



Report No.: RZA1102-0186HAC01R1



ANSI C63.19

TEST REPORT

Product Name	CDMA 1X Digital Mobile Telephone
Model	HUAWEI M580
FCC ID	QISC5870
Client	Huawei Technologies Co., Ltd.

TA Technology (Shanghai) Co., Ltd.



GENERAL SUMMARY

Product Name	CDMA 1X Digital Mobile Telephone	Model	HUAWEI M580
FCC ID	QISC5870	Report No.	RZA1102-0186HAC01R1
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	This portable wireless equipment has been measured in all cases requested by the relevant standards. General Judgment: M4 (RF Emission)  (Stamp) Date of issue: March 10th, 2011		
Comment	The test result only responds to the measured sample.		

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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

Company: Huawei Technologies Co., Ltd.
Address: Bantian, Longgang District
City: Shenzhen
Postal Code: 518129
Country: P.R. China
Contact: Wang Yue
Telephone: 0755-28780808
Fax: 0755-28780808

1.4. Manufacturer Information

Company: Huawei Technologies Co., Ltd.
Address: Bantian, Longgang District
City: Shenzhen
Postal Code: 518129
Country: P.R. China
Telephone: 0755-28780808
Fax: 0755-28780808

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1.5. Information of EUT

General Information

Device Type:	Portable Device		
Product Name:	CDMA 1X Digital Mobile Telephone		
MEID:	A0000020F25561		
Hardware Version:	Ver.C		
Software Version:	M580C45B102		
Antenna Type:	Internal Antenna		
Device Operating Configurations:			
Supporting Mode(s):	CDMA Cellular (tested)		
	CDMA PCS (tested)		
	CDMA AWS (tested)		
	Bluetooth		
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 AWS	1711.25 ~ 1752.5	2111.25 ~ 2152.5
Test Channel: (Low - Middle - High)	1013 - 384 - 777 (CDMA Cellular) (tested) 25 - 600 - 1175 (CDMA PCS) (tested) 25 - 450 - 850 (CDMA AWS) (tested)		
Power Class:	CDMA Cellular: Tested with Power Control All up bits		
	CDMA PCS: Tested with Power Control All up bits		
	CDMA AWS: Tested with Power Control All up bits		

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Auxiliary Equipment Details

AE1: Battery

Model: HB4A1H
Manufacturer: Huawei Technologies Co., Ltd.
S/N: YACAC01HI4910648

Equipment Under Test (EUT) is a model of CDMA 1X Digital Mobile Telephone. It can be slid open and close. The detail about Mobile phone and Lithium Battery is in chapter 1.5 in this report. HAC is tested for CDMA Cellular, CDMA PCS and CDMA AWS. The EUT has a CDMA antenna that is used for Tx/Rx, and the other is BT antenna that is used for Tx/Rx.

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 AWS	M4

1.8. Test Date

The test is performed on February 18, 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 25, 450 and 850 respectively in the case of CDMA AWS, 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

2.2.1. HAC Measurement Set-up

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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
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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.

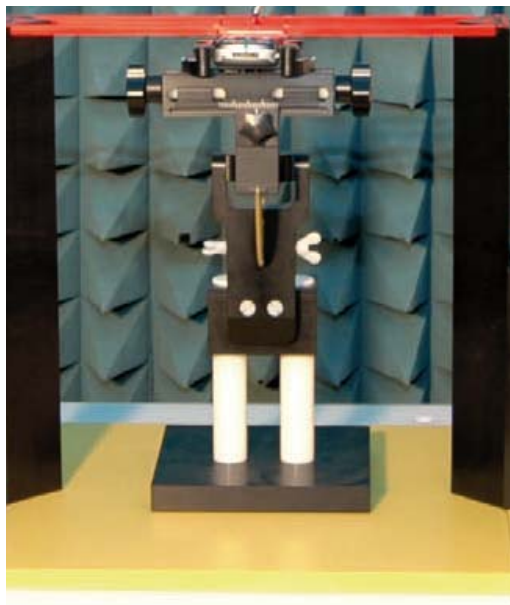


Figure 4 HAC Phantom & Device Holder

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.

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Figure 5 WD reference and plane for RF emission measurements

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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."

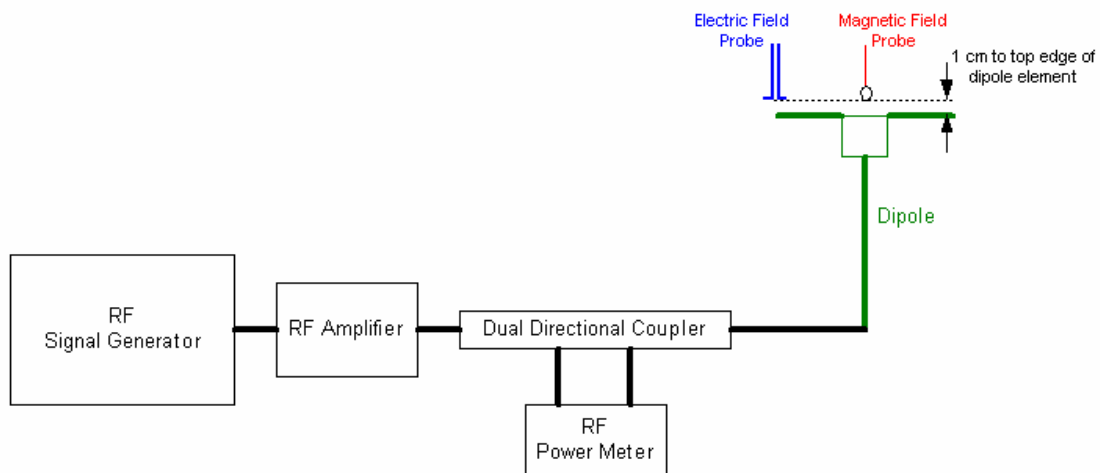


Figure 6 Dipole Validation Setup

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	February 18, 2011
CW	1880	100	131.4	142.9	8.05	February 18, 2011
F-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	February 18, 2011
CW	1880	100	0.449	0.475	5.47	February 18, 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.

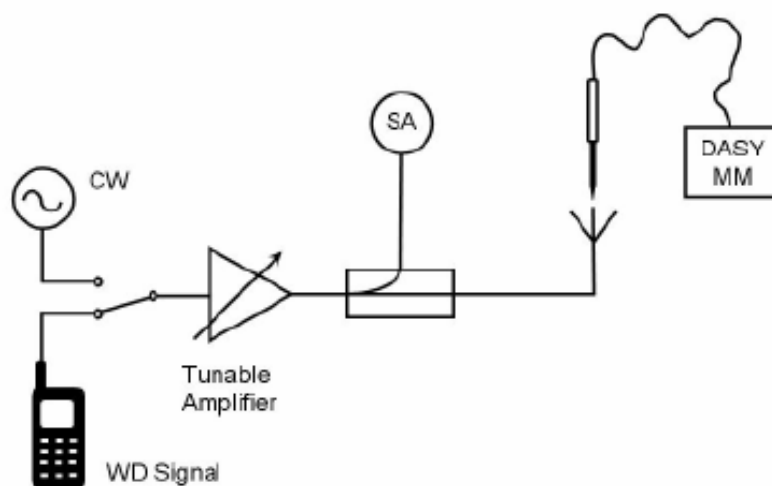


Figure Figure 7 Probe Modulation Factor Test Setup

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PMF

Band	E-Field Probe Modulation Factor	H-Field Probe Modulation Factor
CDMA Cellular	1.05	1.01
CDMA PCS	1.03	1.00
CDMA AWS	1.03	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
RC3	Before test	24.2	24.4	24.4
	After test	24.3	24.3	24.5
RC1	Before test	24.3	24.3	24.4
CDMA PCS		Conducted Power (dBm)		
		Channel 25	Channel 600	Channel 1175
RC3	Before test	24.3	24.4	24.5
	After test	24.3	24.2	24.4
RC1	Before test	24.4	24.5	24.3
CDMA AWS		Conducted Power (dBm)		
		Channel 25	Channel 450	Channel 850
RC3	Before test	24.3	24.5	24.4
	After test	24.3	24.3	24.2
RC1	Before test	24.4	24.4	24.3

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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 (Close)					
Channel	Frequency (MHz)	Peak Field (V/m)	Power Drift (dB)	Rating	Graph Results
777	848.31	62.70	-0.003	M4	Figure 12
384	836.52	76.7	-0.134	M4	Figure 13
1013	824.70	69.5	-0.027	M4	Figure 14
E-Field (Open)					
Channel	Frequency (MHz)	Peak Field (V/m)	Power Drift (dB)	Rating	Graph Results
777	848.31	92.60	-0.175	M4	Figure 15
384	836.52	100.4	0.004	M4	Figure 16
1013	824.70	96.8	-0.031	M4	Figure 17
H-Field (Close)					
Channel	Frequency (MHz)	Peak Field (A/m)	Power Drift (dB)	Rating	Graph Results
777	848.31	0.086	0.014	M4	Figure 18
384	836.52	0.104	-0.095	M4	Figure 19
1013	824.70	0.091	-0.137	M4	Figure 20
H-Field (Open)					
Channel	Frequency (MHz)	Peak Field (A/m)	Power Drift (dB)	Rating	Graph Results
777	848.31	0.131	-0.078	M4	Figure 21
384	836.52	0.139	0.055	M4	Figure 22
1013	824.70	0.138	0.021	M4	Figure 23

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CDMA PCS Results

E-Field (Close)					
Channel	Frequency (MHz)	Peak Field (V/m)	Power Drift (dB)	Rating	Graph Results
1175	1908.75	37.20	0.003	M4	Figure 24
600	1880	35	-0.059	M4	Figure 25
25	1851.25	39.9	-0.104	M4	Figure 26
E-Field (Open)					
Channel	Frequency (MHz)	Peak Field (V/m)	Power Drift (dB)	Rating	Graph Results
1175	1908.75	50.40	0.049	M4	Figure 27
600	1880	50.4	-0.023	M4	Figure 28
25	1851.25	53.3	0.033	M4	Figure 29
H-Field (Close)					
Channel	Frequency (MHz)	Peak Field (A/m)	Power Drift (dB)	Rating	Graph Results
1175	1908.75	0.084	-0.018	M4	Figure 30
600	1880	0.080	-0.127	M4	Figure 31
25	1851.25	0.087	0.038	M4	Figure 32
H-Field (Open)					
Channel	Frequency (MHz)	Peak Field (A/m)	Power Drift (dB)	Rating	Graph Results
1175	1908.75	0.138	0.077	M4	Figure 33
600	1880	0.126	-0.028	M4	Figure 34
25	1851.25	0.122	-0.095	M4	Figure 35

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CDMA AWS Results

E-Field (Close)					
Channel	Frequency (MHz)	Peak Field (V/m)	Power Drift (dB)	Rating	Graph Results
850	1752.5	43.1	0.070	M4	Figure 36
450	1732.5	41.8	0.031	M4	Figure 37
25	1711.25	42.10	0.077	M4	Figure 38
E-Field (Open)					
Channel	Frequency (MHz)	Peak Field (V/m)	Power Drift (dB)	Rating	Graph Results
850	1752.5	52.2	-0.012	M4	Figure 39
450	1732.5	54.2	-0.044	M4	Figure 40
25	1711.25	56.70	-0.037	M4	Figure 41
H-Field (Close)					
Channel	Frequency (MHz)	Peak Field (A/m)	Power Drift (dB)	Rating	Graph Results
850	1752.5	0.095	-0.027	M4	Figure 42
450	1732.5	0.101	0.037	M4	Figure 43
25	1711.25	0.104	0.055	M4	Figure 44
H-Field (Open)					
Channel	Frequency (MHz)	Peak Field (A/m)	Power Drift (dB)	Rating	Graph Results
850	1752.5	0.139	0.008	M4	Figure 45
450	1732.5	0.145	0.036	M4	Figure 46
25	1711.25	0.154	0.044	M4	Figure 47

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4. Measurement Uncertainty

No.	Error source	Type	Uncertainty Value (%)	Prob. Dist.	k	c_{iE}	c_{iH}	Standard Uncertainty (%) u_i (%) E	Standard Uncertainty (%) u_i (%) H	Degree of freedom V_{eff} or v_i
Measurement System										
1	Probe Calibration	B	5.	N	1	1	1	5.1	5.1	∞
2	Axial Isotropy	B	4.7	R	$\sqrt{3}$	1	1	2.7	2.7	∞
3	Sensor Displacement	B	16.5	R	$\sqrt{3}$	1	0.145	9.5	1.4	∞
4	Boundary Effects	B	2.4	R	$\sqrt{3}$	1	1	1.4	1.4	∞
5	Linearity	B	4.7	R	$\sqrt{3}$	1	1	2.7	2.7	∞
6	Scaling to Peak Envelope Power	B	2.0	R	$\sqrt{3}$	1	1	1.2	1.2	∞
7	System Detection Limit	B	1.0	R	$\sqrt{3}$	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	$\sqrt{3}$	1	1	0.5	0.5	∞
10	Integration Time	B	2.6	R	$\sqrt{3}$	1	1	1.5	1.5	∞
11	RF Ambient Conditions	B	3.0	R	$\sqrt{3}$	1	1	1.7	1.7	∞
12	RF Reflections	B	12.0	R	$\sqrt{3}$	1	1	6.9	6.9	∞
13	Probe Positioner	B	1.2	R	$\sqrt{3}$	1	0.67	0.7	0.5	∞
14	Probe Positioning	A	4.7	R	$\sqrt{3}$	1	0.67	2.7	1.8	∞
15	Extra. And Interpolation	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
Test Sample Related										
16	Device Positioning Vertical	B	4.7	R	$\sqrt{3}$	1	0.67	2.7	1.8	∞
17	Device Positioning Lateral	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
18	Device Holder and Phantom	B	2.4	R	$\sqrt{3}$	1	1	1.4	1.4	∞

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19	Power Drift	B	5.0	R	$\sqrt{3}$	1	1	2.9	2.9	∞
Phantom and Setup related										
20s	Phantom Thickness	B	2.4	R	$\sqrt{3}$	1	0.67	1.4	0.9	∞
Combined standard uncertainty(%)								14.7	10.9	
Expanded uncertainty (confidence interval of 95 %)		$u_e = 2u_c$		N	k=2			29.4	21.8	

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5. Main Test Instruments

No.	Name	Type	Serial Number	Calibration Date	Valid Period
01	Power meter	Agilent E4417A	GB41291714	March 13, 2010	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*****

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ANNEX A: System Check Results

HAC_System Performance Check at 835MHz_E

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

Date/Time: 2/18/2011 4:40:32 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

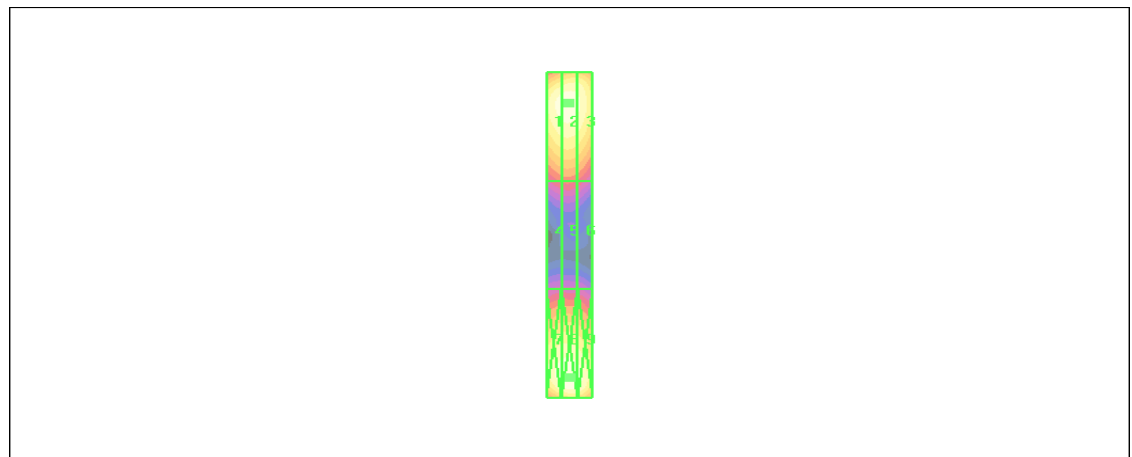
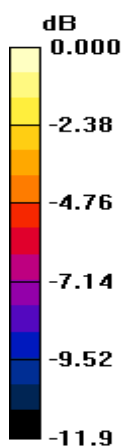
Device Reference Point: 0.000, 0.000, -6.30 mm

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: 2/18/2011 5:55:58 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

