

# Hearing Aid Compatibility (HAC) Test Report

Applicant : SeniorTech LLC  
Address : 100 Cherokee Blvd, Suite 216,  
Chattanooga, TN 37405  
Equipment : 3G senior feature phone  
Brand name : Snapfon  
Model name : EZ TWO-B1  
FCC ID : ZXL-EZTWOB1



**Date of Receipt :** Sep.24.2014

**Date of Test :** Oct.15.2014

**Report No. :** 140918001HAC2-FCC

The test results relate only to the samples tested.

The test report shall not be reproduced except in full without the written approval of IAC Compliance Laboratory.

# Test Report Certification

Test Date : 10-Oct-2014

Report No. : 140918001HAC2-FCC

**Product Name** : 3G senior feature phone  
**Applicant** : SeniorTech LLC  
**Address** : 100 Cherokee Blvd, Suite 216, Chattanooga, TN 37405  
**Manufacturer** : ENJOY GROUP(HK) CO,LIMITED  
**Model No.** : EZ TWO-B1  
**Trade Name** : Snapfon  
**Measurement Standard** : ANSI C63.19-2007 (8 June,2007)  
**M category** : T3/T4  
**Test Result** : Complied

The test results relate only to the samples tested.

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Documented By : Jin-Qiang Wang

Tested By : vida gu

Approved By : Jeff Huang

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## 1. GENERAL INFORMATION

### 1.1. EUT Description

**Product Name** : 3G senior feature phone  
**Trade Name** : Snapfon  
**Model No.** : EZ TWO-B1  
**TX Frequency** : GSM 850: 824MHz~849MHz  
GSM 1900: 1850MHz~1910MHz  
WCDMA 850: 826.4MHz-846.60MHz  
WCDMA 1900: 1852.4-1907.6MHz  
**RX Frequency** : GSM 850: 869MHz~894MHz  
GSM 1900: 1930MHz~1990MHz  
WCDMA 850: 871.4 - 891.6MHz  
WCDMA 1900: 1932.4 - 1987.6MHz  
**Antenna Type** : PIFA  
**Device Category** : Portable  
**Hardware version** : N/A  
**Max. Output Power (Conducted)** : GSM850: 32.88dBm  
GSM1900:29.42dBm  
WCDMA850:22.80  
WCDMA1900:22.55

### 1.2. Test Environment

Ambient conditions in the laboratory:

Items	Required	Actual
Temperature(°C)	15~30	21.4
Humidity(%RH)	30~70	46

## **2. Test Conditions**

### **2.1 Test Conditions Description**

Test frequency: GSM 850MHz PCS 1900MHz

WCDMA II: 1900MHz

WCDMA V: 850MH

Operation mode: Call established

Power Level: GSM 850 MHz Maximum output power(level 5)

PCS 1900 MHz Maximum output power(level 0)

WCDMA II: Maximum output power

WCDMA V: Maximum output power

During 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 allocated to 128, 189 and 251 respectively in the case of GSM 850 MHz, or to 512, 661 and 810 respectively in the case of PCS 1900 MHz, The EUT is commanded to operate at maximum transmitting power.

### **2.2 Test Opertaion Description**

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

## 2.3 ANSI/IEEE PC 63.19 Performance Categories

### 2.3.1. T-coil

The table below provides the signal quality requirement for the intended audio magnetic signal from a wireless device. Only the RF immunity of the hearing aid is measured in T-coil mode. It is assumed that a hearing aid can have no immunity to an interference signal in the audio band, which is the intended reception band for this mode. The only criterion that can be measured is the RF immunity in T-coil mode. This is measured using the same procedure as the audio coupling mode at the same levels. The signal quality of the axial and radial components of the magnetic field was used to determine the T-coil mode category.

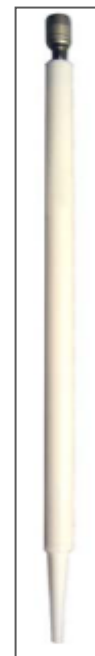
Category	Telephone RF Parameter
	Wirless Device Signal Quality (Signal+Noise-to-noise ratio in dB)
T1	0-10 dB
T2	10-20 dB
T3	20-30 dB
T4	>30 dB
Magnetic Coupling Parameters	

### 2.3.2. Articulation Weighing Factor (AWF)

Standard	Technology	AWF
T1/T1P1/3GPP	UMTS(WCDMA)	0
IS-95	CDMA	0
iden	GSM(22 and 11Hz)	0
J-STD-007	GSM (217Hz)	-5
Note: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		

### 2.4 E-Field Probe Specification

Compliant Standards	ANSI C63.19 200x
Construction	3 Dipoles utilizing high impedance lines diode mounted and arranged for X, Y, Z measurements
Frequency Range	700MHz to 3GHz
Sensitivity Air	Better than $0.65 \mu\text{V}/(\text{V/m})^2$
Dynamic Range	2mV to 200mV typical (non amplified)
Isotropic Response Axial	Typically $\pm 0.1\text{dB}$
Linearity	$\pm 0.2 \text{ dB}$ or better
Probe Tip Radius	5 mm
Sensor Offset	1.56 ( $\pm 0.02 \text{ mm}$ )
Probe Length	290 mm
Connector	6 Pin Bayonet
Material	Ertalyte™



Compliant Standards	ANSI C63.19 200x
Construction	3 Dipoles utilizing high impedance lines diode mounted and arranged for X, Y, Z measurements
Frequency Range	700MHz to 3GHz
Sensitivity Air	$33.0\text{mV}/(\text{A/m})^2$
Dynamic Range	5 mA/m to 2 A/m
Linearity	$\pm 0.2 \text{ dB}$ or better
Probe Tip Radius	User selectable all $< 7 \text{ mm}$
Sensor Offset	3.5 ( $\pm 0.02 \text{ mm}$ )
Probe Length	300 mm
Connector	6 Pin Bayonet
Material	Ertalyte™



ALSAS-10U utilizes a six articulated robot, which is controlled using a Pentium based real-time movement controller. The movement kinematics engine utilizes proprietary (Thermo CRS) interpolation and extrapolation algorithms, which allow full freedom of movement for each of the six joints within the working envelop. Utilization of joint 6 allows for full probe rotation with a tolerance better than 0.05mm around the central axis.



<b>Robot/Controller Manufacturer</b>	Thermo CRS
<b>Number of Axis</b>	Six independently controlled axis
<b>Positioning Repeatability</b>	0.05mm
<b>Controller Type</b>	Single phase Pentium based C500C
<b>Robot Reach</b>	710mm
<b>Communication</b>	RS232 and LAN compatible

## 2.7 Universal Device Positioner

The universal device positioner allows complete freedom of movement of the EUT. Developed to hold a EUT in a free-space scenario any additional loading attributable to the material used in the construction of the positioner has been eliminated. Repeatability has been enhanced through the linear scales which form the design used to indicate positioning for any given test scenario in all major axes.





## 2.8 T-Coil Probe



Serial Number:	SN 37/55 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

### 2.8.1 System Hardware

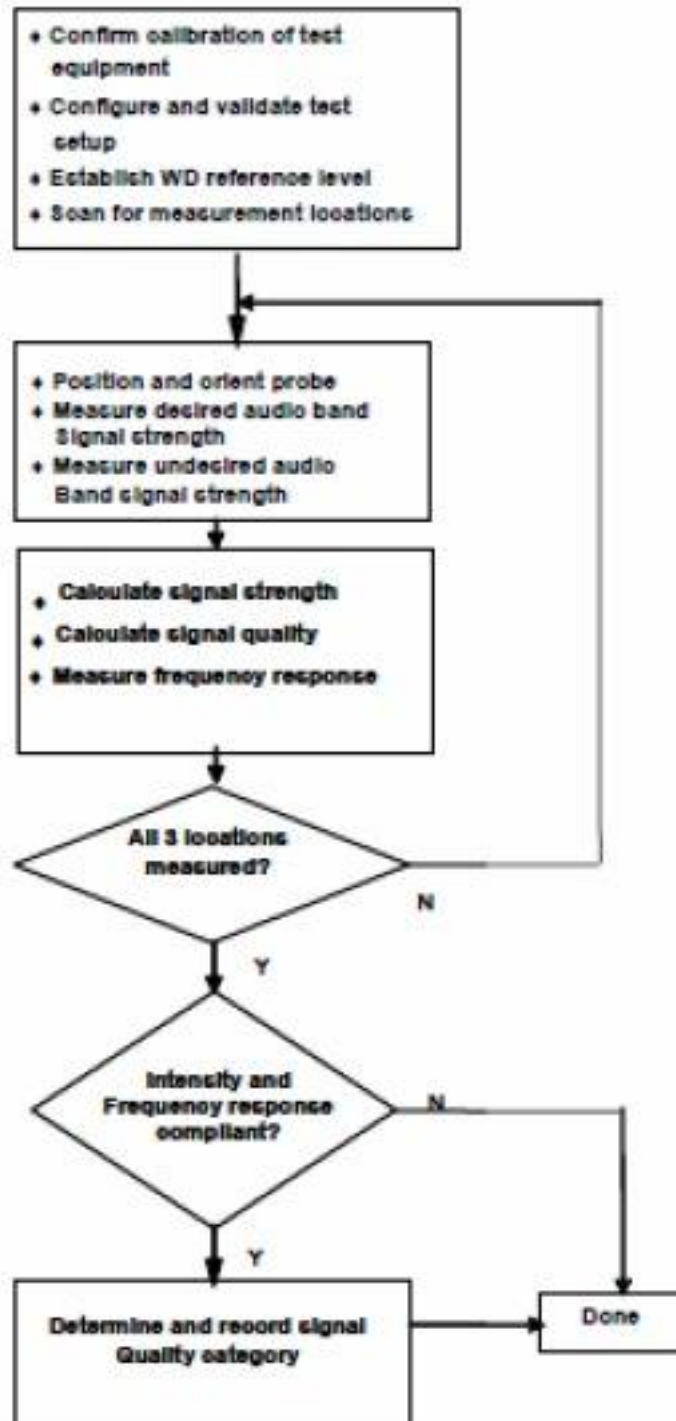
The HAC positioning ruler is used to position the phone properly with the regard to the position of the probe during a measurement. The positioning system is made of a dedicated frame that can be fixed on the table. The tip of the probe is positioned on a reference point located on the top of the positioning 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.

