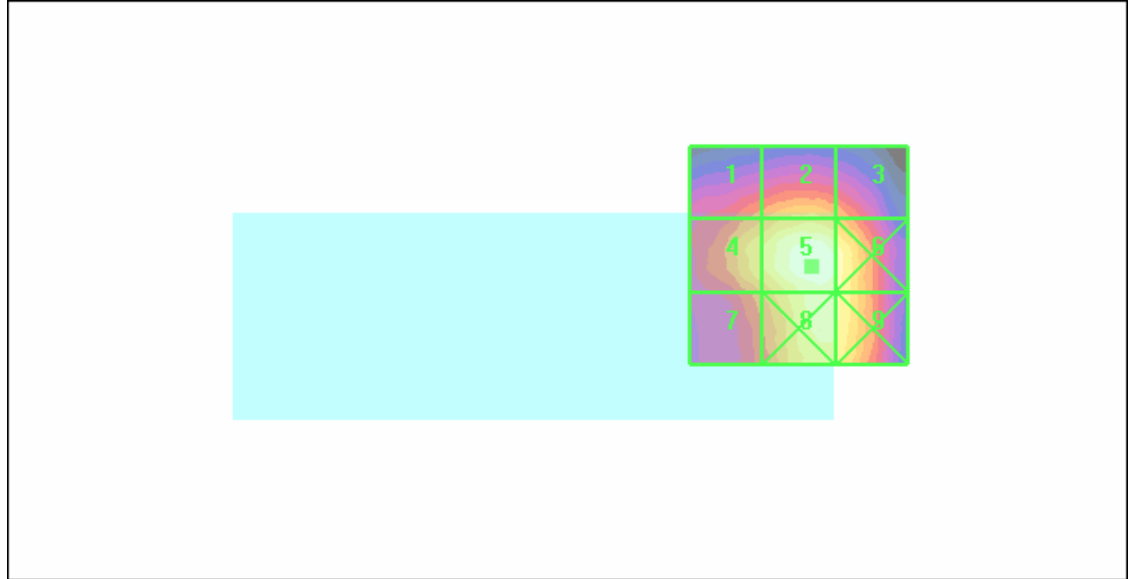
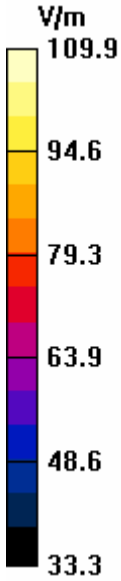
Probe Modulation Factor = 1.00

Reference Value = 110.2 V/m; Power Drift = -0.150 dB

Hearing Aid Near-Field Category: M3 (AWF 0 dB)

Peak E-field in V/m

Grid 1	Grid 2	Grid 3
83.5	93.0	87.0
Grid 4	Grid 5	Grid 6
95.5	109.9	104.2
Grid 7	Grid 8	Grid 9
85.1	103.4	101.4





Date/Time: 8/28/2006 1:23:35 PM

Test Laboratory: TCC Dallas

RM-66, CDMA 1900, Ch600, E field, Slide Closed Position, At T-coil Axial Location

Communication System: CDMA1900; Frequency: 1880 MHz; Duty Cycle: 1:1
DASY4 Configuration:

- Probe: ER3DV4R - SN2240; ConvF(1, 1, 1); Calibrated: 1/24/2006
- Sensor-Surface: (Fix Surface)
- Electronics: DAE3 Sn389; Calibrated: 1/20/2006
- Phantom: HAC Test Arch 4.6; Phantom section: E Device Section
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

E Scan - ER probe center 10mm above Device Reference/Hearing Aid Compatibility Test (251x251x1): Measurement grid:
dx=2mm, dy=2mm

Maximum value of peak Total field = 58.0 V/m

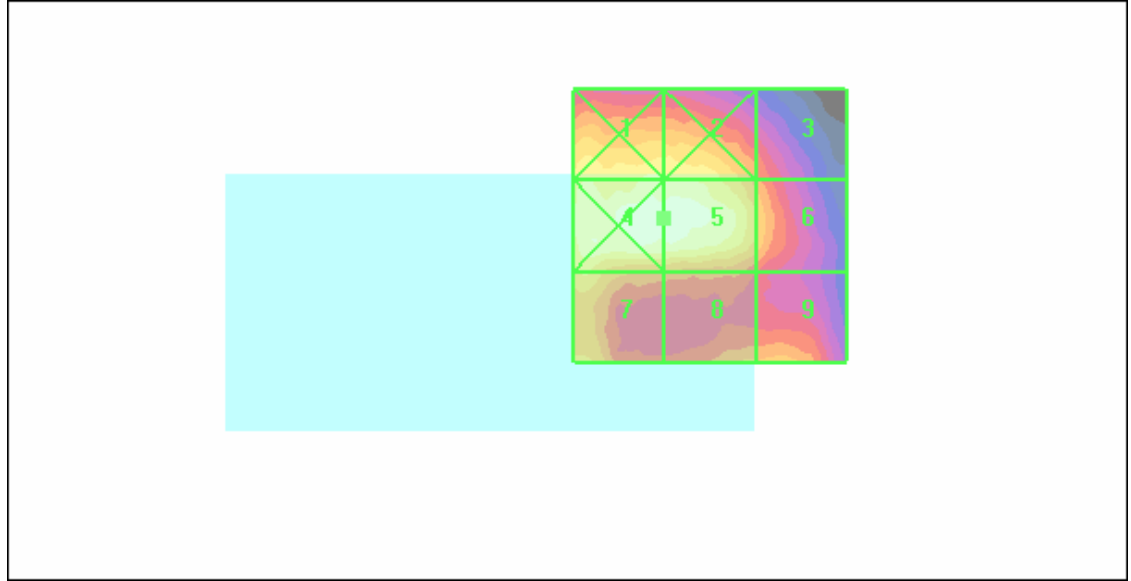
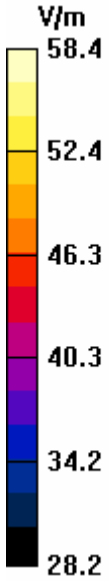
Probe Modulation Factor = 1.00

Reference Value = 57.3 V/m; Power Drift = 0.059 dB

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

Peak E-field in V/m

Grid 1	Grid 2	Grid 3
55.1	54.8	47.3
Grid 4	Grid 5	Grid 6
58.4	58.0	50.8
Grid 7	Grid 8	Grid 9
52.7	49.0	49.9



TCC

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APPENDIX C: PROBE CALIBRATION REPORTS AND DIPOLE CALIBRATION REPORTS