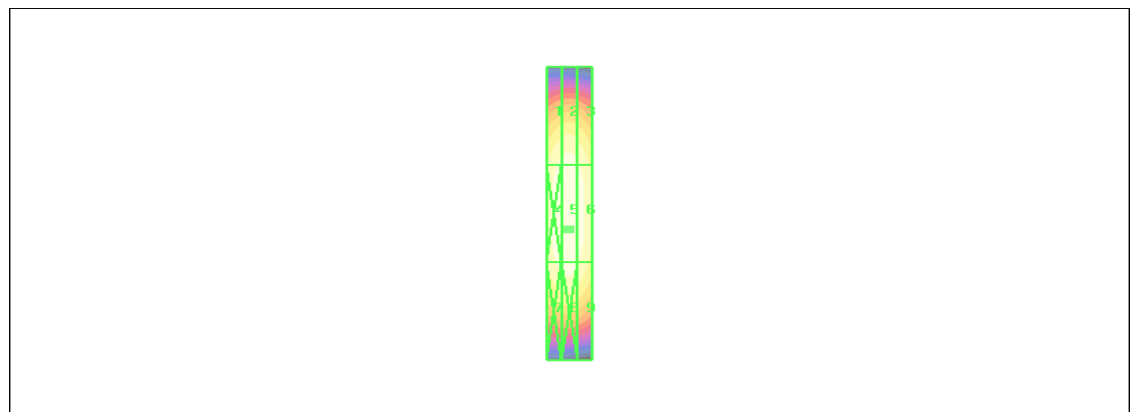
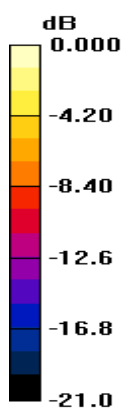
Device Reference Point: 0.000, 0.000, -6.30 mm

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: 2/18/2011 7:14:34 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 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 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

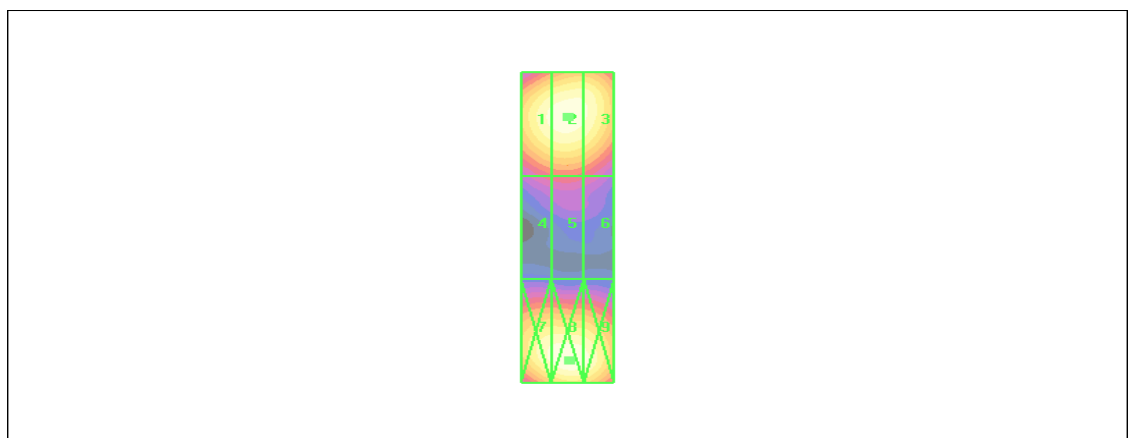
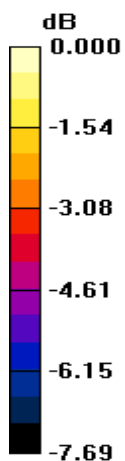
Device Reference Point: 0.000, 0.000, -6.30 mm

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: 2/18/2011 8:29:22 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 0.400 M2	Grid 2 0.413 M2	Grid 3 0.387 M2
Grid 4 0.435 M2	Grid 5 0.449 M2	Grid 6 0.422 M2
Grid 7 0.397 M2	Grid 8 0.410 M2	Grid 9 0.384 M2

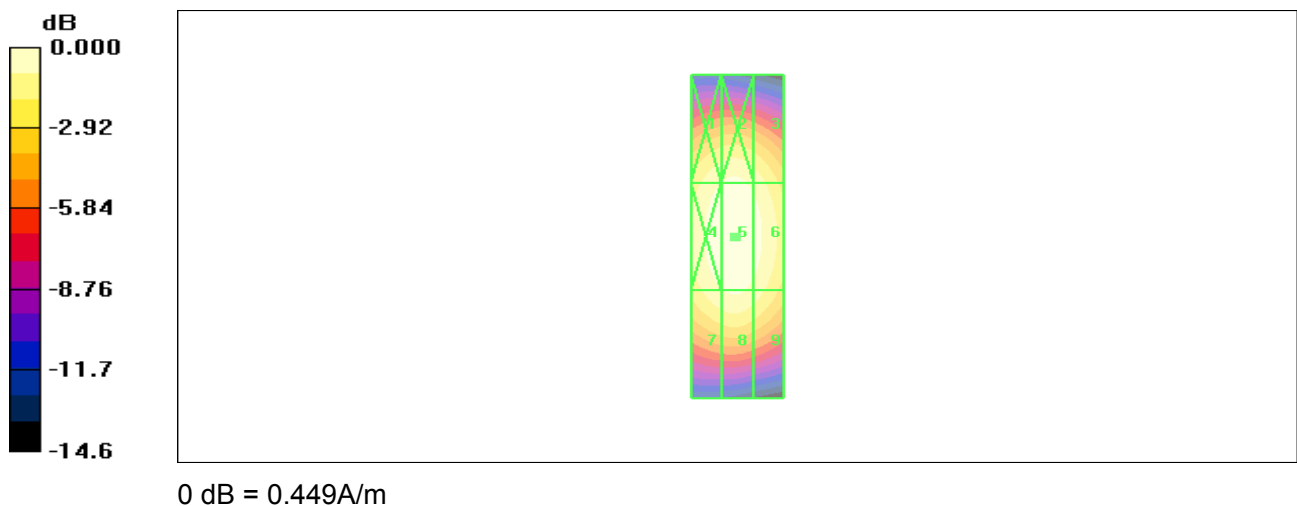


Figure 11 System Performance Check 1880MHz_H

ANNEX B: Graph Results

HAC RF E-Field(close) CDMA Cellular High

Date/Time: 2/18/2011 12:44:16 PM

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 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; Serial: Not Specified

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 = 62.7 V/m

Probe Modulation Factor = 1.05

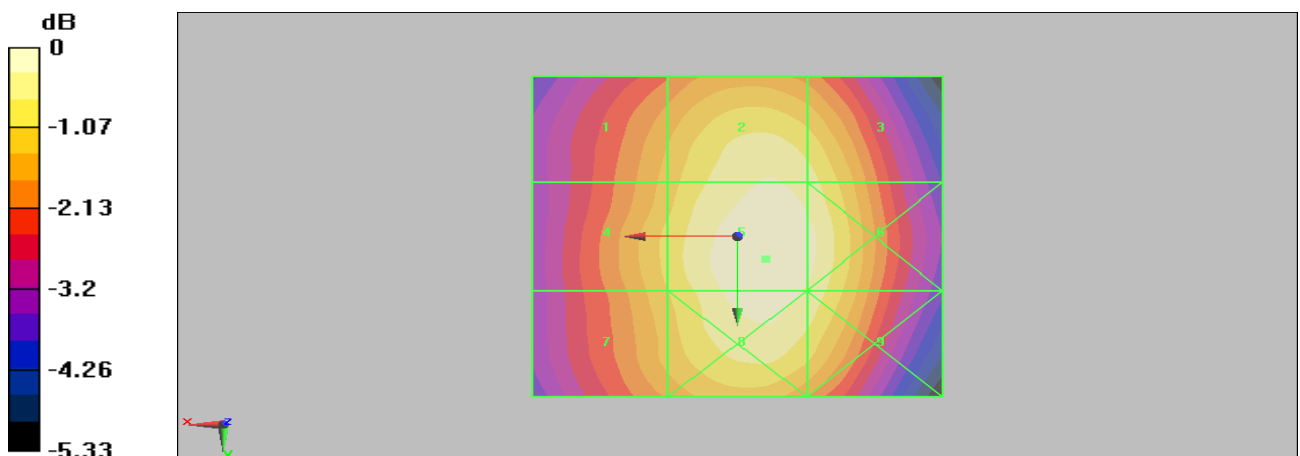
Device Reference Point: 0, 0, -6.3 mm

Reference Value = 78.5 V/m; Power Drift = -0.003 dB

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

Peak E-field in V/m

Grid 1 54.3 M4	Grid 2 60.4 M4	Grid 3 59 M4
Grid 4 56.3 M4	Grid 5 62.7 M4	Grid 6 61 M4
Grid 7 55.4 M4	Grid 8 61.7 M4	Grid 9 59.9 M4



0 dB = 62.7V/m

Figure 12 HAC RF E-Field(close) CDMA Cellular Channel 777

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HAC RF E-Field(close) CDMA Cellular Middle

Date/Time: 2/18/2011 12:31:38 PM

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 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; Serial: Not Specified

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 = 76.7 V/m

Probe Modulation Factor = 1.05

Device Reference Point: 0, 0, -6.3 mm

Reference Value = 96.6 V/m; Power Drift = -0.134 dB

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

Peak E-field in V/m

Grid 1	Grid 2	Grid 3
66.4 M4	73.7 M4	71.7 M4
Grid 4	Grid 5	Grid 6
69.1 M4	76.7 M4	74.2 M4
Grid 7	Grid 8	Grid 9
67.9 M4	75.2 M4	72.8 M4

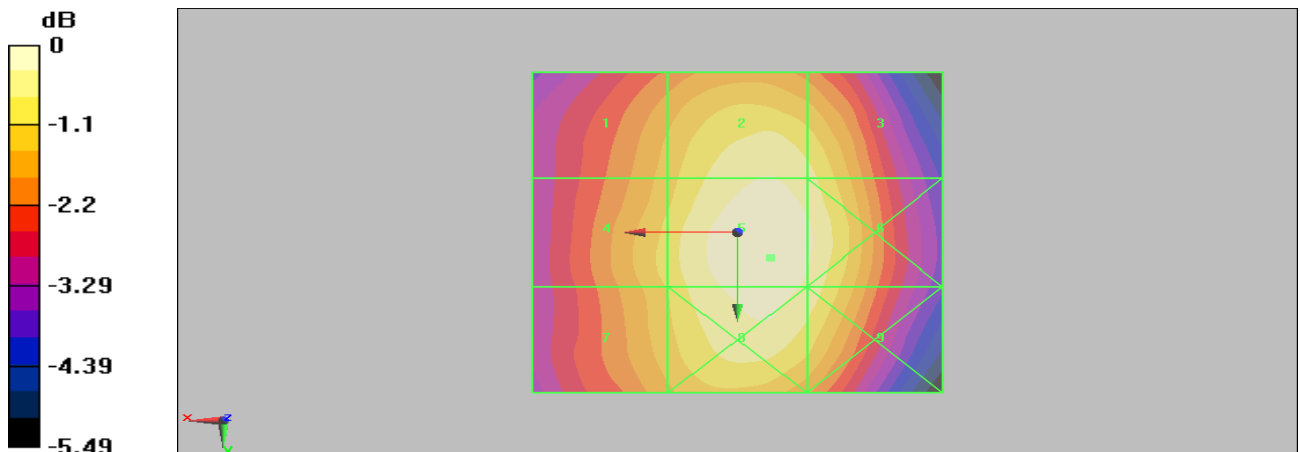


Figure 13 HAC RF E-Field(close) CDMA Cellular Channel 384

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HAC RF E-Field(close) CDMA Cellular Low

Date/Time: 2/18/2011 12:49:36 PM

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 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; Serial: Not Specified

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 = 69.5 V/m

Probe Modulation Factor = 1.05

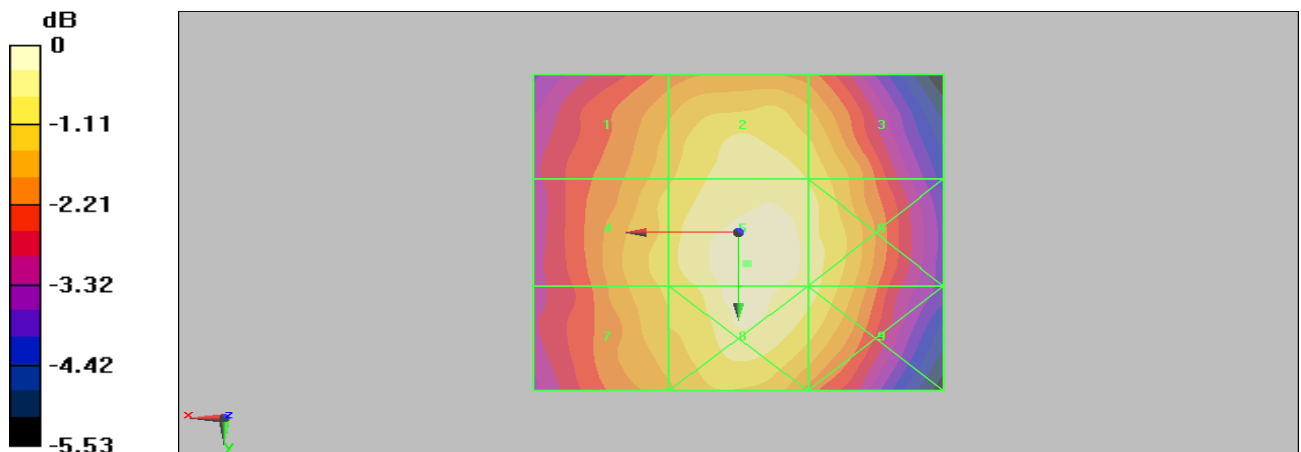
Device Reference Point: 0, 0, -6.3 mm

Reference Value = 86.5 V/m; Power Drift = -0.027 dB

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

Peak E-field in V/m

Grid 1	Grid 2	Grid 3
60.7 M4	65.6 M4	63.7 M4
Grid 4	Grid 5	Grid 6
63.1 M4	69.5 M4	65.8 M4
Grid 7	Grid 8	Grid 9
62 M4	68.6 M4	65.1 M4



0 dB = 69.5V/m

Figure 14 HAC RF E-Field(close) CDMA Cellular Channel 1013

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HAC RF E-Field(open) CDMA Cellular High

Date/Time: 2/18/2011 2:10:10 PM

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 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; Serial: Not Specified

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 = 92.6 V/m

Probe Modulation Factor = 1.05

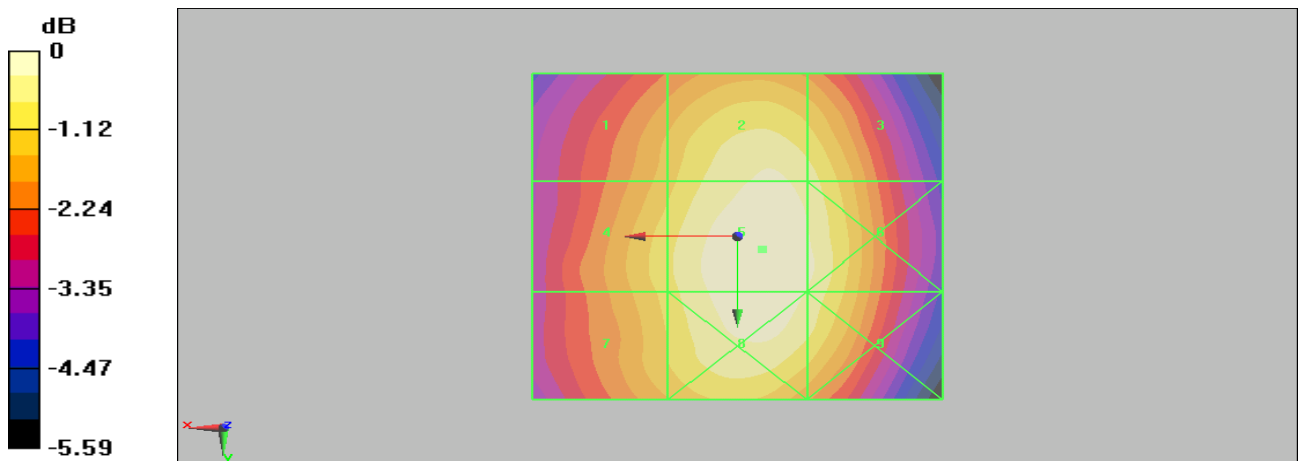
Device Reference Point: 0, 0, -6.3 mm

Reference Value = 117.7 V/m; Power Drift = -0.175 dB

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

Peak E-field in V/m

Grid 1	Grid 2	Grid 3
80.2 M4	89.6 M4	86.9 M4
Grid 4	Grid 5	Grid 6
84.3 M4	92.6 M4	89.8 M4
Grid 7	Grid 8	Grid 9
83.2 M4	91.6 M4	88.4 M4



0 dB = 92.6V/m

Figure 15 HAC RF E-Field(open) CDMA Cellular Channel 777

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HAC RF E-Field(open) CDMA Cellular Middle

Date/Time: 2/18/2011 2:04:33 PM

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 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; Serial: Not Specified

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 = 100.4 V/m

Probe Modulation Factor = 1.05

Device Reference Point: 0, 0, -6.3 mm

Reference Value = 126.1 V/m; Power Drift = 0.004 dB

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

Peak E-field in V/m

Grid 1	Grid 2	Grid 3
87.8 M4	96.8 M4	93.7 M4
Grid 4	Grid 5	Grid 6
92 M4	100.4 M4	96.8 M4
Grid 7	Grid 8	Grid 9
90.6 M4	99.5 M4	95.5 M4

