



# HAC TEST REPORT

*Issued to*

**Teleepoch Limited**

*For*

**Mobile phone**

Model Name : Wi920;WI920E/MAX

Trade Name : PUBLIC/UMX

Brand Name : PUBLIC/UMX

FCC ID : U46-MAX

Standard : ANSI C 63.19:2007

HAC Level : H-Field: M3

E-Field: M3

Test date : 2011-09-06

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*by*

**Shenzhen MORLAB Communication Technology Co., Ltd.**

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Date 2011.09.16



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Date 2011.09.16

CTIA Authorized Test Lab  
IEEE 1725

OTA

OFTA  
電訊管理局



GCF  
Official Observer of  
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Bluetooth  
BQTF

FCC  
Reg. No.  
741109

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## Contents

<b>1.1. Identification of the Responsible Testing Laboratory .....</b>	<b>3</b>	
<b>1.2. Identification of the Responsible Testing Location .....</b>	<b>3</b>	
<b>1.3. Accreditation Certificate .....</b>	<b>3</b>	
<b>1.4. List of Test Equipments .....</b>	<b>3</b>	
<b>2. TECHNICAL INFORMATION .....</b>	<b>4</b>	
<b>2.1. Identification of Applicant.....</b>	<b>4</b>	
<b>2.2. Identification of Manufacturer .....</b>	<b>4</b>	
<b>2.3. Equipment Under Test (EUT) .....</b>	<b>4</b>	
<b>2.3.1. Photographs of the EUT .....</b>	<b>4</b>	
<b>2.3.2. Identification of all used EUTs.....</b>	<b>5</b>	
<b>2.4. Applied Reference Documents .....</b>	<b>5</b>	
<b>2.5. Test Environment/Conditions .....</b>	<b>6</b>	
<b>2.6. Operational Conditions During Test .....</b>	<b>7</b>	
<b>2.6.1. INTRODUCTION.....</b>	<b>7</b>	
<b>2.6.2. ANSI/IEEE PC 63.19 PERFORMANCE CATEGORIES .....</b>	<b>8</b>	
<b>2.6.3. Description of Test System .....</b>	<b>10</b>	
<b>2.6.4. TEST PROCEDURE .....</b>	<b>14</b>	
<b>2.6.5. SYSTEM CHECK.....</b>	<b>16</b>	
<b>2.6.6. Uncertainty Estimation Table .....</b>	<b>18</b>	
<b>2.6.7. OVERALL MEASUREMENT SUMMARY .....</b>	<b>19</b>	
<b>2.6.8. TEST DATA .....</b>	<b>20</b>	
<b>ANNEX A</b>	<b>PHOTOGRAPHS OF THE EUT.....</b>	<b>61</b>
<b>ANNEX B</b>	<b>EUT SETUP PHOTO .....</b>	<b>62</b>

## 1.1. Identification of the Responsible Testing Laboratory

Company Name: Shenzhen Morlab Communications Technology Co., Ltd.  
Department: Morlab Laboratory  
Address: 3/F, Electronic Testing Building, Shahe Road, Nanshan District, Shenzhen, 518055 P. R. China  
Responsible Test Lab Manager: Mr. Shu Luan  
Telephone: +86 755 86130268  
Facsimile: +86 755 86130218

## 1.2. Identification of the Responsible Testing Location

Name: Shenzhen Morlab Communications Technology Co., Ltd. Morlab Laboratory  
Address: 3/F, Electronic Testing Building, Shahe Road, Nanshan District, Shenzhen, 518055 P. R. China

## 1.3. Accreditation Certificate

Accredited Testing Laboratory: No. CNAS L1659

## 1.4. List of Test Equipments

No.	Instrument	Type
1	PC	Dell (Pentium IV 2.4GHz, SN:X10-23533)
2	Network Emulator	Rohde&Schwarz (CMU200, SN:105894)
3	Voltmeter	Keithley (2000, SN:1000572)
4	Synthetizer	Rohde&Schwarz (SML_03, SN:101868)
5	Amplifier	Nucl udes (ALB216, SN:10800)
6	Power Meter	Rohde&Schwarz (NRVD, SN:101066)
7	Audio DAQ	NI (MonDAQ, SN:MonNumero)
8	E-FIELD PROBE	SN: SN 41/08 EPH17
9	H-FIELD PROBE	SN: SN 41/08 HPH18
10	T-COIL PROBE	SN: SN 39/08 TCP11
11	800-950 MHZ DIPOLE	SN: SN 36/08 DHA16
12	1700-2000 MHZ DIPOLE	SN: SN 36/08 DHB16
13	HAC holder	SN02_EPH02 (SN:SN_3608_SUPH16)

## 2. Technical Information

Note: the following data is based on the information by the applicant.

### 2.1. Identification of Applicant

Company Name: Teleepoch Limited  
Address: 5A, B1 Building, Digital Tech Zone, High-Tech Park(south), Nanshan district, Shenzhen, Guangdong Province, China

### 2.2. Identification of Manufacturer

Company Name: Teleepoch Limited  
Address: 5A, B1 Building, Digital Tech Zone, High-Tech Park(south), Nanshan district, Shenzhen, Guangdong Province, China

### 2.3. Equipment Under Test (EUT)

Brand Name: PUBLIC/UMX  
Type Name: PUBLIC/UMX  
Marking Name: Wi920;WI920E/MAX 1  
Hardware Version: WI920\_V1.2  
Software Version: N/A  
Frequency Bands: CDMA 800MHz /CDMA 1700MHz/CDMA 1900MHz  
WIFI: 2412MHz-2462MHz  
BT: 2402MHz-2480MHz  
Modulation Mode: CDMA : CDMA  
WIFI 802.11B : DSSS  
WIFI 802.11G: OFDM  
BT: GMSK  
Antenna type: Fixed Internal Antenna  
Development Stage: Identical prototype  
Battery Model: N/A  
Battery specification: 1450mAh 3.7V

#### 2.3.1. Photographs of the EUT

Please see for photographs of the EUT.

### 2.3.2. Identification of all used EUTs

The EUT identity consists of numerical and letter characters, the letter character indicates the test sample, and the following two numerical characters indicate the software version of the test sample.

EUT Identity	Hardware Version	Software Version
1#	WI920_V1.2	N/A

### 2.4. Applied Reference Documents

Leading reference documents for testing:

No.	Identity	Document Title
1	<b>ANSI C 63.19:2007</b>	American National Standard Methods of Measurement of Compatibility between Wireless Communications Devices and Hearing Aids

**Note:** Test report, reference KDB 285076 documents.

## 2.5. Test Environment/Conditions

Normal Temperature (NT):	20 ... 25 °C
Relative Humidity:	30 ... 75 %
Air Pressure:	980 ... 1020 hPa
Extreme Voltage of the EUT:	Normal Voltage (NV) = 3.70V
	Low Voltage (LV) = 3.60V
	High Voltage (HV) = 4.20V

Test frequency:	CDMA 800MHz/CDMA 1700MHz/CDMA 1900MHz
Operation mode:	Call established
Power Level:	CDMA Maximum output power

During SAR test, EUT is in Traffic Mode (Channel Allocated) at Normal Voltage Condition. 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) is 1013, 384 and 777 respectively in the case of CDMA 800MHz or is allocated to 40, 440 and 840 respectively in the case of CDMA 1700MHz, or is allocated to 25, 600 and 1175 respectively in the case of CDMA 1900MHz, The EUT is commanded to operate at maximum transmitting power.

The EUT shall use its internal transmitter. The antenna(s), battery and accessories shall be those specified by the manufacturer. The EUT battery must be fully charged and checked periodically during the test to ascertain uniform power output. If a wireless link is used, the antenna connected to the output of the base station simulator shall be placed at least 50 cm away from the handset.

The signal transmitted by the simulator to the antenna feeding point shall be lower than the output power level of the handset by at least 35 dB.

## 2.6.Operational Conditions During Test

### 2.6.1. INTRODUCTION

On July 10.2003.the Federal Communications Commission (FCC) adopted new rules requiring wireless manufacturers and service providers to provide digital wireless phones that are compatible with hearing aids. The FCC has modified the exemption for wireless phones under the Hearing Aid Compatibility Act of 1998 (HAC Act) in WT Docket 01-309 RM-8658 to extend the benefits of wireless telecommunications to individuals with hearing disabilities. These benefits encompass business, social and emergency communications, which increase the value of the wireless network for everyone. An estimated more than 10% of the population in the United States show signs of hearing impairment and of that fraction, almost 80% use hearing aids. Approximately 500 million people worldwide suffer from hearing loss.

Compatibility Tests involved:

The standard calls for wireless communications devices to be measured for:

- RF Electric-field emissions.
- RF Magnetic- field emissions.
- T-coil mode, magnetic-signal strength in the audio band.
- T-coil mode, magnetic-signal frequency response through the audio band.
- T-coil mode, magnetic-signal and noise articulation index.

The hearing aid must be measured for:

- RF immunity in microphone mode
- RF immunity in T-coil mode

In the following tests and results, this report includes the evaluation for a wireless communications device

## 2.6.2. ANSI/IEEE PC 63.19 PERFORMANCE CATEGORIES

### 4.3.2.1. RF EMISSIONS

The ANSI Standard presents performance requirements for acceptable interoperability of hearing with wireless communications devices. When these parameters are met, a hearing aid operates acceptably in close proximity to a wireless communications device.

