



ANSI C63.19

TEST REPORT

Product Name	cdma2000 Digital Mobile Phone
Model	PCDM650KT/HUAWEI M650/ M650/HUAWEI C8350/C8350
FCC ID	QISM650
Client	Huawei Technologies Co., Ltd.

TA Technology (Shanghai) Co., Ltd.

TA Technology (Shanghai) Co., Ltd.
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GENERAL SUMMARY

Product Name	cdma2000 Digital Mobile Phone	Model	PCDM650KT/HUAWEI M650/ M650/HUAWEI C8350/C8350
FCC ID	QISM650	Report No.	RZA1106-1064HAC01
Client	Huawei Technologies Co., Ltd.		
Manufacturer	Huawei Technologies Co., Ltd.		
Reference Standard(s)	ANSI C63.19-2007: American National Standard Methods of Measurement of Compatibility between Wireless Communications Devices and Hearing Aids.		
Conclusion	<p>This portable wireless equipment has been measured in all cases requested by the relevant standards.</p> <p>General Judgment: M4 (RF Emission)</p> <div style="text-align: right;">  (Stamp) Date of issue: July 6th, 2011 </div>		
Comment	The test result only responds to the measured sample.		

Approved by Derek Yang
Director

Revised by Jeff. Wang
SAR Manager

Performed by Jason. Du
SAR Engineer

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1. General Information

1.1. Notes of the Test Report

TA Technology (Shanghai) Co., Ltd. guarantees the reliability of the data presented in this test report, which is the results of measurements and tests performed for the items under test on the date and under the conditions stated in this test report and is based on the knowledge and technical facilities available at TA Technology (Shanghai) Co., Ltd. at the time of execution of the test.

TA Technology (Shanghai) Co., Ltd. is liable to the client for the maintenance by its personnel of the confidentiality of all information related to the items under test and the results of the test. This report only refers to the item that has undergone the test.

This report standalone dose not constitute or imply by its own an approval of the product by the certification Bodies or competent Authorities. This report cannot be used partially or in full for publicity and/or promotional purposes without previous written approval of **TA Technology (Shanghai) Co., Ltd.** and the Accreditation Bodies, if it applies.

If the electrical report is inconsistent with the printed one, it should be subject to the latter.

1.2. Testing Laboratory

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1.3. Applicant Information

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City: Shenzhen
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1.4. Manufacturer Information

Company: Huawei Technologies Co., Ltd.
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1.5. Information of EUT

General Information

Device Type:	Portable Device		
Product Name:	cdma2000 Digital Mobile Phone		
MEID:	A000002E1FB16D		
Hardware Version:	HC1M650M Ver.D		
Software Version:	M650V100R001USAC237B822		
Antenna Type:	Internal Antenna		
Device Operating Configurations:			
Supporting Mode(s):	CDMA Cellular/CDMA PCS; (tested)		
	CDMA BC10/CDMA BC14; (tested)		
	WiFi(802.11b/g/n HT20); (untested)		
	Bluetooth; (untested)		
Test Modulation:	QPSK		
Operating Frequency Range(s):	Mode	Tx (MHz)	Rx (MHz)
	CDMA Cellular	824.7 ~ 848.31	869.7 ~ 893.31
	CDMA PCS	1851.25 ~ 1908.75	1931.25 ~ 1988.75
	CDMA BC10	817.9 ~ 823.1	862.9 ~ 868.1
	CDMA BC14	1911.25 ~ 1913.75	1991.25 ~ 1993.75
Test Channel: (Low - Middle - High)	1013 - 384 - 777	(CDMA Cellular)	(tested)
	25 - 600 - 1175	(CDMA PCS)	(tested)
	476 - 580 - 684	(CDMA BC10)	(tested)
	1225 - 1250 - 1275	(CDMA BC14)	(tested)
Power Class:	CDMA Cellular: Tested with Power Control All up bits		
	CDMA PCS: Tested with Power Control All up bits		
	CDMA BC10: Tested with Power Control All up bits		
	CDMA BC14: Tested with Power Control All up bits		

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Auxiliary Equipment Details

AE:Battery

Model: HB4F1
Manufacturer: Huawei Technologies Co., Ltd.
S/N: SGCB317HI1231065

Equipment Under Test (EUT) is a model of cdma2000 Digital Mobile Phone. It has Personal Wireless Routers (hot spots) function and Proximity Sensor function. The detail about Mobile phone and Lithium Battery is in chapter 1.5 in this report. HAC is tested for CDMA Cellular, CDMA PCS, CDMA BC10 and CDMA BC14. The EUT has a CDMA antenna that is used for Tx/Rx, and the other is BT/WiFi antenna. WiFi and Bluetooth modes don't have voice capability, and do not operate in the held to ear mode for providing handset service.

The sample under test was selected by the Client.

Components list please refer to documents of the manufacturer.

1.6. The Ambient Conditions during Test

Temperature	Min. = 18°C, Max. = 28 °C
Relative humidity	Min. = 0%, Max. = 80%
Ground system resistance	< 0.5 Ω
Ambient noise is checked and found very low and in compliance with requirement of standards.	
Reflection of surrounding objects is minimized and in compliance with requirement of standards.	

1.7. The Total M-rating of each tested band

Band	Rating
CDMA Cellular	M4
CDMA PCS	M4
CDMA BC10	M4
CDMA BC14	M4

1.8. Test Date

The test is performed on July 6, 2011.

2. Test Information

2.1. Operational Conditions during Test

2.1.1. General Description of Test Procedures

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

2.1.2. CDMA Test Configuration

A communication link is set up with a System Simulator (SS) by air link, and a call is established. The Absolute Radio Frequency Channel Number (ARFCN) are allocated to 1013, 384 and 777 respectively in the case of CDMA Cellular, allocated to 25, 600 and 1175 respectively in the case of CDMA PCS, allocated to 476, 580 and 684 respectively in the case of CDMA BC10, allocated to 1225, 1250 and 1275 respectively in the case of CDMA BC14. The EUT is commanded to operate at maximum transmitting power.

Test Parameter setup for maximum RF output power according to section 4.4.5 of 3GPP2.

Parameter	Units	Value
I or	dBm/1.23MHz	-104
PilotE c /I or	dB	-7
TrafficE c /I or	dB	-7.4

2.2. HAC RF Measurements System Configuration

2.2.1. HAC Measurement Set-up

These measurements are performed using the DASY5 automated dosimetric assessment system. It is made by Schmid & Partner Engineering AG (SPEAG) in Zurich, Switzerland. It consists of high precision robotics system (Stäubli), robot controller, Intel Core2 computer, near-field probe, probe alignment sensor. The robot is a six-axis industrial robot performing precise movements. Cell controller systems contain the power supply, robot controller, teach pendant (Joystick) and remote control, and are used to drive the robot motors. The Stäubli Robot is connected to the cell controller to allow software manipulation of the robot. A data acquisition electronic (DAE) circuit 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.

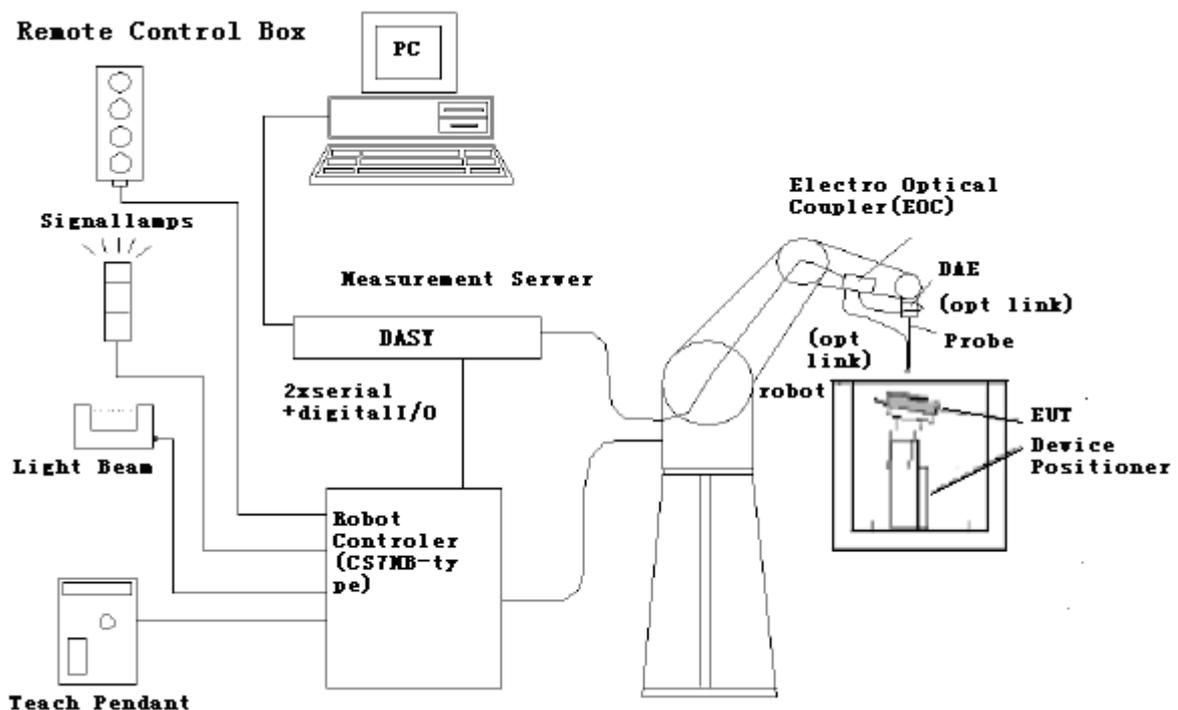


Figure 1 HAC Test Measurement Set-up

The DAE4 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.

2.2.2. Probe System

The HAC measurements were conducted with the E-Field Probe ER3DV6 and the H-Field Probe H3DV6 (manufactured by SPEAG), designed in the classical triangular configuration and optimized for dosimetric evaluation.

E-Field Probe Description

Construction	One dipole parallel, two dipoles normal to probe axis Built-in shielding against static charges PEEK enclosure material
Calibration	In air from 100 MHz to 3.0 GHz (absolute accuracy $\pm 6.0\%$, $k=2$)
Frequency	40 MHz to > 6 GHz (can be extended to < 20 MHz) 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



Figure 2 ER3DV6 E-field Probe

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 PEEK enclosure material (resistant to organic solvents, e.g., glycolether)
Frequency	200 MHz to 3 GHz (absolute accuracy $\pm 6.0\%$, $k=2$); Output linearized
Directivity	± 0.2 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

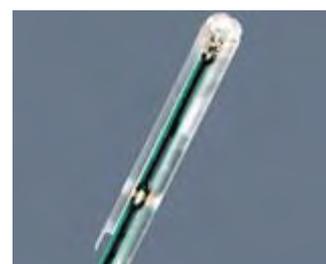


Figure 3 H3DV6 H-field Probe

Application General magnetic near-field measurements up to 3
 GHz (in air or liquids)
 Field component measurements
 Surface current measurements
 Low interaction with the measured field

2.2.3. Test Arch Phantom & Phone Positioner

The Test Arch phantom should be positioned horizontally on a stable surface. Reference markings on the Phantom allow the complete setup of all predefined phantom positions and measurement grids by manually teaching three points in the robot. It enables easy and well defined positioning of the phone and validation dipoles as well as simple teaching of the robot (Dimensions: 370 x 370 x 370 mm).

The Device reference point is set for the EUT at 6.3 mm, the Grid reference point is on the upper surface at the origin of the coordinates, and the “user point \Height Check 0.5 mm” is 0.5mm above the center, allowing verification of the gap of 0.5mm while the probe is positioned there.

The Phone Positioner supports accurate and reliable positioning of any phone with effect on near field $<\pm 0.5$ dB.

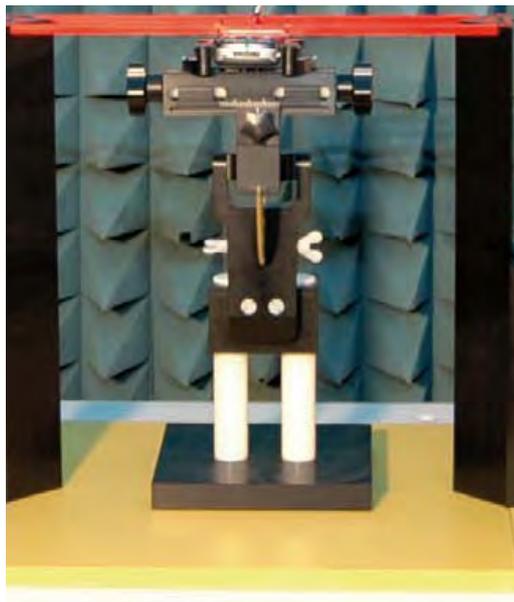


Figure 4 HAC Phantom & Device Holder

2.3. RF Test Procedures

The evaluation was performed with the following procedure:

1. Confirm proper operation of the field probe, probe measurement system and other instrumentation and the positioning system.
2. Position the WD in its intended test position. The gauge block can simplify this positioning. Note that a separate E-field and H-field gauge block will be needed if the center of the probe sensor elements is at different distances from the tip of the probe.
3. Configure the WD normal operation for maximum rated RF output power, at the desired channel and other operating parameters (e.g., test mode), as intended for the test.
4. The center sub-grid shall center on the center of the axial measurement point or the acoustic output, as appropriate. Locate the field probe at the initial test position in the 50 mm by 50 mm grid, which is contained in the measurement plane. If the field alignment method is used, align the probe for maximum field reception.
5. Record the reading.
6. Scan the entire 50 mm by 50 mm region in equally spaced increments and record the reading at each measurement point. The grid is 5 cm by 5 cm area that is divided into 9 evenly sized blocks or sub-grids. The distance between measurement points shall be sufficient to assure the identification of the maximum reading.
7. Identify the five contiguous sub-grids around the center sub-grid with the lowest maximum field strength readings. Thus the six areas to be used to determine the WD's highest emissions are identified and outlined for the final manual scan. Please note that a maximum of five blocks can be excluded for both E-field and H-field measurements for the WD output being measured. Stated another way, the center sub-grid and three others must be common to both the E-field and H-field measurements.
8. Identify the maximum field reading within the non-excluded sub-grids identified in Step 7.
9. Convert the maximum field strength reading identified in Step 8 to V/m or A/m, as appropriate. For probes which require a probe modulation factor, this conversion shall be done using the appropriate probe modulation factor and the calibration.
10. Repeat Step 1 through Step 10 for both the E-field and H-field measurements.
11. Compare this reading to the categories in ANSI C63.19 Clause 7 and record the resulting category. The lowest category number listed in 7.2, Table 7.4, or Table 7.5 obtained in Step 10 for either E- or H-field determines the M category for the audio coupling mode assessment. Record the WD category rating.



Figure 5 WD reference and plane for RF emission measurements

2.4. System Check

Validation Procedure

Place a dipole antenna meeting the requirements given in ANSI C63.19 D.5 in the position normally occupied by the WD. The dipole antenna serves as a known source for an electrical and magnetic output. Position the E-field and H-field probes so that:

The probes and their cables are parallel to the coaxial feed of the dipole antenna.

The probe cables and the coaxial feed of the dipole antenna approach the measurement area from opposite directions.

The center point of the probe element(s) are 10 mm from the closest surface of the dipole elements. Validation was performed to verify that measured E-field and H-field values are within +/-25% from the target reference values provided by the manufacturer. "Values within +/-25% are acceptable. Of which 12% is deviation and 13% is measurement uncertainty."

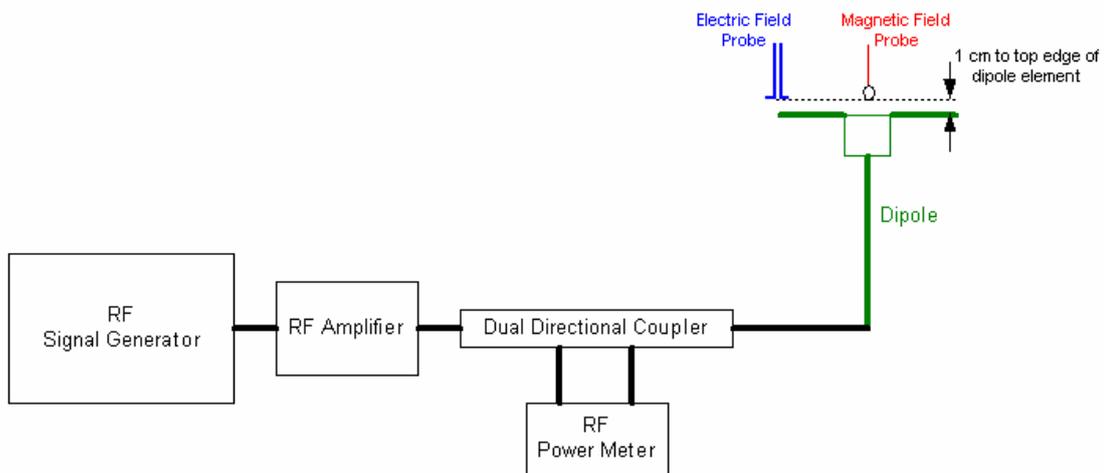


Figure 6 Dipole Validation Setup

Dipole Measurement Summary

E-Field Scan						
Mode	Frequency (MHz)	Input Power (mW)	Measured ¹ Value(V/m)	Target ² Value(V/m)	Deviation ³ (%)	Test Date
CW	835	100	149.2	170.7	12.60	July 6, 2011
CW	1880	100	131.4	142.9	8.05	July 6, 2011
H-Field Scan						
Mode	Frequency (MHz)	Input Power (mW)	Measured Value(A/m)	Target Value(A/m)	Deviation (%)	Test Date
CW	835	100	0.443	0.465	4.73	July 6, 2011
CW	1880	100	0.449	0.475	5.47	July 6, 2011

Notes: 1. please refer to the attachment for detailed measurement data and plot.