### 2.8.2 Test Procedure

#### 2.8.2.1 T-coil Test Flow

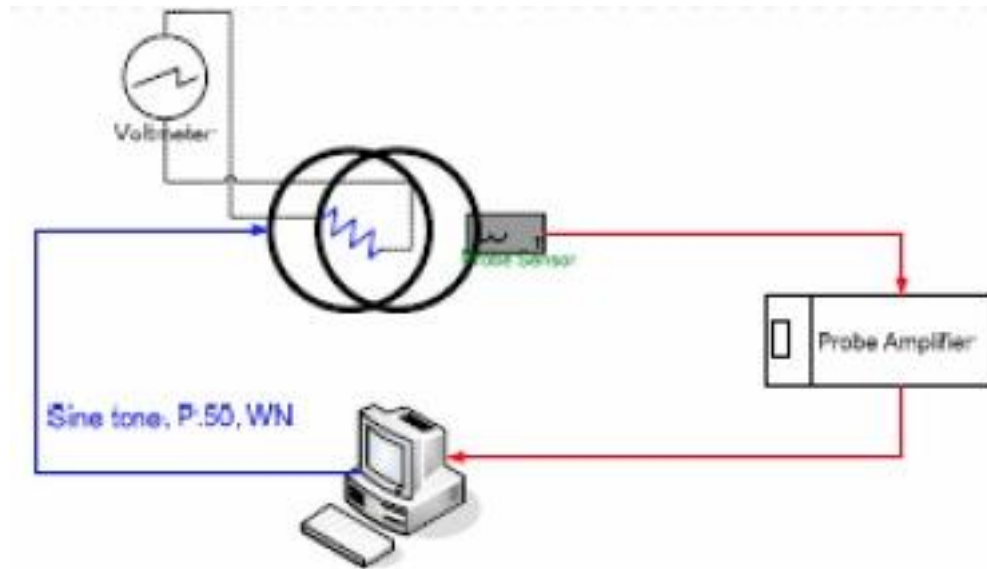
The flow diagram below was followed:



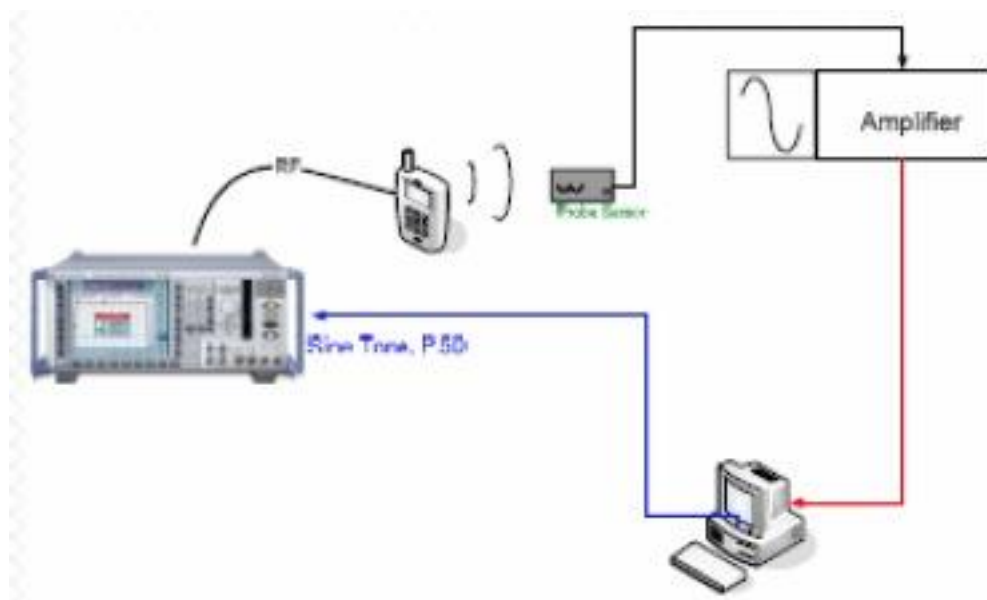
T-Coil Signal Test Process

### 2.8.2.2 Test Setup

The equipment was connected as shown in an acoustic/RF hemi-anechoic chamber:



Validation Setup with Helmholtz Coil



T-Coil Test Setup

### 2.8.2.3 Test Procedure

**Frequency Response Validation** The frequency response through the Helmholtz Coil was verified to be within 0.5 dB relative to 1 kHz, between 300 – 3000 Hz using the ITU-P.50 artificial speech signal as shown below:



**Measurement Validation** WD noise measurements are filtered with A-weighting and Half-Band Integration over a frequency range of 100Hz – 10kHz to process ABM2 measurements. Below is the verification of the system processing A-weighting and Half-Band integration between system input to output within 0.5 dB of the theoretical result:

f(Hz)	HBI, A- Measured (dB re 1kHz)	HBI, A- Theoretical (dB re 1kHz)	dB Var.
100	-16.150	-16.170	0.012
125	-13.241	-13.250	0.008
160	-10.333	-10.340	0.007
200	-8.005	-8.010	0.006
250	-5.915	-5.920	0.005
315	-4.035	-4.040	0.005
400	-2.395	-2.400	0.004
500	-1.207	-1.210	0.003
630	-0.347	-0.350	0.003
800	0.068	0.070	0.002
1000	0.001	0.000	0.001
1250	-0.501	-0.500	-0.001
1600	-1.511	-1.510	-0.001
2000	-2.783	-2.780	-0.003
2500	-4.323	-4.320	-0.003
3150	-6.175	-6.170	-0.005
4000	-8.338	-8.330	-0.008
5000	-10.599	-10.590	-0.009
6300	-13.212	-13.200	-0.010
8000	-16.284	-16.270	-0.011
10000	-19.539	-19.520	-0.015

## 2.8.2.4 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				1.02	1.02	
Hemispherical Isotropy	E.2.2	4.0	R				1.63	1.63	
Boundary effect	E.2.3	1.0	R		1	1	0.58	0.58	
Linearity	E.2.4	5.0	R		1	1	2.89	2.89	
System detection limits	E.2.5	1.0	R		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		1	1	1.73	1.73	
Integration Time	E.2.8	2.0	R		1	1	1.15	1.15	
RF ambient Conditions	E.6.1	3.0	R		1	1	1.73	1.73	
Probe positioner Mechanical Tolerance	E.6.2	2.0	R		1	1	1.15	1.15	
Probe positioning with respect to Phantom Shell	E.6.3	0.05	R		1	1	0.03	0.03	
Extrapolation, interpolation and integration Algorithms for Max. SAR Evaluation	E.5.2	5.0	R		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 - SAR drift measurement	6.6.2	5.78	R		1	1	3.34	3.34	

## 2.9 Test Equipment List

Instrument	Manufacture	Model No.	Serial No.	Last Calibration
Universal Work Station	Apriel	ALS-UWS	100-00154	NCR
Data Acquisition Package	Apriel	ALS-DAQ-PAQ-3	110-00215	NCR
Probe Mounting Device and Boundary Detection Sensor System	Apriel	ALS-PMDPS-3	120-00265	NCR
E-Field Probe	Apriel	E-020-H	274	Aug.2014
H-Field Probe	Apriel	H-030	400-00102	Aug.2014
Reference Validation Dipole 900MHz	Apriel	ALS-D-900-S-2-HAC	190-00607	May.2014
Reference Validation Dipole 1900MHz	Apriel	ALS-D-1900-S-2-HAC	210-00708	May.2014
Dielectric Probe Kit	Apriel	ALS-PR-DIEL	260-00955	NCR
Device Holder 2.0	Apriel	ALS-H-E-SET-2	170-00506	NCR
SAR software	Apriel	ALS-SAR-AL-10	Ver.2.3.8.90	NCR
CRS C500C Controller	Thermo	ALS-C500	RCF0504291	NCR
CRS F3 Robot	Apriel	ALS-F3-SW	N/A	NCR
Power Amplifier	Mini-Circuit	SN0974	040306	NCR
Directional Coupler	Agilent	778D-012	N/A	NCR
Universal Radio Communication Tester	Agilent	E5515C	104845	Mar.2014
Spectrum Analyzer	R&S	FSP7	100614	Dec.2013
Signal Generator	Agilent	E8257D	N/A	Dec.2013
Power Meter	R&S	NRP	N/A	Dec.2013

**Note: All equipment upon which need to be calibrated are with calibration period of 1 year.**

### 3 OVERALL MEASUREMENT SUMMARY

#### 3.1 Conducted Power(Unit:dBm)

Band	GSM850			GSM1900		
Channel	128	190	251	512	661	810
Frequency(MHz)	824.2	836.6	848.8	1850.2	1880.0	1909.8
GSM	32.40	32.91	32.44	29.99	29.67	29.91
Band	WCDMA 850			WCDMA1900		
Channel	4132	4182	4233	9262	9400	9538
Frequency(MHz)	826.0	836.0	846.0	1850.0	1880.0	1907.0
AMR	22.69	22.63	22.75	22.54	22.28	22.40
RMC12.2K	22.66	22.68	22.80	22.55	22.27	22.34

#### 3.2 T-coil for GSM:

##### T-Coil Test Result

Mode	Channel	Antenna	Result
GSM850	Low	Fixed	T3
	Middle	Fixed	T4
	High	Fixed	T3
PCS1900	Low	Fixed	T4
	Middle	Fixed	T4
	High	Fixed	T4
WCDMA 850	Low	Fixed	T4
	Middle	Fixed	T4
	High	Fixed	T4
WCDMA1900	Low	Fixed	T4
	Middle	Fixed	T4
	High	Fixed	T4

## 4 Test Data

Frequency	PARAMETERS
GSM850	Measurement 1: T-coil on Low Channel
	Measurement 2: T-coil on Middle Channel
	Measurement 3: T-coil on High Channel
PCS1900	Measurement 4: T-coil on Low Channel
	Measurement 5: T-coil on Middle Channel
	Measurement 6: T-coil on High Channel
WCDMA 850	Measurement 7: T-coil on Low Channel
	Measurement 8: T-coil on Middle Channel
	Measurement 9: T-coil on High Channel
WCDMA1900	Measurement 10: T-coil on Low Channel
	Measurement 11: T-coil on Middle Channel
	Measurement 12: T-coil on High Channel



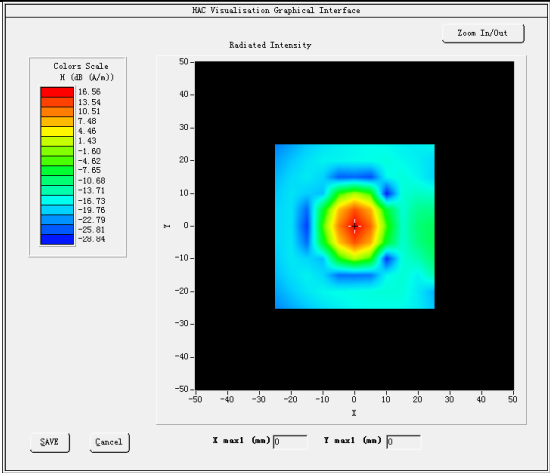
GSM850-Low

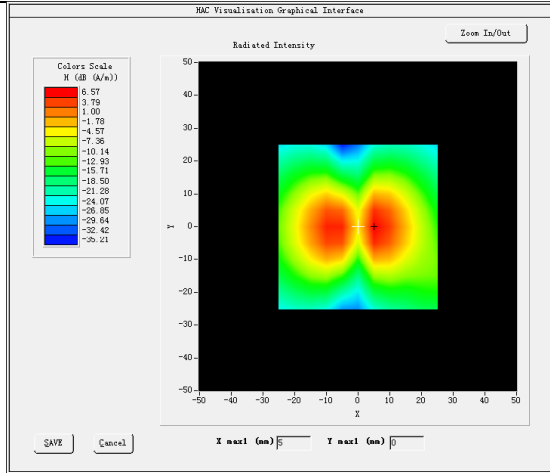
A. Experimental conditions.