#### <960MHz Limit:

Category	AWF (dB)	Limits for E-Field Emission (V/m)	Limits for H-Field Emission (A/m)
M1	0	631.0 - 1122.0	1.91 - 3.39
	-5	473.2 - 841.4	1.43 - 2.54
M2	0	354.8 - 631.0	1.07 - 1.91
	-5	266.1 - 473.2	0.80 - 1.43
M3	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.80
M4	0	<199.5	<0.60
	-5	<149.6	<0.45

Hearing aid and WD near-field categories as defined in ANSI PC 63.19. During testing, the hearing aid must maintain an input-referenced interference level of less than 55dB a gain compression of less than 6dB.

#### >960MHz Limit:

Category	AWF (dB)	Limits for E-Field Emission (V/m)	Limits for H-Field Emission (A/m)
M1	0	199.5 - 354.8	0.6 - 1.07
	-5	149.6 - 266.1	0.45 - 0.8
M2	0	112.2 - 199.5	0.34 - 0.6
	-5	84.1 - 149.6	0.25 - 0.45
M3	0	63.1 - 112.2	0.19 - 0.34
	-5	47.3 - 84.1	0.15 - 0.25
M4	0	<63.1	<0.19
	-5	<47.3	<0.15

#### 4.3.2.2. Articulation Weighing Factor (AWF)

Standard	Technology	AWF
T1/T1P1/3GPP	UMTS(WCDMA)	0
IS-95	CDMA	0
iden	GSM(22and 11Hz)	0
J-STD-007	GSM(217Hz)	-5
AWF has been developed from information presented to the committee regarding the interference potential of the various modulation types according to ANSI PC 63.19		

## 2.6.3. Description of Test System

### 4.3.3.1. COMOHAC E-FIELD PROBE



Serial Number:	SN 41/08 EPH17
Frequency:	100MHz – 3GHz
Probe length:	330mm
Length of one dipole:	3.3mm
Maximum external diameter:	8mm
Probe extremity diameter:	6mm
Distance between dipoles/probe extremity:	3mm
Resistance of the three dipole (at the connector):	Dipole 1:R1=2.1807 MΩ Dipole 2:R1=2.0612 MΩ Dipole 3:R3=2.1892 MΩ
Connector (HIROSE series SR30)	6 wire male (Hirose SR30series)

## CALIBRATION TEST EQUIPMENT

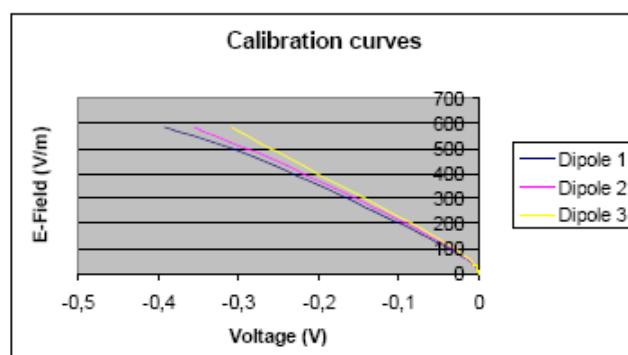
TYPE	IDENTIFICATION
Calibration bench	SATIMO AIR CALIBRATION SOFTWARE
Multimeter	Keithley 2000

## MEASUREMENT PROCEDURE

Probe calibration is realized by using the waveguide method. The probe was inserted in a waveguide loading by a 50 load. By controlling the input power in the waveguide, we are able to create a known EField value in the waveguide. ,

Keithley configuration:

Rate = Medium; Filter =ON; RDGS=10; FILTER TYPE =MOVING AVERAGE; RANGE AUTO



The following tables represent the calibration curves linearization by curve segment in CW signal.

#### 4.3.3.2. COMOHAC H-FIELD PROBE



Serial Number:	SN 41/08 HPH18
Frequency:	100MHz – 3GHz
Probe length:	330mm
Length of one dipole:	3.3mm
Maximum external diameter:	8mm
Probe extremity diameter:	6mm
Distance between dipoles/probe extremity:	3mm
Resistance of the three dipole (at the connector):	Dipole 1:R1=2.1650 MΩ Dipole 2:R1=2.2176 MΩ Dipole 3:R3=2.4084 MΩ
Connector (HIROSE series SR30)	6 wire male (Hirose SR30series)

#### CALIBRATION TEST EQUIPMENT

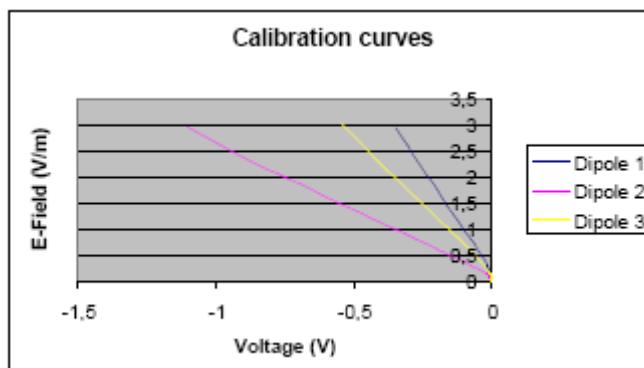
TYPE	IDENTIFICATION
Calibration bench	SATIMO AIR CALIBRATION SOFTWARE
Multimeter	Keithley 2000

#### MEASUREMENT PROCEDURE

Probe calibration is realized by using the waveguide method. The probe was inserted in a waveguide loading by a 50 load. By controlling the input power in the waveguide, we are able to create a known HField value in the waveguide.

Keithley configuration:

Rate = Medium; Filter =ON; RDGS=10; FILTER TYPE =MOVING AVERAGE; RANGE AUTO



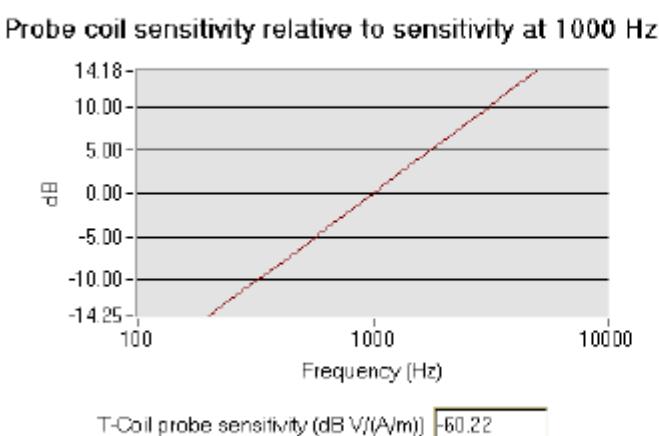
The following tables represent the calibration curves linearization by curve segment in CW signal.

#### 4.3.3.3. COMOHAC T-COIL PROBE



Serial Number:	SN 39/08 TCP11
Dimensions:	6.55mm length*2.29mm diameter
DC resistance:	860.6Ω
Wire size:	51 AWG
Inductance:	132.1 mH at 1kHz
Sensitivity:	-60.22 dB (V/A/m) at 1kHz

#### SENSITIVITY



Frequency (Hz)	H (dB (V/(A/m)))
200	-73,92940009
250	-72,01119983
315	-70,06378892
400	-67,88880017
500	-66,00059991
630	-64,07318901
800	-62,00820026
1000	-60,22
1250	-58,29179974
1600	-56,20760035
2000	-54,31940009
2500	-52,36119983
3150	-50,38378892
4000	-48,50880017
5000	-46,44059991

#### LINEARITY

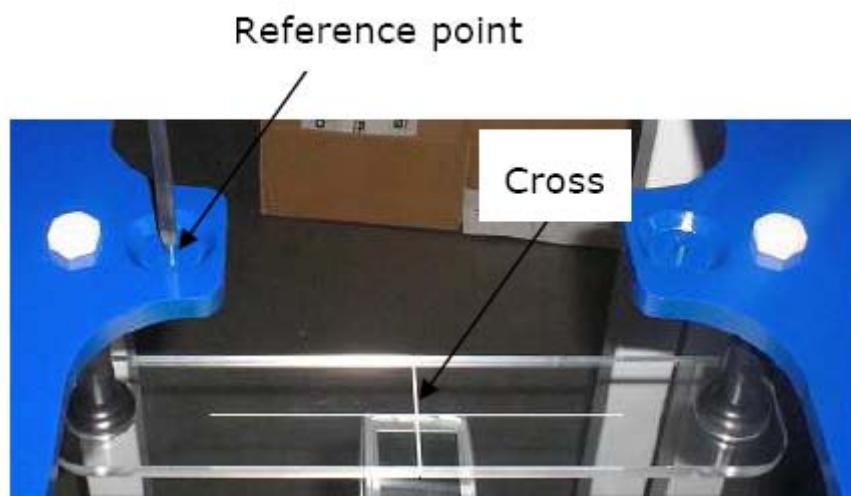
Linearity = 0.27 dB

Power (dB) relative to 1 A/m	0	-10	-20	-30	-40	-50
H (dB (V/(A/m)))	0	-9,95	-19,95	-30	-39,9	-49,73

#### 4.3.3.4. System Hardware

The HAC positioning ruler is used to position the phone properly with the regard to the position of the probe during a measurement. The positioning system is made of a dedicated frame that can be fixed on the table. The tip of the probe is positioned on a reference point located on the top of the positioning ruler. The distance between this reference point and the cross located on the ruler being known, the speaker of the phone is positioned on this cross in order to make sure both probe and phone are positioned properly.

During the measurement, the HAC ruler has to be removed so that it does not interfere with the measurement.