2. Target value is provided by SPEAD in the calibration certificate of specific dipoles.

3. Deviation (%) = 100 * (Target value minus Measured value) divided by Target value.

2.5. Probe Modulation Factor

The Probe Modulation Factor (PMF) is defined as the ratio of the field readings for a CW and a modulated signal with the equivalent Field Envelope Peak as defined in ANSI C63.19 (Chapter C.3.1). Calibration shall be made of the modulation response of the probe and its instrumentation chain. This Calibration shall be performed with the field probe, attached to the instrumentation that is to be used with it during the measurement. The response of the probe system to a CW field at the frequency(s) of interest is compared to its response to a modulated signal with equal peak amplitude. The field level of the test signals shall 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 field shall be applied to the readings taken of modulated fields of the specified type.

Modulation Factor Test Procedure

This may be done using the following procedure:

1. Fix the field probe in a set location relative to a field generating device, such as the reference dipole antenna.
2. Illuminate the probe using the wireless device connected to the reference dipole with a test signal at the intended measurement frequency, Ensure there is sufficient field coupling between the probe and the antenna so the resulting reading is greater than 10 dB above the probe system noise floor but within the systems operating range.
3. Record the amplitude applied to the antenna during transmission and the field strength measured by the E-field probe located near the tip of the dipole antenna
4. Replace the wireless device with an RF signal generator producing an unmodulated CW signal and set to the wireless device operating frequency.
5. Set the amplitude of the unmodulated signal to equal that recorded from the wireless device.
6. Record the reading of the probe measurement system of the unmodulated signal.
7. The ratio, in linear units, of the probe reading in Step 6 to the reading in Step 3 is the E-field modulation factor. $PMF_E = E_{CW} / E_{mod}$ ($PMF_H = H_{CW} / H_{mod}$)
8. Repeat the previous steps using the H-field probe, except locate the probe at the center of the dipole.

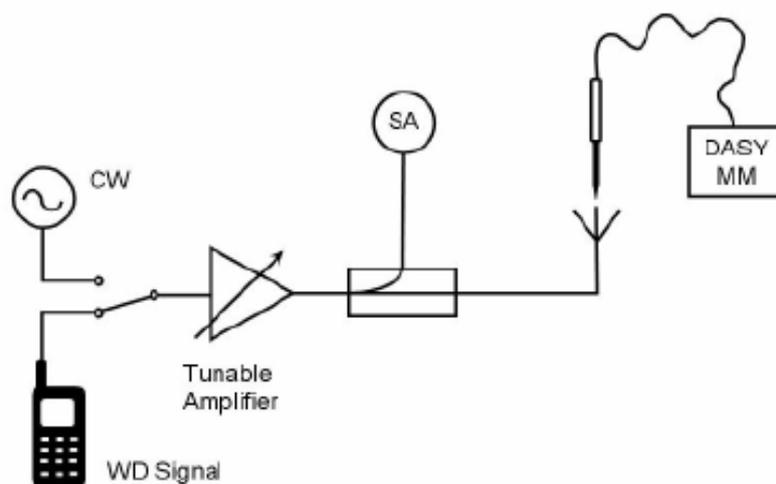


Figure Figure 7 Probe Modulation Factor Test Setup

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PMF

Band	E-Field Probe Modulation Factor	H-Field Probe Modulation Factor
CDMA Cellular	1.05	1.01
CDMA PCS	1.02	1.00
CDMA BC10	1.05	1.01
CDMA BC14	1.02	1.00

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2.6. Conducted Output Power Measurement

Summary

The DUT is tested using an E5515C communications tester as controller unit to set test channels and maximum output power to the DUT, as well as for measuring the conducted power. Conducted output power was measured using an integrated RF connector and attached RF cable. This result contains conducted output power for the EUT.

Conducted Power Results

CDMA Cellular	Conducted Power (dBm)		
	Channel 1013	Channel 384	Channel 777
RC1	24.99	24.77	24.97
RC3	24.97	24.89	24.94
CDMA PCS	Conducted Power (dBm)		
	Channel 25	Channel 600	Channel 1175
RC1	23.96	24.18	23.73
RC3	23.97	24.21	23.77
CDMA BC10	Conducted Power (dBm)		
	Channel 476	Channel 580	Channel 684
RC1	24.37	24.22	24.28
RC3	24.49	24.36	24.33
CDMA BC14	Conducted Power (dBm)		
	Channel 1225	Channel 1250	Channel 1275
RC1	23.85	23.92	23.95
RC3	23.86	23.97	23.99

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3. Test Results

3.1. ANSI C63.19-2007 Limits

Category		Telephone RF parameters < 960 MHz			
Near field	AWF	E-field emissions		H-field emissions	
Category M1/T1	0	631.0 to 1122.0	V/m	1.91 to 3.39	A/m
	-5	473.2 to 841.4	V/m	1.43 to 2.54	A/m
Category M2/T2	0	354.8 to 631.0	V/m	1.07 to 1.91	A/m
	-5	266.1 to 473.2	V/m	0.80 to 1.43	A/m
Category M3/T3	0	199.5 to 354.8	V/m	0.60 to 1.07	A/m
	-5	149.6 to 266.1	V/m	0.45 to 0.80	A/m
Category M4/T4	0	< 199.5	V/m	< 0.60	A/m
	-5	< 149.6	V/m	< 0.45	A/m
Category		Telephone RF parameters > 960 MHz			
Near field	AWF	E-field emissions		H-field emissions	
Category M1/T1	0	199.5 to 354.8	V/m	0.60 to 1.07	A/m
	-5	149.6 to 266.1	V/m	0.45 to 0.80	A/m
Category M2/T2	0	112.2 to 199.5	V/m	0.34 to 0.60	A/m
	-5	84.1 to 149.6	V/m	0.25 to 0.45	A/m
Category M3/T3	0	63.1 to 112.2	V/m	0.19 to 0.34	A/m
	-5	47.3 to 84.1	V/m	0.14 to 0.25	A/m
Category M4/T4	0	< 63.1	V/m	< 0.19	A/m
	-5	< 47.3	V/m	< 0.14	A/m

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3.2. Summary Test Results

CDMA Cellular Results

E-Field					
Channel	Frequency (MHz)	Peak Field (V/m)	Power Drift (dB)	Rating	Graph Results
777	848.31	95.2	-0.070	M4	Figure 12
384	836.52	97	0.043	M4	Figure 13
1013	824.70	92.3	-0.166	M4	Figure 14
H-Field					
Channel	Frequency (MHz)	Peak Field (A/m)	Power Drift (dB)	Rating	Graph Results
777	848.31	0.148	-0.004	M4	Figure 15
384	836.52	0.145	-0.096	M4	Figure 16
1013	824.70	0.134	-0.111	M4	Figure 17

CDMA PCS Results

E-Field					
Channel	Frequency (MHz)	Peak Field (V/m)	Power Drift (dB)	Rating	Graph Results
1175	1908.75	36.6	-0.052	M4	Figure 18
600	1880	35.3	-0.127	M4	Figure 19
25	1851.25	30.5	-0.005	M4	Figure 20
H-Field					
Channel	Frequency (MHz)	Peak Field (A/m)	Power Drift (dB)	Rating	Graph Results
1175	1908.75	0.087	0.049	M4	Figure 21
600	1880	0.087	0.039	M4	Figure 22
25	1851.25	0.072	0.034	M4	Figure 23

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CDMA BC10 Results

E-Field					
Channel	Frequency (MHz)	Peak Field (V/m)	Power Drift (dB)	Rating	Graph Results
684	823.1	82.3	-0.002	M4	Figure 24
580	820.5	84.7	-0.064	M4	Figure 25
476	817.9	85.7	0.050	M4	Figure 26
H-Field					
Channel	Frequency (MHz)	Peak Field (A/m)	Power Drift (dB)	Rating	Graph Results
684	823.1	0.134	-0.026	M4	Figure 27
580	820.5	0.143	-0.078	M4	Figure 28
476	817.9	0.133	-0.053	M4	Figure 29

CDMA BC14 Results

E-Field					
Channel	Frequency (MHz)	Peak Field (V/m)	Power Drift (dB)	Rating	Graph Results
1275	1913.75	37.1	-0.116	M4	Figure 30
1250	1912.50	37.4	-0.072	M4	Figure 31
1225	1911.25	36.2	0.071	M4	Figure 32
H-Field					
Channel	Frequency (MHz)	Peak Field (A/m)	Power Drift (dB)	Rating	Graph Results
1275	1913.75	0.094	-0.167	M4	Figure 33
1250	1912.50	0.094	0.031	M4	Figure 34
1225	1911.25	0.091	0.017	M4	Figure 35

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4. Measurement Uncertainty

No.	Error source	Type	Uncertainty Value (%)	Prob. Dist.	k	c _i /E	c _i /H	Standard Uncertainty		Degree of freedom V _{eff} or v _i	
								(%)	(%)		
									E	H	
Measurement System											
1	Probe Calibration	B	5.1	N	1	1	1	5.1	5.1	∞	
2	Axial Isotropy	B	4.7	R		1	1	2.7	2.7	∞	
3	Sensor Displacement	B	16.5	R		1	0.145	9.5	1.4	∞	
4	Boundary Effects	B	2.4	R		1	1	1.4	1.4	∞	
5	Linearity	B	4.7	R		1	1	2.7	2.7	∞	
6	Scaling to Peak Envelope Power	B	2.0	R		1	1	1.2	1.2	∞	
7	System Detection Limit	B	1.0	R		1	1	0.6	0.6	∞	
8	Readout Electronics	B	0.3	N	1	1	1	0.3	0.3	∞	
9	Response Time	B	0.8	R		1	1	0.5	0.5	∞	
10	Integration Time	B	2.6	R		1	1	1.5	1.5	∞	
11	RF Ambient Conditions	B	3.0	R		1	1	1.7	1.7	∞	
12	RF Reflections	B	12.0	R		1	1	6.9	6.9	∞	
13	Probe Positioner	B	1.2	R		1	0.67	0.7	0.5	∞	
14	Probe Positioning	A	4.7	R		1	0.67	2.7	1.8	∞	
15	Extra. And Interpolation	B	1.0	R		1	1	0.6	0.6	∞	
Test Sample Related											

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16	Device Positioning Vertical	B	4.7	R		1	0.67	2.7	1.8	∞
17	Device Positioning Lateral	B	1.0	R		1	1	0.6	0.6	∞
18	Device Holder and Phantom	B	2.4	R		1	1	1.4	1.4	∞
19	Power Drift	B	5.0	R		1	1	2.9	2.9	∞
Phantom and Setup related										
20s	Phantom Thickness	B	2.4	R		1	0.67	1.4	0.9	∞
Combined standard uncertainty(%)								14.7	10.9	
Expanded Std. uncertainty on power (K=2)								29.4	21.8	
Expanded Std. uncertainty on field (K=2)								14.7	10.9	

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5. Main Test Instruments

No.	Name	Type	Serial Number	Calibration Date	Valid Period
01	Power meter	Agilent E4417A	GB41291714	March 12, 2011	One year
02	Power sensor	Agilent N8481H	MY50350004	September 26, 2010	One year
03	Signal Generator	HP 8341B	2730A00804	September 13, 2010	One year
04	Amplifier	IXA-020	0401	No Calibration Requested	
05	BTS	E5515C	MY48360988	December 3, 2010	One year
06	E-Field Probe	ER3DV6	2428	October 20, 2009	Two years
07	H-Field Probe	H3DV6	6260	October 20, 2009	Two years
08	DAE	DAE4	871	November 18, 2010	One year
09	Validation Kit 835MHz	CD835V3	1149	January 12, 2010	Two years
10	Validation Kit 1880MHz	CD1880V3	1135	January 13, 2010	Two years

*****END OF REPORT BODY*****

ANNEX A: System Check Results

HAC_System Performance Check at 835MHz_E

DUT: Dipole 835 MHz; Type: CD835V3; SN:1149

Date/Time: 7/6/2011 8:20:32 AM

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

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

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: RF Section

DASY5 Configuration:

Probe: ER3DV6 - SN2428; ConvF(1, 1, 1); Calibrated: 10/20/2009

Electronics: DAE4 Sn871; Calibrated: 11/18/2010

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

E Scan - measurement distance from the probe sensor center to CD835 Dipole = 10mm/Hearing Aid Compatibility Test (41x361x1): Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 149.2 V/m

Probe Modulation Factor = 1.00

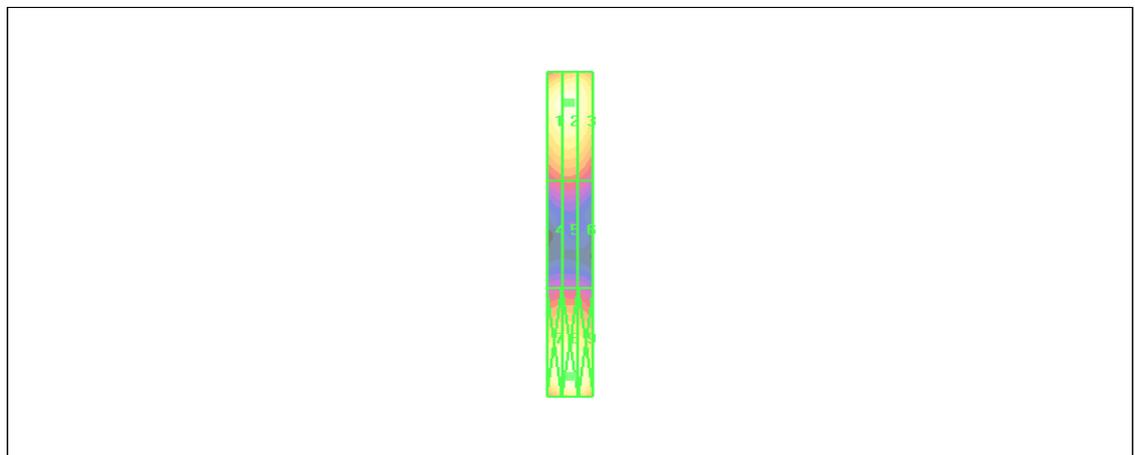
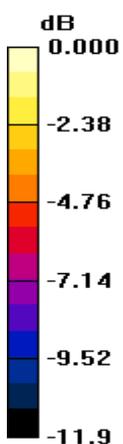
Device Reference Point: 0.000, 0.000, -6.30 mm

Reference Value = 100.7 V/m; Power Drift = -0.066 dB

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

Peak E-field in V/m

Grid 1 147.0 M4	Grid 2 149.2 M4	Grid 3 143.9 M4
Grid 4 83.4 M4	Grid 5 85.0 M4	Grid 6 81.1 M4
Grid 7 148.8 M4	Grid 8 154.0 M4	Grid 9 148.9 M4



0 dB = 154.0V/m

Figure 8 System Performance Check 835MHz_E

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HAC_System Performance Check at 835MHz_H

DUT: Dipole 835 MHz; Type: CD835V3; SN: 1149

Date/Time: 7/6/2011 7:05:58 AM

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

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

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: RF Section

DASY5 Configuration:

Probe: H3DV6 - SN6260 ; Calibrated: 10/20/2009

Electronics: DAE4 Sn871; Calibrated: 11/18/2010

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

H Scan - measurement distance from the probe sensor center to CD835 Dipole = 10mm/Hearing Aid Compatibility Test (41x361x1): Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 0.443 A/m