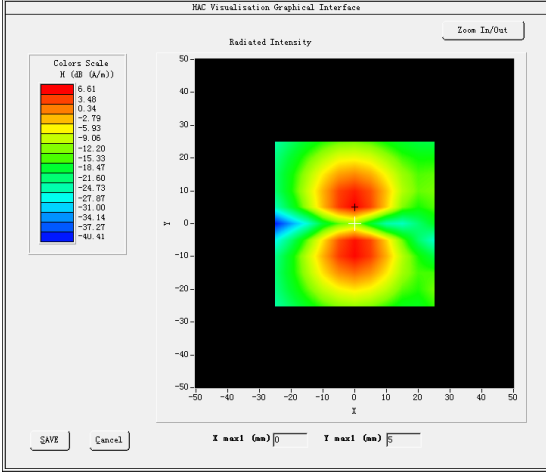
Grid size (mm x mm)	50.0, 50.0
Step (mm)	5
Scanning Height (mm)	10.0
Band	GSM850

B. HAC Measurement Results

Frequency (MHz): 824.200000

AXIAL ABM1	AXIAL ABM2
	NOT AVAILABLE

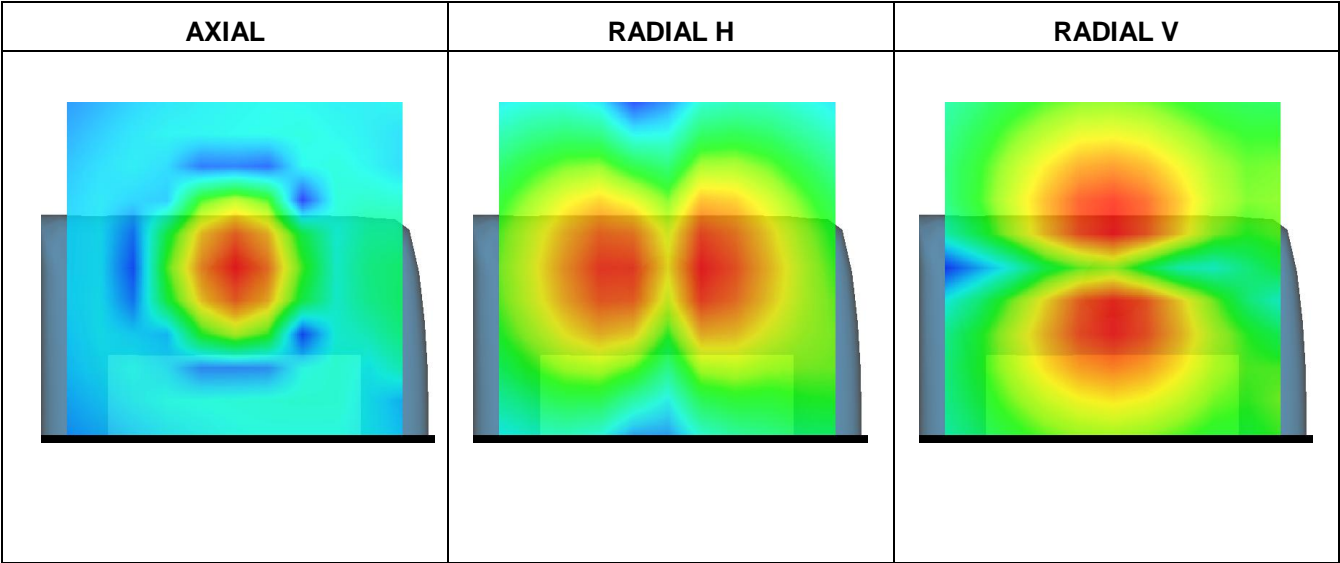
RADIAL H ABM1	RADIAL H ABM2
	NOT AVAILABLE

RADIAL V ABM1	RADIAL V ABM2
	NOT AVAILABLE

## Test Summary

C63.19	Mod e	Band	Test Description	Minimum Limit	Location	Measure d	Categor y	Verdict
				dBA/m	-	dBA/m	-	Pass/Fail
7.3.1.1	GSM	GSM850	Intensity, Axial	-18	Max	16.56	-	PASS
7.3.1.2			Intensity, RadialH	-18	Max	6.57	-	PASS
				-	-	-	-	-
7.3.1.2			Intensity, RadialV	-18	Max	6.61	-	PASS
				-	-	-	-	-
7.3.3			Signal to noise/noise, Axial	20	Max	39.11	T4	PASS
7.3.3			Signal to noise/noise, RadialH	20	Max	34.90	T4	PASS
				-	-	-	-	-
7.3.3			Signal to noise/noise, RadialV	20	Max	25.46	T3	PASS
				-	-	-	-	-
7.3.2			Frequency reponse, Axial	-	-	-	-	-

**T.Coil Scan Overlay Magnetic Field Distributions**



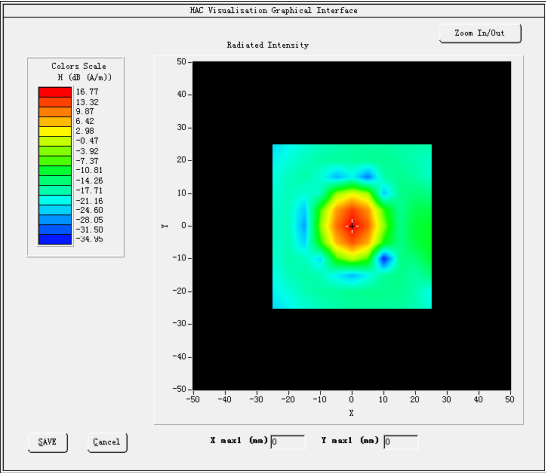
GSM850-Middle

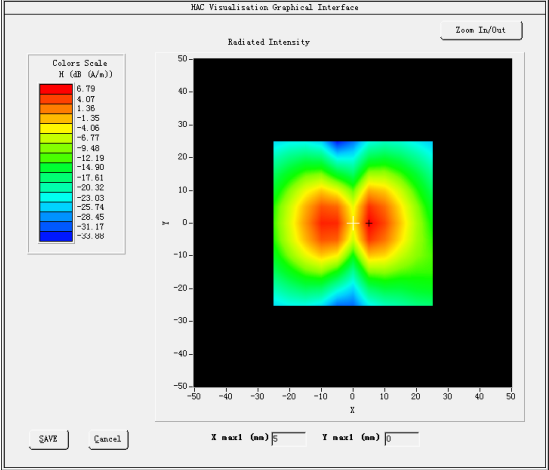
A. Experimental conditions.

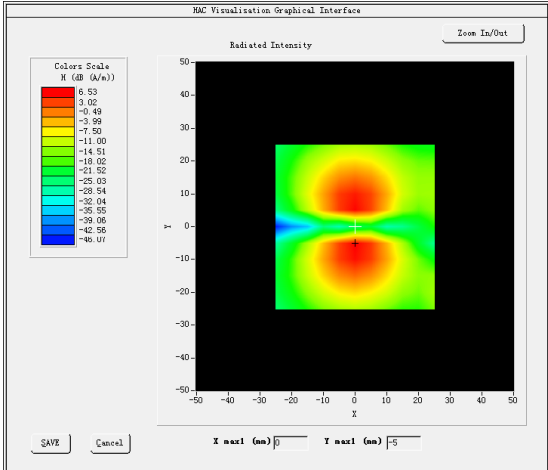
Grid size (mm x mm)	50.0, 50.0
Step (mm)	5
Scanning Height (mm)	10.0
Band	GSM850

B. HAC Measurement Results

Frequency (MHz): 836.400000

AXIAL ABM1	AXIAL ABM2
	NOT AVAILABLE

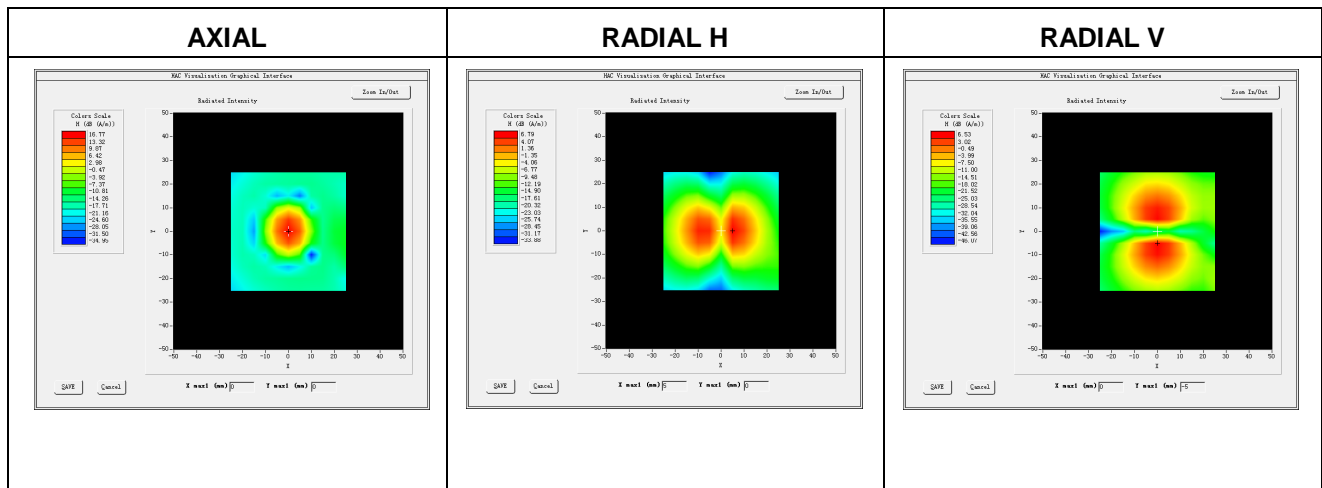
<div><div>RADIAL H ABM1</div><div></div></div>	<div><div>RADIAL H ABM2</div><div>NOT AVAILABLE</div></div>
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<div><div>RADIAL V ABM1</div><div></div></div>	<div><div>RADIAL V ABM2</div><div>NOT AVAILABLE</div></div>
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## Test Summary

C63.19	Mod e	Band	Test Description	Minimum Limit	Location	Measure d	Categor y	Verdict
				dBA/m	-	dBA/m	-	Pass/Fail
7.3.1.1	GSM	GSM850	Intensity, Axial	-18	Max	16.77	-	PASS
7.3.1.2			Intensity, RadialH	-18	Max	6.79	-	PASS
				-	-	-	-	-
7.3.1.2			Intensity, RadialV	-18	Max	6.53	-	PASS
				-	-	-	-	-
7.3.3			Signal to noise/noise, Axial	20	Max	38.45	T4	PASS
7.3.3			Signal to noise/noise, RadialH	20	Max	34.85	T4	PASS
				-	-	-	-	-
7.3.3			Signal to noise/noise, RadialV	20	Max	32.30	T4	PASS
				-	-	-	-	-
7.3.2			Frequency reponse, Axial	-	-	-	-	-

## T.Coil Scan Overlay Magnetic Field Distributions



GSM850-High

A. Experimental conditions.

Grid size (mm x mm)	50.0, 50.0
Step (mm)	5
Scanning Height (mm)	10.0
Band	GSM850

B. HAC Measurement Results

Frequency (MHz): 848.799988

AXIAL ABM1	AXIAL ABM2
	NOT AVAILABLE

## RADIAL H ABM1

RAC Visualization Graphical Interface

Zoom In/Out

Colors Scale  
K (dB (A/m))

6.87
3.88
1.10
-1.69
-4.48
-7.26
-10.05
-12.83
-15.62
-18.41
-21.19
-23.98
-26.76
-29.55
-32.34
-35.12

Radiated Intensity

X

Y

X max1 (mm) 5 Y max1 (mm) 5

SAVE Cancel

## RADIAL H ABM2

NOT AVAILABLE

## RADIAL V ABM1

RAC Visualization Graphical Interface

Zoom In/Out

Colors Scale  
K (dB (A/m))

6.25
3.13
0.01
-3.10
-6.22
-9.34
-12.46
-15.58
-18.70
-21.82
-24.94
-28.05
-31.17
-34.29
-37.41
-40.52