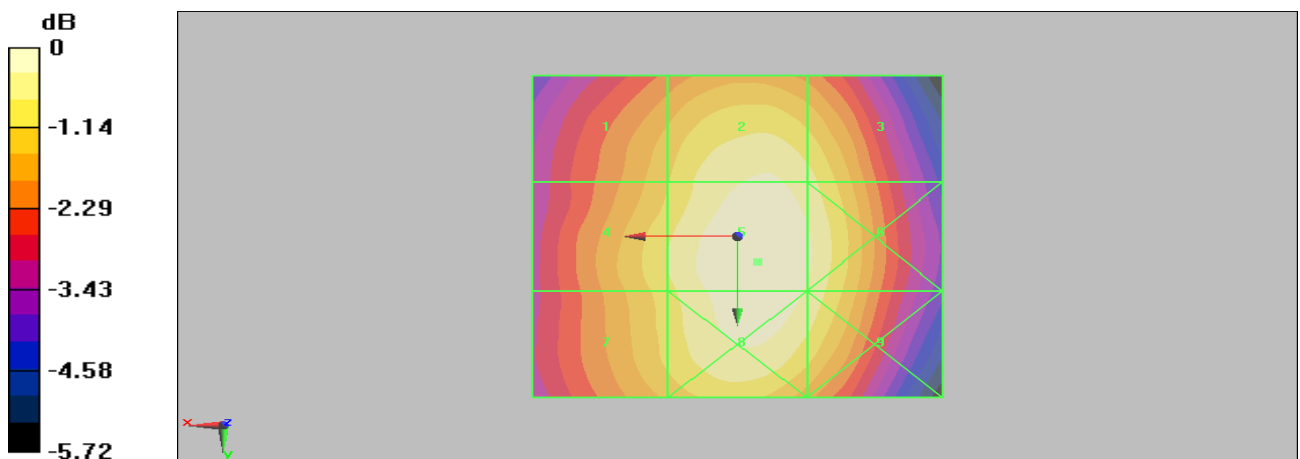


Figure 16 HAC RF E-Field(open) CDMA Cellular Channel 384

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HAC RF E-Field(open) CDMA Cellular Low

Date/Time: 2/18/2011 2:15:51 PM

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 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; Serial: Not Specified

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 = 96.8 V/m

Probe Modulation Factor = 1.05

Device Reference Point: 0, 0, -6.3 mm

Reference Value = 128.8 V/m; Power Drift = -0.031 dB

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

Peak E-field in V/m

Grid 1	Grid 2	Grid 3
86.1 M4	95.1 M4	88.2 M4
Grid 4	Grid 5	Grid 6
91.2 M4	96.8 M4	93.2 M4
Grid 7	Grid 8	Grid 9
89.4 M4	96.6 M4	93.2 M4

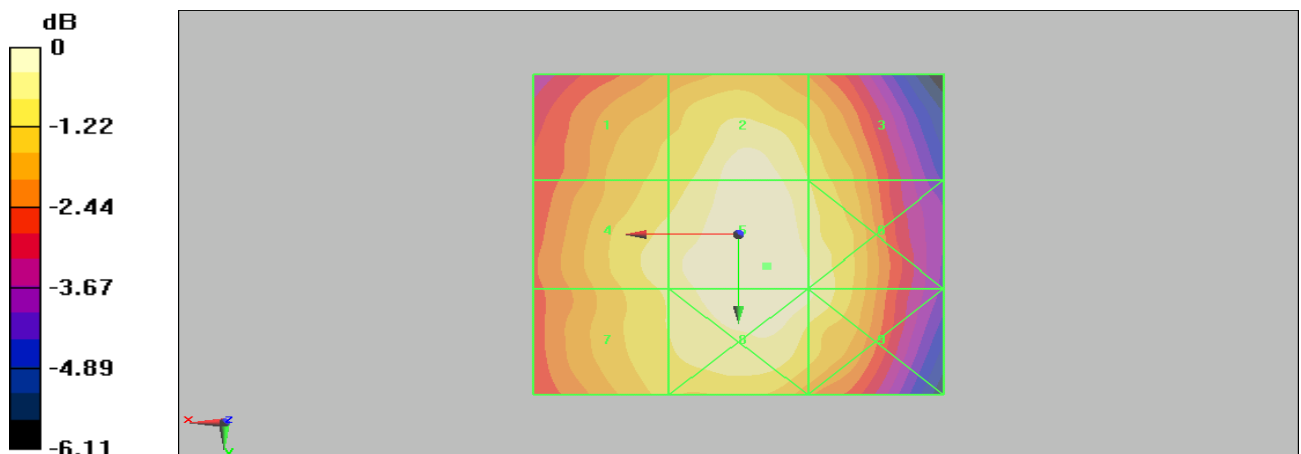


Figure 17 HAC RF E-Field(open) CDMA Cellular Channel 1013

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HAC RF H-Field(close) CDMA Cellular High

Date/Time: 2/18/2011 10:00:43 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 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; Serial: Not Specified

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

H Scan - H3DV6 - 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 = 0.086 A/m

Probe Modulation Factor = 1.01

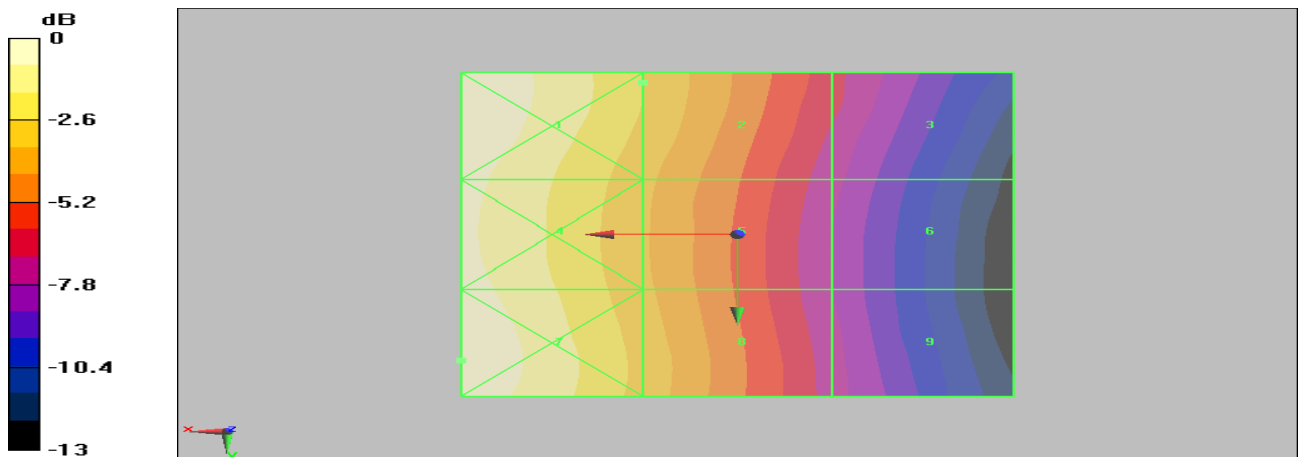
Device Reference Point: 0, 0, -6.3 mm

Reference Value = 0.064 A/m; Power Drift = 0.014 dB

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

Peak H-field in A/m

Grid 1 0.116 M4	Grid 2 0.086 M4	Grid 3 0.054 M4
Grid 4 0.110 M4	Grid 5 0.080 M4	Grid 6 0.049 M4
Grid 7 0.116 M4	Grid 8 0.083 M4	Grid 9 0.050 M4



0 dB = 0.116A/m

Figure 18 HAC RF H-Field(close) CDMA Cellular Channel 777

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HAC RF H-Field(close) CDMA Cellular Middle

Date/Time: 2/18/2011 9:49:16 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 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; Serial: Not Specified

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

H Scan - H3DV6 - 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 = 0.104 A/m

Probe Modulation Factor = 1.01

Device Reference Point: 0, 0, -6.3 mm

Reference Value = 0.077 A/m; Power Drift = -0.095 dB

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

Peak H-field in A/m

Grid 1 0.141 M4	Grid 2 0.104 M4	Grid 3 0.065 M4
Grid 4 0.132 M4	Grid 5 0.097 M4	Grid 6 0.058 M4
Grid 7 0.139 M4	Grid 8 0.100 M4	Grid 9 0.059 M4

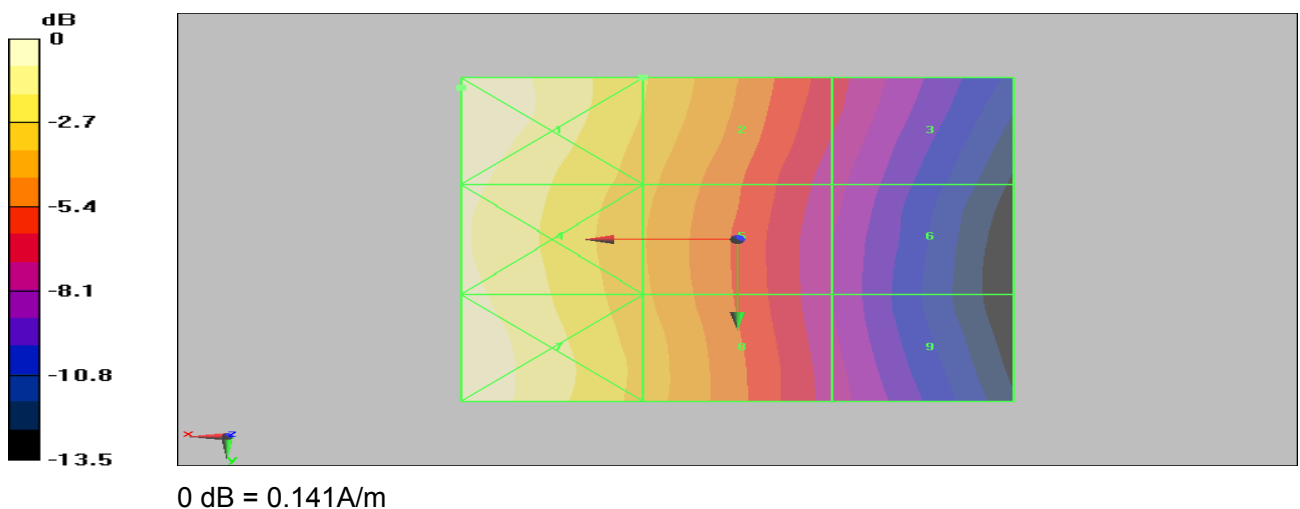


Figure 19 HAC RF H-Field(close) CDMA Cellular Channel 384

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HAC RF H-Field(close) CDMA Cellular Low

Date/Time: 2/18/2011 9:55:06 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 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; Serial: Not Specified

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

H Scan - H3DV6 - 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 = 0.091 A/m

Probe Modulation Factor = 1.01

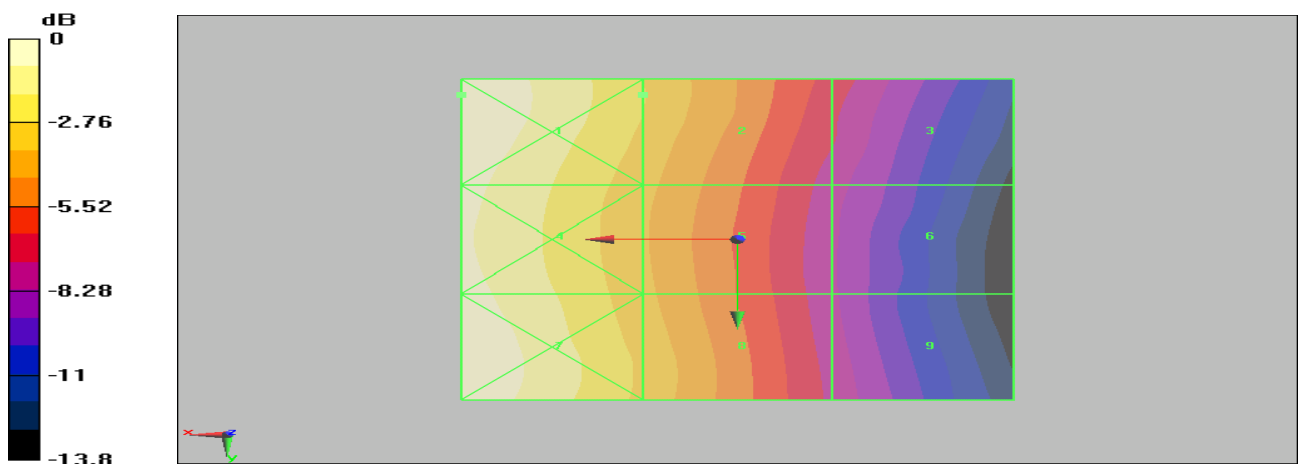
Device Reference Point: 0, 0, -6.3 mm

Reference Value = 0.067 A/m; Power Drift = -0.137 dB

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

Peak H-field in A/m

Grid 1 0.124 M4	Grid 2 0.091 M4	Grid 3 0.057 M4
Grid 4 0.117 M4	Grid 5 0.084 M4	Grid 6 0.051 M4
Grid 7 0.124 M4	Grid 8 0.088 M4	Grid 9 0.052 M4



0 dB = 0.124 A/m

Figure 20 HAC RF H-Field(close) CDMA Cellular Channel 1013

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HAC RF H-Field(open) CDMA Cellular High

Date/Time: 2/18/2011 12:04:28 PM

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 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; Serial: Not Specified

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

H Scan - H3DV6 - 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 = 0.131 A/m

Probe Modulation Factor = 1.01

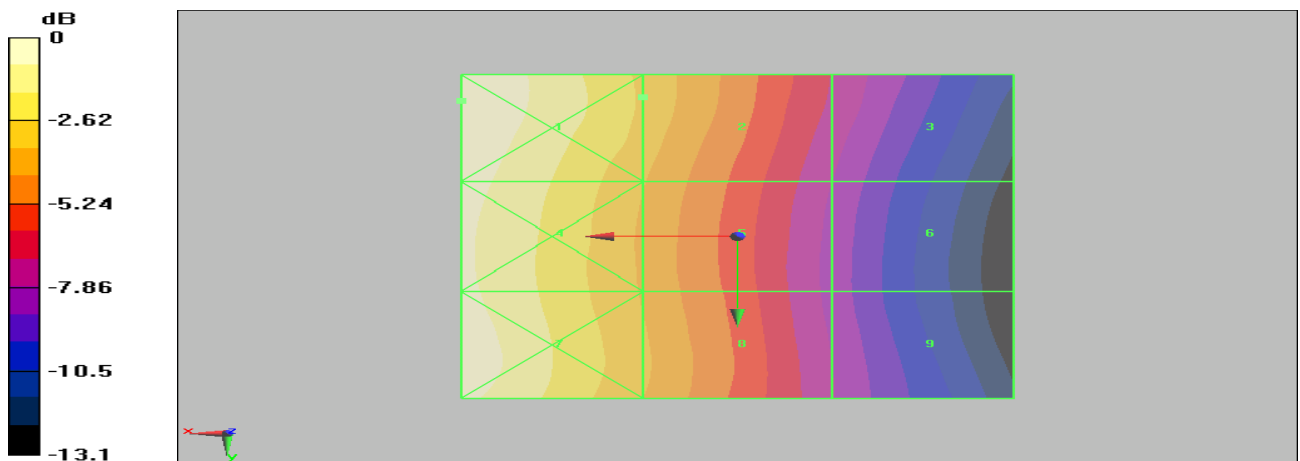
Device Reference Point: 0, 0, -6.3 mm

Reference Value = 0.096 A/m; Power Drift = -0.078 dB

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

Peak H-field in A/m

Grid 1 0.180 M4	Grid 2 0.131 M4	Grid 3 0.081 M4
Grid 4 0.170 M4	Grid 5 0.121 M4	Grid 6 0.073 M4
Grid 7 0.172 M4	Grid 8 0.123 M4	Grid 9 0.074 M4



0 dB = 0.180 A/m

Figure 21 HAC RF H-Field(open) CDMA Cellular Channel 777

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HAC RF H-Field(open) CDMA Cellular Middle

Date/Time: 2/18/2011 11:59:02 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 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; Serial: Not Specified

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

H Scan - H3DV6 - 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 = 0.139 A/m

Probe Modulation Factor = 1.01

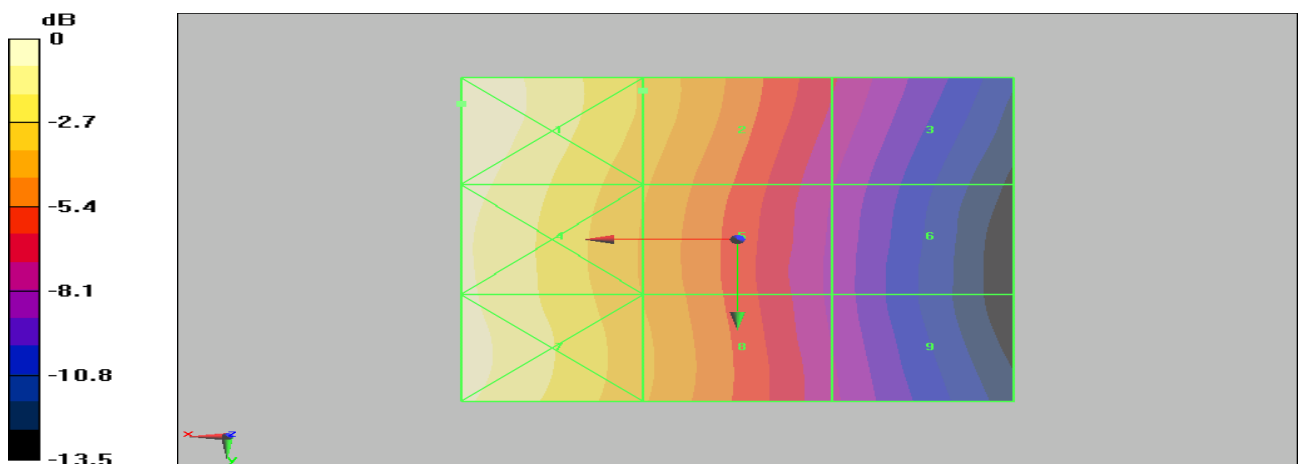
Device Reference Point: 0, 0, -6.3 mm

Reference Value = 0.100 A/m; Power Drift = 0.055 dB

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

Peak H-field in A/m

Grid 1 0.192 M4	Grid 2 0.139 M4	Grid 3 0.086 M4
Grid 4 0.181 M4	Grid 5 0.129 M4	Grid 6 0.077 M4
Grid 7 0.182 M4	Grid 8 0.130 M4	Grid 9 0.078 M4