Probe Modulation Factor = 1.00

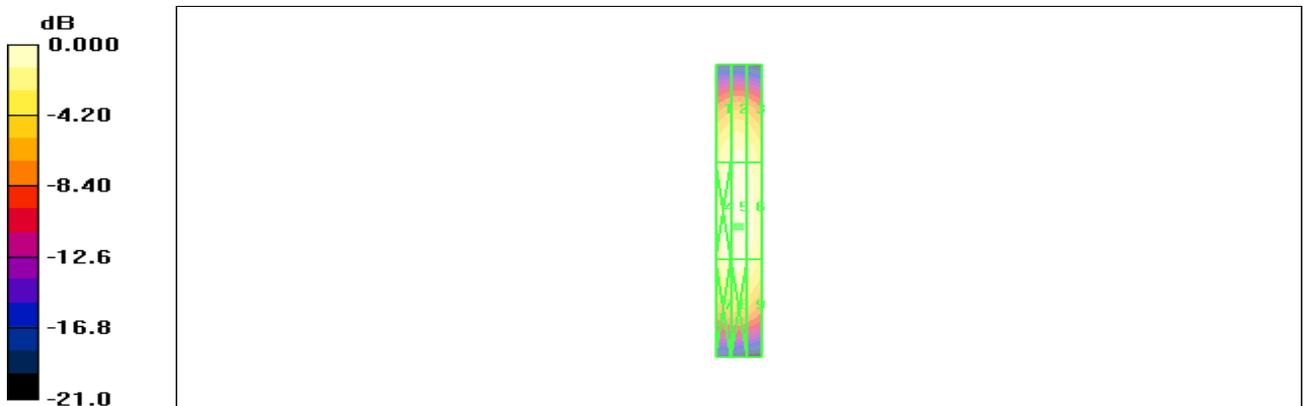
Device Reference Point: 0.000, 0.000, -6.30 mm

Reference Value = 0.464 A/m; Power Drift = 0.019 dB

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

Peak H-field in A/m

Grid 1 0.391 M4	Grid 2 0.408 M4	Grid 3 0.384 M4
Grid 4 0.427 M4	Grid 5 0.443 M4	Grid 6 0.414 M4
Grid 7 0.397 M4	Grid 8 0.410 M4	Grid 9 0.381 M4



0 dB = 0.443A/m

Figure 9 System Performance Check 835MHz_H

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HAC_System Performance Check at 1880MHz_E

DUT: Dipole 1880 MHz; Type: CD1880V3; SN:1135

Date/Time: 7/6/2011 5:43:34 AM

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

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

Ambient Temperature:22.3 °C Liqjud Temperature: 21.5°C

Phantom section: RF Section

DASY5 Configuration:

Probe: ER3DV6 - SN2428; ConvF(1, 1, 1); Calibrated: 10/20/2009

Electronics: DAE4 Sn871; Calibrated: 11/18/2010

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

E Scan - measurement distance from the probe sensor center to CD1880 Dipole = 10mm/Hearing Aid Compatibility Test (41x181x1): Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 131.4 V/m

Probe Modulation Factor = 1.00

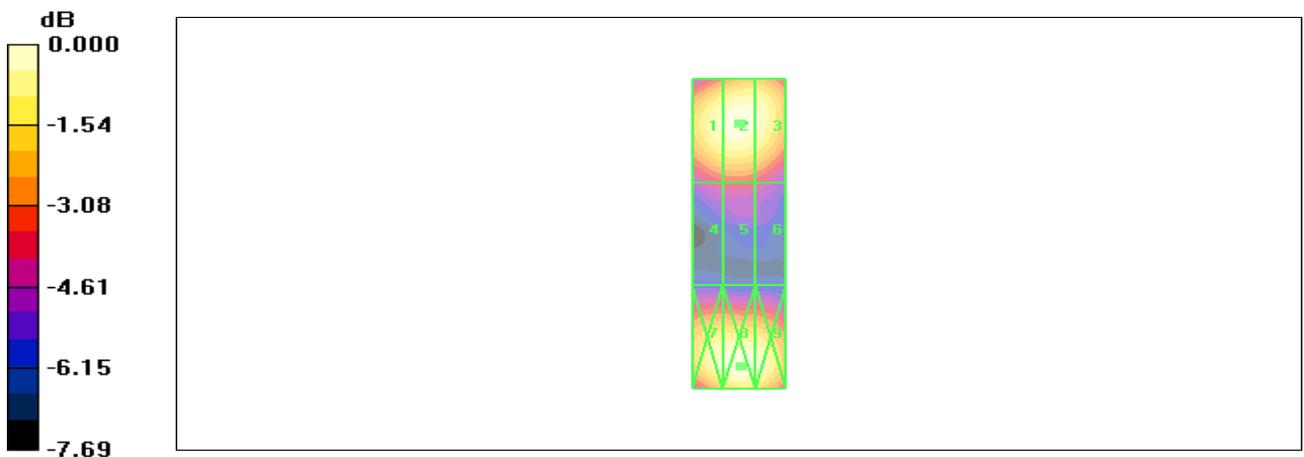
Device Reference Point: 0.000, 0.000, -6.30 mm

Reference Value = 151.0 V/m; Power Drift = -0.047 dB

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

Peak E-field in V/m

Grid 1 128.5 M2	Grid 2 131.4 M2	Grid 3 128.5 M2
Grid 4 87.5 M3	Grid 5 89.7 M3	Grid 6 86.2 M3
Grid 7 128.7 M2	Grid 8 134.0 M2	Grid 9 130.3 M2



0 dB = 134.0V/m

Figure 10 System Performance Check 1880MHz_E

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HAC_System Performance Check at 1880MHz_H

DUT: Dipole 1880 MHz; Type: CD1880V3; SN:1135

Date/Time: 7/6/2011 4:25:22 AM

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

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

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: RF Section

DASY5 Configuration:

Probe: H3DV6 - SN6260 ; Calibrated: 10/20/2009

Electronics: DAE4 Sn871; Calibrated: 11/18/2010

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

H Scan - measurement distance from the probe sensor center to Dipole = 10mm/Hearing Aid

Compatibility Test (41x181x1): Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 0.449 A/m

Probe Modulation Factor = 1.00

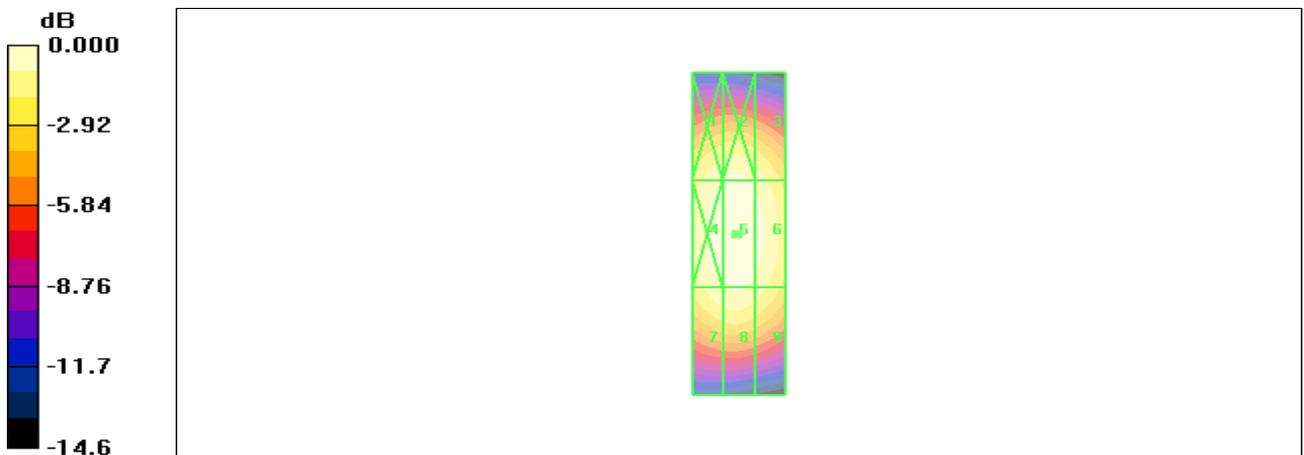
Device Reference Point: 0.000, 0.000, -6.30 mm

Reference Value = 0.472 A/m; Power Drift = -0.005 dB

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

Peak H-field in A/m

Grid 1	Grid 2	Grid 3
0.400 M2	0.413 M2	0.387 M2
Grid 4	Grid 5	Grid 6
0.435 M2	0.449 M2	0.422 M2
Grid 7	Grid 8	Grid 9
0.397 M2	0.410 M2	0.384 M2



0 dB = 0.449A/m

Figure 11 System Performance Check 1880MHz_H

ANNEX B: Graph Results

HAC RF E-Field CDMA Cellular High

Date/Time: 7/6/2011 9:45:42 AM

Communication System: CDMA Cellular; Frequency: 848.31 MHz; Duty Cycle: 1:1

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

Ambient Temperature: 22.3 °C

DASY5 Configuration:

Probe: ER3DV6 - SN2428; ConvF(1, 1, 1); Calibrated: 10/20/2009

Electronics: DAE4 Sn871; Calibrated: 11/18/2010

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

E Scan - ER3D - 2007: 15 mm from Probe Center to the Device High/Hearing Aid Compatibility

Test (101x101x1): Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 95.2 V/m

Probe Modulation Factor = 1.05

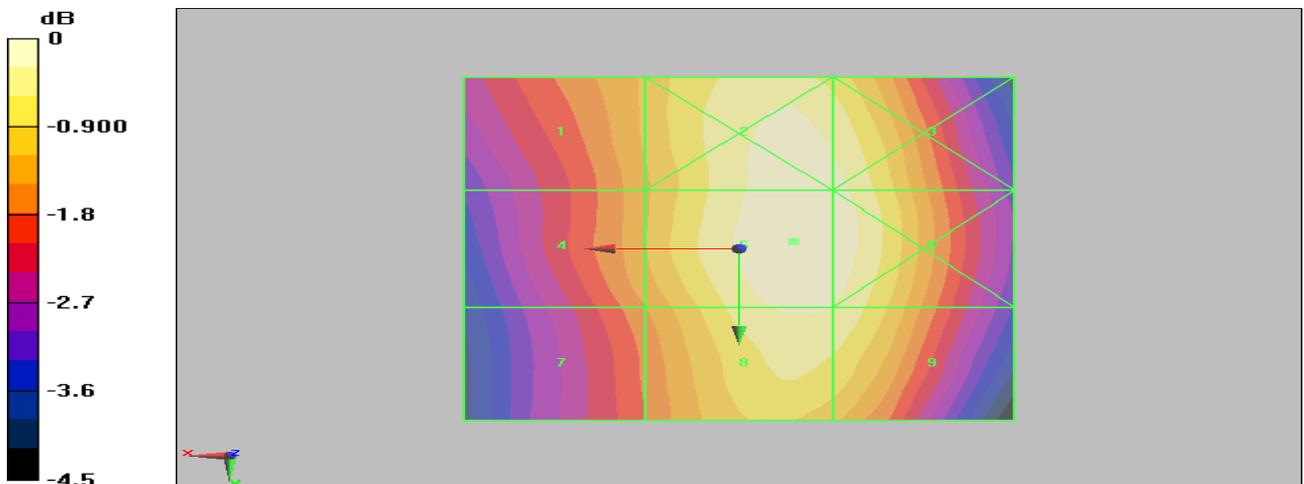
Device Reference Point: 0, 0, -6.3 mm

Reference Value = 116.1 V/m; Power Drift = -0.070 dB

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

Peak E-field in V/m

Grid 1	Grid 2	Grid 3
83.6 M4	94.1 M4	93.2 M4
Grid 4	Grid 5	Grid 6
82.8 M4	95.2 M4	94.2 M4
Grid 7	Grid 8	Grid 9
80.1 M4	92.4 M4	91.9 M4



0 dB = 95.2V/m

Figure 12 HAC RF E-Field CDMA Cellular Channel 777

HAC RF E-Field CDMA Cellular Middle

Date/Time: 7/6/2011 9:40:13 AM

Communication System: CDMA Cellular; Frequency: 836.52 MHz; Duty Cycle: 1:1

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

Ambient Temperature: 22.3 °C

DASY5 Configuration:

Probe: ER3DV6 - SN2428; ConvF(1, 1, 1); Calibrated: 10/20/2009

Electronics: DAE4 Sn871; Calibrated: 11/18/2010

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

E Scan - ER3D - 2007: 15 mm from Probe Center to the Device Middle/Hearing Aid

Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 97 V/m

Probe Modulation Factor = 1.05

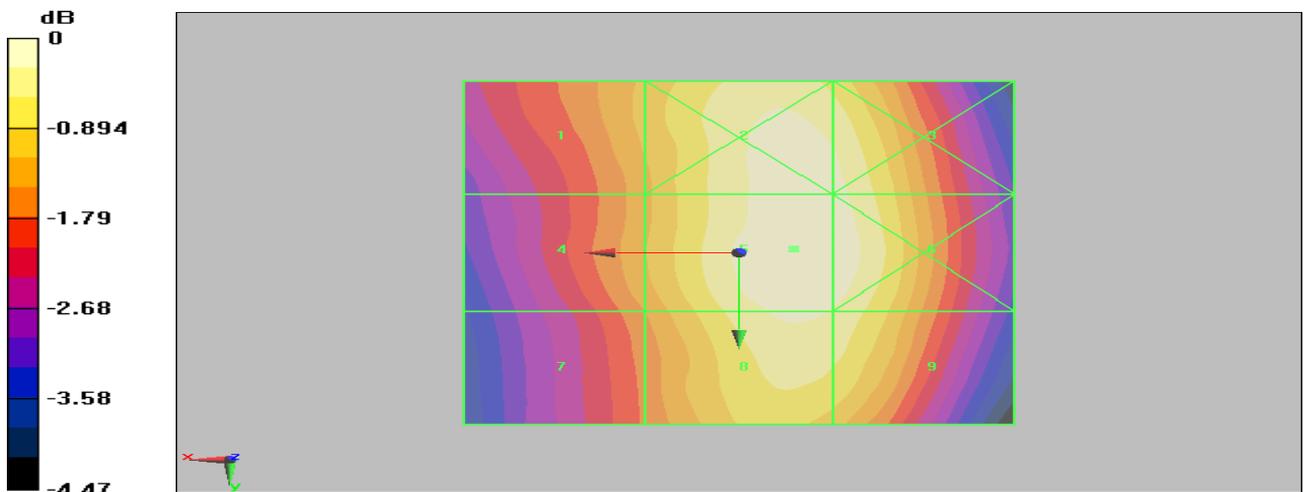
Device Reference Point: 0, 0, -6.3 mm

Reference Value = 117.5 V/m; Power Drift = 0.043 dB

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

Peak E-field in V/m

Grid 1	Grid 2	Grid 3
85.7 M4	96.3 M4	95 M4
Grid 4	Grid 5	Grid 6
84.5 M4	97 M4	96.3 M4
Grid 7	Grid 8	Grid 9
81.9 M4	94.4 M4	93.5 M4



0 dB = 97V/m

Figure 13 HAC RF E-Field CDMA Cellular Channel 384

HAC RF E-Field CDMA Cellular Low

Date/Time: 7/6/2011 9:51:10 AM

Communication System: CDMA Cellular; Frequency: 824.7 MHz; Duty Cycle: 1:1

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

Ambient Temperature: 22.3 °C

DASY5 Configuration:

Probe: ER3DV6 - SN2428; ConvF(1, 1, 1); Calibrated: 10/20/2009

Electronics: DAE4 Sn871; Calibrated: 11/18/2010

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

E Scan - ER3D - 2007: 15 mm from Probe Center to the Device Low/Hearing Aid Compatibility

Test (101x101x1): Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 92.3 V/m

Probe Modulation Factor = 1.05

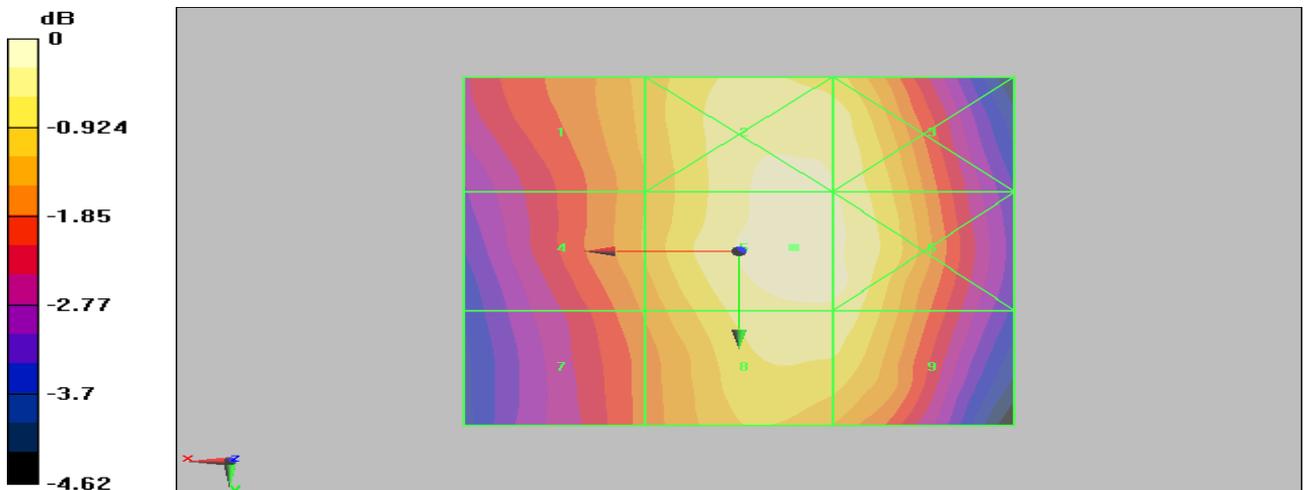
Device Reference Point: 0, 0, -6.3 mm

Reference Value = 112.1 V/m; Power Drift = -0.166 dB

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

Peak E-field in V/m

Grid 1	Grid 2	Grid 3
81.2 M4	90.8 M4	89.4 M4
Grid 4	Grid 5	Grid 6
80.7 M4	92.3 M4	90.2 M4
Grid 7	Grid 8	Grid 9
77.8 M4	88.7 M4	88.5 M4