Radiated Intensity

X

Y

X max1 (mm) 5 Y max1 (mm) 5

SAVE Cancel

## RADIAL V ABM2

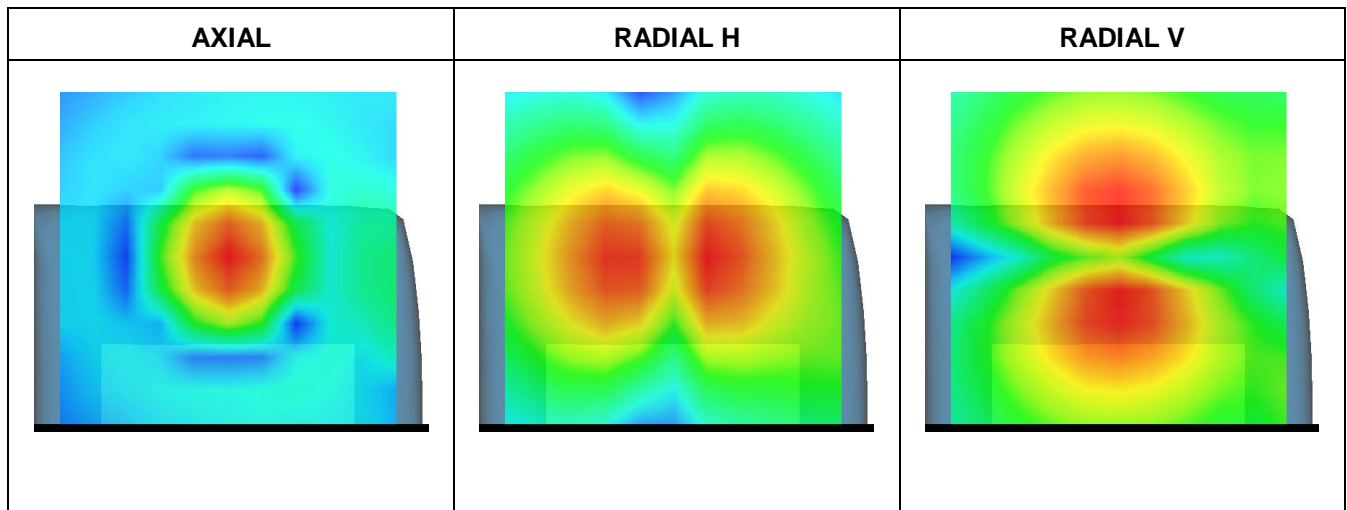
NOT AVAILABLE



## Test Summary

C63.19	Mod e	Band	Test Description	Minimum Limit	Location	Measure d	Categor y	Verdict
				dBA/m	-	dBA/m	-	Pass/Fail
7.3.1.1	GSM	GSM850	Intensity, Axial	-18	Max	16.85	-	PASS
7.3.1.2			Intensity, RadialH	-18	Max	7.04	-	PASS
				-	-	-	-	-
7.3.1.2			Intensity, RadialV	-18	Max	6.62	-	PASS
				-	-	-	-	-
7.3.3			Signal to noise/noise, Axial	20	Max	37.70	T4	PASS
7.3.3			Signal to noise/noise, RadialH	20	Max	35.02	T4	PASS
				-	-	-	-	-
7.3.3			Signal to noise/noise, RadialV	20	Max	26.02	T3	PASS
				-	-	-	-	-
7.3.2			Frequency reponse, Axial	-	-	-	-	-

## T.Coil Scan Overlay Magnetic Field Distributions



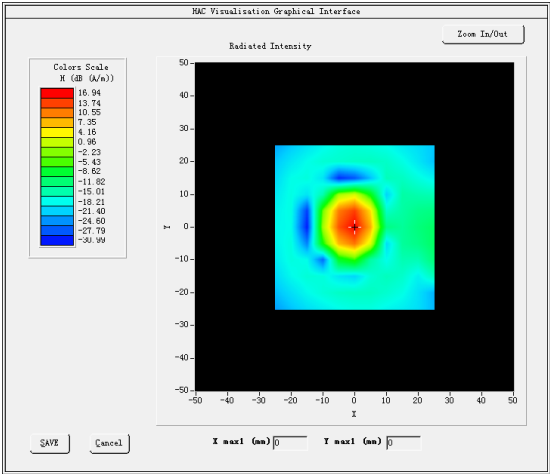
GSM1900-Low

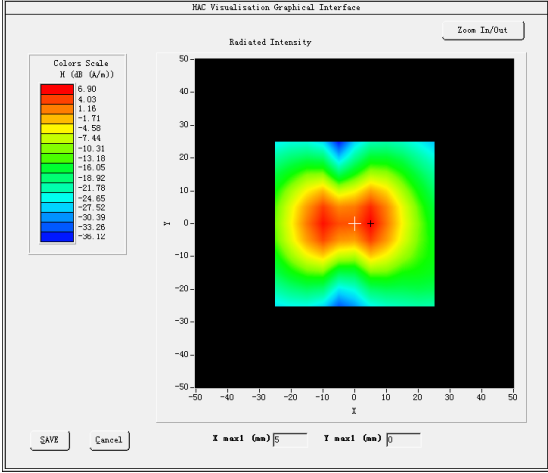
A. Experimental conditions.

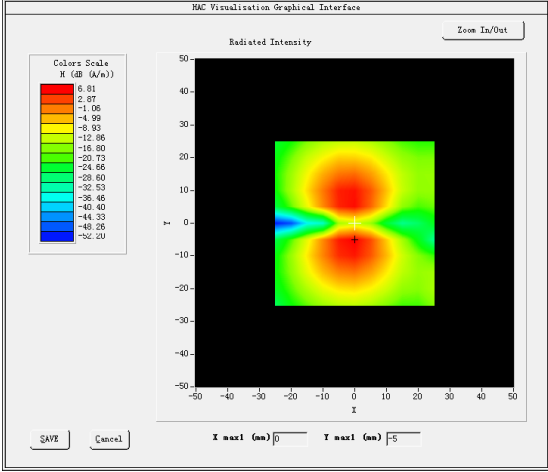
Grid size (mm x mm)	50.0, 50.0
Step (mm)	5
Scanning Height (mm)	10.0
Band	GSM1900

B. HAC Measurement Results

Frequency (MHz): 1850.199951

AXIAL ABM1	AXIAL ABM2
	NOT AVAILABLE

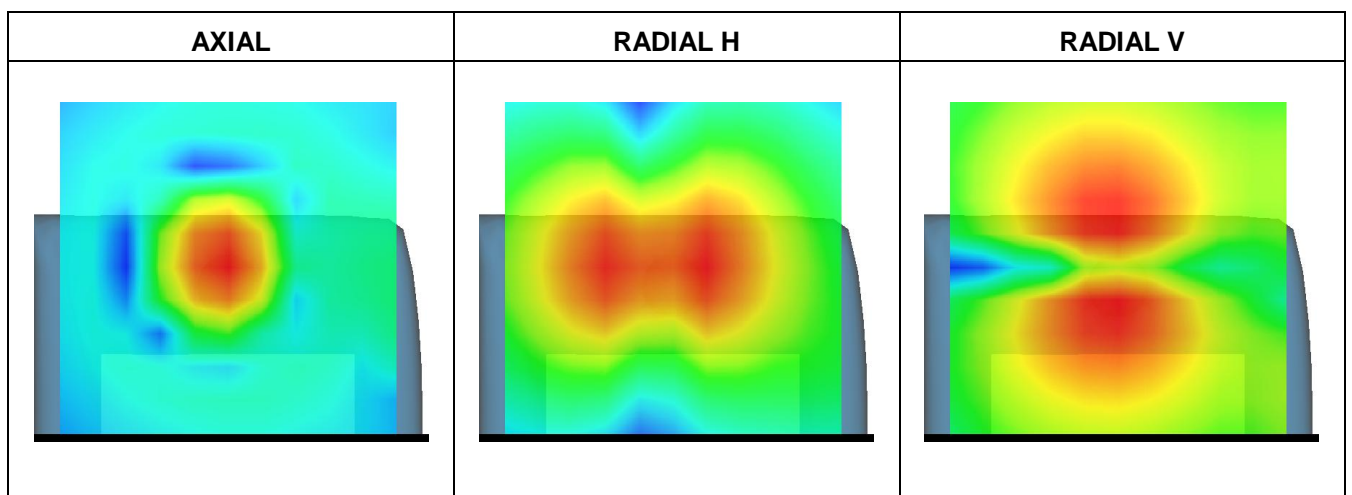
RADIAL H ABM1	RADIAL H ABM2
	NOT AVAILABLE

RADIAL V ABM1	RADIAL V ABM2
	NOT AVAILABLE

## Test Summary

C63.19	Mod e	Band	Test Description	Minimum Limit	Location	Measure d	Category	Verdict
				dBA/m	-	dBA/m	-	Pass/Fail
7.3.1.1	GSM	GSM190 0	Intensity, Axial	-18	Max	16.94	-	PASS
7.3.1.2			Intensity, RadialH	-18	Max	6.90	-	PASS
				-	-	-	-	-
7.3.1.2			Intensity, RadialV	-18	Max	6.81	-	PASS
				-	-	-	-	-
7.3.3			Signal to noise/noise, Axial	20	Max	39.79	T4	PASS
7.3.3			Signal to noise/noise, RadialH	20	Max	36.22	T4	PASS
				-	-	-	-	-
7.3.3			Signal to noise/noise, RadialV	20	Max	30.31	T4	PASS
				-	-	-	-	-
7.3.2			Frequency reponse, Axial	-	-	-	-	-

## T.Coil Scan Overlay Magnetic Field Distributions



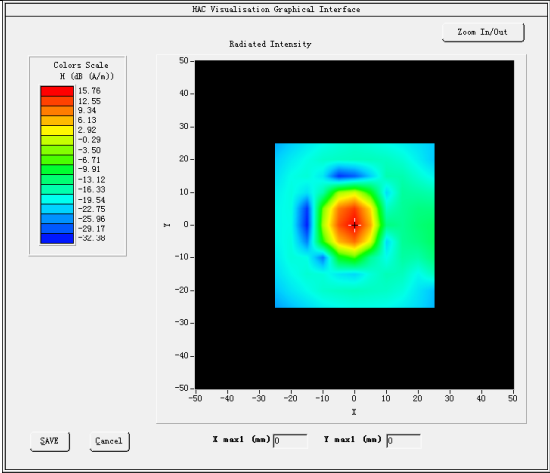
GSM1900-Middle

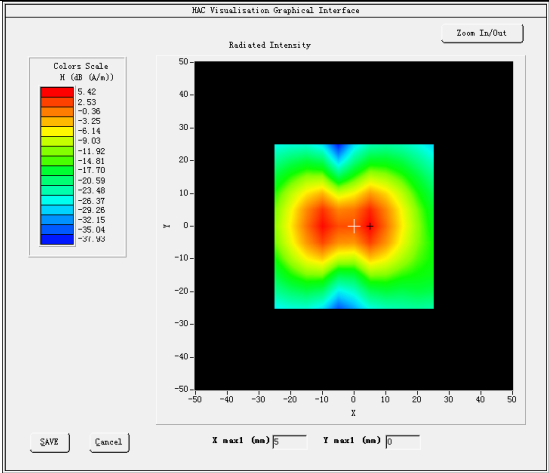
A. Experimental conditions.