0 dB = 0.192 A/m

Figure 22 HAC RF H-Field(open) CDMA Cellular Channel 384

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HAC RF H-Field(open) CDMA Cellular Low

Date/Time: 2/18/2011 12:09:49 PM

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 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; Serial: Not Specified

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

H Scan - H3DV6 - 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 = 0.138 A/m

Probe Modulation Factor = 1.01

Device Reference Point: 0, 0, -6.3 mm

Reference Value = 0.098 A/m; Power Drift = 0.021 dB

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

Peak H-field in A/m

Grid 1 0.191 M4	Grid 2 0.138 M4	Grid 3 0.084 M4
Grid 4 0.181 M4	Grid 5 0.129 M4	Grid 6 0.076 M4
Grid 7 0.180 M4	Grid 8 0.131 M4	Grid 9 0.078 M4

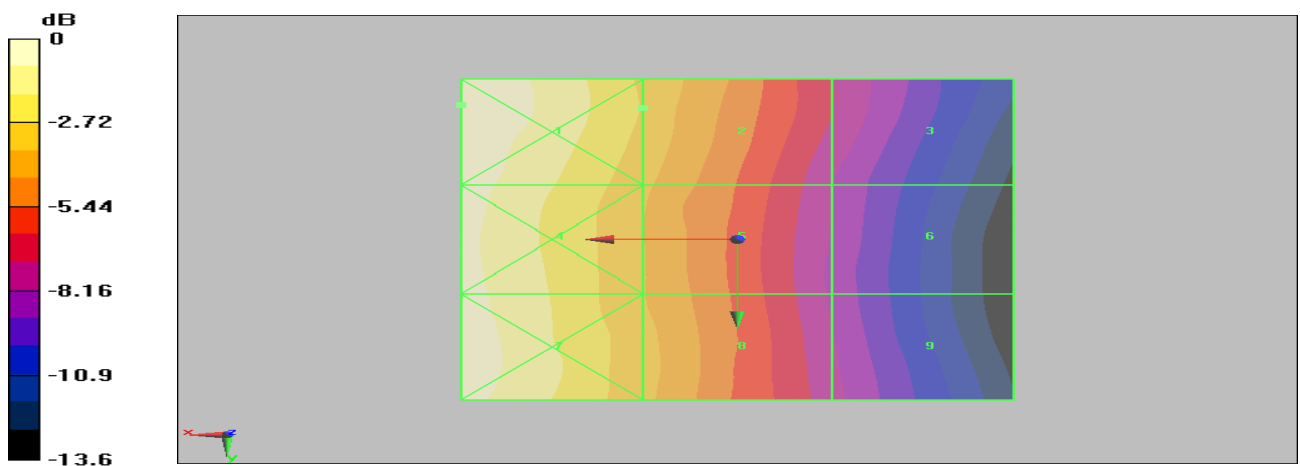


Figure 23 HAC RF H-Field(open) CDMA Cellular Channel 1013

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HAC RF E-Field(close) CDMA PCS High

Date/Time: 2/18/2011 1:18:58 PM

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 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; Serial: Not Specified

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 = 37.2 V/m

Probe Modulation Factor = 1.03

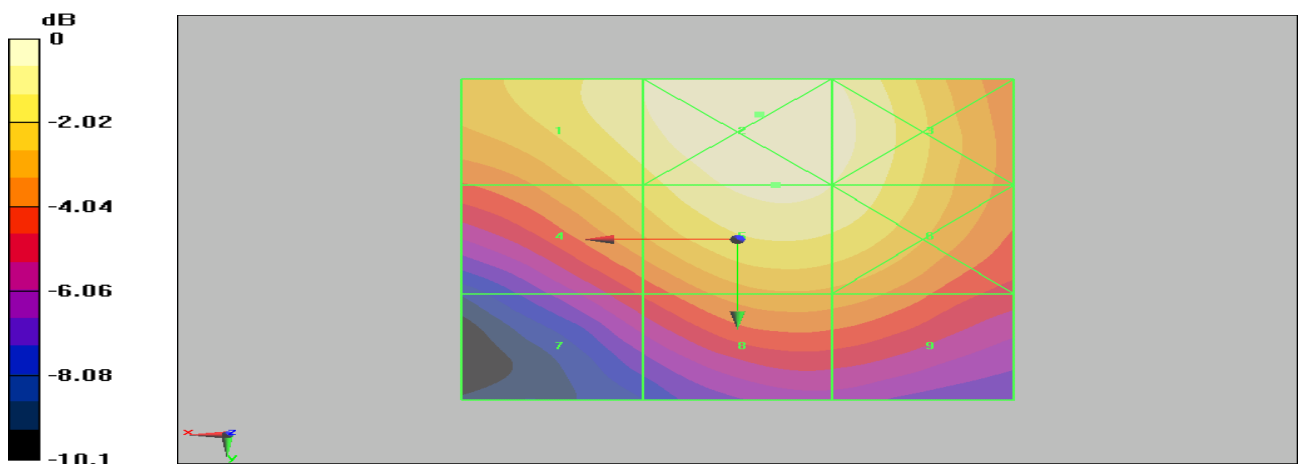
Device Reference Point: 0, 0, -6.3 mm

Reference Value = 40.6 V/m; Power Drift = 0.003 dB

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

Peak E-field in V/m

Grid 1	Grid 2	Grid 3
36.2 M4	39.1 M4	37.5 M4
Grid 4	Grid 5	Grid 6
32.3 M4	37.2 M4	36.2 M4
Grid 7	Grid 8	Grid 9
23.1 M4	28.4 M4	28 M4



0 dB = 39.1V/m

Figure 24 HAC RF E-Field(close) CDMA PCS Channel 1175

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HAC RF E-Field(close) CDMA PCS Middle

Date/Time: 2/18/2011 1:13:33 PM

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 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; Serial: Not Specified

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 V/m

Probe Modulation Factor = 1.03

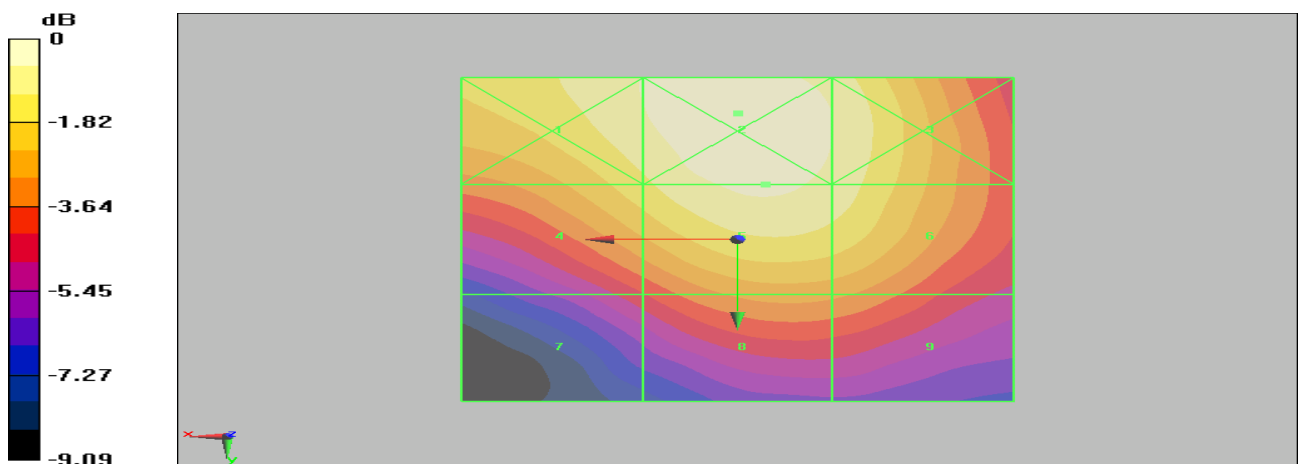
Device Reference Point: 0, 0, -6.3 mm

Reference Value = 38.8 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
34.6 M4	37 M4	34.6 M4
Grid 4	Grid 5	Grid 6
31.6 M4	35 M4	33.7 M4
Grid 7	Grid 8	Grid 9
22.6 M4	27 M4	26.6 M4



0 dB = 37V/m

Figure 25 HAC RF E-Field(close) CDMA PCS Channel 600

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HAC RF E-Field(close) CDMA PCS Low

Date/Time: 2/18/2011 1:24:32 PM

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 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; Serial: Not Specified

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 = 39.9 V/m

Probe Modulation Factor = 1.03

Device Reference Point: 0, 0, -6.3 mm

Reference Value = 44.1 V/m; Power Drift = -0.104 dB

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

Peak E-field in V/m

Grid 1 40.3 M4	Grid 2 42.1 M4	Grid 3 39.4 M4
Grid 4 36.8 M4	Grid 5 39.9 M4	Grid 6 38 M4
Grid 7 26.3 M4	Grid 8 29.7 M4	Grid 9 29 M4

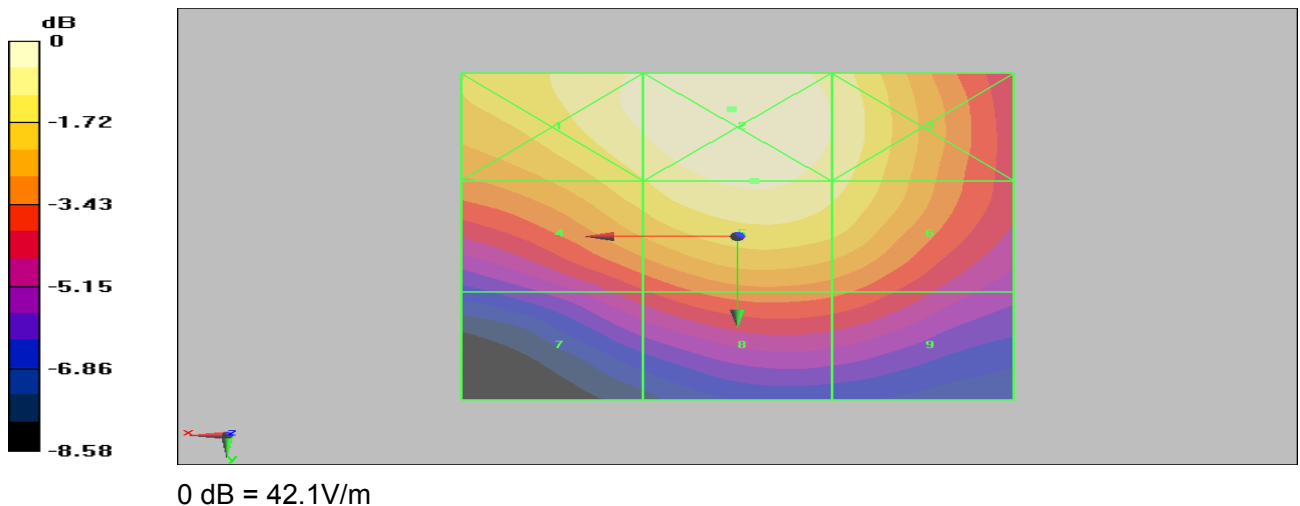


Figure 26 HAC RF E-Field(close) CDMA PCS Channel 25

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HAC RF E-Field(open) CDMA PCS High

Date/Time: 2/18/2011 1:37:28 PM

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 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; Serial: Not Specified

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 = 50.4 V/m

Probe Modulation Factor = 1.03

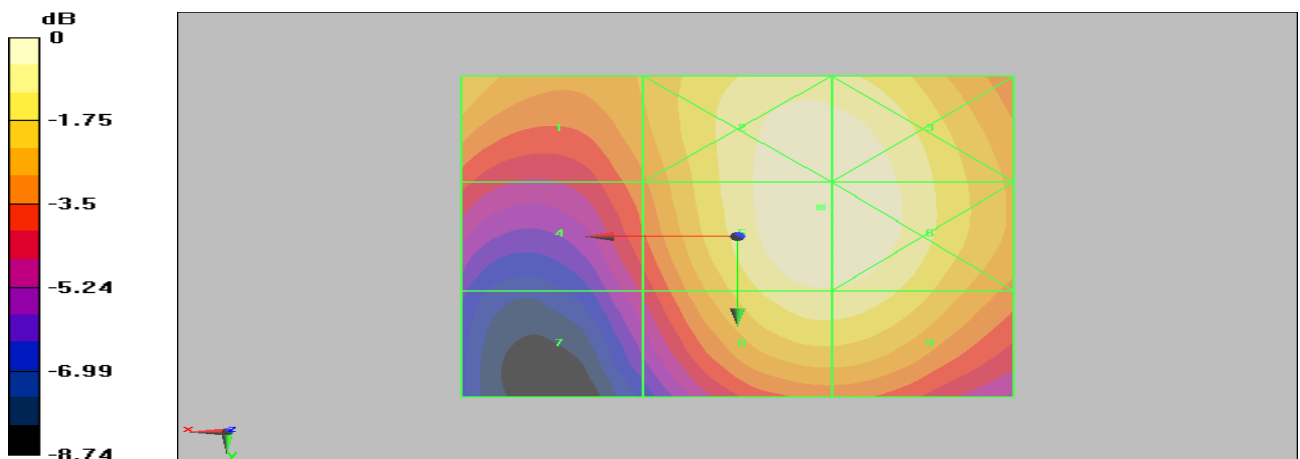
Device Reference Point: 0, 0, -6.3 mm

Reference Value = 55.8 V/m; Power Drift = 0.049 dB

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

Peak E-field in V/m

Grid 1	Grid 2	Grid 3
41.5 M4	50.2 M4	50.1 M4
Grid 4	Grid 5	Grid 6
35.7 M4	50.4 M4	50.4 M4
Grid 7	Grid 8	Grid 9
30.1 M4	46.9 M4	46.8 M4



0 dB = 50.4V/m

Figure 27 HAC RF E-Field(open) CDMA PCS Channel 1175

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HAC RF E-Field(open) CDMA PCS Middle

Date/Time: 2/18/2011 1:31:59 PM

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 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; Serial: Not Specified

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 = 50.4 V/m

Probe Modulation Factor = 1.03

Device Reference Point: 0, 0, -6.3 mm

Reference Value = 56.9 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
40.5 M4	50.3 M4	50.2 M4
Grid 4	Grid 5	Grid 6
36.3 M4	50.4 M4	50.3 M4
Grid 7	Grid 8	Grid 9
30.2 M4	46.2 M4	46.2 M4

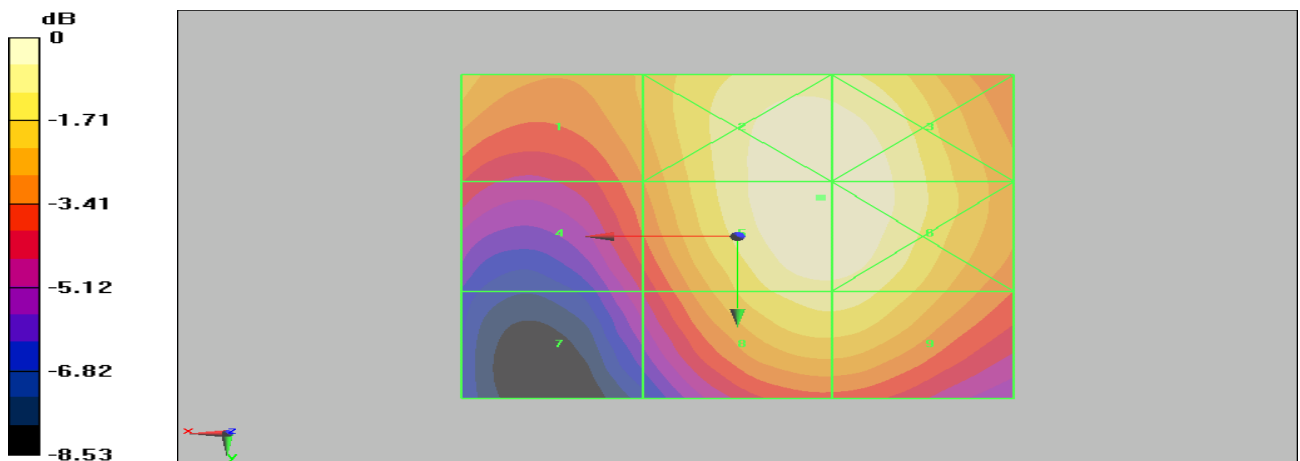


Figure 28 HAC RF E-Field(open) CDMA PCS Channel 600

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HAC RF E-Field(open) CDMA PCS Low

Date/Time: 2/18/2011 1:42:49 PM

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 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; Serial: Not Specified