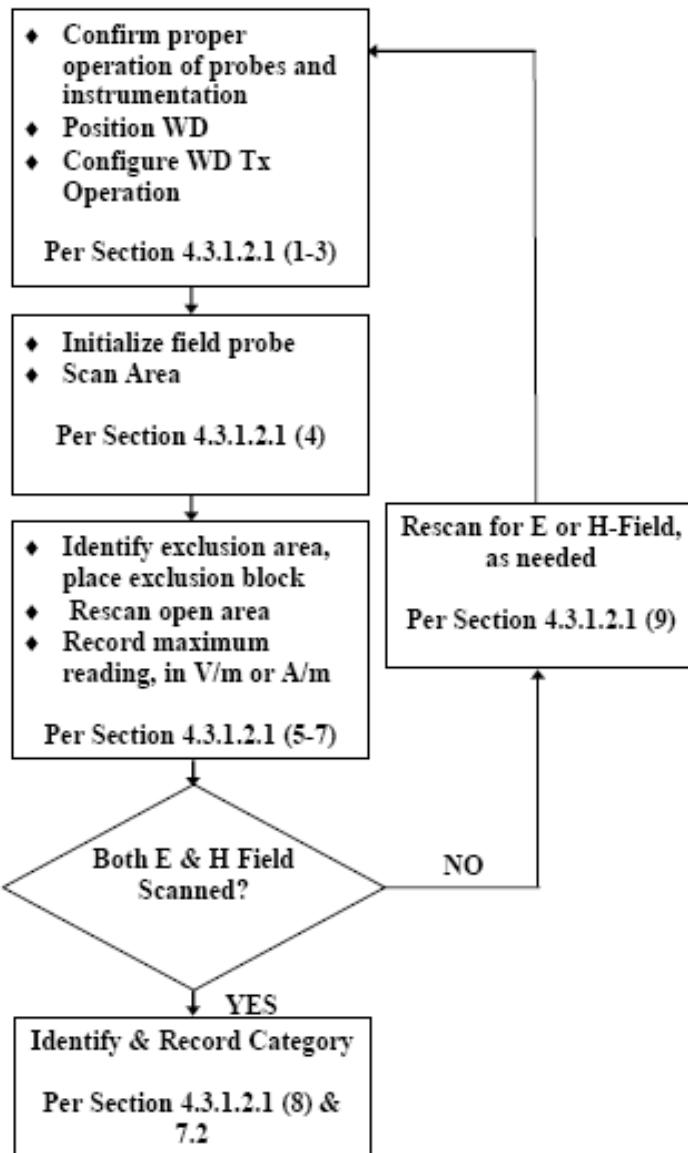
HAC positioning ruler

## 2.6.4. TEST PROCEDURE

### 4.3.4.1. RF EMISSIONS

Per ANSI C 63.19 2007:

#### Test Instructions



#### 4.3.4.2. TEST Setup



WD reference and plane for RF emission measurements

#### 4.3.4.3. RF Emission Test Procedure

The following illustrate a typical RF emissions test scan over a wireless communications device:

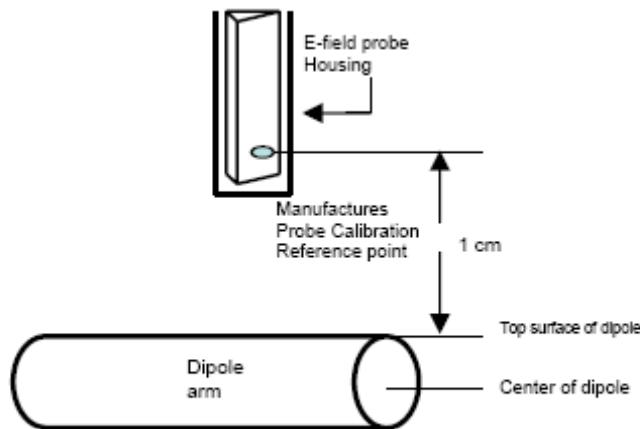
1. Proper operation of the field probe, probe measurement system, other instrumentation, and the positioning system was confirmed.
2. WD is positioned in its intended test position, acoustic output point of the device perpendicular to the field probe.
3. The WD operation for maximum rated RF output power was configured and confirmed with the base station simulator, at the test channel and other normal operating parameters as intended for the test. The battery was ensured to be fully charged before each test.
4. The center sub-grid was centered over the center of the acoustic output (also audio band magnetic output, if applicable). The WD audio output was positioned tangent (as physically possible) to the measurement plane.
5. A surface calibration was performed before each setup change to ensure repeatable spacing and proper maintenance of the measurement plane using the HAC Phantom.
6. The measurement system measured the field strength at the reference location.

## 2.6.5. SYSTEM CHECK

### 4.3.5.1. System Check Parameters

The input signal was an unmodulated continuous wave. The following points were taken into consideration in performing this check:

- Average Input Power  $P = 100\text{mW RMS}$  ( $20\text{dBm RMS}$ ) after adjustment for return loss
- The test fixture must meet the 2 wavelength separation criterion
- The proper measurement of the 1 cm probe to dipole separation, which is measured from top surface of the dipole to the calibration reference point of the sensor, defined by the probe manufacturer is shown in the following diagram:



**Figure 15**  
Separation Distance from Dipole to Field Probe

RF power was recorded using both an average reading meter and a peak reading meter. Readings of the probe are provided by the measurement system.

To assure proper operation of the near-field measurement probe the input power to the dipole shall be commensurate with the full rated output power of the wireless device (e.g. - for a cellular phone wireless device the average peak antenna input power will be on the order of  $100\text{mW}$  (i.e. -  $20\text{dBm}$ ) RMS after adjustment for any mismatch.

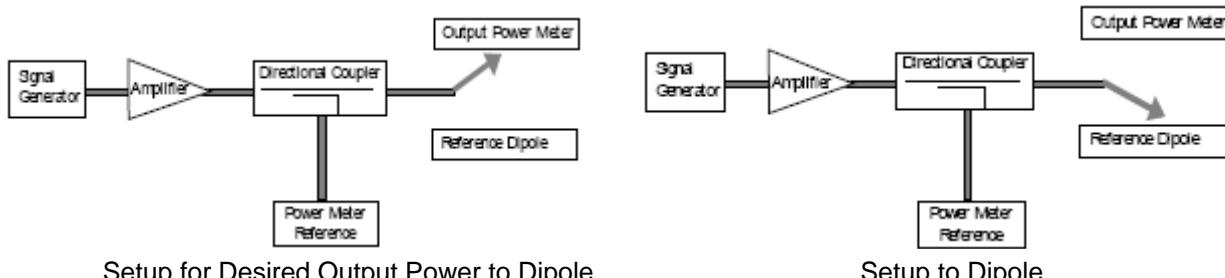
### 4.3.5.2 Validation Procedure

A dipole antenna meeting the requirements given in PC63.19 was placed in the position normally occupied by the WD.

The length of the dipole was scanned with both E-field and H-field probes and the maximum values for each were recorded.

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

RF power was recorded using both an average and a peak power reading meter.

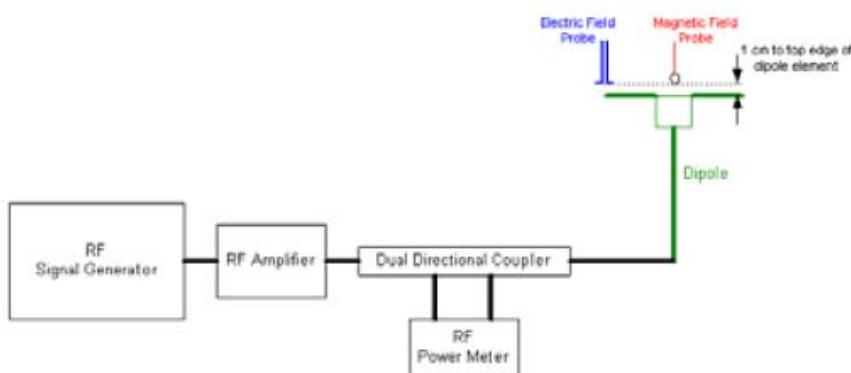


Using this setup configuration, the signal generator was adjusted for the desired output power (100mW) at a specified frequency. The reference power from the coupled port of the directional coupler is recorded. Next, the output cable is connected to the reference dipole,

#### 4.3.5.3. Test System Validation

**Validation Results (1W forward input power),** System checks the specific test data please see page 63-70

Frequency	Input Power (dBm)	E-field Result (V/m)	Target Field (V/m)
900 MHz	20.0	207	205
1800MHz	20.0	161.52	165
Frequency	Input Power (dBm)	H-field Result (A/m)	Target Field (A/m)
900 MHz	20.0	0.442	0.448
1800MHz	20.0	0.447	0.452



System Check Setup

## 2.6.6. Uncertainty Estimation Table

a	b	c	d	e= f(d,k)	f	g	h= c*f/e	i= c*g/e	k
Uncertainty Component	Sec.	Tol (+- )	Prob. Dist.	Div.	Ci (1g)	Ci (10g)	1g Ui (+-%)	10g Ui (+-%)	V i
<b>Measurement System</b>									
Probe calibration	E.2.1	7.0	N	1	1	1	7.00	7.00	
Axial Isotropy	E.2.2	2.5	R	$\sqrt{3}$			1.02	1.02	
Hemispherical Isotropy	E.2.2	4.0	R	$\sqrt{3}$			1.63	1.63	
Boundary effect	E.2.3	1.0	R	$\sqrt{3}$	1	1	0.58	0.58	
Linearity	E.2.4	5.0	R	$\sqrt{3}$	1	1	2.89	2.89	
System detection limits	E.2.5	1.0	R	$\sqrt{3}$	1	1	0.58	0.58	
Readout Electronics	E.2.6	0.02	N	1	1	1	0.02	0.02	
Reponse Time	E.2.7	3.0	R	$\sqrt{3}$	1	1	1.73	1.73	
Integration Time	E.2.8	2.0	R	$\sqrt{3}$	1	1	1.15	1.15	
RF ambient Conditions	E.6.1	3.0	R	$\sqrt{3}$	1	1	1.73	1.73	
Probe positioner Mechanical Tolerance	E.6.2	2.0	R	$\sqrt{3}$	1	1	1.15	1.15	
Probe positioning with respect to Phantom Shell	E.6.3	0.05	R	$\sqrt{3}$	1	1	0.03	0.03	
Extrapolation, interpolation and integration Algorithms for Max. SAR Evaluation	E.5.2	5.0	R	$\sqrt{3}$	1	1	2.89	2.89	
<b>Test sample Related</b>									
Test sample positioning	E.4.2.1	0.03	N	1	1	1	0.03	0.03	N - 1
Device Holder Uncertainty	E.4.1.1	5.00	N	1	1	1	5.00	5.00	
Output power Variation - drift measurement	6.6.2	5.78	R		1	1	3.34	3.34	