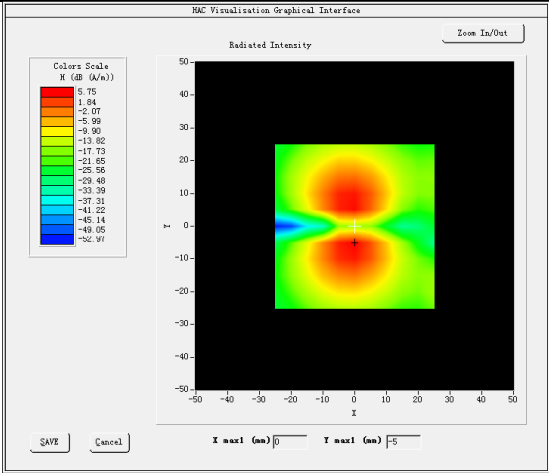
Grid size (mm x mm)	50.0, 50.0
Step (mm)	5
Scanning Height (mm)	10.0
Band	GSM1900

B. HAC Measurement Results

Frequency (MHz): 1880.000000

AXIAL ABM1	AXIAL ABM2
	NOT AVAILABLE

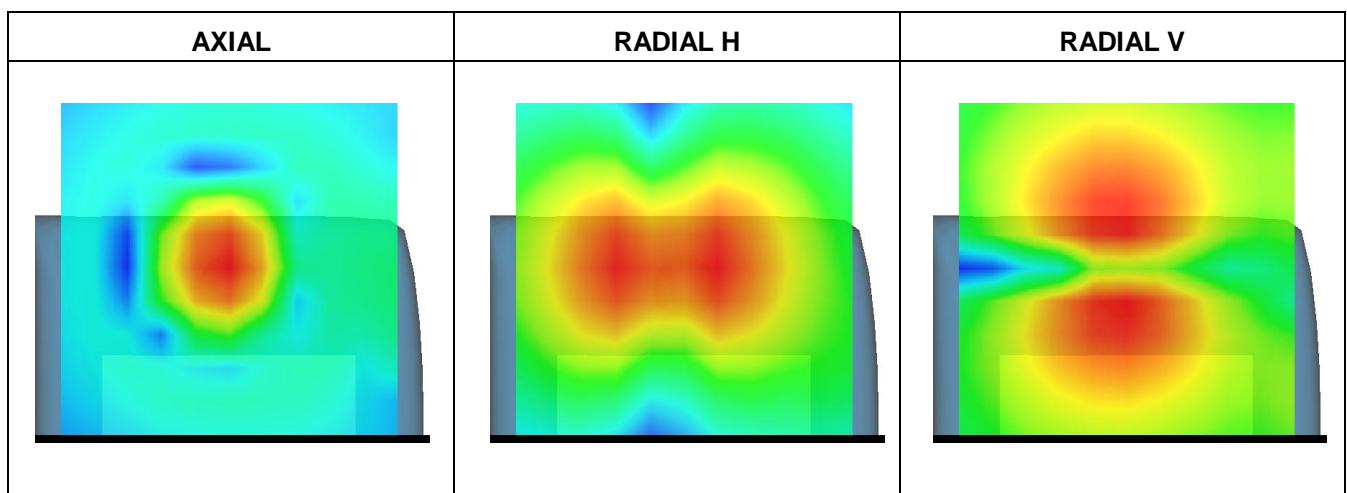
<div><div>RADIAL H ABM1</div><div></div></div>	<div><div>RADIAL H ABM2</div><div>NOT AVAILABLE</div></div>
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<div><div>RADIAL V ABM1</div><div></div></div>	<div><div>RADIAL V ABM2</div><div>NOT AVAILABLE</div></div>
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## Test Summary

C63.19	Mod e	Band	Test Description	Minimum Limit	Location	Measure d	Categor y	Verdict
				dBa/m	-	dBa/m	-	Pass/Fail
7.3.1.1	GSM	GSM190 0	Intensity, Axial	-18	Max	15.76	-	PASS
7.3.1.2			Intensity, RadialH	-18	Max	5.42	-	PASS
				-	-	-	-	-
7.3.1.2			Intensity, RadialV	-18	Max	5.75	-	PASS
				-	-	-	-	-
7.3.3			Signal to noise/noise, Axial	20	Max	37.25	T4	PASS
7.3.3			Signal to noise/noise, RadialH	20	Max	37.00	T4	PASS
				-	-	-	-	-
7.3.3			Signal to noise/noise, RadialV	20	Max	30.40	T4	PASS
				-	-	-	-	-
7.3.2			Frequency reponse, Axial	-	-	-	-	-

## T.Coil Scan Overlay Magnetic Field Distributions



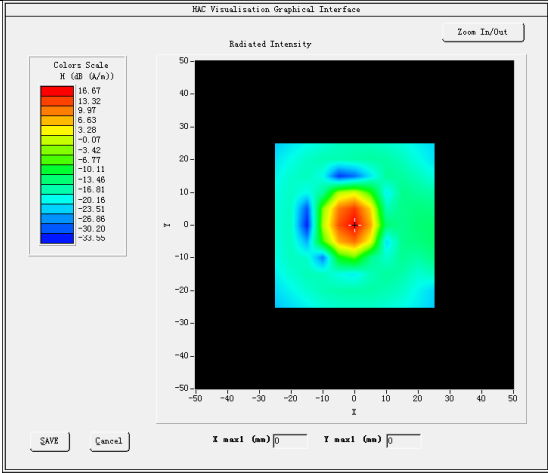
GSM1900-High

A. Experimental conditions.

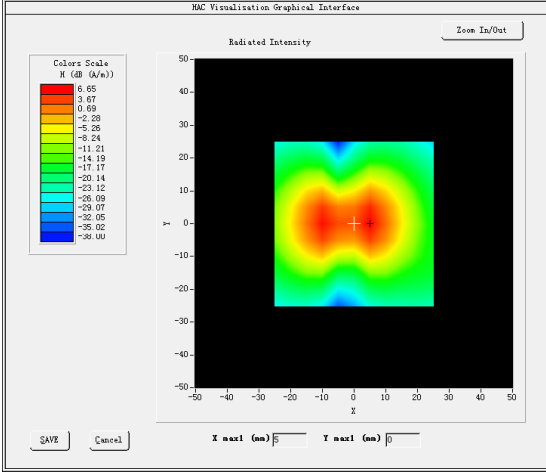
Grid size (mm x mm)	50.0, 50.0
Step (mm)	5
Scanning Height (mm)	10.0
Band	GSM1900

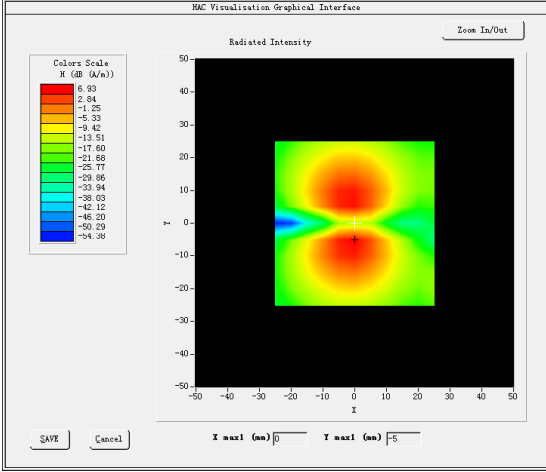
B. HAC Measurement Results

Frequency (MHz): 1909.800049

AXIAL ABM1	AXIAL ABM2
	NOT AVAILABLE



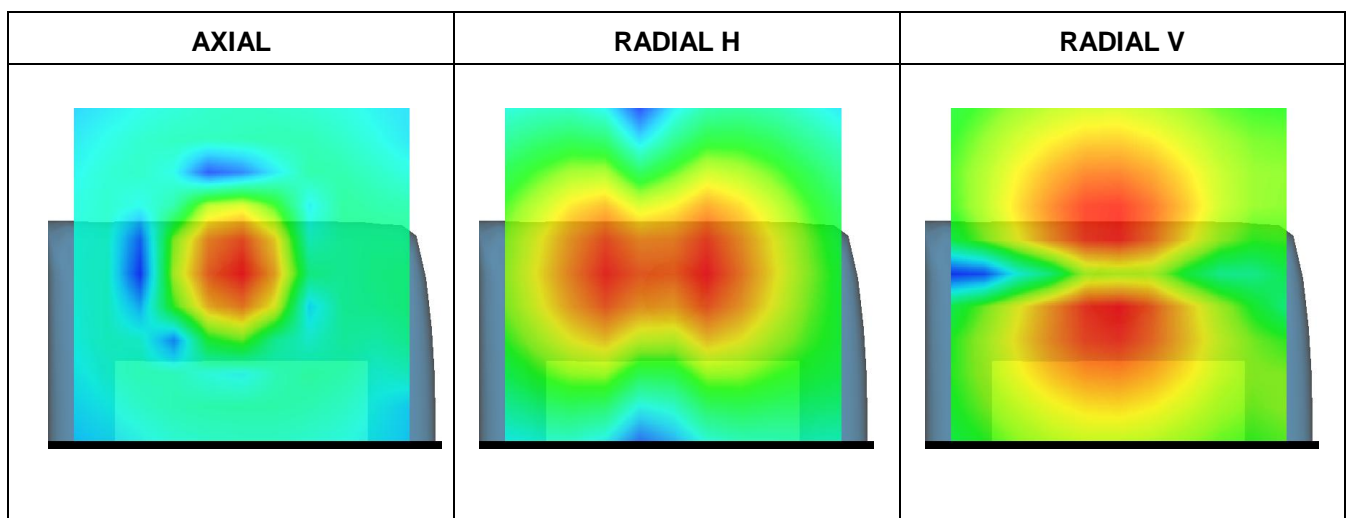
<div><div>RADIAL H ABM1</div><div></div></div>	<div><div>RADIAL H ABM2</div><div>NOT AVAILABLE</div></div>
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<div><div>RADIAL V ABM1</div><div></div></div>	<div><div>RADIAL V ABM2</div><div>NOT AVAILABLE</div></div>
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## Test Summary

C63.19	Mod e	Band	Test Description	Minimum Limit	Location	Measure d	Categor y	Verdict
				dBA/m	-	dBA/m	-	Pass/Fail
7.3.1.1	GSM	GSM190 0	Intensity, Axial	-18	Max	16.67	-	PASS
7.3.1.2			Intensity, RadialH	-18	Max	6.73	-	PASS
				-	-	-	-	-
7.3.1.2			Intensity, RadialV	-18	Max	6.97	-	PASS
				-	-	-	-	-
7.3.3			Signal to noise/noise, Axial	20	Max	39.93	T4	PASS
7.3.3			Signal to noise/noise, RadialH	20	Max	38.65	T4	PASS
				-	-	-	-	-
7.3.3			Signal to noise/noise, RadialV	20	Max	33.58	T4	PASS
				-	-	-	-	-
7.3.2			Frequency reponse, Axial	-	-	-	-	-

## T.Coil Scan Overlay Magnetic Field Distributions



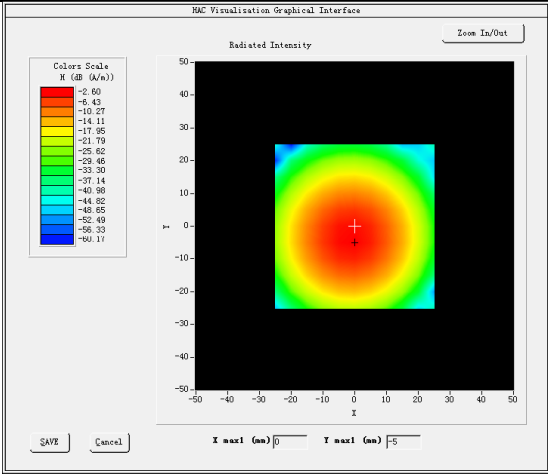
WCDMA 1900-Low

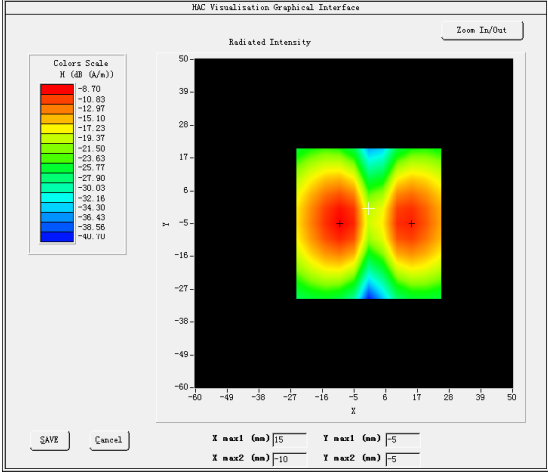
A. Experimental conditions.