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 = 53.3 V/m

Probe Modulation Factor = 1.03

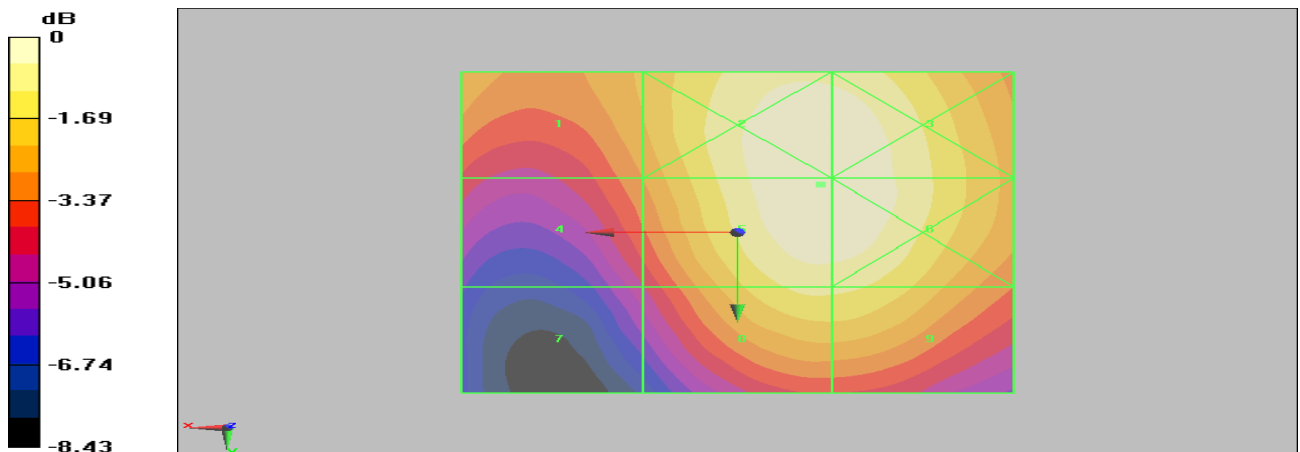
Device Reference Point: 0, 0, -6.3 mm

Reference Value = 58.5 V/m; Power Drift = 0.033 dB

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

Peak E-field in V/m

Grid 1	Grid 2	Grid 3
41.7 M4	53.3 M4	53.1 M4
Grid 4	Grid 5	Grid 6
38.7 M4	53.3 M4	53.2 M4
Grid 7	Grid 8	Grid 9
31.7 M4	47.8 M4	47.7 M4



0 dB = 53.3V/m

Figure 29 HAC RF E-Field(open) CDMA PCS Channel 25

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HAC RF H-Field(close) CDMA PCS High

Date/Time: 2/18/2011 10:47:38 AM

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 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; Serial: Not Specified

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

H Scan - H3DV6 - 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 = 0.084 A/m

Probe Modulation Factor = 1

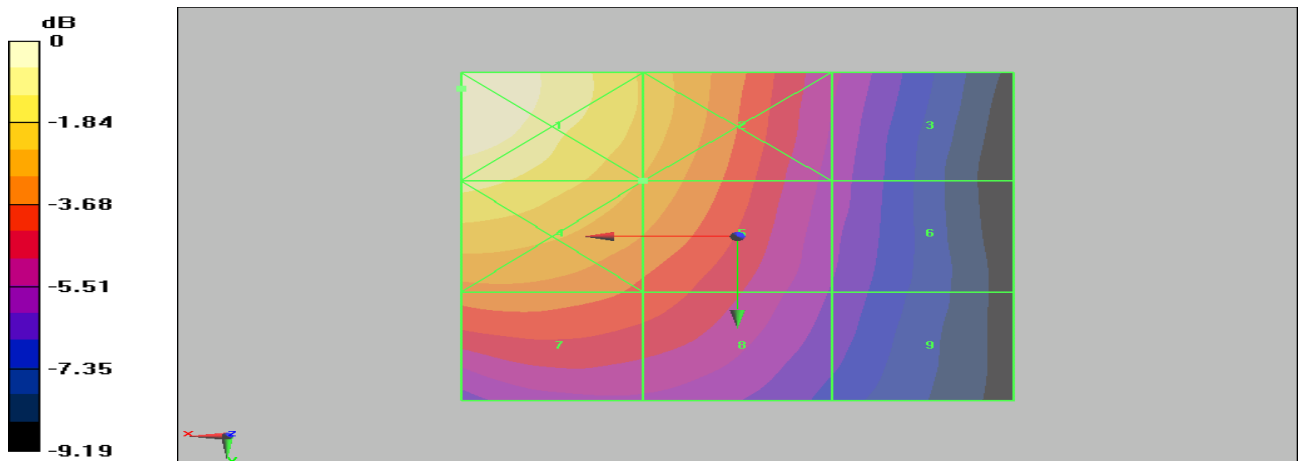
Device Reference Point: 0, 0, -6.3 mm

Reference Value = 0.072 A/m; Power Drift = -0.018 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 0.061 M4
Grid 4 0.100 M4	Grid 5 0.084 M4	Grid 6 0.058 M4
Grid 7 0.077 M4	Grid 8 0.072 M4	Grid 9 0.055 M4



0 dB = 0.112 A/m

Figure 30 HAC RF H-Field(close) CDMA PCS Channel 1175

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HAC RF H-Field(close) CDMA PCS Middle

Date/Time: 2/18/2011 10:42:14 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 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; Serial: Not Specified

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

H Scan - H3DV6 - 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 = 0.080 A/m

Probe Modulation Factor = 1

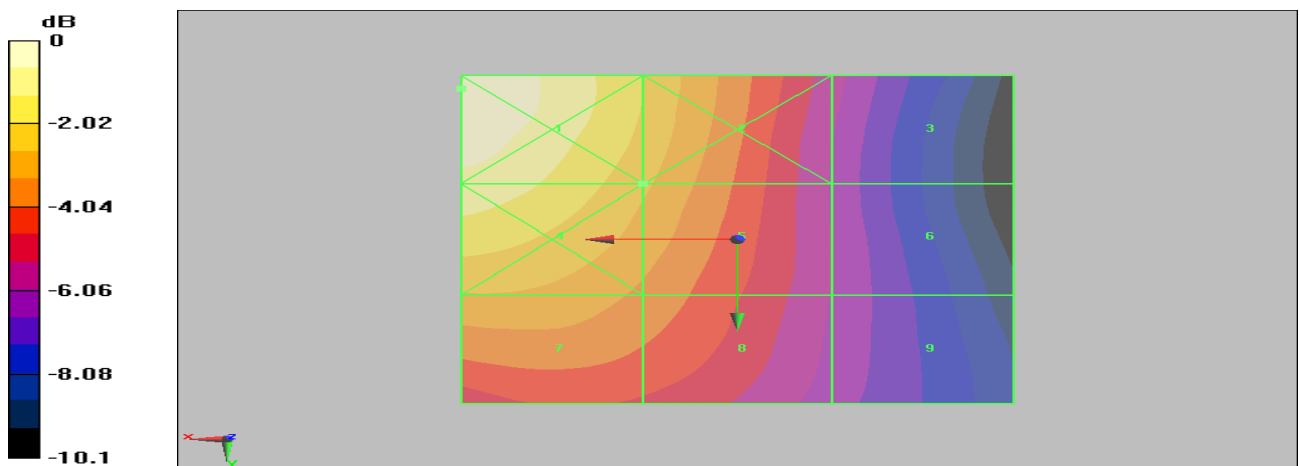
Device Reference Point: 0, 0, -6.3 mm

Reference Value = 0.069 A/m; Power Drift = -0.127 dB

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

Peak H-field in A/m

Grid 1 0.107 M4	Grid 2 0.085 M4	Grid 3 0.055 M4
Grid 4 0.097 M4	Grid 5 0.080 M4	Grid 6 0.054 M4
Grid 7 0.078 M4	Grid 8 0.071 M4	Grid 9 0.053 M4



0 dB = 0.107 A/m

Figure 31 HAC RF H-Field(close) CDMA PCS Channel 600

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HAC RF H-Field(close) CDMA PCS Low

Date/Time: 2/18/2011 10:53:14 AM

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 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; Serial: Not Specified

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

H Scan - H3DV6 - 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 = 0.087 A/m

Probe Modulation Factor = 1

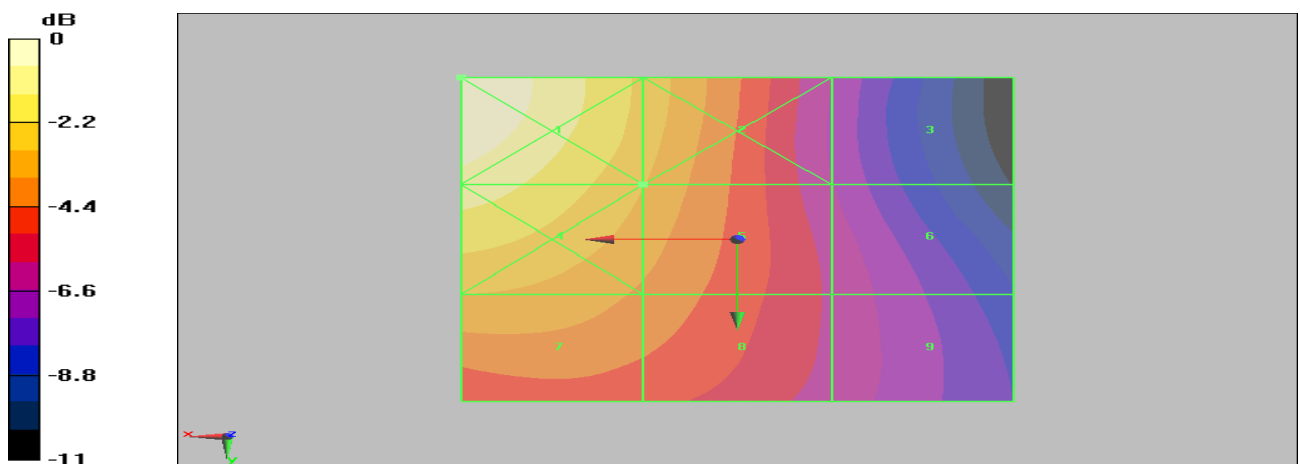
Device Reference Point: 0, 0, -6.3 mm

Reference Value = 0.076 A/m; Power Drift = 0.038 dB

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

Peak H-field in A/m

Grid 1 0.121 M4	Grid 2 0.092 M4	Grid 3 0.057 M4
Grid 4 0.108 M4	Grid 5 0.087 M4	Grid 6 0.061 M4
Grid 7 0.086 M4	Grid 8 0.078 M4	Grid 9 0.061 M4



0 dB = 0.121 A/m

Figure 32 HAC RF H-Field(close) CDMA PCS Channel 25

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HAC RF H-Field(open) CDMA PCS High

Date/Time: 2/18/2011 11:11:04 AM

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 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; Serial: Not Specified

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

H Scan - H3DV6 - 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 = 0.138 A/m

Probe Modulation Factor = 1

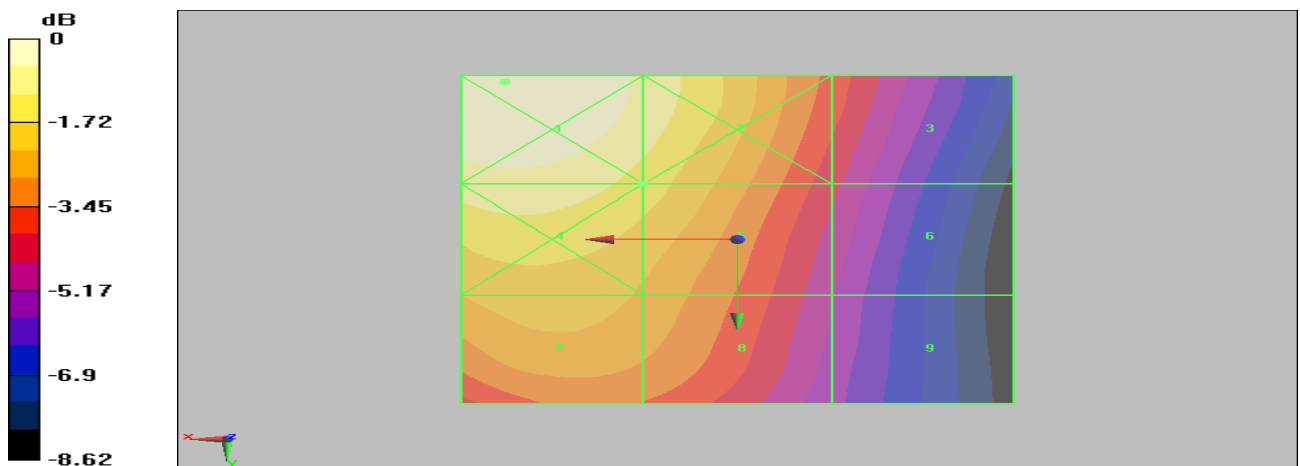
Device Reference Point: 0, 0, -6.3 mm

Reference Value = 0.116 A/m; Power Drift = 0.077 dB

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

Peak H-field in A/m

Grid 1 0.162 M4	Grid 2 0.149 M4	Grid 3 0.107 M4
Grid 4 0.148 M4	Grid 5 0.138 M4	Grid 6 0.098 M4
Grid 7 0.129 M4	Grid 8 0.123 M4	Grid 9 0.090 M4



0 dB = 0.162 A/m

Figure 33 HAC RF H-Field(open) CDMA PCS Channel 1175

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HAC RF H-Field(open) CDMA PCS Middle

Date/Time: 2/18/2011 11:05:43 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 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; Serial: Not Specified

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

H Scan - H3DV6 - 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 = 0.126 A/m

Probe Modulation Factor = 1

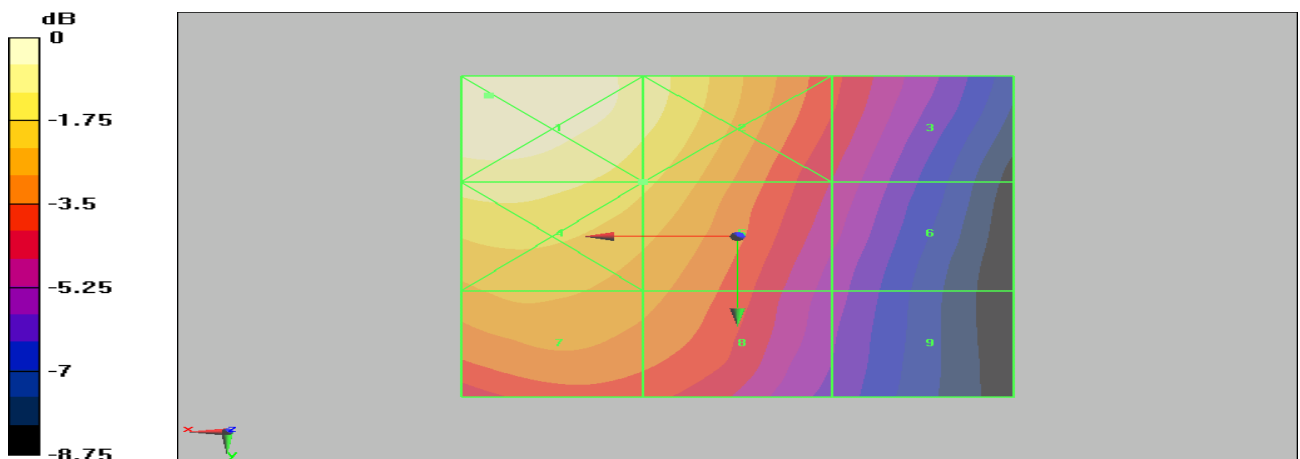
Device Reference Point: 0, 0, -6.3 mm

Reference Value = 0.108 A/m; Power Drift = -0.028 dB

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

Peak H-field in A/m

Grid 1 0.152 M4	Grid 2 0.138 M4	Grid 3 0.097 M4
Grid 4 0.137 M4	Grid 5 0.126 M4	Grid 6 0.089 M4
Grid 7 0.118 M4	Grid 8 0.112 M4	Grid 9 0.081 M4



0 dB = 0.152 A/m

Figure 34 HAC RF H-Field(open) CDMA PCS Channel 600

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HAC RF H-Field(open) CDMA PCS Low

Date/Time: 2/18/2011 11:21:52 AM

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 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; Serial: Not Specified

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

H Scan - H3DV6 - 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 = 0.122 A/m