0 dB = 92.3V/m

Figure 14 HAC RF E-Field CDMA Cellular Channel 1013

HAC RF H-Field CDMA Cellular High

Date/Time: 7/6/2011 11:47:57 AM

Communication System: CDMA Cellular; Frequency: 848.31 MHz; Duty Cycle: 1:1

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

Ambient Temperature: 22.3 °C

DASY5 Configuration:

Probe: H3DV6 - SN6260; Calibrated: 10/20/2009

Electronics: DAE4 Sn871; Calibrated: 11/18/2010

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

H Scan - H3DV6 - 2007: 15 mm from Probe High/Hearing Aid Compatibility Test (101x101x1):

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

Maximum value of peak Total field = 0.148 A/m

Probe Modulation Factor = 1.01

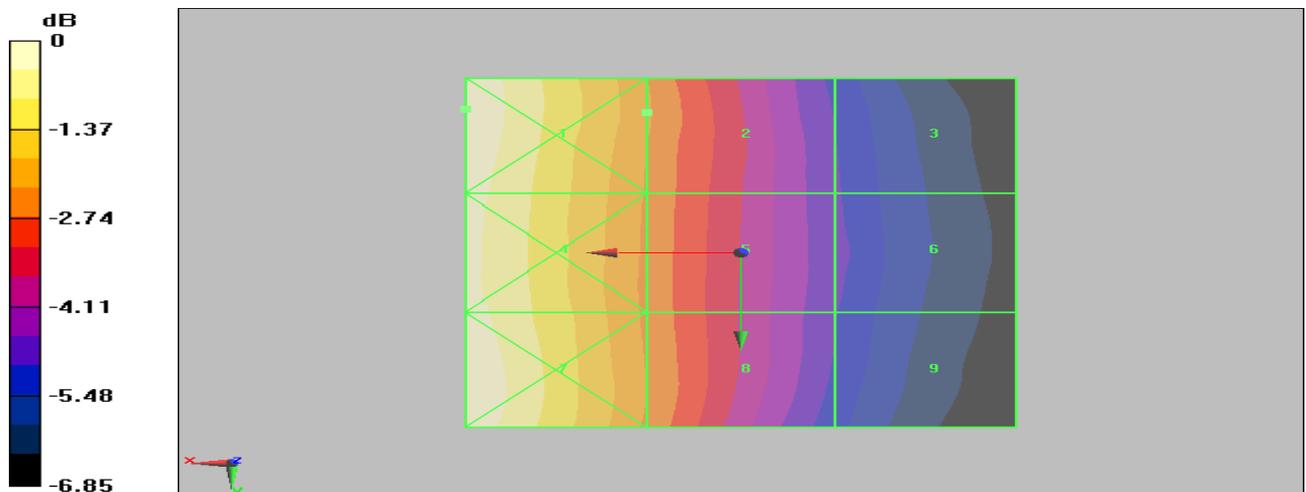
Device Reference Point: 0, 0, -6.3 mm

Reference Value = 0.124 A/m; Power Drift = -0.004 dB

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

Peak H-field in A/m

Grid 1 0.191 M4	Grid 2 0.148 M4	Grid 3 0.108 M4
Grid 4 0.186 M4	Grid 5 0.146 M4	Grid 6 0.110 M4
Grid 7 0.190 M4	Grid 8 0.147 M4	Grid 9 0.108 M4



0 dB = 0.191A/m

Figure 15 HAC RF H-Field CDMA Cellular Channel 777

HAC RF H-Field CDMA Cellular Middle

Date/Time: 7/6/2011 11:42:27 AM

Communication System: CDMA Cellular; Frequency: 836.52 MHz; Duty Cycle: 1:1

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

Ambient Temperature: 22.3 °C

DASY5 Configuration:

Probe: H3DV6 - SN6260; Calibrated: 10/20/2009

Electronics: DAE4 Sn871; Calibrated: 11/18/2010

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

H Scan - H3DV6 - 2007: 15 mm from Probe Middle/Hearing Aid Compatibility Test (101x101x1):

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

Maximum value of peak Total field = 0.145 A/m

Probe Modulation Factor = 1.01

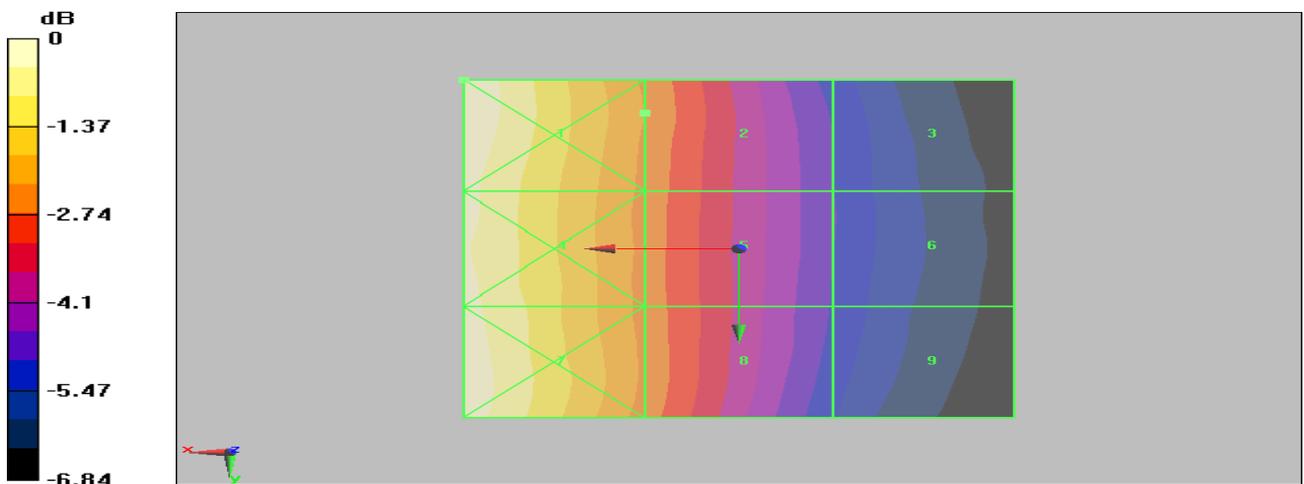
Device Reference Point: 0, 0, -6.3 mm

Reference Value = 0.122 A/m; Power Drift = -0.096 dB

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

Peak H-field in A/m

Grid 1 0.189 M4	Grid 2 0.145 M4	Grid 3 0.107 M4
Grid 4 0.183 M4	Grid 5 0.143 M4	Grid 6 0.107 M4
Grid 7 0.186 M4	Grid 8 0.144 M4	Grid 9 0.106 M4



0 dB = 0.189A/m

Figure 16 HAC RF H-Field CDMA Cellular Channel 384

HAC RF H-Field CDMA Cellular Low

Date/Time: 7/6/2011 11:53:20 AM

Communication System: CDMA Cellular; Frequency: 824.7 MHz; Duty Cycle: 1:1

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

Ambient Temperature: 22.3 °C

DASY5 Configuration:

Probe: H3DV6 - SN6260; Calibrated: 10/20/2009

Electronics: DAE4 Sn871; Calibrated: 11/18/2010

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

H Scan - H3DV6 - 2007: 15 mm from Probe Low/Hearing Aid Compatibility Test (101x101x1):

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

Maximum value of peak Total field = 0.134 A/m

Probe Modulation Factor = 1.01

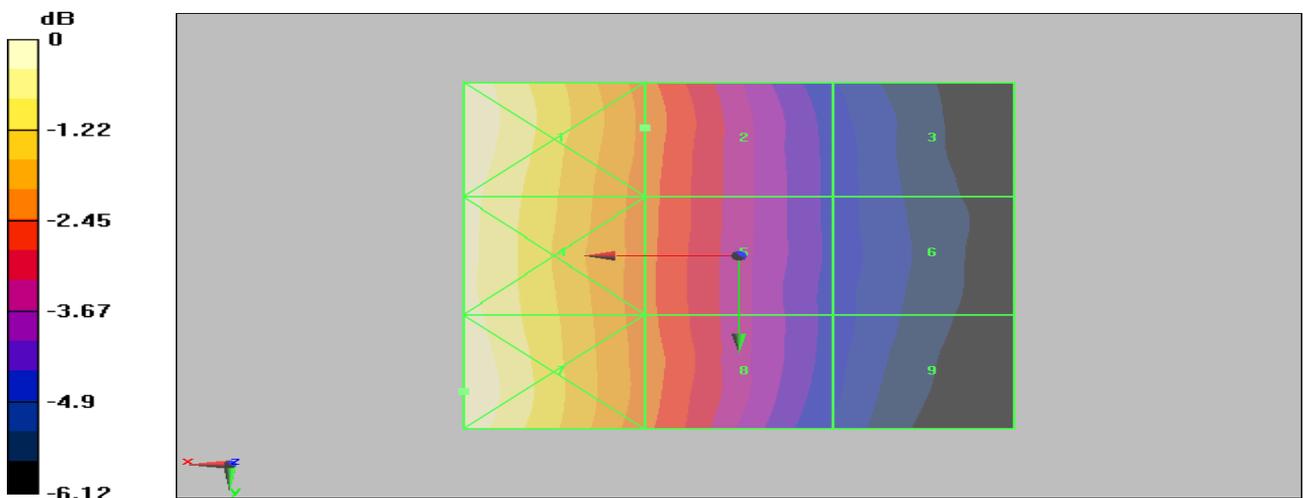
Device Reference Point: 0, 0, -6.3 mm

Reference Value = 0.115 A/m; Power Drift = -0.111 dB

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

Peak H-field in A/m

Grid 1 0.171 M4	Grid 2 0.134 M4	Grid 3 0.101 M4
Grid 4 0.168 M4	Grid 5 0.133 M4	Grid 6 0.101 M4
Grid 7 0.172 M4	Grid 8 0.133 M4	Grid 9 0.101 M4



0 dB = 0.172A/m

Figure 17 HAC RF H-Field CDMA Cellular Channel 1013

HAC RF E-Field CDMA PCS High

Date/Time: 7/6/2011 10:10:01 AM

Communication System: CDMA PCS; Frequency: 1908.75 MHz; Duty Cycle: 1:1

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

Ambient Temperature: 22.3 °C

DASY5 Configuration:

Probe: ER3DV6 - SN2428; ConvF(1, 1, 1); Calibrated: 10/20/2009

Electronics: DAE4 Sn871; Calibrated: 11/18/2010

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

E Scan - ER3D - 2007: 15 mm from Probe Center to the Device High/Hearing Aid Compatibility

Test (101x101x1): Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 36.6 V/m

Probe Modulation Factor = 1.02

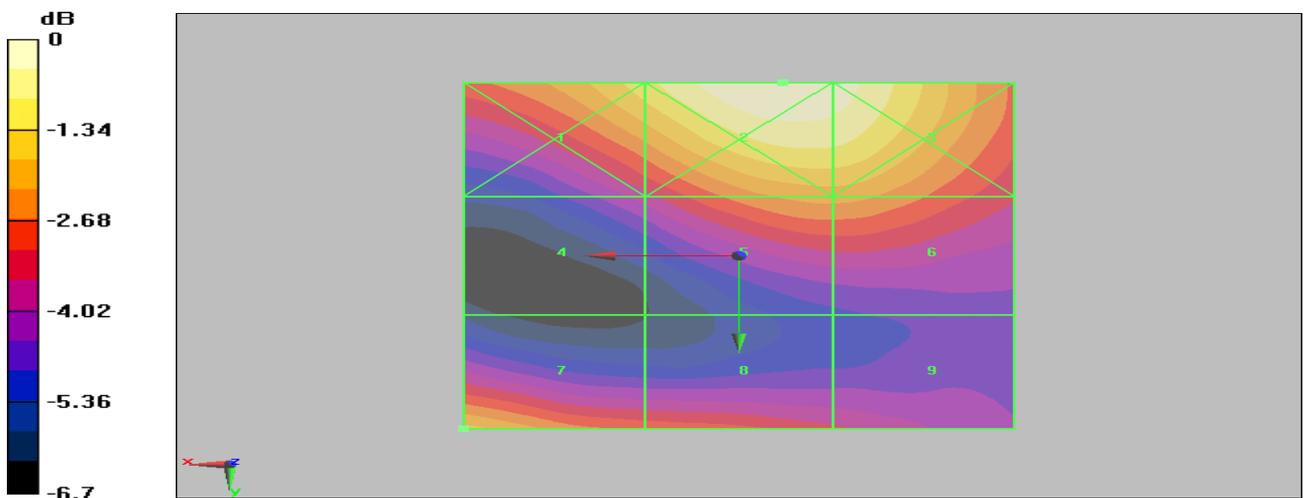
Device Reference Point: 0, 0, -6.3 mm

Reference Value = 28.9 V/m; Power Drift = -0.052 dB

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

Peak E-field in V/m

Grid 1 38.8 M4	Grid 2 43.8 M4	Grid 3 42.8 M4
Grid 4 28.5 M4	Grid 5 34.6 M4	Grid 6 34.6 M4
Grid 7 36.6 M4	Grid 8 31.9 M4	Grid 9 29.5 M4



0 dB = 43.8V/m

Figure 18 HAC RF E-Field CDMA PCS Channel 1175

HAC RF E-Field CDMA PCS Middle

Date/Time: 7/6/2011 9:56:48 AM

Communication System: CDMA PCS; Frequency: 1880 MHz; Duty Cycle: 1:1

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

Ambient Temperature: 22.3 °C

DASY5 Configuration:

Probe: ER3DV6 - SN2428; ConvF(1, 1, 1); Calibrated: 10/20/2009

Electronics: DAE4 Sn871; Calibrated: 11/18/2010

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

E Scan - ER3D - 2007: 15 mm from Probe Center to the Device Middle/Hearing Aid

Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 35.3 V/m

Probe Modulation Factor = 1.02

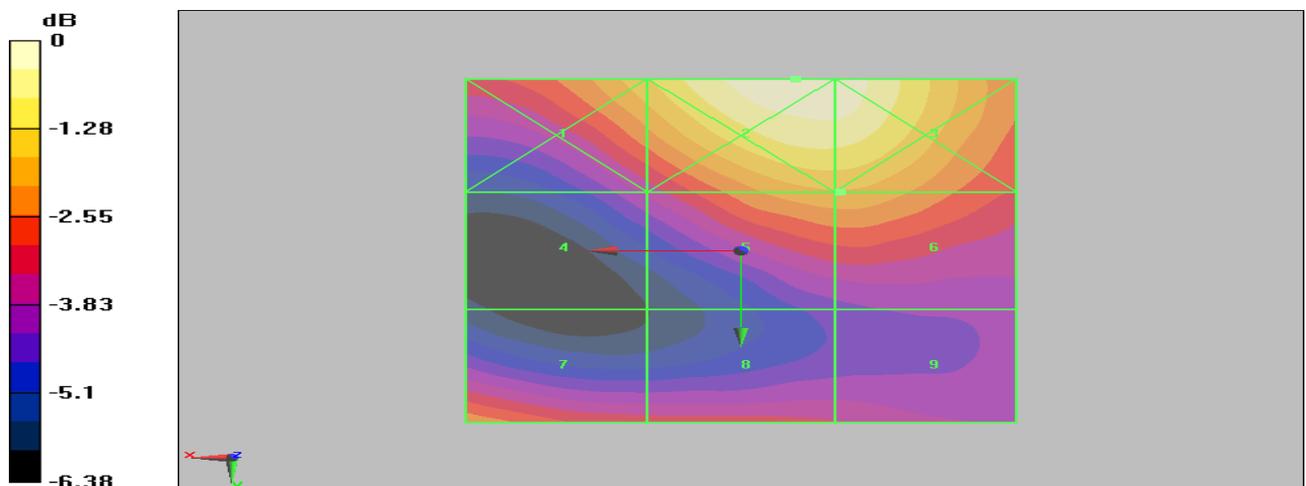
Device Reference Point: 0, 0, -6.3 mm

Reference Value = 30.6 V/m; Power Drift = -0.127 dB

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

Peak E-field in V/m

Grid 1 37.1 M4	Grid 2 43.2 M4	Grid 3 42.6 M4
Grid 4 28.2 M4	Grid 5 35.3 M4	Grid 6 35.3 M4
Grid 7 33.7 M4	Grid 8 30.3 M4	Grid 9 29.5 M4