## 2.6.7. OVERALL MEASUREMENT SUMMARY

### 4.3.7.1 E-FIELD EMISSIONS

Band	Mode	Channel	M Rating	Output power (dBm)
E-FIELD EMISSIONS				
CDMA800	CDMA	1013	M4	28.49
CDMA800	CDMA	384	M4	29.04
CDMA800	CDMA	777	M4	28.29
CDMA1700	CDMA	40	M4	
CDMA1700	CDMA	440	M3	
CDMA1700	CDMA	840	M3	
CDMA1900	CDMA	25	M4	27.89
CDMA1900	CDMA	600	M4	27.19
CDMA1900	CDMA	1175	M4	26.72
G-block	CDMA	1275	M4	23.97

### 4.3.7.2 H-FIELD EMISSIONS

Band	Mode	Channel	M Rating	Output power (dBm)
H-FIELD EMISSIONS				
CDMA800	CDMA	1013	M4	28.49
CDMA800	CDMA	384	M4	29.04
CDMA800	CDMA	777	M4	28.29
CDMA1700	CDMA	40	M3	
CDMA1700	CDMA	440	M3	
CDMA1700	CDMA	840	M4	
CDMA1900	CDMA	25	M4	27.89
CDMA1900	CDMA	600	M4	27.19
CDMA1900	CDMA	1175	M3	26.72
G-block	CDMA	1275	M4	23.97

## 2.6.8. TEST DATA

<u>FREQUENCY</u>	<u>PARAMETERS</u>
<u>CDMA800</u>	<u>Measurement 1:</u> Efield on Low Channel <u>Measurement 2:</u> Hfield on Low Channel <u>Measurement 3:</u> Efield on Middle Channel <u>Measurement 4:</u> Hfield on Middle Channel <u>Measurement 5:</u> Efield on High Channel <u>Measurement 6:</u> Hfield on High Channel
<u>CDMA 1700</u>	<u>Measurement 7:</u> Efield on Low Channel <u>Measurement 8:</u> Hfield on Low Channel <u>Measurement 9:</u> Efield on Middle Channel <u>Measurement 10:</u> Hfield on Middle Channel <u>Measurement 11:</u> Efield on High Channel <u>Measurement 12:</u> Hfield on High Channel
<u>CDMA 1900</u>	<u>Measurement 13:</u> Efield on Low Channel <u>Measurement 14:</u> Hfield on Low Channel <u>Measurement 15:</u> Efield on Middle Channel <u>Measurement 16:</u> Hfield on Middle Channel <u>Measurement 17:</u> Efield on High Channel <u>Measurement 18:</u> Hfield on High Channel
<u>G-block</u>	<u>Measurement 19:</u> Efield on High Channel <u>Measurement 20:</u> Hfield on High Channel

# MEASUREMENT 1

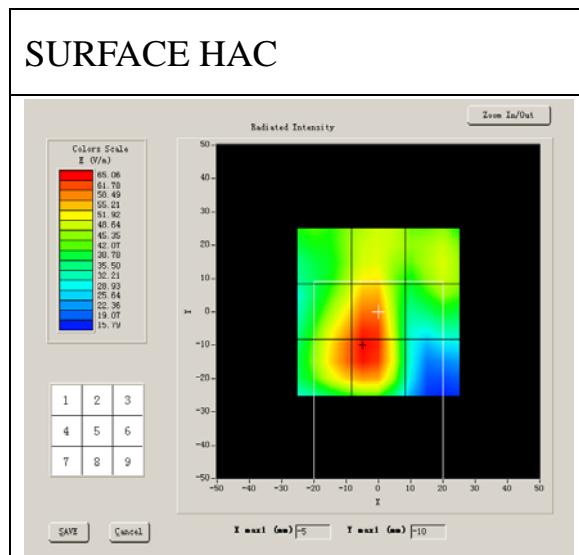
## A. Experimental conditions.

<b>Grid size (mm x mm)</b>	50.0, 50.0
<b>Step (mm)</b>	5
<b>Band</b>	CDMA800
<b>Channel</b>	Low
<b>Signal</b>	CDMA

## B. HAC Measurement Results

Lower Band (Channel 1013):

Frequency (MHz): 824.700000



Probe Modulation Factor = 1.000000

Maximum value of total field = 65.17 V/m

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

E in V/m

Grid 1: 48.67	Grid 2: 53.28	Grid 3: 49.78
Grid 4: 60.48	Grid 5: 65.17	Grid 6: 48.65
Grid 7: 62.57	Grid 8: 65.84	Grid 9: 30.04

## MEASUREMENT 2

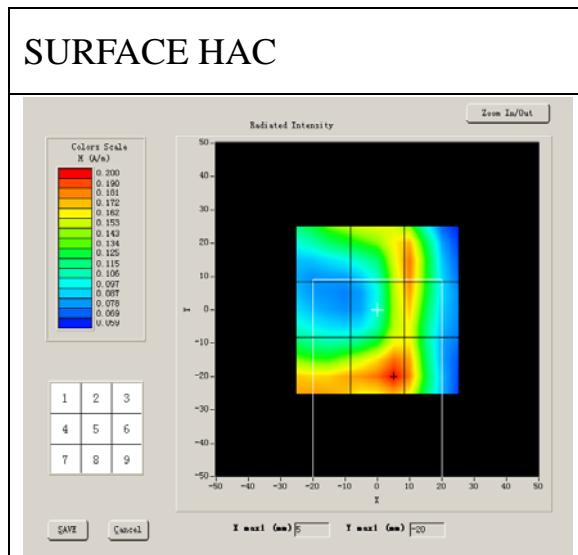
### A. Experimental conditions.

Grid size (mm x mm)	50.0, 50.0
Step (mm)	5
Band	CDMA800
Channel	Low
Signal	CDMA

### B. HAC Measurement Results

Lower Band (Channel 1013):

Frequency (MHz): 824.700000



Probe Modulation Factor = 1.000000

Maximum value of total field = 0.18 A/m

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

H in A/m

Grid 1: 0.15	Grid 2: 0.18	Grid 3: 0.18
Grid 4: 0.11	Grid 5: 0.18	Grid 6: 0.18
Grid 7: 0.18	Grid 8: 0.20	Grid 9: 0.18

## MEASUREMENT 3

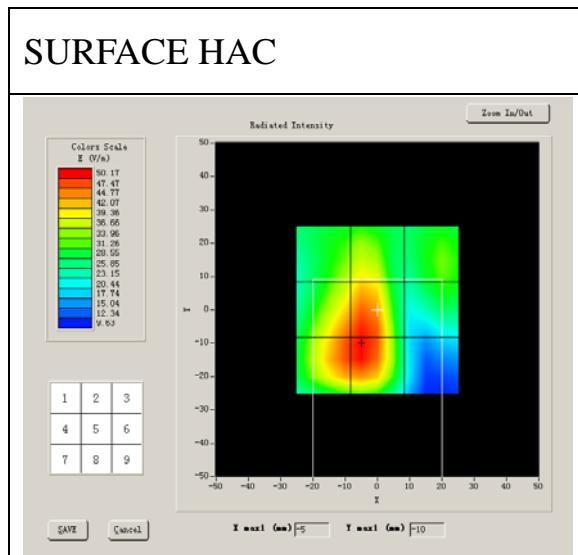
### A. Experimental conditions.

Grid size (mm x mm)	50.0, 50.0
Step (mm)	5
Band	CDMA800
Channel	Middle
Signal	CDMA

### B. HAC Measurement Results

Middle Band (Channel 384):

Frequency (MHz): 836.520000



Probe Modulation Factor = 1.000000

Maximum value of total field = 49.81 V/m

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

E in V/m

Grid 1: 37.14	Grid 2: 40.09	Grid 3: 33.43
Grid 4: 47.57	Grid 5: 49.81	Grid 6: 32.56
Grid 7: 49.17	Grid 8: 50.40	Grid 9: 19.77

## MEASUREMENT 4

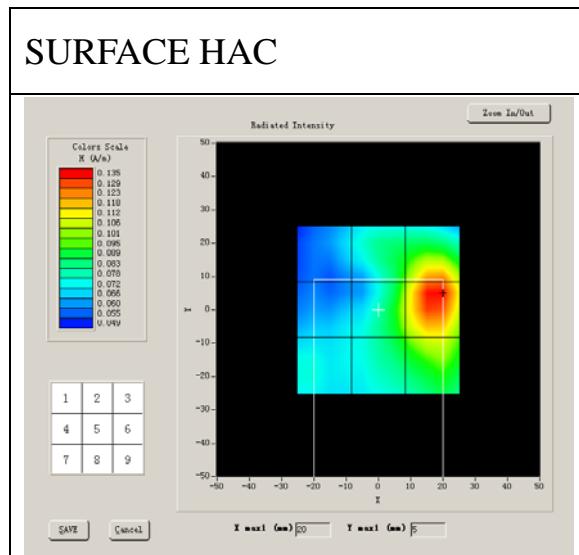
### A. Experimental conditions.