Probe Modulation Factor = 1

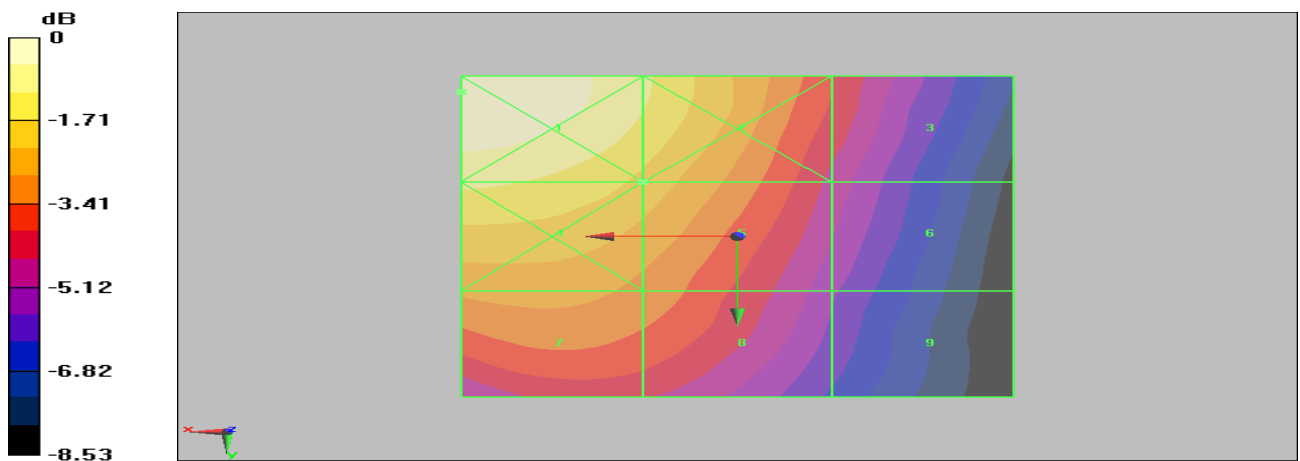
Device Reference Point: 0, 0, -6.3 mm

Reference Value = 0.105 A/m; Power Drift = -0.095 dB

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

Peak H-field in A/m

Grid 1 0.151 M4	Grid 2 0.134 M4	Grid 3 0.096 M4
Grid 4 0.134 M4	Grid 5 0.122 M4	Grid 6 0.088 M4
Grid 7 0.112 M4	Grid 8 0.107 M4	Grid 9 0.080 M4



0 dB = 0.151 A/m

Figure 35 HAC RF H-Field(open) CDMA PCS Channel 25

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HAC RF E-Field(close) CDMA AWS High

Date/Time: 2/18/2011 1:01:55 PM

Communication System: CDMA AWS; Frequency: 1752.5 MHz; Duty Cycle: 1:1

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

Ambient Temperature: 22.3 °C 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; Serial: Not Specified

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 = 43.1 V/m

Probe Modulation Factor = 1.03

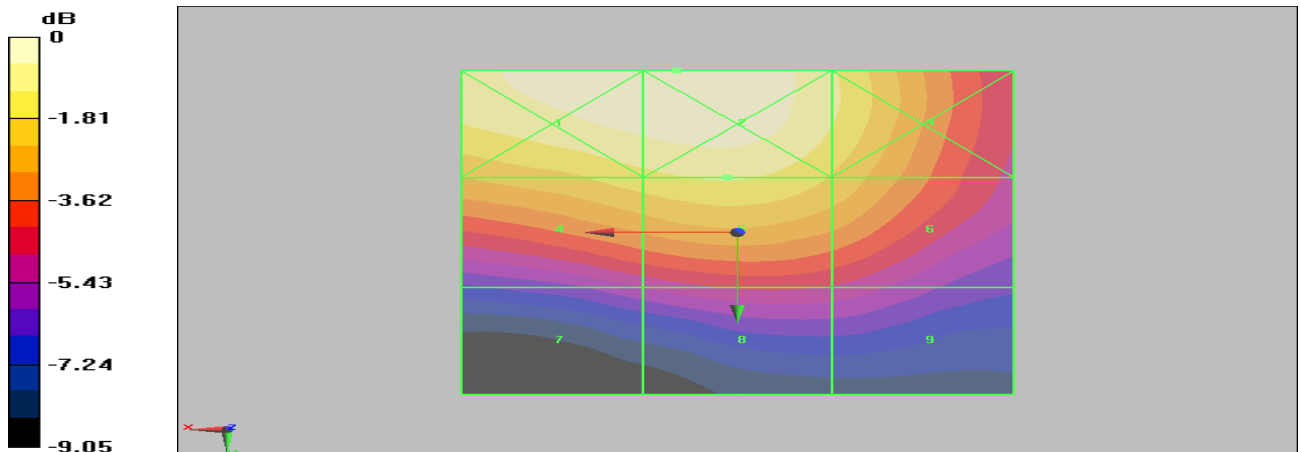
Device Reference Point: 0, 0, -6.3 mm

Reference Value = 44.2 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
48.7 M4	49.1 M4	43.5 M4
Grid 4	Grid 5	Grid 6
41.7 M4	43.1 M4	39.6 M4
Grid 7	Grid 8	Grid 9
26.4 M4	28.6 M4	28 M4



0 dB = 49.1V/m

Figure 36 HAC RF E-Field(close) CDMA AWS Channel 850

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HAC RF E-Field(close) CDMA AWS Middle

Date/Time: 2/18/2011 12:56:20 PM

Communication System: CDMA AWS; Frequency: 1732.5 MHz; Duty Cycle: 1:1

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

Ambient Temperature: 22.3 °C 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; Serial: Not Specified

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 = 41.8 V/m

Probe Modulation Factor = 1.03

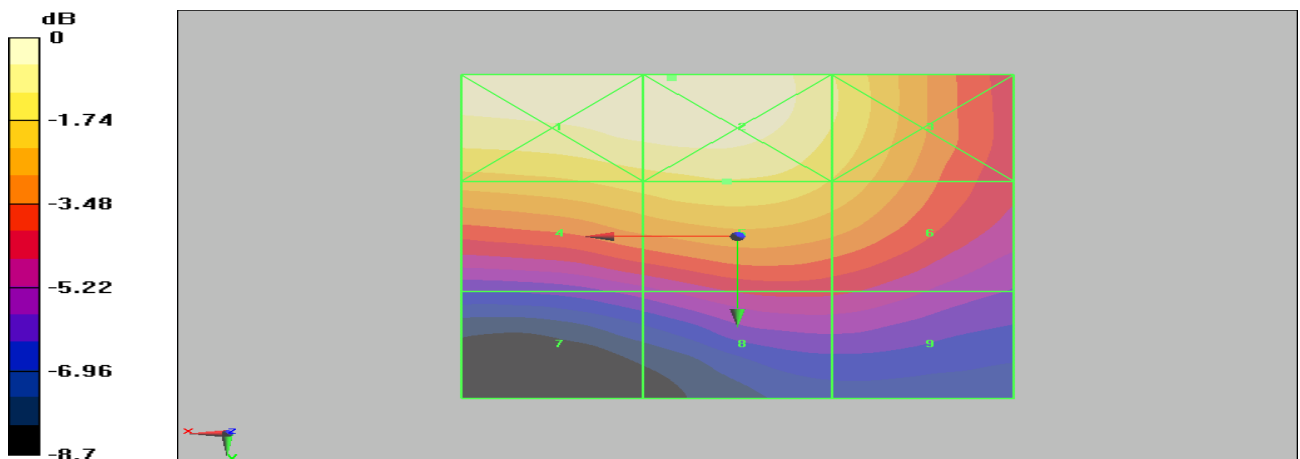
Device Reference Point: 0, 0, -6.3 mm

Reference Value = 43 V/m; Power Drift = 0.031 dB

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

Peak E-field in V/m

Grid 1	Grid 2	Grid 3
47.8 M4	48 M4	42.6 M4
Grid 4	Grid 5	Grid 6
40.6 M4	41.8 M4	39.2 M4
Grid 7	Grid 8	Grid 9
25.6 M4	28.8 M4	28.6 M4



0 dB = 48V/m

Figure 37 HAC RF E-Field(close) CDMA AWS Channel 450

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HAC RF E-Field(close) CDMA AWS Low

Date/Time: 2/18/2011 1:07:12 PM

Communication System: CDMA AWS; Frequency: 1711.25 MHz; Duty Cycle: 1:1

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

Ambient Temperature: 22.3 °C 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; Serial: Not Specified

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 = 42.1 V/m

Probe Modulation Factor = 1.03

Device Reference Point: 0, 0, -6.3 mm

Reference Value = 43.1 V/m; Power Drift = 0.077 dB

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

Peak E-field in V/m

Grid 1	Grid 2	Grid 3
48.3 M4	48.5 M4	43.9 M4
Grid 4	Grid 5	Grid 6
40.6 M4	42.1 M4	40.4 M4
Grid 7	Grid 8	Grid 9
25 M4	29.8 M4	29.8 M4

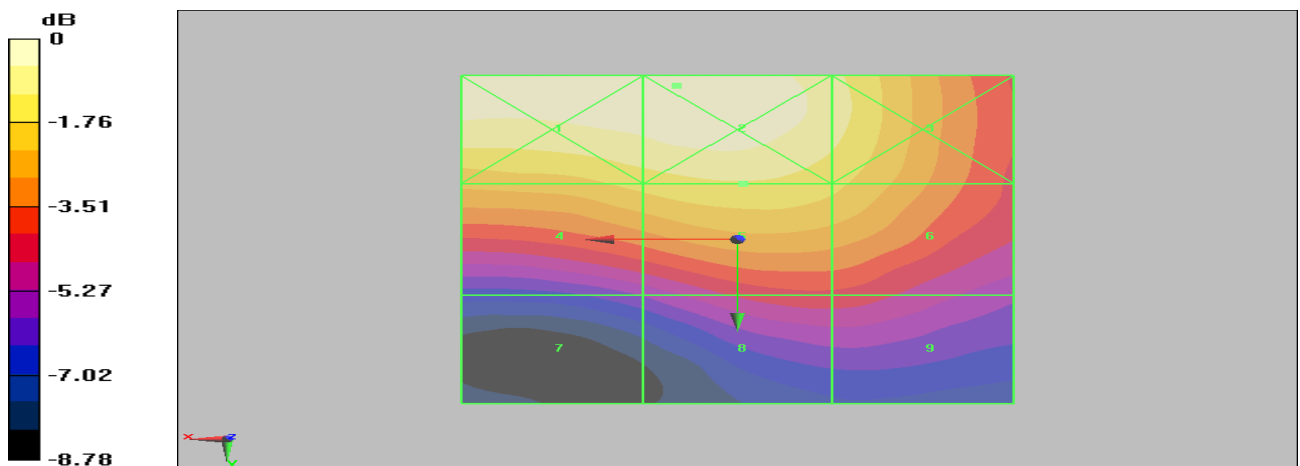


Figure 38 HAC RF E-Field(close) CDMA AWS Channel 25

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HAC RF E-Field(open) CDMA AWS High

Date/Time: 2/18/2011 1:59:07 PM

Communication System: CDMA AWS; Frequency: 1752.5 MHz; Duty Cycle: 1:1

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

Ambient Temperature: 22.3 °C 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; Serial: Not Specified

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 = 52.2 V/m

Probe Modulation Factor = 1.03

Device Reference Point: 0, 0, -6.3 mm

Reference Value = 58.2 V/m; Power Drift = -0.012 dB

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

Peak E-field in V/m

Grid 1	Grid 2	Grid 3
41 M4	52.2 M4	52 M4
Grid 4	Grid 5	Grid 6
37.4 M4	52.2 M4	52 M4
Grid 7	Grid 8	Grid 9
29.9 M4	46.5 M4	46.5 M4

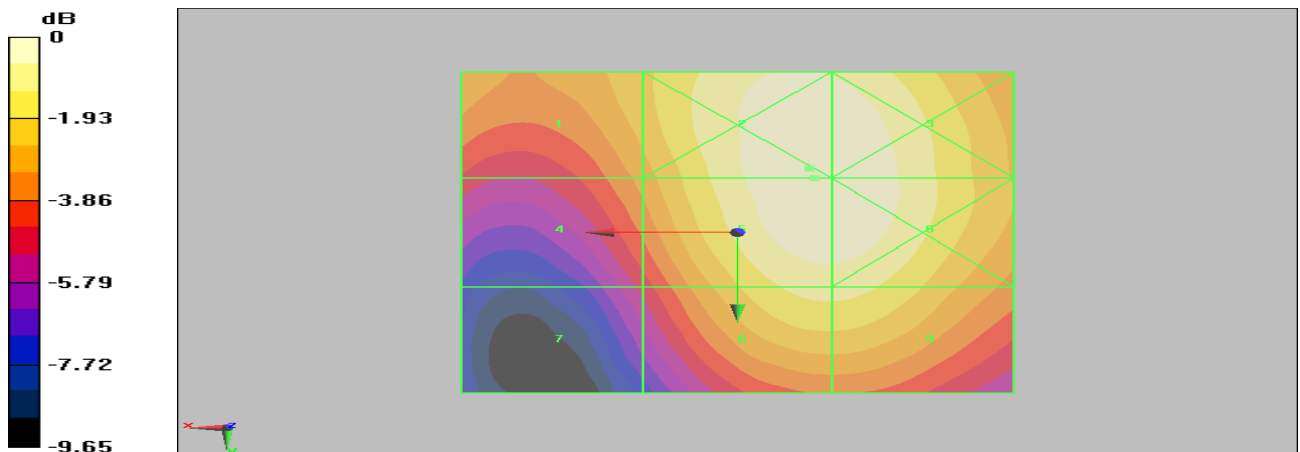


Figure 39 HAC RF E-Field(open) CDMA AWS Channel 850

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HAC RF E-Field(open) CDMA AWS Middle

Date/Time: 2/18/2011 1:48:21 PM

Communication System: CDMA AWS; Frequency: 1732.5 MHz; Duty Cycle: 1:1

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

Ambient Temperature: 22.3 °C 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; Serial: Not Specified

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 = 54.2 V/m

Probe Modulation Factor = 1.03

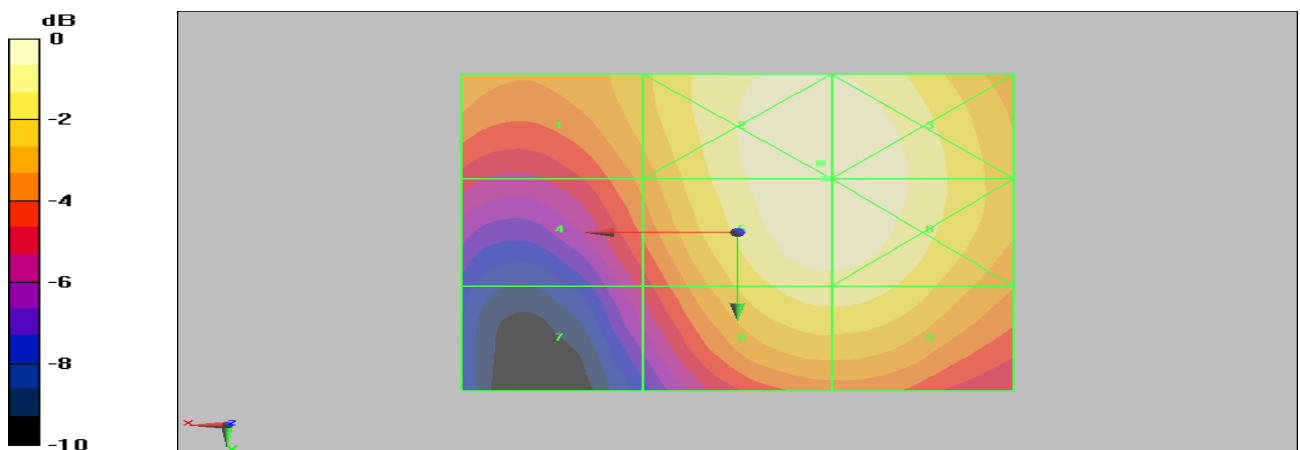
Device Reference Point: 0, 0, -6.3 mm

Reference Value = 60.5 V/m; Power Drift = -0.044 dB

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

Peak E-field in V/m

Grid 1	Grid 2	Grid 3
42.2 M4	54.2 M4	54.2 M4
Grid 4	Grid 5	Grid 6
38.1 M4	54.2 M4	54.1 M4
Grid 7	Grid 8	Grid 9
30.4 M4	48.8 M4	48.8 M4



0 dB = 54.2V/m

Figure 40 HAC RF E-Field(open) CDMA AWS Channel 450

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HAC RF E-Field(open) CDMA AWS Low

Date/Time: 2/18/2011 1:53:36 PM

Communication System: CDMA AWS; Frequency: 1711.25 MHz; Duty Cycle: 1:1

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

Ambient Temperature: 22.3 °C 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; Serial: Not Specified

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 = 56.7 V/m

Probe Modulation Factor = 1.03

Device Reference Point: 0, 0, -6.3 mm

Reference Value = 64.3 V/m; Power Drift = -0.037 dB

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

Peak E-field in V/m

Grid 1	Grid 2	Grid 3
44.4 M4	56.7 M4	56.6 M4
Grid 4	Grid 5	Grid 6
40 M4	56.7 M4	56.6 M4
Grid 7	Grid 8	Grid 9
32.6 M4	51.5 M4	51.5 M4

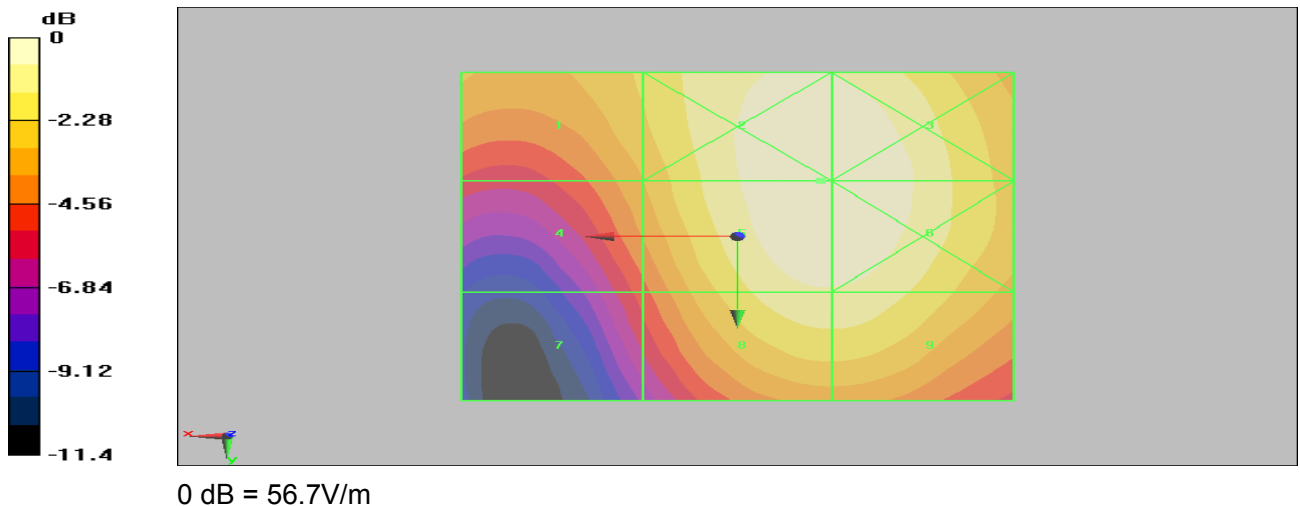


Figure 41 HAC RF E-Field(open) CDMA AWS Channel 25

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HAC RF H-Field(close) CDMA AWS High