0 dB = 43.2V/m

Figure 19 HAC RF E-Field CDMA PCS Channel 600

HAC RF E-Field CDMA PCS Low

Date/Time: 7/6/2011 10:04:31 AM

Communication System: CDMA PCS; Frequency: 1851.25 MHz; Duty Cycle: 1:1

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

Ambient Temperature: 22.3 °C

DASY5 Configuration:

Probe: ER3DV6 - SN2428; ConvF(1, 1, 1); Calibrated: 10/20/2009

Electronics: DAE4 Sn871; Calibrated: 11/18/2010

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

E Scan - ER3D - 2007: 15 mm from Probe Center to the Device Low/Hearing Aid Compatibility

Test (101x101x1): Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 30.5 V/m

Probe Modulation Factor = 1.02

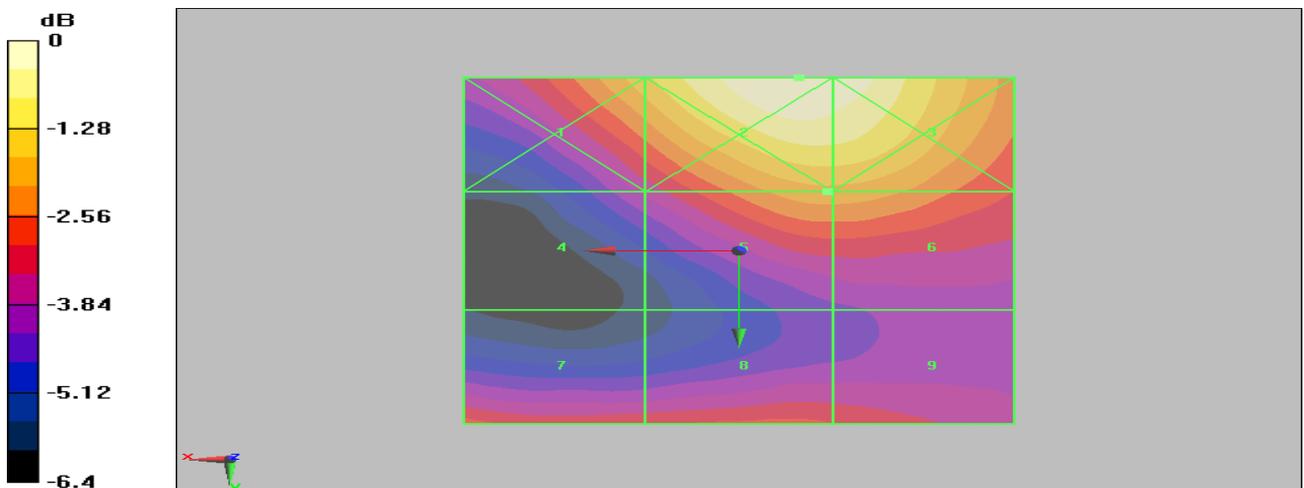
Device Reference Point: 0, 0, -6.3 mm

Reference Value = 26.3 V/m; Power Drift = -0.005 dB

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

Peak E-field in V/m

Grid 1 32.2 M4	Grid 2 37.7 M4	Grid 3 37.5 M4
Grid 4 24.6 M4	Grid 5 30.5 M4	Grid 6 30.5 M4
Grid 7 27.6 M4	Grid 8 27.3 M4	Grid 9 26.8 M4



0 dB = 37.7V/m

Figure 20 HAC RF E-Field CDMA PCS Channel 25

HAC RF H-Field CDMA PCS High

Date/Time: 7/6/2011 12:04:09 PM

Communication System: CDMA PCS; Frequency: 1908.75 MHz; Duty Cycle: 1:1

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

Ambient Temperature: 22.3 °C

DASY5 Configuration:

Probe: H3DV6 - SN6260; Calibrated: 10/20/2009

Electronics: DAE4 Sn871; Calibrated: 11/18/2010

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

H Scan - H3DV6 - 2007: 15 mm from Probe High/Hearing Aid Compatibility Test (101x101x1):

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

Maximum value of peak Total field = 0.087 A/m

Probe Modulation Factor = 1

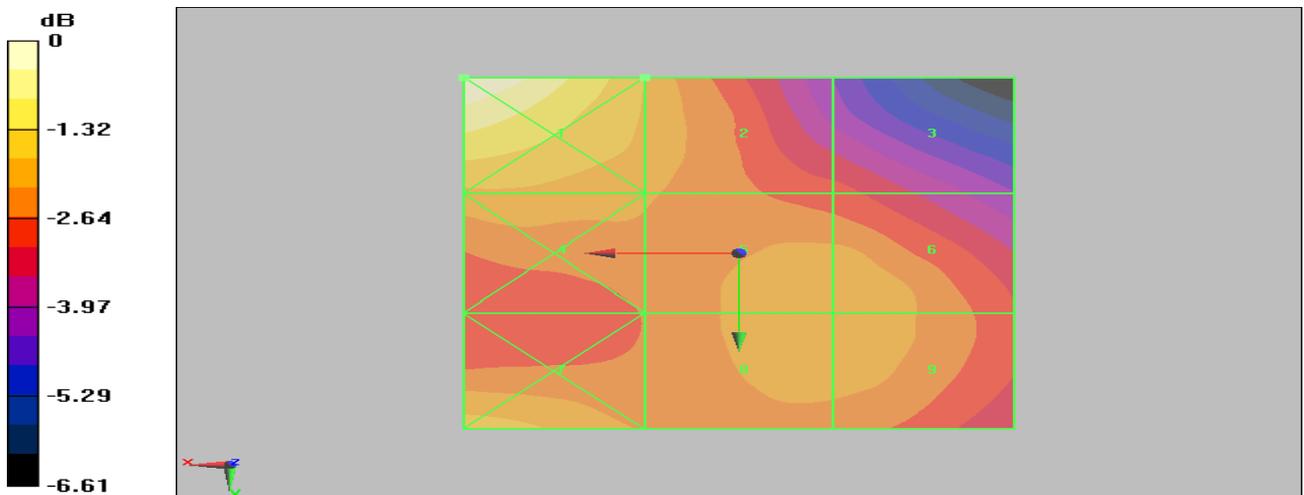
Device Reference Point: 0, 0, -6.3 mm

Reference Value = 0.088 A/m; Power Drift = 0.049 dB

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

Peak H-field in A/m

Grid 1 0.107 M4	Grid 2 0.087 M4	Grid 3 0.077 M4
Grid 4 0.087 M4	Grid 5 0.087 M4	Grid 6 0.087 M4
Grid 7 0.091 M4	Grid 8 0.087 M4	Grid 9 0.087 M4



0 dB = 0.107A/m

Figure 21 HAC RF H-Field CDMA PCS Channel 1175

HAC RF H-Field CDMA PCS Middle

Date/Time: 7/6/2011 11:58:47 AM

Communication System: CDMA PCS; Frequency: 1880 MHz; Duty Cycle: 1:1

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

Ambient Temperature: 22.3 °C

DASY5 Configuration:

Probe: H3DV6 - SN6260; Calibrated: 10/20/2009

Electronics: DAE4 Sn871; Calibrated: 11/18/2010

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

H Scan - H3DV6 - 2007: 15 mm from Probe Middle/Hearing Aid Compatibility Test (101x101x1):

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

Maximum value of peak Total field = 0.087 A/m

Probe Modulation Factor = 1

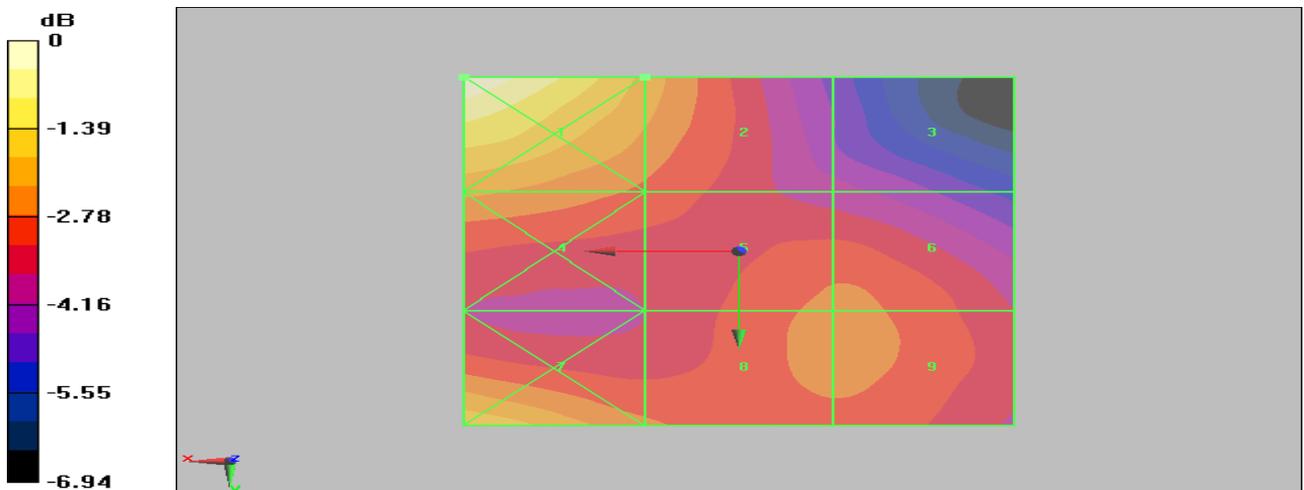
Device Reference Point: 0, 0, -6.3 mm

Reference Value = 0.080 A/m; Power Drift = 0.039 dB

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

Peak H-field in A/m

Grid 1 0.109 M4	Grid 2 0.087 M4	Grid 3 0.069 M4
Grid 4 0.085 M4	Grid 5 0.080 M4	Grid 6 0.080 M4
Grid 7 0.093 M4	Grid 8 0.081 M4	Grid 9 0.081 M4



0 dB = 0.109A/m

Figure 22 HAC RF H-Field CDMA PCS Channel 600

HAC RF H-Field CDMA PCS Low

Date/Time: 7/6/2011 12:26:40 PM

Communication System: CDMA PCS; Frequency: 1851.25 MHz; Duty Cycle: 1:1

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

Ambient Temperature: 22.3 °C

DASY5 Configuration:

Probe: H3DV6 - SN6260; Calibrated: 10/20/2009

Electronics: DAE4 Sn871; Calibrated: 11/18/2010

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

H Scan - H3DV6 - 2007: 15 mm from Probe Low 2/Hearing Aid Compatibility Test (101x101x1):

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

Maximum value of peak Total field = 0.072 A/m

Probe Modulation Factor = 1

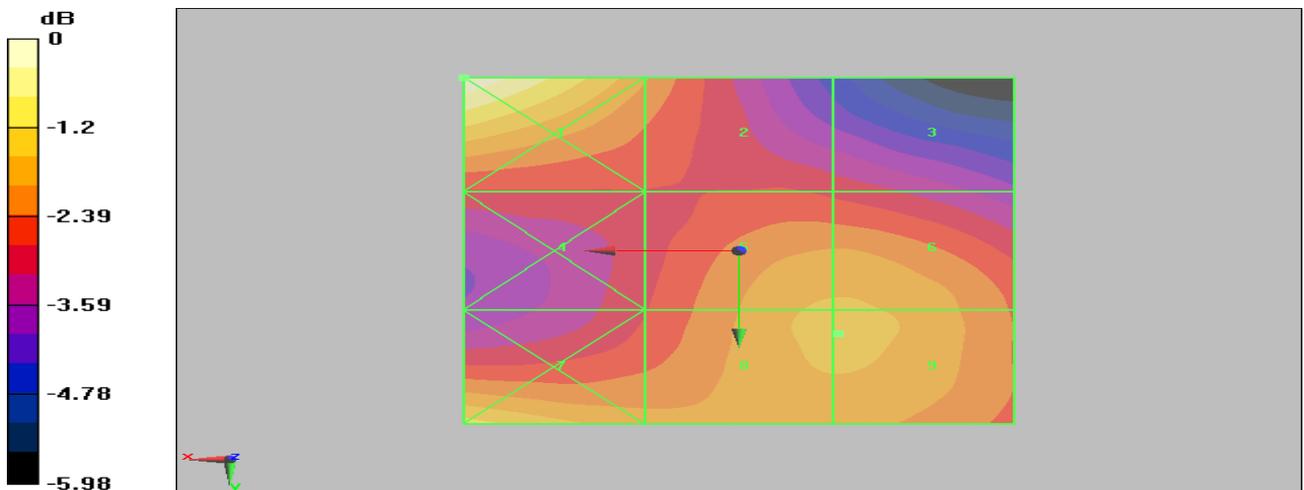
Device Reference Point: 0, 0, -6.3 mm

Reference Value = 0.073 A/m; Power Drift = 0.034 dB

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

Peak H-field in A/m

Grid 1	Grid 2	Grid 3
0.086 M4	0.069 M4	0.062 M4
Grid 4	Grid 5	Grid 6
0.062 M4	0.072 M4	0.072 M4
Grid 7	Grid 8	Grid 9
0.077 M4	0.072 M4	0.072 M4



0 dB = 0.086A/m

Figure 23 HAC RF H-Field CDMA PCS Channel 25

HAC RF E-Field CDMA BC10 High

Date/Time: 7/6/2011 10:39:08 AM

Communication System: Secondary 800 MHz (BC10); Frequency: 823.1 MHz; Duty Cycle: 1:1

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

Ambient Temperature: 22.3 °C

DASY5 Configuration:

Probe: ER3DV6 - SN2428; ConvF(1, 1, 1); Calibrated: 10/20/2009

Electronics: DAE4 Sn871; Calibrated: 11/18/2010

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

E Scan - ER3D - 2007: 15 mm from Probe Center to the Device High/Hearing Aid Compatibility

Test (101x101x1): Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 82.3 V/m

Probe Modulation Factor = 1.05

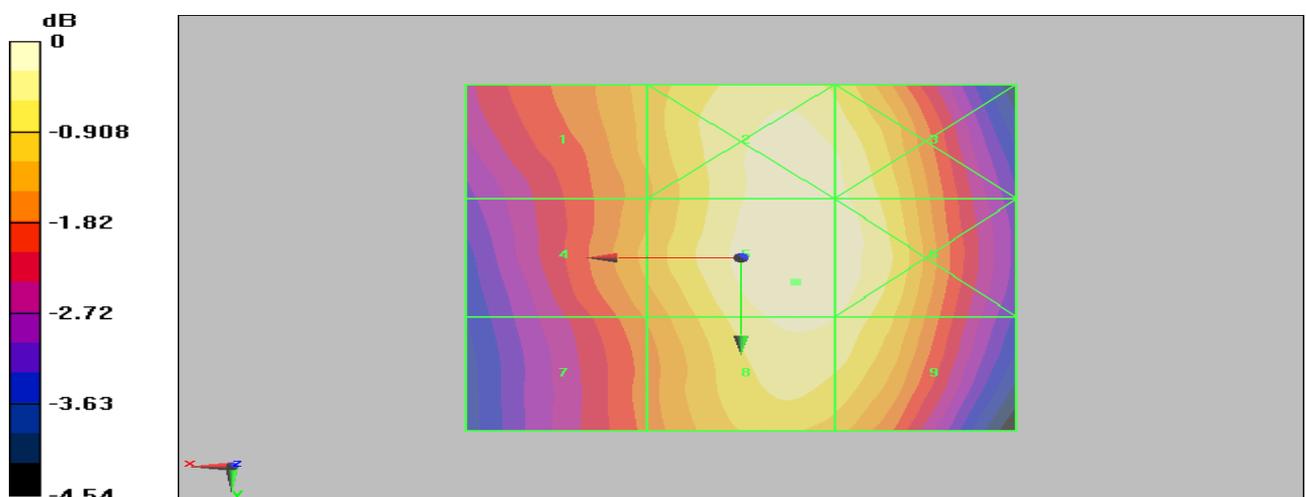
Device Reference Point: 0, 0, -6.3 mm

Reference Value = 100.4 V/m; Power Drift = -0.002 dB

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

Peak E-field in V/m

Grid 1 72.7 M4	Grid 2 81.6 M4	Grid 3 80.6 M4
Grid 4 72.5 M4	Grid 5 82.3 M4	Grid 6 81.5 M4
Grid 7 69.6 M4	Grid 8 80.3 M4	Grid 9 79.5 M4