Grid size (mm x mm)	50.0, 50.0
Step (mm)	5
Band	CDMA800
Channel	Middle
Signal	CDMA

### B. HAC Measurement Results

Middle Band (Channel 384):

Frequency (MHz): 836.520000



Probe Modulation Factor = 1.000000

Maximum value of total field = 0.11 A/m

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

H in A/m

Grid 1: 0.07	Grid 2: 0.10	Grid 3: 0.12
Grid 4: 0.07	Grid 5: 0.11	Grid 6: 0.14
Grid 7: 0.07	Grid 8: 0.10	Grid 9: 0.11

## MEASUREMENT 5

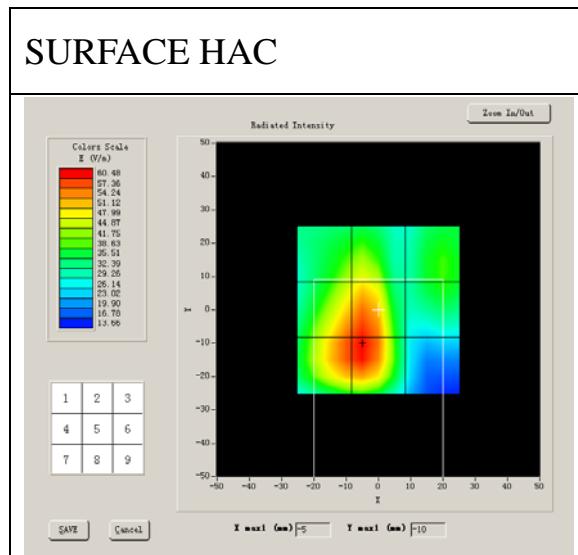
### Experimental conditions.

Grid size (mm x mm)	50.0, 50.0
Step (mm)	5
Band	CDMA800
Channel	High
Signal	CDMA

### B. HAC Measurement Results

Higher Band (Channel 777):

Frequency (MHz): 848.310000



Probe Modulation Factor = 1.000000

Maximum value of total field = 59.23 V/m

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

E in V/m

Grid 1: 44.46	Grid 2: 46.91	Grid 3: 39.93
Grid 4: 57.30	Grid 5: 59.23	Grid 6: 39.44
Grid 7: 59.27	Grid 8: 60.79	Grid 9: 25.18

## MEASUREMENT 6

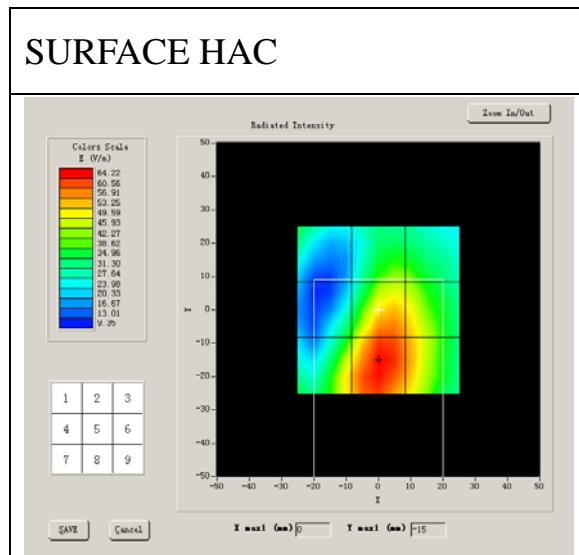
### A. Experimental conditions.

Grid size (mm x mm)	50.0, 50.0
Step (mm)	5
Band	CDMA 1700
Channel	Low
Signal	CDMA

### B. HAC Measurement Results

Lower Band (Channel 40):

Frequency (MHz): 1711.250000



Probe Modulation Factor = 1.000000

Maximum value of total field = 59.95 V/m

**Hearing Aid Near-Field Category: M4 (AWF -5 dB)**

E in V/m

Grid 1: 34.55	Grid 2: 42.83	Grid 3: 41.27
Grid 4: 39.25	Grid 5: 59.95	Grid 6: 52.65
Grid 7: 54.78	Grid 8: 64.53	Grid 9: 54.76

## MEASUREMENT 7

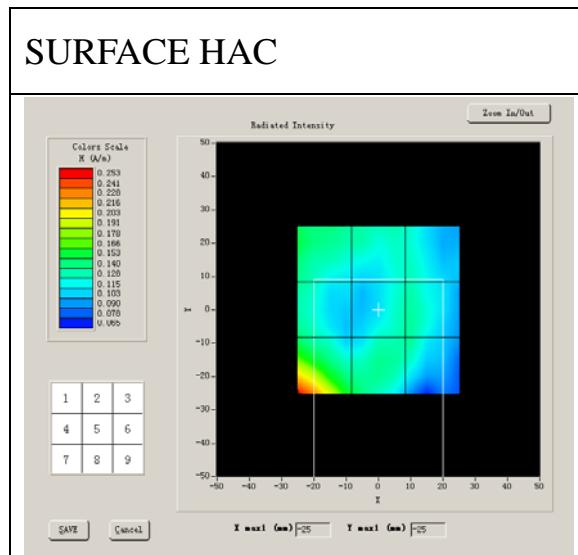
### A. Experimental conditions.

<b>Grid size (mm x mm)</b>	50.0, 50.0
<b>Step (mm)</b>	5
<b>Band</b>	CDMA 1700
<b>Channel</b>	Low
<b>Signal</b>	CDMA

### B. HAC Measurement Results

Lower Band (Channel 40):

Frequency (MHz): 1711.250000



Probe Modulation Factor = 1.000000

Maximum value of total field = 0.15 A/m

**Hearing Aid Near-Field Category: M4 (AWF -5 dB)**

H in A/m

Grid 1: 0.15	Grid 2: 0.13	Grid 3: 0.13
Grid 4: 0.14	Grid 5: 0.13	Grid 6: 0.13
Grid 7: 0.25	Grid 8: 0.15	Grid 9: 0.13

## MEASUREMENT 8

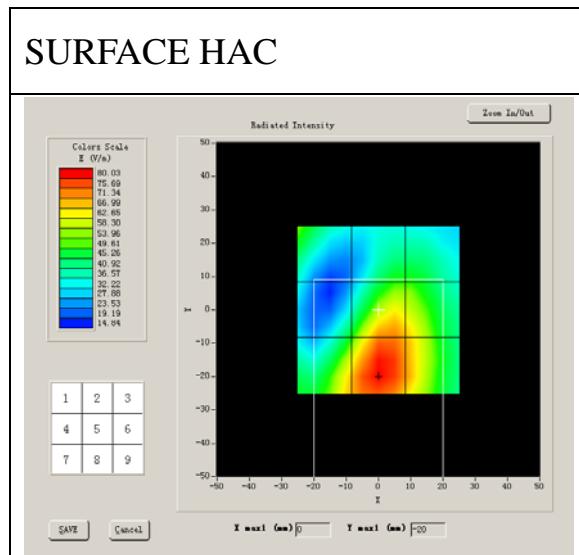
### A. Experimental conditions.

Grid size (mm x mm)	50.0, 50.0
Step (mm)	5
Band	CDMA 1700
Channel	Middle
Signal	CDMA

### B. HAC Measurement Results

Middle Band (Channel 440):

Frequency (MHz): 1732.500000



Probe Modulation Factor = 1.000000

Maximum value of total field = 71.55 V/m

**Hearing Aid Near-Field Category: M3 (AWF -5 dB)**

E in V/m

Grid 1: 53.22	Grid 2: 48.24	Grid 3: 47.70
Grid 4: 47.41	Grid 5: 71.55	Grid 6: 64.31
Grid 7: 69.22	Grid 8: 80.57	Grid 9: 67.66

## MEASUREMENT 9

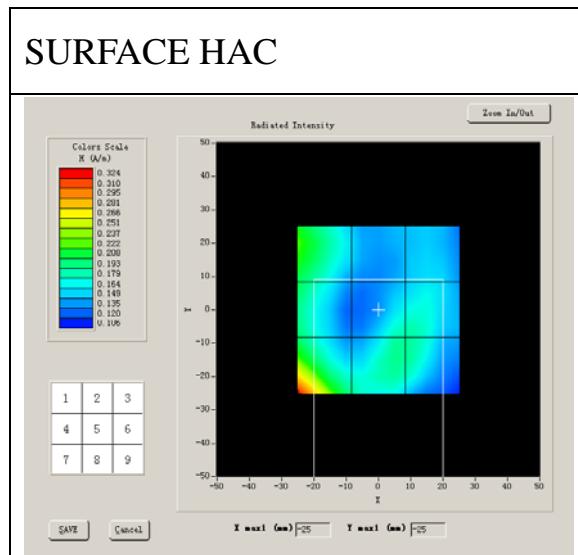
### A. Experimental conditions.