Date/Time: 2/18/2011 10:21:45 AM

Communication System: CDMA AWS; Frequency: 1752.5 MHz; Duty Cycle: 1:1

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

Ambient Temperature: 22.3 °C 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; Serial: Not Specified

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

H Scan - H3DV6 - 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 = 0.095 A/m

Probe Modulation Factor = 1

Device Reference Point: 0, 0, -6.3 mm

Reference Value = 0.097 A/m; Power Drift = -0.027 dB

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

Peak H-field in A/m

Grid 1 0.126 M4	Grid 2 0.095 M4	Grid 3 0.074 M4
Grid 4 0.114 M4	Grid 5 0.094 M4	Grid 6 0.080 M4
Grid 7 0.095 M4	Grid 8 0.089 M4	Grid 9 0.079 M4

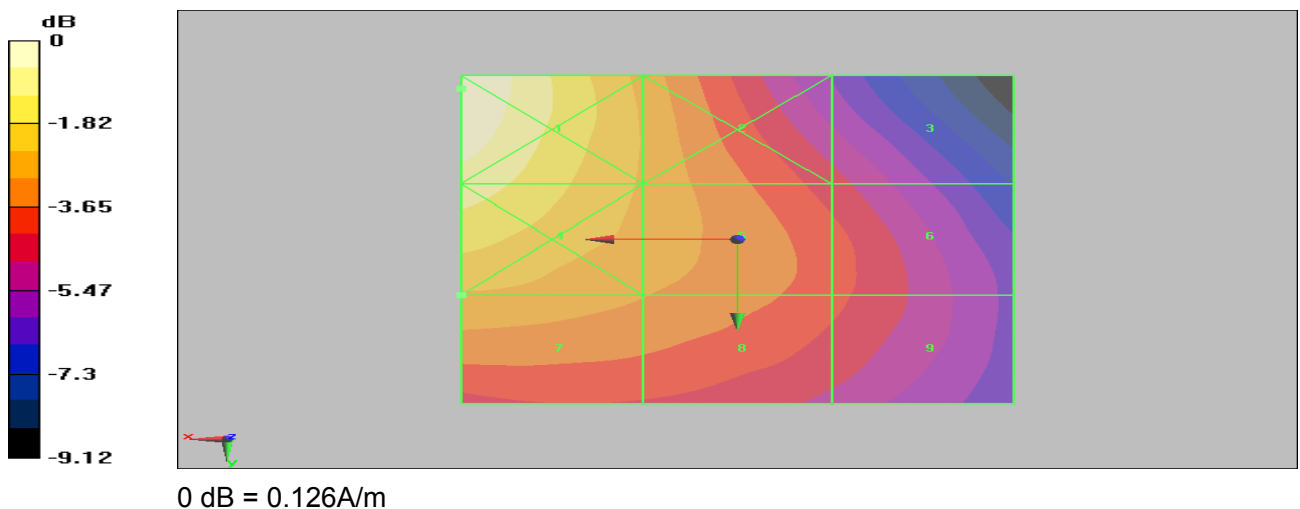


Figure 42 HAC RF H-Field(close) CDMA AWS Channel 850

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HAC RF H-Field(close) CDMA AWS Middle

Date/Time: 2/18/2011 10:14:25 AM

Communication System: CDMA AWS; Frequency: 1732.5 MHz; Duty Cycle: 1:1

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

Ambient Temperature: 22.3 °C 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; Serial: Not Specified

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

H Scan - H3DV6 - 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 = 0.101 A/m

Probe Modulation Factor = 1

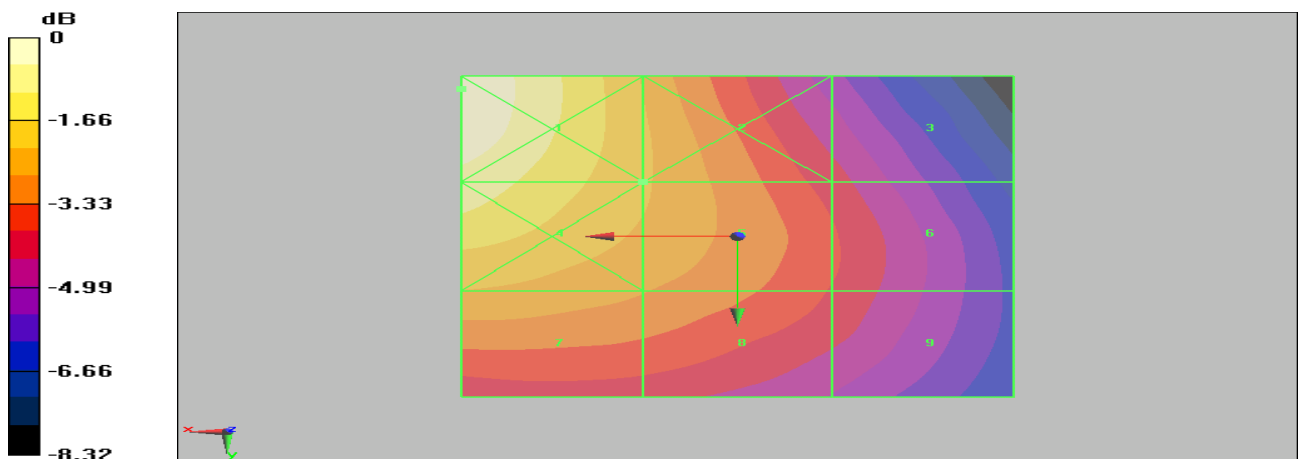
Device Reference Point: 0, 0, -6.3 mm

Reference Value = 0.103 A/m; Power Drift = 0.037 dB

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

Peak H-field in A/m

Grid 1 0.129 M4	Grid 2 0.101 M4	Grid 3 0.080 M4
Grid 4 0.119 M4	Grid 5 0.101 M4	Grid 6 0.084 M4
Grid 7 0.100 M4	Grid 8 0.094 M4	Grid 9 0.082 M4



0 dB = 0.129 A/m

Figure 43 HAC RF H-Field(close) CDMA AWS Channel 450

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HAC RF H-Field(close) CDMA AWS Low

Date/Time: 2/18/2011 10:27:10 AM

Communication System: CDMA AWS; Frequency: 1711.25 MHz; Duty Cycle: 1:1

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

Ambient Temperature: 22.3 °C 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; Serial: Not Specified

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

H Scan - H3DV6 - 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 = 0.104 A/m

Probe Modulation Factor = 1

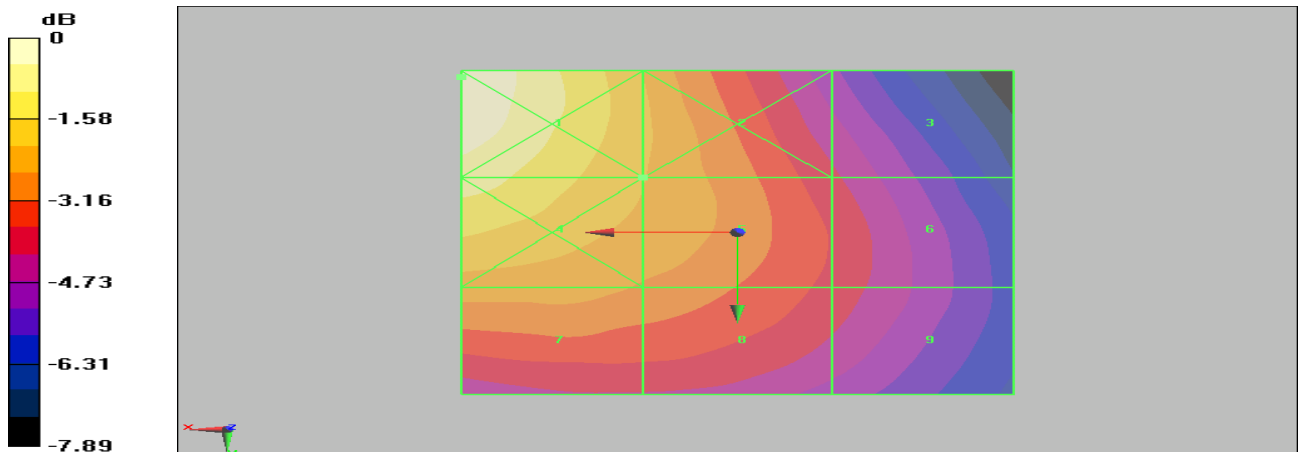
Device Reference Point: 0, 0, -6.3 mm

Reference Value = 0.105 A/m; Power Drift = 0.055 dB

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

Peak H-field in A/m

Grid 1 0.132 M4	Grid 2 0.105 M4	Grid 3 0.083 M4
Grid 4 0.121 M4	Grid 5 0.104 M4	Grid 6 0.086 M4
Grid 7 0.101 M4	Grid 8 0.097 M4	Grid 9 0.085 M4



0 dB = 0.132 A/m

Figure 44 HAC RF H-Field(close) CDMA AWS Channel 25

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HAC RF H-Field(open) CDMA AWS High

Date/Time: 2/18/2011 11:32:53 AM

Communication System: CDMA AWS; Frequency: 1752.5 MHz; Duty Cycle: 1:1

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

Ambient Temperature: 22.3 °C 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; Serial: Not Specified

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

H Scan - H3DV6 - 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 = 0.139 A/m

Probe Modulation Factor = 1

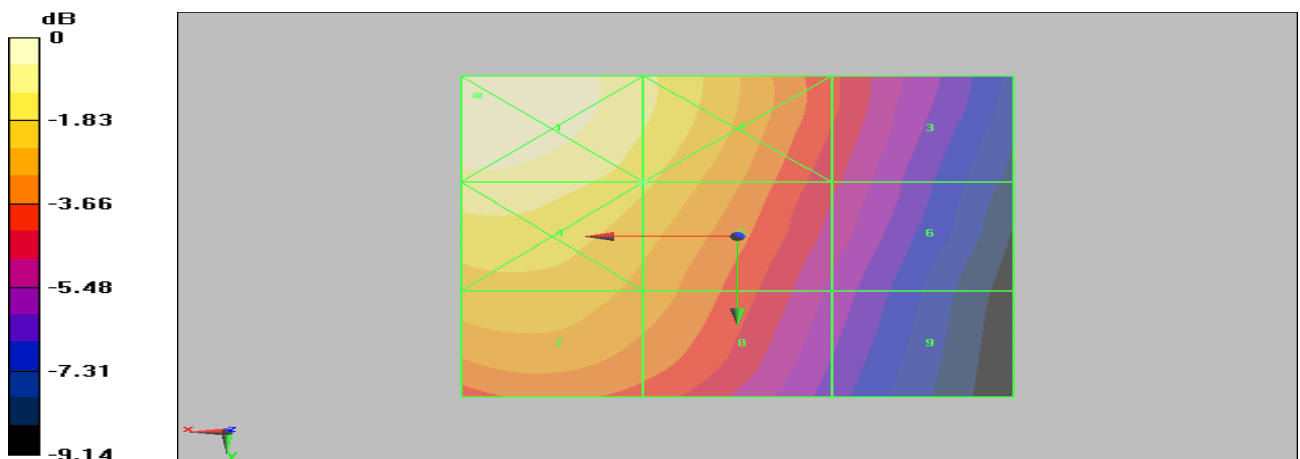
Device Reference Point: 0, 0, -6.3 mm

Reference Value = 0.118 A/m; Power Drift = 0.008 dB

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

Peak H-field in A/m

Grid 1 0.168 M4	Grid 2 0.149 M4	Grid 3 0.105 M4
Grid 4 0.154 M4	Grid 5 0.139 M4	Grid 6 0.098 M4
Grid 7 0.134 M4	Grid 8 0.124 M4	Grid 9 0.088 M4



0 dB = 0.168 A/m

Figure 45 HAC RF H-Field(open) CDMA AWS Channel 850

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HAC RF H-Field(open) CDMA AWS Middle

Date/Time: 2/18/2011 11:27:31 AM

Communication System: CDMA AWS; Frequency: 1732.5 MHz; Duty Cycle: 1:1

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

Ambient Temperature: 22.3 °C 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; Serial: Not Specified

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

H Scan - H3DV6 - 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 = 0.145 A/m

Probe Modulation Factor = 1

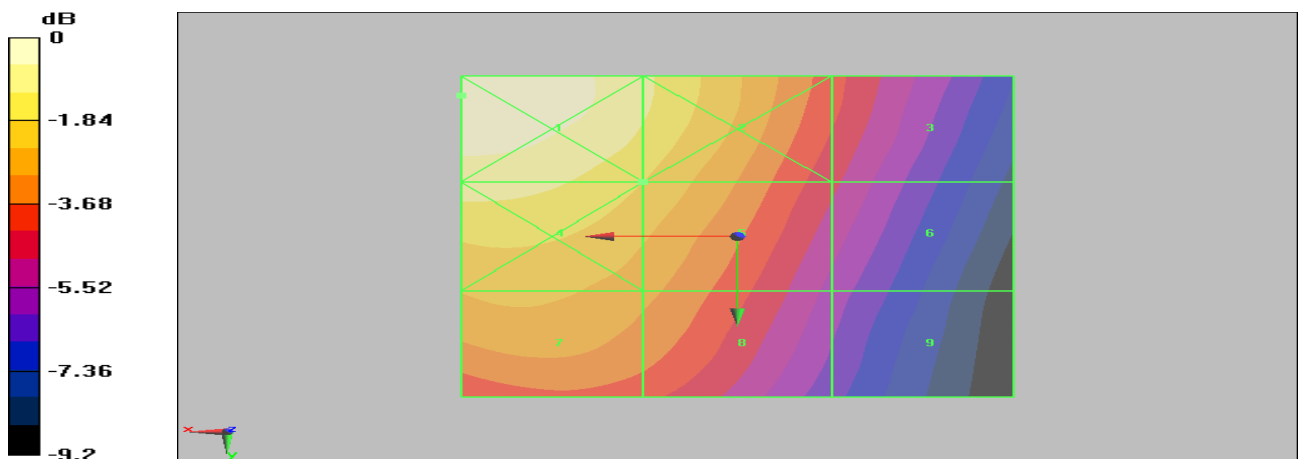
Device Reference Point: 0, 0, -6.3 mm

Reference Value = 0.124 A/m; Power Drift = 0.036 dB

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

Peak H-field in A/m

Grid 1 0.179 M4	Grid 2 0.158 M4	Grid 3 0.113 M4
Grid 4 0.160 M4	Grid 5 0.145 M4	Grid 6 0.104 M4
Grid 7 0.138 M4	Grid 8 0.129 M4	Grid 9 0.093 M4



0 dB = 0.179 A/m

Figure 46 HAC RF H-Field(open) CDMA AWS Channel 450

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HAC RF H-Field(open) CDMA AWS Low

Date/Time: 2/18/2011 11:38:15 AM

Communication System: CDMA AWS; Frequency: 1711.25 MHz; Duty Cycle: 1:1

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

Ambient Temperature: 22.3 °C 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; Serial: Not Specified

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

H Scan - H3DV6 - 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 = 0.154 A/m

Probe Modulation Factor = 1

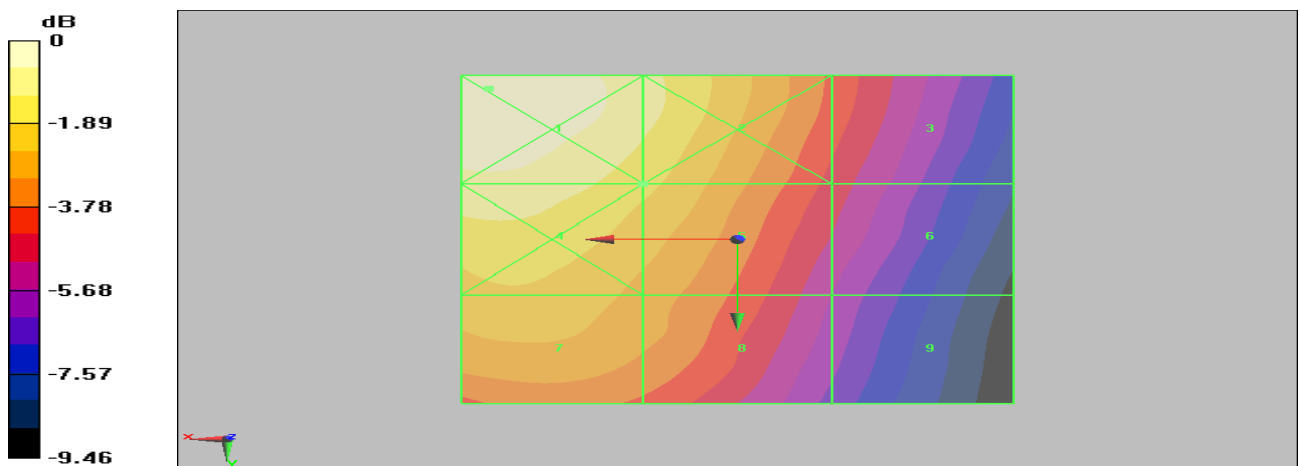
Device Reference Point: 0, 0, -6.3 mm

Reference Value = 0.131 A/m; Power Drift = 0.044 dB

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

Peak H-field in A/m

Grid 1 0.187 M4	Grid 2 0.167 M4	Grid 3 0.119 M4
Grid 4 0.171 M4	Grid 5 0.154 M4	Grid 6 0.110 M4
Grid 7 0.149 M4	Grid 8 0.136 M4	Grid 9 0.098 M4



0 dB = 0.187 A/m

Figure 47 HAC RF H-Field(open) CDMA AWS Channel 25

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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 S Servizio svizzero di taratura S Swiss Calibration Service	
Accredited by the Swiss Accreditation Service (SAS) The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates		Accreditation No.: SCS 108	
Client 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 E4419B	GB41293874	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-99 (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: Oct-10
Calibrated by:	Name Marcel Fehr	Function Laboratory Technician	Signature 
Approved by:	Katja Pokovic	Technical Manager	
Issued: October 22, 2009			
This calibration certificate shall not be reproduced except in full without written approval of the laboratory.			