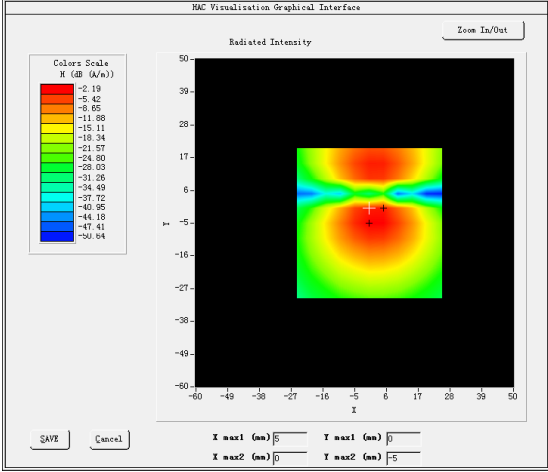
Grid size (mm x mm)	50.0, 50.0
Step (mm)	5
Scanning Height (mm)	10.0
Band	WCDMA II

B. HAC Measurement Results

Frequency (MHz): 1852.000000

AXIAL ABM1	AXIAL ABM2
	NOT AVAILABLE

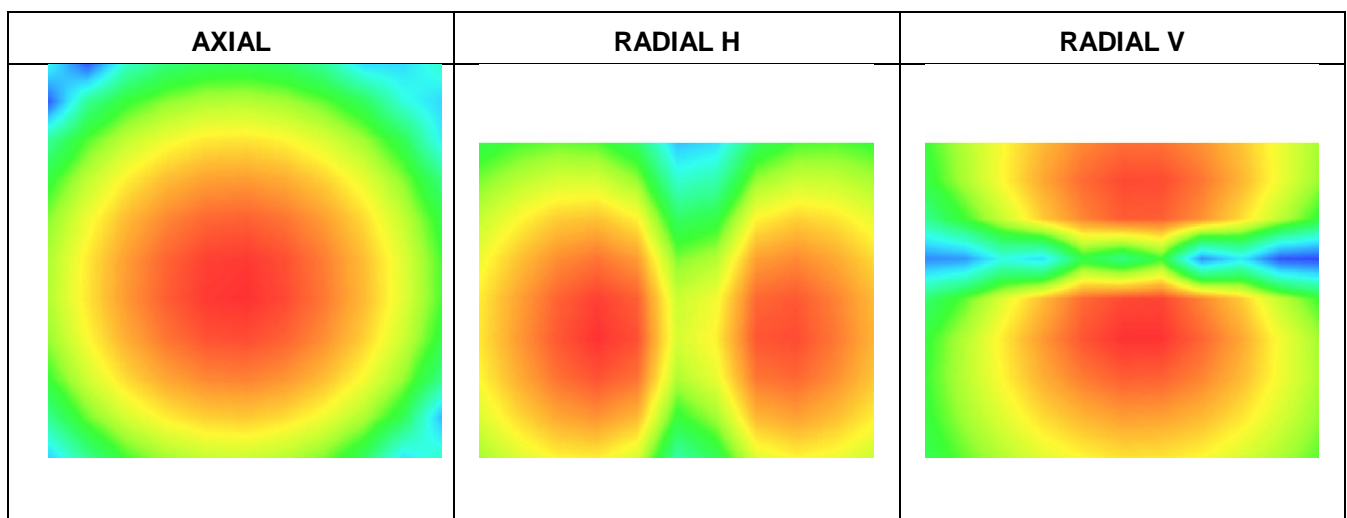
<div><div>RADIAL H ABM1</div><div></div></div>	<div><div>RADIAL H ABM2</div><div>NOT AVAILABLE</div></div>
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<div><div>RADIAL V ABM1</div><div></div></div>	<div><div>RADIAL V ABM2</div><div>NOT AVAILABLE</div></div>
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## Test Summary

C63.19	Mod e	Band	Test Description	Minimum Limit	Location	Measure d	Categor y	Verdict
				dBA/m	-	dBA/m	-	Pass/Fail
7.3.1.1	WCD MA	Band2_W CDMA19 00	Intensity, Axial	-18	Max	-2.60	-	PASS
7.3.1.2			Intensity, RadialH	-18	Max	-8.70	-	PASS
				-	-	-	-	-
7.3.1.2			Intensity, RadialV	-18	Max	-2.19	-	PASS
				-	-	-	-	-
7.3.3			Signal to noise/noise, Axial	20	Max	38.91	T4	PASS
7.3.3			Signal to noise/noise, RadialH	20	Max	32.86	T4	PASS
				-	-	-	-	-
7.3.3			Signal to noise/noise, RadialV	20	Max	32.36	T4	PASS
				-	-	-	-	-
7.3.2			Frequency reponse, Axial	-	-	-	-	-

## T.Coil Scan Overlay Magnetic Field Distributions



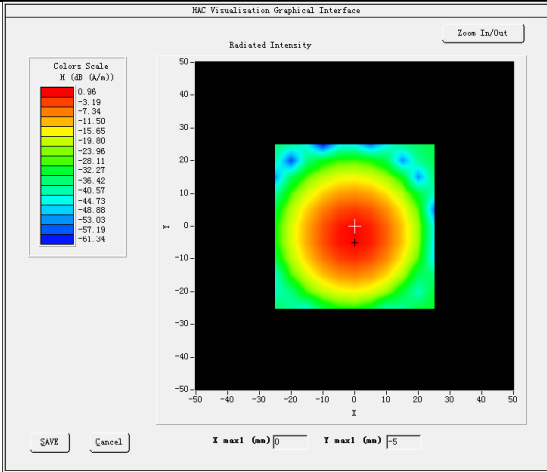
WCDMA 1900-Mid

A. Experimental conditions.

Grid size (mm x mm)	50.0, 50.0
Step (mm)	5
Scanning Height (mm)	10.0
Band	WCDMA II

B. HAC Measurement Results

Frequency (MHz): 1880.000000

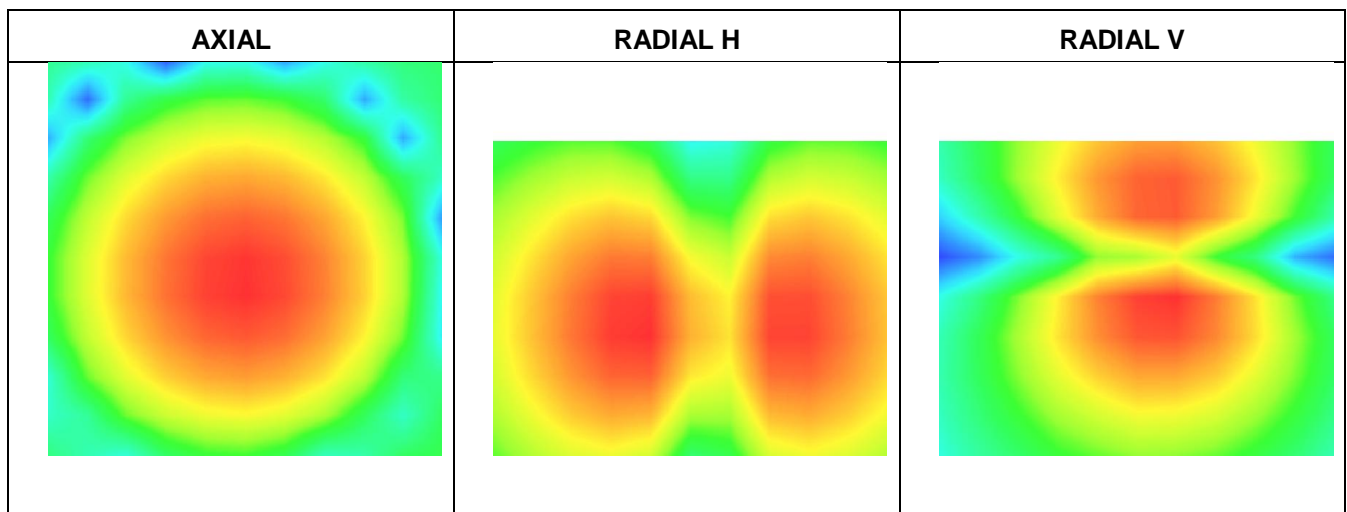
AXIAL ABM1	AXIAL ABM2
	NOT AVAILABLE



## Test Summary

C63.19	Mod e	Band	Test Description	Minimum Limit	Location	Measure d	Categor y	Verdict
				dBA/m	-	dBA/m	-	Pass/Fail
7.3.1.1	WCD MA	Band2_WC DMA1900	Intensity, Axial	-18	Max	0.96	-	PASS
7.3.1.2			Intensity, RadialH	-18	Max	-3.85	-	PASS
				-	-	-	-	-
7.3.1.2			Intensity, RadialV	-18	Max	4.91	-	PASS
				-	-	-	-	-
7.3.3			Signal to noise/noise, Axial	20	Max	40.78	T4	PASS
7.3.3			Signal to noise/noise, RadialH	20	Max	37.06	T4	PASS
				-	-	-	-	-
7.3.3			Signal to noise/noise, RadialV	20	Max	37.54	T4	PASS
				-	-	-	-	-
7.3.2			Frequency reponse, Axial	-	-	-	-	-

## T.Coil Scan Overlay Magnetic Field Distributions





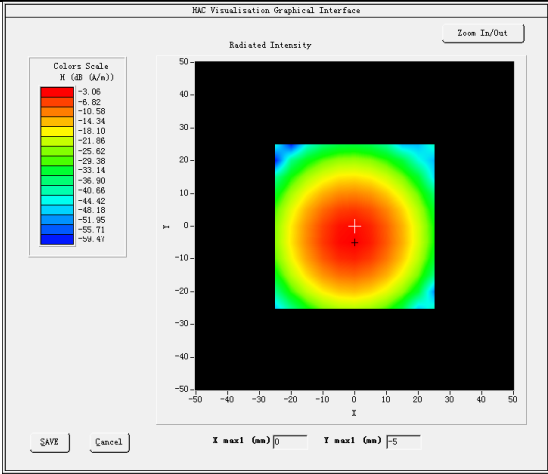
WCDMA 1900-High

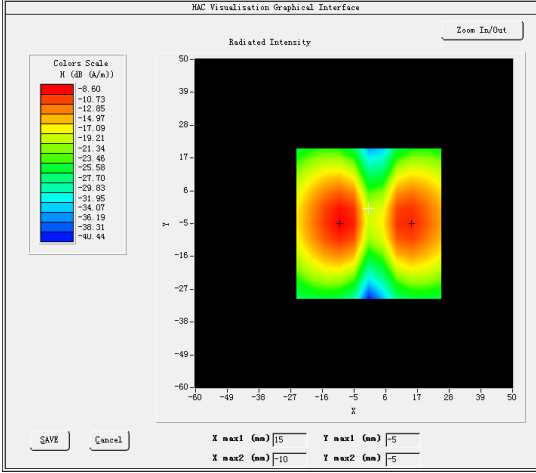
A. Experimental conditions.