0 dB = 82.3V/m

Figure 24 HAC RF E-Field CDMA BC10 Channel 684

HAC RF E-Field CDMA BC10 Middle

Date/Time: 7/6/2011 10:33:38 AM

Communication System: Secondary 800 MHz (BC10); Frequency: 820.5 MHz; Duty Cycle: 1:1

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

Ambient Temperature: 22.3 °C

DASY5 Configuration:

Probe: ER3DV6 - SN2428; ConvF(1, 1, 1); Calibrated: 10/20/2009

Electronics: DAE4 Sn871; Calibrated: 11/18/2010

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

E Scan - ER3D - 2007: 15 mm from Probe Center to the Device Middle/Hearing Aid

Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 84.7 V/m

Probe Modulation Factor = 1.05

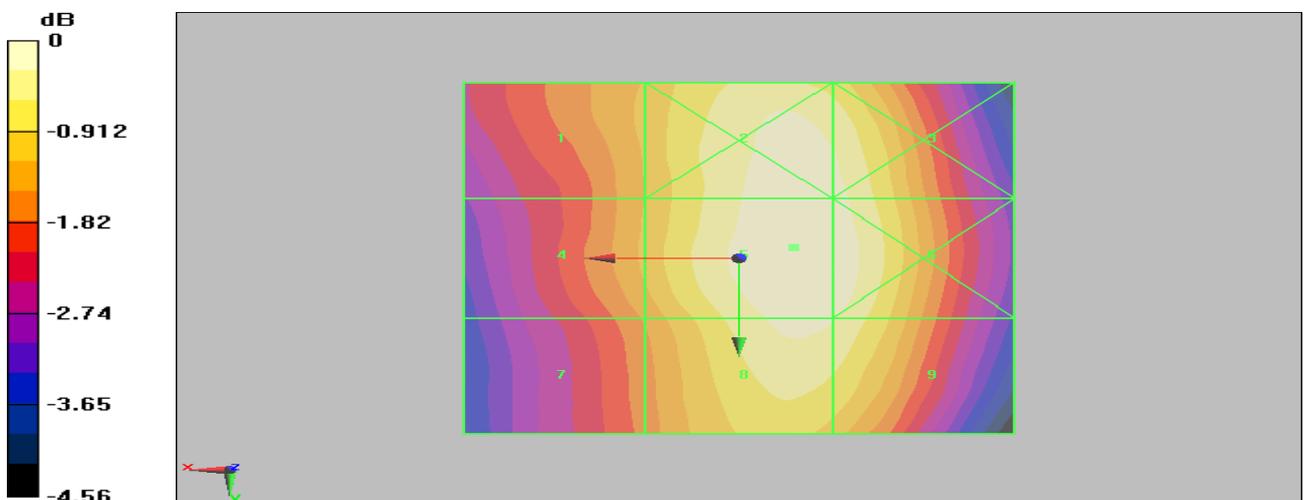
Device Reference Point: 0, 0, -6.3 mm

Reference Value = 104.1 V/m; Power Drift = -0.064 dB

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

Peak E-field in V/m

Grid 1	Grid 2	Grid 3
74.5 M4	83.8 M4	82.9 M4
Grid 4	Grid 5	Grid 6
74.4 M4	84.7 M4	84 M4
Grid 7	Grid 8	Grid 9
71.6 M4	82.7 M4	82 M4



0 dB = 84.7V/m

Figure 25 HAC RF E-Field CDMA BC10 Channel 580

HAC RF E-Field CDMA BC10 Low

Date/Time: 7/6/2011 10:44:38 AM

Communication System: Secondary 800 MHz (BC10); Frequency: 817.9 MHz; Duty Cycle: 1:1

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

Ambient Temperature: 22.3 °C

DASY5 Configuration:

Probe: ER3DV6 - SN2428; ConvF(1, 1, 1); Calibrated: 10/20/2009

Electronics: DAE4 Sn871; Calibrated: 11/18/2010

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

E Scan - ER3D - 2007: 15 mm from Probe Center to the Device Low/Hearing Aid Compatibility

Test (101x101x1): Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 85.7 V/m

Probe Modulation Factor = 1.05

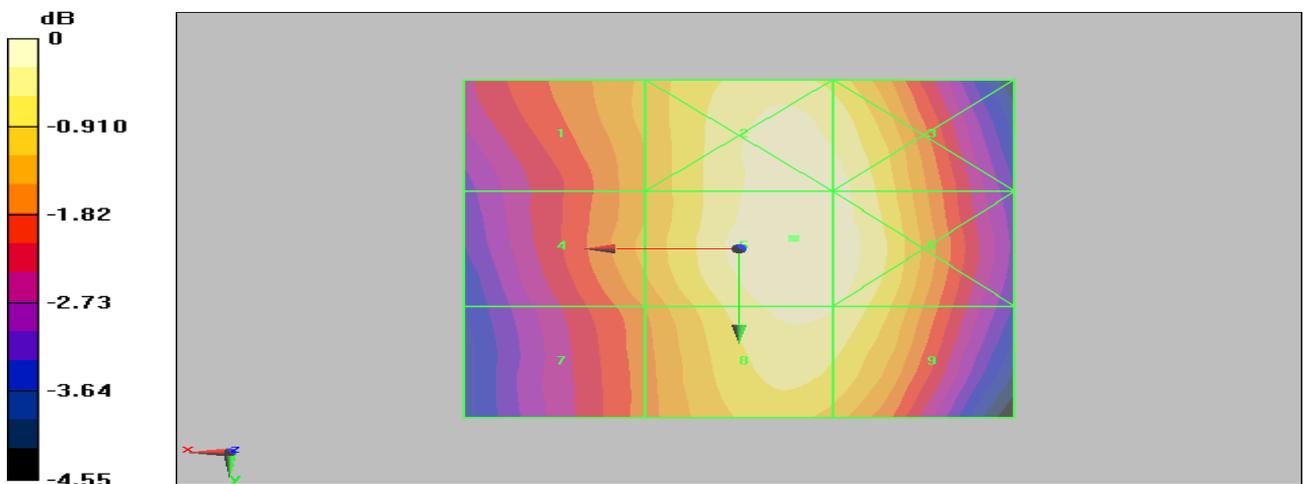
Device Reference Point: 0, 0, -6.3 mm

Reference Value = 104.1 V/m; Power Drift = 0.050 dB

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

Peak E-field in V/m

Grid 1	Grid 2	Grid 3
75.5 M4	84.9 M4	84.1 M4
Grid 4	Grid 5	Grid 6
75.5 M4	85.7 M4	85 M4
Grid 7	Grid 8	Grid 9
72.3 M4	83.7 M4	83 M4



0 dB = 85.7V/m

Figure 26 HAC RF E-Field CDMA BC10 Channel 476

HAC RF H-Field CDMA BC10 High

Date/Time: 7/6/2011 11:05:08 AM

Communication System: Secondary 800 MHz (BC10); Frequency: 823.1 MHz; Duty Cycle: 1:1

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

Ambient Temperature: 22.3 °C

DASY5 Configuration:

Probe: H3DV6 - SN6260; Calibrated: 10/20/2009

Electronics: DAE4 Sn871; Calibrated: 11/18/2010

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

H Scan - H3DV6 - 2007: 15 mm from Probe High/Hearing Aid Compatibility Test (101x101x1):

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

Maximum value of peak Total field = 0.134 A/m

Probe Modulation Factor = 1.01

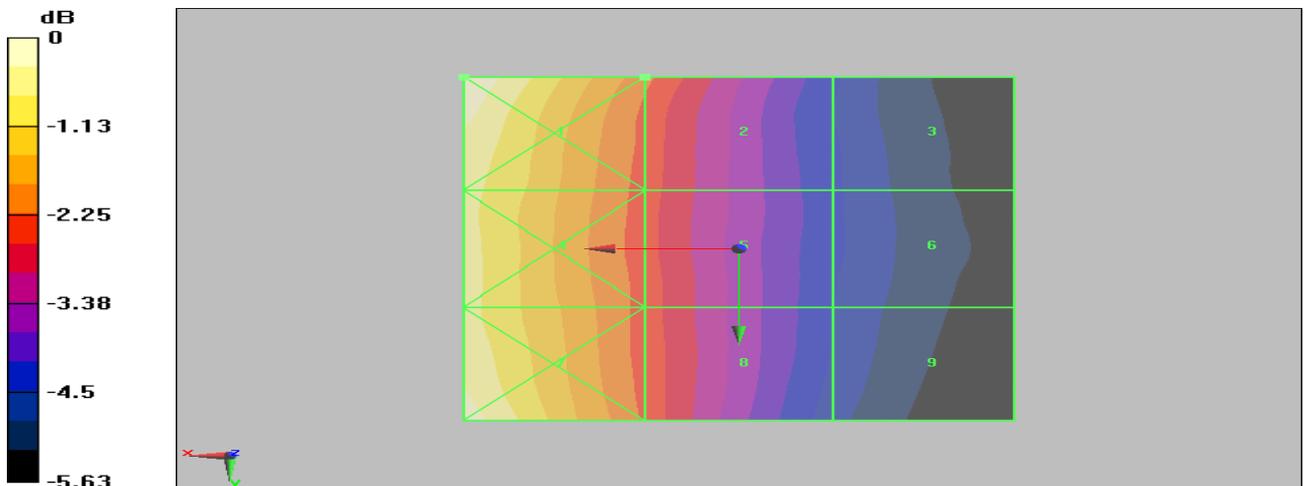
Device Reference Point: 0, 0, -6.3 mm

Reference Value = 0.114 A/m; Power Drift = -0.026 dB

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

Peak H-field in A/m

Grid 1 0.171 M4	Grid 2 0.134 M4	Grid 3 0.103 M4
Grid 4 0.160 M4	Grid 5 0.129 M4	Grid 6 0.103 M4
Grid 7 0.168 M4	Grid 8 0.131 M4	Grid 9 0.102 M4



0 dB = 0.171A/m

Figure 27 HAC RF H-Field CDMA BC10 Channel 684

HAC RF H-Field CDMA BC10 Middle

Date/Time: 7/6/2011 10:59:31 AM

Communication System: Secondary 800 MHz (BC10); Frequency: 820.5 MHz; Duty Cycle: 1:1

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

Ambient Temperature: 22.3 °C

DASY5 Configuration:

Probe: H3DV6 - SN6260; Calibrated: 10/20/2009

Electronics: DAE4 Sn871; Calibrated: 11/18/2010

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

H Scan - H3DV6 - 2007: 15 mm from Probe Middle/Hearing Aid Compatibility Test (101x101x1):

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

Maximum value of peak Total field = 0.143 A/m

Probe Modulation Factor = 1.01

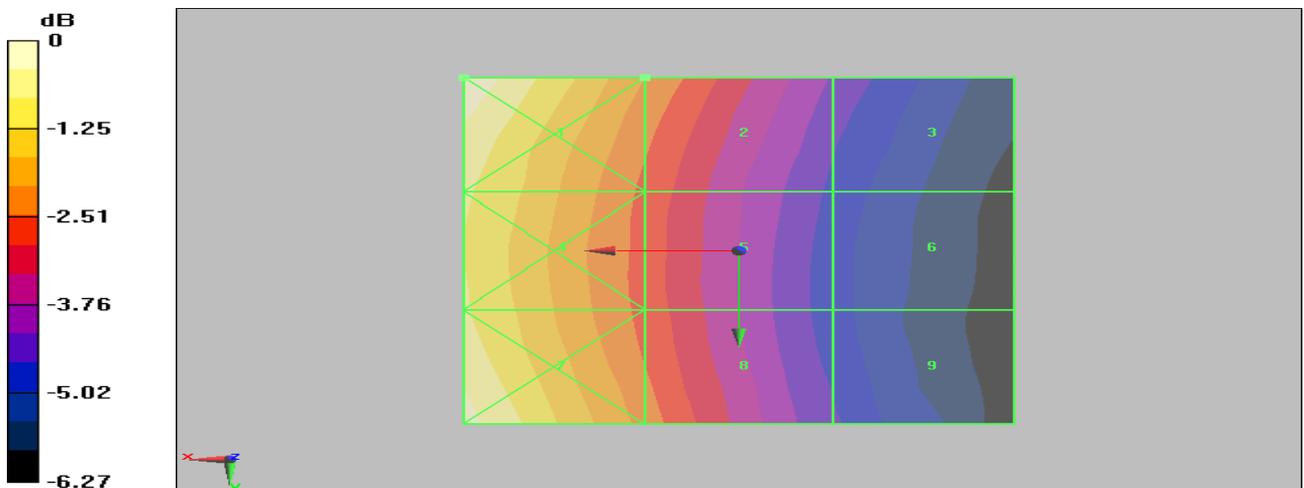
Device Reference Point: 0, 0, -6.3 mm

Reference Value = 0.120 A/m; Power Drift = -0.078 dB

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

Peak H-field in A/m

Grid 1 0.181 M4	Grid 2 0.143 M4	Grid 3 0.112 M4
Grid 4 0.166 M4	Grid 5 0.134 M4	Grid 6 0.106 M4
Grid 7 0.176 M4	Grid 8 0.140 M4	Grid 9 0.108 M4



0 dB = 0.181A/m

Figure 28 HAC RF H-Field CDMA BC10 Channel 580

HAC RF H-Field CDMA BC10 Low

Date/Time: 7/6/2011 11:10:28 AM

Communication System: Secondary 800 MHz (BC10); Frequency: 817.9 MHz; Duty Cycle: 1:1

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

Ambient Temperature: 22.3 °C

DASY5 Configuration:

Probe: H3DV6 - SN6260; Calibrated: 10/20/2009

Electronics: DAE4 Sn871; Calibrated: 11/18/2010

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

H Scan - H3DV6 - 2007: 15 mm from Probe Low/Hearing Aid Compatibility Test (101x101x1):

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

Maximum value of peak Total field = 0.133 A/m

Probe Modulation Factor = 1.01

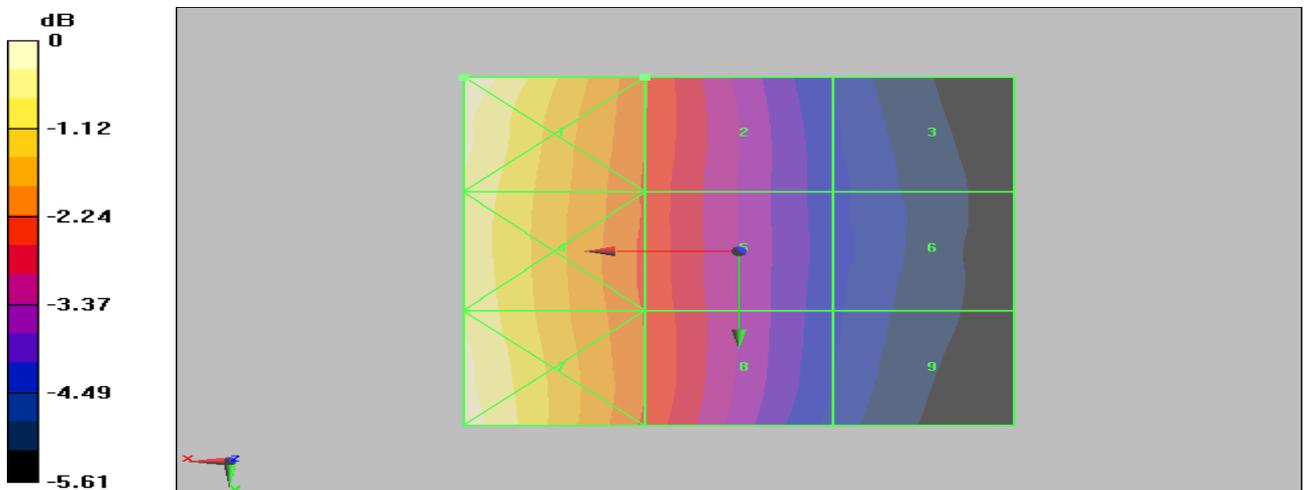
Device Reference Point: 0, 0, -6.3 mm

Reference Value = 0.115 A/m; Power Drift = -0.053 dB

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

Peak H-field in A/m

Grid 1 0.171 M4	Grid 2 0.133 M4	Grid 3 0.104 M4
Grid 4 0.163 M4	Grid 5 0.132 M4	Grid 6 0.104 M4
Grid 7 0.168 M4	Grid 8 0.132 M4	Grid 9 0.103 M4



0 dB = 0.171A/m

Figure 29 HAC RF H-Field CDMA BC10 Channel 476

HAC RF E-Field CDMA BC14 High

Date/Time: 7/6/2011 10:21:24 AM

Communication System: CDMA US PCS 1900 (BC14); Frequency: 1913.75 MHz; Duty Cycle: 1:1

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

Ambient Temperature: 22.3 °C

DASY5 Configuration:

Probe: ER3DV6 - SN2428; ConvF(1, 1, 1); Calibrated: 10/20/2009

Electronics: DAE4 Sn871; Calibrated: 11/18/2010

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

E Scan - ER3D - 2007: 15 mm from Probe Center to the Device High/Hearing Aid Compatibility

Test (101x101x1): Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 37.1 V/m

Probe Modulation Factor = 1.02

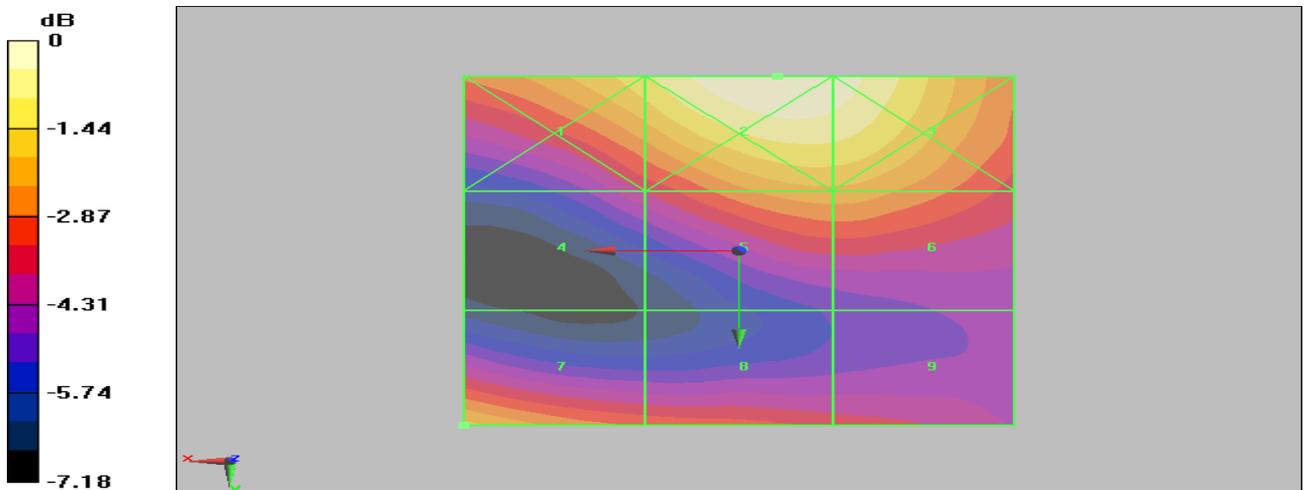
Device Reference Point: 0, 0, -6.3 mm

Reference Value = 29.6 V/m; Power Drift = -0.116 dB

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

Peak E-field in V/m

Grid 1 39.9 M4	Grid 2 45.1 M4	Grid 3 44.1 M4
Grid 4 29.2 M4	Grid 5 35.7 M4	Grid 6 35.6 M4
Grid 7 37.1 M4	Grid 8 32.3 M4	Grid 9 30.2 M4



0 dB = 45.1V/m

Figure 30 HAC RF E-Field CDMA BC14 Channel 1275

HAC RF E-Field CDMA BC14 Middle

Date/Time: 7/6/2011 10:16:00 AM

Communication System: CDMA US PCS 1900 (BC14); Frequency: 1912.5 MHz; Duty Cycle: 1:1

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

Ambient Temperature: 22.3 °C

DASY5 Configuration:

Probe: ER3DV6 - SN2428; ConvF(1, 1, 1); Calibrated: 10/20/2009

Electronics: DAE4 Sn871; Calibrated: 11/18/2010

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

E Scan - ER3D - 2007: 15 mm from Probe Center to the Device Middle/Hearing Aid

Compatibility Test (101x101x1): Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 37.4 V/m

Probe Modulation Factor = 1.02

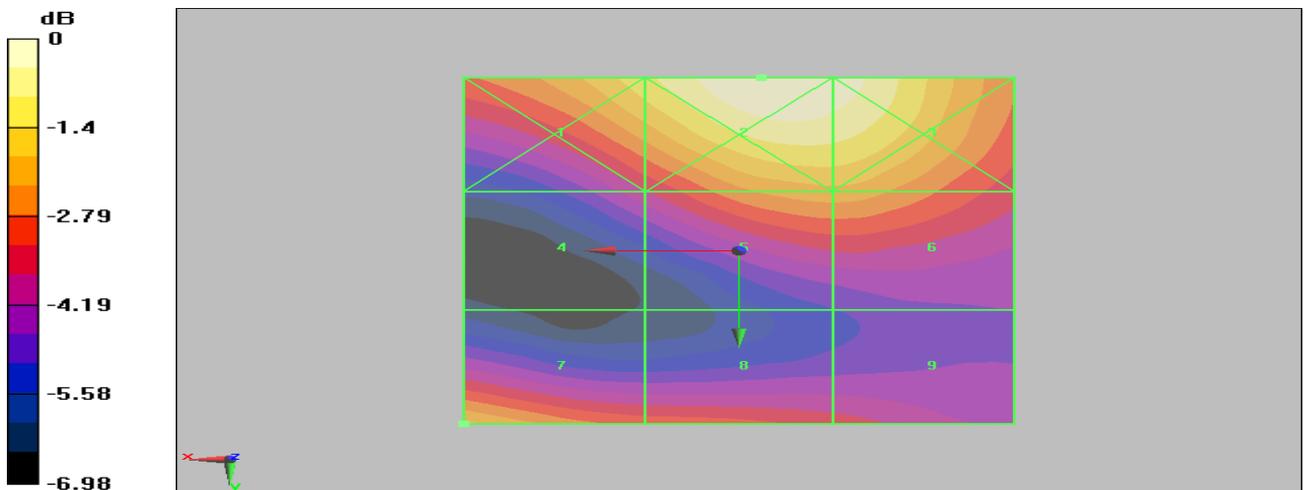
Device Reference Point: 0, 0, -6.3 mm

Reference Value = 29.7 V/m; Power Drift = -0.072 dB

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

Peak E-field in V/m

Grid 1 40.3 M4	Grid 2 45.5 M4	Grid 3 44.7 M4
Grid 4 29.5 M4	Grid 5 36.1 M4	Grid 6 36.1 M4
Grid 7 37.4 M4	Grid 8 32.6 M4	Grid 9 30.8 M4



0 dB = 45.5V/m

Figure 31 HAC RF E-Field CDMA BC14 Channel 1250

HAC RF E-Field CDMA BC14 Low

Date/Time: 7/6/2011 10:26:49 AM

Communication System: CDMA US PCS 1900 (BC14); Frequency: 1911.25 MHz; Duty Cycle: 1:1

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

Ambient Temperature: 22.3 °C

DASY5 Configuration:

Probe: ER3DV6 - SN2428; ConvF(1, 1, 1); Calibrated: 10/20/2009

Electronics: DAE4 Sn871; Calibrated: 11/18/2010

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

E Scan - ER3D - 2007: 15 mm from Probe Center to the Device Low/Hearing Aid Compatibility

Test (101x101x1): Measurement grid: dx=5mm, dy=5mm

Maximum value of peak Total field = 36.2 V/m

Probe Modulation Factor = 1.02

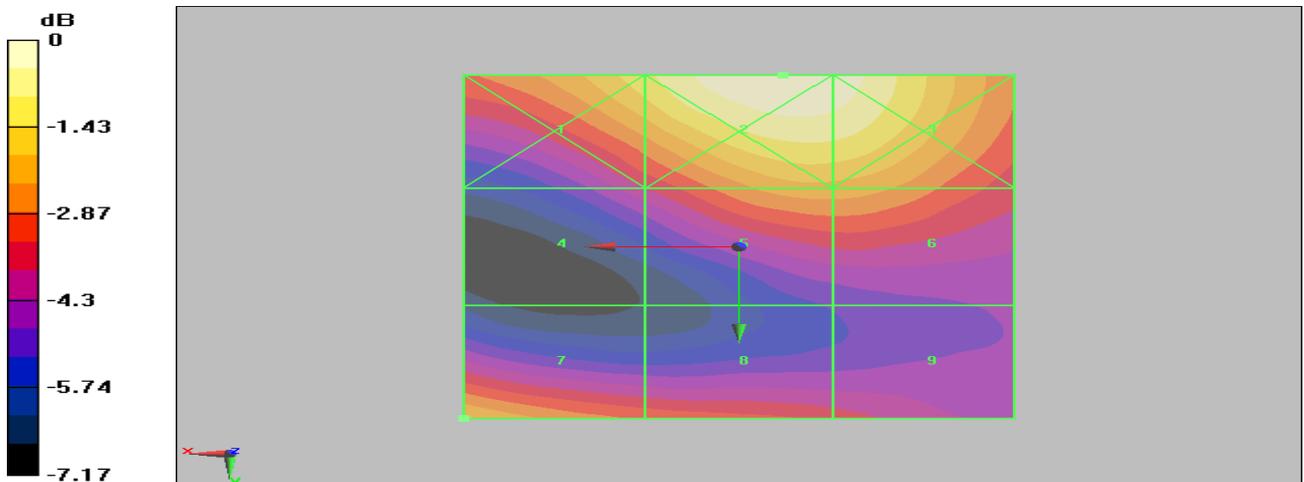
Device Reference Point: 0, 0, -6.3 mm

Reference Value = 28.7 V/m; Power Drift = 0.071 dB

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

Peak E-field in V/m

Grid 1 39.1 M4	Grid 2 44.3 M4	Grid 3 43.4 M4
Grid 4 28.5 M4	Grid 5 34.9 M4	Grid 6 34.8 M4
Grid 7 36.2 M4	Grid 8 31.8 M4	Grid 9 29.6 M4



0 dB = 44.3V/m

Figure 32 HAC RF E-Field CDMA BC14 Channel 1225

HAC RF H-Field CDMA BC14 High

Date/Time: 7/6/2011 11:23:13 AM

Communication System: CDMA US PCS 1900 (BC14); Frequency: 1913.75 MHz; Duty Cycle: 1:1

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

Ambient Temperature: 22.3 °C

DASY5 Configuration:

Probe: H3DV6 - SN6260; Calibrated: 10/20/2009

Electronics: DAE4 Sn871; Calibrated: 11/18/2010

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

H Scan - H3DV6 - 2007: 15 mm from Probe High/Hearing Aid Compatibility Test (101x101x1):

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

Maximum value of peak Total field = 0.094 A/m

Probe Modulation Factor = 1

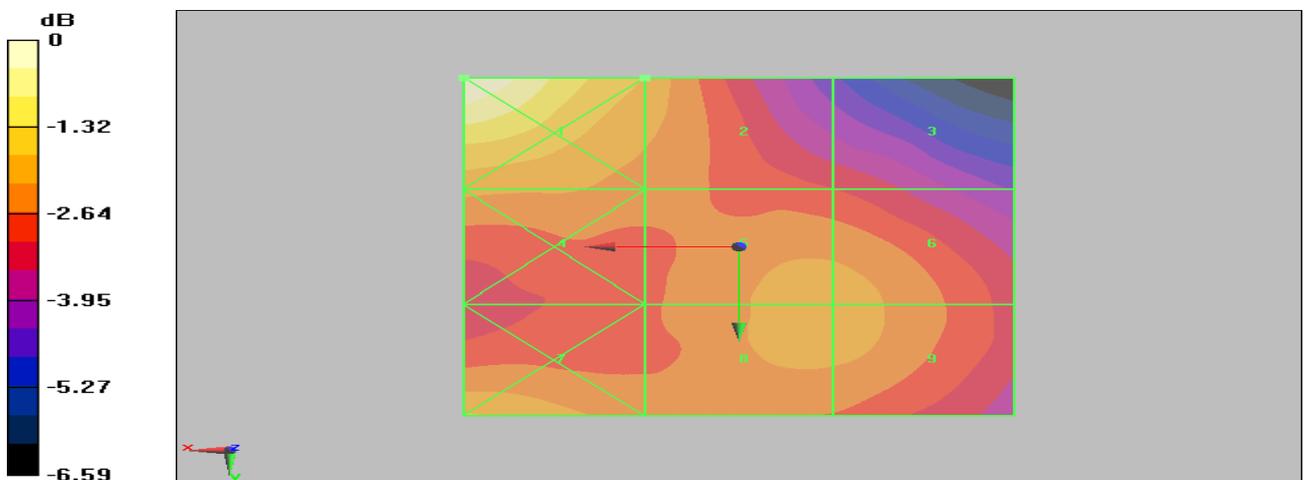
Device Reference Point: 0, 0, -6.3 mm

Reference Value = 0.094 A/m; Power Drift = -0.167 dB

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

Peak H-field in A/m

Grid 1	Grid 2	Grid 3
0.116 M4	0.094 M4	0.082 M4
Grid 4	Grid 5	Grid 6
0.092 M4	0.092 M4	0.092 M4
Grid 7	Grid 8	Grid 9
0.096 M4	0.093 M4	0.092 M4



0 dB = 0.116A/m

Figure 33 HAC RF H-Field CDMA BC14 Channel 1275

HAC RF H-Field CDMA BC14 Middle

Date/Time: 7/6/2011 11:17:43 AM

Communication System: CDMA US PCS 1900 (BC14); Frequency: 1912.5 MHz; Duty Cycle: 1:1

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

Ambient Temperature: 22.3 °C

DASY5 Configuration:

Probe: H3DV6 - SN6260; Calibrated: 10/20/2009

Electronics: DAE4 Sn871; Calibrated: 11/18/2010

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

H Scan - H3DV6 - 2007: 15 mm from Probe Middle/Hearing Aid Compatibility Test (101x101x1):

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

Maximum value of peak Total field = 0.094 A/m

Probe Modulation Factor = 1

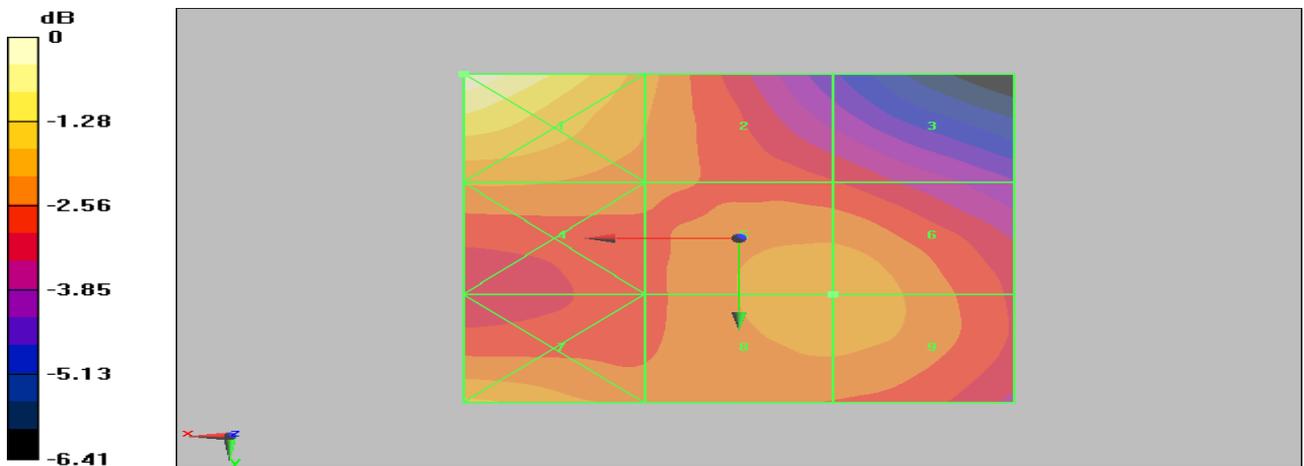
Device Reference Point: 0, 0, -6.3 mm

Reference Value = 0.095 A/m; Power Drift = 0.031 dB

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

Peak H-field in A/m

Grid 1 0.116 M4	Grid 2 0.093 M4	Grid 3 0.083 M4
Grid 4 0.091 M4	Grid 5 0.094 M4	Grid 6 0.094 M4
Grid 7 0.097 M4	Grid 8 0.094 M4	Grid 9 0.094 M4



0 dB = 0.116A/m

Figure 34 HAC RF H-Field CDMA BC14 Channel 1250

HAC RF H-Field CDMA BC14 Low

Date/Time: 7/6/2011 11:28:50 AM

Communication System: CDMA US PCS 1900 (BC14); Frequency: 1911.25 MHz; Duty Cycle: 1:1

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

Ambient Temperature: 22.3 °C

DASY5 Configuration:

Probe: H3DV6 - SN6260; Calibrated: 10/20/2009

Electronics: DAE4 Sn871; Calibrated: 11/18/2010

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

H Scan - H3DV6 - 2007: 15 mm from Probe 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 = 1