<b>Grid size (mm x mm)</b>	50.0, 50.0
<b>Step (mm)</b>	5
<b>Band</b>	CDMA 1700
<b>Channel</b>	Middle
<b>Signal</b>	CDMA

### B. HAC Measurement Results

Middle Band (Channel 440):

Frequency (MHz): 1732.500000



Probe Modulation Factor = 1.000000

Maximum value of total field = 0.19 A/m

**Hearing Aid Near-Field Category: M3 (AWF -5 dB)**

H in A/m

Grid 1: 0.23	Grid 2: 0.15	Grid 3: 0.15
Grid 4: 0.20	Grid 5: 0.18	Grid 6: 0.18
Grid 7: 0.32	Grid 8: 0.19	Grid 9: 0.18

## MEASUREMENT 10

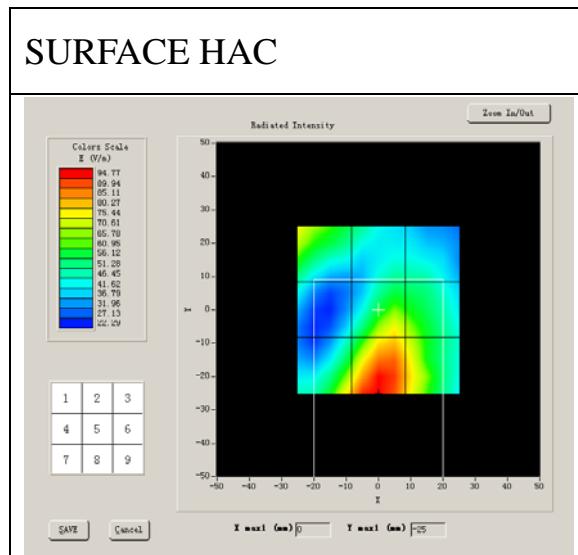
### A. Experimental conditions.

Grid size (mm x mm)	50.0, 50.0
Step (mm)	5
Band	CDMA 1700
Channel	High
Signal	CDMA

### B. HAC Measurement Results

Higher Band (Channel 840):

Frequency (MHz): 1753.700000



Probe Modulation Factor = 1.000000

Maximum value of total field = 76.90 V/m

**Hearing Aid Near-Field Category: M3 (AWF -5 dB)**

E in V/m

Grid 1: 74.54	Grid 2: 51.55	Grid 3: 48.04
Grid 4: 47.82	Grid 5: 76.90	Grid 6: 67.60
Grid 7: 83.07	Grid 8: 95.57	Grid 9: 77.23

## MEASUREMENT 11

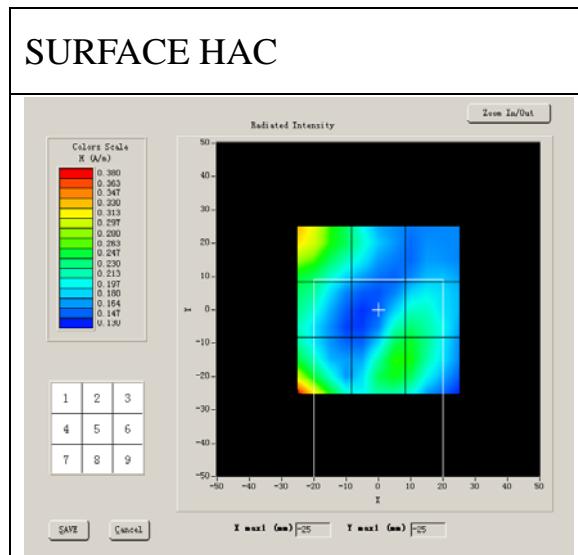
### A. Experimental conditions.

Grid size (mm x mm)	50.0, 50.0
Step (mm)	5
Band	CDMA1700
Channel	High
Signal	CDMA

### B. HAC Measurement Results

Higher Band (Channel 840):

Frequency (MHz): 1753.700000



Probe Modulation Factor = 1.000000

Maximum value of total field = 0.27 A/m

**Hearing Aid Near-Field Category: M3 (AWF -5 dB)**

H in A/m

Grid 1: 0.33	Grid 2: 0.22	Grid 3: 0.18
Grid 4: 0.24	Grid 5: 0.24	Grid 6: 0.24
Grid 7: 0.38	Grid 8: 0.27	Grid 9: 0.26

## MEASUREMENT 12

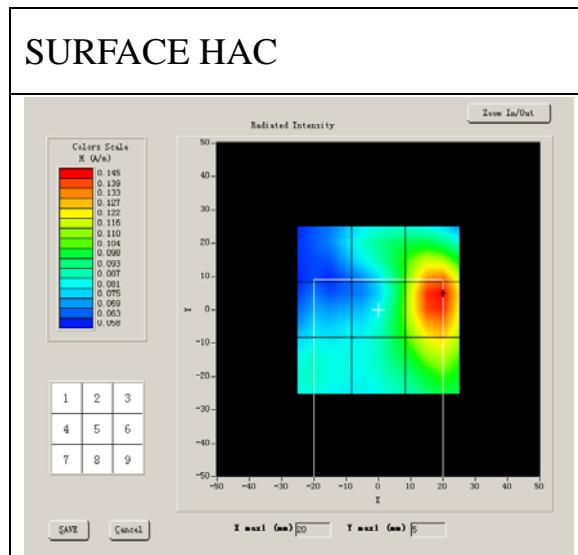
### A. Experimental conditions.

<b>Grid size (mm x mm)</b>	50.0, 50.0
<b>Step (mm)</b>	5
<b>Band</b>	CDMA800
<b>Channel</b>	High
<b>Signal</b>	CDMA

### B. HAC Measurement Results

Higher Band (Channel 777):

Frequency (MHz): 848.310000



Probe Modulation Factor = 1.000000

Maximum value of total field = 0.11 A/m

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

H in A/m

Grid 1: 0.08	Grid 2: 0.11	Grid 3: 0.14
Grid 4: 0.08	Grid 5: 0.11	Grid 6: 0.15
Grid 7: 0.09	Grid 8: 0.11	Grid 9: 0.13

## MEASUREMENT 13

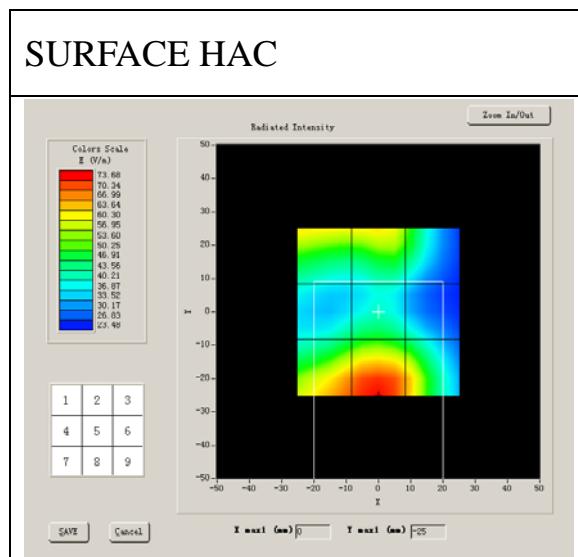
### A. Experimental conditions.

Grid size (mm x mm)	50.0, 50.0
Step (mm)	5
Band	CDMA 1900
Channel	Low
Signal	CDMA

### B. HAC Measurement Results

Lower Band (Channel 25):

Frequency (MHz): 1851.250000



Probe Modulation Factor = 1.000000

Maximum value of total field = 61.66 V/m

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

E in V/m

Grid 1: 61.61	Grid 2: 61.66	Grid 3: 49.98
Grid 4: 44.02	Grid 5: 47.25	Grid 6: 40.17
Grid 7: 70.17	Grid 8: 73.74	Grid 9: 63.46

## MEASUREMENT 14

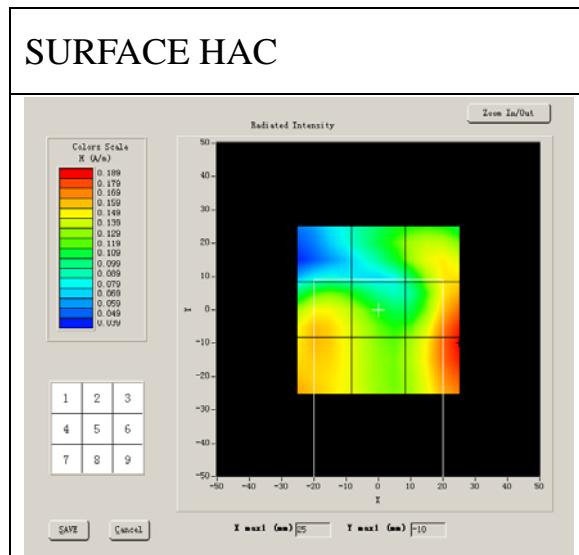
### A. Experimental conditions.

Grid size (mm x mm)	50.0, 50.0
Step (mm)	5
Band	CDMA 1900
Channel	Low
Signal	CDMA

### B. HAC Measurement Results

Lower Band (Channel 25):

Frequency (MHz): 1851.250000



Probe Modulation Factor = 1.000000

Maximum value of total field = 0.16 A/m

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

H in A/m

Grid 1: 0.09	Grid 2: 0.13	Grid 3: 0.15
Grid 4: 0.16	Grid 5: 0.14	Grid 6: 0.19
Grid 7: 0.16	Grid 8: 0.14	Grid 9: 0.19

## MEASUREMENT 15

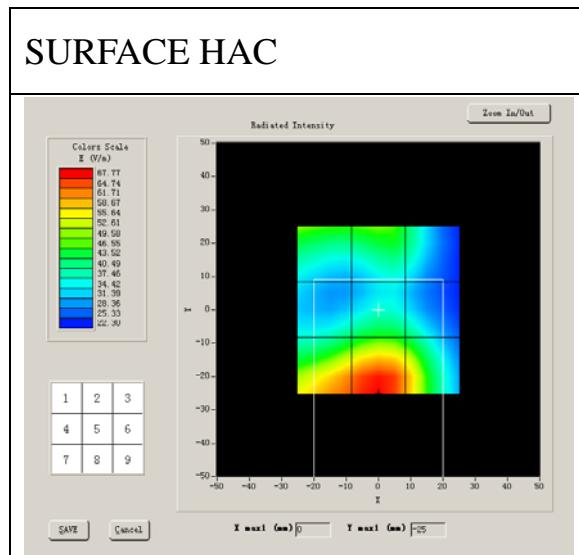
### A. Experimental conditions.