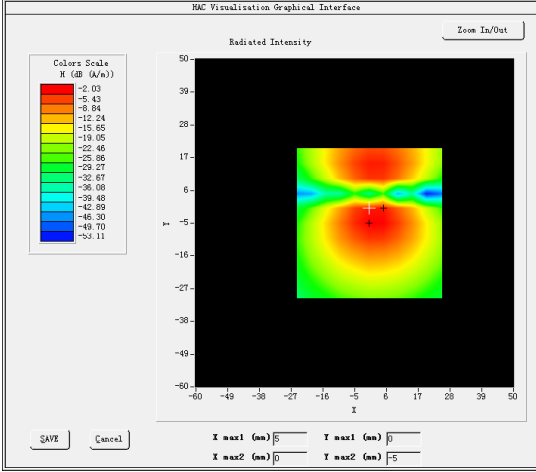
Grid size (mm x mm)	50.0, 50.0
Step (mm)	5
Scanning Height (mm)	10.0
Band	WCDMA II

B. HAC Measurement Results

Frequency (MHz): 1907.000000

AXIAL ABM1	AXIAL ABM2
	NOT AVAILABLE

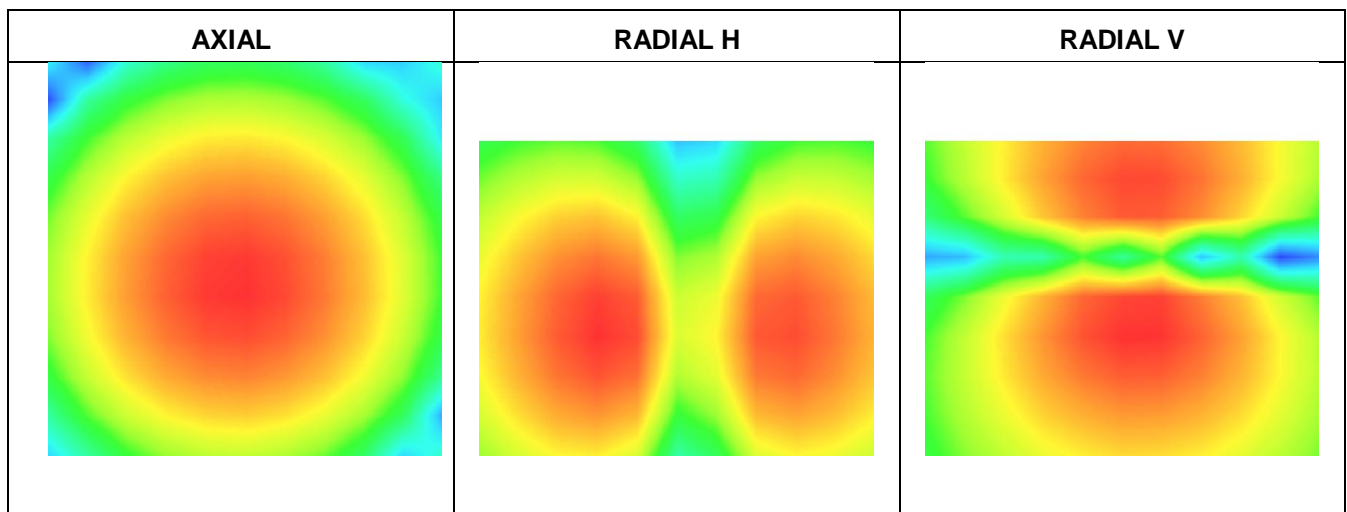
RADIAL H ABM1	RADIAL H ABM2
	NOT AVAILABLE

RADIAL V ABM1	RADIAL V ABM2
	NOT AVAILABLE

## Test Summary

C63.19	Mod e	Band	Test Description	Minimum Limit	Location	Measure d	Categor y	Verdict
				dBA/m	-	dBA/m	-	Pass/Fail
7.3.1.1	WCD MA	Band2_WC DMA1900	Intensity, Axial	-18	Max	-3.06	-	PASS
7.3.1.2			Intensity, RadialH	-18	Max	-8.60	-	PASS
				-	-	-	-	-
7.3.1.2			Intensity, RadialV	-18	Max	-2.03	-	PASS
				-	-	-	-	-
7.3.3			Signal to noise/noise, Axial	20	Max	38.28	T4	PASS
7.3.3			Signal to noise/noise, RadialH	20	Max	32.64	T4	PASS
				-	-	-	-	-
7.3.3			Signal to noise/noise, RadialV	20	Max	33.26	T4	PASS
				-	-	-	-	-
7.3.2			Frequency reponse, Axial	-	-	-	-	-

## T.Coil Scan Overlay Magnetic Field Distributions



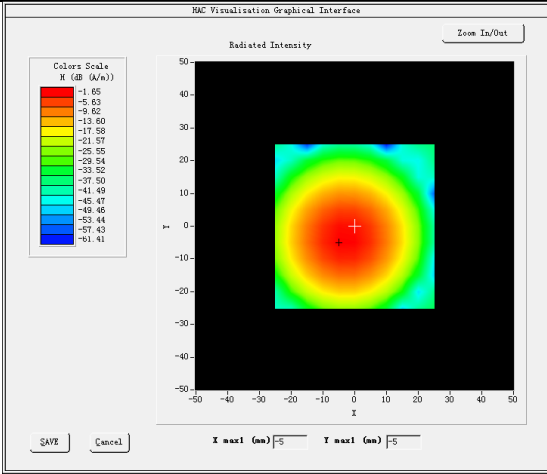
WCDMA 850-Low

A. Experimental conditions.

Grid size (mm x mm)	50.0, 50.0
Step (mm)	5
Scanning Height (mm)	10.0
Band	WCDMA V

B. HAC Measurement Results

Frequency (MHz): 826.000000

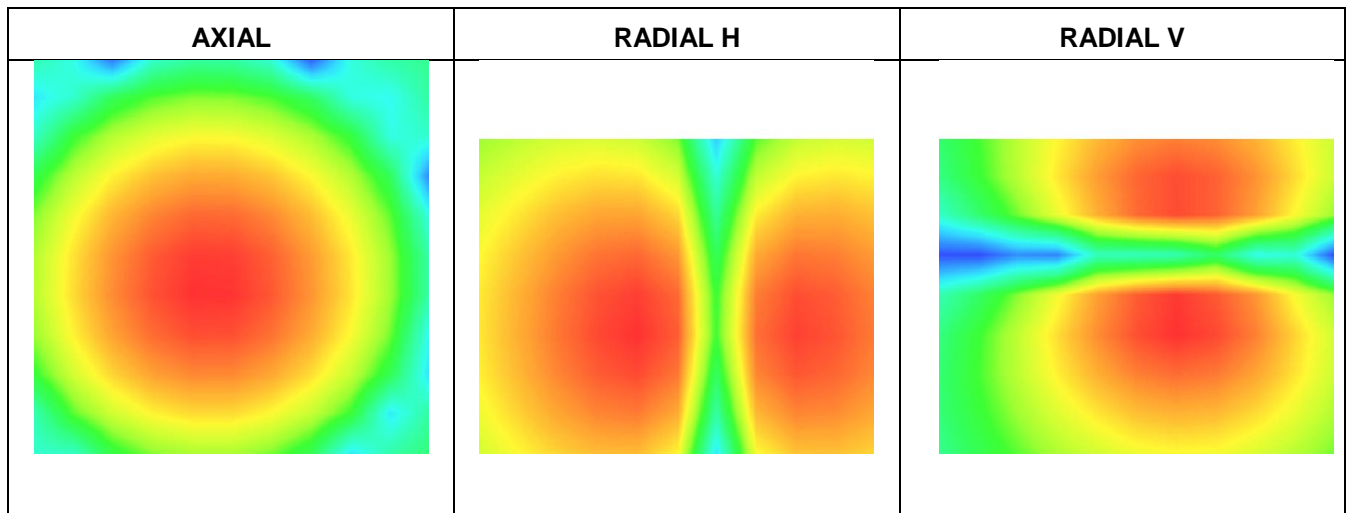
AXIAL ABM1	AXIAL ABM2
	NOT AVAILABLE



## Test Summary

C63.19	Mod e	Band	Test Description	Minimum Limit	Location	Measure d	Categor y	Verdict
				dBA/m	-	dBA/m	-	Pass/Fail
7.3.1.1	WCD MA	Band2_WC DMA1900	Intensity, Axial	-18	Max	-1.65	-	PASS
7.3.1.2			Intensity, RadialH	-18	Max	-5.15	-	PASS
				-	-	-	-	-
7.3.1.2			Intensity, RadialV	-18	Max	0.79	-	PASS
				-	-	-	-	-
7.3.3			Signal to noise/noise, Axial	20	Max	38.66	T4	PASS
7.3.3			Signal to noise/noise, RadialH	20	Max	35.01	T4	PASS
				-	-	-	-	-
7.3.3			Signal to noise/noise, RadialV	20	Max	35.01	T4	PASS
				-	-	-	-	-
7.3.2			Frequency reponse, Axial	-	-	-	-	-

## T.Coil Scan Overlay Magnetic Field Distributions



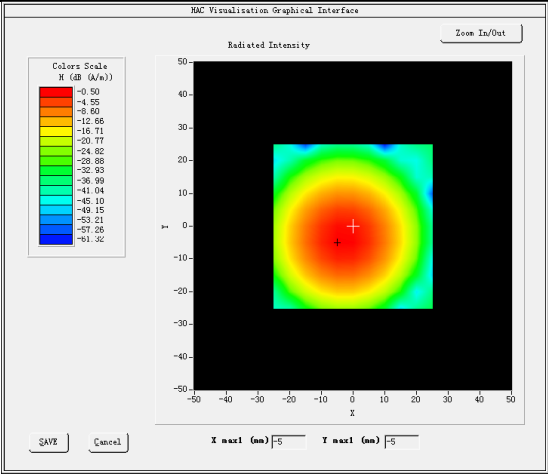
WCDMA 850-Mid

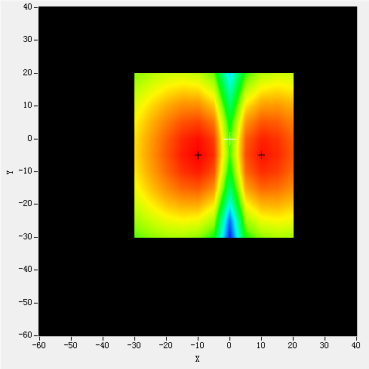
A. Experimental conditions.