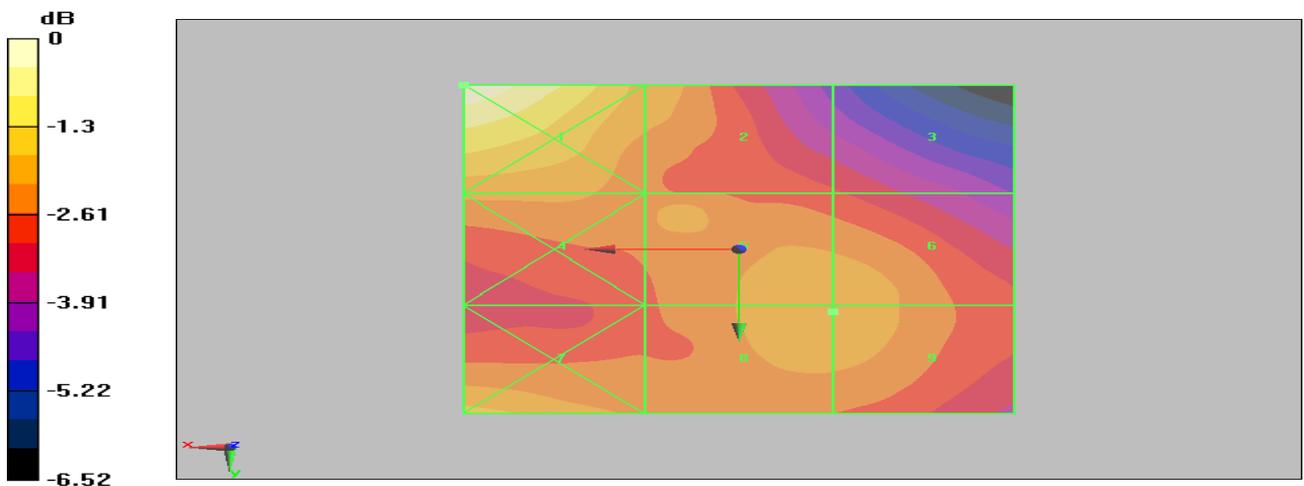
Device Reference Point: 0, 0, -6.3 mm

Reference Value = 0.091 A/m; Power Drift = 0.017 dB

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

Peak H-field in A/m

Grid 1 0.112 M4	Grid 2 0.090 M4	Grid 3 0.080 M4
Grid 4 0.089 M4	Grid 5 0.090 M4	Grid 6 0.090 M4
Grid 7 0.094 M4	Grid 8 0.091 M4	Grid 9 0.091 M4



0 dB = 0.112A/m

Figure 35 HAC RF H-Field CDMA BC14 Channel 1225

TA Technology (Shanghai) Co., Ltd. Test Report

Report No. RZA1106-1064HAC01

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ANNEX C: E-Probe Calibration Certificate

**Calibration Laboratory of
Schmid & Partner
Engineering AG**
Zeughausstrasse 43, 8004 Zurich, Switzerland



S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **TMC**

Certificate No: **ER3-2428_Oct09**

CALIBRATION CERTIFICATE

Object **ER3DV6 - SN:2428**

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

Calibration date: **October 20, 2009**

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4418B	GB41283874	1-Apr-09 (No. 217-01030)	Apr-10
Power sensor E4412A	MY41495277	1-Apr-09 (No. 217-01030)	Apr-10
Power sensor E4412A	MY41498087	1-Apr-09 (No. 217-01030)	Apr-10
Reference 3 dB Attenuator	SN: S5054 (3c)	31-Mar-09 (No. 217-01026)	Mar-10
Reference 20 dB Attenuator	SN: S5086 (20b)	31-Mar-09 (No. 217-01028)	Mar-10
Reference 30 dB Attenuator	SN: S5129 (30b)	31-Mar-09 (No. 217-01027)	Mar-10
Reference Probe ER3DV6	SN: 2328	3-Oct-09 (No. ER3-2328_Oct09)	Oct-10
DAE4	SN: 789	19-Dec-08 (No. DAE4-789_Dec08)	Dec-09

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-09 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-09)	In house check: Oct10

Calibrated by:	Name	Function	Signature
	Marcel Fehr	Laboratory Technician	
Approved by:	Katja Pekovic	Technical Manager	

Issued: October 22, 2009

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

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Calibration Laboratory of
Schmid & Partner
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Zeughausstrasse 43, 8004 Zurich, Switzerland



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Glossary:

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

Calibration is Performed According to the Following Standards:

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

Methods Applied and Interpretation of Parameters:

- NORM_{x,y,z}*: Assessed for E-field polarization $\vartheta = 0$ for XY sensors and $\vartheta = 90$ for Z sensor ($f \leq 900$ MHz in TEM-cell; $f > 1800$ MHz: R22 waveguide).
- NORM(f)_{x,y,z} = NORM_{x,y,z} * frequency_response* (see Frequency Response Chart).
- DCP_{x,y,z}*: DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- A_{x,y,z}; B_{x,y,z}; C_{x,y,z}* are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media.
- Spherical isotropy (3D deviation from isotropy)*: in a locally homogeneous field realized using an open waveguide setup.
- Sensor Offset*: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.
- Connector Angle*: The angle is assessed using the information gained by determining the *NORM_x* (no uncertainty required).

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Probe ER3DV6

SN:2428

Manufactured:	September 11, 2007
Last calibrated:	December 13, 2007
Recalibrated:	October 20, 2009

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

TA Technology (Shanghai) Co., Ltd.

Test Report

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DASY - Parameters of Probe: ER3DV6 SN:2428

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu\text{V}/(\text{V}/\text{m})^2$)	1.52	1.59	1.86	$\pm 10.1\%$
DCP (mV) ^A	91.5	93.0	98.9	

Modulation Calibration Parameters

UID	Communication System Name	PAR		A dB	B dBuV	C	VR mV	Unc (k=2)
10000	CW		X	0.00	0.00	1.00	300	$\pm 1.5\%$
			Y	0.00	0.00	1.00	300	
			Z	0.00	0.00	1.00	300	

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

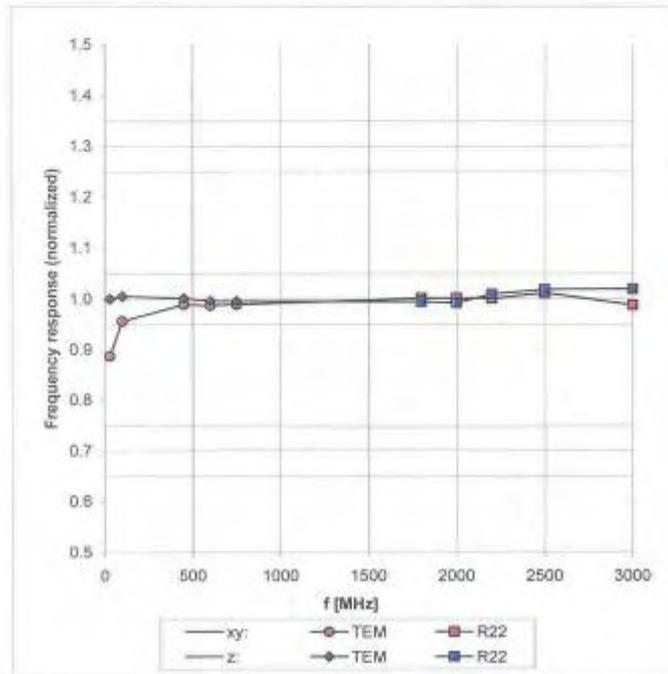
^A numerical linearization parameter; uncertainty not required

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Frequency Response of E-Field

(TEM-Cell:ifi110 EXX, Waveguide R22)

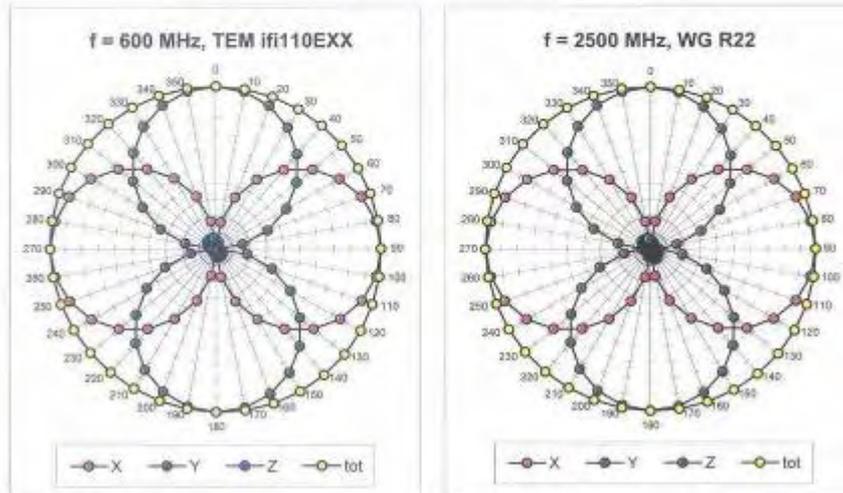


Uncertainty of Frequency Response of E-field: $\pm 6.3\%$ (k=2)

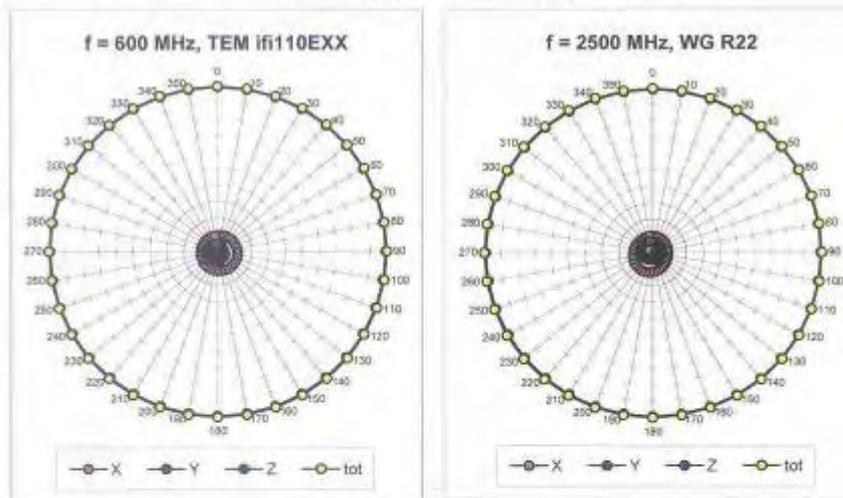
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Receiving Pattern (ϕ), $\vartheta = 0^\circ$



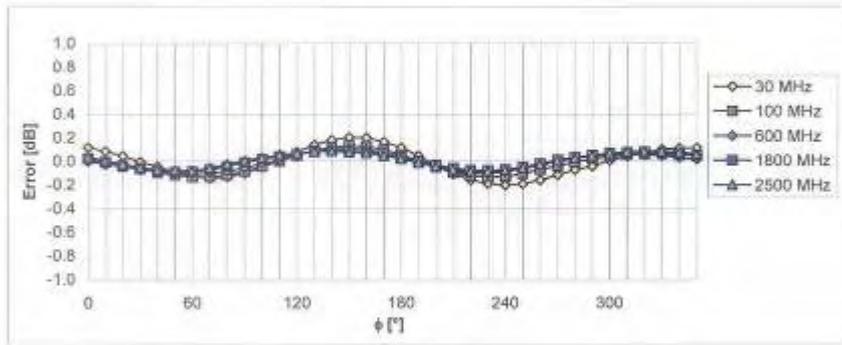
Receiving Pattern (ϕ), $\vartheta = 90^\circ$



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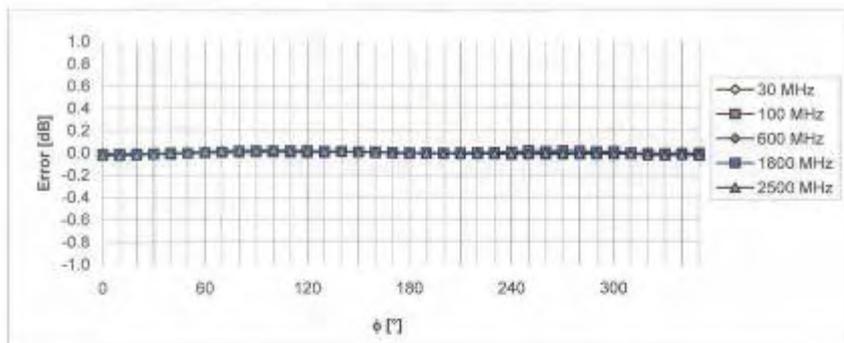
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Receiving Pattern (ϕ), $\vartheta = 0^\circ$



Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ (k=2)

Receiving Pattern (ϕ), $\vartheta = 90^\circ$

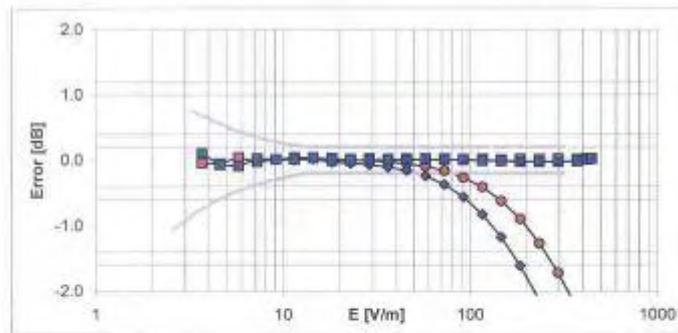
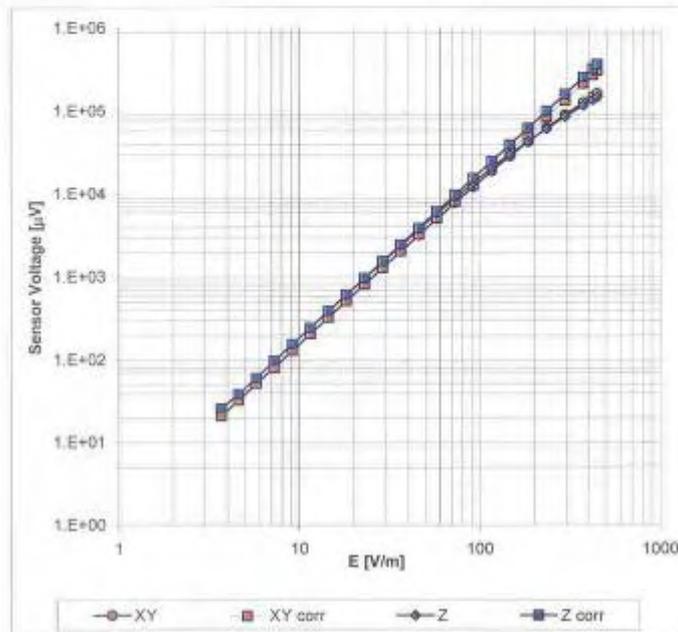


Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ (k=2)

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Dynamic Range f(E-field)
(Waveguide R22, f = 1800 MHz)

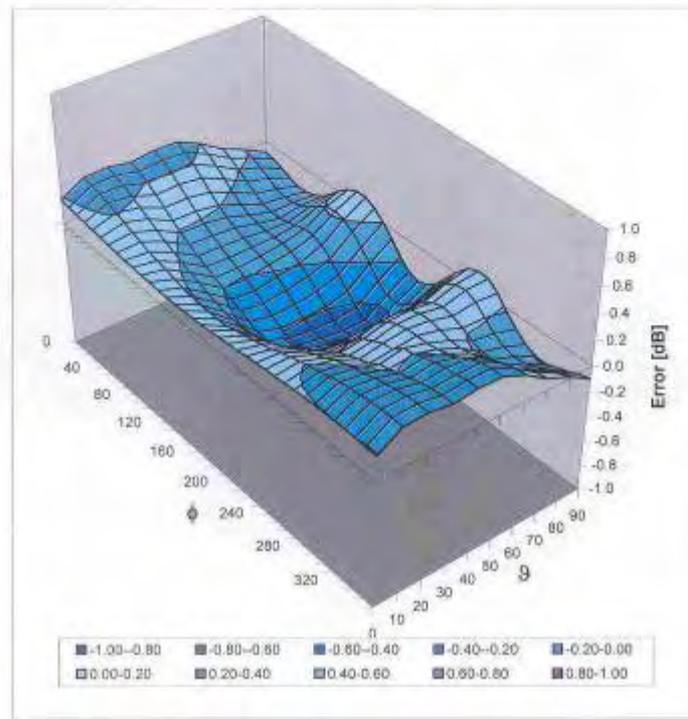


Uncertainty of Linearity Assessment: $\pm 0.6\%$ ($k=2$)

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



Uncertainty of Spherical Isotropy Assessment: $\pm 2.6\%$ ($k=2$)

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Other Probe Parameters

Sensor Arrangement	Rectangular
Connector Angle (°)	-218.7
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	10 mm
Tip Diameter	8.0 mm
Probe Tip to Sensor X Calibration Point	2.5 mm
Probe Tip to Sensor Y Calibration Point	2.5 mm
Probe Tip to Sensor Z Calibration Point	2.5 mm