<b>Grid size (mm x mm)</b>	50.0, 50.0
<b>Step (mm)</b>	5
<b>Band</b>	CDMA 1900
<b>Channel</b>	Middle
<b>Signal</b>	CDMA

### B. HAC Measurement Results

Middle Band (Channel 600):

Frequency (MHz): 1880.000000



Probe Modulation Factor = 1.000000

Maximum value of total field = 49.37 V/m

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

E in V/m

Grid 1: 49.37	Grid 2: 48.97	Grid 3: 40.61
Grid 4: 40.12	Grid 5: 44.40	Grid 6: 39.58
Grid 7: 64.53	Grid 8: 68.17	Grid 9: 58.38

## MEASUREMENT 16

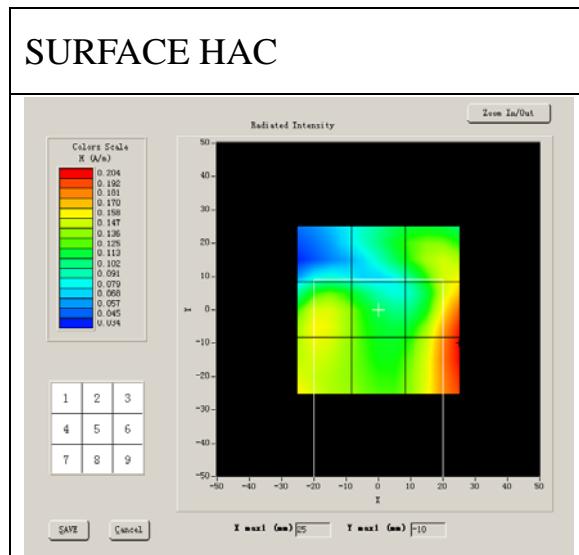
### A. Experimental conditions.

Grid size (mm x mm)	50.0, 50.0
Step (mm)	5
Band	CDMA 1900
Channel	Middle
Signal	CDMA

### B. HAC Measurement Results

Middle Band (Channel 600):

Frequency (MHz): 1880.000000



Probe Modulation Factor = 1.000000

Maximum value of total field = 0.16 A/m

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

H in A/m

Grid 1: 0.08	Grid 2: 0.13	Grid 3: 0.16
Grid 4: 0.16	Grid 5: 0.13	Grid 6: 0.20
Grid 7: 0.16	Grid 8: 0.14	Grid 9: 0.20

## MEASUREMENT 17

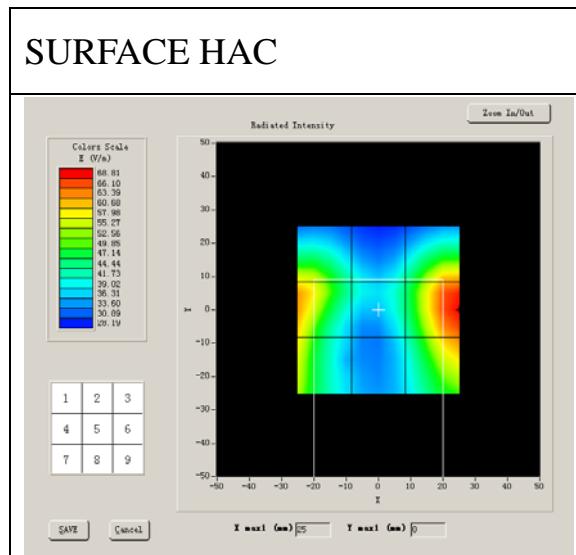
### A. Experimental conditions.

Grid size (mm x mm)	50.0, 50.0
Step (mm)	5
Band	CDMA 1900
Channel	High
Signal	CDMA

### B. HAC Measurement Results

Higher Band (Channel 1175):

Frequency (MHz): 1908.750000



Probe Modulation Factor = 1.000000

Maximum value of total field = 62.98 V/m

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

E in V/m

Grid 1: 56.08	Grid 2: 43.08	Grid 3: 60.90
Grid 4: 62.98	Grid 5: 45.63	Grid 6: 68.95
Grid 7: 58.82	Grid 8: 41.52	Grid 9: 64.13

## MEASUREMENT 18

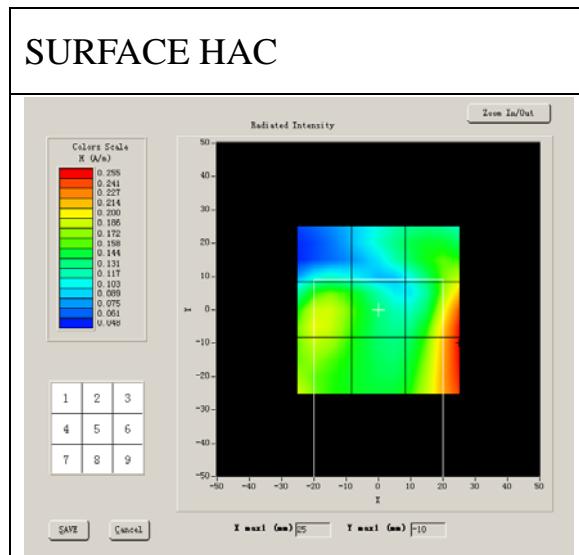
### A. Experimental conditions.

Grid size (mm x mm)	50.0, 50.0
Step (mm)	5
Band	CDMA 1900
Channel	High
Signal	CDMA

### B. HAC Measurement Results

Higher Band (Channel 1175):

Frequency (MHz): 1908.750000



Probe Modulation Factor = 1.000000

Maximum value of total field = 0.20 A/m

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

H in A/m

Grid 1: 0.11	Grid 2: 0.14	Grid 3: 0.18
Grid 4: 0.20	Grid 5: 0.16	Grid 6: 0.25
Grid 7: 0.19	Grid 8: 0.16	Grid 9: 0.26

## MEASUREMENT 19

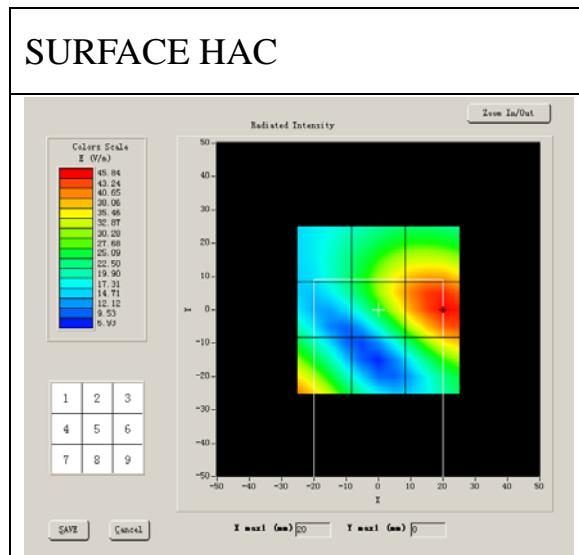
### A. Experimental conditions.

<b>Grid size (mm x mm)</b>	50.0, 50.0
<b>Step (mm)</b>	5
<b>Band</b>	CDMA 1900 G-block
<b>Channel</b>	High
<b>Signal</b>	CDMA

### B. HAC Measurement Results

Higher Band (Channel 1275):

Frequency (MHz): 1913.750000



Probe Modulation Factor = 1.000000

Maximum value of total field = 41.10 V/m

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

E in V/m

Grid 1: 23.66	Grid 2: 37.57	Grid 3: 39.65
Grid 4: 23.56	Grid 5: 40.15	Grid 6: 46.02
Grid 7: 41.10	Grid 8: 25.84	Grid 9: 40.25

## MEASUREMENT 20

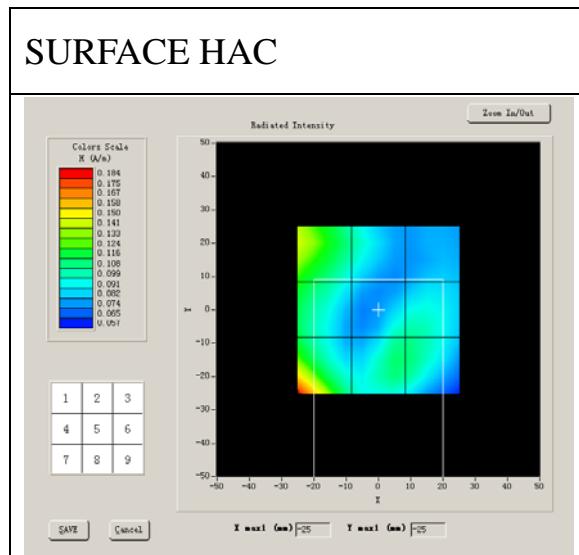
### A. Experimental conditions.