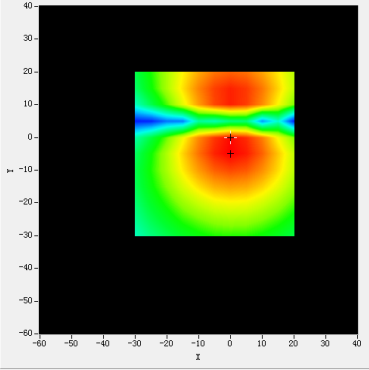
Grid size (mm x mm)	50.0, 50.0
Step (mm)	5
Scanning Height (mm)	10.0
Band	WCDMA V

B. HAC Measurement Results

Frequency (MHz): 836.000000

AXIAL ABM1	AXIAL ABM2
	NOT AVAILABLE

<div><div>RADIAL H ABM1</div><div><div>RAC Visualization Graphical Interface</div><div><div>Zoom In/Out</div><div>Colors Scale H (dB (A/m))</div><div><div><div>-5.94</div><div>-8.95</div><div>-12.76</div><div>-16.17</div><div>-19.59</div><div>-23.00</div><div>-26.41</div><div>-29.82</div><div>-33.23</div><div>-36.64</div><div>-40.06</div><div>-43.47</div><div>-46.88</div><div>-50.29</div><div>-53.70</div><div>-57.12</div></div></div><div><div>Radiated Intensity</div><div></div><div><div>X max1 (mm)</div><div>10</div><div>Y max1 (mm)</div><div>-5</div><div>X max2 (mm)</div><div>-10</div><div>Y max2 (mm)</div><div>-5</div></div><div><div>SAVE</div><div>CANCEL</div></div></div></div></div></div>	<div><div>RADIAL H ABM2</div><div>NOT AVAILABLE</div></div>
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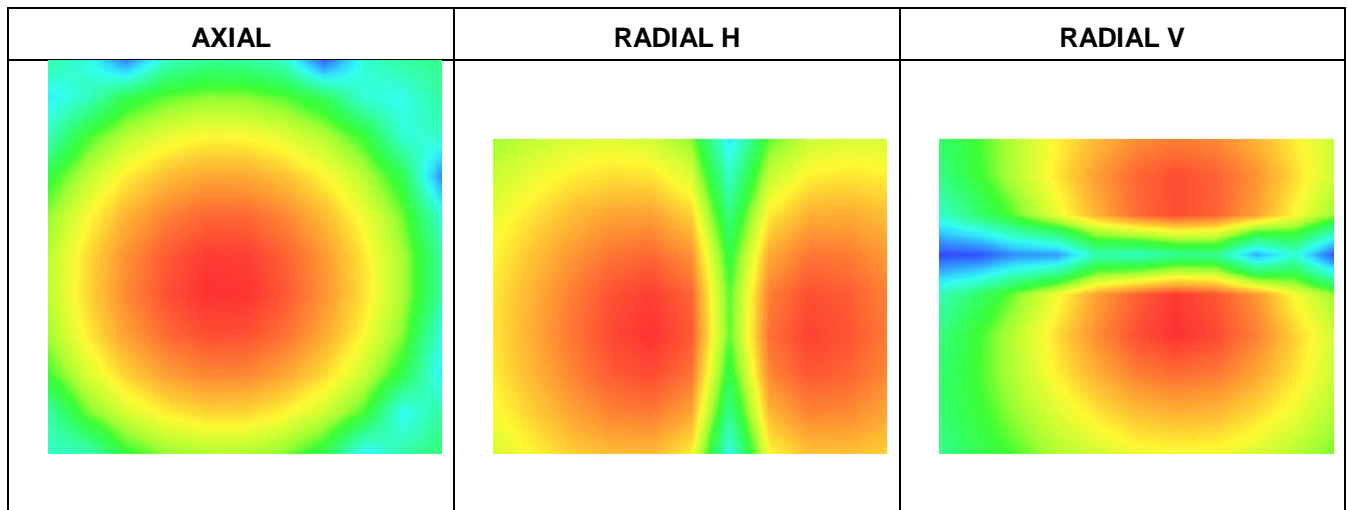
<div><div>RADIAL V ABM1</div><div><div>RAC Visualization Graphical Interface</div><div><div>Zoom In/Out</div><div>Colors Scale H (dB (A/m))</div><div><div><div>2.39</div><div>-1.13</div><div>-4.88</div><div>-8.17</div><div>-11.69</div><div>-15.21</div><div>-18.73</div><div>-22.25</div><div>-25.77</div><div>-29.30</div><div>-32.82</div><div>-36.34</div><div>-39.86</div><div>-43.38</div><div>-46.90</div><div>-50.42</div></div></div><div><div>Radiated Intensity</div><div></div><div><div>X max1 (mm)</div><div>0</div><div>Y max1 (mm)</div><div>0</div><div>X max2 (mm)</div><div>0</div><div>Y max2 (mm)</div><div>-5</div></div><div><div>SAVE</div><div>CANCEL</div></div></div></div></div></div>	<div><div>RADIAL V ABM2</div><div>NOT AVAILABLE</div></div>
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## Test Summary

C63.19	Mod e	Band	Test Description	Minimum Limit	Location	Measure d	Categor y	Verdict
				dBA/m	-	dBA/m	-	Pass/Fail
7.3.1.1	WCD MA	Band2_WC DMA1900	Intensity, Axial	-18	Max	-0.50	-	PASS
7.3.1.2			Intensity, RadialH	-18	Max	-5.94	-	PASS
				-	-	-	-	-
7.3.1.2			Intensity, RadialV	-18	Max	2.39	-	PASS
				-	-	-	-	-
7.3.3			Signal to noise/noise, Axial	20	Max	40.71	T4	PASS
7.3.3			Signal to noise/noise, RadialH	20	Max	34.99	T4	PASS
				-	-	-	-	-
7.3.3			Signal to noise/noise, RadialV	20	Max	34.45	T4	PASS
				-	-	-	-	-
7.3.2			Frequency reponse, Axial	-	-	-	-	-

## T.Coil Scan Overlay Magnetic Field Distributions



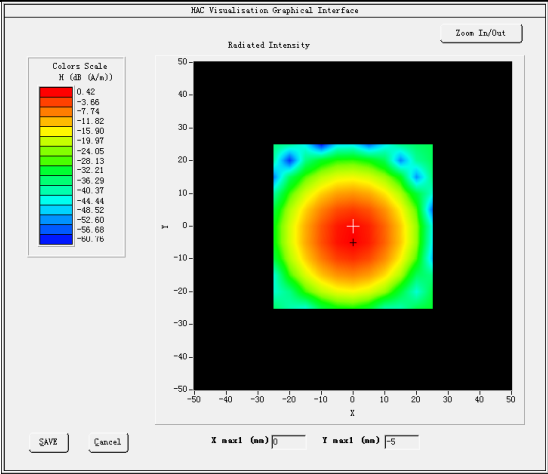
WCDMA 850-High

A. Experimental conditions.

Grid size (mm x mm)	50.0, 50.0
Step (mm)	5
Scanning Height (mm)	10.0
Band	WCDMA V

B. HAC Measurement Results

Frequency (MHz): 846.000000

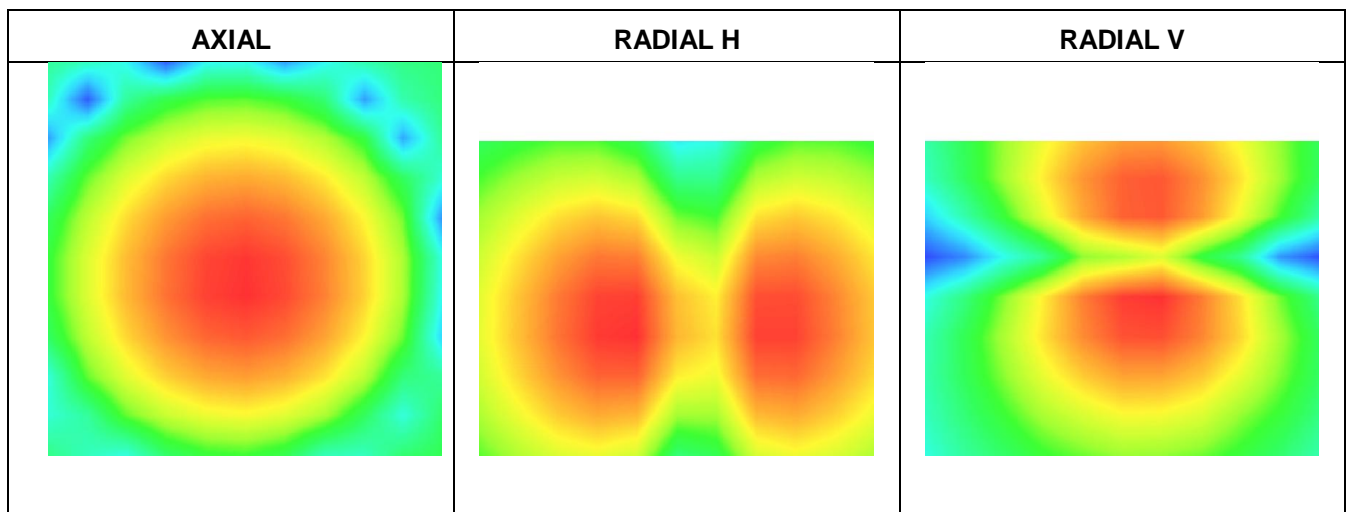
AXIAL ABM1	AXIAL ABM2
	NOT AVAILABLE



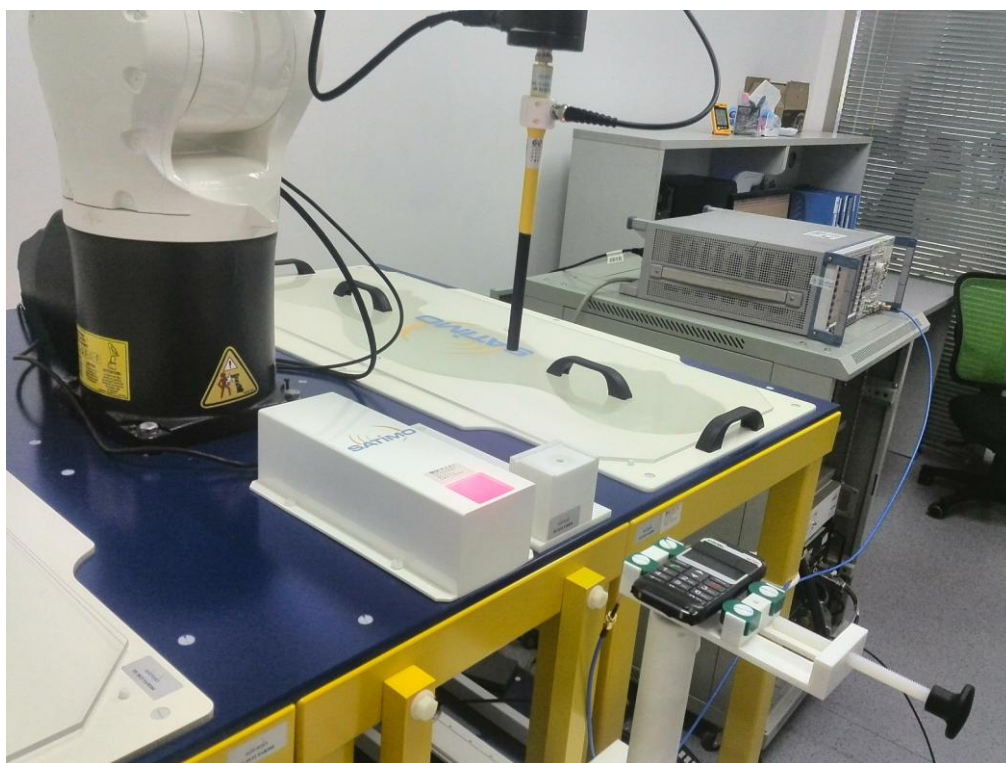
## Test Summary

C63.19	Mod e	Band	Test Description	Minimum Limit	Location	Measure d	Categor y	Verdict
				dBA/m	-	dBA/m	-	Pass/Fail
7.3.1.1	WCD MA	Band2_WC DMA1900	Intensity, Axial	-18	Max	0.42	-	PASS
7.3.1.2			Intensity, RadialH	-18	Max	-3.64	-	PASS
				-	-	-	-	-
7.3.1.2			Intensity, RadialV	-18	Max	4.98	-	PASS
				-	-	-	-	-
7.3.3			Signal to noise/noise, Axial	20	Max	40.42	T4	PASS
7.3.3			Signal to noise/noise, RadialH	20	Max	37.12	T4	PASS
				-	-	-	-	-
7.3.3			Signal to noise/noise, RadialV	20	Max	38.83	T4	PASS
				-	-	-	-	-
7.3.2			Frequency reponse, Axial	-	-	-	-	-

## T.Coil Scan Overlay Magnetic Field Distributions



## 5. T-coil Test Photo



---END OF THE REORT---