Certificate No: ER3-2428_Oct09

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Calibration Laboratory of
Schmid & Partner
Engineering AG
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The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

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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ER3DV6 SN:2428

October 20, 2009

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!)

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ER3DV6 SN:2428

October 20, 2009

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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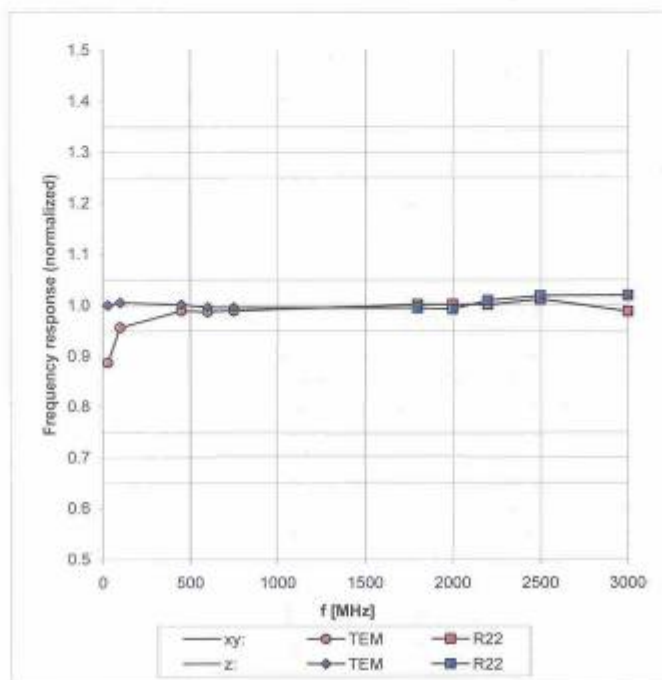
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ER3DV6 SN:2428

October 20, 2009

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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Test Report

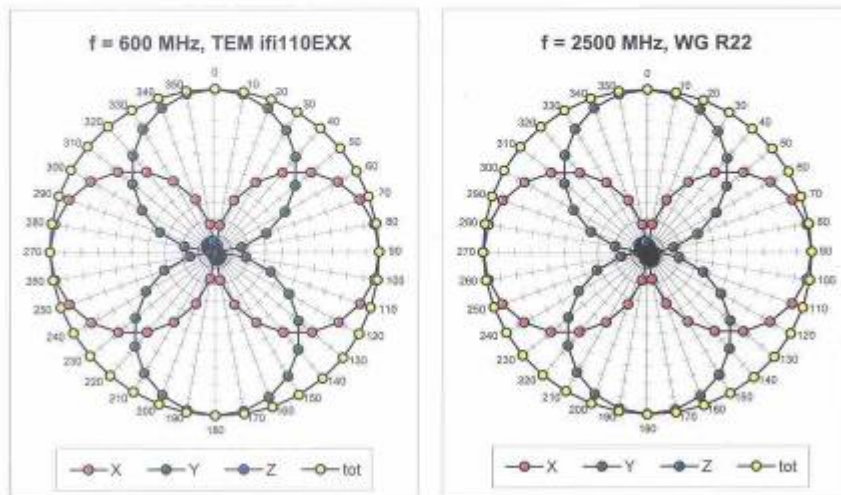
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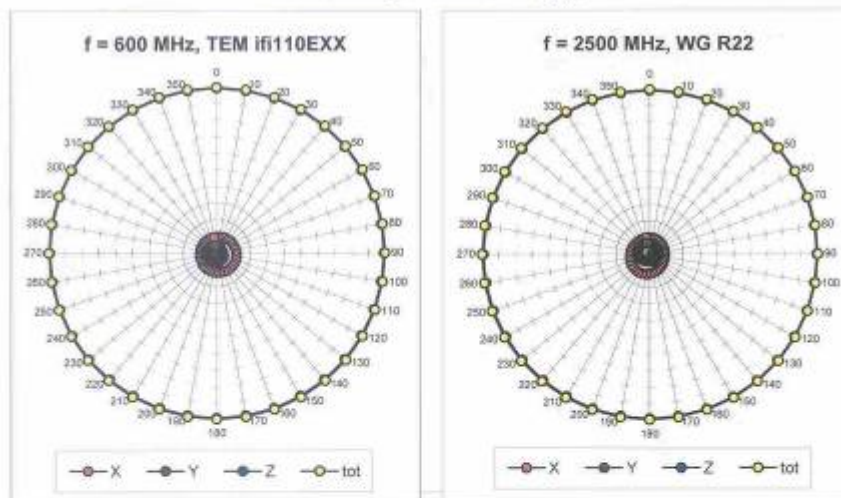
ER3DV6 SN:2428

October 20, 2009

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



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



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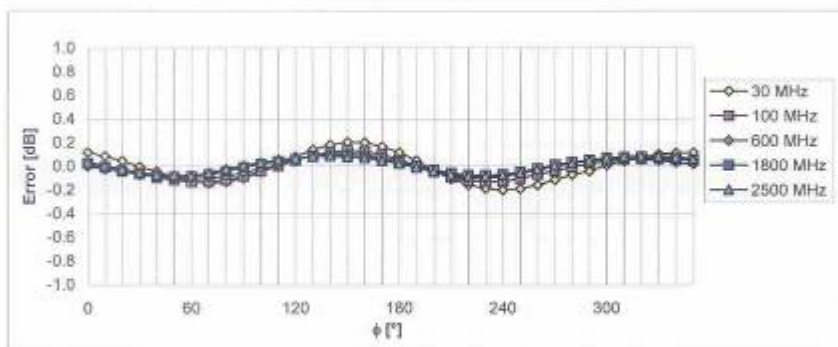
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ER3DV6 SN:2428

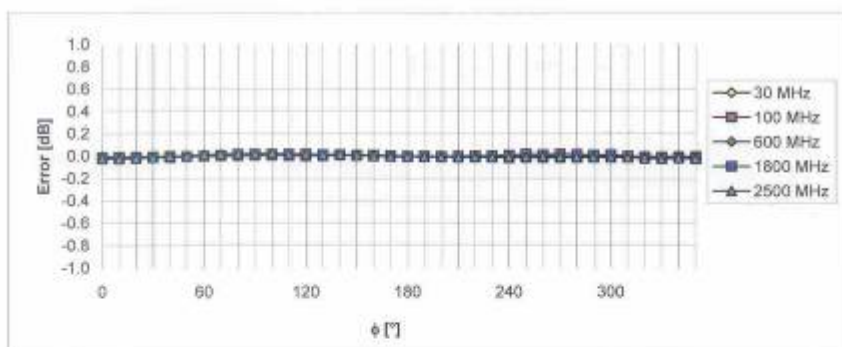
October 20, 2009

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



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

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



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

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

Report No. RZA1102-0186HAC01R1

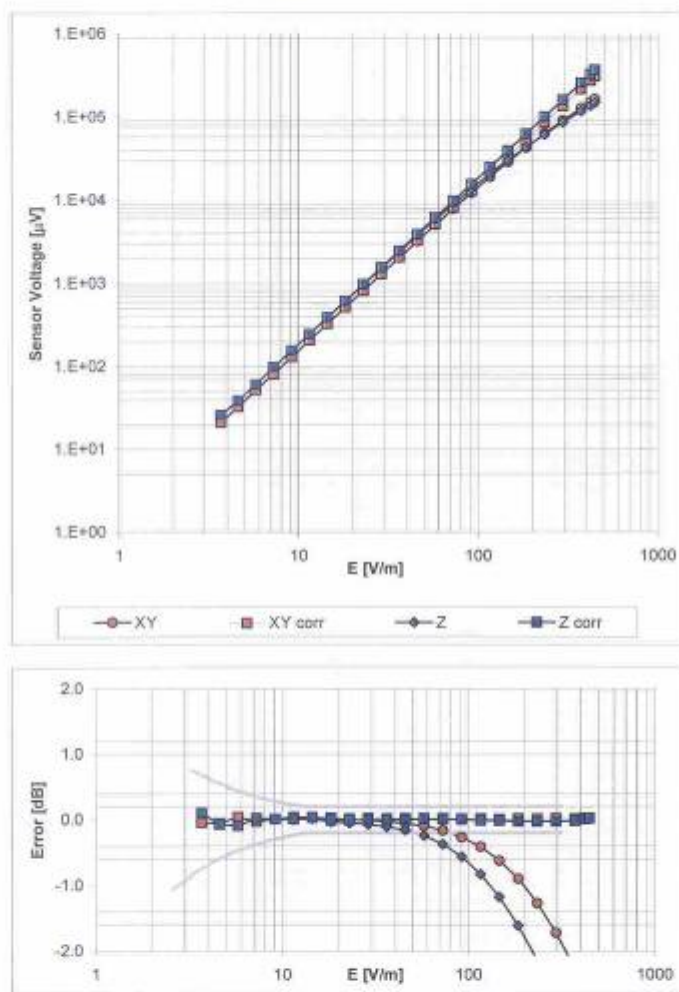
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ER3DV6 SN:2428

October 20, 2009

Dynamic Range f(E-field)

(Waveguide R22, $f = 1800$ MHz)



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

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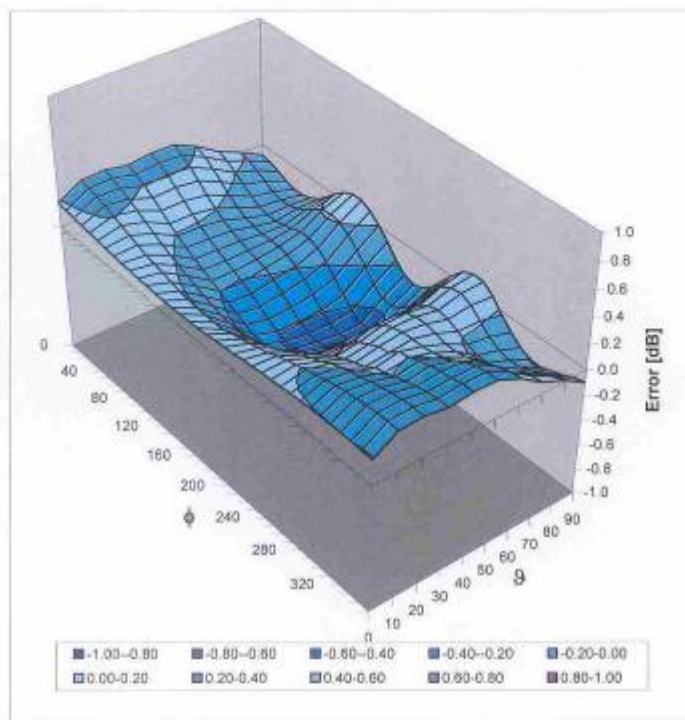
Report No. RZA1102-0186HAC01R1

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October 20, 2009

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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ER3DV6 SN:2428

October 20, 2009

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

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ANNEX D: H-Probe Calibration Certificate

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



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S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

Client **TMC**

Certificate No: **H3-6260_Oct09**

CALIBRATION CERTIFICATE

Object **H3DV6 - SN:6260**

Calibration procedure(s) **QA CAL-03.v5 and QA CAL-25.v2**
Calibration procedure for H-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 E4419B	GB41293874	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 H3DV6	SN: 6182	3-Oct-09 (No. H3-6182_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 Marcel Fehr	Function Laboratory Technician	Signature
Approved by:	Katja Pokovic	Technical Manager	

Issued: October 22, 2009

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

Certificate No: H3-6260_Oct09

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TA Technology (Shanghai) Co., Ltd.

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Calibration Laboratory of
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Accredited by the Swiss Accreditation Service (SAS)
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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

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:

- a) 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).
- X, Y, Z(f)_a0a1a2**= X, Y, Z_a0a1a2* *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 X_a0a1a2 (no uncertainty required).

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H3DV6 SN:6260

October 20, 2009

Probe H3DV6

SN:6260

Manufactured:	September 7, 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.

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H3DV6 SN:6260

October 20, 2009

DASY - Parameters of Probe: H3DV6 SN:6260

Basic Calibration Parameters

		Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm (A/m / $\sqrt{\mu V}$)	a0	2.47E-3	2.49E-3	2.95E-3	$\pm 10.1\%$
Norm (A/m / $\sqrt{\mu V}$)	a1	-2.97E-5	5.62E-6	-4.47E-5	$\pm 10.1\%$
Norm (A/m / $\sqrt{\mu V}$)	a2	4.84E-5	4.36E-5	6.01E-5	$\pm 10.1\%$
DCP (mV) ^A		84.5	90.3	83.9	

Modulation Calibration Parameters

UID	Communication System Name	PAR		A dB	B dBuV	C	VR mV	Unc (k=2)
10000	CW	0.00	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%.

¹ numerical linearization parameter: uncertainty not required

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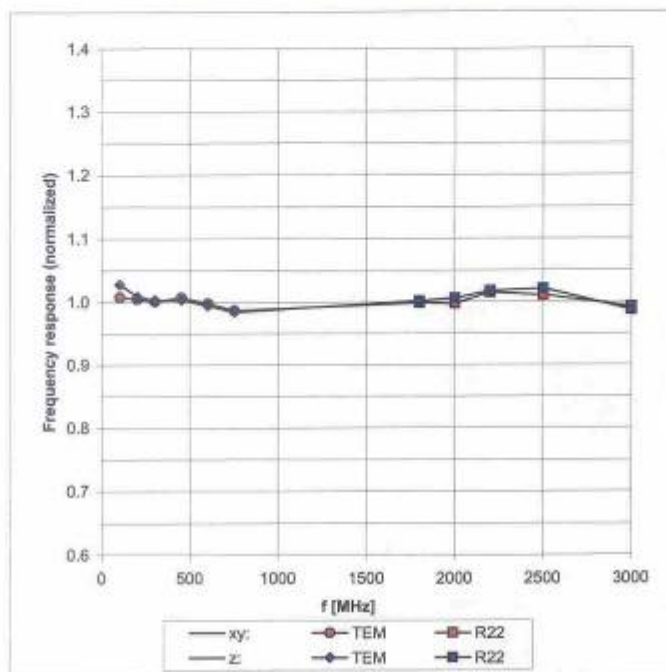
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H3DV6 SN:6260

October 20, 2009

Frequency Response of H-Field

(TEM-Cell:ifi110 EXX, Waveguide R22)



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

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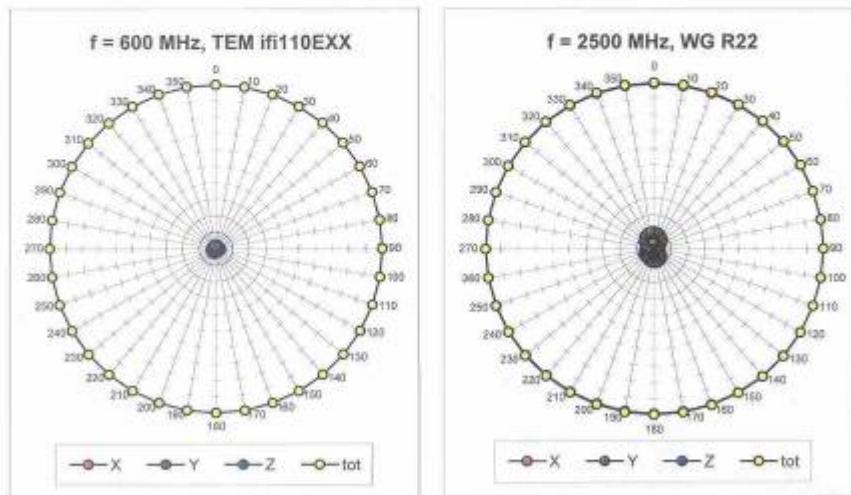
Report No. RZA1102-0186HAC01R1

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H3DV6 SN:6260

October 20, 2009

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



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