<b>Grid size (mm x mm)</b>	50.0, 50.0
<b>Step (mm)</b>	5
<b>Band</b>	CDMA 1900 G-block
<b>Channel</b>	High
<b>Signal</b>	CDMA

### B. HAC Measurement Results

Higher Band (Channel 1275):

Frequency (MHz): 1913.750000



Probe Modulation Factor = 1.000000

Maximum value of total field = 0.11 A/m

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

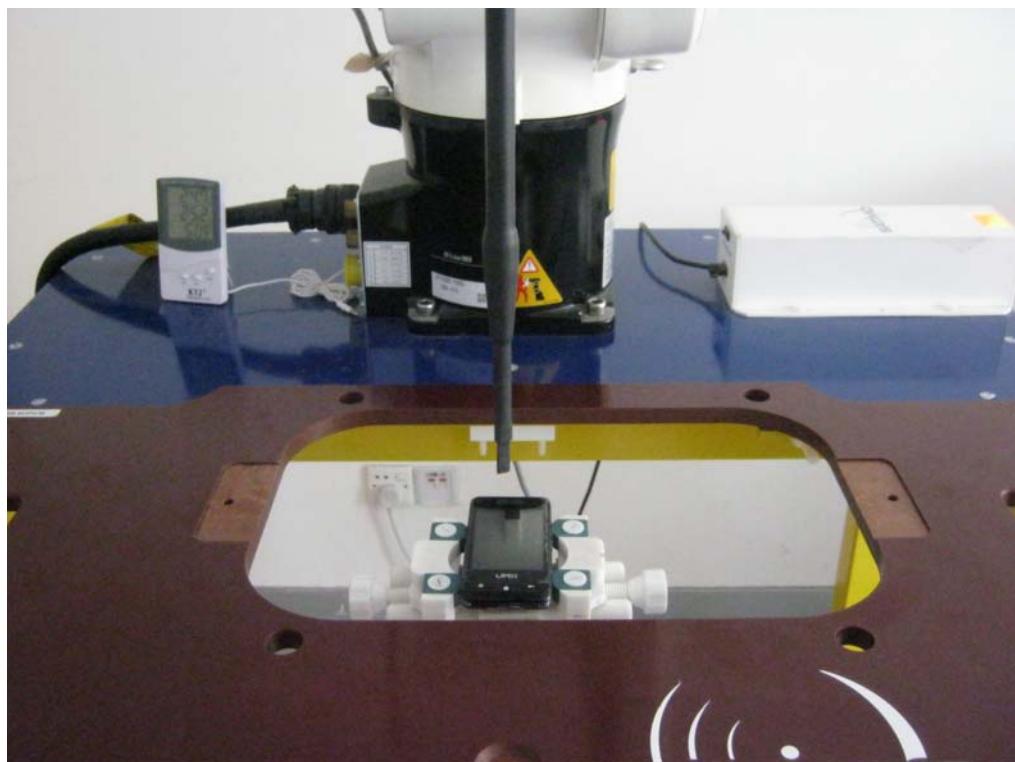
H in A/m

Grid 1: 0.14	Grid 2: 0.10	Grid 3: 0.08
Grid 4: 0.12	Grid 5: 0.10	Grid 6: 0.10
Grid 7: 0.18	Grid 8: 0.11	Grid 9: 0.11

## Annex A Photographs of the EUT



## Annex B EUT Setup photo



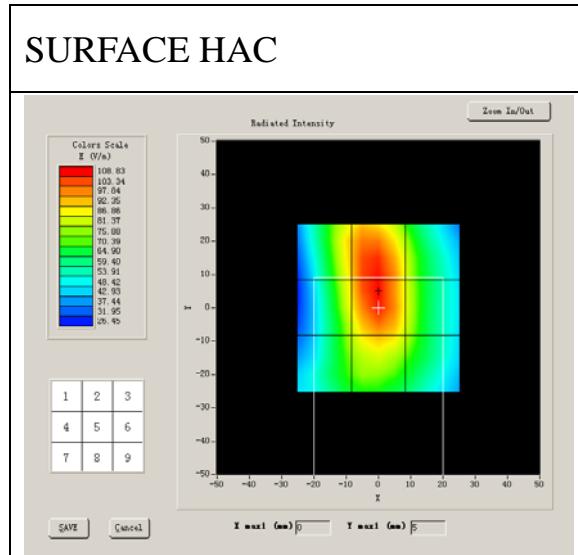
## System Performance Check (E-field)

### A. Experimental conditions.

<b>Grid size (mm x mm)</b>	50.0, 50.0
<b>Step (mm)</b>	5
<b>Band</b>	850 MHz
<b>Channel</b>	
<b>Signal</b>	CW
<b>Date of measurement</b>	2011-09-06

### B. HAC Measurement Results

Frequency (MHz): 850.000000



Probe Modulation Factor = 2.820000

Maximum value of total field = 205 V/m

E in V/m

Grid 1: 194.51	Grid 2: 198.12	Grid 3: 177.56
Grid 4: 192.69	Grid 5: 205.00	Grid 6: 178.98
Grid 7: 181.13	Grid 8: 194.18	Grid 9: 176.51

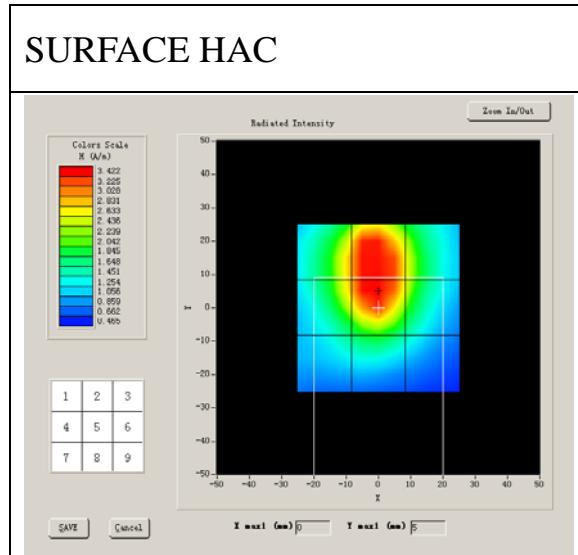
## System Performance Check (H-field)

### A. Experimental conditions.

<b>Grid size (mm x mm)</b>	50.0, 50.0
<b>Step (mm)</b>	5
<b>Band</b>	850 MHz
<b>Channel</b>	
<b>Signal</b>	CW
<b>Date of measurement</b>	2011-09-06

### B. HAC Measurement Results

Frequency (MHz): 850.000000



Probe Modulation Factor = 2.800000

Maximum value of total field = 0.448 A/m

H in A/m

Grid 1: 0.302	Grid 2: 0.421	Grid 3: 0.336
Grid 4: 0.381	Grid 5: 0.449	Grid 6: 0.332
Grid 7: 0.370	Grid 8: 0.400	Grid 9: 0.239

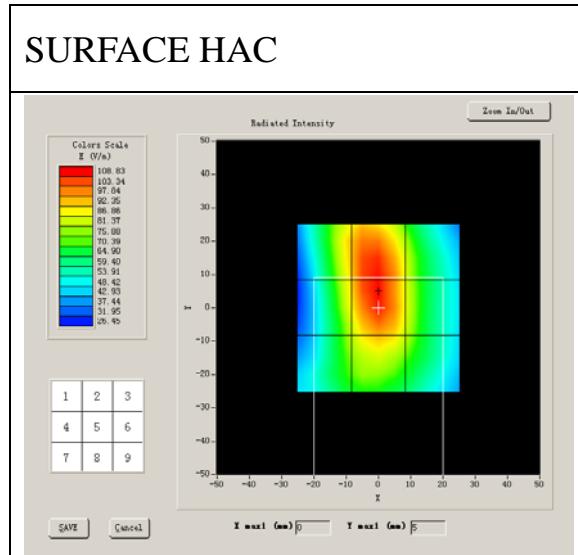
## System Performance Check (E-field)

### A. Experimental conditions.

<b>Grid size (mm x mm)</b>	50.0, 50.0
<b>Step (mm)</b>	5
<b>Band</b>	1800 MHz
<b>Channel</b>	
<b>Signal</b>	CW
<b>Date of measurement</b>	2011-09-06

### B. HAC Measurement Results

Frequency (MHz): 1800.000000



Probe Modulation Factor = 2.820000

Maximum value of total field = 161.52V/m

E in V/m

Grid 1: 145.51	Grid 2: 158.33	Grid 3: 136.11
Grid 4: 151.64	Grid 5: 161.52	Grid 6: 142.95
Grid 7: 141.52	Grid 8: 148.62	Grid 9: 126.77

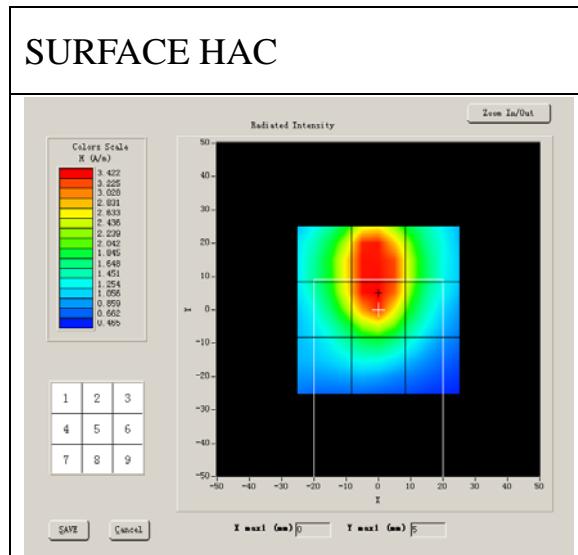
## System Performance Check (H-field)

### A. Experimental conditions.

<b>Grid size (mm x mm)</b>	50.0, 50.0
<b>Step (mm)</b>	5
<b>Band</b>	1800 MHz
<b>Channel</b>	
<b>Signal</b>	CW
<b>Date of measurement</b>	2011-09-06

### B. HAC Measurement Results

Frequency (MHz): 1800.000000



Probe Modulation Factor = 2.800000

Maximum value of total field = 0.447 A/m

H in A/m

Grid 1: 0.424	Grid 2: 0.434	Grid 3: 0.384
Grid 4: 0.437	Grid 5: 0.447	Grid 6: 0.415
Grid 7: 0.432	Grid 8: 0.415	Grid 9: 0.361